



0042977

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

Client: WESTINGHOUSE HANFORD
RFW #: 9309L997

W.O. #: 06168-002-001-9999-00
Date Received: 09-17-93

GC/MS VOLATILE

The set of samples consisted of three (3) soil samples collected on 09-15,16-93.

The samples were analyzed according to criteria set forth in CLP SOW 03/90 for TCL Volatile target compounds on 09-21,22,23-93.

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

1. Non-target compounds were detected in these samples.
2. All system monitoring compound (surrogate) recoveries were within EPA QC limits.
3. All matrix spike recoveries were within EPA QC limits.
4. The laboratory blanks contained the common contaminants Methylene Chloride and Acetone at levels less than 4x the CRQL. The laboratory blank 93LVR137-MB1 also contained the target compound 1,1,1-Trichloroethane at a level less than the CRQL.
5. All internal standard area and retention time criteria were met.



Margaret M. Beatty, J.P.C.

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

10/13/93
Date

9613401.2123

Westinghouse Hanford Company	SAMPLE ANALYSIS REQUEST		
Collector L E ROGERS	S.A.F. # 93-263	Date 9-16-93	
Company Contact L E ROGERS	Telephone (509) 376-7690		

Sample Number	*	Date Collected	Time Collected	Number and Type of Sample Containers/Analysis Required
B09342	S	9-15-93	0750	1,500ml P:CLP;TAL Metals,Hg,Ti 1,125ml Gs:VOA CLP 1,500ml aG:Semi-VOA CLP 1,250ml G:Anions F,Cl,SO4 (EPA 300.0) 1,125ml P/G:Anions NO2,NO3 (EPA 353.1) 1,250ml G:Cyanide CLP 1,1000ml P/G:Gross alpha/beta (PRO-032-15), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (PRO-042-5), U-235,U-234,U-238 (PRO-052-32) Np-237,(PRO-042-5) Pu-238,Pu-239/240 (PRO-052-32) Sr-90 (PRO-032-38,PRO-032-25) Tc-99 (PRO-032-78) Am-241,Cm-244 (PRO-052-32 or PRO-062-109) Se-79
B09343	S	9-15-93	0856	1,500ml P:CLP;TAL Metals,Hg,Ti 1,125ml Gs:VOA CLP 1,500ml aG:Semi-VOA CLP 1,250ml G:Anions F,Cl,SO4 (EPA 300.0) 1,125ml P/G:Anions NO2,NO3 (EPA 353.1) 1,250ml G:Cyanide CLP 1,1000ml P/G:Gross alpha/beta (PRO-032-15), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (PRO-042-5), U-235,U-234,U-238 (PRO-052-32) Np-237,(PRO-042-5) Pu-238,Pu-239/240 (PRO-052-32) Sr-90 (PRO-032-38,PRO-032-25) Tc-99 (PRO-032-78) Am-241,Cm-244 (PRO-052-32 or PRO-062-109) Se-79
			JER 9-16-93	 1,500ml P:CLP;TAL Metals,Hg,Ti 1,125ml Gs:VOA CLP 1,500ml aG:Semi-VOA CLP 1,250ml G:Anions F,Cl,SO4 (EPA 300.0) 1,125ml P/G:Anions NO2,NO3 (EPA 353.1) 1,250ml G:Cyanide CLP 1,1000ml P/G:Gross alpha/beta (PRO-032-15), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (PRO-042-5), U-235,U-234,U-238 (PRO-052-32) Np-237,(PRO-042-5) Pu-238,Pu-239/240 (PRO-052-32) Sr-90 (PRO-032-38,PRO-032-25) Tc-99 (PRO-032-78) Am-241,Cm-244 (PRO-052-32 or PRO-062-109) Se-79

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

Field Information **WESTON**
 Special Handling and/or Storage Maintain at 4C ; (SOIL)
 Possible Sample Hazards **NONE NOTED**

9613401-2124

Westinghouse
Hanford Company

CHAIN OF CUSTODY

Custody Form Initiator L E ROGERS

Company Contact L E ROGERS

Telephone 376-7690

Project Designation/Sampling Locations 200-UP-2

Collection Date 9-16-93

Ice Chest No. SML 364

Field Logbook No. EFL-1091

Bill of Lading/Airbill No. 2536956202

Offsite Property No. _____

Method of Shipment OVERNIGHT AIR SERVICE

Shipped to WESTON

Possible Sample Hazards/Remarks Keep samples at 4C (SOIL)

9309L997

Sample Identification

003 1)
1,250ml
for
9-16-93

B09348

- ~~1,500ml P:CLP;TAL Metals,Hg,Ti~~
- ~~1,125ml Gs:VOA CLP~~
- ~~1,500ml aG:Semi-VOA CLP~~
- ~~1,250ml G:Anions F,Cl,SO4 (EPA 300.0)~~
- ~~1,125ml P/G:Anions NO2,NO3 (EPA 353.1)~~
- ~~1,250ml G:Cyanide CLP~~
- ~~1,1000ml P/G:Gross alpha/beta (PRO-032-15), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152,
Eu-154,Eu-155,K-40,Ru-106,Na-22 (PRO-042-5), U-235,U-234,U-238 (PRO-052-32) Np-237,(PRO-042-5) Pu-238,Pu-
239/240 (PRO-052-32) Sr-90 (PRO-032-38,PRO-032-25) Tc-99 (PRO-032-78) Am-241,Cm-244 (PRO-052-32 or PRO-062-
109) Se-79~~

2)

- 1,500ml P:CLP;TAL Metals,Hg,Ti
- 1,125ml Gs:VOA CLP
- 1,500ml aG:Semi-VOA CLP
- 1,250ml G:Anions F,Cl,SO4 (EPA 300.0)
- 1,125ml P/G:Anions NO2,NO3 (EPA 353.1)
- 1,250ml G:Cyanide CLP
- 1,1000ml P/G:Gross alpha/beta (PRO-032-15), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152,
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239/240 (PRO-052-32) Sr-90 (PRO-032-38,PRO-032-25) Tc-99 (PRO-032-78) Am-241,Cm-244 (PRO-052-32 or PRO-062-
109) Se-79

3)

- 1,500ml P:CLP;TAL Metals,Hg,Ti
- 1,125ml Gs:VOA CLP
- 1,500ml aG:Semi-VOA CLP
- 1,250ml G:Anions F,Cl,SO4 (EPA 300.0)
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- 1,1000ml P/G:Gross alpha/beta (PRO-032-15), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152,
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239/240 (PRO-052-32) Sr-90 (PRO-032-38,PRO-032-25) Tc-99 (PRO-032-78) Am-241,Cm-244 (PRO-052-32 or PRO-062-
109) Se-79

TEMP 2.8

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

Relinquished by: <u>[Signature]</u> <u>9-16-93</u>	Received by: _____	Date/Time: _____
Relinquished by: _____	Received by: _____	Date/Time: _____
Relinquished by: _____	Received by: _____	Date/Time: <u>9-17-93 13:00</u>
Relinquished by: _____	Received by: _____	Date/Time: _____

Final Sample Disposition

Disposal Method: _____	Disposed by: _____	Date/Time: _____
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Comments: _____

9613401.2125

Westinghouse Hanford Company	SAMPLE ANALYSIS REQUEST
Collector L E ROGERS	S.A.F. # 93-263
Company Contact L E ROGERS	Date 9-16-93 Telephone (509) 376-7690

Sample Number	*	Date Collected	Time Collected	Number and Type of Sample Containers/Analysis Required
809348	S	9-16-93	1040	 1,500ml P:CLP;TAL Metals,Hg,Ti 1,125ml Gs:VOA CLP 1,500ml aG:Semi-VOA CLP 1,250ml G:Anions F,Cl,SO4 (EPA 300.0) 1,125ml P/G:Anions NO2,NO3 (EPA 353.1) 1,250ml G:Cyanide CLP 1,1000ml P/G:Gross alpha/beta (PRO-032-15), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (PRO-042-5), U- 235,U-234,U-238 (PRO-052-32) Np-237 (PRO-042-5) Pu-238,Pu-239/240 (PRO-052-32) Sr-90 (PRO-032- 38,PRO-032-25) Tc-99 (PRO-032-78) Am-241,Cm-244 (PRO-052-32 or PRO-062-109) Se-79
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*Type of Sample A = Air L = Liquid SE = Sediment T = Tissue X = Other
 DL = Drum Liquids O = Oil SL = Sludge W = Water
 DS = Drum Solids S = Soil SO = Solid WI = Wipe

Field Information **WESTON**
 Special Handling and/or Storage Maintain at 4C ; (SOIL)
 Possible Sample Hazards **NONE NOTED**

Overnight Delivery

Contractor Westinghouse Hanford Company	OFF-SITE PROPERTY CONTROL	CONTROL NUMBER (To be obtained from PROPERTY MANAGEMENT) W93-0-0764#11
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PART I - TO BE COMPLETED BY ORIGINATOR

Department Environmental	Section Env Field Services	Unit Env Charac & Sampling
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The following items are to be shipped from Contractor Vendor

Routing **Air** Contractor Vendor

Shipped to ROY F. WESTON 208 WELSH POOL ROAD LIONVILLE PA 19341-1313	Off-site Custodian Josie Edwards
	Full Title Project Coordinator

Quantity	Description (Include Serial and any Government Tag Numbers)	Original Cost
1 SML 364 71 LBS	poly cooler. Contains soil samples that are double-bagged and packed in wet ice and vermiculite. Samples are nonhazardous. Sample #: B09342, B09343, B09348	N/A

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

Necessity for the Off-Site Use of this Property
To support drilling and sampling at the 200 Areas

Bill of Lading 253 695 6202

CERTIFICATION OF THE RADIATION MONITORING RELEASE MUST BE SECURED THE SAME DAY THAT MATERIAL IS DELIVERED TO SHIPPING.

RM Clearance for Public Release C.K. BIAZ	RM Survey No 110305	Date 8-16-93
Location of Property (Area & Bldg.) 200 Area	Contact L. E. Rogers	Phone 376-7690
Date Ready for Shipment 9-16-93	Cost Code to be Charged 81710/PT2AB	Approximate Date This Property will be Returned N/A
Originated By: Relinquished by: [Signature]	Date 9-16-93	Authorized By LORENE ROGERS
Signature and Name of Property Control	Custodian Date	Property Management Approval [Signature]
		Date 9-16-93

PART II - TO BE COMPLETED BY SHIPPING

Signature of Recipient [Signature]	Return Order No.	Date Issued	Purchase Order No.	Date Issued
Date 9-16-93				

DISTRIBUTION

By Originator White, Green, Yellow, Pink - Property Management Goldenrod - Retain	Shipping Operation - Sign all Copies and Forward to: White - Property Management Yellow - Retain	Green - Property Control Custodian (Issuing Office) Pink - Originator
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0019

FORM OF PAYMENT				SERVICES**				INTERNATIONAL			
Check <input type="checkbox"/> GBL <input type="checkbox"/> FCCOD <input type="checkbox"/>				<input type="checkbox"/> UNITED STATES / CANADA (Extra Charges) <input checked="" type="checkbox"/> AM <input type="checkbox"/> Second Day				<input type="checkbox"/> Express <input type="checkbox"/> Standard Plus <input type="checkbox"/> Preferred <input type="checkbox"/> Saturday Delivery <input type="checkbox"/> Standard			
Bill to Shipper <input checked="" type="checkbox"/> Bill to Consignee <input type="checkbox"/> Third Party Billing <input type="checkbox"/>				EMERY WORLDWIDE				A CF Company			
Shipper's Account Number E 850281585				Date 09-16-93 Origin PSC				Shipment Number 253695620 2			
From: WESTINGHOUSE SHIPPING DEPT. (503) 376-6665 U.S. DEPARTMENT OF ENERGY C/O WESTINGHOUSE HANFORD BLDG 1163 2355 STEVENS DRIVE RICHLAND WA						To: RF WESTON INC RF WESTON INC 256 WELSH POOL ROAD LIONVILLE PA USA					
Customer's Reference Numbers W81710 PT2AB W93-0-0764811						Consignee's Account Number E 99332					
Description 1 COOLER SML 364 SOIL SAMPLES						Dimensions: Pos L W H 1 21 16 17 Total Pieces: 1 Total Weight (in Lbs): 71					
Remarks OVERNIGHT DELIVERY						Mark if Emery Packaging is used <input type="checkbox"/> Zip Ship <input type="checkbox"/> Urgent Letter <input type="checkbox"/> Urgent Pack					
Shipper's Signature <i>[Signature]</i> 09-16-93						FOR INFORMATION OR RATES. CALL 1-800 44 EMERY (or 800-443-6379)					
Commodity Code						Declared Value \$					
Third Party Account Number mandatory for Third Party Billing E						2536956202 					
International Customs Value						3-PHLA Terms and Conditions of Sale					
Base Charge						International Insurance Total Transportation Charges Other Charges/Advance at Origin <input type="checkbox"/> OCAO					

9613401.2127

Sample Information	Cust ID:	B09342	B09343	B09343	B09343	B09348	VBLK
	RFW#:	001	002	002 MS	002 MSD	003	93LVR137-MB1
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	D.F.:	1.00	1.02	0.980	0.980	0.962	1.00
	Units:	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg
Surrogate	Toluene-d8	100 %	102 %	98 %	95 %	103 %	99 %
Recovery	Bromofluorobenzene	95 %	99 %	97 %	96 %	111 %	97 %
	1,2-Dichloroethane-d4	101 %	99 %	94 %	92 %	98 %	101 %
-----f1-----f1-----f1-----f1-----f1-----f1-----							
Chloromethane		11 U	11 U	10 U	10 U	10 U	10 U
Bromomethane		11 U	11 U	10 U	10 U	10 U	10 U
Vinyl Chloride		11 U	11 U	10 U	10 U	10 U	10 U
Chloroethane		11 U	11 U	10 U	10 U	10 U	10 U
Methylene Chloride		3 JB	22 B	22 B	19 B	6 JB	3 J
Acetone		3 JB	8 JB	8 JB	12 B	7 JB	13
Carbon Disulfide		11 U	11 U	10 U	10 U	10 U	10 U
1,1-Dichloroethene		11 U	11 U	120 %	122 %	10 U	10 U
1,1-Dichloroethane		11 U	11 U	10 U	10 U	10 U	10 U
1,2-Dichloroethene (total)		11 U	11 U	10 U	10 U	10 U	10 U
Chloroform		11 U	11 U	10 U	10 U	10 U	10 U
1,2-Dichloroethane		11 U	11 U	10 U	10 U	10 U	10 U
2-Butanone		3 J	11 U	10 U	10 U	10 U	10 U
1,1,1-Trichloroethane		11 U	11 U	10 U	10 U	10 U	3 J
Carbon Tetrachloride		11 U	11 U	10 U	10 U	10 U	10 U
Bromodichloromethane		11 U	11 U	10 U	10 U	10 U	10 U
1,2-Dichloropropane		11 U	11 U	10 U	10 U	10 U	10 U
cis-1,3-Dichloropropene		11 U	11 U	10 U	10 U	10 U	10 U
Trichloroethene		11 U	11 U	106 %	109 %	10 U	10 U
Dibromochloromethane		11 U	11 U	10 U	10 U	10 U	10 U
1,1,2-Trichloroethane		11 U	11 U	10 U	10 U	10 U	10 U
Benzene		11 U	11 U	112 %	118 %	10 U	10 U
Trans-1,3-Dichloropropene		11 U	11 U	10 U	10 U	10 U	10 U
Bromoform		11 U	11 U	10 U	10 U	10 U	10 U
4-Methyl-2-pentanone		11 U	11 U	10 U	10 U	10 U	10 U
2-Hexanone		11 U	11 U	10 U	10 U	10 U	10 U
Tetrachloroethene		11 U	11 U	10 U	10 U	10 U	10 U
1,1,2,2-Tetrachloroethane		11 U	11 U	10 U	10 U	10 U	10 U
Toluene		11 U	11 U	108 %	110 %	10 U	10 U

*= Outside of EPA CLP QC limits.

8212*1043196

0021

Cust ID:	B09342	B09343	B09343	B09343	B09343	B09348	VBLK
RFW#:	001	002	002 MS	002 MSD		003	93LVR137-MB1
Chlorobenzene	11 U	11 U	110 %	111 %		10 U	10 U
Ethylbenzene	11 U	11 U	10 U	10 U		10 U	10 U
Styrene	11 U	11 U	10 U	10 U		10 U	10 U
Xylene (total)	11 U	11 U	10 U	10 U		10 U	10 U

*= Outside of EPA CLP QC limits.

0022

9613401.2129

9613401.2130

CLIENT SAMPLE NO.

VOLATILE ORGANICS ANALYSIS DATA SHEET

B09342

Lab Name: Roy F. Weston, Inc. Work Order: 6168-02-0Client: WESTINGHOUSE HANFORDMatrix: (soil/water) SOILLab Sample ID: 9309L997-001Sample wt/vol: 5.00 (g/mL) GLab File ID: R092120Level: (low/med) LOWDate Received: 09/17/93% Moisture: not dec. 5Date Analyzed: 09/22/93GC Column: DB624 ID: .53(mm)Dilution Factor: 1.00

Soil Extract Volume: (uL)

Soil Aliquot Volume: (uL)

CONCENTRATION UNITS:

CAS NO. COMPOUND (ug/L or ug/Kg) ug/Kg Q

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

9613401.2131

CLIENT SAMPLE NO.

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

B09342

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

Client: WESTINGHOUSE HANFORD

Matrix: (soil/water) SOIL

Lab Sample ID: 9309L997-001

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

Lab File ID: R092120

Level: (low/med) LOW

Date Received: 09/17/93

% Moisture: not dec. 5

Date Analyzed: 09/22/93

GC Column: DB624 ID: .53(mm)

Dilution Factor: 1.00

Soil Extract Volume: (uL)

Soil Aliquot Volume: (uL)

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

Number TICs found: 1

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	SILOXANE	21.48	5	BJ

9613401.2132

VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

B09343

Lab Name: Roy F. Weston, Inc. Work Order: 6168-02-0Client: WESTINGHOUSE HANFORDMatrix: (soil/water) SOILLab Sample ID: 9309L997-002Sample wt/vol: 4.90 (g/mL) GLab File ID: W092309Level: (low/med) LOWDate Received: 09/17/93% Moisture: not dec. 3Date Analyzed: 09/23/93GC Column: SP1000 ID: 2.00(mm)Dilution Factor: 1.02

Soil Extract Volume: (uL)

Soil Aliquot Volume: (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS:	
		(ug/L or ug/Kg)	ug/Kg
74-87-3	Chloromethane	11	U
74-83-9	Bromomethane	11	U
75-01-4	Vinyl Chloride	11	U
75-00-3	Chloroethane	11	U
75-09-2	Methylene Chloride	22	B
67-64-1	Acetone	8	JB
75-15-0	Carbon Disulfide	11	U
75-35-4	1,1-Dichloroethene	11	U
75-34-3	1,1-Dichloroethane	11	U
540-59-0	1,2-Dichloroethene (total)	11	U
67-66-3	Chloroform	11	U
107-06-2	1,2-Dichloroethane	11	U
78-93-3	2-Butanone	11	U
71-55-6	1,1,1-Trichloroethane	11	U
56-23-5	Carbon Tetrachloride	11	U
75-27-4	Bromodichloromethane	11	U
78-87-5	1,2-Dichloropropane	11	U
10061-01-5	cis-1,3-Dichloropropene	11	U
79-01-6	Trichloroethene	11	U
124-48-1	Dibromochloromethane	11	U
79-00-5	1,1,2-Trichloroethane	11	U
71-43-2	Benzene	11	U
10061-02-6	Trans-1,3-Dichloropropene	11	U
75-25-2	Bromoform	11	U
108-10-1	4-Methyl-2-pentanone	11	U
591-78-6	2-Hexanone	11	U
127-18-4	Tetrachloroethene	11	U
79-34-5	1,1,2,2-Tetrachloroethane	11	U
108-88-3	Toluene	11	U
108-90-7	Chlorobenzene	11	U
100-41-4	Ethylbenzene	11	U
100-42-5	Styrene	11	U
1330-20-7	Xylene (total)	11	U

9613401.2133

CLIENT SAMPLE NO.

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

B09343

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

Client: WESTINGHOUSE HANFORD

Matrix: (soil/water) SOIL

Lab Sample ID: 9309L997-002

Sample wt/vol: 4.90 (g/mL) G

Lab File ID: W092309

Level: (low/med) LOW

Date Received: 09/17/93

% Moisture: not dec. 3

Date Analyzed: 09/23/93

GC Column: SP1000 ID: 2.00(mm)

Dilution Factor: 1.02

Soil Extract Volume: (uL)

Soil Aliquot Volume: (uL)

Number TICs found: 1

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN	27.67	10	J

9613401.2134

CLIENT SAMPLE NO.

VOLATILE ORGANICS ANALYSIS DATA SHEET

B09348

Lab Name: Roy F. Weston, Inc. Work Order: 6168-02-0Client: WESTINGHOUSE HANFORDMatrix: (soil/water) SOILLab Sample ID: 9309L997-003Sample wt/vol: 5.20 (g/mL) GLab File ID: W092228Level: (low/med) LOWDate Received: 09/17/93% Moisture: not dec. 0Date Analyzed: 09/23/93GC Column: SP1000 ID: 2.00(mm)Dilution Factor: 0.962

Soil Extract Volume: (uL)

Soil Aliquot Volume: (uL)

CONCENTRATION UNITS:

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

9613401.2135

CLIENT SAMPLE NO.

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

B09348

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

Client: WESTINGHOUSE HANFORD

Matrix: (soil/water) SOIL

Lab Sample ID: 9309L997-003

Sample wt/vol: 5.20 (g/mL) G

Lab File ID: W092228

Level: (low/med) LOW

Date Received: 09/17/93

% Moisture: not dec. 0

Date Analyzed: 09/23/93

GC Column: SP1000 ID: 2.00(mm)

Dilution Factor: 0.962

Soil Extract Volume: (uL)

Soil Aliquot Volume: (uL)

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

Number TICs found: 2

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN	27.67	8	J
2.	UNKNOWN	29.37	6	J



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

Client: WESTINGHOUSE HANFORD
RFW #: 9309L997

W.O. #: 06168-002-001-9999-00
Date Received: 09-17-93

SEMIVOLATILE

The set of samples consisted of two (2) soil samples collected on 09-15-93.

The samples were extracted on 09-27-93 and analyzed according to criteria set forth in CLP SOW 03/90 for TCL Semivolatile target compounds on 10-05,07-93.

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

1. Non-target compounds were detected in these samples.
2. All surrogate recoveries were within EPA QC limits.
3. Two (2) of twenty-two (22) matrix spike recoveries were outside EPA QC limits.
4. All blank spike recoveries were within EPA QC limits.
5. The laboratory blank 93LE1687-MB1 contained the common contaminants Diethylphthalate, Bis(2-ethylhexyl)phthalate and the target compounds Naphthalene, 2-Methylnaphthalene, Acenaphthylene, Dibenzofuran, Fluorene, Phenanthrene, Anthracene, Carbazole, Fluoroanthene, Pyrene, Benzo(a)anthracene, Chrysene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Benzo(a)pyrene, Indeno(1,2,3-cd)pyrene and Benzo(g,h,i)perylene at levels less than the CRQL.

The laboratory blank 93LE1690-MB1 contained the common contaminant Bis(2-ethylhexyl)phthalate and the target compounds Phenanthrene and Fluoranthene at levels less than the CRQL.

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

J. Peter Hershey

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

10.27.93
 Date

Sample Information	Cust ID:	B09342	B09343	B09343	B09343	SBLK	SBLK BS
	RFW#:	001	002	002 MS	002 MSD	93LE1690-MB1	93LE1690-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	
Nitrobenzene-d5	64 %	78 %	79 %	74 %	65 %	63 %	
Surrogate 2-Fluorobiphenyl	69 %	76 %	80 %	75 %	71 %	66 %	
Recovery Terphenyl-d14	101 %	114 %	109 %	107 %	99 %	91 %	
Phenol-d5	54 %	61 %	65 %	58 %	57 %	54 %	
2-Fluorophenol	45 %	52 %	59 %	53 %	48 %	47 %	
2,4,6-Tribromophenol	78 %	89 %	98 %	86 %	74 %	75 %	
2-Chlorophenol-d4	55 %	63 %	67 %	61 %	56 %	54 %	
1,2-Dichlorobenzene-d4	59 %	66 %	71 %	66 %	64 %	62 %	
=====fl=====fl=====fl=====fl=====fl=====fl=====fl=====							
Phenol	18 J	340 U	61 %	58 %	330 U	46 %	
bis(2-Chloroethyl)ether	350 U	340 U	340 U	340 U	330 U	330 U	
2-Chlorophenol	350 U	340 U	66 %	61 %	330 U	50 %	
1,3-Dichlorobenzene	350 U	340 U	340 U	340 U	330 U	330 U	
1,4-Dichlorobenzene	350 U	340 U	62 %	60 %	330 U	47 %	
1,2-Dichlorobenzene	350 U	340 U	340 U	340 U	330 U	330 U	
2-Methylphenol	350 U	340 U	340 U	340 U	330 U	330 U	
2,2'-oxybis(1-Chloropropane)	350 U	340 U	340 U	340 U	330 U	330 U	
4-Methylphenol	350 U	340 U	340 U	340 U	330 U	330 U	
N-Nitroso-di-n-propylamine	350 U	340 U	83 %	86 %	330 U	63 %	
Hexachloroethane	350 U	340 U	340 U	340 U	330 U	330 U	
Nitrobenzene	350 U	340 U	340 U	340 U	330 U	330 U	
Isophorone	350 U	340 U	340 U	340 U	330 U	330 U	
2-Nitrophenol	350 U	340 U	340 U	340 U	330 U	330 U	
2,4-Dimethylphenol	350 U	340 U	340 U	340 U	330 U	330 U	
bis(2-Chloroethoxy)methane	350 U	340 U	340 U	340 U	330 U	330 U	
2,4-Dichlorophenol	350 U	340 U	340 U	340 U	330 U	330 U	
1,2,4-Trichlorobenzene	350 U	340 U	73 %	70 %	330 U	53 %	
Naphthalene	550	210 JB	56 JB	310 JB	330 U	330 U	
4-Chloroaniline	350 U	340 U	340 U	340 U	330 U	330 U	
Hexachlorobutadiene	350 U	340 U	340 U	340 U	330 U	330 U	
4-Chloro-3-methylphenol	350 U	340 U	79 %	72 %	330 U	57 %	
2-Methylnaphthalene	70 J	25 JB	340 U	36 JB	330 U	330 U	
Hexachlorocyclopentadiene	350 U	340 U	340 U	340 U	330 U	330 U	

*= Outside of EPA CLP QC limits.

9613401.2137

0022

	Cust ID:	B09342	B09343	B09343	B09343	SBLK	SBLK BS
RFW#:	001	002	002 MS	002 MSD	93LE1690-MB1	93LE1690-MB1	
2,4,6-Trichlorophenol	350 U	340 U	340 U	340 U	330 U	330 U	U
2,4,5-Trichlorophenol	880 U	850 U	860 U	860 U	840 U	840 U	U
2-Chloronaphthalene	350 U	340 U	340 U	340 U	330 U	330 U	U
2-Nitroaniline	880 U	850 U	860 U	860 U	840 U	840 U	U
Dimethylphthalate	350 U	340 U	340 U	340 U	330 U	330 U	U
Acenaphthylene	60 J	19 JB	340 U	28 JB	330 U	330 U	U
2,6-Dinitrotoluene	350 U	340 U	340 U	340 U	330 U	330 U	U
3-Nitroaniline	880 U	850 U	860 U	860 U	840 U	840 U	U
Acenaphthene	26 J	340 U	78 %	74 %	330 U	59 %	%
2,4-Dinitrophenol	880 U	850 U	860 U	860 U	840 U	840 U	U
4-Nitrophenol	880 U	850 U	99 %	101 %	840 U	71 %	%
Dibenzofuran	73 J	24 JB	340 U	340 U	330 U	330 U	U
2,4-Dinitrotoluene	350 U	340 U	94 * %	93 * %	330 U	73 %	%
Diethylphthalate	350 U	340 U	340 U	340 U	330 U	330 U	U
4-Chlorophenyl-phenylether	350 U	340 U	340 U	340 U	330 U	330 U	U
Fluorene	84 J	32 JB	340 U	37 JB	330 U	330 U	U
4-Nitroaniline	880 U	850 U	860 U	860 U	840 U	840 U	U
4,6-Dinitro-2-methylphenol	880 U	850 U	860 U	860 U	840 U	840 U	U
N-Nitrosodiphenylamine (1)	350 U	340 U	340 U	340 U	330 U	330 U	U
4-Bromophenyl-phenylether	350 U	340 U	340 U	340 U	330 U	330 U	U
Hexachlorobenzene	350 U	340 U	340 U	340 U	330 U	330 U	U
Pentachlorophenol	880 U	850 U	101 %	101 %	840 U	64 %	%
Phenanthrene	300 JB	120 JB	41 JB	160 JB	21 J	37 JB	JB
Anthracene	58 J	25 JB	340 U	28 JB	330 U	330 U	U
Carbazole	45 J	16 JB	340 U	26 JB	330 U	330 U	U
Di-n-butylphthalate	17 J	19 J	340 U	340 U	330 U	330 U	U
Fluoranthene	190 JB	71 JB	24 JB	96 JB	11 J	22 JB	JB
Pyrene	140 J	59 JB	90 %	95 %	330 U	75 %	%
Butylbenzylphthalate	350 U	340 U	340 U	340 U	330 U	330 U	U
3,3'-Dichlorobenzidine	350 U	340 U	340 U	340 U	330 U	330 U	U
Benzo(a)anthracene	59 J	21 JB	340 U	30 JB	330 U	330 U	U
Chrysene	60 J	20 JB	340 U	30 JB	330 U	330 U	U
bis(2-Ethylhexyl)phthalate	29 JB	49 JB	31 JB	27 JB	13 J	11 JB	JB
Di-n-octyl phthalate	350 U	340 U	340 U	340 U	330 U	330 U	U
Benzo(b)fluoranthene	42 J	340 U	340 U	18 JB	330 U	330 U	U
Benzo(k)fluoranthene	45 J	340 U	340 U	19 JB	330 U	330 U	U
Benzo(a)pyrene	48 J	340 U	340 U	29 JB	330 U	330 U	U
Indeno(1,2,3-cd)pyrene	27 J	340 U	340 U	14 JB	330 U	330 U	U
Dibenz(a,h)anthracene	350 U	340 U	340 U	340 U	330 U	330 U	U
Benzo(g,h,i)perylene	19 J	340 U	340 U	14 JB	330 U	330 U	U

0023

9613401.2138

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

9613401.2139
LB

CLIENT SAMPLE NO.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

B09342

Lab Name: Roy F. Weston, Inc. Work Order: 6168-02-0Client: WESTINGHOUSE HANFORDMatrix: (soil/water) SOILLab Sample ID: 9309L997-001Sample wt/vol: 30.0 (g/mL) GLab File ID: A100516Level: (low/med) LOWDate Received: 09/17/93% Moisture: 5 decanted: (Y/N) Date Extracted: 09/27/93Concentrated Extract Volume: 500(uL)Date Analyzed: 10/05/93Injection Volume: 2.0(uL)Dilution Factor: 1.00GPC Cleanup: (Y/N) YpH: 6.9

CONCENTRATION UNITS:

CAS NO. COMPOUND (ug/L or ug/Kg) ug/Kg Q

108-95-2	Phenol	18	J
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
95-50-1	1,2-Dichlorobenzene	350	U
95-48-7	2-Methylphenol	350	U
108-60-1	2,2'-oxybis(1-Chloropropane)	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
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	550	
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	70	J
77-47-4	Hexachlorocyclopentadiene	350	U
88-06-2	2,4,6-Trichlorophenol	350	U
95-95-4	2,4,5-Trichlorophenol	880	U
91-58-7	2-Chloronaphthalene	350	U
88-74-4	2-Nitroaniline	880	U
131-11-3	Dimethylphthalate	350	U
208-96-8	Acenaphthylene	60	J
606-20-2	2,6-Dinitrotoluene	350	U
99-09-2	3-Nitroaniline	880	U
83-32-9	Acenaphthene	26	J

9613401.2140

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

B09342

Lab Name: Roy F. Weston, Inc. Work Order: 6168-02-0Client: WESTINGHOUSE HANFORDMatrix: (soil/water) SOILLab Sample ID: 9309L997-001Sample wt/vol: 30.0 (g/mL) GLab File ID: A100516Level: (low/med) LOWDate Received: 09/17/93% Moisture: 5 decanted: (Y/N) Date Extracted: 09/27/93Concentrated Extract Volume: 500(uL)Date Analyzed: 10/05/93Injection Volume: 2.0(uL)Dilution Factor: 1.00GPC Cleanup: (Y/N) YpH: 6.9

CONCENTRATION UNITS:

CAS NO. COMPOUND (ug/L or ug/Kg) ug/Kg Q

CAS NO.	COMPOUND	(ug/L or ug/Kg)	ug/Kg	Q
51-28-5	2,4-Dinitrophenol	880		U
100-02-7	4-Nitrophenol	880		U
132-64-9	Dibenzofuran	73		J
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	84		J
100-01-6	4-Nitroaniline	880		U
534-52-1	4,6-Dinitro-2-methylphenol	880		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	880		U
85-01-8	Phenanthrene	300		JB
120-12-7	Anthracene	58		J
86-74-8	Carbazole	45		J
84-74-2	Di-n-butylphthalate	17		J
206-44-0	Fluoranthene	190		JB
129-00-0	Pyrene	140		J
85-68-7	Butylbenzylphthalate	350		U
91-94-1	3,3'-Dichlorobenzidine	350		U
56-55-3	Benzo(a)anthracene	59		J
218-01-9	Chrysene	60		J
117-81-7	bis(2-Ethylhexyl)phthalate	29		JB
117-84-0	Di-n-octyl phthalate	350		U
205-99-2	Benzo(b)fluoranthene	42		J
207-08-9	Benzo(k)fluoranthene	45		J
50-32-8	Benzo(a)pyrene	48		J
193-39-5	Indeno(1,2,3-cd)pyrene	27		J
53-70-3	Dibenz(a,h)anthracene	350		U
191-24-2	Benzo(g,h,i)perylene	19		J

(1) - Cannot be separated from Diphenylamine

FORM 1 SV-2

3/90

0043

9613401.2141
1F

CLIENT SAMPLE NO.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

B09342

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

Client: WESTINGHOUSE HANFORD

Matrix: (soil/water) SOIL

Lab Sample ID: 9309L997-001

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

Lab File ID: A100516

Level: (low/med) LOW

Date Received: 09/17/93

% Moisture: 5 decanted: (Y/N) __

Date Extracted: 09/27/93

Concentrated Extract Volume: 500(uL)

Date Analyzed: 10/05/93

Injection Volume: 2.0(uL)

Dilution Factor: 1.00

GPC Cleanup: (Y/N) Y pH: 6.9

CONCENTRATION UNITS:

Number TICs found: 9

(ug/L or ug/Kg) ug/Kg

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	ALDOL CONDENSATE	6.04	1000	JAB
2.	ALDOL CONDENSATE	6.65	40000	JAB
3.	UNKNOWN	7.03	80	JB
4.	ALDOL CONDENSATE	8.07	200	JA
5.	ALDOL CONDENSATE	9.39	100	JA
6.	UNKNOWN	18.48	100	J
7.	ORGANIC ACID	21.35	200	J
8.	ADIPATE	23.99	70	J
9.	UNKNOWN	24.65	300	J

9613401.2142

CLIENT SAMPLE NO.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

B09343

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

Client: WESTINGHOUSE HANFORD

Matrix: (soil/water) SOIL Lab Sample ID: 9309L997-002

Sample wt/vol: 30.3 (g/mL) G Lab File ID: A100714

Level: (low/med) LOW Date Received: 09/17/93

% Moisture: 3 decanted: (Y/N) __ Date Extracted: 09/27/93

Concentrated Extract Volume: 500(uL) Date Analyzed: 10/07/93

Injection Volume: 2.0(uL) Dilution Factor: 1.00

GPC Cleanup: (Y/N) Y pH: 6.7

CONCENTRATION UNITS:

CAS NO. COMPOUND (ug/L or ug/Kg) ug/Kg Q

108-95-2	Phenol	340	U
111-44-4	bis(2-Chloroethyl)ether	340	U
95-57-8	2-Chlorophenol	340	U
541-73-1	1,3-Dichlorobenzene	340	U
106-46-7	1,4-Dichlorobenzene	340	U
95-50-1	1,2-Dichlorobenzene	340	U
95-48-7	2-Methylphenol	340	U
108-60-1	2,2'-oxybis(1-Chloropropane)	340	U
106-44-5	4-Methylphenol	340	U
621-64-7	N-Nitroso-di-n-propylamine	340	U
67-72-1	Hexachloroethane	340	U
98-95-3	Nitrobenzene	340	U
78-59-1	Isophorone	340	U
88-75-5	2-Nitrophenol	340	U
105-67-9	2,4-Dimethylphenol	340	U
111-91-1	bis(2-Chloroethoxy)methane	340	U
120-83-2	2,4-Dichlorophenol	340	U
120-82-1	1,2,4-Trichlorobenzene	340	U
91-20-3	Naphthalene	210	JB
106-47-8	4-Chloroaniline	340	U
87-68-3	Hexachlorobutadiene	340	U
59-50-7	4-Chloro-3-methylphenol	340	U
91-57-6	2-Methylnaphthalene	25	JB
77-47-4	Hexachlorocyclopentadiene	340	U
88-06-2	2,4,6-Trichlorophenol	340	U
95-95-4	2,4,5-Trichlorophenol	850	U
91-58-7	2-Chloronaphthalene	340	U
88-74-4	2-Nitroaniline	850	U
131-11-3	Dimethylphthalate	340	U
208-96-8	Acenaphthylene	19	JB
606-20-2	2,6-Dinitrotoluene	340	U
99-09-2	3-Nitroaniline	850	U
83-32-9	Acenaphthene	340	U

9613401.2143

CLIENT SAMPLE NO.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

B09343

Lab Name: Roy F. Weston, Inc. Work Order: 6168-02-0Client: WESTINGHOUSE HANFORDMatrix: (soil/water) SOILLab Sample ID: 9309L997-002Sample wt/vol: 30.3 (g/mL) GLab File ID: A100714Level: (low/med) LOWDate Received: 09/17/93% Moisture: 3 decanted: (Y/N) __Date Extracted: 09/27/93Concentrated Extract Volume: 500(uL)Date Analyzed: 10/07/93Injection Volume: 2.0(uL)Dilution Factor: 1.00GPC Cleanup: (Y/N) YpH: 6.7

CONCENTRATION UNITS:

CAS NO. COMPOUND (ug/L or ug/Kg) ug/Kg Q

51-28-5-----	2,4-Dinitrophenol	850	U
100-02-7-----	4-Nitrophenol	850	U
132-64-9-----	Dibenzofuran	24	JB
121-14-2-----	2,4-Dinitrotoluene	340	U
84-66-2-----	Diethylphthalate	340	U
7005-72-3-----	4-Chlorophenyl-phenylether	340	U
86-73-7-----	Fluorene	32	JB
100-01-6-----	4-Nitroaniline	850	U
534-52-1-----	4,6-Dinitro-2-methylphenol	850	U
86-30-6-----	N-Nitrosodiphenylamine (1)	340	U
101-55-3-----	4-Bromophenyl-phenylether	340	U
118-74-1-----	Hexachlorobenzene	340	U
87-86-5-----	Pentachlorophenol	850	U
85-01-8-----	Phenanthrene	120	JB
120-12-7-----	Anthracene	25	JB
86-74-8-----	Carbazole	16	JB
84-74-2-----	Di-n-butylphthalate	19	J
206-44-0-----	Fluoranthene	71	JB
129-00-0-----	Pyrene	59	JB
85-68-7-----	Butylbenzylphthalate	340	U
91-94-1-----	3,3'-Dichlorobenzidine	340	U
56-55-3-----	Benzo(a)anthracene	21	JB
218-01-9-----	Chrysene	20	JB
117-81-7-----	bis(2-Ethylhexyl)phthalate	49	JB
117-84-0-----	Di-n-octyl phthalate	340	U
205-99-2-----	Benzo(b)fluoranthene	340	U
207-08-9-----	Benzo(k)fluoranthene	340	U
50-32-8-----	Benzo(a)pyrene	340	U
193-39-5-----	Indeno(1,2,3-cd)pyrene	340	U
53-70-3-----	Dibenz(a,h)anthracene	340	U
191-24-2-----	Benzo(g,h,i)perylene	340	U

(1) - Cannot be separated from Diphenylamine

FORM 1 SV-2

3/90

0082

9613401.2144

CLIENT SAMPLE NO.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

B09343

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

Client: WESTINGHOUSE HANFORD

Matrix: (soil/water) SOIL

Lab Sample ID: 9309L997-002

Sample wt/vol: 30.3 (g/mL) G

Lab File ID: A100714

Level: (low/med) LOW

Date Received: 09/17/93

% Moisture: 3 decanted: (Y/N) __

Date Extracted: 09/27/93

Concentrated Extract Volume: 500(uL)

Date Analyzed: 10/07/93

Injection Volume: 2.0(uL)

Dilution Factor: 1.00

GPC Cleanup: (Y/N) Y pH: 6.7

CONCENTRATION UNITS:

Number TICs found: 8

(ug/L or ug/Kg) ug/Kg

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	ALDOL CONDENSATE	6.05	900	JA
2.	ALDOL CONDENSATE	6.66	30000	JA
3.	UNKNOWN	7.04	90	JB
4.	ALDOL CONDENSATE	8.08	100	JA
5.	ALDOL CONDENSATE	8.63	100	JA
6.	ALDOL CONDENSATE	9.40	90	JA
7.	ORGANIC ACID	21.35	200	J
8.	UNKNOWN	24.66	200	J

9613401.2145



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

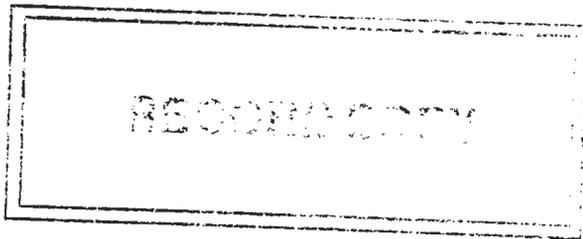
Client : WESTINGHOUSE HANFORD
RFW# : 9309L997

W.O. #: 06168-002-001-9999-00
Date Received: 09-17-93

INORGANIC

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

1. All sample holding times as required by 40CFR136 were met.
2. All preparation blank results were below the required detection limits.
3. All laboratory control standards (blank spikes) were within the control limits of 80-120%. All %RPD were within the 20% guidance limit.
4. All calibration verification checks were within the required control limits of 90-110%. Calibration verification is performed using independent standards.
5. Matrix spike recoveries are summarized on the Inorganic Accuracy Report contained within this document. All recoveries were within the 75-125% guidance limits. All %RPD were within the 20% guidance limit.
6. Replicate results are summarized on the Inorganic Precision Report contained within this document. All results were within the 20% RPD guidance limit.
7. The analytical methods applied by the laboratory, unless otherwise requested, for the analysis of solid samples are derived from Test Methods for Evaluating Solid Waste (USEPA SW846).



Margaret M. Sealy
J. Peter Hershey, Ph.D.
Laboratory Manager
Lionville Analytical Laboratory

10/26/93
Date

9613401.2146

ROY F. WESTON INC.

INORGANIC DATA SUMMARY REPORT 10/26/93

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

WESTON BATCH #: 9309L997

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	B09342	% Solids	95.1	%	0.10	1.0
		Chloride by IC	16.1	MG/KG	1.3	1.0
		Fluoride by IC	2.6	u MG/KG	2.6	1.0
		Cyanide, Total	1.1	u MG/KG	1.1	1.0
		Sulfate by IC	7.7	MG/KG	1.3	1.0
		Nitrate Nitrite	0.78	MG-N/KG	0.10	1.0
-002	B09343	% Solids	96.8	%	0.10	1.0
		Chloride by IC	12.6	MG/KG	1.3	1.0
		Fluoride by IC	2.6	u MG/KG	2.6	1.0
		Cyanide, Total	7.5	MG/KG	1.0	1.0
		Sulfate by IC	7.8	MG/KG	1.3	1.0
		Nitrate Nitrite	0.44	MG-N/KG	0.10	1.0
-003	B09348	% Solids	100	%	0.10	1.0

0004



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

Client: WESTINGHOUSE HANFORD
RFW #: 9309L997

W.O. #: 06168-002-001-9999-00
Date Received: 09-11-93

CLP METALS

1. This narrative covers the analyses of two (2) soil samples.
2. The samples were prepared and analyzed in accordance with the following protocols: CLP SOW 3/90.
3. ICVs, CCVs, and LCSs stock standards were purchased from Inorganic Ventures Laboratory and High Purity.
4. All analyses were performed within the required holding times except for mercury in the following samples:

List samples

9309L997-001, 002

- 1.) Due to instrument failure, the above samples were analyzed six (6) days past the hold time for mercury.
5. All Initial and Continuing Calibration Verifications (ICV/CCV's) were within control limits.
6. All Initial and Continuing Calibration Blanks (ICB/CCB's) were within control limits.
7. All Preparation/Method Blanks were below Reporting Limits.
8. All ICP Interference Check Samples (ICSA and ICSAB) were within control limits.
9. All Laboratory Control Samples (LCS) were within the 80-120% control limits.
10. All Serial Dilution percent differences were within USEPA SOW control limits except for:

<u>RFW #</u>	<u>Element</u>	<u>%Difference</u>	<u>RFW #</u>	<u>Element</u>	<u>%Difference</u>
001	Aluminum	13.2	001	Magnesium	14.6
	Calcium	13.8		Manganese	17.1
	Iron	14.4			

0015



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

<u>RFW #</u>	<u>Element</u>	<u>%Recovery</u>
001	Lead	52.6

For analytes where the Matrix Spike is out of control, a Post-digestion Matrix Spike and Serial Dilution are performed (exception allowed for Ag).

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

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

<u>RFW #</u>	<u>Element</u>	<u>%RPD</u>
001	Lead	28.0

13. Method of Standard Additions (MSA) analyses was performed on the following sample:

<u>Element</u>	<u>Sample #</u>
Lead	002

14. The code CV is currently in use by the laboratory for both mercury instruments in operation (HG1 and HG2). HG1 is complete with autosampler and software, but still requires manual digestion; HG2 is operated by the analyst, produces a strip chart and also requires manual digestion.
15. HG1 requires less total volume of digestate due to the autosampler analysis. Sample volumes and reagents for mercury determinations in water and soil have been proportionally scaled down to adapt to this semi-automated technique. The sample volume used for water analysis is 33 ml. For soils, 0.1 gram of sample is taken to a final volume of 50 ml (including all reagents).
16. ICP Interelement Correction Factors for IC1 and IC3 are included in this package, but do not appear on EDD.
17. The graphite furnace time that appears on form XIV is the time of the first injection. The time that appears on the data is the print time.



18. The ICB was run before the ICV for Cyanide on the raw data printout.

A handwritten signature in black ink, appearing to read "Raymond A. Siery".

Raymond A. Siery
Inorganic Section Manager
Lionville Analytical Laboratory

11.2.93
Date

9613401.2150

ROY F. WESTON INC.

INORGANIC DATA SUMMARY REPORT 10/27/93

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

WESTON BATCH #: 9309L997

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-----	-----	-----	-----	-----	-----	-----
-001	B09342	Silver, Total	1.9	u MG/KG	1.9	1.0
		Aluminum, Total	3510	MG/KG	38.1	1.0
		Arsenic, Total	2.1	MG/KG	1.9	1.0
		Barium, Total	54.7	MG/KG	38.1	1.0
		Beryllium, Total	0.95	u MG/KG	0.95	1.0
		Calcium, Total	6790	MG/KG	954	1.0
		Cadmium, Total	0.95	u MG/KG	0.95	1.0
		Cobalt, Total	9.5	u MG/KG	9.5	1.0
		Chromium, Total	6.5	MG/KG	1.9	1.0
		Copper, Total	7.8	MG/KG	4.8	1.0
		Iron, Total	9090	MG/KG	19.1	1.0
		Mercury, Total	0.10	u MG/KG	0.10	1.0
		Potassium, Total	972	MG/KG	954	1.0
		Magnesium, Total	2930	MG/KG	954	1.0
		Manganese, Total	197	MG/KG	2.9	1.0
		Sodium, Total	954	u MG/KG	954	1.0
		Nickel, Total	7.6	u MG/KG	7.6	1.0
		Lead, Total	5.7	MG/KG	0.57	1.0
		Antimony, Total	11.4	u MG/KG	11.4	1.0
		Selenium, Total	0.95	u MG/KG	0.95	1.0
		Titanium, Total	394	MG/KG	19.1	1.0
		Thallium, Total	1.9	u MG/KG	1.9	1.0
		Vanadium, Total	15.3	MG/KG	9.5	1.0
		Zinc, Total	23.4	MG/KG	3.8	1.0

0019

9613401.2151

ROY F. WESTON INC.

INORGANIC DATA SUMMARY REPORT 10/27/93

CLIENT: WESTINGHOUSE HANFORD

WESTON BATCH #: 9309L997

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-----	-----	-----	-----	-----	-----	-----
-002	B09343	Silver, Total	1.8	u MG/KG	1.8	1.0
		Aluminum, Total	3650	MG/KG	36.3	1.0
		Arsenic, Total	2.2	MG/KG	1.8	1.0
		Barium, Total	41.2	MG/KG	36.3	1.0
		Beryllium, Total	0.91	u MG/KG	0.91	1.0
		Calcium, Total	7670	MG/KG	908	1.0
		Cadmium, Total	0.91	u MG/KG	0.91	1.0
		Cobalt, Total	9.1	u MG/KG	9.1	1.0
		Chromium, Total	5.8	MG/KG	1.8	1.0
		Copper, Total	6.8	MG/KG	4.5	1.0
		Iron, Total	8730	MG/KG	18.2	1.0
		Mercury, Total	0.10	u MG/KG	0.10	1.0
		Potassium, Total	908	u MG/KG	908	1.0
		Magnesium, Total	3060	MG/KG	908	1.0
		Manganese, Total	209	MG/KG	2.7	1.0
		Sodium, Total	908	u MG/KG	908	1.0
		Nickel, Total	7.3	u MG/KG	7.3	1.0
		Lead, Total	4.3	MG/KG	0.54	1.0
		Antimony, Total	10.9	u MG/KG	10.9	1.0
		Selenium, Total	0.91	u MG/KG	0.91	1.0
		Titanium, Total	368	MG/KG	18.2	1.0
		Thallium, Total	1.8	u MG/KG	1.8	1.0
		Vanadium, Total	14.5	MG/KG	9.1	1.0
		Zinc, Total	23.1	MG/KG	3.6	1.0

0020

9613401.2152

U.S. EPA - CLP

EPA SAMPLE NO.

1

INORGANIC ANALYSIS DATA SHEET

B09342

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

Lab Code: WESTON Case No.: WEST SAS No.: SDG No.: CLP997

Matrix (soil/water): SOIL Lab Sample ID: 930999701

Level (low/med): LOW Date Received: 9/17/93

% Solids: 95.1

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	3510.00	-	E	P
7440-36-0	Antimony	8.77	U		P
7440-38-2	Arsenic	2.10			F
7440-39-3	Barium	54.70			P
7440-41-7	Beryllium	.19	U		P
7440-43-9	Cadmium	.95	U		P
7440-70-2	Calcium	6790.00		E	P
7440-47-3	Chromium	6.50			P
7440-48-4	Cobalt	4.30	B		P
7440-50-8	Copper	7.80			P
7439-89-6	Iron	9090.00		E	P
7439-92-1	Lead	5.70		N*	F
7439-95-4	Magnesium	2930.00		E	P
7439-96-5	Manganese	197.00		E	P
7439-97-6	Mercury	.05	U		CV
7440-02-0	Nickel	5.50	B		P
7440-09-7	Potassium	972.00			P
7782-49-2	Selenium	.38	U		F
7440-22-4	Silver	1.33	U		P
7440-23-5	Sodium	105.00	B		P
7440-28-0	Thallium	.38	U		F
7440-62-2	Vanadium	15.30			P
7440-66-6	Zinc	23.40			P
	Cyanide	1.05	U		C

Color Before: BROWN

Clarity Before:

Texture: FINE

Color After: BROWN

Clarity After:

Artifacts:

Comments:

FORM I - IN

03/90

0029

9613401.2153

U.S. EPA - CLP

EPA SAMPLE NO.

1
INORGANIC ANALYSIS DATA SHEET

B09343

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

Lab Code: WESTON Case No.: WEST SAS No.: SDG No.: CLP997

Matrix (soil/water): SOIL Lab Sample ID: 930999702

Level (low/med): LOW Date Received: 9/17/93

% 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	3650.00	-	E	P
7440-36-0	Antimony	8.35	U		P
7440-38-2	Arsenic	2.20			F
7440-39-3	Barium	41.20			P
7440-41-7	Beryllium	.18	U		P
7440-43-9	Cadmium	.91	U		P
7440-70-2	Calcium	7670.00		E	P
7440-47-3	Chromium	5.80			P
7440-48-4	Cobalt	4.70	B		P
7440-50-8	Copper	6.80			P
7439-89-6	Iron	8730.00		E	P
7439-92-1	Lead	4.30		NS*	F
7439-95-4	Magnesium	3060.00		E	P
7439-96-5	Manganese	209.00		E	P
7439-97-6	Mercury	.05	U		CV
7440-02-0	Nickel	3.40	B		P
7440-09-7	Potassium	862.00	B		P
7782-49-2	Selenium	.36	U	W	F
7440-22-4	Silver	1.27	U		P
7440-23-5	Sodium	104.00	B		P
7440-28-0	Thallium	.36	U		F
7440-62-2	Vanadium	14.50			P
7440-66-6	Zinc	23.10			P
	Cyanide	2.93			C

Color Before: BROWN

Clarity Before:

Texture: FINE

Color After: BROWN

Clarity After:

Artifacts:

Comments:

9309L997-5615
9615401-309
2154

MEMORANDUM



TO: 200-UP-2 Project QA Record

February 18, 1994

FR: Susan Winter, Golder Associates Inc.

RE: VOLATILE ORGANIC DATA VALIDATION SUMMARY FOR DATA PACKAGE:
9309L997-WES-1309 (923-E418, Filename 9309L997.VOA)

INTRODUCTION

This memo presents the results of data validation on data package 9309L997-WES-1309 prepared by the Weston Analytics laboratory. A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

SAMPLE ID	SAMPLE DATE	MEDIA	ANALYSIS
B09342	09/15/93	SOIL	SEE NOTE 1
B09343	09/15/93	SOIL	
B09348	09/16/93	SOIL	

Note 1. All samples were analyzed for CLP TCL volatiles.

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

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

DATA QUALITY OBJECTIVES

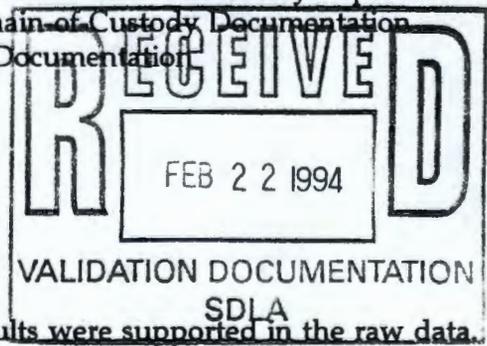
Precision. Goals for precision were met.

Accuracy. Goals for accuracy were met.

Sample Result Verification. All sample results were supported in the raw data.

Detection Limits. Detection limit goals were met for all sample results as specified in the reference analytical method.

Completeness. The data package was complete for all requested analyses. A total of three samples were validated in this data package with a total of 99 determinations reported, all of which were deemed valid. This results in a completeness of 100 percent, which meets normal work plan objectives of 90%.



Sample B09348 was identified as a solid trip blank in which all results were verified as nondetects with the exception of two tentatively identified compounds (TIC) labeled as unknowns, at retention times of 27.67 and 29.37 minutes. Sample B09343 also contained a TIC labeled as an unknown at the retention time of 27.67 minutes.

MAJOR DEFICIENCIES

No major deficiencies were identified during data validation which required qualification of data as unusable.

MINOR DEFICIENCIES

The following minor deficiencies were identified during data validation which required qualification of data.

Laboratory Blanks

- Methylene chloride and acetone were present in the associated laboratory blanks. Therefore, the associated sample results, all of which are less than ten times the respective blank concentration, have been qualified as undetected (U).
- The TIC siloxane was detected in the laboratory blank associated with sample B09342. Therefore, the TIC result for the indicated sample has been qualified as undetected (U).

REFERENCES

WHC 1993a, Validation of 200-UP-2 Data, Statement of Work, Analytical Laboratory Data Validation, Task Order S-94-18, December 14, 1993, Purchase Order M073750. Westinghouse Hanford Company, Richland, Washington.

WHC 1993b, Data Validation Procedures for Chemical Analyses, WHC-SD-EN-SPP-002, Rev. 2, 1993. Westinghouse Hanford Company, Richland, Washington.

9613401.2156

ATTACHMENT 1

GLOSSARY OF DATA REPORTING QUALIFIERS

GLOSSARY OF ORGANIC DATA REPORTING QUALIFIERS

- B -** Indicates the constituent was analyzed for and detected in the associated laboratory blank. This qualifier is applied by the laboratory. During the process of data validation this qualifier may be replaced by other appropriate qualifiers as defined by the validation procedures. The associated data should be considered usable for decision making purposes.
- U -** Indicates the constituent was analyzed for and not detected. The concentration reported is the sample quantitation limit corrected for aliquot size, dilution and percent solids (in the case of solid matrices) by the laboratory. The associated data should be considered usable for decision making purposes.
- UJ -** Indicates the constituent was analyzed for and not detected. Due to a minor quality control deficiency identified during data validation the concentration reported may not accurately reflect the sample quantitation limit. The associated data should be considered usable for decision making purposes.
- J -** Indicates the constituent was analyzed for and detected. This qualifier may be applied by the laboratory to indicate a concentration which is less than the contract required quantitation limit (CRQL) but greater than the instrument detection limit (IDL). During data validation this qualifier may be applied to indicate a minor quality control deficiency. However in either case, the associated data should be considered usable for decision making purposes.
- NJ -** Indicates presumptive evidence of a constituent at an estimated value. This qualifier is normally applied to GC analysis data (such as organochlorine pesticide and PCB data). The associated data should be considered usable for decision making purposes.
- N -** Indicates presumptive evidence of a constituent. This qualifier is normally applied to GC analysis data (such as organochlorine pesticide and PCB data). The associated data should be considered usable for decision making purposes.
- JN -** Indicates a tentatively identified compound (TIC) whose concentration and identification have been determined to be valid as a result of data validation. The associated data should be considered usable for decision making purposes.
- UR -** Indicates the constituent was analyzed for and not detected. The concentration reported has been qualified as unusable due to a major quality control deficiency identified during data validation. The associated data should be considered unusable for decision making purposes.
- R -** Indicates the constituent was analyzed for and detected. The concentration reported has been qualified as unusable due to a major quality control deficiency identified during data validation. The associated data should be considered unusable for decision making purposes.

9613401.2158

ATTACHMENT 2
SUMMARY OF DATA QUALIFICATIONS

9613401.2160

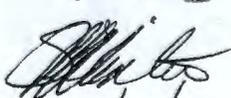
ATTACHMENT 3

QUALIFIED DATA SUMMARY AND ANNOTATED LABORATORY REPORTS

Validated Data Summary, Data Package: 9309L997-WES-1309

Parameter	Samp#	B09342		B09343		B09348	
	Date	9-15-93		9-15-93		9-16-93	
	Location	299-W19-97		299-W19-95		299-W19-97	
	Depth	101.0 - 103.3		105.0 - 107.5		---	
	Type	---		---		---	
	Comments	SPLIT		SPLIT		TRIP	
	Units	Result	Q	Result	Q	Result	Q
CHLOROMETHANE	UG/KG	11.000	U	11.000	U	10.000	U
BROMOMETHANE	UG/KG	11.000	U	11.000	U	10.000	U
VINYL CHLORIDE	UG/KG	11.000	U	11.000	U	10.000	U
CHLOROETHANE	UG/KG	11.000	U	11.000	U	10.000	U
METHYLENE CHLORIDE	UG/KG	11.000	U	22.000	U	10.000	U
ACETONE	UG/KG	11.000	U	11.000	U	10.000	U
CARBON DISULFIDE	UG/KG	11.000	U	11.000	U	10.000	U
1,1-DICHLOROETHENE	UG/KG	11.000	U	11.000	U	10.000	U
1,1-DICHLOROETHANE	UG/KG	11.000	U	11.000	U	10.000	U
1,2-DICHLOROETHENE (TOTAL)	UG/KG	11.000	U	11.000	U	10.000	U
CHLOROFORM	UG/KG	11.000	U	11.000	U	10.000	U
1,2-DICHLOROETHANE	UG/KG	11.000	U	11.000	U	10.000	U
2-BUTANONE	UG/KG	3.000	J	11.000	U	10.000	U
1,1,1-TRICHLOROETHANE	UG/KG	11.000	U	11.000	U	10.000	U
CARBON TETRACHLORIDE	UG/KG	11.000	U	11.000	U	10.000	U
BROMODICHLOROMETHANE	UG/KG	11.000	U	11.000	U	10.000	U
1,2-DICHLOROPROPANE	UG/KG	11.000	U	11.000	U	10.000	U
CIS-1,3-DICHLOROPROPENE	UG/KG	11.000	U	11.000	U	10.000	U
TRICHLOROETHENE	UG/KG	11.000	U	11.000	U	10.000	U
DIBROMOCHLOROMETHANE	UG/KG	11.000	U	11.000	U	10.000	U
1,1,2-TRICHLOROETHANE	UG/KG	11.000	U	11.000	U	10.000	U
BENZENE	UG/KG	11.000	U	11.000	U	10.000	U
TRANS-1,3-DICHLOROPROPENE	UG/KG	11.000	U	11.000	U	10.000	U
BROMOFORM	UG/KG	11.000	U	11.000	U	10.000	U
4-METHYL-2-PENTANONE	UG/KG	11.000	U	11.000	U	10.000	U
2-HEXANONE	UG/KG	11.000	U	11.000	U	10.000	U
TETRACHLOROETHENE	UG/KG	11.000	U	11.000	U	10.000	U
1,1,2,2-TETRACHLOROETHANE	UG/KG	11.000	U	11.000	U	10.000	U
TOLUENE	UG/KG	11.000	U	11.000	U	10.000	U
CHLOROBENZENE	UG/KG	11.000	U	11.000	U	10.000	U
ETHYLBENZENE	UG/KG	11.000	U	11.000	U	10.000	U
STYRENE	UG/KG	11.000	U	11.000	U	10.000	U
XYLENES (TOTAL)	UG/KG	11.000	U	11.000	U	10.000	U

9613401.2161

Verified

 2/18/94

9613401.2162
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

299-W19-97

SDG 9309L997-WES-1309

B09342

101-103.3

Field Split

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

Client: WESTINGHOUSE HANFORD

Matrix: (soil/water) SOIL

Lab Sample ID: 9309L997-001

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

Lab File ID: R092120

Level: (low/med) LOW

Date Received: 09/17/93

% Moisture: not dec. 5

Date Analyzed: 09/22/93

GC Column: DB624 ID: .53(mm)

Dilution Factor: 1.00

Soil Extract Volume: (uL)

Soil Aliquot Volume: (uL)

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

verified
2/15/94

9613401.2163

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

299-419-97

B09342

101-103.3

Field Split

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

Client: WESTINGHOUSE HANFORD

Matrix: (soil/water) SOIL

Lab Sample ID: 9309L997-001

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

Lab File ID: R092120

Level: (low/med) LOW

Date Received: 09/17/93

% Moisture: not dec. 5

Date Analyzed: 09/22/93

GC Column: DB624 ID: .53(mm)

Dilution Factor: 1.00

Soil Extract Volume: (uL)

Soil Aliquot Volume: (uL)

Number TICs found: 1

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	SILOXANE	21.48	5	5

Q
u

Verified
[Signature]
2/15/94

9613401.2164

VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

299-W19-95

B09343

105'-107.5'

Field Split

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

Client: WESTINGHOUSE HANFORD

Matrix: (soil/water) SOIL

Lab Sample ID: 9309L997-002

Sample wt/vol: 4.90 (g/mL) G

Lab File ID: W092309

Level: (low/med) LOW

Date Received: 09/17/93

% Moisture: not dec. 3

Date Analyzed: 09/23/93

GC Column: SP1000 ID: 2.00(mm)

Dilution Factor: 1.02

Soil Extract Volume: (uL)

Soil Aliquot Volume: (uL)

CONCENTRATION UNITS:

(ug/L or ug/Kg) ug/Kg

CAS NO.

COMPOUND

Q

Q

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/Kg	Q
74-87-3	Chloromethane	11	U
74-83-9	Bromomethane	11	U
75-01-4	Vinyl Chloride	11	U
75-00-3	Chloroethane	11	U
75-09-2	Methylene Chloride	22	U
67-64-1	Acetone	11	U
75-15-0	Carbon Disulfide	11	U
75-35-4	1,1-Dichloroethene	11	U
75-34-3	1,1-Dichloroethane	11	U
540-59-0	1,2-Dichloroethene (total)	11	U
67-66-3	Chloroform	11	U
107-06-2	1,2-Dichloroethane	11	U
78-93-3	2-Butanone	11	U
71-55-6	1,1,1-Trichloroethane	11	U
56-23-5	Carbon Tetrachloride	11	U
75-27-4	Bromodichloromethane	11	U
78-87-5	1,2-Dichloropropane	11	U
10061-01-5	cis-1,3-Dichloropropene	11	U
79-01-6	Trichloroethene	11	U
124-48-1	Dibromochloromethane	11	U
79-00-5	1,1,2-Trichloroethane	11	U
71-43-2	Benzene	11	U
10061-02-6	Trans-1,3-Dichloropropene	11	U
75-25-2	Bromoform	11	U
108-10-1	4-Methyl-2-pentanone	11	U
591-78-6	2-Hexanone	11	U
127-18-4	Tetrachloroethene	11	U
79-34-5	1,1,2,2-Tetrachloroethane	11	U
108-88-3	Toluene	11	U
108-90-7	Chlorobenzene	11	U
100-41-4	Ethylbenzene	11	U
100-42-5	Styrene	11	U
1330-20-7	Xylene (total)	11	U

11-8

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verified
2/15/94

9613401.2165

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

299-w19-95

B09343

105'-107.5'

Field Split

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

Client: WESTINGHOUSE HANFORD

Matrix: (soil/water) SOIL

Lab Sample ID: 9309L997-002

Sample wt/vol: 4.90 (g/mL) G

Lab File ID: W092309

Level: (low/med) LOW

Date Received: 09/17/93

% Moisture: not dec. 3

Date Analyzed: 09/23/93

GC Column: SP1000 ID: 2.00(mm)

Dilution Factor: 1.02

Soil Extract Volume: (uL)

Soil Aliquot Volume: (uL)

CONCENTRATION UNITS:

(ug/L or ug/Kg) ug/Kg

Number TICs found: 1

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN	27.67	10	<u>J</u>

Q
JN

Verified
[Signature]
2/15/94

9613401.2166

VOLATILE ORGANICS ANALYSIS DATA SHEET

(Solid)

CLIENT SAMPLE NO.

Trip Blank
B09348
299-619-97

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

Client: WESTINGHOUSE HANFORD

Matrix: (soil/water) SOIL

Lab Sample ID: 9309L997-003

Sample wt/vol: 5.20 (g/mL) G

Lab File ID: W092228

Level: (low/med) LOW

Date Received: 09/17/93

% Moisture: not dec. 0

Date Analyzed: 09/23/93

GC Column: SP1000 ID: 2.00(mm)

Dilution Factor: 0.962

Soil Extract Volume: (uL)

Soil Aliquot Volume: (uL)

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

Q
u
u

Verified
2/15/94

9613401.2167

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

(Solid)

CLIENT SAMPLE NO.

Trip Blank

B09348

299-619-97

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

Client: WESTINGHOUSE HANFORD

Matrix: (soil/water) SOIL

Lab Sample ID: 9309L997-003

Sample wt/vol: 5.20 (g/mL) G

Lab File ID: W092228

Level: (low/med) LOW

Date Received: 09/17/93

% Moisture: not dec. 0

Date Analyzed: 09/23/93

GC Column: SP1000 ID: 2.00 (mm)

Dilution Factor: 0.962

Soil Extract Volume: (uL)

Soil Aliquot Volume: (uL)

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

Number TICs found: 2

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN	27.67	8	J
2.	UNKNOWN	29.37	6	J

Handwritten notes: JH, JH

verified
Handwritten signature
2/15/94

9613401.2168

ATTACHMENT 4

LABORATORY NARRATIVE AND CHAIN-OF-CUSTODY DOCUMENTATION



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

Client: WESTINGHOUSE HANFORD
RFW #: 9309L997

W.O. #: 06168-002-001-9999-00
Date Received: 09-17-93

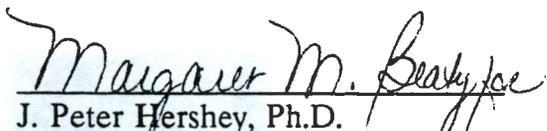
GC/MS VOLATILE

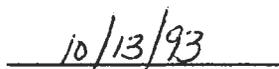
The set of samples consisted of three (3) soil samples collected on 09-15,16-93.

The samples were analyzed according to criteria set forth in CLP SOW 03/90 for TCL Volatile target compounds on 09-21,22,23-93.

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

1. Non-target compounds were detected in these samples.
2. All system monitoring compound (surrogate) recoveries were within EPA QC limits.
3. All matrix spike recoveries were within EPA QC limits.
4. The laboratory blanks contained the common contaminants Methylene Chloride and Acetone at levels less than 4x the CRQL. The laboratory blank 93LVR137-MB1 also contained the target compound 1,1,1-Trichloroethane at a level less than the CRQL.
5. All internal standard area and retention time criteria were met.


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


Date

9613401.2170

Westinghouse
Hanford Company

CHAIN OF CUSTODY

Custody Form Initiator L E ROGERS

Company Contact L E ROGERS

Telephone 376-7690

Project Designation/Sampling Locations 200-UP-2

Collection Date 9-15-93

Ice Chest No. SML 364

Field Logbook No. EFL-1091

Bill of Lading/Airbill No. 2536956202

Offsite Property No. _____

Method of Shipment OVERNIGHT AIR SERVICE

Shipped to WESTON

Possible Sample Hazards/Remarks Keep samples at 4C (SOIL) NONE NOTED 9309L 997

Sample Identification

1) RAD B09342

001

- 1,500ml P:CLP;TAL Metals,Hg,Ti
- 1,125ml Gs:VOA CLP
- 1,500ml aG:Semi-VOA CLP
- 1,250ml G:Anions F,Cl,SO4 (EPA 300.0)
- 1,125ml P/G:Anions NO2,NO3 (EPA 353.1)
- 1,250ml G:Cyanide CLP
- 1,1000ml P/G:Gross alpha/beta (PRO-032-15), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (PRO-042-5), U-235,U-234,U-238 (PRO-052-32) Np-237,(PRO-042-5) Pu-238,Pu-239/240 (PRO-052-32) Sr-90 (PRO-032-38,PRO-032-25) Tc-99 (PRO-032-78) Am-241,Cm-244 (PRO-052-32 or PRO-062-109) Se-79

002

B09343

- 1,500ml P:CLP;TAL Metals,Hg,Ti
- 1,125ml Gs:VOA CLP
- 1,500ml aG:Semi-VOA CLP
- 1,250ml G:Anions F,Cl,SO4 (EPA 300.0)
- 1,125ml P/G:Anions NO2,NO3 (EPA 353.1)
- 1,250ml G:Cyanide CLP
- 1,1000ml P/G:Gross alpha/beta (PRO-032-15), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (PRO-042-5), U-235,U-234,U-238 (PRO-052-32) Np-237,(PRO-042-5) Pu-238,Pu-239/240 (PRO-052-32) Sr-90 (PRO-032-38,PRO-032-25) Tc-99 (PRO-032-78) Am-241,Cm-244 (PRO-052-32 or PRO-062-109) Se-79

3)

- 1,500ml P:CLP;TAL Metals,Hg,Ti
- 1,125ml Gs:VOA CLP
- 1,500ml aG:Semi-VOA CLP
- 1,250ml G:Anions F,Cl,SO4 (EPA 300.0)
- 1,125ml P/G:Anions NO2,NO3 (EPA 353.1)
- 1,250ml G:Cyanide CLP
- 1,1000ml P/G:Gross alpha/beta (PRO-032-15), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (PRO-042-5), U-235,U-234,U-238 (PRO-052-32) Np-237,(PRO-042-5) Pu-238,Pu-239/240 (PRO-052-32) Sr-90 (PRO-032-38,PRO-032-25) Tc-99 (PRO-032-78) Am-241,Cm-244 (PRO-052-32 or PRO-062-109) Se-79

PER 9-16-93

TAMU-2.8

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

Relinquished by: <u>1050</u> <u>Jason E. Rogers 9-16-93</u>	Received by:	Date/Time:
Relinquished by: <u>LMON</u>	Received by: <u>[Signature]</u>	Date/Time: <u>9-17-93 17100</u>
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:
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Comments:

9613401.2171

Westinghouse
Hanford Company

CHAIN OF CUSTODY

Custody Form Initiator L E ROGERS

Company Contact L E ROGERS Telephone 376-7690

Project Designation/Sampling Locations 200-UP-2 Collection Date 9-16-93

Ice Chest No. SML 364 Field Logbook No. EFL-1091

Bill of Lading/Airbill No. 2536956202 Offsite Property No. _____

Method of Shipment OVERNIGHT AIR SERVICE

Shipped to WESTON

Possible Sample Hazards/Remarks Keep samples at 4C (SOIL) 9309L997

Sample Identification

003 1)
1/2 50ml
for
9-16-93

B09348

~~1,500ml P:CLP;TAL Metals,Hg,Ti~~
~~1,125ml Gs:VOA CLP~~
~~1,500ml aG:Semi-VOA CLP~~
~~1,250ml G:Anions F,Cl,SO4 (EPA 300.0)~~
~~1,125ml P/G:Anions NO2,NO3 (EPA 353.1)~~
~~1,250ml G:Cyanide CLP~~
~~1,1000ml P/G:Gross alpha/beta (PRO-032-15), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152,
 Eu-154,Eu-155,K-40,Ru-106,Na-22 (PRO-042-5), U-235,U-234,U-238 (PRO-052-32) Np-237 (PRO-042-5) Pu-238,Pu-
 239/240 (PRO-052-32) Sr-90 (PRO-032-38,PRO-032-25) Tc-99 (PRO-032-78) Am-241,Cm-244 (PRO-052-32 or PRO-062-
 109) Se-79~~

2)

1,500ml P:CLP;TAL Metals,Hg,Ti
 1,125ml Gs:VOA CLP
 1,500ml aG:Semi-VOA CLP
 1,250ml G:Anions F,Cl,SO4 (EPA 300.0)
 1,125ml P/G:Anions NO2,NO3 (EPA 353.1)
 1,250ml G:Cyanide CLP
 1,1000ml P/G:Gross alpha/beta (PRO-032-15), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152,
 Eu-154,Eu-155,K-40,Ru-106,Na-22 (PRO-042-5), U-235,U-234,U-238 (PRO-052-32) Np-237 (PRO-042-5) Pu-238,Pu-
 239/240 (PRO-052-32) Sr-90 (PRO-032-38,PRO-032-25) Tc-99 (PRO-032-78) Am-241,Cm-244 (PRO-052-32 or PRO-062-
 109) Se-79

3)

1,500ml P:CLP;TAL Metals,Hg,Ti
 1,125ml Gs:VOA CLP
 1,500ml aG:Semi-VOA CLP
 1,250ml G:Anions F,Cl,SO4 (EPA 300.0)
 1,125ml P/G:Anions NO2,NO3 (EPA 353.1)
 1,250ml G:Cyanide CLP
 1,1000ml P/G:Gross alpha/beta (PRO-032-15), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152,
 Eu-154,Eu-155,K-40,Ru-106,Na-22 (PRO-042-5), U-235,U-234,U-238 (PRO-052-32) Np-237 (PRO-042-5) Pu-238,Pu-
 239/240 (PRO-052-32) Sr-90 (PRO-032-38,PRO-032-25) Tc-99 (PRO-032-78) Am-241,Cm-244 (PRO-052-32 or PRO-062-
 109) Se-79
 Temp = 2.8

Field Transfer of Custody		Chain of Possession	(Sign and Print Names)
Relinquished by:	<u>1050</u> <u>[Signature]</u>	Received by:	Date/Time:
Relinquished by:	<u>[Signature]</u>	Received by:	<u>9-17-93 13:00</u>
Relinquished by:		Received by:	Date/Time:
Relinquished by:		Received by:	Date/Time:

Final Sample Disposition		
Disposal Method:	Disposed by:	Date/Time:
Comments:		

9613401.2172

ATTACHMENT 5

DATA VALIDATION SUPPORTING DOCUMENTATION

9613401.2173

GC/MS ORGANIC DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT:	200-UP-2		DATA PACKAGE: 9309L997-WES-1309		
VALIDATOR:	[Signature]		LAB: Weston	DATE: 2/15/94	
CASE:	SDG: 9309L997-WES-1309				
ANALYSES PERFORMED					
<input checked="" type="checkbox"/> CLP Volatiles	<input type="checkbox"/> SW-846 8240 (cap column)	<input type="checkbox"/> SW-846 8260 (packed column)	<input type="checkbox"/> CLP Semivolatiles	<input type="checkbox"/> SW-846 8270 (cap column)	<input type="checkbox"/> SW-846 (packed column)
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
SAMPLES/MATRIX Soils					
B09342					
B09343					
B09348					

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Is technical verification documentation present? **Yes** No N/A

Is a case narrative present? **Yes** No N/A

Comments: _____

2. HOLDING TIMES

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

Comments: _____

GC/MS ORGANIC DATA VALIDATION CHECKLIST

3. INSTRUMENT TUNING AND CALIBRATION

- Is the GC/MS tuning/performance check acceptable? Yes No N/A
- Are initial calibrations acceptable? Yes No N/A
- Are continuing calibrations acceptable? Yes No N/A

Comments: _____

4. BLANKS

- Were laboratory blanks analyzed? Yes No N/A
- Are laboratory blank results acceptable? Yes No N/A
- Were field/trip blanks analyzed? Yes No N/A 2/15/94
- Are field/trip blank results acceptable? Yes No N/A 2/15/94

Comments: Sample B09348 is identified as a solid (soil) trip blank. All assoc. results are ND after lab blank adjustment with the exception of two TICs both labeled as unknowns.

5. ACCURACY

- Were surrogates/System Monitoring Compounds analyzed? Yes No N/A
- Are surrogate/System Monitoring Compound recoveries acceptable? Yes No N/A
- Were MS/MSD samples analyzed? Yes No N/A
- Are MS/MSD results acceptable? Yes No N/A

Comments: _____

GC/MS ORGANIC DATA VALIDATION CHECKLIST

6. PRECISION

- Are MS/MSD RPD values acceptable? Yes No N/A
- Are field duplicate RPD values acceptable? Yes No N/A
- Are field split RPD values acceptable? *See comments.* Yes No N/A

Comments: Samples B09342 and B09343 are field split samples and will be compared to the corresponding sample results in the quarterly project report.

7. SYSTEM PERFORMANCE

- Were internal standards analyzed? Yes No N/A
- Are internal standard areas acceptable? Yes No N/A
- Are internal standard retention times acceptable? Yes No N/A

Comments: _____

8. COMPOUND IDENTIFICATION AND QUANTITATION

- Is compound identification acceptable? Yes No N/A
- Is compound quantitation acceptable? Yes No N/A

Comments: _____

9. REPORTED RESULTS AND QUANTITATION LIMITS

- Are results reported for all requested analyses? Yes No N/A
- Are all results supported in the raw data? Yes No N/A
- Do results meet the CRQLs? Yes No N/A
- Has the laboratory properly identified and coded all TIC? . . . Yes No N/A

Comments: _____

9613401.2176

2/15/94
Holding Times

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

DATE RECEIVED: 09/17/93

RFW LOT # :9309L997

CLIENT ID	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B09342	001	S	93LVR137	09/15/93	N/A	09/22/93
B09343	002	S	93LVW200	09/15/93	N/A	09/23/93
B09343	002 MS	S	93LVW200	09/15/93	N/A	09/23/93
B09343	002 MSD	S	93LVW200	09/15/93	N/A	09/23/93
B09348	003	S	93LVW199	09/16/93	N/A	09/23/93

7
8
8
8
7

LAB QC:

VBLK	MB1	S	93LVR137	N/A	N/A	09/21/93
VBLK	MB1	S	93LVW200	N/A	N/A	09/23/93
VBLK	MB1	S	93LVW199	N/A	N/A	09/22/93

2/15/94

023

~~0002~~

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VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

VBLK

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

Client: WESTINGHOUSE HANFORD

Assoc. w/ B09342

Matrix: (soil/water) SOIL

Lab Sample ID: 93LVR137-MB1

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

Lab File ID: R092114

Level: (low/med) LOW

Date Received: 09/21/93

% Moisture: not dec.

Date Analyzed: 09/21/93

GC Column: DB624 ID: .53(mm)

Dilution Factor: 1.00

Soil Extract Volume: (uL)

Soil Aliquot Volume: (uL)

CONCENTRATION UNITS:

CAS NO. COMPOUND (ug/L or ug/Kg) ug/Kg Q

74-87-3	-----Chloromethane	10	U
74-83-9	-----Bromomethane	10	U
75-01-4	-----Vinyl Chloride	10	U
75-00-3	-----Chloroethane	10	U
75-09-2	-----Methylene Chloride	3	J
67-64-1	-----Acetone	13	J
75-15-0	-----Carbon Disulfide	10	U
75-35-4	-----1,1-Dichloroethene	10	U
75-34-3	-----1,1-Dichloroethane	10	U
540-59-0	-----1,2-Dichloroethene (total)	10	U
67-66-3	-----Chloroform	10	U
107-06-2	-----1,2-Dichloroethane	10	U
78-93-3	-----2-Butanone	10	U
71-55-6	-----1,1,1-Trichloroethane	3	J
56-23-5	-----Carbon Tetrachloride	10	U
75-27-4	-----Bromodichloromethane	10	U
78-87-5	-----1,2-Dichloropropane	10	U
10061-01-5	-----cis-1,3-Dichloropropene	10	U
79-01-6	-----Trichloroethene	10	U
124-48-1	-----Dibromochloromethane	10	U
79-00-5	-----1,1,2-Trichloroethane	10	U
71-43-2	-----Benzene	10	U
10061-02-6	-----Trans-1,3-Dichloropropene	10	U
75-25-2	-----Bromoform	10	U
108-10-1	-----4-Methyl-2-pentanone	10	U
591-78-6	-----2-Hexanone	10	U
127-18-4	-----Tetrachloroethene	10	U
79-34-5	-----1,1,2,2-Tetrachloroethane	10	U
108-88-3	-----Toluene	10	U
108-90-7	-----Chlorobenzene	10	U
100-41-4	-----Ethylbenzene	10	U
100-42-5	-----Styrene	10	U
1330-20-7	-----Xylene (total)	10	U

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2/18/94

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CLIENT SAMPLE NO.

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

VBLK

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

Client: WESTINGHOUSE HANFORD

Matrix: (soil/water) SOIL

Lab Sample ID: 93LVR137-MB1

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

Lab File ID: R092114

Level: (low/med) LOW

Date Received: 09/21/93

% Moisture: not dec.

Date Analyzed: 09/21/93

GC Column: DB624 ID: .53(mm)

Dilution Factor: 1.00

Soil Extract Volume: (uL)

Soil Aliquot Volume: (uL)

Number TICs found: 1

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

Assoc. w/ B09342

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	SILOXANE	21.43	2	J

Weston
2/18/94

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CLIENT SAMPLE NO.

VOLATILE ORGANICS ANALYSIS DATA SHEET

VBLK

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

Client: WESTINGHOUSE HANFORD

Assoc. w/ 809343

Matrix: (soil/water) SOIL

Lab Sample ID: 93LVW200-MB1

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

Lab File ID: W092306

Level: (low/med) LOW

Date Received: 09/23/93

% Moisture: not dec.

Date Analyzed: 09/23/93

GC Column: SP1000 ID: 2.00(mm)

Dilution Factor: 1.00

Soil Extract Volume: (uL)

Soil Aliquot Volume: (uL)

CONCENTRATION UNITS:

CAS NO. COMPOUND (ug/L or ug/Kg) ug/Kg Q

74-87-3	Chloromethane	10	U
74-83-9	Bromomethane	10	U
75-01-4	Vinyl Chloride	10	U
75-00-3	Chloroethane	10	U
75-09-2	Methylene Chloride	9	J
67-64-1	Acetone	30	
75-15-0	Carbon Disulfide	10	U
75-35-4	1,1-Dichloroethene	10	U
75-34-3	1,1-Dichloroethane	10	U
540-59-0	1,2-Dichloroethene (total)	10	U
67-66-3	Chloroform	10	U
107-06-2	1,2-Dichloroethane	10	U
78-93-3	2-Butanone	10	U
71-55-6	1,1,1-Trichloroethane	10	U
56-23-5	Carbon Tetrachloride	10	U
75-27-4	Bromodichloromethane	10	U
78-87-5	1,2-Dichloropropane	10	U
10061-01-5	cis-1,3-Dichloropropene	10	U
79-01-6	Trichloroethene	10	U
124-48-1	Dibromochloromethane	10	U
79-00-5	1,1,2-Trichloroethane	10	U
71-43-2	Benzene	10	U
10061-02-6	Trans-1,3-Dichloropropene	10	U
75-25-2	Bromoform	10	U
108-10-1	4-Methyl-2-pentanone	10	U
591-78-6	2-Hexanone	10	U
127-18-4	Tetrachloroethene	10	U
79-34-5	1,1,2,2-Tetrachloroethane	10	U
108-88-3	Toluene	10	U
108-90-7	Chlorobenzene	10	U
100-41-4	Ethylbenzene	10	U
100-42-5	Styrene	10	U
1330-20-7	Xylene (total)	10	U

No TICs detected. FORM 1 VOA

3/90

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CLIENT SAMPLE NO.

VOLATILE ORGANICS ANALYSIS DATA SHEET

VBLK

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

Client: WESTINGHOUSE HANFORD

Assoc. w/ B09348

Matrix: (soil/water) SOIL

Lab Sample ID: 93LVW199-MB1

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

Lab File ID: W092216

Level: (low/med) LOW

Date Received: 09/22/93

% Moisture: not dec.

Date Analyzed: 09/22/93

GC Column: SP1000 ID: 2.00(mm)

Dilution Factor: 0.980

Soil Extract Volume: (uL)

Soil Aliquot Volume: (uL)

CONCENTRATION UNITS:

CAS NO. COMPOUND (ug/L or ug/Kg) ug/Kg Q

74-87-3	Chloromethane	10	U
74-83-9	Bromomethane	10	U
75-01-4	Vinyl Chloride	10	U
75-00-3	Chloroethane	10	U
75-09-2	Methylene Chloride	9	J
67-64-1	Acetone	35	
75-15-0	Carbon Disulfide	10	U
75-35-4	1,1-Dichloroethene	10	U
75-34-3	1,1-Dichloroethane	10	U
540-59-0	1,2-Dichloroethene (total)	10	U
67-66-3	Chloroform	10	U
107-06-2	1,2-Dichloroethane	10	U
78-93-3	2-Butanone	10	U
71-55-6	1,1,1-Trichloroethane	10	U
56-23-5	Carbon Tetrachloride	10	U
75-27-4	Bromodichloromethane	10	U
78-87-5	1,2-Dichloropropane	10	U
10061-01-5	cis-1,3-Dichloropropene	10	U
79-01-6	Trichloroethene	10	U
124-48-1	Dibromochloromethane	10	U
79-00-5	1,1,2-Trichloroethane	10	U
71-43-2	Benzene	10	U
10061-02-6	Trans-1,3-Dichloropropene	10	U
75-25-2	Bromoform	10	U
108-10-1	4-Methyl-2-pentanone	10	U
591-78-6	2-Hexanone	10	U
127-18-4	Tetrachloroethene	10	U
79-34-5	1,1,2,2-Tetrachloroethane	10	U
108-88-3	Toluene	10	U
108-90-7	Chlorobenzene	10	U
100-41-4	Ethylbenzene	10	U
100-42-5	Styrene	10	U
1330-20-7	Xylene (total)	10	U

FORM 1 VOA

3/90

No TICs detected.

027-0153

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2/15/94



TO: 200-UP-2 Project QA Record

February 18, 1994

FR: Susan Winter, Golder Associates Inc. *S. Winter*RE: SEMIVOLATILE ORGANIC DATA VALIDATION SUMMARY FOR DATA PACKAGE:
9309L997-WES-1309 (923-E418, Filename 9309L997.BNA)

INTRODUCTION

This memo presents the results of data validation on data package 9309L997-WES-1309 prepared by the Weston Analytics laboratory. A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

SAMPLE ID	SAMPLE DATE	MEDIA	ANALYSIS
B09342	09/15/93	SOIL	SEE NOTE 1
B09343	09/15/93	SOIL	

Note 1. All samples were analyzed for CLP TCL semivolatiles.

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

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

DATA QUALITY OBJECTIVES

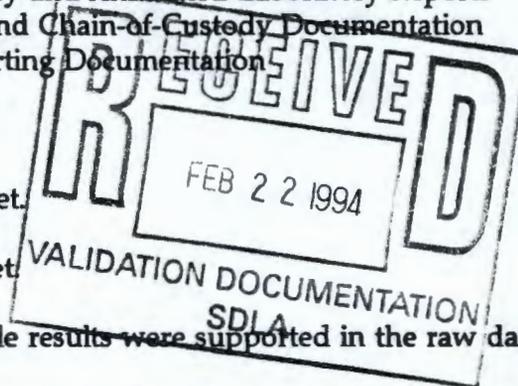
Precision. Goals for precision were met.

Accuracy. Goals for accuracy were met.

Sample Result Verification. All sample results were supported in the raw data.

Detection Limits. Detection limit goals were met for all sample results as specified in the reference analytical method.

Completeness. The data package was complete for all requested analyses. A total of two samples were validated in this data package with a total of 128 determinations reported, all of which were deemed valid. This results in a completeness of 100 percent, which meets normal work plan objectives of 90%.



MAJOR DEFICIENCIES

The following major deficiencies were identified during data validation which required qualification of data as unusable.

- Tentatively identified compounds (TIC) identified as aldol condensate compounds have been qualified as unusable (R) since they are suspected laboratory contaminants. Attachments 2 and 5 provide a summary of the samples affected, data qualifications applied and supporting documentation. However, these qualifications do not affect the percent completeness since the TICs are not TCL compounds.

MINOR DEFICIENCIES

The following minor deficiencies were identified during data validation which required qualification of data.

Continuing Calibration

- Continuing calibration verification percent difference (CCV %D) for pentachlorophenol was greater than 25%. Therefore, the associated result for sample B09342 has been qualified as estimated (UJ).

Laboratory Blanks

- Several compounds, as listed in Attachment 2, were detected in the associated laboratory blanks. Therefore, associated results less than five or ten times the respective blank concentration have been qualified as undetected (U).

REFERENCES

WHC 1993a, Validation of 200-UP-2 Data, Statement of Work, Analytical Laboratory Data Validation, Task Order S-94-18, December 14, 1993, Purchase Order M073750. Westinghouse Hanford Company, Richland, Washington.

WHC 1993b, Data Validation Procedures for Chemical Analyses, WHC-SD-EN-SPP-002, Rev. 2, 1993. Westinghouse Hanford Company, Richland, Washington.

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ATTACHMENT 1

GLOSSARY OF DATA REPORTING QUALIFIERS

GLOSSARY OF ORGANIC DATA REPORTING QUALIFIERS

- B -** Indicates the constituent was analyzed for and detected in the associated laboratory blank. This qualifier is applied by the laboratory. During the process of data validation this qualifier may be replaced by other appropriate qualifiers as defined by the validation procedures. The associated data should be considered usable for decision making purposes.
- U -** Indicates the constituent was analyzed for and not detected. The concentration reported is the sample quantitation limit corrected for aliquot size, dilution and percent solids (in the case of solid matrices) by the laboratory. The associated data should be considered usable for decision making purposes.
- UJ -** Indicates the constituent was analyzed for and not detected. Due to a minor quality control deficiency identified during data validation the concentration reported may not accurately reflect the sample quantitation limit. The associated data should be considered usable for decision making purposes.
- J -** Indicates the constituent was analyzed for and detected. This qualifier may be applied by the laboratory to indicate a concentration which is less than the contract required quantitation limit (CRQL) but greater than the instrument detection limit (IDL). During data validation this qualifier may be applied to indicate a minor quality control deficiency. However in either case, the associated data should be considered usable for decision making purposes.
- NJ -** Indicates presumptive evidence of a constituent at an estimated value. This qualifier is normally applied to GC analysis data (such as organochlorine pesticide and PCB data). The associated data should be considered usable for decision making purposes.
- N -** Indicates presumptive evidence of a constituent. This qualifier is normally applied to GC analysis data (such as organochlorine pesticide and PCB data). The associated data should be considered usable for decision making purposes.
- JN -** Indicates a tentatively identified compound (TIC) whose concentration and identification have been determined to be valid as a result of data validation. The associated data should be considered usable for decision making purposes.
- UR -** Indicates the constituent was analyzed for and not detected. The concentration reported has been qualified as unusable due to a major quality control deficiency identified during data validation. The associated data should be considered unusable for decision making purposes.
- R -** Indicates the constituent was analyzed for and detected. The concentration reported has been qualified as unusable due to a major quality control deficiency identified during data validation. The associated data should be considered unusable for decision making purposes.

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ATTACHMENT 2
SUMMARY OF DATA QUALIFICATIONS

DATA QUALIFICATION SUMMARY

SDG: 9309L997-WES-1309	VALIDATOR:	DATE: February 18, 1994	PAGE <u>1</u> OF <u>1</u>
COMMENTS: SEMIVOLATILE ORGANICS			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
PENTACHLOROPHENOL	UJ	B09342	CCV %D >25%
BIS(2-ETHYLHEXYL)PHTHALATE	U	B09342	PRESENT IN BLANK
TIC - UNKNOWN @ 7.03 MIN.	U	B09342	PRESENT IN BLANK
TIC - ALDOL CONDENSATE @ 6.04, 6.65, 8.07, AND 9.39 MIN.	R	B09342	LABORATORY CONTAMINANT
TIC - ALDOL CONDENSATE @ 6.05, 6.66, 8.08, 8.63, AND 9.40 MIN.	R	B09343	LABORATORY CONTAMINANT
NAPHTHALENE	U	B09343	PRESENT IN BLANK
2-METHYLNAPHTHALENE	U	B09343	PRESENT IN BLANK
ACENAPHTHYLENE	U	B09343	PRESENT IN BLANK
DIBENZOFURAN	U	B09343	PRESENT IN BLANK
FLUORENE	U	B09343	PRESENT IN BLANK
PHENANTHRENE	U	B09343	PRESENT IN BLANK
ANTHRACENE	U	B09343	PRESENT IN BLANK
CARBAZOLE	U	B09343	PRESENT IN BLANK
FLUORANTHENE	U	B09343	PRESENT IN BLANK
PYRENE	U	B09343	PRESENT IN BLANK
BENZO(A)ANTHRACENE	U	B09343	PRESENT IN BLANK
CHRYSENE	U	B09343	PRESENT IN BLANK
BIS(2-ETHYLHEXYL)PHTHALATE	U	B09343	PRESENT IN BLANK
TIC - UNKNOWN @ 7.04 MIN.	U	B09343	PRESENT IN BLANK
TIC - UNKNOWN @ 18.48 MIN.	JN	B09342	IDENTIFIED AS A VALID RESULT USING DATA VALIDATION PROCEDURES
TIC - ORGANIC ACID @ 21.35 MIN.	JN	B09342 B09342	IDENTIFIED AS A VALID RESULT USING DATA VALIDATION PROCEDURES
TIC - ADIPATE @ 23.99 MIN.	JN	B09342	IDENTIFIED AS A VALID RESULT USING DATA VALIDATION PROCEDURES
TIC - UNKNOWN @ 24.65 MIN.	JN	B09342	IDENTIFIED AS A VALID RESULT USING DATA VALIDATION PROCEDURES
TIC - UNKNOWN @ 24.66 MIN.	JN	B09343	IDENTIFIED AS A VALID RESULT USING DATA VALIDATION PROCEDURES

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ATTACHMENT 3

QUALIFIED DATA SUMMARY AND ANNOTATED LABORATORY REPORTS

Validated Data Summary, Data Package: 9309L997-WES-1309

Parameter	Samp#		B09342		B09343	
	Units	Result	Q	Result	Q	
	Samp#	9-15-93		9-15-93		
	Date	299-W19-97		299-W19-95		
	Location	101.0 - 103.3		105.0 - 107.5		
	Depth	---		---		
	Type	SPLIT		SPLIT		
	Comments					
PHENOL	UG/KG	18.000	J	340.000	U	
BIS(2-CHLOROETHYL)ETHER	UG/KG	350.000	U	340.000	U	
2-CHLOROPHENOL	UG/KG	350.000	U	340.000	U	
1,3-DICHLOROBENZENE	UG/KG	350.000	U	340.000	U	
1,4-DICHLOROBENZENE	UG/KG	350.000	U	340.000	U	
1,2-DICHLOROBENZENE	UG/KG	350.000	U	340.000	U	
2-METHYLPHENOL	UG/KG	350.000	U	340.000	U	
2,2'-OXYBIS(1-CHLOROPROPANE)	UG/KG	350.000	U	340.000	U	
4-METHYLPHENOL	UG/KG	350.000	U	340.000	U	
N-NITROSO-DI-N-PROPYLAMINE	UG/KG	350.000	U	340.000	U	
HEXACHLOROETHANE	UG/KG	350.000	U	340.000	U	
NITROBENZENE	UG/KG	350.000	U	340.000	U	
ISOPHORONE	UG/KG	350.000	U	340.000	U	
2-NITROPHENOL	UG/KG	350.000	U	340.000	U	
2,4-DIMETHYLPHENOL	UG/KG	350.000	U	340.000	U	
BIS(2-CHLOROETHOXY)METHANE	UG/KG	350.000	U	340.000	U	
2,4-DICHLOROPHENOL	UG/KG	350.000	U	340.000	U	
1,2,4-TRICHLOROBENZENE	UG/KG	350.000	U	340.000	U	
NAPHTHALENE	UG/KG	550.000	U	340.000	U	
4-CHLOROANILINE	UG/KG	350.000	U	340.000	U	
HEXACHLOROBUTADIENE	UG/KG	350.000	U	340.000	U	
4-CHLORO-3-METHYLPHENOL	UG/KG	350.000	U	340.000	U	
2-METHYLNAPHTHALENE	UG/KG	70.000	J	340.000	U	
HEXACHLOROCYCLOPENTADIENE	UG/KG	350.000	U	340.000	U	
2,4,6-TRICHLOROPHENOL	UG/KG	350.000	U	340.000	U	
2,4,5-TRICHLOROPHENOL	UG/KG	880.000	U	850.000	U	
2-CHLORONAPHTHALENE	UG/KG	350.000	U	340.000	U	
2-NITROANILINE	UG/KG	880.000	U	850.000	U	
DIMETHYLPHTHALATE	UG/KG	350.000	U	340.000	U	
ACENAPHTHYLENE	UG/KG	60.000	J	340.000	U	
3-NITROANILINE	UG/KG	880.000	U	850.000	U	
ACENAPHTHENE	UG/KG	26.000	J	340.000	U	

verified.

 2/18/94

Validated Data Summary, Data Package: 9309L997-WES-1309

Parameter	Samp#		B09342		B09343	
	Units	Result	Q	Result	Q	Q
	Samp#	809342		809343		
	Date	9-15-93		9-15-93		
	Location	299-W19-97		299-W19-95		
	Depth	101.0 - 103.3		105.0 - 107.5		
	Type	---		---		
	Comments	SPLIT		SPLIT		
Parameter	Units	Result	Q	Result	Q	Q
2,4-DINITROPHENOL	UG/KG	880.000	U	850.000	U	
4-NITROPHENOL	UG/KG	880.000	U	850.000	U	
DIBENZOFURAN	UG/KG	73.000	J	340.000	U	
2,4-DINITROTOLUENE	UG/KG	350.000	U	340.000	U	
2,6-DINITROTOLUENE	UG/KG	350.000	U	340.000	U	
DIETHYLPHTHALATE	UG/KG	350.000	U	340.000	U	
4-CHLOROPHENYL-PHENYLEETHER	UG/KG	350.000	U	340.000	U	
FLUORENE	UG/KG	84.000	J	340.000	U	
4-NITROANILINE	UG/KG	880.000	U	850.000	U	
4,6-DINITRO-2-METHYLPHENOL	UG/KG	880.000	U	850.000	U	
N-NITROSODIPHENYLAMINE	UG/KG	350.000	U	340.000	U	
4-BROMOPHENYL-PHENYLEETHER	UG/KG	350.000	U	340.000	U	
HEXACHLOROBENZENE	UG/KG	350.000	U	340.000	U	
PENTACHLOROPHENOL	UG/KG	880.000	UJ	850.000	U	
PHENANTHRENE	UG/KG	300.000	JB	340.000	U	
ANTHRACENE	UG/KG	58.000	J	340.000	U	
CARBAZOLE	UG/KG	45.000	J	340.000	U	
DI-N-BUTYLPHTHALATE	UG/KG	17.000	J	19.000	J	
FLUORANTHENE	UG/KG	190.000	JB	340.000	U	
PYRENE	UG/KG	140.000	J	340.000	U	
BUTYLBENZYLPHTHALATE	UG/KG	350.000	U	340.000	U	
3,3'-DICHLOROBENZIDINE	UG/KG	350.000	U	340.000	U	
BENZO(A)ANTHRACENE	UG/KG	59.000	J	340.000	U	
BIS(2-ETHYLHEXYL)PHTHALATE	UG/KG	350.000	U	340.000	U	
CHRYSENE	UG/KG	60.000	J	340.000	U	
DI-N-OCTYLPHTHALATE	UG/KG	350.000	U	340.000	U	
BENZO(B)FLUORANTHENE	UG/KG	42.000	J	340.000	U	
BENZO(K)FLUORANTHENE	UG/KG	45.000	J	340.000	U	
BENZO(A)PYRENE	UG/KG	48.000	J	340.000	U	
INDENO(1,2,3-CD)PYRENE	UG/KG	27.000	J	340.000	U	
DIBENZ(A,H)ANTHRACENE	UG/KG	350.000	U	340.000	U	
BENZO(G,H,I)PERYLENE	UG/KG	19.000	J	340.000	U	

Verified.
[Signature] 2/18/94

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1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

299-W19-97

SOG 9309L997-WES-1309

B09342

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

Client: WESTINGHOUSE HANFORD

101'-103.3'
Field Split

Matrix: (soil/water) SOIL

Lab Sample ID: 9309L997-001

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

Lab File ID: A100516

Level: (low/med) LOW

Date Received: 09/17/93

% Moisture: 5 decanted: (Y/N)

Date Extracted: 09/27/93

Concentrated Extract Volume: 500(uL)

Date Analyzed: 10/05/93

Injection Volume: 2.0(uL)

Dilution Factor: 1.00

GPC Cleanup: (Y/N) Y

pH: 6.9

CONCENTRATION UNITS:

CAS NO. COMPOUND (ug/L or ug/Kg) ug/Kg Q

CAS NO.	COMPOUND	(ug/L or ug/Kg)	ug/Kg	Q
108-95-2	Phenol	18	J	
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	
95-50-1	1,2-Dichlorobenzene	350	U	
95-48-7	2-Methylphenol	350	U	
108-60-1	2,2'-oxybis(1-Chloropropane)	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	
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	550		
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	70	J	
77-47-4	Hexachlorocyclopentadiene	350	U	
88-06-2	2,4,6-Trichlorophenol	350	U	
95-95-4	2,4,5-Trichlorophenol	880	U	
91-58-7	2-Chloronaphthalene	350	U	
88-74-4	2-Nitroaniline	880	U	
131-11-3	Dimethylphthalate	350	U	
208-96-8	Acenaphthylene	60	J	
606-20-2	2,6-Dinitrotoluene	350	U	
99-09-2	3-Nitroaniline	880	U	
83-32-9	Acenaphthene	26	J	

Q

verified
2/16/94

9613401.2191

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

299-619-97

B09342

101'-103.3'

Field Split

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

Client: WESTINGHOUSE HANFORD

Matrix: (soil/water) SOIL

Lab Sample ID: 9309L997-001

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

Lab File ID: A100516

Level: (low/med) LOW

Date Received: 09/17/93

% Moisture: 5 decanted: (Y/N)

Date Extracted: 09/27/93

Concentrated Extract Volume: 500(uL)

Date Analyzed: 10/05/93

Injection Volume: 2.0(uL)

Dilution Factor: 1.00

GPC Cleanup: (Y/N) Y pH: 6.9

CONCENTRATION UNITS:

CAS NO. COMPOUND (ug/L or ug/Kg) ug/Kg Q

CAS NO.	COMPOUND	(ug/L or ug/Kg)	ug/Kg	Q
51-28-5	2,4-Dinitrophenol	880		U
100-02-7	4-Nitrophenol	880		U
132-64-9	Dibenzofuran	73		J
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	84		J
100-01-6	4-Nitroaniline	880		U
534-52-1	4,6-Dinitro-2-methylphenol	880		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	880		U
85-01-8	Phenanthrene	300		JB
120-12-7	Anthracene	58		J
86-74-8	Carbazole	45		J
84-74-2	Di-n-butylphthalate	17		J
206-44-0	Fluoranthene	190		JB
129-00-0	Pyrene	140		J
85-68-7	Butylbenzylphthalate	350		U
91-94-1	3,3'-Dichlorobenzidine	350		U
56-55-3	Benzo(a)anthracene	59		J
218-01-9	Chrysene	60		J
117-81-7	bis(2-Ethylhexyl)phthalate	350	29	JB
117-84-0	Di-n-octyl phthalate	350		U
205-99-2	Benzo(b)fluoranthene	42		J
207-08-9	Benzo(k)fluoranthene	45		J
50-32-8	Benzo(a)pyrene	48		J
193-39-5	Indeno(1,2,3-cd)pyrene	27		J
53-70-3	Dibenz(a,h)anthracene	350		U
191-24-2	Benzo(g,h,i)perylene	19		J

(1) - Cannot be separated from Diphenylamine

FORM 1 SV-2

3/90

011 0043

verified
2/16/94

9613401.2192

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

299-6919-97

B09342

101'-103.3'

Field Split

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

Client: WESTINGHOUSE HANFORD

Matrix: (soil/water) SOIL

Lab Sample ID: 9309L997-001

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

Lab File ID: A100516

Level: (low/med) LOW

Date Received: 09/17/93

% Moisture: 5 decanted: (Y/N)

Date Extracted: 09/27/93

Concentrated Extract Volume: 500(uL)

Date Analyzed: 10/05/93

Injection Volume: 2.0(uL)

Dilution Factor: 1.00

GPC Cleanup: (Y/N) Y

pH: 6.9

CONCENTRATION UNITS:

Number TICs found: 9

(ug/L or ug/Kg) ug/Kg

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	ALDOL CONDENSATE	6.04	1000	JAB
2.	ALDOL CONDENSATE	6.65	40000	JAB
3.	UNKNOWN	7.03	80	JB
4.	ALDOL CONDENSATE	8.07	200	JA
5.	ALDOL CONDENSATE	9.39	100	JA
6.	UNKNOWN	18.48	100	J
7.	ORGANIC ACID	21.35	200	J
8.	ADIPATE	23.99	70	J
9.	UNKNOWN	24.65	300	J

10
RR
RR
RR
RR
RR
RR
RR
RR

verified
2/16/94

9613401.2193

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

299-619-95

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

B09343

105-107.5

Fidd Split

Client: WESTINGHOUSE HANFORD

Matrix: (soil/water) SOIL

Lab Sample ID: 9309L997-002

Sample wt/vol: 30.3 (g/mL) G

Lab File ID: A100714

Level: (low/med) LOW

Date Received: 09/17/93

% Moisture: 3 decanted: (Y/N)

Date Extracted: 09/27/93

Concentrated Extract Volume: 500(uL)

Date Analyzed: 10/07/93

Injection Volume: 2.0(uL)

Dilution Factor: 1.00

GPC Cleanup: (Y/N) Y

pH: 6.7

CONCENTRATION UNITS:

CAS NO.	COMPOUND	(ug/L or ug/Kg) <u>ug/Kg</u>	Q	<u>Q</u>
108-95-2	Phenol	340	U	
111-44-4	bis(2-Chloroethyl)ether	340	U	
95-57-8	2-Chlorophenol	340	U	
541-73-1	1,3-Dichlorobenzene	340	U	
106-46-7	1,4-Dichlorobenzene	340	U	
95-50-1	1,2-Dichlorobenzene	340	U	
95-48-7	2-Methylphenol	340	U	
108-60-1	2,2'-oxybis(1-Chloropropane)	340	U	
106-44-5	4-Methylphenol	340	U	
621-64-7	N-Nitroso-di-n-propylamine	340	U	
67-72-1	Hexachloroethane	340	U	
98-95-3	Nitrobenzene	340	U	
78-59-1	Isophorone	340	U	
88-75-5	2-Nitrophenol	340	U	
105-67-9	2,4-Dimethylphenol	340	U	
111-91-1	bis(2-Chloroethoxy)methane	340	U	
120-83-2	2,4-Dichlorophenol	340	U	
120-82-1	1,2,4-Trichlorobenzene	340	U	
91-20-3	Naphthalene	340 210	U	u
106-47-8	4-Chloroaniline	340	U	
87-68-3	Hexachlorobutadiene	340	U	
59-50-7	4-Chloro-3-methylphenol	340	U	
91-57-6	2-Methylnaphthalene	340 25	U	u
77-47-4	Hexachlorocyclopentadiene	340	U	
88-06-2	2,4,6-Trichlorophenol	340	U	
95-95-4	2,4,5-Trichlorophenol	850	U	
91-58-7	2-Chloronaphthalene	340	U	
88-74-4	2-Nitroaniline	850	U	
131-11-3	Dimethylphthalate	340	U	
208-96-8	Acenaphthylene	340 29	U	u
606-20-2	2,6-Dinitrotoluene	340	U	
99-09-2	3-Nitroaniline	850	U	
83-32-9	Acenaphthene	340	U	

verified
2/16/94

9613401.2194

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

299-619-95

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

B09343

105-107.5

Client: WESTINGHOUSE HANFORD

Fidd Split

Matrix: (soil/water) SOIL

Lab Sample ID: 9309L997-002

Sample wt/vol: 30.3 (g/mL) G

Lab File ID: A100714

Level: (low/med) LOW

Date Received: 09/17/93

% Moisture: 3 decanted: (Y/N)___

Date Extracted: 09/27/93

Concentrated Extract Volume: 500(uL)

Date Analyzed: 10/07/93

Injection Volume: 2.0(uL)

Dilution Factor: 1.00

GPC Cleanup: (Y/N) Y pH: 6.7

CONCENTRATION UNITS:

CAS NO.	COMPOUND	(ug/L or ug/Kg) ug/Kg	Q	Q
51-28-5	2,4-Dinitrophenol	850	U	
100-02-7	4-Nitrophenol	850	U	
132-64-9	Dibenzofuran	340 24	JB	u
121-14-2	2,4-Dinitrotoluene	340	U	
84-66-2	Diethylphthalate	340	U	
7005-72-3	4-Chlorophenyl-phenylether	340	U	
86-73-7	Fluorene	340 32	JB	u
100-01-6	4-Nitroaniline	850	U	
534-52-1	4,6-Dinitro-2-methylphenol	850	U	
86-30-6	N-Nitrosodiphenylamine (1)	340	U	
101-55-3	4-Bromophenyl-phenylether	340	U	
118-74-1	Hexachlorobenzene	340	U	
87-86-5	Pentachlorophenol	850	U	
85-01-8	Phenanthrene	340 120	JB	u
120-12-7	Anthracene	340 25	JB	u
86-74-8	Carbazole	340 16	JB	u
84-74-2	Di-n-butylphthalate	19	J	u
206-44-0	Fluoranthene	340 71	JB	u
129-00-0	Pyrene	340 59	JB	u
85-68-7	Butylbenzylphthalate	340	U	
91-94-1	3,3'-Dichlorobenzidine	340	U	
56-55-3	Benzo(a)anthracene	340 21	JB	u
218-01-9	Chrysene	340 20	JB	u
117-81-7	bis(2-Ethylhexyl)phthalate	340 49	JB	u
117-84-0	Di-n-octyl phthalate	340	U	
205-99-2	Benzo(b)fluoranthene	340	U	
207-08-9	Benzo(k)fluoranthene	340	U	
50-32-8	Benzo(a)pyrene	340	U	
193-39-5	Indeno(1,2,3-cd)pyrene	340	U	
53-70-3	Dibenz(a,h)anthracene	340	U	
191-24-2	Benzo(g,h,i)perylene	340	U	

(1) - Cannot be separated from Diphenylamine

FORM 1 SV-2

3/90

Verified
2/16/94

014

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9613401.2195

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

299-419-95

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

B09343

105-107.5'

Field Split

Client: WESTINGHOUSE HANFORD

Matrix: (soil/water) SOIL

Lab Sample ID: 9309L997-002

Sample wt/vol: 30.3 (g/mL) G

Lab File ID: A100714

Level: (low/med) LOW

Date Received: 09/17/93

% Moisture: 3 decanted: (Y/N)

Date Extracted: 09/27/93

Concentrated Extract Volume: 500(uL)

Date Analyzed: 10/07/93

Injection Volume: 2.0(uL)

Dilution Factor: 1.00

GPC Cleanup: (Y/N) Y

pH: 6.7

CONCENTRATION UNITS:

Number TICs found: 8

(ug/L or ug/Kg) ug/Kg

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	ALDOL CONDENSATE	6.05	900	JA
2.	ALDOL CONDENSATE	6.66	30000	JA
3.	UNKNOWN	7.04	90	JB
4.	ALDOL CONDENSATE	8.08	100	JA
5.	ALDOL CONDENSATE	8.63	100	JA
6.	ALDOL CONDENSATE	9.40	90	JA
7.	ORGANIC ACID	21.35	200	J
8.	UNKNOWN	24.66	200	J

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Verified
2/16/94

9613401.2196

ATTACHMENT 4

LABORATORY NARRATIVE AND CHAIN-OF-CUSTODY DOCUMENTATION



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

Client: WESTINGHOUSE HANFORD
RFW #: 9309L997

W.O. #: 06168-002-001-9999-00
Date Received: 09-17-93

SEMIVOLATILE

The set of samples consisted of two (2) soil samples collected on 09-15-93.

The samples were extracted on 09-27-93 and analyzed according to criteria set forth in CLP SOW 03/90 for TCL Semivolatile target compounds on 10-05,07-93.

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

1. Non-target compounds were detected in these samples.
2. All surrogate recoveries were within EPA QC limits.
3. Two (2) of twenty-two (22) matrix spike recoveries were outside EPA QC limits.
4. All blank spike recoveries were within EPA QC limits.
5. The laboratory blank 93LE1687-MB1 contained the common contaminants Diethylphthalate, Bis(2-ethylhexyl)phthalate and the target compounds Naphthalene, 2-Methylnaphthalene, Acenaphthylene, Dibenzofuran, Fluorene, Phenanthrene, Anthracene, Carbazole, Fluoroanthene, Pyrene, Benzo(a)anthracene, Chrysene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Benzo(a)pyrene, Indeno(1,2,3-cd)pyrene and Benzo(g,h,i)perylene at levels less than the CRQL.

The laboratory blank 93LE1690-MB1 contained the common contaminant Bis(2-ethylhexyl)phthalate and the target compounds Phenanthrene and Fluoranthene at levels less than the CRQL.

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

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

10.27.93
Date

9613401 2198

Westinghouse
Hanford Company

CHAIN OF CUSTODY

Custody Form Initiator L E ROGERS
 Company Contact L E ROGERS Telephone 376-7690
 Project Designation/Sampling Locations 200-UP-2 Collection Date 9-15-93
 Ice Chest No. SML 364 Field Logbook No. EFL-1091
 Bill of Lading/Airbill No. 2536956202 Offsite Property No. _____
 Method of Shipment OVERNIGHT AIR SERVICE
 Shipped to WESTON
 Possible Sample Hazards/Remarks Keep samples at 4C (SOIL) NONE NOTED 9309L 997

Sample Identification

RAD B09342

1) 001
 1,500ml P:CLP;TAL Metals,Hg,Ti
 1,125ml Gs:VOA CLP
 1,500ml aG:Semi-VOA CLP
 1,250ml G:Anions F,Cl,SO4 (EPA 300.0)
 1,125ml P/G:Anions NO2,NO3 (EPA 353.1)
 1,250ml G:Cyanide CLP
 1,1000ml P/G:Gross alpha/beta (PRO-032-15), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152,
 Eu-154,Eu-155,K-40,Ru-106,Na-22 (PRO-042-5), U-235,U-234,U-238 (PRO-052-32) Np-237,(PRO-042-5) Pu-238,Pu-
 239/240 (PRO-052-32) Sr-90 (PRO-032-38,PRO-032-25) Tc-99 (PRO-032-78) Am-241,Cm-244 (PRO-052-32 or PRO-062-
 109) Se-79

2) 002
B09343
 1,500ml P:CLP;TAL Metals,Hg,Ti
 1,125ml Gs:VOA CLP
 1,500ml aG:Semi-VOA CLP
 1,250ml G:Anions F,Cl,SO4 (EPA 300.0)
 1,125ml P/G:Anions NO2,NO3 (EPA 353.1)
 1,250ml G:Cyanide CLP
 1,1000ml P/G:Gross alpha/beta (PRO-032-15), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152,
 Eu-154,Eu-155,K-40,Ru-106,Na-22 (PRO-042-5), U-235,U-234,U-238 (PRO-052-32) Np-237,(PRO-042-5) Pu-238,Pu-
 239/240 (PRO-052-32) Sr-90 (PRO-032-38,PRO-032-25) Tc-99 (PRO-032-78) Am-241,Cm-244 (PRO-052-32 or PRO-062-
 109) Se-79

3) PER 9-16-93
 1,500ml P:CLP;TAL Metals,Hg,Ti
 1,125ml Gs:VOA CLP
 1,500ml aG:Semi-VOA CLP
 1,250ml G:Anions F,Cl,SO4 (EPA 300.0)
 1,125ml P/G:Anions NO2,NO3 (EPA 353.1)
 1,250ml G:Cyanide CLP
 1,1000ml P/G:Gross alpha/beta (PRO-032-15), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152,
 Eu-154,Eu-155,K-40,Ru-106,Na-22 (PRO-042-5), U-235,U-234,U-238 (PRO-052-32) Np-237,(PRO-042-5) Pu-238,Pu-
 239/240 (PRO-052-32) Sr-90 (PRO-032-38,PRO-032-25) Tc-99 (PRO-032-78) Am-241,Cm-244 (PRO-052-32 or PRO-062-
 109) Se-79 TKM-2.8

<input type="checkbox"/> Field Transfer of Custody	Chain of Possession	(Sign and Print Names)
Relinquished by: <u>1050</u> <u>Jason E. Rogers 9-16-93</u>	Received by:	Date/Time:
Relinquished by: <u>BMH</u>	Received by: <u>[Signature]</u>	Date/Time: <u>9-17-93 17100</u>
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition		
Disposal Method:	Disposed by:	Date/Time:
Comments:		

9613401.2199

ATTACHMENT 5

DATA VALIDATION SUPPORTING DOCUMENTATION

9613401.2200

WHC-SD-EN-SPP-002, Rev. 2

GC/MS ORGANIC DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: 200-UP-2			DATA PACKAGE: 9309L 997-WES-1309		
VALIDATOR: <i>[Signature]</i>		LAB: <i>Weston</i>		DATE: 22/15/94	
CASE:			SDG: 9309L 997-WES-1309		
ANALYSES PERFORMED					
<input type="checkbox"/> CLP Volatiles	<input type="checkbox"/> SW-846 8240 (cap column)	<input type="checkbox"/> SW-846 8260 (packed column)	<input checked="" type="checkbox"/> CLP Semivolatiles	<input type="checkbox"/> SW-846 8270 (cap column)	<input type="checkbox"/> SW-846 (packed column)
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
SAMPLES/MATRIX <i>Soils</i>					
<i>B09342</i>					
<i>B09343</i>					

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Is technical verification documentation present? **Yes** No N/A

Is a case narrative present? **Yes** No N/A

Comments: _____

2. HOLDING TIMES

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

Comments: _____

GC/MS ORGANIC DATA VALIDATION CHECKLIST

3. INSTRUMENT TUNING AND CALIBRATION

Is the GC/MS tuning/performance check acceptable? Yes No N/A
 Are initial calibrations acceptable? Yes No N/A
 Are continuing calibrations acceptable? Yes No N/A

Comments: CCU 30 for Pentachlorophenol, assoc.
of sample B09342, was 725%. Therefore,
the assoc. result was qualified as estimated (U).

4. BLANKS

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

Comments: See attached blank forms for
blank contamination.
Associated results less than five or ten times
the respective blank concentration have been
qualified as undetected (U). See the last page of
this check list for further comments.

5. ACCURACY

Were surrogates/System Monitoring Compounds analyzed? Yes No N/A
 Are surrogate/System Monitoring Compound recoveries acceptable? Yes No N/A
 Were MS/MSD samples analyzed? Yes No N/A
 Are MS/MSD results acceptable? Yes No N/A

Comments: The MS & MSD %R for 2,4-dinitrotoluene are
above the control limits as 94% and 93%,
respectively. No qualification is required,
as the MS %R are good - close to 100%.
 2/18/94

GC/MS ORGANIC DATA VALIDATION CHECKLIST

6. PRECISION

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

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

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

Comments: Samples B09342 and B09343 were identified as field splits and will be compared to the original sample in the quarterly project report.

7. SYSTEM PERFORMANCE

Were internal standards analyzed? Yes No N/A

Are internal standard areas acceptable? Yes No N/A

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

Comments: _____

8. COMPOUND IDENTIFICATION AND QUANTITATION

Is compound identification acceptable? Yes No N/A

Is compound quantitation acceptable? Yes No N/A

Comments: _____

9. REPORTED RESULTS AND QUANTITATION LIMITS

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

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

Do results meet the CRQLs? Yes No N/A

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

Comments: _____

GC/MS ORGANIC DATA VALIDATION CHECKLIST

Comments (attach additional sheets as necessary): _____

Blanks

in sample B09342

2/18/94

The results for phenanthrene and fluoranthene were not qualified as undetected (U) since the sample concentrations are greater than five times the blank concentration.

Missing Page

The semi-volatile data package was missing the page numbered '45'. No qualification was required since the data was still fully validatable.

[Signature]
2/18/94

[Signature]
2/16/94

9613401.2204

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

DATE RECEIVED: 09/17/93

RFW LOT # :9309L997

CLIENT ID	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B09342	001	S	93LE1690	09/15/93	09/27/93	10/05/93
B09343	002	S	93LE1687	09/15/93	09/27/93	10/07/93
B09343	002 MS	S	93LE1687	09/15/93	09/27/93	10/07/93
B09343	002 MSD	S	93LE1687	09/15/93	09/27/93	10/07/93

#025
#025
12
18

LAB QC:

SBLK	MB1	S	93LE1690	N/A	09/27/93	10/05/93
SBLK	MB1 BS	S	93LE1690	N/A	09/27/93	10/05/93
SBLK	MB1 BSD	S	93LE1690	N/A	09/27/93	10/05/93
SBLK	MB1	S	93LE1687	N/A	09/27/93	10/07/93
SBLK	MB1 BS	S	93LE1687	N/A	09/27/93	10/07/93

Samples were extracted and analyzed within the required holding time. No qualification is required.

[Signature]
2/15/94

9613401.2205

3D

SOIL SEMIVOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: Roy F. Weston, Inc.

Contract: 6168-02-01

Case No.: WESTINGHOUSE HANFORD

RFW Lot No.: 9309L997-002

MATRIX Spike - Sample No.: B09343

Level (low/med): LOW

COMPOUND	SPIKE ADDED UG/KG	SAMPLE CONCENTRATION UG/KG	MS CONCENTRATION UG/KG	MS % REC #	QC LIMITS REC.
Phenol	2580	0	1570	61 ✓	26 - 90
2-Chlorophenol	2580	0	1700	66 ✓	25 -102
1,4-Dichlorobenzene	1720	0	1080	63 ✓	28 -104
N-Nitroso-di-n-prop. (1)	1720	0	1430	83 ✓	41 -126
1,2,4-Trichlorobenzene	1720	0	1260	73 ✓	38 -107
4-Chloro-3-methylphenol	2580	0	2050	79 ✓	26 -103
Acenaphthene	1720	0	1340	78 ✓	31 -137
4-Nitrophenol	2580	0	2570	99 ✓	11 -114
2,4-Dinitrotoluene	1720	0	1620	94 *	28 - 89
Pentachlorophenol	2580	0	2600	101 ✓	17 -109
Pyrene	1720	59.3	1610	90 ✓	35 -142

COMPOUND	SPIKE ADDED UG/KG	MSD CONCENTRATION UG/KG	MSD % REC #	% RPD #	QC LIMITS RPD REC
Phenol	2560	1480	58 ✓	5 ✓	35 26 - 90
2-Chlorophenol	2560	1570	61 ✓	7 ✓	50 25 -102
1,4-Dichlorobenzene	1710	1030	60 ✓	4 ✓	27 28 -104
N-Nitroso-di-n-prop. (1)	1710	1460	86 ✓	3 ✓	38 41 -126
1,2,4-Trichlorobenzene	1710	1190	70 ✓	4 ✓	23 38 -107
4-Chloro-3-methylphenol	2560	1860	72 ✓	9 ✓	33 26 -103
Acenaphthene	1710	1260	74 ✓	5 ✓	19 31 -137
4-Nitrophenol	2560	2600	101 ✓	2 ✓	50 11 -114
2,4-Dinitrotoluene	1710	1580	93 *	1 ✓	47 28 - 89
Pentachlorophenol	2560	2580	101 ✓	0 ✓	47 17 -109
Pyrene	1710	1690	95 ✓	5 ✓	36 35 -142

(1) N-Nitroso-di-n-propylamine *No qualification is required.*

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: 2 out of 22 outside limits

COMMENTS: _____

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~~0027~~

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7C

SEMIVOLATILE CONTINUING CALIBRATION CHECK

Lab Name: Roy F. Weston, Inc.Contract: 6168-02-01Case No.: WESTINGHOUSE HANFORDRFW Lot: 9309L997Instrument ID: 5971ACalibration Date: 10/05/93Time: 0851Lab File ID: A100502Init. Calib. Date(s): 10/04/93 10/04/93Init. Calib. Times: 0857 1224Assoc. w/ B09342

COMPOUND	RRF	RRF50	MIN RRF	%D	MAX %D
Diethylphthalate	1.531	1.842		-20.3	
4-Chlorophenyl-phenylether	0.617	0.686	0.400	-11.2	25.0
Fluorene	1.102	1.230	0.900	-11.6	25.0
4-Nitroaniline	0.345	0.429		-24.3	
4,6-Dinitro-2-methylphenol	0.175	0.204		-16.6	
N-Nitrosodiphenylamine (1)	0.417	0.460		-10.3	
4-Bromophenyl-phenylether	0.200	0.238	0.100	-19.0	25.0
Hexachlorobenzene	0.256	0.293	0.100	-14.5	25.0
Pentachlorophenol	0.167	0.212	0.050	-26.9	25.0
Phenanthrene	0.902	0.955	0.700	-5.9	25.0
Anthracene	0.904	0.959	0.700	-6.1	25.0
Carbazole	0.707	0.861		-21.8	
Di-n-butylphthalate	1.277	1.487		-16.4	
Fluoranthene	0.923	1.048	0.600	-13.5	25.0
Pyrene	1.303	1.268	0.600	2.7	25.0
Butylbenzylphthalate	0.745	0.828		-11.1	
3,3'-Dichlorobenzidine	0.402	0.465		-15.7	
Benzo(a)anthracene	1.085	1.167	0.800	-7.6	25.0
Chrysene	0.997	1.047	0.700	-5.0	25.0
bis(2-Ethylhexyl)phthalate	0.936	1.058		-13.0	
Di-n-octyl phthalate	2.141	2.221		-3.7	
Benzo(b)fluoranthene	1.386	1.363	0.700	1.7	25.0
Benzo(k)fluoranthene	1.298	1.281	0.700	1.3	25.0
Benzo(a)pyrene	1.287	1.332	0.700	-3.5	25.0
Indeno(1,2,3-cd)pyrene	1.277	1.241	0.500	2.8	25.0
Dibenz(a,h)anthracene	1.033	0.999	0.400	3.3	25.0
Benzo(g,h,i)perylene	1.182	1.132	0.500	4.2	25.0
Nitrobenzene-d5	0.427	0.488	0.200	-14.3	25.0
2-Fluorobiphenyl	1.229	1.363	0.700	-10.9	25.0
Terphenyl-d14	0.847	0.874	0.500	-3.2	25.0
Phenol-d5	1.910	1.851	0.800	3.1	25.0
2-Fluorophenol	1.792	1.844	0.600	-2.9	25.0
2,4,6-Tribromophenol	0.167	0.197		-18.0	
2-Chlorophenol-d4	1.421	1.514	0.800	-6.5	25.0
1,2-Dichlorobenzene-d4	0.833	0.886	0.400	-6.4	25.0

(1) Cannot be separated from Diphenylamine

All other compounds must meet a minimum RRF of 0.010.

FORM VII SV-2

3/90 Rev.

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CLIENT SAMPLE NO.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

SBLK

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

Client: WESTINGHOUSE HANFORD

Matrix: (soil/water) SOIL

Lab Sample ID: 93LE1690-MB1

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

Lab File ID: A100513

Level: (low/med) LOW

Date Received: 09/27/93

% Moisture: decanted: (Y/N)

Date Extracted: 09/27/93

Concentrated Extract Volume: 500 (uL)

Date Analyzed: 10/05/93

Injection Volume: 2.0 (uL)

Dilution Factor: 1.00

GPC Cleanup: (Y/N) Y

pH: 7.0

Assoc. w/ B09342

CONCENTRATION UNITS:

CAS NO. COMPOUND (ug/L or ug/Kg) ug/Kg Q

51-28-5	2,4-Dinitrophenol	840	U
100-02-7	4-Nitrophenol	840	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	840	U
534-52-1	4,6-Dinitro-2-methylphenol	840	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	840	U
85-01-8	Phenanthrene	21	J
120-12-7	Anthracene	330	U
86-74-8	Carbazole	330	U
84-74-2	Di-n-butylphthalate	330	U
206-44-0	Fluoranthene	11	J
129-00-0	Pyrene	330	U
85-68-7	Butylbenzylphthalate	330	U
91-94-1	3,3'-Dichlorobenzidine	330	U
56-55-3	Benzo(a)anthracene	330	U
218-01-9	Chrysene	330	U
117-81-7	bis(2-Ethylhexyl)phthalate	13	J
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	Dibenz(a,h)anthracene	330	U
191-24-2	Benzo(g,h,i)perylene	330	U

x5 = 105

x5 = 55

x90 = 130

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2/16/94

(1) - Cannot be separated from Diphenylamine

9613401.2208

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

SBLK

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

Client: WESTINGHOUSE HANFORD

Matrix: (soil/water) SOIL

Lab Sample ID: 93LE1690-MB1

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

Lab File ID: A100513

Level: (low/med) LOW

Date Received: 09/27/93

% Moisture: decanted: (Y/N)

Date Extracted: 09/27/93

Concentrated Extract Volume: 500(uL)

Date Analyzed: 10/05/93

Injection Volume: 2.0(uL)

Dilution Factor: 1.00

GPC Cleanup: (Y/N) Y

pH: 7.0

Assoc. w/ B09342

CONCENTRATION UNITS:

Number TICs found: 3

(ug/L or ug/Kg) ug/Kg

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	ALDOL CONDENSATE	6.01	200	JA
2.	ALDOL CONDENSATE	6.56	4000	JA
3.	UNKNOWN	7.01	70	J

x5-350

2/16/94

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CLIENT SAMPLE NO.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

SBLK

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

Client: WESTINGHOUSE HANFORD

Matrix: (soil/water) SOIL

Lab Sample ID: 93LE1687-MB1

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

Lab File ID: A100712

Level: (low/med) LOW

Date Received: 09/27/93

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

Date Extracted: 09/27/93

Concentrated Extract Volume: 500(uL)

Date Analyzed: 10/07/93

Injection Volume: 2.0(uL)

Dilution Factor: 1.00

GPC Cleanup: (Y/N) Y

pH: 7.0

Assoc w/ B09343

CAS NO. COMPOUND CONCENTRATION UNITS: (ug/L or ug/Kg) ug/Kg Q

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
95-50-1	1,2-Dichlorobenzene	330	U
95-48-7	2-Methylphenol	330	U
108-60-1	2,2'-oxybis(1-Chloropropane)	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
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	270	J
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	32	J
77-47-4	Hexachlorocyclopentadiene	330	U
88-06-2	2,4,6-Trichlorophenol	330	U
95-95-4	2,4,5-Trichlorophenol	840	U
91-58-7	2-Chloronaphthalene	330	U
88-74-4	2-Nitroaniline	840	U
131-11-3	Dimethylphthalate	330	U
208-96-8	Acenaphthylene	28	J
606-20-2	2,6-Dinitrotoluene	330	U
99-09-2	3-Nitroaniline	840	U
83-32-9	Acenaphthene	330	U

RS = 1350

RS = 160

RS = 140

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CLIENT SAMPLE NO.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

SBLK

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

Client: WESTINGHOUSE HANFORD

Matrix: (soil/water) SOIL

Lab Sample ID: 93LE1687-MB1

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

Lab File ID: A100712

Level: (low/med) LOW

Date Received: 09/27/93

% Moisture: decanted: (Y/N)

Date Extracted: 09/27/93

Concentrated Extract Volume: 500(uL)

Date Analyzed: 10/07/93

Injection Volume: 2.0(uL)

Dilution Factor: 1.00

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

Assoc. w/ 809343

CONCENTRATION UNITS:

CAS NO. COMPOUND (ug/L or ug/Kg) ug/Kg Q

51-28-5	2,4-Dinitrophenol	840	U	
100-02-7	4-Nitrophenol	840	U	
132-64-9	Dibenzofuran	33	J	$\times 5 = 165$
121-14-2	2,4-Dinitrotoluene	330	U	
84-66-2	Diethylphthalate	24	J	$\times 5 \cdot 10 = 240$
7005-72-3	4-Chlorophenyl-phenylether	330	U	
86-73-7	Fluorene	40	J	$\times 5 = 200$
100-01-6	4-Nitroaniline	840	U	
534-52-1	4,6-Dinitro-2-methylphenol	840	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	840	U	
85-01-8	Phenanthrene	150	J	$\times 5 = 750$
120-12-7	Anthracene	33	J	$\times 5 = 165$
86-74-8	Carbazole	22	J	$\times 5 = 110$
84-74-2	Di-n-butylphthalate	330	U	
206-44-0	Fluoranthene	96	J	$\times 5 = 480$
129-00-0	Pyrene	80	J	$\times 5 = 400$
85-68-7	Butylbenzylphthalate	330	U	
91-94-1	3,3'-Dichlorobenzidine	330	U	
56-55-3	Benzo(a)anthracene	27	J	$\times 5 = 135$
218-01-9	Chrysene	27	J	$\times 5 = 135$
117-81-7	bis(2-Ethylhexyl)phthalate	21	J	$\times 10 = 210$
117-84-0	Di-n-octyl phthalate	330	U	
205-99-2	Benzo(b)fluoranthene	18	J	$\times 5 = 90$
207-08-9	Benzo(k)fluoranthene	20	J	$\times 5 = 100$
50-32-8	Benzo(a)pyrene	27	J	$\times 5 = 135$
193-39-5	Indeno(1,2,3-cd)pyrene	12	J	$\times 5 = 60$
53-70-3	Dibenz(a,h)anthracene	330	U	
191-24-2	Benzo(g,h,i)perylene	16	J	$\times 5 = 80$

(1) - Cannot be separated from Diphenylamine

FORM 1 SV-2

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1F

CLIENT SAMPLE NO.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

SBLK

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

Client: WESTINGHOUSE HANFORD

Matrix: (soil/water) SOIL

Lab Sample ID: 93LE1687-MB1

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

Lab File ID: A100712

Level: (low/med) LOW

Date Received: 09/27/93

% Moisture: decanted: (Y/N)

Date Extracted: 09/27/93

Concentrated Extract Volume: 500(uL)

Date Analyzed: 10/07/93

Injection Volume: 2.0(uL)

Dilution Factor: 1.00

GPC Cleanup: (Y/N) Y

pH: 7.0

Assoc. w/ B09343

CONCENTRATION UNITS:

Number TICs found: 1

(ug/L or ug/Kg) ug/Kg

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN	7.03	90	J

x5=450

2/16/94

MEMORANDUM



TO: 200-UP-2 Project QA Record

February 18, 1994

FR: Susan Winter, Golder Associates Inc. *S. Winter*

RE: GENERAL CHEMISTRY DATA VALIDATION SUMMARY FOR DATA PACKAGE:
9309L997-WES-1309 (923-E418, Filename 9309L997.GCH)

INTRODUCTION

This memo presents the results of data validation on data package 9309L997-WES-1309 prepared by the Weston Analytics laboratory. A list of samples validated along with the analyses reported is provided in the following table.

SAMPLE ID	SAMPLE DATE	MEDIA	ANALYSIS
B09342	09/15/93	SOIL	SEE NOTE 1
B09343	09/15/93	SOIL	
B09348	09/16/93	SOIL	

Note 1. Samples B09342 and B09343 were analyzed for percent solids, chloride, fluoride, cyanide, sulfate, nitrate+nitrite-N and sample B09348 was analyzed for percent solids only.

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

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

DATA QUALITY OBJECTIVES

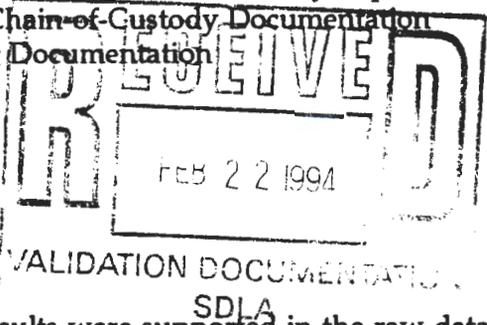
Precision. Goals for precision were met.

Accuracy. Goals for accuracy were met.

Sample Result Verification. All sample results were supported in the raw data with the exception of the cyanide result for sample B09343 which has been corrected on the laboratory report form from 7.5 mg/kg to 2.9 mg/kg as according to the raw data. This correction is also reflected in the validated data summary.

Detection Limits. Detection limit goals were met for all sample results as specified in the reference analytical method.

Completeness. The data package was complete for all requested analyses. A total of three samples were validated in this data package with a total of 13 determinations reported, all of



which were deemed valid. This results in a completeness of 100 percent, which meets normal work plan objectives of 90%.

MAJOR DEFICIENCIES

No major deficiencies were identified during data validation which required qualification of data as unusable.

MINOR DEFICIENCIES

No minor deficiencies were identified during data validation which required qualification of data.

REFERENCES

WHC 1993a, Validation of 200-UP-2 Data, Statement of Work, Analytical Laboratory Data Validation, Task Order S-94-18, December 14, 1993, Purchase Order M073750. Westinghouse Hanford Company, Richland, Washington.

WHC 1993b, Data Validation Procedures for Chemical Analyses, WHC-SD-EN-SPP-002, Rev. 2, 1993. Westinghouse Hanford Company, Richland, Washington.

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ATTACHMENT 1

GLOSSARY OF DATA REPORTING QUALIFIERS

GLOSSARY OF INORGANIC DATA REPORTING QUALIFIERS

- B - Indicates the constituent was analyzed for and detected. The concentration reported is less than the contract required detection limit (CRDL) but greater than the instrument detection limit (IDL). The associated data should be considered usable for decision making purposes.
- U - Indicates the constituent was analyzed for and not detected. The concentration reported is the sample detection limit corrected for aliquot size, dilution and percent solids (in the case of solid matrices) by the laboratory. The associated data should be considered usable for decision making purposes.
- UJ - Indicates the constituent was analyzed for and not detected. Due to a minor quality control deficiency identified during data validation the concentration may not accurately reflect the sample detection limit. The associated data have been qualified as estimated but should be considered usable for decision making purposes.
- BJ - Indicates the constituent was analyzed for and detected at a concentration less than the contract required detection limit (CRDL) but greater than the instrument detection limit (IDL). Due to a minor quality control deficiency identified during data validation the associated data have been qualified as estimated, but should be considered usable for decision making purposes.
- J - Indicates the constituent was analyzed for and detected. Due to a minor quality control deficiency identified during data validation the associated data have been qualified as estimated, but should be considered usable for decision making purposes.
- UR - Indicates the constituent was analyzed for and not detected. Due to a major quality control deficiency identified during data validation, the associated data have been qualified as unusable for decision making purposes.
- R - Indicates the constituent was analyzed for and detected. Due to a major quality control deficiency identified during data validation, the associated data have been qualified as unusable for decision making purposes.

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ATTACHMENT 2
SUMMARY OF DATA QUALIFICATIONS

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ATTACHMENT 3

QUALIFIED DATA SUMMARY AND ANNOTATED LABORATORY REPORTS

Validated Data Summary, Data Package: 9309L997-WES-1309

Parameter	Samp#		B09342		B09343		B09348	
	Units	Result	Q	Result	Q	Result	Q	
	Date	9-15-93		9-15-93		9-16-93		
	Location	299-W19-97		299-W19-95		299-W19-97		
	Depth	101.0 - 103.3		105.0 - 107.5		---		
	Type	---		---		---		
	Comments	SPLIT		SPLIT		TRIP		
PERCENT SOLIDS	%	95.100		96.800		100.000		
CHLORIDE	MG/KG	16.100		12.600		---		
FLUORIDE	MG/KG	2.600	U	2.600	U	---		
CYANIDE	MG/KG	1.100	U	2.900		---		
SULFATE	MG/KG	7.700		7.800		---		
NITRATE+NITRITE	MG-N/KG	0.780		0.440		---		

Verified
[Signature]
 2/18/94

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9613401.2220
 SOG 9309L997-WFS-1309

ROY F. WESTON INC.

INORGANIC DATA SUMMARY REPORT 10/26/93

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

WESTON BATCH #: 9309L997

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	B09342	% Solids	95.1	%	0.10	1.0
		Chloride by IC	16.1	MG/KG	1.3	1.0
		Fluoride by IC	2.6	u MG/KG	2.6	1.0
		Cyanide, Total	1.1	u MG/KG	1.1	1.0
		Sulfate by IC	7.7	MG/KG	1.3	1.0
		Nitrate Nitrite	0.78	MG-N/KG	0.10	1.0
-002	B09343	% Solids	96.8	%	0.10	1.0
		Chloride by IC	12.6	MG/KG	1.3	1.0
		Fluoride by IC	2.6	u MG/KG	2.6	1.0
		Cyanide, Total	2.9	MG/KG	1.0	1.0
		Sulfate by IC	7.8	MG/KG	1.3	1.0
		Nitrate Nitrite	0.44	MG-N/KG	0.10	1.0
-003	B09348	% Solids	100	%	0.10	1.0

299-W19-97
 101-103.3'
 Field Split

299-W19-95
 105-107.5'
 Field Split

299-W19-97
 Solid Trip Blank

9

2/18/94

2/18/94

Ver. Sig.
 [Signature]
 2/16/94

009 0004

9613401.2221

ATTACHMENT 4

LABORATORY NARRATIVE AND CHAIN-OF-CUSTODY DOCUMENTATION

9613401.2222



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

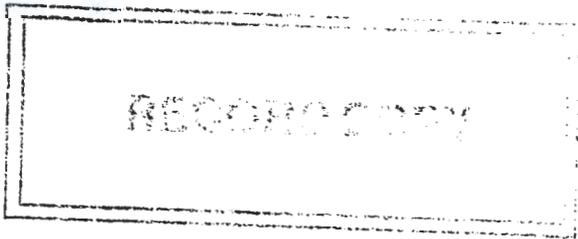
Client : WESTINGHOUSE HANFORD
RFW# : 9309L997

W.O. #: 06168-002-001-9999-00
Date Received: 09-17-93

INORGANIC

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

1. All sample holding times as required by 40CFR136 were met.
2. All preparation blank results were below the required detection limits.
3. All laboratory control standards (blank spikes) were within the control limits of 80-120%. All %RPD were within the 20% guidance limit.
4. All calibration verification checks were within the required control limits of 90-110%. Calibration verification is performed using independent standards.
5. Matrix spike recoveries are summarized on the Inorganic Accuracy Report contained within this document. All recoveries were within the 75-125% guidance limits. All %RPD were within the 20% guidance limit.
6. Replicate results are summarized on the Inorganic Precision Report contained within this document. All results were within the 20% RPD guidance limit.
7. The analytical methods applied by the laboratory, unless otherwise requested, for the analysis of solid samples are derived from Test Methods for Evaluating Solid Waste (USEPA SW846).



Margaret M. Sealy
J. Peter Hershey, Ph.D.
Laboratory Manager
Lionville Analytical Laboratory

10/26/93
Date

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~~0001~~

9613401.2223

Westinghouse
Hanford Company

CHAIN OF CUSTODY

Custody Form Initiator L E ROGERS
 Company Contact L E ROGERS Telephone 376-7690
 Project Designation/Sampling Locations 200-UP-2 Collection Date 9-15-93
 Ice Chest No. SML 364 Field Logbook No. EFL-1091
 Bill of Lading/Airbill No. 2536956202 Offsite Property No. _____
 Method of Shipment OVERNIGHT AIR SERVICE
 Shipped to WESTON
 Possible Sample Hazards/Remarks Keep samples at 4C (SOIL) NONE NOTED 9309L 997

Sample Identification

RAD B09342

- 1) *001*
- 1,500ml P:CLP;TAL Metals,Hg,Ti
 - 1,125ml Gs:VOA CLP
 - 1,500ml aG:Semi-VOA CLP
 - 1,250ml G:Anions F,Cl,SO4 (EPA 300.0)
 - 1,125ml P/G:Anions NO2,NO3 (EPA 353.1)
 - 1,250ml G:Cyanide CLP
 - 1,1000ml P/G:Gross alpha/beta (PRO-032-15), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154, Eu-155, K-40, Ru-106, Na-22 (PRO-042-5), U-235, U-234, U-238 (PRO-052-32) Np-237, (PRO-042-5) Pu-238, Pu-239/240 (PRO-052-32) Sr-90 (PRO-032-38, PRO-032-25) Tc-99 (PRO-032-78) Am-241, Cm-244 (PRO-052-32 or PRO-062-109) Se-79

- 2) *002*
- 1,500ml P:CLP;TAL Metals,Hg,Ti
 - 1,125ml Gs:VOA CLP
 - 1,500ml aG:Semi-VOA CLP
 - 1,250ml G:Anions F,Cl,SO4 (EPA 300.0)
 - 1,125ml P/G:Anions NO2,NO3 (EPA 353.1)
 - 1,250ml G:Cyanide CLP
 - 1,1000ml P/G:Gross alpha/beta (PRO-032-15), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154, Eu-155, K-40, Ru-106, Na-22 (PRO-042-5), U-235, U-234, U-238 (PRO-052-32) Np-237, (PRO-042-5) Pu-238, Pu-239/240 (PRO-052-32) Sr-90 (PRO-032-38, PRO-032-25) Tc-99 (PRO-032-78) Am-241, Cm-244 (PRO-052-32 or PRO-062-109) Se-79

- 3)
- 1,500ml P:CLP;TAL Metals,Hg,Ti
 - 1,125ml Gs:VOA CLP
 - 1,500ml aG:Semi-VOA CLP
 - 1,250ml G:Anions F,Cl,SO4 (EPA 300.0)
 - 1,125ml P/G:Anions NO2,NO3 (EPA 353.1)
 - 1,250ml G:Cyanide CLP
 - 1,1000ml P/G:Gross alpha/beta (PRO-032-15), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154, Eu-155, K-40, Ru-106, Na-22 (PRO-042-5), U-235, U-234, U-238 (PRO-052-32) Np-237, (PRO-042-5) Pu-238, Pu-239/240 (PRO-052-32) Sr-90 (PRO-032-38, PRO-032-25) Tc-99 (PRO-032-78) Am-241, Cm-244 (PRO-052-32 or PRO-062-109) Se-79
- PER 9-16-93*
- TADMP = 2.8*

[] Field Transfer of Custody	Chain of Possession	(Sign and Print Names)
Relinquished by: <u>1050</u> <i>Jason Rogers 9-16-93</i>	Received by:	Date/Time:
Relinquished by: <i>LYMCH</i>	Received by: <i>[Signature]</i>	Date/Time: <u>9-17-93 13100</u>
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition		
Disposal Method:	Disposed by:	Date/Time:

Comments:

9613401.2224

ATTACHMENT 5
DATA VALIDATION SUPPORTING DOCUMENTATION

9613401.2225

WHC-SD-EN-SPP-002, Rev. 2

GENERAL CHEMISTRY DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT:	200-UP-2		DATA PACKAGE: 9309L997-WES-1309		
VALIDATOR:	[Signature]		LAB: Weston	DATE: 02/16/94	
CASE:			SDG: 9309L997-WES-1309		
ANALYSES PERFORMED					
<input checked="" type="checkbox"/> Anions/IC	<input type="checkbox"/> TOC	<input type="checkbox"/> TOX	<input type="checkbox"/> TPH-418.1	Oil and Grease	Alkalinity
<input type="checkbox"/> Ammonia	<input type="checkbox"/> BOD/COD	<input type="checkbox"/> Chloride	<input type="checkbox"/> Chromium-VI	<input type="checkbox"/> pH	<input checked="" type="checkbox"/> NO ₃ /NO ₂
<input type="checkbox"/> Sulfate	<input type="checkbox"/> TDS	<input type="checkbox"/> TKN	<input type="checkbox"/> Phosphate	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/> Solids	<input checked="" type="checkbox"/> Cyanide	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
SAMPLES/MATRIX: Soils					
B09342					
B09343					
B09348					

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Is technical verification documentation present? Yes No N/A

Is a case narrative present? Yes No N/A

Comments: _____

2. HOLDING TIMES

Are sample holding times acceptable? Yes No N/A

Comments: _____

~~Nitrate + Nitrite-N analysis was performed out of holding time.~~

Holding time was determined from the date of extraction instead of date of collection. Therefore, no qualification was required.

2/16/94

as specified in Table 9-1 of the data Validation Procedures, footnote 6
5/21/94

GENERAL CHEMISTRY DATA VALIDATION CHECKLIST

3. INSTRUMENT CALIBRATION

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

Comments: _____

4. BLANKS

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

Comments: *Sample B09348 was identified as a trip blank and was analyzed for percent solids only*

5. ACCURACY

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

Comments: _____

6. PRECISION

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

GENERAL CHEMISTRY DATA VALIDATION CHECKLIST

Comments: Samples B09342 and B09343 are identified as field split samples and will be compared to the original sample results in the quarterly project report.

7. ANALYTE QUANTITATION

Was analyte quantitation performed properly? Yes No N/A

Comments: _____

8. REPORTED RESULTS AND DETECTION LIMITS

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

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

Are results calculated properly? Yes No N/A

Do results meet the CRDLs? Yes No N/A

Comments: _____

The cyanide result for sample B09343 was corrected from 7.5 mg/kg to 2.9 mg/kg as according to the raw data

GENERAL CHEMISTRY DATA VALIDATION CHECKLIST

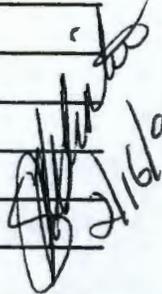
Comments (attach additional sheets as necessary): _____

Several pages were missing from the general chemistry data package. However, sufficient information was provided and therefore complete validation was performed.

Missing Pages from Gen Chem Pkg:

Pg. 29.	Pg 100	Pg 106
31	101	107
37	103	108
42	104	

This may be due to a pagination problem since sufficient information was provided for validation.


2/16/94

9613401.2230

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

DATE RECEIVED: 09/17/93

RFW LOT # :9309L997

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B09348						
% SOLIDS	003	S	93L&S176	09/16/93	09/29/93	09/30/93 <i>UP</i>
% SOLIDS	003 REP	S	93L&S176	09/16/93	09/29/93	09/30/93 <i>DOWN</i>

LAB QC:

2/15/94

CHLORIDE BY IC	LC1	S	93LCS113	N/A	09/30/93	09/30/93
CHLORIDE BY IC	LC1 BS	S	93LCS113	N/A	09/30/93	09/30/93
CHLORIDE BY IC	MB1	S	93LCS113	N/A	09/30/93	09/30/93
CHLORIDE BY IC	MB1 BS	S	93LCS113	N/A	09/30/93	09/30/93
CHLORIDE BY IC	MB1 BSD	S	93LCS113	N/A	09/30/93	09/30/93
CHLORIDE BY IC	MB2	S	93LCS113	N/A	09/30/93	09/30/93
CHLORIDE BY IC	MB2 BS	S	93LCS113	N/A	09/30/93	09/30/93
FLUORIDE BY IC	LC1	S	93LFS113	N/A	09/30/93	09/30/93
FLUORIDE BY IC	LC1 BS	S	93LFS113	N/A	09/30/93	09/30/93
FLUORIDE BY IC	MB1	S	93LFS113	N/A	09/30/93	09/30/93
FLUORIDE BY IC	MB1 BS	S	93LFS113	N/A	09/30/93	09/30/93
FLUORIDE BY IC	MB1 BSD	S	93LFS113	N/A	09/30/93	09/30/93
FLUORIDE BY IC	MB2	S	93LFS113	N/A	09/30/93	09/30/93
FLUORIDE BY IC	MB2 BS	S	93LFS113	N/A	09/30/93	09/30/93
TOTAL CYANIDE	LC1 L	S	93LC239	N/A	09/29/93	09/29/93
TOTAL CYANIDE	LC2 L	S	93LC239	N/A	09/29/93	09/29/93
TOTAL CYANIDE	MB1	S	93LC239	N/A	09/29/93	09/29/93
SULFATE BY IC	LC1	S	93L4S113	N/A	09/30/93	09/30/93
SULFATE BY IC	LC1 BS	S	93L4S113	N/A	09/30/93	09/30/93
SULFATE BY IC	MB1	S	93L4S113	N/A	09/30/93	09/30/93
SULFATE BY IC	MB1 BS	S	93L4S113	N/A	09/30/93	09/30/93
SULFATE BY IC	MB1 BSD	S	93L4S113	N/A	09/30/93	09/30/93
SULFATE BY IC	MB2	S	93L4S113	N/A	09/30/93	09/30/93
SULFATE BY IC	MB2 BS	S	93L4S113	N/A	09/30/93	09/30/93
NITRATE NITRITE	MB1	S	93LNT188	N/A	10/26/93	10/26/93
NITRATE NITRITE	MB1 BS	S	93LNT188	N/A	10/26/93	10/26/93
NITRATE NITRITE	MB1 BSD	S	93LNT188	N/A	10/26/93	10/26/93
NITRATE NITRITE	MB2	S	93LNT188	N/A	10/26/93	10/26/93
NITRATE NITRITE	MB2 BS	S	93LNT188	N/A	10/26/93	10/26/93
TOTAL CYANIDE	LC1 L	S	93LC232	N/A	09/27/93	09/28/93

2/16/94

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9613401.2231

WESTON®
ANALYTICS DIVISION

CYANIDE ANALYSIS LOG

WORKSHEET: CN0928
RUN BATCH: 93LC232, 93LC233
DISTILLATION DATE(S): 09.27.93

LOGBOOK # 3767

RFW #	RUN #	QC	ABSORBANCE @ 578 nm	FINAL RESULTS (µg/L) or (mg/kg)	TIME HH:MM	COMMENTS % solid
0	PP13	Curve	0.000		14.25	
5			0.008		14.16	
10			0.016		14.17	
20			0.031		14.18	
50			0.083		14.19	
100			0.159		14.20	
150			0.232		14.21	
200			0.320		14.22	
1CV			0.157		14.23	
1CB			0.002		14.24	
93LC232-MB1			0.002	<1.0 mg/kg	14.25	
-LC1			0.295	9.312	14.26	
-LC2			0.314	9.912	14.27	
9309L984001			0.006	<2.090	14.28	47.85
-002			0.015	<2.723	14.29	36.73
-003			0.020	<1.844	14.30	54.24
-004			0.004	<1.380	14.31	72.46
-005			0.005	<2.439	14.32	34.03
-006			0.004	<1.069	14.33	93.58
-007			0.022	<2.674	14.34	37.40
CCV			0.159	100 ug/L	14.35	
CCB			0.002	<10.0	14.36	
9309L987002			0.002	<1.110	14.37	90.05
-003				Abx high not updated	14.38	79.56
-004				Abx high not updated	14.39	79.20
9309L997002			0.090	2.927	14.40	96.83
-002R			0.084	2.731	14.41	
-002S			0.210	6.843	14.42	
-002T			0.231	7.528	14.43	

ANALYST: AJP
ANALYSIS DATE: 9.28.93

REVIEWED BY/DATE: RD/10/5/93
PAGE # 5

Cyanide Report

Date of Prep: 09/27/93
 Date of Analysis: 09/28/93
 Worksheet: CN928
 Computer #: DAFWIN
 Directory: INORGANICS
 Run Batch: 93LC232
 Method: CLP
 Analyst: AJP
 Instrument: CN1.1
 CALIB DATA
 SLOPE: 0.00
 INTERCEPT: 0.00
 CORRELATION COEF.: 0.9994

RFW SAMPLE ID	INST. TEST	INST. ABS	INITIAL RESULT	DILUTION FACTOR	C/D	FINAL RESULT	ORCL EPA 20.00	UNITS	REPLICATE		SPIKE		LCS		SOILS PREP						
									ORIG SAMPLE RESULT	REP % DIFF	SPIKE LEVEL 200.00	SAMPLE SPIKE AMOUNT	% RECOV	AMT LCS 100.00	% RECOV	PREP BATCH	INITIAL SAMPLE WT./VOL.	FINAL VOL.	COLOR VOL.	% SOLIDS	ANAL TIME
50	ICNTO	0.000	-0.193	1	1.0000	-0.193 u	10.000	UG/L							93LC232	250	250	50	14:15	09/27/93	
55	ICNTO	0.000	4.862	1	1.0000	4.862 u	10.000	UG/L							93LC232	250	250	50	14:16	09/27/93	
510	ICNTO	0.016	9.918	1	1.0000	9.918 u	10.000	UG/L							93LC232	250	250	50	14:17	09/27/93	
520	ICNTO	0.031	19.398	1	1.0000	19.398 u	10.000	UG/L							93LC232	250	250	50	14:18	09/27/93	
550	ICNTO	0.083	52.261	1	1.0000	52.261 u	10.000	UG/L							93LC232	250	250	50	14:19	09/27/93	
5100	ICNTO	0.159	100.291	1	1.0000	100.291 u	10.000	UG/L							93LC232	250	250	50	14:20	09/27/93	
5150	ICNTO	0.232	146.425	1	1.0000	146.425 u	10.000	UG/L							93LC232	250	250	50	14:21	09/27/93	
5200	ICNTO	0.320	202.039	1	1.0000	202.039 u	10.000	UG/L							93LC232	250	250	50	14:22	09/27/93	
ICV	ICNTOL	0.157	99.027	1	1.0000	99.027 u	10.000	UG/L				100.0	99.0		93LC232	250	250	50	14:23	09/27/93	
ICB	ICNTO	0.002	1.071	1	1.0000	1.071 u	10.000	UG/L							93LC232	250	250	50	14:24	09/27/93	
93LC232-MB1	ICNTO	0.002	1.071	1	0.0500	0.054 u	1.000	MG/KG							93LC232	5	250	50	100.0	14:25	09/27/93
93LC232-LC1	ICNTOL	0.295	186.239	1	0.0500	9.312 u	1.000	MG/KG				10.0	93.1		93LC232	5	250	50	100.0	14:26	09/27/93
93LC232-LC2	ICNTOL	0.314	198.247	1	0.0500	9.912 u	1.000	MG/KG				10.0	99.1		93LC232	5	250	50	100.0	14:27	09/27/93
9309L984-001	ICNTO	0.006	3.599	1	0.1045	0.376 u	2.090	MG/KG							93LC232	5	250	50	47.9	14:28	09/27/93
9309L984-002	ICNTO	0.015	9.286	1	0.1361	1.264 u	2.723	MG/KG							93LC232	5	250	50	36.7	14:29	09/27/93
9309L984-003	ICNTO	0.020	12.446	1	0.0922	1.147 u	1.844	MG/KG							93LC232	5	250	50	54.2	14:30	09/27/93
9309L984-004	ICNTO	0.004	2.335	1	0.0690	0.161 u	1.380	MG/KG							93LC232	5	250	50	72.5	14:31	09/27/93
9309L984-005	ICNTO	0.005	2.967	1	0.1469	0.436 u	2.939	MG/KG							93LC232	5	250	50	34.0	14:32	09/27/93
9309L984-006	ICNTO	0.004	2.335	1	0.0534	0.125 u	1.069	MG/KG							93LC232	5	250	50	93.6	14:33	09/27/93
9309L984-007	ICNTO	0.022	13.710	1	0.1337	1.833 u	2.674	MG/KG							93LC232	5	250	50	37.4	14:34	09/27/93
CCV	ICNTOL	0.159	100.291	1	1.0000	100.291 u	10.000	UG/L				100.0	100.3		93LC232	250	250	50	14:35	09/27/93	
CCB	ICNTO	0.002	1.071	1	1.0000	1.071 u	10.000	UG/L							93LC232	250	250	50	14:36	09/27/93	
9309L987-002	ICNTO	0.002	1.071	1	0.0535	0.059 u	1.110	MG/KG							93LC232	5	250	50	96.1	14:37	09/27/93
9309L987-003	ICNTO	0.209	131.809	2500	0.0628	20721.690	3142.283	MG/KG							93LC232	5	250	0.02	79.6	15:45	09/27/93
9309L987-004	ICNTO	0.159	100.291	2500	0.0631	15820.704	3156.566	MG/KG							93LC232	5	250	0.02	79.2	15:46	09/27/93
9309L997-002	ICNTO	0.090	56.684	1	0.0516	2.927 u	1.033	MG/KG							93LC232	5	250	50	96.8	14:40	09/27/93
9309L997-002	ICNTO	0.004	52.893	1	0.0516	2.731 u	1.033	MG/KG							93LC232	5	250	50	96.8	14:41	09/27/93
	ICNTO	0.210	132.521	1	0.0516	6.843 u	1.033	MG/KG							93LC232	5	250	50	96.8	14:42	09/27/93
	ICNTO	0.231	145.793	1	0.0516	7.528 u	1.033	MG/KG							93LC232	5	250	50	96.8	14:43	09/27/93
9309L914-004	ICNTO	0.145	91.443	5	0.0563	25.724 u	5.626	MG/KG							93LC232	5	250	10	88.9	14:44	09/27/93
CCV	ICNTOL	0.155	97.763	1	1.0000	97.763 u	10.000	UG/L				100.0	97.8		93LC232	250	250	50	14:45	09/27/93	
CCB	ICNTO	0.001	0.439	1	1.0000	0.439 u	10.000	UG/L							93LC232	250	250	50	14:46	09/27/93	
93LC233-MB1	ICNTO	0.004	2.335	1	0.5000	1.167 u	10.000	UG/L							93LC233	500	250	50	14:47	09/27/93	
93LC233-LC1	ICNTOL	0.298	186.135	1	0.5000	94.060 u	10.000	UG/L				100.0	94.1		93LC233	500	250	50	14:48	09/27/93	
93LC233-LC2	ICNTOL	0.291	183.711	1	0.5000	91.856 u	10.000	UG/L				100.0	91.9		93LC233	500	250	50	14:49	09/27/93	
9309L990-006	ICNTO	0.004	2.335	1	0.5000	1.167 u	10.000	UG/L							93LC233	500	250	50	14:50	09/27/93	
9309L990-006	ICNTOR	0.005	2.967	1	0.5000	1.483 u	10.000	UG/L		1.167	23.8				93LC233	500	250	50	14:51	09/27/93	
9309L990-006	ICNTOS	0.137	86.387	1	0.5000	43.194 u	10.000	UG/L		1.167		100	50.000	84.1	93LC233	500	250	50	14:52	09/27/93	
9309L990-006	ICNTOT	0.141	88.915	1	0.5000	44.458 u	10.000	UG/L		1.167	3.0	100	50.000	86.6	93LC233	500	250	50	14:53	09/27/93	
9309L990-001	ICNTO	0.002	1.071	1	0.5000	0.535 u	10.000	UG/L							93LC233	500	250	50	14:54	09/27/93	
9309L990-004	ICNTO	0.002	1.071	1	0.5000	0.535 u	10.000	UG/L							93LC233	500	250	50	14:55	09/27/93	
9309L991-001	ICNTO	0.003	1.703	1	0.5000	0.851 u	10.000	UG/L							93LC233	500	250	50	14:56	09/27/93	
CCV	ICNTOL	0.150	99.659	1	1.0000	99.659 u	10.000	UG/L				100.0	99.7		93LC233	250	250	50	14:57	09/27/93	
CCB	ICNTO	0.000	-0.193	1	1.0000	-0.193 u	10.000	UG/L							93LC233	250	250	50	14:58	09/27/93	
9309L992-001	ICNTO	0.004	2.335	1	0.5000	1.167 u	10.000	UG/L							93LC233	500	250	50	14:59	09/27/93	
															93LC233				14:02	09/27/93	
															93LC233				14:02	09/27/93	
9309L992-007	ICNTO	0.004	2.335	1	0.5000	1.167 u	10.000	UG/L							93LC233	500	250	50	14:02	09/27/93	
9309L992-010	ICNTO	0.005	2.967	1	0.5000	1.483 u	10.000	UG/L							93LC233	500	250	50	14:03	09/27/93	
9309L985-009	ICNTO	0.010	6.126	1	0.5000	3.063 u	10.000	UG/L							93LC233	500	250	50	14:04	09/27/93	
9309L985-001	ICNTO	0.009	5.494	1	0.5000	2.747 u	10.000	UG/L							93LC233	500	250	50	14:05	09/27/93	
9309L985-002	ICNTO	0.008	4.862	1	0.5000	2.431 u	10.000	UG/L							93LC233	500	250	50	14:06	09/27/93	
9309L985-003	ICNTO	0.008	4.862	1	0.5000	2.431 u	10.000	UG/L							93LC233	500	250	50	14:07	09/27/93	

Handwritten signature
 2/16/94

2110

9613401.2232

MEMORANDUM



TO: 200-UP-2 Project QA Record

February 18, 1994

FR: Susan Winter, Golder Associates Inc. *Susan Winter*

RE: METALS DATA VALIDATION SUMMARY FOR DATA PACKAGE: 9309L997-WES-1309 (923-E418, Filename 9309L997.MET)

INTRODUCTION

This memo presents the results of data validation on data package 9309L997-WES-1309 prepared by the Weston Analytics laboratory. A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

SAMPLE ID	SAMPLE DATE	MEDIA	ANALYSIS
B09342	09/15/93	SOIL	SEE NOTE 1
B09343	09/15/93	SOIL	

Note 1. All samples were analyzed for CLP TAL metals, titanium and cyanide.

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

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

DATA QUALITY OBJECTIVES

Precision. Goals for precision were met with the exception of the deficiencies identified below.

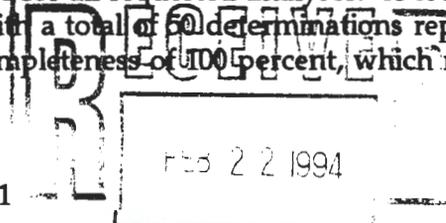
Accuracy. Goals for accuracy were met with the exception of the deficiencies identified below.

Sample Result Verification. All sample results were supported in the raw data.

Detection Limits. Detection limit goals were met for all sample results as specified in the reference analytical method.

Completeness. The data package was complete for all requested analyses. A total of two samples were validated in this data package with a total of 50 determinations reported, all of which were deemed valid. This results in a completeness of 100 percent, which meets normal work plan objectives of 90%.

1



001

MAJOR DEFICIENCIES

No major deficiencies were identified during data validation which required qualification of data as unusable.

MINOR DEFICIENCIES

The following minor deficiencies were identified during data validation which required qualification of data as estimated.

Holding Times

- Mercury analysis was performed out of holding time for samples B09342 and B09343. Therefore, the associated results have been qualified as estimated (UJ).

Laboratory Blanks

- Nickel was detected in the continuing calibration blank at a negative concentration. Attachments 2 and 5 provide a summary of the sample affected, data qualification applied and supporting documentation.

Matrix Spike

- The matrix spike percent recovery (MS %R) for lead and titanium were unacceptable. Attachments 2 and 5 provide a summary of the samples affected, data qualifications applied and supporting documentation.

ICP Serial Dilution

- ICP serial dilution percent difference (%D) for aluminum, calcium, iron, magnesium, and manganese were greater than 10% and the sample results greater than fifty times the IDL. Attachments 2 and 5 provide a summary of the samples affected, data qualifications applied and supporting documentation.

GFAA Analytical Spikes

- Selenium and thallium GFAA analytical spikes for sample B09343 were unacceptable. Attachments 2 and 5 provide a summary of the samples affected, data qualifications applied and supporting documentation.

REFERENCES

WHC 1993a, Validation of 200-UP-2 Data, Statement of Work, Analytical Laboratory Data Validation, Task Order S-94-18, December 14, 1993, Purchase Order M073750. Westinghouse Hanford Company, Richland, Washington.

WHC 1993b, Data Validation Procedures for Chemical Analyses, WHC-SD-EN-SPP-002, Rev. 2, 1993. Westinghouse Hanford Company, Richland, Washington.

ATTACHMENT 1
GLOSSARY OF DATA REPORTING QUALIFIERS

GLOSSARY OF INORGANIC DATA REPORTING QUALIFIERS

- B - Indicates the constituent was analyzed for and detected. The concentration reported is less than the contract required detection limit (CRDL) but greater than the instrument detection limit (IDL). The associated data should be considered usable for decision making purposes.
- U - Indicates the constituent was analyzed for and not detected. The concentration reported is the sample detection limit corrected for aliquot size, dilution and percent solids (in the case of solid matrices) by the laboratory. The associated data should be considered usable for decision making purposes.
- UJ - Indicates the constituent was analyzed for and not detected. Due to a minor quality control deficiency identified during data validation the concentration may not accurately reflect the sample detection limit. The associated data have been qualified as estimated but should be considered usable for decision making purposes.
- BJ - Indicates the constituent was analyzed for and detected at a concentration less than the contract required detection limit (CRDL) but greater than the instrument detection limit (IDL). Due to a minor quality control deficiency identified during data validation the associated data have been qualified as estimated, but should be considered usable for decision making purposes.
- J - Indicates the constituent was analyzed for and detected. Due to a minor quality control deficiency identified during data validation the associated data have been qualified as estimated, but should be considered usable for decision making purposes.
- UR - Indicates the constituent was analyzed for and not detected. Due to a major quality control deficiency identified during data validation, the associated data have been qualified as unusable for decision making purposes.
- R - Indicates the constituent was analyzed for and detected. Due to a major quality control deficiency identified during data validation, the associated data have been qualified as unusable for decision making purposes.

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ATTACHMENT 2
SUMMARY OF DATA QUALIFICATIONS

9613401.2240

ATTACHMENT 3

QUALIFIED DATA SUMMARY AND ANNOTATED LABORATORY REPORTS

Validated Data Summary, Data Package: 9309L997-WES-1309

Parameter	809342		809343		
	Units	Result	Q	Result	Q
ALUMINUM	MG/KG	3510.000	J	3650.000	J
ANTIMONY	MG/KG	8.770	U	8.350	U
ARSENIC	MG/KG	2.100		2.200	
BARIUM	MG/KG	54.700		41.200	
BERYLLIUM	MG/KG	0.190	U	0.180	U
CADMIUM	MG/KG	0.950	U	0.910	U
CALCIUM	MG/KG	6790.000	J	7670.000	J
CHROMIUM	MG/KG	6.500		5.800	
COBALT	MG/KG	4.300	B	4.700	B
COPPER	MG/KG	7.800		6.800	
IRON	MG/KG	9090.000	J	8730.000	J
LEAD	MG/KG	5.700	J	4.300	J
MAGNESIUM	MG/KG	2930.000	J	3060.000	J
MANGANESE	MG/KG	197.000	J	209.000	J
MERCURY	MG/KG	0.050	UJ	0.050	UJ
NICKEL	MG/KG	5.500	B	3.400	BJ
POTASSIUM	MG/KG	972.000		862.000	B
SELENIUM	MG/KG	0.380	U	0.360	UJ
SILVER	MG/KG	1.330	U	1.270	U
SODIUM	MG/KG	105.000	B	104.000	B
THALLIUM	MG/KG	0.380	U	0.360	UJ
VANADIUM	MG/KG	15.300		14.500	
ZINC	MG/KG	23.400		23.100	
CYANIDE	MG/KG	1.050	U	2.930	
TITANIUM	MG/KG	394.000	J	368.000	J

Verified
[Signature]
 2/18/94

600~

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506-93-92 9613401 2242 WEST-1309

U.S. EPA - CLP

2/15/94

1
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.
299-W19-4597
B09342
101-103.3'
Split sample
SDG No.: CLP99V

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

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

Matrix (soil/water): SOIL

Lab Sample ID: 930999701

Level (low/med): LOW

Date Received: 9/17/93

% Solids: 95.1

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

CAS No.	Analyte	Concentration	C	Q	M	Q
7429-90-5	Aluminum	3510.00	-	E	P	u
7440-36-0	Antimony	8.77	U		P	
7440-38-2	Arsenic	2.10			F	
7440-39-3	Barium	54.70			P	
7440-41-7	Beryllium	.19	U		P	
7440-43-9	Cadmium	.95	U		P	
7440-70-2	Calcium	6790.00		E	P	u
7440-47-3	Chromium	6.50			P	
7440-48-4	Cobalt	4.30	B		P	
7440-50-8	Copper	7.80			P	
7439-89-6	Iron	9090.00		E	P	u
7439-92-1	Lead	5.70		N*	F	u
7439-95-4	Magnesium	2930.00		E	P	u
7439-96-5	Manganese	197.00		E	P	u
7439-97-6	Mercury	.05	U		CV	u
7440-02-0	Nickel	5.50	B		P	
7440-09-7	Potassium	972.00			P	
7782-49-2	Selenium	.38	U		F	
7440-22-4	Silver	1.33	U		P	
7440-23-5	Sodium	105.00	B		P	
7440-28-0	Thallium	.38	U		F	
7440-62-2	Vanadium	15.30			P	
7440-66-6	Zinc	23.40			P	
	Cyanide	1.05	U		C	
	Titanium	394.			P	u

Color Before: BROWN

Clarity Before:

Texture: FINE

Color After: BROWN

Clarity After:

Artifacts:

Comments:

FORM I - IN

verified

03/90

2/15/94

-010

~~0029~~

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U.S. EPA - CLP

1
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.
299-419-95
B09343
105-107.5'
Split Sample
SDG No.: CLP997

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

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

Matrix (soil/water): SOIL

Lab Sample ID: 930999702

Level (low/med): LOW

Date Received: 9/17/93

% 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	3650.00	-	E	P	Q
7440-36-0	Antimony	8.35	U		P	P
7440-38-2	Arsenic	2.20			F	
7440-39-3	Barium	41.20			P	
7440-41-7	Beryllium	.18	U		P	
7440-43-9	Cadmium	.91	U		P	
7440-70-2	Calcium	7670.00		E	P	U
7440-47-3	Chromium	5.80			P	
7440-48-4	Cobalt	4.70	B		P	
7440-50-8	Copper	6.80			P	
7439-89-6	Iron	8730.00		E	P	U
7439-92-1	Lead	4.30		NS*	F	U
7439-95-4	Magnesium	3060.00		E	P	U
7439-96-5	Manganese	209.00		E	P	U
7439-97-6	Mercury	.05	U		CV	U
7440-02-0	Nickel	3.40	B		P	U
7440-09-7	Potassium	862.00	B		P	U
7782-49-2	Selenium	.36	U	W	F	U
7440-22-4	Silver	1.27	U		P	U
7440-23-5	Sodium	104.00	B		P	U
7440-28-0	Thallium	.36	U		F	U
7440-62-2	Vanadium	14.50			P	U
7440-66-6	Zinc	23.10			P	U
	Cyanide	2.93			C	U
	Titanium	368.			P	U

Color Before: BROWN

Clarity Before:

Texture: FINE

Color After: BROWN

Clarity After:

Artifacts:

Comments:

FORM I - IN

Verified
2/15/94

03/90

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ATTACHMENT 4

LABORATORY NARRATIVE AND CHAIN-OF-CUSTODY DOCUMENTATION



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

Client: WESTINGHOUSE HANFORD
RFW #: 9309L997

W.O. #: 06168-002-001-9999-00
Date Received: 09-11-93

CLP METALS

1. This narrative covers the analyses of two (2) soil samples.
2. The samples were prepared and analyzed in accordance with the following protocols: CLP SOW 3/90.
3. ICVs, CCVs, and LCSs stock standards were purchased from Inorganic Ventures Laboratory and High Purity.
4. All analyses were performed within the required holding times except for mercury in the following samples:

List samples

9309L997-001, 002

- 1.) Due to instrument failure, the above samples were analyzed six (6) days past the hold time for mercury.
5. All Initial and Continuing Calibration Verifications (ICV/CCV's) were within control limits.
6. All Initial and Continuing Calibration Blanks (ICB/CCB's) were within control limits.
7. All Preparation/Method Blanks were below Reporting Limits.
8. All ICP Interference Check Samples (ICSA and ICSAB) were within control limits.
9. All Laboratory Control Samples (LCS) were within the 80-120% control limits.
10. All Serial Dilution percent differences were within USEPA SOW control limits except for:

<u>RFW #</u>	<u>Element</u>	<u>%Difference</u>	<u>RFW #</u>	<u>Element</u>	<u>%Difference</u>
001	Aluminum	13.2	001	Magnesium	14.6
	Calcium	13.8		Manganese	17.1
	Iron	14.4			

013

~~0015~~



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

<u>RFW #</u>	<u>Element</u>	<u>%Recovery</u>
001	Lead	52.6

For analytes where the Matrix Spike is out of control, a Post-digestion Matrix Spike and Serial Dilution are performed (exception allowed for Ag).

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

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

<u>RFW #</u>	<u>Element</u>	<u>%RPD</u>
001	Lead	28.0

13. Method of Standard Additions (MSA) analyses was performed on the following sample:

<u>Element</u>	<u>Sample #</u>
Lead	002

14. The code CV is currently in use by the laboratory for both mercury instruments in operation (HG1 and HG2). HG1 is complete with autosampler and software, but still requires manual digestion; HG2 is operated by the analyst, produces a strip chart and also requires manual digestion.
15. HG1 requires less total volume of digestate due to the autosampler analysis. Sample volumes and reagents for mercury determinations in water and soil have been proportionally scaled down to adapt to this semi-automated technique. The sample volume used for water analysis is 33 ml. For soils, 0.1 gram of sample is taken to a final volume of 50 ml (including all reagents).
16. ICP Interelement Correction Factors for IC1 and IC3 are included in this package, but do not appear on EDD.
17. The graphite furnace time that appears on form XIV is the time of the first injection. The time that appears on the data is the print time.



18. The ICB was run before the ICV for Cyanide on the raw data printout.

A handwritten signature in black ink, appearing to read "Raymond A. Siery".

Raymond A. Siery
Inorganic Section Manager
Lionville Analytical Laboratory

11.2.93
Date

9613401.2248

Westinghouse
Hanford Company

CHAIN OF CUSTODY

Custody Form Initiator L E ROGERS

Company Contact L E ROGERS

Telephone 376-7690

Project Designation/Sampling Locations 200-UP-2

Collection Date 9-15-93

Ice Chest No. SML 364

Field Logbook No. EFL-1091

Bill of Lading/Airbill No. 2536956202

Offsite Property No. _____

Method of Shipment OVERNIGHT AIR SERVICE

Shipped to WESTON

Possible Sample Hazards/Remarks Keep samples at 4C (SOIL) NONE NOTED 9309L 997

Sample Identification

RAD B09342

001

- 1,500ml P:CLP;TAL Metals,Hg,Ti
- 1,125ml Gs:VOA CLP
- 1,500ml aG:Semi-VOA CLP
- 1,250ml G:Anions F,Cl,SO4 (EPA 300.0)
- 1,125ml P/G:Anions NO2,NO3 (EPA 353.1)
- 1,250ml G:Cyanide CLP
- 1,1000ml P/G:Gross alpha/beta (PRO-032-15), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (PRO-042-5), U-235,U-234,U-238 (PRO-052-32) Np-237,(PRO-042-5) Pu-238,Pu-239/240 (PRO-052-32) Sr-90 (PRO-032-38,PRO-032-25) Tc-99 (PRO-032-78) Am-241,Cm-244 (PRO-052-32 or PRO-062-109) Se-79

002

B09343

- 1,500ml P:CLP;TAL Metals,Hg,Ti
- 1,125ml Gs:VOA CLP
- 1,500ml aG:Semi-VOA CLP
- 1,250ml G:Anions F,Cl,SO4 (EPA 300.0)
- 1,125ml P/G:Anions NO2,NO3 (EPA 353.1)
- 1,250ml G:Cyanide CLP
- 1,1000ml P/G:Gross alpha/beta (PRO-032-15), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (PRO-042-5), U-235,U-234,U-238 (PRO-052-32) Np-237,(PRO-042-5) Pu-238,Pu-239/240 (PRO-052-32) Sr-90 (PRO-032-38,PRO-032-25) Tc-99 (PRO-032-78) Am-241,Cm-244 (PRO-052-32 or PRO-062-109) Se-79

PER 9-16-93

3)

- 1,500ml P:CLP;TAL Metals,Hg,Ti
- 1,125ml Gs:VOA CLP
- 1,500ml aG:Semi-VOA CLP
- 1,250ml G:Anions F,Cl,SO4 (EPA 300.0)
- 1,125ml P/G:Anions NO2,NO3 (EPA 353.1)
- 1,250ml G:Cyanide CLP
- 1,1000ml P/G:Gross alpha/beta (PRO-032-15), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (PRO-042-5), U-235,U-234,U-238 (PRO-052-32) Np-237,(PRO-042-5) Pu-238,Pu-239/240 (PRO-052-32) Sr-90 (PRO-032-38,PRO-032-25) Tc-99 (PRO-032-78) Am-241,Cm-244 (PRO-052-32 or PRO-062-109) Se-79

TEMP = 2.8

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

Relinquished by: <u>1050</u> <u>Jason E. Rogers 9-16-93</u>	Received by:	Date/Time:
Relinquished by: <u>LMON</u>	Received by: <u>[Signature]</u>	Date/Time: <u>9-17-93 17100</u>
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method: _____ Disposed by: _____ Date/Time: _____

Comments: _____

9613401.2249

ATTACHMENT 5

DATA VALIDATION SUPPORTING DOCUMENTATION

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: 200-UP-2			DATA PACKAGE: 9309L997-WES-1309		
VALIDATOR: <i>[Signature]</i>	LAB: Weston		DATE: 02/14/94		
CASE:			SDG: 9309L997-WES-1309		
ANALYSES PERFORMED (ICP)					
<input checked="" type="checkbox"/> CLP/ICP	<input checked="" type="checkbox"/> CLP/GFAA	<input checked="" type="checkbox"/> CLP/Hg	<input checked="" type="checkbox"/> CLP/Cyanide	<input checked="" type="checkbox"/> Titanium	<input type="checkbox"/>
<input type="checkbox"/> SW-846/ICP	<input type="checkbox"/> SW-846/GFAA	<input type="checkbox"/> SW-846/Hg	<input type="checkbox"/> SW-846 Cyanide	<input type="checkbox"/>	<input type="checkbox"/>
SAMPLES/MATRIX <i>Soil</i>					
<i>B09342</i>					
<i>B09343</i>					

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Is technical verification documentation present? Yes No N/A
 Is a case narrative present? Yes No N/A

Comments: _____

2. HOLDING TIMES

Are sample holding times acceptable? Yes No N/A

Comments: *Mercury was analyzed out of holding time for both samples. Therefore, the Hg sample results have been qualified as estimated (UE).*

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

3. INSTRUMENT PERFORMANCE AND CALIBRATIONS

- Were initial calibrations performed on all instruments? . . . Yes No N/A
- Are initial calibrations acceptable? Yes No N/A
- Are ICP interference checks acceptable? Yes No N/A
- Were ICV and CCV checks performed on all instruments? Yes No N/A
- Are ICV and CCV checks acceptable? Yes No N/A

Comments: _____

4. BLANKS

- Were ICB and CCB checks performed for all applicable analyses? Yes No N/A
- Are ICB and CCB results acceptable? *see comments below* . Yes No N/A
- Were preparation blanks analyzed? Yes No N/A
- Are preparation blank results acceptable? *see comments below* Yes No N/A
- Were field/trip blanks analyzed? Yes No N/A
- Are field/trip blank results acceptable? Yes No N/A

Comments: ¹ICB/CCB: Qualify Ni result for sample 809343 as estimated (B) due to neg. blank value.

²Prep Blank- All sample results are greater than 5 or 10 times the assoc. blank concentration, therefore, no qualification was required.

5. ACCURACY

- Were spike samples analyzed? Yes No N/A
- Are spike sample recoveries acceptable? Yes No N/A
- Were laboratory control samples (LCS) analyzed? Yes No N/A
- Are LCS recoveries acceptable? Yes No N/A

Comments: _____

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

6. PRECISION

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

Comments: Both 809342 and 809343 are defined as field split samples. However, the corresponding data for the corresponding samples are not currently available. The field splits will be compared to the original sample in the quarterly report.

7. FURNACE AA QUALITY CONTROL

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

Comments: _____

8. REPORTED RESULTS AND DETECTION LIMITS

- Are results reported for all requested analyses? Yes No N/A
- Are all results supported in the raw data? Yes No N/A
- Are results calculated properly? Yes No N/A
- Do results meet the CRDLs? Yes No N/A

Comments: The sample results were calculated properly. However, the MS&R for Cobalt and ICP serial dilutions for manganese were incorrectly calculated by the laboratory. The calculation corrections are noted on the associated lab forms following this page.

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

Comments (attach additional sheets as necessary): The case narrative
incorrectly noted that the %RPD for lead
exceeded control limits. This was due to the
use of water sample criteria (20%)
instead of soil sample criteria (35%).
No qualification required

*Added
3/25/14*

9613401-2254

RECORD COPY



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

DATE RECEIVED: 09/17/93

RFW LOT # :9309L997

CLIENT ID /ANALYSIS RFW # MTX PREP # COLLECTION EXTR/PREP ANALYSIS

B09342

SILVER, TOTAL	001	S	93L6934	09/15/93	10/12/93	10/23/93	38
SILVER, TOTAL	001 REP	S	93L6934	09/15/93	10/12/93	10/23/93	↓
SILVER, TOTAL	001 MS	S	93L6934	09/15/93	10/12/93	10/23/93	↓
ALUMINUM, TOTAL	001	S	93L6934	09/15/93	10/12/93	10/22/93	37
ALUMINUM, TOTAL	001 REP	S	93L6934	09/15/93	10/12/93	10/22/93	↓
ALUMINUM, TOTAL	001 MS	S	93L6934	09/15/93	10/12/93	10/22/93	↓
ARSENIC, TOTAL	001	S	93L6933	09/15/93	10/12/93	10/23/93	38
ARSENIC, TOTAL	001 REP	S	93L6933	09/15/93	10/12/93	10/23/93	↓
ARSENIC, TOTAL	001 MS	S	93L6933	09/15/93	10/12/93	10/23/93	↓
BARIUM, TOTAL	001	S	93L6934	09/15/93	10/12/93	10/22/93	37
BARIUM, TOTAL	001 REP	S	93L6934	09/15/93	10/12/93	10/22/93	
BARIUM, TOTAL	001 MS	S	93L6934	09/15/93	10/12/93	10/22/93	
BERYLLIUM, TOTAL	001	S	93L6934	09/15/93	10/12/93	10/22/93	
BERYLLIUM, TOTAL	001 REP	S	93L6934	09/15/93	10/12/93	10/22/93	
BERYLLIUM, TOTAL	001 MS	S	93L6934	09/15/93	10/12/93	10/22/93	
CALCIUM, TOTAL	001	S	93L6934	09/15/93	10/12/93	10/22/93	
CALCIUM, TOTAL	001 REP	S	93L6934	09/15/93	10/12/93	10/22/93	
CALCIUM, TOTAL	001 MS	S	93L6934	09/15/93	10/12/93	10/22/93	
CADMIUM, TOTAL	001	S	93L6934	09/15/93	10/12/93	10/22/93	
CADMIUM, TOTAL	001 REP	S	93L6934	09/15/93	10/12/93	10/22/93	
CADMIUM, TOTAL	001 MS	S	93L6934	09/15/93	10/12/93	10/22/93	
COBALT, TOTAL	001	S	93L6934	09/15/93	10/12/93	10/22/93	
COBALT, TOTAL	001 REP	S	93L6934	09/15/93	10/12/93	10/22/93	
COBALT, TOTAL	001 MS	S	93L6934	09/15/93	10/12/93	10/22/93	
CHROMIUM, TOTAL	001	S	93L6934	09/15/93	10/12/93	10/22/93	
CHROMIUM, TOTAL	001 REP	S	93L6934	09/15/93	10/12/93	10/22/93	
CHROMIUM, TOTAL	001 MS	S	93L6934	09/15/93	10/12/93	10/22/93	
COPPER, TOTAL	001	S	93L6934	09/15/93	10/12/93	10/22/93	
COPPER, TOTAL	001 REP	S	93L6934	09/15/93	10/12/93	10/22/93	
COPPER, TOTAL	001 MS	S	93L6934	09/15/93	10/12/93	10/22/93	
IRON, TOTAL	001	S	93L6934	09/15/93	10/12/93	10/22/93	
IRON, TOTAL	001 REP	S	93L6934	09/15/93	10/12/93	10/22/93	
IRON, TOTAL	001 MS	S	93L6934	09/15/93	10/12/93	10/22/93	
MERCURY, TOTAL	001	S	93C0306	09/15/93	10/13/93	10/19/93	34
MERCURY, TOTAL	001 REP	S	93C0306	09/15/93	10/13/93	10/19/93	↓

Qualify Hg results for B09342 and B09343 as estimated (u).
2/1/94

9613401.2255

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

DATE RECEIVED: 09/17/93

RFW LOT # :9309L997

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
MERCURY, TOTAL	001 MS	S	93C0306	09/15/93	10/13/93	10/19/93 <u>34</u>
POTASSIUM, TOTAL	001	S	93L6934	09/15/93	10/12/93	10/22/93 <u>37</u>
POTASSIUM, TOTAL	001 REP	S	93L6934	09/15/93	10/12/93	10/22/93
POTASSIUM, TOTAL	001 MS	S	93L6934	09/15/93	10/12/93	10/22/93
MAGNESIUM, TOTAL	001	S	93L6934	09/15/93	10/12/93	10/22/93
MAGNESIUM, TOTAL	001 REP	S	93L6934	09/15/93	10/12/93	10/22/93
MAGNESIUM, TOTAL	001 MS	S	93L6934	09/15/93	10/12/93	10/22/93
MANGANESE, TOTAL	001	S	93L6934	09/15/93	10/12/93	10/22/93
MANGANESE, TOTAL	001 REP	S	93L6934	09/15/93	10/12/93	10/22/93
MANGANESE, TOTAL	001 MS	S	93L6934	09/15/93	10/12/93	10/22/93
SODIUM, TOTAL	001	S	93L6934	09/15/93	10/12/93	10/22/93
SODIUM, TOTAL	001 REP	S	93L6934	09/15/93	10/12/93	10/22/93
SODIUM, TOTAL	001 MS	S	93L6934	09/15/93	10/12/93	10/22/93
NICKEL, TOTAL	001	S	93L6934	09/15/93	10/12/93	10/22/93
NICKEL, TOTAL	001 REP	S	93L6934	09/15/93	10/12/93	10/22/93
NICKEL, TOTAL	001 MS	S	93L6934	09/15/93	10/12/93	10/22/93
LEAD, TOTAL	001	S	93L6933	09/15/93	10/12/93	10/23/93 <u>38</u>
LEAD, TOTAL	001 REP	S	93L6933	09/15/93	10/12/93	10/23/93
LEAD, TOTAL	001 MS	S	93L6933	09/15/93	10/12/93	10/23/93
ANTIMONY, TOTAL	001	S	93L6934	09/15/93	10/12/93	10/22/93 <u>37</u>
ANTIMONY, TOTAL	001 REP	S	93L6934	09/15/93	10/12/93	10/22/93
ANTIMONY, TOTAL	001 MS	S	93L6934	09/15/93	10/12/93	10/22/93
SELENIUM, TOTAL	001	S	93L6933	09/15/93	10/12/93	10/23/93 <u>38</u>
SELENIUM, TOTAL	001 REP	S	93L6933	09/15/93	10/12/93	10/23/93
SELENIUM, TOTAL	001 MS	S	93L6933	09/15/93	10/12/93	10/23/93
TITANIUM, TOTAL	001	S	93L6934	09/15/93	10/12/93	10/22/93 <u>37</u>
TITANIUM, TOTAL	001 REP	S	93L6934	09/15/93	10/12/93	10/22/93
TITANIUM, TOTAL	001 MS	S	93L6934	09/15/93	10/12/93	10/22/93
THALLIUM, TOTAL	001	S	93L6933	09/15/93	10/12/93	10/23/93 <u>38</u>
THALLIUM, TOTAL	001 REP	S	93L6933	09/15/93	10/12/93	10/23/93
THALLIUM, TOTAL	001 MS	S	93L6933	09/15/93	10/12/93	10/23/93
VANADIUM, TOTAL	001	S	93L6934	09/15/93	10/12/93	10/22/93 <u>37</u>
VANADIUM, TOTAL	001 REP	S	93L6934	09/15/93	10/12/93	10/22/93
VANADIUM, TOTAL	001 MS	S	93L6934	09/15/93	10/12/93	10/22/93
ZINC, TOTAL	001	S	93L6934	09/15/93	10/12/93	10/22/93
ZINC, TOTAL	001 REP	S	93L6934	09/15/93	10/12/93	10/22/93
ZINC, TOTAL	001 MS	S	93L6934	09/15/93	10/12/93	10/22/93
<i>Cyanide</i> B09343				9/15/93	9/29/93	9/29/93 <u>14</u>
SILVER, TOTAL	002	S	93L6934	09/15/93	10/12/93	10/23/93 <u>38</u>

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2/14/94

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

DATE RECEIVED: 09/17/93

RFW LOT # :9309L997

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
ALUMINUM, TOTAL	002	S	93L6934	09/15/93	10/12/93	10/22/93 37
ARSENIC, TOTAL	002	S	93L6933	09/15/93	10/12/93	10/23/93 38
BARIIUM, TOTAL	002	S	93L6934	09/15/93	10/12/93	10/22/93 37
BERYLLIUM, TOTAL	002	S	93L6934	09/15/93	10/12/93	10/22/93
CALCIUM, TOTAL	002	S	93L6934	09/15/93	10/12/93	10/22/93
CADMIUM, TOTAL	002	S	93L6934	09/15/93	10/12/93	10/22/93
COBALT, TOTAL	002	S	93L6934	09/15/93	10/12/93	10/22/93
CHROMIUM, TOTAL	002	S	93L6934	09/15/93	10/12/93	10/22/93
COPPER, TOTAL	002	S	93L6934	09/15/93	10/12/93	10/22/93
IRON, TOTAL	002	S	93L6934	09/15/93	10/12/93	10/22/93
MERCURY, TOTAL	002	S	93C0306	09/15/93	10/13/93	10/19/93 34
POTASSIUM, TOTAL	002	S	93L6934	09/15/93	10/12/93	10/22/93 37
MAGNESIUM, TOTAL	002	S	93L6934	09/15/93	10/12/93	10/22/93
MANGANESE, TOTAL	002	S	93L6934	09/15/93	10/12/93	10/22/93
SODIUM, TOTAL	002	S	93L6934	09/15/93	10/12/93	10/22/93
NICKEL, TOTAL	002	S	93L6934	09/15/93	10/12/93	10/22/93
LEAD, TOTAL	002	S	93L6933	09/15/93	10/12/93	10/23/93 38
ANTIMONY, TOTAL	002	S	93L6934	09/15/93	10/12/93	10/22/93 37
SELENIUM, TOTAL	002	S	93L6933	09/15/93	10/12/93	10/23/93 38
TITANIUM, TOTAL	002	S	93L6934	09/15/93	10/12/93	10/22/93 37
THALLIUM, TOTAL	002	S	93L6933	09/15/93	10/12/93	10/23/93 38
VANADIUM, TOTAL	002	S	93L6934	09/15/93	10/12/93	10/22/93 37
ZINC, TOTAL	002	S	93L6934	09/15/93	10/12/93	10/22/93

Cyanide
 LAB QC:

9115193 912793 9128193 13

SILVER LABORATORY	LC1 BS	S	93L6934	N/A	10/12/93	10/23/93
SILVER LABORATORY	LC2 BS	S	93L6934	N/A	10/12/93	10/23/93
SILVER, TOTAL	MB1	S	93L6934	N/A	10/12/93	10/23/93
ALUMINUM LABORTORY	LC1 BS	S	93L6934	N/A	10/12/93	10/22/93
ALUMINUM LABORTORY	LC2 BS	S	93L6934	N/A	10/12/93	10/22/93
ALUMINUM, TOTAL	MB1	S	93L6934	N/A	10/12/93	10/22/93
ARSENIC LABORATORY	LC1 BS	S	93L6933	N/A	10/12/93	10/23/93
ARSENIC LABORATORY	LC2 BS	S	93L6933	N/A	10/12/93	10/23/93
ARSENIC, TOTAL	MB1	S	93L6933	N/A	10/12/93	10/23/93
BARIIUM LABORATORY	LC1 BS	S	93L6934	N/A	10/12/93	10/22/93
BARIIUM LABORATORY	LC2 BS	S	93L6934	N/A	10/12/93	10/22/93
BARIIUM, TOTAL	MB1	S	93L6934	N/A	10/12/93	10/22/93

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U.S. EPA - CLP

3
BLANKS

Lab name: ROY F. WESTON, INC - L372 Contract: 6168-02-01
 Lab code: WESTON Case No.: WEST SAS No.: SDG No.: CLP997
 Preparation Blank Matrix (soil/water): SOIL
 Preparation Blank Concentration Units (ug/L or mg/kg): MG/KG

Analyte	Initial Calib. Blank (ug/L)		Continuing Calibration Blank (ug/L)						Preparation Blank		M
		C	1	C	2	C	3	C	C		
Aluminum	48.0	U	48.0	U	48.0	U	48.0	U	9.600	U	P
Antimony	46.0	U	46.0	U	46.0	U	46.0	U	9.200	U	P
Arsenic	2.0	U	2.0	U	2.0	U	2.0	U	.400	U	F
Barium	6.0	U	6.0	U	6.0	U	6.0	U	1.200	U	P
Beryllium	1.0	U	1.0	U	1.0	U	1.0	U	.200	U	P
Cadmium	5.0	U	5.0	U	5.0	U	5.0	U	1.000	U	P
Calcium	28.0	U	28.0	U	28.0	U	28.0	U	5.600	U	P
Chromium	6.0	U	6.0	U	6.0	U	6.0	U	1.200	U	P
Cobalt	7.0	U	7.0	U	7.0	U	7.0	U	1.400	U	P
Copper	7.0	U	7.0	U	7.0	U	7.0	U	1.400	U	P
Iron	7.0	U	7.0	U	7.0	U	8.1	B	1.400	U	P
Lead	2.0	U	2.0	U	2.0	U	2.0	U	.560	B	F
Magnesium	58.0	U	58.0	U	58.0	U	58.0	U	11.600	U	P
Manganese	2.0	U	2.0	U	2.0	U	2.0	U	-.400	B	P
Mercury	.1	U	.1	U	.1	U	.1	U	.050	U	CV
<u>Nickel</u>	12.0	U	12.0	U	-15.0	B	12.0	U	2.400	U	P
Potassium	905.0	U	905.0	U	905.0	U	905.0	U	181.000	U	P
Selenium	2.0	U	2.0	U	2.0	U	2.0	U	.400	U	F
Silver	7.0	U	7.0	U	7.0	U	7.0	U	1.400	U	P
Sodium	47.0	U	47.0	U	47.0	U	47.0	U	9.400	U	P
Thallium	2.0	U	2.0	U	2.0	U	2.0	U	2.000	U	F
Vanadium	4.6	B	3.0		3.0	U	3.3	B	.600	U	P
Zinc	3.0	U	3.0	U	3.0	U	3.0	U	1.200	B	P
Cyanide	10.0	U	10.0	U	10.0	U			1.000	U	C

FORM III - IN

03/90

~~Assoc. w/~~

2/15/94

Assoc. w/

B-9342

Assoc. w/

B-9343

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2/15/94

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U.S. EPA - CLP

5A
SPIKE SAMPLE RECOVERY

EPA SAMPLE NO.

B09342S

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

Lab Code: WESTON Case No.: WEST SAS No.: SDG No.: CLP997

Matrix: SOIL Level (low/med): LOW

% Solids for Sample: 95.1

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	82.0000	8.7722 U	95.30	86.0		P
Arsenic	75-125	9.3000	2.1000	7.60	94.7		F
Barium	75-125	421.7000	54.7000	381.40	96.2		P
Beryllium	75-125	8.7000	.1907 U	9.50	91.2		P
Cadmium	75-125	9.0000	.9535 U	9.50	94.2		P
Calcium							NR
Chromium	75-125	41.8000	6.5000	38.10	92.7		P
Cobalt	75-125	94.7000	4.3000 B	95.30	94.9 99.3		P
Copper	75-125	51.5000	7.8000	47.70	92.0		P
Iron							NR
Lead	75-125	7.7000	5.7000	3.80	52.6		F
Magnesium							NR
Manganese	75-125	286.2000	196.7000	95.30	93.9		P
Mercury	75-125	.4950	.0526 U	.53	93.4		CV
Nickel	75-125	95.5000	5.5000 B	95.30	94.4		P
Potassium							NR
Selenium	75-125	1.6000	.3814 U	1.90	84.2		F
Silver	75-125	8.1000	1.3349 U	9.50	84.8		P
Sodium							NR
Thallium		8.8000	.3814 U	9.50	92.6		F
Vanadium	75-125	106.7000	15.3000	95.30	95.9		P
Zinc	75-125	112.9000	23.4000	95.30	93.9		P
Cyanide							NR

Comments: Cobalt %R = $\frac{(94.7 - 4.3)}{95.3} \times 100 = 94.86 = 94.9\%$

FORM V (Part 1) - IN

03/90

Qualify lead sample results as estimated (E).

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2/14/94

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ROY F. WESTON INC.

INORGANIC ACCURACY REPORT 10/27/93

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

WESTON BATCH #: 9309L997

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-001	B09342	Silver, Total	8.1	1.9 u	9.5	85.3	1.0
		Aluminum, Total	4020	3510	381	132 *	1.0
		Arsenic, Total	9.3	2.1	7.6	94.7	1.0
		Barium, Total	422	54.7	381	96.2	1.0
		Beryllium, Total	8.7	0.95u	9.5	91.6	1.0
		Calcium, Total	12600	6790	4770	123	1.0
		Cadmium, Total	9.0	0.95u	9.5	94.7	1.0
		Cobalt, Total	94.7	9.5 u	95.3	99.4	1.0
		Chromium, Total	41.8	6.5	38.1	92.7	1.0
		Copper, Total	51.5	7.8	47.7	91.6	1.0
		Iron, Total	9430	9090	191	180 *	1.0
		Mercury, Total	0.50	0.10u	0.53	94.1	1.0
		Potassium, Total	5270	972	4770	90.1	1.0
		Magnesium, Total	7700	2930	4770	100	1.0
		Manganese, Total	286	197	95.3	93.9	1.0
		Sodium, Total	4670	954 u	4770	97.9	1.0
		Nickel, Total	95.5	7.6 u	95.3	100	1.0
		Lead, Total	7.7	5.7	3.8	52.6	1.0
		Antimony, Total	82.0	11.4 u	95.3	86.0	1.0
		Selenium, Total	1.6	0.95u	1.9	84.2	1.0
		Titanium, Total	667	394	191	143	1.0
		Thallium, Total	8.8	1.9 u	9.5	92.6	1.0
		Vanadium, Total	107	15.3	95.3	95.9	1.0
		Zinc, Total	113	23.4	95.3	93.9	1.0

Qualify titanium sample results
as estimated (S).

[Signature]
2/15/94

027

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9613401.2261

U.S. EPA - CLP

9
ICP SERIAL DILUTIONS

EPA SAMPLE NO.

B09342L

Lab Name: ROY F. WESTON, INC - L372

Contract: 6168-02-01

Lab Code: WESTON

Case No.: WEST

SAS No.:

SDG No.: CLP997

Matrix (soil/water): SOIL

Level (low/med): LOW

Concentration Units: ug/L

Analyte	Initial Sample Result (I)	C	Serial Dilution Result (S)	C	% Difference	Q	M
Aluminum	18413.30		20845.51		13.2	E	P
Antimony	46.00	U	230.00	U			P
Arsenic							
Barium	287.00		333.50	B	16.2		P
Beryllium	1.00	U	5.00	U			P
Cadmium	5.00	U	25.00	U			P
Calcium	35596.50		40509.49		13.8	E	P
Chromium	33.90		34.00	B	.3		P
Cobalt	22.80	B	46.50	B	103.9		P
Copper	40.90		57.50	B	40.6		P
Iron	47655.20		54534.00		14.4	E	P
Lead							
Magnesium	15361.80		17606.50	B	14.6	E	P
Manganese	1031.50		1171.50		13.6	E	P
Mercury							
Nickel	28.90	B	60.00	U	100.0		P
Potassium	5098.50		8157.50	B	60.0		P
Selenium							
Silver	7.00	U	35.00	U			P
Sodium	549.70	B	794.00	B	44.4		P
Thallium							
Vanadium	80.30		96.50	B	20.2		P
Zinc	122.80		140.00		14.0		P

FORM IX - IN

03/90

$$Mn \% D = \frac{|303 - 1031.5 - 1171.5|}{1031.5} \times 100 = 13.6\%$$

Qualifying Al, Ca, Fe, Mg, & Mn results as estimated (S).

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2/15/94

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