START 9613973.1543

0045171

B09D93-DAT-255

DATA CHEM LABORATORIES

ENVIRONMENTAL WATER REPORT

Form EPRW-A
Page 1 of 5
Part 1 of 4

Date _____
Agency Identification Number SX-0460-AA
Account No. 3534E

Westinghouse Hanford Company
2355 Stevens Drive
MSIN H4-23 345 Hill Street/300 Area
Richland, WA 99352
Attention: Briana Colley

DEC 1993 RECEIVED SDLA

Telephone (509) 373-3225

Sampling Collection and Shipment

Sampling Site _____ Date of Collection October 26, 1993

Date Samples Received at Laboratory November 12, 1993

Analytical Results

Parameter Name / Analysis Date / Units / Method / Prep Method	Field Number / Lab Number	BL-21566-1 / BL-21566-1	QC-21566-1 / QC-21566-1	B09D93 / CLP 17112	B09D93MSD / CLP 17112MSD	B09D93MS / CLP 17112MS	B09DJ5 / CLP 17113	B09D73 / CLP 17114	B09D81 / CLP 17115
Hydrazine 11/23/1993 ASTMD1385	µg/L	ND*	86.	ND*	98.	97.	ND*	ND*	ND*

SEP 1996 RECEIVED EDMC

† See comment on last page.
ND Parameter not detected.
NR Parameter not requested.
* Analyses completed on or before this date.

** Parameter not analyzed (See comment page).
( ) Parameter between LOD and LOQ.
[ ] Method Reference (See comments page.)

Analyst: Wendy L. Odell

Reviewer: Katherine Kellersberger

Laboratory Supervisor: Norman K. Christensen

0001

960 West LeVoy Drive / Salt Lake City, Utah 84123-2547 / (801) 266-7700
A Sorenson Company

9613473.1544

DATA CHEM LABORATORIES

ENVIRONMENTAL WATER REPORT

Form EPRW-A
Page 2 of 5
Part 2 of 4

Date _____
Agency Identification Number SX-0460-AA
Account No. 3534E

Westinghouse Hanford Company
2355 Stevens Drive
MSIN H4-23 345 Hill Street/300 Area
Richland, WA 99352
Attention: Briana Colley

Telephone (509) 373-3225

Sampling Collection and Shipment

Sampling Site _____ Date of Collection October 26, 1993

Date Samples Received at Laboratory November 12, 1993

Analytical Results

Parameter Name / Analysis Date / Method / Trap Method / Units	Field Number / Lab Number	B09DD5 CLP 17116	B09DJ1 CLP 17117	B09D69 CLP 17118	B09DB9 CLP 17119	B09DB1 CLP 17120	B09D97 CLP 17121	B09DG9 CLP 17122	B09DC7 CLP 17123
Hydrazine 11/23/1993 ASTMD1385	µg/L	ND*	ND*	ND*	ND*	ND*	ND*	ND*	ND*

† See comment on last page.
ND Parameter not detected.
NR Parameter not requested.
[1] Analyses completed on or before this date.

** Parameter not analyzed (See comment page).
( ) Parameter between LOD and LOQ.
[ ] Method Reference (See comments page.)

0002

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9613473.1545

DATA CHEM LABORATORIES

ENVIRONMENTAL WATER REPORT

Form EPRW-A
Page 3 of 5
Part 3 of 4

Date _____
Agency Identification Number SX-0460-AA
Account No. 3534E

Westinghouse Hanford Company
2355 Stevens Drive
MSIN H4-23 345 Hill Street/300 Area
Richland, WA 99352
Attention: Briana Colley

Telephone (509) 373-3225

Sampling Collection and Shipment

Sampling Site _____ Date of Collection October 26, 1993

Date Samples Received at Laboratory November 12, 1993

Analytical Results

Parameter Name / Analysis Date / Method / Prep Method	Units	Field Number / Lab Number	B09DH7 CLP 17124	B09D89 CLP 17125	B09DG5 CLP 17126	B09D85 CLP 17127	B09DF7 CLP 17128	B09DG1 CLP 17129	B09DC3 CLP 17130	
Hydrazine 11/23/1993 ASTMD1385	µg/L		ND*	ND*	ND*	ND*	ND*	ND*	ND*	

† See comment on last page.
ND Parameter not detected.
NR Parameter not requested.
¹ Analyses completed on or before this date.

** Parameter not analyzed (See comment page).
( ) Parameter between LOD and LOQ.
[ ] Method Reference (See comments page.)

0003

9613473.1546

DATA CHEM LABORATORIES

ENVIRONMENTAL WATER REPORT

Form EPRW-A
Page 4 of 5
Part 4 of 4

Date _____
Agency Identification Number SX-0460-AA
Account No. 3534E

Westinghouse Hanford Company
2355 Stevens Drive
MSIN H4-23 345 Hill Street/300 Area
Richland, WA 99352
Attention: Briana Colley

Telephone (509) 373-3225

Sampling Collection and Shipment

Sampling Site _____ Date of Collection October 26, 1993

Date Samples Received at Laboratory November 12, 1993

Analytical Results

Parameter Name / Analysis Date / Units / Method / Prep Method	Field Number / Lab Number	B09DD1 CLP 17131							% Limit of Detection
Hydrazine 11/23/1993 ASTMD1385	µg/L	ND*							3.

† See comment on last page.
ND Parameter not detected.
NR Parameter not requested.
¹ Analyses completed on or before this date.

** Parameter not analyzed (See comment page).
( ) Parameter between LOD and LOQ.
[ ] Method Reference (See comments page.)

0004

DATA CHEM LABORATORIES

ENVIRONMENTAL WATER REPORT

Date _____

Agency Identification Number SX-0460-AA

General Set Comments

Case Narrative: Analysis went well and without any complications. All original data is with this set.

QC Data: QC target = 80 µg/L. Spike target = 90 µg/L.

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DataChem Laboratories
Quality Control Report

Method	D-1385	**Report Date**	12/3/93
Analyte	Hydrazine	**Instrument**	VIS SPEC
Matrix	Water	**Run Number**	54-382
		Reporting Limit	3.000 ug/L

Blanks (ug/L)

Preparation Group	ID Number	Amount Found	Upper Limit	Date Analyzed	Analyst
WHC-51	BL-21566-1	-0.014	3.000	11/23/93	KIRBY

LCS (ug/L)

Preparation Group	ID Number	Amount Found	Amount Spiked	Percent Recovery	Upper Limit	Lower Limit	Date Analyzed	Analyst
WHC-51	QC-21566-1	85.511	80.000	106.889	120.000	80.000	11/23/93	KIRBY

Matrix Spike (ug/L)

Preparation Group	ID Number	Amount Found	Amount Spiked	Percent Recovery	Upper Limit	Lower Limit	Date Analyzed	Analyst
WHC-51	CLP 17112	97.450	90.000	108.278	125.000	75.000	11/23/93	KIRBY

Matrix Spike Duplicates (ug/L)

Preparation Group	ID Number	Amount Found (1)	Amount Found (2)	Relative % Difference	Upper Limit	Date Analyzed	Analyst	MSD % Recovery
WHC-51	CLP 17112	97.450	98.192	0.759	125.000	11/23/93	KIRBY	109.103

0006

THIS SET DUE:	TIME	DEADLINE	STARTED
Preparation:			11/23/93
Analysis:			11/23/93

DataChem Laboratories
CHAIN-OF-CUSTODY
Environmental Contract Program

SDG/Batch #: WHC 51

DCL Set ID: SX-0460

Client: WESTINGHOUSE | Account: 3534

Comments:

SPLIT: A

SUBSEQUENCE

ANALYSIS: HYDRAZINE

Date Sampled	Field ID Number	DCL Sample Number(s)	QC	Matrix	Cooler	HYDRAZINE
10-30-93	B09D93	CLP 17112		WATER	C93 3649	1
11-3-93	B09DJ5	17113				1
10-28-93	B09D73	17114				1
11-6-93	B09D81	17115				1
10-30-93	B09DD5	17116				1
10-28-93	B09DJ1	17117				1
10-29-93	B09D69	17118				1
10-31-93	B09DB9	17119				1
11-6-93	B09DB1	17120				1
10-30-93	B09D97	17121				1

ORIGINAL FIELD SAMPLE CONTAINER(S) FOR ANALYSIS OF: →

Received: Date/Time/Signature 11-12-93 / 1000 / Mark Mendenhall

ORIGINAL FIELD SAMPLE CHAIN-OF-CUSTODY

Relinquished By: (Signature)	Date/Time	Received By: (Signature)	Reason for Transfer/ Storage Location
Mark Mendenhall	11-12-93 1600	SAMPLE STORAGE MM	STORAGE R241
Sample Storage WLO	11/23/93 0900	Sandy Odell	Hydrazine Analysis

SAMPLE PREPARATION / ANALYSIS CHAIN-OF-CUSTODY

SAMPLE PREP/ANALYSIS FOR: Hydr

LAB NOTEBOOK NO. 2686

Prepared/Analyzed by: WLO

Date/Time: 11/23/93 0900

Relinquished By: (Signature)	Date/Time	Received By: (Signature)	Reason for Transfer/ Storage Location

9613974.4149

DataChem Laboratories
CHAIN-OF-CUSTODY
Environmental Contract Program

THIS SET DIES:	TIME	DEADLINE	STARTED
Preparation:			11/23/93
Analysis:			11/23/93

SDG/Batch #: WHC 51

DCL Set ID: SX - 0460

Client: WESTINGHOUSE | Account: 3534

Comments:

SPLIT: A

SUBSEQUENCE

ANALYSIS: HYDRAZINE

Date Sampled	Field ID Number	DCL Sample Number(s)	QC	Matrix	Cooler	HYDRAZINE
10-31-93	B09DG9	CLP 17122		WATER	C93 3649	1
10-30-93	B09DC7	17123				1
10-31-93	B09DH7	17124				1
10-30-93	B09D89	17125				1
10-26-93	B09D5G5 MM 11-12-93	17126				1
⊥	B09D85	17127				1
10-29-93	B09DF7	17128				1
⊥	B09DG1	17129				1
10-31-93	B09DC3	17130				1
10-27-93	B09DD1	17131				1

ORIGINAL FIELD SAMPLE CONTAINER(S) FOR ANALYSIS OF: →

Received: Date/Time/Signature ____ / ____ / ____

ORIGINAL FIELD SAMPLE CHAIN-OF-CUSTODY

Relinquished By: (Signature)	Date/Time	Received By: (Signature)	Reason for Transfer/ Storage Location
Mark Vendenhall	11-12-93 1600	SAMPLE STORAGE	STORAGE R24-1
Sample Storage WLO	11/23/93 0900	Wendy Odell	Hydrazine/Analysis

SAMPLE PREPARATION / ANALYSIS CHAIN-OF-CUSTODY

SAMPLE PREP/ANALYSIS FOR: Hydr LAB NOTEBOOK NO. 2686

Prepared/Analyzed by: WLO Date/Time: 11/23/93 0900

Relinquished By: (Signature)	Date/Time	Received By: (Signature)	Reason for Transfer/ Storage Location

9613473.1550

9613473.1551

DATA CHEM LABORATORIES

ENVIRONMENTAL WATER REPORT

Form EPRW-A
Page 1 of 2
Part 1 of 1

Date _____
Agency Identification Number SX-0461-AA
Account No. 3534E

Westinghouse Hanford Company
2355 Stevens Drive
MSIN H4-23 345 Hill Street/300 Area
Richland, WA 99352
Attention: Briana Colley

Telephone (509) 373-3225

Sampling Collection and Shipment

Sampling Site _____ Date of Collection October 31, 1993

Date Samples Received at Laboratory November 12, 1993

Analytical Results

Parameter Name / Analysis Date / Method	Units / Prep Method	Field Number / Lab Number	BL-21567-1 / BL-21567-1	QC-21567-1 / QC-21567-1	B09DF3 / CLP 17132	B09DB5 / CLP 17133	B09DD9 / CLP 17134	B09DD9MSD / CLP 17134MSD	B09DD9MS / CLP 17134MS	* Limit of Detection
Hydrazine 11/23/1993 ASTMD1385	µg/L		ND*	86.	ND*	ND*	ND*	94.	93.	3.

† See comment on last page.
ND Parameter not detected.
NR Parameter not requested.
¹ Analyses completed on or before this date.

** Parameter not analyzed (See comment page).
( ) Parameter between LOD and LOQ.
[ ] Method Reference (See comments page.)

Analyst: Wendy L. Odell

Reviewer: Katherine Kellersberger

Laboratory Supervisor: Norman K. Christensen

0009

960 West LeVoy Drive / Salt Lake City, Utah 84123-2547 / (801) 266-7700
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DATA CHEM LABORATORIES

ENVIRONMENTAL WATER REPORT

Date _____

Agency Identification Number SX-0461-AA

General Set Comments

Case Narrative: Analysis went well and without complications. Original data is with set SX-0460-AA.

QC Data: QC target = 80 µg/L. Spike target = 90 µg/L.

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THIS SET DIES:	TIME	DEADLINE	STARTED
Preparation:			11/23/93
Analysis:			11/23/93

DataChem Laboratories
CHAIN-OF-CUSTODY
Environmental Contract Program

SDG/Batch #: WHC 52

DCL Set ID: SX-0461

Client: WESTINGHOUSE | Account: 3534

Comments:

SPLIT: A

SUBSEQUENCE:

ANALYSIS: HYDRAZINE

Date Sampled	Field ID Number	DCL Sample Number(s)	QC	Matrix	Cooler	HYDRAZINE
10-31-93	B09DF3	CLP 17132		WATER	C93 3649	1
11-6-93	B09DB5	17133				1
	B09DD9	17134				1

ORIGINAL FIELD SAMPLE CONTAINER(S) FOR ANALYSIS OF: →

Received: Date/Time/Signature 11-12-93 1000 Mark Mendenhall

ORIGINAL FIELD SAMPLE CHAIN-OF-CUSTODY

Relinquished By: (Signature)	Date/Time	Received By: (Signature)	Reason for Transfer/ Storage Location
Mark Mendenhall	11-12-93 1000	SAMPLE STORAGE	STORAGE 224-1
Sample Storage WO	11/23/93 0900	Wendy Odell	Hydrazine/Nova

SAMPLE PREPARATION / ANALYSIS CHAIN-OF-CUSTODY

SAMPLE PREP/ANALYSIS FOR: Hydr

LAB NOTEBOOK NO. 2L8L

Prepared/Analyzed by: WLO

Date/Time: 11/23/93 0900

Relinquished By: (Signature)	Date/Time	Received By: (Signature)	Reason for Transfer/ Storage Location

IS SET CONTINUED ON CONTINUATION PAGE? ___ YES ___ NO

Revised 08/92

0011

DataChem Laboratories
Quality Control Report

Method	D-1385	**Report Date**	12/3/93
Analyte	Hydrazine	**Instrument**	VIS SPEC
Matrix	Water	**Run Number**	54-381
		Reporting Limit	3.000 ug/L

Blanks (ug/L)

Preparation Group	ID Number	Amount Found	Upper Limit	Date Analyzed	Analyst
WHC-52	BL-21567-1	0.793	3.000	11/23/93	KIRBY

LCS (ug/L)

Preparation Group	ID Number	Amount Found	Amount Spiked	Percent Recovery	Upper Limit	Lower Limit	Date Analyzed	Analyst
WHC-52	QC-21567-1	86.261	80.000	107.826	120.000	80.000	11/23/93	KIRBY

Matrix Spike (ug/L)

Preparation Group	ID Number	Amount Found	Amount Spiked	Percent Recovery	Upper Limit	Lower Limit	Date Analyzed	Analyst
WHC-52	CLP 17134	92.987	90.000	103.319	125.000	75.000	11/23/93	KIRBY

Matrix Spike Duplicates (ug/L)

Preparation Group	ID Number	Amount Found (1)	Amount Found (2)	Relative % Difference	Upper Limit	Date Analyzed	Analyst	MSD % Recovery
WHC-52	CLP 17134	92.987	93.732	0.798	125.000	11/23/93	KIRBY	104.147

0012

Westinghouse Hanford Company

CHAIN OF CUSTODY

Custody Form Initiator KD LEE/GG HAMILTON

Company Contact PH BUTCHER

Project Designation/Sampling Locations 100-FR-3

Ice Chest No. Cooler I

Bill of Lading/Airbill No. 251 901 0439

Method of Shipment EMERY

Shipped to DATA CHEM

Possible Sample Hazards/Remarks None

Telephone (509) 376-5045

Collection Date 10/30/93

Field Logbook No. EFL-1054

Offsite Property No. ~~W93-~~ W94-0-0001-39 WS 11-9-93

Sample Identification

B09093

1, 40ml, Gs, WATER; HYDRAZINE(HCL to pH<2.0)

[] Field Transfer of Custody

Chain of Possession (Sign and Print Names)

Relinquished By	Date	Time	Received By	Date	Time
[illegible]	10/30/93	1600	T Sweeney / Sweeney	11-9-93	0800
T Sweeney / Sweeney	11-9-93	1100	Mark Mendenhall	11-12-93	1000

Final Sample Disposition

Disposal Method: Disposed by: Date/Time:

Comments: relinq. to frig. @ 2C by K.D. Lee 10/30/93 1400

42a

Westinghouse Hanford Company

SAMPLE ANALYSIS REQUEST

PART I: FIELD SECTION

Collector K. Lee, L. Walker Date Sampled 10/30/93 Time 0727 hours

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

Sample Number	Number and Type of Sample Containers	Type of Sample*	Analysis Requested
B09D73	1: 40ml; Gs;	WATER	HYDRAZINE (HCl to pH<2.0)
			OPC: ~~W93~~ W94-0-0001-38 CL 11-9-93
			BOL: 2519010439
			TASK#: 93-319

Field Information**

Special Handling and/or Storage

Possible Sample Hazards

PART II: LABORATORY SECTION

Received by _____ Title _____ Date _____

Analysis Required _____

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

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

A-6000-406(05/90)

42b

E 2717

Westinghouse Hanford Company	CHAIN OF CUSTODY

Custody Form Initiator KD LEE/GG HAMILTON

Company Contact PH BUTCHER

Telephone (509) 376-5045

Project Designation/Sampling Locations 100-FR-3

Collection Date 11/3/93

Ice Chest No. Gander I

Field Logbook No. EFL-1054

Bill of Lading/Airbill No. 2519010439

Offsite Property No. ~~W93~~ W24-0-0007-39 LCS 11-9-93

Method of Shipment EMERY

Shipped to DATA CHEM

Possible Sample Hazards/Remarks None

Sample Identification

B09DJ5

1, 40ml, Gs, WATER; HYDRAZINE(HCL to pH<2.0)

[] Field Transfer of Custody

Chain of Possession (Sign and Print Names)

Relinquished By	Date	Time	Received By	Date	Time
K.D. Lee K.D. Lee	11/3/93	1015	L. Sweeney L. Sweeney	11-9-93	0800
L. Sweeney L. Sweeney	11-5-53	1100	Mark Vandenhelt	11-12-93	1000

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

reling. to frig. # 3C by K.D. Lee 11/3/93

42C

A-6000-407 (12/92) WEF061

Westinghouse Hanford Company

SAMPLE ANALYSIS REQUEST

PART I: FIELD SECTION

Collector: K. Lee, L. Walker — Date Sampled: 11/3/93 — Time: 1015 hours

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

Sample Number	Number and Type of Sample Containers	Type of Sample*	Analysis Requested
B09DJ5	1; 40ml; Gs;	WATER	HYDRAZINE (HCl to pH<2.0)
			OPC: W93-1094-0-0001-35 LLS 11-9-93
			BOL: 2517010438
			TASK#: 93-319

Field Information**

Special Handling and/or Storage

Possible Sample Hazards

PART II: LABORATORY SECTION

Received by _____ Title _____ Date _____

Analysis Required _____

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

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

A-6000-406(05/90)

42d

Westinghouse Hanford Company	CHAIN OF CUSTODY

Custody Form Initiator KD LEE/GG HAMILTON

Company Contact PH BUTCHER

Telephone (509) 376-5045

Project Designation/Sampling Locations 100-FR-3

Collection Date 10-28-93

Ice Chest No. Gander T.

Field Logbook No. EFL-1054

Bill of Lading/Airbill No. 2519010439

Offsite Property No. ~~W93-~~ WS94-A-00001-3 ? LCS 11-9-93

Method of Shipment EMERY

Shipped to DATA CHEM

Possible Sample Hazards/Remarks None

Sample Identification

B09D73

1, 40ml, Gs, WATER; HYDRAZINE(HCL to pH<2.0)

[] Field Transfer of Custody

Chain of Possession (Sign and Print Names)

Relinquished By	Date	Time	Received By	Date	Time
[illegible]	10/28/93	1306	L Sweeney L Sweeney	10/29/93	0800
L Sweeney L Sweeney	10/29/93	1348	L Sweeney L Sweeney	11-9-93	1800
L Sweeney L Sweeney	11-9-93	1100	[illegible]	11-12-93	1000

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments: Relinq to Frig #3A by Bill Whitney 1300

42e

Westinghouse Hanford Company

SAMPLE ANALYSIS REQUEST

PART I: FIELD SECTION

Collector: K. Lee, L. Walker — Date Sampled: 10/28/93 — Time: 0928 hour

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

Sample Number	Number and Type of Sample Containers	Type of Sample*	Analysis Requested
B09D73	1; 40ml; Gs;	WATER	HYDRAZINE (HCl to pH<2.0)
			OPC: ~~W93-~~ W94-0-0001-35 LCS 11-9-93
			BOL: 2519010439
			TASK#: 93-319

Field Information**

Special Handling and/or Storage

Possible Sample Hazards

PART II: LABORATORY SECTION

Received by _____ Title _____ Date _____

Analysis Required

42 F

Westinghouse Hanford Company	CHAIN OF CUSTODY

Custody Form Initiator KD LEE/GG HAMILTON

Company Contact PH BUTCHER

Telephone (509) 376-5045

Project Designation/Sampling Locations 100-FR 3

Collection Date 11/6/93

Ice Chest No. Garden I

Field Logbook No. EFL-1054

Bill of Lading/Airbill No. 257 901 0439

Offsite Property No. ~~W93-~~ W94-0-0001-33

Method of Shipment EMERY

LCS 11-9-93

Shipped to DATA CHEM

Possible Sample Hazards/Remarks None

Sample Identification

B09D51

1, 40ml, Gs, WATER; HYDRAZINE(HCL to pH<2.0)

[] Field Transfer of Custody

Chain of Possession (Sign and Print Names)

Relinquished By	Date	Time	Received By	Date	Time
[illegible]	11/6/93	1500	[illegible]	11-9-93	0800
[illegible]	11-9-93	1100	[illegible]	11-12-93	1000

Final Sample Disposition

Disposal Method: Disposed by: Date/Time:

Comments: relinq. to Frig. #2B by K.D. Lee 11/6/93 1500

42G

Westinghouse Hanford Company

SAMPLE ANALYSIS REQUEST

PART I: FIELD SECTION

Collector K. Lee, L. Walker Date Sampled 11/6/98 Time 1204 hours

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

Sample Number	Number and Type of Sample Containers	Type of Sample*	Analysis Requested
B09D81	1: 40ml: Gs:	WATER	HYDRAZINE (HCl to pH<2.0)
			OPC: ~~W02~~ W284-0-M01-39
			BOL: 251901 0438
			TASK#: 93-319

Field Information**

Special Handling and/or Storage

Possible Sample Hazards

PART II: LABORATORY SECTION

Received by Title Date

Analysis Required

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

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

A-6000-406(05/90)

42 b

Westinghouse Hanford Company	CHAIN OF CUSTODY

Custody Form Initiator KD LEE/GG HAMILTON

Company Contact PH BUTCHER

Telephone (509) 376-5045

Project Designation/Sampling Locations 100-FR-3

Collection Date 10/30/93

Ice Chest No. Gander I

Field Logbook No. EFL-1054

Bill of Lading/Airbill No. 2579010439

Offsite Property No. ~~W93-~~ W94-0-0001-38 LCS 11-9-93

Method of Shipment EMERY

Shipped to DATA CHEM

Possible Sample Hazards/Remarks None

Sample Identification

H09D05

1, 40ml, Gs, WATER; HYDRAZINE(HCL to pH<2.0)

[] Field Transfer of Custody

Chain of Possession (Sign and Print Names)

Relinquished By	Date	Time	Received By	Date	Time
[illegible]	10/30/93	1400	L Suzanne / Suzanne	11-9-93	0800
L Suzanne / Suzanne	11-9-93	1100	Mark Mendenhall	11-12-93	1000

Final Sample Disposition

Disposal Method:

Disposed By:

Date/Time:

Comments: relog to log # 2B by K.D. Lee 10/20/93 1400

42

Westinghouse Hanford Company

SAMPLE ANALYSIS REQUEST

PART I: FIELD SECTION

Collector: K. Lee, L. Walker — Date Sampled: 10/30/03 — Time: 1204 hours

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

Sample Number	Number and Type of Sample Containers	Type of Sample*	Analysis Requested
B09D75	1; 40ml; Gs;	WATER	HYDRAZINE (HCl to pH<2.0)
			OPC: ~~W93-~~ W294.0.0001-39 11-5-03
			BOL: 0519010439
			TASK#: 93-319

Field Information**

Special Handling and/or Storage

Possible Sample Hazards

PART II: LABORATORY SECTION

Received by _____ Title _____ Date _____

Analysis Required _____

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

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

A-6000-406(05/90)

42J

Westinghouse Hanford Company

CHAIN OF CUSTODY

Custody Form Initiator KD LEE/GG HAMILTON

Company Contact PH BUTCHER

Telephone (509) 376-5045

Project Designation/Sampling Locations 100-FR-3

Collection Date 10/28/93

Ice Chest No. Garder-I

Field Logbook No. EFL-1054

Bill of Lading/Airbill No. 2519010439

Offsite Property No. W93-1394-0-0001-39 LGS 11-5-93

Method of Shipment EMERY

Shipped to DATA CHEM

Possible Sample Hazards/Remarks None

Sample Identification

B09D71

1, 40ml, Gs, WATER; HYDRAZINE(HCL to pH<2.0)

[] Field Transfer of Custody

Chain of Possession (Sign and Print Names)

Relinquished By	Date	Time	Received By	Date	Time
[signature]	10/28/93	1306	[signature]	10-29-93	0800
[signature]	10/28/93	1348	[signature]	11-9-93	0800
[signature]	11-9-93	1100	[signature]	11-17-93	1000

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments: relinq. to Orig. # 3A by K.D Lee 10/28/93 1306

42K

A-6000-407 (12/92) WEF061

Westinghouse Hanford Company

SAMPLE ANALYSIS REQUEST

PART I: FIELD SECTION

Collector K. Lee, L. Walker Date Sampled 10/28/93 Time 1120 hours

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

Sample Number	Number and Type of Sample Containers	Type of Sample*	Analysis Requested
B09DJ1	1; 40ml; Gs;	WATER	HYDRAZINE (HCl to pH<2.0)
			OPC: ~~W93~~ W91-0-C001-39 CCS 11-9-93
			BOL: 2513010439
			TASK#: 93-319

Field Information**

Special Handling and/or Storage

Possible Sample Hazards

PART II: LABORATORY SECTION

Received by _____ Title _____ Date _____

Analysis Required _____

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

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

A-6000-406(05/90)

42L

Westinghouse Hanford Company	CHAIN OF CUSTODY

Custody Form Initiator KD LEE/GG HAMILTON

Company Contact PH BUTCHER

Telephone (509) 376-5045

Project Designation/Sampling Locations 100-FR-3

Collection Date 10-29-93

Ice Chest No. Gander I

Field Logbook No. CRL-1659

Bill of Lading/Airbill No. 251901043 5

Offsite Property No. ~~W93-~~ W94-0-0001-37 LCS 11-5-93

Method of Shipment EMERY

Shipped to DATA CHEM

Possible Sample Hazards/Remarks None

Sample Identification

B09D61

1, 40ml, Gs, WATER: HYDRAZINE(HCL to pH<2.0)

[] Field Transfer of Custody

Chain of Possession (Sign and Print Names)

Relinquished By	Date	Time	Received By	Date	Time
Phil Butcher Butcher	10/29/93	1240	T Sweeney L Sweeney	11-9-93	0800
T Sweeney L Sweeney	11-9-93	1100	Mark Hendershell	11-12-93	1000

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments: Relog to File# 3A by Phil Butcher 1240

42M

A-6000-407 (12/92) WEF061

Westinghouse Hanford Company

SAMPLE ANALYSIS REQUEST

PART I: FIELD SECTION

Collector: K. Lee, L. Walker — Date Sampled: 10/29/93 — Time: 1107 hour.

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

Sample Number	Number and Type of Sample Containers	Type of Sample*	Analysis Requested
B09D69	1; 40ml; Gs;	WATER	HYDRAZINE (HCl to pH<2.0)
			OPC: ~~W93~~ 1094-0-0001-39 CCS 11-9-93
			BOL: 2579010439
			TASK#: 93-319

Field Information

Special Handling and/or Storage

Possible Sample Hazards

PART II: LABORATORY SECTION

Received by _____ Title _____ Date _____

Analysis Required

42 N

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

Westinghouse Hanford Company	CHAIN OF CUSTODY

Custody Form Initiator KD LEE/GG HAMILTON

Company Contact PH BUTCHER

Telephone (509) 376-5045

Project Designation/Sampling Locations 100-FR-3

Collection Date 10/31/93

Ice Chest No. Gander.T

Field Logbook No. FFL-1054

Bill of Lading/Airbill No. 2519010439

Offsite Property No. ~~W93~~ W74-0-0007-37 LCS 11-9-93

Method of Shipment EMERY

Shipped to DATA CHEM

Possible Sample Hazards/Remarks None

Sample Identification

B09DB9

1, 40ml, Gs, WATER; HYDRAZINE(HCL to pH<2.0)

[] Field Transfer of Custody

Chain of Possession (Sign and Print Names)

Relinquished By	Date	Time	Received By	Date	Time
[illegible] K.D. Lee	10/31/93	1400	[illegible]	11-7-93	0800
[illegible]	11-7-93	1100	[illegible]	11-17-93	1000

Final Sample Disposition

Disposal Method: Disposed by: Date/Time:

Comments: relinq. to frig. @ 2R by K.D. Lee 10/31/93 1400

420

Westinghouse Hanford Company

SAMPLE ANALYSIS REQUEST

PART I: FIELD SECTION

Collector K. Lee, L. Walker Date Sampled 10/31/93 Time 1017 hr.

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

Sample Number	Number and Type of Sample Containers	Type of Sample*	Analysis Requested
B09D69	1; 40ml; Gs;	WATER	HYDRAZINE (HCl to pH<2.0)
			OPC: ~~W93~~ ~~W94-0001~~ WX4-0-0001-39 LCS 11-9-93
			BOL: 2519010439
			TASK#: 93-319

Field Information**

Special Handling and/or Storage

Possible Sample Hazards

PART II: LABORATORY SECTION

Received by Title Date

Analysis Required

42P

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

Westinghouse Hanford Company

CHAIN OF CUSTODY

Custody Form Initiator KD LEE/GG HAMILTON

Company Contact PH BUTCHER

Telephone (509) 376-5045

Project Designation/Sampling Locations 100-FR-3

Collection Date 11/6/93

Ice Chest No. Grandw I

Field Logbook No. FFC-1054

Bill of Lading/Airbill No. DST 901 04 33

Offsite Property No. W93-U394-0-0001-37

Method of Shipment EMERY

Shipped to DATA CHEM

Possible Sample Hazards/Remarks None

LCS 11-4-93

Sample Identification

B09D51

1, 40ml, Gs, WATER; HYDRAZINE(HCL to pH<2.0)

[] Field Transfer of Custody

Chain of Possession (Sign and Print Names)

Relinquished By	Date	Time	Received By	Date	Time
[illegible]	11/6/93	1500	[illegible]	11-9-93	0800
			[illegible]	11-12-93	1000

Final Sample Disposition

Disposal Method: Disposed by: Date/Time:

Comments: relinq. to Fig. 4 2C by K.D. Lee 11/6/93 1500

42Q

A-6000-407 (12/97) WEF061

Westinghouse Hanford Company

SAMPLE ANALYSIS REQUEST

PART I: FIELD SECTION

Collector K. Lee, L. Walker Date Sampled 11/6/93 Time 0803 hc

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

Sample Number	Number and Type of Sample Containers	Type of Sample*	Analysis Requested
~~B09D63~~ B09U81 KR 10/20/93	1; 40ml; Gs;	WATER	HYDRAZINE (HCl to pH<2.0)
			OPC: ~~W93~~ W94-0-0001-38 LCS 11-9-93
			BOL: 2519010438
			TASK#: 93-319

Field Information*

Special Handling and/or Storage

Possible Sample Hazards

42R

PART II: LABORATORY SECTION

Westinghouse Hanford Company	CHAIN OF CUSTODY

Custody Form Initiator KD LEE/GG HAMILTON

Company Contact PH BUTCHER

Telephone (509) 376-5045

Project Designation/Sampling Locations 100-FR-3

Collection Date 10/30/93

Ice Chest No. Gander I

Field Logbook No. EFL-1054

Bill of Lading/Airbill No. 257 901 0439

Offsite Property No. ~~W93~~ W74-8-0001-38 CS 11-8-93

Method of Shipment EMERY

Shipped to DATA CHEM

Possible Sample Hazards/Remarks None

Sample Identification

B09D97

1, 40ml, Gs, WATER; HYDRAZINE(HCL to pH<2.0)

[] Field Transfer of Custody

Chain of Possession (Sign and Print Names)

Relinquished By	Date	Time	Received By	Date	Time
Kathy D. Lee K.D. Lee	10/30/93	1400	L Sweeney L Sweeney	11-9-93	0800
L Sweeney L. Sweeney	11-9-93	1100	Mark Mendenhall	11-12-93	1000

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments: relinq. to Frig # 3B by K.D. Lee 10/30/93 1400

42 S

A-6000-407 (12/92) WEF061

Westinghouse Hanford Company

SAMPLE ANALYSIS REQUEST

PART I: FIELD SECTION

Collector K. Lee, L. Walker Date Sampled 10/30/93 Time 1016 hours

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

Sample Number	Number and Type of Sample Containers	Type of Sample*	Analysis Requested
B09D97	1; 40ml; Gs;	WATER	HYDRAZINE (HCl to pH<2.0)
			OPC: ~~W97-~~ U254-0-0001-39
			BOL: 2519010439
			TASK#: 93-319

Field Information**

Special Handling and/or Storage

Possible Sample Hazards

PART II: LABORATORY SECTION

Received by _____ Title _____ Date _____

Analysis Required _____

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

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

A-6000-406(05/90

42T

E2706

Westinghouse Hanford Company	CHAIN OF CUSTODY

Custody Form Initiator KD LEE/GG HAMILTON

Company Contact PH BUTCHER

Telephone (509) 376-5045

Project Designation/Sampling Locations 100-FR-3

Collection Date 10/31/93

Ice Chest No. Grinder I

Field Logbook No. FIFE-1054, 11-9-93

Bill of Lading/Airbill No. 25-19010439

Offsite Property No. ~~W93-~~ W24-0-0001-38

Method of Shipment EMERY

Shipped to DATA CHEM

Possible Sample Hazards/Remarks None

Sample Identification

B09DG9

1, 40ml, Gs, WATER; HYDRAZINE(HCL to pH<2.0)

[] Field Transfer of Custody

Chain of Possession (Sign and Print Names)

Relinquished By	Date	Time	Received By	Date	Time
Christopher R. Butcher	10/31/93	1400	L. Sweeney L. Sweeney	11-9-93	0800
L. Sweeney L. Sweeney	11-9-93	1100	Mark Mendenhall	11-12-93	1000

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments: relinq. to frig. # 2A by K.D. Lee 10/31/93 1400

42U

A-6000-407 (12/92) WEF061

Westinghouse Hanford Company

SAMPLE ANALYSIS REQUEST

PART I: FIELD SECTION

Collector K. Lee, L. Walker Date Sampled 10/31/93 Time 1017 hours

Company Contact P. H. Butcher Telephone (509) 376-5015

Sample Number	Number and Type of Sample Containers	Type of Sample*	Analysis Requested
B09DG9	1: 40ml; Gs;	WATER	HYDRAZINE (HCl to pH<2.0)
			OPC: ~~W99~~ W94-A-0001-39 LES 11-9-93
			BOL: 2519010439
			TASK#: 93-319

Field Information**

Special Handling and/or Storage

Possible Sample Hazards

PART II: LABORATORY SECTION

Received by Title Date

Analysis Required

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

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

A-6000-406(05/91

42 W

Westinghouse Hanford Company	CHAIN OF CUSTODY

Custody Form Initiator KD LEE/GG HAMILTON

Company Contact PH BUTCHER

Telephone (509) 376-5045

Project Designation/Sampling Locations 100-FR-3

Collection Date 10/30/93

Ice Chest No. Gander-I

Field Logbook No. EFL-1054

Bill of Lading/Airbill No. 2519010439

Offsite Property No. ~~W93-~~ 93-93 (1)94-0-01101-39

Method of Shipment EMERY

Shipped to DATA CHEM

Possible Sample Hazards/Remarks None

Sample Identification

B09DC7

1, 40ml, Gs, WATER; HYDRAZINE(HCL to pH<2.0)

[] Field Transfer of Custody

Chain of Possession (Sign and Print Names)

Relinquished By	Date	Time	Received By	Date	Time
Kimby Butcher K.D. Lee	10/30/93	1400	L Sweeney / L Sweeney	11-9-93	0800
L Sweeney / L Sweeney	11-9-93	1100	Mark Hendershell	11-12-93	1000

Final Sample Disposition

Disposal Method: Disposed by: Date/Time:

Comments:

relinq. to Sig. # 2Bec by K.D. Lee 10/30/93 1400

42X

A-6000-407 (12/92) WEF061

Westinghouse Hanford Company

SAMPLE ANALYSIS REQUEST

PART I: FIELD SECTION

Collector K. Lee, L. Walker Date Sampled 10/30/93 Time 1106 hours

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

Sample Number	Number and Type of Sample Containers	Type of Sample*	Analysis Requested
B09DC7	1; 40ml; Ga;	WATER	HYDRAZINE (HCl to pH<2.0)
			OPC: ~~W99-~~ W294-0-0001-39 GS 11-9-93
			BOL: DS1901 0439
			TASK#: 93-319

Field Information**

Special Handling and/or Storage

Possible Sample Hazards

PART II: LABORATORY SECTION

Received by Title Date

Analysis Required

424

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

**Indicate any information relative to sample location

Westinghouse Hanford Company

CHAIN OF CUSTODY

Custody Form Initiator KD LEE/GG HAMILTON

Company Contact PH BUTCHER

Telephone (509) 376-5045

Project Designation/Sampling Locations 100-FR-3

Collection Date 10/31/93

Ice Chest No. Cooler I

Field Logbook No. EFL-1054

Bill of Lading/Airbill No. 051 901 0439

Offsite Property No. ~~W93-~~ W94-A-C001-33 LCS 11-9-93

Method of Shipment EMERY

Shipped to DATA CHEM

Possible Sample Hazards/Remarks

Sample Identification

B09DH7
1, 40ml, Gs, WATER; HYDRAZINE(HCL to pH<2.0)

[] Field Transfer of Custody

Chain of Possession (Sign and Print Names)

Relinquished By	Date	Time	Received By	Date	Time
[illegible] K.D. Lee	10/31/93	1400	L Sweeney / Sweeney	11-9-93	0800
L Sweeney / L Sweeney	11-9-93	1100	Mark Henderschell	11-12-93	1000

Final Sample Disposition

Disposal Method: Disposed by: Date/Time:

Comments: rel. wg. to Fig. # 2C by K.D. Lee 10/31/93 1400

422

A-6000-407 (12/92) WFF061

Westinghouse Hanford Company

SAMPLE ANALYSIS REQUEST

PART I: FIELD SECTION

Collector K. Lee, k. Donnelson Date Sampled 10/31/93 Time 1017 hours

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

Sample Number	Number and Type of Sample Containers	Type of Sample*	Analysis Requested
B09DK7	1; 40ml; Gs;	WATER	HYDRAZINE (HCl to pH<2.0)
			OPC: # ~~W93~~ W94-0-0001-39 LCS 11-9-93
			BOL: # 2519010439
			TASK#: ~~93-174~~ PWO 11/11/93 93-319

Field Information** _____

Special Handling and/or Storage _____

Possible Sample Hazards _____

PART II: LABORATORY SECTION

Received by _____ Title _____ Date _____

Analysis Required 42aa

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

A 6000-406/0

Westinghouse Hanford Company

CHAIN OF CUSTODY

Custody Form Initiator KD LEE/GG HAMILTON

Company Contact PH BUTCHER

Telephone (509) 376-5045

Project Designation/Sampling Locations 100-FR-3

Collection Date 10/30/93

Ice Chest No. Gander-E

Field Logbook No. EFL-1054 LCS 11-9-93

Bill of Lading/Airbill No. 2519010439

Offsite Property No. ~~W93-~~ W94-0 0001-39

Method of Shipment EMERY

Shipped to DATA CHEM

Possible Sample Hazards/Remarks None

Sample Identification

B09D89

1, 40ml, Gs, WATER; HYDRAZINE(HCL to pH<2.0)

[] Field Transfer of Custody

Chain of Possession (Sign and Print Names)

Relinquished By	Date	Time	Received By	Date	Time
K.D. Lee K.D. Lee	10/30/93	1400	L Sweeney L Sweeney	11-9-93	0800
L Sweeney L Sweeney	11-9-93	1100	Mark McDerhall	11-12-93	1000

Final Sample Disposition

Disposal Methods:	Disposed by:	Date/Time:

Comments:

relinq. to frig. # 34 by K.D. Lee. 10/30/93 1400

A-6000-607 (12/92) WEF061

42ab

Westinghouse Hanford Company

SAMPLE ANALYSIS REQUEST

PART I: FIELD SECTION

Collector K. Lee, L. Walker Date Sampled 10/30/93 Time 0832 hours

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

Sample Number	Number and Type of Sample Containers	Type of Sample*	Analysis Requested
B09D97	1; 40ml; Gs;	WATER	HYDRAZINE (HCl to pH<2.0)
			OPC: ~~W93-~~ W394-0-0007-99 RS 11-5-93
			BOL: 2519010439
			TASK#: 93-319

Field Information**

Special Handling and/or Storage

Possible Sample Hazards

PART II: LABORATORY SECTION

Received by Title Date

Analysis Required

42 ac

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

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

A-6000-406(05/90)

E 2698

Westinghouse Hanford Company	CHAIN OF CUSTODY

Custody Form Initiator KD LEE/GG HAMILTON

Company Contact PH BUTCHER

Telephone (509) 376-5045

Project Designation/Sampling Locations 100-FR-3

Collection Date 10/26/93

Ice Chest No. Gardner I

Field Logbook No. EFL-1054

Bill of Lading/Airbill No. 2519010439

Offsite Property No. ~~1193~~ 1094-C-0007 37 LCS 11-9-93

Method of Shipment EMERY

Shipped to DATA CHEM

Possible Sample Hazards/Remarks None

Sample Identification

B09DG5

1, 40ml, GS, WATER; HYDRAZINE(HCL to pH<2.0)

[] Field Transfer of Custody

Chain of Possession (Sign and Print Names)

Relinquished By	Date	Time	Received By	Date	Time
Kelly P. Lee K.P. Lee	10/26/93	1336	L Sweeney L Sweeney	10/29/93	0805
L Sweeney L Sweeney	10/29/93	1348	L Sweeney L Sweeney	11-9-93	0800
L Sweeney L Sweeney	11-9-93	1100	Mark Wakefield	11-12-93	1000

Final Sample Disposition

Disposal Method: Disposed by: Date/Time:

Comments: Relinq. to frig. # 3B by K.P. Lee 10/26/93 1336

42 ad

A-6000-407 (12/92) WEF061

Westinghouse Hanford Company

SAMPLE ANALYSIS REQUEST

PART I: FIELD SECTION

Collector K. Lee, L. Walker Date Sampled 10/26/93 Time 1030 hours

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

Sample Number	Number and Type of Sample Containers	Type of Sample*	Analysis Requested
B09DG5	1; 40ml; Gs;	WATER	HYDRAZINE (HCl to pH<2.0)
			COC: ~~W93~~ W94-0-0001-38 CS 11-8-93
			BOL: 351901043 9
			TASK#: 93-319

Field Information**

Special Handling and/or Storage

Possible Sample Hazards

PART II: LABORATORY SECTION

Received by _____ Title _____ Date _____

Analysis Required

42ae

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

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

A-6000-406(05/90)

Westinghouse Hanford Company

CHAIN OF CUSTODY

Custody Form Initiator KD LEE/GG HAMILTON

Company Contact PH BUTCHER

Telephone (509) 376-5045

Project Designation/Sampling Locations 100-FR-3

Collection Date 10/26/93

Ice Chest No. Gandozzi

Field Logbook No. FRL-1054

Bill of Lading/Airbill No. 2519070457

Offsite Property No. ~~W93~~ W94-0-CC001-39 CCS 11-7-93

Method of Shipment EMERY

Shipped to DATA CHEM

Possible Sample Hazards/Remarks None

Sample Identification

809D85

1. 40ml, Gs, WATER; HYDRAZINE(HCL to pH<2.0)

[] Field Transfer of Custody

Chain of Possession (Sign and Print Names)

Relinquished By	Date	Time	Received By	Date	Time
K.D. Lee K.D. Lee	10/26/93	1336	L. Sweeney L. Sweeney	10/29/93	0800
L. Sweeney L. Sweeney	10/29/93	1348	Mark Mendenhall	11-11-93	1000

Final Sample Disposition

Disposal Method: Disposed by: Date/Time:

Comments: rel'wg. to Fig. # 3B by K.D. Lee. 10/26/93 1336

42 of

A-6000-407 (12/92) WEF061

Westinghouse Hanford Company

SAMPLE ANALYSIS REQUEST

PART I: FIELD SECTION

Collector: K. Lee, L. Walker — Date Sampled: 10/26/93 — Time: 1030 hours

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

Sample Number	Number and Type of Sample Containers	Type of Sample*	Analysis Requested
B09D55	1; 40ml; Gs;	WATER	HYDRAZINE (HCl to pH<2.0)
			OPC: ~~W93-~~ W914-0-CC01-35 11-8-93
			BOL: 2579010438
			TASK#: 93-319

Field Information**

Special Handling and/or Storage

Possible Sample Hazards

PART II: LABORATORY SECTION

Received by _____ Title _____ Date _____

Analysis Required

42 a g

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

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

A-6000-406(05/90)

Westinghouse Hanford Company	CHAIN OF CUSTODY

Custody Form Initiator KD LEE/GG HAMILTON

Company Contact PII BUTCHER

Telephone (509) 376-5045

Project Designation/Sampling Locations 100-FR-3

Collection Date 10-19-93

Ice Chest No. Gender I.

Field Logbook No. EFL-1054

Bill of Lading/Airbill No. 2579010439

Offsite Property No. ~~W93-~~ W94-0-0001-39 US 11-5-93

Method of Shipment EMERY

Shipped to DATA CHEM

Possible Sample Hazards/Remarks None

Sample Identification

B090F1

1, 40ml, Gs, WATER; HYDRAZINE(HCL to pH<2.0)

[ ] Field Transfer of Custody

Chain of Possession (Sign and Print Names)

Relinquished By	Date	Time	Received By	Date	Time
[signature]	10/29/93	1240	[signature]	11-9-93	0800
[signature]	11-9-93	1100	[signature]	11-12-93	1000

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments: Relinq to Frig #3C by [signature] 1240

A-6000-407 (12/92) WEF061

42ah

[redacted]

Westinghouse Hanford Company

SAMPLE ANALYSIS REQUEST

PART I: FIELD SECTION

Collector: K. Lee, L. Walker — Date Sampled: 10/29/93 — Time: 1013 hours

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

Sample Number	Number and Type of Sample Containers	Type of Sample*	Analysis Requested
B09DF7	1; 40ml; Gs;	WATER	HYDRAZINE (HCl to pH<2.0)
			OPC: ~~W93~~ W94-0-0001-35 [illegible] 9-93
			BOL: 2S7901043P
			TASK#: 93-319

Field Information**

Special Handling and/or Storage

Possible Sample Hazards

PART II: LABORATORY SECTION

Received by _____ Title _____ Date _____

Analysis Required _____

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

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

A-6000-406(05/90)

42 ai

E.2715

Westinghouse Hanford Company

CHAIN OF CUSTODY

Custody Form Initiator KD LEE/GG HAMILTON

Company Contact PH BUTCHER

Telephone (509) 376-5045

Project Designation/Sampling Locations 100-FR 3

Collection Date 10-29-93

Ice Chest No. Grandon.E

Field Logbook No. EFL 1654

Bill of Lading/Airbill No. 2519010439

Offsite Property No. ~~W93-208~~ 11-9-93 W94-0-0001-38

Method of Shipment EMERY

Shipped to DATA CHEM

Possible Sample Hazards/Remarks None

Sample Identification

B09DG1

1, 40ml, Gs, WATER; HYDRAZINE(HCL to pH<2.0)

[] Field Transfer of Custody

Chain of Possession (Sign and Print Names)

Relinquished By	Date	Time	Received By	Date	Time
[signature] G. WALTER	10/29/93	1240	[signature] L. Sweeney	11-9-93	0805
L. Sweeney	11-9-93	1105	[signature]	11-12-93	1000

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments: Relinq to FAIR #3 by [signature] 1240

A-6000-407 (12/92) WEF061

42 aJ

Westinghouse Hanford Company

SAMPLE ANALYSIS REQUEST

PART I: FIELD SECTION

Collector K. Lee, L. Walker Date Sampled 10/26/03 Time 0920 hours

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

Sample Number	Number and Type of Sample Containers	Type of Sample*	Analysis Requested
B09DG1	1; 40ml; Gs;	WATER	HYDRAZINE (HCl to pH<2.0)
			OPC: ~~SW93~~- W94-0-0001-39 LCS 11-5-93
			BOL: 2519010439
			TASK#: 93-319

Field Information**

Special Handling and/or Storage

Possible Sample Hazards

PART II: LABORATORY SECTION

Received by Title Date

Analysis Required

42 ak

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

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

A-6000-406(05/90)

E-2705

Westinghouse Hanford Company

CHAIN OF CUSTODY

Custody Form Initiator KD LEE/CC HAMILTON

Company Contact PH BUTCHER

Telephone (509) 376-5045

Project Designation/Sampling Locations 100-FR-3

Collection Date 10/31/93

Ice Chest No. Grandar I

Field Logbook No. RFC-1054

Bill of Lading/Airbill No. 2579010437

Offsite Property No. ~~W93-~~ W940-0-0001-88

Method of Shipment EMERY

Shipped to DATA CHEM

Possible Sample Hazards/Remarks None

Sample Identification

B09D<3

1, 40ml, Gs, WATER; HYDRAZINE(HCL to pH<2.0)

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

Relinquished By	Date	Time	Received By	Date	Time
Kathy D. Lee K.D. Lee	10/31/93	1400	L Sweeney L Sweeney	11-9-93	0800
L Sweeney L Sweeney	11-9-93	1100	Mark Mendenhall	11-12-93	1800

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments: relinq. to Arig. # QC by K.D. Lee 10/31/93 1400

42 aL

A-6000-407 (12/92) WEF061

Westinghouse Hanford Company

SAMPLE ANALYSIS REQUEST

PART I: FIELD SECTION

Collector K. Lee, L. Walker Date Sampled 10/31/03 Time 0757 hours

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

Sample Number	Number and Type of Sample Containers	Type of Sample*	Analysis Requested
B09DC3	1; 40ml; Gs;	WATER	HYDRAZINE (HCl to pH<2.0)
			OPC: ~~W93-~~ W194-070001-39 CCS 11-8-03
			BOL: 2571901043P
			TASK#: 93-319

Field Information**

Special Handling and/or Storage

Possible Sample Hazards

PART II: LABORATORY SECTION

Received by Title Date

Analysis Required

42am.

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

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

A-6000-406(05/90)

Westinghouse
Hanford Company

CHAIN OF CUSTODY

Custody Form Initiator KD LEE/GG HAMILTON
Company Contact PH BUTCHER
Project Designation/Sampling Locations 100-FR-3
Ice Chest No. Gandor L
Bill of Lading/Airbill No. 2519010439
Method of Shipment EMERY
Shipped to DATA CHEM
Possible Sample Hazards/Remarks None

Telephone (509) 376-5045
Collection Date 10/27/93
Field Logbook No. EFL-1054
Offsite Property No. ~~W93~~ LCS 11-9-93
W94-0-0001-39

Sample Identification

B09DD1
1. 40ml, Gs, WATER; HYDRAZINE(HCL to pH<2.0)

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

Relinquished By	Date	Time	Received By	Date	Time
B. WHITTEN	10/27/93	1245	L Sweeney L Sweeney	10/29/93	0800
L Sweeney L Sweeney	10/29/93	1348	L Sweeney L Sweeney	11-9-93	0800
L Sweeney L Sweeney	11-9-93	1100	[illegible]	11-12-93	1000

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:
RELING TO FRIG # 3C By [illegible] 10/21/93 1265

A-6000-407 (12/92) WEF061

42 AN

Westinghouse Hanford Company

SAMPLE ANALYSIS REQUEST

PART I: FIELD SECTION

Collector K. Lee, L. Walker Date Sampled 10/27/93 Time 1055 hours

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

Sample Number	Number and Type of Sample Containers	Type of Sample*	Analysis Requested
B09D01	1; 40ml; Gs;	WATER	HYDRAZINE (HCl to pH<2.0)
			OPC: ~~W93-~~ W94-0-1XX01-39 LCS 11-9-93
			BOL: 2519010439
			TASK#: 93-319

Field Information**

Special Handling and/or Storage

Possible Sample Hazards

PART II: LABORATORY SECTION

Received by _____ Title _____ Date _____

Analysis Required _____

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

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

A-6000-406(05/90)

4200

Westinghouse Hanford Company	CHAIN OF CUSTODY

Custody Form Initiator KD LEE/GG HAMILTON

Company Contact PH BUTCHER

Telephone (509) 376-5045

Project Designation/Sampling Locations 100-FR-3

Collection Date 10/31/93

Ice Chest No. Gander I

Field Logbook No. EFC-1054

Bill of Lading/Airbill No. 2519010439

Offsite Property No. ~~W93-~~ W94-0-0001-39

Method of Shipment EMERY

LCL 11-9-93

Shipped to DATA CHEM

Possible Sample Hazards/Remarks None

Sample Identification

B09DF3

1, 40ml, Gs, WATER; HYDRAZINE(HCL to pH<2.0)

[] Field Transfer of Custody

Chain of Possession (Sign and Print Name)

Relinquished By	Date	Time	Received By	Date	Time
K.D. Lee	10/31/93	1400	L. Sweeney	11-9-93	0800
L. Sweeney	11-5-93		Mark Henderhall	11-12-93	1000

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments: relinq to frig. #. 3C by K.D. Lee 10/31/93 1400

A-6000-407 (12/92) WEF061

42 aa

Westinghouse Hanford Company

SAMPLE ANALYSIS REQUEST

PART I: FIELD SECTION

Collector: K. Lee, L. Walker — Date Sampled: 10/31/93 — Time: 0924 hour

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

Sample Number	Number and Type of Sample Containers	Type of Sample*	Analysis Requested
B09D F3	1; 40ml; Gs;	WATER	HYDRAZINE (HCl to pH<2.0)
			OPC: ~~W93-~~ W294-0-0001-35 11-8-93
			BOL: 2519010439
			TASK#: 93-319

Field Information*

Special Handling and/or Storage

Possible Sample Hazards

PART II: LABORATORY SECTION

Received by _____ Title _____ Date _____

Analysis Required

42 ar

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

Westinghouse Hanford Company	CHAIN OF CUSTODY

Custody Form Initiator KD LEE/GG HAMILTON

Company Contact PH BUTCHER

Telephone (509) 376-5045

Project Designation/Sampling Locations 100-FR-3

Collection Date 11/6/93

Ice Chest No. Grandor I.

Field Logbook No. EFL-1054

Bill of Lading/Airbill No. 2574010439

Offsite Property No. ~~W93~~ W34-0-0001-39

Method of Shipment EMERY

Shipped to DATA CHEM

Possible Sample Hazards/Remarks None

Sample Identification

B09D65

1, 40ml, Gs, WATER; HYDRAZINE(HCL to pH<2.0)

[ ] Field Transfer of Custody

Chain of Possession (Sign and Print Names)

Relinquished By	Date	Time	Received By	Date	Time
K.D. Lee	11/6/93	1500	L Sweeney	11-9-93	0850
L Sweeney	11-9-93	1100	[illegible]	11-12-93	1800

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments: relinq. to frig # 2C by K.D. Lee 11/6/93 1500

A-6000-407 (12/92) WEF061

42 as

Westinghouse Hanford Company

SAMPLE ANALYSIS REQUEST

PART I: FIELD SECTION

Collector K. Lee, L. Walker Date Sampled 11/6/93 Time 0864 hours

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

Sample Number	Number and Type of Sample Containers	Type of Sample*	Analysis Requested
B09D65	1; 40ml; Ga;	WATER	HYDRAZINE (HCl to pH<2.0)
			OPC: ~~W93-~~ W94-0-0001-39 LCS 11-8-93
			BOL: 2519010439
			TASK#: 93-319

Field Information**

Special Handling and/or Storage

Possible Sample Hazards

PART II: LABORATORY SECTION

Received by Title Date

Analysis Required

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

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

A-6000-406(05/90)

42 at

Westinghouse Hanford Company

CHAIN OF CUSTODY

Custody Form Initiator KD LEE/GG HAMILTON

Company Contact PH BUTCHER

Project Designation/Sampling Locations 100-FR-3

Ice Chest No. Gander I.

Bill of Lading/Airbill No. 2519010439

Method of Shipment EMERY

Shipped to DATA CHEM

Possible Sample Hazards/Remarks None

Telephone (509) 376-5045

Collection Date 11/6/93

Field Logbook No. EFC-1054

Offsite Property No. ~~W93-~~ W74-0-0001-3

Sample Identification

B09DD9

1, 40ml, Gs, WATER; HYDRAZINE(HCL to pH<2.0)

[] Field Transfer of Custody

Chain of Possession (Sign and Print Nam

Relinquished By	Date	Time	Received By	Date	Time
K.D. Lee K.D. Lee	11/6/93	1500	L. Sweeney L. Sweeney	11-9-93	083
L. Sweeney L. Sweeney	11-9-93	1100	[illegible]	11-12-93	1000

Final Sample Disposition

Disposal Method: Disposed by: Date/Time:

Comments: relinq. to ~~fr.~~ g. # 28 by K.D. Lee 11/6/93 1500

42 all

Westinghouse Hanford Company

SAMPLE ANALYSIS REQUEST

PART I: FIELD SECTION

Collector: K. Lee, L. Walker — Date Sampled: 1/6/93 — Time: 1255 hours

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

Sample Number	Number and Type of Sample Containers	Type of Sample*	Analysis Requested
B09D	1; 40ml; Gs;	WATER	HYDRAZINE (HCl to pH<2.0)
			OPC: ~~W93~~ W91-0-0001-38 [illegible] 11-7-93
			BOL: 251901043S
			TASK#: 93-319

Field Information**

Special Handling and/or Storage

Possible Sample Hazards

PART II: LABORATORY SECTION

Received by _____ Title _____ Date _____

Analysis Required _____

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

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

A-6000-406(05/90)

42 aV

9613473.1601

A.T. Kearney, Inc.
One Lagoon Drive
Redwood City, California 94065
415 595 4300
Facsimile 415 595 5659

Management
Consultants

February 2, 1994

ATKEARNEY

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

Reference: Purchase Order No. 272980; Task Order KD-94-08, Validation of 100 Area Data, Validation Report Submittal

Internal: A.T. Kearney Project Number G954-29

Dear Ms. Duncan:

Enclosed are five copies of the following data validation report:

- WHC-SD-EN-TI-238 100-FR-3, Fourth Quarter 1993

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

Sincerely,

for John W. Goode, Ph.D
Task Order Manager

Enclosure

cc. R. Henckel, WHC
M. Schwab, WHC
K. Pool, HASM
J. Darabaris
C. Reyes
H. Duncan

9613473.1602

Validation Reports 100-FR-3

DATA VALIDATION REPORT FOR THE 100-FR-3 OPERABLE UNIT FOURTH QUARTER 1993

Submitted To:

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

Submitted By:

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

RECEIVED
3 1994
VALIDATION DOCUMENTATION
SDLA

In Response To:

Purchase Order 272980
Task Order K-94-08

FEB 1994
RECEIVED
TQO

Document Control Number
WHC-SD-EN-TI-238, Rev. 0

February 1994

DISCLAIMER

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

At the request of Westinghouse Hanford Company (Westinghouse-Hanford), a minimum of 20% of the total number of Sample Delivery Groups received by A.T. Kearney, Inc. from the 100-FR-3 Operable Unit Fourth Quarter 1993 Sampling Remedial Investigation and their related quality assurance samples, including all field quality control samples, were reviewed and validated to verify that reported sample results were of sufficient quality to meet quality control objectives. With the consent of Westinghouse-Hanford, Sample Delivery Groups were chosen by A.T. Kearney, Inc. randomly, but reflect the overall character of samples within the unit. Findings are, however, insufficient to allow for extrapolation of these validation results to other unvalidated samples of Sample Delivery Groups within the 100-FR-3 Operable Unit.

ACRONYMS

%D	Percent difference
AA	Atomic absorption
BFB	Bromofluorobenzene
BNA	Base/neutral and acid (equivalent to semivolatiles)
CCB	Continuing calibration blank
CCV	Continuing calibration verification
CLP	Contract Laboratory Program
CRA	CRDL standard for AA
CRDL	Contract required detection limit
CRI	CRDL standard for ICP
CRII	CRDL standard for ICP initial
CRIF	CRDL standard for ICP final
CRQL	Contract required quantitation limit
DBC	Dibutylchlorendate
DFTPP	Decafluorotriphenylphosphine
DQO	Data quality objectives
EPA	U.S. Environmental Protection Agency
GC/MS	Gas chromatography/mass spectrometry
GC	Gas chromatography
GFAA	Graphite furnace atomic absorption
GPC	Gel permeation chromatography
ICB	Initial Calibration Blank
ICP	Inductively coupled plasma emission spectrometry
ICS	ICP interference check sample
ICV	Initial calibration verification
IDL	Instrument detection limit
LCS	Laboratory control sample
LCSS	Laboratory control sample soil
LCSW	Laboratory control sample water
MSA	Method of standard addition
MS/MSD	Matrix spike/matrix spike duplicate
NV	Not Validated
PBW	Preparation blank water
PCB	Polychlorinated biphenyl
PEM	Performance evaluation mixture
QA	Quality assurance
QC	Quality control
RDL	Required Detection Limit
RF	Response factor
RIC	Reconstructed ion chromatogram
RPD	Relative percent difference
RRF	Relative response factor
RRT	Relative retention time
RSD	Relative standard deviation
RT	Retention time
SDG	Sample delivery group
SOW	Statement of work

ACRONYMS (Cont'd.)

TAL	Target analyte list
TCL	Target compound list
TIC	Tentatively identified compounds
TOC	Total organic carbon
TOX	Total organic halides
V	Validated
VOC	Volatile organic compounds

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1.0 INTRODUCTION

The following samples were obtained from the 100-FR-3 Operable Unit Fourth Quarter 1993 Groundwater Sampling event:

B09D66	B09D90	B09DC0	B09DF0	B09DH0
B09D67	B09D91	B09DC1	B09DF1	B09DH1
B09D68	B09D92	B09DC2	B09DF2	B09DH2
B09D69	B09D93	B09DC3	B09DF3	B09DH4
B09D70	B09D94	B09DC4	B09DF4	B09DH5
B09D71	B09D95	B09DC5	B09DF5	B09DH6
B09D72	B09D96	B09DC6	B09DF6	B09DH7
B09D73	B09D97	B09DC7	B09DF7	B09DH8
B09D78	B09D98	B09DC8	B09DF8	B09DH9
B09D79	B09D99	B09DC9	B09DF9	B09DJ0
B09D80	B09DB0	B09DD0	B09DG0	B09DJ1
B09D81	B09DB1	B09DD1	B09DG1	B09DJ2
B09D82	B09DB2	B09DD2	B09DG2	B09DJ3
B09D83	B09DB3	B09DD3	B09DG3	B09DJ4
B09D84	B09DB4	B09DD4	B09DG4	B09DJ5
B09D85	B09DB5	B09DD5	B09DG5	B09DJ6
B09D86	B09DB6	B09DD6	B09DG6	B09DJ7
B09D87	B09DB7	B09DD7	B09DG7	
B09D88	B09DB8	B09DD8	B09DG8	
B09D89	B09DB9	B09DD9	B09DG9	

Westinghouse-Hanford has requested that a minimum of 20% of the total number of Sample Delivery Groups be validated for the 100-FR-3 Operable Unit Fourth Quarter 1993 Sampling Investigation. Therefore, the data from the chemical analysis of fifty-two samples from this sampling event and their related quality assurance samples were reviewed and validated to verify that reported sample results were of sufficient quality to support decisions regarding remedial actions performed at this site. The samples were analyzed by Thermo-Analytic Laboratories (TMA) and Roy F. Weston Laboratories (WESTON) using U.S. Environmental Protection Agency (EPA) CLP protocols. All hydrazine analyses were performed by DataChem Laboratories (DataChem).

Sample analyses included:

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

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

SDG No.	Matrix	No. of Samples Validated	Parameters
B09D69	W	20	Wet Chem
B09D70	W	5	VOC
B09D70	W	2	BNA, Pest/PCB, Inorganic, Wet Chem
B09D71	W	2	Inorganic
B09D78	W	1	VOC
B09D82	W	4	VOC, Inorganic
B09D82	W	2	BNA, Pest/PCB, Wet Chem
B09D83	W	2	Inorganic
B09DB5	W	3	Wet Chem
B09DB6	W	4	VOC
B09DB6	W	2	BNA, Pest/PCB, Inorganic, Wet Chem
B09DB7	W	2	Inorganic
B09DH0	W	2	VOC, Inorganic
B09DH0	W	1	BNA, Pest/PCB, Wet Chem
B09DH4	W	2	VOC, Inorganic
B09DH4	W	1	BNA, Pest/PCB, Wet Chem
B09DJ2	W	2	VOC, Inorganic
B09DJ2	W	1	BNA, Pest/PCB, Wet Chem
B09DJ3	W	1	Inorganic

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

- Gross alpha and gross beta determination
- Alpha spectroscopy

- Gamma spectroscopy
- Strontium-90
- Technetium-99
- Carbon-14
- Tritium.

SDG No.	Matrix	No. of Samples Analyzed	Parameters
B09D66	W	17	Radiochemistry
B09D78	W	5	Radiochemistry
B09DH0	W	1	Radiochemistry
B09DH4	W	1	Radiochemistry

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

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

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

Set 1:

Sample No.	Split Sample No.	Well Location
B09D82	B09DH0	199-F5-6
B09D83	B09DH1	199-F5-6
B09D84	B09D62	199-F5-6

Set 2:

Sample No.	Split Sample No.	Well Location
B09DB6	B09DH4	199-F5-47
B09DB7	B09DH5	199-F5-47
B09DB8	B09DH6	199-F5-47
B09DB9	B09DH7	199-F5-47

The sample and split samples for both well locations were included in the validated data. The results were compared using the sample guidelines for determining the RPD between a sample and its duplicate. All results for both well locations were

within QC limits and appear in the summary tables within this report.

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

Set 1:

Sample No.	Duplicate Sample No.	Well Location
B09D82	B09DG2	199-F5-6
B09D83	B09DG3	199-F5-6
B09D84	B09DG4	199-F5-6
B09D85	B09DG5	199-F5-6

Set 2:

Sample No.	Duplicate Sample No.	Well Location
B09DB6	B09DG6	199-F5-47
B09DB7	B09DG7	199-F5-47
B09DB8	B09DG8	199-F5-47
B09DB9	B09DG9	199-F5-47

The duplicate sample results for both well locations were included in the validated data. The results were compared using the sample guidelines for determining the RPD between a sample and its duplicate. All results for both well locations appear in the summary tables within this report. All results fell within the required QC limits with the following exception:

- The field duplicate RPD results for copper and iron in sample numbers B09D82 and B09DG2 in SDG No. B09D82.

Two sets of equipment blanks were submitted to TMA, Weston and DataChem as shown in the table below. The sets were collected on 10/28/93 and 11/03/93, and designated EB-1 and EB-2, respectively.

Set 1: Sample Number	Set 2: Sample Number
B09DH8	B09DJ2
B09DH9	B09DJ3
B09DJ0	B09DJ4
B09DJ1	B09DJ5

Under EPA protocol, equipment blanks are water samples used to indicate whether or not decontamination procedures were adequate or that contamination was not inherent in the equipment used. The equipment blank information provided was inadequate to determine what contamination, if any, was a result of the

equipment used. Equipment blanks require well number locations and associated sample numbers in order to make such a determination.

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

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

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

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

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

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

R - Indicates the analyte was analyzed for and due to a significant QC deficiency, the data are deemed unusable. Analytic results flagged "R" are invalid and provide no information as to whether or not the analyte is present.

It should be noted that, frequently, results will bear two qualifiers - one given by the laboratory and one given during the validation process. For example, a "U" qualifier is given by the laboratory when the compound has not been detected during the analysis, and a "J" qualifier may be added during the validation to qualify the result due to minor quality problems. Therefore, the resulting qualification is "UJ", where the "U" qualifier has been given by the laboratory and the "J" qualifier given by the validator.

The results of data validation performed for the 100-FR-3 Operable Unit Fourth Quarter 1993 Sampling Investigation are contained in the tables following each of the chapters in this report.

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

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

- The calibration verification results for several compounds exceeded QC limits for one pesticide/PCB sample. All associated sample results were estimated and flagged "J".

- The metals analysis showed minor matrix spike accuracy problems, laboratory duplicate problems, ICP serial dilution problems and analytical spike recoveries below the QC limit. All associated metals results were flagged accordingly due to these factors.

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

- Several wet chemistry samples did not meet QC limits for holding times, matrix spike, recovery problems and precision problems. All results were qualified accordingly.

- Due to precision results outside of QC limits, all gross alpha and gross beta results in one data package and technetium-99 results in another data package were qualified as estimates.

- Due to continuing calibration problems, gamma spectroscopy results in two data packages were qualified as estimates.

- Due to an LCS problem, all uranium-235 results and plutonium-238 results in one data package were qualified as estimates and flagged "J".

- Reported MDA values for several alpha spectroscopy, gamma spectroscopy and technetium-99 results were above the RDL.
- Due to lack of checksource data and high radiochemical yields, carbon-14 results in several data packages were qualified as estimates.
- Due to laboratory blank contamination, several technetium-99 results were qualified as estimates and flagged "J".
- Due to the lack of a matrix spike analysis, tritium results in two data packages were qualified as estimates.

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

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

WELL AND SAMPLE INFORMATION					SAMPLE LOCATION INFORMATION
SAMPLE LOCATION	SAMPLE NUMBER	MATRIX	DATE SAMPLED	NV/V	VOLATILES
199-F1-2	B09D66	W	10/29/93	NV	2-5
	B09D68	W	10/29/93	NV	2-5
199-F5-1	B09D70	W	10/28/93	V	2-7
	B09D72	W	10/28/93	V	2-7
	B09DJ6	W	10/28/93	V	2-7
199-F5-4	B09D78	W	11/06/93	NV	2-8
	B09D80	W	11/06/93	NV	2-8
199-F5-6	B09D82	W	10/26/93	V	2-9
	B09D84	W	10/26/93	V	2-9
	B09DG2	W	10/26/93	V	2-9
	B09DG4	W	10/26/93	V	2-9
	B09DH0	W	10/26/93	V	2-13
	B09DH2	W	10/26/93	V	2-13
199-F5-42	B09D86	W	10/30/93	NV	2-5
	B09D88	W	10/30/93	NV	2-5
199-F5-43A	B09D90	W	10/30/93	NV	2-5
	B09D92	W	10/30/93	NV	2-5
199-F5-44	B09D94	W	10/30/93	NV	2-5
	B09D96	W	10/30/93	NV	2-5
199-F5-45	B09D98	W	11/06/93	NV	2-8
	B09DB0	W	11/06/93	NV	2-8
	B09DJ7	W	11/06/93	V	2-8
199-F5-46	B09DB2	W	11/06/93	NV	2-10
	B09DB4	W	11/06/93	NV	2-10
199-F5-47	B09DB6	W	10/31/93	V	2-11
	B09DB8	W	10/31/93	V	2-11
	B09DG6	W	10/31/93	V	2-11
	B09DG8	W	10/31/93	V	2-11
	B09DH4	W	10/31/93	V	2-16
	B09DH6	W	10/31/93	V	2-16
199-F5-48	B09DC0	W	10/31/93	NV	2-11
	B09DC2	W	10/31/93	NV	2-11
199-F6-1	B09DC4	W	10/30/93	NV	2-5
	B09DC6	W	10/30/93	NV	2-5
199-F7-1	B09DC8	W	10/27/93	NV	2-12
	B09DD0	W	10/27/93	NV	2-12

WELL AND SAMPLE INFORMATION					SAMPLE LOCATION INFORMATION
SAMPLE LOCATION	SAMPLE NUMBER	MATRIX	DATE SAMPLED	NV/V	VOLATILES
199-F7-2	B09DD2 B09DD4	W W	10/30/93 10/30/93	NV NV	2-6 2-6
199-F7-3	B09DD6 B09DD8	W W	11/06/93 11/06/93	NV NV	2-10 2-10
199-F8-2	B09DF0 B09DF2	W W	10/31/93 10/31/93	NV NV	2-11 2-11
199-F8-3	B09DF4 B09DF6	W W	10/29/93 10/29/93	NV NV	2-6 2-6
199-F8-4	B09DF8 B09DG0	W W	10/29/93 10/29/93	NV NV	2-6 2-6
EB-1	B09DH8 B09DJ0	W W	10/28/93 10/28/93	V V	2-7 2-7
EB-2	B09DJ2 B09DJ4	W W	11/03/93 11/03/93	V V	2-17 2-17

2.0 VOLATILE ORGANIC DATA VALIDATION

2.1 DATA PACKAGE COMPLETENESS

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

B09D70	B09D82	B09DH0	B09DJ2
B09D78	B09DB6	B09DH4	

2.2 HOLDING TIMES

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

Holding times were met for all samples.

2.3 INSTRUMENT CALIBRATION AND TUNING

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

All initial and continuing calibration results were acceptable.

2.3.1 GC/MS Tuning/Instrument Performance Check

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

standards or samples and must meet the criteria for acceptable GC/MS instrument tuning using BFB as outlined in Westinghouse-Hanford (WHC 1992) and in EPA (EPA 1988b and 1991) criteria.

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

All GC/MS tuning data were acceptable.

2.4 BLANKS

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

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

- Sample numbers B09DH0 and B09DH2 in SDG No. B09DH0.
- Sample number B09DJ2 in SDG No. B09DJ2.

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

- Sample number B09DH2 in SDG No. B09DH0.

All other laboratory blank results were acceptable.

2.5 ACCURACY

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

2.5.1 Matrix Spike Recovery

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

compounds are interfered with, either positively or negatively, by the sample matrix.

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

2.5.2 Surrogate Recovery

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

All surrogate recovery results were acceptable.

2.6 PRECISION

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

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

2.7 INTERNAL STANDARDS PERFORMANCE

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

All internal standard recovery results were acceptable.

2.8 COMPOUND IDENTIFICATION AND QUANTITATION

The identity of detected compounds are confirmed to investigate the possibility of false positives. The confirmation of compound identification during the quality assurance review focuses on false positives because only mass spectra for positive identifications are submitted. However, target compounds that

are reported as undetected are also evaluated to investigate the possibility of false negatives. Confirmation of possible false negatives is addressed by reviewing other factors relating to analytical sensitivity (e.g., relative response factors, detection limits, linearity, analytical recovery).

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

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

All reported results and quantitation limits were verified as correct.

2.9 OVERALL ASSESSMENT AND SUMMARY

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

In general, the volatile data presented in this report met the protocol-specified QA/QC requirements. Minor blank contamination was detected in four samples, all from laboratory blank contamination. All other validated data are considered valid and usable within the standard error associated with the method.

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

Project: WESTINGHOUSE-HANFORD																					
Laboratory: TMA																					
Case	SDG: B09D66																				
Sample Number		B09D66		B09D68		B09D86		B09D88		B09D90		B09D92		B09D94		B09D96		B09DC4		B09DC6	
Location		199-F1-2		199-F1-2		199-F5-42		199-F5-42		199-F5-43A		199-F5-43A		199-F5-44		199-F5-44		199-F6-1		199-F6-1	
Remarks		NV		NV		NV		NV		NV		NV		NV		NV		NV		NV	
Sample Date		10/29/93		10/29/93		10/30/93		10/30/93		10/30/93		10/30/93		10/30/93		10/30/93		10/30/93		10/30/93	
Analysis Date		11/04/93		11/05/93		11/04/93		11/05/93		11/04/93		11/06/93		11/04/93		11/08/93		11/04/93		11/05/93	
Volatile Organic Compound	CRQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Chloromethane	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
Bromomethane	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
Vinyl Chloride	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
Chloroethane	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
Methylene Chloride	10	10	U	10	U	1	J	10	U	10	U	10	U	10	U	10	U	10	U	2	J
Acetone	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
Carbon Disulfide	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
1,1-Dichloroethene	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
1,1-Dichloroethane	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
1,2-Dichloroethene (total)	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
Chloroform	10	1	J	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
1,2-Dichloroethane	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
2-Butanone	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
1,1,1-Trichloroethane	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
Carbon Tetrachloride	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
Bromodichloromethane	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
1,2-Dichloropropane	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
cis-1,3-Dichloropropene	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
Trichloroethene	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
Dibromochloromethane	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
1,1,2-Trichloroethane	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
Benzene	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
trans-1,3-Dichloropropene	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
Bromoform	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
4-Methyl-2-Pentanone	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
2-Hexanone	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
Tetrachloroethene	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
1,1,2,2-Tetrachloroethane	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
Toluene	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
Chlorobenzene	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
Ethylbenzene	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
Styrene	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
Xylene (total)	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U

NV = Not Validated

9615473.1620

Project: WESTINGHOUSE-HANFORD																					
Laboratory: TMA																					
Case	SDG: B09D66																				
Sample Number		B09DD2		B09DD4		B09DF4		B09DF6		B09DF8		B09DG0									
Location		199-F7-2		199-F7-2		199-F8-3		199-F8-3		199-F8-4		199-F8-4									
Remarks		NV		NV		NV		NV		NV		NV									
Sample Date		10/30/93		10/30/93		10/29/93		10/29/93		10/29/93		10/29/93									
Analysis Date		11/08/93		11/05/93		11/08/93		11/05/93		11/08/93		11/05/93									
Volatile Organic Compound	CRQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Chloromethane	10	10	U	10	U	10	U	10	U	10	U	10	U								
Bromomethane	10	10	U	10	U	10	U	10	U	10	U	10	U								
Vinyl Chloride	10	10	U	10	U	10	U	10	U	10	U	10	U								
Chloroethane	10	10	U	10	U	10	U	10	U	10	U	10	U								
Methylene Chloride	10	10	U	2	J	10	U	1	J	10	U	1	J								
Acetone	10	10	U	10	U	10	U	10	U	10	U	10	U								
Carbon Disulfide	10	10	U	10	U	10	U	10	U	10	U	10	U								
1,1-Dichloroethene	10	10	U	10	U	10	U	10	U	10	U	10	U								
1,1-Dichloroethane	10	10	U	10	U	10	U	10	U	10	U	10	U								
1,2-Dichloroethene (total)	10	10	U	10	U	10	U	10	U	10	U	10	U								
Chloroform	10	10	U	10	U	10	U	10	U	10	U	10	U								
1,2-Dichloroethane	10	10	U	10	U	10	U	10	U	10	U	10	U								
2-Butanone	10	10	U	10	U	10	U	10	U	10	U	10	U								
1,1,1-Trichloroethane	10	10	U	10	U	10	U	10	U	10	U	10	U								
Carbon Tetrachloride	10	10	U	10	U	10	U	10	U	10	U	10	U								
Bromodichloromethane	10	10	U	10	U	10	U	10	U	10	U	10	U								
1,2-Dichloropropane	10	10	U	10	U	10	U	10	U	10	U	10	U								
cis-1,3-Dichloropropene	10	10	U	10	U	10	U	10	U	10	U	10	U								
Trichloroethene	10	3	J	10	U	10	U	10	U	10	U	10	U								
Dibromochloromethane	10	10	U	10	U	10	U	10	U	10	U	10	U								
1,1,2-Trichloroethane	10	10	U	10	U	10	U	10	U	10	U	10	U								
Benzene	10	10	U	10	U	10	U	10	U	10	U	10	U								
trans-1,3-Dichloropropene	10	10	U	10	U	10	U	10	U	10	U	10	U								
Bromoform	10	10	U	10	U	10	U	10	U	10	U	10	U								
4-Methyl-2-Pentanone	10	10	U	10	U	10	U	10	U	10	U	10	U								
2-Hexanone	10	10	U	10	U	10	U	10	U	10	U	10	U								
Tetrachloroethene	10	10	U	10	U	10	U	10	U	10	U	10	U								
1,1,2,2-Tetrachloroethane	10	10	U	10	U	10	U	10	U	10	U	10	U								
Toluene	10	10	U	10	U	10	U	10	U	10	U	10	U								
Chlorobenzene	10	10	U	10	U	10	U	10	U	10	U	10	U								
Ethylbenzene	10	10	U	10	U	10	U	10	U	10	U	10	U								
Styrene	10	10	U	10	U	10	U	10	U	10	U	10	U								
Xylene (total)	10	10	U	10	U	10	U	10	U	10	U	10	U								

NV = Not Validated

9613473.1621

Project: WESTINGHOUSE-HANFORD																					
Laboratory: TMA																					
Case	SDG: B09D70																				
Sample Number		B09D70		B09D72		B09DH8		B09DJ0		B09DJ6											
Location		199-F5-1		199-F5-1		EB-1		EB-1		199-F5-1											
Remarks						EB		EB		MB-1											
Sample Date		10/28/93		10/28/93		10/28/93		10/28/93		10/28/93											
Analysis Date		11/03/93		11/03/93		11/03/93		11/03/93		11/03/93											
Volatile Organic Compound	CRQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Chloromethane	10	10	U	10	U	10	U	10	U	10	U										
Bromomethane	10	10	U	10	U	10	U	10	U	10	U										
Vinyl Chloride	10	10	U	10	U	10	U	10	U	10	U										
Chloroethane	10	10	U	10	U	10	U	10	U	10	U										
Methylene Chloride	10	10	U	10	U	10	U	1	J	1	J										
Acetone	10	10	U	10	U	10	U	10	U	10	U										
Carbon Disulfide	10	10	U	10	U	10	U	10	U	10	U										
1,1-Dichloroethene	10	10	U	10	U	10	U	10	U	10	U										
1,1-Dichloroethane	10	10	U	10	U	10	U	10	U	10	U										
1,2-Dichloroethene (total)	10	10	U	10	U	10	U	10	U	10	U										
Chloroform	10	10	U	10	U	10	U	10	U	10	U										
1,2-Dichloroethane	10	10	U	10	U	10	U	10	U	10	U										
2-Butanone	10	10	U	10	U	10	U	10	U	10	U										
1,1,1-Trichloroethane	10	10	U	10	U	10	U	10	U	10	U										
Carbon Tetrachloride	10	10	U	10	U	10	U	10	U	10	U										
Bromodichloromethane	10	10	U	10	U	10	U	10	U	10	U										
1,2-Dichloropropane	10	10	U	10	U	10	U	10	U	10	U										
cis-1,3-Dichloropropene	10	10	U	10	U	10	U	10	U	10	U										
Trichloroethene	10	10	U	10	U	10	U	10	U	10	U										
Dibromochloromethane	10	10	U	10	U	10	U	10	U	10	U										
1,1,2-Trichloroethane	10	10	U	10	U	10	U	10	U	10	U										
Benzene	10	10	U	10	U	10	U	10	U	10	U										
trans-1,3-Dichloropropene	10	10	U	10	U	10	U	10	U	10	U										
Bromoform	10	10	U	10	U	10	U	10	U	10	U										
4-Methyl-2-Pentanone	10	10	U	10	U	10	U	10	U	10	U										
2-Hexanone	10	10	U	10	U	10	U	10	U	10	U										
Tetrachloroethene	10	10	U	10	U	10	U	10	U	10	U										
1,1,2,2-Tetrachloroethane	10	10	U	10	U	10	U	10	U	10	U										
Toluene	10	10	U	10	U	10	U	10	U	10	U										
Chlorobenzene	10	10	U	10	U	10	U	10	U	10	U										
Ethylbenzene	10	10	U	10	U	10	U	10	U	10	U										
Styrene	10	10	U	10	U	10	U	10	U	10	U										
Xylene (total)	10	10	U	10	U	10	U	10	U	10	U										

EB = Equipment Blank, MB = Method Blank

9613473.1622
WHC-SD-EN-TI-238, Rev. 0

Project: WESTINGHOUSE-HANFORD																					
Laboratory: TMA																					
Case	SDG: B09D78																				
Sample Number		B09D78		B09D80		B09D98		B09DB0		B09DJ7											
Location		199-F5-4		199-F5-4		199-F5-45		199-F5-45		199-F5-45											
Remarks		NV		NV		NV		NV		MB-2											
Sample Date		11/06/93		11/06/93		11/06/93		11/06/93		11/06/93											
Analysis Date		11/12/93		11/12/93		11/12/93		11/12/93		11/12/93											
Volatile Organic Compound	CRQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Chloromethane	10	10	U	10	U	10	U	10	U	10	U										
Bromomethane	10	10	U	10	U	10	U	10	U	10	U										
Vinyl Chloride	10	10	U	10	U	10	U	10	U	10	U										
Chloroethane	10	10	U	10	U	10	U	10	U	10	U										
Methylene Chloride	10	10	U	10	U	10	U	10	U	10	U										
Acetone	10	10	U	10	U	10	U	10	U	10	U										
Carbon Disulfide	10	10	U	10	U	10	U	10	U	10	U										
1,1-Dichloroethene	10	10	U	10	U	10	U	10	U	10	U										
1,1-Dichloroethane	10	10	U	10	U	10	U	10	U	10	U										
1,2-Dichloroethene (total)	10	10	U	10	U	10	U	10	U	10	U										
Chloroform	10	10	U	10	U	7	J	10	U	10	U										
1,2-Dichloroethane	10	10	U	10	U	10	U	10	U	10	U										
2-Butanone	10	10	U	10	U	10	U	10	U	10	U										
1,1,1-Trichloroethane	10	10	U	10	U	10	U	10	U	10	U										
Carbon Tetrachloride	10	10	U	10	U	10	U	10	U	10	U										
Bromodichloromethane	10	10	U	10	U	10	U	10	U	10	U										
1,2-Dichloropropane	10	10	U	10	U	10	U	10	U	10	U										
cis-1,3-Dichloropropene	10	10	U	10	U	10	U	10	U	10	U										
Trichloroethene	10	10	U	10	U	1	J	10	U	10	U										
Dibromochloromethane	10	10	U	10	U	10	U	10	U	10	U										
1,1,2-Trichloroethane	10	10	U	10	U	10	U	10	U	10	U										
Benzene	10	10	U	10	U	10	U	10	U	10	U										
trans-1,3-Dichloropropene	10	10	U	10	U	10	U	10	U	10	U										
Bromoform	10	10	U	10	U	10	U	10	U	10	U										
4-Methyl-2-Pentanone	10	10	U	10	U	10	U	10	U	10	U										
2-Hexanone	10	10	U	10	U	10	U	10	U	10	U										
Tetrachloroethene	10	10	U	10	U	10	U	10	U	10	U										
1,1,2,2-Tetrachloroethane	10	10	U	10	U	10	U	10	U	10	U										
Toluene	10	10	U	10	U	10	U	10	U	10	U										
Chlorobenzene	10	10	U	10	U	10	U	10	U	10	U										
Ethylbenzene	10	10	U	10	U	10	U	10	U	10	U										
Styrene	10	10	U	10	U	10	U	10	U	10	U										
Xylene (total)	10	10	U	10	U	10	U	10	U	10	U										

NV = Not Validated, MB = Method Blank

Project: WESTINGHOUSE-HANFORD																					
Laboratory: TMA																					
Case	SDG: B09D82																				
Sample Number		B09D82		B09D84		B09DG2		B09DG4													
Location		199-F5-6		199-F5-6		199-F5-6		199-F5-6													
Remarks						DUP		DUP													
Sample Date		10/26/93		10/26/93		10/26/93		10/26/93													
Analysis Date		11/02/93		11/02/93		11/02/93		11/02/93													
Volatile Organic Compound	CRQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Chloromethane	10	10	U	10	U	10	U	10	U												
Bromomethane	10	10	U	10	U	10	U	10	U												
Vinyl Chloride	10	10	U	10	U	10	U	10	U												
Chloroethane	10	10	U	10	U	10	U	10	U												
Methylene Chloride	10	10	U	1	J	10	U	3	J												
Acetone	10	10	U	10	U	10	U	10	U												
Carbon Disulfide	10	10	U	10	U	10	U	10	U												
1,1-Dichloroethene	10	10	U	10	U	10	U	10	U												
1,1-Dichloroethane	10	10	U	10	U	10	U	10	U												
1,2-Dichloroethene (total)	10	10	U	10	U	10	U	10	U												
Chloroform	10	10	U	10	U	10	U	10	U												
1,2-Dichloroethane	10	10	U	10	U	10	U	10	U												
2-Butanone	10	10	U	10	U	10	U	10	U												
1,1,1-Trichloroethane	10	10	U	10	U	10	U	10	U												
Carbon Tetrachloride	10	10	U	10	U	10	U	10	U												
Bromodichloromethane	10	10	U	10	U	10	U	10	U												
1,2-Dichloropropane	10	10	U	10	U	10	U	10	U												
cis-1,3-Dichloropropene	10	10	U	10	U	10	U	10	U												
Trichloroethene	10	10	U	10	U	10	U	10	U												
Dibromochloromethane	10	10	U	10	U	10	U	10	U												
1,1,2-Trichloroethane	10	10	U	10	U	10	U	10	U												
Benzene	10	10	U	10	U	10	U	10	U												
trans-1,3-Dichloropropene	10	10	U	10	U	10	U	10	U												
Bromoform	10	10	U	10	U	10	U	10	U												
4-Methyl-2-Pentanone	10	10	U	10	U	10	U	10	U												
2-Hexanone	10	10	U	10	U	10	U	10	U												
Tetrachloroethene	10	10	U	10	U	10	U	10	U												
1,1,2,2-Tetrachloroethane	10	10	U	10	U	10	U	10	U												
Toluene	10	10	U	10	U	10	U	10	U												
Chlorobenzene	10	10	U	10	U	10	U	10	U												
Ethylbenzene	10	10	U	10	U	10	U	10	U												
Styrene	10	10	U	10	U	10	U	10	U												
Xylene (total)	10	10	U	10	U	10	U	10	U												

DUP = Duplicate

Project: WESTINGHOUSE-HANFORD																					
Laboratory: TMA																					
Case	SDG: B09DB2																				
Sample Number		B09DB2		B09DB4		B09DD6		B09DD8													
Location		199-F5-46		199-F5-46		199-F7-3		199-F7-3													
Remarks		NV		NV		NV		NV													
Sample Date		11/06/93		11/06/93		11/06/93		11/06/93													
Analysis Date		11/15/93		11/15/93		11/15/93		11/15/93													
Volatile Organic Compound	CRQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Chloromethane	10	10	U	10	U	10	U	10	U												
Bromomethane	10	10	U	10	U	10	U	10	U												
Vinyl Chloride	10	10	U	10	U	10	U	10	U												
Chloroethane	10	10	U	10	U	10	U	10	U												
Methylene Chloride	10	5	J	6	J	2	J	6	J												
Acetone	10	10	U	10	U	10	U	10	U												
Carbon Disulfide	10	10	U	10	U	10	U	10	U												
1,1-Dichloroethene	10	10	U	10	U	10	U	10	U												
1,1-Dichloroethane	10	10	U	10	U	10	U	10	U												
1,2-Dichloroethene (total)	10	10	U	10	U	10	U	10	U												
Chloroform	10	3	J	10	U	10	U	10	U												
1,2-Dichloroethane	10	10	U	10	U	10	U	10	U												
2-Butanone	10	10	U	10	U	10	U	10	U												
1,1,1-Trichloroethane	10	10	U	10	U	10	U	10	U												
Carbon Tetrachloride	10	10	U	10	U	10	U	10	U												
Bromodichloromethane	10	10	U	10	U	10	U	10	U												
1,2-Dichloropropane	10	10	U	10	U	10	U	10	U												
cis-1,3-Dichloropropene	10	10	U	10	U	10	U	10	U												
Trichloroethene	10	4	J	10	U	2	J	10	U												
Dibromochloromethane	10	10	U	10	U	10	U	10	U												
1,1,2-Trichloroethane	10	10	U	10	U	10	U	10	U												
Benzene	10	10	U	10	U	10	U	10	U												
trans-1,3-Dichloropropene	10	10	U	10	U	10	U	10	U												
Bromoform	10	10	U	10	U	10	U	10	U												
4-Methyl-2-Pentanone	10	10	U	10	U	10	U	10	U												
2-Hexanone	10	10	U	10	U	10	U	10	U												
Tetrachloroethene	10	10	U	10	U	10	U	10	U												
1,1,2,2-Tetrachloroethane	10	10	U	10	U	10	U	10	U												
Toluene	10	10	U	10	U	10	U	10	U												
Chlorobenzene	10	10	U	10	U	10	U	10	U												
Ethylbenzene	10	10	U	10	U	10	U	10	U												
Styrene	10	10	U	10	U	10	U	10	U												
Xylene (total)	10	10	U	10	U	10	U	10	U												

NV = Not Validated

Project: WESTINGHOUSE-HANFORD																					
Laboratory: TMA																					
Case	SDG: B09DB6																				
Sample Number		B09DB6		B09DB8		B09DC0		B09DC2		B09DF0		B09DF2		B09DG6		B09DG8					
Location		199-F5-47		199-F5-47		199-F5-48		199-F5-48		199-F8-2		199-F8-2		199-F5-47		199-F5-47					
Remarks						NV		NV		NV		NV		DUP		DUP					
Sample Date		10/31/93		10/31/93		10/31/93		10/31/93		10/31/93		10/31/93		10/31/93		10/31/93					
Analysis Date		11/09/93		11/09/93		11/09/93		11/09/93		11/09/93		11/10/93		11/10/93		11/10/93					
Volatile Organic Compound	CRQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Chloromethane	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U				
Bromomethane	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U				
Vinyl Chloride	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U				
Chloroethane	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U				
Methylene Chloride	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U				
Acetone	10	10	U	10	U	10	U	10	U	10	U	10	U	9	J	23					
Carbon Disulfide	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U				
1,1-Dichloroethene	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U				
1,1-Dichloroethane	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U				
1,2-Dichloroethene (total)	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U				
Chloroform	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U				
1,2-Dichloroethane	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U				
2-Butanone	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U				
1,1,1-Trichloroethane	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U				
Carbon Tetrachloride	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U				
Bromodichloromethane	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U				
1,2-Dichloropropane	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U				
cis-1,3-Dichloropropene	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U				
Trichloroethene	10	10	U	10	U	2	J	10	U	10	U	10	U	10	U	10	U				
Dibromochloromethane	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U				
1,1,2-Trichloroethane	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U				
Benzene	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U				
trans-1,3-Dichloropropene	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U				
Bromoform	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U				
4-Methyl-2-Pentanone	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U				
2-Hexanone	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U				
Tetrachloroethene	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U				
1,1,2,2-Tetrachloroethane	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U				
Toluene	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U				
Chlorobenzene	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U				
Ethylbenzene	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U				
Styrene	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U				
Xylene (total)	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U				

NV = Not Validated, DUP = Duplicate

Project: WESTINGHOUSE-HANFORD																					
Laboratory: TMA																					
Case	SDG: B09DC8																				
Sample Number		B09DC8		B09DD0																	
Location		199-F7-1		199-F7-1																	
Remarks		NV		NV																	
Sample Date		10/27/93		10/27/93																	
Analysis Date		11/02/93		11/02/93																	
Volatile Organic Compound	CRQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Chloromethane	10	10	U	10	U																
Bromomethane	10	10	U	10	U																
Vinyl Chloride	10	10	U	10	U																
Chloroethane	10	10	U	10	U																
Methylene Chloride	10	2	J	2	J																
Acetone	10	10	U	10	U																
Carbon Disulfide	10	10	U	10	U																
1,1-Dichloroethene	10	10	U	10	U																
1,1-Dichloroethane	10	10	U	10	U																
1,2-Dichloroethene (total)	10	10	U	10	U																
Chloroform	10	10	U	10	U																
1,2-Dichloroethane	10	10	U	10	U																
2-Butanone	10	10	U	10	U																
1,1,1-Trichloroethane	10	10	U	10	U																
Carbon Tetrachloride	10	10	U	10	U																
Bromodichloromethane	10	10	U	10	U																
1,2-Dichloropropane	10	10	U	10	U																
cis-1,3-Dichloropropene	10	10	U	10	U																
Trichloroethene	10	21		21																	
Dibromochloromethane	10	10	U	10	U																
1,1,2-Trichloroethane	10	10	U	10	U																
Benzene	10	10	U	10	U																
trans-1,3-Dichloropropene	10	10	U	10	U																
Bromoform	10	10	U	10	U																
4-Methyl-2-Pentanone	10	10	U	10	U																
2-Hexanone	10	10	U	10	U																
Tetrachloroethene	10	10	U	10	U																
1,1,2,2-Tetrachloroethane	10	10	U	10	U																
Toluene	10	10	U	10	U																
Chlorobenzene	10	10	U	10	U																
Ethylbenzene	10	10	U	10	U																
Styrene	10	10	U	10	U																
Xylene (total)	10	10	U	10	U																

NV = Not Validated

9613473.1627

Project: WESTINGHOUSE-HANFORD
Laboratory: Roy F. Weston
Case SDG: B09DH0

Sample Number		B09DH0		B09DH2																	
Location		199-F5-6		199-F5-6																	
Remarks		SPLIT		SPLIT																	
Sample Date		10/26/93		10/26/93																	
Analysis Date		11/01/93		11/01/93																	
Volatile Organic Compound	CRQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Chloromethane	10	10	U	10	U																
Bromomethane	10	10	U	10	U																
Vinyl Chloride	10	10	U	10	U																
Chloroethane	10	10	U	10	U																
Methylene Chloride	10	10	U	10	U																
Acetone	10	10	U	10	U																
Carbon Disulfide	10	10	U	10	U																
1,1-Dichloroethene	10	10	U	10	U																
1,1-Dichloroethane	10	10	U	10	U																
1,2-Dichloroethene (total)	10	10	U	10	U																
Chloroform	10	1	J	10	U																
1,2-Dichloroethane	10	10	U	10	U																
2-Butanone	10	10	U	10	U																
1,1,1-Trichloroethane	10	10	U	10	U																
Carbon Tetrachloride	10	10	U	10	U																
Bromodichloromethane	10	10	U	10	U																
1,2-Dichloropropane	10	10	U	10	U																
cis-1,3-Dichloropropene	10	10	U	10	U																
Trichloroethene	10	10	U	10	U																
Dibromochloromethane	10	10	U	10	U																
1,1,2-Trichloroethane	10	10	U	10	U																
Benzene	10	10	U	10	U																
trans-1,3-Dichloropropene	10	10	U	10	U																
Bromoform	10	10	U	10	U																
4-Methyl-2-Pentanone	10	10	U	10	U																
2-Hexanone	10	10	U	10	U																
Tetrachloroethene	10	10	U	10	U																
1,1,2,2-Tetrachloroethane	10	10	U	10	U																
Toluene	10	10	U	10	U																
Chlorobenzene	10	10	U	10	U																
Ethylbenzene	10	10	U	10	U																
Styrene	10	10	U	10	U																
Xylene (total)	10	10	U	10	U																

9613473.1628

BLANK AND SAMPLE DATA SUMMARY

SDG: B09DH0	REVIEWER: SC			DATE: 1/19/94				PAGE 1 OF 1	
COMMENTS:									
SAMPLE ID	COMPOUND	RESULT	Q	RT	UNITS	5X RESULT	10X RESULT	SAMPLES AFFECTED	QUALIFIER
VBLK	Methylene Chloride	3	J		ug/L	15	30	B09DH0, B09DH2	U
VBLK	Acetone	3	J		ug/L	15	30	B09DH2	U

9613473.1629

DATA QUALIFICATION SUMMARY

SDG: B09DH0	REVIEWER: SC	DATE: 1/19/94	PAGE 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Methylene Chloride	U	B09DH0, B09DH2	Lab Blank Contamination
Acetone	U	B09DH2	Lab Blank Contamination

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

Project: WESTINGHOUSE-HANFORD																					
Laboratory: Roy F. Weston																					
Case	SDG: B09DH4																				
Sample Number		B09DH4		B09DH6																	
Location		199-F5-47		199-F5-47																	
Remarks		SPLIT		SPLIT																	
Sample Date		10/31/93		10/31/93																	
Analysis Date		11/03/93		11/03/93																	
Volatile Organic Compound	CRQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Chloromethane	10	10	U	10	U																
Bromomethane	10	10	U	10	U																
Vinyl Chloride	10	10	U	10	U																
Chloroethane	10	10	U	10	U																
Methylene Chloride	10	6	J	5	J																
Acetone	10	10	U	10	U																
Carbon Disulfide	10	10	U	10	U																
1,1-Dichloroethene	10	10	U	10	U																
1,1-Dichloroethane	10	10	U	10	U																
1,2-Dichloroethene (total)	10	10	U	10	U																
Chloroform	10	10	U	10	U																
1,2-Dichloroethane	10	10	U	10	U																
2-Butanone	10	10	U	10	U																
1,1,1-Trichloroethane	10	10	U	10	U																
Carbon Tetrachloride	10	10	U	10	U																
Bromodichloromethane	10	10	U	10	U																
1,2-Dichloropropane	10	10	U	10	U																
cis-1,3-Dichloropropene	10	10	U	10	U																
Trichloroethene	10	10	U	10	U																
Dibromochloromethane	10	10	U	10	U																
1,1,2-Trichloroethane	10	10	U	10	U																
Benzene	10	10	U	10	U																
trans-1,3-Dichloropropene	10	10	U	10	U																
Bromoform	10	10	U	10	U																
4-Methyl-2-Pentanone	10	10	U	10	U																
2-Hexanone	10	10	U	10	U																
Tetrachloroethene	10	10	U	10	U																
1,1,2,2-Tetrachloroethane	10	10	U	10	U																
Toluene	10	10	U	10	U																
Chlorobenzene	10	10	U	10	U																
Ethylbenzene	10	10	U	10	U																
Styrene	10	10	U	10	U																
Xylene (total)	10	10	U	10	U																

Project: WESTINGHOUSE-HANFORD																						
Laboratory:																						
Case	SDG: B09DJ2																					
Sample Number		B09DJ2		B09DJ4																		
Location		EB-2		EB-2																		
Remarks		EB		EB																		
Sample Date		11/03/93		11/03/93																		
Analysis Date		11/09/93		11/09/93																		
Volatile Organic Compound	CRQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Chloromethane	10	10	U	10	U																
Bromomethane	10	10	U	10	U																
Vinyl Chloride	10	10	U	10	U																
Chloroethane	10	10	U	10	U																
Methylene Chloride	10	10	U	10	U																
Acetone	10	10	U	10	U																
Carbon Disulfide	10	10	U	10	U																
1,1-Dichloroethene	10	10	U	10	U																
1,1-Dichloroethane	10	10	U	10	U																
1,2-Dichloroethene (total)	10	10	U	10	U																
Chloroform	10	10	U	10	U																
1,2-Dichloroethane	10	10	U	10	U																
2-Butanone	10	10	U	10	U																
1,1,1-Trichloroethane	10	10	U	10	U																
Carbon Tetrachloride	10	10	U	10	U																
Bromodichloromethane	10	10	U	10	U																
1,2-Dichloropropane	10	10	U	10	U																
cis-1,3-Dichloropropene	10	10	U	10	U																
Trichloroethene	10	10	U	10	U																
Dibromochloromethane	10	10	U	10	U																
1,1,2-Trichloroethane	10	10	U	10	U																
Benzene	10	10	U	10	U																
trans-1,3-Dichloropropene	10	10	U	10	U																
Bromoform	10	10	U	10	U																
4-Methyl-2-Pentanone	10	10	U	10	U																
2-Hexanone	10	10	U	10	U																
Tetrachloroethene	10	10	U	10	U																
1,1,2,2-Tetrachloroethane	10	10	U	10	U																
Toluene	10	10	U	10	U																
Chlorobenzene	10	10	U	10	U																
Ethylbenzene	10	10	U	10	U																
Styrene	10	10	U	10	U																
Xylene (total)	10	10	U	10	U																

EB = Equipment Blank

9615473.1632
WHC-SD-EN-TI-238, Rev. 0

BLANK AND SAMPLE DATA SUMMARY

SDG: B09DJ2	REVIEWER: CENH			DATE: 1/21/94				PAGE 1 OF 1	
COMMENTS:									
SAMPLE ID	COMPOUND	RESULT	Q	RT	UNITS	5X RESULT	10X RESULT	SAMPLES AFFECTED	QUALIFIER
VBLK	Methylene chloride	2	J		ug/L	10	20	B09DJ2	U

9613473.1633

DATA QUALIFICATION SUMMARY

SDG: B09DJ2	REVIEWER: CENH	DATE: 1/21/94	PAGE 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Methylene chloride	U	B09DJ2	Lab Blank Contamination

WELL AND SAMPLE INFORMATION					SAMPLE LOCATION INFORMATION
SAMPLE LOCATION	SAMPLE NUMBER	MATRIX	DATE SAMPLED	NV/V	SEMIVOLATILES
199-F1-2	B09D66	W	10/29/93	NV	3-6, 3-7
199-F5-1	B09D70	W	10/28/93	V	3-8, 3-9
199-F5-4	B09D78	W	11/06/93	NV	3-10, 3-11
199-F5-6	B09D82 B09DG2 B09DH0	W W W	10/26/93 10/26/93 10/26/93	V V V	3-12, 3-13 3-12, 3-13 3-20, 3-21
199-F5-42	B09D86	W	10/30/93	NV	3-6, 3-7
199-F5-43A	B09D90	W	10/30/93	NV	3-6, 3-7
199-F5-44	B09D94	W	10/30/93	NV	3-6, 3-7
199-F5-45	B09D98	W	11/06/93	NV	3-10, 3-11
199-F5-46	B09DB2	W	11/06/93	NV	3-14, 3-15
199-F5-47	B09DB6 B09DG6 B09DH4	W W W	10/31/93 10/31/93 10/31/93	V V V	3-16, 3-17 3-16, 3-17 3-22, 3-23
199-F5-48	B09DC0	W	10/31/93	NV	3-16, 3-17
199-F6-1	B09DC4	W	10/30/93	NV	3-6, 3-7
199-F7-1	B09DC8	W	10/27/93	NV	3-18, 3-19
199-F7-2	B09DD2	W	10/30/93	NV	3-6, 3-7
199-F7-3	B09DD6	W	11/06/93	NV	3-14, 3-15
199-F8-2	B09DF0	W	10/31/93	NV	3-16, 3-17
199-F8-3	B09DF4	W	10/29/93	NV	3-6, 3-7
199-F8-4	B09DF8	W	10/29/93	NV	3-6, 3-7
EB-1	B09DH8	W	10/28/93	V	3-8, 3-9
EB-2	B09DJ2	W	11/03/93	V	3-24, 3-25

3.0 SEMIVOLATILE DATA VALIDATION

3.1 DATA PACKAGE COMPLETENESS

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

B09D70	B09DB6	B09DH4
B09D82	B09DH0	B09DJ2

3.2 HOLDING TIMES

Analytical holding times were assessed to ascertain whether the holding time requirements for semivolatile analyses were met by the laboratory. Westinghouse-Hanford protocols require that samples be extracted within seven days of collection and be analyzed within 40 days of extraction (WHC 1992a).

Holding time requirements were met for all samples.

3.3 INSTRUMENT CALIBRATION AND TUNING

3.3.1 GC/MS Tuning/Instrument Performance Check

Tuning is performed to ensure that mass resolution, and to some degree, sensitivity, of the GC/MS instrument has been established. When analyzing for semivolatile organic compounds, the GC/MS is tuned using DFTPP. The GC/MS must be tuned prior to the analysis of either standards or samples, and tuning must meet the criteria established by the analytical protocol. The specific criteria for acceptable GC/MS tuning using DFTPP are outlined in Westinghouse-Hanford procedures (WHC 1992a) and in CLP protocols (EPA 1988b and 1991).

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

All tuning and performance criteria were met.

3.3.2 Initial Calibration

The GC/MS instrument is calibrated to ensure that it is capable of producing acceptable and reliable analytical data over a range of concentrations. The initial and continuing

calibrations are to be performed according to CLP protocols. An initial multipoint calibration is performed prior to sample analysis to establish the linearity range of the GC/MS instrument. Continuing calibration checks are performed to verify that instrument performance is stable and reproducible on a day-to-day basis.

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

All initial calibration results were acceptable.

3.3.3 Continuing Calibration

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

All continuing calibration results were acceptable.

3.4 BLANKS

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

All blank results were acceptable.

3.5 ACCURACY

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

3.5.1 Matrix Spike Recovery

Matrix spike compounds are added to a sample which is representative of the sample delivery group. Matrix spike analyses are performed in duplicate using the six compounds

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

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

3.5.2 Surrogate Recovery

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

All surrogate recovery results were acceptable.

3.6 PRECISION

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

Field precision is measured by analyzing duplicate samples taken in the field. No standards have been established for qualifying data based on RPD for duplicate field samples by CLP protocols. Westinghouse-Hanford procedures establish the following criteria for duplicate field sample analyses for organic compounds, based on criteria established for inorganic analyses for laboratory duplicates:

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

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

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

3.7 INTERNAL STANDARDS PERFORMANCE

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

All internal standard results were acceptable.

3.8 COMPOUND IDENTIFICATION AND QUANTITATION

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

3.8.1 Reported Results and Quantitation Limits

Compound quantitations and reported detection limits were recalculated and verified to ensure that they are accurate and are consistent with the internal standards and relative retention times specified by the CLP scope of work.

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

All compound identifications and quantitations have been verified as correct in the validated data.

3.8.2 Tentatively Identified Compounds

Chromatographic peaks may be present in an analysis that are not TCL analytes, surrogates, or internal standards and are considered TIC.

The validator verified that spectral library searches were conducted for at least 20 or less candidate TIC. All compounds, including common laboratory contaminants present in the blanks using Westinghouse-Hanford blank review criteria, were qualified as non-detects and flagged "U".

3.9 OVERALL ASSESSMENT AND SUMMARY

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

In general, the semivolatile data presented in this report met the protocol-specified QA/QC requirements. All validated data are considered valid and usable within the standard error associated with the method.

Project: WESTINGHOUSE-HANFORD																					
Laboratory: TMA																					
Case	SDG: B09D66																				
Sample Number		B09D66		B09D86		B09D90		B09D94		B09DC4		B09DD2		B09DF4		B09DF8					
Location		199-F1-2		199-F5-42		199-F5-43A		199-F5-44		199-F6-1		199-F7-2		199-F8-3		199-F8-4					
Remarks		NV		NV		NV		NV		NV		NV		NV		NV					
Sample Date		10/29/93		10/30/93		10/30/93		10/30/93		10/30/93		10/30/93		10/29/93		10/29/93					
Extraction Date		11/03/93		11/03/93		11/03/93		11/03/93		11/03/93		11/03/93		11/03/93		11/03/93					
Analysis Date		11/16/93		11/16/93		11/16/93		11/16/93		11/16/93		11/16/93		11/16/93		11/16/93					
Semivolatile Compound	CRQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Phenol	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U				
bis(2-Chloroethyl)ether	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U				
2-Chlorophenol	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U				
1,3-Dichlorobenzene	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U				
1,4-Dichlorobenzene	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U				
1,2-Dichlorobenzene	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U				
2-Methylphenol	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U				
2,2'-oxybis(1-Chloropropane)	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U				
4-Methylphenol	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U				
N-Nitroso-Di-n-Propylamine	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U				
Hexachloroethane	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U				
Nitrobenzene	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U				
Isophorone	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U				
2-Nitrophenol	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U				
2,4-Dimethylphenol	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U				
bis(2-Chloroethoxy)methane	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U				
2,4-Dichlorophenol	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U				
1,2,4-Trichlorobenzene	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U				
Naphthalene	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U				
4-Chloroaniline	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U				
Hexachlorobutadiene	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U				
4-Chloro-3-Methylphenol	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U				
2-Methylnaphthalene	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U				
Hexachlorocyclopentadiene	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U				
2,4,6-Trichlorophenol	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U				
2,4,5-Trichlorophenol	50	25	U	25	U	25	U	25	U	25	U	25	U	25	U	25	U				
2-Chloronaphthalene	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U				
2-Nitroaniline	50	25	U	25	U	25	U	25	U	25	U	25	U	25	U	25	U				
Dimethylphthalate	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U				
Acenaphthylene	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U				
3-Nitroaniline	50	25	U	25	U	25	U	25	U	25	U	25	U	25	U	25	U				
Acenaphthene	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U				
2,4-Dinitrophenol	50	25	U	25	U	25	U	25	U	25	U	25	U	25	U	25	U				

NV = Not Validated

9613473.1941

WHC-SD-EN-TI-238, Rev. 0

Project: WESTINGHOUSE-HANFORD																					
Laboratory: TMA																					
Case	SDG: B09D66																				
Sample Number		B09D66		B09D86		B09D90		B09D94		B09DC4		B09DD2		B09DF4		B09DF8					
Location		199-F1-2		199-F5-42		199-F5-43A		199-F5-44		199-F6-1		199-F7-2		199-F8-3		199-F8-4					
Remarks		NV		NV		NV		NV		NV		NV		NV		NV					
Sample Date		10/29/93		10/30/93		10/30/93		10/30/93		10/30/93		10/30/93		10/29/93		10/29/93					
Extraction Date		11/03/93		11/03/93		11/03/93		11/03/93		11/03/93		11/03/93		11/03/93		11/03/93					
Analysis Date		11/16/93		11/16/93		11/16/93		11/16/93		11/16/93		11/16/93		11/16/93		11/16/93					
Semivolatile Compound	CRQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
4-Nitrophenol	50	25	U	25	U	25	U	25	U	25	U	25	U	25	U	25	U				
Dibenzofuran	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U				
2,4-Dinitrotoluene	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U				
2,6-Dinitrotoluene	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U				
Diethylphthalate	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U				
4-Chlorophenyl-phenylether	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U				
Fluorene	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U				
4-Nitroaniline	50	25	U	25	U	25	U	25	U	25	U	25	U	25	U	25	U				
4,6-Dinitro-2-methylphenol	50	25	U	25	U	25	U	25	U	25	U	25	U	25	U	25	U				
N-Nitrosodiphenylamine	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U				
4-Bromophenyl-phenylether	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U				
Hexachlorobenzene	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U				
Pentachlorophenol	50	25	U	25	U	25	U	25	U	25	U	25	U	25	U	25	U				
Phenanthrene	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U				
Anthracene	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U				
Carbazole	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U				
Di-n-Butylphthalate	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U				
Fluoranthene	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U				
Pyrene	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U				
Butylbenzylphthalate	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U				
3,3'-Dichlorobenzidine	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U				
Benzo(a)Anthracene	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U				
bis(2-Ethylhexyl)Phthalate	10	2	J	10	U	10	U	10	U	10	U	10	U	10	U	10	U				
Chrysene	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U				
Di-n-Octyl Phthalate	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U				
Benzo(b)Fluoranthene	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U				
Benzo(k)Fluoranthene	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U				
Benzo(a)Pyrene	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U				
Indeno(1,2,3-cd)Pyrene	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U				
Dibenzo(a,h)Anthracene	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U				
Benzo(g,h,i)Perylene	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U				

NV = Not Validated

9613473.1642
WHC-SD-EN-TI-238, Rev. 0

Project: WESTINGHOUSE-HANFORD																					
Laboratory: TMA																					
Case	SDG: B09D70																				
Sample Number		B09D70		B09DH8																	
Location		199-F5-1		EB-1																	
Remarks				EB																	
Sample Date		10/28/93		10/28/93																	
Extraction Date		11/03/93		11/03/93																	
Analysis Date		11/08/93		11/08/93																	
Semivolatile Compound	CRQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Phenol	10	10	U	10	U																
bis(2-Chloroethyl)ether	10	10	U	10	U																
2-Chlorophenol	10	10	U	10	U																
1,3-Dichlorobenzene	10	10	U	10	U																
1,4-Dichlorobenzene	10	10	U	10	U																
1,2-Dichlorobenzene	10	10	U	10	U																
2-Methylphenol	10	10	U	10	U																
2,2'-oxybis(1-Chloropropane)	10	10	U	10	U																
4-Methylphenol	10	10	U	10	U																
N-Nitroso-Di-n-Propylamine	10	10	U	10	U																
Hexachloroethane	10	10	U	10	U																
Nitrobenzene	10	10	U	10	U																
Isophorone	10	10	U	10	U																
2-Nitrophenol	10	10	U	10	U																
2,4-Dimethylphenol	10	10	U	10	U																
bis(2-Chloroethoxy)methane	10	10	U	10	U																
2,4-Dichlorophenol	10	10	U	10	U																
1,2,4-Trichlorobenzene	10	10	U	10	U																
Naphthalene	10	10	U	10	U																
4-Chloroaniline	10	10	U	10	U																
Hexachlorobutadiene	10	10	U	10	U																
4-Chloro-3-Methylphenol	10	10	U	10	U																
2-Methylnaphthalene	10	10	U	10	U																
Hexachlorocyclopentadiene	10	10	U	10	U																
2,4,6-Trichlorophenol	10	10	U	10	U																
2,4,5-Trichlorophenol	50	25	U	25	U																
2-Chloronaphthalene	10	10	U	10	U																
2-Nitroaniline	50	25	U	25	U																
Dimethylphthalate	10	10	U	10	U																
Acenaphthylene	10	10	U	10	U																
3-Nitroaniline	50	25	U	25	U																
Acenaphthene	10	10	U	10	U																
2,4-Dinitrophenol	50	25	U	25	U																

EB = Equipment Blank

Project: WESTINGHOUSE-HANFORD																					
Laboratory: TMA																					
Case	SDG: B09D70																				
Sample Number		B09D70		B09DH8																	
Location		199-F5-1		EB-1																	
Remarks				EB																	
Sample Date		10/28/93		10/28/93																	
Extraction Date		11/03/93		11/03/93																	
Analysis Date		11/08/93		11/08/93																	
Semivolatile Compound	CRQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
4-Nitrophenol	50	25	U	25	U																
Dibenzofuran	10	10	U	10	U																
2,4-Dinitrotoluene	10	10	U	10	U																
2,6-Dinitrotoluene	10	10	U	10	U																
Diethylphthalate	10	10	U	10	U																
4-Chlorophenyl-phenylether	10	10	U	10	U																
Fluorene	10	10	U	10	U																
4-Nitroaniline	50	25	U	25	U																
4,6-Dinitro-2-methylphenol	50	25	U	25	U																
N-Nitrosodiphenylamine	10	10	U	10	U																
4-Bromophenyl-phenylether	10	10	U	10	U																
Hexachlorobenzene	10	10	U	10	U																
Pentachlorophenol	50	25	U	25	U																
Phenanthrene	10	10	U	10	U																
Anthracene	10	10	U	10	U																
Carbazole	10	10	U	10	U																
Di-n-Butylphthalate	10	10	U	10	U																
Fluoranthene	10	10	U	10	U																
Pyrene	10	10	U	10	U																
Butylbenzylphthalate	10	10	U	10	U																
3,3'-Dichlorobenzidine	10	10	U	10	U																
Benzo(a)Anthracene	10	10	U	10	U																
bis(2-Ethylhexyl)Phthalate	10	47		3	J																
Chrysene	10	10	U	10	U																
Di-n-Octyl Phthalate	10	10	U	10	U																
Benzo(b)Fluoranthene	10	10	U	10	U																
Benzo(k)Fluoranthene	10	10	U	10	U																
Benzo(a)Pyrene	10	10	U	10	U																
Indeno(1,2,3-cd)Pyrene	10	10	U	10	U																
Dibenzo(a,h)Anthracene	10	10	U	10	U																
Benzo(g,h,i)Perylene	10	10	U	10	U																

EB = Equipment Blank

9618478.1641

WHC-SD-EN-TI-238, Rev. 0

Project: WESTINGHOUSE-HANFORD																					
Laboratory: TMA																					
Case	SDG: B09D78																				
Sample Number		B09D78		B09D98																	
Location		199-F5-4		199-F5-45																	
Remarks		NV		NV																	
Sample Date		11/06/93		11/06/93																	
Extraction Date		11/11/93		11/11/93																	
Analysis Date		11/16/93		11/16/93																	
Semivolatile Compound	CRQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Phenol	10	10	U	10	U																
bis(2-Chloroethyl)ether	10	10	U	10	U																
2-Chlorophenol	10	10	U	10	U																
1,3-Dichlorobenzene	10	10	U	10	U																
1,4-Dichlorobenzene	10	10	U	10	U																
1,2-Dichlorobenzene	10	10	U	10	U																
2-Methylphenol	10	10	U	10	U																
2,2'-oxybis(1-Chloropropane)	10	10	U	10	U																
4-Methylphenol	10	10	U	10	U																
N-Nitroso-Di-n-Propylamine	10	10	U	10	U																
Hexachloroethane	10	10	U	10	U																
Nitrobenzene	10	10	U	10	U																
Isophorone	10	10	U	10	U																
2-Nitrophenol	10	10	U	10	U																
2,4-Dimethylphenol	10	10	U	10	U																
bis(2-Chloroethoxy)methane	10	10	U	10	U																
2,4-Dichlorophenol	10	10	U	10	U																
1,2,4-Trichlorobenzene	10	10	U	10	U																
Naphthalene	10	10	U	10	U																
4-Chloroaniline	10	10	U	10	U																
Hexachlorobutadiene	10	10	U	10	U																
4-Chloro-3-Methylphenol	10	10	U	10	U																
2-Methylnaphthalene	10	10	U	10	U																
Hexachlorocyclopentadiene	10	10	U	10	U																
2,4,6-Trichlorophenol	10	10	U	10	U																
2,4,5-Trichlorophenol	50	25	U	25	U																
2-Chloronaphthalene	10	10	U	10	U																
2-Nitroaniline	50	25	U	25	U																
Dimethylphthalate	10	10	U	10	U																
Acenaphthylene	10	10	U	10	U																
3-Nitroaniline	50	25	U	25	U																
Acenaphthene	10	10	U	10	U																
2,4-Dinitrophenol	50	25	U	25	U																

NV = Not Validated

Project: WESTINGHOUSE-HANFORD																					
Laboratory: TMA																					
Case	SDG: B09D78																				
Sample Number		B09D78		B09D98																	
Location		199-F5-4		199-F5-45																	
Remarks		NV		NV																	
Sample Date		11/06/93		11/06/93																	
Extraction Date		11/11/93		11/11/93																	
Analysis Date		11/16/93		11/16/93																	
Semivolatile Compound	CRQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
4-Nitrophenol	50	25	U	25	U																
Dibenzofuran	10	10	U	10	U																
2,4-Dinitrotoluene	10	10	U	10	U																
2,6-Dinitrotoluene	10	10	U	10	U																
Diethylphthalate	10	10	U	10	U																
4-Chlorophenyl-phenylether	10	10	U	10	U																
Fluorene	10	10	U	10	U																
4-Nitroaniline	50	25	U	25	U																
4,6-Dinitro-2-methylphenol	50	25	U	25	U																
N-Nitrosodiphenylamine	10	10	U	10	U																
4-Bromophenyl-phenylether	10	10	U	10	U																
Hexachlorobenzene	10	10	U	10	U																
Pentachlorophenol	50	25	U	25	U																
Phenanthrene	10	10	U	10	U																
Anthracene	10	10	U	10	U																
Carbazole	10	10	U	10	U																
Di-n-Butylphthalate	10	10	U	10	U																
Fluoranthene	10	10	U	10	U																
Pyrene	10	10	U	10	U																
Butylbenzylphthalate	10	10	U	10	U																
3,3'-Dichlorobenzidine	10	10	U	10	U																
Benzo(a)Anthracene	10	10	U	10	U																
bis(2-Ethylhexyl)Phthalate	10	10	U	10	U																
Chrysene	10	10	U	10	U																
Di-n-Octyl Phthalate	10	10	U	10	U																
Benzo(b)Fluoranthene	10	10	U	10	U																
Benzo(k)Fluoranthene	10	10	U	10	U																
Benzo(a)Pyrene	10	10	U	10	U																
Indeno(1,2,3-cd)Pyrene	10	10	U	10	U																
Dibenzo(a,h)Anthracene	10	10	U	10	U																
Benzo(g,h,i)Perylene	10	10	U	10	U																

NV = Not Validated

Project: WESTINGHOUSE-HANFORD																					
Laboratory: TMA																					
Case	SDG: B09D82																				
Sample Number		B09D82		B09DG2																	
Location		199-F5-6		199-F5-6																	
Remarks				DUP																	
Sample Date		10/26/93		10/26/93																	
Extraction Date		11/01/93		11/01/93																	
Analysis Date		11/08/93		11/08/93																	
Semivolatile Compound	CRQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Phenol	10	10	U	10	U																
bis(2-Chloroethyl)ether	10	10	U	10	U																
2-Chlorophenol	10	10	U	10	U																
1,3-Dichlorobenzene	10	10	U	10	U																
1,4-Dichlorobenzene	10	10	U	10	U																
1,2-Dichlorobenzene	10	10	U	10	U																
2-Methylphenol	10	10	U	10	U																
2,2'-oxybis(1-Chloropropane)	10	10	U	10	U																
4-Methylphenol	10	10	U	10	U																
N-Nitroso-Di-n-Propylamine	10	10	U	10	U																
Hexachloroethane	10	10	U	10	U																
Nitrobenzene	10	10	U	10	U																
Isophorone	10	10	U	10	U																
2-Nitrophenol	10	10	U	10	U																
2,4-Dimethylphenol	10	10	U	10	U																
bis(2-Chloroethoxy)methane	10	10	U	10	U																
2,4-Dichlorophenol	10	10	U	10	U																
1,2,4-Trichlorobenzene	10	10	U	10	U																
Naphthalene	10	10	U	10	U																
4-Chloroaniline	10	10	U	10	U																
Hexachlorobutadiene	10	10	U	10	U																
4-Chloro-3-Methylphenol	10	10	U	10	U																
2-Methylnaphthalene	10	10	U	10	U																
Hexachlorocyclopentadiene	10	10	U	10	U																
2,4,6-Trichlorophenol	10	10	U	10	U																
2,4,5-Trichlorophenol	50	25	U	25	U																
2-Chloronaphthalene	10	10	U	10	U																
2-Nitroaniline	50	25	U	25	U																
Dimethylphthalate	10	10	U	10	U																
Acenaphthylene	10	10	U	10	U																
3-Nitroaniline	50	25	U	25	U																
Acenaphthene	10	10	U	10	U																
2,4-Dinitrophenol	50	25	U	25	U																

DUP = Duplicate

Project: WESTINGHOUSE-HANFORD																					
Laboratory: TMA																					
Case	SDG: B09D82																				
Sample Number		B09D82		B09DG2																	
Location		199-F5-6		199-F5-6																	
Remarks				DUP																	
Sample Date		10/26/93		10/26/93																	
Extraction Date		11/01/93		11/01/93																	
Analysis Date		11/08/93		11/08/93																	
Semivolatile Compound	CRQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
4-Nitrophenol	50	25	U	25	U																
Dibenzofuran	10	10	U	10	U																
2,4-Dinitrotoluene	10	10	U	10	U																
2,6-Dinitrotoluene	10	10	U	10	U																
Diethylphthalate	10	10	U	10	U																
4-Chlorophenyl-phenylether	10	10	U	10	U																
Fluorene	10	10	U	10	U																
4-Nitroaniline	50	25	U	25	U																
4,6-Dinitro-2-methylphenol	50	25	U	25	U																
N-Nitrosodiphenylamine	10	10	U	10	U																
4-Bromophenyl-phenylether	10	10	U	10	U																
Hexachlorobenzene	10	10	U	10	U																
Pentachlorophenol	50	25	U	25	U																
Phenanthrene	10	10	U	10	U																
Anthracene	10	10	U	10	U																
Carbazole	10	10	U	10	U																
Di-n-Butylphthalate	10	10	U	10	U																
Fluoranthene	10	10	U	10	U																
Pyrene	10	10	U	10	U																
Butylbenzylphthalate	10	10	U	10	U																
3,3'-Dichlorobenzidine	10	10	U	10	U																
Benzo(a)Anthracene	10	10	U	10	U																
bis(2-Ethylhexyl)Phthalate	10	10	U	10	U																
Chrysene	10	10	U	10	U																
Di-n-Octyl Phthalate	10	10	U	10	U																
Benzo(b)Fluoranthene	10	10	U	10	U																
Benzo(k)Fluoranthene	10	10	U	10	U																
Benzo(a)Pyrene	10	10	U	10	U																
Indeno(1,2,3-cd)Pyrene	10	10	U	10	U																
Dibenzo(a,h)Anthracene	10	10	U	10	U																
Benzo(g,h,i)Perylene	10	10	U	10	U																

DUP = Duplicate

9613473.1668

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Project: WESTINGHOUSE-HANFORD																					
Laboratory: TMA																					
Case	SDG: B09DB2																				
Sample Number		B09DB2		B09DD6																	
Location		199-F5-46		199-F7-3																	
Remarks		NV		NV																	
Sample Date		11/06/93		11/06/93																	
Extraction Date		11/12/93		11/12/93																	
Analysis Date		11/17/93		11/18/93																	
Semivolatile Compound	CRQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Phenol	10	10	U	10	U																
bis(2-Chloroethyl)ether	10	10	U	10	U																
2-Chlorophenol	10	10	U	10	U																
1,3-Dichlorobenzene	10	10	U	10	U																
1,4-Dichlorobenzene	10	10	U	10	U																
1,2-Dichlorobenzene	10	10	U	10	U																
2-Methylphenol	10	10	U	10	U																
2,2'-oxybis(1-Chloropropane)	10	10	U	10	U																
4-Methylphenol	10	10	U	10	U																
N-Nitroso-Di-n-Propylamine	10	10	U	10	U																
Hexachloroethane	10	10	U	10	U																
Nitrobenzene	10	10	U	10	U																
Isophorone	10	10	U	10	U																
2-Nitrophenol	10	10	U	10	U																
2,4-Dimethylphenol	10	10	U	10	U																
bis(2-Chloroethoxy)methane	10	10	U	10	U																
2,4-Dichlorophenol	10	10	U	10	U																
1,2,4-Trichlorobenzene	10	10	U	10	U																
Naphthalene	10	10	U	10	U																
4-Chloroaniline	10	10	U	10	U																
Hexachlorobutadiene	10	10	U	10	U																
4-Chloro-3-Methylphenol	10	10	U	10	U																
2-Methylnaphthalene	10	10	U	10	U																
Hexachlorocyclopentadiene	10	10	U	10	U																
2,4,6-Trichlorophenol	10	10	U	10	U																
2,4,5-Trichlorophenol	50	25	U	25	U																
2-Chloronaphthalene	10	10	U	10	U																
2-Nitroaniline	50	25	U	25	U																
Dimethylphthalate	10	10	U	10	U																
Acenaphthylene	10	10	U	10	U																
3-Nitroaniline	50	25	U	25	U																
Acenaphthene	10	10	U	10	U																
2,4-Dinitrophenol	50	25	U	25	U																

NV = Not Validated

Project: WESTINGHOUSE-HANFORD																					
Laboratory: TMA																					
Case	SDG: B09DB2																				
Sample Number		B09DB2		B09DD6																	
Location		199-F5-46		199-F7-3																	
Remarks		NV		NV																	
Sample Date		11/06/93		11/06/93																	
Extraction Date		11/12/93		11/12/93																	
Analysis Date		11/17/93		11/18/93																	
Semivolatile Compound	CRQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
4-Nitrophenol	50	25	U	25	U																
Dibenzofuran	10	10	U	10	U																
2,4-Dinitrotoluene	10	10	U	10	U																
2,6-Dinitrotoluene	10	10	U	10	U																
Diethylphthalate	10	10	U	10	U																
4-Chlorophenyl-phenylether	10	10	U	10	U																
Fluorene	10	10	U	10	U																
4-Nitroaniline	50	25	U	25	U																
4,6-Dinitro-2-methylphenol	50	25	U	25	U																
N-Nitrosodiphenylamine	10	10	U	10	U																
4-Bromophenyl-phenylether	10	10	U	10	U																
Hexachlorobenzene	10	10	U	10	U																
Pentachlorophenol	50	25	U	25	U																
Phenanthrene	10	10	U	10	U																
Anthracene	10	10	U	10	U																
Carbazole	10	10	U	10	U																
Di-n-Butylphthalate	10	10	U	10	U																
Fluoranthene	10	10	U	10	U																
Pyrene	10	10	U	10	U																
Butylbenzylphthalate	10	10	U	10	U																
3,3'-Dichlorobenzidine	10	10	U	10	U																
Benzo(a)Anthracene	10	10	U	10	U																
bis(2-Ethylhexyl)Phthalate	10	10		10	U																
Chrysene	10	10	U	10	U																
Di-n-Octyl Phthalate	10	10	U	10	U																
Benzo(b)Fluoranthene	10	10	U	10	U																
Benzo(k)Fluoranthene	10	10	U	10	U																
Benzo(a)Pyrene	10	10	U	10	U																
Indeno(1,2,3-cd)Pyrene	10	10	U	10	U																
Dibenzo(a,h)Anthracene	10	10	U	10	U																
Benzo(g,h,i)Perylene	10	10	U	10	U																

NV = Not Validated

9615473.1650
WHC-SD-EN-TI-238, Rev. 0

Project: WESTINGHOUSE-HANFORD																					
Laboratory: TMA																					
Case	SDG: B09DB6																				
Sample Number		B09DB6		B09DC0		B09DF0		B09DG6													
Location		199-F5-47		199-F5-48		199-F8-2		199-F5-47													
Remarks				NV		NV		DUP													
Sample Date		10/31/93		10/31/93		10/31/93		10/31/93													
Extraction Date		11/05/93		11/05/93		11/05/93		11/05/93													
Analysis Date		11/12/93		11/12/93		11/12/93		11/12/93													
Semivolatile Compound	CRQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Phenol	10	10	U	10	U	10	U	10	U												
bis(2-Chloroethyl)ether	10	10	U	10	U	10	U	10	U												
2-Chlorophenol	10	10	U	10	U	10	U	10	U												
1,3-Dichlorobenzene	10	10	U	10	U	10	U	10	U												
1,4-Dichlorobenzene	10	10	U	10	U	10	U	10	U												
1,2-Dichlorobenzene	10	10	U	10	U	10	U	10	U												
2-Methylphenol	10	10	U	10	U	10	U	10	U												
2,2'-oxybis(1-Chloropropane)	10	10	U	10	U	10	U	10	U												
4-Methylphenol	10	10	U	10	U	10	U	10	U												
N-Nitroso-Di-n-Propylamine	10	10	U	10	U	10	U	10	U												
Hexachloroethane	10	10	U	10	U	10	U	10	U												
Nitrobenzene	10	10	U	10	U	10	U	10	U												
Isophorone	10	10	U	10	U	10	U	10	U												
2-Nitrophenol	10	10	U	10	U	10	U	10	U												
2,4-Dimethylphenol	10	10	U	10	U	10	U	10	U												
bis(2-Chloroethoxy)methane	10	10	U	10	U	10	U	10	U												
2,4-Dichlorophenol	10	10	U	10	U	10	U	10	U												
1,2,4-Trichlorobenzene	10	10	U	10	U	10	U	10	U												
Naphthalene	10	10	U	10	U	10	U	10	U												
4-Chloroaniline	10	10	U	10	U	10	U	10	U												
Hexachlorobutadiene	10	10	U	10	U	10	U	10	U												
4-Chloro-3-Methylphenol	10	10	U	10	U	10	U	10	U												
2-Methylnaphthalene	10	10	U	10	U	10	U	10	U												
Hexachlorocyclopentadiene	10	10	U	10	U	10	U	10	U												
2,4,6-Trichlorophenol	10	10	U	10	U	10	U	10	U												
2,4,5-Trichlorophenol	50	25	U	25	U	25	U	25	U												
2-Chloronaphthalene	10	10	U	10	U	10	U	10	U												
2-Nitroaniline	50	25	U	25	U	25	U	25	U												
Dimethylphthalate	10	10	U	10	U	10	U	10	U												
Acenaphthylene	10	10	U	10	U	10	U	10	U												
3-Nitroaniline	50	25	U	25	U	25	U	25	U												
Acenaphthene	10	10	U	10	U	10	U	10	U												
2,4-Dinitrophenol	50	25	U	25	U	25	U	25	U												

NV = Not Validated. DUP = Duplicate

96134716.1
WHC-SD-EN-TI-238, Rev. 0

Project: WESTINGHOUSE-HANFORD																					
Laboratory: TMA																					
Case	SDG: B09DB6																				
Sample Number		B09DB6		B09DC0		B09DF0		B09DG6													
Location		199-F5-47		199-F5-48		199-F8-2		199-F5-47													
Remarks				NV		NV		DUP													
Sample Date		10/31/93		10/31/93		10/31/93		10/31/93													
Extraction Date		11/05/93		11/05/93		11/05/93		11/05/93													
Analysis Date		11/12/93		11/12/93		11/12/93		11/12/93													
Semivolatile Compound	CRQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
4-Nitrophenol	50	25	U	25	U	25	U	25	U												
Dibenzofuran	10	10	U	10	U	10	U	10	U												
2,4-Dinitrotoluene	10	10	U	10	U	10	U	10	U												
2,6-Dinitrotoluene	10	10	U	10	U	10	U	10	U												
Diethylphthalate	10	10	U	10	U	10	U	10	U												
4-Chlorophenyl-phenylether	10	10	U	10	U	10	U	10	U												
Fluorene	10	10	U	10	U	10	U	10	U												
4-Nitroaniline	50	25	U	25	U	25	U	25	U												
4,6-Dinitro-2-methylphenol	50	25	U	25	U	25	U	25	U												
N-Nitrosodiphenylamine	10	10	U	10	U	10	U	10	U												
4-Bromophenyl-phenylether	10	10	U	10	U	10	U	10	U												
Hexachlorobenzene	10	10	U	10	U	10	U	10	U												
Pentachlorophenol	50	25	U	25	U	25	U	25	U												
Phenanthrene	10	10	U	10	U	10	U	10	U												
Anthracene	10	10	U	10	U	10	U	10	U												
Carbazole	10	10	U	10	U	10	U	10	U												
Di-n-Butylphthalate	10	10	U	10	U	10	U	10	U												
Fluoranthene	10	10	U	10	U	10	U	10	U												
Pyrene	10	10	U	10	U	10	U	10	U												
Butylbenzylphthalate	10	10	U	10	U	10	U	10	U												
3,3'-Dichlorobenzidine	10	10	U	10	U	10	U	10	U												
Benzo(a)Anthracene	10	10	U	10	U	10	U	10	U												
bis(2-Ethylhexyl)Phthalate	10	10	U	10	U	10	U	10	U												
Chrysene	10	10	U	10	U	10	U	10	U												
Di-n-Octyl Phthalate	10	10	U	10	U	10	U	10	U												
Benzo(b)Fluoranthene	10	10	U	10	U	10	U	10	U												
Benzo(k)Fluoranthene	10	10	U	10	U	10	U	10	U												
Benzo(a)Pyrene	10	10	U	10	U	10	U	10	U												
Indeno(1,2,3-cd)Pyrene	10	10	U	10	U	10	U	10	U												
Dibenzo(a,h)Anthracene	10	10	U	10	U	10	U	10	U												
Benzo(g,h,i)Perylene	10	10	U	10	U	10	U	10	U												

NV = Not Validated, DUP = Duplicate

9413173.1652
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Project: WESTINGHOUSE-HANFORD																					
Laboratory: TMA																					
Case	SDG: B09DC8																				
Sample Number		B09DC8																			
Location		199-F7-1																			
Remarks		NV																			
Sample Date		10/27/93																			
Extraction Date		11/03/93																			
Analysis Date		11/08/93																			
Semivolatile Compound	CRQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Phenol	10	10	U																		
bis(2-Chloroethyl)ether	10	10	U																		
2-Chlorophenol	10	10	U																		
1,3-Dichlorobenzene	10	10	U																		
1,4-Dichlorobenzene	10	10	U																		
1,2-Dichlorobenzene	10	10	U																		
2-Methylphenol	10	10	U																		
2,2'-oxybis(1-Chloropropane)	10	10	U																		
4-Methylphenol	10	10	U																		
N-Nitroso-Di-n-Propylamine	10	10	U																		
Hexachloroethane	10	10	U																		
Nitrobenzene	10	10	U																		
Isophorone	10	10	U																		
2-Nitrophenol	10	10	U																		
2,4-Dimethylphenol	10	10	U																		
bis(2-Chloroethoxy)methane	10	10	U																		
2,4-Dichlorophenol	10	10	U																		
1,2,4-Trichlorobenzene	10	10	U																		
Naphthalene	10	10	U																		
4-Chloroaniline	10	10	U																		
Hexachlorobutadiene	10	10	U																		
4-Chloro-3-Methylphenol	10	10	U																		
2-Methylnaphthalene	10	10	U																		
Hexachlorocyclopentadiene	10	10	U																		
2,4,6-Trichlorophenol	10	10	U																		
2,4,5-Trichlorophenol	50	25	U																		
2-Chloronaphthalene	10	10	U																		
2-Nitroaniline	50	25	U																		
Dimethylphthalate	10	10	U																		
Acenaphthylene	10	10	U																		
3-Nitroaniline	50	25	U																		
Acenaphthene	10	10	U																		
2,4-Dinitrophenol	50	25	U																		

NV = Not Validated

Project: WESTINGHOUSE-HANFORD																					
Laboratory: TMA																					
Case	SDG: B09DC8																				
Sample Number		B09DC8																			
Location		199-F7-1																			
Remarks		NV																			
Sample Date		10/27/93																			
Extraction Date		11/03/93																			
Analysis Date		11/08/93																			
Semivolatile Compound	CRQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
4-Nitrophenol	50	25	U																		
Dibenzofuran	10	10	U																		
2,4-Dinitrotoluene	10	10	U																		
2,6-Dinitrotoluene	10	10	U																		
Diethylphthalate	10	10	U																		
4-Chlorophenyl-phenylether	10	10	U																		
Fluorene	10	10	U																		
4-Nitroaniline	50	25	U																		
4,6-Dinitro-2-methylphenol	50	25	U																		
N-Nitrosodiphenylamine	10	10	U																		
4-Bromophenyl-phenylether	10	10	U																		
Hexachlorobenzene	10	10	U																		
Pentachlorophenol	50	25	U																		
Phenanthrene	10	10	U																		
Anthracene	10	10	U																		
Carbazole	10	10	U																		
Di-n-Butylphthalate	10	10	U																		
Fluoranthene	10	10	U																		
Pyrene	10	10	U																		
Butylbenzylphthalate	10	10	U																		
3,3'-Dichlorobenzidine	10	10	U																		
Benzo(a)Anthracene	10	10	U																		
bis(2-Ethylhexyl)Phthalate	10	2	J																		
Chrysene	10	10	U																		
Di-n-Octyl Phthalate	10	10	U																		
Benzo(b)Fluoranthene	10	10	U																		
Benzo(k)Fluoranthene	10	10	U																		
Benzo(a)Pyrene	10	10	U																		
Indeno(1,2,3-cd)Pyrene	10	10	U																		
Dibenzo(a,h)Anthracene	10	10	U																		
Benzo(g,h,i)Perylene	10	10	U																		

NV = Not Validated

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

Project: WESTINGHOUSE-HANFORD																					
Laboratory: Roy F. Weston																					
Case	SDG: B09DH0																				
Sample Number		B09DH0																			
Location		199-F5-6																			
Remarks		SPLIT																			
Sample Date		10/26/93																			
Extraction Date		11/01/93																			
Analysis Date		11/03/93																			
Semivolatile Compound	CRQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Phenol	10	10	U																		
bis(2-Chloroethyl)ether	10	10	U																		
2-Chlorophenol	10	10	U																		
1,3-Dichlorobenzene	10	10	U																		
1,4-Dichlorobenzene	10	10	U																		
1,2-Dichlorobenzene	10	10	U																		
2-Methylphenol	10	10	U																		
2,2'-oxybis(1-Chloropropane)	10	10	U																		
4-Methylphenol	10	10	U																		
N-Nitroso-Di-n-Propylamine	10	10	U																		
Hexachloroethane	10	10	U																		
Nitrobenzene	10	10	U																		
Isophorone	10	10	U																		
2-Nitrophenol	10	10	U																		
2,4-Dimethylphenol	10	10	U																		
bis(2-Chloroethoxy)methane	10	10	U																		
2,4-Dichlorophenol	10	10	U																		
1,2,4-Trichlorobenzene	10	10	U																		
Naphthalene	10	10	U																		
4-Chloroaniline	10	10	U																		
Hexachlorobutadiene	10	10	U																		
4-Chloro-3-Methylphenol	10	10	U																		
2-Methylnaphthalene	10	10	U																		
Hexachlorocyclopentadiene	10	10	U																		
2,4,6-Trichlorophenol	10	10	U																		
2,4,5-Trichlorophenol	50	25	U																		
2-Chloronaphthalene	10	10	U																		
2-Nitroaniline	50	25	U																		
Dimethylphthalate	10	10	U																		
Acenaphthylene	10	10	U																		
2,6-Dinitrotoluene	10	10	U																		
3-Nitroaniline	50	25	U																		
Acenaphthene	10	10	U																		

9613473.1665

Project: WESTINGHOUSE-HANFORD																					
Laboratory: Roy F. Weston																					
Case	SDG: B09DH0																				
Sample Number		B09DH0																			
Location		199-F5-6																			
Remarks		SPLIT																			
Sample Date		10/26/93																			
Extraction Date		11/01/93																			
Analysis Date		11/03/93																			
Semivolatile Compound	CRQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
2,4-Dinitrophenol	50	25	U																		
4-Nitrophenol	50	25	U																		
Dibenzofuran	10	10	U																		
2,4-Dinitrotoluene	10	10	U																		
Diethylphthalate	10	10	U																		
4-Chlorophenyl-phenylether	10	10	U																		
Fluorene	10	10	U																		
4-Nitroaniline	50	25	U																		
4,6-Dinitro-2-methylphenol	50	25	U																		
N-Nitrosodiphenylamine	10	10	U																		
4-Bromophenyl-phenylether	10	10	U																		
Hexachlorobenzene	10	10	U																		
Pentachlorophenol	50	25	U																		
Phenanthrene	10	10	U																		
Anthracene	10	10	U																		
Carbazole	10	10	U																		
Di-n-Butylphthalate	10	10	U																		
Fluoranthene	10	10	U																		
Pyrene	10	10	U																		
Butylbenzylphthalate	10	10	U																		
3,3'-Dichlorobenzidine	10	10	U																		
Benzo(a)Anthracene	10	10	U																		
Chrysene	10	10	U																		
bis(2-Ethylhexyl)Phthalate	10	10	U																		
Di-n-Octyl Phthalate	10	10	U																		
Benzo(b)Fluoranthene	10	10	U																		
Benzo(k)Fluoranthene	10	10	U																		
Benzo(a)Pyrene	10	10	U																		
Indeno(1,2,3-cd)Pyrene	10	10	U																		
Dibenzo(a,h)Anthracene	10	10	U																		
Benzo(g,h,i)Perylene	10	10	U																		

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Project: WESTINGHOUSE-HANFORD																							
Laboratory: Roy F. Weston																							
Case	SDG: B09DH4																						
Sample Number		B09DH4																					
Location		199-F5-47																					
Remarks		SPLIT																					
Sample Date		10/31/93																					
Extraction Date		11/03/93																					
Analysis Date		11/08/93																					
Semivolatile Compound	CRQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q		
Phenol	10	10	U																				
bis(2-Chloroethyl)ether	10	10	U																				
2-Chlorophenol	10	10	U																				
1,3-Dichlorobenzene	10	10	U																				
1,4-Dichlorobenzene	10	10	U																				
1,2-Dichlorobenzene	10	10	U																				
2-Methylphenol	10	10	U																				
2,2'-oxybis(1-Chloropropane)	10	10	U																				
4-Methylphenol	10	10	U																				
N-Nitroso-Di-n-Propylamine	10	10	U																				
Hexachloroethane	10	10	U																				
Nitrobenzene	10	10	U																				
Isophorone	10	10	U																				
2-Nitrophenol	10	10	U																				
2,4-Dimethylphenol	10	10	U																				
bis(2-Chloroethoxy)methane	10	10	U																				
2,4-Dichlorophenol	10	10	U																				
1,2,4-Trichlorobenzene	10	10	U																				
Naphthalene	10	10	U																				
4-Chloroaniline	10	10	U																				
Hexachlorobutadiene	10	10	U																				
4-Chloro-3-Methylphenol	10	10	U																				
2-Methylnaphthalene	10	10	U																				
Hexachlorocyclopentadiene	10	10	U																				
2,4,6-Trichlorophenol	10	10	U																				
2,4,5-Trichlorophenol	50	25	U																				
2-Chloronaphthalene	10	10	U																				
2-Nitroaniline	50	25	U																				
Dimethylphthalate	10	10	U																				
Acenaphthylene	10	10	U																				
2,6-Dinitrotoluene	10	10	U																				
3-Nitroaniline	50	25	U																				
Acenaphthene	10	10	U																				

9613173.1697

Project: WESTINGHOUSE-HANFORD																							
Laboratory: Roy F. Weston																							
Case	SDG: B09DH4																						
Sample Number		B09DH4																					
Location		199-F5-47																					
Remarks		SPLIT																					
Sample Date		10/31/93																					
Extraction Date		11/03/93																					
Analysis Date		11/08/93																					
Semivolatile Compound	CRQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
2,4-Dinitrophenol	50	25	U																				
4-Nitrophenol	50	25	U																				
Dibenzofuran	10	10	U																				
2,4-Dinitrotoluene	10	10	U																				
Diethylphthalate	10	10	U																				
4-Chlorophenyl-phenylether	10	10	U																				
Fluorene	10	10	U																				
4-Nitroaniline	50	25	U																				
4,6-Dinitro-2-methylphenol	50	25	U																				
N-Nitrosodiphenylamine	10	10	U																				
4-Bromophenyl-phenylether	10	10	U																				
Hexachlorobenzene	10	10	U																				
Pentachlorophenol	50	25	U																				
Phenanthrene	10	10	U																				
Anthracene	10	10	U																				
Carbazole	10	10	U																				
Di-n-Butylphthalate	10	10	U																				
Fluoranthene	10	10	U																				
Pyrene	10	10	U																				
Butylbenzylphthalate	10	10	U																				
3,3'-Dichlorobenzidine	10	10	U																				
Benzo(a)Anthracene	10	10	U																				
Chrysene	10	10	U																				
bis(2-Ethylhexyl)Phthalate	10	10	U																				
Di-n-Octyl Phthalate	10	10	U																				
Benzo(b)Fluoranthene	10	10	U																				
Benzo(k)Fluoranthene	10	10	U																				
Benzo(a)Pyrene	10	10	U																				
Indeno(1,2,3-cd)Pyrene	10	10	U																				
Dibenzo(a,h)Anthracene	10	10	U																				
Benzo(g,h,i)Perylene	10	10	U																				

Project: WESTINGHOUSE-HANFORD																					
Laboratory: TMA																					
Case	SDG: B09DJ2																				
Sample Number		B09DJ2																			
Location		EB-2																			
Remarks		EB																			
Sample Date		11/03/93																			
Extraction Date		11/08/93																			
Analysis Date		11/17/93																			
Semivolatile Compound	CRQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Phenol	10	10	U																		
bis(2-Chloroethyl)ether	10	10	U																		
2-Chlorophenol	10	10	U																		
1,3-Dichlorobenzene	10	10	U																		
1,4-Dichlorobenzene	10	10	U																		
1,2-Dichlorobenzene	10	10	U																		
2-Methylphenol	10	10	U																		
2,2'-oxybis(1-Chloropropane)	10	10	U																		
4-Methylphenol	10	10	U																		
N-Nitroso-Di-n-Propylamine	10	10	U																		
Hexachloroethane	10	10	U																		
Nitrobenzene	10	10	U																		
Isophorone	10	10	U																		
2-Nitrophenol	10	10	U																		
2,4-Dimethylphenol	10	10	U																		
bis(2-Chloroethoxy)methane	10	10	U																		
2,4-Dichlorophenol	10	10	U																		
1,2,4-Trichlorobenzene	10	10	U																		
Naphthalene	10	10	U																		
4-Chloroaniline	10	10	U																		
Hexachlorobutadiene	10	10	U																		
4-Chloro-3-Methylphenol	10	10	U																		
2-Methylnaphthalene	10	10	U																		
Hexachlorocyclopentadiene	10	10	U																		
2,4,6-Trichlorophenol	10	10	U																		
2,4,5-Trichlorophenol	50	25	U																		
2-Chloronaphthalene	10	10	U																		
2-Nitroaniline	50	25	U																		
Dimethylphthalate	10	10	U																		
Acenaphthylene	10	10	U																		
3-Nitroaniline	50	25	U																		
Acenaphthene	10	10	U																		
2,4-Dinitrophenol	50	25	U																		

EB = Equipment Blank

Project: WESTINGHOUSE-HANFORD																					
Laboratory: TMA																					
Case	SDG: B09DJ2																				
Sample Number		B09DJ2																			
Location		EB-2																			
Remarks		EB																			
Sample Date		11/03/93																			
Extraction Date		11/08/93																			
Analysis Date		11/17/93																			
Semivolatile Compound	CRQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
4-Nitrophenol	50	25	U																		
Dibenzofuran	10	10	U																		
2,4-Dinitrotoluene	10	10	U																		
2,6-Dinitrotoluene	10	10	U																		
Diethylphthalate	10	10	U																		
4-Chlorophenyl-phenylether	10	10	U																		
Fluorene	10	10	U																		
4-Nitroaniline	50	25	U																		
4,6-Dinitro-2-methylphenol	50	25	U																		
N-Nitrosodiphenylamine	10	10	U																		
4-Bromophenyl-phenylether	10	10	U																		
Hexachlorobenzene	10	10	U																		
Pentachlorophenol	50	25	U																		
Phenanthrene	10	10	U																		
Anthracene	10	10	U																		
Carbazole	10	10	U																		
Di-n-Butylphthalate	10	10	U																		
Fluoranthene	10	10	U																		
Pyrene	10	10	U																		
Butylbenzylphthalate	10	10	U																		
3,3'-Dichlorobenzidine	10	10	U																		
Benzo(a)Anthracene	10	10	U																		
bis(2-Ethylhexyl)Phthalate	10	10	U																		
Chrysene	10	10	U																		
Di-n-Octyl Phthalate	10	10	U																		
Benzo(b)Fluoranthene	10	10	U																		
Benzo(k)Fluoranthene	10	10	U																		
Benzo(a)Pyrene	10	10	U																		
Indeno(1,2,3-cd)Pyrene	10	10	U																		
Dibenzo(a,h)Anthracene	10	10	U																		
Benzo(g,h,i)Perylene	10	10	U																		

EB = Equipment Blank

9613473.1660

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WELL AND SAMPLE INFORMATION					SAMPLE LOCATION INFORMATION
SAMPLE LOCATION	SAMPLE NUMBER	MATRIX	DATE SAMPLED	NV/V	PCB/PESTICIDES
199-F1-2	B09D66	W	10/29/93	NV	4-5
199-F5-1	B09D70	W	10/28/93	V	4-6
199-F5-4	B09D78	W	11/06/93	NV	4-7
199-F5-6	B09D82 B09DG2 B09DH0	W W W	10/26/93 10/26/93 10/26/93	V V V	4-8 4-8 4-12
199-F5-42	B09D86	W	10/30/93	NV	4-5
199-F5-43A	B09D90	W	10/30/93	NV	4-5
199-F5-44	B09D94	W	10/30/93	NV	4-5
199-F5-45	B09D98	W	11/06/93	NV	4-7
199-F5-46	B09DB2	W	11/06/93	NV	4-9
199-F5-47	B09DB6 B09DG6 B09DH4	W W W	10/31/93 10/31/93 10/31/93	V V V	4-10 4-10 4-13
199-F5-48	B09DC0	W	10/31/93	NV	4-10
199-F6-1	B09DC4	W	10/30/93	NV	4-5
199-F7-1	B09DC8	W	10/27/93	NV	4-11
199-F7-2	B09DD2	W	10/30/93	NV	4-5
199-F7-3	B09DD6	W	11/06/93	NV	4-9
199-F8-2	B09DF0	W	10/31/93	NV	4-10
199-F8-3	B09DF4	W	10/29/93	NV	4-5
199-F8-4	B09DF8	W	10/29/93	NV	4-5
EB-1	B09DH8	W	10/28/93	V	4-6
EB-2	B09DJ2	W	11/03/93	V	4-14

4.0 PESTICIDE AND PCB DATA VALIDATION

4.1 DATA PACKAGE COMPLETENESS

The following data packages (SDG Nos.) were submitted for validation:

B09D70	B09DB6	B09DH4
B09D82	B09DH0	B09DJ2

4.2 HOLDING TIMES

Analytical holding times were assessed to ascertain whether the holding time requirements for pesticide/PCB analyses were met by the laboratory. Westinghouse-Hanford procedures require that samples be extracted within seven days of collection and analyzed within 40 days of extraction (WHC 1992a).

Holding time requirements were met for all samples.

4.3 INSTRUMENT PERFORMANCE AND CALIBRATIONS

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

The specific criteria for acceptable instrument performance are outlined in EPA guidelines (EPA 1988b and 1991), including the evaluation and qualification procedures that may be performed on the analytical results.

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

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

4.3.1 Initial Calibrations

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

All initial calibration results were acceptable.

4.3.2 Calibration Verification

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

Continuing calibration results exceeded QC limits for alpha-BHC, gamma-BHC (Lindane) and aldrin in sample number B09DJ2 in SDG No. B09DJ2. All associated results were qualified as estimates and flagged "J".

All other calibration verification results were acceptable.

4.4 BLANKS

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

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

4.5 ACCURACY

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

4.5.1 Matrix Spike Recovery

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

All matrix spike/matrix spike duplicate results were acceptable.

4.5.2 Surrogate Recovery

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

All surrogate recovery results were acceptable.

4.6 PRECISION

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

All matrix spike/matrix spike duplicate RPDs were acceptable.

4.7 COMPOUND IDENTIFICATION AND QUANTITATION

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

Compound quantitations and reported detection limits were recalculated and verified for a minimum of 20 percent of the samples in each case to ensure that they were accurate and are consistent with CLP requirements (EPA 1991). The reported detection limits must be in accordance with the CRQLs specified in the applicable CLP statement of work.

All validated compound identifications, CRQLs, and quantitation results were acceptable.

4.8 OVERALL ASSESSMENT AND SUMMARY

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

In general, the pesticide/PCB data presented in this report met the protocol-specified QA/QC requirements. Continuing calibration results exceeded QC limits for alpha-BHC, gamma-BHC (Lindane) and aldrin results in sample number B09DJ2 in SDG No. B09DJ2. All associated results were qualified as estimates and flagged "J". Estimated data are usable for limited purposes only. All other validated data are considered valid and usable within the standard error associated with the method.

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

Project: WESTINGHOUSE-HANFORD
Laboratory: TMA
Case SDG: B09D66

Sample Number		B09D66		B09D86		B09D90		B09D94		B09DC4		B09DD2		B09DF4		B09DF8					
Location		199-F1-2		199-F5-42		199-F5-43A		199-F5-44		199-F6-1		199-F7-2		199-F8-3		199-F8-4					
Remarks		NV		NV		NV		NV		NV		NV		NV		NV					
Sample Date		10/29/93		10/30/93		10/30/93		10/30/93		10/30/93		10/30/93		10/29/93		10/29/93					
Extraction Date		11/03/93		11/03/93		11/03/93		11/03/93		11/03/93		11/03/93		11/03/93		11/03/93					
Analysis Date		11/26/93		11/26/93		11/26/93		11/26/93		11/26/93		11/26/93		11/26/93		11/26/93					
Pesticide/PCB	CRQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
alpha-BHC	0.05	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U				
beta-BHC	0.05	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U				
delta-BHC	0.05	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U				
gamma-BHC (Lindane)	0.05	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U				
Heptachlor	0.05	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U				
Aldrin	0.05	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U				
Heptachlor epoxide	0.05	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.90		0.05	U				
Endosulfan I	0.05	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U				
Dieldrin	0.10	0.10	U	0.10	U	0.10	U	0.10	U	0.10	U	0.10	U	0.10	U	0.10	U				
4,4'-DDE	0.10	0.10	U	0.10	U	0.10	U	0.10	U	0.10	U	0.10	U	0.10	U	0.10	U				
Endrin	0.10	0.10	U	0.10	U	0.10	U	0.10	U	0.10	U	0.10	U	0.10	U	0.10	U				
Endosulfan II	0.10	0.10	U	0.10	U	0.10	U	0.10	U	0.10	U	0.10	U	0.10	U	0.10	U				
4,4'-DDD	0.10	0.10	U	0.10	U	0.10	U	0.10	U	0.10	U	0.10	U	0.10	U	0.10	U				
Endosulfan sulfate	0.10	0.10	U	0.10	U	0.10	U	0.10	U	0.10	U	0.10	U	0.10	U	0.10	U				
4,4'-DDT	0.10	0.10	U	0.10	U	0.10	U	0.10	U	0.10	U	0.10	U	0.10	U	0.10	U				
Methoxychlor	0.50	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U				
Endrin Ketone	0.10	0.10	U	0.10	U	0.10	U	0.10	U	0.10	U	0.10	U	0.10	U	0.10	U				
Endrin Aldehyde	0.10	0.10	U	0.10	U	0.10	U	0.10	U	0.10	U	0.10	U	0.10	U	0.10	U				
alpha-Chlordane	0.05	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U				
gamma-Chlordane	0.05	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U				
Toxaphene	5.0	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U				
Aroclor-1016	1.0	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U				
Aroclor-1221	2.0	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U				
Aroclor-1232	1.0	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U				
Aroclor-1242	1.0	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U				
Aroclor-1248	1.0	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U				
Aroclor-1254	1.0	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U				
Aroclor-1260	1.0	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U				

NV = Not Validated

9613175.1666

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

Project: WESTINGHOUSE-HANFORD																						
Laboratory: TMA																						
Case	SDG: B09D70																					
Sample Number		B09D70		B09DH8																		
Location		199-F5-1		EB-1																		
Remarks				EB																		
Sample Date		10/28/93		10/28/93																		
Extraction Date		11/03/93		11/03/93																		
Analysis Date		11/26/93		11/26/93																		
Pesticide/PCB	CRQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	
alpha-BHC	0.05	0.05	U	0.05	U																	
beta-BHC	0.05	0.05	U	0.05	U																	
delta-BHC	0.05	0.05	U	0.05	U																	
gamma-BHC (Lindane)	0.05	0.05	U	0.05	U																	
Heptachlor	0.05	0.05	U	0.05	U																	
Aldrin	0.05	0.05	U	0.05	U																	
Heptachlor epoxide	0.05	0.05	U	0.05	U																	
Endosulfan I	0.05	0.05	U	0.05	U																	
Dieldrin	0.10	0.10	U	0.10	U																	
4,4'-DDE	0.10	0.10	U	0.10	U																	
Endrin	0.10	0.10	U	0.10	U																	
Endosulfan II	0.10	0.10	U	0.10	U																	
4,4'-DDD	0.10	0.10	U	0.10	U																	
Endosulfan sulfate	0.10	0.10	U	0.10	U																	
4,4'-DDT	0.10	0.10	U	0.10	U																	
Methoxychlor	0.50	0.50	U	0.50	U																	
Endrin Ketone	0.10	0.10	U	0.10	U																	
Endrin Aldehyde	0.10	0.10	U	0.10	U																	
alpha-Chlordane	0.05	0.05	U	0.05	U																	
gamma-Chlordane	0.05	0.05	U	0.05	U																	
Toxaphene	5.0	5.0	U	5.0	U																	
Aroclor-1016	1.0	1.0	U	1.0	U																	
Aroclor-1221	2.0	2.0	U	2.0	U																	
Aroclor-1232	1.0	1.0	U	1.0	U																	
Aroclor-1242	1.0	1.0	U	1.0	U																	
Aroclor-1248	1.0	1.0	U	1.0	U																	
Aroclor-1254	1.0	1.0	U	1.0	U																	
Aroclor-1260	1.0	1.0	U	1.0	U																	

EB = Equipment Blank

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

Project: WESTINGHOUSE-HANFORD																						
Laboratory: TMA																						
Case	SDG: B09D78																					
Sample Number		B09D78		B09D98																		
Location		199-F5-4		199-F5-45																		
Remarks		NV		NV																		
Sample Date		11/06/93		11/06/93																		
Extraction Date		11/11/93		11/11/93																		
Analysis Date		11/28/93		11/28/93																		
Pesticide/PCB	CRQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	
alpha-BHC	0.05	0.05	U	0.05	U																	
beta-BHC	0.05	0.05	U	0.05	U																	
delta-BHC	0.05	0.05	U	0.05	U																	
gamma-BHC (Lindane)	0.05	0.05	U	0.05	U																	
Heptachlor	0.05	0.05	U	0.05	U																	
Aldrin	0.05	0.05	U	0.05	U																	
Heptachlor epoxide	0.05	0.05	U	0.05	U																	
Endosulfan I	0.05	0.05	U	0.05	U																	
Dieldrin	0.10	0.10	U	0.10	U																	
4,4'-DDE	0.10	0.10	U	0.10	U																	
Endrin	0.10	0.10	U	0.10	U																	
Endosulfan II	0.10	0.10	U	0.10	U																	
4,4'-DDD	0.10	0.10	U	0.10	U																	
Endosulfan sulfate	0.10	0.10	U	0.10	U																	
4,4'-DDT	0.10	0.10	U	0.10	U																	
Methoxychlor	0.50	0.50	U	0.50	U																	
Endrin Ketone	0.10	0.10	U	0.10	U																	
Endrin Aldehyde	0.10	0.10	U	0.10	U																	
alpha-Chlordane	0.05	0.05	U	0.05	U																	
gamma-Chlordane	0.05	0.05	U	0.05	U																	
Toxaphene	5.0	5.0	U	5.0	U																	
Aroclor-1016	1.0	1.0	U	1.0	U																	
Aroclor-1221	2.0	2.0	U	2.0	U																	
Aroclor-1232	1.0	1.0	U	1.0	U																	
Aroclor-1242	1.0	1.0	U	1.0	U																	
Aroclor-1248	1.0	1.0	U	1.0	U																	
Aroclor-1254	1.0	1.0	U	1.0	U																	
Aroclor-1260	1.0	1.0	U	1.0	U																	

NV = Not Validated

9613473.1668

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

Project: WESTINGHOUSE-HANFORD																					
Laboratory: TMA																					
Case	SDG: B09D82																				
Sample Number		B09D82		B09DG2																	
Location		199-F5-6		199-F5-6																	
Remarks				DUP																	
Sample Date		10/26/93		10/26/93																	
Extraction Date		11/01/93		11/01/93																	
Analysis Date		11/16/93		11/16/93																	
Pesticide/PCB	CRQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
alpha-BHC	0.05	0.05	U	0.05	U																
beta-BHC	0.05	0.05	U	0.05	U																
delta-BHC	0.05	0.05	U	0.05	U																
gamma-BHC (Lindane)	0.05	0.05	U	0.05	U																
Heptachlor	0.05	0.05	U	0.05	U																
Aldrin	0.05	0.05	U	0.05	U																
Heptachlor epoxide	0.05	0.05	U	0.05	U																
Endosulfan I	0.05	0.05	U	0.05	U																
Dieldrin	0.10	0.10	U	0.10	U																
4,4'-DDE	0.10	0.10	U	0.10	U																
Endrin	0.10	0.10	U	0.10	U																
Endosulfan II	0.10	0.10	U	0.10	U																
4,4'-DDD	0.10	0.10	U	0.10	U																
Endosulfan sulfate	0.10	0.10	U	0.10	U																
4,4'-DDT	0.10	0.10	U	0.10	U																
Methoxychlor	0.50	0.50	U	0.50	U																
Endrin Ketone	0.10	0.10	U	0.10	U																
Endrin Aldehyde	0.10	0.10	U	0.10	U																
alpha-Chlordane	0.05	0.05	U	0.05	U																
gamma-Chlordane	0.05	0.05	U	0.05	U																
Toxaphene	5.0	5.0	U	5.0	U																
Aroclor-1016	1.0	1.0	U	1.0	U																
Aroclor-1221	2.0	2.0	U	2.0	U																
Aroclor-1232	1.0	1.0	U	1.0	U																
Aroclor-1242	1.0	1.0	U	1.0	U																
Aroclor-1248	1.0	1.0	U	1.0	U																
Aroclor-1254	1.0	1.0	U	1.0	U																
Aroclor-1260	1.0	1.0	U	1.0	U																

DUP = Duplicate

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

Project: WESTINGHOUSE-HANFORD																					
Laboratory: TMA																					
Case	SDG: B09DB2																				
Sample Number		B09DB2		B09DD6																	
Location		199-F5-46		199-F7-3																	
Remarks		NV		NV																	
Sample Date		11/06/93		11/06/93																	
Extraction Date		11/12/93		11/12/93																	
Analysis Date		11/29/93		11/29/93																	
Pesticide/PCB	CRQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
alpha-BHC	0.05	0.05	U	0.05	U																
beta-BHC	0.05	0.05	U	0.05	U																
delta-BHC	0.05	0.05	U	0.05	U																
gamma-BHC (Lindane)	0.05	0.05	U	0.05	U																
Heptachlor	0.05	0.05	U	0.05	U																
Aldrin	0.05	0.05	U	0.05	U																
Heptachlor epoxide	0.05	0.05	U	0.05	U																
Endosulfan I	0.05	0.05	U	0.05	U																
Dieldrin	0.10	0.10	U	0.10	U																
4,4'-DDE	0.10	0.10	U	0.10	U																
Endrin	0.10	0.10	U	0.10	U																
Endosulfan II	0.10	0.10	U	0.10	U																
4,4'-DDD	0.10	0.10	U	0.10	U																
Endosulfan sulfate	0.10	0.10	U	0.10	U																
4,4'-DDT	0.10	0.10	U	0.10	U																
Methoxychlor	0.50	0.50	U	0.50	U																
Endrin Ketone	0.10	0.10	U	0.10	U																
Endrin Aldehyde	0.10	0.10	U	0.10	U																
alpha-Chlordane	0.05	0.05	U	0.05	U																
gamma-Chlordane	0.05	0.05	U	0.05	U																
Toxaphene	5.0	5.0	U	5.0	U																
Aroclor-1016	1.0	1.0	U	1.0	U																
Aroclor-1221	2.0	2.0	U	2.0	U																
Aroclor-1232	1.0	1.0	U	1.0	U																
Aroclor-1242	1.0	1.0	U	1.0	U																
Aroclor-1248	1.0	1.0	U	1.0	U																
Aroclor-1254	1.0	1.0	U	1.0	U																
Aroclor-1260	1.0	1.0	U	1.0	U																

NV = Not Validated

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

Project: WESTINGHOUSE-HANFORD																					
Laboratory: TMA																					
Case	SDG: B09DB6																				
Sample Number		B09DB6		B09DC0		B09DF0		B09DG6													
Location		199-F5-47		199-F5-48		199-F8-2		199-F5-47													
Remarks				NV		NV		DUP													
Sample Date		10/31/93		10/31/93		10/31/93		10/31/93													
Extraction Date		11/05/93		11/05/93		11/05/93		11/05/93													
Analysis Date		11/27/93		11/27/93		11/27/93		11/27/93													
Pesticide/PCB	CRQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
alpha-BHC	0.05	0.05	U	0.05	U	0.05	U	0.05	U												
beta-BHC	0.05	0.05	U	0.05	U	0.05	U	0.05	U												
delta-BHC	0.05	0.05	U	0.05	U	0.05	U	0.05	U												
gamma-BHC (Lindane)	0.05	0.05	U	0.05	U	0.05	U	0.05	U												
Heptachlor	0.05	0.05	U	0.05	U	0.05	U	0.05	U												
Aldrin	0.05	0.05	U	0.05	U	0.05	U	0.05	U												
Heptachlor epoxide	0.05	0.05	U	0.05	U	0.027	J	0.05	U												
Endosulfan I	0.05	0.05	U	0.05	U	0.05	U	0.05	U												
Dieldrin	0.10	0.10	U	0.10	U	0.10	U	0.10	U												
4,4'-DDE	0.10	0.10	U	0.10	U	0.10	U	0.10	U												
Endrin	0.10	0.10	U	0.10	U	0.10	U	0.10	U												
Endosulfan II	0.10	0.10	U	0.10	U	0.10	U	0.10	U												
4,4'-DDD	0.10	0.10	U	0.10	U	0.10	U	0.10	U												
Endosulfan sulfate	0.10	0.10	U	0.10	U	0.10	U	0.10	U												
4,4'-DDT	0.10	0.10	U	0.10	U	0.10	U	0.10	U												
Methoxychlor	0.50	0.50	U	0.50	U	0.50	U	0.50	U												
Endrin Ketone	0.10	0.10	U	0.10	U	0.10	U	0.10	U												
Endrin Aldehyde	0.10	0.10	U	0.10	U	0.10	U	0.10	U												
alpha-Chlordane	0.05	0.05	U	0.05	U	0.05	U	0.05	U												
gamma-Chlordane	0.05	0.05	U	0.05	U	0.05	U	0.05	U												
Toxaphene	5.0	5.0	U	5.0	U	5.0	U	5.0	U												
Aroclor-1016	1.0	1.0	U	1.0	U	1.0	U	1.0	U												
Aroclor-1221	2.0	2.0	U	2.0	U	2.0	U	2.0	U												
Aroclor-1232	1.0	1.0	U	1.0	U	1.0	U	1.0	U												
Aroclor-1242	1.0	1.0	U	1.0	U	1.0	U	1.0	U												
Aroclor-1248	1.0	1.0	U	1.0	U	1.0	U	1.0	U												
Aroclor-1254	1.0	1.0	U	1.0	U	1.0	U	1.0	U												
Aroclor-1260	1.0	1.0	U	1.0	U	1.0	U	1.0	U												

NV = Not Validated, DUP = Duplicate

9513473.1671

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

Project: WESTINGHOUSE-HANFORD																					
Laboratory: TMA																					
Case	SDG: B09DC8																				
Sample Number		B09DC8																			
Location		199-F7-1																			
Remarks		NV																			
Sample Date		10/27/93																			
Extraction Date		11/03/93																			
Analysis Date		11/26/93																			
Pesticide/PCB	CRQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
alpha-BHC	0.05	0.05	U																		
beta-BHC	0.05	0.05	U																		
delta-BHC	0.05	0.05	U																		
gamma-BHC (Lindane)	0.05	0.05	U																		
Heptachlor	0.05	0.05	U																		
Aldrin	0.05	0.05	U																		
Heptachlor epoxide	0.05	0.05	U																		
Endosulfan I	0.05	0.05	U																		
Dieldrin	0.10	0.10	U																		
4,4'-DDE	0.10	0.10	U																		
Endrin	0.10	0.10	U																		
Endosulfan II	0.10	0.10	U																		
4,4'-DDD	0.10	0.10	U																		
Endosulfan sulfate	0.10	0.10	U																		
4,4'-DDT	0.10	0.10	U																		
Methoxychlor	0.50	0.50	U																		
Endrin Ketone	0.10	0.10	U																		
Endrin Aldehyde	0.10	0.10	U																		
alpha-Chlordane	0.05	0.05	U																		
gamma-Chlordane	0.05	0.05	U																		
Toxaphene	5.0	5.0	U																		
Aroclor-1016	1.0	1.0	U																		
Aroclor-1221	2.0	2.0	U																		
Aroclor-1232	1.0	1.0	U																		
Aroclor-1242	1.0	1.0	U																		
Aroclor-1248	1.0	1.0	U																		
Aroclor-1254	1.0	1.0	U																		
Aroclor-1260	1.0	1.0	U																		

NV = Not Validated

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

Page__1__ of__1__

Project: WESTINGHOUSE-HANFORD																						
Laboratory: Roy F. Weston																						
Case	SDG: B09DH0																					
Sample Number		B09DH0																				
Location		199-F5-6																				
Remarks		SPLIT																				
Sample Date		10/26/93																				
Extraction Date		11/01/93																				
Analysis Date		11/04/93																				
Pesticide/PCB	CRQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
alpha-BHC	0.05	0.05	U																		
beta-BHC	0.05	0.05	U																		
delta-BHC	0.05	0.05	U																		
gamma-BHC (Lindane)	0.05	0.05	U																		
Heptachlor	0.05	0.05	U																		
Aldrin	0.05	0.05	U																		
Heptachlor epoxide	0.05	0.05	U																		
Endosulfan I	0.05	0.05	U																		
Dieldrin	0.10	0.10	U																		
4,4'-DDE	0.10	0.10	U																		
Endrin	0.10	0.10	U																		
Endosulfan II	0.10	0.10	U																		
4,4'-DDD	0.10	0.10	U																		
Endosulfan sulfate	0.10	0.10	U																		
4,4'-DDT	0.10	0.10	U																		
Methoxychlor	0.50	0.50	U																		
Endrin Ketone	0.10	0.10	U																		
Endrin Aldehyde	0.10	0.10	U																		
alpha-Chlordane	0.05	0.05	U																		
gamma-Chlordane	0.05	0.05	U																		
Toxaphene	5.0	5.0	U																		
Aroclor-1016	1.0	1.0	U																		
Aroclor-1221	2.0	2.0	U																		
Aroclor-1232	1.0	1.0	U																		
Aroclor-1242	1.0	1.0	U																		
Aroclor-1248	1.0	1.0	U																		
Aroclor-1254	1.0	1.0	U																		
Aroclor-1260	1.0	1.0	U																		

9613472.1629

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

Page__1__ of__1__

Project: WESTINGHOUSE-HANFORD																					
Laboratory: Roy F. Weston																					
Case	SDG: B09DH4																				
Sample Number		B09DH4																			
Location		199-F5-47																			
Remarks		SPLIT																			
Sample Date		10/31/93																			
Extraction Date		11/03/93																			
Analysis Date		11/05/93																			
Pesticide/PCB	CRQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
alpha-BHC	0.05	0.05	U																		
beta-BHC	0.05	0.05	U																		
delta-BHC	0.05	0.05	U																		
gamma-BHC (Lindane)	0.05	0.05	U																		
Heptachlor	0.05	0.05	U																		
Aldrin	0.05	0.05	U																		
Heptachlor epoxide	0.05	0.05	U																		
Endosulfan I	0.05	0.05	U																		
Dieldrin	0.10	0.10	U																		
4,4'-DDE	0.10	0.10	U																		
Endrin	0.10	0.10	U																		
Endosulfan II	0.10	0.10	U																		
4,4'-DDD	0.10	0.10	U																		
Endosulfan sulfate	0.10	0.10	U																		
4,4'-DDT	0.10	0.10	U																		
Methoxychlor	0.50	0.50	U																		
Endrin Ketone	0.10	0.10	U																		
Endrin Aldehyde	0.10	0.10	U																		
alpha-Chlordane	0.05	0.05	U																		
gamma-Chlordane	0.05	0.05	U																		
Toxaphene	5.0	5.0	U																		
Aroclor-1016	1.0	1.0	U																		
Aroclor-1221	2.0	2.0	U																		
Aroclor-1232	1.0	1.0	U																		
Aroclor-1242	1.0	1.0	U																		
Aroclor-1248	1.0	1.0	U																		
Aroclor-1254	1.0	1.0	U																		
Aroclor-1260	1.0	1.0	U																		

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

Project: WESTINGHOUSE-HANFORD																						
Laboratory: TMA																						
Case	SDG: B09DJ2																					
Sample Number		B09DJ2																				
Location		EB-2																				
Remarks		EB																				
Sample Date		11/03/93																				
Extraction Date		11/08/93																				
Analysis Date		11/30/93																				
Pesticide/PCB	CRQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	
alpha-BHC	0.05	0.05	UJ																			
beta-BHC	0.05	0.05	U																			
delta-BHC	0.05	0.05	U																			
gamma-BHC (Lindane)	0.05	0.05	UJ																			
Heptachlor	0.05	0.05	U																			
Aldrin	0.05	0.05	UJ																			
Heptachlor epoxide	0.05	0.05	U																			
Endosulfan I	0.05	0.05	U																			
Dieldrin	0.10	0.10	U																			
4,4'-DDE	0.10	0.10	U																			
Endrin	0.10	0.10	U																			
Endosulfan II	0.10	0.10	U																			
4,4'-DDD	0.10	0.10	U																			
Endosulfan sulfate	0.10	0.10	U																			
4,4'-DDT	0.10	0.10	U																			
Methoxychlor	0.50	0.50	U																			
Endrin Ketone	0.10	0.10	U																			
Endrin Aldehyde	0.10	0.10	U																			
alpha-Chlordane	0.05	0.05	U																			
gamma-Chlordane	0.05	0.05	U																			
Toxaphene	5.0	5.0	U																			
Aroclor-1016	1.0	1.0	U																			
Aroclor-1221	2.0	2.0	U																			
Aroclor-1232	1.0	1.0	U																			
Aroclor-1242	1.0	1.0	U																			
Aroclor-1248	1.0	1.0	U																			
Aroclor-1254	1.0	1.0	U																			
Aroclor-1260	1.0	1.0	U																			

EB = Equipment Blank

CALIBRATION DATA SUMMARY

SDG: B09DJ2	REVIEWER: SC	DATE: 1/18/94		PAGE 1 OF 1	
COMMENTS:					
CALIB. TYPE:	INITIAL CONTINUING	INSTRUMENT:			
CALIB. DATE	COMPOUND	RF	RPD	SAMPLES AFFECTED	QUALIFIER
11/30/93	alpha-BHC		41.0	B09DJ2	J
11/30/93	gamma-BHC (Lindane)		36.0	B09DJ2	J
11/30/93	Aldrin		28.0	B09DJ2	J

9613473.1676

DATA QUALIFICATION SUMMARY

SDG: B09DJ2	REVIEWER: SC	DATE: 1/18/94	PAGE 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
alpha-BHC	J	B09DJ2	Calibration verification RPD outside of QC limits
gamma-BHC (Lindane)	J	B09DJ2	Calibration verification RPD outside of QC limits
Aldrin	J	B09DJ2	Calibration verification RPD outside of QC limits

WELL AND SAMPLE INFORMATION					SAMPLE LOCATION INFORMATION
SAMPLE LOCATION	SAMPLE NUMBER	MATRIX	DATE SAMPLED	NV/V	INORGANICS
199-F1-2	B09D66	W	10/29/93	NV	5-14
	B09D67	W	10/29/93	NV	5-15
199-F5-1	B09D70	W	10/28/93	V	5-16
	B09D71	W	10/28/93	V	5-20
199-F5-4	B09D78	W	11/06/93	NV	5-23
	B09D79	W	11/06/93	NV	5-24
199-F5-6	B09D82	W	10/26/93	V	5-25
	B09D83	W	10/26/93	V	5-30
	B09DG2	W	10/26/93	V	5-25
	B09DG3	W	10/26/93	V	5-30
	B09DH0	W	10/26/93	V	5-47
	B09DH1	W	10/26/93	V	5-47
199-F5-42	B09D86	W	10/30/93	NV	5-14
	B09D87	W	10/30/93	NV	5-15
199-F5-43A	B09D90	W	10/30/93	NV	5-14
	B09D91	W	10/30/93	NV	5-15
199-F5-44	B09D94	W	10/30/93	NV	5-14
	B09D95	W	10/30/93	NV	5-15
199-F5-45	B09D98	W	11/06/93	NV	5-23
	B09D99	W	11/06/93	NV	5-24
199-F5-46	B09DB2	W	11/06/93	NV	5-34
	B09DB3	W	11/06/93	NV	5-35
199-F5-47	B09DB6	W	10/31/93	V	5-36
	B09DB7	W	10/31/93	V	5-40
	B09DG6	W	10/31/93	V	5-36
	B09DG7	W	10/31/93	V	5-40
	B09DH4	W	10/31/93	V	5-53
	B09DH5	W	10/31/93	V	5-53
199-F5-48	B09DC0	W	10/31/93	NV	5-36
	B09DC1	W	10/31/93	NV	5-40
199-F6-1	B09DC4	W	10/30/93	NV	5-14
	B09DC5	W	10/30/93	NV	5-15
199-F7-1	B09DC8	W	10/27/93	NV	5-45
	B09DC9	W	10/27/93	NV	5-46
199-F7-2	B09DD2	W	10/30/93	NV	5-14
	B09DD3	W	10/30/93	NV	5-15

WELL AND SAMPLE INFORMATION					SAMPLE LOCATION INFORMATION
SAMPLE LOCATION	SAMPLE NUMBER	MATRIX	DATE SAMPLED	NV/V	INORGANICS
199-F7-3	B09DD6 B09DD7	W W	11/06/93 11/06/93	NV NV	5-34 5-35
199-F8-2	B09DF0 B09DF1	W W	10/31/93 10/31/93	NV NV	5-36 5-40
199-F8-3	B09DF4 B09DF5	W W	10/29/93 10/29/93	NV NV	5-14 5-15
199-F8-4	B09DF8 B09DF9	W W	10/29/93 10/29/93	NV NV	5-14 5-15
EB-1	B09DH8 B09DH9	W W	10/28/93 10/28/93	V V	5-16 5-20
EB-2	B09DJ2 B09DJ3	W W	11/03/93 11/03/93	V V	5-59 5-63

5.0 INORGANIC DATA VALIDATION

5.1 DATA PACKAGE COMPLETENESS

The following data packages (SDG Nos.) were submitted for validation and checked for completeness:

B09D70	B09D82	B09DB6	B09DH0	B09DJ2
B09D71	B09D83	B09DB7	B09DH4	B09DJ3

5.2 HOLDING TIMES

Analytical holding times for ICP metals, GFAA metals and CVAA mercury analyses were assessed to ascertain whether the holding time requirements were met by the laboratory. The holding time requirements are as follows: samples must be analyzed within 28 days for mercury, 14 days for cyanide and within six months for all other metals.

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

5.3 INSTRUMENT PERFORMANCE AND CALIBRATIONS

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

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

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

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

The above calibrations were each immediately verified with an ICV standard and a calibration blank. The ICV was prepared from a source independent of the calibration standards, at a mid-calibration range concentration. The ICV percent recovery must fall within the control limits of 90 to 110 percent for metals analyzed by ICP and GFAA, and 80 to 120 percent for mercury. Calibration linearity near the detection limit was

verified with a standard prepared at a concentration near the CRDL.

The ICVs met the recommended control limits in all cases.

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

The CCVs met the recommended control limits in all cases.

All midpoint standard distillation for the cyanide analysis were performed.

5.3.1 ICP Calibration

An ICS was analyzed at the beginning and end of each ICP sample run to verify the laboratory interelement and background correction factors. Results for the ICS solution must fall within the control limit of ±20 percent of the true value. Arsenic, lead, selenium and thallium were analyzed using a Thermo-Jarrell Ash ICP61E. Under USEPA CLP protocol, this is acceptable provided the ICP is able to meet the required detection limits and the analytical run follows the USEPA CLP protocol for ICP analysis. Under the ICP method, an ICS is required for lead at a concentration of 1.0 mg/L. Refer to Table 2, page E-14, of the USEPA CLP ILM01.0.

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

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

5.3.2 Atomic Absorption Calibrations

Duplicate injections are required for all GFAA analyses. The duplicate injections establish the precision of the individual analytical determinations. For sample concentrations greater than the CRDL, duplicate injections must agree within ±20 percent RSD or CV. The AA calibration results are discussed further in Section 5.7 of this report.

5.4 BLANKS

5.4.1 Positive Blank Results

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

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

- Sample number B09D70 in SDG No. B09D70.
- Sample number B09DH9 in SDG No. B09D71.
- Sample number B09D82 in SDG No. B09D82.
- All samples in SDG No. B09D83.
- Sample numbers B09DB6 and B09DG6 in SDG No. B09DB6.
- Sample number B09DG7 in SDG No. B09DB7.
- All samples in SDG No. B09DH0.
- Sample numbers B09DH4 and B09DH5 in SDG No. B09DH4.
- Sample number B09DJ2 in SDG No. B09DJ2.

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

- Sample number B09D70 in SDG No. B09D70.
- Sample numbers B09D71 and B09DH9 in SDG No. B09D71.

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

- Sample number B09D70 in SDG No. B09D70.
- Sample number B09DJ3 in SDG No. B09DJ3.

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

- All samples in SDG No. B09D83.
- Sample number B09DB6 in SDG No. B09DB6.

- Sample number B09DJ2 in SDG No. B09DJ2.
- Sample number B09DJ3 in SDG No. B09DJ3.

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

- Sample numbers B09D70 and B09DH8 in SDG No. B09D70.
- Sample numbers B09D71 and B09DH9 in SDG No. B09D71.

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

- Sample numbers B09D70 and B09DH8 in SDG No. B09D70.
- Sample number B09DH9 in SDG No. B09D71.
- All samples in SDG No. B09D83.
- All samples in SDG No. B09DH0.
- Sample number B09DJ3 in SDG No. B09DJ3.

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

- Sample number B09DH8 in SDG No. B09D70.
- Sample number B09D71 in SDG No. B09D71.
- All samples in SDG No. B09D83.
- Sample numbers B09DB6 and B09DG6 in SDG No. B09DB6.
- Sample numbers B09DB7 and B09DG7 in SDG No. B09DB7.
- Sample number B09DH1 in SDG No. B09DH0.
- Sample numbers B09DH4 and B09DH5 in SDG No. B09DH4.
- Sample number B09DJ2 in SDG No. B09DJ2.

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

- Sample number B09DH9 in SDG No. B09D71.
- Sample number B09DJ3 in SDG No. B09DJ3.

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

- Sample number B09D70 in SDG No. B09D70.

- Sample numbers B09D71 and B09DH9 in SDG No. B09D71.
- All samples in SDG No. B09D83.
- Sample number B09DB6 and B09DG6 in SDG No. B09DB6.
- Sample number B09DG7 in SDG No. B09DB7.
- All samples in SDG No. B09DH0.
- Sample number B09DJ2 in SDG No. B09DJ2.

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

- Sample numbers B09D70 and B09DH8 in SDG No. B09D70.
- Sample number B09DH9 in SDG No. B09D71.
- All samples in SDG No. B09DH0.

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

- Sample number B09DH9 in SDG No. B09D71.

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

- All samples in SDG No. B09D82.
- All samples in SDG No. B09D83.
- Sample number B09DB6 in SDG No. B09DB6.
- Sample number B09DJ3 in SDG No. B09DJ3.

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

- All samples in SDG No. B09DH0.

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

- Sample number B09D70 in SDG No. B09D70.
- Sample number B09DH9 in SDG No. B09D71.
- Sample number B09D83 in SDG No. B09D83.
- All samples in SDG No. B09DH0.
- Sample number B09DH4 and B09DH5 in SDG No. B09DH4.

- Sample number B09DJ3 in SDG No. B09DJ3.

All other laboratory blank results were acceptable.

5.4.2 Negative Blank Results

In the case of negative blank results, if the absolute value of any calibration blank exceeds the IDL, all non-detects are qualified as estimates and flagged "J", and all positive results within two times the absolute value of the blank result are qualified as estimates and flagged "J". In the case of preparation blanks, if the absolute value exceeds the CRDL, all non-detects are rejected and flagged "R" and all detected that are less than ten times the absolute value of the preparation blank result are qualified as estimates and flagged "J".

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

- All samples in SDG No. B09D82.
- All samples in SDG No. B09D83.
- All samples in SDG No. B09DH0.
- Sample numbers B09DH4 and B09DH5 in SDG No. B09DH4.

Due to the presence of negative laboratory contamination, the following samples were flagged "J" for antimony:

- Sample numbers B09DH4 and B09DH5 in SDG No. B09DH4.

Due to the presence of negative laboratory contamination, the following samples were flagged "J" for cadmium:

- Sample numbers B09DB7 and B09DG7 in SDG No. B09DB7.

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

- Sample numbers B09DB6 and B09DG6 in SDG No. B09DB6.

Due to the presence of negative laboratory contamination, the following samples were flagged "J" for lead:

- All samples in SDG No. B09DH0.

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

- Sample numbers B09DH4 and B09DH5 in SDG No. B09DH4.

Due to the presence of negative laboratory contamination, the following samples were flagged "J" for silver:

- Sample numbers B09DH4 and B09DH5 in SDG No. B09DH4.

Due to the presence of negative laboratory contamination, the following samples were flagged "J" for thallium:

- Sample numbers B09DH4 and B09DH5 in SDG No. B09DH4.

Due to the presence of negative laboratory contamination, the following sample was flagged "J" for vanadium:

- Sample number B09DH5 in SDG No. B09DH4.

5.5 ACCURACY

5.5.1 Matrix Spike Recovery

Matrix spike analyses are used to assess the analytical accuracy of the reported data and the effect of the matrix on the ability to accurately quantify sample concentrations. Matrix spike recoveries must generally fall within the range of 75 to 125 percent. Samples with a spike recovery of less than 30% and a sample value below the IDL were rejected and flagged "R". All other samples with a spike recovery outside the QC limits are qualified as estimates and flagged "J".

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

- All samples in SDG No. B09DH0.

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

- All samples in SDG No. B09DH0.
- Sample numbers B09DH4 and B09DH5 in SDG No. B09DH4.

The matrix spike recovery fell below the 30% QC recovery limit and the associated results flagged "R" for cyanide in the following samples:

- Sample numbers B09D70 and B09DH8 in SDG No. B09D70.

All other matrix spike recovery results were acceptable.

5.5.2 Laboratory Control Sample Recovery

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

One liquid LCS was digested and analyzed for each of the cases in this report that contained water samples. The results were compared against the control limit of 80-120% as required by the EPA CLP SOW 3/90 protocol and found to be acceptable.

All LCSW results were found to be acceptable.

5.6 PRECISION

5.6.1 Laboratory Duplicate Samples

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

The laboratory duplicate results fell outside the QC limits and the associated results were flagged "J" for aluminum in the following samples:

- Sample number B09DJ2 in SDG No. B09DJ2.
- Sample number B09DJ3 in SDG No. B09DJ3.

The laboratory duplicate results fell outside the QC limits and the associated results were flagged "J" for cadmium in the following samples:

- All samples in SDG No. B09DH0.

The laboratory duplicate results fell outside the QC limits and the associated results were flagged "J" for manganese in the following sample:

- Sample number B09DJ3 in SDG No. B09DJ3.

The laboratory duplicate results fell outside the QC limits and the associated results were flagged "J" for zinc in the following samples:

- Sample numbers B09DB7 and B09DG7 in SDG No. B09DB7.

All other laboratory duplicate recovery results were acceptable.

5.6.2 ICP Serial Dilution

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

The ICP serial dilution results fell outside the QC limits and the associated results were flagged "J" for aluminum in the following sample:

- Sample number B09DJ3 in SDG No. B09DJ3.

The ICP serial dilution results fell outside the QC limits and the associated results were flagged "J" for calcium in the following samples:

- All samples in SDG No. B09DH0.
- Sample numbers B09DH4 and B09DH5 in SDG No. B09DH4.

The ICP serial dilution results fell outside the QC limits and the associated results were flagged "J" for iron in the following samples:

- All samples in SDG No. B09DH0.

The ICP serial dilution results fell outside the QC limits and the associated results were flagged "J" for magnesium in the following samples:

- All samples in SDG No. B09DH0.
- Sample numbers B09DH4 and B09DH5 in SDG No. B09DH4.

The ICP serial dilution results fell outside the QC limits and the associated results were flagged "J" for sodium in the following samples:

- All samples in SDG No. B09DH0.
- Sample numbers B09DH4 and B09DH5 in SDG No. B09DH4.

All other ICP serial dilution results were acceptable.

5.6.3 Total and Dissolved Sample Analysis

Inorganics parameters included the analysis of the total as well as dissolved samples. Total samples include particulate and

dissolved fractions while dissolved samples are first filtered prior to preparation. The purpose of the analysis is to determine what metals are inherent in the particulate matter found in the aqueous sample.

Since Westinghouse Validation Guidelines do not address this issue, the total and dissolved samples are presented in the report, but no judgement on the data was made.

Below is a table of the total and dissolved samples which were validated.

Total	Dissolved
B09DH0	B09DH1
B09DH8	B09DH9
B09D82	B09D83
B09DG2	B09DG3
B09DB6	B09DB7
B09DG6	B09DG7
B09DH0	B09DH1
B09DH4	B09DH5

No judgements were made on the samples as per Westinghouse-Hanford data validation guidelines.

5.7 FURNACE AA QUALITY CONTROL

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

5.7.1 Duplicate Injections

Each furnace analysis requires a minimum of two injections (burns), except for full Method of Standard Addition (MSA). For concentrations greater than CRDL, the duplicate injection readings must agree within 20% relative standard deviation (RSD) or coefficient of variation (CV). If these requirements are not met, the analytical sample must be rerun once (i.e., two additional burns). If the readings are then still outside the QC limits, the result is qualified as an estimate and flagged "J".

All duplicate injection quality control requirements were met.

5.7.2 Analytical Spike Recoveries

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

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

- Sample number B09DH5 in SDG No. B09DH4.

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

- Sample numbers B09DH0 and B09DH1 in SDG No. B09DH0.
- Sample numbers B09DH4 and B09DH5 in SDG No. B09DH4.

All other analytical spike recovery results were acceptable.

5.7.3 Method of Standard Addition (MSA) Results

For all samples whose analytical spike results are outside the 85 to 115 percent control limit and whose absorbances are greater than 50 percent of the analytical spike absorbance an MSA is required. In cases where the MSA correlation coefficient was less than 0.995 the MSA analysis was repeated once. If the correlation coefficient was still less than 0.995, samples were flagged as estimates "J".

All MSA results were acceptable.

5.8 ANALYTE QUANTITATION AND DETECTION LIMITS

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

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

5.9 OVERALL ASSESSMENT AND SUMMARY

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

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

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

For samples analyzed by Roy F. Weston, incorrect ICP instrument detection limits (IDL's) are being used to report results down to the IDL. Two sets of IDL's (Form 10) are included in the data package for ICAP analysis, one for instrument IC1 and one for instrument IC3. According to the case narrative addendum, Roy F. Weston states that the highest IDL of the two instruments is used as per Exhibit E, Section V, Item 10 (pg. E-53) of the EPA Statement of Work for Inorganics Analysis, Document Number ILM01.0. This is correct only when two instruments are being used to determine sample results within a data package. However, in this data package Roy F. Weston used only one ICP instrument to determine the sample results and therefore it is that instrument's IDL's which should be used to calculate results. According to Form XIV information IC1 is the instrument being used for analysis while the IDL's of IC3 are the ones reported on Forms 1-9. This can effect results flagged "U" or results which may be flagged "U" because of laboratory blank contamination.

All raw data associated with Roy F. Weston have not been labeled with the client (EPA) ID number. Results labeled with only the laboratory sample ID number is insufficient. Refer to Section B-10 of the EPA CLP SOW 3/90.

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

or results which may be flagged "U" because of laboratory blank contamination.

All raw data associated with Roy F. Weston have not been labeled with the client (EPA) ID number. Results labeled with only the laboratory sample ID number is insufficient. Refer to Section B-10 of the EPA CLP SOW 3/90.

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

INORGANIC ANALYSIS, WATER MATRIX, (μg/L)

Project: WESTINGHOUSE-HANFORD																					
Laboratory: TMA																					
Case	SDG: B09D66																				
Sample Number		B09D66		B09D86		B09D90		B09D94		B09DC4		B09DD2		B09DF4		B09DF8					
Location		199-F1-2		199-F5-42		199-F5-43A		199-F5-44		199-F6-1		199-F7-2		199-F8-3		199-F8-4					
Remarks		NV		NV		NV		NV		NV		NV		NV		NV					
Sample Date		10/29/93		10/30/93		10/30/93		10/30/93		10/30/93		10/30/93		10/29/93		10/29/93					
Inorganic Analytes	CRDL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Aluminum	200	24.2		30.9		36.9		30.9		15.5	U	17.7		20.1		322					
Antimony	60	13.0		19.6		14.5		9.2	U	14.0		9.2	U	12.8		9.2	U				
Arsenic	10	12.1		2.1	U	2.1	U	2.1	U	2.1	U	5.9		2.3		5.1					
Barium	200	32.7		32.7		28.6		20.4		24.5		25.9		129		40.9					
Beryllium	5	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U				
Cadmium	5	1.0	U	1.1		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U				
Calcium	5000	36500		29400		28400		31600		30100		58700		143000		69500					
Chromium	10	4.1	U	8.4		10.9		21.0		11.8		14.3		14.3		14.3					
Cobalt	50	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U				
Copper	25	2.9	U	2.9	U	2.9	U	4.0		2.9	U	2.9	U	2.9	U	2.9	U				
Iron	100	32.1		36.8		74.0		65.8		31.8		53.0		24.8		414					
Lead	3	2.9	U	2.9	U	2.9	U	2.9	U	2.9	U	2.9	U	2.9	U	2.9	U				
Magnesium	5000	11900		5270		4240		5510		3990		17500		36300		17200					
Manganese	15	1.3	U	2.8		4.3		2.3		1.5		1.3	U	1.5		10.7					
Mercury	0.2	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U				
Nickel	40	5.3		7.5		6.8		8.3		8.3		15.1		4.5		4.2					
Potassium	5000	4680		2300		1810		1870		2880		6730		8030		6170					
Selenium	5	2.8	U	2.8	U	2.8	U	2.8	U	2.8	U	2.8	U	2.8	U	2.8	U				
Silver	10	3.7	U	3.7	U	3.7	U	3.7	U	3.7	U	3.7	U	3.7	U	3.7	U				
Sodium	5000	50700		2780		2820		4140		3730		52600		61800		47900					
Thallium	10	1.6	U	1.6	U	1.6	U	2.0		1.6	U	1.6	U	1.6	U	1.6	U				
Vanadium	50	23.9		4.7		5.3		5.9		3.0		17.6		10.0		13.0					
Zinc	20	19.6		15.6		18.5		17.6		8.5	U	8.5	U	8.5	U	17.9					
Cyanide	10	10.0	U	10.0	U	10.0	U	10.0	U	10.0	U	10.0	U	10.0	U	10.0	U				

NV = Not Validated

INORGANIC ANALYSIS, WATER MATRIX, (μg/L)

Project: WESTINGHOUSE-HANFORD																					
Laboratory: TMA																					
Case	SDG: B09D67																				
Sample Number		B09D67		B09D87		B09D91		B09D95		B09DC5		B09DD3		B09DF5		B09DF9					
Location		199-F1-2		199-F5-42		199-F5-43A		199-F5-44		199-F6-1		199-F7-2		199-F8-3		199-F8-4					
Remarks		NV,FIL		NV,FIL		NV,FIL		NV,FIL		NV,FIL		NV,FIL		NV,FIL		NV,FIL					
Sample Date		10/29/93		10/30/93		10/30/93		10/30/93		10/30/93		10/30/93		10/29/93		10/29/93					
Inorganic Analytes	CRDL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Aluminum	200	15.5	U	15.5	U	15.5	U	15.5	U	15.5	U	15.5	U	15.5	U	15.5	U				
Antimony	60	9.2	U	9.2	U	9.2	U	9.2	U	9.2	U	9.2	U	9.2	U	9.2	U				
Arsenic	10	12.0		2.1	U	2.1	U	2.1	U	2.1	U	5.5		2.6		6.0					
Barium	200	29.8		33.6		29.8		22.4		26.1		29.8		114		36.0					
Beryllium	5	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U				
Cadmium	5	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U				
Calcium	5000	34200		28000		27500		29800		28300		56600		136000		69200					
Chromium	10	4.6		6.9		6.1		16.1		6.1		10.0		7.7		11.5					
Cobalt	50	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U				
Copper	25	2.9	U	2.9	U	2.9	U	2.9	U	2.9	U	2.9		4.4		2.9	U				
Iron	100	30.0		27.5		16.2		24.0		13.4		23.3		23.3		16.2					
Lead	3	2.9	U	2.9	U	2.9	U	2.9	U	2.9	U	2.9	U	2.9	U	2.9	U				
Magnesium	5000	11300		5060		4100		5210		3790		16900		34700		17300					
Manganese	15	1.3	U	1.8		1.4		1.4		1.4		1.4		1.4		1.3	U				
Mercury	0.2	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U				
Nickel	40	3.9	U	3.9	U	3.9	U	3.9	U	3.9	U	3.9	U	3.9	U	3.9	U				
Potassium	5000	4170		1910		1580		1620		2690		6380		7680		5830					
Selenium	5	4.0		2.8	U	2.8	U	2.8	U	2.8	U	2.8	U	3.5		2.8	U				
Silver	10	3.7	U	3.7	U	3.7	U	3.7	U	3.7	U	3.7	U	3.7	U	3.7	U				
Sodium	5000	47400		2680		2840		4000		3550		50800		59000		47400					
Thallium	10	1.6	U	1.6	U	1.6	U	1.6	U	1.6	U	1.6	U	1.6	U	1.6	U				
Vanadium	50	22.0		2.6	U	2.6	U	2.7		3.7		14.2		10.5		10.5					
Zinc	20	8.5	U	8.5	U	8.5	U	8.5	U	12.9		8.5	U	8.5	U	8.5	U				
Cyanide	10	N/A		N/A		N/A		N/A		N/A		N/A		N/A		N/A					

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

9613473.1694

INORGANIC ANALYSIS, WATER MATRIX, (µg/L)

Project: WESTINGHOUSE-HANFORD																					
Laboratory: TMA																					
Case	SDG: B09D70																				
Sample Number		B09D70		B09DH8																	
Location		199-F5-1		EB-1																	
Remarks				EB																	
Sample Date		10/28/93		10/28/93																	
Inorganic Analytes	CRDL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Aluminum	200	19.1	U	10.6	U																
Antimony	60	16.0	U	12.9	U																
Arsenic	10	2.1	U	2.1	U																
Barium	200	46.7	U	1.2	U																
Beryllium	5	0.20	U	0.20	U																
Cadmium	5	1.3	U	1.3	U																
Calcium	5000	46000		59.0	U																
Chromium	10	6.0	U	2.4	U																
Cobalt	50	2.6	U	2.6	U																
Copper	25	8.3	U	5.2	U																
Iron	100	342		10.0	U																
Lead	3	2.9	U	2.9	U																
Magnesium	5000	6800		22.9	U																
Manganese	15	4.7	U	0.80	U																
Mercury	0.2	0.20	U	0.20	U																
Nickel	40	7.6	U	4.4	U																
Potassium	5000	2880		186																	
Selenium	5	2.8	U	2.8	U																
Silver	10	2.6	U	2.6	U																
Sodium	5000	4400		114	U																
Thallium	10	1.6	U	1.6	U																
Vanadium	50	5.5	U	5.5	U																
Zinc	20	13.3	U	4.4	U																
Cyanide	10	10.0	R	10.0	R																

EB = Equipment Blank

BLANK AND SAMPLE DATA SUMMARY

SDG: B09D70	REVIEWER: RS			DATE: 1/19/94				PAGE_1_OF_1_	
COMMENTS:									
SAMPLE ID	COMPOUND	RESULT	Q	RT	UNITS	5X RESULT	10X RESULT	SAMPLES AFFECTED	QUALIFIER
CCB	Aluminum	31.0			ug/L	155	310	B09D70	U
CCB	Antimony	23.3			ug/L	116.5	233	B09D70	U
CCB	Barium	2.3			ug/L	11.5	23	B09D70	U
CCB	Chromium	3.8			ug/L	19.0	38.0	B09D70, B09DH8	U
CCB	Copper	13.4			ug/L	67.0	134	B09D70, B09DH8	U
CCB	Iron	17.0			ug/L	85.0	170	B09DH8	U
CCB	Manganese	1.8			ug/L	9.0	18.0	B09D70	U
CCB	Nickel	6.1			ug/L	30.5	61.0	B09D70, B09DH8	U
CCB	Zinc	9.8			ug/L	49	98	B09D70	U

9613473.1696

ACCURACY DATA SUMMARY

SDG: B09D70	REVIEWER: RJS	DATE: 1/19/94	PAGE 1 OF 1	
COMMENTS:				
SAMPLE ID	COMPOUND	% RECOVERY	SAMPLE(S) AFFECTED	QUALIFIER REQUIRED
B09DH8S	Cyanide	16.7	B09D70, B09DH8	R

9413473.1697

DATA QUALIFICATION SUMMARY

SDG: B09D70	REVIEWER: RJS	DATE: 1/19/94	PAGE 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Aluminum	U	B09D70	Lab Blank Contamination
Antimony	U	B09D70	Lab Blank Contamination
Barium	U	B09D70	Lab Blank Contamination
Chromium	U	B09D70, B09DH8	Lab Blank Contamination
Copper	U	B09D70, B09DH8	Lab Blank Contamination
Iron	U	B09DH8	Lab Blank Contamination
Manganese	U	B09D70	Lab Blank Contamination
Nickel	U	B09D70, B09DH8	Lab Blank Contamination
Zinc	U	B09D70	Lab Blank Contamination
Cyanide	R	B09D70, B09DH8	Matrix Spike

INORGANIC ANALYSIS, WATER MATRIX, (μg/L)

Project: WESTINGHOUSE-HANFORD																					
Laboratory: TMA																					
Case	SDG: B09D71																				
Sample Number		B09D71		B09DH9																	
Location		199-F5-1		EB-1																	
Remarks		FIL		EB,FIL																	
Sample Date		10/28/93		10/28/93																	
Inorganic Analytes	CRDL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Aluminum	200	10.6	U	13.1	U																
Antimony	60	14.3	U	21.4	U																
Arsenic	10	2.1	U	2.1	U																
Barium	200	47.3		1.2	U																
Beryllium	5	0.20	U	0.20	U																
Cadmium	5	1.3	U	1.3	U																
Calcium	5000	46300		59.0	U																
Chromium	10	2.2	U	3.0	U																
Cobalt	50	2.6	U	2.6	U																
Copper	25	2.5	U	4.3	U																
Iron	100	15.5	U	5.3	U																
Lead	3	2.9	U	2.9	U																
Magnesium	5000	6870		40.2	U																
Manganese	15	1.2	U	1.6	U																
Mercury	0.2	0.20	U	0.20	U																
Nickel	40	3.4	U	3.7	U																
Potassium	5000	2800		308	U																
Selenium	5	2.8	U	2.8	U																
Silver	10	2.6	U	2.6	U																
Sodium	5000	4520		138																	
Thallium	10	1.6	U	1.6	U																
Vanadium	50	5.5	U	5.5	U																
Zinc	20	4.4	U	6.2	U																
Cyanide	10	N/A		N/A																	

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

BLANK AND SAMPLE DATA SUMMARY

SDG: B09D71	REVIEWER: RJS			DATE: 1/18/94				PAGE 1 OF 1	
COMMENTS:									
SAMPLE ID	COMPOUND	RESULT	Q	RT	UNITS	5X RESULT	10X RESULT	SAMPLES AFFECTED	QUALIFIER
PB	Aluminum	49.95			ug/L	247.5	499.5	B09DH9	U
CCB	Antimony	23.3			ug/L	116.5	233.0	B09D71, B09DH9	U
CCB	Chromium	3.8			ug/L	19.0	38	B09D71, B09DH9	U
CCB	Copper	13.4			ug/L	67.0	134	B09DH9	U
CCB	Iron	17.0			ug/L	85.0	170	B09D71	U
CCB	Magnesium	63.1			ug/L	315.5	631.0	B09DH9	U
CCB	Manganese	1.8			ug/L	9.0	18.0	B09D71, B09DH9	U
CCB	Nickel	6.1			ug/L	30.5	61.0	B09DH9	U
CCB	Potassium	90.130			ug/L	450.65	901.3	B09DH9	U
CCB	Zinc	9.8			ug/L	49.0	98.0	B09DH9	U

9413428.1700

DATA QUALIFICATION SUMMARY

SDG: B09D71	REVIEWER: RJS	DATE: 1/18/94	PAGE 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Aluminum	U	B09DH9	Lab Blank Contamination
Antimony	U	B09D71, B09DH9	Lab Blank Contamination
Chromium	U	B09D71, B09DH9	Lab Blank Contamination
Copper	U	B09DH9	Lab Blank Contamination
Iron	U	B09D71	Lab Blank Contamination
Magnesium	U	B09DH9	Lab Blank Contamination
Manganese	U	B09D71, B09DH9	Lab Blank Contamination
Nickel	U	B09DH9	Lab Blank Contamination
Potassium	U	B09DH9	Lab Blank Contamination
Zinc	U	B09DH9	Lab Blank Contamination

INORGANIC ANALYSIS, WATER MATRIX, (µg/L)

Project: WESTINGHOUSE-HANFORD																					
Laboratory: TMA																					
Case	SDG: B09D78																				
Sample Number		B09D78		B09D98																	
Location		199-F5-4		199-F5-45																	
Remarks		NV		NV																	
Sample Date		11/06/93		11/06/93																	
Inorganic Analytes	CRDL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Aluminum	200	10.6	U	10.6	U																
Antimony	60	12.9	U	12.9	U																
Arsenic	10	4.0		7.3																	
Barium	200	51.3		23.6																	
Beryllium	5	0.33		0.33																	
Cadmium	5	1.3	U	1.3	U																
Calcium	5000	102000		51300																	
Chromium	10	18.4		11.7																	
Cobalt	50	2.6	U	2.6	U																
Copper	25	8.0		4.9																	
Iron	100	42.1		21.3																	
Lead	3	2.9	U	2.9	U																
Magnesium	5000	23500		11800																	
Manganese	15	1.6		1.3																	
Mercury	0.2	0.20	U	0.20	U																
Nickel	40	3.4	U	5.0																	
Potassium	5000	6600		4710																	
Selenium	5	3.6		2.8	U																
Silver	10	2.6	U	2.6	U																
Sodium	5000	27100		16800																	
Thallium	10	1.6	U	4.1																	
Vanadium	50	5.5	U	9.1																	
Zinc	20	5.4		4.4	U																
Cyanide	10	10.0	U	10.0	U																

NV = Not Validated

INORGANIC ANALYSIS, WATER MATRIX, (µg/L)

Project: WESTINGHOUSE-HANFORD																					
Laboratory: TMA																					
Case	SDG: B09D79																				
Sample Number		B09D79		B09D99																	
Location		199-F5-4		199-F5-45																	
Remarks		NV,FIL		NV,FIL																	
Sample Date		11/06/93		11/06/93																	
Inorganic Analytes	CRDL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Aluminum	200	22.4		21.2																	
Antimony	60	9.2	U	15.4																	
Arsenic	10	5.1		5.4																	
Barium	200	56.6		29.5																	
Beryllium	5	0.20	U	0.20	U																
Cadmium	5	1.1		1.6																	
Calcium	5000	102000		50300																	
Chromium	10	20.1		8.8																	
Cobalt	50	3.0	U	3.0	U																
Copper	25	2.9	U	3.0																	
Iron	100	22.4		21.3																	
Lead	3	2.9	U	2.9	U																
Magnesium	5000	23700		11700																	
Manganese	15	1.3	U	2.4																	
Mercury	0.2	0.20	U	0.20	U																
Nickel	40	3.9	U	5.1																	
Potassium	5000	6580		4810																	
Selenium	5	3.6		2.8	U																
Silver	10	3.7	U	3.7	U																
Sodium	5000	27700		17100																	
Thallium	10	1.6	U	2.2																	
Vanadium	50	5.5		14.0																	
Zinc	20	8.5	U	8.5	U																
Cyanide	10	N/A		N/A																	

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

INORGANIC ANALYSIS, WATER MATRIX, (µg/L)

Project: WESTINGHOUSE-HANFORD																					
Laboratory: TMA																					
Case	SDG: B09D82																				
Sample Number		B09D82		B09DG2																	
Location		199-F5-6		199-F5-6																	
Remarks				DUP																	
Sample Date		10/26/93		10/26/93																	
Inorganic Analytes	CRDL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Aluminum	200	49.0	U	123																	
Antimony	60	9.2	U	9.2	U																
Arsenic	10	2.1	UJ	2.1	UJ																
Barium	200	30.8		34.7																	
Beryllium	5	0.20	U	0.20	U																
Cadmium	5	1.0	U	1.0	U																
Calcium	5000	54900		54500																	
Chromium	10	53.2		61.1																	
Cobalt	50	3.0	U	3.0	U																
Copper	25	10.4		55.8																	
Iron	100	312		1180																	
Lead	3	2.9	U	2.9	U																
Magnesium	5000	8680		8650																	
Manganese	15	9.2		16.3																	
Mercury	0.2	0.20	U	0.20	U																
Nickel	40	3.9	U	3.9	U																
Potassium	5000	2570		2520																	
Selenium	5	2.8	U	2.8	U																
Silver	10	3.7	U	3.7	U																
Sodium	5000	7670		7640																	
Thallium	10	2.6	U	1.9	U																
Vanadium	50	3.0		2.7																	
Zinc	20	12.3		21.2																	
Cyanide	10	10.0	U	10.0	U																

9613473.1904

BLANK AND SAMPLE DATA SUMMARY

SDG: B09D82	REVIEWER: HMS			DATE: 1/18/94				PAGE 1 OF 2	
COMMENTS:									
SAMPLE ID	COMPOUND	RESULT	Q	RT	UNITS	5X RESULT	10X RESULT	SAMPLES AFFECTED	QUALIFIER
PB	Aluminum	18.05			ug/L	90.25	180.5	B09D82	U
CCB	Thallium	3.2			ug/L	16	32	All	U

9513475.1705

BLANK AND SAMPLE DATA SUMMARY

SDG: B09D82	REVIEWER: HMS			DATE: 1/18/94				PAGE 2 OF 2	
COMMENTS:									
SAMPLE ID	COMPOUND	RESULT	Q	RT	UNITS	2X RESULT	10X RESULT	SAMPLES AFFECTED	QUALIFIER
CCB	Arsenic	-2.4			ug/L	12	24	All	J

9613475.1706

9613473.1707

PRECISION DATA SUMMARY

SDG: B09D82	REVIEWER: SC	DATE: 1/20/94	PAGE 1 OF 1		
COMMENTS:					
COMPOUND	SAMPLE ID:	SAMPLE ID:	RPD	SAMPLES AFFECTED	QUALIFIER
Copper	B09D82	B09DG2	81.4	B09DB6, B09DG6	None
Iron	B09D82	B09DG2	73.6	B09DB6, B09DG6	None

DATA QUALIFICATION SUMMARY

SDG: B09D82	REVIEWER: HMS	DATE: 1/18/94	PAGE 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Aluminum	U	B09D82	Lab Blank Contamination
Thallium	U	All	Lab Blank Contamination
Arsenic	J	All	Negative Lab Blank Contamination
Copper	None	All	Field Duplicate RPD
Iron	None	All	Field Duplicate RPD

INORGANIC ANALYSIS, WATER MATRIX, (μg/L)

Project: WESTINGHOUSE-HANFORD																						
Laboratory: TMA																						
Case	SDG: B09D83																					
Sample Number		B09D83		B09DG3																		
Location		199-F5-6		199-F5-6																		
Remarks		FIL		DUP,FIL																		
Sample Date		10/26/93		10/26/93																		
Inorganic Analytes	CRDL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	
Aluminum	200	12.7	U	24.4	U																	
Antimony	60	12.9	U	12.9	U																	
Arsenic	10	2.1	UJ	2.1	UJ																	
Barium	200	31.4		31.6																		
Beryllium	5	0.21	U	0.20	U																	
Cadmium	5	1.3	U	1.3	U																	
Calcium	5000	56800		58300																		
Chromium	10	48.3		49.7																		
Cobalt	50	2.6	U	2.6	U																	
Copper	25	6.0	U	3.2	U																	
Iron	100	44.8	U	30.3	U																	
Lead	3	2.9	U	2.9	U																	
Magnesium	5000	8930		9110																		
Manganese	15	5.2	U	5.4	U																	
Mercury	0.2	0.20	U	0.20	U																	
Nickel	40	3.4	U	3.4	U																	
Potassium	5000	2660		2730																		
Selenium	5	2.8	U	2.8	U																	
Silver	10	2.6	U	2.6	U																	
Sodium	5000	7910		8090																		
Thallium	10	3.7	U	2.5	U																	
Vanadium	50	5.5	U	5.5	U																	
Zinc	20	5.5	U	4.4	U																	
Cyanide	10	N/A		N/A																		

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

BLANK AND SAMPLE DATA SUMMARY

SDG: B09D83	REVIEWER: HMS			DATE: 1/18/94				PAGE 1 OF 2	
COMMENTS:									
SAMPLE ID	COMPOUND	RESULT	Q	RT	UNITS	5X RESULT	10X RESULT	SAMPLES AFFECTED	QUALIFIER
PB	Aluminum	23.77			ug/L	118.85	237.7	All	U
CCB	Beryllium	.30			ug/L	1.5	3.0	All	U
ICB	Copper	17.8			ug/L	89	178	All	U
PB	Iron	53.49			ug/L	267.45	534.9	All	U
CCB	Manganese	1.4			ug/L	7	14	All	U
CCB	Thallium	3.2			ug/L	16	32	All	U
ICB	Zinc	10			ug/L	50	100	B09D83	U

9613174.1710

BLANK AND SAMPLE DATA SUMMARY

SDG: B09D83	REVIEWER: HMS			DATE: 1/18/94				PAGE 2 OF 2	
COMMENTS:									
SAMPLE ID	COMPOUND	RESULT	Q	RT	UNITS	2X RESULT	10X RESULT	SAMPLES AFFECTED	QUALIFIER
CCB	Arsenic	-2.4			ug/L	12	24	All	J

DATA QUALIFICATION SUMMARY

SDG: B09D83	REVIEWER: HMS	DATE: 1/18/94	PAGE 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Aluminum	U	All	Lab Blank Contamination
Beryllium	U	All	Lab Blank Contamination
Copper	U	All	Lab Blank Contamination
Iron	U	All	Lab Blank Contamination
Manganese	U	All	Lab Blank Contamination
Thallium	U	All	Lab Blank Contamination
Zinc	U	B09D83	Lab Blank Contamination
Arsenic	J	All	Negative Lab Blank Contamination

INORGANIC ANALYSIS, WATER MATRIX, (µg/L)

Project: WESTINGHOUSE-HANFORD																					
Laboratory: TMA																					
Case	SDG: B09DB2																				
Sample Number		B09DB2		B09DD6																	
Location		199-F5-46		199-F7-3																	
Remarks		NV		NV																	
Sample Date		11/06/93		11/06/93																	
Inorganic Analytes	CRDL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Aluminum	200	122		310																	
Antimony	60	13.0		14.9																	
Arsenic	10	6.2		7.3																	
Barium	200	40.4		47.6																	
Beryllium	5	0.20	U	0.20	U																
Cadmium	5	1.3	U	1.3	U																
Calcium	5000	75600		67800																	
Chromium	10	75.1		8.0																	
Cobalt	50	2.6	U	2.6	U																
Copper	25	2.5	U	3.1																	
Iron	100	26.5		26.6																	
Lead	3	2.9	U	2.9	U																
Magnesium	5000	10300		20600																	
Manganese	15	3.5		49.9																	
Mercury	0.2	0.20	U	0.20	U																
Nickel	40	5.3		7.0																	
Potassium	5000	4500		8360																	
Selenium	5	3.4		3.9																	
Silver	10	2.6	U	2.6	U																
Sodium	5000	21000		74500																	
Thallium	10	2.5		2.2																	
Vanadium	50	5.5	U	9.9																	
Zinc	20	4.4	U	4.4	U																
Cyanide	10	10.0	U	10.0	U																

NV = Not Validated

9613473.1716

INORGANIC ANALYSIS, WATER MATRIX, (μg/L)

Project: WESTINGHOUSE-HANFORD																					
Laboratory: TMA																					
Case	SDG: B09DB3																				
Sample Number		B09DB3		B09DD7																	
Location		199-F5-46		199-F7-3																	
Remarks		NV,FIL		NV,FIL																	
Sample Date		11/06/93		11/06/93																	
Inorganic Analytes	CRDL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Aluminum	200	25.3		18.2																	
Antimony	60	12.9	U	12.9	U																
Arsenic	10	6.2		9.3																	
Barium	200	40.1		46.1																	
Beryllium	5	0.20	U	0.20	U																
Cadmium	5	1.3	U	1.3	U																
Calcium	5000	76500		66800																	
Chromium	10	70.2		3.5																	
Cobalt	50	2.8		2.6	U																
Copper	25	2.5	U	2.5	U																
Iron	100	5.3	U	5.3	U																
Lead	3	2.9	U	2.9	U																
Magnesium	5000	10300		20400																	
Manganese	15	0.80	U	43.1																	
Mercury	0.2	0.20	U	0.20	U																
Nickel	40	3.4	U	3.4	U																
Potassium	5000	4500		8020																	
Selenium	5	3.1		4.0																	
Silver	10	2.6	U	2.6	U																
Sodium	5000	21000		72900																	
Thallium	10	2.4		2.5																	
Vanadium	50	5.5	U	7.9																	
Zinc	20	4.4	U	4.4	U																
Cyanide	10	N/A		N/A																	

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

9613479.1714

INORGANIC ANALYSIS, WATER MATRIX, (µg/L)

Project: WESTINGHOUSE-HANFORD																					
Laboratory: TMA																					
Case	SDG: B09DB6																				
Sample Number		B09DB6		B09DC0		B09DF0		B09DG6													
Location		199-F5-47		199-F5-48		199-F8-2		199-F5-47													
Remarks				NV		NV		DUP													
Sample Date		10/31/93		10/31/93		10/31/93		10/31/93													
Inorganic Analytes	CRDL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Aluminum	200	30.9	U	116		23.6		27.9	U												
Antimony	60	12.9	U	12.9	U	12.9	U	12.9	U												
Arsenic	10	3.0		2.1	U	3.3		2.4													
Barium	200	53.5		38.2		45.8		53.8													
Beryllium	5	0.22	U	0.30		0.20	U	0.20	U												
Cadmium	5	1.3	U	1.3	U	1.3	U	1.3	U												
Calcium	5000	102000		82200		97000		106000													
Chromium	10	15.4		19.6		8.1		15.4													
Cobalt	50	2.6	U	2.6	U	2.6	U	2.6	U												
Copper	25	2.5	UJ	2.5	U	2.5	U	2.5	UJ												
Iron	100	64.5	U	60.3		173		48.9	U												
Lead	3	2.9	U	2.9	U	2.9	U	2.9	U												
Magnesium	5000	23300		19300		25200		24100													
Manganese	15	2.8	U	4.1		4.4		2.4	U												
Mercury	0.2	0.20	U	0.20	U	0.20	U	0.20	U												
Nickel	40	27.2		7.4		3.4	U	44.8													
Potassium	5000	6120		6390		8130		6320													
Selenium	5	2.8	U	2.8	U	2.8	U	3.4													
Silver	10	2.6	U	2.6	U	2.6	U	2.6	U												
Sodium	5000	32900		22800		32600		34100													
Thallium	10	2.6	U	2.2		1.6	U	1.6	U												
Vanadium	50	5.5	U	6.0		5.5	U	5.5	U												
Zinc	20	4.4	U	6.6		4.4	U	4.4	U												
Cyanide	10	10.0	U	10.0	U	10.0	U	10.0	U												

9513974.1715

BLANK AND SAMPLE DATA SUMMARY

SDG: B09DB6	REVIEWER: HMS			DATE: 1/20/94				PAGE 1 OF 1	
COMMENTS:									
SAMPLE ID	COMPOUND	RESULT	Q	RT	UNITS	5X RESULT	10X RESULT	SAMPLES AFFECTED	QUALIFIER
CCB	Aluminum	36.9			ug/L	184.5	369	B09DB6, B09DG6	U
CCB	Beryllium	0.70			ug/L	3.5	7.0	B09DB6	U
PB	Copper	-5.6			ug/L	28.0	56	B09DB6, B09DG6	J
PB	Iron	30.46			ug/L	152.3	304.6	B09DB6, B09DG6	U
CCB	Manganese	4.1			ug/L	20.5	41	B09DB6, B09DG6	U
ICB	Thallium	3.2			ug/L	16	32	B09DB6	U

9513473.1717

ACCURACY DATA SUMMARY

SDG: B09DB6	REVIEWER: HMS	DATE: 1/20/94	PAGE 1 OF 1	
COMMENTS:				
SAMPLE ID	COMPOUND	% RECOVERY	SAMPLE(S) AFFECTED	QUALIFIER REQUIRED
B09DG6S	Iron	129.8	B09DB6, B09DG6	None
B09DG6S	Mercury	128.7	B09DB6, B09DG6	None

DATA QUALIFICATION SUMMARY

SDG: B09DB6	REVIEWER: HMS	DATE: 1/20/94	PAGE 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Aluminum	U	B09DB6, B09DG6	Lab Blank Contamination
Beryllium	U	B09DB6	Lab Blank Contamination
Iron	U	B09DB6, B09DG6	Lab Blank Contamination
Manganese	U	B09DB6, B09DG6	Lab Blank Contamination
Thallium	U	B09DB6	Lab Blank Contamination
Copper	J	B09DB6, B09DG6	Negative Lab Blank Contamination
Iron	None	B09DB6, B09DG6	Matrix Spike
Mercury	None	B09DB6, B09DG6	Matrix Spike

INORGANIC ANALYSIS, WATER MATRIX, (µg/L)

Project: WESTINGHOUSE-HANFORD																					
Laboratory: TMA																					
Case	SDG: B09DB7																				
Sample Number		B09DB7		B09DC1		B09DF1		B09DG7													
Location		199-F5-47		199-F5-48		199-F8-2		199-F5-47													
Remarks		FIL		NV,FIL		NV,FIL		DUP,FIL													
Sample Date		10/31/93		10/31/93		10/31/93		10/31/93													
Inorganic Analytes	CRDL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Aluminum	200	193		13.7		10.6	U	28.4	U												
Antimony	60	12.9	U	12.9	U	12.9	U	12.9	U												
Arsenic	10	4.2		2.7		3.1		2.4													
Barium	200	56.8		39.9		48.2		52.5													
Beryllium	5	0.20	U	0.20	U	0.20	U	0.20	U												
Cadmium	5	1.3	UJ	1.3	U	1.3	U	1.3	UJ												
Calcium	5000	106000		87900		101000		102000													
Chromium	10	15.0		17.4		4.7		15.3													
Cobalt	50	2.6	U	2.6	U	2.6	U	2.6	U												
Copper	25	2.5	U	2.5	U	2.5	U	2.5	U												
Iron	100	24.2	U	8.0		12.3		30.4	U												
Lead	3	2.9	U	2.9	U	2.9	U	2.9	U												
Magnesium	5000	23700		20200		25800		22700													
Manganese	15	8.1		1.3		1.0		2.4	U												
Mercury	0.2	0.20	U	0.20	U	0.20	U	0.20	U												
Nickel	40	14.2		3.4	U	3.4	U	15.2													
Potassium	5000	6120		6430		8430		5870													
Selenium	5	2.8	U	2.8	U	2.8	U	2.8	U												
Silver	10	2.6	U	2.6	U	2.6	U	2.6	U												
Sodium	5000	33800		23300		33900		32100													
Thallium	10	1.6	U	1.9		1.6	U	1.6	U												
Vanadium	50	5.5	U	5.5	U	5.5	U	5.5	U												
Zinc	20	4.4	UJ	5.6		4.4	U	4.4	UJ												
Cyanide	10	N/A		N/A		N/A		N/A													

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

9413473.1719

9613473.1720

BLANK AND SAMPLE DATA SUMMARY

SDG: B09DB7	REVIEWER: HMS	DATE: 1/20/94	PAGE 1 OF 2
COMMENTS:			

SAMPLE ID	COMPOUND	RESULT	Q	RT	UNITS	5X RESULT	10X RESULT	SAMPLES AFFECTED	QUALIFIER
CCB	Aluminum	30.9			ug/L	154.5	309	B09DG7	U
PB	Iron	29.42			ug/L	147.1	294.2	B09DB7, B09DG7	U
CCB	Manganese	1.4			ug/L	7.0	14.0	B09DG7	U

BLANK AND SAMPLE DATA SUMMARY

SDG: B09DB7	REVIEWER: HMS			DATE: 1/20/94				PAGE 2 OF 2	
COMMENTS:									
SAMPLE ID	COMPOUND	RESULT	Q	RT	UNITS	2X RESULT	10X RESULT	SAMPLES AFFECTED	QUALIFIER
ICB	Cadmium	-1.6			ug/L	3.2	16.0	B09DB7, B09DG7	J

9613473.1721

PRECISION DATA SUMMARY

SDG: B09DB7	REVIEWER: HMS	DATE: 1/20/94	PAGE 1 OF 1		
COMMENTS:					
COMPOUND	SAMPLE ID:	SAMPLE ID:	RPD	SAMPLES AFFECTED	QUALIFIER
Zinc	B09DG7	B09DG7D	200.0	B09DB7, B09DG7	J

9613473.1722

DATA QUALIFICATION SUMMARY

SDG: B09DB7	REVIEWER: HMS	DATE: 1/20/94	PAGE 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Aluminum	U	B09DG7	Lab Blank Contamination
Iron	U	B09DB7, B09DG7	Lab Blank Contamination
Manganese	U	B09DG7	Lab Blank Contamination
Cadmium	J	B09DG7	Negative Lab Blank Contamination
Zinc	J	B09DB7, B09DG7	Lab Duplicate

INORGANIC ANALYSIS, WATER MATRIX, (μg/L)

Page__1__ of__1__

Project: WESTINGHOUSE-HANFORD																					
Laboratory: TMA																					
Case	SDG: B09DC8																				
Sample Number		B09DC8																			
Location		199-F7-1																			
Remarks		NV																			
Sample Date		10/27/93																			
Inorganic Analytes	CRDL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Aluminum	200	17.9																			
Antimony	60	12.9	U																		
Arsenic	10	9.3																			
Barium	200	45.0																			
Beryllium	5	0.20	U																		
Cadmium	5	1.3	U																		
Calcium	5000	58700																			
Chromium	10	4.1																			
Cobalt	50	2.6	U																		
Copper	25	6.8																			
Iron	100	9.7																			
Lead	3	2.9	U																		
Magnesium	5000	18100																			
Manganese	15	1.3																			
Mercury	0.2	0.20	U																		
Nickel	40	3.4	U																		
Potassium	5000	7680																			
Selenium	5	3.6																			
Silver	10	2.6	U																		
Sodium	5000	55900																			
Thallium	10	2.5																			
Vanadium	50	17.4																			
Zinc	20	12.5																			
Cyanide	10	10.0	U																		

NV = Not Validated

9413172.1724

INORGANIC ANALYSIS, WATER MATRIX, (μg/L)

Project: WESTINGHOUSE-HANFORD																					
Laboratory: TMA																					
Case	SDG: B09DC9																				
Sample Number		B09DC9																			
Location		199-F7-1																			
Remarks		NV,FIL																			
Sample Date		10/27/93																			
Inorganic Analytes	CRDL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Aluminum	200	26.4																			
Antimony	60	14.0																			
Arsenic	10	10.1																			
Barium	200	46.2																			
Beryllium	5	0.24																			
Cadmium	5	1.3	U																		
Calcium	5000	59200																			
Chromium	10	5.5																			
Cobalt	50	2.6	U																		
Copper	25	2.5	U																		
Iron	100	25.5																			
Lead	3	2.9	U																		
Magnesium	5000	18200																			
Manganese	15	1.4																			
Mercury	0.2	0.20	U																		
Nickel	40	3.4	U																		
Potassium	5000	7540																			
Selenium	5	3.3																			
Silver	10	2.6	U																		
Sodium	5000	55400																			
Thallium	10	2.4																			
Vanadium	50	17.7																			
Zinc	20	5.0																			
Cyanide	10	N/A																			

NV = Not Validated N/A = Not Applicable

9613473.1725

9613479.1726

INORGANIC ANALYSIS, WATER MATRIX, (µg/L)

Project: WESTINGHOUSE-HANFORD																					
Laboratory: Roy F. Weston																					
Case	SDG: B09DH0																				
Sample Number		B09DH0		B09DH1																	
Location		199-F5-6		199-F5-6																	
Remarks		SPLIT		SPLIT,FIL																	
Sample Date		10/26/93		10/26/93																	
Inorganic Analytes	CRDL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Aluminum	200	64.7	U	37.3	U																
Antimony	60	20.0	UJ	20.0	UJ																
Arsenic	10	2.0	UJ	2.0	UJ																
Barium	200	34.9		29.6																	
Beryllium	5	1.0	U	1.0	U																
Cadmium	5	2.7	J	2.3	J																
Calcium	5000	52900	J	49600	J																
Chromium	10	55.9		42.5																	
Cobalt	50	5.0	U	5.0	U																
Copper	25	6.8	U	3.2	U																
Iron	100	343	J	46.4	UJ																
Lead	3	2.9	J	2.0	UJ																
Magnesium	5000	8580	J	7970	J																
Manganese	15	10.1	U	6.5	U																
Mercury	0.2	0.10	U	0.10	U																
Nickel	40	8.0	U	8.0	U																
Potassium	5000	2790		2670																	
Selenium	5	2.2	J	2.0	UJ																
Silver	10	3.0	U	3.0	U																
Sodium	5000	7600	J	7060	J																
Thallium	10	2.0	U	2.0	U																
Vanadium	50	15.6	U	15.8	U																
Zinc	20	11.2	U	9.4	U																
Cyanide	10	20.0	U	N/A																	

FIL = Filtered N/A = Not Applicable

BLANK AND SAMPLE DATA SUMMARY

SDG: B09DH0	REVIEWER: HMS			DATE: 1/18/94				PAGE 1 OF 2	
COMMENTS:									
SAMPLE ID	COMPOUND	RESULT	Q	RT	UNITS	5X RESULT	10X RESULT	SAMPLES AFFECTED	QUALIFIER
PB	Aluminum	28.3			ug/L	141.5	283	All	U
PB	Arsenic	-2.1			ug/L	10.5	21	All	J
PB	Copper	3.5			ug/L	17.5	35	All	U
PB	Iron	64.5			ug/L	322.5	645	B09DH1	U
ICB	Manganese	2.2			ug/L	11	22	All	U
PB	Nickel	20.3			ug/L	101.5	203	All	U
CCB	Vanadium	15.2			ug/L	76	152	All	U
PB	Zinc	6.6			ug/L	33	66	All	U

9613473.1727

BLANK AND SAMPLE DATA SUMMARY

SDG: B09DH0	REVIEWER: HMS			DATE: 1/18/94				PAGE 2 OF 2	
COMMENTS:									
SAMPLE ID	COMPOUND	RESULT	Q	RT	UNITS	2X RESULT	10X RESULT	SAMPLES AFFECTED	QUALIFIER
CCB	Lead	-2.2			ug/L	4.4	22	All	J

9613473.1728

9613473.1729

ACCURACY DATA SUMMARY

SDG: B09DH0	REVIEWER: HMS	DATE: 1/18/94	PAGE 1 OF 1	
COMMENTS:				
SAMPLE ID	COMPOUND	% RECOVERY	SAMPLE(S) AFFECTED	QUALIFIER REQUIRED
B09DH0S	Antimony	71.1	All	J
B09DH0S	Selenium	69.0	All	J
B09DH0A	Selenium	52.0	B09DH0	J
B09DH1A	Selenium	66.3	B09DH1	J

PRECISION DATA SUMMARY

SDG: B09DH0	REVIEWER: HMS	DATE: 1/18/94	PAGE 1 OF 1		
COMMENTS:					
COMPOUND	SAMPLE ID:	SAMPLE ID:	RPD	SAMPLES AFFECTED	QUALIFIER
Cadmium	B09DH0	B09DH0D	118.2	All	J
Calcium	B09DH0	B09DH0L	14.3	All	J
Iron	B09DH0	B09DH0L	13.3	All	J
Magnesium	B09DH0	B09DH0L	16.7	All	J
Sodium	B09DH0	B09DH0L	14.5	All	J

9513478.1750

DATA QUALIFICATION SUMMARY

SDG: B09DH0	REVIEWER: HMS	DATE: 1/18/94	PAGE 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Aluminum	U	All	Lab Blank Contamination
Copper	U	All	Lab Blank Contamination
Iron	U	B09DH1	Lab Blank Contamination
Manganese	U	All	Lab Blank Contamination
Nickel	U	All	Lab Blank Contamination
Vanadium	U	All	Lab Blank Contamination
Zinc	U	All	Lab Blank Contamination
Arsenic	J	All	Negative Lab Blank Contamination
Lead	J	All	Negative Lab Blank Contamination
Antimony	J	All	Matrix Spike
Selenium	J	All	Matrix Spike
Cadmium	J	All	Lab Duplicate
Selenium	J	All	GFAA Analytical Spike
Calcium	J	All	ICP Serial Dilution
Iron	J	All	ICP Serial Dilution
Magnesium	J	All	ICP Serial Dilution
Sodium	J	All	ICP Serial Dilution

INORGANIC ANALYSIS, WATER MATRIX, (µg/L)

Project: WESTINGHOUSE-HANFORD																					
Laboratory: Roy F. Weston																					
Case	SDG: B09DH4																				
Sample Number		B09DH4		B09DH5																	
Location		199-F5-47		199-F5-47																	
Remarks		SPLIT		SPLIT,FIL																	
Sample Date		10/31/93		10/31/93																	
Inorganic Analytes	CRDL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Aluminum	200	21.4	U	25.5	U																
Antimony	60	20.0	UJ	20.0	UJ																
Arsenic	10	2.0	UJ	2.0	UJ																
Barium	200	60.4		57.6																	
Beryllium	5	1.0	U	1.0	U																
Cadmium	5	2.0	U	2.0	U																
Calcium	5000	102000	J	102000	J																
Chromium	10	17.1		21.1																	
Cobalt	50	5.0	U	5.0	U																
Copper	25	3.0	U	3.0	U																
Iron	100	49.5	U	69.1	U																
Lead	3	2.0	U	2.0	UJ																
Magnesium	5000	23500	J	23500	J																
Manganese	15	2.3	J	2.3	J																
Mercury	0.2	0.10	U	0.10	U																
Nickel	40	20.6		14.9																	
Potassium	5000	6180		5400																	
Selenium	5	3.3	J	2.0	UJ																
Silver	10	3.0	UJ	3.0	UJ																
Sodium	5000	34300	J	34000	J																
Thallium	10	2.0	UJ	2.0	UJ																
Vanadium	50	10.9		8.1	J																
Zinc	20	9.3	U	8.0	U																
Cyanide	10	20.0	U	N/A																	

FIL -- Filtered N/A -- Not Applicable

9613473.1732

BLANK AND SAMPLE DATA SUMMARY

SDG: B09DH4	REVIEWER: RJS				DATE: 1/20/94			PAGE 1 OF 2	
COMMENTS:									
SAMPLE ID	COMPOUND	RESULT	Q	RT	UNITS	5X RESULT	10X RESULT	SAMPLES AFFECTED	QUALIFIER
CCB	Aluminum	39.9			ug/L	199.5	399	B09DH4, B09DH5	U
PB	Antimony	-20.0			ug/L	100	200	B09DH4, B09DH5	J
CCB	Iron	17.2			ug/L	86	172	B09DH4, B09DH5	U
PB	Silver	-3.0			ug/L	15	30	B09DH4, B09DH5	J
ICB	Zinc	16.6			ug/L	83	166	B09DH4, B09DH5	U

9613475.1773

9613473.1734

BLANK AND SAMPLE DATA SUMMARY

SDG: B09DH4	REVIEWER: RJS			DATE: 1/20/94				PAGE 2 OF 2	
COMMENTS:									
SAMPLE ID	COMPOUND	RESULT	Q	RT	UNITS	2X RESULT	10X RESULT	SAMPLES AFFECTED	QUALIFIER
CCB	Arsenic	-2.6			ug/L	5.2	26	B09DH4, B09DH5	J
ICB	Manganese	-2.3			ug/L	4.6	23	B09DH4, B09DH5	J
CCB	Thallium	-3.5			ug/L	7.0	35	B09DH4, B09DH5	J
CCB	Vanadium	-4.4			ug/L	8.8	44	B09DH5	J

ACCURACY DATA SUMMARY

SDG: B09DH4	REVIEWER: RJS	DATE: 1/20/94	PAGE 1 OF 1	
COMMENTS:				
SAMPLE ID	COMPOUND	% RECOVERY	SAMPLE(S) AFFECTED	QUALIFIER REQUIRED
B09DH4S	Selenium	64	B09DH4, B09DH5	J
B09DH5A	Lead	84.9	B09DH5	J
B09DH4A	Selenium	72	B09DH4	J
B09DH5A	Selenium	79.5	B09DH5	J

9413473.1736

PRECISION DATA SUMMARY

SDG: B09DH4	REVIEWER: RJS	DATE: 1/20/94	PAGE 1 OF 1
COMMENTS:			

COMPOUND	SAMPLE ID:	SAMPLE ID:	RPD	SAMPLES AFFECTED	QUALIFIER
Calcium	B09DH4	B09DH4L	14.8	B09DH4, B09DH5	J
Magnesium	B09DH4	B09DH4L	15	B09DH4, B09DH5	J
Sodium	B09DH4	B09DH4L	12.2	B09DH4, B09DH5	J

9413473.1736

DATA QUALIFICATION SUMMARY

SDG: B09DH4	REVIEWER: RJS	DATE: 1/20/94	PAGE 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Aluminum	U	B09DH4, B09DH5	Lab Blank Contamination
Iron	U	B09DH4, B09DH5	Lab Blank Contamination
Zinc	U	B09DH4, B09DH5	Lab Blank Contamination
Antimony	J	B09DH4, B09DH5	Negative Lab Blank Contamination
Arsenic	J	B09DH4, B09DH5	Negative Lab Blank Contamination
Manganese	J	B09DH4, B09DH5	Negative Lab Blank Contamination
Silver	J	B09DH4, B09DH5	Negative Lab Blank Contamination
Thallium	J	B09DH4, B09DH5	Negative Lab Blank Contamination
Vanadium	J	B09DH5	Negative Lab Blank Contamination
Selenium	J	B09DH4, B09DH5	Matrix Spike
Lead	J	B09DH5	GFAA Analytical Spike
Selenium	J	B09DH4, B09DH5	GFAA Analytical Spike
Calcium	J	B09DH4, B09DH5	ICP Serial Dilution
Magnesium	J	B09DH4, B09DH5	ICP Serial Dilution
Sodium	J	B09DH4, B09DH5	ICP Serial Dilution

INORGANIC ANALYSIS, WATER MATRIX, (µg/L)

Project: WESTINGHOUSE-HANFORD																					
Laboratory: TMA																					
Case	SDG: B09DJ2																				
Sample Number		B09DJ2																			
Location		EB-2																			
Remarks		EB																			
Sample Date		11/03/93																			
Inorganic Analytes	CRDL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Aluminum	200	19.5	UJ																		
Antimony	60	12.9	U																		
Arsenic	10	2.1	U																		
Barium	200	1.2	U																		
Beryllium	5	0.31	U																		
Cadmium	5	1.3	U																		
Calcium	5000	59.0	U																		
Chromium	10	6.3																			
Cobalt	50	2.6	U																		
Copper	25	2.5	U																		
Iron	100	37.7	U																		
Lead	3	2.9	U																		
Magnesium	5000	22.9	U																		
Manganese	15	0.86	U																		
Mercury	0.2	0.20	U																		
Nickel	40	3.6																			
Potassium	5000	101																			
Selenium	5	2.8	U																		
Silver	10	2.6	U																		
Sodium	5000	114	U																		
Thallium	10	1.6	U																		
Vanadium	50	5.5	U																		
Zinc	20	4.4	U																		
Cyanide	10	10.0	U																		

9613473.1736

9613475.1736

BLANK AND SAMPLE DATA SUMMARY

SDG: B09DJ2	REVIEWER: HMS			DATE: 1/19/94				PAGE 1 OF 1	
COMMENTS:									
SAMPLE ID	COMPOUND	RESULT	Q	RT	UNITS	5X RESULT	10X RESULT	SAMPLES AFFECTED	QUALIFIER
CCB	Aluminum	26.5			ug/L	132.5	265	B09DJ2	U
CCB	Beryllium	0.5			ug/L	2.5	50	B09DJ2	U
PB	Iron	34.17			ug/L	170.85	341.7	B09DJ2	U
CCB	Manganese	1.2			ug/L	6	12	B09DJ2	U

PRECISION DATA SUMMARY

SDG: B09DJ2	REVIEWER: HMS	DATE: 1/19/94	PAGE 1 OF 1		
COMMENTS:					
COMPOUND	SAMPLE ID:	SAMPLE ID:	RPD	SAMPLES AFFECTED	QUALIFIER
Aluminum	B09DJ2	B09DJ2D	183.1	B09DJ2	J

DATA QUALIFICATION SUMMARY

SDG: B98DJ2	REVIEWER: HMS	DATE: 1/19/94	PAGE 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Aluminum	U	B09DJ2	Lab Blank Contamination
Beryllium	U	B09DJ2	Lab Blank Contamination
Iron	U	B09DJ2	Lab Blank Contamination
Manganese	U	B09DJ2	Lab Blank Contamination
Aluminum	J	B09DJ2	Lab Duplicate

INORGANIC ANALYSIS, WATER MATRIX, (μg/L)

Project: WESTINGHOUSE-HANFORD																					
Laboratory: TMA																					
Case	SDG: B09DJ3																				
Sample Number		B09DJ3																			
Location		EB-2																			
Remarks		EB,FIL																			
Sample Date		11/03/93																			
Inorganic Analytes	CRDL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Aluminum	200	1230	J																		
Antimony	60	12.9	U																		
Arsenic	10	2.1	U																		
Barium	200	5.1	U																		
Beryllium	5	0.23	U																		
Cadmium	5	1.3	U																		
Calcium	5000	1230																			
Chromium	10	2.9																			
Cobalt	50	2.6	U																		
Copper	25	2.6	U																		
Iron	100	85.9																			
Lead	3	2.9	U																		
Magnesium	5000	130	U																		
Manganese	15	35.6	J																		
Mercury	0.2	0.20	U																		
Nickel	40	3.4	U																		
Potassium	5000	166																			
Selenium	5	2.8	U																		
Silver	10	2.6	U																		
Sodium	5000	262																			
Thallium	10	1.7	U																		
Vanadium	50	5.5	U																		
Zinc	20	8.6	U																		
Cyanide	10	N/A																			

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

9613473.1742

BLANK AND SAMPLE DATA SUMMARY

SDG: B09DJ3	REVIEWER: HMS			DATE: 1/19/94				PAGE 1 OF 1	
COMMENTS:									
SAMPLE ID	COMPOUND	RESULT	Q	RT	UNITS	5X RESULT	10X RESULT	SAMPLES AFFECTED	QUALIFIER
CCB	Barium	1.4			ug/L	7.0	14.0	B09DJ3	U
CCB	Beryllium	.50			ug/L	2.5	5.0	B09DJ3	U
CCB	Copper	7.5			ug/L	37.5	75	B09DJ3	U
CCB	Magnesium	40.2			ug/L	201	402	B09DJ3	U
ICB	Thallium	3.2			ug/L	16	32	B09DJ3	U
CCB	Zinc	5.1			ug/L	25.5	51.0	B09DJ3	U

PRECISION DATA SUMMARY

SDG: B09DJ3	REVIEWER: HMS	DATE: 1/19/94	PAGE 1 OF 1
COMMENTS:			

COMPOUND	SAMPLE ID:	SAMPLE ID:	RPD	SAMPLES AFFECTED	QUALIFIER
Aluminum	B09DJ3	B09DJ3D	106.2	B09DJ3	J
Manganese	B09DJ3	B09DJ3D	95.9	B09DJ3	J
Aluminum	B09DJ3	B09DJ3L	88.5	B09DJ3	J

9613473.1744

DATA QUALIFICATION SUMMARY

SDG: B09DJ3	REVIEWER: HMS	DATE: 1/19/94	PAGE 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Barium	U	B09DJ3	Lab Blank Contamination
Beryllium	U	B09DJ3	Lab Blank Contamination
Copper	U	B09DJ3	Lab Blank Contamination
Magnesium	U	B09DJ3	Lab Blank Contamination
Thallium	U	B09DJ3	Lab Blank Contamination
Zinc	U	B09DJ3	Lab Blank Contamination
Aluminum	J	B09DJ3	Lab Duplicate
Manganese	J	B09DJ3	Lab Duplicate
Aluminum	J	B09DJ3	ICP Serial Dilution

WELL AND SAMPLE INFORMATION					SAMPLE LOCATION INFORMATION
SAMPLE LOCATION	SAMPLE NUMBER	MATRIX	DATE SAMPLED	NV/V	WET CHEMISTRY
199-F1-2	B09D66	W	10/29/93	NV	6-5, 6-6, 6-7
	B09D69	W	10/29/93	V	6-8
199-F5-1	B09D70	W	10/28/93	V	6-17, 6-20, 6-21
	B09D73	W	10/28/93	V	6-8
199-F5-4	B09D78	W	11/06/93	NV	6-25, 6-26, 6-27
	B09D81	W	11/06/93	V	6-8
199-F5-6	B09D82	W	10/26/93	V	6-28, 6-31, 6-32
	B09D85	W	10/26/93	V	6-8
	B09DG2	W	10/26/93	V	6-28, 6-31, 6-32
	B09DG5	W	10/26/93	V	6-9
	B09DH0	W	10/26/93	V	6-44
199-F5-42	B09D86	W	10/30/93	NV	6-5, 6-6, 6-7
	B09D89	W	10/30/93	V	6-8
199-F5-43A	B09D90	W	10/30/93	NV	6-5, 6-6, 6-7
	B09D93	W	10/30/93	V	6-8
199-F5-44	B09D94	W	10/30/93	NV	6-5, 6-6, 6-7
	B09D97	W	10/30/93	V	6-8
199-F5-45	B09D98	W	11/06/93	NV	6-25, 6-26, 6-27
	B09DB1	W	11/06/93	V	6-8
199-F5-46	B09DB2	W	11/06/93	NV	6-33, 6-34, 6-35
	B09DB5	W	11/06/93	V	6-14
199-F5-47	B09DB6	W	10/31/93	V	6-36, 6-39, 6-40
	B09DB9	W	10/31/93	V	6-8
	B09DG6	W	10/31/93	V	6-36, 6-39, 6-40
	B09DG9	W	10/31/93	V	6-9
	B09DH4	W	10/31/93	V	6-47
	B09DH7	W	10/31/93	V	6-9
199-F5-48	B09DC0	W	10/31/93	NV	6-36, 6-39
	B09DC3	W	10/31/93	V	6-9
199-F6-1	B09DC4	W	10/30/93	NV	6-5, 6-6, 6-7
	B09DC7	W	10/30/93	V	6-8
199-F7-1	B09DC8	W	10/27/93	NV	6-41, 6-42, 6-43
	B09DD1	W	10/27/93	V	6-9
199-F7-2	B09DD2	W	10/30/93	NV	6-5, 6-6, 6-7
	B09DD5	W	10/30/93	V	6-8

WELL AND SAMPLE INFORMATION					SAMPLE LOCATION INFORMATION
SAMPLE LOCATION	SAMPLE NUMBER	MATRIX	DATE SAMPLED	NV/V	WET CHEMISTRY
199-F7-3	B09DD6 B09DD9	W W	11/06/93 11/06/93	NV V	6-33, 6-34, 6-35 6-14
199-F8-2	B09DF0 B09DF3	W W	10/31/93 10/31/93	NV V	6-36, 6-39, 6-40 6-14
199-F8-3	B09DF4 B09DF7	W W	10/29/93 10/29/93	NV V	6-5, 6-6, 6-7 6-9
199-F8-4	B09DF8 B09DG1	W W	10/29/93 10/29/93	NV V	6-5, 6-6, 6-7 6-9
EB-1	B09DH8 B09DJ1	W W	10/28/93 10/28/93	V V	6-17, 6-20, 6-21 6-10
EB-2	B09DJ2 B09DJ5	W W	11/03/93 11/03/93	V V	6-50, 6-53, 6-54 6-10

6.0 WET CHEMISTRY DATA VALIDATION

6.1 DATA PACKAGE COMPLETENESS

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

B09D69	B09D82	B09DB6	B09DH4
B09D70	B09DB5	B09DH0	B09DJ2

6.2 HOLDING TIMES

Analytical holding times for alkalinity, ammonia, nitrogen, chloride, COD, fluoride, hydrazine, nitrate-nitrite, pH, phosphate, specific conductance, sulfate, sulfide, TDS, TOC and TOX were assessed to ascertain whether the holding time requirements were met by the laboratory. The holding time requirements are as follows: 28 days for ammonia-nitrogen, chloride, COD, fluoride, NO3NO2, specific conductance, sulfate and TOC; 14 days for alkalinity and hydrazine; seven days for sulfide, TDS and TOX; 72 hours for pH; and 48 hours for phosphate.

The 72-hour holding time for pH was exceeded and all associated results were flagged "J" in the following samples:

- Sample numbers B09D70 and B09DH8 in SDG No. B09D70.
- Sample numbers B09D82 and B09DG2 in SDG No. B09D82.
- Sample numbers B09DB6 and B09DG6 in SDG No. B09DB6.
- Sample number B09DJ2 in SDG No. B09DJ2.

The 48-hour holding time for phosphate was exceeded and the associated results were flagged "J" in the following samples:

- Sample number B09DH0 in SDG No. B09DH0.
- Sample number B09DH4 in SDG No. B09DH4.

The 14-day holding time for hydrazine was exceeded and all associated results were flagged "J" in the following samples:

- All samples in SDG No. B09D69.
- All samples in SDG No. B09DB5.

The twenty-eight day holding time for N03N02 was exceeded and all associated results were qualified as estimates and flagged "J" in the following sample:

- Sample number B09DJ2 in SDG No. B09DJ2.

The seven-day holding time for TOX and TDS was exceeded and all associated results were qualified as estimates and flagged "J" in the following sample:

- Sample number B09DH0 in SDG No. B09DH0.

The twenty-eight day holding time for TOC was exceeded and all associated results were qualified as estimates and flagged "J" in the following sample:

- Sample number B09DH0 in SDG No. B09DH0.

The 48-hour holding time for phosphate was grossly exceeded and all associated results were rejected and flagged "R" in the following samples:

- Sample numbers B09D70 and B09DH8 in SDG No. B09D70.
- Sample numbers B09D82 and B09DG2 in SDG No. B09D82.
- Sample numbers B09DB6 and B09DG6 in SDG No. B09DB6.
- Sample number B09DJ2 in SDG No. B09DJ2.

Holding times for all other analytes reviewed met QC requirements.

6.3 CALIBRATIONS

6.3.1 Initial Calibration

The following calibration procedures must be conducted:

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

  All initial calibration results were acceptable.

6.3.2 Continuing Calibration Verification

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

All continuing calibration results were acceptable.

6.4 BLANKS

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

All laboratory blank results were acceptable.

6.5 ACCURACY

6.5.1 Matrix Spike Recovery

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

The matrix spike recovery for organic bromide and organic chloride (TOX) fell below the QC limits and were qualified as estimates and flagged "J" for the following:

- Sample numbers B09D70 and B09DH8 in SDG No. B09D70.

No matrix spike/matrix spike duplicate analyses were performed for organic iodide (TOX). All associated results were qualified as estimates and flagged "J".

All other matrix spike results were acceptable.

6.5.2 Laboratory Control Sample Recovery

The LCS monitors the overall performance of the analysis, including the sample preparation. An LCS should be prepared (e.g., digested or distilled) and analyzed with every group of samples which have been prepared together. The performance criteria for aqueous LCS percent recovery is 80 to 120 percent. The performance criteria for solid LCS samples are established through interlaboratory studies coordinated by a certifying agency (e.g., EPA or an independent commercial supplier).

All LCS results were found to be acceptable.

6.6 PRECISION

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

The precision RPD for organic bromide and organic chloride (TOX) fell below the QC limits and were qualified as estimates and flagged "J" in the following samples:

- Sample numbers B09D70 and B09DH8 in SDG No. B09D70.

All other duplicate analyses results were acceptable for this data.

6.7 ANALYTE QUANTITATION AND DETECTION LIMITS

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

6.8 OVERALL ASSESSMENT AND SUMMARY

A review of instrument continuing calibration information and QC data indicate that instrument performance was adequate for most analyses. Holding times were exceeded for pH, phosphate and hydrazine, TOX, TOC, TDS and N03N02 in several samples and grossly exceeded for phosphate analyses in three data packages. The accuracy and precision results for organic bromide and organic chloride (TOX) did not meet QC limits in one data package. All associated results were qualified as estimates and flagged "J". Estimated results are usable for limited purposes only. All other validated results are considered accurate within the standard error associated with the methods.

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

Project: WESTINGHOUSE-HANFORD																			
Laboratory: TMA																			
Case	SDG: B09D66																		
Sample Number		B09D66		B09D86		B09D90		B09D94		B09DC4		B09DD2		B09DF4		B09DF8			
Location		199-F1-2		199-F5-42		199-F5-43A		199-F5-44		199-F6-1		199-F7-2		199-F8-3		199-F8-4			
Remarks		NV		NV		NV		NV		NV		NV		NV		NV			
Sample Date		10/29/93		10/30/93		10/30/93		10/30/93		10/30/93		10/30/93		10/29/93		10/29/93			
Analytes	Method	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Chloride	300.0	10.9		0.9		1.2		3.0		1.1		14.3		7.3		10			
Fluoride	300.0	0.7		0.1		0.1		0.1		0.1		0.3		0.2		0.3			
Phosphate	300.0	0.4	U	0.4	U	0.4	U	0.4	U	0.4	U	0.4	U	0.4	U	0.4	U		
pH (pH units)	9040	7.7		7.3		7.7		7.6		7.9		7.8		7.2		7.9			
Sulfate	300.0	52		13		14		21		15		59		55		55			
Alkalinity	310.1	163		86		83		78		81		210		496		202			
TDS	160.1	348		142		138		159		176		473		797		519			
Sulfide	9030	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U		
Ammonia, as N	350.3	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U		
COD	410.1	30	U	30	U	30	U	30	U	30	U	30	U	30	U	30	U		
Elect. Conductivity (umhos/cm)	9050	490		197		187		224		194		652		1130		704			

NV = Not Validated

9613473.1752

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

Project: WESTINGHOUSE-HANFORD																			
Laboratory: TMA																			
Case	SDG: B09D66																		
Sample Number		B09D66		B09D86		B09D90		B09D94		B09DC4		B09DD2		B09DF4		B09DF8			
Location		199-F1-2		199-F5-42		199-F5-43A		199-F5-44		199-F6-1		199-F7-2		199-F8-3		199-F8-4			
Remarks		NV		NV		NV		NV		NV		NV		NV		NV			
Sample Date		10/29/93		10/30/93		10/30/93		10/30/93		10/30/93		10/30/93		10/29/93		10/29/93			
Analytes	Method	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
TOC	415.1	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.4		4.0		1.6			
Organic Bromide	9022	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.06		0.03			
Organic Chloride	9022	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U		
Organic Iodide	9022	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01		0.01	U		

NV = Not Validated

9613473.1753

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

Project: WESTINGHOUSE-HANFORD																			
Laboratory: TMA																			
Case	SDG: B09D66																		
Sample Number		B09D66		B09D86		B09D90		B09D94		B09DC4		B09DD2		B09DF4		B09DF8			
Location		199-F1-2		199-F5-42		199-F5-43A		199-F5-44		199-F6-1		199-F7-2		199-F8-3		199-F8-4			
Remarks		NV		NV		NV		NV		NV		NV		NV		NV			
Sample Date		10/29/93		10/30/93		10/30/93		10/30/93		10/30/93		10/30/93		10/29/93		10/29/93			
Analytes	Method	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
N03N02	415.1	4.95		0.38		0.76		2.32		0.57		16.0		25.8		24.4			

NV = Not Validated

9613473.1764

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

Project: WESTINGHOUSE-HANFORD																			
Laboratory: DataChem																			
Case	SDG: B09D69																		
Sample Number		B09D69		B09D73		B09D81		B09D85		B09D89		B09D93		B09D97		B09DB1		B09DB9	
Location		199-F1-2		199-F5-1		199-F5-4		199-F5-6		199-F5-42		199-F5-43A		199-F5-44		199-F5-45		199-F5-47	
Remarks																			
Sample Date		10/29/93		10/28/93		11/06/93		10/26/93		10/30/93		10/30/93		10/30/93		11/06/93		10/31/93	
Analytes	Method	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Hydrazine	D1385	3.0	UJ	3.0	UJ	3.0	UJ	3.0	UJ	3.0	UJ	3.0	UJ	3.0	UJ	3.0	UJ	3.0	UJ

DUP = Duplicate, EB = Equipment Blank

9613473.1765

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

Project: WESTINGHOUSE-HANFORD																			
Laboratory: DataChem																			
Case	SDG: B09D69																		
Sample Number		B09DC3		B09DC7		B09DD1		B09DD5		B09DF7		B09DG1		B09DG5		B09DG9		B09DH7	
Location		199-F5-48		199-F6-1		199-F7-1		199-F7-2		199-F8-3		199-F8-4		199-F5-6		199-F5-47		199-F5-47	
Remarks														DUP		DUP		SPLIT	
Sample Date		10/31/93		10/30/93		10/27/93		10/30/93		10/29/93		10/29/93		10/26/93		10/31/93		10/31/93	
Analytes	Method	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Hydrazine	D1385	3.0	UJ	3.0	UJ	3.0	UJ	3.0	UJ	3.0	UJ	3.0	UJ	3.0	UJ	3.0	UJ	3.0	UJ

DUP = Duplicate, EB = Equipment Blank

9613473.1756

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

Project: WESTINGHOUSE-HANFORD																			
Laboratory: DataChem																			
Case	SDG: B09D69																		
Sample Number		B09DJ1		B09DJ5															
Location		EB-1		EB-2															
Remarks		EB		EB															
Sample Date		10/28/93		11/03/93															
Analytes	Method	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Hydrazine	D1385	3.0	UJ	3.0	UJ														

DUP = Duplicate, EB = Equipment Blank

9413142.1757

9513473.1758

HOLDING TIME SUMMARY

SDG: B09D69	REVIEWER: LM			DATE: 1/21/94		PAGE 1 OF 2	
COMMENTS:							
FIELD SAMPLE ID	ANALYSIS TYPE	DATE SAMPLED	DATE PREPARED	DATE ANALYZED	PREP. HOLDING TIME, DAYS	ANALYSIS HOLDING TIME, DAYS	QUALIFIER
B09D69	Hydrazine	10/27/93		11/23/93		14	J
B09D73	Hydrazine	10/28/93		11/23/93		14	J
B09D81	Hydrazine	11/06/93		11/23/93		14	J
B09D85	Hydrazine	10/26/93		11/23/93		14	J
B09D89	Hydrazine	10/30/93		11/23/93		14	J
B09D93	Hydrazine	10/30/93		11/23/93		14	J
B09D97	Hydrazine	10/30/93		11/23/93		14	J
B09DB1	Hydrazine	11/06/93		11/23/93		14	J
B09DB9	Hydrazine	10/31/93		11/23/93		14	J
B09DC3	Hydrazine	10/31/93		11/23/93		14	J
B09DC7	Hydrazine	10/30/93		11/23/93		14	J
B09DD1	Hydrazine	10/27/93		11/23/93		14	J
B09DD5	Hydrazine	10/30/93		11/23/93		14	J
B09DF7	Hydrazine	10/29/93		11/23/93		14	J
B09DG1	Hydrazine	10/29/93		11/23/93		14	J
B09DG5	Hydrazine	10/26/93		11/23/93		14	J

9613473.1759

HOLDING TIME SUMMARY

SDG: B09D69	REVIEWER: LM			DATE: 1/21/94		PAGE 2 OF 2	
COMMENTS:							
FIELD SAMPLE ID	ANALYSIS TYPE	DATE SAMPLED	DATE PREPARED	DATE ANALYZED	PREP. HOLDING TIME, DAYS	ANALYSIS HOLDING TIME, DAYS	QUALIFIER
B09DG9	Hydrazine	10/31/93		11/23/93		14	J
B09DH7	Hydrazine	10/31/93		11/23/93		14	J
B09DJ1	Hydrazine	10/28/93		11/23/93		14	J
B09DJ5	Hydrazine	11/03/93		11/23/93		14	J

DATA QUALIFICATION SUMMARY

SDG: B09D69	REVIEWER: LM	DATE: 1/21/94	PAGE 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Hydrazine	J	All	Holding Times Exceeded

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

Project: WESTINGHOUSE-HANFORD																			
Laboratory: DataChem																			
Case	SDG: B09DB5																		
Sample Number		B09DB5		B09DD9		B09DF3													
Location		199-F5-46		199-F7-3		199-F8-2													
Remarks																			
Sample Date		11/06/93		11/06/93		10/31/93													
Analytes	Method	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Hydrazine	D1385	3.0	UJ	3.0	UJ	3.0	UJ												

9513172.1791

HOLDING TIME SUMMARY

SDG: B09DB5	REVIEWER: LM			DATE: 1/21/94		PAGE 1 OF 1	
COMMENTS:							
FIELD SAMPLE ID	ANALYSIS TYPE	DATE SAMPLED	DATE PREPARED	DATE ANALYZED	PREP. HOLDING TIME, DAYS	ANALYSIS HOLDING TIME, DAYS	QUALIFIER
B09DB5	Hydrazine	11/06/93		11/23/93		14	J
B09DD9	Hydrazine	11/06/93		11/23/93		14	J
B09DF3	Hydrazine	10/31/93		11/23/93		14	J

DATA QUALIFICATION SUMMARY

SDG: B09DB5	REVIEWER: LM	DATE: 1/21/94	PAGE 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Hydrazine	J	B09DB5, B09DD9, B09DF3	Holding Times Exceeded

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

Project: WESTINGHOUSE-HANFORD																			
Laboratory: TMA																			
Case	SDG: B09D70																		
Sample Number		B09D70		B09DH8															
Location		199-F5-1		EB-1															
Remarks				EB															
Sample Date		10/28/93		10/28/93															
Analytes	Method	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Chloride	300.0	2.9		0.3															
Fluoride	300.0	0.1		0.1	U														
Phosphate	300.0	0.4	R	0.4	R														
pH (pH units)	9040	7.7	J	5.3	J														
Sulfate	300.0	37		1.0	U														
Alkalinity	310.1	101		8.0															
TDS	160.1	196		5.0	U														
Sulfide	9030	1.0	U	1.0	U														
Ammonia, as N	350.3	0.05	U	0.05	U														
COD	410.1	30	U	30	U														
Elect. Conductivity (umhos/cm)	9050	299		6.0	U														

EB = Equipment Blank

9613473.1764

HOLDING TIME SUMMARY

SDG: B09D70	REVIEWER: SC			DATE: 1/18/94		PAGE 1 OF 1	
COMMENTS:							
FIELD SAMPLE ID	ANALYSIS TYPE	DATE SAMPLED	DATE PREPARED	DATE ANALYZED	PREP. HOLDING TIME, DAYS	ANALYSIS HOLDING TIME, DAYS	QUALIFIER
B09D70	pH	10/28/93		11/02/93		3	J
B09DH8	pH	10/28/93		11/02/93		3	J
B09D70	Phosphate	10/28/93		11/11/93		2	R
B09DH8	Phosphate	10/28/93		11/11/93		2	R

9613473.1765

DATA QUALIFICATION SUMMARY

SDG: B09D70	REVIEWER: SC	DATE: 1/18/94	PAGE 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
pH	J	B09D70, B09DH8	Holding Times Exceeded
Phosphate	R	B09D70, B09DH8	Holding Times Grossly Exceeded

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

Page__1__ of__1__

Project: WESTINGHOUSE-HANFORD																			
Laboratory: TMA																			
Case	SDG: B09D70																		
Sample Number		B09D70		B09DH8															
Location		199-F5-1		EB-1															
Remarks				EB															
Sample Date		10/28/93		10/28/93															
Analytes	Method	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
N03N02	353.2	3.04		0.25	U														

EB = Equipment Blank

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

Project: WESTINGHOUSE-HANFORD																			
Laboratory: TMA																			
Case	SDG: B09D70																		
Sample Number		B09D70		B09DH8															
Location		199-F5-1		EB-1															
Remarks				EB															
Sample Date		10/28/93		10/28/93															
Analytes	Method	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
TOC	415.1	1.0	U	1.0	U														
Organic Bromide	9022	0.01	UJ	0.01	UJ														
Organic Chloride	9022	0.01	UJ	0.01	UJ														
Organic Iodide	9022	0.01	UJ	0.01	UJ														

EB = Equipment Blank

9613473.1768

ACCURACY DATA SUMMARY

SDG: B09D70	REVIEWER: SC	DATE: 1/18/94	PAGE 1 OF 1	
COMMENTS:				
SAMPLE ID	COMPOUND	% RECOVERY	SAMPLE(S) AFFECTED	QUALIFIER REQUIRED
B09DH8MS	Organic Chloride	28%	B09D70, B09DH8	J
B09DH8MS	Organic Bromide	28%	B09D70, B09DH8	J

9613473.1770

PRECISION DATA SUMMARY

SDG: B09D70	REVIEWER: SC	DATE: 1/18/94	PAGE 1 OF 1		
COMMENTS:					
COMPOUND	SAMPLE ID:	SAMPLE ID:	RPD	SAMPLES AFFECTED	QUALIFIER
Organic Chloride	B09DH8MS	B09DH8MSD	120	B09D70, B09DH8	J
Organic Bromide	B09DH8MS	B09DH8MSD	117.5	B09D70, B09DH8	J

DATA QUALIFICATION SUMMARY

SDG: B09D70	REVIEWER: SC	DATE: 1/18/94	PAGE 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Organic Bromide	J	B09D70, B09DH8	Matrix Spike/Precision
Organic Chloride	J	B09D70, B09DH8	Matrix Spike/Precision
Organic Iodide	J	B09D70, B09DH8	No Matrix Spike, Matrix Spike Duplicate Analyses Not Performed

96J473.1772

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

Project: WESTINGHOUSE-HANFORD																			
Laboratory: TMA																			
Case	SDG: B09D78																		
Sample Number		B09D78		B09D98															
Location		199-F5-4		199-F5-45															
Remarks		NV		NV															
Sample Date		11/06/93		11/06/93															
Analytes	Method	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Chloride	300.0	34.4		12.2															
Fluoride	300.0	0.2		0.2															
Phosphate	300.0	0.4	U	0.4	U														
pH (pH units)	9040	7.8		7.9															
Sulfate	300.0	99		40															
Alkalinity	310.1	205		138															
TDS	160.1	538		287															
Sulfide	9030	1.0	U	1.0	U														
Ammonia, as N	350.3	0.05	U	0.05	U														
COD	410.1	30	U	30	U														
Elect. Conductivity	9050	850		450															
(umhos/cm)																			

NV = Not Validated

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

Page__1__ of__1__

Project: WESTINGHOUSE-HANFORD																			
Laboratory: TMA																			
Case	SDG: B09D78																		
Sample Number		B09D78		B09D98															
Location		199-F5-4		199-F5-45															
Remarks		NV		NV															
Sample Date		11/06/93		11/06/93															
Analytes	Method	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
N03N02	353.2	18.6		7.14															

NV = Not Validated

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

Project: WESTINGHOUSE-HANFORD																			
Laboratory: TMA																			
Case	SDG: B09D78																		
Sample Number		B09D78		B09D98															
Location		199-F5-4		199-F5-45															
Remarks		NV		NV															
Sample Date		11/06/93		11/06/93															
Analytes	Method	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
TOC	415.1	1.5		1.2															
Organic Bromide	9022	0.01		0.01	U														
Organic Chloride	9022	0.01	U	0.01	U														
Organic Iodide	9022	0.01	U	0.01	U														

NV = Not Validated

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

Page__1__ of__1__

Project: WESTINGHOUSE-HANFORD																			
Laboratory: TMA																			
Case	SDG: B09D82																		
Sample Number		B09D82		B09DG2															
Location		199-F5-6		199-F5-6															
Remarks				DUP															
Sample Date		10/26/93		10/26/93															
Analytes	Method	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Chloride	300.0	10.8		11.3															
Fluoride	300.0	0.2		0.1															
Phosphate	300.0	0.4	R	0.4	R														
pH (pH units)	9040	7.5	J	7.6	J														
Sulfate	300.0	48		48															
TDS	160.1	257		243															
Sulfide	9030	1.0	U	1.0	U														
Ammonia, as N	350.3	0.05	U	0.05	U														
COD	410.1	30	U	30	U														
Elect. Conductivity (umhos/cm)	9050	376		385															

DUP = Duplicate

HOLDING TIME SUMMARY

SDG: B09D82	REVIEWER: SC			DATE: 1/18/94		PAGE 1 OF 1	
COMMENTS:							
FIELD SAMPLE ID	ANALYSIS TYPE	DATE SAMPLED	DATE PREPARED	DATE ANALYZED	PREP. HOLDING TIME, DAYS	ANALYSIS HOLDING TIME, DAYS	QUALIFIER
B09D82	Phosphate	10/26/93		11/11/93		2	R
B09DG2	Phosphate	10/26/93		11/11/93		2	R
B09D82	pH	10/26/93		11/01/93		3	J
B09DG2	pH	10/26/93		11/01/93		3	J

DATA QUALIFICATION SUMMARY

SDG: B09D82	REVIEWER: SC	DATE: 1/18/94	PAGE 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Phosphate	R	B09D82, B09DG2	Holding Times Grossly Exceeded
pH	J	B09D82, B09DG2	Holding Times Exceeded

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

Page__1__ of__1__

Project: WESTINGHOUSE-HANFORD																			
Laboratory: TMA																			
Case	SDG: B09D82																		
Sample Number		B09D82		B09DG2															
Location		199-F5-6		199-F5-6															
Remarks				DUP															
Sample Date		10/26/93		10/26/93															
Analytes	Method	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
TOC	415.1	1.0	U	1.0	U														
Organic Bromide	9022	0.01	U	0.01	U														
Organic Chloride	9022	0.01	U	0.01	U														
Organic Iodide	9022	0.01	U	0.01	U														

DUP = Duplicate

9613478.1770

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

Project: WESTINGHOUSE-HANFORD																			
Laboratory: TMA																			
Case	SDG: B09D82																		
Sample Number		B09D82		B09DG2															
Location		199-F5-6		199-F5-6															
Remarks				DUP															
Sample Date		10/26/93		10/26/93															
Analytes	Method	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
N03N02	353.2	5.13		5.24															

DUP = Duplicate

9613472.1779

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

Project: WESTINGHOUSE-HANFORD																			
Laboratory: TMA																			
Case	SDG: B09DB2																		
Sample Number		B09DB2		B09DD6															
Location		199-F5-46		199-F7-3															
Remarks		NV		NV															
Sample Date		11/06/93		11/06/93															
Analytes	Method	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Chloride	300.0	13.6		28.2															
Fluoride	300.0	0.2		0.5															
Phosphate	300.0	0.4	U	0.4	U														
pH (pH units)	9040	7.7		7.5															
Sulfate	300.0	52		92															
Alkalinity	310.1	174		202															
TDS	160.1	358		565															
Sulfide	9030	1.0	U	1.0	U														
Ammonia, as N	350.3	0.05	U	0.05	U														
COD	410.1	30	U	30	U														
Specific Conductance (umhos/cm)	9050	550		872															

NV = Not Validated

9613473.1780

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

Project: WESTINGHOUSE-HANFORD																			
Laboratory: TMA																			
Case	SDG: B09DB2																		
Sample Number		B09DB2		B09DD6															
Location		199-F5-46		199-F7-3															
Remarks		NV		NV															
Sample Date		11/06/93		11/06/93															
Analytes	Method	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
N03N02	353.2	8.31		27.9															

NV = Not Validated

9416473.1281

9613473.1702

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

Project: WESTINGHOUSE-HANFORD																			
Laboratory: TMA																			
Case	SDG: B09DB2																		
Sample Number		B09DB2		B09DD6															
Location		199-F5-46		199-F7-3															
Remarks		NV		NV															
Sample Date		11/06/93		11/06/93															
Analytes	Method	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
TOC	415.1	1.2		2.3															
Organic Bromide	9022	0.01	U	0.01	U														
Organic Chloride	9022	0.01	U	0.01	U														
Organic Iodide	9022	0.01	U	0.01	U														

NV = Not Validated

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

Project: WESTINGHOUSE-HANFORD																			
Laboratory: TMA																			
Case	SDG: B09DB6																		
Sample Number		B09DB6		B09DC0		B09DF0		B09DG6											
Location		199-F5-47		199-F5-48		199-F8-2		199-F5-47											
Remarks				NV		NV		DUP											
Sample Date		10/31/93		10/31/93		10/31/93		10/31/93											
Analytes	Method	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Chloride	300.0	33.7		22.8		14.5		33.5											
Fluoride	300.0	0.2		0.2		0.2		0.2											
Phosphate	300.0	0.4	R	0.4	U	0.4	U	0.4	R										
pH (pH units)	9040	7.7	J	7.8		7.9		7.8	J										
Sulfate	300.0	95		69		81		96											
Alkalinity	310.1	210		195		257		211											
TDS	160.1	590		496		578		576											
Sulfide	9030	1.0	U	1.0	U	1.0	U	1.0	U										
Ammonia, as N	350.3	0.05	U	0.05	U	0.05	U	0.05	U										
COD	410.1	30	U	30	U	30	U	30	U										
Elect. Conductivity	9050	810		660		785		808											
(umhos/cm)																			

NV = Not Validated, DUP = Duplicate

9613473.1783

HOLDING TIME SUMMARY

SDG: B09DB6	REVIEWER: SC			DATE: 1/20/94		PAGE 1 OF 1	
COMMENTS:							
FIELD SAMPLE ID	ANALYSIS TYPE	DATE SAMPLED	DATE PREPARED	DATE ANALYZED	PREP. HOLDING TIME, DAYS	ANALYSIS HOLDING TIME, DAYS	QUALIFIER
B09DB6	pH	10/31/93		11/06/93		3	J
B09DB6	pH	10/31/93		11/06/93		3	J
B09DB6	Phosphate	10/31/93		11/18/93		2	R
B09DG6	Phosphate	10/31/93		11/18/93		2	R

DATA QUALIFICATION SUMMARY

SDG: B09DB6	REVIEWER: SC	DATE: 1/20/94	PAGE 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
pH	J	B09DB6, B09DG6	Holding Times Exceeded
Phosphate	R	B09DB6, B09DG6	Holding Times Grossly Exceeded

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

Project: WESTINGHOUSE-HANFORD																			
Laboratory: TMA																			
Case	SDG: B09DB6																		
Sample Number		B09DB6		B09DC0		B09DF0		B09DG6											
Location		199-F5-47		199-F5-48		199-F8-2		199-F5-47											
Remarks				NV		NV		DUP											
Sample Date		10/31/93		10/31/93		10/31/93		10/31/93											
Analytes	Method	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
TOC	415.1	2.2		2.3		2.3		2.0											
Organic Bromide	9022	0.01		0.01		0.05		0.01											
Organic Chloride	9022	0.01	U	0.01	U	0.01	U	0.01	U										
Organic Iodide	9022	0.01	U	0.01	U	0.01	U	0.01	U										

NV = Not Validated, DUP = Duplicate

9613473.1786

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

Project: WESTINGHOUSE-HANFORD																			
Laboratory: TMA																			
Case	SDG: B09DB6																		
Sample Number		B09DB6		B09DC0		B09DF0		B09DG6											
Location		199-F5-47		199-F5-48		199-F8-2		199-F5-47											
Remarks				NV		NV		DUP											
Sample Date		10/31/93		10/31/93		10/31/93		10/31/93											
Analytes	Method	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
N03N02	353.2	20.5		15.5		19.6		20.7											

NV = Not Validated, DUP = Duplicate

9613473.1787

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

Project: WESTINGHOUSE-HANFORD																					
Laboratory: TMA																					
Case	SDG: B09DC8																				
Sample Number		B09DC8																			
Location		199-F7-1																			
Remarks		NV																			
Sample Date		10/27/93																			
Analytes	Method	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q		
Chloride	300.0	15.1																			
Fluoride	300.0	0.7																			
Phosphate	300.0	0.4	U																		
pH (pH units)	9040	7.6																			
Sulfate	300.0	67																			
Alkalinity	310.1	187																			
TDS	160.1	466																			
Sulfide	9030	1.0	U																		
Ammonia, as N	350.3	0.05	U																		
COD	410.1	30	U																		
Elect. Conductivity (umhos/cm)	9050	679																			

NV = Not Validated

9613473.1788

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

Page__1__ of__1__

Project: WESTINGHOUSE-HANFORD																				
Laboratory: TMA																				
Case	SDG: B09DC8																			
Sample Number		B09DC8																		
Location		199-F7-1																		
Remarks		NV																		
Sample Date		10/27/93																		
Analytes	Method	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	
N03N02	353.2	22.5																		

NV = Not Validated

9613474.1789

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

Project: WESTINGHOUSE-HANFORD																			
Laboratory: TMA																			
Case	SDG: B09DC8																		
Sample Number		B09DC8																	
Location		199-F7-1																	
Remarks		NV																	
Sample Date		10/27/93																	
Analytes	Method	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
TOC	415.1	1.3																	
Organic Bromide	9022	0.01	U																
Organic Chloride	9022	0.01	U																
Organic Iodide	9022	0.01	U																

NV = Not Validated

9615473.1790

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

Project: WESTINGHOUSE-HANFORD																			
Laboratory: Roy F. Weston																			
Case	SDG: B09DH0																		
Sample Number		B09DH0																	
Location		199-F5-6																	
Remarks		SPLIT																	
Sample Date		10/26/93																	
Analytes	Method	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Alkalinity	310.1	110																	
Chloride	300.0	11.0																	
Fluoride	300.0	0.50	U																
COD	410.4	5.0	U																
Phosphate	300.0	0.25	UJ																
Sulfate	300.0	52.4																	
N03N02 (mg N/L)	353.2	6.6																	
Ammonia, as N	350.3	0.10	U																
TOC	415.1	0.78	J																
pH (pH units)	150.1	7.6																	
Sulfide	376.2	0.10	U																
TDS	160.1	271	J																
TOX	9020.1	25.5	J																
Specific Conductance	120.1	324																	
(umhos/cm)																			

9613473.1791

HOLDING TIME SUMMARY

SDG: B09DH0	REVIEWER: SC			DATE: 1/19/94		PAGE 1 OF 1	
COMMENTS:							
FIELD SAMPLE ID	ANALYSIS TYPE	DATE SAMPLED	DATE PREPARED	DATE ANALYZED	PREP. HOLDING TIME, DAYS	ANALYSIS HOLDING TIME, DAYS	QUALIFIER
B09DH0	TOX	10/26/93		11/03/93		7	J
B09DH0	TOC	10/26/93		11/17/93		7	J
B09DH0	TDS	10/26/93		11/03/93		7	J
B09DH0	Phosphate	10/26/93		11/08/93		2	J

DATA QUALIFICATION SUMMARY

SDG: B09DH0	REVIEWER: SC	DATE: 1/19/94	PAGE 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
TOX	J	B09DH0	Holding Times Exceeded
TOC	J	B09DH0	Holding Times Exceeded
TDS	J	B09DH0	Holding Times Exceeded
Phosphate	J	B09DH0	Holding Times Exceeded

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

Project: WESTINGHOUSE-HANFORD																			
Laboratory: Roy F. Weston																			
Case	SDG: B09DH4																		
Sample Number		B09DH4																	
Location		199-F5-47																	
Remarks		SPLIT																	
Sample Date		10/31/93																	
Analytes	Method	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Alkalinity	310.1	210																	
Chloride	300.0	33.7																	
Fluoride	300.0	0.50	U																
COD	410.1	5.0	U																
Phosphate	300.0	0.25	UJ																
Sulfate	300.0	100																	
N03N02 (mg N/L)	353.2	20.8																	
Ammonia, as N	350.3	0.10	U																
TOC	415.1	1.7																	
pH (pH units)	150.1	8.2																	
Sulfide	376.2	0.10	U																
TDS	160.2	253																	
TOX	9020	20.0	U																
Specific Conductance	120.1	720																	
(umhos/cm)																			

9413473.1791

HOLDING TIME SUMMARY

SDG: B09DH4	REVIEWER: SC			DATE: 1/18/94		PAGE 1 OF 1	
COMMENTS:							
FIELD SAMPLE ID	ANALYSIS TYPE	DATE SAMPLED	DATE PREPARED	DATE ANALYZED	PREP. HOLDING TIME, DAYS	ANALYSIS HOLDING TIME, DAYS	QUALIFIER
B09DH4	Phosphate	10/31/93		11/05/93		2	J

DATA QUALIFICATION SUMMARY

SDG: B09DH4	REVIEWER: SC	DATE: 11/18/94	PAGE 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Phosphate	J	B09DH4	Holding Times Exceeded

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

Project: WESTINGHOUSE-HANFORD																			
Laboratory: TMA																			
Case	SDG: B09DJ2																		
Sample Number		B09DJ2																	
Location		EB-2																	
Remarks		EB																	
Sample Date		11/03/93																	
Analytes	Method	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Chloride	300.0	0.2	U																
Fluoride	300.0	0.1	U																
Phosphate	300.0	0.4	R																
pH (pH units)	9040	6.1	J																
Sulfate	300.0	1.0	U																
Alkalinity	310.1	2.0	U																
TDS	160.1	5.0	U																
Sulfide	9030	1.0	U																
Ammonia, as N	350.3	0.05	U																
COD	410.1	30.0	U																
Elect. Conductivity	9050	6.0	U																
(umhos/cm)																			

EB = Equipment Blank

9613473.1298

HOLDING TIME SUMMARY

SDG: B09DJ2	REVIEWER: SC			DATE: 1/18/94		PAGE 1 OF 1	
COMMENTS:							
FIELD SAMPLE ID	ANALYSIS TYPE	DATE SAMPLED	DATE PREPARED	DATE ANALYZED	PREP. HOLDING TIME, DAYS	ANALYSIS HOLDING TIME, DAYS	QUALIFIER
B09DJ2	pH	11/03/93		11/09/93		3	J
B09DJ2	Phosphate	11/03/93		11/30/93		2	R

DATA QUALIFICATION SUMMARY

SDG: B09DJ2	REVIEWER: SC	DATE: 11/18/94	PAGE 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
pH	J	B09DJ2	Holding Times Exceeded
Phosphate	R	B09DJ2	Holding Times Grossly Exceeded

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

Project: WESTINGHOUSE-HANFORD																			
Laboratory: TMA																			
Case	SDG: B09DJ2																		
Sample Number		B09DJ2																	
Location		EB-2																	
Remarks		EB																	
Sample Date		11/03/93																	
Analytes	Method	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
TOC	415.1	1.0	U																
Organic Bromide	9022	0.01	U																
Organic Chloride	9022	0.01	U																
Organic Iodide	9022	0.01	U																

EB = Equipment Blank

9613175.1800

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

Project: WESTINGHOUSE-HANFORD																			
Laboratory: TMA																			
Case	SDG: B09DJ2																		
Sample Number		B09DJ2																	
Location		EB-2																	
Remarks		EB																	
Sample Date		11/03/93																	
Analytes	Method	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
N03N02	353.2	0.25	UJ																

EB = Equipment Blank

9613473.1801

9613473.1802

HOLDING TIME SUMMARY

SDG: B09DJ2	REVIEWER: SC			DATE: 1/18/94		PAGE 1 OF 1	
COMMENTS:							
FIELD SAMPLE ID	ANALYSIS TYPE	DATE SAMPLED	DATE PREPARED	DATE ANALYZED	PREP. HOLDING TIME, DAYS	ANALYSIS HOLDING TIME, DAYS	QUALIFIER
B09DJ2	N03N02	11/03/93		12/02/93		28	J

DATA QUALIFICATION SUMMARY

SDG: B09DJ2	REVIEWER: SC	DATE: 1/18/94	PAGE 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
N03N02	J	B09DJ2	Holding Times Exceeded

WELL AND SAMPLE INFORMATION					SAMPLE LOCATION INFORMATION
SAMPLE LOCATION	SAMPLE NUMBER	MATRIX	DATE SAMPLED	NV/V	RADIOCHEMISTRY
199-F1-2	B09D66	W	10/29/93	V	13-4
199-F5-1	B09D70	W	10/28/93	V	13-4
199-F5-4	B09D78	W	11/06/93	V	13-6
199-F5-6	B09D82 B09DG2 B09DH0	W W W	10/26/93 10/26/93 10/26/93	V V V	13-4 13-5 13-7
199-F5-42	B09D86	W	10/30/93	V	13-4
199-F5-43A	B09D90	W	10/30/93	V	13-4
199-F5-44	B09D94	W	10/30/93	V	13-4
199-F5-45	B09D98	W	11/06/93	V	13-6
199-F5-46	B09DB2	W	11/06/93	V	13-6
199-F5-47	B09DB6 B09DG6 B09DH4	W W W	10/31/93 10/31/93 10/31/93	V V V	13-4 13-5 13-7
199-F5-48	B09DC0	W	10/31/93	V	13-4
199-F6-1	B09DC4	W	10/30/93	V	13-4
199-F7-1	B09DC8	W	10/27/93	V	13-4
199-F7-2	B09DD2	W	10/30/93	V	13-5
199-F7-3	B09DD6	W	11/06/93	V	13-6
199-F8-2	B09DF0	W	10/31/93	V	13-5
199-F8-3	B09DF4	W	10/29/93	V	13-5
199-F8-4	B09DF8	W	10/29/93	V	13-5
EB-1	B09DH8	W	10/28/93	V	13-5
EB-2	B09DJ2	W	11/03/93	V	13-6

7.0 GROSS ALPHA AND GROSS BETA DATA VALIDATION

7.1 DATA PACKAGE COMPLETENESS

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

B09D66 B09D78 B09DH0 B09DH4

7.2 HOLDING TIMES

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

All holding times were acceptable.

7.3 INSTRUMENT CALIBRATION AND PERFORMANCE

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

Gross beta results in sample B09DJ2 (an equipment blank) in SDG No. B09D78 had background counts taken more than one week before analysis.

All other calibration results, including efficiency checks and background counts, were acceptable.

7.4 ACCURACY

Accuracy was evaluated by analyzing distilled water samples spiked with known amounts of alpha or beta emitting radionuclides. The sample activity as determined by analysis is compared to the known activity to assess accuracy. Acceptable accuracy of spiked sample data must fall within a range of 70 to 130 percent. If spiked sample results were outside this range, associated sample data were qualified as estimated, rejected or not qualified, depending on the individual sample activity.

All accuracy results were acceptable.

7.5 PRECISION

Analytical precision is expressed by the RPD between the recoveries of duplicate matrix spike analyses performed on a sample. When the laboratory has not performed duplicate spike analyses, precision may also be assessed using unspiked duplicate sample analyses. If both sample and replicate activities are greater than five times the RDL and the RPD is less than 35 percent for soil samples and 20 percent for water samples, the results are acceptable. If either activities are <5xRDL, a control limit of ≤2xRDL is used for soil samples and ≤RDL for water samples. If either the original or replicate value is below the RDL, the applicable control limits are ≤RDL for water samples and ≤2xRDL for soil samples. If the RPD is outside the applicable control limit, associated results are qualified as estimated detects or estimated non-detects.

All gross alpha and gross beta results in SDG No. B09DH4 were qualified as estimates and flagged "J" due to duplicate analysis RPD's outside QC limits.

All other precision results were acceptable.

7.6 BLANK SAMPLES

Blank samples are analyzed to determine if positive results are due to laboratory reagent, sample container, or detector contamination. If blank analysis results indicated the presence of an analyte above both the MDA and the statistical uncertainty associated with that MDA, the following qualifiers were applied: All positive sample results less than five times the blank concentration were qualified as estimated; sample results below the MDA were elevated to the MDA and qualified as undetected; sample results above the MDA and greater than five times the blank concentration were not qualified.

All blank results were acceptable.

7.7 ANALYTE QUANTITATION AND REPORTED DETECTION LIMITS

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

All analyte quantitation and reported detection limits were acceptable.

7.8 OVERALL ASSESSMENT AND SUMMARY

A review of instrument continuing calibration information and QC data indicates that instrument performance was adequate for these analyses. All gross alpha and gross beta results in SDG No. B09DH4 were qualified as estimates and flagged "J" due to duplicate analysis RPD's outside QC limits. Data qualified as estimates and flagged "J" are valid and usable for limited purposes only. Gross beta results in sample number B09DJ2 (an equipment blank) in SDG No. B09D78 had background counts taken more than one week prior to analysis. All other QC data is valid and usable for all purposes.

8.0 ALPHA SPECTROSCOPY DATA VALIDATION

8.1 DATA PACKAGE COMPLETENESS

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

B09D66 B09D78 B09DH0 B09DH4

8.2 HOLDING TIMES

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

All holding times were acceptable.

8.3 INSTRUMENT CALIBRATION AND PERFORMANCE

Instrument calibration is performed to establish that the alpha spectroscopy system used is capable of producing acceptable and reliable analytical data. Continuing calibration checks are performed to verify that instrument performance is stable and reproducible. The calibration consists of an instrument efficiency determination for each alpha radionuclide region of interest, and a system resolution assessment as measured by the full-width at half maximum for each peak.

Americium-241 results for sample number B09DJ2 (an equipment blank) in SDG No. B09D78 had a continuing calibration efficiency count outside QC limits.

All other calibration results, including efficiency checks and background counts, were acceptable.

8.4 ACCURACY

Accuracy was evaluated by analyzing distilled water samples spiked with known amounts of alpha emitting radionuclides. The sample activity as determined by analysis is compared to the known activity to assess accuracy. The acceptable laboratory control sample recovery range is 70 to 130 percent, while that for a matrix spike is 60 to 140 percent. Spike sample results outside the above ranges resulted in associated sample results being qualified as estimated, rejected, or not qualified, depending on the activity of the individual sample. A chemical

tracer is used to determine the efficiency of the analytical method, with tracer yield limits of 20 to 105 percent. Sample results with chemical yields outside the above stated limits were qualified as estimated or rejected depending on sample activity.

Due to a LCS percent recovery of 52%, all uranium-235 results in SDG No. B09DH4 were qualified as estimates and flagged "J".

Due to the lack of an LCS, all plutonium-238 results in SDG No. B09D78 (except equipment blanks) were qualified as estimates and flagged "J".

All other accuracy results were acceptable.

8.5 PRECISION

Analytical precision is expressed by the RPD between the recoveries of duplicate matrix spike analyses performed on a sample. When the laboratory has not performed duplicate spike analyses, precision may also be assessed using unspiked duplicate sample analyses. If both sample and replicate activities are greater than five times the RDL and the RPD is less than 35 percent for soil samples and 20 percent for water samples, the results are acceptable. If either activities are <5xRDL, a control limit of ≤2xRDL is used for soil samples and ≤RDL for water samples. If either the original or replicate value is below the RDL, the applicable control limits are ≤RDL for water samples and ≤2xRDL for soil samples. If the RPD is outside the applicable control limit, associated results are qualified as estimated detects or estimated non-detects.

All precision results were acceptable.

8.6 BLANK SAMPLES

Blank samples are analyzed to determine if positive results are due to laboratory reagent, sample container, or detector contamination. If blank analysis results indicated the presence of an analyte above both the MDA and the statistical uncertainty associated with that MDA, the following qualifiers were applied: All positive sample results less than five times the blank concentration were qualified as estimated; sample results below the MDA were elevated to the MDA and qualified as undetected; sample results above the MDA and greater than five times the blank concentration were not qualified.

All blank results were acceptable.

8.7 ANALYTE QUANTITATION AND REPORTED DETECTION LIMITS

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

Reported MDA values for the following samples were above the RDL:

- Plutonium-238 and plutonium-239 in sample number B09DD6 in SDG No. B09D78.
- Plutonium-239 and americium-241 in sample number B09DH0 in SDG No. B09DH0.
- Plutonium-239 and americium-241 in sample number B09DH4 in SDG No. B09DH4.

All other analyte quantitation and reported detection limits were acceptable.

8.8 OVERALL ASSESSMENT AND SUMMARY

A complete review of all QC and calibration data indicates that overall system performance was adequate. Due to a low LCS percent recovery, all uranium-235 results in SDG No. B09DH4 were qualified as estimates and flagged "J". Due to the lack of a LCS, all plutonium-238 results in SDG No. B09D78 (except equipment blanks) were qualified as estimates and flagged "J". Data qualified as estimated are valid and usable for limited purposes only. Americium-241 results for sample number B09DJ2 (an equipment blank) in SDG No. B09D78 had a continuing calibration efficiency count outside QC limits. All other QC data are valid and usable for all purposes.

9.0 GAMMA SPECTROSCOPY DATA VALIDATION

9.1 DATA PACKAGE COMPLETENESS

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

B09D66 B09D78 B09DH0 B09DH4

9.2 HOLDING TIMES

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

All holding times were acceptable.

9.3 INSTRUMENT CALIBRATION AND PERFORMANCE

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

All gamma spectroscopy results in SDG Nos. B09DH0 and B09DH4 were qualified as estimates and flagged "J" due to the continuing calibration checksource geometry not matching the sample geometry.

All other calibration results, including efficiency checks and background counts, were acceptable.

9.4 ACCURACY

Accuracy was evaluated by analyzing soil or distilled water samples spiked with known amounts of gamma emitting radionuclides. The sample activity as determined by sample analysis is compared to the known activity to assess accuracy. The acceptable spiked recovery range is 70 to 130 percent. If

spiked sample results were outside this range, the associated sample results were qualified as estimated, rejected or not qualified, depending on the sample activity.

All accuracy results were acceptable.

9.5 PRECISION

Analytical precision is expressed by the RPD between the recoveries of duplicate matrix spike analyses performed on a sample. When the laboratory has not performed duplicate spike analyses, precision may also be assessed using unspiked duplicate sample analyses. If both sample and replicate activities are greater than five times the RDL and the RPD is less than 35 percent for soil samples and 20 percent for water samples, the results are acceptable. If either activities are <5xRDL, a control limit of ≤2xRDL is used for soil samples and ≤RDL for water samples. If either the original or replicate value is below the RDL, the applicable control limits are ≤RDL for water samples and ≤2xRDL for soil samples. If the RPD is outside the applicable control limit, associated results are qualified as estimated detects or estimated non-detects.

All precision results were acceptable.

9.6 BLANK SAMPLES

Blank samples are analyzed to determine if positive results are due to laboratory reagent, sample container, or detector contamination. If blank analysis results indicated the presence of an analyte above both the MDA and the statistical uncertainty associated with that MDA, the following qualifiers were applied: All positive sample results less than five times the blank concentration were qualified as estimated; sample results below the MDA were elevated to the MDA and qualified as undetected; sample results above the MDA and greater than five times the blank concentration were not qualified.

All blank results were acceptable.

9.7 ANALYTE QUANTITATION AND REPORTED DETECTION LIMITS

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

Reported MDA values for the following samples were above the RDL:

- Iron-59 in all samples in SDG No. B09D78.

- Iron-59 in sample numbers B09D66, B09D82, B09D86, B09D90, B09D94, B09DB6, B09DC0 B09DC8, B09DF0, B09DF4 and B09DH8 in SDG No. B09D66.

All other analyte quantitation and reported detection limits were acceptable.

9.8 OVERALL ASSESSMENT AND SUMMARY

A review of instrument continuing calibration information and QC data indicates that instrument performance was adequate for these analyses. Gamma spectroscopy results in SDG Nos. B09DH0 and B09DH4 were qualified as estimates and flagged "J" due to the continuing calibration checksource geometry not matching the sample geometry. All other QC data are usable and valid for all purposes.

10.0 STRONTIUM-90 DATA VALIDATION

10.1 DATA PACKAGE COMPLETENESS

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

B09D66 B09D78 B09DH0 B09DH4

10.2 HOLDING TIMES

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

All holding times were acceptable.

10.3 INSTRUMENT CALIBRATION AND PERFORMANCE

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

All calibration results, including efficiency checks and background counts, were acceptable.

10.4 ACCURACY

Accuracy was evaluated by analyzing soil or distilled water samples spiked with known amounts of beta emitting radionuclides. The sample activity as determined by analysis is compared to the known activity to assess accuracy. The acceptable laboratory control sample recovery range is 70 to 130 percent, while that for a matrix spike is 60 to 140 percent. Spike sample results outside the above ranges resulted in associated sample results being qualified as estimated, rejected, or not qualified, depending on the activity of the individual sample. A chemical tracer is used to determine the efficiency of the analytical method, with tracer yield limits of 30 to 105 percent. Sample results above the MDA with chemical yields outside the above stated limits were qualified as estimated or rejected.

All accuracy results were acceptable.

10.5 PRECISION

Analytical precision is expressed by the RPD between the recoveries of duplicate matrix spike analyses performed on a sample. When the laboratory has not performed duplicate spike analyses, precision may also be assessed using unspiked duplicate sample analyses. If both sample and replicate activities are greater than five times the RDL and the RPD is less than 35 percent for soil samples and 20 percent for water samples, the results are acceptable. If either activities are <5xRDL, a control limit of ≤2xRDL is used for soil samples and ≤RDL for water samples. If either the original or replicate value is below the RDL, the applicable control limits are ≤RDL for water samples and ≤2xRDL for soil samples. If the RPD is outside the applicable control limit, associated results are qualified as estimated detects or estimated non-detects.

All precision results were acceptable.

10.6 BLANK SAMPLES

Blank samples are analyzed to determine if positive results are due to laboratory reagent, sample container, or detector contamination. If blank analysis results indicated the presence of an analyte above both the MDA and the statistical uncertainty associated with that MDA, the following qualifiers were applied: All positive sample results less than five times the blank concentration were qualified as estimated; sample results below the MDA were elevated to the MDA and qualified as undetected; sample results above the MDA and greater than five times the blank concentration were not qualified.

All blank results were acceptable.

10.7 ANALYTE QUANTITATION AND REPORTED DETECTION LIMITS

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

All analyte quantitation and reported detection limits were acceptable.

10.8 OVERALL ASSESSMENT AND SUMMARY

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

11.0 TECHNETIUM-99 DATA VALIDATION

11.1 DATA PACKAGE COMPLETENESS

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

B09D66 B09D78 B09DH0 B09DH4

11.2 HOLDING TIMES

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

All holding times were acceptable.

11.3 INSTRUMENT CALIBRATION AND PERFORMANCE

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

All calibration results, including efficiency checks and background counts, were acceptable.

11.4 ACCURACY

Accuracy was evaluated by analyzing soil or distilled water samples spiked with known amounts of beta emitting radionuclides. The sample activity as determined by analysis is compared to the known activity to assess accuracy. The acceptable laboratory control sample recovery range is 70 to 130 percent, while that for a matrix spike is 60 to 140 percent. Spike sample results outside the above ranges resulted in associated sample results being qualified as estimated, rejected, or not qualified, depending on the activity of the individual sample. A chemical tracer is used to determine the efficiency of the analytical method, with tracer yield limits of 30 to 105 percent. Sample results with chemical yields outside the above stated limits were qualified as estimated or rejected depending on sample activity.

All accuracy results were acceptable.

11.5 PRECISION

Analytical precision is expressed by the RPD between the recoveries of duplicate matrix spike analyses performed on a sample. When the laboratory has not performed duplicate spike analyses, precision may also be assessed using unspiked duplicate sample analyses. If both sample and replicate activities are greater than five times the RDL and the RPD is less than 35 percent for soil samples and 20 percent for water samples, the results are acceptable. If either activities are <5xRDL, a control limit of ≤2xRDL is used for soil samples and ≤RDL for water samples. If either the original or replicate value is below the RDL, the applicable control limits are ≤RDL for water samples and ≤2xRDL for soil samples. If the RPD is outside the applicable control limit, associated results are qualified as estimated detects or estimated non-detects.

All technetium-99 results in SDG No. B09D78 (except equipment blanks) were qualified as estimates due to a duplicate analysis RPD outside QC limits.

All other precision results were acceptable.

11.6 BLANK SAMPLES

Blank samples are analyzed to determine if positive results are due to laboratory reagent, sample container, or detector contamination. If blank analysis results indicated the presence of an analyte above both the MDA and the statistical uncertainty associated with that MDA, the following qualifiers were applied: All positive sample results less than five times the blank concentration were qualified as estimated; sample results below the MDA were elevated to the MDA and qualified as undetected; sample results above the MDA and greater than five times the blank concentration were not qualified.

Due to blank contamination, all technetium-99 sample results, except sample number B09DJ2 in SDG No. B09D78, were qualified as estimates and flagged "J".

All other blank results were acceptable.

11.7 ANALYTE QUANTITATION AND REPORTED DETECTION LIMITS

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

The MDA was above the RDL for sample number B09DD6 in SDG No. B09D78.

All other analyte quantitation and reported detection limits were acceptable.

11.8 OVERALL ASSESSMENT AND SUMMARY

A review of instrument continuing calibration information and QC data indicates that instrument performance was adequate for these analyses. All technetiom-99 results in SDG No. B09D78 (except equipment blanks) were qualified as estimates and flagged "J" due to a duplicate analysis RPD outside QC limits. Due to blank contamination, all technetium-99 sample results, except sample number B09DJ2 in SDG No. B09D78, were qualified as estimates and flagged "J". Estimated data are considered usable for limited purposes only. All other QC data are acceptable for all purposes.

12.0 CARBON-14 DATA VALIDATION

12.1 DATA PACKAGE COMPLETENESS

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

B09D66 B09D78 B09DH0 B09DH4

12.2 HOLDING TIMES

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

All holding times were acceptable.

12.3 INSTRUMENT CALIBRATION AND PERFORMANCE

Instrument calibration is performed to establish that the low background liquid scintillation counting system used for carbon-14 determination is capable of producing acceptable and reliable analytical data. Each counting system must be factory calibrated at installation and after any maintenance or repair. Calibration consists of an instrument efficiency determination for each applicable radionuclide. Continuing calibration checks are performed to verify that instrument performance is stable and reproducible.

Due to no checksource being run with the data package, all carbon-14 sample results in SDG Nos. B09DH0 and B09DH4 were qualified as estimates and flagged "J".

All other calibration results, including efficiency checks and background counts, were acceptable.

12.4 ACCURACY

Accuracy was evaluated by analyzing soil or distilled water samples spiked with known amounts of beta emitting radionuclides. The sample activity as determined by analysis is compared to the known activity to assess accuracy. The acceptable laboratory control sample recovery range is 70 to 130 percent, while that for a matrix spike is 60 to 140 percent. Spike sample results outside the above ranges resulted in associated sample results being qualified as estimated, rejected, or not qualified,

depending on the activity of the individual sample. A chemical tracer is used to determine the efficiency of the analytical method, with tracer yield limits of 30 to 105 percent. Sample results above the MDA with chemical yields outside the above stated limits were qualified as estimated or rejected.

The following samples were qualified as estimates and flagged "J" due to high radiochemical yields:

- Samples B09DJ2 (an equipment blank, no qualifier)(128%), B09D78 (121%), and B09D98 (116%) in SDG No. B09D78.
- Sample B09DH0 (113%) in SDG No. B09DH0 and sample B09DH4 (133%) in SDG No. B09DH4.

All other accuracy results were acceptable.

12.5 PRECISION

Analytical precision is expressed by the RPD between the recoveries of duplicate matrix spike analyses performed on a sample. When the laboratory has not performed duplicate spike analyses, precision may also be assessed using unspiked duplicate sample analyses. If both sample and replicate activities are greater than five times the RDL and the RPD is less than 35 percent for soil samples and 20 percent for water samples, the results are acceptable. If either activities are <5xRDL, a control limit of ≤2xRDL is used for soil samples and ≤RDL for water samples. If either the original or replicate value is below the RDL, the applicable control limits are ≤RDL for water samples and ≤2xRDL for soil samples. If the RPD is outside the applicable control limit, associated results are qualified as estimated detects or estimated non-detects.

All precision results were acceptable.

12.6 BLANK SAMPLES

Blank samples are analyzed to determine if positive results are due to laboratory reagent, sample container, or detector contamination. If blank analysis results indicated the presence of an analyte above both the MDA and the statistical uncertainty associated with that MDA, the following qualifiers were applied: All positive sample results less than five times the blank concentration were qualified as estimated; sample results below the MDA were elevated to the MDA and qualified as undetected; sample results above the MDA and greater than five times the blank concentration were not qualified.

All blank results were acceptable.

12.7 ANALYTE QUANTITATION AND REPORTED DETECTION LIMITS

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

All analyte quantitation and reported detection limits were acceptable.

12.8 OVERALL ASSESSMENT AND SUMMARY

A review of instrument performance and calibration indicates that the overall system performance is adequate. Due to no checksource being run with the data package, all carbon-14 sample results in SDG Nos. B09DH0 and B09DH4 were qualified as estimates and flagged "J". Data were qualified as estimates in SDG Nos. B09D78, B09DH0 and B09DH4 due to high radiochemical yields. Data qualified as estimated is valid and usable for limited purposes only. All but two of the seventeen sample results in SDG No. B09D66 were negative. No data was qualified based on this observation, however it may indicate a negative bias in the LCS used for these analysis. All other QC data are acceptable for all purposes.

13.0 TRITIUM DATA VALIDATION

13.1 DATA PACKAGE COMPLETENESS

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

B09D66 B09D78 B09DH0 B09DH4

13.2 HOLDING TIMES

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

All holding times were acceptable.

13.3 INSTRUMENT CALIBRATION AND PERFORMANCE

Instrument calibration is performed to establish that the low background liquid scintillation counting system used for tritium determination is capable of producing acceptable and reliable analytical data. Each counting system must be factory calibrated at installation and after any maintenance or repair. Calibration consists of an instrument efficiency determination for each applicable radionuclide. Continuing calibration checks are performed to verify that instrument performance is stable and reproducible.

All calibration results, including efficiency checks and background counts, were acceptable.

13.4 ACCURACY

Accuracy was evaluated by analyzing soil or distilled water samples spiked with known amounts of beta emitting radionuclides. The sample activity as determined by analysis is compared to the known activity to assess accuracy. The acceptable laboratory control sample recovery range is 70 to 130 percent, while that for a matrix spike is 60 to 140 percent. Spike sample results outside the above ranges resulted in associated sample results being qualified as estimated, rejected, or remaining unchanged, depending on the activity of the individual sample.

Due to the lack of a matrix spike analysis, all tritium results in SDG Nos. B09D78 and B09D66 (except equipment blanks) were qualified as estimates and flagged "J".

All other accuracy results were acceptable.

13.5 PRECISION

Analytical precision is expressed by the RPD between the recoveries of duplicate matrix spike analyses performed on a sample. When the laboratory has not performed duplicate spike analyses, precision may also be assessed using unspiked duplicate sample analyses. If both sample and replicate activities are greater than five times the RDL and the RPD is less than 35 percent for soil samples and 20 percent for water samples, the results are acceptable. If either activities are <5xRDL, a control limit of ≤2xRDL is used for soil samples and ≤RDL for water samples. If either the original or replicate value is below the RDL, the applicable control limits are ≤RDL for water samples and ≤2xRDL for soil samples. If the RPD is outside the applicable control limit, associated results are qualified as estimated detects or estimated non-detects.

All precision results were acceptable.

13.6 BLANK SAMPLES

Blank samples are analyzed to determine if positive results are due to laboratory reagent, sample container, or detector contamination. If blank analysis results indicated the presence of an analyte above both the MDA and the statistical uncertainty associated with that MDA, the following qualifiers were applied: All positive sample results less than five times the blank concentration were qualified as estimated; sample results below the MDA were elevated to the MDA and qualified as undetected; sample results above the MDA and greater than five times the blank concentration were not qualified.

All blank results were acceptable.

13.7 ANALYTE QUANTITATION AND REPORTED DETECTION LIMITS

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

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

13.8 OVERALL ASSESSMENT AND SUMMARY

A review of instrument performance and calibration indicates that the overall system performance is adequate. Due to the lack of a matrix spike analysis, all tritium results in SDG Nos. B09D78 and B09D66 (except equipment blanks) were qualified as estimates and flagged "J". Estimated data are considered usable for limited purposes only. All other QC results were acceptable and usable for all purposes.

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

Project: WESTINGHOUSE-HANFORD																					
Laboratory: TMA																					
Case	SDG: B09D66																				
Sample Number	B09D66		B09D70		B09D82		B09D86		B09D90		B09D94		B09DB6		B09DC0		B09DC4		B09DC8	
Location	199-F1-2		199-F5-1		199-F5-6		199-F5-42		199-F5-43A		199-F5-44		199-F5-47		199-F5-48		199-F6-1		199-F7-1	
Remarks																					
Sample Date	10/29/93		10/28/93		10/26/93		10/30/93		10/30/93		10/30/93		10/31/93		10/31/93		10/30/93		10/27/93	
Radiochemistry Analytes	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Gross Alpha	2.6	J	0.049	U	5.2		0.11	U	1.1	J	-0.022	U	4.1		6.3		0.95	J	3.2	
Gross Beta	3.7	J	59		18		10		8.8		12		9.0		7.8		2.8	J	7.8	
Tritium	180	UJ	300	J	1800	J	95	UJ	100	UJ	250	J	9700	J	9900	J	100	UJ	370	J
Carbon-14	-43	U	-8.1	U	-46	U	-23	U	-33	U	-31	U	-7.5	U	-26	U	-44	U	12	U
Strontium-90	0.32	U	27		5.2		5.0		2.1		6.1		0.40	U	0.15	U	0.29	U	0.070	U
Technetium-99	0.85	UJ	0.97	UJ	1.7	UJ	1.2	UJ	1.7	UJ	0.19	UJ	1.2	UJ	0.62	UJ	1.0	UJ	0.73	UJ
Uranium-233/234	1.9		0.74		1.1		0.19	J	0.42		0.37		5.1		3.9		0.45		0.58	
Uranium-235	0.11	J	0.025	U	0.085	U	-0.005	U	0.071	U	0.036	U	0.10	U	0.16	J	0.016	U	0.022	U
Uranium-238	1.6		0.64		1.0		0.22		0.20		0.52		4.0		3.2		0.45		0.69	
Plutonium-239/240	0.025	U	0	U	0.024	U	-0.007	U	0.040	J	0	U	-0.003	U	-0.006	U	0.006	U	-0.005	U
Americium-241	0	U	-0.007	U	0.009	U	0.011	U	-0.008	U	0.003	U	0.006	U	0.067		0	U	0	U
Sodium-22	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U
Potassium-40	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U
Manganese-54	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U
Iron-59	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U
Cobalt-58	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U
Cobalt-60	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U
Niobium-94	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U
Ruthenium-103	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U
Ruthenium-106	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U
Tin-113	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U
Cesium-134	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U
Cesium-137	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U
Cerium-144	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U
Europium-152	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U
Europium-154	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U
Europium-155	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U
Radium-226	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U
Radium-228	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U
Thorium-228	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U
Thorium-232	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U

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

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

Project: WESTINGHOUSE-HANFORD
Laboratory: TMA
Case SDG: B09D66

Sample Number	B09DD2		B09DF0		B09DF4		B09DF8		B09DG2		B09DG6		B09DH8							
Location	199-F7-2		199-F8-2		199-F8-3		199-F8-4		199-F5-6		199-F5-47		EB-1							
Remarks									DUP		DUP		EB							
Sample Date	10/30/93		10/31/93		10/29/93		10/29/93		10/26/93		10/31/93		10/28/93							
Radiochemistry Analytes	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Gross Alpha	2.5	J	11		7.1		7.3		3.4		6.5		0.51	U						
Gross Beta	7.6		14		17		6.6		22		9.3		0.18	U						
Tritium	470	J	2000	J	110000	J	11000	J	1600	J	9700	J	130	U						
Carbon-14	-58	U	-45	U	410		-42	U	-40	U	-14	U	-86	U						
Strontium-90	0.20	U	0.13	U	0.078	U	0.12	U	9.3		1.9	J	0.17	U						
Technetium-99	1.6	J	0.75	UJ	2.0	J	1.3	J	0.52	J	-0.006	UJ	1.3	J						
Uranium-233/234	2.7		9.3		3.9		4.8		3.0		2.9		0.036	U						
Uranium-235	0.15	J	0.31		0.24		0.24		0.14	U	0.12	U	0.010	U						
Uranium-238	2.2		8.2		3.2		3.9		2.3		2.3		0.084	J						
Plutonium-239/240	0.013	U	0	U	0.036	U	-0.006	U	0.016	U	0.002	U	0.017	U						
Americium-241	0.014	U	-0.004	U	0.015	U	0.007	U	0.009	U	0	U	-0.009	U						
Sodium-22	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U						
Potassium-40	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U						
Manganese-54	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U						
Iron-59	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U						
Cobalt-58	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U						
Cobalt-60	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U						
Niobium-94	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U						
Ruthenium-103	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U						
Ruthenium-106	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U						
Tin-113	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U						
Cesium-134	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U						
Cesium-137	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U						
Cerium-144	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U						
Europium-152	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U						
Europium-154	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U						
Europium-155	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U						
Radium-226	N/D	U	N/D	U	N/D	U	23		N/D	U	N/D	U	N/D	U						
Radium-228	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U						
Thorium-228	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U						
Thorium-232	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U						

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

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Project: WESTINGHOUSE-HANFORD																				
Laboratory: TMA																				
Case	SDG: B09D78																			
Sample Number	B09D78		B09D98		B09DB2		B09DD6		B09DJ2											
Location	199-F5-4		199-F5-45		199-F5-46		199-F7-3		EB-2											
Remarks									EB											
Sample Date	11/06/93		11/06/93		11/06/93		11/06/93		11/03/93											
Radiochemistry Analytes	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Gross Alpha	4.3		0.88	U	3.2		1.9	U	0.064	U										
Gross Beta	8.7		5.6		25		7.0		0.34	U										
Tritium	9800	J	1100	J	4700	J	1100	J	15	U										
Carbon-14	86	J	61	J	16	U	12	U	83	J										
Strontium-90	0.43	U	0.17	U	9.1		0.096	U	0.062	U										
Technetium-99	13		8.3		9.9		38		19											
Uranium-233/234	4.1		1.3		2.8		2.2		0.055	U										
Uranium-235	0.18	J	0.10	J	0.17	J	0.096	J	0.008	U										
Uranium-238	3.5		1.2		2.6		1.7		0.17	J										
Plutonium-238	0.003	UJ	0	UJ	0	UJ	-0.021	UJ	-0.004	U										
Plutonium-239/240	0	U	0.003	U	-0.005	U	0.005	U	0	U										
Americium-241	-0.004	U	0.010	U	0.021	J	-0.005	U	0.003	U										
Sodium-22	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U										
Potassium-40	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U										
Manganese-54	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U										
Iron-59	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U										
Cobalt-58	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U										
Cobalt-60	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U										
Niobium-94	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U										
Ruthenium-103	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U										
Ruthenium-106	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U										
Tin-113	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U										
Cesium-134	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U										
Cesium-137	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U										
Cerium-144	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U										
Europium-152	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U										
Europium-154	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U										
Europium-155	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U										
Radium-226	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U										
Thorium-228	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U										
Thorium-228	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U										
Thorium-234	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U										

EB = Equipment Blank, N/D = Not Detected

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

Project: WESTINGHOUSE-HANFORD																				
Laboratory: TELEDYNE																				
Case	SDG: B09DH0																			
Sample Number	B09DH0																			
Location	199-F5-6																			
Remarks	SPLIT																			
Sample Date	10/26/93																			
Radiochemistry Analytes	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Gross Alpha	3.6																			
Gross Beta	28																			
Strontium-90	9.3																			
Technetium-99	<2	U																		
Carbon-14	<10	UJ																		
Beryllium-7	<100	UJ																		
Potassium-40	<200	UJ																		
Manganese-54	<8	UJ																		
Cobalt-58	<10	UJ																		
Iron-59	<30	UJ																		
Cobalt-60	<7	UJ																		
Zinc-65	<20	UJ																		
Zirconium-95	<10	UJ																		
Ruthenium-103	<10	UJ																		
Ruthenium-106	<80	UJ																		
Iodine-131	<300	UJ																		
Cesium-134	<8	UJ																		
Cesium-137	<8	UJ																		
Barium-140	<70	UJ																		
Cerium-141	<20	UJ																		
Cerium-144	<50	UJ																		
Europium-152	<20	UJ																		
Europium-154	<20	UJ																		
Europium-155	<30	UJ																		
Radium-226	<100	UJ																		
Thorium-228	<10	UJ																		
Thorium-234	<200	UJ																		
Tritium	1600																			
Uranium-238	2.0																			
Americium-241	<.08	U																		
Uranium-235	0.086																			
Plutonium-239	<.1	U																		

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

Project: WESTINGHOUSE-HANFORD																				
Laboratory: TELEDYNE																				
Case	SDG: B09DH4																			
Sample Number	B09DH4																			
Location	199-F5-47																			
Remarks	SPLIT																			
Sample Date	10/31/93																			
Radiochemistry Analytes	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Gross Alpha	7.5	J																		
Gross Beta	14	J																		
Technetium-99	<3	U																		
Carbon-14	<10	UJ																		
Strontium-90	<0.9	U																		
Beryllium-7	<80	UJ																		
Potassium-40	<200	UJ																		
Manganese-54	<7	UJ																		
Cobalt-58	<9	UJ																		
Iron-59	<20	UJ																		
Cobalt-60	<7	UJ																		
Zinc-65	<20	UJ																		
Zirconium-95	<10	UJ																		
Ruthenium-103	<10	UJ																		
Ruthenium-106	<70	UJ																		
Iodine-131	<100	UJ																		
Cesium-134	<8	UJ																		
Cesium-137	<8	UJ																		
Barium-140	<40	UJ																		
Cerium-141	<20	UJ																		
Cerium-144	<40	UJ																		
Europium-152	<20	UJ																		
Europium-154	<30	UJ																		
Europium-155	<20	UJ																		
Radium-226	<100	UJ																		
Thorium-228	<10	UJ																		
Thorium-234	<100	UJ																		
Tritium	11000																			
Uranium-238	3.1																			
Americium-241	<0.07	U																		
Uranium-235	<0.08	UJ																		
Plutonium-239	<0.09	U																		

14.0 REFERENCES

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