9713517.1988

START

0046233

B09DT4-TMA-690

TMA 506

MAR 1994
RECEIVED
Data
Log In

WESTINGHOUSE HANFORD COMPANY

Results of Analyses For:

ORGANICS & GENERAL CHEMISTRY
Case No. 01-025
(TMA/ARLI W.O. No. A4-01-025)

METALS & NITRATE/NITRITE
Case N4-01-049
(TMA/Skinner & Sherman W.O. Nos. S4-01-120 & S4-01-124)

March 3, 1994

TMA Master Work Order N4-01-049

JAN 1997
RECEIVED
EDMC

9713517.1981

000002

E 1 TMA/Norcal CHAIN OF CUSTODY ORD # N4-01-049

RCVD: 01/18/94 DUE: 02/22/94 01/18/94 14:54:29 KEEP: 02/22/95 DISP: S

DASH	SAMPLE IDENTIFICATION	STORED	TESTS for FRACTIONS with work in DEPT: SU and CATEGORY			
01A-S	B09DT4	ARLI	WH014	WH016	WH195	WH232
02A-S	B09DT5	ARLI	WH014	WH016	WH195	WH232
03A-S	B09DT7	ARLI	WH014	WH016	WH195	WH232
04A-S	B09DT9	ARLI	WH014	WH016	WH195	WH232
05A-S	B09WF3	ARLI	WH014	WH016	WH195	WH232
06A-S	B09WF5	ARLI	WH014	WH016	WH195	WH232
07A-S	B09WF6	ARLI	WH014	WH016	WH195	WH232
07C-S	B09WF6 MS	ARLI	WH014	WH016	WH195	WH232
07D-S	B09WF6 MSD	ARLI	WH014	WH016	WH195	
07E-S	B09WF6 DUP	ARLI	WH232			
08A-S	B09DT6	ARLI	WH014			

RELEASED BY	DATE	TRANSFERRED TO	DATE	RECEIVED BY	DATE
Yamamoto	1/18/94	ARLI	1/18/94	C Harris	1/19/94

9213512.1992

000002A

Westinghouse Hanford Company

CHAIN OF CUSTODY

Custody Form Initiator: L E ROGERS / W.U. SETZER

Company Contact: L E ROGERS — Telephone: 376-7690

Project Designation/Sampling Locations: 200-UP-2 — Collection Date: 1-11-94

Ice Chest No.: SML 342 — Field Logbook No.: ~~EFL-1091~~ EFL-115 1-13-94

Bill of Lading/Airbill No.: 2519008360 — Offsite Property No.: W94-0-0216-1

Method of Shipment: AIR

Shipped to: TMA

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

Sample Identification

1) B09DT4
- 1,250ml P:CLP;TAL Metals,Hg,Ti
- 1,250ml Gs:VOA CLP
- 1,250ml aG:Semi-VOA CLP
- 1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
- 1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
- 1,125ml G:Cyanide CLP
- 1,125ml Gw:Kerosene (8015M)
- 1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

2) B09DT5
- 1,250ml P:CLP;TAL Metals,Hg,Ti
- 1,250ml Gs:VOA CLP
- 1,250ml aG:Semi-VOA CLP
- 1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
- 1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
- 1,125ml G:Cyanide CLP
- 1,125ml Gw:Kerosene (8015M)
- 1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

3) B09DT7
- 1,250ml P:CLP;TAL Metals,Hg,Ti
- 1,250ml Gs:VOA CLP
- 1,250ml aG:Semi-VOA CLP
- 1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
- 1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
- 1,125ml G:Cyanide CLP
- 1,125ml Gw:Kerosene (8015M)
- 1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

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

Relinquished by:	Received by:	Date/Time:
W.U. Setzer	Kermit Blum K. Blum	1-18-94 1330
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

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

92135127.1993 00C002B

Westinghouse Hanford Company	SAMPLE ANALYSIS REQUEST

Collector L E ROGERS S.A.F. # 93-263 Date

Company Contact L E ROGERS Telephone (509) 376-7690

Sample Number	*	Date Collected	Time Collected	Number and Type of Sample Containers/Analysis Required
B09DT4	S	1-11-94	1310	1,250ml P:CLP;TAL Metals,Hg,Ti 1,250ml Gs:VOA CLP 1,250ml aG:Semi-VOA CLP 1,125ml G:Anions F,Cl,SO4 (EPA 300.0) 1,125ml P/G:Anions NO2,NO3 (EPA 353.2) 1,125ml G:Cyanide CLP 1,125ml Gw:Kerosene (8015M) 1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152,Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30),TotalUranium(EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79
B09DT5	S	1-11-94	1310	1,250ml P:CLP;TAL Metals,Hg,Ti 1,250ml Gs:VOA CLP 1,250ml aG:Semi-VOA CLP 1,125ml G:Anions F,Cl,SO4 (EPA 300.0) 1,125ml P/G:Anions NO2,NO3 (EPA 353.2) 1,125ml G:Cyanide CLP 1,125ml Gw:Kerosene (8015M) 1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152,Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30),TotalUranium(EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79
B09DT7	S	1-11-94	1310	1,250ml P:CLP;TAL Metals,Hg,Ti 1,250ml Gs:VOA CLP 1,250ml aG:Semi-VOA CLP 1,125ml G:Anions F,Cl,SO4 (EPA 300.0) 1,125ml P/G:Anions NO2,NO3 (EPA 353.2) 1,125ml G:Cyanide CLP 1,125ml Gw:Kerosene (8015M) 1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152,Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30),TotalUranium(EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

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

Field Information TMA

Special Handling and/or Storage Maintain at 4C ; (SOIL)

Possible Sample Hazards

A-6000-406 (06/91) WEF060

9213517.1984

000002G

Westinghouse Hanford Company	CHAIN OF CUSTODY

Custody Form Initiator: L E ROGERS / W.V. SETZER

Company Contact: L E ROGERS — Telephone: 376-7690

Project Designation/Sampling Locations: 200-UP-2 — Collection Date: 1-11-94

Ice Chest No.: SML 342 — Field Logbook No.: ~~EFL-1091~~ EFL-1115 1-13-94

Bill of Lading/Airbill No.: 2619008360 — Offsite Property No.: W94-0-0216-1

Method of Shipment: AIR

Shipped to: TMA

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

Sample Identification

1) B09DT6 (0700)
~~1,250ml P:CLP;TAL Metals,Hg,Ti~~
1,250ml Gs:VOA CLP
~~1,250ml aG:Semi-VOA CLP~~
~~1,125ml G:Anions F,Cl,SO4 (EPA 300.0)~~
~~1,125ml P/G:Anions NO2,NO3 (EPA 353.2)~~
~~1,125ml G:Cyanide CLP~~
~~1,125ml Gw:Kerosene (8015M)~~
~~1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152,~~
Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

WVS 1-11-94

2)
1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152,
Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

WVS 1-11-94

3)
1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152,
Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

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

Relinquished by:	Received by:	Date/Time:
W.V. Setzer	Kermit Blum K. Blum	1-18-94 1330
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

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

9213512.1965

0000024

Westinghouse Hanford Company	SAMPLE ANALYSIS REQUEST

Collector L E ROGERS S.A.F. # 93-263 Date

Company Contact L E ROGERS Telephone (509) 376-7690

Sample Number		Date Collected	Time Collected	Number and Type of Sample Containers/Analysis Required
B09DT6	S	1·11·94	0700	~~1,250ml P:CLP;TAL Metals,Hg,Ti~~ 1,250ml Gs:VOA CLP ~~1,250ml aG:Semi-VOA CLP~~ ~~1,125ml G:Anions F,Cl,SO4 (EPA 300.0)~~ WWS 1·11·94 ~~1,125ml P/G:Anions NO2,NO3 (EPA 353.2)~~ ~~1,125ml G:Cyanide CLP~~ ~~1,125ml Gw:Kerosene (8015M)~~ ~~1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152,Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30),TotalUranium(EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79~~
				1,250ml P:CLP;TAL Metals,Hg,Ti 1,250ml Gs:VOA CLP 1,250ml aG:Semi-VOA CLP 1,125ml G:Anions F,Cl,SO4 (EPA 300.0) 1,125ml P/G:Anions NO2,NO3 (EPA 353.2) 1,125ml G:Cyanide CLP 1,125ml Gw:Kerosene (8015M) 1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152,Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30),TotalUranium(EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79
				1,250ml P:CLP;TAL Metals,Hg,Ti 1,250ml Gs:VOA CLP 1,250ml aG:Semi-VOA CLP 1,125ml G:Anions F,Cl,SO4 (EPA 300.0) 1,125ml P/G:Anions NO2,NO3 (EPA 353.2) 1,125ml G:Cyanide CLP 1,125ml Gw:Kerosene (8015M) 1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152,Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30),TotalUranium(EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

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

Field Information TMA

Special Handling and/or Storage Maintain at 4C ; (SOIL)

Possible Sample Hazards

A-6000-406 (06/91) WEF060

SAMPLE LOG-IN SHEET

LAB NAME : TMA/ARL

PAGE : 1 OF 1

RECEIVED BY (PRINT NAME): D. WHITAKER

LOG-IN-DATE : 1-19-94

RECEIVED BY (SIGNATURE): D Whitaker

ICE CHEST NO. SML-342

REMARKS:

1. Custody Seal(s) — Present / Absent* (Intact / Broken)
2. Custody Seal Nos: _____
3. Chain of Custody Records — Present / Absent*
4. Traffic Reports or Packing List — Present / Absent*
5. Airbill — Airbill / Sticker Present / Absent*
6. Airbill No.: 728953863
7. Sample Tags — Present / Absent*
8. Sample Tag Numbers — Listed / Not Listed on Chain of Custody
9. Sample Condition: Intact / Broken* / Leaking
10. Does information on custody records, traffic reports, and sample tags agree? — Yes / No*
11. Date Recieved at Lab: 1-19-94
12. Temp of ice chest: 4 °C
13. Time Recieved: 0930

EPA SAMPLE #	CORRESPONDING SAMPLE TAG #	CORRESPONDING ASSIGNED LAB #	REMARKS: CONDITION OF SAMPLE SHIPMENT, ETC
	B09DT4	A401025	
	B09DT5	A401025	
	B09WF6	A401025	
	B09WF5	A401025	
	B09DT6	A401025	
	B09DT7	A401025	

SAMPLE TRANSFER

Fraction: _____

Area #: _____

By: _____

On: _____

* Contact SMO and attach record of resolution

Reviewed By: _____ Logbook No.: _____

Date: _____ Logbook Page No.: _____

FORM DC-1

9715517.1987

SAMPLE LOG-IN SHEET

LAB NAME : TMA/ARU

PAGE : 1 OF 1

RECEIVED BY (PRINT NAME): D WHITTAKER

LOG-IN-DATE : 1-19-94

RECEIVED BY (SIGNATURE): D Whittaker

ICE CHEST NO. SML-332

	EPA SAMPLE #	CORRESPONDING SAMPLE TAG #	CORRESPONDING ASSIGNED LAB #	REMARKS: CONDITION OF SAMPLE SHIPMENT, ETC
REMARKS:				
1. Custody Seal(s) Present / Absent* Intact / Broken		B09DT9	A401025	
		B09WF3	A401025	
2. Custody Seal Nos:				
3. Chain of Custody Records Present / Absent*				
4. Traffic Reports or Packing List Present / Absent*				
5. Airbill Airbill Present / Sticker Absent*				
6. Airbill No.: 8630656273				
7. Sample Tags Present / Absent*				
8. Sample Tag Numbers Listed / Not Listed on Chain of Custody				
9. Sample Condition: Intact / Broken* / Leaking				
10. Does information on custody records, traffic reports, and sample tags agree? Yes / No*				
11. Date Recieved at Lab: 1-19-94				
12. Temp of ice chest 4 °C				
13. Time Recieved: 0930				
SAMPLE TRANSFER				
Fraction:				
Area #:				
By:				
On:				

* Contact SMO and attach record of resolution

Reviewed By: _____ Logbook No.: _____

Date: _____ Logbook Page No.: _____

FORM QC-1

000005

FEDERAL EXPRESS

QUESTIONS? CALL 800-238-5355 TOLL FREE.

AIRBILL PACKAGE TRACKING NUMBER 7289153863

3088M 7289153863

RECIPIENT'S COPY

1 Date 1-18-94

From (Your Name) Please Print: SAMPLE CONTROL

Your Phone Number (Very Important): 610-235-2633

Department/Floor No.

Company: T M A /NORCAL

Street Address: 2030 WRIGHT AVE

City: RICHMOND State: CA ZIP Required: 94804

2 To (Recipient's Name) Please Print: CAROLE HANKIS

Recipient's Phone Number (Very Important): (818) 357-3247

Department/Floor No.

Company: TMA/ARLI

Exact Street Address (We Cannot Deliver to P.O. Boxes or P.O. Zip Codes.): 160 TAYLOR STREET

City: MONROVIA State: CA ZIP Required: 91016

YOUR INTERNAL BILLING REFERENCE INFORMATION (optional) (First 24 characters will appear on invoice.): 2340-6406

H IF HOLD FOR PICK-UP, Print FEDEX Address Here
Street Address
City State ZIP Required

3 PAYMENT 1 [X] Bill Sender 2 [ ] Bill Recipient's FedEx Acct. No. 3 [ ] Bill 3rd Party FedEx Acct. No. 4 [ ] Bill Credit Card 5 [ ] Cash/Check

4 SERVICES (Check only one box)

Priority Overnight (Delivery by next business morning)
- 11 [X] OTHER PACKAGING
- 16 [ ] FEDEX LETTER*
- 12 [ ] FEDEX PAK*
- 13 [ ] FEDEX BOX
- 14 [ ] FEDEX TUBE

Standard Overnight (Delivery by next business afternoon. No Saturday delivery†)
- 51 [ ] OTHER PACKAGING
- 56 [ ] FEDEX LETTER*
- 52 [ ] FEDEX PAK*
- 53 [ ] FEDEX BOX
- 54 [ ] FEDEX TUBE

Economy Two-Day (Delivery by second business day †)
- 30 [ ] ECONOMY*

* Economy Letter rate not available. Minimum charge: One pound economy rate.

Government Overnight (Restricted for authorized users only)
- 46 [ ] GOVT LETTER
- 41 [ ] GOVT PACKAGE

Freight Service (for packages over 150 lbs.)
- 70 [ ] OVERNIGHT FREIGHT** (Combined reservation required)
- 80 [ ] TWO-DAY FREIGHT**

† Delivery commitment may be later in some areas.

*Declared Value Limit $500.
**Call for delivery schedule.

5 DELIVERY AND SPECIAL HANDLING (Check services required)
- 1 [ ] HOLD FOR PICK-UP (Fill in Box H)
- 2 [X] DELIVER WEEKDAY
- 3 DELIVER SATURDAY (Extra charge) (Not available to all locations) [ ]
- 4 [ ] DANGEROUS GOODS (Extra charge)
- 5 [ ]
- 6 [ ] DRY ICE Dangerous Goods Shipper's Declaration not required
  Dry Ice, 9, UN 1845 ____ x ____ kg. 904 III
- 7 [ ] OTHER SPECIAL SERVICE
- 8 [ ]
- 9 [ ] SATURDAY PICK-UP (Extra charge)
- [ ]
- 12 [ ] HOLIDAY DELIVERY (If offered) (Extra charge)

6

PACKAGES	WEIGHT In Pounds Only	YOUR DECLARED VALUE (See right)
1	67	
1	89	
1	63	
1	46	
Total 4	Total 255	Total

TOTAL SHIPMENT (Chargeable Weight) [ ] lbs.

L x W x H

Received At: 1 [X] Regular Stop 2 [ ] On-Call Stop 3 [ ] Drop Box 4 [ ] B.S.C. 5 [ ] Station

Emp. No. Date
- [ ] Cash Received
- [ ] Return Shipment
- [ ] Third Party [ ] Chg. To Del. [ ] Chg. To Hold

Street Address
City State Zip

Received By: X

Date/Time Received FedEx Employee Number

7 Release Signature:

Federal Express Use
Base Charges
Declared Value Charge
Other 1
Other 2
Total Charges

REVISION DATE 11/92 PART #137204 FXEM 3/93 FORMAT #156

155

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000006

MULTIPLE PACKAGE SHIPMENT LABELS

SHIPMENT DATE	1-18-94
MASTER AIRBILL NUMBER	2789153863

2 OF 4 — 863 0656 255

DESCRIPTION

3 OF 4 — 863 0656 264

DESCRIPTION

4 OF 4 — 863 0656 273

DESCRIPTION

OF — 863 0656 282

DESCRIPTION

OF — 863 0656 291

DESCRIPTION

TERMS AND CONDITIONS

DEFINITIONS

On this Airbill, we, our and us refer to Federal Express Corporation, its employees and agents. You and your refer to the sender, its employees and agents.

AGREEMENT TO TERMS

By giving us your package to deliver, you agree to all the terms on this Airbill and in our current Service Guide, which is available on request. If there is a conflict between the current Service Guide and this Airbill, the Service Guide will control. No one is authorized to alter or modify the terms of our Agreement.

RESPONSIBILITY FOR PACKAGING AND COMPLETING AIRBILL

You are responsible for adequately packaging your goods and for properly filling out the Airbill. Omission of the number of packages and weight per package from this Airbill will result in a billing based on our best estimate of the number of packages received from you and an estimated "default" weight per package, as determined and periodically adjusted by us.

AIR TRANSPORTATION TAX INCLUDED

Our basic rate includes a federal tax required by Internal Revenue Code Section 4271 on the air transportation portion of this service.

LIMITATIONS ON OUR LIABILITY AND LIABILITIES NOT ASSUMED

Our liability for loss or damage to your package is limited to your actual damages or $100, whichever is less, unless you pay for and declare a higher authorized value. We do not provide cargo liability insurance, but you may pay an additional charge for each additional $100 of declared value. If you declare a higher value and pay the additional charge, our liability will be the lesser of your declared value or the actual value of your package.

In any event, we will not be liable for any damages, whether direct, incidental, special, or consequential in excess of the declared value of a shipment, whether or not Federal Express had knowledge that such damages might be incurred including, but not limited to, loss of income or profits.

We won't be liable for your acts or omissions, including but not limited to improper or insufficient packing, securing, marking or addressing, or for the acts or omissions of the recipient or anyone else with an interest in the package. Also, we won't be liable if you or the recipient violates any of the terms of our agreement. We won't be liable for loss of or damage to shipments of prohibited items.

We won't be liable for loss, damage or delay caused by events we cannot control, including but not limited to acts of God, perils of the air, weather conditions, acts of public enemies, war, strikes, civil commotions, or acts or omissions of public authorities (including customs and quarantine officials) with actual or apparent authority.

DECLARED VALUE LIMITS

The highest declared value we allow for FedEx Letter and FedEx Pak shipments is $500. For other shipments, the highest declared value we allow is $25,000 unless your package contains items of "extraordinary value," in which case the highest declared value we allow is $500. Items of "extraordinary value," include artwork, jewelry, furs, precious metals, negotiable instruments and other items listed in our current Service Guide.

If you send more than one package on this Airbill, you may fill in the total declared value for all packages, not to exceed the $100, $500 or $25,000 per package limit described above. (Example: 5 packages can have a total declared value of up to $125,000.) If more than one package is shipped on this Airbill and liability for loss or damage will be limited by the actual value of the package(s) lost or damaged (not to exceed the lesser of the total declared value or the per package limits described above), you have the responsibility of proving the actual loss or damage.

FILING A CLAIM

ALL CLAIMS MUST BE MADE BY YOU IN WRITING. You must notify us of your claim within strict time limits. See current Service Guide.

We'll consider your claim filed if you call and notify our Customer Service Department at 800-238-5355 and notify us in writing as soon as possible.

Within 90 days after you notify us of your claim, you must send us all relevant information about it. We are not obligated to act on any claim until you have paid all transportation charges, and you may not deduct the amount of your claim from those charges.

If the recipient accepts your package without noting any damage on the delivery record, we will assume that the package was delivered in good condition. In order for us to process your claim, you must, to the extent possible, make the original shipping cartons and packing available for inspection.

RIGHT TO INSPECT

We may, at our option, open and inspect your packages prior to or after you give them to us to deliver.

NO C.O.D. SERVICES

NO C.O.D. SERVICES ON THIS AIRBILL. If C.O.D. Service is required, please use a Federal Express C.O.D. Airbill for this purpose.

RESPONSIBILITY FOR PAYMENT

Even if you give us different payment instructions, you will always be primarily responsible for all delivery costs, as well as any cost we may incur in either returning your package to you or warehousing it pending disposition.

RIGHT OF REJECTION

We reserve the right to reject a shipment at any time, when such shipment would be likely to cause damage or delay to other shipments, equipment or personnel, or if the transportation of which is prohibited by law or is in violation of any rules contained in this Airbill or our current Service Guide.

MONEY-BACK GUARANTEE

In the event of untimely delivery, Federal Express will, at your request and with some limitations, refund your credible all transportation charges. See current Service Guide for further information.

Part # 137204037205
Rev. 11/92

9/15/94

9713517.1990

TMA/ARLI
Thermo Analytical Inc.

000007

RADIATION DOSE RATE SURVEY FORM

Date 1/19/94 COMPANY TMA/NORCAL (WHC) OTHER ORD # 728915386 3

Surveyor's Name MARK S. McCRAY

Model No. HP-210 / ESP-1 Model No. AC-3-7 / ESP-1

Serial Nos. 710289 / 02619 Serial Nos. 407726 / 02628

Calibration Date 11/17/93 Calibration Date 9/16/93

Instrument Calibration Factor 0.280 Instrument Calibration Factor 0.192

Sample	Location	HP-210 CPM	HP-210 Factor	HP-210 DPM	AC-3-7 CPM	AC-3-7 Factor	AC-3-7 DPM	Spillage or Breakage?	Activity, nCi/mL or nCi/g
Background		40.0			0				
Consistency		7,530	0.2907		4,099	0.1506			
Smears: SML 442		54.0			3.0			None	
SML 332		55.0			5.0			None	
SML 311		73.0			12.0			None	
SML 342		44.0			3.0			None	
Reported WHC (21) samples each <50 pCi/gram									

All OK ✓ Approved MSM

Not OK Date 1/19/94

Comments: VICTOREEN 450 P shows 16 μ/Rh MSM 1/19/94

FORM SOP-075.1

"quality environmental services"

9713517.1981

GENERAL CHEMISTRY RESULTS

CASE NO. 01-025

Solid Sample #:

B09DT4	B09DT5
B09DT6	B09DT7
B09DT9	B09WF3
B09WF5	B09WF6

CASE NARRATIVE

The Matrix Spike recovery for Fluoride was below the QC requirement for sample B09DT9. A second spike (MSD) was injected with approximately one fourth the sample size that was used on the original matrix spike. The Fluoride recovery indicates that the matrix amount has an effect on the recovery of the Fluoride matrix spike and therefore the low recovery is due to matrix interferences.

Injection number 5 was reprocessed on 02/03/94 only to provide a more legible copy to the client.

No other problems were encountered during sample analysis. All QC results were acceptable.

Maureen Parrish 3/2/94

Maureen Parrish

9315517.1952

TMA Inc. REPORT Work Order # A4-01-025

Received: 01/18/94 03/02/94 14:15:18

000009

REPORT TO: Westinghouse Hanford Company
345 Hills
Richland, WA 99352

ATTEN: Ms. Briana Colley

PREPARED BY: Thermo Analytical, Inc.
160 Taylor Street
Monrovia, CA 91016

ATTEN: Ms. Carole Harris
PHONE: 818-357-3247

Maureen Parrish
CERTIFIED BY

CONTACT: MKP CIH

CLIENT: WHC SAMPLES: 9
COMPANY: Westinghouse Hanford Company
FACILITY:

This report is for the sole and exclusive use of the client to whom it is addressed and represents only those samples herein described. Samples not destroyed in testing are retained a maximum of 30 days unless otherwise requested.

WORK ID: SAF# 93-263 CLP
TAKEN: By Westinghouse Staff
TRANS: Federal Express
TYPE: Soil
P.O. #: N4-01-049-SU-AR
INVOICE: under separate cover

SAMPLE IDENTIFICATION

01	B09DT9
01	B09DT9 MS
01	B09DT9 MSD
01	B09DT9
01	B09DT9 MS
01	B09DT9
02	B09WF3
02	B09WF3 Duplicate
02	B09WF3
02	B09WF3 MS
02	B09WF3 MSD
03	B09WF5
04	B09WF6
05	B09DT6
05	B09DT6 MS
05	B09DT6 MSD
06	B09DT4
07	B09DT5
08	B09DT7
09	Lab Blank
09	LCS
09	KBLK0112S

TEST CODES and NAMES used on this workorder

8015E3	8015M (Extractable) Form 3
8015MS	EPA 8015M EXTRACT.
BLKSUM	Method Blank Summary
BNCLPS	CLP Semivol. Solid
IC_AN	Anions Extraction Solids
WCCLPS	Anions in Solids
WCLCS	Lab Control Sample Summary
WCL_S	Chloride in Solids - WH216
WCQCD	Quality Control Summary
WCQCS	Quality Control Summary
WF_S	Fluoride in Solids
WMOIST	Moisture
WPH_S	pH of Solids
WSO4_S	Sulfate (in Solids)

9713517.1993

TMA Inc. REPORT Work Order # A4-01-025

Received: 01/18/94

Results by Sample

000011

SAMPLE ID B09DT9 FRACTION 01E TEST CODE WCCLPS NAME Anions in Solids

Date & Time Collected 01/13/94 Category

ANIONS AND WET CHEMISTRY - SOLIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT
Chloride	300.0	7.8	mg/kg	1.0
Fluoride	300.0	1.5	mg/kg	0.5
Sulfate	300.0	23	mg/kg	5

FORM I

9713517.1994

TMA Inc. REPORT Work Order # A4-01-025

Received: 01/18/94

Results by Sample

SAMPLE ID B09WF3 FRACTION 02C TEST CODE WCCLPS NAME Anions in Solids

Date & Time Collected 01/13/94 Category

ANIONS AND WET CHEMISTRY - SOLIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT
Chloride	300.0	6.9	mg/kg	1.0
Fluoride	300.0	4.4	mg/kg	0.5
Sulfate	300.0	10	mg/kg	5

FORM I

9713517.1995

000013

TMA Inc. REPORT Work Order # A4-01-025

Received: 01/18/94 Results by Sample

SAMPLE ID B09WF5 FRACTION 03C TEST CODE WCCLPS NAME Anions in Solids

Date & Time Collected 01/13/94 Category

ANIONS AND WET CHEMISTRY - SOLIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT
Chloride	300.0	7.6	mg/kg	1.0
Fluoride	300.0	1.4	mg/kg	0.5
Sulfate	300.0	8	mg/kg	5

FORM I

9713517.1996

000014

TMA Inc. REPORT Work Order # A4-01-025

Received: 01/18/94

Results by Sample

SAMPLE ID B09WF6 FRACTION 04C TEST CODE WCCLPS NAME Anions in Solids

Date & Time Collected 01/13/94 Category

ANIONS AND WET CHEMISTRY - SOLIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT
Chloride	300.0	6.5	mg/kg	1.0
Fluoride	300.0	<0.5	mg/kg	0.5
Sulfate	300.0	7	mg/kg	5

FORM I

TMA Inc. REPORT Work Order # A4-01-025

Received: 01/18/94

Results by Sample

SAMPLE ID B09DT4 FRACTION 06C TEST CODE WCCLPS NAME Anions in Solids

Date & Time Collected 01/11/94 Category

ANIONS AND WET CHEMISTRY - SOLIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT
Chloride	300.0	7.1	mg/kg	1.0
Fluoride	300.0	<0.5	mg/kg	0.5
Sulfate	300.0	8	mg/kg	5

FORM I

TMA Inc. REPORT Work Order # A4-01-025

Received: 01/18/94 Results by Sample

SAMPLE ID B09DT5 FRACTION 07C TEST CODE WCCLPS NAME Anions in Solids

Date & Time Collected 01/11/94 Category

ANIONS AND WET CHEMISTRY - SOLIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT
Chloride	300.0	6.5	mg/kg	1.0
Fluoride	300.0	<0.5	mg/kg	0.5
Sulfate	300.0	7	mg/kg	5

FORM I

9713517.1999

000017

TMA Inc. REPORT Work Order # A4-01-025

Received: 01/18/94

Results by Sample

SAMPLE ID B09DT7 FRACTION 08C TEST CODE WCCLPS NAME Anions in Solids

Date & Time Collected 01/11/94 Category

ANIONS AND WET CHEMISTRY - SOLIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT
Chloride	300.0	5.0	mg/kg	1.0
Fluoride	300.0	0.9	mg/kg	0.5
Sulfate	300.0	10	mg/kg	5

FORM I

000085

CASE NARRATIVE

LABORATORY : TMA/ARLI

CASE : 01-025

CONTRACT ID : WESTINGHOUSE HANFORD COMPANY

SDG RECEIPT DATE : January 18, 1994

1.0 DESCRIPTION OF CASE :

Eight soil samples were analyzed for TCL Organics- Volatiles and Semivolatiles according to the USEPA Contract Laboratory Program (CLP) Statement of Work for Organic Analysis, Revision OLM01.8. The Extractable Hydrocarbons for Kerosene (K) were analyzed according to the SW-846 Method 8015M.

2.0 SAMPLE LIST :

WESTINGHOUSE ID	LAB ID	ANALYSIS REQUESTED	MATRIX
B09DT9	A4-01-025-01A	V	SOIL
B09DT9	A4-01-025-01B	SV	SOIL
B09DT9 MS	A4-01-025-01C	SV	SOIL
B09DT9 MSD	A4-01-025-01D	SV	SOIL
B09DT9	A4-01-025-01G	K	SOIL
B09WF3	A4-01-025-02A	V	SOIL
B09WF3	A4-01-025-02B	SV	SOIL
B09WF3	A4-01-025-02E	K	SOIL
B09WF3 MS	A4-01-025-02F	K	SOIL
B09WF3 MSD	A4-01-025-02G	K	SOIL
B09WF5	A4-01-025-03A	V	SOIL
B09WF5	A4-01-025-03B	SV	SOIL
B09WF5	A4-01-025-03D	K	SOIL
B09WF6	A4-01-025-04A	V	SOIL
B09WF6	A4-01-025-04B	SV	SOIL
B09WF6	A4-01-025-04D	K	SOIL
B09DT6	A4-01-025-05A	V	SOIL
B09DT6 MS	A4-01-025-05B	V	SOIL
B09DT6 MSD	A4-01-025-05C	V	SOIL
B09DT4	A4-01-025-06A	V	SOIL
B09DT4	A4-01-025-06B	SV	SOIL
B09DT4	A4-01-025-06D	K	SOIL
B09DT5	A4-01-025-07A	V	SOIL
B09DT5	A4-01-025-07B	SV	SOIL
B09DT5	A4-01-025-07D	K	SOIL
B09DT7	A4-01-025-08A	V	SOIL
B09DT7	A4-01-025-08B	SV	SOIL
B09DT7	A4-01-025-08D	K	SOIL

000086

3.0 COMMENTS :

3.1 SHIPPING AND DOCUMENTATION :

All of the samples were received intact and properly documented.

3.2 ANALYSIS

3.2.1 VOLATILE ANALYSIS COMMENTS :

LOW LEVEL SOIL :

The samples were analyzed by heated purge within the CLP SOW holding times. The samples were analyzed during a period from 01/19/94 through 01/27/94, on the instrument "ROCKY". On 01/19/94, the operator inadvertently entered the wrong year during the instrument system boot-up, and therefore, all of the sample data incorrectly documented the year as "1993". Since it was not possible to change the date of analysis within the system the work order data was processed as is, and the appropriate manual corrections were made on the raw data by the laboratory. In addition, the report forms were changed to reflect the correct year of analysis (1994).

The analyte Acetone was detected at concentrations above the CRQL in samples B09DT4, B09DT5, B09DT6, B09WF6, B09DT6MS, and the blanks, VBLK0124R and VBLK0125R. In all of the other samples, Acetone was detected at concentrations either at or below the CRQL. Other TCL analytes detected in some of the samples included Methylene Chloride, 4-Methyl-2-pentanone, and Toluene, all at concentrations below the CRQL.

All of the QC results were within the limits specified by the EPA CLP SOW.

3.2.2 SEMIVOLATILE ANALYSIS COMMENTS :

LOW LEVEL SOIL :

The samples were extracted and analyzed within the contract required holding times.

In all of the samples Di-n-butylphthalate was detected at concentrations less than the CRQL. In addition, sample B09WF5 had bis(2-Ethylhexyl)phthalate detected at a concentration below the CRQL.

Both the MS and the MSD sample had matrix spike recoveries above the QC limits for 2,4-Dinitrotoluene, while the MSD sample also had a high recovery for 4-Nitrophenol. In accordance with the protocol, no further action was required.

All of the other QC results were within the limits specified

000087

by the EPA CLP SOW.

3.2.3 EXTRACTABLE HYDROCARBONS "KEROSENE RANGE" COMMENTS :

SEQUENCE NOTES :

The sequence was started on 01/19/94 and was analyzed according to the SW-846 Method 8015M. The initial calibration consisted of 5 different levels of the Kerosene standard that ranged from approximately 200ppm to 2000ppm. The continuing calibration at approximately 1000ppm was injected amongst the samples, in order to verify the instrument stability. The %RSD in the initial calibration and the %D in the continuing calibration were below their 20% and 15% limits, respectively.

SAMPLE NOTES :

LOW LEVEL SOIL :

The samples were extracted and analyzed within the required holding times. Approximately 20 g of each sample was extracted and concentrated to 5 mL.

There was no Kerosene detected in any of the samples. Sample B09WF3 was spiked with Kerosene, and the matrix spike recoveries were 51% for the MS, and 54% for the MSD. The blank spike was prepared at the same time and had a 52% recovery, and the data was included in the "Additional Raw Data" portion of the package.

All of the QC results were within the limits specified by the SW-846 Method 8015M.

We certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data in this hardcopy data package and in the computer-readable data submitted on diskette is authorized by the Laboratory Manager or his designees, as verified by the following signatures.

Nicole Roth 3/3/94
Nicole Roth
Program Manager

Maureen Parrish 3/2/94
Maureen Parrish
Project Manager

9713517.2003

000083

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B09DT4

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 01025 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A401025-06A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 40124R11

Level: (low/med) LOW Date Received: 01/18/94

% Moisture: not dec. 0 Date Analyzed: 01/24/94

GC Column: PACK ID: 2.00 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

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

9713512.2004

000089

EPA SAMPLE NO.

B09DT4

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 01025 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A401025-06A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 40124R11

Level: (low/med) LOW Date Received: 01/18/94

% Moisture: not dec. 0 Date Analyzed: 01/24/94

GC Column: PACK ID: 2.00 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____(uL)

Number TICs found: 2

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN HYDROCARBON	18.45	8	J
2.	UNKNOWN HYDROCARBON	27.70	13	J

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B09DT5

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 01025 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A401025-07A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 40125R04

Level: (low/med) LOW Date Received: 01/18/94

% Moisture: not dec. 0 Date Analyzed: 01/25/94

GC Column: PACK ID: 2.00 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
74-87-3	Chloromethane	10	U
74-83-9	Bromomethane	10	U
75-01-4	Vinyl Chloride	10	U
75-00-3	Chloroethane	10	U
75-09-2	Methylene Chloride	10	U
67-64-1	Acetone	13	B
75-15-0	Carbon Disulfide	10	U
75-35-4	1,1-Dichloroethene	10	U
75-34-3	1,1-Dichloroethane	10	U
540-59-0	1,2-Dichloroethene (total)	10	U
67-66-3	Chloroform	10	U
107-06-2	1,2-Dichloroethane	10	U
78-93-3	2-Butanone	10	U
71-55-6	1,1,1-Trichloroethane	10	U
56-23-5	Carbon Tetrachloride	10	U
75-27-4	Bromodichloromethane	10	U
78-87-5	1,2-Dichloropropane	10	U
10061-01-5	cis-1,3-Dichloropropene	10	U
79-01-6	Trichloroethene	10	U
124-48-1	Dibromochloromethane	10	U
79-00-5	1,1,2-Trichloroethane	10	U
71-43-2	Benzene	10	U
10061-02-6	trans-1,3-Dichloropropene	10	U
75-25-2	Bromoform	10	U
108-10-1	4-Methyl-2-Pentanone	2	J
591-78-6	2-Hexanone	10	U
127-18-4	Tetrachloroethene	10	U
79-34-5	1,1,2,2-Tetrachloroethane	10	U
108-88-3	Toluene	10	U
108-90-7	Chlorobenzene	10	U
100-41-4	Ethylbenzene	10	U
100-42-5	Styrene	10	U
1330-20-7	Xylene (total)	10	U

9213517.2006

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B09DT5

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 01025 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A401025-07A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 40125R04

Level: (low/med) LOW Date Received: 01/18/94

% Moisture: not dec. 0 Date Analyzed: 01/25/94

GC Column: PACK ID: 2.00 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

Number TICs found: 1

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN HYDROCARBON	27.75	6	J

9713517.2007

000092
EPA SAMPLE NO.

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

B09DT6

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 01025 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A401025-05A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 40124R04

Level: (low/med) LOW Date Received: 01/18/94

% Moisture: not dec. 17 Date Analyzed: 01/24/94

GC Column: PACK ID: 2.00 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____(uL)

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

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B09DT6

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 01025 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A401025-05A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 40124R04

Level: (low/med) LOW Date Received: 01/18/94

% Moisture: not dec. 17 Date Analyzed: 01/24/94

GC Column: PACK ID: 2.00 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

Number TICs found: 1

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN HYDROCARBON	27.75	7	J

9713517.2009

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B09DT7

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 01025 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A401025-08A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 40124R13

Level: (low/med) LOW Date Received: 01/18/94

% Moisture: not dec. 4 Date Analyzed: 01/24/94

GC Column: PACK ID: 2.00 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

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

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B09DT7

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 01025 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A401025-08A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 40124R13

Level: (low/med) LOW Date Received: 01/18/94

% Moisture: not dec. 4 Date Analyzed: 01/24/94

GC Column: PACK ID: 2.00 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

Number TICs found: 0

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

9213512.2011

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B09DT9

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 01025 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A401025-01A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 40124R07

Level: (low/med) LOW Date Received: 01/18/94

% Moisture: not dec. 9 Date Analyzed: 01/24/94

GC Column: PACK ID: 2.00 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____(uL)

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

9213517.2012

000097

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B09DT9

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 01025 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A401025-01A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 40124R07

Level: (low/med) LOW Date Received: 01/18/94

% Moisture: not dec. 9 Date Analyzed: 01/24/94

GC Column: PACK ID: 2.00 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

Number TICs found: 1

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN HYDROCARBON	27.75	14	J

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B09WF3

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 01025 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A401025-02A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 40124R08

Level: (low/med) LOW Date Received: 01/18/94

% Moisture: not dec. 7 Date Analyzed: 01/24/94

GC Column: PACK ID: 2.00 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

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

9213517.2014

000099

EPA SAMPLE NO.

B09WF3

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 01025 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A401025-02A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 40124R08

Level: (low/med) LOW Date Received: 01/18/94

% Moisture: not dec. 7 Date Analyzed: 01/24/94

GC Column: PACK ID: 2.00 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

Number TICs found: 0

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B09WF5

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 01025 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A401025-03A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 40124R09

Level: (low/med) LOW Date Received: 01/18/94

% Moisture: not dec. 0 Date Analyzed: 01/24/94

GC Column: PACK ID: 2.00 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____(uL)

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

9716517_2016

000101

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B09WF5

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 01025 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A401025-03A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 40124R09

Level: (low/med) LOW Date Received: 01/18/94

% Moisture: not dec. 0 Date Analyzed: 01/24/94

GC Column: PACK ID: 2.00 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____(uL)

Number TICs found: 2

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN HYDROCARBON	27.75	10	J
2.	UNKNOWN HYDROCARBON	28.92	5	J

9215517.2017

000102

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B09WF6

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 01025 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A401025-04A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 40124R10

Level: (low/med) LOW Date Received: 01/18/94

% Moisture: not dec. 0 Date Analyzed: 01/24/94

GC Column: PACK ID: 2.00 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
74-87-3	Chloromethane	10	U
74-83-9	Bromomethane	10	U
75-01-4	Vinyl Chloride	10	U
75-00-3	Chloroethane	10	U
75-09-2	Methylene Chloride	1	BJ
67-64-1	Acetone	14	B
75-15-0	Carbon Disulfide	10	U
75-35-4	1,1-Dichloroethene	10	U
75-34-3	1,1-Dichloroethane	10	U
540-59-0	1,2-Dichloroethene (total)	10	U
67-66-3	Chloroform	10	U
107-06-2	1,2-Dichloroethane	10	U
78-93-3	2-Butanone	10	U
71-55-6	1,1,1-Trichloroethane	10	U
56-23-5	Carbon Tetrachloride	10	U
75-27-4	Bromodichloromethane	10	U
78-87-5	1,2-Dichloropropane	10	U
10061-01-5	cis-1,3-Dichloropropene	10	U
79-01-6	Trichloroethene	10	U
124-48-1	Dibromochloromethane	10	U
79-00-5	1,1,2-Trichloroethane	10	U
71-43-2	Benzene	10	U
10061-02-6	trans-1,3-Dichloropropene	10	U
75-25-2	Bromoform	10	U
108-10-1	4-Methyl-2-Pentanone	10	U
591-78-6	2-Hexanone	10	U
127-18-4	Tetrachloroethene	10	U
79-34-5	1,1,2,2-Tetrachloroethane	10	U
108-88-3	Toluene	4	J
108-90-7	Chlorobenzene	10	U
100-41-4	Ethylbenzene	10	U
100-42-5	Styrene	10	U
1330-20-7	Xylene (total)	10	U

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B09WF6

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 01025 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A401025-04A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 40124R10

Level: (low/med) LOW Date Received: 01/18/94

% Moisture: not dec. 0 Date Analyzed: 01/24/94

GC Column: PACK ID: 2.00 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

Number TICs found: 0

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

9215517.2019

000104

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B09DT4

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 01025 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A401025-06B

Sample wt/vol: 30.4 (g/mL) G Lab File ID: 40202S06

Level: (low/med) LOW Date Received: 01/18/94

% Moisture: 0 decanted: (Y/N) N Date Extracted: 01/20/94

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 02/02/94

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 8.6

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-95-2	Phenol	330	U
111-44-4	bis(2-Chloroethyl)Ether	330	U
95-57-8	2-Chlorophenol	330	U
541-73-1	1,3-Dichlorobenzene	330	U
106-46-7	1,4-Dichlorobenzene	330	U
95-50-1	1,2-Dichlorobenzene	330	U
95-48-7	2-Methylphenol	330	U
108-60-1	2,2'-oxybis(1-Chloropropane)	330	U
106-44-5	4-Methylphenol	330	U
621-64-7	N-Nitroso-Di-n-Propylamine	330	U
67-72-1	Hexachloroethane	330	U
98-95-3	Nitrobenzene	330	U
78-59-1	Isophorone	330	U
88-75-5	2-Nitrophenol	330	U
105-67-9	2,4-Dimethylphenol	330	U
111-91-1	bis(2-Chloroethoxy)Methane	330	U
120-83-2	2,4-Dichlorophenol	330	U
120-82-1	1,2,4-Trichlorobenzene	330	U
91-20-3	Naphthalene	330	U
106-47-8	4-Chloroaniline	330	U
87-68-3	Hexachlorobutadiene	330	U
59-50-7	4-Chloro-3-Methylphenol	330	U
91-57-6	2-Methylnaphthalene	330	U
77-47-4	Hexachlorocyclopentadiene	330	U
88-06-2	2,4,6-Trichlorophenol	330	U
95-95-4	2,4,5-Trichlorophenol	790	U
91-58-7	2-Chloronaphthalene	330	U
88-74-4	2-Nitroaniline	790	U
131-11-3	Dimethylphthalate	330	U
208-96-8	Acenaphthylene	330	U
99-09-2	3-Nitroaniline	790	U
83-32-9	Acenaphthene	330	U
51-28-5	2,4-Dinitrophenol	790	U

9713517.2020

000105

EPA SAMPLE NO.

1C

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

B09DT4

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 01025 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A401025-06B

Sample wt/vol: 30.4 (g/mL) G Lab File ID: 40202S06

Level: (low/med) LOW Date Received: 01/18/94

% Moisture: 0 decanted: (Y/N) N Date Extracted: 01/20/94

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 02/02/94

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 8.6

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-02-7	4-Nitrophenol	790	U
132-64-9	Dibenzofuran	330	U
121-14-2	2,4-Dinitrotoluene	330	U
606-20-2	2,6-Dinitrotoluene	330	U
84-66-2	Diethylphthalate	330	U
7005-72-3	4-Chlorophenyl-phenylether	330	U
86-73-7	Fluorene	330	U
100-01-6	4-Nitroaniline	790	U
534-52-1	4,6-Dinitro-2-methylphenol	790	U
86-30-6	N-Nitrosodiphenylamine (1)	330	U
101-55-3	4-Bromophenyl-phenylether	330	U
118-74-1	Hexachlorobenzene	330	U
87-86-5	Pentachlorophenol	790	U
85-01-8	Phenanthrene	330	U
120-12-7	Anthracene	330	U
86-74-8	Carbazole	330	U
84-74-2	Di-n-Butylphthalate	190	BJ
206-44-0	Fluoranthene	330	U
129-00-0	Pyrene	330	U
85-68-7	Butylbenzylphthalate	330	U
91-94-1	3,3'-Dichlorobenzidine	330	U
56-55-3	Benzo(a)Anthracene	330	U
117-81-7	bis(2-Ethylhexyl)Phthalate	330	U
218-01-9	Chrysene	330	U
117-84-0	Di-n-Octyl Phthalate	330	U
205-99-2	Benzo(b)Fluoranthene	330	U
207-08-9	Benzo(k)Fluoranthene	330	U
50-32-8	Benzo(a)Pyrene	330	U
193-39-5	Indeno(1,2,3-cd)Pyrene	330	U
53-70-3	Dibenz(a,h)Anthracene	330	U
191-24-2	Benzo(g,h,i)Perylene	330	U

(1) - Cannot be separated from Diphenylamine

9213517.2021

000106

EPA SAMPLE NO.

B09DT4

1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 01025 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A401025-06B

Sample wt/vol: 30.4 (g/mL) G Lab File ID: 40202S06

Level: (low/med) LOW Date Received: 01/18/94

% Moisture: 0 decanted: (Y/N) N Date Extracted: 01/20/94

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 02/02/94

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 8.6

Number TICs found: 5

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN COMPOUND	5.52	1600	BJ
2.	UNKNOWN KETONE	6.48	660	BJ
3.	UNKNOWN KETONE	7.02	130	BJ
4.	UNKNOWN HYDROCARBON	7.83	200	J
5.	HEXANEDIOIC ACID ESTER ISOME	25.28	66	J

9715517.2022

000107

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B09DT5

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 01025 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A401025-07B

Sample wt/vol: 30.6 (g/mL) G Lab File ID: 40202S07

Level: (low/med) LOW Date Received: 01/18/94

% Moisture: 0 decanted: (Y/N) N Date Extracted: 01/20/94

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 02/02/94

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 8.6

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-95-2	Phenol	320	U
111-44-4	bis(2-Chloroethyl)Ether	320	U
95-57-8	2-Chlorophenol	320	U
541-73-1	1,3-Dichlorobenzene	320	U
106-46-7	1,4-Dichlorobenzene	320	U
95-50-1	1,2-Dichlorobenzene	320	U
95-48-7	2-Methylphenol	320	U
108-60-1	2,2'-oxybis(1-Chloropropane)	320	U
106-44-5	4-Methylphenol	320	U
621-64-7	N-Nitroso-Di-n-Propylamine	320	U
67-72-1	Hexachloroethane	320	U
98-95-3	Nitrobenzene	320	U
78-59-1	Isophorone	320	U
88-75-5	2-Nitrophenol	320	U
105-67-9	2,4-Dimethylphenol	320	U
111-91-1	bis(2-Chloroethoxy)Methane	320	U
120-83-2	2,4-Dichlorophenol	320	U
120-82-1	1,2,4-Trichlorobenzene	320	U
91-20-3	Naphthalene	320	U
106-47-8	4-Chloroaniline	320	U
87-68-3	Hexachlorobutadiene	320	U
59-50-7	4-Chloro-3-Methylphenol	320	U
91-57-6	2-Methylnaphthalene	320	U
77-47-4	Hexachlorocyclopentadiene	320	U
88-06-2	2,4,6-Trichlorophenol	320	U
95-95-4	2,4,5-Trichlorophenol	780	U
91-58-7	2-Chloronaphthalene	320	U
88-74-4	2-Nitroaniline	780	U
131-11-3	Dimethylphthalate	320	U
208-96-8	Acenaphthylene	320	U
99-09-2	3-Nitroaniline	780	U
83-32-9	Acenaphthene	320	U
51-28-5	2,4-Dinitrophenol	780	U

9213517.2025

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B09DT5

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 01025 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A401025-07B

Sample wt/vol: 30.6 (g/mL) G Lab File ID: 40202S07

Level: (low/med) LOW Date Received: 01/18/94

% Moisture: 0 decanted: (Y/N) N Date Extracted: 01/20/94

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 02/02/94

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 8.6

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-02-7	4-Nitrophenol	780	U
132-64-9	Dibenzofuran	320	U
121-14-2	2,4-Dinitrotoluene	320	U
606-20-2	2,6-Dinitrotoluene	320	U
84-66-2	Diethylphthalate	320	U
7005-72-3	4-Chlorophenyl-phenylether	320	U
86-73-7	Fluorene	320	U
100-01-6	4-Nitroaniline	780	U
534-52-1	4,6-Dinitro-2-methylphenol	780	U
86-30-6	N-Nitrosodiphenylamine (1)	320	U
101-55-3	4-Bromophenyl-phenylether	320	U
118-74-1	Hexachlorobenzene	320	U
87-86-5	Pentachlorophenol	780	U
85-01-8	Phenanthrene	320	U
120-12-7	Anthracene	320	U
86-74-8	Carbazole	320	U
84-74-2	Di-n-Butylphthalate	170	BJ
206-44-0	Fluoranthene	320	U
129-00-0	Pyrene	320	U
85-68-7	Butylbenzylphthalate	320	U
91-94-1	3,3'-Dichlorobenzidine	320	U
56-55-3	Benzo(a)Anthracene	320	U
117-81-7	bis(2-Ethylhexyl)Phthalate	320	U
218-01-9	Chrysene	320	U
117-84-0	Di-n-Octyl Phthalate	320	U
205-99-2	Benzo(b)Fluoranthene	320	U
207-08-9	Benzo(k)Fluoranthene	320	U
50-32-8	Benzo(a)Pyrene	320	U
193-39-5	Indeno(1,2,3-cd)Pyrene	320	U
53-70-3	Dibenz(a,h)Anthracene	320	U
191-24-2	Benzo(g,h,i)Perylene	320	U

(1) - Cannot be separated from Diphenylamine

9715017.2024

000109

EPA SAMPLE NO.

B09DT5

1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 01025 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A401025-07B

Sample wt/vol: 30.6 (g/mL) G Lab File ID: 40202S07

Level: (low/med) LOW Date Received: 01/18/94

% Moisture: 0 decanted: (Y/N) N Date Extracted: 01/20/94

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 02/02/94

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 8.6

Number TICs found: 8

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN COMPOUND	5.52	1700	BJ
2.	UNKNOWN KETONE	6.50	750	BJ
3.	UNKNOWN KETONE	7.03	130	BJ
4.	UNKNOWN HYDROCARBON	7.85	200	J
5.	UNKNOWN HYDROCARBON	21.65	65	J
6.	HEXANEDIOIC ACID ESTER ISOME	25.30	98	J
7.	UNKNOWN CARBOXYLIC ACID ESTE	26.52	65	J
8.	UNKNOWN HYDROCARBON	29.22	98	J

9713617.2025

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B09DT7

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 01025 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A401025-08B

Sample wt/vol: 30.5 (g/mL) G Lab File ID: 40202S08

Level: (low/med) LOW Date Received: 01/18/94

% Moisture: 4 decanted: (Y/N) N Date Extracted: 01/20/94

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 02/02/94

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 9.4

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-95-2	Phenol	340	U
111-44-4	bis(2-Chloroethyl)Ether	340	U
95-57-8	2-Chlorophenol	340	U
541-73-1	1,3-Dichlorobenzene	340	U
106-46-7	1,4-Dichlorobenzene	340	U
95-50-1	1,2-Dichlorobenzene	340	U
95-48-7	2-Methylphenol	340	U
108-60-1	2,2'-oxybis(1-Chloropropane)	340	U
106-44-5	4-Methylphenol	340	U
621-64-7	N-Nitroso-Di-n-Propylamine	340	U
67-72-1	Hexachloroethane	340	U
98-95-3	Nitrobenzene	340	U
78-59-1	Isophorone	340	U
88-75-5	2-Nitrophenol	340	U
105-67-9	2,4-Dimethylphenol	340	U
111-91-1	bis(2-Chloroethoxy)Methane	340	U
120-83-2	2,4-Dichlorophenol	340	U
120-82-1	1,2,4-Trichlorobenzene	340	U
91-20-3	Naphthalene	340	U
106-47-8	4-Chloroaniline	340	U
87-68-3	Hexachlorobutadiene	340	U
59-50-7	4-Chloro-3-Methylphenol	340	U
91-57-6	2-Methylnaphthalene	340	U
77-47-4	Hexachlorocyclopentadiene	340	U
88-06-2	2,4,6-Trichlorophenol	340	U
95-95-4	2,4,5-Trichlorophenol	820	U
91-58-7	2-Chloronaphthalene	340	U
88-74-4	2-Nitroaniline	820	U
131-11-3	Dimethylphthalate	340	U
208-96-8	Acenaphthylene	340	U
99-09-2	3-Nitroaniline	820	U
83-32-9	Acenaphthene	340	U
51-28-5	2,4-Dinitrophenol	820	U

9713517.2026

000111

1C

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B09DT7

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 01025 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A401025-08B

Sample wt/vol: 30.5 (g/mL) G Lab File ID: 40202S08

Level: (low/med) LOW Date Received: 01/18/94

% Moisture: 4 decanted: (Y/N) N Date Extracted: 01/20/94

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 02/02/94

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 9.4

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-02-7	4-Nitrophenol	820	U
132-64-9	Dibenzofuran	340	U
121-14-2	2,4-Dinitrotoluene	340	U
606-20-2	2,6-Dinitrotoluene	340	U
84-66-2	Diethylphthalate	340	U
7005-72-3	4-Chlorophenyl-phenylether	340	U
86-73-7	Fluorene	340	U
100-01-6	4-Nitroaniline	820	U
534-52-1	4,6-Dinitro-2-methylphenol	820	U
86-30-6	N-Nitrosodiphenylamine (1)	340	U
101-55-3	4-Bromophenyl-phenylether	340	U
118-74-1	Hexachlorobenzene	340	U
87-86-5	Pentachlorophenol	820	U
85-01-8	Phenanthrene	340	U
120-12-7	Anthracene	340	U
86-74-8	Carbazole	340	U
84-74-2	Di-n-Butylphthalate	270	BJ
206-44-0	Fluoranthene	340	U
129-00-0	Pyrene	340	U
85-68-7	Butylbenzylphthalate	340	U
91-94-1	3,3'-Dichlorobenzidine	340	U
56-55-3	Benzo(a)Anthracene	340	U
117-81-7	bis(2-Ethylhexyl)Phthalate	340	U
218-01-9	Chrysene	340	U
117-84-0	Di-n-Octyl Phthalate	340	U
205-99-2	Benzo(b)Fluoranthene	340	U
207-08-9	Benzo(k)Fluoranthene	340	U
50-32-8	Benzo(a)Pyrene	340	U
193-39-5	Indeno(1,2,3-cd)Pyrene	340	U
53-70-3	Dibenz(a,h)Anthracene	340	U
191-24-2	Benzo(g,h,i)Perylene	340	U

(1) - Cannot be separated from Diphenylamine

9713517.2027

000112
EPA SAMPLE NO.

1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

B09DT7

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 01025 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A401025-08B

Sample wt/vol: 30.5 (g/mL) G Lab File ID: 40202S08

Level: (low/med) LOW Date Received: 01/18/94

% Moisture: 4 decanted: (Y/N) N Date Extracted: 01/20/94

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 02/02/94

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 9.4

Number TICs found: 6

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN COMPOUND	5.52	1600	BJ
2.	UNKNOWN HYDROCARBON	5.90	68	J
3.	UNKNOWN KETONE	6.48	720	BJ
4.	UNKNOWN KETONE	7.02	210	BJ
5.	UNKNOWN HYDROCARBON	7.83	210	J
6.	HEXANEDIOIC ACID ESTER ISOME	25.30	68	J

9713517.2028

000113

1B

EPA SAMPLE NO.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

B09DT9

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 01025 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A401025-01B

Sample wt/vol: 30.2 (g/mL) G Lab File ID: 40202S09

Level: (low/med) LOW Date Received: 01/18/94

% Moisture: 9 decanted: (Y/N) N Date Extracted: 01/20/94

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 02/02/94

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 8.1

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-95-2	Phenol	360	U
111-44-4	bis(2-Chloroethyl)Ether	360	U
95-57-8	2-Chlorophenol	360	U
541-73-1	1,3-Dichlorobenzene	360	U
106-46-7	1,4-Dichlorobenzene	360	U
95-50-1	1,2-Dichlorobenzene	360	U
95-48-7	2-Methylphenol	360	U
108-60-1	2,2'-oxybis(1-Chloropropane)	360	U
106-44-5	4-Methylphenol	360	U
621-64-7	N-Nitroso-Di-n-Propylamine	360	U
67-72-1	Hexachloroethane	360	U
98-95-3	Nitrobenzene	360	U
78-59-1	Isophorone	360	U
88-75-5	2-Nitrophenol	360	U
105-67-9	2,4-Dimethylphenol	360	U
111-91-1	bis(2-Chloroethoxy)Methane	360	U
120-83-2	2,4-Dichlorophenol	360	U
120-82-1	1,2,4-Trichlorobenzene	360	U
91-20-3	Naphthalene	360	U
106-47-8	4-Chloroaniline	360	U
87-68-3	Hexachlorobutadiene	360	U
59-50-7	4-Chloro-3-Methylphenol	360	U
91-57-6	2-Methylnaphthalene	360	U
77-47-4	Hexachlorocyclopentadiene	360	U
88-06-2	2,4,6-Trichlorophenol	360	U
95-95-4	2,4,5-Trichlorophenol	870	U
91-58-7	2-Chloronaphthalene	360	U
88-74-4	2-Nitroaniline	870	U
131-11-3	Dimethylphthalate	360	U
208-96-8	Acenaphthylene	360	U
99-09-2	3-Nitroaniline	870	U
83-32-9	Acenaphthene	360	U
51-28-5	2,4-Dinitrophenol	870	U

9713517.2029

000114

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B09DT9

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 01025 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A401025-01B

Sample wt/vol: 30.2 (g/mL) G Lab File ID: 40202S09

Level: (low/med) LOW Date Received: 01/18/94

% Moisture: 9 decanted: (Y/N) N Date Extracted: 01/20/94

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 02/02/94

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 8.1

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-02-7	4-Nitrophenol	870	U
132-64-9	Dibenzofuran	360	U
121-14-2	2,4-Dinitrotoluene	360	U
606-20-2	2,6-Dinitrotoluene	360	U
84-66-2	Diethylphthalate	360	U
7005-72-3	4-Chlorophenyl-phenylether	360	U
86-73-7	Fluorene	360	U
100-01-6	4-Nitroaniline	870	U
534-52-1	4,6-Dinitro-2-methylphenol	870	U
86-30-6	N-Nitrosodiphenylamine (1)	360	U
101-55-3	4-Bromophenyl-phenylether	360	U
118-74-1	Hexachlorobenzene	360	U
87-86-5	Pentachlorophenol	870	U
85-01-8	Phenanthrene	360	U
120-12-7	Anthracene	360	U
86-74-8	Carbazole	360	U
84-74-2	Di-n-Butylphthalate	310	BJ
206-44-0	Fluoranthene	360	U
129-00-0	Pyrene	360	U
85-68-7	Butylbenzylphthalate	360	U
91-94-1	3,3'-Dichlorobenzidine	360	U
56-55-3	Benzo(a)Anthracene	360	U
117-81-7	bis(2-Ethylhexyl)Phthalate	360	U
218-01-9	Chrysene	360	U
117-84-0	Di-n-Octyl Phthalate	360	U
205-99-2	Benzo(b)Fluoranthene	360	U
207-08-9	Benzo(k)Fluoranthene	360	U
50-32-8	Benzo(a)Pyrene	360	U
193-39-5	Indeno(1,2,3-cd)Pyrene	360	U
53-70-3	Dibenz(a,h)Anthracene	360	U
191-24-2	Benzo(g,h,i)Perylene	360	U

(1) - Cannot be separated from Diphenylamine

9713517.2050

000115

1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B09DT9

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 01025 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A401025-01B

Sample wt/vol: 30.2 (g/mL) G Lab File ID: 40202S09

Level: (low/med) LOW Date Received: 01/18/94

% Moisture: 9 decanted: (Y/N) N Date Extracted: 01/20/94

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 02/02/94

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 8.1

Number TICs found: 18

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN COMPOUND	5.52	2200	BJ
2.	UNKNOWN KETONE	6.50	800	BJ
3.	UNKNOWN HYDROCARBON	6.80	1100	J
4.	UNKNOWN KETONE	7.03	330	BJ
5.	UNKNOWN HYDROCARBON	7.85	470	J
6.	UNKNOWN HYDROCARBON	8.28	220	J
7.	UNKNOWN ALKANE	18.55	180	J
8.	UNKNOWN ALKANE	19.67	110	J
9.	UNKNOWN ALKANE	20.75	150	J
10.	UNKNOWN ALKANE	21.78	180	J
11.	UNKNOWN ALKANE	22.75	150	J
12.	UNKNOWN ALKANE	23.67	150	J
13.	UNKNOWN ALKANE	24.55	110	J
14.	HEXANEDIOIC ACID ESTER ISOME	25.30	73	J
15.	UNKNOWN ALKANE	25.38	110	J
16.	UNKNOWN ALKANE	26.22	73	J
17.	UNKNOWN HYDROCARBON	27.93	110	J
18.	UNKNOWN ALKANE	30.23	220	J

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B09WF3

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 01025 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A401025-02B

Sample wt/vol: 30.5 (g/mL) G Lab File ID: 40202S03

Level: (low/med) LOW Date Received: 01/18/94

% Moisture: 7 decanted: (Y/N) N Date Extracted: 01/20/94

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 02/02/94

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 8.8

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-95-2	Phenol	350	U
111-44-4	bis(2-Chloroethyl)Ether	350	U
95-57-8	2-Chlorophenol	350	U
541-73-1	1,3-Dichlorobenzene	350	U
106-46-7	1,4-Dichlorobenzene	350	U
95-50-1	1,2-Dichlorobenzene	350	U
95-48-7	2-Methylphenol	350	U
108-60-1	2,2'-oxybis(1-Chloropropane)	350	U
106-44-5	4-Methylphenol	350	U
621-64-7	N-Nitroso-Di-n-Propylamine	350	U
67-72-1	Hexachloroethane	350	U
98-95-3	Nitrobenzene	350	U
78-59-1	Isophorone	350	U
88-75-5	2-Nitrophenol	350	U
105-67-9	2,4-Dimethylphenol	350	U
111-91-1	bis(2-Chloroethoxy)Methane	350	U
120-83-2	2,4-Dichlorophenol	350	U
120-82-1	1,2,4-Trichlorobenzene	350	U
91-20-3	Naphthalene	350	U
106-47-8	4-Chloroaniline	350	U
87-68-3	Hexachlorobutadiene	350	U
59-50-7	4-Chloro-3-Methylphenol	350	U
91-57-6	2-Methylnaphthalene	350	U
77-47-4	Hexachlorocyclopentadiene	350	U
88-06-2	2,4,6-Trichlorophenol	350	U
95-95-4	2,4,5-Trichlorophenol	850	U
91-58-7	2-Chloronaphthalene	350	U
88-74-4	2-Nitroaniline	850	U
131-11-3	Dimethylphthalate	350	U
208-96-8	Acenaphthylene	350	U
99-09-2	3-Nitroaniline	850	U
83-32-9	Acenaphthene	350	U
51-28-5	2,4-Dinitrophenol	850	U

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B09WF3

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 01025 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A401025-02B

Sample wt/vol: 30.5 (g/mL) G Lab File ID: 40202S03

Level: (low/med) LOW Date Received: 01/18/94

% Moisture: 7 decanted: (Y/N) N Date Extracted: 01/20/94

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 02/02/94

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 8.8

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-02-7	4-Nitrophenol	850	U
132-64-9	Dibenzofuran	350	U
121-14-2	2,4-Dinitrotoluene	350	U
606-20-2	2,6-Dinitrotoluene	350	U
84-66-2	Diethylphthalate	350	U
7005-72-3	4-Chlorophenyl-phenylether	350	U
86-73-7	Fluorene	350	U
100-01-6	4-Nitroaniline	850	U
534-52-1	4,6-Dinitro-2-methylphenol	850	U
86-30-6	N-Nitrosodiphenylamine (1)	350	U
101-55-3	4-Bromophenyl-phenylether	350	U
118-74-1	Hexachlorobenzene	350	U
87-86-5	Pentachlorophenol	850	U
85-01-8	Phenanthrene	350	U
120-12-7	Anthracene	350	U
86-74-8	Carbazole	350	U
84-74-2	Di-n-Butylphthalate	190	BJ
206-44-0	Fluoranthene	350	U
129-00-0	Pyrene	350	U
85-68-7	Butylbenzylphthalate	350	U
91-94-1	3,3'-Dichlorobenzidine	350	U
56-55-3	Benzo(a)Anthracene	350	U
117-81-7	bis(2-Ethylhexyl)Phthalate	350	U
218-01-9	Chrysene	350	U
117-84-0	Di-n-Octyl Phthalate	350	U
205-99-2	Benzo(b)Fluoranthene	350	U
207-08-9	Benzo(k)Fluoranthene	350	U
50-32-8	Benzo(a)Pyrene	350	U
193-39-5	Indeno(1,2,3-cd)Pyrene	350	U
53-70-3	Dibenz(a,h)Anthracene	350	U
191-24-2	Benzo(g,h,i)Perylene	350	U

(1) - Cannot be separated from Diphenylamine

EPA SAMPLE NO.

B09WF3

1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 01025 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A401025-02B

Sample wt/vol: 30.5 (g/mL) G Lab File ID: 40202S03

Level: (low/med) LOW Date Received: 01/18/94

% Moisture: 7 decanted: (Y/N) N Date Extracted: 01/20/94

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 02/02/94

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 8.8

Number TICs found: 10

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN COMPOUND	5.52	1500	BJ
2.	UNKNOWN KETONE	6.48	670	BJ
3.	UNKNOWN HYDROCARBON	6.77	140	J
4.	UNKNOWN KETONE	7.00	280	BJ
5.	UNKNOWN HYDROCARBON	7.83	280	J
6.	UNKNOWN HYDROCARBON	8.27	140	J
7.	HEXANEDIOIC ACID ESTER ISOME	25.27	71	J
8.	UNKNOWN ALKANE	27.92	71	J
9.	UNKNOWN ALKANE	30.22	280	J
10.	UNKNOWN ALKANE	33.53	110	J

9713517.2054

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B09WF5

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 01025 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A401025-03B

Sample wt/vol: 30.3 (g/mL) G Lab File ID: 40202S04

Level: (low/med) LOW Date Received: 01/18/94

% Moisture: 0 decanted: (Y/N) N Date Extracted: 01/20/94

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 02/02/94

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 9.1

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-95-2	Phenol	330	U
111-44-4	bis(2-Chloroethyl)Ether	330	U
95-57-8	2-Chlorophenol	330	U
541-73-1	1,3-Dichlorobenzene	330	U
106-46-7	1,4-Dichlorobenzene	330	U
95-50-1	1,2-Dichlorobenzene	330	U
95-48-7	2-Methylphenol	330	U
108-60-1	2,2'-oxybis(1-Chloropropane)	330	U
106-44-5	4-Methylphenol	330	U
621-64-7	N-Nitroso-Di-n-Propylamine	330	U
67-72-1	Hexachloroethane	330	U
98-95-3	Nitrobenzene	330	U
78-59-1	Isophorone	330	U
88-75-5	2-Nitrophenol	330	U
105-67-9	2,4-Dimethylphenol	330	U
111-91-1	bis(2-Chloroethoxy)Methane	330	U
120-83-2	2,4-Dichlorophenol	330	U
120-82-1	1,2,4-Trichlorobenzene	330	U
91-20-3	Naphthalene	330	U
106-47-8	4-Chloroaniline	330	U
87-68-3	Hexachlorobutadiene	330	U
59-50-7	4-Chloro-3-Methylphenol	330	U
91-57-6	2-Methylnaphthalene	330	U
77-47-4	Hexachlorocyclopentadiene	330	U
88-06-2	2,4,6-Trichlorophenol	330	U
95-95-4	2,4,5-Trichlorophenol	790	U
91-58-7	2-Chloronaphthalene	330	U
88-74-4	2-Nitroaniline	790	U
131-11-3	Dimethylphthalate	330	U
208-96-8	Acenaphthylene	330	U
99-09-2	3-Nitroaniline	790	U
83-32-9	Acenaphthene	330	U
51-28-5	2,4-Dinitrophenol	790	U

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B09WF5

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 01025 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A401025-03B

Sample wt/vol: 30.3 (g/mL) G Lab File ID: 40202S04

Level: (low/med) LOW Date Received: 01/18/94

% Moisture: 0 decanted: (Y/N) N Date Extracted: 01/20/94

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 02/02/94

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 9.1

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-02-7	4-Nitrophenol	790	U
132-64-9	Dibenzofuran	330	U
121-14-2	2,4-Dinitrotoluene	330	U
606-20-2	2,6-Dinitrotoluene	330	U
84-66-2	Diethylphthalate	330	U
7005-72-3	4-Chlorophenyl-phenylether	330	U
86-73-7	Fluorene	330	U
100-01-6	4-Nitroaniline	790	U
534-52-1	4,6-Dinitro-2-methylphenol	790	U
86-30-6	N-Nitrosodiphenylamine (1)	330	U
101-55-3	4-Bromophenyl-phenylether	330	U
118-74-1	Hexachlorobenzene	330	U
87-86-5	Pentachlorophenol	790	U
85-01-8	Phenanthrene	330	U
120-12-7	Anthracene	330	U
86-74-8	Carbazole	330	U
84-74-2	Di-n-Butylphthalate	240	BJ
206-44-0	Fluoranthene	330	U
129-00-0	Pyrene	330	U
85-68-7	Butylbenzylphthalate	330	U
91-94-1	3,3'-Dichlorobenzidine	330	U
56-55-3	Benzo(a)Anthracene	330	U
117-81-7	bis(2-Ethylhexyl)Phthalate	57	J
218-01-9	Chrysene	330	U
117-84-0	Di-n-Octyl Phthalate	330	U
205-99-2	Benzo(b)Fluoranthene	330	U
207-08-9	Benzo(k)Fluoranthene	330	U
50-32-8	Benzo(a)Pyrene	330	U
193-39-5	Indeno(1,2,3-cd)Pyrene	330	U
53-70-3	Dibenz(a,h)Anthracene	330	U
191-24-2	Benzo(g,h,i)Perylene	330	U

(1) - Cannot be separated from Diphenylamine

9213517.2056

000121

1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B09WF5

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 01025 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A401025-03B

Sample wt/vol: 30.3 (g/mL) G Lab File ID: 40202S04

Level: (low/med) LOW Date Received: 01/18/94

% Moisture: 0 decanted: (Y/N) N Date Extracted: 01/20/94

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 02/02/94

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 9.1

Number TICs found: 6

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN COMPOUND	5.52	1100	BJ
2.	UNKNOWN KETONE	6.47	660	BJ
3.	UNKNOWN HYDROCARBON	6.75	160	J
4.	UNKNOWN KETONE	7.00	130	BJ
5.	PROPANOIC ACID ESTER ISOMER	17.15	99	J
6.	HEXANEDIOIC ACID ESTER ISOME	25.27	66	J

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B09WF6

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 01025 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A401025-04B

Sample wt/vol: 30.2 (g/mL) G Lab File ID: 40202S05

Level: (low/med) LOW Date Received: 01/18/94

% Moisture: 0 decanted: (Y/N) N Date Extracted: 01/20/94

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 02/02/94

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 8.8

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-95-2	Phenol	330	U
111-44-4	bis(2-Chloroethyl)Ether	330	U
95-57-8	2-Chlorophenol	330	U
541-73-1	1,3-Dichlorobenzene	330	U
106-46-7	1,4-Dichlorobenzene	330	U
95-50-1	1,2-Dichlorobenzene	330	U
95-48-7	2-Methylphenol	330	U
108-60-1	2,2'-oxybis(1-Chloropropane)	330	U
106-44-5	4-Methylphenol	330	U
621-64-7	N-Nitroso-Di-n-Propylamine	330	U
67-72-1	Hexachloroethane	330	U
98-95-3	Nitrobenzene	330	U
78-59-1	Isophorone	330	U
88-75-5	2-Nitrophenol	330	U
105-67-9	2,4-Dimethylphenol	330	U
111-91-1	bis(2-Chloroethoxy)Methane	330	U
120-83-2	2,4-Dichlorophenol	330	U
120-82-1	1,2,4-Trichlorobenzene	330	U
91-20-3	Naphthalene	330	U
106-47-8	4-Chloroaniline	330	U
87-68-3	Hexachlorobutadiene	330	U
59-50-7	4-Chloro-3-Methylphenol	330	U
91-57-6	2-Methylnaphthalene	330	U
77-47-4	Hexachlorocyclopentadiene	330	U
88-06-2	2,4,6-Trichlorophenol	330	U
95-95-4	2,4,5-Trichlorophenol	790	U
91-58-7	2-Chloronaphthalene	330	U
88-74-4	2-Nitroaniline	790	U
131-11-3	Dimethylphthalate	330	U
208-96-8	Acenaphthylene	330	U
99-09-2	3-Nitroaniline	790	U
83-32-9	Acenaphthene	330	U
51-28-5	2,4-Dinitrophenol	790	U

9213517.2058

000123

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B09WF6

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 01025 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A401025-04B

Sample wt/vol: 30.2 (g/mL) G Lab File ID: 40202S05

Level: (low/med) LOW Date Received: 01/18/94

% Moisture: 0 decanted: (Y/N) N Date Extracted: 01/20/94

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 02/02/94

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 8.8

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-02-7	4-Nitrophenol	790	U
132-64-9	Dibenzofuran	330	U
121-14-2	2,4-Dinitrotoluene	330	U
606-20-2	2,6-Dinitrotoluene	330	U
84-66-2	Diethylphthalate	330	U
7005-72-3	4-Chlorophenyl-phenylether	330	U
86-73-7	Fluorene	330	U
100-01-6	4-Nitroaniline	790	U
534-52-1	4,6-Dinitro-2-methylphenol	790	U
86-30-6	N-Nitrosodiphenylamine (1)	330	U
101-55-3	4-Bromophenyl-phenylether	330	U
118-74-1	Hexachlorobenzene	330	U
87-86-5	Pentachlorophenol	790	U
85-01-8	Phenanthrene	330	U
120-12-7	Anthracene	330	U
86-74-8	Carbazole	330	U
84-74-2	Di-n-Butylphthalate	230	BJ
206-44-0	Fluoranthene	330	U
129-00-0	Pyrene	330	U
85-68-7	Butylbenzylphthalate	330	U
91-94-1	3,3'-Dichlorobenzidine	330	U
56-55-3	Benzo(a)Anthracene	330	U
117-81-7	bis(2-Ethylhexyl)Phthalate	330	U
218-01-9	Chrysene	330	U
117-84-0	Di-n-Octyl Phthalate	330	U
205-99-2	Benzo(b)Fluoranthene	330	U
207-08-9	Benzo(k)Fluoranthene	330	U
50-32-8	Benzo(a)Pyrene	330	U
193-39-5	Indeno(1,2,3-cd)Pyrene	330	U
53-70-3	Dibenz(a,h)Anthracene	330	U
191-24-2	Benzo(g,h,i)Perylene	330	U

(1) - Cannot be separated from Diphenylamine

1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B09WF6

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 01025 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A401025-04B

Sample wt/vol: 30.2 (g/mL) G Lab File ID: 40202S05

Level: (low/med) LOW Date Received: 01/18/94

% Moisture: 0 decanted: (Y/N) N Date Extracted: 01/20/94

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 02/02/94

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 8.8

Number TICs found: 10

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN COMPOUND	5.52	1700	BJ
2.	UNKNOWN HYDROCARBON	5.90	66	J
3.	UNKNOWN KETONE	6.48	660	J
4.	UNKNOWN HYDROCARBON	6.78	99	J
5.	UNKNOWN KETONE	7.02	170	BJ
6.	UNKNOWN HYDROCARBON	7.83	230	J
7.	UNKNOWN HYDROCARBON	8.27	99	J
8.	PROPANOIC ACID ESTER ISOMER	17.15	66	J
9.	UNKNOWN HYDROCARBON	21.63	66	J
10.	HEXANEDIOIC ACID ESTER ISOME	25.28	66	J

9713517.2040

 Skinner&Sherman REPORT Work Order # S4-01-124

Received: 01/19/94 02/23/94 13:00:37

REPORT TMA/NORCAL
TO 2030 Wright Avenue
Richmond, CA 94804

ATTEN Dan Steurmer

CLIENT HANFORD NOR SAMPLES 8
COMPANY TMA/NORCAL Hanford
FACILITY Richmond, CA

PREPARED TMA / Skinner & Sherman Labs.
BY 300 Second Avenue
P.O. Box 521
Waltham, MA 02254
ATTEN Client Services
PHONE (617) 890-7200

CERTIFIED BY

CONTACT DP

WORK ID N4-01-049
TAKEN By Client
TRANS Fedex
TYPE 7 soils
P.O. # N4-01-049
INVOICE under separate cover

SAMPLE IDENTIFICATION

01 B09DT4
02 B09DT5
03 B09DT7
04 B09DT9
05 B09WF3
06 B09WF5
07 B09WF6
07 B09WF6D
07 B09WF6S
08 LCSS

TEST CODES and NAMES used on this workorder

NITR S Nitrate/Nitrite in Soils

TMA
Thermo Analytical Inc.

This report is rendered upon all of the following conditions: Skinner & Sherman Laboratories, Inc., retains ownership of this report until associated submitted invoice is satisfied. Expert witness services shall be available in conjunction with this report only if prior notification of this potential requirement was made and accepted, before the analysis. Client will be responsible for Skinner & Sherman costs and consulting fees if our services are required by subpoena or otherwise in legal proceedings. Total liability is limited to the invoice amount. The results listed refer only to tested samples and applicable parameters. Samples are not analyzed in accordance with New York State protocol unless indicated. Product endorsement is neither inferred nor implied. Skinner & Sherman Laboratories, Inc., will exercise due diligence but will not be responsible for lost or destroyed samples or evidence unless client makes appropriate insurance coverage arrangements. Samples are held for thirty days following issuance of report. Samples will be stored at client's expense, if authorized in writing.

Skinner & Sherman Laboratories Inc. 300 Second Avenue, P.O. Box 521, Waltham, Massachusetts 02254-0521 (617) 890-7200
1-800-4 LAB TEST FAX (617) 890-3883

9713517.2041

Received: 01/19/94

Results by Sample

SAMPLE ID B09DT4 SAMPLE # 01 FRACTIONS: A
Date & Time Collected 01/11/94 Category SOIL

NITR_S 18.5
mg N/kg

SAMPLE ID B09DT5 SAMPLE # 02 FRACTIONS: A
Date & Time Collected 01/11/94 Category SOIL

NITR_S <2.48
mg N/kg

SAMPLE ID B09DT7 SAMPLE # 03 FRACTIONS: A
Date & Time Collected 01/11/94 Category SOIL

NITR_S <2.48
mg N/kg

SAMPLE ID B09DT9 SAMPLE # 04 FRACTIONS: A
Date & Time Collected 01/13/94 Category SOIL

NITR_S 236
mg N/kg

SAMPLE ID B09WF3 SAMPLE # 05 FRACTIONS: A
Date & Time Collected 01/13/94 Category SOIL

NITR_S 3.98
mg N/kg

SAMPLE ID B09WF5 SAMPLE # 06 FRACTIONS: A
Date & Time Collected 01/13/94 Category SOIL

NITR_S <2.49
mg N/kg

SAMPLE ID B09WF6 SAMPLE # 07 FRACTIONS: A
Date & Time Collected 01/13/94 Category SOIL

NITR_S <2.47
mg N/kg

TMA
Thermo Analytical Inc.

This report is rendered upon all of the following conditions: Skinner & Sherman Laboratories, Inc., retains ownership of this report until associated submitted invoice is satisfied. Expert witness services shall be available in conjunction with this report only if prior notification of this potential requirement was made and accepted, before the analysis. Client will be responsible for Skinner & Sherman costs and consulting fees if our services are required by subpoena or otherwise in legal proceedings. Total liability is limited to the invoice amount. The results listed refer only to tested samples and applicable parameters. Samples are not analyzed in accordance with New York State protocol unless indicated. Product endorsement is neither inferred nor implied. Skinner & Sherman Laboratories, Inc., will exercise due diligence but will not be responsible for lost or destroyed samples or evidence unless client makes appropriate insurance coverage arrangements. Samples are held for thirty days following issuance of report. Samples will be stored at client's expense, if authorized in writing.

Skinner & Sherman Laboratories Inc. 300 Second Avenue, P.O. Box 521, Waltham, Massachusetts 02254-0521 (617) 890-7200
1-800-4 LAB TEST FAX (617) 890-3883

9713517.2042

 Skinner&Sherman REPORT Work Order # S4-01-124

Received: 01/19/94 Results by Sample

SAMPLE ID B09WF6D SAMPLE # 07 FRACTIONS: B
Date & Time Collected 01/13/94 Category SOIL

NITR_S <2.48
mg N/kg

SAMPLE ID B09WF6S SAMPLE # 07 FRACTIONS: C
Date & Time Collected 01/13/94 Category SOIL

NITR_S 21.1
mg N/kg

SAMPLE ID LCSS SAMPLE # 08 FRACTIONS: A
Date & Time Collected not specified Category SOIL

NITR_S 2.04
mg N/L

TMA
Thermo Analytical Inc.

This report is rendered upon all of the following conditions: Skinner & Sherman Laboratories, Inc., retains ownership of this report until associated submitted invoice is satisfied. Expert witness services shall be available in conjunction with this report only if prior notification of this potential requirement was made and accepted, before the analysis. Client will be responsible for Skinner & Sherman costs and consulting fees if our services are required by subpoena or otherwise in legal proceedings. Total liability is limited to the invoice amount. The results listed refer only to tested samples and applicable parameters. Samples are not analyzed in accordance with New York State protocol unless indicated. Product endorsement is neither inferred nor implied. Skinner & Sherman Laboratories, Inc., will exercise due diligence but will not be responsible for lost or destroyed samples or evidence unless client makes appropriate insurance coverage arrangements. Samples are held for thirty days following issuance of report. Samples will be stored at client's expense, if authorized in writing.

Skinner & Sherman Laboratories Inc. 300 Second Avenue, P.O. Box 521, Waltham, Massachusetts 02254-0521 (617) 890-7200
1-800-4 LAB TEST FAX (617) 890-3883

Received: 01/19/94 02/23/94 13:00:37

TMA/NORCAL Hanford

Q U A L I T Y C O N T R O L

MATRIX SPIKE

Sample ID	Sample Result	Spike Added	Spike Result	% Recovery
S401124-07	<2.47 mg/kg	19.7 mg/kg	21.1 mg/kg	107.1

DUPLICATE

Sample ID	Sample result	Duplicate Result	Relative % Difference
S401124-07	<2.47 mg/kg	<2.48 mg/kg	not calculable

QUALITY CONTROL SAMPLES

Sample ID	True Value	Found Value	Percent Recovery
LCS	2.00 mg/L	2.04 mg/L	100.2
Prep blank	--	<0.25 mg/L	--

TMA
Thermo Analytical Inc.
Skinner & Sherman Laboratories Inc.

This report is rendered upon all of the following conditions: Skinner & Sherman Laboratories, Inc., retains ownership of this report until associated submitted invoice is satisfied. Expert witness services shall be available in conjunction with this report only if prior notification of this potential requirement was made and accepted, before the analysis. Client will be responsible for Skinner & Sherman costs and consulting fees if our services are required by subpoena or otherwise in legal proceedings. Total liability is limited to the invoice amount. The results listed refer only to tested samples and applicable parameters. Samples are not analyzed in accordance with New York State protocol unless indicated. Product endorsement is neither inferred nor implied. Skinner & Sherman Laboratories, Inc., will exercise due diligence but will not be responsible for lost or destroyed samples or evidence unless client makes appropriate insurance coverage arrangements. Samples are held for thirty days following issuance of report. Samples will be stored at client's expense, if authorized in writing.

300 Second Avenue, P.O. Box 521, Waltham, Massachusetts 02254-0521 (617) 890-7200
1-800-4 LAB TEST FAX (617) 890-3883

Received: 01/19/94

Test Methodology

TEST CODE MITR S NAME Nitrate/Nitrite in Soils

The sample was extracted with deionized water and analyzed in accordance with Method for Chemical Analysis of Water and Wastes EPA-600/4-79-020, March 1979, Method 353.2 (modified)

TMA
Thermo Analytical Inc.

This report is rendered upon all of the following conditions: Skinner & Sherman Laboratories, Inc., retains ownership of this report until associated submitted invoice is satisfied. Expert witness services shall be available in conjunction with this report only if prior notification of this potential requirement was made and accepted, before the analysis. Client will be responsible for Skinner & Sherman costs and consulting fees if our services are required by subpoena or otherwise in legal proceedings. Total liability is limited to the invoice amount. The results listed refer only to tested samples and applicable parameters. Samples are not analyzed in accordance with New York State protocol unless indicated. Product endorsement is neither inferred nor implied. Skinner & Sherman Laboratories, Inc., will exercise due diligence but will not be responsible for lost or destroyed samples or evidence unless client makes appropriate insurance coverage arrangements. Samples are held for thirty days following issuance of report. Samples will be stored at client's expense, if authorized in writing.

Skinner & Sherman Laboratories Inc. 300 Second Avenue, P.O. Box 521, Waltham, Massachusetts 02254-0521 (617) 890-7200
1-800-4 LAB TEST FAX (617) 890-3883

9713512.2045

000633

TMA Inc. REPORT Work Order # A4-01-025

Received: 01/18/94

Results by Sample

SAMPLE ID B09DT4 FRACTION 06D TEST CODE 8015MS NAME EPA 8015M EXTRACT.

Date & Time Collected 01/11/94 Category

MODIFIED 8015 - EXTRACTABLE FUEL HYDROCARBONS

Matrix: SOIL
Date Analyzed: 01/27/94
Dilution factor: 1.00
Concentration Units: mg/Kg

Compound	Sample Result	PQL
Kerosene Range	ND	5.0
C10 - C16 Jet Fuel Range	NA	NA
C9 - C22 Diesel Range	NA	NA
Hydraulic Range	NA	NA

ND = Not detected at the specified limits

Form I

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000635

TMA Inc. REPORT

Results by Sample

Received: 01/18/94

Work Order # 000635 SP 3/24/97

44-01-025

SAMPLE ID B09DT5 FRACTION 07D TEST CODE 8015MS NAME EPA 8015M EXTRACT.

Date & Time Collected 01/11/94 Category

MODIFIED 8015 - EXTRACTABLE FUEL HYDROCARBONS

Matrix: SOIL

Date Analyzed: 01/27/94

Dilution factor: 1.00

Concentration Units: mg/Kg

Compound	Sample Result	PQL
Kerosene Range	ND	5.0
C10 - C16 Jet Fuel Range	NA	NA
C9 - C22 Diesel Range	NA	NA
Hydraulic Range	NA	NA

ND = Not detected at the specified limits

Form I

TMA Inc. REPORT Work Order # A4-01-025

Received: 01/18/94

Results by Sample

SAMPLE ID B09DT7 FRACTION 08D TEST CODE 8015MS NAME EPA 8015M EXTRACT.

Date & Time Collected 01/11/94 Category

MODIFIED 8015 - EXTRACTABLE FUEL HYDROCARBONS

Matrix: SOIL
Date Analyzed: 01/27/94
Dilution factor: 1.00
Concentration Units: mg/Kg

Compound	Sample Result	PQL
Kerosene Range	ND	5.0
C10 - C16 Jet Fuel Range	NA	NA
C9 - C22 Diesel Range	NA	NA
Hydraulic Range	NA	NA

ND = Not detected at the specified limits

Form I

TMA Inc. REPORT Work Order # A4-01-025

Received: 01/18/94 Results by Sample

SAMPLE ID B09DT9 FRACTION 01G TEST CODE 8015MS NAME EPA 8015M EXTRACT.

Date & Time Collected 01/13/94 Category

MODIFIED 8015 - EXTRACTABLE FUEL HYDROCARBONS

Matrix: SOIL
Date Analyzed: 01/27/94
Dilution factor: 1.00
Concentration Units: mg/Kg

Compound	Sample Result	PQL
Kerosene Range	ND	5.0
C10 - C16 Jet Fuel Range	NA	NA
C9 - C22 Diesel Range	NA	NA
Hydraulic Range	NA	NA

ND = Not detected at the specified limits

Form I

TMA Inc. REPORT Work Order # A4-01-025

Received: 01/18/94 Results by Sample

SAMPLE ID B09WF3 FRACTION 02E TEST CODE 8015MS NAME EPA 8015M EXTRACT.

Date & Time Collected 01/13/94 Category

MODIFIED 8015 - EXTRACTABLE FUEL HYDROCARBONS

Matrix: SOIL
Date Analyzed: 01/27/94
Dilution factor: 1.00
Concentration Units: mg/Kg

Compound	Sample Result	PQL
Kerosene Range	ND	5.0
C10 - C16 Jet Fuel Range	NA	NA
C9 - C22 Diesel Range	NA	NA
Hydraulic Range	NA	NA

ND = Not detected at the specified limits

Form I

TMA Inc. REPORT Work Order # A4-01-025

Received: 01/18/94

Results by Sample

SAMPLE ID B09WF5 FRACTION 03D TEST CODE 8015MS NAME EPA 8015M EXTRACT.

Date & Time Collected 01/13/94 Category

MODIFIED 8015 - EXTRACTABLE FUEL HYDROCARBONS

Matrix: SOIL
Date Analyzed: 01/27/94
Dilution factor: 1.00
Concentration Units: mg/Kg

Compound	Sample Result	PQL
Kerosene Range	ND	5.0
C10 - C16 Jet Fuel Range	NA	NA
C9 - C22 Diesel Range	NA	NA
Hydraulic Range	NA	NA

ND = Not detected at the specified limits

Form I

TMA Inc. REPORT Work Order # A4-01-025

Received: 01/18/94

Results by Sample

SAMPLE ID B09WF6 FRACTION 04D TEST CODE 8015MS NAME EPA 8015M EXTRACT.

Date & Time Collected 01/13/94 Category

MODIFIED 8015 - EXTRACTABLE FUEL HYDROCARBONS

Matrix: SOIL
Date Analyzed: 01/27/94
Dilution factor: 1.00
Concentration Units: mg/Kg

Compound	Sample Result	PQL
Kerosene Range	ND	5.0
C10 - C16 Jet Fuel Range	NA	NA
C9 - C22 Diesel Range	NA	NA
Hydraulic Range	NA	NA

ND = Not detected at the specified limits

Form I

TMA
Thermo Analytical Inc.

Skinner & Sherman Labs., Inc.
300 Second Avenue
Post Office Box 521
Waltham, MA 02254-0521
(617) 890-7200
FAX (617) 890-3883

9713512.2052

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MAR 1994
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SDLA

February 18, 1994

TMA/NORCAL
2030 Wright Avenue
Richmond, CA 94804
Attention: Dan Stuermer

Quality Control Narrative

Scope
Seven (7) soil samples were submitted to TMA/Skinner & Sherman Laboratories, Inc. on January 19, 1994 from TMA/Norcal. The samples were analyzed for the USEPA CLP Target Analyte List metals, titanium, and cyanide. The analyses were performed under TMA/Skinner and Sherman work order S401120.

Methodology
The samples were prepared, analyzed and reported in accordance with the USEPA Contract Laboratory Program Statement of Work ILM02.

Discussion
All quality control requirements were met for the samples with the following exceptions:

The laboratory duplicate for iron exceeded the control limit requirement.

Please feel free to call if there are any questions concerning this package.

Respectfully submitted,

TMA/SKINNER & SHERMAN LABORATORIES, INC.

Steven Provencal

Steven R. Provencal
Lead Chemist

8-2-96
MC

9713517.2053

WESTINGHOUSE/HANFORD

COVER PAGE - INORGANIC ANALYSES DATA PACKAGE

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D2-0039

Lab Code: SKINER Case No.: N4-01-049 SAS No.: SDG No.: B09DT4

SOW No.: ILM02.1

SAMPLE NUMBER:	Lab Sample ID.	
B09DT4	S401120-01	S
B09DT5	S401120-02	S
B09DT7	S401120-03	S
B09DT9	S401120-04	S
B09WF3	S401120-05	S
B09WF5	S401120-06	S
B09WF6	S401120-07	S
B09WF6D	S401120-07	S2
B09WF6S	S401120-07	DS

Were ICP interelement corrections applied? Yes/No YES

Were ICP background corrections applied? Yes/No YES

If yes-were raw data generated before application of background corrections? Yes/No NO

Comments:

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

Signature: Steven Provencal Name: Steven R. Provencal

Date: 2/18/94 Title: Lead Chemist

9216517.2054

WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER:

B09DT4

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D2-0039

Lab Code: SKINER Case No.: N4-01-049SAS No.: SDG No.: B09DT4

Matrix (soil/water): SOIL Lab Sample ID: S401120-01 S

Level (low/med): LOW Date Received: 01/19/94

% Solids: 99.9

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	56.3			P
7440-36-0	Antimony	2.4	U		P
7440-38-2	Arsenic	0.59	U		P
7440-39-3	Barium	0.59	B		P
7440-41-7	Beryllium	0.11	B		P
7440-43-9	Cadmium	0.33	U		P
7440-70-2	Calcium	16.4	U		P
7440-47-3	Chromium	0.88	B		P
7440-48-4	Cobalt	0.57	U		P
7440-50-8	Copper	0.84	B		P
7439-89-6	Iron	160		*	P
7439-92-1	Lead	0.45	B		P
7439-95-4	Magnesium	7.3	B		P
7439-96-5	Manganese	0.33	B		P
7439-97-6	Mercury	0.05	U		CV
7440-02-0	Nickel	0.86	U		P
7440-09-7	Potassium	21.3	B		P
7782-49-2	Selenium	0.55	U		P
7440-22-4	Silver	0.41	U		P
7440-23-5	Sodium	17.2	B		P
7440-28-0	Thallium	0.73	U		P
7440-62-2	Vanadium	0.47	U		P
7440-66-6	Zinc	1.6	B		P
	Cyanide	0.49	U		CA
7440-32-6	Titanium	2.0	B		P

Color Before: WHITE Clarity Before: Texture: FINE

Color After: WHITE Clarity After: Artifacts:

Comments:

FORM I - IN ILM02.1

9213517.2055

WESTINGHOUSE/HANFORD

1

SAMPLE NUMBER:

INORGANIC ANALYSIS DATA SHEET

B09DT5

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D2-0039

Lab Code: SKINER Case No.: N4-01-049SAS No.: SDG No.: B09DT4

Matrix (soil/water): SOIL Lab Sample ID: S401120-02 S

Level (low/med): LOW Date Received: 01/19/94

% Solids: 99.9

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	65.7			P
7440-36-0	Antimony	2.2	U		P
7440-38-2	Arsenic	0.55	U		P
7440-39-3	Barium	0.28	B		P
7440-41-7	Beryllium	0.06	U		P
7440-43-9	Cadmium	0.31	U		P
7440-70-2	Calcium	15.3	U		P
7440-47-3	Chromium	0.83	B		P
7440-48-4	Cobalt	0.53	U		P
7440-50-8	Copper	0.79	B		P
7439-89-6	Iron	171		*	P
7439-92-1	Lead	0.42	B		P
7439-95-4	Magnesium	7.7	B		P
7439-96-5	Manganese	0.34	B		P
7439-97-6	Mercury	0.05	U		CV
7440-02-0	Nickel	0.81	U		P
7440-09-7	Potassium	27.0	B		P
7782-49-2	Selenium	0.51	U		P
7440-22-4	Silver	0.39	U		P
7440-23-5	Sodium	12.1	B		P
7440-28-0	Thallium	0.68	U		P
7440-62-2	Vanadium	0.44	U		P
7440-66-6	Zinc	0.84	U		P
	Cyanide	0.48	U		CA
7440-32-6	Titanium	2.5	B		P

Color Before: WHITE Clarity Before: Texture: FINE

Color After: WHITE Clarity After: Artifacts:

Comments:

FORM I - IN ILM02.1

WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B09DT7

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D2-0039

Lab Code: SKINER Case No.: N4-01-049SAS No.: SDG No.: B09DT4

Matrix (soil/water): SOIL Lab Sample ID: S401120-03 S

Level (low/med): LOW Date Received: 01/19/94

% Solids: 96.1

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	7310			P
7440-36-0	Antimony	2.5	U		P
7440-38-2	Arsenic	3.7			P
7440-39-3	Barium	45.2			P
7440-41-7	Beryllium	0.37	B		P
7440-43-9	Cadmium	0.34	U		P
7440-70-2	Calcium	2360			P
7440-47-3	Chromium	9.3			P
7440-48-4	Cobalt	6.1	B		P
7440-50-8	Copper	10.4			P
7439-89-6	Iron	14200		*	P
7439-92-1	Lead	5.1			P
7439-95-4	Magnesium	5150			P
7439-96-5	Manganese	282			P
7439-97-6	Mercury	0.05	U		CV
7440-02-0	Nickel	8.4			P
7440-09-7	Potassium	1190			P
7782-49-2	Selenium	0.57	U		P
7440-22-4	Silver	0.70	B		P
7440-23-5	Sodium	148	B		P
7440-28-0	Thallium	0.75	U		P
7440-62-2	Vanadium	27.5			P
7440-66-6	Zinc	35.0			P
	Cyanide	0.52	U		CA
7440-32-6	Titanium	623			P

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

9713517.2057

WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER:

B09DT9

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D2-0039

Lab Code: SKINER Case No.: N4-01-049SAS No.: SDG No.: B09DT4

Matrix (soil/water): SOIL Lab Sample ID: S401120-04 S

Level (low/med): LOW Date Received: 01/19/94

% Solids: 89.4

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	7530			P
7440-36-0	Antimony	2.6	U		P
7440-38-2	Arsenic	3.7			P
7440-39-3	Barium	104			P
7440-41-7	Beryllium	0.35	B		P
7440-43-9	Cadmium	0.41	B		P
7440-70-2	Calcium	90600			P
7440-47-3	Chromium	11.3			P
7440-48-4	Cobalt	8.7	B		P
7440-50-8	Copper	12.9			P
7439-89-6	Iron	15100		*	P
7439-92-1	Lead	3.9			P
7439-95-4	Magnesium	5130			P
7439-96-5	Manganese	505			P
7439-97-6	Mercury	0.06	U		CV
7440-02-0	Nickel	11.6			P
7440-09-7	Potassium	923	B		P
7782-49-2	Selenium	0.60	U		P
7440-22-4	Silver	0.45	U		P
7440-23-5	Sodium	181	B		P
7440-28-0	Thallium	0.79	U		P
7440-62-2	Vanadium	49.8			P
7440-66-6	Zinc	31.3			P
	Cyanide	0.54	U		CA
7440-32-6	Titanium	1160			P

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

WESTINGHOUSE/HANFORD
1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER:

B09WF3

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D2-0039

Lab Code: SKINER Case No.: N4-01-049SAS No.: SDG No.: B09DT4

Matrix (soil/water): SOIL Lab Sample ID: S401120-05 S

Level (low/med): LOW Date Received: 01/19/94

% Solids: 92.9

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	6270			P
7440-36-0	Antimony	2.5	U		P
7440-38-2	Arsenic	3.8			P
7440-39-3	Barium	74.1			P
7440-41-7	Beryllium	0.33	B		P
7440-43-9	Cadmium	0.52	B		P
7440-70-2	Calcium	7370			P
7440-47-3	Chromium	15.0			P
7440-48-4	Cobalt	11.1			P
7440-50-8	Copper	16.0			P
7439-89-6	Iron	19900		*	P
7439-92-1	Lead	7.9			P
7439-95-4	Magnesium	4520			P
7439-96-5	Manganese	340			P
7439-97-6	Mercury	0.72			CV
7440-02-0	Nickel	11.0			P
7440-09-7	Potassium	1030			P
7782-49-2	Selenium	0.56	U		P
7440-22-4	Silver	0.87	B		P
7440-23-5	Sodium	232	B		P
7440-28-0	Thallium	0.74	U		P
7440-62-2	Vanadium	46.7			P
7440-66-6	Zinc	43.1			P
	Cyanide	0.51	U		CA
7440-32-6	Titanium	1550			P

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts: YES

Comments:
STONES

FORM I - IN ILM02.1

WESTINGHOUSE/HANFORD

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B09WF5

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D2-0039

Lab Code: SKINER Case No.: N4-01-049SAS No.: SDG No.: B09DT4

Matrix (soil/water): SOIL Lab Sample ID: S401120-06 S

Level (low/med): LOW Date Received: 01/19/94

% Solids: 99.9

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	74.4			P
7440-36-0	Antimony	2.3	U		P
7440-38-2	Arsenic	0.57	U		P
7440-39-3	Barium	0.43	B		P
7440-41-7	Beryllium	0.06	U		P
7440-43-9	Cadmium	0.32	U		P
7440-70-2	Calcium	15.9	U		P
7440-47-3	Chromium	0.86	B		P
7440-48-4	Cobalt	0.55	U		P
7440-50-8	Copper	0.31	U		P
7439-89-6	Iron	232		*	P
7439-92-1	Lead	0.37	B		P
7439-95-4	Magnesium	11.7	B		P
7439-96-5	Manganese	0.62	B		P
7439-97-6	Mercury	0.05	U		CV
7440-02-0	Nickel	0.84	U		P
7440-09-7	Potassium	31.6	B		P
7782-49-2	Selenium	0.53	U		P
7440-22-4	Silver	0.68	B		P
7440-23-5	Sodium	28.9	B		P
7440-28-0	Thallium	0.71	U		P
7440-62-2	Vanadium	0.46	U		P
7440-66-6	Zinc	0.88	U		P
	Cyanide	0.49	U		CA
7440-32-6	Titanium	2.9	B		P

Color Before: WHITE Clarity Before: Texture: FINE

Color After: WHITE Clarity After: Artifacts:

Comments:

SAMPLE NUMBER:

INORGANIC ANALYSIS DATA SHEET

B09WF6

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D2-0039

Lab Code: SKINER Case No.: N4-01-049SAS No.: SDG No.: B09DT4

Matrix (soil/water): SOIL Lab Sample ID: S401120-07 S

Level (low/med): LOW Date Received: 01/19/94

% Solids: 99.9

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	60.2			P
7440-36-0	Antimony	2.4	U		P
7440-38-2	Arsenic	0.59	U		P
7440-39-3	Barium	0.34	B		P
7440-41-7	Beryllium	0.06	U		P
7440-43-9	Cadmium	0.33	U		P
7440-70-2	Calcium	16.4	U		P
7440-47-3	Chromium	0.94	B		P
7440-48-4	Cobalt	0.57	U		P
7440-50-8	Copper	0.31	U		P
7439-89-6	Iron	141		*	P
7439-92-1	Lead	0.54	B		P
7439-95-4	Magnesium	7.0	B		P
7439-96-5	Manganese	0.58	B		P
7439-97-6	Mercury	0.05	U		CV
7440-02-0	Nickel	0.86	U		P
7440-09-7	Potassium	20.0	B		P
7782-49-2	Selenium	0.55	U		P
7440-22-4	Silver	0.41	U		P
7440-23-5	Sodium	7.8	U		P
7440-28-0	Thallium	0.73	U		P
7440-62-2	Vanadium	0.47	U		P
7440-66-6	Zinc	0.90	U		P
	Cyanide	0.50	U		CA
7440-32-6	Titanium	2.1	B		P

Color Before: WHITE Clarity Before: Texture: FINE

Color After: WHITE Clarity After: Artifacts:

Comments:

9213517.2061

TMA
Thermo Analytical Inc.

TMA/ARLI
160 Taylor Street
Monrovia, CA 91016
(818) 357-3247

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MAR 1994
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16 March 1994

Westinghouse Hanford Company
ATTN: Ms. Briana Colley
345 Hills
Richland, WA 99352

RE: Nonconformances concerning the date of analysis for the following TMA/ARLI cases (work orders): # A401017, A401025, A401037, and A401038.

Dear Ms. Colley:

The Volatile samples of the referenced work orders were all analyzed during a period from 01/19/94 through 01/27/94, on the instrument "ROCKY". On 01/19/94, the operator inadvertently entered the wrong year during the instrument system boot-up, and therefore, all of the sample data from 01/19/94 through 01/27/94 was incorrectly documented with the year as "1993". Since it was not possible to change the date of analysis within the system, the cases were processed as is, with the appropriate manual corrections made on the raw data by the laboratory's Data Verification Department. The report forms also reflect the correct year of analysis (1994).

TMA/ARLI uniquely identifies each GCMS file name with the year, month and day, instrument initial, and the sequence number (i.e. 40119R01). Enclosed are copies of the Volatile analyst's logbook pages, indicating the correct date on which the Volatile samples were analyzed for each affected work order. In addition, we have included a list of the samples affected within each work order for reference.

We regret any inconvenience that occurred as a result of this discrepancy.

If you have any questions, please call me at 818/357-3247.

Sincerely,

Nicole Roth

Nicole Roth
Assistant Lab Manager

cc: Dolores Sanchez - Program Coordinator
Maureen Parrish - Project Manager

9713517.2062

RECORD COPY

MAR 1994
RECEIVED
SDLA

WESTINGHOUSE HANFORD COMPANY

Results of Analyses For:

GENERAL CHEMISTRY & ORGANICS
Case No. 01-038
(TMA\ARLI W.O. Nos. A4-01-038)

METALS & NITRATE/NITRITE
Case No. N4-01-070
(TMA\Skinner & Sherman W.O. Nos. S4-01-177 & S4-01-176)

March 18, 1994

TMA Master Work Order N4-01-070

 8-2-96 MC

9413517.2063

000002

PAGE 1 TMA/Norcal CHAIN OF CUSTODY ORD # N4-01-070

RCVD: 01/21/94 DUE: 02/25/94 01/24/94 15:22:47 KEEP: 02/25/95 DISP: S

DASH	SAMPLE IDENTIFICATION		STORED	TESTS for FRACTIONS with work in DEPT: SU and CATEGORY			
01A-S	B09WF4		ARLI	WH014	WH016	WH195	WH232
01C-S	B09WF4	MS	ARLI	WH014	WH016	WH195	WH232
01D-S	B09WF4	MSD	ARLI	WH014	WH016	WH195	
01E	B09WF4	DUP	ARLI	WH232			
02A-W	B09WF7		ARLI	WH014			

RELEASED BY	DATE	TRANSFERRED TO	DATE	RECEIVED BY	DATE
Yjumamoto	1/24/94	ARLI	1/24/94	[illegible]	1/25/94

9213517.2084

000002A

Westinghouse Hanford Company	CHAIN OF CUSTODY

Custody Form Initiator: L E ROGERS

Company Contact: L E ROGERS

Telephone: 376-7690

Project Designation/Sampling Locations: 200-UP-2

Collection Date: 1-17-94

Ice Chest No.: SNL-196

Field Logbook No.: EFL-1091

Bill of Lading/Airbill No.:

Offsite Property No.:

Method of Shipment: AIR

Shipped to: TMA

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

Sample Identification

1) B09WF4

~~1~~,250ml P:CLP;TAL Metals,Hg,Ti
~~1~~,250ml Gs:VOA CLP
~~1~~,250ml aG:Semi-VOA CLP
~~1~~,125ml G:Anions F,Cl,SO4 (EPA 300.0)
~~1~~,125ml P/G:Anions NO2,NO3 (EPA 353.2)
~~1~~,125ml G:Cyanide CLP
~~1~~,125ml Gw:Kerosene (8015M)
~~1~~,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

2) B09WF7

~~1,250ml P:CLP;TAL Metals,Hg,Ti~~
~~1~~,250ml Gs:VOA CLP
~~1,250ml aG:Semi-VOA CLP~~
~~1,125ml G:Anions F,Cl,SO4 (EPA 300.0)~~
~~1,125ml P/G:Anions NO2,NO3 (EPA 353.2)~~
~~1,125ml G:Cyanide CLP~~
~~1,125ml Gw:Kerosene (8015M)~~
~~1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79~~

1-17-94

3)

~~1,250ml P:CLP;TAL Metals,Hg,Ti~~
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

1-17-94

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

Relinquished by:	Received by:	Date/Time:
1-20-94 Loren E. Rogers 0955	[signature]	1-21-94 10:58
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

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

0000023

Westinghouse Hanford Company	SAMPLE ANALYSIS REQUEST

Collector L E ROGERS S.A.F. # 93-263 Date 1-17-94

Company Contact L E ROGERS Telephone (509) 376-7690

Sample Number	*	Date Collected	Time Collected	Number and Type of Sample Containers/Analysis Required
B09WF4	S	1-17-94	1330	1,250ml P:CLP;TAL Metals,Hg,Ti 1,250ml Gs:VOA CLP 1,250ml aG:Semi-VOA CLP 1,125ml G:Anions F,Cl,SO4 (EPA 300.0) 1,125ml P/G:Anions NO2,NO3 (EPA 353.2) 1,125ml G:Cyanide CLP 1,125ml Gw:Kerosene (8015M) 1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152,Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30),TotalUranium(EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79
B09WF7	S	1-17-94	0700	~~1,250ml P:CLP;TAL Metals,Hg,Ti~~ 1,250ml Gs:VOA CLP ~~1,250ml aG:Semi-VOA CLP~~ ~~1,125ml G:Anions F,Cl,SO4 (EPA 300.0)~~ ~~1,125ml P/G:Anions NO2,NO3 (EPA 353.2)~~ ~~1,125ml G:Cyanide CLP~~ ~~1,125ml Gw:Kerosene (8015M)~~ ~~1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152,Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30),TotalUranium(EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79~~ LR 1-17-94
			LR 1-17-94	1,250ml P:CLP;TAL Metals,Hg,Ti 1,250ml Gs:VOA CLP 1,250ml aG:Semi-VOA CLP 1,125ml G:Anions F,Cl,SO4 (EPA 300.0) 1,125ml P/G:Anions NO2,NO3 (EPA 353.2) 1,125ml G:Cyanide CLP 1,125ml Gw:Kerosene (8015M) 1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152,Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30),TotalUranium(EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

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

Field Information TMA

Special Handling and/or Storage Maintain at 4C ; (SOIL)

Possible Sample Hazards RADIOACTIVE

A-6000-406 (06/91) WEF060

9213517.2066

000003

SAMPLE LOG-IN SHEET (WHC)

LAB NAME : TMA/ARU

PAGE : 1 OF 1

RECEIVED BY (PRINT NAME): PAYAM SHADI

LOG-IN-DATE : 1/25/94

RECEIVED BY (SIGNATURE): Payam Shadi

ICE CHEST NO. SMC 341

REMARKS:

1. Custody Seal(s) — Present / Absent* (Intact / Broken)
2. Custody Seal Nos: _____
3. Chain of Custody Records — Present / Absent*
4. Traffic Reports or Packing List — Present / Absent*
5. Airbill — Airbill / Sticker Present / Absent*
6. Airbill No.: 882-6003-8410
7. Sample Tags — Present / Absent*
8. Sample Tag Numbers — Listed / Not Listed on Chain of Custody
9. Sample Condition: Intact / Broken* / Leaking
10. Does information on custody records, traffic reports, and sample tags agree? — Yes / No*
11. Date Recieved at Lab: 1/25/94
12. Temp of Ice chest 4 °C
13. Time Recieved: 9:30

EPA SAMPLE #	CORRESPONDING SAMPLE TAG #	CORRESPONDING ASSIGNED LAB #	REMARKS: CONDITION OF SAMPLE SHIPMENT, ETC
	B09WF7	A4-01-038	
	B09WF4	A4-01-038	

SAMPLE TRANSFER

Fraction: _____

Area #: _____

By: _____

On: _____

* Contact SMO and attach record of resolution

Reviewed By: _____ Logbook No.: _____

Date: _____ Logbook Page No.: _____

FORM DC-1

000004

FEDERAL EXPRESS

USE THIS AIRBILL FOR SHIPMENTS WITHIN THE CONTINENTAL U.S.A., ALASKA AND HAWAII.
USE THE INTERNATIONAL AIR WAYBILL FOR SHIPMENTS TO PUERTO RICO AND ALL NON U.S. LOCATIONS.
QUESTIONS? CALL 800-238-5355 TOLL FREE.

AIRBILL PACKAGE TRACKING NUMBER 8826003841

3356M 8826003841

RECIPIENT'S COPY

1 Date 1-29-94

From (Your Name) Please Print: SAMPLE CONTROL
Your Phone Number (Very Important): (510-235-2633)
Company: T M A ZNERCAL
Department/Floor No.:
Street Address: 2030 WRIGHT AVE
City: RICHMOND State: CA ZIP Required: 94804

2 To (Recipient's Name) Please Print: CAROLE HARRIS
Recipient's Phone Number (Very Important): (818) 357-3217
Company: TMA/ARLI
Department/Floor No.:
Exact Street Address (We Cannot Deliver to P.O. Boxes or P.O. Zip Codes.): 160 TAYLOR STREET
City: MONROVIA, State: CA. ZIP Required: 91016

YOUR INTERNAL BILLING REFERENCE INFORMATION (optional) (First 24 characters will appear on invoice.)
2340-6406

H IF HOLD AT FEDEX LOCATION, Print FEDEX Address Here
Street Address:
City: State: ZIP Required:

3 PAYMENT 1 [X] Bill Sender 2 [ ] Bill Recipient's FedEx Acct. No. 3 [ ] Bill 3rd Party FedEx Acct. No. 4 [ ] Bill Credit Card 5 [ ] Cash/Check

4 SERVICES (Check only one box)

Priority Overnight (Delivery by next business morning†)
11 [X] OTHER PACKAGING
16 [ ] FEDEX LETTER*
12 [ ] FEDEX PAK*
13 [ ] FEDEX BOX
14 [ ] FEDEX TUBE

Standard Overnight (Delivery by next business afternoon. No Saturday delivery†)
51 [ ] OTHER PACKAGING
56 [ ] FEDEX LETTER*
52 [ ] FEDEX PAK*
53 [ ] FEDEX BOX
54 [ ] FEDEX TUBE

Economy Two-Day (Delivery by second business day †)
30 [ ] ECONOMY*
* Economy Letter Rate not available. Minimum charge: One-pound Economy rate.

Government Overnight (Restricted for authorized users only)
46 [ ] GOVT LETTER
41 [ ] GOVT PACKAGE

Freight Service (†for packages over 150 lbs.)
70 [ ] OVERNIGHT FREIGHT** (Confirmed reservation required)
80 [ ] TWO-DAY FREIGHT**
** Delivery commitment may vary in some areas
* Declared Value Limit $500.
** Call for delivery schedule

5 DELIVERY AND SPECIAL HANDLING (Check services required)

Weekday Service
1 [ ] HOLD AT FEDEX LOCATION WEEKDAY (Fill in Section H)
2 [X] DELIVER WEEKDAY

Saturday Service
31 [ ] HOLD AT FEDEX LOCATION SATURDAY (Fill in Section H)
3 [ ] DELIVER SATURDAY (Extra charge) (Not available to all locations)
9 [ ] SATURDAY PICK-UP (Extra charge)

Special Handling
4 [ ] DANGEROUS GOODS (Extra charge)
6 [ ] DRY ICE Dangerous Goods Shipper's Declaration not required
Dry Ice, 9, UN 1845 _____ X _____ kg. 904 III.
[ ] DESCRIPTION
12 [ ] HOLIDAY DELIVERY (If offered) (Extra charge)

6

PACKAGES	WEIGHT In Pounds Only	YOUR DECLARED VALUE (See right)
1	69	
1	89	
1	85	
1	44	
Total 5	Total 73	Total

DIM SHIPMENT (Chargeable Weight) [ ] _____ lbs.
L x W x H

Received At
[X] Regular Stop 3 [ ] Drop Box
2 [ ] On-Call Stop 4 [ ] B.S.C. 5 [ ] Station

7 Release Signature:

Emp. No. Date
[ ] Cash Received
[ ] Return Shipment
[ ] Third Party [ ] Chg. To Del. [ ] Chg. To Hold
Street Address
City State Zip
Received By: X
Date/Time Received FedEx Employee Number

Federal Express Use
Base Charges
Declared Value Charge
Other 1
Other 2
Total Charges

REVISION DATE 12/92
PART #137204 FXEM 11/93
FORMAT #158
158
© 1992-93 FEDEX PRINTED IN U.S.A.

BEST AVAILABLE COPY

000005

MULTIPLE PACKAGE SHIPMENT LABELS

SHIPMENT DATE	1-24-94
MASTER AIRBILL NUMBER	

2 OF 5 — 863 0656 106

DESCRIPTION

3 OF 5 — 863 0656 115

DESCRIPTION

4 OF 5 — 863 0656 124

DESCRIPTION

5 OF 5 — 863 0656 133

DESCRIPTION

OF — 863 0656 142

DESCRIPTION

TERMS AND CONDITIONS

DEFINITIONS

On this Airbill, we, our and us refer to Federal Express Corporation, its employees and agents. You and your refer to the sender, its employees and agents.

AGREEMENT TO TERMS

By giving us your package to deliver, you agree to all the terms on this Airbill and in our current Service Guide, which is available on request. If there is a conflict between the current Service Guide and this Airbill, the Service Guide will control. No one is authorized to alter or modify the terms of our Agreement.

RESPONSIBILITY FOR PACKAGING AND COMPLETING AIRBILL

You are responsible for adequately packaging your goods and for properly filling out this Airbill. Omission of the number of packages and weight per package from this Airbill will result in a billing based on our best estimate of the number of packages received from you and an estimated "default" weight per package, as determined and periodically adjusted by us.

AIR TRANSPORTATION TAX INCLUDED

Our basic rate includes a federal tax required by Internal Revenue Code Section 4271 on the air transportation portion of this service.

LIMITATIONS ON OUR LIABILITY AND LIABILITIES NOT ASSUMED

Our liability for loss or damage to your package is limited to your actual damages or $100, whichever is less, unless you pay for and declare a higher authorized value. We do not provide cargo liability insurance, but you may pay an additional charge for each additional $100 of declared value. If you declare a higher value and pay the additional charge, our liability will be the lesser of your declared value or the actual value of your package.

In any event we will not be liable for any damages, whether direct, incidental, special or consequential in excess of the declared value of a shipment, whether or not Federal Express had knowledge that such damages might be incurred including, but not limited to, loss of income or profits.

We won't be liable for your acts or omissions, including but not limited to improper or insufficient packing, securing, marking or addressing, or for the acts or omissions of the recipient or anyone else with an interest in the package. Also, we won't be liable, if you or the recipient violates any of the terms of our agreement. We won't be liable for loss of or damage to shipments of prohibited items.

We won't be liable for loss, damage or delay caused by events we cannot control, including but not limited to acts of God, perils of the air, weather conditions, acts of public enemies, war, strikes, civil commotions, or acts or omissions of public authorities (including customs and quarantine officials) with actual or apparent authority.

DECLARED VALUE LIMITS

The highest declared value we allow for FedEx Letter and FedEx Pak shipments is $500. For other shipments, the highest declared value we allow is $25,000 unless your package contains items of "extraordinary value," in which case the highest declared value we allow is $500. Items of "extraordinary value," include artwork, jewelry, furs, precious metals, negotiable instruments, and other items listed in our current Service Guide.

If you send more than one package on this Airbill, you may fill in the total declared value for all packages, not to exceed the $100, $500 or $25,000 per package limit described above. Example: 5 packages can have a total declared value of up to $125,000.

If more than one package is shipped on this airbill, our liability for loss or damage will be limited to the actual value of the package(s) lost or damaged (not to exceed the lesser of the total declared value or the per package limits described above). You have the responsibility of proving the actual loss or damage.

FILING A CLAIM

ALL CLAIMS MUST BE MADE BY YOU IN WRITING. You must notify us of your claim within strict time limits. See current Service Guide.

We'll consider your claim filed if you call and notify our Customer Service Department at 800-238-5355 and notify us in writing as soon as possible.

Within 90 days after you notify us of your claim, you must send us all relevant information about it. We are not obligated to act on any claim until you have paid all transportation charges, and you may not deduct the amount of your claim from those charges.

If the recipient accepts your package without noting any damage on the delivery record, we will assume that the package was delivered in good condition. In order for us to process your claim, you must, to the extent possible, make the original shipping cartons and packing available for inspection.

RIGHT TO INSPECT

We may, at our option, open and inspect your packages prior to or after you give them to us to deliver.

NO C.O.D. SERVICES

NO C.O.D. SERVICES ON THIS AIRBILL. If C.O.D. Service is required, please use a Federal Express C.O.D. Airbill for this purpose.

RESPONSIBILITY FOR PAYMENT

Even if you give us different payment instructions, you will always be primarily responsible for all delivery costs, as well as any cost we may incur in either returning your package to you or warehousing it pending disposition.

RIGHT OF REJECTION

We reserve the right to reject a shipment at any time, when such shipment would be likely to cause damage or delay to other shipments, equipment or personnel, or if the transportation of which is prohibited by law or is in violation of any rules contained in this Airbill or our current Service Guide.

MONEY-BACK GUARANTEE

In the event of untimely delivery, Federal Express will, at your request and with some limitations, refund or credit all transportation charges. See current Service Guide for further information.

Part # 137204/137205
Rev. 12/92

BEST AVAILABLE COPY

9214517.3069

TMA/ARLI
Thermo Analytical Inc.

000006

RADIATION DOSE RATE SURVEY FORM

Date 1/25/94 COMPANY TMA/NORCAL OTHER ORD # 8826003841

Surveyor's Name MARK S. McCray

Model No. HP-210 / ESP-1 Model No. AC-3-7 / ESP-1

Serial Nos. 710289 / 02619 Serial Nos. 407726 / 02628

Calibration Date 11/17/93 Calibration Date 9/16/93

Instrument Calibration Factor 0.280 Instrument Calibration Factor 0.192

Sample	Location	HP-210 CPM	HP-210 Factor	HP-210 DPM	AC-3-7 CPM	AC-3-7 Factor	AC-3-7 DPM	Spillage or Breakage?	Activity, nCi/mL or nCi/g
Background		38.0			1.0				
Consistency		7,360	0.2841		4,096	0.1503		NONE	
Smears: SML 341		37.0			3.0			NONE	
SML 375		51.0			2.0			NONE	
SML 415		90.0			14.0			NONE	
SML 319		41.0			0			NONE	
SML 347		38.0			0			NONE	
Reported WHC (15) samples each									
<50pCi/gram									

Comments:

All OK ✓ Approved MSM

Not OK Date 1/25/94

FORM SOP-075.1

"quality environmental services"

GENERAL CHEMISTRY RESULTS

CASE NO. 01-038

Soil Sample #s:

B09WF4 B09WF7

CASE NARRATIVE

The holding time for the pH analysis was exceeded. Careful review of the QC analysis indicates that the data is reliable.

Sample B09WF4 obtained a Percent Recovery below QC criteria for Fluoride. A matrix spike duplicate (MSD), with one fourth of the original sample, was injected with excellent results indicating a sample matrix effect. Only the original matrix spike has been reported on Form V. Both analyses have been included in the "Raw Data" section of the report.

No other problems were encountered during sample analysis. All QC results were acceptable.

Maureen Parrish 3/17/94

Maureen Parrish

9413517.2071

TMA Inc. REPORT Work Order # A4-01-038

Received: 01/21/94 03/17/94 10:27:50

000008

REPORT TO: Westinghouse Hanford Company, 345 Hills, Richland, WA 99352

ATTEN: Ms. Briana Colley

PREPARED BY: Thermo Analytical, Inc., 160 Taylor Street, Monrovia, CA 91016

ATTEN: Ms. Carole Harris

PHONE: 818-357-3247

Maureen Parrish

CERTIFIED BY

CONTACT: MKP CIH

CLIENT: WHC SAMPLES: 3

COMPANY: Westinghouse Hanford Company

FACILITY:

This report is for the sole and exclusive use of the client to whom it is addressed and represents only those samples herein described. Samples not destroyed in testing are retained a maximum of 30 days unless otherwise requested.

WORK ID: SAF# 93-263

TAKEN: By Westinghouse Staff

TRANS: Federal Express

TYPE: Soil

P.O. #: N4-01-070-SU-AR

INVOICE: under separate cover

SAMPLE IDENTIFICATION

01	B09WF4
01	B09WF4 MS
01	B09WF4 MSD
01	B09WF4
01	B09WF4 MS
01	B09WF4 Duplicate
01	B09WF4
01	B09WF4 MS
01	B09WF4 MSD
01	B09WF4 RE
01	B09WF4 MS RE
01	B09WF4 MSD RE
02	B09WF7
02	B09WF7 MS
02	B09WF7 MSD
03	Lab Blank
03	LCS
03	KBLK0126
03	KBLK0224

TEST CODES and NAMES used on this workorder

8015E3	8015M (Extractable) Form 3
8015MS	EPA 8015M EXTRACT.
BLKSUM	Method Blank Summary
BNCLPS	CLP Semivol. Solid
IC_AN	Anions Extraction Solids
MOIST	Moisture
WCCLPS	Anions in Solids
WCLCS	Lab Control Sample Summary
WCL_S	Chloride in Solids - WH216
WCQCD	Quality Control Summary
WCQCS	Quality Control Summary
WF_S	Fluoride in Solids
WPH_S	pH of Solids
WSO4_S	Sulfate (in Solids)

000010

TMA Inc. REPORT Work Order # A4-01-038

Received: 01/21/94

Results by Sample

SAMPLE ID B09WF4 FRACTION 01E TEST CODE WCCLPS NAME Anions in Solids

Date & Time Collected 01/17/94 Category

ANIONS AND WET CHEMISTRY - SOLIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT
Chloride	300.0	7.8	mg/kg	1.0
Fluoride	300.0	1.9	mg/kg	0.5
pH	9045	7.5	pH	0.1
Sulfate	300.0	12	mg/kg	5

FORM I

000072

CASE NARRATIVE

LABORATORY : TMA/ARLI

CASE : 01-038

CONTRACT ID : WESTINGHOUSE HANFORD COMPANY

SDG RECEIPT DATE : January 21, 1994

1.0 DESCRIPTION OF CASE :

Two soil samples were analyzed for TCL Organics- Volatiles and Semivolatiles according to the USEPA Contract Laboratory Program (CLP) Statement of Work for Organic Analysis, Revision OLM01.8. The Extractable Hydrocarbons for Kerosene (K) were analyzed according to the SW-846 Method 8015M.

2.0 SAMPLE LIST :

WESTINGHOUSE ID	LAB ID	ANALYSIS REQUESTED	MATRIX
B09WF4	A4-01-038-01A	V	SOIL
B09WF4	A4-01-038-01B	SV	SOIL
B09WF4 MS	A4-01-038-01C	SV	SOIL
B09WF4 MSD	A4-01-038-01D	SV	SOIL
B09WF4	A4-01-038-01H	K	SOIL
B09WF4 RE	A4-01-038-01H	K	SOIL
B09WF4 MS	A4-01-038-01I	K	SOIL
B09WF4 MSRE	A4-01-038-01I	K	SOIL
B09WF4 MSD	A4-01-038-01J	K	SOIL
B09WF4 MSDRE	A4-01-038-01J	K	SOIL
B09WF7	A4-01-038-02A	V	SOIL
B09WF7 MS	A4-01-038-02B	V	SOIL
B09WF7 MSD	A4-01-038-02C	V	SOIL

3.0 COMMENTS :

3.1 SHIPPING AND DOCUMENTATION :

All of the samples were received intact and properly documented.

3.2 ANALYSIS

3.2.1 VOLATILE ANALYSIS COMMENTS :

LOW LEVEL SOIL :

The samples were analyzed by heated purge within the CLP SOW holding times. The samples were analyzed during a period from 01/19/94 through 01/27/94, on the instrument "ROCKY". On 01/19/94, the operator inadvertently entered the wrong year during the instrument system boot-up, and therefore, all of

the sample data incorrectly documented the year as "1993". Since it was not possible to change the date of analysis within the system the work order data was processed as is, and the appropriate manual corrections were made on the raw data by the laboratory. In addition, the report forms were changed to reflect the correct year of analysis (1994).

The analyte Acetone was detected at concentrations above the CRQL in samples B09WF4, B09WF7MS, B09WF7MSD, and the blank, VBLK0127R. In sample B09WF7, both Acetone and Chloromethane were detected at concentrations below the CRQL. Methylene Chloride was detected at concentrations below the CRQL in all of the samples. In addition, both 4-Methyl-2-pentanone and 2-Hexanone were detected below the CRQL in sample B09WF7MS. However, since these two analytes were not detected in either sample B09WF7 or in sample B09WF7MSD, the spectra for the analytes have been included with sample B09WF7MS for confirmation purposes.

All of the QC results were within the limits specified by the EPA CLP SOW.

3.2.2 SEMIVOLATILE ANALYSIS COMMENTS :

LOW LEVEL SOIL :

The samples were extracted and analyzed within the contract required holding times.

In all of the samples Di-n-butylphthalate was detected at concentrations less than the CRQL. In addition, sample B09WF4MSD had bis(2-Ethylhexyl)phthalate detected at a concentration below the CRQL. Since it was not detected in the unspiked sample or in sample B09WF4MS, the spectra was included in the package along with the raw data for sample B09WF4MSD.

Both the MS and the MSD sample had matrix spike recoveries above the QC limits for 2,4-Dinitrotoluene, 4-Nitrophenol, and Pentachlorophenol. In accordance with the protocol, no further action was required.

All of the other QC results were within the limits specified by the EPA CLP SOW.

000074

3.2.3 EXTRACTABLE HYDROCARBONS "KEROSENE RANGE" COMMENTS :

SEQUENCE NOTES :

The original sequence was started on 01/31/94 and was analyzed according to the SW-846 Method 8015M. Due to low Kerosene recoveries for the spiked samples (the MS, MSD, and LCS), all of the samples were reextracted and reanalyzed outside of the holding times. The reanalysis sequence was started on 02/24/94. Both of the initial calibrations consisted of 5 different levels of the Kerosene standard that ranged from approximately 200ppm to 2000ppm. A continuing calibration at approximately 1000ppm was injected amongst the samples, in order to verify the instrument stability. The %RSD in the all of the initial calibrations and the %D in the continuing calibrations were below their 20% and 15% limits, respectively.

SAMPLE NOTES :

LOW LEVEL SOIL :

The samples were extracted and analyzed within the required holding times. Approximately 20 g of each sample were extracted and concentrated to 5 mL.

The matrix spike and matrix spike duplicate recoveries for Kerosene were low in the original analysis - 46% and 50%, respectively. An LCS, KLCS0126S, was prepared at the same time and had a recovery of 65%. These low recoveries were probably be due to an evaporation problem during the extraction process. Samples B09WF4, B09WF4MS, and B09WF4MSD, were reextracted outside of the holding time on 02/24/94. The sample reanalyses results were included in the package for further confirmation.

Sample B09WF4RE was spiked with Kerosene, and the matrix spike recoveries were 86% for B09WF4MSRE, and 85% for sample B09WF4MSDRE. A second LCS, KLCS0224, was prepared at the same time and had an 85% recovery. Both the original and the reanalyzed LCS results were included in the "Additional Raw Data" portion of the package. No Kerosene was detected in sample B09WF4 for either of the analyses.

All of the QC results were within the limits specified by the SW-846 Method 8015M.

000075

We certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data in this hardcopy data package and in the computer-readable data submitted on diskette is authorized by the Laboratory Manager or his designees, as verified by the following signatures.

Nicole Roth 3/18/94
Nicole Roth
Program Manager

Maureen Parrish 3/17/94
Maureen Parrish
Project Manager

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

000076 EPA SAMPLE NO.

B09WF4

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 01038 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A401038-01A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 40127R08

Level: (low/med) LOW Date Received: 01/21/94

% Moisture: not dec. 21 Date Analyzed: 01/27/94

GC Column: PACK ID: 2.00 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
74-87-3	Chloromethane	13	U
74-83-9	Bromomethane	13	U
75-01-4	Vinyl Chloride	13	U
75-00-3	Chloroethane	13	U
75-09-2	Methylene Chloride	2	BJ
67-64-1	Acetone	17	B
75-15-0	Carbon Disulfide	13	U
75-35-4	1,1-Dichloroethene	13	U
75-34-3	1,1-Dichloroethane	13	U
540-59-0	1,2-Dichloroethene (total)	13	U
67-66-3	Chloroform	13	U
107-06-2	1,2-Dichloroethane	13	U
78-93-3	2-Butanone	13	U
71-55-6	1,1,1-Trichloroethane	13	U
56-23-5	Carbon Tetrachloride	13	U
75-27-4	Bromodichloromethane	13	U
78-87-5	1,2-Dichloropropane	13	U
10061-01-5	cis-1,3-Dichloropropene	13	U
79-01-6	Trichloroethene	13	U
124-48-1	Dibromochloromethane	13	U
79-00-5	1,1,2-Trichloroethane	13	U
71-43-2	Benzene	13	U
10061-02-6	trans-1,3-Dichloropropene	13	U
75-25-2	Bromoform	13	U
108-10-1	4-Methyl-2-Pentanone	13	U
591-78-6	2-Hexanone	13	U
127-18-4	Tetrachloroethene	13	U
79-34-5	1,1,2,2-Tetrachloroethane	13	U
108-88-3	Toluene	13	U
108-90-7	Chlorobenzene	13	U
100-41-4	Ethylbenzene	13	U
100-42-5	Styrene	13	U
1330-20-7	Xylene (total)	13	U

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B09WF4

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 01038 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A401038-01A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 40127R08

Level: (low/med) LOW Date Received: 01/21/94

% Moisture: not dec. 21 Date Analyzed: 01/27/94

GC Column: PACK ID: 2.00 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

Number TICs found: 0

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B09WF7

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 01038 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A401038-02A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 40127R05

Level: (low/med) LOW Date Received: 01/21/94

% Moisture: not dec. 0 Date Analyzed: 01/27/94

GC Column: PACK ID: 2.00 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

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

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B09WF7

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 01038 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A401038-02A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 40127R05

Level: (low/med) LOW Date Received: 01/21/94

% Moisture: not dec. 0 Date Analyzed: 01/27/94

GC Column: PACK ID: 2.00 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

Number TICs found: 0

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

9713512081

000080

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B09WF4

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 01038 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A401038-01B

Sample wt/vol: 30.6 (g/mL) G Lab File ID: 40218I14

Level: (low/med) LOW Date Received: 01/21/94

% Moisture: 21 decanted: (Y/N) N Date Extracted: 01/26/94

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 02/18/94

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 7.4

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-95-2	Phenol	410	U
111-44-4	bis(2-Chloroethyl)Ether	410	U
95-57-8	2-Chlorophenol	410	U
541-73-1	1,3-Dichlorobenzene	410	U
106-46-7	1,4-Dichlorobenzene	410	U
95-50-1	1,2-Dichlorobenzene	410	U
95-48-7	2-Methylphenol	410	U
108-60-1	2,2'-oxybis(1-Chloropropane)	410	U
106-44-5	4-Methylphenol	410	U
621-64-7	N-Nitroso-Di-n-Propylamine	410	U
67-72-1	Hexachloroethane	410	U
98-95-3	Nitrobenzene	410	U
78-59-1	Isophorone	410	U
88-75-5	2-Nitrophenol	410	U
105-67-9	2,4-Dimethylphenol	410	U
111-91-1	bis(2-Chloroethoxy)Methane	410	U
120-83-2	2,4-Dichlorophenol	410	U
120-82-1	1,2,4-Trichlorobenzene	410	U
91-20-3	Naphthalene	410	U
106-47-8	4-Chloroaniline	410	U
87-68-3	Hexachlorobutadiene	410	U
59-50-7	4-Chloro-3-Methylphenol	410	U
91-57-6	2-Methylnaphthalene	410	U
77-47-4	Hexachlorocyclopentadiene	410	U
88-06-2	2,4,6-Trichlorophenol	410	U
95-95-4	2,4,5-Trichlorophenol	990	U
91-58-7	2-Chloronaphthalene	410	U
88-74-4	2-Nitroaniline	990	U
131-11-3	Dimethylphthalate	410	U
208-96-8	Acenaphthylene	410	U
99-09-2	3-Nitroaniline	990	U
83-32-9	Acenaphthene	410	U
51-28-5	2,4-Dinitrophenol	990	U

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B09WF4

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 01038 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A401038-01B

Sample wt/vol: 30.6 (g/mL) G Lab File ID: 40218I14

Level: (low/med) LOW Date Received: 01/21/94

% Moisture: 21 decanted: (Y/N) N Date Extracted: 01/26/94

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 02/18/94

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 7.4

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-02-7	4-Nitrophenol	990	U
132-64-9	Dibenzofuran	410	U
121-14-2	2,4-Dinitrotoluene	410	U
606-20-2	2,6-Dinitrotoluene	410	U
84-66-2	Diethylphthalate	410	U
7005-72-3	4-Chlorophenyl-phenylether	410	U
86-73-7	Fluorene	410	U
100-01-6	4-Nitroaniline	990	U
534-52-1	4,6-Dinitro-2-methylphenol	990	U
86-30-6	N-Nitrosodiphenylamine (1)	410	U
101-55-3	4-Bromophenyl-phenylether	410	U
118-74-1	Hexachlorobenzene	410	U
87-86-5	Pentachlorophenol	990	U
85-01-8	Phenanthrene	410	U
120-12-7	Anthracene	410	U
86-74-8	Carbazole	410	U
84-74-2	Di-n-Butylphthalate	320	BJ
206-44-0	Fluoranthene	410	U
129-00-0	Pyrene	410	U
85-68-7	Butylbenzylphthalate	410	U
91-94-1	3,3'-Dichlorobenzidine	410	U
56-55-3	Benzo(a)Anthracene	410	U
117-81-7	bis(2-Ethylhexyl)Phthalate	410	U
218-01-9	Chrysene	410	U
117-84-0	Di-n-Octyl Phthalate	410	U
205-99-2	Benzo(b)Fluoranthene	410	U
207-08-9	Benzo(k)Fluoranthene	410	U
50-32-8	Benzo(a)Pyrene	410	U
193-39-5	Indeno(1,2,3-cd)Pyrene	410	U
53-70-3	Dibenz(a,h)Anthracene	410	U
191-24-2	Benzo(g,h,i)Perylene	410	U

(1) - Cannot be separated from Diphenylamine

9713512.2083

000082

EPA SAMPLE NO.

B09WF4

1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 01038 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A401038-01B

Sample wt/vol: 30.6 (g/mL) G Lab File ID: 40218I14

Level: (low/med) LOW Date Received: 01/21/94

% Moisture: 21 decanted: (Y/N) N Date Extracted: 01/26/94

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 02/18/94

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 7.4

Number TICs found: 5

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN HYDROCARBON	5.17	250	BJ
2.	UNKNOWN HYDROCARBON	6.22	700	BJ
3.	UNKNOWN KETONE	6.73	170	BJ
4.	UNKNOWN HYDROCARBON	8.62	120	J
5.	UNKNOWN PHTHALATE	20.70	460	BJ

9713517.2084

000336

TMA Inc. REPORT Work Order # A4-01-038

Received: 01/21/94

Results by Sample

SAMPLE ID B09WF4 FRACTION 01H TEST CODE 8015MS NAME EPA 8015M EXTRACT.

Date & Time Collected 01/17/94 Category

MODIFIED 8015 - EXTRACTABLE FUEL HYDROCARBONS

Matrix: SOIL
Date Analyzed: 02/17/94
Dilution factor: 1.00
Concentration Units: mg/Kg

Compound	Sample Result	PQL
Kerosene Range	ND	5.0
C10 - C16 Jet Fuel Range	NA	NA
C9 - C22 Diesel Range	NA	NA
Hydraulic Range	NA	NA

ND = Not detected at the specified limits

Form I

9716517.2085

TMA Inc. REPORT Work Order # A4-01-038

Received: 01/21/94

Results by Sample

SAMPLE ID B09WF4 RE FRACTION 01K TEST CODE 8015MS NAME EPA 8015M EXTRACT.

Date & Time Collected 01/17/94 Category

MODIFIED 8015 - EXTRACTABLE FUEL HYDROCARBONS

Matrix: SOIL
Date Analyzed: 02/25/94
Dilution factor: 1.00
Concentration Units: mg/Kg

Compound	Sample Result	PQL
Kerosene Range	ND	5.0
C10 - C16 Jet Fuel Range	NA	NA
C9 - C22 Diesel Range	NA	NA
Hydraulic Range	NA	NA

ND = Not detected at the specified limits

Form I

9713517.2086

 Skinner&Sherman REPORT Work Order # S4-01-177

Received: 01/25/94 02/25/94 15:49:44

REPORT TMA/NORCAL
TO 2030 Wright Avenue
Richmond, CA 94804

ATTEN Dan Steurmer

CLIENT HANFORD NOR SAMPLES 2
COMPANY TMA/NORCAL Hanford
FACILITY Richmond, CA

PREPARED TMA / Skinner & Sherman Labs.
BY 300 Second Avenue
P.O. Box 521
Waltham, MA 02254
ATTEN Client Services
PHONE (617) 890-7200

CERTIFIED BY

CONTACT DP

WORK ID N4-01-070
TAKEN By Client
TRANS Fedex
TYPE 1 soil
P.O. # N4-01-070
INVOICE under separate cover

SAMPLE IDENTIFICATION

01 B09WF4
01 B09WF4D
01 B09WF4S
02 LCSS

TEST CODES and NAMES used on this workorder

NITR S Nitrate/Nitrite in Soils

TMA
Thermo Analytical Inc.
Skinner & Sherman Laboratories Inc.

This report is rendered upon all of the following conditions: Skinner & Sherman Laboratories, Inc., retains ownership of this report until associated submitted invoice is satisfied. Expert witness services shall be available in conjunction with this report only if prior notification of this potential requirement was made and accepted, before the analysis. Client will be responsible for Skinner & Sherman costs and consulting fees if our services are required by subpoena or otherwise in legal proceedings. Total liability is limited to the invoice amount. The results listed refer only to tested samples and applicable parameters. Samples are not analyzed in accordance with New York State protocol unless indicated. Product endorsement is neither inferred nor implied. Skinner & Sherman Laboratories, Inc., will exercise due diligence but will not be responsible for lost or destroyed samples or evidence unless client makes appropriate insurance coverage arrangements. Samples are held for thirty days following issuance of report. Samples will be stored at client's expense, if authorized in writing.

300 Second Avenue, P.O. Box 521, Waltham, Massachusetts 02254-0521 (617) 890-7200
1-800-4 LAB TEST FAX (617) 890-3883

9713517.2087

Received: 01/25/94

Results by Sample

SAMPLE ID B09WF4 SAMPLE # 01 FRACTIONS: A
Date & Time Collected 01/17/94 13:30:00 Category SOIL

NITR_S 304
mg N/kg

SAMPLE ID B09WF4D SAMPLE # 01 FRACTIONS: B
Date & Time Collected 01/17/94 13:30:00 Category SOIL

NITR_S 392
mg N/kg

SAMPLE ID B09WF4S SAMPLE # 01 FRACTIONS: C
Date & Time Collected 01/17/94 13:30:00 Category SOIL

NITR_S 363
mg N/kg

SAMPLE ID LCSS SAMPLE # 02 FRACTIONS: A
Date & Time Collected not specified Category SOIL

NITR_S 2.04
mg N/L

TMA
Thermo Analytical Inc.
Skinner & Sherman Laboratories Inc.

This report is rendered upon all of the following conditions: Skinner & Sherman Laboratories, Inc., retains ownership of this report until associated submitted invoice is satisfied. Expert witness services shall be available in conjunction with this report only if prior notification of this potential requirement was made and accepted, before the analysis. Client will be responsible for Skinner & Sherman costs and consulting fees if our services are required by subpoena or otherwise in legal proceedings. Total liability is limited to the invoice amount. The results listed refer only to tested samples and applicable parameters. Samples are not analyzed in accordance with New York State protocol unless indicated. Product endorsement is neither inferred nor implied. Skinner & Sherman Laboratories, Inc., will exercise due diligence but will not be responsible for lost or destroyed samples or evidence unless client makes appropriate insurance coverage arrangements. Samples are held for thirty days following issuance of report. Samples will be stored at client's expense, if authorized in writing.

300 Second Avenue, P.O. Box 521, Waltham, Massachusetts 02254-0521 (617) 890-7200
1-800-4 LAB TEST FAX (617) 890-3883

9713517.2088

Received: 01/25/94 02/25/94 15:49:44

TMA/NORCAL Hanford

Q U A L I T Y C O N T R O L

MATRIX SPIKE

Sample ID	Sample Result	Spike Added	Spike Result	% Recovery
S401177-01	304 mg/kg	20.1 mg/kg	363 mg/kg	294

DUPLICATE

Sample ID	Sample result	Duplicate Result	Relative % Difference
S401177-01	304 mg/kg	392 mg/kg	25.3

QUALITY CONTROL SAMPLES

Sample ID	True Value	Found Value	Percent Recovery
LCS	2.00 mg/L	2.04 mg/L	102.0
Prep blank	--	<0.25 mg/L	--

TMA
Thermo Analytical Inc.
Skinner & Sherman Laboratories Inc.

This report is rendered upon all of the following conditions: Skinner & Sherman Laboratories, Inc., retains ownership of this report until associated submitted invoice is satisfied. Expert witness services shall be available in conjunction with this report only if prior notification of this potential requirement was made and accepted, before the analysis. Client will be responsible for Skinner & Sherman costs and consulting fees if our services are required by subpoena or otherwise in legal proceedings. Total liability is limited to the invoice amount. The results listed refer only to tested samples and applicable parameters. Samples are not analyzed in accordance with New York State protocol unless indicated. Product endorsement is neither inferred nor implied. Skinner & Sherman Laboratories, Inc., will exercise due diligence but will not be responsible for lost or destroyed samples or evidence unless client makes appropriate insurance coverage arrangements. Samples are held for thirty days following issuance of report. Samples will be stored at client's expense, if authorized in writing.

300 Second Avenue, P.O. Box 521, Waltham, Massachusetts 02254-0521 (617) 890-7200
1-800-4 LAB TEST FAX (617) 890-3883

Received: 01/25/94

Test Methodology

TEST CODE NITR S NAME Nitrate/Nitrite in Soils

The sample was extracted with deionized water and analyzed in accordance with Method for Chemical Analysis of Water and Wastes EPA-600/4-79-020, March 1979, Method 353.2 (modified)

TMA
Thermo Analytical Inc.

This report is rendered upon all of the following conditions: Skinner & Sherman Laboratories, Inc., retains ownership of this report until associated submitted invoice is satisfied. Expert witness services shall be available in conjunction with this report only if prior notification of this potential requirement was made and accepted, before the analysis. Client will be responsible for Skinner & Sherman costs and consulting fees if our services are required by subpoena or otherwise in legal proceedings. Total liability is limited to the invoice amount. The results listed refer only to tested samples and applicable parameters. Samples are not analyzed in accordance with New York State protocol unless indicated. Product endorsement is neither inferred nor implied. Skinner & Sherman Laboratories, Inc., will exercise due diligence but will not be responsible for lost or destroyed samples or evidence unless client makes appropriate insurance coverage arrangements. Samples are held for thirty days following issuance of report. Samples will be stored at client's expense, if authorized in writing.

Skinner & Sherman Laboratories Inc. 300 Second Avenue, P.O. Box 521, Waltham, Massachusetts 02254-0521 (617) 890-7200
1-800-4 LAB TEST FAX (617) 890-3883

TMA
Thermo Analytical Inc.

Skinner & Sherman Labs., Inc.
300 Second Avenue
Post Office Box 521
Waltham, MA 02254-0521
(617) 890-7200
FAX (617) 890-3883

9713512.2090

RECORD COPY

MAR 1994
RECEIVED
SDLA

February 25, 1994

TMA/NORCAL
2030 Wright Avenue
Richmond, CA 94804
Attention: Dan Stuermer

Quality Control Narrative

Scope
One (1) soil sample was submitted to TMA/Skinner & Sherman Laboratories, Inc. on January 25, 1994 from TMA/Norcal. The sample was analyzed for the USEPA CLP Target Analyte List metals, titanium and cyanide. The analysis were performed under TMA/Skinner and Sherman work order S401176.

Methodology
The sample was prepared, analyzed and reported in accordance with the USEPA Contract Laboratory Program Statement of Work ILM02.

Discussion
All quality control requirements were met for the samples with the following exceptions:

The matrix spike recovery for antimony exceeded the control limit requirements.

The ICP serial dilution for copper and zinc exceeded the control limit requirements.

Please feel free to call if there are any questions concerning this package.

Respectfully submitted,

TMA/SKINNER & SHERMAN LABORATORIES, INC.

Steven Provencal

Steven R. Provencal
Lead Chemist

8-2-96
MC

9215517.2091

WESTINGHOUSE/HANFORD

COVER PAGE - INORGANIC ANALYSES DATA PACKAGE

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D2-0039

Lab Code: SKINER Case No.: N4-01-070 SAS No.: SDG No.: B09WF4

SOW No.: ILM02.1

SAMPLE NUMBER:	Lab Sample ID.
B09WF4	01176-01S
B09WF4D	01176-01S2
B09WF4S	01176-01DS

Were ICP interelement corrections applied? Yes/No YES
Were ICP background corrections applied? Yes/No YES
If yes-were raw data generated before application of background corrections? Yes/No NO

Comments:

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

Signature: Steven Provencal Name: Steven R. Provencal

Date: 2/25/94 Title: Lead Chemist

9713517.2092

WESTINGHOUSE/HANFORD

1

SAMPLE NUMBER:

INORGANIC ANALYSIS DATA SHEET

B09WF4

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D2-0039

Lab Code: SKINER Case No.: N4-01-070SAS No.: SDG No.: B09WF4

Matrix (soil/water): SOIL Lab Sample ID: 01176-01S

Level (low/med): LOW Date Received: 01/25/94

% Solids: 79.5

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	30400			P
7440-36-0	Antimony	3.7	B	N	P
7440-38-2	Arsenic	6.5			P
7440-39-3	Barium	149			P
7440-41-7	Beryllium	1.0	B		P
7440-43-9	Cadmium	0.59	B		P
7440-70-2	Calcium	8780			P
7440-47-3	Chromium	28.4			P
7440-48-4	Cobalt	14.4			P
7440-50-8	Copper	29.4		E	P
7439-89-6	Iron	40400			P
7439-92-1	Lead	6.9			P
7439-95-4	Magnesium	9320			P
7439-96-5	Manganese	325			P
7439-97-6	Mercury	0.06	U		CV
7440-02-0	Nickel	22.5			P
7440-09-7	Potassium	3060			P
7782-49-2	Selenium	0.66	U		P
7440-22-4	Silver	1.6	B		P
7440-23-5	Sodium	437	B		P
7440-28-0	Thallium	0.88	U		P
7440-62-2	Vanadium	76.1			P
7440-66-6	Zinc	70.3		E	P
	Cyanide	0.62	U		CA
7440-32-6	Titanium	2350			P

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

002

9713517.2093

TMA/Skinner & Sherman Laboratories
Sample Login Sheet

Workorder SI-01-176 Client Hanford Nuc Number/Type of Samples 1 Soil
Protocol CLP Turnaround 33 Days Cooler Temp: 4 °C, or N/A Cooler Yes/No
Custodian: D. Martinez Shipper & # Fedex SDG/Batch# N/A
Custody Seal: Present/Absent/Intact/Not Client Case# N4-01-070
Purchase Order/Contract# N4-01-070 Client Contact D. Sanchez
Tag#: Present/Absent/NA (See COC) Chain of Custody: Present/Absent/NA, #

Sample Containers Intact/Broken Comment:
Client Comment? Yes/No
Sample labels agree with Chain of Custody Information? Yes/No (Comment)
Client paperwork agrees with samples and Chain of Custody? Yes/No (Comment)
Shipment Dates: 1/25/94
List any date with paperwork/shipment problems & specify the problem:

	Client ID	Matrix	Received	pH*	Test(s) & QC	Holding Times
1	B09WF4	Soil	1/25/94	NA	CLP metals + Ti	(D.S.)
2						
3						
4						
5						
6						
7					complete	
8						
9						
10					OKM 1/25/94	
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						

These samples are from a site known to have Radioactive Contamination: Yes ✓ No
These samples have detectable amounts of Radioactive Material: Yes ✓ No

Subcontract: Yes/No, To: Date:

Reviewed Date

150

* EPA/CLP required

Rev 1.7

Page: 2

9213517.2094

TMA
Thermo Analytical Inc.

TMA/Norcal
2030 Wright Avenue
P. O. Box 4040
Richmond, CA 94804-0040
(510) 235-2633 Fax No. (510) 235-0438

MAR 1994
RECEIVED
Data
Log In

March 23, 1994

Ref: TMA/Norcal N4-01-051-7313

Ms. Briana Colley
Westinghouse Hanford Company
345 Hills Street
Richland, WA 99352

Dear Ms. Colley:

Enclosed is the data report for the eight soil samples received January 18 and 21, 1994 from location 200-UP-2. Results are given for gross alpha, gross beta, selenium-79, strontium-90, technetium-99, iodine-129, neptunium-237, total uranium, isotopic uranium, isotopic plutonium, americium-241, curium-244, and gamma scan analyses.

The data package is paginated 1 through 836.

Please call if you have any questions concerning this data.

Sincerely,

Julie D. Wose
Manager, Nuclear Programs
TMA/Norcal

JDW/ss

Enclosure: Data Package

TMA/Norcal

Report N4-01-051-7313
Sample Delivery Group 7313

Westinghouse Hanford Company
P.O. MBH-SVV-069262

Case Narrative

March 23, 1994

1.0 GENERAL

TMA/Norcal Sample Delivery Group 7313 is comprised of eight soil samples from location 200-UP-2, delivered under Field Log Book #EFL-1091 and EFL-1115. Chain-of-Custody numbers were not provided.

One 1000 mL plastic bottle containing each sample was received for analysis.

Activity reports provided by the WHC indicated elevated activity in samples B09DT9 and B09WF4. All analyses for these samples were therefore processed in separate preparation batches in a lab area reserved for high level samples.

2.0 ANALYSIS NOTES

2.1 Gross Alpha Analyses

No problems were encountered by the laboratory in the analyses.

2.2 Gross Beta Analyses

Reagent blank 7313-013 shows beta activity at 14 pCi/L which is slightly above the 10 pCi/L RDL. This blank was run with the high level samples containing gross beta activity at levels 70 to 100 times the RDL, the slightly positive result does not affect the validity of the data.

2.3 Selenium-79 Analyses

No problems were encountered by the laboratory in the analyses.

2.4 Strontium-90 Analyses

No problems were encountered.

2.5 Technetium-99 Analyses

The duplicate analysis of B09DT4 had an MDA slightly over the RDL due to a low chemical recovery of 32%.

2.6 Iodine-129 Analyses

The original data sheets for reagent blank 7313-10 were misplaced. We have provided a backup copy from the QC Department files, which only include the first page.

4

TMA/Norcal
Report N4-01-051-7313
Sample Delivery Group 7313

Westinghouse Hanford Company
P.O. MBH-SVV-069262

Case Narrative

March 23, 1994

2.0 ANALYSIS NOTES (con't.)

2.7 Neptunium-237 Analyses

The neptunium-237 recoveries of laboratory control samples 7313-009 and 7313-012 are both 85% which is below the 3σ protocol limits (88-112)% but within the contractual limits (80-120)%. Samples BO9WF5 and BO9WF3 had low chemical yields (16% and 17% respectively). No cause could be determined for the low yields and there was not enough sample remaining for a reanalysis, however, MDA's met the RDL's.

2.8 Total Uranium Analyses

The MDA for sample B09DT9 was 2 μg/g which is higher than the RDL of 0.1 μg/g because of extra dilutions required to eliminate matrix interferences. The result of the analysis was 100 times the MDA and therefore there was no adverse impact on the data.

2.9 Isotopic Uranium Analyses

The count times for many samples were was less than the nominal count time of 150 minutes but the MDA's were not adversely affected. The MDA for sample B09DT9 was higher than the RDL due to a very small aliquot being used because of high uranium activity. The original data sheets for laboratory control sample 7313-009 were misplaced. We have provided a backup copy from the QC Department files, which only include the first page.

2.10 Isotopic Plutonium Analyses

Samples BO9DT9 and BO9WF3 had poor yields (13%). The samples were reanalyzed and satisfactory results were obtained. No cause could be determined for the initial low yields. The plutonium-238 MDA of the reagent blank is slightly higher than the RDL due to a higher detector background in the region of interest. The plutonium-239/240 MDA is well below the RDL.

2.11 Americium-241/Curium-244 Analyses

The americium-241 recovery of laboratory control sample 7313-009 is 122% which is within the 3σ limits (73-127)% but slightly above the contract limits (80-120)%. A low curium-244 recovery in the laboratory control sample associated with the first batch of samples indicated an apparent fractionation of the curium species from americium. The samples were reanalyzed with new QC and satisfactory results were obtained.

2.0 ANALYSIS NOTES (con't.)

2.12 Gamma Scan Analyses

Aliquot sizes ranged from 80 to 90 grams, which are smaller than the nominal 750 grams normally used for soil analyses. This was done because of concerns for high sample activity as indicated form the supplied activity reports. Several MDA's exceeded the RDL's as a result.

9713517.2098

N401051-01

TMA NORCAL
REPORTING GROUP 7313

DATA SHEET

B09DT4

SDG 7313 Client Westinghouse Hanford
Contact Julie D. Wose Contract MBH-SVV-069262

Lab sample id N401051-01 Client sample id B09DT4
Dept sample id 7313-001 Location/Matrix 200-UP-2 SOLID
Received 01/18/94 Collected 01/11/94
% moisture 2.0 Chain of custody id EFL-1115

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Gross Alpha	Alpha	2.0	2.3	3	10	U	80A
Gross Beta	Beta	0.58	3.2	5	10	U	80B
Selenium 79	15758-45-9	0.36	0.85	1	10	U	SE
Strontium 90	10098-97-2	0	0.47	0.5	1	U	Y
Technetium 99	14133-76-7	-0.011	0.071	0.2	0.5	U	TC
Iodine 129	15046-84-1	0.013	0.85	2	2	U	I
Uranium 233/234		0.15	0.10	0.1	0.3	J	U
Uranium 235	15117-96-1	0.040	0.041	0.2	0.3	U	U
Uranium 238		0	0.033	0.1	0.3	U	U
Total Uranium (ug/g)	7440-61-1	0.19	0.037	0.002	0.1	X	U_T
Neptunium 237	13994-20-2	0.002	0.005	0.007	0.2	U	NP
Plutonium 238	13981-16-3	0.013	0.013	0.02	0.05	U	PU
Plutonium 239/240		0	0.006	0.02	0.05	U	PU
Americium 241	14596-10-2	-0.005	0.009	0.03	0.05	U	TP
Curium 244	13981-15-2	0.018	0.018	0.04	0.05	U	TP
GAMMA SCAN ANALYTES							
Sodium 22	13966-32-0	U		0.1		U	GAM
Potassium 40	13966-00-2	U		3		U	GAM
Manganese 54	13966-31-9	U		0.1		U	GAM
Iron 59	14596-12-4	U		0.3	0.05	U	GAM
Cobalt 58	13981-38-9	U		0.1	0.05	U	GAM
Cobalt 60	10198-40-0	U		0.2	0.05	U	GAM
Niobium 94	14681-63-1	U		0.1		U	GAM
Ruthenium 103	13968-53-1	U		0.1		U	GAM
Ruthenium 106	13967-48-1	U		1		U	GAM
Tin 113	13966-06-8	U		0.1		U	GAM
Cesium 134	13967-70-9	U		0.1		U	GAM
Cesium 137	10045-97-3	U		0.1	0.05	U	GAM

Lab id TMAN
Protocol WHC-HASM
Version Ver 1.0
Form DVD-DS
Version 2.28
Report date 03/22/94

9213517.2099

N401051-01

TMA NORCAL
REPORTING GROUP 7313

DATA SHEET, cont

B09DT4

SDG	7313	Client	Westinghouse Hanford
Contact	Julie D. Wose	Contract	MBH-SVV-069262
Lab sample id	N401051-01	Client sample id	B09DT4
Dept sample id	7313-001	Location/Matrix	200-UP-2 SOLID
Received	01/18/94	Collected	01/11/94
% moisture	2.0	Chain of custody id	EFL-1115

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Cerium 144	14762-78-8	U		0.4		U	GAM
Europium 152	14683-23-9	U		0.2	0.1	U	GAM
Europium 154	15585-10-1	U		0.1	0.1	U	GAM
Europium 155	14391-16-3	U		0.2	0.1	U	GAM
Radium 226	13982-63-3	0.24	0.23				GAM
Radium 228	15262-20-1	U		0.4		U	GAM
Thorium 228	14274-82-9	0.28	0.16				GAM
Thorium 232	7440-29-1	U		0.4		U	GAM

Lab id	TMAN
Protocol	WHC-HASM
Version	Ver 1.0
Form	DVD-DS
Version	2.28
Report date	03/22/94

9713517.2100

N401051-02

TMA NORCAL
REPORTING GROUP 7313

DATA SHEET

B09DT5

SDG	7313	Client	Westinghouse Hanford
Contact	Julie D. Wose	Contract	MBH-SVV-069262
Lab sample id	N401051-02	Client sample id	B09DT5
Dept sample id	7313-002	Location/Matrix	200-UP-2 SOLID
Received	01/18/94	Collected	01/11/94
% moisture	1.2	Chain of custody id	EFL-1115

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Gross Alpha	Alpha	3.6	2.3	3	10	J	80A
Gross Beta	Beta	1.6	3.3	5	10	U	80B
Selenium 79	15758-45-9	-0.54	1.0	2	10	U	SE
Strontium 90	10098-97-2	-0.054	0.46	0.5	1	U	Y
Technetium 99	14133-76-7	0.081	0.11	0.2	0.5	U	TC
Iodine 129	15046-84-1	-0.002	0.63	1	2	U	I
Uranium 233/234		0.11	0.14	0.2	0.3	U	U
Uranium 235	15117-96-1	0	0.055	0.2	0.3	U	U
Uranium 238		0	0.045	0.2	0.3	U	U
Total Uranium (ug/g)	7440-61-1	0.23	0.044	0.002	0.1	X	U_T
Neptunium 237	13994-20-2	0.019	0.015	0.01	0.2	J	NP
Plutonium 238	13981-16-3	0.002	0.015	0.03	0.05	U	PU
Plutonium 239/240		0.007	0.010	0.02	0.05	U	PU
Americium 241	14596-10-2	0.003	0.011	0.02	0.05	U	TP
Curium 244	13981-15-2	0.025	0.016	0.02	0.05	J	TP
GAMMA SCAN ANALYTES							
Sodium 22	13966-32-0	U		0.1		U	GAM
Potassium 40	13966-00-2	0.98	0.85			B	GAM
Manganese 54	13966-31-9	U		0.1		U	GAM
Iron 59	14596-12-4	U		0.3	0.05	U	GAM
Cobalt 58	13981-38-9	U		0.08	0.05	U	GAM
Cobalt 60	10198-40-0	U		0.2	0.05	U	GAM
Niobium 94	14681-63-1	U		0.07		U	GAM
Ruthenium 103	13968-53-1	U		0.1		U	GAM
Ruthenium 106	13967-48-1	U		0.9		U	GAM
Tin 113	13966-06-8	U		0.1		U	GAM
Cesium 134	13967-70-9	U		0.1		U	GAM
Cesium 137	10045-97-3	U		0.1	0.05	U	GAM

Lab id	TMAN
Protocol	WHC-HASM
Version	Ver 1.0
Form	DVD-DS
Version	2.28
Report date	03/22/94

0 3

TMA NORCAL
REPORTING GROUP 7313

N401051-02

DATA SHEET, cont

B09DT5

SDG	7313	Client	Westinghouse Hanford
Contact	Julie D. Wose	Contract	MBH-SVV-069262
Lab sample id	N401051-02	Client sample id	B09DT5
Dept sample id	7313-002	Location/Matrix	200-UP-2 SOLID
Received	01/18/94	Collected	01/11/94
% moisture	1.2	Chain of custody id	EFL-1115

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Cerium 144	14762-78-8	U		0.5		U	GAM
Europium 152	14683-23-9	U		0.2	0.1	U	GAM
Europium 154	15585-10-1	U		0.1	0.1	U	GAM
Europium 155	14391-16-3	U		0.2	0.1	U	GAM
Radium 226	13982-63-3	U		0.2		U	GAM
Radium 228	15262-20-1	U		0.5		U	GAM
Thorium 228	14274-82-9	0.19	0.11				GAM
Thorium 232	7440-29-1	U		0.5		U	GAM

Lab id	TMAN
Protocol	WHC-HASM
Version	Ver 1.0
Form	DVD-DS
Version	2.28
Report date	03/22/94

N401051-03

TMA NORCAL
REPORTING GROUP 7313

DATA SHEET

B09DT7

SDG 7313 Client Westinghouse Hanford
Contact Julie D. Wose Contract MBH-SVV-069262

Lab sample id N401051-03 Client sample id B09DT7
Dept sample id 7313-003 Location/Matrix 200-UP-2 SOLID
Received 01/18/94 Collected 01/11/94
% moisture 4.4 Chain of custody id EFL-1115

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Gross Alpha	Alpha	11	4.1	3	10		80A
Gross Beta	Beta	26	5.1	6	10		80B
Selenium 79	15758-45-9	-1.4	1.6	3	10	U	SE
Strontium 90	10098-97-2	-0.022	0.37	0.5	1	U	Y
Technetium 99	14133-76-7	0.062	0.089	0.2	0.5	U	TC
Iodine 129	15046-84-1	0.017	0.67	2	2	U	I
Uranium 233/234		3.4	0.69	0.2	0.3		U
Uranium 235	15117-96-1	0.25	0.14	0.2	0.3	J	U
Uranium 238		4.0	0.76	0.1	0.3		U
Total Uranium (ug/g)	7440-61-1	10	2.0	0.02	0.1		U_T
Neptunium 237	13994-20-2	0.057	0.032	0.04	0.2	J	NP
Plutonium 238	13981-16-3	-0.004	0.015	0.04	0.05	U	PU
Plutonium 239/240		0.015	0.015	0.03	0.05	U	PU
Americium 241	14596-10-2	0.010	0.012	0.01	0.05	J	TP
Curium 244	13981-15-2	0.004	0.012	0.02	0.05	U	TP
GAMMA SCAN ANALYTES							
Sodium 22	13966-32-0	U		0.2		U	GAM
Potassium 40	13966-00-2	19	3.4				GAM
Manganese 54	13966-31-9	U		0.2		U	GAM
Iron 59	14596-12-4	U		0.5	0.05	U	GAM
Cobalt 58	13981-38-9	U		0.2	0.05	U	GAM
Cobalt 60	10198-40-0	U		0.2	0.05	U	GAM
Niobium 94	14681-63-1	U		0.2		U	GAM
Ruthenium 103	13968-53-1	U		0.2		U	GAM
Ruthenium 106	13967-48-1	U		2		U	GAM
Tin 113	13966-06-8	U		0.2		U	GAM
Cesium 134	13967-70-9	U		0.2		U	GAM
Cesium 137	10045-97-3	U		0.2	0.05	U	GAM

Lab id TMAN
Protocol WHC-HASM
Version Ver 1.0
Form DVD-DS
Version 2.28
Report date 03/22/94

9715517.2103

TMA NORCAL
REPORTING GROUP 7313

N401051-03

DATA SHEET, cont

B09DT7

SDG	7313	Client	Westinghouse Hanford
Contact	Julie D. Wose	Contract	MBH-SVV-069262
Lab sample id	N401051-03	Client sample id	B09DT7
Dept sample id	7313-003	Location/Matrix	200-UP-2 SOLID
Received	01/18/94	Collected	01/11/94
% moisture	4.4	Chain of custody id	EFL-1115

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Cerium 144	14762-78-8	U		0.7		U	GAM
Europium 152	14683-23-9	U		0.3	0.1	U	GAM
Europium 154	15585-10-1	U		0.2	0.1	U	GAM
Europium 155	14391-16-3	U		0.3	0.1	U	GAM
Radium 226	13982-63-3	1.0	0.41				GAM
Radium 228	15262-20-1	1.3	0.64				GAM
Thorium 228	14274-82-9	1.1	0.19				GAM
Thorium 232	7440-29-1	1.3	0.64				GAM

Lab id	TMAN
Protocol	WHC-HASM
Version	Ver 1.0
Form	DVD-DS
Version	2.28
Report date	03/22/94

9713517.2104

N401051-04

TMA NORCAL
REPORTING GROUP 7313

DATA SHEET

B09DT9

SDG	7313	Client	Westinghouse Hanford
Contact	Julie D. Wose	Contract	MBH-SVV-069262
Lab sample id	N401051-04	Client sample id	B09DT9
Dept sample id	7313-004	Location/Matrix	200-UP-2 SOLID
Received	01/17/94	Collected	01/13/94
% moisture	1.4	Chain of custody id	EFL-1091

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Gross Alpha	Alpha	210	19	4	10		80A
Gross Beta	Beta	970	21	5	10	B	80B
Selenium 79	15758-45-9	0	1.3	2	10	U	SE
Strontium 90	10098-97-2	410	17	1	1		Y
Technetium 99	14133-76-7	0.18	0.11	0.2	0.5	U	TC
Iodine 129	15046-84-1	0.35	0.47	1	2	U	I
Uranium 233/234		140	16	2	0.3		U
Uranium 235	15117-96-1	6.7	2.0	1	0.3		U
Uranium 238		150	17	1	0.3		U
Total Uranium (ug/g)	7440-61-1	280	56	2	0.1	X	U_T
Neptunium 237	13994-20-2	0.092	0.032	0.03	0.2	J	NP
Plutonium 238	13981-16-3	0.006	0.012	0.03	0.05	U	PU
Plutonium 239/240		0.006	0.012	0.02	0.05	U	PU
Americium 241	14596-10-2	0.16	0.042	0.03	0.05		TP
Curium 244	13981-15-2	0.11	0.033	0.03	0.05		TP
GAMMA SCAN ANALYTES							
Sodium 22	13966-32-0	U		0.2		U	GAM
Potassium 40	13966-00-2	8.6	2.5			B	GAM
Manganese 54	13966-31-9	U		0.2		U	GAM
Iron 59	14596-12-4	U		0.4	0.05	U	GAM
Cobalt 58	13981-38-9	U		0.2	0.05	U	GAM
Cobalt 60	10198-40-0	U		0.2	0.05	U	GAM
Niobium 94	14681-63-1	U		0.2		U	GAM
Ruthenium 103	13968-53-1	U		0.3		U	GAM
Ruthenium 106	13967-48-1	U		2		U	GAM
Tin 113	13966-06-8	U		0.3		U	GAM
Cesium 134	13967-70-9	U		0.3		U	GAM
Cesium 137	10045-97-3	U		0.2	0.05	U	GAM

Lab id	TMAN
Protocol	WHC-HASM
Version	Ver 1.0
Form	DVD-DS
Version	2.28
Report date	03/22/94

9213517.2105

TMA NORCAL
REPORTING GROUP 7313

N401051-04

DATA SHEET, cont

B09DT9

SDG	7313	Client	Westinghouse Hanford
Contact	Julie D. Wose	Contract	MBH-SVV-069262
Lab sample id	N401051-04	Client sample id	B09DT9
Dept sample id	7313-004	Location/Matrix	200-UP-2 SOLID
Received	01/17/94	Collected	01/13/94
% moisture	1.4	Chain of custody id	EFL-1091

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Cerium 144	14762-78-8	U		1		U	GAM
Europium 152	14683-23-9	U		0.6	0.1	U	GAM
Europium 154	15585-10-1	U		0.5	0.1	U	GAM
Europium 155	14391-16-3	U		1	0.1	U	GAM
Radium 226	13982-63-3	0.59	0.30				GAM
Radium 228	15262-20-1	0.71	0.62				GAM
Thorium 228	14274-82-9	0.93	0.39				GAM
Thorium 232	7440-29-1	0.71	0.62				GAM

Lab id	TMAN
Protocol	WHC-HASM
Version	Ver 1.0
Form	DVD-DS
Version	2.28
Report date	03/22/94

9713517.2106

N401051-05

TMA NORCAL
REPORTING GROUP 7313

DATA SHEET

B09WF3

SDG	7313	Client	Westinghouse Hanford
Contact	Julie D. Wose	Contract	MBH-SVV-069262
Lab sample id	N401051-05	Client sample id	B09WF3
Dept sample id	7313-005	Location/Matrix	200-UP-2 SOLID
Received	01/18/94	Collected	01/13/94
% moisture	1.4	Chain of custody id	EFL-1091

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Gross Alpha	Alpha	130	14	3	10		80A
Gross Beta	Beta	700	18	6	10	B	80B
Selenium 79	15758-45-9	0.71	2.4	4	10	U	SE
Strontium 90	10098-97-2	93	7.6	1	1		Y
Technetium 99	14133-76-7	0.15	0.11	0.3	0.5	U	TC
Iodine 129	15046-84-1	-0.39	0.86	2	2	U	I
Uranium 233/234		1.8	0.36	0.1	0.3		U
Uranium 235	15117-96-1	0.12	0.092	0.1	0.3	J	U
Uranium 238		1.6	0.32	0.1	0.3		U
Total Uranium (ug/g)	7440-61-1	4.4	0.85	0.02	0.1		U_T
Neptunium 237	13994-20-2	0.21	0.077	0.05	0.2		NP
Plutonium 238	13981-16-3	0.55	0.078	0.03	0.05		PU
Plutonium 239/240		0.61	0.084	0.02	0.05		PU
Americium 241	14596-10-2	0.15	0.033	0.02	0.05		TP
Curium 244	13981-15-2	0.064	0.026	0.03	0.05		TP
GAMMA SCAN ANALYTES							
Sodium 22	13966-32-0	U		0.4		U	GAM
Potassium 40	13966-00-2	12	2.8			B	GAM
Manganese 54	13966-31-9	U		0.2		U	GAM
Iron 59	14596-12-4	U		0.6	0.05	U	GAM
Cobalt 58	13981-38-9	U		0.2	0.05	U	GAM
Cobalt 60	10198-40-0	0.96	0.26		0.05		GAM
Niobium 94	14681-63-1	U		0.2		U	GAM
Ruthenium 103	13968-53-1	U		1		U	GAM
Ruthenium 106	13967-48-1	U		7		U	GAM
Tin 113	13966-06-8	U		2		U	GAM
Cesium 134	13967-70-9	U		0.3		U	GAM
Cesium 137	10045-97-3	420	3.3		0.05		GAM

Lab id	TMAN
Protocol	WHC-HASM
Version	Ver 1.0
Form	DVD-DS
Version	2.28
Report date	03/22/94

9213517.2107

TMA NORCAL
REPORTING GROUP 7313

N401051-05

DATA SHEET, cont

B09WF3

SDG	7313	Client	Westinghouse Hanford
Contact	Julie D. Wose	Contract	MBH-SVV-069262
Lab sample id	N401051-05	Client sample id	B09WF3
Dept sample id	7313-005	Location/Matrix	200-UP-2 SOLID
Received	01/18/94	Collected	01/13/94
% moisture	1.4	Chain of custody id	EFL-1091

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Cerium 144	14762-78-8	U		4		U	GAM
Europium 152	14683-23-9	1.1	0.73		0.1		GAM
Europium 154	15585-10-1	0.64	0.61		0.1		GAM
Europium 155	14391-16-3	U		2	0.1	U	GAM
Radium 226	13982-63-3	0.91	0.85				GAM
Radium 228	15262-20-1	1.6	0.98				GAM
Thorium 228	14274-82-9	1.3	1.0				GAM
Thorium 232	7440-29-1	1.6	0.98				GAM

Lab id	TMAN
Protocol	WHC-HASM
Version	Ver 1.0
Form	DVD-DS
Version	2.28
Report date	03/22/94

9713517.2108

N401051-08

TMA NORCAL
REPORTING GROUP 7313

DATA SHEET

B09WF4

SDG	7313	Client	Westinghouse Hanford
Contact	Julie D. Wose	Contract	MBH-SVV-069262
Lab sample id	N401051-08	Client sample id	B09WF4
Dept sample id	7313-008	Location/Matrix	200-UP-2 SOLID
Received	01/21/94	Collected	01/17/94
% moisture	3.3	Chain of custody id	EFL-1091

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Gross Alpha	Alpha	12	5.9	3	10		80A
Gross Beta	Beta	600	16	5	10		80B
Selenium 79	15758-45-9	-0.83	1.6	3	10	U	SE
Strontium 90	10098-97-2	270	7.0	1	1		Y
Technetium 99	14133-76-7	0.004	0.13	0.3	0.5	U	TC
Iodine 129	15046-84-1	0.52	0.71	2	2	U	I
Uranium 233/234		0.75	0.24	0.2	0.3		U
Uranium 235	15117-96-1	0.097	0.078	0.1	0.3	U	U
Uranium 238		0.75	0.24	0.1	0.3		U
Total Uranium (ug/g)	7440-61-1	2.6	0.50	0.002	0.1	X	U_T
Neptunium 237	13994-20-2	0.001	0.009	0.02	0.2	U	NP
Plutonium 238	13981-16-3	0.017	0.024	0.04	0.05	U	PU
Plutonium 239/240		-0.002	0.009	0.02	0.05	U	PU
Americium 241	14596-10-2	0.008	0.016	0.03	0.05	U	TP
Curium 244	13981-15-2	0.004	0.016	0.03	0.05	U	TP
GAMMA SCAN ANALYTES							
Sodium 22	13966-32-0	U		0.3		U	GAM
Potassium 40	13966-00-2	11	3.7				GAM
Manganese 54	13966-31-9	U		0.3		U	GAM
Iron 59	14596-12-4	U		0.5	0.05	U	GAM
Cobalt 58	13981-38-9	U		0.3	0.05	U	GAM
Cobalt 60	10198-40-0	U		0.2	0.05	U	GAM
Niobium 94	14681-63-1	U		0.2		U	GAM
Ruthenium 103	13968-53-1	U		0.3		U	GAM
Ruthenium 106	13967-48-1	U		2		U	GAM
Tin 113	13966-06-8	U		0.3		U	GAM
Cesium 134	13967-70-9	U		0.3		U	GAM
Cesium 137	10045-97-3	U		0.3	0.05	U	GAM

Lab id	TMAN
Protocol	WHC-HASM
Version	Ver 1.0
Form	DVD-DS
Version	2.28
Report date	03/22/94

9713517.2109

TMA NORCAL
REPORTING GROUP 7313

N401051-08

DATA SHEET, cont

B09WF4

SDG	7313	Client	Westinghouse Hanford
Contact	Julie D. Wose	Contract	MBH-SVV-069262
Lab sample id	N401051-08	Client sample id	B09WF4
Dept sample id	7313-008	Location/Matrix	200-UP-2 SOLID
Received	01/21/94	Collected	01/17/94
% moisture	3.3	Chain of custody id	EFL-1091

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Cerium 144	14762-78-8	U		1		U	GAM
Europium 152	14683-23-9	U		0.5	0.1	U	GAM
Europium 154	15585-10-1	U		0.3	0.1	U	GAM
Europium 155	14391-16-3	U		0.7	0.1	U	GAM
Radium 226	13982-63-3	U		0.6		U	GAM
Radium 228	15262-20-1	1.6	0.98				GAM
Thorium 228	14274-82-9	0.76	0.37				GAM
Thorium 232	7440-29-1	1.6	0.98				GAM

Lab id	TMAN
Protocol	WHC-HASM
Version	Ver 1.0
Form	DVD-DS
Version	2.28
Report date	03/22/94

N401051-06

TMA NORCAL
REPORTING GROUP 7313

DATA SHEET

B09WF5

SDG	7313	Client	Westinghouse Hanford
Contact	Julie D. Wose	Contract	MBH-SVV-069262
Lab sample id	N401051-06	Client sample id	B09WF5
Dept sample id	7313-006	Location/Matrix	200-UP-2 SOLID
Received	01/18/94	Collected	01/13/94
% moisture	1.1	Chain of custody id	EFL-1091

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Gross Alpha	Alpha	70	8.0	2	10		80A
Gross Beta	Beta	-5.5	3.9	6	10	U	80B
Selenium 79	15758-45-9	0.22	1.6	3	10	U	SE
Strontium 90	10098-97-2	0.22	0.28	0.8	1	U	Y
Technetium 99	14133-76-7	0.022	0.13	0.4	0.5	U	TC
Iodine 129	15046-84-1	0.11	0.70	2	2	U	I
Uranium 233/234		0.12	0.12	0.2	0.3	U	U
Uranium 235	15117-96-1	0	0.049	0.2	0.3	U	U
Uranium 238		0.082	0.082	0.2	0.3	U	U
Total Uranium (ug/g)	7440-61-1	0.21	0.041	0.002	0.1	X	U_T
Neptunium 237	13994-20-2	0	0.014	0.06	0.2	U	NP
Plutonium 238	13981-16-3	0.006	0.020	0.04	0.05	U	PU
Plutonium 239/240		0.006	0.008	0.02	0.05	U	PU
Americium 241	14596-10-2	0.017	0.015	0.02	0.05	U	TP
Curium 244	13981-15-2	0.021	0.015	0.02	0.05	J	TP
GAMMA SCAN ANALYTES							
Sodium 22	13966-32-0	U		0.1		U	GAM
Potassium 40	13966-00-2	U		2		U	GAM
Manganese 54	13966-31-9	U		0.1		U	GAM
Iron 59	14596-12-4	U		0.2	0.05	U	GAM
Cobalt 58	13981-38-9	U		0.1	0.05	U	GAM
Cobalt 60	10198-40-0	U		0.1	0.05	U	GAM
Niobium 94	14681-63-1	U		0.09		U	GAM
Ruthenium 103	13968-53-1	U		0.1		U	GAM
Ruthenium 106	13967-48-1	U		0.7		U	GAM
Tin 113	13966-06-8	U		0.1		U	GAM
Cesium 134	13967-70-9	U		0.1		U	GAM
Cesium 137	10045-97-3	U		0.1	0.05	U	GAM

Lab id	TMAN
Protocol	WHC-HASM
Version	Ver 1.0
Form	DVD-DS
Version	2.28
Report date	03/22/94

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N401051-06

TMA NORCAL
REPORTING GROUP 7313

DATA SHEET, cont

B09WF5

SDG	7313	Client	Westinghouse Hanford
Contact	Julie D. Wose	Contract	MBH-SVV-069262
Lab sample id	N401051-06	Client sample id	B09WF5
Dept sample id	7313-006	Location/Matrix	200-UP-2 SOLID
Received	01/18/94	Collected	01/13/94
% moisture	1.1	Chain of custody id	EFL-1091

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Cerium 144	14762-78-8	U		0.4		U	GAM
Europium 152	14683-23-9	U		0.2	0.1	U	GAM
Europium 154	15585-10-1	U		0.1	0.1	U	GAM
Europium 155	14391-16-3	U		0.2	0.1	U	GAM
Radium 226	13982-63-3	U		0.2		U	GAM
Radium 228	15262-20-1	U		0.5		U	GAM
Thorium 228	14274-82-9	U		0.3		U	GAM
Thorium 232	7440-29-1	U		0.5		U	GAM

Lab id	TMAN
Protocol	WHC-HASM
Version	Ver 1.0
Form	DVD-DS
Version	2.28
Report date	03/22/94

9713517.2112

N401051-07

TMA NORCAL
REPORTING GROUP 7313

DATA SHEET

B09WF6

SDG 7313 Client Westinghouse Hanford
Contact Julie D. Wose Contract MBH-SVV-069262

Lab sample id N401051-07 Client sample id B09WF6
Dept sample id 7313-007 Location/Matrix 200-UP-2 SOLID
Received 01/18/94 Collected 01/13/94
% moisture 1.0 Chain of custody id EFL-1091

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Gross Alpha	Alpha	3.2	2.2	2	10	J	80A
Gross Beta	Beta	1.3	3.7	6	10	U	80B
Selenium 79	15758-45-9	-1.7	1.6	3	10	U	SE
Strontium 90	10098-97-2	0.065	0.25	0.8	1	U	Y
Technetium 99	14133-76-7	0.017	0.11	0.3	0.5	U	TC
Iodine 129	15046-84-1	0.21	0.63	1	2	U	I
Uranium 233/234		0.044	0.088	0.1	0.3	U	U
Uranium 235	15117-96-1	0.035	0.036	0.1	0.3	U	U
Uranium 238		0.044	0.059	0.1	0.3	U	U
Total Uranium (ug/g)	7440-61-1	0.19	0.038	0.002	0.1	X	U_T
Neptunium 237	13994-20-2	0	0.003	0.01	0.2	U	NP
Plutonium 238	13981-16-3	0.019	0.022	0.04	0.05	U	PU
Plutonium 239/240		0.009	0.009	0.02	0.05	U	PU
Americium 241	14596-10-2	0.004	0.006	0.01	0.05	U	TP
Curium 244	13981-15-2	0.11	0.026	0.01	0.05		TP
GAMMA SCAN ANALYTES							
Sodium 22	13966-32-0	U		0.1		U	GAM
Potassium 40	13966-00-2	U		2		U	GAM
Manganese 54	13966-31-9	U		0.09		U	GAM
Iron 59	14596-12-4	U		0.3	0.05	U	GAM
Cobalt 58	13981-38-9	U		0.1	0.05	U	GAM
Cobalt 60	10198-40-0	U		0.1	0.05	U	GAM
Niobium 94	14681-63-1	U		0.1		U	GAM
Ruthenium 103	13968-53-1	U		0.1		U	GAM
Ruthenium 106	13967-48-1	U		0.9		U	GAM
Tin 113	13966-06-8	U		0.1		U	GAM
Cesium 134	13967-70-9	U		0.1		U	GAM
Cesium 137	10045-97-3	U		0.1	0.05	U	GAM

Lab id TMAN
Protocol WHC-HASM
Version Ver 1.0
Form DVD-DS
Version 2.28
Report date 03/22/94

9213517.2113

TMA NORCAL
REPORTING GROUP 7313

N401051-07

DATA SHEET, cont

B09WF6

SDG	7313	Client	Westinghouse Hanford
Contact	Julie D. Wose	Contract	MBH-SVV-069262
Lab sample id	N401051-07	Client sample id	B09WF6
Dept sample id	7313-007	Location/Matrix	200-UP-2 SOLID
Received	01/18/94	Collected	01/13/94
% moisture	1.0	Chain of custody id	EFL-1091

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Cerium 144	14762-78-8	U		0.4		U	GAM
Europium 152	14683-23-9	U		0.2	0.1	U	GAM
Europium 154	15585-10-1	U		0.1	0.1	U	GAM
Europium 155	14391-16-3	U		0.3	0.1	U	GAM
Radium 226	13982-63-3	U		0.2		U	GAM
Radium 228	15262-20-1	0.30	0.26				GAM
Thorium 228	14274-82-9	U		0.2		U	GAM
Thorium 232	7440-29-1	0.30	0.26				GAM

Lab id	TMAN
Protocol	WHC-HASM
Version	Ver 1.0
Form	DVD-DS
Version	2.28
Report date	03/22/94

9713567.2114

Westinghouse Hanford Company	CHAIN OF CUSTODY

Custody Form Initiator: L E ROGERS

Company Contact: L E ROGERS — Telephone: 376-7690

Project Designation/Sampling Locations: 200-UP-2 — Collection Date: 1-13-94

Ice Chest No.: SML-335 — Field Logbook No.: EFL-1091

Bill of Lading/Airbill No.: 2519008448 — Offsite Property No.: W94-0-0216-3

Method of Shipment: AIR

Shipped to: TMA

Possible Sample Hazards/Remarks: Keep samples at 4C (SOIL) NONE NOTED

Sample Identification

1) B09WF5

~~1,250ml~~ P:CLP;TAL Metals,Hg,Ti
~~1,250ml~~ Gs:VOA CLP
~~1,250ml~~ aG:Semi-VOA CLP
~~1,125ml~~ G:Anions F,Cl,SO4 (EPA 300.0)
~~1,125ml~~ P/G:Anions NO2,NO3 (EPA 353.2)
~~1,125ml~~ G:Cyanide CLP
~~1,125ml~~ Gw:Kerosene (8015M)
~~1,1000ml~~ P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

2) B09WF6

~~1,250ml~~ P:CLP;TAL Metals,Hg,Ti
~~1,250ml~~ Gs:VOA CLP
~~1,250ml~~ aG:Semi-VOA CLP
~~1,125ml~~ G:Anions F,Cl,SO4 (EPA 300.0)
~~1,125ml~~ P/G:Anions NO2,NO3 (EPA 353.2)
~~1,125ml~~ G:Cyanide CLP
~~1,125ml~~ Gw:Kerosene (8015M)
~~1,1000ml~~ P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

~~3)~~

~~1,250ml~~ P:CLP;TAL Metals,Hg,Ti
~~1,250ml~~ Gs:VOA CLP
~~1,250ml~~ aG:Semi-VOA CLP
~~1,125ml~~ G:Anions F,Cl,SO4 (EPA 300.0)
~~1,125ml~~ P/G:Anions NO2,NO3 (EPA 353.2)
~~1,125ml~~ G:Cyanide CLP
~~1,125ml~~ Gw:Kerosene (8015M)
~~1,1000ml~~ P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

1-17-94

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

Relinquished by:	Received by:	Date/Time:
0940 Loren E. Rogers 1-17-94	W.V. Setzer	1-17-94 0940
Relinquished by: W.V. Setzer	Received by: Kermit Blum K. Blum	Date/Time: 1-18-94 1330
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

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

9213517.2115

Westinghouse Hanford Company	SAMPLE ANALYSIS REQUEST

Collector L E ROGERS S.A.F. # 93-263 Date 1-13-94

Company Contact L E ROGERS Telephone (509) 376-7690

Sample Number	*	Date Collected	Time Collected	Number and Type of Sample Containers/Analysis Required
B09WF5	S	1-13-94	0910	1,250ml P:CLP;TAL Metals,Hg,Ti 1,250ml Gs:VOA CLP 1,250ml aG:Semi-VOA CLP 1,125ml G:Anions F,Cl,SO4 (EPA 300.0) 1,125ml P/G:Anions NO2,NO3 (EPA 353.2) 1,125ml G:Cyanide CLP 1,125ml Gw:Kerosene (8015M) 1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152,Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30),TotalUranium(EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79
B09WF6	S	1-13-94	0910	1,250ml P:CLP;TAL Metals,Hg,Ti 1,250ml Gs:VOA CLP 1,250ml aG:Semi-VOA CLP 1,125ml G:Anions F,Cl,SO4 (EPA 300.0) 1,125ml P/G:Anions NO2,NO3 (EPA 353.2) 1,125ml G:Cyanide CLP 1,125ml Gw:Kerosene (8015M) 1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152,Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30),TotalUranium(EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79
			1-17-94	1,250ml P:CLP;TAL Metals,Hg,Ti 1,250ml Gs:VOA CLP 1,250ml aG:Semi-VOA CLP 1,125ml G:Anions F,Cl,SO4 (EPA 300.0) 1,125ml P/G:Anions NO2,NO3 (EPA 353.2) 1,125ml G:Cyanide CLP 1,125ml Gw:Kerosene (8015M) 1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152,Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30),TotalUranium(EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

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

Field Information TMA

Special Handling and/or Storage Maintain at 4C ; (SOIL)

Possible Sample Hazards NONE NOTED

A-6000-406 (06/91) WEF060

9413517.2116

Westinghouse Hanford Company	CHAIN OF CUSTODY

Custody Form Initiator: L E ROGERS

Company Contact: L E ROGERS

Telephone: 376-7690

Project Designation/Sampling Locations: 200-UP-2

Collection Date: 1-13-94

Ice Chest No.: SML-311

Field Logbook No.: EFL-1091

Bill of Lading/Airbill No.:

Offsite Property No.: OPSF-17394

Method of Shipment: AIR

Shipped to: TMA

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

Sample Identification

1) B09D79

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

2) B09WF3

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

3)

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

1-17-94

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

Relinquished by:	Received by:	Date/Time:
1-17-94 Loren E. Rogers 0930	W.V. SETZER W.V. Setzer	1-17-94 0930
W.V. Setzer	[illegible]	1-18-94 10:35

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

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

9715517.2117

Westinghouse Hanford Company	SAMPLE ANALYSIS REQUEST

Collector L E ROGERS S.A.F. # 93-263 Date 1-13-94

Company Contact L E ROGERS Telephone (509) 376-7690

Sample Number	*	Date Collected	Time Collected	Number and Type of Sample Containers/Analysis Required
B09D19	S	1-13-94	0800	1,250ml P:CLP;TAL Metals,Hg,Ti 1,250ml Gs:VOA CLP 1,250ml aG:Semi-VOA CLP 1,125ml G:Anions F,Cl,SO4 (EPA 300.0) 1,125ml P/G:Anions NO2,NO3 (EPA 353.2) 1,125ml G:Cyanide CLP 1,125ml GW:Kerosene (8015M) 1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152,Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30),TotalUranium(EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79
B09WF3	S	1-13-94	1325	1,250ml P:CLP;TAL Metals,Hg,Ti 1,250ml Gs:VOA CLP 1,250ml aG:Semi-VOA CLP 1,125ml G:Anions F,Cl,SO4 (EPA 300.0) 1,125ml P/G:Anions NO2,NO3 (EPA 353.2) 1,125ml G:Cyanide CLP 1,125ml GW:Kerosene (8015M) 1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152,Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30),TotalUranium(EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79
			1-17-94	1,250ml P:CLP;TAL Metals,Hg,Ti 1,250ml Gs:VOA CLP 1,250ml aG:Semi-VOA CLP 1,125ml G:Anions F,Cl,SO4 (EPA 300.0) 1,125ml P/G:Anions NO2,NO3 (EPA 353.2) 1,125ml G:Cyanide CLP 1,125ml GW:Kerosene (8015M) 1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152,Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30),TotalUranium(EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

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

Field Information TMA

Special Handling and/or Storage Maintain at 4C ; (SOIL)

Possible Sample Hazards RADIOACTIVE

A-6000-406 (06/91) WEF060

Emergency Contact: (509) 373-3800 ERG #61 OverNight Delivery Air Bill #

OFFSITE RADIOACTIVE SHIPMENT RECORD

– EXTERIOR INSPECTION PERMITTED –

17895

SHIPPING INST.

SHIP TO:

Company: TMA/Kiscal

Address: 2030 Wright

City, State, Zip: Richmond, CA 94804

Attention: Dolores Sanchez

Contractor: ☐ PNL ☐ KEH ☒ WHC

Site Carrier: Loren Rogers

PR No: 84682 Veh No: 1G-1582

Ship: ☒ Prepaid ☐ Collect Via: ☐ Motor-Rail ☒ Air Psgr. ☐ Excl. Use ☒ Air Cargo ☐ DOE Veh. ☐ Mail ☐ UPS Sur ☐

SHIPMENT DESCRIPTION AND CERTIFICATION

Proper Shipping Name	UN Number
Radioactive Material, EXCEPTED PACKAGE,	
1 Empty Packages	☐ UN 2908
2. Low Specific Activity, n.o.s	☐ UN 2912
3 Limited quantity, ~~n.o.s.~~ OF MATERIAL 7	☒ UN 2910
4. N.O.S.	☐ UN 2982
5. Fissile n.o.s.	☐ UN 2918
6. Special Form, n.o.s.	☐ UN 2974
7 Instruments & Articles	☐ UN 2911
8.	☐

Material Form: ☐ Special (A1) ☒ Normal (A2)

Labels Applied: ☐ Empty ☐ Radioactive LSA ☐ White I ☐ Yellow II ☐ Yellow III ☒ None ☐ Danger (Air Cargo) ☐ Secondary

Material Category: ☐ Empty ☐ Low Specific Act. (LSA) ☒ Limited Quantity ☐ Type A Quantity ☐ Type B Quantity ☐ Highway Route Controlled Quantity

For Normal Form Identify:

Physical Form: ☒ Solid ☐ Liquid ☐ Gas

Chemical Form: ☐ Metal ☐ Oxide ☒ Elemental ☐ Nitrate

Other

TYPE PACKAGE: ☒ Strong Tight ☐ Type A ☐ Type B ☐ Type B (U) ☐ Type B (M)

CONSTRUCTION: ☐ Box, FB ☐ Wood ☐ Steel ☐ Drum ☐ Cask ☒ Other Poly Cooler

FISSILE CLASS: ☒ Non Fissile ☐ Fissile Exempt ☐ Fissile I ☐ Fissile II ☐ Fissile III

Grams Fissile

SNM: ☒ No ☐ Yes ☐ < 1 gr ☐ Category I ☐ Category II ☐ Category III

ACCOUNTABILITY/SECURITY CONTROL: ☐ Classified ☒ Unclassified

Consignee authorized to receive this qty ☒

Sig. Security Svc. Reg. ☐ NA ☒

~~Pu, EU > 1g~~ ☐ N/A ~~NU, DU > 1Kg~~ ☐ N/A

Security Escorts Req. ☐ Not. Req. ☒

External Cask Temperature N/A ☒

(Max. 122° F LTL, 180° F Ex. Use) N/A °F

Packaging conforms to appropriate packaging procedure ☐ N/A ☒ Yes

Complies with D.O.T packaging marking and labeling requirements ☐ N/A ☒ Yes

Container acceptability documented (incl. 7A cert.) ☒ N/A ☐ Yes

Container examined: No evidence of deterioration or damage ☒ Yes

QA Inspection Current ☐ Yes ☒ N/A Seals required ☒ No ☐ Yes

Shipping Doc 49CFR Authorization No N/A

No. Pkgs.	Model Package	COC/Spec No.	Serial No.	Seal No.	Isotopes	Curies/Pkg	T.I.	Gr. Wt.
1	Strong Tight	N/A		N/A	[illegible]	593 nCi	N/A	52 lbs
Contents: Soil Samples in glass bottles. Bottles are barite-based and packed in water surrounded by vermiculite absorbent. Sample # B99CF4 B99WF7								
(Shipper may describe package in detail on one of unused lines above)					TOTAL	593 nCi	N/A	52 lbs

This is to certify that the above named materials are properly classified, described, packaged, marked and labeled, and are in proper condition for transportation, according to the applicable federal, state, local and international regulations for the transportation of hazardous materials.

Certifier's Signature: [signature] Date: 1-20-94 Organization: Env Field Services Complete Cost Code (inc. end function): PT2BA

AREA MONITOR

Surface Dose Rate of Package: ☒ ≤0.5 or ___ mrem/hr (N + βγ)

Dose Rate at 1 Meter from Surface of Package: ☒ ≤0.5 or ___ mrem/hr (N + βγ)

Smears of Outer Container: ☒ ≤22 dpm βγ/cm² ☒ ≤2.2 dpm α/cm²

TRUCK LOAD OR EXCLUSIVE USE: Surface: ☒ ≤ 200 mrem/hr (N + βγ) @ 6 feet: ☒ ≤ 10 mrem/hr (N + βγ) @ Cab or Sleeper ☒ ≤ 2.0 mrem/hr (N + βγ)

Additional Data and Instructions (inc. Readings on Internal Packaging): N/A

Signature - Radiation Monitoring: [signature] Bldg. 222-S Survey No. 167343 Date 1-20-94

AUTHORIZATION FOR SHIPMENT

APPROVAL

AIR TRANSPORT CERTIFICATION ▸ Cargo Only: ☐ Danger Labels Applied

Passenger: ☒ 1. Ltd. Qty. ☐ 2. ≤3 T.I ☐ 3. Research or Medical Diagnosis ☐ 4. Human Medical Research

Pkg. Dimensions

Traffic has inspected and verified preshipment compliance to DOT regulations.

Authorized Signature ▸ [signature] Printed Name ▸ Eli R. Smith Date ▸ 20 JAN 94

APPROVED FOR OFFSITE SHIPMENT

TRAFFIC

B.L. No. RMW-8441 Date Shipped 1/20/94 E.T.A. 1/21/94 Routing FED EX ☐ N/A

Placards ☐ Yes ☒ No

Surveyed By [signature] Date 1-20-94 Approved for Shipment ~~Westinghouse Hanford Company~~ [signature] Date 1/20/94

Route Plan ☐ Yes ☒ No

FEDERAL EXPRESS

QUESTIONS? CALL 800-238-5355 TOLL FREE.

PACKAGE TRACKING NUMBER 4230052675

4230052675

Date 1-20-94

RECIPIENT'S COPY

From (Your Name) Please Print: J.E. MAXWELL

Your Phone Number (Very Important): (509) 376-7493

Company: DOE/WESTINGHOUSE HANFORD

Department/Floor No.

Street Address: 1100 AREA 1163 BLDG (EMERGENCY CONTACT PHONE NUMBER 509-373-3800)

City: RICHLAND State: WA ZIP Required: 99352

2 To (Recipient's Name) Please Print: DELORES SANCHEZ

Recipient's Phone Number (Very Important): ( )

Company: TMA / NORCAL

Department/Floor

Exact Street Address (We Cannot Deliver to P.O. Boxes or P.O. Zip Codes.): 2030 WRIGHT AVENUE

City: RICHMOND State: CA ZIP Required: 94804

YOUR INTERNAL BILLING REFERENCE INFORMATION (First 24 characters will appear on invoice.)
RSM-8441 RADIOACTIVE MATERIAL, EXCEPTED PACKAGE - LIMITED QUANTITY
81710 PT22A OF MATERIAL DOT EMERGENCY RESPONSE GUIDE #61 ATTACHED

H IF HOLD FOR PICK-UP, Print FEDEX Address Here (Not available at all locations)
Street Address
City State ZIP Required

3 PAYMENT 1 [X] Bill Sender 2 [ ] Bill Recipient's FedEx Acct. No. 3 [ ] Bill 3rd Party FedEx Acct. No. 4 [ ] Bill Credit Card 5 [ ] Cash/Check

SERVICES (Check only one box)
Priority Overnight (Delivery by next business morning†) 1 [X]
Standard Overnight (Delivery by next business afternoon†) 51 [ ]
Economy Two-Day (Delivery by second business day†) 30 [ ]
Government Overnight (Restricted to authorized users only) 41 [ ]

Freight Service (for Extra Large or any package over 150 lbs.)
70 [ ] OVERNIGHT FREIGHT ** (Confirmed reservation required) 80 [ ] TWO-DAY FREIGHT **
†Delivery commitment may be later in some areas. *Declared Value Limit $100. **Call for delivery schedule.

INSTRUCTIONS (Mark appropriate boxes)
- Dangerous Goods as per attached Shipper's Declaration [ ]
- Dangerous Goods Shipper's Declaration not required [X]
- Cargo Aircraft only [ ]

DELIVERY AND SPECIAL HANDLING (Check services required)
1 [ ] HOLD FOR PICK-UP (Fill in Box H)
2 [X] DELIVER WEEKDAY
3 DELIVER SATURDAY (Extra charge) (Not available to all locations) [ ]
4 [X] DANGEROUS GOODS (Extra charge)
6 [ ] DRY ICE Lbs.
- Dangerous Goods Shipper's Declaration not required
- Dry Ice, 9, UN 1845.

7 [ ] OTHER SPECIAL SERVICE
11 [ ]
12 [ ] HOLIDAY DELIVERY (If offered) (Extra charge)

PACKAGES / WEIGHT in Pounds Only: 1 52
Total 1 Total 52

DIM SHIPMENT (Chargeable Weight) lbs.

Received At: 1 [ ] Regular Stop 3 [ ] Drop Box 2 [ ] On-Call Stop 4 [ ] B.S.C. 5 [ ] Station

FedEx Emp. No. Date/Time

Emp. No. Date
[ ] Cash Received
[ ] Return Shipment
[ ] Third Party [ ] Chg. To Del. [ ] Chg. To Hold
Street Address
City State Zip
Received By: X
Date/Time Received FedEx Employee Number

Federal Express Use
Base Charges
Declared Value Charge
Other 1
Other 2
Total Charges

SIGNATURE RELEASE UNAVAILABLE

REVISION DATE 2/91 PART # 137211 FORMAT #069 069

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FEDERAL EXPRESS

QUESTIONS? CALL 800-238-5355 TOLL FREE.

AIRBILL PACKAGE TRACKING NUMBER 4230852743

4230852743

Date 1-17-94

RECIPIENT'S COPY

From (Your Name) Please Print: G.O. BONESS

Your Phone Number (Very Important): (509) 376-7627

Company: DOE/WESTINGHOUSE HANFORD

Department/Floor No.

Street Address: 1100 AREA 1163 BLDG (EMERGENCY CONTACT PHONE NUMBER 509-373-3800)

City: RICHLAND State: WA ZIP Required: 99352

2 To (Recipient's Name) Please Print: DELORES SANCHEZ

Recipient's Phone Number (Very Important): ( )

Company: TMA / NORCAL

Department/Floor

Exact Street Address (We Cannot Deliver to P.O. Boxes or P.O. Zip Codes.): 2030 WRIGHT AVENUE

City: RICHMOND State: CA ZIP Required: 94804

YOUR INTERNAL BILLING REFERENCE INFORMATION (First 24 characters will appear on invoice.)
RSM-8429 RADIOACTIVE MATERIAL, EXCEPTED PACKAGE - LIMITED QUANTITY
81700 PT22A OF MATERIAL DOT EMERGENCY RESPONSE GUIDE #61 ATTACHED

H IF HOLD FOR PICK-UP, Print FEDEX Address Here (Not available at all locations)
Street Address
City State ZIP Required

3 PAYMENT 1 [X] Bill Sender 2 [ ] Bill Recipient's FedEx Acct. No. 3 [ ] Bill 3rd Party FedEx Acct. No. 4 [ ] Bill Credit Card 5 [ ] Cash/Check

SERVICES (Check only one box)
Priority Overnight (Delivery by next business morning†) 11 [X]
Standard Overnight (Delivery by next business afternoon†) 51 [ ]
Economy Two-Day (Delivery by second business day†) 30 [ ]
Government Overnight (Restricted to authorized users only) 41 [ ]

Freight Service (for Extra Large or any package over 150 lbs.)
70 [ ] OVERNIGHT FREIGHT ** (Confirmed reservation required) 80 [ ] TWO-DAY FREIGHT **
†Delivery commitment may be later in some areas. *Declared Value Limit $100. **Call for delivery schedule.

INSTRUCTIONS (Mark appropriate boxes)
- Dangerous Goods as per attached Shipper's Declaration [ ]
- Dangerous Goods Shipper's Declaration not required [X]
- Cargo Aircraft only [ ]

DELIVERY AND SPECIAL HANDLING (Check services required)
1 [ ] HOLD FOR PICK-UP (Fill in Box H)
2 [X] DELIVER WEEKDAY
3 DELIVER SATURDAY (Extra charge) (Not available to all locations) [ ]
4 [X] DANGEROUS GOODS (Extra charge)
6 [ ] DRY ICE Lbs.
- Dangerous Goods Shipper's Declaration not required
- Dry Ice, 9, UN 1845.

7 [ ] OTHER SPECIAL SERVICE
11 [ ]
12 [ ] HOLIDAY DELIVERY (If offered) (Extra charge)

PACKAGES / WEIGHT in Pounds Only: 1 62
Total 1 Total 62

DIM SHIPMENT (Chargeable Weight) lbs.

Received At: 1 [X] Regular Stop 3 [ ] Drop Box 2 [ ] On-Call Stop 4 [ ] B.S.C. 5 [ ] Station

FedEx Emp. No. Date/Time

Emp. No. Date
[ ] Cash Received
[ ] Return Shipment
[ ] Third Party [ ] Chg. To Del. [ ] Chg. To Hold
Street Address
City State Zip
Received By: X
Date/Time Received FedEx Employee Number

Federal Express Use
Base Charges
Declared Value Charge
Other 1
Other 2
Total Charges

SIGNATURE RELEASE UNAVAILABLE

REVISION DATE 2/91 PART # 137211 FORMAT #069 069

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9713517.2120

FORM OF PAYMENT

Check ☐ GBL ☐ FCCOD ☐

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

EMERY WORLDWIDE — A CF Company

SERVICES

UNITED STATES / CANADA: Same Day (Extra Charges) ☐ · AM ☒ · PM ☐ · Second Day ☐ · Saturday Delivery ☐

INTERNATIONAL: Express ☐ · Standard Plus ☐ · Preferred ☐ · Standard ☐

Shipper's Account Number: E 850281585

Date: 01-17-94 · Origin: PSC · Shipment Number: 2519008444

From:
WESTINGHOUSE SHIPPING DEPT (509) 376-6665
U.S. DEPARTMENT OF ENERGY C/O
WESTINGHOUSE HANFORD
BLDG 1163
2355 STEVENS DRIVE
RICHLAND WA Canada ☐

To:
TMA/NORCAL
TMA/NORCAL
2030 WRIGHT AVENUE
RICHMOND CA USA 94804 Canada ☐

Customer's Reference Numbers: W81710 PT2BA W94-0216#3

Zip: 99352

Consignee's Account Number: E

Tariff Dest.

Check to Shipper $

Hold for Pick Up ☐

EMERY WORLD will accept Con check with all being assume Shipper, inclu but not limite non-payment, and misrepres

Description	Pcs.	L	W	H	Total Pieces	Total Weight (In Lbs.)
WV SETZER 1 COOLER SML 335 SOIL SAMPLES	1	24	16	16	1	60 LBS

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

Declared Va $

2519008444

Remarks: OVERNIGHT DELIVERY

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

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

Shipper's Signature: 1-17-94

International Shipments: Free Domicile ☐ · Commodity Code

Third Party Account Number mandatory for Third Party Billing. E

Third Party Account Number

International Customs Value

International Insurance

Base Charge

Total Transportation Charges

Other Charges/Advance at Origin ☐ OC/AO- $

1-048-1

Terms and Conditions on Back

98

Emergency Contact: (509) 373-3800 Overnight Delivery Air Bill #

SHIPPING INST.

SHIP TO:
Company: TMA/NORCAL
Address: 2030 WRIGHT AVE
City, State, Zip: RICHMOND CA 94804
Attention: Delores Sanchez

OFFSITE RADIOACTIVE SHIPMENT RECORD
– EXTERIOR INSPECTION PERMITTED –

17394

Contractor: ☐ PNL ☐ KEH ☒ WHC

Site Carrier: W.U. SETZER

PR No. 84279 Veh. No. 16-1566

Ship: ☒ Prepaid ☐ Collect Via:
☐ Motor-Rail ☒ Air Psgr.
☐ Excl. Use ☐ Air Cargo
☐ DOE Veh. ☐ Mail
☐ UPS Sur. ☐

SHIPMENT DESCRIPTION AND CERTIFICATION

Proper Shipping Name (Radioactive Material,)	UN Number
1. Empty Packages	☐ UN 2908
Excepted package -	☐ UN 2912
3. Limited quantity ~~n.o.s.~~	☒ UN 2910
of material, 7	☐ UN 2982
5. Fissile n.o.s.	☐ UN 2918
6. Special Form, n.o.s.	☐ UN 2974
7. Instruments & Articles	☐ UN 2911
8.	☐

Material Form: ☐ Special (A1) ☒ Normal (A2)

Labels Applied: ☐ Empty ☐ Radioactive LSA ☐ White I ☐ Yellow II ☐ Yellow III ☒ None ☐ Danger (Air Cargo) ☐ Secondary

Material Category: ☐ Empty ☐ Low Specific Act. (LSA) ☒ Limited Quantity ☐ Type A Quantity ☐ Type B Quantity ☐ Highway Route Controlled Quantity

For Normal Form Identify:
Physical Form: ☒ Solid ☐ Liquid ☐ Gas
Chemical Form: ☐ Metal ☐ Oxide ☒ Elemental ☐ Nitrate
Other

TYPE PACKAGE: ☒ Strong Tight ☐ Type A ☐ Type B ☐ Type B (U) ☐ Type B (M)

CONSTRUCTION: ☐ Box, FB ☐ Wood ☐ Steel ☐ Drum ☐ Cask ☒ Other Poly cooler

FISSILE CLASS: ☒ Non Fissile ☐ Fissile Exempt ☐ Fissile I ☐ Fissile II ☐ Fissile III
Grams Fissile

SNM: ☒ No ☐ Yes ☐ <1 gr ☐ Category I ☐ Category II ☐ Category III

ACCOUNTABILITY/SECURITY CONTROL: ☐ Classified ☒ Unclassified
Consignee authorized to receive this qty ☒
~~Stg. Security Svc. Req~~ ☐ NA ☒
~~Pu, EU > 1 g~~ ☐ NA ~~NU, DU > 1 Kg~~ ☐
Security Escorts Req. ☐ Not Req. ☒
External Cask Temperature (Max. 122° F LTL, 180° F Ex. Use) N/A ☒ °F

Packaging conforms to appropriate packaging procedure ☐ N/A ☒ Yes
Complies with D.O.T. packaging marking and labeling requirements ☐ N/A ☒ Yes
Container acceptability documented (incl. 7A cert.) ☒ N/A ☐ Yes
Container examined: No evidence of deterioration or damage ☒ Yes
QA Inspection Current ☐ Yes ☒ N/A Seals required ☒ No ☐ Yes
Shipping Doc. 49 CFR Authorization No. N/A

No. Pkgs.	Model Package	COC/Spec. No.	Serial No.	Seal No.	Isotopes	Curies/Pkg	TSI	Gr. Wt.
1	Strong tight	N/A	N/A	N/A	Cs-137, Sr-90	1.46 uCi	N/A	62#
Poly Cooler #SML-311 contains 16 bottles, total volume 250 ml								
Sample #'s B09DT9, B09W3F3								
Soil samples in glass bottles, bottles are double bagged and packed								
(Shipper may describe package in detail on one of unused lines above) in wet ice & vermiculite						1.46 uCi	N/A	62#

This is to certify that the above named materials are properly classified, described, packaged, marked and labeled, and are in proper condition for transportation, according to the applicable federal, state, local and international regulations for the transportation of hazardous materials.

Certifier's Signature: [signature] Date: 1-17-94 Organization: Env Field Services Complete Cost Code (inc. end function): PT2BA

AREA MONITOR

Surface Dose Rate of Package: ☒ ≤0.5 or ___ mrem/hr (N + βγ)
Dose Rate at 1 Meter from Surface of Package: ☒ ≤0.5 or ___ mrem/hr (N + βγ)
Smears of Outer Container: ☒ ≤22 dpm βγ/cm² ☒ ≤2.2 dpm α/cm²
TRUCK LOAD OR EXCLUSIVE USE: Surface: ☒ ≤ 200 mrem/hr (N + βγ) @ 6 feet: ☒ ≤10 mrem/hr (N + βγ) @ Cab or Sleeper ☒ ≤2.0 mrem/hr (N + βγ)

Additional Data and Instructions (inc. Readings on Internal Packaging)

Signature - Radiation Monitoring: [signature] Bldg. 222-S Survey No. 167338 Date 1-17-94

AUTHORIZATION FOR SHIPMENT

APPROVAL

AIR TRANSPORT CERTIFICATION ▶ Cargo Only: ☐ Danger Labels Applied
Passenger: ☒ 1. Ltd. Qty. ☐ 2. ≤3 T.I. ☐ 3. Research or Medical Diagnosis ☐ 4. Human Medical Research
Pkg. Dimensions

Traffic has inspected and verified preshipment compliance to DOT regulations.

Authorized Signature ▶ [signature] Printed Name ▶ M.A. SAMS Date ▶ 1-17-94

APPROVED FOR OFFSITE SHIPMENT

TRAFFIC

B. L. No. BMW-8429 Date Shipped 1/17/94 E.T.A. 1/18/94 Routing FED X ☐ N/A
Placards ☐ Yes ☒ No
Surveyed By [signature] Date 1-17-94 Approved for Shipment Westinghouse Hanford Company [signature] Date 1/17/94
Route Plan ☐ Yes ☒ No

*U.S. GPO 1994-692-714/40068 54-6000-088 (10/88)

Emergency Contact: (509) 373-3800 ERG #61 Overnight Delivery Air Bill #

OFFSITE RADIOACTIVE SHIPMENT RECORD
- EXTERIOR INSPECTION PERMITTED -

17895

SHIPPING INST.

SHIP TO:
Company: TMA/Uboral
Address: 2030 Wright
City, State, Zip: Richmond, CA 94804
Attention: Delores Sanchez

Contractor: ☐ PNL ☐ KEH ☒ WHC
Site Carrier: Loren Rogers
PR No. 84682 Veh. No. 1G-1582

Ship: ☒ Prepaid ☐ Collect Via:
☐ Motor-Rail ☒ Air Psgr.
☐ Excl. Use ☒ Air Cargo
☐ DOE Veh. ☐ Mail
☐ UPS Sur. ☐

SHIPMENT DESCRIPTION AND CERTIFICATION

Proper Shipping Name	UN Number
Radioactive Material, EXCEPTED PACKAGE,	
1. Empty Packages	☐ UN 2908
2. Low Specific Activity, n.o.s	☐ UN 2912
3. Limited quantity ~~n.o.s.~~ OF MATERIAL	☒ UN 2910
4. N.O.S.	☐ UN 2982
5. Fissile n.o.s.	☐ UN 2918
6. Special Form, n.o.s.	☐ UN 2974
7. Instruments & Articles	☐ UN 2911
8.	☐

Material Form: ☐ Special (A1) ☒ Normal (A2)

Labels Applied: ☐ Empty ☐ Radioactive LSA ☐ White I ☐ Yellow II ☐ Yellow III ☒ None ☐ Danger (Air Cargo) ☐ Secondary

Material Category: ☐ Empty ☐ Low Specific Act. (LSA) ☒ Limited Quantity ☐ Type A Quantity ☐ Type B Quantity ☐ Highway Route Controlled Quantity

For Normal Form Identify:
Physical Form: ☒ Solid ☐ Liquid ☐ Gas
Chemical Form: ☐ Metal ☐ Oxide ☒ Elemental ☐ Nitrate
Other

TYPE PACKAGE	CONSTRUCTION	FISSILE CLASS	SNM
☒ Strong Tight	☐ Box, FB	☒ Non Fissile	☒ No ☐ Yes
☐ Type A	☐ Wood	☐ Fissile Exempt	☐ <1 gr
☐ Type B	☐ Steel	☐ Fissile I	☐ Category I
☐ Type B (U)	☐ Drum	☐ Fissile II	☐ Category II
☐ Type B (M)	☐ Cask	☐ Fissile III	☐ Category III
	☒ Other Poly Cooler	Grams Fissile	

ACCOUNTABILITY/SECURITY CONTROL
☐ Classified ☒ Unclassified
Consignee authorized to receive this qty ☒
Sig. Security Svc. Req. ☐ NA ☒
~~Pu, EU > 1 g~~ ☐ N/A ~~NU, DU > 1 Kg~~ ☐ N/A
Security Escorts Req. ☐ Not. Req. ☒
External Cask Temperature N/A ☒
(Max. 122° F LTL, 180° F Ex. Use) N/A °F

Packaging conforms to appropriate packaging procedure ☐ N/A ☒ Yes
Complies with D.O.T. packaging marking and labeling requirements ☐ N/A ☒ Yes
Container acceptability documented (incl. 7A cert.) ☒ N/A ☐ Yes

Container examined, No evidence of deterioration or damage ☒ Yes
QA Inspection Current ☐ Yes ☒ N/A Seals required ☒ No ☐ Yes
Shipping Doc. 49CFR Authorization No. N/A

No. Pkgs.	Model Package	COC/Spec. No.	Serial No.	Seal No.	Isotopes	Curies/Pkg	T.I.	Gr. Wt.
1	Strong Tight Cooler #SYNL-196	N/A	N/A	N/A	Sc-90	593mCi	N/A	52 lbs
	Soil Samples in glass bottles. Bottles are double bagged and packed in wet ice surrounded by vermiculite absorbent. Sample # B09WF4, B09WF7							
	(Shipper may describe package in detail on one of unused lines above)				TOTAL	593mCi	N/A	52 lbs

This is to certify that the above named materials are properly classified, described, packaged, marked and labeled, and are in proper condition for transportation, according to the applicable federal, state, local and international regulations for the transportation of hazardous materials.

Certifier's Signature	Date	Organization	Complete Cost Code (inc. end function)
Loren Rogers	1-20-94	ENV Field Services	PT2BA

AREA MONITOR

Surface Dose Rate of Package: ☒ ≤0.5 or ___ mrem/hr (N + βγ)
Dose Rate at 1 Meter from Surface of Package: ☒ ≤0.5 or ___ mrem/hr (N + βγ)
Smears of Outer Container: ☒ ≤22 dpm βγ/cm² ☒ ≤2.2 dpm α/cm²
TRUCK LOAD OR EXCLUSIVE USE: Surface ☒ ≤200 mrem/hr (N + βγ); @ 6 feet ☒ ≤10 mrem/hr (N + βγ); @ Cab or Sleeper ☒ ≤2.0 mrem/hr (N + βγ)

Additional Data and Instructions (inc. Readings on Internal Packaging): N/A

Signature - Radiation Monitoring	Bldg.	Survey No.	Date
See backside	222-S	167343	1-20-94

AUTHORIZATION FOR SHIPMENT

APPROVAL

AIR TRANSPORT CERTIFICATION ▶ Cargo Only: ☐ Danger Labels Applied
Passenger: ☒ 1. Ltd. Qty. ☐ 2. ≤3 T.I. ☐ 3. Research or Medical Diagnosis ☐ 4. Human Medical Research
Pkg. Dimensions

Traffic has inspected and verified preshipment compliance to DOT regulations.

Authorized Signature ▶ E. R. Smith
Printed Name ▶ 100 E. R. Smith
Date ▶ 20 JAN 94

APPROVED FOR OFFSITE SHIPMENT

TRAFFIC

B. L. No.	Date Shipped	E.T.A.	Routing		Placards
RMW-8441	1/20/94	1/21/94	FED EX	☐ N/A	☐ Yes ☒ No
Surveyed By	Date	Approved for Shipment		Date	Route Plan
	1-20-94	~~Westinghouse Hanford Company~~ RHC		1/20/94	☐ Yes ☒ No

9713517.2123

MEMORANDUM

APR 1994 RECEIVED TQO

TO: 200-UP-2 Project QA Record

April 18, 1994

FR: Susan Winter, Golder Associates Inc.

RE: SEMIVOLATILE ORGANICS DATA VALIDATION SUMMARY FOR DATA PACKAGE: B09DT4-TMA-690 (923-E418, Filename B09DT4.BNA)

INTRODUCTION

This memo presents the results of data validation on data package B09DT4-TMA-690 prepared by the Thermo Analytical (TMA) laboratory. A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

SAMPLE ID	SAMPLE DATE	MEDIA	ANALYSIS
B09DT4	01/11/94	SOIL	SEE NOTE 1
B09DT5	01/11/94	SOIL	
B09DT7	01/11/94	SOIL	
B09DT9	01/13/94	SOIL	
B09WF3	01/13/94	SOIL	
B09WF5	01/13/94	SOIL	
B09WF6	01/13/94	SOIL	

Note 1. All samples were analyzed for CLP TCL semivolatile organics.

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

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

RECEIVED APR 1 1994 VALIDATION DOCUMENTATION SDLA

DATA QUALITY OBJECTIVES

This section presents a summary of the data quality in terms of the referenced validation criteria.

Precision. Goals for precision were met.

Accuracy. Goals for accuracy were met.

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

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

001

Completeness. The data package was complete for all requested analyses. A total of seven samples were validated in this data package with a total of 448 determinations reported, all of which were deemed valid. This results in a completeness of 100 percent, which meets normal work plan objectives of 90%.

MAJOR DEFICIENCIES

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

MINOR DEFICIENCIES

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

Laboratory Blanks

- Di-n-butylphthalate, bis(2-ethylhexyl)phthalate, and three tentatively identified compounds (TIC) were detected in the laboratory blank. Attachments 2 and 5 provide a summary of the samples affected, data qualifications applied and supporting documentation.

TENTATIVELY IDENTIFIED COMPOUND EVALUATION

Tentatively identified compounds (TICs) reported by the laboratory were evaluated during validation and qualified as follows:

- TICs were detected in the samples and associated laboratory blank and were common laboratory contaminants, resulting in qualification of the TICs as unusable (UR) as shown in Attachment 3.

- TICs were detected in the samples and associated laboratory blank and have been qualified due to associated blank contamination and have been determined to be presumptive and valid (UJN).

- TICs were detected in the samples and identified as common laboratory contaminants, resulting in qualification of the results as unusable (R) as shown in Attachment 3.

- TICs were detected in the samples and determined to be valid, resulting in qualification of the results as presumptive and valid (JN).

- TICs reported by the laboratory as "unknown hydrocarbon" and at retention times of 7.83 and 7.85 minutes have been corrected to "unknown ketone" following review of the spectra. The specified TICs are identified as common laboratory contaminants (aldol condensation products), resulting in qualification of the results as unusable (R) as shown in Attachment 3.

REFERENCES

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

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

9713517.2126

ATTACHMENT 1

GLOSSARY OF DATA REPORTING QUALIFIERS

9715517.2127

GLOSSARY OF ORGANIC DATA REPORTING QUALIFIERS

B - Indicates the constituent was analyzed for and detected in the associated laboratory blank. This qualifier is applied by the laboratory. During the process of data validation this qualifier may be replaced by other appropriate qualifiers as defined by the validation procedures. The associated data should be considered usable for decision making purposes.

U - Indicates the constituent was analyzed for and not detected. The concentration reported is the sample quantitation limit corrected for aliquot size, dilution and percent solids (in the case of solid matrices) by the laboratory. The associated data should be considered usable for decision making purposes.

UJ - Indicates the constituent was analyzed for and not detected. Due to a minor quality control deficiency identified during data validation the concentration reported may not accurately reflect the sample quantitation limit. The associated data should be considered usable for decision making purposes.

J - Indicates the constituent was analyzed for and detected. This qualifier may be applied by the laboratory to indicate a concentration which is less than the contract required quantitation limit (CRQL) but greater than the instrument detection limit (IDL). During data validation this qualifier may be applied to indicate a minor quality control deficiency. However in either case, the associated data should be considered usable for decision making purposes.

NJ - Indicates presumptive evidence of a constituent at an estimated value. This qualifier is normally applied to GC analysis data (such as organochlorine pesticide and PCB data). The associated data should be considered usable for decision making purposes.

N - Indicates presumptive evidence of a constituent. This qualifier is normally applied to GC analysis data (such as organochlorine pesticide and PCB data). The associated data should be considered usable for decision making purposes.

JN - Indicates a tentatively identified compound (TIC) whose concentration and identification have been determined to be valid as a result of data validation. The associated data should be considered usable for decision making purposes.

UJN - Indicates a tentatively identified compound (TIC) that has been determined to be presumptive and valid (JN) in terms of identification and quantitation and has been qualified as undetected (U) due to associated blank contamination.

UR - Indicates the constituent was analyzed for and not detected. The concentration reported has been qualified as unusable due to a major quality control deficiency identified during data validation. The associated data should be considered unusable for decision making purposes.

R - Indicates the constituent was analyzed for and detected. The concentration reported has been qualified as unusable due to a major quality control deficiency identified during data validation. The associated data should be considered unusable for decision making purposes.

9713517.2128

ATTACHMENT 2

SUMMARY OF DATA QUALIFICATIONS

DATA QUALIFICATION SUMMARY

SDG: B09DT4-TMA-690	VALIDATOR:	DATE: April 18, 1994	PAGE 1 OF 1
COMMENTS: SEMIVOLATILE ORGANICS			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
DI-N-BUTYLPHTHALATE	U	B09DT4 B09DT5 B09DT7 B09DT9 B09WF3 B09WF5 B09WF6	PRESENT IN BLANK
BIS(2-ETHYLHEXYL)PHTHALATE	U	B09WF5	PRESENT IN BLANK

9713517.2130

ATTACHMENT 3

QUALIFIED DATA SUMMARY AND ANNOTATED LABORATORY REPORTS

Validated Data Summary, Data Package: B09DT4-TMA-690

	Samp#	B09DT4		B09DT5		B09DT7		B09DT9		B09WF3		B09WF5	
	Date	1-11-94		1-11-94		1-11-94		1-13-94		1-13-94		1-13-94	
	Location	---		---		---		---		---		---	
	Depth	---		---		---		---		---		---	
	Type	---		---		---		---		---		---	
	Comments	---		---		---		---		---		---	
Parameter	Units	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
PHENOL	UG/KG	330.000	U	320.000	U	340.000	U	360.000	U	350.000	U	330.000	U
BIS(2-CHLOROETHYL)ETHER	UG/KG	330.000	U	320.000	U	340.000	U	360.000	U	350.000	U	330.000	U
2-CHLOROPHENOL	UG/KG	330.000	U	320.000	U	340.000	U	360.000	U	350.000	U	330.000	U
1,3-DICHLOROBENZENE	UG/KG	330.000	U	320.000	U	340.000	U	360.000	U	350.000	U	330.000	U
1,4-DICHLOROBENZENE	UG/KG	330.000	U	320.000	U	340.000	U	360.000	U	350.000	U	330.000	U
1,2-DICHLOROBENZENE	UG/KG	330.000	U	320.000	U	340.000	U	360.000	U	350.000	U	330.000	U
2-METHYLPHENOL	UG/KG	330.000	U	320.000	U	340.000	U	360.000	U	350.000	U	330.000	U
2,2'-OXYBIS(1-CHLOROPROPANE)	UG/KG	330.000	U	320.000	U	340.000	U	360.000	U	350.000	U	330.000	U
4-METHYLPHENOL	UG/KG	330.000	U	320.000	U	340.000	U	360.000	U	350.000	U	330.000	U
N-NITROSO-DI-N-PROPYLAMINE	UG/KG	330.000	U	320.000	U	340.000	U	360.000	U	350.000	U	330.000	U
HEXACHLOROETHANE	UG/KG	330.000	U	320.000	U	340.000	U	360.000	U	350.000	U	330.000	U
NITROBENZENE	UG/KG	330.000	U	320.000	U	340.000	U	360.000	U	350.000	U	330.000	U
ISOPHORONE	UG/KG	330.000	U	320.000	U	340.000	U	360.000	U	350.000	U	330.000	U
2-NITROPHENOL	UG/KG	330.000	U	320.000	U	340.000	U	360.000	U	350.000	U	330.000	U
2,4-DIMETHYLPHENOL	UG/KG	330.000	U	320.000	U	340.000	U	360.000	U	350.000	U	330.000	U
BIS(2-CHLOROETHOXY)METHANE	UG/KG	330.000	U	320.000	U	340.000	U	360.000	U	350.000	U	330.000	U
2,4-DICHLOROPHENOL	UG/KG	330.000	U	320.000	U	340.000	U	360.000	U	350.000	U	330.000	U
1,2,4-TRICHLOROBENZENE	UG/KG	330.000	U	320.000	U	340.000	U	360.000	U	350.000	U	330.000	U
NAPHTHALENE	UG/KG	330.000	U	320.000	U	340.000	U	360.000	U	350.000	U	330.000	U
4-CHLOROANILINE	UG/KG	330.000	U	320.000	U	340.000	U	360.000	U	350.000	U	330.000	U
HEXACHLOROBUTADIENE	UG/KG	330.000	U	320.000	U	340.000	U	360.000	U	350.000	U	330.000	U
4-CHLORO-3-METHYLPHENOL	UG/KG	330.000	U	320.000	U	340.000	U	360.000	U	350.000	U	330.000	U
2-METHYLNAPHTHALENE	UG/KG	330.000	U	320.000	U	340.000	U	360.000	U	350.000	U	330.000	U
HEXACHLOROCYCLOPENTADIENE	UG/KG	330.000	U	320.000	U	340.000	U	360.000	U	350.000	U	330.000	U
2,4,6-TRICHLOROPHENOL	UG/KG	330.000	U	320.000	U	340.000	U	360.000	U	350.000	U	330.000	U
2,4,5-TRICHLOROPHENOL	UG/KG	790.000	U	780.000	U	820.000	U	870.000	U	850.000	U	790.000	U
2-CHLORONAPHTHALENE	UG/KG	330.000	U	320.000	U	340.000	U	360.000	U	350.000	U	330.000	U
2-NITROANILINE	UG/KG	790.000	U	780.000	U	820.000	U	870.000	U	850.000	U	790.000	U
DIMETHYLPHTHALATE	UG/KG	330.000	U	320.000	U	340.000	U	360.000	U	350.000	U	330.000	U
ACENAPHTHYLENE	UG/KG	330.000	U	320.000	U	340.000	U	360.000	U	350.000	U	330.000	U
3-NITROANILINE	UG/KG	790.000	U	780.000	U	820.000	U	870.000	U	850.000	U	790.000	U
ACENAPHTHENE	UG/KG	330.000	U	320.000	U	340.000	U	360.000	U	350.000	U	330.000	U

Verified
[illegible] 4/12/94

Validated Data Summary, Data Package: B09DT4-TMA-690

	Samp#	B09DT4		B09DT5		B09DT7		B09DT9		B09WF3		B09WF5	
	Date	1-11-94		1-11-94		1-11-94		1-13-94		1-13-94		1-13-94	
	Location	---		---		---		---		---		---	
	Depth	---		---		---		---		---		---	
	Type	---		---		---		---		---		---	
	Comments	---		---		---		---		---		---	
Parameter	Units	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
2,4-DINITROPHENOL	UG/KG	790.000	U	780.000	U	820.000	U	870.000	U	850.000	U	790.000	U
4-NITROPHENOL	UG/KG	790.000	U	780.000	U	820.000	U	870.000	U	850.000	U	790.000	U
DIBENZOFURAN	UG/KG	330.000	U	320.000	U	340.000	U	360.000	U	350.000	U	330.000	U
2,4-DINITROTOLUENE	UG/KG	330.000	U	320.000	U	340.000	U	360.000	U	350.000	U	330.000	U
2,6-DINITROTOLUENE	UG/KG	330.000	U	320.000	U	340.000	U	360.000	U	350.000	U	330.000	U
DIETHYLPHTHALATE	UG/KG	330.000	U	320.000	U	340.000	U	360.000	U	350.000	U	330.000	U
4-CHLOROPHENYL-PHENYLETHER	UG/KG	330.000	U	320.000	U	340.000	U	360.000	U	350.000	U	330.000	U
FLUORENE	UG/KG	330.000	U	320.000	U	340.000	U	360.000	U	350.000	U	330.000	U
4-NITROANILINE	UG/KG	790.000	U	780.000	U	820.000	U	870.000	U	850.000	U	790.000	U
4,6-DINITRO-2-METHYLPHENOL	UG/KG	790.000	U	780.000	U	820.000	U	870.000	U	850.000	U	790.000	U
N-NITROSODIPHENYLAMINE	UG/KG	330.000	U	320.000	U	340.000	U	360.000	U	350.000	U	330.000	U
4-BROMOPHENYL-PHENYLETHER	UG/KG	330.000	U	320.000	U	340.000	U	360.000	U	350.000	U	330.000	U
HEXACHLOROBENZENE	UG/KG	330.000	U	320.000	U	340.000	U	360.000	U	350.000	U	330.000	U
PENTACHLOROPHENOL	UG/KG	790.000	U	780.000	U	820.000	U	870.000	U	850.000	U	790.000	U
PHENANTHRENE	UG/KG	330.000	U	320.000	U	340.000	U	360.000	U	350.000	U	330.000	U
ANTHRACENE	UG/KG	330.000	U	320.000	U	340.000	U	360.000	U	350.000	U	330.000	U
CARBAZOLE	UG/KG	330.000	U	320.000	U	340.000	U	360.000	U	350.000	U	330.000	U
DI-N-BUTYLPHTHALATE	UG/KG	330.000	U	320.000	U	340.000	U	360.000	U	350.000	U	330.000	U
FLUORANTHENE	UG/KG	330.000	U	320.000	U	340.000	U	360.000	U	350.000	U	330.000	U
PYRENE	UG/KG	330.000	U	320.000	U	340.000	U	360.000	U	350.000	U	330.000	U
BUTYLBENZYLPHTHALATE	UG/KG	330.000	U	320.000	U	340.000	U	360.000	U	350.000	U	330.000	U
3,3'-DICHLOROBENZIDINE	UG/KG	330.000	U	320.000	U	340.000	U	360.000	U	350.000	U	330.000	U
BENZO(A)ANTHRACENE	UG/KG	330.000	U	320.000	U	340.000	U	360.000	U	350.000	U	330.000	U
BIS(2-ETHYLHEXYL)PHTHALATE	UG/KG	330.000	U	320.000	U	340.000	U	360.000	U	350.000	U	330.000	U
CHRYSENE	UG/KG	330.000	U	320.000	U	340.000	U	360.000	U	350.000	U	330.000	U
DI-N-OCTYLPHTHALATE	UG/KG	330.000	U	320.000	U	340.000	U	360.000	U	350.000	U	330.000	U
BENZO(B)FLUORANTHENE	UG/KG	330.000	U	320.000	U	340.000	U	360.000	U	350.000	U	330.000	U
BENZO(K)FLUORANTHENE	UG/KG	330.000	U	320.000	U	340.000	U	360.000	U	350.000	U	330.000	U
BENZO(A)PYRENE	UG/KG	330.000	U	320.000	U	340.000	U	360.000	U	350.000	U	330.000	U
INDENO(1,2,3-CD)PYRENE	UG/KG	330.000	U	320.000	U	340.000	U	360.000	U	350.000	U	330.000	U
DIBENZ(A,H)ANTHRACENE	UG/KG	330.000	U	320.000	U	340.000	U	360.000	U	350.000	U	330.000	U
BENZO(G,H,I)PERYLENE	UG/KG	330.000	U	320.000	U	340.000	U	360.000	U	350.000	U	330.000	U

Verified
4/12/94

9425142.2452

Validated Data Summary, Data Package: B09DT4-TMA-690

	Samp#	B09WF6	
	Date	1-13-94	
	Location	---	
	Depth	---	
	Type	---	
	Comments	---	
Parameter	Units	Result	Q
PHENOL	UG/KG	330.000	U
BIS(2-CHLOROETHYL)ETHER	UG/KG	330.000	U
2-CHLOROPHENOL	UG/KG	330.000	U
1,3-DICHLOROBENZENE	UG/KG	330.000	U
1,4-DICHLOROBENZENE	UG/KG	330.000	U
1,2-DICHLOROBENZENE	UG/KG	330.000	U
2-METHYLPHENOL	UG/KG	330.000	U
2,2'-OXYBIS(1-CHLOROPROPANE)	UG/KG	330.000	U
4-METHYLPHENOL	UG/KG	330.000	U
N-NITROSO-DI-N-PROPYLAMINE	UG/KG	330.000	U
HEXACHLOROETHANE	UG/KG	330.000	U
NITROBENZENE	UG/KG	330.000	U
ISOPHORONE	UG/KG	330.000	U
2-NITROPHENOL	UG/KG	330.000	U
2,4-DIMETHYLPHENOL	UG/KG	330.000	U
BIS(2-CHLOROETHOXY)METHANE	UG/KG	330.000	U
2,4-DICHLOROPHENOL	UG/KG	330.000	U
1,2,4-TRICHLOROBENZENE	UG/KG	330.000	U
NAPHTHALENE	UG/KG	330.000	U
4-CHLOROANILINE	UG/KG	330.000	U
HEXACHLOROBUTADIENE	UG/KG	330.000	U
4-CHLORO-3-METHYLPHENOL	UG/KG	330.000	U
2-METHYLNAPHTHALENE	UG/KG	330.000	U
HEXACHLOROCYCLOPENTADIENE	UG/KG	330.000	U
2,4,6-TRICHLOROPHENOL	UG/KG	330.000	U
2,4,5-TRICHLOROPHENOL	UG/KG	790.000	U
2-CHLORONAPHTHALENE	UG/KG	330.000	U
2-NITROANILINE	UG/KG	790.000	U
DIMETHYLPHTHALATE	UG/KG	330.000	U
ACENAPHTHYLENE	UG/KG	330.000	U
3-NITROANILINE	UG/KG	790.000	U
ACENAPHTHENE	UG/KG	330.000	U

Verified
[illegible] 4/12/94

Validated Data Summary, Data Package: B09DT4-TMA-690

	Samp#	B09WF6	
	Date	1-13-94	
	Location	---	
	Depth	---	
	Type	---	
	Comments	---	
Parameter	Units	Result	Q
2,4-DINITROPHENOL	UG/KG	790.000	U
4-NITROPHENOL	UG/KG	790.000	U
DIBENZOFURAN	UG/KG	330.000	U
2,4-DINITROTOLUENE	UG/KG	330.000	U
2,6-DINITROTOLUENE	UG/KG	330.000	U
DIETHYLPHTHALATE	UG/KG	330.000	U
4-CHLOROPHENYL-PHENYLETHER	UG/KG	330.000	U
FLUORENE	UG/KG	330.000	U
4-NITROANILINE	UG/KG	790.000	U
4,6-DINITRO-2-METHYLPHENOL	UG/KG	790.000	U
N-NITROSODIPHENYLAMINE	UG/KG	330.000	U
4-BROMOPHENYL-PHENYLETHER	UG/KG	330.000	U
HEXACHLOROBENZENE	UG/KG	330.000	U
PENTACHLOROPHENOL	UG/KG	790.000	U
PHENANTHRENE	UG/KG	330.000	U
ANTHRACENE	UG/KG	330.000	U
CARBAZOLE	UG/KG	330.000	U
DI-N-BUTYLPHTHALATE	UG/KG	330.000	U
FLUORANTHENE	UG/KG	330.000	U
PYRENE	UG/KG	330.000	U
BUTYLBENZYLPHTHALATE	UG/KG	330.000	U
3,3'-DICHLOROBENZIDINE	UG/KG	330.000	U
BENZO(A)ANTHRACENE	UG/KG	330.000	U
BIS(2-ETHYLHEXYL)PHTHALATE	UG/KG	330.000	U
CHRYSENE	UG/KG	330.000	U
DI-N-OCTYLPHTHALATE	UG/KG	330.000	U
BENZO(B)FLUORANTHENE	UG/KG	330.000	U
BENZO(K)FLUORANTHENE	UG/KG	330.000	U
BENZO(A)PYRENE	UG/KG	330.000	U
INDENO(1,2,3-CD)PYRENE	UG/KG	330.000	U
DIBENZ(A,H)ANTHRACENE	UG/KG	330.000	U
BENZO(G,H,I)PERYLENE	UG/KG	330.000	U

Verified
[illegible] 4/12/94

9413517.2155

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1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B09DT4

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 01025 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A401025-06B

Sample wt/vol: 30.4 (g/mL) G Lab File ID: 40202S06

Level: (low/med) LOW Date Received: 01/18/94

% Moisture: 0 decanted: (Y/N) N Date Extracted: 01/20/94

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 02/02/94

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 8.6

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-95-2	Phenol	330	U
111-44-4	bis(2-Chloroethyl)Ether	330	U
95-57-8	2-Chlorophenol	330	U
541-73-1	1,3-Dichlorobenzene	330	U
106-46-7	1,4-Dichlorobenzene	330	U
95-50-1	1,2-Dichlorobenzene	330	U
95-48-7	2-Methylphenol	330	U
108-60-1	2,2'-oxybis(1-Chloropropane)	330	U
106-44-5	4-Methylphenol	330	U
621-64-7	N-Nitroso-Di-n-Propylamine	330	U
67-72-1	Hexachloroethane	330	U
98-95-3	Nitrobenzene	330	U
78-59-1	Isophorone	330	U
88-75-5	2-Nitrophenol	330	U
105-67-9	2,4-Dimethylphenol	330	U
111-91-1	bis(2-Chloroethoxy)Methane	330	U
120-83-2	2,4-Dichlorophenol	330	U
120-82-1	1,2,4-Trichlorobenzene	330	U
91-20-3	Naphthalene	330	U
106-47-8	4-Chloroaniline	330	U
87-68-3	Hexachlorobutadiene	330	U
59-50-7	4-Chloro-3-Methylphenol	330	U
91-57-6	2-Methylnaphthalene	330	U
77-47-4	Hexachlorocyclopentadiene	330	U
88-06-2	2,4,6-Trichlorophenol	330	U
95-95-4	2,4,5-Trichlorophenol	790	U
91-58-7	2-Chloronaphthalene	330	U
88-74-4	2-Nitroaniline	790	U
131-11-3	Dimethylphthalate	330	U
208-96-8	Acenaphthylene	330	U
99-09-2	3-Nitroaniline	790	U
83-32-9	Acenaphthene	330	U
51-28-5	2,4-Dinitrophenol	790	U

Q

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Verified 4/8/94

9213517.2136

~~000351~~

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B09DT4

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 01025 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A401025-06B

Sample wt/vol: 30.4 (g/mL) G Lab File ID: 40202S06

Level: (low/med) LOW Date Received: 01/18/94

% Moisture: 0 decanted: (Y/N) N Date Extracted: 01/20/94

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 02/02/94

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 8.6

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q	Q
100-02-7	4-Nitrophenol	790	U	
132-64-9	Dibenzofuran	330	U	
121-14-2	2,4-Dinitrotoluene	330	U	
606-20-2	2,6-Dinitrotoluene	330	U	
84-66-2	Diethylphthalate	330	U	
7005-72-3	4-Chlorophenyl-phenylether	330	U	
86-73-7	Fluorene	330	U	
100-01-6	4-Nitroaniline	790	U	
534-52-1	4,6-Dinitro-2-methylphenol	790	U	
86-30-6	N-Nitrosodiphenylamine (1)	330	U	
101-55-3	4-Bromophenyl-phenylether	330	U	
118-74-1	Hexachlorobenzene	330	U	
87-86-5	Pentachlorophenol	790	U	
85-01-8	Phenanthrene	330	U	
120-12-7	Anthracene	330	U	
86-74-8	Carbazole	330	U	
84-74-2	Di-n-Butylphthalate	330 ~~190~~	~~BJ~~	u
206-44-0	Fluoranthene	330	U	
129-00-0	Pyrene	330	U	
85-68-7	Butylbenzylphthalate	330	U	
91-94-1	3,3'-Dichlorobenzidine	330	U	
56-55-3	Benzo(a)Anthracene	330	U	
117-81-7	bis(2-Ethylhexyl)Phthalate	330	U	
218-01-9	Chrysene	330	U	
117-84-0	Di-n-Octyl Phthalate	330	U	
205-99-2	Benzo(b)Fluoranthene	330	U	
207-08-9	Benzo(k)Fluoranthene	330	U	
50-32-8	Benzo(a)Pyrene	330	U	
193-39-5	Indeno(1,2,3-cd)Pyrene	330	U	
53-70-3	Dibenz(a,h)Anthracene	330	U	
191-24-2	Benzo(g,h,i)Perylene	330	U	

(1) - Cannot be separated from Diphenylamine

Verified 4/8/94

FORM I SV-2 3/90

01

9715517.2157

~~000352~~

1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B09DT4

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 01025 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A401025-06B

Sample wt/vol: 30.4 (g/mL) G Lab File ID: 40202S06

Level: (low/med) LOW Date Received: 01/18/94

% Moisture: 0 decanted: (Y/N) N Date Extracted: 01/20/94

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 02/02/94

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 8.6

Number TICs found: 5

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q	Q
1.	UNKNOWN COMPOUND	5.52	1600	~~BJ~~	USH
2.	UNKNOWN KETONE	6.48	660	~~BJ~~	UR
3.	UNKNOWN KETONE	7.02	130	~~BJ~~	UR
4.	UNKNOWN ~~HYDROCARBON~~ Ketone	7.83	200	~~J~~	R
5.	HEXANEDIOIC ACID ESTER ISOME	25.28	66	~~J~~	SH

4/18/94

Verified 4/1/94

015

FORM I SV-TIC 3/90

9713617.2158

~~000371~~

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B09DT5

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 01025 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A401025-07B

Sample wt/vol: 30.6 (g/mL) G Lab File ID: 40202S07

Level: (low/med) LOW Date Received: 01/18/94

% Moisture: 0 decanted: (Y/N) N Date Extracted: 01/20/94

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 02/02/94

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 8.6

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-95-2	Phenol	320	U
111-44-4	bis(2-Chloroethyl)Ether	320	U
95-57-8	2-Chlorophenol	320	U
541-73-1	1,3-Dichlorobenzene	320	U
106-46-7	1,4-Dichlorobenzene	320	U
95-50-1	1,2-Dichlorobenzene	320	U
95-48-7	2-Methylphenol	320	U
108-60-1	2,2'-oxybis(1-Chloropropane)	320	U
106-44-5	4-Methylphenol	320	U
621-64-7	N-Nitroso-Di-n-Propylamine	320	U
67-72-1	Hexachloroethane	320	U
98-95-3	Nitrobenzene	320	U
78-59-1	Isophorone	320	U
88-75-5	2-Nitrophenol	320	U
105-67-9	2,4-Dimethylphenol	320	U
111-91-1	bis(2-Chloroethoxy)Methane	320	U
120-83-2	2,4-Dichlorophenol	320	U
120-82-1	1,2,4-Trichlorobenzene	320	U
91-20-3	Naphthalene	320	U
106-47-8	4-Chloroaniline	320	U
87-68-3	Hexachlorobutadiene	320	U
59-50-7	4-Chloro-3-Methylphenol	320	U
91-57-6	2-Methylnaphthalene	320	U
77-47-4	Hexachlorocyclopentadiene	320	U
88-06-2	2,4,6-Trichlorophenol	320	U
95-95-4	2,4,5-Trichlorophenol	780	U
91-58-7	2-Chloronaphthalene	320	U
88-74-4	2-Nitroaniline	780	U
131-11-3	Dimethylphthalate	320	U
208-96-8	Acenaphthylene	320	U
99-09-2	3-Nitroaniline	780	U
83-32-9	Acenaphthene	320	U
51-28-5	2,4-Dinitrophenol	780	U

~~01C~~

9/16/94

Verified 4/11/94

016

9215972159

~~000372~~

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B09DT5

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 01025 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A401025-07B

Sample wt/vol: 30.6 (g/mL) G Lab File ID: 40202S07

Level: (low/med) LOW Date Received: 01/18/94

% Moisture: 0 decanted: (Y/N) N Date Extracted: 01/20/94

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 02/02/94

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 8.6

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q	Q
100-02-7	4-Nitrophenol	780	U	
132-64-9	Dibenzofuran	320	U	
121-14-2	2,4-Dinitrotoluene	320	U	
606-20-2	2,6-Dinitrotoluene	320	U	
84-66-2	Diethylphthalate	320	U	
7005-72-3	4-Chlorophenyl-phenylether	320	U	
86-73-7	Fluorene	320	U	
100-01-6	4-Nitroaniline	780	U	
534-52-1	4,6-Dinitro-2-methylphenol	780	U	
86-30-6	N-Nitrosodiphenylamine (1)	320	U	
101-55-3	4-Bromophenyl-phenylether	320	U	
118-74-1	Hexachlorobenzene	320	U	
87-86-5	Pentachlorophenol	780	U	
85-01-8	Phenanthrene	320	U	
120-12-7	Anthracene	320	U	
86-74-8	Carbazole	320	U	
84-74-2	Di-n-Butylphthalate	320 ~~170~~	~~BJ~~	U
206-44-0	Fluoranthene	320	U	
129-00-0	Pyrene	320	U	
85-68-7	Butylbenzylphthalate	320	U	
91-94-1	3,3'-Dichlorobenzidine	320	U	
56-55-3	Benzo(a)Anthracene	320	U	
117-81-7	bis(2-Ethylhexyl)Phthalate	320	U	
218-01-9	Chrysene	320	U	
117-84-0	Di-n-Octyl Phthalate	320	U	
205-99-2	Benzo(b)Fluoranthene	320	U	
207-08-9	Benzo(k)Fluoranthene	320	U	
50-32-8	Benzo(a)Pyrene	320	U	
193-39-5	Indeno(1,2,3-cd)Pyrene	320	U	
53-70-3	Dibenz(a,h)Anthracene	320	U	
191-24-2	Benzo(g,h,i)Perylene	320	U	

(1) - Cannot be separated from Diphenylamine

Verified 4/11/94

017

FORM I SV-2 3/90

9213917.2140

~~000373~~

EPA SAMPLE NO.

B09DT5

1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 01025 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A401025-07B

Sample wt/vol: 30.6 (g/mL) G Lab File ID: 40202S07

Level: (low/med) LOW Date Received: 01/18/94

% Moisture: 0 decanted: (Y/N) N Date Extracted: 01/20/94

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 02/02/94

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 8.6

Number TICs found: 8

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q	Q
1.	UNKNOWN COMPOUND	5.52	1700	~~BJ~~	NJ
2.	UNKNOWN KETONE	6.50	750	~~BJ~~	NJ
3.	UNKNOWN KETONE	7.03	130	~~BJ~~	NJ
4.	UNKNOWN ~~HYDROCARBON~~ Ketone	7.85	200	~~J~~	NJ
5.	UNKNOWN HYDROCARBON	21.65	65	~~J~~	NJ
6.	HEXANEDIOIC ACID ESTER ISOME	25.30	98	~~J~~	NJ
7.	UNKNOWN CARBOXYLIC ACID ESTE	26.52	65	~~J~~	NJ
8.	UNKNOWN HYDROCARBON	29.22	98	~~J~~	NJ

4/18/94

L018

Verified 4/11/94

FORM I SV-TIC 3/90

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B09DT7

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 01025 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A401025-08B

Sample wt/vol: 30.5 (g/mL) G Lab File ID: 40202S08

Level: (low/med) LOW Date Received: 01/18/94

% Moisture: 4 decanted: (Y/N) N Date Extracted: 01/20/94

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 02/02/94

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 9.4

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-95-2	Phenol	340	U
111-44-4	bis(2-Chloroethyl)Ether	340	U
95-57-8	2-Chlorophenol	340	U
541-73-1	1,3-Dichlorobenzene	340	U
106-46-7	1,4-Dichlorobenzene	340	U
95-50-1	1,2-Dichlorobenzene	340	U
95-48-7	2-Methylphenol	340	U
108-60-1	2,2'-oxybis(1-Chloropropane)	340	U
106-44-5	4-Methylphenol	340	U
621-64-7	N-Nitroso-Di-n-Propylamine	340	U
67-72-1	Hexachloroethane	340	U
98-95-3	Nitrobenzene	340	U
78-59-1	Isophorone	340	U
88-75-5	2-Nitrophenol	340	U
105-67-9	2,4-Dimethylphenol	340	U
111-91-1	bis(2-Chloroethoxy)Methane	340	U
120-83-2	2,4-Dichlorophenol	340	U
120-82-1	1,2,4-Trichlorobenzene	340	U
91-20-3	Naphthalene	340	U
106-47-8	4-Chloroaniline	340	U
87-68-3	Hexachlorobutadiene	340	U
59-50-7	4-Chloro-3-Methylphenol	340	U
91-57-6	2-Methylnaphthalene	340	U
77-47-4	Hexachlorocyclopentadiene	340	U
88-06-2	2,4,6-Trichlorophenol	340	U
95-95-4	2,4,5-Trichlorophenol	820	U
91-58-7	2-Chloronaphthalene	340	U
88-74-4	2-Nitroaniline	820	U
131-11-3	Dimethylphthalate	340	U
208-96-8	Acenaphthylene	340	U
99-09-2	3-Nitroaniline	820	U
83-32-9	Acenaphthene	340	U
51-28-5	2,4-Dinitrophenol	820	U

Verified 4/11/94

9716512 2142

~~000396~~

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B09DT7

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 01025 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A401025-08B

Sample wt/vol: 30.5 (g/mL) G Lab File ID: 40202S08

Level: (low/med) LOW Date Received: 01/18/94

% Moisture: 4 decanted: (Y/N) N Date Extracted: 01/20/94

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 02/02/94

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 9.4

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q	Q
100-02-7	4-Nitrophenol	820	U	
132-64-9	Dibenzofuran	340	U	
121-14-2	2,4-Dinitrotoluene	340	U	
606-20-2	2,6-Dinitrotoluene	340	U	
84-66-2	Diethylphthalate	340	U	
7005-72-3	4-Chlorophenyl-phenylether	340	U	
86-73-7	Fluorene	340	U	
100-01-6	4-Nitroaniline	820	U	
534-52-1	4,6-Dinitro-2-methylphenol	820	U	
86-30-6	N-Nitrosodiphenylamine (1)	340	U	
101-55-3	4-Bromophenyl-phenylether	340	U	
118-74-1	Hexachlorobenzene	340	U	
87-86-5	Pentachlorophenol	820	U	
85-01-8	Phenanthrene	340	U	
120-12-7	Anthracene	340	U	
86-74-8	Carbazole	340	U	
84-74-2	Di-n-Butylphthalate	340 ~~270~~	~~BJ~~	u
206-44-0	Fluoranthene	340	U	
129-00-0	Pyrene	340	U	
85-68-7	Butylbenzylphthalate	340	U	
91-94-1	3,3'-Dichlorobenzidine	340	U	
56-55-3	Benzo(a)Anthracene	340	U	
117-81-7	bis(2-Ethylhexyl)Phthalate	340	U	
218-01-9	Chrysene	340	U	
117-84-0	Di-n-Octyl Phthalate	340	U	
205-99-2	Benzo(b)Fluoranthene	340	U	
207-08-9	Benzo(k)Fluoranthene	340	U	
50-32-8	Benzo(a)Pyrene	340	U	
193-39-5	Indeno(1,2,3-cd)Pyrene	340	U	
53-70-3	Dibenz(a,h)Anthracene	340	U	
191-24-2	Benzo(g,h,i)Perylene	340	U	

(1) - Cannot be separated from Diphenylamine

Verified 4/11/94

020

9216512.2145

~~000397~~

1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B09DT7

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 01025 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A401025-08B

Sample wt/vol: 30.5 (g/mL) G Lab File ID: 40202S08

Level: (low/med) LOW Date Received: 01/18/94

% Moisture: 4 decanted: (Y/N) N Date Extracted: 01/20/94

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 02/02/94

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 9.4

Number TICs found: 6

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q	Q
1.	UNKNOWN COMPOUND	5.52	1600	~~BJ~~	UJN
2.	UNKNOWN HYDROCARBON	5.90	68	~~J~~	JN
3.	UNKNOWN KETONE	6.48	720	~~BJ~~	UR
4.	UNKNOWN KETONE	7.02	210	~~BJ~~	UR
5.	UNKNOWN ~~HYDROCARBON~~ Ketone	7.83	210	~~J~~	R
6.	HEXANEDIOIC ACID ESTER ISOME	25.30	68	~~J~~	JN

4/18/94

021

Verified 4/11/94

FORM I SV-TIC 3/90

9213517 2144

~~000417~~

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B09DT9

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 01025 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A401025-01B

Sample wt/vol: 30.2 (g/mL) G Lab File ID: 40202S09

Level: (low/med) LOW Date Received: 01/18/94

% Moisture: 9 decanted: (Y/N) N Date Extracted: 01/20/94

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 02/02/94

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 8.1

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-95-2	Phenol	360	U
111-44-4	bis(2-Chloroethyl)Ether	360	U
95-57-8	2-Chlorophenol	360	U
541-73-1	1,3-Dichlorobenzene	360	U
106-46-7	1,4-Dichlorobenzene	360	U
95-50-1	1,2-Dichlorobenzene	360	U
95-48-7	2-Methylphenol	360	U
108-60-1	2,2'-oxybis(1-Chloropropane)	360	U
106-44-5	4-Methylphenol	360	U
621-64-7	N-Nitroso-Di-n-Propylamine	360	U
67-72-1	Hexachloroethane	360	U
98-95-3	Nitrobenzene	360	U
78-59-1	Isophorone	360	U
88-75-5	2-Nitrophenol	360	U
105-67-9	2,4-Dimethylphenol	360	U
111-91-1	bis(2-Chloroethoxy)Methane	360	U
120-83-2	2,4-Dichlorophenol	360	U
120-82-1	1,2,4-Trichlorobenzene	360	U
91-20-3	Naphthalene	360	U
106-47-8	4-Chloroaniline	360	U
87-68-3	Hexachlorobutadiene	360	U
59-50-7	4-Chloro-3-Methylphenol	360	U
91-57-6	2-Methylnaphthalene	360	U
77-47-4	Hexachlorocyclopentadiene	360	U
88-06-2	2,4,6-Trichlorophenol	360	U
95-95-4	2,4,5-Trichlorophenol	870	U
91-58-7	2-Chloronaphthalene	360	U
88-74-4	2-Nitroaniline	870	U
131-11-3	Dimethylphthalate	360	U
208-96-8	Acenaphthylene	360	U
99-09-2	3-Nitroaniline	870	U
83-32-9	Acenaphthene	360	U
51-28-5	2,4-Dinitrophenol	870	U

Q

L022

Verified 4/11/94

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B09DT9

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 01025 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A401025-01B

Sample wt/vol: 30.2 (g/mL) G Lab File ID: 40202S09

Level: (low/med) LOW Date Received: 01/18/94

% Moisture: 9 decanted: (Y/N) N Date Extracted: 01/20/94

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 02/02/94

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 8.1

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG		Q	Q
100-02-7	4-Nitrophenol		870	U	
132-64-9	Dibenzofuran		360	U	
121-14-2	2,4-Dinitrotoluene		360	U	
606-20-2	2,6-Dinitrotoluene		360	U	
84-66-2	Diethylphthalate		360	U	
7005-72-3	4-Chlorophenyl-phenylether		360	U	
86-73-7	Fluorene		360	U	
100-01-6	4-Nitroaniline		870	U	
534-52-1	4,6-Dinitro-2-methylphenol		870	U	
86-30-6	N-Nitrosodiphenylamine (1)		360	U	
101-55-3	4-Bromophenyl-phenylether		360	U	
118-74-1	Hexachlorobenzene		360	U	
87-86-5	Pentachlorophenol		870	U	
85-01-8	Phenanthrene		360	U	
120-12-7	Anthracene		360	U	
86-74-8	Carbazole		360	U	
84-74-2	Di-n-Butylphthalate	360	~~310~~	~~BJ~~	u
206-44-0	Fluoranthene		360	U	
129-00-0	Pyrene		360	U	
85-68-7	Butylbenzylphthalate		360	U	
91-94-1	3,3'-Dichlorobenzidine		360	U	
56-55-3	Benzo(a)Anthracene		360	U	
117-81-7	bis(2-Ethylhexyl)Phthalate		360	U	
218-01-9	Chrysene		360	U	
117-84-0	Di-n-Octyl Phthalate		360	U	
205-99-2	Benzo(b)Fluoranthene		360	U	
207-08-9	Benzo(k)Fluoranthene		360	U	
50-32-8	Benzo(a)Pyrene		360	U	
193-39-5	Indeno(1,2,3-cd)Pyrene		360	U	
53-70-3	Dibenz(a,h)Anthracene		360	U	
191-24-2	Benzo(g,h,i)Perylene		360	U	

(1) - Cannot be separated from Diphenylamine

Verified 4/11/94

9213517.2146

~~000419~~
~~000419~~ 3/2/94

1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B09DT9

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 01025 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A401025-01B

Sample wt/vol: 30.2 (g/mL) G Lab File ID: 40202S09

Level: (low/med) LOW Date Received: 01/18/94

% Moisture: 9 decanted: (Y/N) N Date Extracted: 01/20/94

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 02/02/94

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 8.1

Number TICs found: 18

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q	Q
1.	UNKNOWN COMPOUND	5.52	2200	~~BJ~~	UJN
2.	UNKNOWN KETONE	6.50	800	~~BJ~~	UR
3.	UNKNOWN HYDROCARBON	6.80	1100	~~J~~	UJ
4.	UNKNOWN KETONE	7.03	330	~~BJ~~	UR
5.	UNKNOWN ~~HYDROCARBON~~ Ketone	7.85	470	~~J~~	R
6.	UNKNOWN HYDROCARBON	8.28	220	~~J~~	UJ
7.	UNKNOWN ALKANE	18.55	180	~~J~~	UJ
8.	UNKNOWN ALKANE	19.67	110	~~J~~	UJ
9.	UNKNOWN ALKANE	20.75	150	~~J~~	UJ
10.	UNKNOWN ALKANE	21.78	180	~~J~~	UJ
11.	UNKNOWN ALKANE	22.75	150	~~J~~	UJ
12.	UNKNOWN ALKANE	23.67	150	~~J~~	UJ
13.	UNKNOWN ALKANE	24.55	110	~~J~~	UJ
14.	HEXANEDIOIC ACID ESTER ISOME	25.30	73	~~J~~	UJ
15.	UNKNOWN ALKANE	25.38	110	~~J~~	UJ
16.	UNKNOWN ALKANE	26.22	73	~~J~~	UJ
17.	UNKNOWN HYDROCARBON	27.93	110	~~J~~	UJ
18.	UNKNOWN ALKANE	30.23	220	~~J~~	UJ

4/18/94

024

Verified
4/11/94

9113517.2147

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1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B09WF3

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 01025 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A401025-02B

Sample wt/vol: 30.5 (g/mL) G Lab File ID: 40202S03

Level: (low/med) LOW Date Received: 01/18/94

% Moisture: 7 decanted: (Y/N) N Date Extracted: 01/20/94

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 02/02/94

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 8.8

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-95-2	Phenol	350	U
111-44-4	bis(2-Chloroethyl)Ether	350	U
95-57-8	2-Chlorophenol	350	U
541-73-1	1,3-Dichlorobenzene	350	U
106-46-7	1,4-Dichlorobenzene	350	U
95-50-1	1,2-Dichlorobenzene	350	U
95-48-7	2-Methylphenol	350	U
108-60-1	2,2'-oxybis(1-Chloropropane)	350	U
106-44-5	4-Methylphenol	350	U
621-64-7	N-Nitroso-Di-n-Propylamine	350	U
67-72-1	Hexachloroethane	350	U
98-95-3	Nitrobenzene	350	U
78-59-1	Isophorone	350	U
88-75-5	2-Nitrophenol	350	U
105-67-9	2,4-Dimethylphenol	350	U
111-91-1	bis(2-Chloroethoxy)Methane	350	U
120-83-2	2,4-Dichlorophenol	350	U
120-82-1	1,2,4-Trichlorobenzene	350	U
91-20-3	Naphthalene	350	U
106-47-8	4-Chloroaniline	350	U
87-68-3	Hexachlorobutadiene	350	U
59-50-7	4-Chloro-3-Methylphenol	350	U
91-57-6	2-Methylnaphthalene	350	U
77-47-4	Hexachlorocyclopentadiene	350	U
88-06-2	2,4,6-Trichlorophenol	350	U
95-95-4	2,4,5-Trichlorophenol	850	U
91-58-7	2-Chloronaphthalene	350	U
88-74-4	2-Nitroaniline	850	U
131-11-3	Dimethylphthalate	350	U
208-96-8	Acenaphthylene	350	U
99-09-2	3-Nitroaniline	850	U
83-32-9	Acenaphthene	350	U
51-28-5	2,4-Dinitrophenol	850	U

Q

025

Verified 4/11/94

9216517.2948

~~000454~~

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B09WF3

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 01025 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A401025-02B

Sample wt/vol: 30.5 (g/mL) G Lab File ID: 40202S03

Level: (low/med) LOW Date Received: 01/18/94

% Moisture: 7 decanted: (Y/N) N Date Extracted: 01/20/94

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 02/02/94

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 8.8

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q	Q
100-02-7	4-Nitrophenol	850	U	
132-64-9	Dibenzofuran	350	U	
121-14-2	2,4-Dinitrotoluene	350	U	
606-20-2	2,6-Dinitrotoluene	350	U	
84-66-2	Diethylphthalate	350	U	
7005-72-3	4-Chlorophenyl-phenylether	350	U	
86-73-7	Fluorene	350	U	
100-01-6	4-Nitroaniline	850	U	
534-52-1	4,6-Dinitro-2-methylphenol	850	U	
86-30-6	N-Nitrosodiphenylamine (1)	350	U	
101-55-3	4-Bromophenyl-phenylether	350	U	
118-74-1	Hexachlorobenzene	350	U	
87-86-5	Pentachlorophenol	850	U	
85-01-8	Phenanthrene	350	U	
120-12-7	Anthracene	350	U	
86-74-8	Carbazole	350	U	
84-74-2	Di-n-Butylphthalate	350 ~~190~~	~~BJ~~	u
206-44-0	Fluoranthene	350	U	
129-00-0	Pyrene	350	U	
85-68-7	Butylbenzylphthalate	350	U	
91-94-1	3,3'-Dichlorobenzidine	350	U	
56-55-3	Benzo(a)Anthracene	350	U	
117-81-7	bis(2-Ethylhexyl)Phthalate	350	U	
218-01-9	Chrysene	350	U	
117-84-0	Di-n-Octyl Phthalate	350	U	
205-99-2	Benzo(b)Fluoranthene	350	U	
207-08-9	Benzo(k)Fluoranthene	350	U	
50-32-8	Benzo(a)Pyrene	350	U	
193-39-5	Indeno(1,2,3-cd)Pyrene	350	U	
53-70-3	Dibenz(a,h)Anthracene	350	U	
191-24-2	Benzo(g,h,i)Perylene	350	U	

(1) - Cannot be separated from Diphenylamine

Verified 4/11/94

FORM I SV-2 3/90

026

9213517.2149

~~000455~~

1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B09WF3

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 01025 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A401025-02B

Sample wt/vol: 30.5 (g/mL) G Lab File ID: 40202S03

Level: (low/med) LOW Date Received: 01/18/94

% Moisture: 7 decanted: (Y/N) N Date Extracted: 01/20/94

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 02/02/94

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 8.8

Number TICs found: 10

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q	G
1.	UNKNOWN COMPOUND	5.52	1500	~~BJ~~	N
2.	UNKNOWN KETONE	6.48	670	~~BJ~~	NR
3.	UNKNOWN HYDROCARBON	6.77	140	~~J~~	N
4.	UNKNOWN KETONE	7.00	280	~~BJ~~	NR
5.	UNKNOWN ~~HYDROCARBON~~ Ketone	7.83	280	~~J~~	NR
6.	UNKNOWN HYDROCARBON	8.27	140	~~J~~	N
7.	HEXANEDIOIC ACID ESTER ISOME	25.27	71	~~J~~	N
8.	UNKNOWN ALKANE	27.92	71	~~J~~	N
9.	UNKNOWN ALKANE	30.22	280	~~J~~	N
10.	UNKNOWN ALKANE	33.53	110	~~J~~	N

4/18/94

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Verified 4/11/94

FORM I SV-TIC 3/90

9713517.2150

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EPA SAMPLE NO.

B09WF5

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 01025 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A401025-03B

Sample wt/vol: 30.3 (g/mL) G Lab File ID: 40202S04

Level: (low/med) LOW Date Received: 01/18/94

% Moisture: 0 decanted: (Y/N) N Date Extracted: 01/20/94

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 02/02/94

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 9.1

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-95-2	Phenol	330	U
111-44-4	bis(2-Chloroethyl)Ether	330	U
95-57-8	2-Chlorophenol	330	U
541-73-1	1,3-Dichlorobenzene	330	U
106-46-7	1,4-Dichlorobenzene	330	U
95-50-1	1,2-Dichlorobenzene	330	U
95-48-7	2-Methylphenol	330	U
108-60-1	2,2'-oxybis(1-Chloropropane)	330	U
106-44-5	4-Methylphenol	330	U
621-64-7	N-Nitroso-Di-n-Propylamine	330	U
67-72-1	Hexachloroethane	330	U
98-95-3	Nitrobenzene	330	U
78-59-1	Isophorone	330	U
88-75-5	2-Nitrophenol	330	U
105-67-9	2,4-Dimethylphenol	330	U
111-91-1	bis(2-Chloroethoxy)Methane	330	U
120-83-2	2,4-Dichlorophenol	330	U
120-82-1	1,2,4-Trichlorobenzene	330	U
91-20-3	Naphthalene	330	U
106-47-8	4-Chloroaniline	330	U
87-68-3	Hexachlorobutadiene	330	U
59-50-7	4-Chloro-3-Methylphenol	330	U
91-57-6	2-Methylnaphthalene	330	U
77-47-4	Hexachlorocyclopentadiene	330	U
88-06-2	2,4,6-Trichlorophenol	330	U
95-95-4	2,4,5-Trichlorophenol	790	U
91-58-7	2-Chloronaphthalene	330	U
88-74-4	2-Nitroaniline	790	U
131-11-3	Dimethylphthalate	330	U
208-96-8	Acenaphthylene	330	U
99-09-2	3-Nitroaniline	790	U
83-32-9	Acenaphthene	330	U
51-28-5	2,4-Dinitrophenol	790	U

028

Verified 4/11/94

9713517.2151

~~000480~~
EPA SAMPLE NO.

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

B09WF5

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 01025 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A401025-03B

Sample wt/vol: 30.3 (g/mL) G Lab File ID: 40202S04

Level: (low/med) LOW Date Received: 01/18/94

% Moisture: 0 decanted: (Y/N) N Date Extracted: 01/20/94

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 02/02/94

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 9.1

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q	Q
100-02-7	4-Nitrophenol	790	U	
132-64-9	Dibenzofuran	330	U	
121-14-2	2,4-Dinitrotoluene	330	U	
606-20-2	2,6-Dinitrotoluene	330	U	
84-66-2	Diethylphthalate	330	U	
7005-72-3	4-Chlorophenyl-phenylether	330	U	
86-73-7	Fluorene	330	U	
100-01-6	4-Nitroaniline	790	U	
534-52-1	4,6-Dinitro-2-methylphenol	790	U	
86-30-6	N-Nitrosodiphenylamine (1)	330	U	
101-55-3	4-Bromophenyl-phenylether	330	U	
118-74-1	Hexachlorobenzene	330	U	
87-86-5	Pentachlorophenol	790	U	
85-01-8	Phenanthrene	330	U	
120-12-7	Anthracene	330	U	
86-74-8	Carbazole	330	U	
84-74-2	Di-n-Butylphthalate	330 ~~240~~	~~BJ~~	u
206-44-0	Fluoranthene	330	U	
129-00-0	Pyrene	330	U	
85-68-7	Butylbenzylphthalate	330	U	
91-94-1	3,3'-Dichlorobenzidine	330	U	
56-55-3	Benzo(a)Anthracene	330	U	
117-81-7	bis(2-Ethylhexyl)Phthalate	330 ~~57~~	~~J~~	u
218-01-9	Chrysene	330	U	
117-84-0	Di-n-Octyl Phthalate	330	U	
205-99-2	Benzo(b)Fluoranthene	330	U	
207-08-9	Benzo(k)Fluoranthene	330	U	
50-32-8	Benzo(a)Pyrene	330	U	
193-39-5	Indeno(1,2,3-cd)Pyrene	330	U	
53-70-3	Dibenz(a,h)Anthracene	330	U	
191-24-2	Benzo(g,h,i)Perylene	330	U	

(1) - Cannot be separated from Diphenylamine

Verified 4/11/94

FORM I SV-2 3/90

029

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~~000481~~

EPA SAMPLE NO.

B09WF5

1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 01025 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A401025-03B

Sample wt/vol: 30.3 (g/mL) G Lab File ID: 40202S04

Level: (low/med) LOW Date Received: 01/18/94

% Moisture: 0 decanted: (Y/N) N Date Extracted: 01/20/94

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 02/02/94

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 9.1

Number TICs found: 6

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q	R
1.	UNKNOWN COMPOUND	5.52	1100	~~BJ~~	JSN
2.	UNKNOWN KETONE	6.47	660	~~BJ~~	JSR
3.	UNKNOWN HYDROCARBON	6.75	160	~~J~~	JSN
4.	UNKNOWN KETONE	7.00	130	~~BJ~~	JSR
5.	PROPANOIC ACID ESTER ISOMER	17.15	99	~~J~~	JSN
6.	HEXANEDIOIC ACID ESTER ISOME	25.27	66	~~J~~	JSN

Verified

FORM I SV-TIC 4/11/94 3/90

9713517.2153

~~000503~~

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B09WF6

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 01025 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A401025-04B

Sample wt/vol: 30.2 (g/mL) G Lab File ID: 40202S05

Level: (low/med) LOW Date Received: 01/18/94

% Moisture: 0 decanted: (Y/N) N Date Extracted: 01/20/94

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 02/02/94

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 8.8

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-95-2	Phenol	330	U
111-44-4	bis(2-Chloroethyl)Ether	330	U
95-57-8	2-Chlorophenol	330	U
541-73-1	1,3-Dichlorobenzene	330	U
106-46-7	1,4-Dichlorobenzene	330	U
95-50-1	1,2-Dichlorobenzene	330	U
95-48-7	2-Methylphenol	330	U
108-60-1	2,2'-oxybis(1-Chloropropane)	330	U
106-44-5	4-Methylphenol	330	U
621-64-7	N-Nitroso-Di-n-Propylamine	330	U
67-72-1	Hexachloroethane	330	U
98-95-3	Nitrobenzene	330	U
78-59-1	Isophorone	330	U
88-75-5	2-Nitrophenol	330	U
105-67-9	2,4-Dimethylphenol	330	U
111-91-1	bis(2-Chloroethoxy)Methane	330	U
120-83-2	2,4-Dichlorophenol	330	U
120-82-1	1,2,4-Trichlorobenzene	330	U
91-20-3	Naphthalene	330	U
106-47-8	4-Chloroaniline	330	U
87-68-3	Hexachlorobutadiene	330	U
59-50-7	4-Chloro-3-Methylphenol	330	U
91-57-6	2-Methylnaphthalene	330	U
77-47-4	Hexachlorocyclopentadiene	330	U
88-06-2	2,4,6-Trichlorophenol	330	U
95-95-4	2,4,5-Trichlorophenol	790	U
91-58-7	2-Chloronaphthalene	330	U
88-74-4	2-Nitroaniline	790	U
131-11-3	Dimethylphthalate	330	U
208-96-8	Acenaphthylene	330	U
99-09-2	3-Nitroaniline	790	U
83-32-9	Acenaphthene	330	U
51-28-5	2,4-Dinitrophenol	790	U

Q

031

Verified 4/1/94

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~~000504~~

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B09WF6

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 01025 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A401025-04B

Sample wt/vol: 30.2 (g/mL) G Lab File ID: 40202S05

Level: (low/med) LOW Date Received: 01/18/94

% Moisture: 0 decanted: (Y/N) N Date Extracted: 01/20/94

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 02/02/94

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 8.8

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q	Q
100-02-7	4-Nitrophenol	790	U	
132-64-9	Dibenzofuran	330	U	
121-14-2	2,4-Dinitrotoluene	330	U	
606-20-2	2,6-Dinitrotoluene	330	U	
84-66-2	Diethylphthalate	330	U	
7005-72-3	4-Chlorophenyl-phenylether	330	U	
86-73-7	Fluorene	330	U	
100-01-6	4-Nitroaniline	790	U	
534-52-1	4,6-Dinitro-2-methylphenol	790	U	
86-30-6	N-Nitrosodiphenylamine (1)	330	U	
101-55-3	4-Bromophenyl-phenylether	330	U	
118-74-1	Hexachlorobenzene	330	U	
87-86-5	Pentachlorophenol	790	U	
85-01-8	Phenanthrene	330	U	
120-12-7	Anthracene	330	U	
86-74-8	Carbazole	330	U	
84-74-2	Di-n-Butylphthalate	330 ~~230~~	~~BJ~~	u
206-44-0	Fluoranthene	330	U	
129-00-0	Pyrene	330	U	
85-68-7	Butylbenzylphthalate	330	U	
91-94-1	3,3'-Dichlorobenzidine	330	U	
56-55-3	Benzo(a)Anthracene	330	U	
117-81-7	bis(2-Ethylhexyl)Phthalate	330	U	
218-01-9	Chrysene	330	U	
117-84-0	Di-n-Octyl Phthalate	330	U	
205-99-2	Benzo(b)Fluoranthene	330	U	
207-08-9	Benzo(k)Fluoranthene	330	U	
50-32-8	Benzo(a)Pyrene	330	U	
193-39-5	Indeno(1,2,3-cd)Pyrene	330	U	
53-70-3	Dibenz(a,h)Anthracene	330	U	
191-24-2	Benzo(g,h,i)Perylene	330	U	

(1) - Cannot be separated from Diphenylamine

Verified 4/4/94

L032

9313517.2155

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1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B09WF6

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 01025 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A401025-04B

Sample wt/vol: 30.2 (g/mL) G Lab File ID: 40202S05

Level: (low/med) LOW Date Received: 01/18/94

% Moisture: 0 decanted: (Y/N) N Date Extracted: 01/20/94

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 02/02/94

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 8.8

Number TICs found: 10

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q	Q
1.	UNKNOWN COMPOUND	5.52	1700	~~BJ~~	NJ
2.	UNKNOWN HYDROCARBON	5.90	66	~~J~~	NJ
3.	UNKNOWN KETONE	6.48	660	~~J~~	UR
4.	UNKNOWN ~~HYDROCARBON~~ Ketone	6.78	99	~~J~~	R
5.	UNKNOWN KETONE	7.02	170	~~BJ~~	UR
6.	UNKNOWN ~~HYDROCARBON~~ ketone	7.83	230	~~J~~	R
7.	UNKNOWN HYDROCARBON 54/18/94	8.27	99	~~J~~	NJ
8.	PROPANOIC ACID ESTER ISOMER	17.15	66	~~J~~	NJ
9.	UNKNOWN HYDROCARBON	21.63	66	~~J~~	NJ
10.	HEXANEDIOIC ACID ESTER ISOME	25.28	66	~~J~~	NJ

4/18/94

Verified 4/11/94

FORM I SV-TIC 3/90

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ATTACHMENT 4

LABORATORY NARRATIVE AND CHAIN-OF-CUSTODY DOCUMENTATION

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CASE NARRATIVE

LABORATORY : TMA/ARLI

CASE : 01-025

CONTRACT ID : WESTINGHOUSE HANFORD COMPANY

SDG RECEIPT DATE : January 18, 1994

1.0 DESCRIPTION OF CASE :

Eight soil samples were analyzed for TCL Organics- Volatiles and Semivolatiles according to the USEPA Contract Laboratory Program (CLP) Statement of Work for Organic Analysis, Revision OLM01.8. The Extractable Hydrocarbons for Kerosene (K) were analyzed according to the SW-846 Method 8015M.

2.0 SAMPLE LIST :

WESTINGHOUSE ID	LAB ID	ANALYSIS REQUESTED	MATRIX
B09DT9	A4-01-025-01A	V	SOIL
B09DT9	A4-01-025-01B	SV	SOIL
B09DT9 MS	A4-01-025-01C	SV	SOIL
B09DT9 MSD	A4-01-025-01D	SV	SOIL
B09DT9	A4-01-025-01G	K	SOIL
B09WF3	A4-01-025-02A	V	SOIL
B09WF3	A4-01-025-02B	SV	SOIL
B09WF3	A4-01-025-02E	K	SOIL
B09WF3 MS	A4-01-025-02F	K	SOIL
B09WF3 MSD	A4-01-025-02G	K	SOIL
B09WF5	A4-01-025-03A	V	SOIL
B09WF5	A4-01-025-03B	SV	SOIL
B09WF5	A4-01-025-03D	K	SOIL
B09WF6	A4-01-025-04A	V	SOIL
B09WF6	A4-01-025-04B	SV	SOIL
B09WF6	A4-01-025-04D	K	SOIL
B09DT6	A4-01-025-05A	V	SOIL
B09DT6 MS	A4-01-025-05B	V	SOIL
B09DT6 MSD	A4-01-025-05C	V	SOIL
B09DT4	A4-01-025-06A	V	SOIL
B09DT4	A4-01-025-06B	SV	SOIL
B09DT4	A4-01-025-06D	K	SOIL
B09DT5	A4-01-025-07A	V	SOIL
B09DT5	A4-01-025-07B	SV	SOIL
B09DT5	A4-01-025-07D	K	SOIL
B09DT7	A4-01-025-08A	V	SOIL
B09DT7	A4-01-025-08B	SV	SOIL
B09DT7	A4-01-025-08D	K	SOIL

000086

3.0 COMMENTS :

3.1 SHIPPING AND DOCUMENTATION :

All of the samples were received intact and properly documented.

3.2 ANALYSIS

3.2.1 VOLATILE ANALYSIS COMMENTS :

LOW LEVEL SOIL :

The samples were analyzed by heated purge within the CLP SOW holding times. The samples were analyzed during a period from 01/19/94 through 01/27/94, on the instrument "ROCKY". On 01/19/94, the operator inadvertently entered the wrong year during the instrument system boot-up, and therefore, all of the sample data incorrectly documented the year as "1993". Since it was not possible to change the date of analysis within the system the work order data was processed as is, and the appropriate manual corrections were made on the raw data by the laboratory. In addition, the report forms were changed to reflect the correct year of analysis (1994).

The analyte Acetone was detected at concentrations above the CRQL in samples B09DT4, B09DT5, B09DT6, B09WF6, B09DT6MS, and the blanks, VBLK0124R and VBLK0125R. In all of the other samples, Acetone was detected at concentrations either at or below the CRQL. Other TCL analytes detected in some of the samples included Methylene Chloride, 4-Methyl-2-pentanone, and Toluene, all at concentrations below the CRQL.

All of the QC results were within the limits specified by the EPA CLP SOW.

3.2.2 SEMIVOLATILE ANALYSIS COMMENTS :

LOW LEVEL SOIL :

The samples were extracted and analyzed within the contract required holding times.

In all of the samples Di-n-butylphthalate was detected at concentrations less than the CRQL. In addition, sample B09WF5 had bis(2-Ethylhexyl)phthalate detected at a concentration below the CRQL.

Both the MS and the MSD sample had matrix spike recoveries above the QC limits for 2,4-Dinitrotoluene, while the MSD sample also had a high recovery for 4-Nitrophenol. In accordance with the protocol, no further action was required.

All of the other QC results were within the limits specified

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by the EPA CLP SOW.

3.2.3 EXTRACTABLE HYDROCARBONS "KEROSENE RANGE" COMMENTS :

SEQUENCE NOTES :

The sequence was started on 01/19/94 and was analyzed according to the SW-846 Method 8015M. The initial calibration consisted of 5 different levels of the Kerosene standard that ranged from approximately 200ppm to 2000ppm. The continuing calibration at approximately 1000ppm was injected amongst the samples, in order to verify the instrument stability. The %RSD in the initial calibration and the %D in the continuing calibration were below their 20% and 15% limits, respectively.

SAMPLE NOTES :

LOW LEVEL SOIL :

The samples were extracted and analyzed within the required holding times. Approximately 20 g of each sample was extracted and concentrated to 5 mL.

There was no Kerosene detected in any of the samples. Sample B09WF3 was spiked with Kerosene, and the matrix spike recoveries were 51% for the MS, and 54% for the MSD. The blank spike was prepared at the same time and had a 52% recovery, and the data was included in the "Additional Raw Data" portion of the package.

All of the QC results were within the limits specified by the SW-846 Method 8015M.

We certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data in this hardcopy data package and in the computer-readable data submitted on diskette is authorized by the Laboratory Manager or his designees, as verified by the following signatures.

Nicole Roth 3/3/94
Nicole Roth
Program Manager

Maureen Parrish 3/2/94
Maureen Parrish
Project Manager

9215517.2160

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Westinghouse Hanford Company	CHAIN OF CUSTODY

Custody Form Initiator: L E ROGERS / W.V. SETZER

Company Contact: L E ROGERS — Telephone: 376-7690

Project Designation/Sampling Locations: 200-UP-2 — Collection Date: 1-11-94

Ice Chest No.: SML 342 — Field Logbook No.: ~~EFL 1091~~ EFL-115 JAN 11 1994

Bill of Lading/Airbill No.: 2519008360 — Offsite Property No.: W94-0-026-1

Method of Shipment: AIR

Shipped to: TMA

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

Sample Identification

1) B09DT4
- 1,250ml P:CLP;TAL Metals,Hg,Ti
- 1,250ml Gs:VOA CLP
- 1,250ml aG:Semi-VOA CLP
- 1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
- 1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
- 1,125ml G:Cyanide CLP
- 1,125ml Gw:Kerosene (8015M)
- 1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

2) B09DT5
- 1,250ml P:CLP;TAL Metals,Hg,Ti
- 1,250ml Gs:VOA CLP
- 1,250ml aG:Semi-VOA CLP
- 1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
- 1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
- 1,125ml G:Cyanide CLP
- 1,125ml Gw:Kerosene (8015M)
- 1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

3) B09DT7
- 1,250ml P:CLP;TAL Metals,Hg,Ti
- 1,250ml Gs:VOA CLP
- 1,250ml aG:Semi-VOA CLP
- 1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
- 1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
- 1,125ml G:Cyanide CLP
- 1,125ml Gw:Kerosene (8015M)
- 1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

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

Relinquished by:	Received by:	Date/Time:
W.V. Setzer	Kermit Blum K. Blum	1-18,94 1330
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

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

9213512.2161

~~660020~~

Westinghouse Hanford Company	CHAIN OF CUSTODY

Custody Form Initiator: L E ROGERS

Company Contact: L E ROGERS — Telephone: 376-7690

Project Designation/Sampling Locations: 200-UP-2 — Collection Date: 1-13-94

Ice Chest No.: SML-311 — Field Logbook No.: EFL-1091

Bill of Lading/Airbill No.: — Offsite Property No.: ORSR-17394

Method of Shipment: AIR

Shipped to: TMA

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

Sample Identification

1) B09D19

- 1,250ml P:CLP;TAL Metals,Hg,Ti
- 1,250ml Gs:VOA CLP
- 1,250ml aG:Semi-VOA CLP
- 1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
- 1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
- 1,125ml G:Cyanide CLP
- 1,125ml Gw:Kerosene (8015M)
- 1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

2) B09WF3

- 1,250ml P:CLP;TAL Metals,Hg,Ti
- 1,250ml Gs:VOA CLP
- 1,250ml aG:Semi-VOA CLP
- 1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
- 1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
- 1,125ml G:Cyanide CLP
- 1,125ml Gw:Kerosene (8015M)
- 1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

3)

- ~~1,250ml P:CLP;TAL Metals,Hg,Ti~~
- 1,250ml Gs:VOA CLP
- 1,250ml aG:Semi-VOA CLP
- 1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
- 1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
- 1,125ml G:Cyanide CLP
- 1,125ml Gw:Kerosene (8015M)
- 1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

1-17-94

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

Relinquished by:	Received by:	Date/Time:
1-17-94 Loren E. Rogers 0930	W.V. Setzer	1-17-94 0930
W.V. Setzer	[illegible]	1-18-94 10:35

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

039

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

9713517.2162

~~000002E~~

Westinghouse Hanford Company	CHAIN OF CUSTODY

Custody Form Initiator: L E ROGERS

Company Contact: L E ROGERS — Telephone: 376-7690

Project Designation/Sampling Locations: 200-UP-2 — Collection Date: 1-13-94

Ice Chest No.: SML-335 — Field Logbook No.: EFL-1091

Bill of Lading/Airbill No.: 2519008448 — Offsite Property No.: W94-0-0216-3

Method of Shipment: AIR

Shipped to: TMA

Possible Sample Hazards/Remarks: Keep samples at 4C (SOIL) NONE NOTED

Sample Identification

1) B09WF5

- 1,250ml P:CLP;TAL Metals,Hg,Ti
- 1,250ml Gs:VOA CLP
- 1,250ml aG:Semi-VOA CLP
- 1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
- 1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
- 1,125ml G:Cyanide CLP
- 1,125ml Gw:Kerosene (8015M)
- 1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

2) B09WF6

- 1,250ml P:CLP;TAL Metals,Hg,Ti
- 1,250ml Gs:VOA CLP
- 1,250ml aG:Semi-VOA CLP
- 1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
- 1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
- 1,125ml G:Cyanide CLP
- 1,125ml Gw:Kerosene (8015M)
- 1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

~~3)~~

- ~~1,250ml P:CLP;TAL Metals,Hg,Ti~~
- ~~1,250ml Gs:VOA CLP~~
- ~~1,250ml aG:Semi-VOA CLP~~
- ~~1,125ml G:Anions F,Cl,SO4 (EPA 300.0)~~
- ~~1,125ml P/G:Anions NO2,NO3 (EPA 353.2)~~
- ~~1,125ml G:Cyanide CLP~~
- ~~1,125ml Gw:Kerosene (8015M)~~
- ~~1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79~~

1-17-94

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

Relinquished by:	Received by:	Date/Time:
0940 Aaron E. Rogers 1-17-94	W.V. Seltzer	1-17-94 0940
Relinquished by: W.V. Seltzer	Received by: Kermit Blum K. Blum	Date/Time: 1-18-94 1330
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments: 1040

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

9715517.2163

ATTACHMENT 5

DATA VALIDATION SUPPORTING DOCUMENTATION

GC/MS ORGANIC DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E

PROJECT: 200-UP-2		DATA PACKAGE: B09DT4-TMA-190
VALIDATOR: [illegible]	LAB: TMA	DATE: 04/08/94
CASE:		SDG: B09DT4-TMA-190

ANALYSES PERFORMED

☐ CLP Volatiles	☐ SW-846 8240 (cap column)	☐ SW-846 8260 (packed column)	☒ CLP Semivolatiles	☐ SW-846 8270 (cap column)	☐ SW-846 (packed column)
☐	☐	☐	☐	☐	☐

SAMPLES/MATRIX Soils

B09DT4	B09WF5
B09DT5	B09WF6
B09DT7	
B09DT9	
B09WF3	

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Is technical verification documentation present? . . . . . (Yes) No N/A

Is a case narrative present? . . . . . (Yes) No N/A

Comments:

2. HOLDING TIMES

Are sample holding times acceptable? . . . . . (Yes) No N/A

Comments:

042

GC/MS ORGANIC DATA VALIDATION CHECKLIST

3. INSTRUMENT TUNING AND CALIBRATION

Is the GC/MS tuning/performance check acceptable? . . . . . (Yes) No N/A

Are initial calibrations acceptable? . . . . . (Yes) No N/A

Are continuing calibrations acceptable? . . . . . Yes (No) N/A

Comments: Continuing calibration %D for the surrogate 2-fluorophenol was >25% at 35.6%. However, no qualification is required since none of the TCL compounds are affected.

4. BLANKS

Were laboratory blanks analyzed? . . . . . (Yes) No N/A

Are laboratory blank results acceptable? . . . . . Yes (No) N/A

Were field/trip blanks analyzed? . . . . . Yes No (N/A)

Are field/trip blank results acceptable? . . . . . Yes No (N/A)

Comments: D-n-butyl phthalate, bis-(2-ethyl hexyl) phthalate, and 3 TICs were detected in the lab blank. Assoc. sample results <10 or <5 x blank concentration have been qualified as undetected (U). See blank summary attached for specific concentrations in blank.

5. ACCURACY

Were surrogates/System Monitoring Compounds analyzed? . . . . . (Yes) No N/A

Are surrogate/System Monitoring Compound recoveries acceptable? (Yes) No N/A

Were MS/MSD samples analyzed? . . . . . (Yes) No N/A

Are MS/MSD results acceptable? . . . . . Yes (No) N/A

Comments:

MS/MSD %R for 2,4-Dinitrotoluene are 97% and 107%, respectively, >UCL. The MSD %R for 4-nitrophenol is >UCL at 117%. No qualification is required since all associated results are non-detects and all surrogate recoveries are acceptable.

GC/MS ORGANIC DATA VALIDATION CHECKLIST

6. PRECISION

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

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

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

Comments: Sample locations are not currently available. Field QC ~~but~~ will be evaluated in the Final Summary report.

4/18/94

7. SYSTEM PERFORMANCE

Were internal standards analyzed? . . . . . Yes No N/A

Are internal standard areas acceptable? . . . . . Yes No N/A

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

Comments:

8. COMPOUND IDENTIFICATION AND QUANTITATION

Is compound identification acceptable? . . . . . Yes No N/A

Is compound quantitation acceptable? . . . . . Yes No N/A

Comments:

9. REPORTED RESULTS AND QUANTITATION LIMITS

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

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

Do results meet the CRQLs? . . . . . Yes No N/A

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

Comments:

HOLDING TIME SUMMARY

B09DT4-TMA-690

SDG:	VALIDATOR: [illegible]	DATE: 4/8/94	PAGE 1 OF 1
COMMENTS: Semivolatile Organics			

FIELD SAMPLE ID	ANALYSIS TYPE	DATE SAMPLED	DATE PREPARED	DATE ANALYZED	PREP. HOLDING TIME, DAYS	ANALYSIS HOLDING TIME, DAYS	QUALIFIER
B09DT4	BNA	1/11/94	01/20/94	~~02~~ 2/02/94	9	13	None
B09DT5		1/11/94		2/02/94	9		
B09DT7		1/11/94			9		
B09DT9		1/13/94			7		
B09WF3		1/13/94			7		
B09WF5		1/13/94			7		
B09WF6		1/13/94			7		

BLANK AND SAMPLE DATA SUMMARY

B09DT4-TMA-690

SDG:	VALIDATOR:	DATE: 4/11/94	PAGE 1 OF 1
COMMENTS: Semivolatile Organics for TCL.			

SAMPLE ID	COMPOUND	RESULT	Q	RT	UNITS	5X RESULT	10X RESULT	SAMPLES AFFECTED	QUALIFIER
SBLK0120S	Di-n-butylphthalate	130	J		ug/kg		1300	B09DT4	U
								B09DT5	U
								B09DT7	U
								B09DT9	U
								B09WF3	U
								B09WF5	U
								B09WF6	U
SBLK0120S	Bis(2-ethylhexyl)phthalate	15	J		ug/kg		150	B09WF5	U

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~~000584~~

EPA SAMPLE NO.

SBLK0120S

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 01025 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A401025-BLK

Sample wt/vol: 30.7 (g/mL) G Lab File ID: 40202S02

Level: (low/med) LOW Date Received: _____

% Moisture: _____ decanted: (Y/N) N Date Extracted: 01/20/94

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 02/02/94

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-02-7	4-Nitrophenol	780	U
132-64-9	Dibenzofuran	320	U
121-14-2	2,4-Dinitrotoluene	320	U
606-20-2	2,6-Dinitrotoluene	320	U
84-66-2	Diethylphthalate	320	U
7005-72-3	4-Chlorophenyl-phenylether	320	U
86-73-7	Fluorene	320	U
100-01-6	4-Nitroaniline	780	U
534-52-1	4,6-Dinitro-2-methylphenol	780	U
86-30-6	N-Nitrosodiphenylamine (1)	320	U
101-55-3	4-Bromophenyl-phenylether	320	U
118-74-1	Hexachlorobenzene	320	U
87-86-5	Pentachlorophenol	780	U
85-01-8	Phenanthrene	320	U
120-12-7	Anthracene	320	U
86-74-8	Carbazole	320	U
84-74-2	Di-n-Butylphthalate	130	J x10=1300
206-44-0	Fluoranthene	320	U
129-00-0	Pyrene	320	U
85-68-7	Butylbenzylphthalate	320	U
91-94-1	3,3'-Dichlorobenzidine	320	U
56-55-3	Benzo(a)Anthracene	320	U
117-81-7	bis(2-Ethylhexyl)Phthalate	15 ~~320~~	~~U~~ J x10=15
218-01-9	Chrysene	320	U
117-84-0	Di-n-Octyl Phthalate	320	U
205-99-2	Benzo(b)Fluoranthene	320	U
207-08-9	Benzo(k)Fluoranthene	320	U
50-32-8	Benzo(a)Pyrene	320	U
193-39-5	Indeno(1,2,3-cd)Pyrene	320	U
53-70-3	Dibenz(a,h)Anthracene	320	U
191-24-2	Benzo(g,h,i)Perylene	320	U

(1) - Cannot be separated from Diphenylamine

4/8/94

4/14/94

FORM I SV-2

3/90

047

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~~000585~~

EPA SAMPLE NO.

SBLK0120S

1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 01025 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A401025-BLK

Sample wt/vol: 30.7 (g/mL) G Lab File ID: 40202S02

Level: (low/med) LOW Date Received: _____

% Moisture: _____ decanted: (Y/N) N Date Extracted: 01/20/94

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 02/02/94

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

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

Number TICs found: 3

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q	Q
1.	UNKNOWN COMPOUND	5.52	1400	~~J~~	NJ
2.	UNKNOWN KETONE	6.52	620	~~J~~	R
3.	UNKNOWN KETONE	7.05	130	~~J~~	R

4/11/94

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S8LK01205

~~000594~~

No	m/z	Scan	Time	Ref	RRT	Meth	Area(Hght)	Amount	%Tot
64	NOT FOUND								
65	~~167~~	~~1618~~	~~20:26~~	~~4~~	~~1.031~~	~~A BB~~	~~546.~~	~~0.118 NG/UL~~	~~0.02~~
66	149	1693	21:22	4	1.079	A BB	29024.	4.140 NG/UL	0.75
67	NOT FOUND								
68	NOT FOUND								
69	NOT FOUND								
70	NOT FOUND								
71	~~228~~	~~2089~~	~~26:22~~	~~5~~	~~0.999~~	~~A BB~~	~~730.~~	~~0.207 NG/UL~~	~~0.04~~
72	~~228~~	~~2096~~	~~26:28~~	~~5~~	~~1.002~~	~~A BB~~	~~590.~~	~~0.195 NG/UL~~	~~0.04~~
73	~~149~~	~~2098~~	~~26:29~~	~~5~~	~~1.003~~	~~A BB~~	~~1652.~~	~~0.461 NG/UL~~	~~0.08~~
74	NOT FOUND								
75	~~252~~	~~2335~~	~~29:29~~	~~6~~	~~0.953~~	~~A BV~~	~~766.~~	~~0.309 NG/UL~~	~~0.06~~
76	~~252~~	~~2343~~	~~29:35~~	~~6~~	~~0.956~~	~~A VB~~	~~776.~~	~~0.360 NG/UL~~	~~0.06~~
77	~~252~~	~~2431~~	~~30:41~~	~~6~~	~~0.992~~	~~A BB~~	~~640.~~	~~0.321 NG/UL~~	~~0.06~~
78	NOT FOUND								
79	NOT FOUND								
80	NOT FOUND								

bis(2-ethylhexyl) phthalate

0.461 ng/ul x10 = 4.61 ng/ul

F.H. 2/7/94

No	Ret(L)	Ratio	RRT(L)	Ratio	Amnt	Amnt(L)	R.Fac	R.Fac(L)	Ratio
51	16:29		1.033						
52	15:27		0.968						
53	17:10	1.00	1.076	1.00	0.12	25.00	0.007	1.572	0.00
54	16:29		1.033						
55	17:23		1.089						
56	17:25		1.092						
57	17:27		1.093						
58	17:32		0.886						
59	17:43		0.895						
60	18:40		0.943						
61	18:48		0.950						
62	19:19		0.976						
63	19:52		1.003						
64	19:59		1.010						
65	20:24	1.00	1.031	1.00	0.12	25.00	0.005	1.148	0.00
66	21:22	1.00	1.079	1.00	4.14	25.00	0.288	1.738	0.17
67	22:50		1.154						
68	23:24		0.887						
69	25:04		0.950						
70	26:19		0.998						
71	26:22	1.00	1.000	1.00	0.21	25.00	0.012	1.404	0.01
72	26:27	1.00	1.002	1.00	0.19	25.00	0.009	1.217	0.01
73	26:28	1.00	1.003	1.00	0.46	25.00	0.027	1.440	0.02
74	28:16		0.914						
75	29:29	1.00	0.953	1.00	0.31	25.00	0.021	1.691	0.01
76	29:35	1.00	0.957	1.00	0.36	25.00	0.021	1.468	0.01
77	30:41	1.00	0.993	1.00	0.32	25.00	0.017	1.358	0.01
78	36:14		1.172						
79	36:25		1.178						
80	37:53		1.225						

4/8/94

02/08/94

9413517.2172

MEMORANDUM

APR 1994 RECEIVED TQO

TO: 200-UP-2 Project QA Record

April 7, 1994

FR: Susan Winter, Golder Associates Inc.

RE: GENERAL CHEMISTRY DATA VALIDATION SUMMARY FOR DATA PACKAGE: B09DT4-TMA-690 (923-E418, Filename B09DT4.GCH)

INTRODUCTION

This memo presents the results of data validation on data package B09DT4-TMA-690 prepared by the Thermo Analytical (TMA) laboratory. A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

SAMPLE ID	SAMPLE DATE	MEDIA	ANALYSIS
B09DT4	01/11/94	SOIL	SEE NOTE 1
B09DT5	01/11/94	SOIL	
B09DT7	01/11/94	SOIL	
B09DT9	01/13/94	SOIL	
B09WF3	01/13/94	SOIL	
B09WF5	01/13/94	SOIL	
B09WF6	01/13/94	SOIL	

Note 1. All samples were analyzed for anions (chloride, fluoride, and sulfate) and nitrate+nitrite-N.

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

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

RECEIVED APR 1 1994 VALIDATION DOCUMENTATION SDLA

DATA QUALITY OBJECTIVES

This section presents a summary of the data quality in terms of the referenced validation criteria.

Precision. Goals for precision were met.

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

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

001

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

Completeness. The data package was complete for all requested analyses. A total of seven samples were validated in this data package with a total of 28 determinations reported, all of which were deemed valid. This results in a completeness of 100 percent, which meets normal work plan objectives of 90%.

MAJOR DEFICIENCIES

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

MINOR DEFICIENCIES

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

Matrix Spike

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

REFERENCES

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

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

9713517.2174

ATTACHMENT 1

GLOSSARY OF DATA REPORTING QUALIFIERS

GLOSSARY OF INORGANIC DATA REPORTING QUALIFIERS

B - Indicates the constituent was analyzed for and detected. The concentration reported is less than the contract required detection limit (CRDL) but greater than the instrument detection limit (IDL). The associated data should be considered usable for decision making purposes.

U - Indicates the constituent was analyzed for and not detected. The concentration reported is the sample detection limit corrected for aliquot size, dilution and percent solids (in the case of solid matrices) by the laboratory. The associated data should be considered usable for decision making purposes.

UJ - Indicates the constituent was analyzed for and not detected. Due to a minor quality control deficiency identified during data validation the concentration may not accurately reflect the sample detection limit. The associated data have been qualified as estimated but should be considered usable for decision making purposes.

BJ - Indicates the constituent was analyzed for and detected at a concentration less than the contract required detection limit (CRDL) but greater than the instrument detection limit (IDL). Due to a minor quality control deficiency identified during data validation the associated data have been qualified as estimated, but should be considered usable for decision making purposes.

J - Indicates the constituent was analyzed for and detected. Due to a minor quality control deficiency identified during data validation the associated data have been qualified as estimated, but should be considered usable for decision making purposes.

UR - Indicates the constituent was analyzed for and not detected. Due to a major quality control deficiency identified during data validation, the associated data have been qualified as unusable for decision making purposes.

R - Indicates the constituent was analyzed for and detected. Due to a major quality control deficiency identified during data validation, the associated data have been qualified as unusable for decision making purposes.

9713517.2176

ATTACHMENT 2

SUMMARY OF DATA QUALIFICATIONS

DATA QUALIFICATION SUMMARY

SDG: B09DT4-TMA-690	VALIDATOR:	DATE: April 7, 1994	PAGE 1 OF 1
COMMENTS: GENERAL CHEMISTRY			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
FLUORIDE	J - DETECTS UJ - NONDETECTS	B09DT4 B09DT5 B09DT7 B09DT9 B09WF3 B09WF5 B09WF6	MS %R < 75% BUT > 30%

9713517.2178

ATTACHMENT 3

QUALIFIED DATA SUMMARY AND ANNOTATED LABORATORY REPORTS

Validated Data Summary, Data Package: B09DT4-TMA-690

	Samp#	B09DT4		B09DT5		B09DT7		B09DT9		B09WF3		B09WF5	
	Date	1-11-94		1-11-94		1-11-94		1-13-94		1-13-94		1-13-94	
	Location	---		---		---		---		---		---	
	Depth	---		---		---		---		---		---	
	Type	---		---		---		---		---		---	
	Comments	---		---		---		---		---		---	
Parameter	Units	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
CHLORIDE	MG/KG	7.100		6.500		5.000		7.800		6.900		7.600	
FLUORIDE	MG/KG	0.500	UJ	0.500	UJ	0.900	J	1.500	J	4.400	J	1.400	J
SULFATE	MG/KG	8.000		7.000		10.000		23.000		10.000		8.000	
NITRATE+NITRITE	MG-N/KG	18.500		2.480	U	2.480	U	236.000		3.980		2.490	U

Verified
4/7/94

9415147179

Validated Data Summary, Data Package: B09DT4-TMA-690

	Samp#	B09WF6	
	Date	1-13-94	
	Location	---	
	Depth	---	
	Type	---	
	Comments	---	
Parameter	Units	Result	Q
CHLORIDE	MG/KG	6.500	
FLUORIDE	MG/KG	0.500	UJ
SULFATE	MG/KG	7.000	
NITRATE+NITRITE	MG-N/K	2.470	U

Verified

4/7/94

TMA Inc. REPORT Work Order # A4-01-025

Received: 01/18/94

Results by Sample

SAMPLE ID B09DT4 FRACTION 06C TEST CODE WCCLPS NAME Anions in Solids

Date & Time Collected 01/11/94 Category

ANIONS AND WET CHEMISTRY - SOLIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT
Chloride	300.0	7.1	mg/kg	1.0
Fluoride	300.0	<0.5	mg/kg	0.5
Sulfate	300.0	8	mg/kg	5

FORM I

Verified

4/7/94

TMA Inc. REPORT Work Order # A4-01-025

Received: 01/18/94

Results by Sample

SAMPLE ID B09DT5 FRACTION 07C TEST CODE WCCLPS NAME Anions in Solids

Date & Time Collected 01/11/94 Category

ANIONS AND WET CHEMISTRY - SOLIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT	Q
Chloride	300.0	6.5	mg/kg	1.0	
Fluoride	300.0	<0.5	mg/kg	0.5	U5
Sulfate	300.0	7	mg/kg	5	

FORM I

Verified

1/7/94

TMA Inc. REPORT Work Order # A4-01-025

Received: 01/18/94

Results by Sample

SAMPLE ID B09DT7 FRACTION 08C TEST CODE WCCLPS NAME Anions in Solids

Date & Time Collected 01/11/94 Category

ANIONS AND WET CHEMISTRY - SOLIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT	Q
Chloride	300.0	5.0	mg/kg	1.0	
Fluoride	300.0	0.9	mg/kg	0.5	J
Sulfate	300.0	10	mg/kg	5	

FORM I

Verified

1/17/94

TMA Inc. REPORT Work Order # A4-01-025

Received: 01/18/94

Results by Sample

~~000011~~

SAMPLE ID B09DT9 FRACTION 01E TEST CODE WCCLPS NAME Anions in Solids

Date & Time Collected 01/13/94 Category

ANIONS AND WET CHEMISTRY - SOLIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT	Q
Chloride	300.0	7.8	mg/kg	1.0	
Fluoride	300.0	1.5	mg/kg	0.5	J
Sulfate	300.0	23	mg/kg	5	

FORM I

Verified

4/7/94

TMA Inc. REPORT Work Order # A4-01-025

Received: 01/18/94

Results by Sample

SAMPLE ID B09WP3 FRACTION 02C TEST CODE WCCLPS NAME Anions in Solids

Date & Time Collected 01/13/94 Category

ANIONS AND WET CHEMISTRY - SOLIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT	Q
Chloride	300.0	6.9	mg/kg	1.0	
Fluoride	300.0	4.4	mg/kg	0.5	N
Sulfate	300.0	10	mg/kg	5	

FORM I

4/7/94

TMA Inc. REPORT Work Order # A4-01-025

Received: 01/18/94

Results by Sample

SAMPLE ID B09WF5 FRACTION 03C TEST CODE WCCLPS NAME Anions in Solids

Date & Time Collected 01/13/94 Category

ANIONS AND WET CHEMISTRY - SOLIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT	Q
Chloride	300.0	7.6	mg/kg	1.0	
Fluoride	300.0	1.4	mg/kg	0.5	J
Sulfate	300.0	8	mg/kg	5	

FORM I

Verified

4/7/94

TMA Inc. REPORT Work Order # A4-01-025

Received: 01/18/94

Results by Sample

SAMPLE ID B09WF6 FRACTION 04C TEST CODE WCCLPS NAME Anions in Solids

Date & Time Collected 01/13/94 Category

ANIONS AND WET CHEMISTRY - SOLIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT	Q
Chloride	300.0	6.5	mg/kg	1.0	
Fluoride	300.0	<0.5	mg/kg	0.5	U5
Sulfate	300.0	7	mg/kg	5	

FORM I

Verified

4/7/94

Received: 01/19/94 Results by Sample

Q

SAMPLE ID B09DT4 SAMPLE # 01 FRACTIONS: A
Date & Time Collected 01/11/94 Category SOIL

NITR_S 18.5
mg N/kg

SAMPLE ID B09DT5 SAMPLE # 02 FRACTIONS: A
Date & Time Collected 01/11/94 Category SOIL

NITR_S <2.48 U
mg N/kg

SAMPLE ID B09DT7 SAMPLE # 03 FRACTIONS: A
Date & Time Collected 01/11/94 Category SOIL

NITR_S <2.48 U
mg N/kg

SAMPLE ID B09DT9 SAMPLE # 04 FRACTIONS: A
Date & Time Collected 01/13/94 Category SOIL

NITR_S 236
mg N/kg

SAMPLE ID B09WF3 SAMPLE # 05 FRACTIONS: A
Date & Time Collected 01/13/94 Category SOIL

NITR_S 3.98
mg N/kg

SAMPLE ID B09WF5 SAMPLE # 06 FRACTIONS: A
Date & Time Collected 01/13/94 Category SOIL

NITR_S <2.49 U
mg N/kg

SAMPLE ID B09WF6 SAMPLE # 07 FRACTIONS: A
Date & Time Collected 01/13/94 Category SOIL

NITR_S <2.47 U
mg N/kg

Verified [signature] 4/7/94

017

This report is rendered upon all of the following conditions: Skinner & Sherman Laboratories, Inc., retains ownership of this report until associated submitted invoice is satisfied. Expert witness services shall be available in conjunction with this report only if prior notification of this potential requirement was made and accepted, before the analysis. Client will be responsible for Skinner & Sherman costs and consulting fees if our services are required by subpoena or otherwise in legal proceedings. Total liability is limited to the invoice amount. The results listed refer only to tested samples and applicable parameters. Samples are not analyzed in accordance with New York State protocol unless indicated. Product endorsement is neither inferred nor implied. Skinner & Sherman Laboratories, Inc., will exercise due diligence but will not be responsible for lost or destroyed samples or evidence unless client makes appropriate insurance coverage arrangements. Samples are held for thirty days following issuance of report. Samples will be stored at client's expense, if authorized in writing.

TMA
Thermo Analytical Inc.
Skinner & Sherman Laboratories Inc. 300 Second Avenue, P.O. Box 521, Waltham, Massachusetts 02254-0521 (617) 890-7200

9713517.2189

ATTACHMENT 4

LABORATORY NARRATIVE AND CHAIN-OF-CUSTODY DOCUMENTATION

GENERAL CHEMISTRY RESULTS

CASE NO. 01-025

Solid Sample #:

4/12/94

B09DT4	B09DT5
~~B09DT6~~	B09DT7
B09DT9	B09WF3
B09WF5	B09WF6

CASE NARRATIVE

The Matrix Spike recovery for Fluoride was below the QC requirement for sample B09DT9. A second spike (MSD) was injected with approximately one fourth the sample size that was used on the original matrix spike. The Fluoride recovery indicates that the matrix amount has an effect on the recovery of the Fluoride matrix spike and therefore the low recovery is due to matrix interferences.

Injection number 5 was reprocessed on 02/03/94 only to provide a more legible copy to the client.

No other problems were encountered during sample analysis. All QC results were acceptable.

Maureen Parrish 3/2/94

Maureen Parrish

Received: 01/19/94

Test Methodology

TEST CODE NITR S NAME Nitrate/Nitrite in Soils

The sample was extracted with deionized water and analyzed in accordance with Method for Chemical Analysis of Water and Wastes EPA-600/4-79-020, March 1979, Method 353.2 (modified)

This report is rendered upon all of the following conditions: Skinner & Sherman Laboratories, Inc., retains ownership of this report until associated submitted invoice is satisfied. Expert witness services shall be available in conjunction with this report only if prior notification of this potential requirement was made and accepted, before the analysis. Client will be responsible for Skinner & Sherman costs and consulting fees if our services are required by subpoena or otherwise in legal proceedings. Total liability is limited to the invoice amount. The results listed refer only to tested samples and applicable parameters. Samples are not analyzed in accordance with New York State protocol unless indicated. Product endorsement is neither inferred nor implied. Skinner & Sherman Laboratories, Inc., will exercise due diligence but will not be responsible for lost or destroyed samples or evidence unless client makes appropriate insurance coverage arrangements. Samples are held for thirty days following issuance of report. Samples will be stored at client's expense, if authorized in writing.

TMA
Thermo Analytical Inc.
Skinner & Sherman Laboratories Inc.
300 Second Avenue, P.O. Box 521, Waltham, Massachusetts 02254-0521 (617) 890-7200
1-800-4LAB TEST FAX (617) 890-7882

9713517.2192

~~000002A~~

Westinghouse Hanford Company

CHAIN OF CUSTODY

Custody Form Initiator: L E ROGERS / W.U. SETZER

Company Contact: L E ROGERS — Telephone: 376-7690

Project Designation/Sampling Locations: 200-UP-2 — Collection Date: 1-11-94

Ice Chest No.: SML 342 — Field Logbook No.: ~~EFL-1091~~ EFL-1115 1.13.94

Bill of Lading/Airbill No.: 2519008360 — Offsite Property No.: W94-0-0216-1

Method of Shipment: AIR

Shipped to: TMA

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

Sample Identification

1) B09BT4
- 1,250ml P:CLP;TAL Metals,Hg,Ti
- 1,250ml Gs:VOA CLP
- 1,250ml aG:Semi-VOA CLP
- 1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
- 1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
- 1,125ml G:Cyanide CLP
- 1,125ml Gw:Kerosene (8015M)
- 1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

2) B09BT5
- 1,250ml P:CLP;TAL Metals,Hg,Ti
- 1,250ml Gs:VOA CLP
- 1,250ml aG:Semi-VOA CLP
- 1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
- 1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
- 1,125ml G:Cyanide CLP
- 1,125ml Gw:Kerosene (8015M)
- 1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

3) B09BT7
- 1,250ml P:CLP;TAL Metals,Hg,Ti
- 1,250ml Gs:VOA CLP
- 1,250ml aG:Semi-VOA CLP
- 1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
- 1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
- 1,125ml G:Cyanide CLP
- 1,125ml Gw:Kerosene (8015M)
- 1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

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

Relinquished by:	Received by:	Date/Time:
W.U. Setzer	Kermit Blum K. Blum	1-18-94 1330
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

021

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

9214512.2195

~~000026~~

Westinghouse Hanford Company	CHAIN OF CUSTODY

Custody Form Initiator: L E ROGERS

Company Contact: L E ROGERS — Telephone: 376-7690

Project Designation/Sampling Locations: 200-UP-2 — Collection Date: 1-13-94

Ice Chest No.: SML-311 — Field Logbook No.: EFL-1091

Bill of Lading/Airbill No.: — Offsite Property No.: 0351-17394

Method of Shipment: AIR

Shipped to: TMA

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

Sample Identification

1) B09D19

- 1,250ml P:CLP;TAL Metals,Hg,Ti
- 1,250ml Gs:VOA CLP
- 1,250ml aG:Semi-VOA CLP
- 1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
- 1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
- 1,125ml G:Cyanide CLP
- 1,125ml Gw:Kerosene (8015M)
- 1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

2) B09WF3

- 1,250ml P:CLP;TAL Metals,Hg,Ti
- 1,250ml Gs:VOA CLP
- 1,250ml aG:Semi-VOA CLP
- 1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
- 1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
- 1,125ml G:Cyanide CLP
- 1,125ml Gw:Kerosene (8015M)
- 1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

3)

- 1,250ml P:CLP;TAL Metals,Hg,Ti
- 1,250ml Gs:VOA CLP
- 1,250ml aG:Semi-VOA CLP
- 1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
- 1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
- 1,125ml G:Cyanide CLP
- 1,125ml Gw:Kerosene (8015M)
- 1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

1-17-94

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

Relinquished by:	Received by:	Date/Time:
1-17-94 0930 Loren E. Rogers	W.V. SETZER W.V. Setzer	1-17-94 0930
W.V. Setzer	[illegible]	1-18-94 10:35

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

D22

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

9413512.2194

~~000002E~~

Westinghouse Hanford Company	CHAIN OF CUSTODY

Custody Form Initiator: L E ROGERS

Company Contact: L E ROGERS — Telephone: 376-7690

Project Designation/Sampling Locations: 200-UP-2 — Collection Date: 1-13-94

Ice Chest No.: SML-335 — Field Logbook No.: EFL-1091

Bill of Lading/Airbill No.: 2519008448 — Offsite Property No.: W94-0-0216-3

Method of Shipment: AIR

Shipped to: TMA

Possible Sample Hazards/Remarks: Keep samples at 4C (SOIL) NONE NOTED

Sample Identification

1) B09WF5

- 1,250ml P:CLP;TAL Metals,Hg,Ti
- 1,250ml Gs:VOA CLP
- 1,250ml aG:Semi-VOA CLP
- 1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
- 1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
- 1,125ml G:Cyanide CLP
- 1,125ml Gw:Kerosene (8015M)
- 1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

2) B09WF6

- 1,250ml P:CLP;TAL Metals,Hg,Ti
- 1,250ml Gs:VOA CLP
- 1,250ml aG:Semi-VOA CLP
- 1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
- 1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
- 1,125ml G:Cyanide CLP
- 1,125ml Gw:Kerosene (8015M)
- 1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

3)

- 1,250ml P:CLP;TAL Metals,Hg,Ti
- 1,250ml Gs:VOA CLP
- 1,250ml aG:Semi-VOA CLP
- 1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
- 1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
- 1,125ml G:Cyanide CLP
- 1,125ml Gw:Kerosene (8015M)
- 1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

1-17-94

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

Relinquished by:	Received by:	Date/Time:
0940 Karen E. Rogers 1-17-94	W. V. Seltzer	1-17-94 0940
Relinquished by: W. V. Seltzer	Received by: Kermit Blum K. Blum	Date/Time: 1-18-94 1330
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

023

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

9713512.2195

ATTACHMENT 5

DATA VALIDATION SUPPORTING DOCUMENTATION

9716517.2196

GENERAL CHEMISTRY DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E

PROJECT: 200-UP-2		DATA PACKAGE: B09DT4-TMA-690
VALIDATOR: [illegible]	LAB: TMA	DATE: 04/07/94
CASE:		SDG: B09DT4-TMA-690

ANALYSES PERFORMED

☒ Anions/IC	☐ TOC	☐ TOX	☐ TPH-418.1	Oil and Grease	Alkalinity
☐ Ammonia	☐ BOD/COD	☐ Chloride	☐ Chromium-VI	☐ pH	☒ NO_3/NO_2
☐ Sulfate	☐ TDS	☐ TKN	☐ Phosphate	☐	☐
☐	☐	☐	☐	☐	☐

SAMPLES/MATRIX Soils

B09DT4 B09WF5
B09DT5 B09WF6
B09DT7
B09DT9
B09WF3

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Is technical verification documentation present? . . . . . (Yes) No N/A

Is a case narrative present? . . . . . (Yes) No N/A

Comments:

2. HOLDING TIMES

Are sample holding times acceptable? . . . . . (Yes) No N/A

Comments:

025

GENERAL CHEMISTRY DATA VALIDATION CHECKLIST

3. INSTRUMENT CALIBRATION

Was initial calibration performed for all applicable analyses? (Yes) No N/A

Are initial calibration results acceptable? . . . . . (Yes) No N/A

Was a calibration check performed for all applicable analyses? (Yes) No N/A

Are calibration check results acceptable? . . . . . (Yes) No N/A

Comments:

4. BLANKS

Were laboratory blanks analyzed? . . . . . (Yes) No N/A

Are laboratory blank results acceptable? . . . . . (Yes) No N/A

Were field/trip blanks analyzed? . . . . . Yes No (N/A)

Are field/trip blank results acceptable? . . . . . Yes No (N/A)

Comments: Sample locations are not currently available. Field QC will be evaluated in the final summary report.

5. ACCURACY

Were spike samples analyzed at the required frequency? . . . . (Yes) No N/A

Are spike recoveries acceptable? . . . . . Yes (No) N/A

Were LCS analyses performed at the required frequency? . . . . (Yes) No ~~N/A~~ 4/7/94

Are LCS recoveries acceptable? . . . . . (Yes) No ~~N/A~~ 4/7/94

Comments: MS %R for fluoride is 64%. Qualify assoc. results as estimated (J/UJ).

6. PRECISION

Were laboratory duplicate samples analyzed at the required frequency? . . . . . (Yes) No N/A

Are laboratory duplicate sample RPD values acceptable? . . . . (Yes) No N/A

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

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

026

GENERAL CHEMISTRY DATA VALIDATION CHECKLIST

Comments:

7. ANALYTE QUANTITATION

Was analyte quantitation performed properly? . . . . . Yes No N/A

Comments:

8. REPORTED RESULTS AND DETECTION LIMITS

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

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

Are results calculated properly? . . . . . Yes No N/A

Do results meet the CRDLs? . . . . . Yes No N/A

Comments:

4/7/94 The Nitrate+nitrite-N LCS %R was ~~miscalculated by the lab~~ corrected from 100.2% to ~~102~~ 102%. No qualification is required.

HOLDING TIME SUMMARY

B09DT4-TMA-690

SDG:	VALIDATOR:	DATE: 4/7/94	PAGE 1 OF 1
COMMENTS: General Chemistry			

FIELD SAMPLE ID	ANALYSIS TYPE	DATE SAMPLED	DATE PREPARED	DATE ANALYZED	PREP. HOLDING TIME, DAYS	ANALYSIS HOLDING TIME, DAYS	QUALIFIER
B09DT4	Anions	1/11/94	01/31/94	2/02/94	20	2	None
B09DT5		1/11/94					
B09DT7		1/11/94					
B09DT9		1/13/94			18		
B09WF3		1/13/94			18		
B09WF5		1/13/94			18		
B09WF6		1/13/94			18		
					4/7/94		
B09DT4	NO_2/NO_3	1/11/94	01/25/94	01/27/94	14	2	None
B09DT5					14		
B09DT7					14		
B09DT9		1/13/94			12		
B09WF3							
B09WF5							
B09WF6							

TMA Inc. REPORT Work Order # A4-01-025

Received: 01/18/94

Results by Sample

SAMPLE ID B09DT9 MS FRACTION 01F TEST CODE WCQCS NAME Quality Control Summary

Date & Time Collected 01/13/94 Category

SPIKE QC SUMMARY

ANALYSIS	SAMPLE ID	SAMPLE RESULT	SPIKE RESULT	AMOUNT ADDED	% R
Chloride	B09DT9	7.8	62.3	49.9	109
Fluoride	B09DT9	1.5	33.4	49.9	64
Sulfate	B09DT9	23	118	100	95

FORM V

Qualify fluoride results as estimated (J/UJ)

4/7/94

9214517.2201

MEMORANDUM

APR 1994 RECEIVED TQO

TO: 200-UP-2 Project QA Record

April 11, 1994

FR: Susan Winter, Golder Associates Inc.

RE: GENERAL GC DATA VALIDATION SUMMARY FOR DATA PACKAGE: B09DT4-TMA-690 (923-E418, Filename B09DT4.BNA)

INTRODUCTION

This memo presents the results of data validation on data package B09DT4-TMA-690 prepared by the Thermo Analytical (TMA) laboratory. A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

SAMPLE ID	SAMPLE DATE	MEDIA	ANALYSIS
B09DT4	01/11/94	SOIL	SEE NOTE 1
B09DT5	01/11/94	SOIL	
B09DT7	01/11/94	SOIL	
B09DT9	01/13/94	SOIL	
B09WF3	01/13/94	SOIL	
B09WF5	01/13/94	SOIL	
B09WF6	01/13/94	SOIL	

Note 1. All samples were analyzed for kerosene according to the 8015 Modified method.

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

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

RECEIVED APR 1 1994 VALIDATION DOCUMENTATION SDLA

DATA QUALITY OBJECTIVES

This section presents a summary of the data quality in terms of the referenced validation criteria.

Precision. Goals for precision were met.

Accuracy. Goals for accuracy were met.

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

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

-001

Completeness. The data package was complete for all requested analyses. A total of seven samples were validated in this data package with a total of 7 determinations reported, all of which were deemed valid. This results in a completeness of 100 percent, which meets normal work plan objectives of 90%.

MAJOR DEFICIENCIES

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

MINOR DEFICIENCIES

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

REFERENCES

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

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

9713517.2203

ATTACHMENT 1

GLOSSARY OF DATA REPORTING QUALIFIERS

GLOSSARY OF ORGANIC DATA REPORTING QUALIFIERS

B - Indicates the constituent was analyzed for and detected in the associated laboratory blank. This qualifier is applied by the laboratory. During the process of data validation this qualifier may be replaced by other appropriate qualifiers as defined by the validation procedures. The associated data should be considered usable for decision making purposes.

U - Indicates the constituent was analyzed for and not detected. The concentration reported is the sample quantitation limit corrected for aliquot size, dilution and percent solids (in the case of solid matrices) by the laboratory. The associated data should be considered usable for decision making purposes.

UJ - Indicates the constituent was analyzed for and not detected. Due to a minor quality control deficiency identified during data validation the concentration reported may not accurately reflect the sample quantitation limit. The associated data should be considered usable for decision making purposes.

J - Indicates the constituent was analyzed for and detected. This qualifier may be applied by the laboratory to indicate a concentration which is less than the contract required quantitation limit (CRQL) but greater than the instrument detection limit (IDL). During data validation this qualifier may be applied to indicate a minor quality control deficiency. However in either case, the associated data should be considered usable for decision making purposes.

NJ - Indicates presumptive evidence of a constituent at an estimated value. This qualifier is normally applied to GC analysis data (such as organochlorine pesticide and PCB data). The associated data should be considered usable for decision making purposes.

N - Indicates presumptive evidence of a constituent. This qualifier is normally applied to GC analysis data (such as organochlorine pesticide and PCB data). The associated data should be considered usable for decision making purposes.

JN - Indicates a tentatively identified compound (TIC) whose concentration and identification have been determined to be valid as a result of data validation. The associated data should be considered usable for decision making purposes.

UJN - Indicates a tentatively identified compound (TIC) that has been determined to be presumptive and valid (JN) in terms of identification and quantitation and has been qualified as undetected (U) due to associated blank contamination.

UR - Indicates the constituent was analyzed for and not detected. The concentration reported has been qualified as unusable due to a major quality control deficiency identified during data validation. The associated data should be considered unusable for decision making purposes.

R - Indicates the constituent was analyzed for and detected. The concentration reported has been qualified as unusable due to a major quality control deficiency identified during data validation. The associated data should be considered unusable for decision making purposes.

9713517.2205

ATTACHMENT 2

SUMMARY OF DATA QUALIFICATIONS

DATA QUALIFICATION SUMMARY

SDG: B09DQ6-TMA-681	VALIDATOR: [illegible]	DATE: April 11, 1994	PAGE 1 OF 1
COMMENTS: GENERAL GC AS KEROSENE			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
NO QUALIFICATION IS REQUIRED			

9713517.2207

ATTACHMENT 3

QUALIFIED DATA SUMMARY AND ANNOTATED LABORATORY REPORTS

Validated Data Summary, Data Package: B09DT4-TMA-690

	Samp#	B09DT4		B09DT5		B09DT7		B09DT9		B09WF3		B09WF5	
	Date	1-11-94		1-11-94		1-11-94		1-13-94		1-13-94		1-13-94	
	Location	---		---		---		---		---		---	
	Depth	---		---		---		---		---		---	
	Type	---		---		---		---		---		---	
	Comments	---		---		---		---		---		---	
Parameter	Units	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
KEROSENE	UG/KG	5.000	U	5.000	U	5.000	U	5.000	U	5.000	U	5.000	U

Verified

4/12/94

Validated Data Summary, Data Package: B09DT4-TMA-690

	Samp#	B09WF6	
	Date	1-13-94	
	Location	---	
	Depth	---	
	Type	---	
	Comments	---	
Parameter	Units	Result	Q
KEROSENE	UG/KG	5.000	U

Verified

4/12/94

9719517.2210

~~000633~~

TMA Inc. REPORT Work Order # A4-01-025

Received: 01/18/94

Results by Sample

SAMPLE ID B09DT4 FRACTION 06D TEST CODE 8015MS NAME EPA 8015M EXTRACT.

Date & Time Collected 01/11/94 Category

MODIFIED 8015 - EXTRACTABLE FUEL HYDROCARBONS

Matrix: SOIL
Date Analyzed: 01/27/94
Dilution factor: 1.00
Concentration Units: mg/Kg

Compound	Sample Result	PQL	Q
Kerosene Range	ND	5.0	U
C10 - C16 Jet Fuel Range	NA	NA	
C9 - C22 Diesel Range	NA	NA	
Hydraulic Range	NA	NA	

ND = Not detected at the specified limits

Form I

Verified
4/11/94

010

~~000635~~

TMA Inc. REPORT Work Order #~~AG-010035~~ ~~000635~~ SP 3/21/94

Received: 01/18/94 Results by Sample #44-01-025

SAMPLE ID B09DT5 FRACTION 07D TEST CODE 8015MS NAME EPA 8015M EXTRACT.

Date & Time Collected 01/11/94 Category

MODIFIED 8015 - EXTRACTABLE FUEL HYDROCARBONS

Matrix: SOIL
Date Analyzed: 01/27/94
Dilution factor: 1.00
Concentration Units: mg/Kg

Compound	Sample Result	PQL	Q
Kerosene Range	ND	5.0	U
C10 - C16 Jet Fuel Range	NA	NA	
C9 - C22 Diesel Range	NA	NA	
Hydraulic Range	NA	NA	

ND = Not detected at the specified limits

Form I

Verified

4/11/94

9713517.2212

~~000637~~

TMA Inc. REPORT Work Order # A4-01-025

Received: 01/18/94

Results by Sample

SAMPLE ID B09DT7 FRACTION 08D TEST CODE 8015MS NAME EPA 8015M EXTRACT.

Date & Time Collected 01/11/94 Category

MODIFIED 8015 - EXTRACTABLE FUEL HYDROCARBONS

Matrix: SOIL
Date Analyzed: 01/27/94
Dilution factor: 1.00
Concentration Units: mg/Kg

Compound	Sample Result	PQL	Q
Kerosene Range	ND	5.0	U
C10 - C16 Jet Fuel Range	NA	NA	
C9 - C22 Diesel Range	NA	NA	
Hydraulic Range	NA	NA	

ND = Not detected at the specified limits

Form I

Verified

4/11/94

TMA Inc. REPORT Work Order # A4-01-025

Received: 01/18/94 Results by Sample

SAMPLE ID B09DT9 FRACTION 01G TEST CODE 8015MS NAME EPA 8015M EXTRACT.

Date & Time Collected 01/13/94 Category

MODIFIED 8015 - EXTRACTABLE FUEL HYDROCARBONS

Matrix: SOIL
Date Analyzed: 01/27/94
Dilution factor: 1.00
Concentration Units: mg/Kg

Compound	Sample Result	PQL	Q
Kerosene Range	ND	5.0	u
C10 - C16 Jet Fuel Range	NA	NA	
C9 - C22 Diesel Range	NA	NA	
Hydraulic Range	NA	NA	

ND = Not detected at the specified limits

Form I

Verified

4/11/94

TMA Inc. REPORT Work Order # A4-01-025

Received: 01/18/94

Results by Sample

SAMPLE ID B09WF3 FRACTION 02E TEST CODE 8015MS NAME EPA 8015M EXTRACT.

Date & Time Collected 01/13/94 Category

MODIFIED 8015 - EXTRACTABLE FUEL HYDROCARBONS

Matrix: SOIL
Date Analyzed: 01/27/94
Dilution factor: 1.00
Concentration Units: mg/Kg

Compound	Sample Result	PQL	Q
Kerosene Range	ND	5.0	u
C10 - C16 Jet Fuel Range	NA	NA	
C9 - C22 Diesel Range	NA	NA	
Hydraulic Range	NA	NA	

ND = Not detected at the specified limits

Form I

Verified

4/11/94

TMA Inc. REPORT Work Order # A4-01-025

Received: 01/18/94

Results by Sample

SAMPLE ID B09WF5 FRACTION 03D TEST CODE 8015MS NAME EPA 8015M EXTRACT.

Date & Time Collected 01/13/94 Category

MODIFIED 8015 - EXTRACTABLE FUEL HYDROCARBONS

Matrix: SOIL
Date Analyzed: 01/27/94
Dilution factor: 1.00
Concentration Units: mg/Kg

Compound	Sample Result	PQL	Q
Kerosene Range	ND	5.0	u
C10 - C16 Jet Fuel Range	NA	NA	
C9 - C22 Diesel Range	NA	NA	
Hydraulic Range	NA	NA	

ND = Not detected at the specified limits

Form I Verified

4/11/94

TMA Inc. REPORT Work Order # A4-01-025

Received: 01/18/94

Results by Sample

SAMPLE ID B09WF6 FRACTION 04D TEST CODE 8015MS NAME EPA 8015M EXTRACT.

Date & Time Collected 01/13/94 Category

MODIFIED 8015 - EXTRACTABLE FUEL HYDROCARBONS

Matrix: SOIL
Date Analyzed: 01/27/94
Dilution factor: 1.00
Concentration Units: mg/Kg

Compound	Sample Result	PQL	Q
Kerosene Range	ND	5.0	u
C10 - C16 Jet Fuel Range	NA	NA	
C9 - C22 Diesel Range	NA	NA	
Hydraulic Range	NA	NA	

ND = Not detected at the specified limits

Form I

Verified

4/11/94

9715517.2217

ATTACHMENT 4

LABORATORY NARRATIVE AND CHAIN-OF-CUSTODY DOCUMENTATION

~~000085~~

CASE NARRATIVE

LABORATORY : TMA/ARLI

CASE : 01-025

CONTRACT ID : WESTINGHOUSE HANFORD COMPANY

SDG RECEIPT DATE : January 18, 1994

1.0 DESCRIPTION OF CASE :

Eight soil samples were analyzed for TCL Organics- Volatiles and Semivolatiles according to the USEPA Contract Laboratory Program (CLP) Statement of Work for Organic Analysis, Revision OLM01.8. The Extractable Hydrocarbons for Kerosene (K) were analyzed according to the SW-846 Method 8015M.

2.0 SAMPLE LIST :

WESTINGHOUSE ID	LAB ID	ANALYSIS REQUESTED	MATRIX
B09DT9	A4-01-025-01A	V	SOIL
B09DT9	A4-01-025-01B	SV	SOIL
B09DT9 MS	A4-01-025-01C	SV	SOIL
B09DT9 MSD	A4-01-025-01D	SV	SOIL
B09DT9	A4-01-025-01G	K	SOIL
B09WF3	A4-01-025-02A	V	SOIL
B09WF3	A4-01-025-02B	SV	SOIL
B09WF3	A4-01-025-02E	K	SOIL
B09WF3 MS	A4-01-025-02F	K	SOIL
B09WF3 MSD	A4-01-025-02G	K	SOIL
B09WF5	A4-01-025-03A	V	SOIL
B09WF5	A4-01-025-03B	SV	SOIL
B09WF5	A4-01-025-03D	K	SOIL
B09WF6	A4-01-025-04A	V	SOIL
B09WF6	A4-01-025-04B	SV	SOIL
B09WF6	A4-01-025-04D	K	SOIL
B09DT6	A4-01-025-05A	V	SOIL
B09DT6 MS	A4-01-025-05B	V	SOIL
B09DT6 MSD	A4-01-025-05C	V	SOIL
B09DT4	A4-01-025-06A	V	SOIL
B09DT4	A4-01-025-06B	SV	SOIL
B09DT4	A4-01-025-06D	K	SOIL
B09DT5	A4-01-025-07A	V	SOIL
B09DT5	A4-01-025-07B	SV	SOIL
B09DT5	A4-01-025-07D	K	SOIL
B09DT7	A4-01-025-08A	V	SOIL
B09DT7	A4-01-025-08B	SV	SOIL
B09DT7	A4-01-025-08D	K	SOIL

~~000086~~

3.0 COMMENTS :

3.1 SHIPPING AND DOCUMENTATION :

All of the samples were received intact and properly documented.

3.2 ANALYSIS

3.2.1 VOLATILE ANALYSIS COMMENTS :

LOW LEVEL SOIL :

The samples were analyzed by heated purge within the CLP SOW holding times. The samples were analyzed during a period from 01/19/94 through 01/27/94, on the instrument "ROCKY". On 01/19/94, the operator inadvertently entered the wrong year during the instrument system boot-up, and therefore, all of the sample data incorrectly documented the year as "1993". Since it was not possible to change the date of analysis within the system the work order data was processed as is, and the appropriate manual corrections were made on the raw data by the laboratory. In addition, the report forms were changed to reflect the correct year of analysis (1994).

The analyte Acetone was detected at concentrations above the CRQL in samples B09DT4, B09DT5, B09DT6, B09WF6, B09DT6MS, and the blanks, VBLK0124R and VBLK0125R. In all of the other samples, Acetone was detected at concentrations either at or below the CRQL. Other TCL analytes detected in some of the samples included Methylene Chloride, 4-Methyl-2-pentanone, and Toluene, all at concentrations below the CRQL.

All of the QC results were within the limits specified by the EPA CLP SOW.

3.2.2 SEMIVOLATILE ANALYSIS COMMENTS :

LOW LEVEL SOIL :

The samples were extracted and analyzed within the contract required holding times.

In all of the samples Di-n-butylphthalate was detected at concentrations less than the CRQL. In addition, sample B09WF5 had bis(2-Ethylhexyl)phthalate detected at a concentration below the CRQL.

Both the MS and the MSD sample had matrix spike recoveries above the QC limits for 2,4-Dinitrotoluene, while the MSD sample also had a high recovery for 4-Nitrophenol. In accordance with the protocol, no further action was required.

All of the other QC results were within the limits specified

~~000087~~

by the EPA CLP SOW.

3.2.3 EXTRACTABLE HYDROCARBONS "KEROSENE RANGE" COMMENTS :

SEQUENCE NOTES :

The sequence was started on 01/19/94 and was analyzed according to the SW-846 Method 8015M. The initial calibration consisted of 5 different levels of the Kerosene standard that ranged from approximately 200ppm to 2000ppm. The continuing calibration at approximately 1000ppm was injected amongst the samples, in order to verify the instrument stability. The %RSD in the initial calibration and the %D in the continuing calibration were below their 20% and 15% limits, respectively.

SAMPLE NOTES :

LOW LEVEL SOIL :

The samples were extracted and analyzed within the required holding times. Approximately 20 g of each sample was extracted and concentrated to 5 mL.

There was no Kerosene detected in any of the samples. Sample B09WF3 was spiked with Kerosene, and the matrix spike recoveries were 51% for the MS, and 54% for the MSD. The blank spike was prepared at the same time and had a 52% recovery, and the data was included in the "Additional Raw Data" portion of the package.

All of the QC results were within the limits specified by the SW-846 Method 8015M.

We certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data in this hardcopy data package and in the computer-readable data submitted on diskette is authorized by the Laboratory Manager or his designees, as verified by the following signatures.

Nicole Roth 3/3/94
Nicole Roth
Program Manager

Maureen Parrish 3/2/94
Maureen Parrish
Project Manager

9413017.2221

~~000002A~~

Westinghouse Hanford Company

CHAIN OF CUSTODY

Custody Form Initiator: L E ROGERS / W.U. SETZER

Company Contact: L E ROGERS — Telephone: 376-7690

Project Designation/Sampling Locations: 200-UP-2 — Collection Date: 1-11-94

Ice Chest No.: SML 342 — Field Logbook No.: ~~EFL-1091~~ EFL-115 1-13-94

Bill of Lading/Airbill No.: 2519008360 — Offsite Property No.: W94-0-0216-1

Method of Shipment: AIR

Shipped to: TMA

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

Sample Identification

1) B09DT4
- 1,250ml P:CLP;TAL Metals,Hg,Ti
- 1,250ml Gs:VOA CLP
- 1,250ml aG:Semi-VOA CLP
- 1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
- 1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
- 1,125ml G:Cyanide CLP
- 1,125ml Gw:Kerosene (8015M)
- 1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

2) B09DT5
- 1,250ml P:CLP;TAL Metals,Hg,Ti
- 1,250ml Gs:VOA CLP
- 1,250ml aG:Semi-VOA CLP
- 1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
- 1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
- 1,125ml G:Cyanide CLP
- 1,125ml Gw:Kerosene (8015M)
- 1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

3) B09DT7
- 1,250ml P:CLP;TAL Metals,Hg,Ti
- 1,250ml Gs:VOA CLP
- 1,250ml aG:Semi-VOA CLP
- 1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
- 1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
- 1,125ml G:Cyanide CLP
- 1,125ml Gw:Kerosene (8015M)
- 1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

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

Relinquished by:	Received by:	Date/Time:
W.U. Setzer	Kermit Blum K. Blum	1-18-94 1330
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

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

9413517.2222

~~100020~~

Westinghouse Hanford Company	CHAIN OF CUSTODY

Custody Form Initiator: L E ROGERS

Company Contact: L E ROGERS — Telephone: 376-7690

Project Designation/Sampling Locations: 200-UP-2 — Collection Date: 1-13-94

Ice Chest No.: SML-311 — Field Logbook No.: EFL-1091

Bill of Lading/Airbill No.: — Offsite Property No.: 0351-17394

Method of Shipment: AIR

Shipped to: TMA

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

Sample Identification

1) B09D19

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

2) B09WF3

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

~~3)~~

~~1,250ml P:CLP;TAL Metals,Hg,Ti~~
~~1,250ml Gs:VOA CLP~~
~~1,250ml aG:Semi-VOA CLP~~
~~1,125ml G:Anions F,Cl,SO4 (EPA 300.0)~~
~~1,125ml P/G:Anions NO2,NO3 (EPA 353.2)~~
~~1,125ml G:Cyanide CLP~~
~~1,125ml Gw:Kerosene (8015M)~~
~~1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79~~

1-17-94

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

Relinquished by:	Received by:	Date/Time:
1-17-94 Loren E. Rogers 0930	W.D. SETZER	1-17-94 0930
W.D. Setzer	[illegible]	1-18-94 10:35

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

022

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

9213517.2223

~~0000026~~

Westinghouse Hanford Company	CHAIN OF CUSTODY

Custody Form Initiator: L E ROGERS

Company Contact: L E ROGERS Telephone: 376-7690

Project Designation/Sampling Locations: 200-UP-2 Collection Date: 1-13-94

Ice Chest No.: SML-335 Field Logbook No.: EFL-1091

Bill of Lading/Airbill No.: 2519008448 Offsite Property No.: W94-0-0216-3

Method of Shipment: AIR

Shipped to: TMA

Possible Sample Hazards/Remarks: Keep samples at 4C (SOIL) NONE NOTED

Sample Identification

1) B09WF5

4,250ml P:CLP;TAL Metals,Hg,Ti
4,250ml Gs:VOA CLP
4,250ml aG:Semi-VOA CLP
4,125ml G:Anions F,Cl,SO4 (EPA 300.0)
4,125ml P/G:Anions NO2,NO3 (EPA 353.2)
4,125ml G:Cyanide CLP
4,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

2) B09WF6

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

3)

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

1-17-94

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

Relinquished by:	Received by:	Date/Time:
0940 Karen E. Rogers 1-17-94	W.V. Seltzer	1-17-94 0940
Relinquished by: W.V. Seltzer	Received by: Kermit Blum K. Blum	Date/Time: 1-18-94 1330
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

023

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

9713517.2224

ATTACHMENT 5

DATA VALIDATION SUPPORTING DOCUMENTATION

GENERAL GC DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E

PROJECT: 200-UP-2		DATA PACKAGE: B09T4-TMA-690
VALIDATOR: [signature]	LAB: TMA	DATE: 04/11/94
CASE:		SDG: B09T4-TMA-690

ANALYSES PERFORMED

☐ 8010	☒ 8015 as reference	☐ 8020	☐ 8021	8140	8141
☐ 8150	☐ 8151	☐ WTPH-HCID	☐ WTPH-G	☐ WTPH-D	☐
☐	☐	☐	☐	☐	☐

SAMPLES/MATRIX: Soils

B09T4	~~B09F5~~
B09T5	B09WF3
B09T7	B09WF5
B09T9	B09WF6
~~B09F3~~	

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Is technical verification documentation present? . . . . . (Yes) No N/A

Is a case narrative present? . . . . . (Yes) No N/A

Comments:

2. HOLDING TIMES

Are sample holding times acceptable? . . . . . (Yes) No N/A

Comments:

GENERAL GC DATA VALIDATION CHECKLIST

3. INSTRUMENT CALIBRATION

3.1 INITIAL CALIBRATION

Was an initial calibration performed? . . . . . Yes No N/A

Are %RSD values for calibration or response factors acceptable? . . . . . Yes No N/A

Comments:

3.2 CONTINUING CALIBRATION

Was a continuing calibration check performed? . . . . . Yes No N/A

Are %D values for calibration or response factors acceptable? . Yes No N/A

Comments:

4. BLANKS

Were laboratory blanks analyzed? . . . . . Yes No N/A

Are laboratory blank results acceptable? . . . . . Yes No N/A

Were field/trip blanks analyzed? . . . . . Yes No N/A

Are field/trip blank results acceptable? . . . . . Yes No N/A

Comments: Sample locations are not currently available. Field QC will be evaluated in the final summary report.

5. ACCURACY

Were surrogates analyzed? . . . . . Yes No N/A

Are surrogate recoveries acceptable? . . . . . Yes No N/A

Were MS/MSD samples analyzed? . . . . . Yes No N/A

Are MS/MSD recoveries acceptable? . . . . . Yes No N/A

Were LCS samples analyzed? . . . . . Yes No N/A

Are LCS recoveries acceptable? . . . . . Yes No N/A

GENERAL GC DATA VALIDATION CHECKLIST

Comments: the MS/MSD %R are 51% and 54%, respectively. No qualification was required since specific lab control limits were not provided. Generally limits of 50% to 150% for GC parameters is acceptable.

6. PRECISION

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

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

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

Comments:

7. COMPOUND IDENTIFICATION AND QUANTITATION

Is compound identification acceptable? . . . . . Yes No N/A

Is compound quantitation acceptable? . . . . . Yes No N/A

Comments:

8. REPORTED RESULTS AND DETECTION LIMITS

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

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

Do results meet the CRQLs? . . . . . Yes No N/A

Comments:

027

HOLDING TIME SUMMARY

B09DT4-TMA-690

SDG:	VALIDATOR: [illegible]	DATE: 4/11/94	PAGE 1 OF 1

COMMENTS: GC as Kerosene (Method 8015 Modified)

FIELD SAMPLE ID	ANALYSIS TYPE	DATE SAMPLED	DATE PREPARED	DATE ANALYZED	PREP. HOLDING TIME, DAYS	ANALYSIS HOLDING TIME, DAYS	QUALIFIER
B09DT4	GC as Kerosene	01/11/94	01/20/94	01/27/94	9	7	None
B09DT5	↓	01/11/94	↓	↓	9	7	↓
B09DT7	↓	01/11/94	↓	↓	9	7	↓
B09DT9	↓	01/13/94	↓	↓	7	7	↓
B09WF3	↓	01/13/94	↓	↓	7	7	↓
B09WF5	↓	01/13/94	↓	↓	7	7	↓
B09WF6	↓	01/13/94	↓	↓	7	7	↓

9413597.1229

MEMORANDUM

APR 1994 RECEIVED TQO

TO: 200-UP-2 Project QA Record

April 12, 1994

FR: Susan Winter, Golder Associates Inc.

RE: METALS DATA VALIDATION SUMMARY FOR DATA PACKAGE: B09DT4-TMA-690 (923-E418, Filename B09DT4.MET)

INTRODUCTION

This memo presents the results of data validation on data package B09DT4-TMA-690 prepared by the Thermo Analytical (TMA) laboratory. A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

SAMPLE ID	SAMPLE DATE	MEDIA	ANALYSIS
B09DT4	01/11/94	SOIL	SEE NOTE 1
B09DT5	01/11/94	SOIL	
B09DT7	01/11/94	SOIL	
B09DT9	01/13/94	SOIL	
B09WF3	01/13/94	SOIL	
B09WF5	01/13/94	SOIL	
B09WF6	01/13/94	SOIL	
Note 1. All samples were analyzed for CLP TAL metals, cyanide and titanium.			

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

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

RECEIVED APR 1 1994 VALIDATION DOCUMENTATION SDLA

DATA QUALITY OBJECTIVES

This section presents a summary of the data quality in terms of the referenced validation criteria.

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

Accuracy. Goals for accuracy were met.

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

001

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

Completeness. The data package was complete for all requested analyses. A total of seven samples were validated in this data package with a total of 175 determinations reported, all of which were deemed valid. This results in a completeness of 100 percent, which meets normal work plan objectives of 90%.

MAJOR DEFICIENCIES

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

MINOR DEFICIENCIES

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

Laboratory Blanks

- **Positive Blanks.** Barium, beryllium, chromium, copper, magnesium, manganese, potassium, zinc, titanium, and silver were detected at positive concentrations in the associated calibration and/or preparation blanks. Attachments 2 and 5 provide a summary of the sample affected, data qualification applied and supporting documentation.

- **Negative Blanks.** Antimony and calcium were detected at negative concentrations in the calibration or preparation blanks. Attachments 2 and 5 provide a summary of the sample affected, data qualifications applied and supporting documentation.

Laboratory Duplicate

- The laboratory duplicate relative percent difference (RPD) for iron was unacceptable. Attachments 2 and 5 provide a summary of the samples affected, data qualifications applied and supporting documentation.

REFERENCES

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

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

9713517.2231

ATTACHMENT 1

GLOSSARY OF DATA REPORTING QUALIFIERS

GLOSSARY OF INORGANIC DATA REPORTING QUALIFIERS

B - Indicates the constituent was analyzed for and detected. The concentration reported is less than the contract required detection limit (CRDL) but greater than the instrument detection limit (IDL). The associated data should be considered usable for decision making purposes.

U - Indicates the constituent was analyzed for and not detected. The concentration reported is the sample detection limit corrected for aliquot size, dilution and percent solids (in the case of solid matrices) by the laboratory. The associated data should be considered usable for decision making purposes.

UJ - Indicates the constituent was analyzed for and not detected. Due to a minor quality control deficiency identified during data validation the concentration may not accurately reflect the sample detection limit. The associated data have been qualified as estimated but should be considered usable for decision making purposes.

BJ - Indicates the constituent was analyzed for and detected at a concentration less than the contract required detection limit (CRDL) but greater than the instrument detection limit (IDL). Due to a minor quality control deficiency identified during data validation the associated data have been qualified as estimated, but should be considered usable for decision making purposes.

J - Indicates the constituent was analyzed for and detected. Due to a minor quality control deficiency identified during data validation the associated data have been qualified as estimated, but should be considered usable for decision making purposes.

UR - Indicates the constituent was analyzed for and not detected. Due to a major quality control deficiency identified during data validation, the associated data have been qualified as unusable for decision making purposes.

R - Indicates the constituent was analyzed for and detected. Due to a major quality control deficiency identified during data validation, the associated data have been qualified as unusable for decision making purposes.

9713517.2253

ATTACHMENT 2

SUMMARY OF DATA QUALIFICATIONS

DATA QUALIFICATION SUMMARY

SDG: B09DT4-TMA-690	VALIDATOR:	DATE: April 12, 1994	PAGE 1 OF ~~1~~ 2
COMMENTS: METALS			

COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
BARIUM	U	B09DT4 B09DT5 B09WF5 B09WF6	PRESENT IN CCB AT A POSITIVE CONCENTRATION
BERYLLIUM	U	B09DT4 B09DT7 B09DT9 B09WF3	PRESENT IN ICB AND CCB AT POSITIVE CONCENTRATIONS
CALCIUM	UJ	B09DT4 B09DT5 B09WF5 B09WF6	PRESENT IN ICB AT A NEGATIVE CONCENTRATION
CHROMIUM	U	B09DT4 B09DT5 B09WF5 B09WF6	PRESENT IN CCB AND PREP. BLANK AT POSITIVE CONCENTRATIONS
COPPER	U	B09DT4 B09DT5 B09DT7 B09DT9 B09WF3	PRESENT IN ICB, CCB, AND PREP. BLANK AT POSITIVE CONCENTRATIONS
MAGNESIUM	U	B09DT4 B09DT5 B09WF5 B09WF6	PRESENT IN CCB AT A POSITIVE CONCENTRATION
MANGANESE	U	B09DT4 B09DT5 B09WF5 B09WF6	PRESENT IN CCB AND PREP. BLANK AT POSITIVE CONCENTRATIONS
POTASSIUM	U	B09DT4 B09DT5 B09WF5 B09WF6	PRESENT IN ICB AND PREP. BLANK AT POSITIVE CONCENTRATIONS
ZINC	U	B09DT4	PRESENT IN CCB AT A POSITIVE CONCENTRATION
TITANIUM	U	B09DT4	PRESENT IN CCB AT PREP. BLANK AT POSITIVE CONCENTRATIONS
SILVER	U	B09DT7 B09WF3 B09WF5	PRESENT IN CCB AT A POSITIVE CONCENTRATION
ANTIMONY	UJ	B09DT4 B09DT5 B09DT7 B09DT9 B09WF3 B09WF5 B09WF6	PRESENT IN PREP. BLANK AT A NEGATIVE CONCENTRATION

DATA QUALIFICATION SUMMARY

SDG: B09DT4-TMA-690	VALIDATOR:	DATE: April 12, 1994	PAGE 2 OF 2
COMMENTS: METALS			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
IRON	J	B09DT4 B09DT5 B09DT7 B09DT9 B09WF3 B09WF5 B09WF6	DUPLICATE RPD > 35% AND SAMPLE RESULTS > 5xCRDL

9713517.2256

ATTACHMENT 3

QUALIFIED DATA SUMMARY AND ANNOTATED LABORATORY REPORTS

Validated Data Summary, Data Package: B09DT4-TMA-690

	Samp#	B09DT4		B09DT5		B09DT7		B09DT9		B09WF3		B09WF5	
	Date	1-11-94		1-11-94		1-11-94		1-13-94		1-13-94		1-13-94	
	Location	---		---		---		---		---		---	
	Depth	---		---		---		---		---		---	
	Type	---		---		---		---		---		---	
	Comments	---		---		---		---		---		---	
Parameter	Units	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
ALUMINUM	MG/KG	56.300		65.700		7310.000		7530.000		6270.000		74.400	
ANTIMONY	MG/KG	2.400	UJ	2.200	UJ	2.500	UJ	2.600	UJ	2.500	UJ	2.300	UJ
ARSENIC	MG/KG	0.590	U	0.550	U	3.700		3.700		3.800		0.570	U
BARIUM	MG/KG	0.590	U	0.280	U	45.200		104.000		74.100		0.430	U
BERYLLIUM	MG/KG	0.110	U	0.060	U	0.370	U	0.350	U	0.330	U	0.060	U
CADMIUM	MG/KG	0.330	U	0.310	U	0.340	U	0.410	B	0.520	B	0.320	U
CALCIUM	MG/KG	16.400	UJ	15.300	UJ	2360.000		90600.000		7370.000		15.900	UJ
CHROMIUM	MG/KG	0.880	U	0.830	U	9.300		11.300		15.000		0.860	U
COBALT	MG/KG	0.570	U	0.530	U	6.100	B	8.700	B	11.100		0.550	U
COPPER	MG/KG	0.840	U	0.790	U	10.400	U	12.900	U	16.000	U	0.310	U
IRON	MG/KG	160.000	J	171.000	J	14200.000	J	15100.000	J	19900.000	J	232.000	J
LEAD	MG/KG	0.450	B	0.420	B	5.100		3.900		7.900		0.370	B
MAGNESIUM	MG/KG	7.300	U	7.700	U	5150.000		5130.000		4520.000		11.700	U
MANGANESE	MG/KG	0.330	U	0.340	U	282.000		505.000		340.000		0.620	U
MERCURY	MG/KG	0.050	U	0.050	U	0.050	U	0.060	U	0.720		0.050	U
NICKEL	MG/KG	0.860	U	0.810	U	8.400		11.600		11.000		0.840	U
POTASSIUM	MG/KG	21.300	U	27.000	U	1190.000		923.000	B	1030.000		31.600	U
SELENIUM	MG/KG	0.550	U	0.510	U	0.570	U	0.600	U	0.560	U	0.530	U
SILVER	MG/KG	0.410	U	0.390	U	0.700	U	0.450	U	0.870	U	0.680	U
SODIUM	MG/KG	17.200	B	12.100	B	148.000	B	181.000	B	232.000	B	28.900	B
THALLIUM	MG/KG	0.730	U	0.680	U	0.750	U	0.790	U	0.740	U	0.710	U
VANADIUM	MG/KG	0.470	U	0.440	U	27.500		49.800		46.700		0.460	U
ZINC	MG/KG	1.600	U	0.840	U	35.000		31.300		43.100		0.880	U
CYANIDE	MG/KG	0.490	U	0.480	U	0.520	U	0.540	U	0.510	U	0.490	U
TITANIUM	MG/KG	2.000	U	2.500	B	623.000		1160.000		1550.000		2.900	B

Verified
[illegible] 4/12/94

Validated Data Summary, Data Package: B09DT4-TMA-690

	Samp#	B09WF6	
	Date	1-13-94	
	Location	---	
	Depth	---	
	Type	---	
	Comments	---	
Parameter	Units	Result	Q
ALUMINUM	MG/KG	60.200	
ANTIMONY	MG/KG	2.400	UJ
ARSENIC	MG/KG	0.590	U
BARIUM	MG/KG	0.340	U
BERYLLIUM	MG/KG	0.060	U
CADMIUM	MG/KG	0.330	U
CALCIUM	MG/KG	16.400	UJ
CHROMIUM	MG/KG	0.940	U
COBALT	MG/KG	0.570	U
COPPER	MG/KG	0.310	U
IRON	MG/KG	141.000	J
LEAD	MG/KG	0.540	B
MAGNESIUM	MG/KG	7.000	U
MANGANESE	MG/KG	0.580	U
MERCURY	MG/KG	0.050	U
NICKEL	MG/KG	0.860	U
POTASSIUM	MG/KG	20.000	U
SELENIUM	MG/KG	0.550	U
SILVER	MG/KG	0.410	U
SODIUM	MG/KG	7.800	U
THALLIUM	MG/KG	0.730	U
VANADIUM	MG/KG	0.470	U
ZINC	MG/KG	0.900	U
CYANIDE	MG/KG	0.500	U
TITANIUM	MG/KG	2.100	B

Verified
[illegible] 4/12/94

WESTINGHOUSE/HANFORD

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B09DT4

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D2-0039

Lab Code: SKINER Case No.: N4-01-049SAS No.: SDG No.: B09DT4

Matrix (soil/water): SOIL Lab Sample ID: S401120-01 S

Level (low/med): LOW Date Received: 01/19/94

% Solids: 99.9

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	56.3			P	
7440-36-0	Antimony	2.4	~~U~~		P	u
7440-38-2	Arsenic	0.59	U		P	
7440-39-3	Barium	0.59	~~B~~		P	u
7440-41-7	Beryllium	0.11	~~B~~		P	u
7440-43-9	Cadmium	0.33	U		P	
7440-70-2	Calcium	16.4	~~U~~		P	u
7440-47-3	Chromium	0.88	~~B~~		P	u
7440-48-4	Cobalt	0.57	U		P	
7440-50-8	Copper	0.84	~~B~~		P	u
7439-89-6	Iron	160	—	*	P	u
7439-92-1	Lead	0.45	B		P	
7439-95-4	Magnesium	7.3	~~B~~		P	u
7439-96-5	Manganese	0.33	~~B~~		P	u
7439-97-6	Mercury	0.05	U		CV	
7440-02-0	Nickel	0.86	U		P	
7440-09-7	Potassium	21.3	~~B~~		P	u
7782-49-2	Selenium	0.55	U		P	
7440-22-4	Silver	0.41	U		P	
7440-23-5	Sodium	17.2	B		P	
7440-28-0	Thallium	0.73	U		P	
7440-62-2	Vanadium	0.47	U		P	
7440-66-6	Zinc	1.6	~~B~~		P	u
	Cyanide	0.49	U		CA	
7440-32-6	Titanium	2.0	~~B~~		P	u

Color Before: WHITE Clarity Before: Texture: FINE

Color After: WHITE Clarity After: Artifacts:

Comments:

Verified
[illegible] 4/12/94

011

FORM I - IN ILM02.1

~~002~~

WESTINGHOUSE/HANFORD
1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER:

B09DT5

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D2-0039

Lab Code: SKINER Case No.: N4-01-049SAS No.: SDG No.: B09DT4

Matrix (soil/water): SOIL Lab Sample ID: S401120-02 S

Level (low/med): LOW Date Received: 01/19/94

% Solids: 99.9

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	65.7			P	
7440-36-0	Antimony	2.2	~~U~~		P	U
7440-38-2	Arsenic	0.55	U		P	
7440-39-3	Barium	0.28	~~B~~		P	U
7440-41-7	Beryllium	0.06	U		P	
7440-43-9	Cadmium	0.31	U		P	
7440-70-2	Calcium	15.3	~~U~~		P	U
7440-47-3	Chromium	0.83	~~B~~		P	U
7440-48-4	Cobalt	0.53	U		P	
7440-50-8	Copper	0.79	~~B~~		P	U
7439-89-6	Iron	171		*	P	U
7439-92-1	Lead	0.42	B		P	
7439-95-4	Magnesium	7.7	~~B~~		P	U
7439-96-5	Manganese	0.34	~~B~~		P	U
7439-97-6	Mercury	0.05	U		CV	
7440-02-0	Nickel	0.81	U		P	
7440-09-7	Potassium	27.0	~~B~~		P	U
7782-49-2	Selenium	0.51	U		P	
7440-22-4	Silver	0.39	U		P	
7440-23-5	Sodium	12.1	B		P	
7440-28-0	Thallium	0.68	U		P	
7440-62-2	Vanadium	0.44	U		P	
7440-66-6	Zinc	0.84	U		P	
	Cyanide	0.48	U		CA	
7440-32-6	Titanium	2.5	B		P	

Color Before: WHITE Clarity Before: Texture: FINE

Color After: WHITE Clarity After: Artifacts:

Comments:

Verified
[illegible] 4/12/94

9713517.2241

WESTINGHOUSE/HANFORD
1

SAMPLE NUMBER:

INORGANIC ANALYSIS DATA SHEET

B09DT7

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D2-0039

Lab Code: SKINER Case No.: N4-01-049SAS No.: SDG No.: B09DT4

Matrix (soil/water): SOIL Lab Sample ID: S401120-03 S

Level (low/med): LOW Date Received: 01/19/94

% Solids: 96.1

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	7310			P	
7440-36-0	Antimony	2.5	~~U~~		P	U
7440-38-2	Arsenic	3.7			P	
7440-39-3	Barium	45.2			P	OK
7440-41-7	Beryllium	0.37	~~B~~		P	U
7440-43-9	Cadmium	0.34	U		P	
7440-70-2	Calcium	2360			P	
7440-47-3	Chromium	9.3			P	
7440-48-4	Cobalt	6.1	B		P	
7440-50-8	Copper	10.4			P	U
7439-89-6	Iron	14200		*	P	U
7439-92-1	Lead	5.1			P	
7439-95-4	Magnesium	5150			P	
7439-96-5	Manganese	282			P	
7439-97-6	Mercury	0.05	U		CV	
7440-02-0	Nickel	8.4			P	
7440-09-7	Potassium	1190			P	
7782-49-2	Selenium	0.57	U		P	
7440-22-4	Silver	0.70	~~B~~		P	U
7440-23-5	Sodium	148	B		P	
7440-28-0	Thallium	0.75	U		P	
7440-62-2	Vanadium	27.5			P	
7440-66-6	Zinc	35.0			P	
	Cyanide	0.52	U		CA	
7440-32-6	Titanium	623			P	

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

Verified
4/12/94

013

FORM I - IN ILM02.1

WESTINGHOUSE/HANFORD
1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B09DT9

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D2-0039

Lab Code: SKINER Case No.: N4-01-049SAS No.: SDG No.: B09DT4

Matrix (soil/water): SOIL Lab Sample ID: S401120-04 S

Level (low/med): LOW Date Received: 01/19/94

% Solids: 89.4

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	7530			P	
7440-36-0	Antimony	2.6	~~U~~		P	U
7440-38-2	Arsenic	3.7			P	
7440-39-3	Barium	104			P	
7440-41-7	Beryllium	0.35	~~B~~		P	U
7440-43-9	Cadmium	0.41	B		P	
7440-70-2	Calcium	90600			P	
7440-47-3	Chromium	11.3			P	
7440-48-4	Cobalt	8.7	B		P	
7440-50-8	Copper	12.9			P	U
7439-89-6	Iron	15100		*	P	U
7439-92-1	Lead	3.9			P	
7439-95-4	Magnesium	5130			P	
7439-96-5	Manganese	505			P	
7439-97-6	Mercury	0.06	U		CV	
7440-02-0	Nickel	11.6			P	
7440-09-7	Potassium	923	B		P	
7782-49-2	Selenium	0.60	U		P	
7440-22-4	Silver	0.45	U		P	
7440-23-5	Sodium	181	B		P	
7440-28-0	Thallium	0.79	U		P	
7440-62-2	Vanadium	49.8			P	
7440-66-6	Zinc	31.3			P	
	Cyanide	0.54	U		CA	
7440-32-6	Titanium	1160			P	

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

Verified
[illegible] 4/12/94

FORM I - IN ILM02.1

9215172293

WESTINGHOUSE/HANFORD
1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B09WF3

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D2-0039

Lab Code: SKINER Case No.: N4-01-049SAS No.: SDG No.: B09DT4

Matrix (soil/water): SOIL Lab Sample ID: S401120-05 S

Level (low/med): LOW Date Received: 01/19/94

% Solids: 92.9

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	6270			P	
7440-36-0	Antimony	2.5	~~U~~		P	u5
7440-38-2	Arsenic	3.8			P	
7440-39-3	Barium	74.1			P	
7440-41-7	Beryllium	0.33	~~B~~		P	u
7440-43-9	Cadmium	0.52	B		P	
7440-70-2	Calcium	7370			P	
7440-47-3	Chromium	15.0			P	
7440-48-4	Cobalt	11.1			P	
7440-50-8	Copper	16.0	—		P	u
7439-89-6	Iron	19900	—	*	P	u
7439-92-1	Lead	7.9			P	
7439-95-4	Magnesium	4520			P	
7439-96-5	Manganese	340			P	
7439-97-6	Mercury	0.72			CV	
7440-02-0	Nickel	11.0			P	
7440-09-7	Potassium	1030			P	
7782-49-2	Selenium	0.56	U		P	
7440-22-4	Silver	0.87	~~B~~		P	u
7440-23-5	Sodium	232	B		P	
7440-28-0	Thallium	0.74	U		P	
7440-62-2	Vanadium	46.7			P	
7440-66-6	Zinc	43.1			P	
	Cyanide	0.51	U		CA	
7440-32-6	Titanium	1550			P	

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts: YES

Comments:
STONES

Verified
[illegible] 4/15/94

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FORM I - IN ILM02.1

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WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B09WF5

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D2-0039

Lab Code: SKINER Case No.: N4-01-049SAS No.: SDG No.: B09DT4

Matrix (soil/water): SOIL Lab Sample ID: S401120-06 S

Level (low/med): LOW Date Received: 01/19/94

% Solids: 99.9

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

CAS No.	Analyte	Concentration	C	Q	M	Q
7429-90-5	Aluminum	74.4			P	
7440-36-0	Antimony	2.3	~~U~~		P	U
7440-38-2	Arsenic	0.57	U		P	
7440-39-3	Barium	0.43	~~B~~		P	U
7440-41-7	Beryllium	0.06	U		P	
7440-43-9	Cadmium	0.32	U		P	
7440-70-2	Calcium	15.9	~~U~~		P	U
7440-47-3	Chromium	0.86	~~B~~		P	U
7440-48-4	Cobalt	0.55	U		P	
7440-50-8	Copper	0.31	U		P	
7439-89-6	Iron	232		*	P	J
7439-92-1	Lead	0.37	B		P	
7439-95-4	Magnesium	11.7	~~B~~		P	U
7439-96-5	Manganese	0.62	~~B~~		P	U
7439-97-6	Mercury	0.05	U		CV	
7440-02-0	Nickel	0.84	U		P	
7440-09-7	Potassium	31.6	~~B~~		P	U
7782-49-2	Selenium	0.53	U		P	
7440-22-4	Silver	0.68	~~B~~		P	U
7440-23-5	Sodium	28.9	B		P	
7440-28-0	Thallium	0.71	U		P	
7440-62-2	Vanadium	0.46	U		P	
7440-66-6	Zinc	0.88	U		P	
	Cyanide	0.49	U		CA	
7440-32-6	Titanium	2.9	B		P	

Color Before: WHITE Clarity Before: Texture: FINE

Color After: WHITE Clarity After: Artifacts:

Comments:

Verified 4/12/94

FORM I - IN ILM02.1

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WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B09WF6

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D2-0039

Lab Code: SKINER Case No.: N4-01-049SAS No.: SDG No.: B09DT4

Matrix (soil/water): SOIL Lab Sample ID: S401120-07 S

Level (low/med): LOW Date Received: 01/19/94

% Solids: 99.9

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	60.2			P	
7440-36-0	Antimony	2.4	~~U~~		P	UJ
7440-38-2	Arsenic	0.59	U		P	
7440-39-3	Barium	0.34	~~B~~		P	U
7440-41-7	Beryllium	0.06	U		P	
7440-43-9	Cadmium	0.33	U		P	
7440-70-2	Calcium	16.4	~~U~~		P	UJ
7440-47-3	Chromium	0.94	~~B~~		P	U
7440-48-4	Cobalt	0.57	U		P	
7440-50-8	Copper	0.31	U		P	
7439-89-6	Iron	141		*	P	J
7439-92-1	Lead	0.54	B		P	
7439-95-4	Magnesium	7.0	~~B~~		P	U
7439-96-5	Manganese	0.58	~~B~~		P	U
7439-97-6	Mercury	0.05	U		CV	
7440-02-0	Nickel	0.86	U		P	
7440-09-7	Potassium	20.0	~~B~~		P	U
7782-49-2	Selenium	0.55	U		P	
7440-22-4	Silver	0.41	U		P	
7440-23-5	Sodium	7.8	U		P	
7440-28-0	Thallium	0.73	U		P	
7440-62-2	Vanadium	0.47	U		P	
7440-66-6	Zinc	0.90	U		P	
	Cyanide	0.50	U		CA	
7440-32-6	Titanium	2.1	B		P	

Color Before: WHITE Clarity Before: Texture: FINE

Color After: WHITE Clarity After: Artifacts:

Comments:

Verified 4/12/94

FORM I - IN ILM02.1

017

~~008~~

9713517.2246

ATTACHMENT 4

LABORATORY NARRATIVE AND CHAIN-OF-CUSTODY DOCUMENTATION

TMA
Thermo Analytical Inc.

Skinner & Sherman Labs., Inc.
300 Second Avenue
Post Office Box 521
Waltham, MA 02254-0521
(617) 890-7200
FAX (617) 890-3883

RECORD COPY

MAR 1994
RECEIVED
SDLA

February 18, 1994

TMA/NORCAL
2030 Wright Avenue
Richmond, CA 94804
Attention: Dan Stuermer

Quality Control Narrative

Scope
Seven (7) soil samples were submitted to TMA/Skinner & Sherman Laboratories, Inc. on January 19, 1994 from TMA/Norcal. The samples were analyzed for the USEPA CLP Target Analyte List metals, titanium, and cyanide. The analyses were performed under TMA/Skinner and Sherman work order S401120.

Methodology
The samples were prepared, analyzed and reported in accordance with the USEPA Contract Laboratory Program Statement of Work ILM02.

Discussion
All quality control requirements were met for the samples with the following exceptions:

The laboratory duplicate for iron exceeded the control limit requirement.

Please feel free to call if there are any questions concerning this package.

Respectfully submitted,

TMA/SKINNER & SHERMAN LABORATORIES, INC.

Steven Provencal

Steven R. Provencal
Lead Chemist

9213512.2248

~~0000024~~

Westinghouse Hanford Company

CHAIN OF CUSTODY

Custody Form Initiator: L E ROGERS / W.U. SETZER

Company Contact: L E ROGERS — Telephone: 376-7690

Project Designation/Sampling Locations: 200-UP-2 — Collection Date: 1-11-94

Ice Chest No.: SML 342 — Field Logbook No.: ~~EFL-1091~~ EFL-115 1-13-94

Bill of Lading/Airbill No.: 2519008360 — Offsite Property No.: W94-0-0216-1

Method of Shipment: AIR

Shipped to: TMA

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

Sample Identification

1) B09DT4
- 1,250ml P:CLP;TAL Metals,Hg,Ti
- 1,250ml Gs:VOA CLP
- 1,250ml aG:Semi-VOA CLP
- 1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
- 1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
- 1,125ml G:Cyanide CLP
- 1,125ml Gw:Kerosene (8015M)
- 1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

2) B09DT5
- 1,250ml P:CLP;TAL Metals,Hg,Ti
- 1,250ml Gs:VOA CLP
- 1,250ml aG:Semi-VOA CLP
- 1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
- 1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
- 1,125ml G:Cyanide CLP
- 1,125ml Gw:Kerosene (8015M)
- 1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

3) B09DT7
- 1,250ml P:CLP;TAL Metals,Hg,Ti
- 1,250ml Gs:VOA CLP
- 1,250ml aG:Semi-VOA CLP
- 1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
- 1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
- 1,125ml G:Cyanide CLP
- 1,125ml Gw:Kerosene (8015M)
- 1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

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

Relinquished by:	Received by:	Date/Time:
W.U. Setzer	Kermit Blum K. Blum	1-18-94 1330
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

020

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

9214517.2249

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Westinghouse Hanford Company	CHAIN OF CUSTODY

Custody Form Initiator: L E ROGERS

Company Contact: L E ROGERS — Telephone: 376-7690

Project Designation/Sampling Locations: 200-UP-2 — Collection Date: 1-13-94

Ice Chest No.: SML-311 — Field Logbook No.: EFL-1091

Bill of Lading/Airbill No.: — Offsite Property No.: 0351-17394

Method of Shipment: AIR

Shipped to: TMA

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

Sample Identification

1) B09D19

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

2) B09WF3

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

3)

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

1-17-94

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

Relinquished by:	Received by:	Date/Time:
1-17-94 Loren E. Rogers 0930	W.V. SETZER W.V. Setzer	1-17-94 0930
W.V. Setzer	[illegible]	1-18-94 10:35

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

021

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

9413317.2210

~~000022E~~

Westinghouse Hanford Company	CHAIN OF CUSTODY

Custody Form Initiator: L E ROGERS

Company Contact: L E ROGERS — Telephone: 376-7690

Project Designation/Sampling Locations: 200-UP-2 — Collection Date: 1-13-94

Ice Chest No.: SML-335 — Field Logbook No.: EFL-1091

Bill of Lading/Airbill No.: 2519008448 — Offsite Property No.: W94-0-0216-3

Method of Shipment: AIR

Shipped to: TMA

Possible Sample Hazards/Remarks: Keep samples at 4C (SOIL) NONE NOTED

Sample Identification

1) B09WF5

- 1,250ml P:CLP;TAL Metals,Hg,Ti
- 1,250ml Gs:VOA CLP
- 1,250ml aG:Semi-VOA CLP
- 1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
- 1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
- 1,125ml G:Cyanide CLP
- 1,125ml Gw:Kerosene (8015M)
- 1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

2) B09WF6

- 1,250ml P:CLP;TAL Metals,Hg,Ti
- 1,250ml Gs:VOA CLP
- 1,250ml aG:Semi-VOA CLP
- 1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
- 1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
- 1,125ml G:Cyanide CLP
- 1,125ml Gw:Kerosene (8015M)
- 1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

~~3)~~

- ~~1,250ml P:CLP;TAL Metals,Hg,Ti~~
- ~~1,250ml Gs:VOA CLP~~
- ~~1,250ml aG:Semi-VOA CLP~~
- ~~1,125ml G:Anions F,Cl,SO4 (EPA 300.0)~~
- ~~1,125ml P/G:Anions NO2,NO3 (EPA 353.2)~~
- ~~1,125ml G:Cyanide CLP~~
- ~~1,125ml Gw:Kerosene (8015M)~~
- ~~1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79~~

1-17-94

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

Relinquished by:	Received by:	Date/Time:
0940 Karen E. Rogers 1-17-94	W. V. Seltzer	1-17-94 0940
Relinquished by: W. V. Seltzer	Received by: Kermit Blum K. Blum	Date/Time: 1-18-94 1330
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

022

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

9713512.2251

ATTACHMENT 5

DATA VALIDATION SUPPORTING DOCUMENTATION

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E

PROJECT: 200-UP-2	DATA PACKAGE: B09DT4-TMA-690	
VALIDATOR: [illegible]	LAB: TMA	DATE: 04/12/94
CASE:	SDG: B09DT4-TMA-690	

ANALYSES PERFORMED

☒ CLP/ICP	☐ CLP/GFAA	☒ CLP/Hg	☒ CLP/Cyanide	☒ T-barium-Tcl	☐
☐ SW-846/ICP	☐ SW-846/GFAA	☐ SW-846/Hg	☐ SW-846 Cyanide	☐	☐

SAMPLES/MATRIX Soils

B09DT4	B09WF5
B09DT5	B09WF6
B09DT7	
B09DT9	
B09WF3	

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Is technical verification documentation present? . . . . . (Yes) No N/A

Is a case narrative present? . . . . . (Yes) No N/A

Comments:

2. HOLDING TIMES

Are sample holding times acceptable? . . . . . (Yes) No N/A

Comments:

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

3. INSTRUMENT PERFORMANCE AND CALIBRATIONS

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

4. BLANKS

Were ICB and CCB checks performed for all applicable analyses? Yes No N/A
Are ICB and CCB results acceptable? . . . . . Yes No N/A
Were preparation blanks analyzed? . . . . . Yes No N/A
Are preparation blank results acceptable? . . . . . Yes No N/A
Were field/trip blanks analyzed? . . . . . Yes No N/A
Are field/trip blank results acceptable? . . . . . Yes No N/A
Comments: See attached blank summary form
for blank adjustments.
- Sample locations are not currently available.
Field QC will be evaluated in the final
summary report.

5. ACCURACY

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

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

6. PRECISION

Were laboratory duplicates analyzed? . . . . . Yes No N/A

Are laboratory duplicate samples RPD values acceptable? . . . . Yes No N/A

Were ICP serial dilution samples analyzed? . . . . . Yes No N/A

Are ICP serial dilution %D values acceptable? . . . . . Yes No N/A

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

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

Comments: Iron dup RPD RPD 735%, Qualify all iron results as estimated (J).

7. FURNACE AA QUALITY CONTROL

Were duplicate injections performed as required? . . . . . Yes No N/A

Are duplicate injection %RSD values acceptable? . . . . . Yes No N/A

Were analytical spikes performed as required? . . . . . Yes No N/A

Are analytical spike recoveries acceptable? . . . . . Yes No N/A

Was MSA performed as required? . . . . . Yes No N/A

Are MSA results acceptable? . . . . . Yes No N/A

Comments:

8. REPORTED RESULTS AND DETECTION LIMITS

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

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

Are results calculated properly? . . . . . Yes No N/A

Do results meet the CRDLs? . . . . . Yes No N/A

Comments:

HOLDING TIME SUMMARY

B09DT4-TOA-690

SDG:	VALIDATOR:	DATE: 4/12/94	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
B09DT4	IEP-CLP	1/11/94		2/16/94		36	None
B09DT5		1/11/94				36	
B09DT7		1/11/94				36	
B09DT89		1/13/94				34	
B09QWF3						34	
B09WF5						34	
B09WF6						34	
B09DT4	As/Tl/Se, Pb	1/11/94		2/17/94		37	None
B09DT5						37	
B09DT7						37	
B09DT9		1/13/94				35	
B09WF3						35	
B09WF5						35	
B09WF6						35	

4/12/94

4/12/94

HOLDING TIME SUMMARY

B09DT4-TMA-690

SDG:	VALIDATOR:	DATE: 4/12/94	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
B09DT4	CN	1/11/94		01/24/94		13	None
T5						13	
T7						13	
T8 9		1/13/94				11	
B09WF3						11	
F5						11	
F6						11	
B09DT4	Hg	1/11/94		01/31/94		20	None
T5						20	
T7						20	
T9		1/13/94				18	
B09WF3						18	
F5						18	
F6						18	

4/12/94

BLANK AND SAMPLE DATA SUMMARY

B09DT4-TMA-690

SDG:	VALIDATOR: [illegible]	DATE: 4/12/94	PAGE 1 OF 3

COMMENTS: Metals

SAMPLE ID	COMPOUND	RESULT	Q	RT	UNITS	5X RESULT	10X RESULT	SAMPLES AFFECTED	QUALIFIER
CCB2	Barium	1.6	B		ug/L	8		B09DT4	u
								B09DT5	u
								B09WF5	u
								B09WF6	u
CCB1	Beryllium	0.7	B		ug/L	3.5		B09DT4	u
								B09DT7	u
								B09DT9	u
								B09WF3	u
ICB	Calcium	112.8	B		ug/L	x2 = -225.6		B09DT4	UJ
								B09DT5	UJ
								B09WF5	UJ
								B09WF6	UJ
	~~Calcium~~								
CCB1	Chromium	3.8	B		ug/L	19		B09DT4	u
								B09DT5	u
								B09WF5	u
								B09WF6	u

4/12/94

4/12/94

BLANK AND SAMPLE DATA SUMMARY

B09DT4-TMA-690

SDG:		VALIDATOR:				DATE: 4/12/94		PAGE 2 OF 3	
COMMENTS: Metals									
SAMPLE ID	COMPOUND	RESULT	Q	RT	UNITS	5X RESULT	10X RESULT	SAMPLES AFFECTED	QUALIFIER
CCB1	Copper	18.6	B		ug/L	93		B09DT4	U
								B09DT5	U
								B09DT7	U
								B09DT9	U
								B09WF3	U
~~3~~ CCB1	Magnesium	32.4	B		ug/L	162		B09DT4	U
								B09DT5	U
								B09WF5	U
								B09WF6	U
CCB2	Manganese	1.5	B		ug/L	7.5		B09DT4	U
								B09DT5	U
								B09WF5	U
								B09WF6	U
ICB	Potassium	87.8	B		ug/L	439		B09DT4	U
								B09DT5	U
								B09WF5	U
								B09WF6	U

4/12/94

BLANK AND SAMPLE DATA SUMMARY

B09DT4-TMA-690

SDG:	VALIDATOR: [illegible]	DATE: 4/12/94	PAGE 3 OF 3

COMMENTS:

SAMPLE ID	COMPOUND	RESULT	Q	RT	UNITS	5X RESULT	10X RESULT	SAMPLES AFFECTED	QUALIFIER
CCB2	Zinc	14.6	B		ug/L	73		B09DT4	U
CCB1	Titanium	2	B		ug/L	10		B09DT4	U
CCB1	Silver	2.3	B		ug/L	11.5		B09DT7	U
								~~B09DT9~~	~~U~~
								B09WF3	U
								B09WF5	U
PrepBlank	Antimony	-2.774	B		mg/kg		-27.74	B09DT4	UJ
								B09DT5	UJ
								B09DT7	UJ
								B09DT9	UJ
								B09WF3	UJ
								B09WF5	UJ
								B09WF6	UJ

WESTINGHOUSE/HANFORD

3
BLANKS

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D2-0039

Lab Code: SKINER Case No.: N4-01-049SAS No.: SDG No.: B09DT4

Preparation Blank Matrix (soil/water): SOIL

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

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Prepa-ration Blank	C	M
Aluminum	15.0	U	37.3	B	15.0	U	20.9	B	4.308	B	P
Antimony	12.2	U	12.2	U	12.2	U	-13.0	B	-2.774	B	P
Arsenic	3.0	U	3.0	U	3.0	U	3.0	U	0.600	U	P
Barium	0.8	U	1.5	B	1.6	B	1.7	B	0.160	U	P
Beryllium	0.4	B	0.7	B	0.6	B	0.6	B	0.060	U	P
Cadmium	1.7	U	1.7	U	1.7	U	1.7	U	0.340	U	P
Calcium	-112.8	B	83.4	U	397.0	B	83.4	U	16.680	U	P
Chromium	2.5	U	3.8	B	2.5	U	2.5	U	0.574	B	P
Cobalt	2.9	U	2.9	U	2.9	U	3.3	B	0.580	U	P
Copper	2.8	B	18.6	B	7.7	B	7.3	B	1.182	B	P
Iron	13.4	U	13.6	B	13.4	U	13.4	U	2.680	U	P
Lead	1.8	U	1.8	U	1.8	U	1.8	U	0.360	U	P
Magnesium	32.2	U	32.4	B	32.2	U	32.2	U	6.440	U	P
Manganese	0.8	U	1.3	B	1.5	B	1.6	B	0.244	B	P
Mercury	0.1	U	0.1	U	0.1	U	0.1	U	0.050	U	CV
Nickel	4.4	U	5.0	B	4.4	U	4.4	U	0.880	U	P
Potassium	87.8	B	58.8	U	58.8	U	58.8	U	13.090	B	P
Selenium	2.8	U	2.8	U	2.8	U	2.8	U	0.560	U	P
Silver	2.1	U	2.3	B	2.1	U	2.1	U	0.420	U	P
Sodium	39.6	U	39.6	U	39.6	U	39.6	U	7.920	U	P
Thallium	3.7	U	3.7	U	3.7	U	3.7	U	0.740	U	P
Vanadium	2.4	U	2.4	U	2.4	U	2.4	U	0.480	U	P
Zinc	4.6	U	5.3	B	14.6	B	5.1	B	0.920	U	P
Cyanide	10.0	U	10.0	U	10.0	U	10.0	U	0.500	U	CA
Titanium	1.2	U	2.0	B	1.8	B	1.9	B	0.298	B	P

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WESTINGHOUSE/HANFORD

6

DUPLICATES

SAMPLE NUMBER: B09WF6D

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D2-0039

Lab Code: SKINER Case No.: N4-01-049SAS No.: SDG No.: B09DT4

Matrix (soil/water): SOIL Level (low/med): LOW

% Solids for Sample: 99.9 % Solids for Duplicate: 99.9

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

Analyte	Control Limit	Sample (S)	C	Duplicate (D)	C	RPD	Q	M
Aluminum	39.3	60.2308		64.6724		7.1		P
Antimony		2.3946	U	2.3485	U			P
Arsenic		0.5888	U	0.5775	U			P
Barium		0.3356	B	0.3157	B	6.1		P
Beryllium		0.0589	U	0.0578	U			P
Cadmium		0.3337	U	0.3273	U			P
Calcium		16.3693	U	16.0545	U			P
Chromium		0.9441	B	0.4986	B	61.8		P
Cobalt		0.5692	U	0.5583	U			P
Copper		0.3140	U	0.3080	U			P
Iron		140.9802		230.2687		48.1	*	P
Lead		0.5406	B	0.4314	B	22.5		P
Magnesium		6.9913	B	7.6346	B	8.8		P
Manganese		0.5770	B	0.3427	B	51.0		P
Mercury		0.0501	U	0.0501	U			CV
Nickel		0.8636	U	0.8470	U			P
Potassium		19.9572	B	22.3069	B	11.1		P
Selenium		0.5496	U	0.5390	U			P
Silver		0.4122	U	0.4312	B	200.0		P
Sodium		7.7725	U	9.1091	B	200.0		P
Thallium		0.7262	U	0.7123	U			P
Vanadium		0.4711	U	0.4620	U			P
Zinc		0.9029	U	0.8855	U			P
Cyanide		0.4955	U	0.4907	U			CA
Titanium		2.0628	B	2.0078	B	2.7		P

Qualifying all ~~to~~ positive iron results as estimated (J).

4/12/94

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MEMORANDUM

APR 1994
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TO: 200-UP-2 Project QA Record April 18, 1994

FR: Susan Winter, Golder Associates Inc.

RE: VOLATILE ORGANICS DATA VALIDATION SUMMARY FOR DATA PACKAGE: B09DT4-TMA-690 (923-E418, Filename B09DT4.VOA)

INTRODUCTION

This memo presents the results of data validation on data package B09DT4-TMA-690 prepared by the Thermo Analytical (TMA) laboratory. A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

SAMPLE ID	SAMPLE DATE	MEDIA	ANALYSIS
B09DT4	01/11/94	SOIL	SEE NOTE 1
B09DT5	01/11/94	SOIL	
B09DT6	01/11/94	SOIL	
B09DT7	01/11/94	SOIL	
B09DT9	01/13/94	SOIL	
B09WF3	01/13/94	SOIL	
B09WF5	01/13/94	SOIL	
B09WF6	01/13/94	SOIL	
Note 1. All samples were analyzed for CLP TCL volatile organics.			

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

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

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APR 1 1994
VALIDATION DOCUMENTATION
SDLA

DATA QUALITY OBJECTIVES

This section presents a summary of the data quality in terms of the referenced validation criteria.

Precision. Goals for precision were met.

Accuracy. Goals for accuracy were met.

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

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

001

Completeness. The data package was complete for all requested analyses. A total of eight samples were validated in this data package with a total of 264 determinations reported, all of which were deemed valid. This results in a completeness of 100 percent, which meets normal work plan objectives of 90%.

MAJOR DEFICIENCIES

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

MINOR DEFICIENCIES

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

Laboratory Blanks

- Methylene chloride, acetone, toluene, and 4-methyl-2-pentanone were detected in the associated laboratory blanks. Attachments 2 and 5 provide a summary of the samples affected, data qualifications applied and supporting documentation.

TENTATIVELY IDENTIFIED COMPOUND EVALUATION

Tentatively identified compounds (TICs) reported by the laboratory were evaluated during validation and qualified as follows:

- TICs were detected in the sample(s) and determined to be valid, resulting in qualification of the results as presumptive and valid (JN).

REFERENCES

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

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

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ATTACHMENT 1

GLOSSARY OF DATA REPORTING QUALIFIERS

GLOSSARY OF ORGANIC DATA REPORTING QUALIFIERS

B - Indicates the constituent was analyzed for and detected in the associated laboratory blank. This qualifier is applied by the laboratory. During the process of data validation this qualifier may be replaced by other appropriate qualifiers as defined by the validation procedures. The associated data should be considered usable for decision making purposes.

U - Indicates the constituent was analyzed for and not detected. The concentration reported is the sample quantitation limit corrected for aliquot size, dilution and percent solids (in the case of solid matrices) by the laboratory. The associated data should be considered usable for decision making purposes.

UJ - Indicates the constituent was analyzed for and not detected. Due to a minor quality control deficiency identified during data validation the concentration reported may not accurately reflect the sample quantitation limit. The associated data should be considered usable for decision making purposes.

J - Indicates the constituent was analyzed for and detected. This qualifier may be applied by the laboratory to indicate a concentration which is less than the contract required quantitation limit (CRQL) but greater than the instrument detection limit (IDL). During data validation this qualifier may be applied to indicate a minor quality control deficiency. However in either case, the associated data should be considered usable for decision making purposes.

NJ - Indicates presumptive evidence of a constituent at an estimated value. This qualifier is normally applied to GC analysis data (such as organochlorine pesticide and PCB data). The associated data should be considered usable for decision making purposes.

N - Indicates presumptive evidence of a constituent. This qualifier is normally applied to GC analysis data (such as organochlorine pesticide and PCB data). The associated data should be considered usable for decision making purposes.

JN - Indicates a tentatively identified compound (TIC) whose concentration and identification have been determined to be valid as a result of data validation. The associated data should be considered usable for decision making purposes.

UJN - Indicates a tentatively identified compound (TIC) that has been determined to be presumptive and valid (JN) in terms of identification and quantitation and has been qualified as undetected (U) due to associated blank contamination.

UR - Indicates the constituent was analyzed for and not detected. The concentration reported has been qualified as unusable due to a major quality control deficiency identified during data validation. The associated data should be considered unusable for decision making purposes.

R - Indicates the constituent was analyzed for and detected. The concentration reported has been qualified as unusable due to a major quality control deficiency identified during data validation. The associated data should be considered unusable for decision making purposes.

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ATTACHMENT 2

SUMMARY OF DATA QUALIFICATIONS

DATA QUALIFICATION SUMMARY

SDG: B09DQ6-TMA-681	VALIDATOR:	DATE: April 18, 1994	PAGE 1 OF 1
COMMENTS: VOLATILE ORGANICS			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
METHYLENE CHLORIDE	U	B09DT4 B09DT6 B09DT9 B09WF6	PRESENT IN BLANK
ACETONE	U	B09DT4 B09DT5 B09DT6 B09DT7 B09DT9 B09WF3 B09WF5 B09WF6	PRESENT IN BLANK
4-METHYL-2-PENTANONE	U	B09DT6 B09WF5	PRESENT IN BLANK
TOLUENE	U	B09DT6	PRESENT IN BLANK
~~4-METHYL-2-PENTANONE~~	~~BJ~~	~~B09DT5~~	~~PRESENT IN BLANK, BUT SAMPLE CONCENTRATION IS > 5 x BLANK CONCENTRATION~~
~~TOLUENE~~	~~BJ~~	~~B09WF6~~	~~PRESENT IN BLANK, BUT SAMPLE CONCENTRATION IS > 10 x BLANK CONCENTRATION~~

4/28/94

Reflagged 4/28/94

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ATTACHMENT 3

QUALIFIED DATA SUMMARY AND ANNOTATED LABORATORY REPORTS

Validated Data Summary, Data Package: B09DT4-TMA-690

	Samp#	B09DT4		B09DT5		B09DT6		B09DT7		B09DT9		B09WF3	
	Date	1-11-94		1-11-94		1-11-94		1-11-94		1-13-94		1-13-94	
	Location	---		---		---		---		---		---	
	Depth	---		---		---		---		---		---	
	Type	---		---		---		---		---		---	
	Comments	---		---		---		---		---		---	
Parameter	Units	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
CHLOROMETHANE	UG/KG	10.000	U	10.000	U	12.000	U	10.000	U	11.000	U	11.000	U
BROMOMETHANE	UG/KG	10.000	U	10.000	U	12.000	U	10.000	U	11.000	U	11.000	U
VINYL CHLORIDE	UG/KG	10.000	U	10.000	U	12.000	U	10.000	U	11.000	U	11.000	U
CHLOROETHANE	UG/KG	10.000	U	10.000	U	12.000	U	10.000	U	11.000	U	11.000	U
METHYLENE CHLORIDE	UG/KG	10.000	U	10.000	U	12.000	U	10.000	U	11.000	U	11.000	U
ACETONE	UG/KG	18.000	U	13.000	U	12.000	U	10.000	U	11.000	U	11.000	U
CARBON DISULFIDE	UG/KG	10.000	U	10.000	U	12.000	U	10.000	U	11.000	U	11.000	U
1,1-DICHLOROETHENE	UG/KG	10.000	U	10.000	U	12.000	U	10.000	U	11.000	U	11.000	U
1,1-DICHLOROETHANE	UG/KG	10.000	U	10.000	U	12.000	U	10.000	U	11.000	U	11.000	U
1,2-DICHLOROETHENE (TOTAL)	UG/KG	10.000	U	10.000	U	12.000	U	10.000	U	11.000	U	11.000	U
CHLOROFORM	UG/KG	10.000	U	10.000	U	12.000	U	10.000	U	11.000	U	11.000	U
1,2-DICHLOROETHANE	UG/KG	10.000	U	10.000	U	12.000	U	10.000	U	11.000	U	11.000	U
2-BUTANONE	UG/KG	10.000	U	10.000	U	12.000	U	10.000	U	11.000	U	11.000	U
1,1,1-TRICHLOROETHANE	UG/KG	10.000	U	10.000	U	12.000	U	10.000	U	11.000	U	11.000	U
CARBON TETRACHLORIDE	UG/KG	10.000	U	10.000	U	12.000	U	10.000	U	11.000	U	11.000	U
BROMODICHLOROMETHANE	UG/KG	10.000	U	10.000	U	12.000	U	10.000	U	11.000	U	11.000	U
1,2-DICHLOROPROPANE	UG/KG	10.000	U	10.000	U	12.000	U	10.000	U	11.000	U	11.000	U
CIS-1,3-DICHLOROPROPENE	UG/KG	10.000	U	10.000	U	12.000	U	10.000	U	11.000	U	11.000	U
TRICHLOROETHENE	UG/KG	10.000	U	10.000	U	12.000	U	10.000	U	11.000	U	11.000	U
DIBROMOCHLOROMETHANE	UG/KG	10.000	U	10.000	U	12.000	U	10.000	U	11.000	U	11.000	U
1,1,2-TRICHLOROETHANE	UG/KG	10.000	U	10.000	U	12.000	U	10.000	U	11.000	U	11.000	U
BENZENE	UG/KG	10.000	U	10.000	U	12.000	U	10.000	U	11.000	U	11.000	U
TRANS-1,3-DICHLOROPROPENE	UG/KG	10.000	U	10.000	U	12.000	U	10.000	U	11.000	U	11.000	U
BROMOFORM	UG/KG	10.000	U	10.000	U	12.000	U	10.000	U	11.000	U	11.000	U
4-METHYL-2-PENTANONE	UG/KG	10.000	U	2.000	BJ	12.000	U	10.000	U	11.000	U	11.000	U
2-HEXANONE	UG/KG	10.000	U	10.000	U	12.000	U	10.000	U	11.000	U	11.000	U
TETRACHLOROETHENE	UG/KG	10.000	U	10.000	U	12.000	U	10.000	U	11.000	U	11.000	U
1,1,2,2-TETRACHLOROETHANE	UG/KG	10.000	U	10.000	U	12.000	U	10.000	U	11.000	U	11.000	U
TOLUENE	UG/KG	10.000	U	10.000	U	12.000	U	10.000	U	11.000	U	11.000	U
CHLOROBENZENE	UG/KG	10.000	U	10.000	U	12.000	U	10.000	U	11.000	U	11.000	U
ETHYLBENZENE	UG/KG	10.000	U	10.000	U	12.000	U	10.000	U	11.000	U	11.000	U
STYRENE	UG/KG	10.000	U	10.000	U	12.000	U	10.000	U	11.000	U	11.000	U
XYLENES (TOTAL)	UG/KG	10.000	U	10.000	U	12.000	U	10.000	U	11.000	U	11.000	U

Verified
4/18/94

Validated Data Summary, Data Package: B09DT4-TMA-690

	Samp#	B09WF5		B09WF6	
	Date	1-13-94		1-13-94	
	Location	---		---	
	Depth	---		---	
	Type	---		---	
	Comments	---		---	
Parameter	Units	Result	Q	Result	Q
CHLOROMETHANE	UG/KG	10.000	U	10.000	U
BROMOMETHANE	UG/KG	10.000	U	10.000	U
VINYL CHLORIDE	UG/KG	10.000	U	10.000	U
CHLOROETHANE	UG/KG	10.000	U	10.000	U
METHYLENE CHLORIDE	UG/KG	10.000	U	10.000	U
ACETONE	UG/KG	10.000	U	14.000	U
CARBON DISULFIDE	UG/KG	10.000	U	10.000	U
1,1-DICHLOROETHENE	UG/KG	10.000	U	10.000	U
1,1-DICHLOROETHANE	UG/KG	10.000	U	10.000	U
1,2-DICHLOROETHENE (TOTAL)	UG/KG	10.000	U	10.000	U
CHLOROFORM	UG/KG	10.000	U	10.000	U
1,2-DICHLOROETHANE	UG/KG	10.000	U	10.000	U
2-BUTANONE	UG/KG	10.000	U	10.000	U
1,1,1-TRICHLOROETHANE	UG/KG	10.000	U	10.000	U
CARBON TETRACHLORIDE	UG/KG	10.000	U	10.000	U
BROMODICHLOROMETHANE	UG/KG	10.000	U	10.000	U
1,2-DICHLOROPROPANE	UG/KG	10.000	U	10.000	U
CIS-1,3-DICHLOROPROPENE	UG/KG	10.000	U	10.000	U
TRICHLOROETHENE	UG/KG	10.000	U	10.000	U
DIBROMOCHLOROMETHANE	UG/KG	10.000	U	10.000	U
1,1,2-TRICHLOROETHANE	UG/KG	10.000	U	10.000	U
BENZENE	UG/KG	10.000	U	10.000	U
TRANS-1,3-DICHLOROPROPENE	UG/KG	10.000	U	10.000	U
BROMOFORM	UG/KG	10.000	U	10.000	U
4-METHYL-2-PENTANONE	UG/KG	10.000	U	10.000	U
2-HEXANONE	UG/KG	10.000	U	10.000	U
TETRACHLOROETHENE	UG/KG	10.000	U	10.000	U
1,1,2,2-TETRACHLOROETHANE	UG/KG	10.000	U	10.000	U
TOLUENE	UG/KG	10.000	U	4.000	BJ
CHLOROBENZENE	UG/KG	10.000	U	10.000	U
ETHYLBENZENE	UG/KG	10.000	U	10.000	U
STYRENE	UG/KG	10.000	U	10.000	U
XYLENES (TOTAL)	UG/KG	10.000	U	10.000	U

Verified
[illegible] 4/18/94

9713517.2271

~~000157~~

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B09DT4

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 01025 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A401025-06A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 40124R11

Level: (low/med) LOW Date Received: 01/18/94

% Moisture: not dec. 0 Date Analyzed: 01/24/94

GC Column: PACK ID: 2.00 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

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

010

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9213512.2272

~~000158~~

EPA SAMPLE NO.

B09DT4

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 01025 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A401025-06A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 40124R11

Level: (low/med) LOW Date Received: 01/18/94

% Moisture: not dec. 0 Date Analyzed: 01/24/94

GC Column: PACK ID: 2.00 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

Number TICs found: 2

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q	
1.	UNKNOWN HYDROCARBON	18.45	8	~~J~~	JN
2.	UNKNOWN HYDROCARBON	27.70	13	~~J~~	JN

Verified 4/8/94

011

9413517.2273

~~000171~~

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B09DT5

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 01025 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A401025-07A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 40125R04

Level: (low/med) LOW Date Received: 01/18/94

% Moisture: not dec. 0 Date Analyzed: 01/25/94

GC Column: PACK ID: 2.00 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q	Q
74-87-3	Chloromethane	10	U	
74-83-9	Bromomethane	10	U	
75-01-4	Vinyl Chloride	10	U	
75-00-3	Chloroethane	10	U	
75-09-2	Methylene Chloride	10	U	
67-64-1	Acetone	13	~~B~~	u
75-15-0	Carbon Disulfide	10	U	
75-35-4	1,1-Dichloroethene	10	U	
75-34-3	1,1-Dichloroethane	10	U	
540-59-0	1,2-Dichloroethene (total)	10	U	
67-66-3	Chloroform	10	U	
107-06-2	1,2-Dichloroethane	10	U	
78-93-3	2-Butanone	10	U	
71-55-6	1,1,1-Trichloroethane	10	U	
56-23-5	Carbon Tetrachloride	10	U	
75-27-4	Bromodichloromethane	10	U	
78-87-5	1,2-Dichloropropane	10	U	
10061-01-5	cis-1,3-Dichloropropene	10	U	
79-01-6	Trichloroethene	10	U	
124-48-1	Dibromochloromethane	10	U	
79-00-5	1,1,2-Trichloroethane	10	U	
71-43-2	Benzene	10	U	
10061-02-6	trans-1,3-Dichloropropene	10	U	
75-25-2	Bromoform	10	U	
108-10-1	4-Methyl-2-Pentanone	2	~~J~~	
591-78-6	2-Hexanone	10	U	
127-18-4	Tetrachloroethene	10	U	
79-34-5	1,1,2,2-Tetrachloroethane	10	U	
108-88-3	Toluene	10	U	
108-90-7	Chlorobenzene	10	U	
100-41-4	Ethylbenzene	10	U	
100-42-5	Styrene	10	U	
1330-20-7	Xylene (total)	10	U	

4/28/94

~~012~~ Replaced 4/28/94

FORM I VOA 3/90

Verified 4/8/94

012

9713517.2274

~~000172~~

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B09DT5

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 01025 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A401025-07A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 40125R04

Level: (low/med) LOW Date Received: 01/18/94

% Moisture: not dec. 0 Date Analyzed: 01/25/94

GC Column: PACK ID: 2.00 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

Number TICs found: 1

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN HYDROCARBON	27.75	6	J

Q
JN

Verified 4/8/94

-013

FORM I VOA-TIC 3/90

9413417.2275

~~000184~~
EPA SAMPLE NO.

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

B09DT6

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 01025 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A401025-05A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 40124R04

Level: (low/med) LOW Date Received: 01/18/94

% Moisture: not dec. 17 Date Analyzed: 01/24/94

GC Column: PACK ID: 2.00 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

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

L014

FORM I VOA Verified [signature] 4/8/94 3/90

9713517.2276

~~000185~~

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B09DT6

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 01025 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A401025-05A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 40124R04

Level: (low/med) LOW Date Received: 01/18/94

% Moisture: not dec. 17 Date Analyzed: 01/24/94

GC Column: PACK ID: 2.00 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

Number TICs found: 1

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN HYDROCARBON	27.75	7	~~J~~

Q
JN

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Verified
4/8/94

FORM I VOA-TIC 3/90

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~~000201~~

EPA SAMPLE NO.

B09DT7

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 01025 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A401025-08A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 40124R13

Level: (low/med) LOW Date Received: 01/18/94

% Moisture: not dec. 4 Date Analyzed: 01/24/94

GC Column: PACK ID: 2.00 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

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

Q

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016

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Verified 4/8/94

9713517.2278

~~000202~~
EPA SAMPLE NO.

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

B09DT7

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 01025 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A401025-08A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 40124R13

Level: (low/med) LOW Date Received: 01/18/94

% Moisture: not dec. 4 Date Analyzed: 01/24/94

GC Column: PACK ID: 2.00 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

Number TICs found: 0

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

Verified
4/8/94

FORM I VOA-TIC 3/90

9713517.2279

~~000211~~

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B09DT9

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 01025 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A401025-01A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 40124R07

Level: (low/med) LOW Date Received: 01/18/94

% Moisture: not dec. 9 Date Analyzed: 01/24/94

GC Column: PACK ID: 2.00 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

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

018

FORM I VOA Verified 4/8/94 3/90

9716517.2200

~~000212~~
EPA SAMPLE NO.

B09DT9

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 01025 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A401025-01A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 40124R07

Level: (low/med) LOW Date Received: 01/18/94

% Moisture: not dec. 9 Date Analyzed: 01/24/94

GC Column: PACK ID: 2.00 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____(uL)

Number TICs found: 1

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN HYDROCARBON	27.75	14	~~J~~

Q
JN

019

Verified
4/8/94

FORM I VOA-TIC 3/90

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~~000224~~

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B09WF3

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 01025 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A401025-02A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 40124R08

Level: (low/med) LOW Date Received: 01/18/94

% Moisture: not dec. 7 Date Analyzed: 01/24/94

GC Column: PACK ID: 2.00 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

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

020

FORM I VOA Verified 4/8/94 3/90

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~~000225~~

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B09WF3

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 01025 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A401025-02A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 40124R08

Level: (low/med) LOW Date Received: 01/18/94

% Moisture: not dec. 7 Date Analyzed: 01/24/94

GC Column: PACK ID: 2.00 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

Number TICs found: 0

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

Verified
[signature] 4/8/94

L021

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~~000234~~
EPA SAMPLE NO.

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

B09WF5

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 01025 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A401025-03A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 40124R09

Level: (low/med) LOW Date Received: 01/18/94

% Moisture: not dec. 0 Date Analyzed: 01/24/94

GC Column: PACK ID: 2.00 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

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

1022

FORM I VOA 3/90

Verified 4/8/94

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1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B09WF5

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 01025 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A401025-03A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 40124R09

Level: (low/med) LOW Date Received: 01/18/94

% Moisture: not dec. 0 Date Analyzed: 01/24/94

GC Column: PACK ID: 2.00 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

Number TICs found: 2

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q	Q
1.	UNKNOWN HYDROCARBON	27.75	10	~~J~~	JN
2.	UNKNOWN HYDROCARBON	28.92	5	~~J~~	JN

Verified
[signature] 4/8/94

1023

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1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B09WF6

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 01025 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A401025-04A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 40124R10

Level: (low/med) LOW Date Received: 01/18/94

% Moisture: not dec. 0 Date Analyzed: 01/24/94

GC Column: PACK ID: 2.00 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q	Q
74-87-3	Chloromethane	10	U	
74-83-9	Bromomethane	10	U	
75-01-4	Vinyl Chloride	10	U	
75-00-3	Chloroethane	10	U	
75-09-2	Methylene Chloride	10 ~~1~~	~~BJ~~	U
67-64-1	Acetone	14	~~B~~	U
75-15-0	Carbon Disulfide	10	U	
75-35-4	1,1-Dichloroethene	10	U	
75-34-3	1,1-Dichloroethane	10	U	
540-59-0	1,2-Dichloroethene (total)	10	U	
67-66-3	Chloroform	10	U	
107-06-2	1,2-Dichloroethane	10	U	
78-93-3	2-Butanone	10	U	
71-55-6	1,1,1-Trichloroethane	10	U	
56-23-5	Carbon Tetrachloride	10	U	
75-27-4	Bromodichloromethane	10	U	
78-87-5	1,2-Dichloropropane	10	U	
10061-01-5	cis-1,3-Dichloropropene	10	U	
79-01-6	Trichloroethene	10	U	
124-48-1	Dibromochloromethane	10	U	
79-00-5	1,1,2-Trichloroethane	10	U	
71-43-2	Benzene	10	U	
10061-02-6	trans-1,3-Dichloropropene	10	U	
75-25-2	Bromoform	10	U	
108-10-1	4-Methyl-2-Pentanone	10	U	
591-78-6	2-Hexanone	10	U	
127-18-4	Tetrachloroethene	10	U	
79-34-5	1,1,2,2-Tetrachloroethane	10	U	
108-88-3	Toluene	4	~~J~~	
108-90-7	Chlorobenzene	10	U	
100-41-4	Ethylbenzene	10	U	
100-42-5	Styrene	10	U	
1330-20-7	Xylene (total)	10	U	

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Replaced 4/28/94

FORM I VOA Verified 4/8/94 3/90

024

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EPA SAMPLE NO.

B09WF6

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 01025 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A401025-04A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 40124R10

Level: (low/med) LOW Date Received: 01/18/94

% Moisture: not dec. 0 Date Analyzed: 01/24/94

GC Column: PACK ID: 2.00 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

Number TICs found: 0

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

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[illegible] 4/8/94

025

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ATTACHMENT 4

LABORATORY NARRATIVE AND CHAIN-OF-CUSTODY DOCUMENTATION

000085

CASE NARRATIVE

LABORATORY : TMA/ARLI

CASE : 01-025

CONTRACT ID : WESTINGHOUSE HANFORD COMPANY

SDG RECEIPT DATE : January 18, 1994

1.0 DESCRIPTION OF CASE :

Eight soil samples were analyzed for TCL Organics- Volatiles and Semivolatiles according to the USEPA Contract Laboratory Program (CLP) Statement of Work for Organic Analysis, Revision OLM01.8. The Extractable Hydrocarbons for Kerosene (K) were analyzed according to the SW-846 Method 8015M.

2.0 SAMPLE LIST :

WESTINGHOUSE ID	LAB ID	ANALYSIS REQUESTED	MATRIX
B09DT9	A4-01-025-01A	V	SOIL
B09DT9	A4-01-025-01B	SV	SOIL
B09DT9 MS	A4-01-025-01C	SV	SOIL
B09DT9 MSD	A4-01-025-01D	SV	SOIL
B09DT9	A4-01-025-01G	K	SOIL
B09WF3	A4-01-025-02A	V	SOIL
B09WF3	A4-01-025-02B	SV	SOIL
B09WF3	A4-01-025-02E	K	SOIL
B09WF3 MS	A4-01-025-02F	K	SOIL
B09WF3 MSD	A4-01-025-02G	K	SOIL
B09WF5	A4-01-025-03A	V	SOIL
B09WF5	A4-01-025-03B	SV	SOIL
B09WF5	A4-01-025-03D	K	SOIL
B09WF6	A4-01-025-04A	V	SOIL
B09WF6	A4-01-025-04B	SV	SOIL
B09WF6	A4-01-025-04D	K	SOIL
B09DT6	A4-01-025-05A	V	SOIL
B09DT6 MS	A4-01-025-05B	V	SOIL
B09DT6 MSD	A4-01-025-05C	V	SOIL
B09DT4	A4-01-025-06A	V	SOIL
B09DT4	A4-01-025-06B	SV	SOIL
B09DT4	A4-01-025-06D	K	SOIL
B09DT5	A4-01-025-07A	V	SOIL
B09DT5	A4-01-025-07B	SV	SOIL
B09DT5	A4-01-025-07D	K	SOIL
B09DT7	A4-01-025-08A	V	SOIL
B09DT7	A4-01-025-08B	SV	SOIL
B09DT7	A4-01-025-08D	K	SOIL

000086

3.0 COMMENTS :

3.1 SHIPPING AND DOCUMENTATION :

All of the samples were received intact and properly documented.

3.2 ANALYSIS

3.2.1 VOLATILE ANALYSIS COMMENTS :

LOW LEVEL SOIL :

The samples were analyzed by heated purge within the CLP SOW holding times. The samples were analyzed during a period from 01/19/94 through 01/27/94, on the instrument "ROCKY". On 01/19/94, the operator inadvertently entered the wrong year during the instrument system boot-up, and therefore, all of the sample data incorrectly documented the year as "1993". Since it was not possible to change the date of analysis within the system the work order data was processed as is, and the appropriate manual corrections were made on the raw data by the laboratory. In addition, the report forms were changed to reflect the correct year of analysis (1994).

The analyte Acetone was detected at concentrations above the CRQL in samples B09DT4, B09DT5, B09DT6, B09WF6, B09DT6MS, and the blanks, VBLK0124R and VBLK0125R. In all of the other samples, Acetone was detected at concentrations either at or below the CRQL. Other TCL analytes detected in some of the samples included Methylene Chloride, 4-Methyl-2-pentanone, and Toluene, all at concentrations below the CRQL.

All of the QC results were within the limits specified by the EPA CLP SOW.

3.2.2 SEMIVOLATILE ANALYSIS COMMENTS :

LOW LEVEL SOIL :

The samples were extracted and analyzed within the contract required holding times.

In all of the samples Di-n-butylphthalate was detected at concentrations less than the CRQL. In addition, sample B09WF5 had bis(2-Ethylhexyl)phthalate detected at a concentration below the CRQL.

Both the MS and the MSD sample had matrix spike recoveries above the QC limits for 2,4-Dinitrotoluene, while the MSD sample also had a high recovery for 4-Nitrophenol. In accordance with the protocol, no further action was required.

All of the other QC results were within the limits specified

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by the EPA CLP SOW.

3.2.3 EXTRACTABLE HYDROCARBONS "KEROSENE RANGE" COMMENTS :

SEQUENCE NOTES :

The sequence was started on 01/19/94 and was analyzed according to the SW-846 Method 8015M. The initial calibration consisted of 5 different levels of the Kerosene standard that ranged from approximately 200ppm to 2000ppm. The continuing calibration at approximately 1000ppm was injected amongst the samples, in order to verify the instrument stability. The %RSD in the initial calibration and the %D in the continuing calibration were below their 20% and 15% limits, respectively.

SAMPLE NOTES :

LOW LEVEL SOIL :

The samples were extracted and analyzed within the required holding times. Approximately 20 g of each sample was extracted and concentrated to 5 mL.

There was no Kerosene detected in any of the samples. Sample B09WF3 was spiked with Kerosene, and the matrix spike recoveries were 51% for the MS, and 54% for the MSD. The blank spike was prepared at the same time and had a 52% recovery, and the data was included in the "Additional Raw Data" portion of the package.

All of the QC results were within the limits specified by the SW-846 Method 8015M.

We certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data in this hardcopy data package and in the computer-readable data submitted on diskette is authorized by the Laboratory Manager or his designees, as verified by the following signatures.

Nicole Roth 3/3/94
Nicole Roth
Program Manager

Maureen Parrish 3/2/94
Maureen Parrish
Project Manager

9213517.2291

~~000002A~~

Westinghouse Hanford Company

CHAIN OF CUSTODY

Custody Form Initiator: L E ROGERS / W.U. SETZER

Company Contact: L E ROGERS — Telephone: 376-7690

Project Designation/Sampling Locations: 200-UP-2 — Collection Date: 1-11-94

Ice Chest No.: SML 342 — Field Logbook No.: ~~EFL-1091~~ EFL-115 1-13-94

Bill of Lading/Airbill No.: 2519008360 — Offsite Property No.: W94-0-0216-1

Method of Shipment: AIR

Shipped to: TMA

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

Sample Identification

1) B09DT4
- 1,250ml P:CLP;TAL Metals,Hg,Ti
- 1,250ml Gs:VOA CLP
- 1,250ml aG:Semi-VOA CLP
- 1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
- 1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
- 1,125ml G:Cyanide CLP
- 1,125ml Gw:Kerosene (8015M)
- 1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

2) B09DT5
- 1,250ml P:CLP;TAL Metals,Hg,Ti
- 1,250ml Gs:VOA CLP
- 1,250ml aG:Semi-VOA CLP
- 1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
- 1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
- 1,125ml G:Cyanide CLP
- 1,125ml Gw:Kerosene (8015M)
- 1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

3) B09DT7
- 1,250ml P:CLP;TAL Metals,Hg,Ti
- 1,250ml Gs:VOA CLP
- 1,250ml aG:Semi-VOA CLP
- 1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
- 1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
- 1,125ml G:Cyanide CLP
- 1,125ml Gw:Kerosene (8015M)
- 1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

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

Relinquished by:	Received by:	Date/Time:
W.U. Setzer	Kermit Blum K. Blum	1-18-94 1330
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

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

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~~000020~~

Westinghouse Hanford Company	CHAIN OF CUSTODY

Custody Form Initiator: L E ROGERS

Company Contact: L E ROGERS — Telephone: 376-7690

Project Designation/Sampling Locations: 200-UP-2 — Collection Date: 1-13-94

Ice Chest No.: SML-311 — Field Logbook No.: EFL-1091

Bill of Lading/Airbill No.: — Offsite Property No.: 0351-17394

Method of Shipment: AIR

Shipped to: TMA

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

Sample Identification

1) B09D19

- 1,250ml P:CLP;TAL Metals,Hg,Ti
- 1,250ml Gs:VOA CLP
- 1,250ml aG:Semi-VOA CLP
- 1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
- 1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
- 1,125ml G:Cyanide CLP
- 1,125ml Gw:Kerosene (8015M)
- 1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

2) B09WF3

- 1,250ml P:CLP;TAL Metals,Hg,Ti
- 1,250ml Gs:VOA CLP
- 1,250ml aG:Semi-VOA CLP
- 1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
- 1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
- 1,125ml G:Cyanide CLP
- 1,125ml Gw:Kerosene (8015M)
- 1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

~~3)~~

- ~~1,250ml P:CLP;TAL Metals,Hg,Ti~~
- 1,250ml Gs:VOA CLP
- 1,250ml aG:Semi-VOA CLP
- 1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
- 1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
- 1,125ml G:Cyanide CLP
- 1,125ml Gw:Kerosene (8015M)
- 1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

1-17-94

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

Relinquished by:	Received by:	Date/Time:
1-17-94 Loren E. Rogers 0930	W.V. Setzer W.V. SETZER	1-17-94 0930
Relinquished by: W.V. Setzer	Received by: [illegible]	Date/Time: 1-18-94 10:35
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

031

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

9413517.2293

000002E

Westinghouse Hanford Company

CHAIN OF CUSTODY

Custody Form Initiator: L E ROGERS

Company Contact: L E ROGERS Telephone: 376-7690

Project Designation/Sampling Locations: 200-UP-2 Collection Date: 1-13-94

Ice Chest No.: SML-335 Field Logbook No.: EFL-1091

Bill of Lading/Airbill No.: 2519008448 Offsite Property No.: W94-0-0216-3

Method of Shipment: AIR

Shipped to: TMA

Possible Sample Hazards/Remarks: Keep samples at 4C (SOIL) NONE NOTED

Sample Identification

1) B09WF5

4,250ml P:CLP;TAL Metals,Hg,Ti
4,250ml Gs:VOA CLP
4,250ml aG:Semi-VOA CLP
4,125ml G:Anions F,Cl,SO4 (EPA 300.0)
4,125ml P/G:Anions NO2,NO3 (EPA 353.2)
4,125ml G:Cyanide CLP
4,125ml Gw:Kerosene (8015M)
4,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

2) B09WF6

4,250ml P:CLP;TAL Metals,Hg,Ti
4,250ml Gs:VOA CLP
4,250ml aG:Semi-VOA CLP
4,125ml G:Anions F,Cl,SO4 (EPA 300.0)
4,125ml P/G:Anions NO2,NO3 (EPA 353.2)
4,125ml G:Cyanide CLP
4,125ml Gw:Kerosene (8015M)
4,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

3)

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

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

Relinquished by:	Received by:	Date/Time:
Loren E. Rogers 0940 1-17-94	W.V. Seltzer	1-17-94 0940
W.V. Seltzer	Kermit Blum K. Blum	1-18-94 1330
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

L032

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

9713517.2294

~~CC0002G~~

Westinghouse Hanford Company	CHAIN OF CUSTODY

Custody Form Initiator: L E ROGERS / W.V. SETZER

Company Contact: L E ROGERS — Telephone: 376-7690

Project Designation/Sampling Locations: 200-UP-2 — Collection Date: 1-11-94

Ice Chest No.: SML 342 — Field Logbook No.: ~~EFL 1091~~ EFL-1115 BER 1-13-94

Bill of Lading/Airbill No.: 2519008360 — Offsite Property No.: W94-0-0216-1

Method of Shipment: AIR

Shipped to: TMA

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

Sample Identification

1) B09D76 (0700)
~~1,250ml P:CLP;TAL Metals,Hg,Ti~~
1,250ml Gs:VOA CLP
~~1,250ml aG:Semi-VOA CLP~~
~~1,125ml G:Anions F,Cl,SO4 (EPA 300.0)~~
~~1,125ml P/G:Anions NO2,NO3 (EPA 353.2)~~
~~1,125ml G:Cyanide CLP~~
~~1,125ml Gw:Kerosene (8015M)~~
~~1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152,~~
Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

WVS 1-11-94

2)
1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152,
Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

WVS 1-11-94

3)
1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152,
Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

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

Relinquished by:	Received by:	Date/Time:
W.V. Setzer	Kermit Blum K. Blum	1-18-94 1330
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

L033

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

9713517.2295

ATTACHMENT 5

DATA VALIDATION SUPPORTING DOCUMENTATION

GC/MS ORGANIC DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E

PROJECT: 200-UP-2	DATA PACKAGE: B09DT4-TMA-690	
VALIDATOR: [illegible]	LAB: TMA	DATE: 4/08/94
CASE:	SDG: B09DT4-TMA-690	

ANALYSES PERFORMED

☒ CLP Volatiles	☐ SW-846 8240 (cap column)	☐ SW-846 8260 (packed column)	☐ CLP Semivolatiles	☐ SW-846 8270 (cap column)	☐ SW-846 (packed column)
☐	☐	☐	☐	☐	☐

SAMPLES/MATRIX Soils	
B09DT4	B09WF3
B09DT5	B09WF5
B09DT6	B09WF6
B09DT7	
B09DT9	

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Is technical verification documentation present? . . . . . (Yes) No N/A

Is a case narrative present? . . . . . (Yes) No N/A

Comments:

2. HOLDING TIMES

Are sample holding times acceptable? . . . . . (Yes) No N/A

Comments:

035

GC/MS ORGANIC DATA VALIDATION CHECKLIST

3. INSTRUMENT TUNING AND CALIBRATION

Is the GC/MS tuning/performance check acceptable? . . . . . Yes No N/A

Are initial calibrations acceptable? . . . . . Yes No N/A

Are continuing calibrations acceptable? . . . . . Yes No N/A

Comments:

4. BLANKS

Were laboratory blanks analyzed? . . . . . Yes No N/A

Are laboratory blank results acceptable? . . . . . Yes No N/A

Were field/trip blanks analyzed? . . . . . Yes No N/A

Are field/trip blank results acceptable? . . . . . Yes No N/A

Comments: See following blank summary form for blank adjustments and see last page of checklist for comments.

5. ACCURACY

Were surrogates/System Monitoring Compounds analyzed? . . . . Yes No N/A

Are surrogate/System Monitoring Compound recoveries acceptable? Yes No N/A

Were MS/MSD samples analyzed? . . . . . Yes No N/A

Are MS/MSD results acceptable? . . . . . Yes No N/A

Comments:

GC/MS ORGANIC DATA VALIDATION CHECKLIST

6. PRECISION

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

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

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

Comments:

7. SYSTEM PERFORMANCE

Were internal standards analyzed? . . . . . Yes No N/A

Are internal standard areas acceptable? . . . . . Yes No N/A

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

Comments:

8. COMPOUND IDENTIFICATION AND QUANTITATION

Is compound identification acceptable? . . . . . Yes No N/A

Is compound quantitation acceptable? . . . . . Yes No N/A

Comments:

9. REPORTED RESULTS AND QUANTITATION LIMITS

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

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

Do results meet the CRQLs? . . . . . Yes No N/A

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

Comments:

GC/MS ORGANIC DATA VALIDATION CHECKLIST

Comments (attach additional sheets as necessary):

Sample locations are not currently available. However, field blanks and field duplicates will be evaluated in the final summary report.

4/8/94

Comments to Item (4).

- 4-Methyl-2-pentanone is present in the blank associated with sample B09DT5. However, the sample concentration on the quant sheet, 2.198 ppb, is slightly higher than 5 times the assoc blank concentration of 1.955 ppb (blank conc is is 0.391 ppb). Therefore, the sample result could NOT be qualified as undetected (U). ~~However, the sample result was qualified w/a "B"~~ ~~However, a "B" qualifier was added to the current "J" qualification to flag this compound as present in the blank.~~ No qualification required. 4/28/94

- Toluene is present in the blank assoc w/ sample B09WF6. However, the sample conc on the quant sheet, 4.201 ppb, is slightly higher than 10 x blank concentration: Blank conc = 0.396 ppb x 10 = 3.96 ppb. ~~Therefore, the sample result was not been qualified w/ a "B" instead of a "U".~~ No qualification required. 4/28/94

4/8/94

Reviewed 4/28/94

038

HOLDING TIME SUMMARY

B09DT4-TMA-690

SDG:	VALIDATOR: [illegible]	DATE: 4/8/94	PAGE 1 OF 1
COMMENTS: Volatile Organics			

FIELD SAMPLE ID	ANALYSIS TYPE	DATE SAMPLED	DATE PREPARED	DATE ANALYZED	PREP. HOLDING TIME, DAYS	ANALYSIS HOLDING TIME, DAYS	QUALIFIER
B09DT4	VOA	1/11/94		1/24/94		13	None
B09DT5		1/11/94		1/25/94		14	
B09DT6		1/11/94		1/24/94		13	
B09DT7		1/11/94		1/24/94		13	
B09DT9		1/13/94		1/24/94		11	
B09WF3		1/13/94		1/24/94		11	
B09WF5		1/13/94		1/24/94		11	
B09WF6		1/13/94		1/24/94		11	

BLANK AND SAMPLE DATA SUMMARY

B09DT4-TMA-690

SDG:	VALIDATOR: [illegible]	DATE: 4/8/94	PAGE 1 OF 2

COMMENTS: Volatile Organics, Blank adj. Assoc. w/samples B09DT4, B09DT6, B09DT7, B09DT9, B09DF3, B09WF5, B09WF6.

SAMPLE ID	COMPOUND	RESULT	Q	RT	UNITS	5X RESULT	10X RESULT	SAMPLES AFFECTED	QUALIFIER
VBLK0124R	MeCl2	2	J		ug/kg		20	B09DT4	10 u
								B09DT6	12 u
								B09DT9	11 u
								B09DF6	10 u
VBLK0124R	Acetone	13	—		ug/kg		130	B09DT4	18 u
								B09DT6	12 u
								B09DT7	10 u
								B09DT9	11 u
								B09DF3	11 u
								B09WF5	10 u
								B09WF6	14 u
VBLK0124R	4-Me-2-pentanone	2	J		ug/kg	10		B09DT6	12 u
								B09WF5	10 u
VBLK0124R	Toluene	0.396	J		ug/kg		3.96	B09DT6	12 u
		from ~~[illegible]~~ client.						B09WF6	None - since sample result > 10x blank concentration
		report							
		4/8/94							

B09OT4-TMA-690

BLANK AND SAMPLE DATA SUMMARY

SDG:	VALIDATOR: [illegible]	DATE: 4/8/94	PAGE 2 OF 2
COMMENTS: Blank adjustment Assoc. w/ sample B09OT5			

SAMPLE ID	COMPOUND	RESULT	Q	RT	UNITS	5X RESULT	10X RESULT	SAMPLES AFFECTED	QUALIFIER
VBLK0125R	Acetone	8	J		mg/kg		80	B09OT5	13u

9715517.2303

~~000302~~

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

VBLK0124R

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 01025 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: SBLK0124

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 40124R03

Level: (low/med) LOW Date Received: _____

% Moisture: not dec. ____ Date Analyzed: 01/24/94

GC Column: PACK ID: 2.00 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

Assoc. w/Samples B090T4, B090T6, B090T7, B090T9, B090F3, B090F5, & B090F6.

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q	
74-87-3	Chloromethane	10	U	
74-83-9	Bromomethane	10	U	
75-01-4	Vinyl Chloride	10	U	
75-00-3	Chloroethane	10	U	
75-09-2	Methylene Chloride	2	J	x10=20
67-64-1	Acetone	13		x10=130
75-15-0	Carbon Disulfide	10	U	
75-35-4	1,1-Dichloroethene	10	U	
75-34-3	1,1-Dichloroethane	10	U	
540-59-0	1,2-Dichloroethene (total)	10	U	
67-66-3	Chloroform	10	U	
107-06-2	1,2-Dichloroethane	10	U	
78-93-3	2-Butanone	10	U	
71-55-6	1,1,1-Trichloroethane	10	U	
56-23-5	Carbon Tetrachloride	10	U	
75-27-4	Bromodichloromethane	10	U	
78-87-5	1,2-Dichloropropane	10	U	
10061-01-5	cis-1,3-Dichloropropene	10	U	
79-01-6	Trichloroethene	10	U	
124-48-1	Dibromochloromethane	10	U	
79-00-5	1,1,2-Trichloroethane	10	U	
71-43-2	Benzene	10	U	
10061-02-6	trans-1,3-Dichloropropene	10	U	
75-25-2	Bromoform	10	U	
108-10-1	4-Methyl-2-Pentanone	2	J	x5=10
591-78-6	2-Hexanone	10	U	
127-18-4	Tetrachloroethene	10	U	
79-34-5	1,1,2,2-Tetrachloroethane	10	U	
108-88-3	Toluene	10	U	
108-90-7	Chlorobenzene	10	U	
100-41-4	Ethylbenzene	10	U	
100-42-5	Styrene	10	U	
1330-20-7	Xylene (total)	10	U	

4/8/94

L042

9713512.2304

VBLK0124R

~~000307~~

Assoc. w/ B090T4, B090T6, B090T7, B090T9, B090F3, B090F5, & B090F6.

No	m/z	Scan	Time	Ref	RRT	Meth	Area(Hght)	Amount	%Tot
1	128	183	7:37	1	1.000	A BB	30191.	50.000 PPB	15.06
2	114	391	16:17	2	1.000	A BV	136544.	50.000 PPB	15.06
3	117	490	20:25	3	1.000	A BB	116371.	50.000 PPB	15.06
4	65	240	10:00	1	1.311	A BB	66743.	51.395 PPB	15.48
5	98	465	19:22	3	0.949	A BB	132835.	54.517 PPB	16.42
6	95	578	24:05	3	1.180	A BB	90300.	53.193 PPB	16.02
7	NOT FOUND								
~~8~~	~~94~~	~~40~~	~~1:40~~	~~1~~	~~0.219~~	~~A BB~~	~~975.~~	~~1.100 PPB~~	~~0.33~~
9	NOT FOUND								
10	NOT FOUND								
11	84	112	4:40	1	0.612	A BB	1735.	1.722 PPB	0.52
12	43	126	5:15	1	0.689	A VV	8088.	13.269 PPB	4.00
13	NOT FOUND								
14	NOT FOUND								
15	NOT FOUND								
16	NOT FOUND								
17	NOT FOUND								
~~18~~	~~43~~	~~240~~	~~10:00~~	~~1~~	~~1.311~~	~~A VB~~	~~2276.~~	~~2.666 PPB~~	~~0.80~~
19	NOT FOUND								
~~20~~	~~97~~	~~266~~	~~11:05~~	~~2~~	~~0.680~~	~~A VV~~	~~819.~~	~~0.454 PPB~~	~~0.14~~
21	NOT FOUND								
~~22~~	~~43~~	~~280~~	~~11:40~~	~~2~~	~~0.716~~	~~A VV~~	~~1148.~~	~~0.312 PPB~~	~~0.09~~
~~23~~	~~83~~	~~287~~	~~11:57~~	~~2~~	~~0.734~~	~~A*BB~~	~~612.~~	~~0.263 PPB~~	~~0.08~~
24	NOT FOUND								
25	NOT FOUND								
26	NOT FOUND								
27	NOT FOUND								
28	NOT FOUND								
~~29~~	~~97~~	~~347~~	~~14:27~~	~~2~~	~~0.887~~	~~A BV~~	~~731.~~	~~0.743 PPB~~	~~0.22~~
30	NOT FOUND								
31	NOT FOUND								
32	NOT FOUND								
33	43	407	16:57	3	0.831	A BB	3424.	1.717 PPB	0.52
34	NOT FOUND								
35	NOT FOUND								
36	NOT FOUND								
~~37~~	~~91~~	~~470~~	~~19:35~~	~~3~~	~~0.959~~	~~A BB~~	~~1139.~~	~~0.396 PPB~~	~~0.12~~
38	NOT FOUND								
39	NOT FOUND								
40	NOT FOUND								
41	NOT FOUND								
42	NOT FOUND								

ig 1-25-94

Toluene

0.396 ppb x 10 = 3.96 ppb

No	Ret(L)	Ratio	RRT(L)	Ratio	Amnt	Amnt(L)	R.Fac	R.Fac(L)	Ratio
1	7:40	0.99	1.000	1.00	50.00	50.00	1.000	1.000	1.00
2	16:17	1.00	1.000	1.00	50.00	50.00	1.000	1.000	1.00
3	20:25	1.00	1.000	1.00	50.00	50.00	1.000	1.000	1.00
4	10:00	1.00	1.304	1.01	51.40	50.00	2.211	2.151	1.03
5	19:22	1.00	0.949	1.00	54.52	50.00	1.141	1.047	1.09
6	24:02	1.00	1.178	1.00	53.19	50.00	0.776	0.729	1.06
7	0:52		0.114						
8	1:35	1.05	0.207	1.06	1.10	50.00	0.032	1.468	0.02
9	2:02		0.266						
10	2:50		0.370						
11	4:42	0.99	0.614	1.00	1.72	50.00	0.057	1.669	0.03
12	5:22	0.98	0.701	0.98	13.27	50.00	0.268	1.009	0.27

043

4/18/94

01/28/94

9715517.2305

~~000316~~

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

VBLK0125R

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 01025 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: SBLK0125

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 40125R03

Level: (low/med) LOW Date Received: _____

% Moisture: not dec. ____ Date Analyzed: 01/25/94

GC Column: PACK ID: 2.00 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

Assoc. w/ B090TS

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

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

X10=80

044

FORM I VOA 4/12/94 3/90

9413617.2306

Assoc. w/ B090TS

VBLK0125R

~~000321~~

No	m/z	Scan	Time	Ref	RRT	Meth	Area(Hght)	Amount	%Tot
1	128	179	7:27	1	1.000	A BB	41268.	50.000 PPB	15.95
2	114	390	16:15	2	1.000	A BB	166793.	50.000 PPB	15.95
3	117	489	20:22	3	1.000	A BB	142714.	50.000 PPB	15.95
4	65	238	9:55	1	1.330	A BB	73003.	47.182 PPB	15.05
5	98	464	19:20	3	0.949	A BB	144943.	48.567 PPB	15.49
6	95	576	24:00	3	1.178	A BB	99222.	46.713 PPB	14.90
7	NOT FOUND								
~~8~~	~~94~~	~~40~~	~~1:40~~	~~1~~	~~0.223~~	~~A BB~~	~~1710.~~	~~1.438 PPB~~	~~0.46~~
9	NOT FOUND								
10	NOT FOUND								
~~11~~	~~84~~	~~105~~	~~4:22~~	~~1~~	~~0.587~~	~~A BB~~	~~1025.~~	~~0.777 PPB~~	~~0.25~~
12	43	120	5:00	1	0.670	A BV	5758.	8.321 PPB	2.65
13	NOT FOUND								
14	NOT FOUND								
15	NOT FOUND								
16	NOT FOUND								
17	NOT FOUND								
~~18~~	~~43~~	~~238~~	~~9:55~~	~~1~~	~~1.330~~	~~A VV~~	~~7424.~~	~~6.969 PPB~~	~~2.22~~
19	NOT FOUND								
~~20~~	~~97~~	~~266~~	~~11:05~~	~~2~~	~~0.682~~	~~A BB~~	~~888.~~	~~0.418 PPB~~	~~0.13~~
21	NOT FOUND								
~~22~~	~~43~~	~~275~~	~~11:27~~	~~2~~	~~0.705~~	~~A VV~~	~~896.~~	~~0.202 PPB~~	~~0.06~~
23	NOT FOUND								
24	NOT FOUND								
25	NOT FOUND								
26	NOT FOUND								
27	NOT FOUND								
28	NOT FOUND								
29	NOT FOUND								
30	NOT FOUND								
31	NOT FOUND								
32	NOT FOUND								
~~33~~	~~43~~	~~405~~	~~16:52~~	~~3~~	~~0.828~~	~~A BB~~	~~1036~~	~~0.391 PPB~~	~~0.12~~
~~34~~	~~43~~	~~436~~	~~18:10~~	~~3~~	~~0.892~~	~~A BV~~	~~1308.~~	~~0.653 PPB~~	~~0.21~~
35	NOT FOUND								
36	NOT FOUND								
~~37~~	~~91~~	~~468~~	~~19:30~~	~~3~~	~~0.957~~	~~A BB~~	~~2400.~~	~~0.702 PPB~~	~~0.22~~
38	NOT FOUND								
39	NOT FOUND								
40	NOT FOUND								
41	NOT FOUND								
42	NOT FOUND								

4-Methyl-2-pentanone

0.391 ppb x5 = 1.955 ppb

No	Ret(L)	Ratio	RRT(L)	Ratio	Amnt	Amnt(L)	R.Fac	R.Fac(L)	Ratio
1	7:40	0.97	1.000	1.00	50.00	50.00	1.000	1.000	1.00
2	16:17	1.00	1.000	1.00	50.00	50.00	1.000	1.000	1.00
3	20:25	1.00	1.000	1.00	50.00	50.00	1.000	1.000	1.00
4	10:00	0.99	1.304	1.02	47.18	50.00	1.769	1.875	0.94
5	19:22	1.00	0.949	1.00	48.57	50.00	1.016	1.046	0.97
6	24:02	1.00	1.178	1.00	46.71	50.00	0.695	0.744	0.93
7	0:52		0.114						
8	1:35	1.05	0.207	1.08	1.44	50.00	0.041	1.441	0.03
9	2:02		0.266						
10	2:50		0.370						
11	4:42	0.93	0.614	0.96	0.78	50.00	0.025	1.599	0.02
12	5:22	0.93	0.701	0.96	8.32	50.00	0.140	0.838	0.17

1-27-94

045

4/8/94

01/28/94

9713517.2507

Golder Associates Inc.

4104-148th Avenue, NE
Redmond, WA 98052
Telephone (206) 883-0777
Fax (206) 882-5498

Golder Associates

May 27, 1994

MAY 1994 RECEIVED

Our ref: 923-E418
S/O/3104

Westinghouse Hanford Company
Hanford Analytical Services
P.O. Box 1970
Richland, Washington 99352

ATTENTION: Jeanette Duncan

RE: TRANSMITTAL OF DATA VALIDATION PACKAGES, 200-UP-2 DATA VALIDATION PROJECT, TASK ORDER S94-18, CONTRACT MJK-SVV-M073750

Dear Ms. Duncan:

Enclosed are data validation packages for the 200-UP-2 data validation project. The following provides a summary of the data packages included in this shipment:

- B0BFF5-TMA-721
- B09DT4-TMA-690
- B0BFH4-TMA-733

Please call if you have questions concerning the above at 206/883-0777.

Sincerely,

GOLDER ASSOCIATES INC.

Christina I. Jensen
Task Manager

Kent M. Angelos
Project Manager

RECEIVED
MAY 31 1994
VALIDATION DOCUMENTATION
SDLA

cc: P.K. Brockman, SAIC

9713517.2308

Golder Associates Inc.

4104-148th Avenue, NE
Redmond, WA 98052
Telephone (206) 883-0777
Fax (206) 882-5498

Golder Associates

June 7, 1994

Our ref: 923-E418
S/O/3133

JUN 1994
RECEIVED
TQO

Westinghouse Hanford Company
Hanford Analytical Services
P.O. Box 1970
Richland, Washington 99352

ATTENTION: Jeanette Duncan

RE: TRANSMITTAL REVISED DATA VALIDATION PAGES, 200-UP-2 DATA VALIDATION PROJECT, TASK ORDER S94-18, CONTRACT MJK-SVV-M073750

Dear Ms. Duncan:

Enclosed are revised data validation pages for the 200-UP-2 data validation project. The following provides a summary of the data packages and page revisions included in this transmittal:

Data Package	Revisions
B09DT4-TMA-690	General Chemistry: page 15 General GC: pages 1, 2, 6, 8, 9, 19 and 20 Semivolatiles: no page changes

Please call us at (206)883-0777 if there are any questions concerning the above.

Sincerely,

GOLDER ASSOCIATES INC.

Christina Jensen
Task Manager

Kent M. Angelos
Project Manager

cc: P.K. Brockman, SAIC

9713517.2309

MEMORANDUM

MAY 1994 RECEIVED TQO

TO: 200 UP-2 Project QA Record

May 27, 1994

FR: Thomas Stapp, Golder Associates Inc.

RE: GENERAL CHEMISTRY DATA VALIDATION SUMMARY FOR DATA PACKAGE B09DT4-TMA-690 (923-E418 690GEN.UP2)

INTRODUCTION

This memo presents the results of data validation on data package B09DT4-TMA-690 prepared by TMA laboratory. A list of samples validated along with the analyses reported and the methods of analysis is provided in the following table.

SAMPLE ID	SAMPLE DATE	MEDIA	ANALYSES
B09WF4	1/17/94	SOIL	SEE NOTE 1

Notes:

1. Indicates the sample was analyzed for Nitrate/Nitrite as N (by colorimetry), and IC anions (fluoride, chloride, and sulfate).

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

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

RECEIVED MAY 31 1994 VALIDATION DOCUMENTATION

DATA QUALITY OBJECTIVES

Precision. Goals for precision were met.

Accuracy. Goals for accuracy were met except for matrix spike recoveries as indicated under Minor Deficiencies below.

Sample Result Verification. All sample results were supported in the raw data except for pH analysis raw data documentation which was not provided.

Detection Limits. Detection limit goals were met.

Completeness. The data package was complete for all requested analyses. A total of one (1) sample was validated in this data package with a total of five (5) determinations reported, all of which were deemed valid. This results in a completeness of 100 percent which meets the work plan completeness objective of 90 percent.

MAJOR DEFICIENCIES

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

MINOR DEFICIENCIES

The following minor deficiency was identified during data validation which required qualification of data.

Matrix Spike Recovery

- Fluoride matrix spike recovery was unacceptable. Attachments 2 and 5 provide a summary of the qualification applied and supporting documentation.

DATA REPORTING

- Raw data for pH analysis was not provided by the laboratory although the case narrative indicates it was analyzed, but past the specified holding time. PH analysis was not requested by WHC however, due to the aforementioned deficiency the result reported will be qualified as estimated (J).

REFERENCES

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

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

9713517.2311

ATTACHMENT 1

GLOSSARY OF DATA REPORTING QUALIFIERS

GLOSSARY OF INORGANIC DATA REPORTING QUALIFIERS

B - Indicates the constituent was analyzed for and detected. The concentration reported is less than the contract required detection limit (CRDL) but greater than the instrument detection limit (IDL). . The associated data should be considered usable for decision making purposes.

U - Indicates the constituent was analyzed for and not detected. The concentration reported is the sample detection limit corrected for aliquot size, dilution and percent solids (in the case of solid matrices) by the laboratory. The associated data should be considered usable for decision making purposes.

UJ - Indicates the constituent was analyzed for and not detected. Due to a minor quality control deficiency identified during data validation the concentration may not accurately reflect the sample detection limit. The associated data have been qualified as estimated but should be considered usable for decision making purposes.

BJ - Indicates the constituent was analyzed for and detected at a concentration less than the contract required detection limit (CRDL) but greater than the instrument detection limit (IDL). Due to a minor quality control deficiency identified during data validation the associated data have been qualified as estimated, but should be considered usable for decision making purposes.

J - Indicates the constituent was analyzed for and detected. Due to a minor quality control deficiency identified during data validation the associated data have been qualified as estimated, but should be considered usable for decision making purposes.

UR - Indicates the constituent was analyzed for and not detected. Due to a major quality control deficiency identified during data validation, the associated data have been qualified as unusable for decision making purposes.

R - Indicates the constituent was analyzed for and detected. Due to a major quality control deficiency identified during data validation, the associated data have been qualified as unusable for decision making purposes.

9713517.2313

ATTACHMENT 2

SUMMARY OF DATA QUALIFICATIONS

DATA QUALIFICATION SUMMARY - FORM B-7

SDG: B09DT4-TMA-690	REVIEWER: T. STAPP	DATE: 5-05-94	PAGE 1 OF 1
COMMENTS: WET CHEMISTRY			
COMPOUND/ANALYTE	QUALIFIER	SAMPLES AFFECTED	REASON
FLUORIDE	J	B09WF4	MATRIX SPIKE RECOVERY IS BELOW 75% BUT ABOVE 30% LIMITS
pH	J	B09WF4	ANALYZED PAST HOLDING TIME, RAW DATA NOT PROVIDED

9713512.2315

ATTACHMENT 3

QUALIFIED DATA SUMMARY AND ANNOTATED LABORATORY REPORTS

Validated Data Summary, Data Package: B09DT4-TMA-690

	Samp#	B09WF4	
	Date	1-17-94	
	Location	---	
	Depth	---	
	Type	---	
	Comments	---	
Parameter	Units	Result	Q
CHLORIDE	MG/KG	7.800	
FLUORIDE	MG/KG	1.900	J
PH	STD UNIT	7.500	J
SULFATE	MG/KG	12.000	
NITRATE+NITRITE	MG-N/KG	304.000	

Verified R 5-6-94

9407 1456

5-4-94

000010

TMA Inc. REPORT Work Order # A4-01-038

Received: 01/21/94

Results by Sample

SAMPLE ID B09WF4 FRACTION 01E TEST CODE WCCLPS NAME Anions in Solids

Date & Time Collected 01/17/94 Category

ANIONS AND WET CHEMISTRY - SOLIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT	Q
Chloride	300.0	7.8	mg/kg	1.0	
Fluoride	300.0	1.9	mg/kg	0.5	J
pH	9045	7.5	pH	0.1	J
Sulfate	300.0	12	mg/kg	5	

FORM I

Verified

5-4-94

9713517.2318

5-4-94

Skinner&Sherman REPORT Work Order # S4-01-177

Received: 01/25/94

Results by Sample

SAMPLE ID B09WF4 SAMPLE # 01 FRACTIONS: A

Date & Time Collected 01/17/94 13:30:00 Category SOIL

NITR_S 304

mg N/kg

SAMPLE ID B09WF4D SAMPLE # 01 FRACTIONS: B

Date & Time Collected 01/17/94 13:30:00 Category SOIL

NITR_S 392

mg N/kg

SAMPLE ID B09WF4S SAMPLE # 01 FRACTIONS: C

Date & Time Collected 01/17/94 13:30:00 Category SOIL

NITR_S 363

mg N/kg

SAMPLE ID LCSS SAMPLE # 02 FRACTIONS: A

Date & Time Collected not specified Category SOIL

NITR_S 2.04

mg N/L

Verified 5-4-94

TMA
Thermo Analytical Inc.

This report is rendered upon all of the following conditions: Skinner & Sherman Laboratories, Inc., retains ownership of this report until associated submitted invoice is satisfied. Expert witness services shall be available in conjunction with this report only if prior notification of this potential requirement was made and accepted, before the analysis. Client will be responsible for Skinner & Sherman costs and consulting fees if our services are required by subpoena or otherwise in legal proceedings. Total liability is limited to the invoice amount. The results listed refer only to tested samples and applicable parameters. Samples are not analyzed in accordance with New York State protocol unless indicated. Product endorsement is neither inferred nor implied. Skinner & Sherman Laboratories, Inc., will exercise due diligence but will not be responsible for lost or destroyed samples or evidence unless client makes appropriate insurance coverage arrangements. Samples are held for thirty days following issuance of report. Samples will be stored at client's expense, if authorized in writing.

Skinner & Sherman Laboratories Inc. 300 Second Avenue, P.O. Box 521, Waltham, Massachusetts 02254-0521 (617) 890-7200
1-800-41-LAB TEST FAX (617) 890-2882

9713517.2319

ATTACHMENT 4

LABORATORY NARRATIVE AND CHAIN-OF-CUSTODY DOCUMENTATION

5-4-94
~~000007~~

GENERAL CHEMISTRY RESULTS

CASE NO. 01-038

Soil Sample #s:

B09WF4 ~~B09WF7~~ 5-13-94

CASE NARRATIVE

The holding time for the pH analysis was exceeded. Careful review of the QC analysis indicates that the data is reliable.

Sample B09WF4 obtained a Percent Recovery below QC criteria for Fluoride. A matrix spike duplicate (MSD), with one fourth of the original sample, was injected with excellent results indicating a sample matrix effect. Only the original matrix spike has been reported on Form V. Both analyses have been included in the "Raw Data" section of the report.

No other problems were encountered during sample analysis. All QC results were acceptable.

Maureen Parrish 3/17/94

Maureen Parrish

9715512.2321

5-4-94 ~~0000024~~

Westinghouse Hanford Company	CHAIN OF CUSTODY

Custody Form Initiator: L E ROGERS

Company Contact: L E ROGERS — Telephone: 376-7690

Project Designation/Sampling Locations: 200-UP-2 — Collection Date: 1-17-94

Ice Chest No.: SNL-196 — Field Logbook No.: EFL-1091

Bill of Lading/Airbill No.: — Offsite Property No.:

Method of Shipment: AIR

Shipped to: TMA

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

Sample Identification

1) B09WF4

~~1~~,250ml P:CLP;TAL Metals,Hg,Ti
~~1~~,250ml Gs:VOA CLP
~~1~~,250ml aG:Semi-VOA CLP
~~1~~,125ml G:Anions F,Cl,SO4 (EPA 300.0)
~~1~~,125ml P/G:Anions NO2,NO3 (EPA 353.2)
~~1~~,125ml G:Cyanide CLP
~~1~~,125ml Gw:Kerosene (8015M)
~~1~~,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

2) B09WF7

~~1,250ml P:CLP;TAL Metals,Hg,Ti~~
~~1~~,250ml Gs:VOA CLP
~~1,250ml aG:Semi-VOA CLP~~
~~1,125ml G:Anions F,Cl,SO4 (EPA 300.0)~~
~~1,125ml P/G:Anions NO2,NO3 (EPA 353.2)~~
~~1,125ml G:Cyanide CLP~~
~~1,125ml Gw:Kerosene (8015M)~~
~~1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79~~

1-17-94

3)

~~1,250ml P:CLP;TAL Metals,Hg,Ti~~
1,250ml ~~Gs:VOA CLP~~
1,250ml ~~aG:Semi-VOA CLP~~
1,125ml G:Anions F,Cl,SO4 (EPA ~~300.0~~)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,~~Cs-137~~,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,~~U-234~~,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (~~RC-25, RC-605~~) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, ~~EP-93, EP-5~~) Se-79

1-17-94

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

Relinquished by:	Received by:	Date/Time:
1-20-94 Loren E. Rogers 0955	[signature]	1-21-94 10:58
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

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

9713517.2322

ATTACHMENT 5

DATA VALIDATION SUPPORTING DOCUMENTATION

GENERAL CHEMISTRY DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E

PROJECT: 200-UP-2		DATA PACKAGE: B09DT4-TMA-690
VALIDATOR: T. Stapp	LAB: TMA/Skinner+Sh.	DATE: 5-4-94
CASE:		SDG:

ANALYSES PERFORMED

☑ Anions/IC	☐ TOC	☐ TOX	☐ TPH-418.1	Oil and Grease	Alkalinity
☐ Ammonia	☐ BOD/COD	☐ Chloride	☐ Chromium-VI	☐ pH	☑ NO_3/NO_2
☐ Sulfate	☐ TDS	☐ TKN	☐ Phosphate	☐	☐
☐	☐	☐	☐	☐	☐

SAMPLES/MATRIX B09WF4 / SOIL

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Is technical verification documentation present? NOTE ① . . . . . Yes No N/A

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

Comments: ① Performed by WHC.

2. HOLDING TIMES

Are sample holding times acceptable? . . . . . ~~Yes~~ No N/A 5-6-94

Comments:

	Collected	Analysis	Fl	Cl	SO_4	NO_2/NO_3	PH
B09WF4	1-17-94	2-2-94	✓	✓	✓	1-27 ✓	Ø

pH analysis raw data not provided and analysis date cannot be verified, however ~~it~~ is specified in DV procedure Table 9-1 as "immediately", after extraction. 5-13-94

6-6-94

Revised 6-6-94

-015

GENERAL CHEMISTRY DATA VALIDATION CHECKLIST

3. INSTRUMENT CALIBRATION

Was initial calibration performed for all applicable analyses? (Yes) No N/A
Are initial calibration results acceptable? . . . . . (Yes) No N/A
Was a calibration check performed for all applicable analyses? (Yes) No N/A
Are calibration check results acceptable? . . . . . (Yes) No N/A
Comments:

4. BLANKS

Were laboratory blanks analyzed? . . . . . (Yes) No N/A
Are laboratory blank results acceptable? . . . . . (Yes) No N/A
Were field/trip blanks analyzed? . . . See Note ① . . . . . Yes No (N/A)
Are field/trip blank results acceptable? . . . . . Yes No (N/A)
Comments: ① Field QC has not been identified with this sample set but it has been requested. Field blank will be evaluated with the final data summary.

5. ACCURACY

Were spike samples analyzed at the required frequency? . . . . (Yes) No N/A
Are spike recoveries acceptable? See Note ① . . . . . Yes (No) N/A
Were LCS analyses performed at the required frequency? . . . . (Yes) No N/A
Are LCS recoveries acceptable? . . . . . (Yes) No N/A
Comments: ① Fluoride MS recovery is below 75% limit (@ 68%), qualifies Fl result as estimated (J).

6. PRECISION

Were laboratory duplicate samples analyzed at the required frequency? . . . . . (Yes) No N/A
Are laboratory duplicate sample RPD values acceptable? . . . (Yes) No N/A
Are field duplicate RPD values acceptable? See Note ① . . . Yes No (N/A)
Are field split RPD values acceptable? . . . . . Yes No (N/A)

GENERAL CHEMISTRY DATA VALIDATION CHECKLIST

Comments: ① Field QC has not been identified in this sample set, but it has been requested. Field duplicate analysis will be evaluated in the final data summary.

7. ANALYTE QUANTITATION

Was analyte quantitation performed properly? . . . . . Yes No N/A

Comments:

8. REPORTED RESULTS AND DETECTION LIMITS

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

Are results supported in the raw data? . SEE NOTE ①. . . ~~Yes~~ No N/A TS 5-6-9

Are results calculated properly? . . . . . Yes No N/A

Do results meet the CRDLs? . . . . . Yes No N/A

Comments:

① pH analysis raw data was not provided by the laboratory. Reported result will be qualified as estimated (J)

9715517.2326

MEMORANDUM

MAY 1994
RECEIVED
TQO

TO: 200 UP-2 Project QA Record

May 13, 1994

FR: Thomas Stapp, Golder Associates Inc.

RE: INORGANIC DATA VALIDATION SUMMARY FOR DATA PACKAGE B09DT4-TMA-690 (923-E418 690MET.UP2)

INTRODUCTION

This memo presents the results of data validation on data package B098Y7-TMA-628 prepared by TMA laboratory. A list of samples validated along with the analyses reported and the methods of analysis is provided in the following table.

SAMPLE ID	SAMPLE DATE	MEDIA	ANALYSES
B09WF4	1/17/94	SOIL	SEE NOTE 1

RECEIVED
MAY 31 1994
VALIDATION DOCUMENTATION
SDLA

Notes:

1. Indicates the samples were analyzed for CLP TAL metals, titanium, and cyanide.

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

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

DATA QUALITY OBJECTIVES

The following section presents a summary of the data quality in terms of the referenced validation criteria.

Precision. Goals for precision were met except for serial dilution percent differences as indicated below.

Accuracy. Goals for accuracy were met, with the exception of the matrix spike recoveries as indicated below.

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

Detection Limits. Detection limit goals were met for all sample results.

Completeness. The data package was complete for all requested analyses. A total of one sample was validated in this data package with a total of 25 determinations reported, all of which were deemed valid. This results in a completeness of 100 percent which meets the work plan completeness objective of 90 percent.

MAJOR DEFICIENCIES

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

MINOR DEFICIENCIES

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

Laboratory Blanks

- Cadmium and silver were detected in the continuing calibration blanks. Attachments 2 and 5 provide a summary of the samples affected, data qualification applied and supporting documentation.

Matrix Spike Recoveries

- Matrix spike recovery for antimony was unacceptable. Attachments 2 and 5 provide a summary of the samples affected, data qualification applied, and supporting documentation.

ICP Serial Dilutions

- The zinc and copper serial dilution percent differences were unacceptable. Attachments 2 and 5 provide a summary of the samples affected, data qualification applied and supporting documentation.

REFERENCES

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

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

9713517.2328

ATTACHMENT 1

GLOSSARY OF DATA REPORTING QUALIFIERS

GLOSSARY OF INORGANIC DATA REPORTING QUALIFIERS

B - Indicates the constituent was analyzed for and detected. The concentration reported is less than the contract required detection limit (CRDL) but greater than the instrument detection limit (IDL). The associated data should be considered usable for decision making purposes.

U - Indicates the constituent was analyzed for and not detected. The concentration reported is the sample detection limit corrected for aliquot size, dilution and percent solids (in the case of solid matrices) by the laboratory. The associated data should be considered usable for decision making purposes.

UJ - Indicates the constituent was analyzed for and not detected. Due to a minor quality control deficiency identified during data validation the concentration may not accurately reflect the sample detection limit. The associated data have been qualified as estimated but should be considered usable for decision making purposes.

BJ - Indicates the constituent was analyzed for and detected at a concentration less than the contract required detection limit (CRDL) but greater than the instrument detection limit (IDL). Due to a minor quality control deficiency identified during data validation the associated data have been qualified as estimated, but should be considered usable for decision making purposes.

J - Indicates the constituent was analyzed for and detected. Due to a minor quality control deficiency identified during data validation the associated data have been qualified as estimated, but should be considered usable for decision making purposes.

UR - Indicates the constituent was analyzed for and not detected. Due to a major quality control deficiency identified during data validation, the associated data have been qualified as unusable for decision making purposes.

R - Indicates the constituent was analyzed for and detected. Due to a major quality control deficiency identified during data validation, the associated data have been qualified as unusable for decision making purposes.

9713517.2330

ATTACHMENT 2

SUMMARY OF DATA QUALIFICATIONS

DATA QUALIFICATION SUMMARY - FORM B-7

SDG: B09DT4-TMA-690	REVIEWER: T. STAPP	DATE: 5-10-94	PAGE 1 OF 1
COMMENTS: INORGANIC ANALYSIS			
COMPOUND/ANALYTE	QUALIFIER	SAMPLES AFFECTED	REASON
ANTIMONY	BJ	B09WF4	MATRIX SPIKE RECOVERY IS <75% BUT >30%
CADMIUM, SILVER	U	B09WF4	DETECTED IN CALIBRATION BLANK
COPPER, ZINC	J	B09WF4	ICP SERIAL DILUTION %D >10%

9713517.2352

ATTACHMENT 3

QUALIFIED DATA SUMMARY AND ANNOTATED LABORATORY REPORTS

Validated Data Summary, Data Package: B09DT4-TMA-690

	Samp#	B09WF4	
	Date	1-17-94	
	Location	---	
	Depth	---	
	Type	---	
	Comments	---	
Parameter	Units	Result	Q
ALUMINUM	MG/KG	30400.000	
ANTIMONY	MG/KG	3.700	BJ
ARSENIC	MG/KG	6.500	
BARIUM	MG/KG	149.000	
BERYLLIUM	MG/KG	1.000	B
CADMIUM	MG/KG	0.590	U
CALCIUM	MG/KG	8780.000	
CHROMIUM	MG/KG	28.400	
COBALT	MG/KG	14.400	
COPPER	MG/KG	29.400	J
IRON	MG/KG	40400.000	
LEAD	MG/KG	6.900	
MAGNESIUM	MG/KG	9320.000	
MANGANESE	MG/KG	325.000	
MERCURY	MG/KG	0.060	U
NICKEL	MG/KG	22.500	
POTASSIUM	MG/KG	3060.000	
SELENIUM	MG/KG	0.660	U
SILVER	MG/KG	1.600	U
SODIUM	MG/KG	437.000	B
THALLIUM	MG/KG	0.880	U
VANADIUM	MG/KG	76.100	
ZINC	MG/KG	70.300	J
CYANIDE	MG/KG	0.620	U
TITANIUM	MG/KG	2350.000	

Verified 5-12-94

9713517.2354

WESTINGHOUSE/HANFORD

1

SAMPLE NUMBER:

INORGANIC ANALYSIS DATA SHEET

B09WF4

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D2-0039

Lab Code: SKINER Case No.: N4-01-070SAS No.: SDG No.: B09WF4

Matrix (soil/water): SOIL Lab Sample ID: 01176-01S

Level (low/med): LOW Date Received: 01/25/94

% Solids: 79.5

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	30400			P	
7440-36-0	Antimony	3.7	~~B~~	N	P	BJ
7440-38-2	Arsenic	6.5			P	
7440-39-3	Barium	149			P	
7440-41-7	Beryllium	1.0	B		P	
7440-43-9	Cadmium	0.59	~~B~~		P	U
7440-70-2	Calcium	8780			P	
7440-47-3	Chromium	28.4			P	
7440-48-4	Cobalt	14.4			P	
7440-50-8	Copper	29.4	✓	E	P	J
7439-89-6	Iron	40400			P	
7439-92-1	Lead	6.9			P	
7439-95-4	Magnesium	9320			P	
7439-96-5	Manganese	325			P	
7439-97-6	Mercury	0.06	U		CV	
7440-02-0	Nickel	22.5			P	
7440-09-7	Potassium	3060			P	
7782-49-2	Selenium	0.66	U		P	
7440-22-4	Silver	1.6	~~B~~		P	U
7440-23-5	Sodium	437	B		P	
7440-28-0	Thallium	0.88	U		P	
7440-62-2	Vanadium	76.1			P	
7440-66-6	Zinc	70.3	✓	E	P	J
	Cyanide	0.62	U		CA	
7440-32-6	Titanium	2350			P	

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

Verified RS 5-12-94

~~002~~

FORM I - IN ILM02.1

9713517.2335

ATTACHMENT 4

LABORATORY NARRATIVE AND CHAIN-OF-CUSTODY DOCUMENTATION

TMA
Thermo Analytical Inc.

Skinner & Sherman Labs., Inc.
300 Second Avenue
Post Office Box 521
Waltham, MA 02254-0521
(617) 890-7200
FAX (617) 890-3883

9413517.2356

RECORD COPY

MAR 1994
RECEIVED
SDLA

February 25, 1994

TMA/NORCAL
2030 Wright Avenue
Richmond, CA 94804
Attention: Dan Stuermer

Quality Control Narrative

Scope

One (1) soil sample was submitted to TMA/Skinner & Sherman Laboratories, Inc. on January 25, 1994 from TMA/Norcal. The sample was analyzed for the USEPA CLP Target Analyte List metals, titanium and cyanide. The analysis were performed under TMA/Skinner and Sherman work order S401176.

Methodology

The sample was prepared, analyzed and reported in accordance with the USEPA Contract Laboratory Program Statement of Work ILM02.

Discussion

All quality control requirements were met for the samples with the following exceptions:

The matrix spike recovery for antimony exceeded the control limit requirements.

The ICP serial dilution for copper and zinc exceeded the control limit requirements.

Please feel free to call if there are any questions concerning this package.

Respectfully submitted,

TMA/SKINNER & SHERMAN LABORATORIES, INC.

Steven Provencal

Steven R. Provencal
Lead Chemist

9713517.2337

5-10-94 000002A

Westinghouse Hanford Company	CHAIN OF CUSTODY

Custody Form Initiator: L E ROGERS

Company Contact: L E ROGERS — Telephone: 376-7690

Project Designation/Sampling Locations: 200-UP-2 — Collection Date: 1-17-94

Ice Chest No.: SNL-196 — Field Logbook No.: EFL-1091

Bill of Lading/Airbill No.: — Offsite Property No.:

Method of Shipment: AIR

Shipped to: TMA

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

Sample Identification

1) B09WF4

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

2) B09WF7

~~1,250ml P:CLP;TAL Metals,Hg,Ti~~
1,250ml Gs:VOA CLP
~~1,250ml aG:Semi-VOA CLP~~
~~1,125ml G:Anions F,Cl,SO4 (EPA 300.0)~~
~~1,125ml P/G:Anions NO2,NO3 (EPA 353.2)~~ 1-17-94
~~1,125ml G:Cyanide CLP~~
~~1,125ml Gw:Kerosene (8015M)~~
~~1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79~~

3)

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml ~~Gs:VOA CLP~~
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2) 1-17-94
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

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

Relinquished by:	Received by:	Date/Time:
1-20-94 Karen E. Rogers 0955	[signature]	1-21-94 10:58
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

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

012

9713517.2358

ATTACHMENT 5

DATA VALIDATION SUPPORTING DOCUMENTATION

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E

PROJECT: 200-UP-2	DATA PACKAGE: B09DT4-TMA-690	
VALIDATOR: T. Stapp	LAB: TMA/NORCAL	DATE: 5-10-94
CASE:	SDG:	

ANALYSES PERFORMED

☑ CLP/ICP	☐ CLP/GFAA	☑ CLP/Hg	☑ CLP/Cyanide	☑ Titanium	☐
☐ SW-846/ICP	☐ SW-846/GFAA	☐ SW-846/Hg	☐ SW-846 Cyanide	☐	☐

SAMPLES/MATRIX B09WF4 / SOIL

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Is technical verification documentation present? Note ① . . . . . Yes No N/A

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

Comments: ① Performed by WHC.

2. HOLDING TIMES

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

Comments:

	Collected	Prepared	Analyzed	
			~~TAL Hg CN Ti~~	~~☑~~ 5-10-94
B09WF4	1-17-94	TAL 1-27-94	2-17, 2-24-94	✓
		Hg 2-2-94	2-3-94	✓
		CN 1-27-94	1-31-94	✓
		Ti 1-27-94	2-17-94	✓

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

3. INSTRUMENT PERFORMANCE AND CALIBRATIONS

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

4. BLANKS

Were ICB and CCB checks performed for all applicable analyses? Yes No N/A
Are ICB and CCB results acceptable? . . See Note ① . . . . . Yes No N/A
Were preparation blanks analyzed? . . . . . Yes No N/A
Are preparation blank results acceptable? See Note ① . . . . . Yes No N/A
Were field/trip blanks analyzed? . . . See Note ② . . . . . Yes No N/A
Are field/trip blank results acceptable? . . . . . Yes No N/A
Comments: ① Multiple analytes were detected in CCB and prep. blanks. See attached Blank Summary for ~~IAL~~ samples affected and qualif. applied. ② Field QC was not identified in this sample set, but it has been requested. Field blanks will be evaluated in the final data summary.

5-12-94

5. ACCURACY

Were spike samples analyzed? . . . . . Yes No N/A
Are spike sample recoveries acceptable? . See Note ① . . . . Yes No N/A
Were laboratory control samples (LCS) analyzed? See Note ② . Yes No N/A
Are LCS recoveries acceptable? . . . . . Yes No N/A
Comments: ① Sb ~~and Ti~~ recoveries were below 75% but above 30% limits as specified in DV procedures qualifying assoc. results as estimated (J/UJ). See attached spike recovery summary. Titanium result is >4x spike level and no qualif. applies. ② ~~LCS control limits not provided for Titanium. No qualifier will be applied since titanium spike was not added to the LCS.~~ LCS recovery of Titanium is within control limits provided by laboratory. 5-27-94

5-12-94

U015

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

6. PRECISION

Were laboratory duplicates analyzed? . . . . . Yes No N/A

Are laboratory duplicate samples RPD values acceptable? . . . Yes No N/A

Were ICP serial dilution samples analyzed? . . . . . Yes No N/A

Are ICP serial dilution %D values acceptable? See Note ① . . . Yes No N/A

Are field duplicate RPD values acceptable? See Note ② . . . Yes No N/A

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

Comments: ① Serial dilution results exceed 10% Difference for copper and zinc and assoc. results are qualified (J).
② Field QC was not identified in this sample set but it has been requested. Field dups. will be evaluated in the final data summary.

7. FURNACE AA QUALITY CONTROL

Were duplicate injections performed as required? . . . . . Yes No N/A

Are duplicate injection %RSD values acceptable? . . . . . Yes No N/A

Were analytical spikes performed as required? . . . . . Yes No N/A

Are analytical spike recoveries acceptable? . . . . . Yes No N/A

Was MSA performed as required? . . . . . Yes No N/A

Are MSA results acceptable? . . . . . Yes No N/A

Comments: GFAA analysis was not performed.

8. REPORTED RESULTS AND DETECTION LIMITS

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

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

Are results calculated properly? . . . . . Yes No N/A

Do results meet the CRDLs? . . . . . Yes No N/A

Comments:

MATRIX SPIKE RECOVERY SUMMARY

WESTINGHOUSE/HANFORD

5A

SDG: B09DT4-TMA-690

SAMPLE NUMBER:

SPIKE SAMPLE RECOVERY

B09WF4S

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D2-0039

Lab Code: SKINER Case No.: N4-01-070SAS No.: SDG No.: B09WF4

Matrix (soil/water): SOIL Level (low/med): LOW

% Solids for Sample: 79.5

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

Analyte	Control Limit %R	Spiked Sample Result (SSR)	C	Sample Result (SR)	C	Spike Added (SA)	%R	Q	M
Aluminum									NR
Antimony	75-125	44.2384		3.6525	B	119.80	33.9	N	P
Arsenic	75-125	448.3498		6.5141		479.19	92.2		P
Barium	75-125	605.5466		148.7789		479.19	95.3		P
Beryllium	75-125	11.9629		1.0158	B	11.98	91.4		P
Cadmium	75-125	11.2944		0.5910	B	11.98	89.3		P
Calcium									NR
Chromium	75-125	71.5568		28.3588		47.92	90.1		P
Cobalt	75-125	127.1926		14.3918		119.80	94.2		P
Copper	75-125	85.6113		29.4221		59.90	93.8		P
Iron									NR
Lead	75-125	114.6331		6.9159		119.80	89.9		P
Magnesium									NR
Manganese	75-125	465.6963		324.5758		119.80	117.8		P
Mercury	75-125	0.6111		0.0572	U	0.60	101.8		CV
Nickel	75-125	132.0084		22.4801		119.80	91.4		P
Potassium									NR
Selenium	75-125	431.6023		0.6645	U	479.19	90.1		P
Silver	75-125	13.9179		1.5735	B	11.98	103.0		P
Sodium									NR
Thallium	75-125	416.5798		0.8781	U	479.19	86.9		P
Vanadium	75-125	186.4918		76.0769		119.80	92.2		P
Zinc	75-125	175.0225		70.3216		119.80	87.4		P
Cyanide	75-125	23.2483		0.6227	U	30.83	75.4		CA
Titanium		2386.5828		2349.8279		119.80	30.7		P

FS 5-12-94

Comments: FS 5-10-94

~~Compounds~~ Analytes indicated with low recovery will qualify associated results as estimated (J/UJ).
Titanium result is greater than 4x spike amount and no qualifier is applied.

FS 5-10-94

~~011~~

FORM V (Part 1) - IN ILM02.1

BLANK SUMMARY 9/1997.2343 SDG: B09DT4-TMA-690

WESTINGHOUSE/HANFORD

3
BLANKS

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D2-0039

Lab Code: SKINER Case No.: N4-01-070SAS No.: SDG No.: B09WF4

Preparation Blank Matrix (soil/water): SOIL

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

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Prepa-ration Blank	C	M
Aluminum	15.0	U	38.9	B	24.9	B	37.1	B	3.000	U	P
Antimony	12.2	U	12.2	U	12.2	U	12.2	U	2.440	U	P
Arsenic	3.0	U	3.0	U	3.0	U	3.0	U	0.600	U	P
Barium	0.8	U	2.0	B	0.8	U	1.9	B	0.204	B	P
Beryllium	0.3	U	0.3	U	0.3	U	0.4	B	0.060	U	P
Cadmium	1.7	U	2.1	B	1.7	U	1.7	U	0.340	U	P
Calcium	100.1	B	83.4	U	328.7	B	132.3	B	16.680	U	P
Chromium	2.5	U	2.5	U	2.5	U	3.7	B	0.674	B	P
Cobalt	2.9	U	3.8	B	2.9	U	2.9	U	0.580	U	P
Copper	7.2	B	19.4	B	4.9	B	19.7	B	1.150	B	P
Iron	13.4	U	15.6	B	23.0	B	18.6	B	4.810	B	P
Lead	1.8	U	1.8	U	1.8	U	1.8	U	0.360	U	P
Magnesium	32.2	U	45.2	B	32.2	U	46.9	B	6.440	U	P
Manganese	0.8	U	1.3	B	0.8	U	1.5	B	0.160	U	P
Mercury	0.1	U	0.1	U	0.1	U			0.050	U	CV
Nickel	4.4	U	4.4	U	4.4	U	4.4	U	0.880	U	P
Potassium	58.8	U	58.8	U	58.8	U	58.8	U	11.760	U	P
Selenium	2.8	U	2.8	U	2.8	U	2.8	U	0.560	U	P
Silver	2.1	U	3.1	B	2.1	U	2.4	B	0.420	U	P
Sodium	39.6	U	39.6	U	39.6	U	39.6	U	26.534	B	P
Thallium	3.7	U	3.7	U	3.7	U	3.7	U	0.740	U	P
Vanadium	2.4	U	2.4	U	2.4	U	2.4	U	0.480	U	P
Zinc	4.6	U	6.5	B	9.1	B	9.4	B	0.958	B	P
Cyanide	10.0	U	10.0	U	10.0	U			0.500	U	CA
Titanium	1.3	B	2.5	B	1.4	B	3.0	B	0.240	U	P
	*		*		*				*		

*- Associated with sample B09WF4.
Circled values qualify associated sample results as non-detect. All other blank contaminants do not qualify since the 5x level is below the sample result. ~~007~~

FORM III - IN ILM02.1

5-12-94

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WESTINGHOUSE/HANFORD

SDG: B09DT4-TMA-690

9

SAMPLE NUMBER:

ICP SERIAL DILUTIONS

B09WF4L

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D2-0039

Lab Code: SKINER Case No.: N4-01-070SAS No.: SDG No.: B09WF4

Matrix (soil/water): SOIL Level (low/med): LOW

Concentration Units: ug/L

Analyte	Initial Sample Result (I)	C	Serial Dilution Result (S)	C	% Difference	Q	M
Aluminum	128020.00		122720.00		4.1		P
Antimony	15.39	B	61.00	U	100.0		P
Arsenic	27.45		31.71	B	15.5		P
Barium	626.88		607.55	B	3.1		P
Beryllium	4.28	B	3.90	B	8.9		P
Cadmium	2.49	B	8.50	U	100.0		P
Calcium	36997.00		36741.50		0.7		P
Chromium	119.49		122.80		2.8		P
Cobalt	60.64		71.10	B	17.2		P
Copper	123.97		152.80		23.3	E	P
Iron	170370.00		167540.00		1.7		P
Lead	29.14		29.52		1.3		P
Magnesium	39254.00		38108.00		2.9		P
Manganese	1367.60		1335.80		2.3		P
Mercury							NR
Nickel	94.72		97.25	B	2.7		P
Potassium	12892.00		12388.50	B	3.9		P
Selenium	2.80	U	14.00	U			P
Silver	6.63	B	19.50	B	194.1		P
Sodium	1843.10	B	1918.15	B	4.1		P
Thallium	3.70	U	18.50	U			P
Vanadium	320.55		311.35		2.9		P
Zinc	296.30		331.90		12.0	E	P
Titanium	9901.00		9399.50		5.1		P

Associated results for B09WF4 are qualified as estimated (J) since sample results are greater than 50 x the IDL.

5-12-94 ~~016~~

FORM IX - IN ILM02.1

9713517.2345

MEMORANDUM

MAY 1994
RECEIVED
TQO

TO: 200 UP-2 Project QA Record

May 13, 1994

FR: Thomas Stapp, Golder Associates Inc.

RE: SEMIVOLATILE DATA VALIDATION SUMMARY FOR DATA PACKAGE B09DT4-TMA-690 (923-E418 690SEMI.UP2)

INTRODUCTION

This memo presents the results of data validation on data package B09DT4-TMA-690 prepared by TMA laboratory. A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

SAMPLE ID	SAMPLE DATE	MEDIA	ANALYSES
B09WF4	1/17/94	SOIL	SEE NOTE 1

Notes:

1. Indicates the samples were analyzed for target compound list (TCL) semivolatile organics.

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

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

DATA QUALITY OBJECTIVES

This section presents a summary of the data quality in terms of the referenced validation criteria.

RECEIVED
MAY 1994

Precision. Goals for precision were met.

Accuracy. Goals for accuracy were met.

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

Detection Limits. Detection limit goals were met.

Completeness. The data package was complete for all requested analyses. A total of one (1) sample was validated in this data package with a total of sixty-four (64) determinations reported, of which 63 were deemed valid. This results in a completeness of 98 percent which meets normal work plan objectives of 90 percent.

MAJOR DEFICIENCIES

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

Initial Calibration

- A relative response factor for acenapthene was below the minimum requirment for initial calibration and therefore the associated sample result has been qualified as rejected (UR).

MINOR DEFICIENCIES

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

Laboratory Blanks

- Di-n-butylphthalate was detected in the laboratory blank. Attachments 2 and 5 provide a summary of the sample affected, data qualification applied and supporting documentation.

TENTATIVELY IDENTIFIED COMPOUNDS

Tentatively identified compounds (TICs) reported by the laboratory were evaluated during validation and qualified as follows:

- TICs were detected in the sample and associated laboratory blank and have been qualified due to associated blank contamination and determined to be presumptive and valid (UJN). Attachments 3 and 5 provide a summary of the sample affected, data qualification applied and supporting documentation.

- TICs were detected in the sample and identified as common laboratory contaminants, resulting in qualification of the results as unusable (R) as shown in Attachment 3.

- TICs were detected in the sample and determined to be valid, resulting in qualification of the results as presumptive and valid (JN).

REFERENCES

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

9713512.2347

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

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ATTACHMENT 1

GLOSSARY OF DATA REPORTING QUALIFIERS

GLOSSARY OF ORGANIC DATA REPORTING QUALIFIERS

B - Indicates the constituent was analyzed for and detected in the associated laboratory blank. This qualifier is applied by the laboratory. During the process of data validation this qualifier may be replaced by other appropriate qualifiers as defined by the validation procedures. The associated data should be considered usable for decision making purposes.

U - Indicates the constituent was analyzed for and not detected. The concentration reported is the sample quantitation limit corrected for aliquot size, dilution and percent solids (in the case of solid matrices) by the laboratory. The associated data should be considered usable for decision making purposes.

UJ - Indicates the constituent was analyzed for and not detected. Due to a minor quality control deficiency identified during data validation the concentration reported may not accurately reflect the sample quantitation limit. The associated data should be considered usable for decision making purposes.

J - Indicates the constituent was analyzed for and detected. This qualifier may be applied by the laboratory to indicate a concentration which is less than the contract required quantitation limit (CRQL) but greater than the instrument detection limit (IDL). During data validation this qualifier may be applied to indicate a minor quality control deficiency. However in either case, the associated data should be considered usable for decision making purposes.

NJ - Indicates presumptive evidence of a constituent at an estimated value. This qualifier is normally applied to GC analysis data (such as organochlorine pesticide and PCB data). The associated data should be considered usable for decision making purposes.

N - Indicates presumptive evidence of a constituent. This qualifier is normally applied to GC analysis data (such as organochlorine pesticide and PCB data). The associated data should be considered usable for decision making purposes.

JN - Indicates a tentatively identified compound (TIC) whose concentration and identification have been determined to be valid as a result of data validation. The associated data should be considered usable for decision making purposes.

UJN - Indicates a tentatively identified compound (TIC) that has been determined to be presumptive and valid (JN) in terms of identification and quantitation and has been qualified as undetected (U) due to associated blank contamination.

UR - Indicates the constituent was analyzed for and not detected. The concentration reported has been qualified as unusable due to a major quality control deficiency identified during data validation. The associated data should be considered unusable for decision making purposes.

R - Indicates the constituent was analyzed for and detected. The concentration reported has been qualified as unusable due to a major quality control deficiency identified during data validation. The associated data should be considered unusable for decision making purposes.

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ATTACHMENT 2

SUMMARY OF DATA QUALIFICATIONS

DATA QUALIFICATION SUMMARY - FORM B-7

SDG: B09DT4-TMA-690	REVIEWER: T. STAPP	DATE: 5-09-94	PAGE 1 OF 1
COMMENTS: SEMI-VOLATILE ORGANICS			
COMPOUND/ANALYTE	QUALIFIER	SAMPLES AFFECTED	REASON
DI-N-BUTYLPHTHALATE	U	B09WF4	CONTAMINANT DETECTED IN METHOD BLANK
ACENAPTHENE	UR	B09WF4	INITIAL CALIBRATION RELATIVE RESPONSE FACTOR IS BELOW MINIMUM LIMIT

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ATTACHMENT 3

QUALIFIED DATA SUMMARY and ANNOTATED LABORATORY REPORTS

Validated Data Summary, Data Package: B09DT4-TMA-690

	Samp#	B09WF4	
	Date	1-17-94	
	Location	---	
	Depth	---	
	Type	---	
	Comments	---	
Parameter	Units	Result	Q
PHENOL	UG/KG	410.000	U
BIS(2-CHLOROETHYL)ETHER	UG/KG	410.000	U
2-CHLOROPHENOL	UG/KG	410.000	U
1,3-DICHLOROBENZENE	UG/KG	410.000	U
1,4-DICHLOROBENZENE	UG/KG	410.000	U
1,2-DICHLOROBENZENE	UG/KG	410.000	U
2-METHYLPHENOL	UG/KG	410.000	U
2,2'-OXYBIS(1-CHLOROPROPANE)	UG/KG	410.000	U
4-METHYLPHENOL	UG/KG	410.000	U
N-NITROSO-DI-N-PROPYLAMINE	UG/KG	410.000	U
HEXACHLOROETHANE	UG/KG	410.000	U
NITROBENZENE	UG/KG	410.000	U
ISOPHORONE	UG/KG	410.000	U
2-NITROPHENOL	UG/KG	410.000	U
2,4-DIMETHYLPHENOL	UG/KG	410.000	U
BIS(2-CHLOROETHOXY)METHANE	UG/KG	410.000	U
2,4-DICHLOROPHENOL	UG/KG	410.000	U
1,2,4-TRICHLOROBENZENE	UG/KG	410.000	U
NAPHTHALENE	UG/KG	410.000	U
4-CHLOROANILINE	UG/KG	410.000	U
HEXACHLOROBUTADIENE	UG/KG	410.000	U
4-CHLORO-3-METHYLPHENOL	UG/KG	410.000	U
2-METHYLNAPHTHALENE	UG/KG	410.000	U
HEXACHLOROCYCLOPENTADIENE	UG/KG	410.000	U
2,4,6-TRICHLOROPHENOL	UG/KG	410.000	U
2,4,5-TRICHLOROPHENOL	UG/KG	990.000	U
2-CHLORONAPHTHALENE	UG/KG	410.000	U
2-NITROANILINE	UG/KG	990.000	U
DIMETHYLPHTHALATE	UG/KG	410.000	U
ACENAPHTHYLENE	UG/KG	410.000	U
3-NITROANILINE	UG/KG	990.000	U
ACENAPHTHENE	UG/KG	410.000	UR
2,4-DINITROPHENOL	UG/KG	990.000	U

Verified RS 5-16-94

Validated Data Summary, Data Package: B09DT4-TMA-690

	Samp#	B09WF4	
	Date	1-17-94	
	Location	---	
	Depth	---	
	Type	---	
	Comments	---	
Parameter	Units	Result	Q
4-NITROPHENOL	UG/KG	990.000	U
DIBENZOFURAN	UG/KG	410.000	U
2,4-DINITROTOLUENE	UG/KG	410.000	U
2,6-DINITROTOLUENE	UG/KG	410.000	U
DIETHYLPHTHALATE	UG/KG	410.000	U
4-CHLOROPHENYL-PHENYLETHER	UG/KG	410.000	U
FLUORENE	UG/KG	410.000	U
4-NITROANILINE	UG/KG	990.000	U
4,6-DINITRO-2-METHYLPHENOL	UG/KG	990.000	U
N-NITROSODIPHENYLAMINE	UG/KG	410.000	U
4-BROMOPHENYL-PHENYLETHER	UG/KG	410.000	U
HEXACHLOROBENZENE	UG/KG	410.000	U
PENTACHLOROPHENOL	UG/KG	990.000	U
PHENANTHRENE	UG/KG	410.000	U
ANTHRACENE	UG/KG	410.000	U
CARBAZOLE	UG/KG	410.000	U
DI-N-BUTYLPHTHALATE	UG/KG	410.000	U
FLUORANTHENE	UG/KG	410.000	U
PYRENE	UG/KG	410.000	U
BUTYLBENZYLPHTHALATE	UG/KG	410.000	U
3,3'-DICHLOROBENZIDINE	UG/KG	410.000	U
BENZO(A)ANTHRACENE	UG/KG	410.000	U
BIS(2-ETHYLHEXYL)PHTHALATE	UG/KG	410.000	U
CHRYSENE	UG/KG	410.000	U
DI-N-OCTYLPHTHALATE	UG/KG	410.000	U
BENZO(B)FLUORANTHENE	UG/KG	410.000	U
BENZO(K)FLUORANTHENE	UG/KG	410.000	U
BENZO(A)PYRENE	UG/KG	410.000	U
INDENO(1,2,3-CD)PYRENE	UG/KG	410.000	U
DIBENZ(A,H)ANTHRACENE	UG/KG	410.000	U
BENZO(G,H,I)PERYLENE	UG/KG	410.000	U

Verified RS 5-16-94

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5-12-94

~~000206~~
EPA SAMPLE NO.

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

B09WF4

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 01038 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A401038-01B

Sample wt/vol: 30.6 (g/mL) G Lab File ID: 40218I14

Level: (low/med) LOW Date Received: 01/21/94

% Moisture: 21 decanted: (Y/N) N Date Extracted: 01/26/94

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 02/18/94

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 7.4

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-95-2	Phenol	410	U
111-44-4	bis(2-Chloroethyl)Ether	410	U
95-57-8	2-Chlorophenol	410	U
541-73-1	1,3-Dichlorobenzene	410	U
106-46-7	1,4-Dichlorobenzene	410	U
95-50-1	1,2-Dichlorobenzene	410	U
95-48-7	2-Methylphenol	410	U
108-60-1	2,2'-oxybis(1-Chloropropane)	410	U
106-44-5	4-Methylphenol	410	U
621-64-7	N-Nitroso-Di-n-Propylamine	410	U
67-72-1	Hexachloroethane	410	U
98-95-3	Nitrobenzene	410	U
78-59-1	Isophorone	410	U
88-75-5	2-Nitrophenol	410	U
105-67-9	2,4-Dimethylphenol	410	U
111-91-1	bis(2-Chloroethoxy)Methane	410	U
120-83-2	2,4-Dichlorophenol	410	U
120-82-1	1,2,4-Trichlorobenzene	410	U
91-20-3	Naphthalene	410	U
106-47-8	4-Chloroaniline	410	U
87-68-3	Hexachlorobutadiene	410	U
59-50-7	4-Chloro-3-Methylphenol	410	U
91-57-6	2-Methylnaphthalene	410	U
77-47-4	Hexachlorocyclopentadiene	410	U
88-06-2	2,4,6-Trichlorophenol	410	U
95-95-4	2,4,5-Trichlorophenol	990	U
91-58-7	2-Chloronaphthalene	410	U
88-74-4	2-Nitroaniline	990	U
131-11-3	Dimethylphthalate	410	U
208-96-8	Acenaphthylene	410	U
99-09-2	3-Nitroaniline	990	U
83-32-9	Acenaphthene	410	~~U~~ UR
51-28-5	2,4-Dinitrophenol	990	U

Q

Verified 5-12-94

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5-12-94
~~000207~~

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B09WF4

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 01038 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A401038-01B

Sample wt/vol: 30.6 (g/mL) G Lab File ID: 40218I14

Level: (low/med) LOW Date Received: 01/21/94

% Moisture: 21 decanted: (Y/N) N Date Extracted: 01/26/94

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 02/18/94

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 7.4

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-02-7	4-Nitrophenol	990	U
132-64-9	Dibenzofuran	410	U
121-14-2	2,4-Dinitrotoluene	410	U
606-20-2	2,6-Dinitrotoluene	410	U
84-66-2	Diethylphthalate	410	U
7005-72-3	4-Chlorophenyl-phenylether	410	U
86-73-7	Fluorene	410	U
100-01-6	4-Nitroaniline	990	U
534-52-1	4,6-Dinitro-2-methylphenol	990	U
86-30-6	N-Nitrosodiphenylamine (1)	410	U
101-55-3	4-Bromophenyl-phenylether	410	U
118-74-1	Hexachlorobenzene	410	U
87-86-5	Pentachlorophenol	990	U
85-01-8	Phenanthrene	410	U
120-12-7	Anthracene	410	U
86-74-8	Carbazole	410	U
84-74-2	Di-n-Butylphthalate	410 ~~320~~	~~BJ~~ U
206-44-0	Fluoranthene	410	U
129-00-0	Pyrene	410	U
85-68-7	Butylbenzylphthalate	410	U
91-94-1	3,3'-Dichlorobenzidine	410	U
56-55-3	Benzo(a)Anthracene	410	U
117-81-7	bis(2-Ethylhexyl)Phthalate	410	U
218-01-9	Chrysene	410	U
117-84-0	Di-n-Octyl Phthalate	410	U
205-99-2	Benzo(b)Fluoranthene	410	U
207-08-9	Benzo(k)Fluoranthene	410	U
50-32-8	Benzo(a)Pyrene	410	U
193-39-5	Indeno(1,2,3-cd)Pyrene	410	U
53-70-3	Dibenz(a,h)Anthracene	410	U
191-24-2	Benzo(g,h,i)Perylene	410	U

(1) - Cannot be separated from Diphenylamine

Verified 5-12-94

9213512.2357

5-12-94

~~000208~~

1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B09WF4

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 01038 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A401038-01B

Sample wt/vol: 30.6 (g/mL) G Lab File ID: 40218I14

Level: (low/med) LOW Date Received: 01/21/94

% Moisture: 21 decanted: (Y/N) N Date Extracted: 01/26/94

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 02/18/94

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 7.4

Number TICs found: 4

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q	Q
1.	UNKNOWN HYDROCARBON	5.17	250	~~BJ~~	UJN
2.	UNKNOWN HYDROCARBON	6.22	700	~~BJ~~	UJN
3.	UNKNOWN KETONE	6.73	170	~~BJ~~	R
4.	UNKNOWN HYDROCARBON	8.62	120	~~J~~	~~UJN~~

Total unknown hydrocarbon = 1070 ug/kg ~~UJN~~ 5-12-94

Verified 5-12-94

FORM I SV-TIC

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ATTACHMENT 4

LABORATORY NARRATIVE and CHAIN-OF-CUSTODY DOCUMENTATION

000072
5-9-94

CASE NARRATIVE

LABORATORY : TMA/ARLI

CASE : 01-038

CONTRACT ID : WESTINGHOUSE HANFORD COMPANY

SDG RECEIPT DATE : January 21, 1994

1.0 DESCRIPTION OF CASE :

Two soil samples were analyzed for TCL Organics- Volatiles and Semivolatiles according to the USEPA Contract Laboratory Program (CLP) Statement of Work for Organic Analysis, Revision OLM01.8. The Extractable Hydrocarbons for Kerosene (K) were analyzed according to the SW-846 Method 8015M.

2.0 SAMPLE LIST :

WESTINGHOUSE ID	LAB ID	ANALYSIS REQUESTED	MATRIX
B09WF4	A4-01-038-01A	V	SOIL
B09WF4	A4-01-038-01B	SV	SOIL
B09WF4 MS	A4-01-038-01C	SV	SOIL
B09WF4 MSD	A4-01-038-01D	SV	SOIL
B09WF4	A4-01-038-01H	K	SOIL
B09WF4 RE	A4-01-038-01H	K	SOIL
B09WF4 MS	A4-01-038-01I	K	SOIL
B09WF4 MSRE	A4-01-038-01I	K	SOIL
B09WF4 MSD	A4-01-038-01J	K	SOIL
B09WF4 MSDRE	A4-01-038-01J	K	SOIL
B09WF7	A4-01-038-02A	V	SOIL
B09WF7 MS	A4-01-038-02B	V	SOIL
B09WF7 MSD	A4-01-038-02C	V	SOIL

3.0 COMMENTS :

3.1 SHIPPING AND DOCUMENTATION :

All of the samples were received intact and properly documented.

3.2 ANALYSIS

3.2.1 VOLATILE ANALYSIS COMMENTS :

LOW LEVEL SOIL :

The samples were analyzed by heated purge within the CLP SOW holding times. The samples were analyzed during a period from 01/19/94 through 01/27/94, on the instrument "ROCKY". On 01/19/94, the operator inadvertently entered the wrong year during the instrument system boot-up, and therefore, all of

000073
5-9-94

the sample data incorrectly documented the year as "1993". Since it was not possible to change the date of analysis within the system the work order data was processed as is, and the appropriate manual corrections were made on the raw data by the laboratory. In addition, the report forms were changed to reflect the correct year of analysis (1994).

The analyte Acetone was detected at concentrations above the CRQL in samples B09WF4, B09WF7MS, B09WF7MSD, and the blank, VBLK0127R. In sample B09WF7, both Acetone and Chloromethane were detected at concentrations below the CRQL. Methylene Chloride was detected at concentrations below the CRQL in all of the samples. In addition, both 4-Methyl-2-pentanone and 2-Hexanone were detected below the CRQL in sample B09WF7MS. However, since these two analytes were not detected in either sample B09WF7 or in sample B09WF7MSD, the spectra for the analytes have been included with sample B09WF7MS for confirmation purposes.

All of the QC results were within the limits specified by the EPA CLP SOW.

3.2.2 SEMIVOLATILE ANALYSIS COMMENTS :

LOW LEVEL SOIL :

The samples were extracted and analyzed within the contract required holding times.

In all of the samples Di-n-butylphthalate was detected at concentrations less than the CRQL. In addition, sample B09WF4MSD had bis(2-Ethylhexyl)phthalate detected at a concentration below the CRQL. Since it was not detected in the unspiked sample or in sample B09WF4MS, the spectra was included in the package along with the raw data for sample B09WF4MSD.

Both the MS and the MSD sample had matrix spike recoveries above the QC limits for 2,4-Dinitrotoluene, 4-Nitrophenol, and Pentachlorophenol. In accordance with the protocol, no further action was required.

All of the other QC results were within the limits specified by the EPA CLP SOW.

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5-9-94

3.2.3 EXTRACTABLE HYDROCARBONS "KEROSENE RANGE" COMMENTS :

SEQUENCE NOTES :

The original sequence was started on 01/31/94 and was analyzed according to the SW-846 Method 8015M. Due to low Kerosene recoveries for the spiked samples (the MS, MSD, and LCS), all of the samples were reextracted and reanalyzed outside of the holding times. The reanalysis sequence was started on 02/24/94. Both of the initial calibrations consisted of 5 different levels of the Kerosene standard that ranged from approximately 200ppm to 2000ppm. A continuing calibration at approximately 1000ppm was injected amongst the samples, in order to verify the instrument stability. The %RSD in the all of the initial calibrations and the %D in the continuing calibrations were below their 20% and 15% limits, respectively.

SAMPLE NOTES :

LOW LEVEL SOIL :

The samples were extracted and analyzed within the required holding times. Approximately 20 g of each sample were extracted and concentrated to 5 mL.

The matrix spike and matrix spike duplicate recoveries for Kerosene were low in the original analysis - 46% and 50%, respectively. An LCS, KLCS0126S, was prepared at the same time and had a recovery of 65%. These low recoveries were probably be due to an evaporation problem during the extraction process. Samples B09WF4, B09WF4MS, and B09WF4MSD, were reextracted outside of the holding time on 02/24/94. The sample reanalyses results were included in the package for further confirmation.

Sample B09WF4RE was spiked with Kerosene, and the matrix spike recoveries were 86% for B09WF4MSRE, and 85% for sample B09WF4MSDRE. A second LCS, KLCS0224, was prepared at the same time and had an 85% recovery. Both the original and the reanalyzed LCS results were included in the "Additional Raw Data" portion of the package. No Kerosene was detected in sample B09WF4 for either of the analyses.

All of the QC results were within the limits specified by the SW-846 Method 8015M.

~~000075~~
5-9-94

We certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data in this hardcopy data package and in the computer-readable data submitted on diskette is authorized by the Laboratory Manager or his designees, as verified by the following signatures.

Nicole Roth 3/18/94
Nicole Roth
Program Manager

Maureen Parrish
Maureen Parrish
Project Manager 3/17/94

9213517.2363

5-9-94 ~~0000024~~

Westinghouse Hanford Company	CHAIN OF CUSTODY

Custody Form Initiator: L E ROGERS

Company Contact: L E ROGERS — Telephone: 376-7690

Project Designation/Sampling Locations: 200-UP-2 — Collection Date: 1-17-94

Ice Chest No.: SNL-196 — Field Logbook No.: EFL-1091

Bill of Lading/Airbill No.: — Offsite Property No.:

Method of Shipment: AIR

Shipped to: TMA

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

Sample Identification

1) B09WF4

~~1,250ml P:CLP;TAL Metals,Hg,Ti~~
~~1,250ml Gs:VOA CLP~~
~~1,250ml aG:Semi-VOA CLP~~
~~1,125ml G:Anions F,Cl,SO4 (EPA 300.0)~~
~~1,125ml P/G:Anions NO2,NO3 (EPA 353.2)~~
~~1,125ml G:Cyanide CLP~~
~~1,125ml Gw:Kerosene (8015M)~~
~~1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79~~

2) B09WF7

~~1,250ml P:CLP;TAL Metals,Hg,Ti~~
~~1,250ml Gs:VOA CLP~~
~~1,250ml aG:Semi-VOA CLP~~
~~1,125ml G:Anions F,Cl,SO4 (EPA 300.0)~~
~~1,125ml P/G:Anions NO2,NO3 (EPA 353.2)~~ 1-17-94
~~1,125ml G:Cyanide CLP~~
~~1,125ml Gw:Kerosene (8015M)~~
~~1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79~~

3)

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml ~~Gs:VOA CLP~~
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2) 1-17-94
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

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

Relinquished by:	Received by:	Date/Time:
1-20-94 Loren E. Rogers 0955	[signature]	1-21-94 10:58
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

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

9713517.2364

ATTACHMENT 5

DATA VALIDATION SUPPORTING DOCUMENTATION

GC/MS ORGANIC DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E

PROJECT: 200-UP-2		DATA PACKAGE: B09DT4-TMA-690	
VALIDATOR:	LAB: TMA / ARLI		DATE: 5-6-94
CASE:		SDG:	

ANALYSES PERFORMED

☐ CLP Volatiles	☐ SW-846 8240 (cap column)	☐ SW-846 8260 (packed column)	☑ CLP Semivolatiles	☐ SW-846 8270 (cap column)	☐ SW-846 (packed column)
☐	☐	☐	☐	☐	☐

SAMPLES/MATRIX B09WF4 / SOIL

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Is technical verification documentation present? Note ① . . . . . (Yes) No N/A

Is a case narrative present? . . . . . (Yes) No N/A

Comments: ① Performed by WHC.

2. HOLDING TIMES

Are sample holding times acceptable? . . . . . (Yes) No N/A

Comments:

	Collected	Prepared	Analyzed
B09WF4	1-17-94	1-26-94	2-18-94

GC/MS ORGANIC DATA VALIDATION CHECKLIST

3. INSTRUMENT TUNING AND CALIBRATION

Is the GC/MS tuning/performance check acceptable? . . . . . (Yes) No N/A

Are initial calibrations acceptable? . SEE NOTE ① . . . . . Yes (No) N/A

Are continuing calibrations acceptable? . . . . . (Yes) No N/A

Comments: ① RRF160 for Acenapthene is below minimum req. of 0.800 (0.794) qualifying all detects J and non-detects UR. See attached IC Summary page.

4. BLANKS

Were laboratory blanks analyzed? . . . . . (Yes) No N/A

Are laboratory blank results acceptable? NOTE ① . . . . . Yes (No) N/A

Were field/trip blanks analyzed? . NOTE ② . . . . . Yes No (N/A)

Are field/trip blank results acceptable? . . . . . Yes No (N/A)

Comments: ① Contaminant detected in Lab Blank (Di-n-Butylphthalate) will qualify sample result as non-detect @ the CRQL. TICs detected in the blank have qualified sample TIC's as UJN for similar spectral matches. ② Field QC has not been identified in this sample set, but has been requested. Field blanks will be evaluated in final data summary

5. ACCURACY

Were surrogates/System Monitoring Compounds analyzed? . . . . . (Yes) No N/A

Are surrogate/System Monitoring Compound recoveries acceptable? (Yes) No N/A

Were MS/MSD samples analyzed? . . . . . (Yes) No N/A

Are MS/MSD results acceptable? . See Note ① . . . . . Yes (No) N/A

Comments: ① Six of 22 spike cmpnds. were above the upper control limit, but associated sample results were non-detect and therefore, will not be qualified.

GC/MS ORGANIC DATA VALIDATION CHECKLIST

6. PRECISION

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

Are field duplicate RPD values acceptable? See Note ① . . Yes No N/A

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

Comments: ① Field QC is not ~~avat~~ identified with this Sample set but has been requested. Field Duplicates will be evaluated in the final data Summary.

7. SYSTEM PERFORMANCE

Were internal standards analyzed? . . . . . Yes No N/A

Are internal standard areas acceptable? . . . . . Yes No N/A

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

Comments:

8. COMPOUND IDENTIFICATION AND QUANTITATION

Is compound identification acceptable? . . . . . Yes No N/A

Is compound quantitation acceptable? . . . . . Yes No N/A

Comments:

9. REPORTED RESULTS AND QUANTITATION LIMITS

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

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

Do results meet the CRQLs? . . . . . Yes No N/A

Has the laboratory properly identified and coded all TIC? . . Yes No N/A Note ①

Comments: ① Appropriate qualification of TIC's is as indicated on Laboratory Report Form 1.

INITIAL CALIBRATION SUMMARY

5-9-94

~~000226~~

6B

SEMIVOLATILE ORGANICS INITIAL CALIBRATION DATA

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 01038 SAS No.: NA SDG No.: NA

Instrument ID: INGA Calibration Date(s): 02/16/94 02/16/94

Calibration Times: 1145 1528

LAB FILE ID: RRF20 = 40216I03 RRF50 = 40216I02
RRF80 = 40216I04 RRF120= 40216I05 RRF160= 40216I01

COMPOUND		RRF20	RRF50	RRF80	RRF120	RRF160	$\overline{RRF}$	% RSD
Phenol	*	1.737	1.776	1.743	1.602	1.510	1.674	6.8*
bis(2-Chloroethyl)Ether	*	1.403	1.425	1.370	1.225	1.158	1.316	9.0*
2-Chlorophenol	*	1.274	1.302	1.307	1.213	1.195	1.258	4.1*
1,3-Dichlorobenzene	*	1.438	1.485	1.445	1.384	1.328	1.416	4.3*
1,4-Dichlorobenzene	*	1.478	1.514	1.468	1.382	1.301	1.429	6.0*
1,2-Dichlorobenzene	*	1.400	1.372	1.316	1.157	1.022	1.253	12.8*
2-Methylphenol	*	1.128	1.165	1.122	1.072	1.036	1.105	4.6*
2,2'-oxybis(1-Chloropropane		1.403	1.451	1.385	1.420	1.347	1.401	2.8
4-Methylphenol	*	1.135	1.151	1.093	1.022	0.984	1.077	6.7*
N-Nitroso-Di-n-Propylamine	*	0.947	0.989	0.935	0.924	0.903	0.940	3.4*
Hexachloroethane	*	0.550	0.584	0.569	0.549	0.521	0.555	4.3*
Nitrobenzene	*	0.390	0.399	0.397	0.373	0.374	0.387	3.2*
Isophorone	*	0.779	0.797	0.778	0.744	0.768	0.773	2.5*
2-Nitrophenol	*	0.187	0.208	0.209	0.202	0.207	0.203	4.5*
2,4-Dimethylphenol	*	0.338	0.350	0.347	0.332	0.329	0.339	2.7*
bis(2-Chloroethoxy)Methane	*	0.498	0.496	0.487	0.457	0.447	0.477	4.9*
2,4-Dichlorophenol	*	0.288	0.322	0.319	0.294	0.294	0.303	5.2*
1,2,4-Trichlorobenzene	*	0.347	0.359	0.351	0.328	0.311	0.339	5.7*
Naphthalene	*	1.040	1.027	0.962	0.864	0.811	0.941	10.7*
4-Chloroaniline		0.397	0.450	0.445	0.421	0.412	0.425	5.3
Hexachlorobutadiene		0.196	0.209	0.198	0.186	0.172	0.192	7.3
4-Chloro-3-Methylphenol	*	0.282	0.314	0.305	0.297	0.291	0.298	4.1*
2-Methylnaphthalene	*	0.688	0.720	0.672	0.618	0.562	0.652	9.6*
Hexachlorocyclopentadiene		0.304	0.350	0.370	0.350	0.342	0.343	7.1
2,4,6-Trichlorophenol	*	0.335	0.369	0.392	0.376	0.375	0.369	5.7*
2,4,5-Trichlorophenol	*	0.333	0.387	0.399	0.393	0.379	0.378	7.0*
2-Chloronaphthalene	*	1.058	1.079	1.107	1.012	0.930	1.037	6.7*
2-Nitroaniline		0.308	0.350	0.378	0.355	0.355	0.349	7.3
Dimethylphthalate		1.085	1.159	1.201	1.154	1.142	1.148	3.6
Acenaphthylene	*	1.594	1.638	1.669	1.476	1.409	1.557	7.1*
3-Nitroaniline		0.208	0.254	0.270	0.293	0.299	0.265	13.8
Acenaphthene	*	0.930	0.957	0.951	0.849	0.794	0.896	8.0* ★
2,4-Dinitrophenol		0.090	0.148	0.161	0.183	0.193	0.155	26.1
4-Nitrophenol		0.071	0.097	0.104	0.111	0.110	0.099	16.6
Dibenzofuran	*	1.472	1.532	1.551	1.401	1.291	1.449	7.3*
2,4-Dinitrotoluene	*	0.321	0.378	0.393	0.360	0.359	0.362	7.5*
2,6-Dinitrotoluene	*	0.242	0.282	0.296	0.298	0.296	0.283	8.4*

* Compounds with required minimum RRF and maximum %RSD values.
All other compounds must meet a minimum RRF of 0.010.

★ Lower Control limit is 0.800

FORM VI SV-1

3/90

9213512.2369

Laboratory Blank Summary

5-9-94

~~000281~~

1C

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SBLK0126S

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 01038 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A401038-BLK

Sample wt/vol: 30.1 (g/mL) G Lab File ID: 40218I13

Level: (low/med) LOW Date Received: _____

% Moisture: _____ decanted: (Y/N) N Date Extracted: 01/26/94

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 02/18/94

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-02-7	4-Nitrophenol	800	U
132-64-9	Dibenzofuran	330	U
121-14-2	2,4-Dinitrotoluene	330	U
606-20-2	2,6-Dinitrotoluene	330	U
84-66-2	Diethylphthalate	330	U
7005-72-3	4-Chlorophenyl-phenylether	330	U
86-73-7	Fluorene	330	U
100-01-6	4-Nitroaniline	800	U
534-52-1	4,6-Dinitro-2-methylphenol	800	U
86-30-6	N-Nitrosodiphenylamine (1)	330	U
101-55-3	4-Bromophenyl-phenylether	330	U
118-74-1	Hexachlorobenzene	330	U
87-86-5	Pentachlorophenol	800	U
85-01-8	Phenanthrene	330	U
120-12-7	Anthracene	330	U
86-74-8	Carbazole	330	U
84-74-2	Di-n-Butylphthalate	270	J
206-44-0	Fluoranthene	330	U
129-00-0	Pyrene	330	U
85-68-7	Butylbenzylphthalate	330	U
91-94-1	3,3'-Dichlorobenzidine	330	U
56-55-3	Benzo(a)Anthracene	330	U
117-81-7	bis(2-Ethylhexyl)Phthalate	330	U
218-01-9	Chrysene	330	U
117-84-0	Di-n-Octyl Phthalate	330	U
205-99-2	Benzo(b)Fluoranthene	330	U
207-08-9	Benzo(k)Fluoranthene	330	U
50-32-8	Benzo(a)Pyrene	330	U
193-39-5	Indeno(1,2,3-cd)Pyrene	330	U
53-70-3	Dibenz(a,h)Anthracene	330	U
191-24-2	Benzo(g,h,i)Perylene	330	U

Common laboratory contamina

(1) - Cannot be separated from Diphenylamine

LABORATORY BLANK SUMMARY

5-9-94

~~000282~~

1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

SBLK0126S

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 01038 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A401038-BLK

Sample wt/vol: 30.1 (g/mL) G Lab File ID: 40218I13

Level: (low/med) LOW Date Received: _____

% Moisture: _____ decanted: (Y/N) N Date Extracted: 01/26/94

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 02/18/94

Injection Volume: 2.0(uL) Dilution Factor: 1.0

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

Number TICs found: 6

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN HYDROCARBON	5.17	170	J
2.	UNKNOWN HYDROCARBON	5.67	66	J
3.	UNKNOWN HYDROCARBON	6.23	1100	J
4.	UNKNOWN KETONE	6.53	66	J
5.	UNKNOWN KETONE	6.72	170	J
6.	HEXANEDIOIC ACID ISOMER	24.78	66	J

~~* UNKNOWN HYDROCARBON ~8.67 < DL~~

5-12-94

Unknown Hydrocarbon TIC is below detection limit and will not qualify sample TIC @ ~8.67 min.

~~* Non reported TIC has similar ID and retention time as sample TIC and will qualify sample TIC as UJN.~~

5-12-94

9413517.2371

MEMORANDUM

TO: 200 UP-2 Project QA Record June 6, 1994

FR: Thomas Stapp, Golder Associates Inc.

RE: GENERAL GC DATA VALIDATION SUMMARY FOR DATA PACKAGE B09DT4-TMA-690 (923-E418 690EXTR.UP2)

INTRODUCTION

This memo presents the results of data validation on data package B09DT4-TMA-690 prepared by TMA laboratory. A list of samples validated along with the analyses reported and the methods of analysis is provided in the following table.

SAMPLE ID	SAMPLE DATE	MEDIA	ANALYSES
B09WF4	1/17/94	SOIL	SEE NOTE 1

Notes:

1. Indicates the sample was analyzed for extractable fuel hydrocarbons (kerosene range) by SW-846 method 8015M.

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

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

DATA QUALITY OBJECTIVES

The following section presents a summary of the data quality objectives in terms of the referenced validation criteria.

Precision. Goals for precision were met.

Accuracy. Goals for accuracy were met with the exception of minor deficiencies as indicated below.

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

Detection Limits. Detection limit goals were met.

Completeness. The data package was complete for all requested analyses. A total of one (1) sample was validated in this data package with a total of one (1) determination reported, which was deemed valid. This results in a completeness of 100 percent which meets the work plan completeness objective of 90 percent.

Revised 6-6-94

MAJOR DEFICIENCIES

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

Holding Time

- Sample B09WF4RE was extracted and analyzed past the specified holding time. Attachments 2 and 5 provide a summary of the sample affected, qualification applied and supporting documentation. Qualification of this sample result does not affect completeness criteria since the result for sample B09WF4 is valid.

MINOR DEFICIENCIES

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

Matrix Spike/Matrix Spike Duplicate

- The recovery for MS/MSD analyses was unacceptable for sample B09WF4. Attachments 2 and 5 provide a summary of the sample affected, qualification applied and supporting documentation.

REFERENCES

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

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

Revised 6-6-94 RS ..02

9713517.2373

ATTACHMENT 1

GLOSSARY OF DATA REPORTING QUALIFIERS

GLOSSARY OF ORGANIC DATA REPORTING QUALIFIERS

B - Indicates the constituent was analyzed for and detected in the associated laboratory blank. This qualifier is applied by the laboratory. During the process of data validation this qualifier may be replaced by other appropriate qualifiers as defined by the validation procedures. The associated data should be considered usable for decision making purposes.

U - Indicates the constituent was analyzed for and not detected. The concentration reported is the sample quantitation limit corrected for aliquot size, dilution and percent solids (in the case of solid matrices) by the laboratory. The associated data should be considered usable for decision making purposes.

UJ - Indicates the constituent was analyzed for and not detected. Due to a minor quality control deficiency identified during data validation the concentration reported may not accurately reflect the sample quantitation limit. The associated data should be considered usable for decision making purposes.

J - Indicates the constituent was analyzed for and detected. This qualifier may be applied by the laboratory to indicate a concentration which is less than the contract required quantitation limit (CRQL) but greater than the instrument detection limit (IDL). During data validation this qualifier may be applied to indicate a minor quality control deficiency. However in either case, the associated data should be considered usable for decision making purposes.

NJ - Indicates presumptive evidence of a constituent at an estimated value. This qualifier is normally applied to GC analysis data (such as organochlorine pesticide and PCB data). The associated data should be considered usable for decision making purposes.

N - Indicates presumptive evidence of a constituent. This qualifier is normally applied to GC analysis data (such as organochlorine pesticide and PCB data). The associated data should be considered usable for decision making purposes.

JN - Indicates a tentatively identified compound (TIC) whose concentration and identification have been determined to be valid as a result of data validation. The associated data should be considered usable for decision making purposes.

UJN - Indicates a tentatively identified compound (TIC) that has been determined to be presumptive and valid (JN) in terms of identification and quantitation and has been qualified as undetected (U) due to associated blank contamination.

UR - Indicates the constituent was analyzed for and not detected. The concentration reported has been qualified as unusable due to a major quality control deficiency identified during data validation. The associated data should be considered unusable for decision making purposes.

R - Indicates the constituent was analyzed for and detected. The concentration reported has been qualified as unusable due to a major quality control deficiency identified during data validation. The associated data should be considered unusable for decision making purposes.

9713517.2375

ATTACHMENT 2

SUMMARY OF DATA QUALIFICATIONS

DATA QUALIFICATION SUMMARY - FORM B-7

SDG: B09DT4-TMA-690	REVIEWER: T. STAPP	DATE: 5-11-94	PAGE 1 OF 1
COMMENTS: EXTRACTABLE FUEL HYDROCARBONS			
COMPOUND/ANALYTE	QUALIFIER	SAMPLES AFFECTED	REASON
KEROSENE	UR	B09WF4RE	HOLDING TIME EXCEEDED
KEROSENE	UJ	B09WF4	MS/MSD RECOVERY <50% LIMIT

Revised 6-6-94 BK

9713517.2377

ATTACHMENT 3

QUALIFIED DATA SUMMARY and ANNOTATED LABORATORY REPORTS

Validated Data Summary, Data Package: B09DT4-TMA-690

	Samp#	B09WF4		B09WF4RE	
	Date	1-17-94		1-17-94	
	Location	---		---	
	Depth	---		---	
	Type	SOIL		SOIL	
	Comments	---		---	
Parameter	Units	Result	Q	Result	Q
KEROSENE	MG/KG	5.000	UJ	5.000	UR

Verified 6-6-94

Revised 6-6-94

90-08

97 3517 2378

9713517.2379

5-11-94
~~000336~~

TMA Inc. REPORT Work Order # A4-01-038

Received: 01/21/94 Results by Sample

SAMPLE ID B09WF4 FRACTION 01H TEST CODE 8015MS NAME EPA 8015M EXTRACT.

Date & Time Collected 01/17/94 Category

MODIFIED 8015 - EXTRACTABLE FUEL HYDROCARBONS

Matrix: SOIL
Date Analyzed: 02/17/94
Dilution factor: 1.00
Concentration Units: mg/Kg

Compound	Sample Result	PQL	Q
Kerosene Range	~~ND~~	5.0	UJ
C10 - C16 Jet Fuel Range	NA	NA	
C9 - C22 Diesel Range	NA	NA	
Hydraulic Range	NA	NA	

ND = Not detected at the specified limits

Form I

Verified
5-11-94

Revised
6-6-94

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RS 5-13-94

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TMA Inc. REPORT

Results by Sample

Received: 01/21/94

Work Order # A4-01-038

SAMPLE ID B09WF4 RE FRACTION 01K TEST CODE 8015MS NAME EPA 8015M EXTRACT.

Date & Time Collected 01/17/94 Category

MODIFIED 8015 - EXTRACTABLE FUEL HYDROCARBONS

Matrix: SOIL
Date Analyzed: 02/25/94
Dilution factor: 1.00
Concentration Units: mg/Kg

Compound	Sample Result	PQL	Q
Kerosene Range	~~ND~~	5.0	UR
C10 - C16 Jet Fuel Range	NA	NA	
C9 - C22 Diesel Range	NA	NA	
Hydraulic Range	NA	NA	

Verified

RS 5-13-94

ND = Not detected at the specified limits

Form I

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ATTACHMENT 4

LABORATORY NARRATIVE and CHAIN-OF-CUSTODY DOCUMENTATION

5-11-94

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CASE NARRATIVE

LABORATORY : TMA/ARLI

CASE : 01-038

CONTRACT ID : WESTINGHOUSE HANFORD COMPANY

SDG RECEIPT DATE : January 21, 1994

1.0 DESCRIPTION OF CASE :

Two soil samples were analyzed for TCL Organics- Volatiles and Semivolatiles according to the USEPA Contract Laboratory Program (CLP) Statement of Work for Organic Analysis, Revision OLM01.8. The Extractable Hydrocarbons for Kerosene (K) were analyzed according to the SW-846 Method 8015M.

2.0 SAMPLE LIST :

WESTINGHOUSE ID	LAB ID	ANALYSIS REQUESTED	MATRIX
B09WF4	A4-01-038-01A	V	SOIL
B09WF4	A4-01-038-01B	SV	SOIL
B09WF4 MS	A4-01-038-01C	SV	SOIL
B09WF4 MSD	A4-01-038-01D	SV	SOIL
B09WF4	A4-01-038-01H	K	SOIL
B09WF4 RE	A4-01-038-01H	K	SOIL
B09WF4 MS	A4-01-038-01I	K	SOIL
B09WF4 MSRE	A4-01-038-01I	K	SOIL
B09WF4 MSD	A4-01-038-01J	K	SOIL
B09WF4 MSDRE	A4-01-038-01J	K	SOIL
B09WF7	A4-01-038-02A	V	SOIL
B09WF7 MS	A4-01-038-02B	V	SOIL
B09WF7 MSD	A4-01-038-02C	V	SOIL

3.0 COMMENTS :

3.1 SHIPPING AND DOCUMENTATION :

All of the samples were received intact and properly documented.

3.2 ANALYSIS

3.2.1 VOLATILE ANALYSIS COMMENTS :

LOW LEVEL SOIL :

The samples were analyzed by heated purge within the CLP SOW holding times. The samples were analyzed during a period from 01/19/94 through 01/27/94, on the instrument "ROCKY". On 01/19/94, the operator inadvertently entered the wrong year during the instrument system boot-up, and therefore, all of

5-11-94

000073

the sample data incorrectly documented the year as "1993". Since it was not possible to change the date of analysis within the system the work order data was processed as is, and the appropriate manual corrections were made on the raw data by the laboratory. In addition, the report forms were changed to reflect the correct year of analysis (1994).

The analyte Acetone was detected at concentrations above the CRQL in samples B09WF4, B09WF7MS, B09WF7MSD, and the blank, VBLK0127R. In sample B09WF7, both Acetone and Chloromethane were detected at concentrations below the CRQL. Methylene Chloride was detected at concentrations below the CRQL in all of the samples. In addition, both 4-Methyl-2-pentanone and 2-Hexanone were detected below the CRQL in sample B09WF7MS. However, since these two analytes were not detected in either sample B09WF7 or in sample B09WF7MSD, the spectra for the analytes have been included with sample B09WF7MS for confirmation purposes.

All of the QC results were within the limits specified by the EPA CLP SOW.

3.2.2 SEMIVOLATILE ANALYSIS COMMENTS :

LOW LEVEL SOIL :

The samples were extracted and analyzed within the contract required holding times.

In all of the samples Di-n-butylphthalate was detected at concentrations less than the CRQL. In addition, sample B09WF4MSD had bis(2-Ethylhexyl)phthalate detected at a concentration below the CRQL. Since it was not detected in the unspiked sample or in sample B09WF4MS, the spectra was included in the package along with the raw data for sample B09WF4MSD.

Both the MS and the MSD sample had matrix spike recoveries above the QC limits for 2,4-Dinitrotoluene, 4-Nitrophenol, and Pentachlorophenol. In accordance with the protocol, no further action was required.

All of the other QC results were within the limits specified by the EPA CLP SOW.

5-11-94

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3.2.3 EXTRACTABLE HYDROCARBONS "KEROSENE RANGE" COMMENTS :

SEQUENCE NOTES :

The original sequence was started on 01/31/94 and was analyzed according to the SW-846 Method 8015M. Due to low Kerosene recoveries for the spiked samples (the MS, MSD, and LCS), all of the samples were reextracted and reanalyzed outside of the holding times. The reanalysis sequence was started on 02/24/94. Both of the initial calibrations consisted of 5 different levels of the Kerosene standard that ranged from approximately 200ppm to 2000ppm. A continuing calibration at approximately 1000ppm was injected amongst the samples, in order to verify the instrument stability. The %RSD in the all of the initial calibrations and the %D in the continuing calibrations were below their 20% and 15% limits, respectively.

SAMPLE NOTES :

LOW LEVEL SOIL :

The samples were extracted and analyzed within the required holding times. Approximately 20 g of each sample were extracted and concentrated to 5 mL.

The matrix spike and matrix spike duplicate recoveries for Kerosene were low in the original analysis - 46% and 50%, respectively. An LCS, KLCS0126S, was prepared at the same time and had a recovery of 65%. These low recoveries were probably be due to an evaporation problem during the extraction process. Samples B09WF4, B09WF4MS, and B09WF4MSD, were reextracted outside of the holding time on 02/24/94. The sample reanalyses results were included in the package for further confirmation.

Sample B09WF4RE was spiked with Kerosene, and the matrix spike recoveries were 86% for B09WF4MSRE, and 85% for sample B09WF4MSDRE. A second LCS, KLCS0224, was prepared at the same time and had an 85% recovery. Both the original and the reanalyzed LCS results were included in the "Additional Raw Data" portion of the package. No Kerosene was detected in sample B09WF4 for either of the analyses.

All of the QC results were within the limits specified by the SW-846 Method 8015M.

5-11-94

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We certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data in this hardcopy data package and in the computer-readable data submitted on diskette is authorized by the Laboratory Manager or his designees, as verified by the following signatures.

Nicole Roth 3/18/94
Nicole Roth
Program Manager

Maureen Parrish 3/17/94
Maureen Parrish
Project Manager

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5-10-94
0000027

Westinghouse Hanford Company	CHAIN OF CUSTODY

Custody Form Initiator: L E ROGERS

Company Contact: L E ROGERS — Telephone: 376-7690

Project Designation/Sampling Locations: 200-UP-2 — Collection Date: 1-17-94

Ice Chest No.: SNL-196 — Field Logbook No.: EFL-1091

Bill of Lading/Airbill No.: — Offsite Property No.:

Method of Shipment: AIR

Shipped to: TMA

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

Sample Identification

1) B09WF4

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

2) B09WF7

~~1,250ml P:CLP;TAL Metals,Hg,Ti~~
1,250ml Gs:VOA CLP
~~1,250ml aG:Semi-VOA CLP~~
~~1,125ml G:Anions F,Cl,SO4 (EPA 300.0)~~
~~1,125ml P/G:Anions NO2,NO3 (EPA 353.2)~~ 1-17-94
~~1,125ml G:Cyanide CLP~~
~~1,125ml Gw:Kerosene (8015M)~~
~~1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79~~

3)

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2) 1-17-94
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

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

Relinquished by:	Received by:	Date/Time:
1-20-94 Loren E. Rogers 0955	[signature]	1-21-94 10:58
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

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

016

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ATTACHMENT 5

DATA VALIDATION SUPPORTING DOCUMENTATION

GENERAL GC DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E

PROJECT: 200-UP-2		DATA PACKAGE: B09DT4-TMA-690	
VALIDATOR: T. Stapp	LAB: TMA		DATE: 5-11-94
CASE:		SDG:	

ANALYSES PERFORMED

☐ 8010	☑ 8015 M SW-846	☐ 8020	☐ 8021	8140	8141
☐ 8150	☐ 8151	☐ WTPH-HCID	☐ WTPH-G	☐ WTPH-D	☐
☐	☐	☐	☐	☐	☐

SAMPLES/MATRIX: B09WF4 / SOIL

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Is technical verification documentation present? Note ① . . . . . (Yes) No N/A

Is a case narrative present? . . . . . (Yes) No N/A

Comments: ① Performed by WHC.

2. HOLDING TIMES

Are sample holding times acceptable? . . . . . ~~Yes~~ (No) N/A RE 5-13-94

Comments:

	Collected	Extracted	Analyzed	
B09WF4	1-17-94	1-26-94	2-17-94	✓
B09WF4 RE	1-17-94	2-24-94	2-25-94	Reanalysis for QC purposes

~~No qualification applied.~~

Qualification of UR applied to sample B09WF4 RE only. Since extraction holding time was exceeded. RE 5-13-94

GENERAL GC DATA VALIDATION CHECKLIST

3. INSTRUMENT CALIBRATION

3.1 INITIAL CALIBRATION

Was an initial calibration performed? . . . . . Yes No N/A

Are %RSD values for calibration or response factors acceptable? . . . . . Yes No N/A

Comments:

3.2 CONTINUING CALIBRATION

Was a continuing calibration check performed? . . . . . Yes No N/A

Are %D values for calibration or response factors acceptable? Yes No N/A

Comments:

4. BLANKS

Were laboratory blanks analyzed? . . . . . Yes No N/A

Are laboratory blank results acceptable? . . . . . Yes No N/A

Were field/trip blanks analyzed? . . . . See Note ① . . . Yes No N/A

Are field/trip blank results acceptable? . . . . . Yes No N/A

Comments: ① Field QC was not identified with this Sample set, but it has been requested. Field blanks will be evaluated in the final data Summary.

5. ACCURACY

Were surrogates analyzed? . . . . . See Note ① . . . . . Yes No N/A

Are surrogate recoveries acceptable? . . . . . Yes No N/A

Were MS/MSD samples analyzed? . . . . . Yes No N/A

Are MS/MSD recoveries acceptable? . See Note ② . . . . . ~~Yes~~ No N/A 6-6-94

Were LCS samples analyzed? . . . . . Yes No N/A

Are LCS recoveries acceptable? . . . . . Yes No N/A

Revised 6-6-94

GENERAL GC DATA VALIDATION CHECKLIST

Comments: ① Surrogate analysis appears only in the 2-24-94 initial calibration analyses (Reanalysis date) but not in samples or method blanks. LCS results were acceptable however and therefore no qualif. will be applied for Surrogate absence. ② Limits for MS/MSD recovery are not provided, however lab narrative indicates low recovery and the original sample analysis will therefore be qualified (UJ).

6. PRECISION

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

Are field duplicate RPD values acceptable? See Note ① . . . Yes No N/A

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

Comments: ① Field QC was not identified in this sample set but it has been requested. Field duplicates will be evaluated in the final data summary.

7. COMPOUND IDENTIFICATION AND QUANTITATION

Is compound identification acceptable? . . . . . Yes No N/A

Is compound quantitation acceptable? . . . . . Yes No N/A

Comments:

8. REPORTED RESULTS AND DETECTION LIMITS

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

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

Do results meet the CRQLs? . . . . . Yes No N/A

Comments:

Revised 6-6-94

-020

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MEMORANDUM

MAY 1994 RECEIVED TQO

TO: 200 UP-2 Project QA Record

May 13, 1994

FR: Thomas Stapp, Golder Associates Inc.

RE: VOLATILES DATA VALIDATION SUMMARY FOR DATA PACKAGE B09DT4-TMA-690 (923-E418 690VOA.UP2)

INTRODUCTION

This memo presents the results of data validation on data package B098Y7-TMA-628 prepared by TMA laboratory. A list of samples validated along with the analyses reported and the methods of analysis is provided in the following table.

SAMPLE ID	SAMPLE DATE	MEDIA	ANALYSES
B09WF4 B09WF7	1/17/94 1/17/94	SOIL SOIL	SEE NOTE 1

Notes:

1. Indicates the samples were analyzed for target compound list (TCL) volatile organics.

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

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

DATA QUALITY OBJECTIVES

This section presents a summary of the data quality in terms of the referenced validation criteria.

RECEIVED MAY 1994

Precision. Goals for precision were met.

Accuracy. Goals for accuracy were met.

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

Detection Limits. Detection limit goals were met.

Completeness. The data package was complete for all requested analyses. A total of two (2) samples were validated in this data package with a total of sixty-six (66) determinations reported, all of which were deemed valid. This results in a completeness of 100 percent which meets the work plan completeness objective of 90 percent.

MAJOR DEFICIENCIES

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

MINOR DEFICIENCIES

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

Laboratory Blanks

- Methylene chloride and acetone were detected in the laboratory method blank. Attachments 2 and 5 provide a summary of samples affected, qualification applied and supporting documentation.

REFERENCES

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

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

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ATTACHMENT 1

GLOSSARY OF DATA REPORTING QUALIFIERS

GLOSSARY OF ORGANIC DATA REPORTING QUALIFIERS

B - Indicates the constituent was analyzed for and detected in the associated laboratory blank. This qualifier is applied by the laboratory. During the process of data validation this qualifier may be replaced by other appropriate qualifiers as defined by the validation procedures. The associated data should be considered usable for decision making purposes.

U - Indicates the constituent was analyzed for and not detected. The concentration reported is the sample quantitation limit corrected for aliquot size, dilution and percent solids (in the case of solid matrices) by the laboratory. The associated data should be considered usable for decision making purposes.

UJ - Indicates the constituent was analyzed for and not detected. Due to a minor quality control deficiency identified during data validation the concentration reported may not accurately reflect the sample quantitation limit. The associated data should be considered usable for decision making purposes.

J - Indicates the constituent was analyzed for and detected. This qualifier may be applied by the laboratory to indicate a concentration which is less than the contract required quantitation limit (CRQL) but greater than the instrument detection limit (IDL). During data validation this qualifier may be applied to indicate a minor quality control deficiency. However in either case, the associated data should be considered usable for decision making purposes.

NJ - Indicates presumptive evidence of a constituent at an estimated value. This qualifier is normally applied to GC analysis data (such as organochlorine pesticide and PCB data). The associated data should be considered usable for decision making purposes.

N - Indicates presumptive evidence of a constituent. This qualifier is normally applied to GC analysis data (such as organochlorine pesticide and PCB data). The associated data should be considered usable for decision making purposes.

JN - Indicates a tentatively identified compound (TIC) whose concentration and identification have been determined to be valid as a result of data validation. The associated data should be considered usable for decision making purposes.

UJN - Indicates a tentatively identified compound (TIC) that has been determined to be presumptive and valid (JN) in terms of identification and quantitation and has been qualified as undetected (U) due to associated blank contamination.

UR - Indicates the constituent was analyzed for and not detected. The concentration reported has been qualified as unusable due to a major quality control deficiency identified during data validation. The associated data should be considered unusable for decision making purposes.

R - Indicates the constituent was analyzed for and detected. The concentration reported has been qualified as unusable due to a major quality control deficiency identified during data validation. The associated data should be considered unusable for decision making purposes.

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ATTACHMENT 2

SUMMARY OF DATA QUALIFICATIONS

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

DATA QUALIFICATION SUMMARY - FORM B-7

SDG: B09DT4-TMA-690	REVIEWER: T. STAPP	DATE: 5-05-94	PAGE 1 OF 1
COMMENTS: VOLATILE ORGANICS			
COMPOUND/ ANALYTE	QUALIFIER	SAMPLES AFFECTED	REASON
METHYLENE CHLORIDE	U	B09WF4 B09WF7	CONTAMINANT DETECTED IN LABORATORY BLANK
ACETONE	U	B09WF4 B09WF7	CONTAMINANT DETECTED IN LABORATORY BLANK

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ATTACHMENT 3

QUALIFIED DATA SUMMARY and ANNOTATED LABORATORY REPORTS

Validated Data Summary, Data Package: B09DT4-TMA-690

	Samp#	B09WF4		B09WF7	
	Date	1-17-94		1-17-94	
	Location	---		---	
	Depth	---		---	
	Type	---		---	
	Comments	---		---	
Parameter	Units	Result	Q	Result	Q
CHLOROMETHANE	UG/KG	13.000	U	1.000	J
BROMOMETHANE	UG/KG	13.000	U	10.000	U
VINYL CHLORIDE	UG/KG	13.000	U	10.000	U
CHLOROETHANE	UG/KG	13.000	U	10.000	U
METHYLENE CHLORIDE	UG/KG	13.000	U	10.000	U
ACETONE	UG/KG	17.000	U	10.000	U
CARBON DISULFIDE	UG/KG	13.000	U	10.000	U
1,1-DICHLOROETHENE	UG/KG	13.000	U	10.000	U
1,1-DICHLOROETHANE	UG/KG	13.000	U	10.000	U
1,2-DICHLOROETHENE (TOTAL)	UG/KG	13.000	U	10.000	U
CHLOROFORM	UG/KG	13.000	U	10.000	U
1,2-DICHLOROETHANE	UG/KG	13.000	U	10.000	U
2-BUTANONE	UG/KG	13.000	U	10.000	U
1,1,1-TRICHLOROETHANE	UG/KG	13.000	U	10.000	U
CARBON TETRACHLORIDE	UG/KG	13.000	U	10.000	U
BROMODICHLOROMETHANE	UG/KG	13.000	U	10.000	U
1,2-DICHLOROPROPANE	UG/KG	13.000	U	10.000	U
CIS-1,3-DICHLOROPROPENE	UG/KG	13.000	U	10.000	U
TRICHLOROETHENE	UG/KG	13.000	U	10.000	U
DIBROMOCHLOROMETHANE	UG/KG	13.000	U	10.000	U
1,1,2-TRICHLOROETHANE	UG/KG	13.000	U	10.000	U
BENZENE	UG/KG	13.000	U	10.000	U
TRANS-1,3-DICHLOROPROPENE	UG/KG	13.000	U	10.000	U
BROMOFORM	UG/KG	13.000	U	10.000	U
4-METHYL-2-PENTANONE	UG/KG	13.000	U	10.000	U
2-HEXANONE	UG/KG	13.000	U	10.000	U
TETRACHLOROETHENE	UG/KG	13.000	U	10.000	U
1,1,2,2-TETRACHLOROETHANE	UG/KG	13.000	U	10.000	U
TOLUENE	UG/KG	13.000	U	10.000	U
CHLOROBENZENE	UG/KG	13.000	U	10.000	U
ETHYLBENZENE	UG/KG	13.000	U	10.000	U
STYRENE	UG/KG	13.000	U	10.000	U
XYLENES (TOTAL)	UG/KG	13.000	U	10.000	U

Verified 5-6-94

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5-5-94

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

000076 EPA SAMPLE NO.

B09WF4

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 01038 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A401038-01A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 40127R08

Level: (low/med) LOW Date Received: 01/21/94

% Moisture: not dec. 21 Date Analyzed: 01/27/94

GC Column: PACK ID: 2.00 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q	Q
74-87-3	Chloromethane	13	U	
74-83-9	Bromomethane	13	U	
75-01-4	Vinyl Chloride	13	U	
75-00-3	Chloroethane	13	U	
75-09-2	Methylene Chloride	13 ~~2~~	~~BJ~~	U
67-64-1	Acetone	17	~~B~~	U
75-15-0	Carbon Disulfide	13	U	
75-35-4	1,1-Dichloroethene	13	U	
75-34-3	1,1-Dichloroethane	13	U	
540-59-0	1,2-Dichloroethene (total)	13	U	
67-66-3	Chloroform	13	U	
107-06-2	1,2-Dichloroethane	13	U	
78-93-3	2-Butanone	13	U	
71-55-6	1,1,1-Trichloroethane	13	U	
56-23-5	Carbon Tetrachloride	13	U	
75-27-4	Bromodichloromethane	13	U	
78-87-5	1,2-Dichloropropane	13	U	
10061-01-5	cis-1,3-Dichloropropene	13	U	
79-01-6	Trichloroethene	13	U	
124-48-1	Dibromochloromethane	13	U	
79-00-5	1,1,2-Trichloroethane	13	U	
71-43-2	Benzene	13	U	
10061-02-6	trans-1,3-Dichloropropene	13	U	
75-25-2	Bromoform	13	U	
108-10-1	4-Methyl-2-Pentanone	13	U	
591-78-6	2-Hexanone	13	U	
127-18-4	Tetrachloroethene	13	U	
79-34-5	1,1,2,2-Tetrachloroethane	13	U	
108-88-3	Toluene	13	U	
108-90-7	Chlorobenzene	13	U	
100-41-4	Ethylbenzene	13	U	
100-42-5	Styrene	13	U	
1330-20-7	Xylene (total)	13	U	

FORM I VOA Verified 5-5-94 3/90

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1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B09WF4

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 01038 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A401038-01A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 40127R08

Level: (low/med) LOW Date Received: 01/21/94

% Moisture: not dec. 21 Date Analyzed: 01/27/94

GC Column: PACK ID: 2.00 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

Number TICs found: 0

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

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1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B09WF7

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 01038 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A401038-02A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 40127R05

Level: (low/med) LOW Date Received: 01/21/94

% Moisture: not dec. 0 Date Analyzed: 01/27/94

GC Column: PACK ID: 2.00 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

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

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

FORM I VOA

Verified 5-5-94

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1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B09WF7

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 01038 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A401038-02A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 40127R05

Level: (low/med) LOW Date Received: 01/21/94

% Moisture: not dec. 0 Date Analyzed: 01/27/94

GC Column: PACK ID: 2.00 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

Number TICs found: 0

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

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ATTACHMENT 4

LABORATORY NARRATIVE and CHAIN-OF-CUSTODY DOCUMENTATION

5-5-94

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CASE NARRATIVE

LABORATORY : TMA/ARLI

CASE : 01-038

CONTRACT ID : WESTINGHOUSE HANFORD COMPANY

SDG RECEIPT DATE : January 21, 1994

1.0 DESCRIPTION OF CASE :

Two soil samples were analyzed for TCL Organics- Volatiles and Semivolatiles according to the USEPA Contract Laboratory Program (CLP) Statement of Work for Organic Analysis, Revision OLM01.8. The Extractable Hydrocarbons for Kerosene (K) were analyzed according to the SW-846 Method 8015M.

2.0 SAMPLE LIST :

WESTINGHOUSE ID	LAB ID	ANALYSIS REQUESTED	MATRIX
B09WF4	A4-01-038-01A	V	SOIL
B09WF4	A4-01-038-01B	SV	SOIL
B09WF4 MS	A4-01-038-01C	SV	SOIL
B09WF4 MSD	A4-01-038-01D	SV	SOIL
B09WF4	A4-01-038-01H	K	SOIL
B09WF4 RE	A4-01-038-01H	K	SOIL
B09WF4 MS	A4-01-038-01I	K	SOIL
B09WF4 MSRE	A4-01-038-01I	K	SOIL
B09WF4 MSD	A4-01-038-01J	K	SOIL
B09WF4 MSDRE	A4-01-038-01J	K	SOIL
B09WF7	A4-01-038-02A	V	SOIL
B09WF7 MS	A4-01-038-02B	V	SOIL
B09WF7 MSD	A4-01-038-02C	V	SOIL

3.0 COMMENTS :

3.1 SHIPPING AND DOCUMENTATION :

All of the samples were received intact and properly documented.

3.2 ANALYSIS

3.2.1 VOLATILE ANALYSIS COMMENTS :

LOW LEVEL SOIL :

The samples were analyzed by heated purge within the CLP SOW holding times. The samples were analyzed during a period from 01/19/94 through 01/27/94, on the instrument "ROCKY". On 01/19/94, the operator inadvertently entered the wrong year during the instrument system boot-up, and therefore, all of

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000073

the sample data incorrectly documented the year as "1993". Since it was not possible to change the date of analysis within the system the work order data was processed as is, and the appropriate manual corrections were made on the raw data by the laboratory. In addition, the report forms were changed to reflect the correct year of analysis (1994).

The analyte Acetone was detected at concentrations above the CRQL in samples B09WF4, B09WF7MS, B09WF7MSD, and the blank, VBLK0127R. In sample B09WF7, both Acetone and Chloromethane were detected at concentrations below the CRQL. Methylene Chloride was detected at concentrations below the CRQL in all of the samples. In addition, both 4-Methyl-2-pentanone and 2-Hexanone were detected below the CRQL in sample B09WF7MS. However, since these two analytes were not detected in either sample B09WF7 or in sample B09WF7MSD, the spectra for the analytes have been included with sample B09WF7MS for confirmation purposes.

All of the QC results were within the limits specified by the EPA CLP SOW.

3.2.2 SEMIVOLATILE ANALYSIS COMMENTS :

LOW LEVEL SOIL :

The samples were extracted and analyzed within the contract required holding times.

In all of the samples Di-n-butylphthalate was detected at concentrations less than the CRQL. In addition, sample B09WF4MSD had bis(2-Ethylhexyl)phthalate detected at a concentration below the CRQL. Since it was not detected in the unspiked sample or in sample B09WF4MS, the spectra was included in the package along with the raw data for sample B09WF4MSD.

Both the MS and the MSD sample had matrix spike recoveries above the QC limits for 2,4-Dinitrotoluene, 4-Nitrophenol, and Pentachlorophenol. In accordance with the protocol, no further action was required.

All of the other QC results were within the limits specified by the EPA CLP SOW.

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3.2.3 EXTRACTABLE HYDROCARBONS "KEROSENE RANGE" COMMENTS :

SEQUENCE NOTES :

The original sequence was started on 01/31/94 and was analyzed according to the SW-846 Method 8015M. Due to low Kerosene recoveries for the spiked samples (the MS, MSD, and LCS), all of the samples were reextracted and reanalyzed outside of the holding times. The reanalysis sequence was started on 02/24/94. Both of the initial calibrations consisted of 5 different levels of the Kerosene standard that ranged from approximately 200ppm to 2000ppm. A continuing calibration at approximately 1000ppm was injected amongst the samples, in order to verify the instrument stability. The %RSD in the all of the initial calibrations and the %D in the continuing calibrations were below their 20% and 15% limits, respectively.

SAMPLE NOTES :

LOW LEVEL SOIL :

The samples were extracted and analyzed within the required holding times. Approximately 20 g of each sample were extracted and concentrated to 5 mL.

The matrix spike and matrix spike duplicate recoveries for Kerosene were low in the original analysis - 46% and 50%, respectively. An LCS, KLCS0126S, was prepared at the same time and had a recovery of 65%. These low recoveries were probably be due to an evaporation problem during the extraction process. Samples B09WF4, B09WF4MS, and B09WF4MSD, were reextracted outside of the holding time on 02/24/94. The sample reanalyses results were included in the package for further confirmation.

Sample B09WF4RE was spiked with Kerosene, and the matrix spike recoveries were 86% for B09WF4MSRE, and 85% for sample B09WF4MSDRE. A second LCS, KLCS0224, was prepared at the same time and had an 85% recovery. Both the original and the reanalyzed LCS results were included in the "Additional Raw Data" portion of the package. No Kerosene was detected in sample B09WF4 for either of the analyses.

All of the QC results were within the limits specified by the SW-846 Method 8015M.

5-5-94

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We certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data in this hardcopy data package and in the computer-readable data submitted on diskette is authorized by the Laboratory Manager or his designees, as verified by the following signatures.

Nicole Roth 3/18/94
Nicole Roth
Program Manager

Maureen Parrish
Maureen Parrish
Project Manager 3/17/94

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Westinghouse Hanford Company	CHAIN OF CUSTODY

Custody Form Initiator: L E ROGERS

Company Contact: L E ROGERS — Telephone: 376-7690

Project Designation/Sampling Locations: 200-UP-2 — Collection Date: 1-17-94

Ice Chest No.: SML-196 — Field Logbook No.: EFL-1091

Bill of Lading/Airbill No.: — Offsite Property No.:

Method of Shipment: AIR

Shipped to: TMA

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

Sample Identification

1) B09WF4

~~1,250ml P:CLP;TAL Metals,Hg,Ti~~
~~1,250ml Gs:VOA CLP~~
~~1,250ml aG:Semi-VOA CLP~~
~~1,125ml G:Anions F,Cl,SO4 (EPA 300.0)~~
~~1,125ml P/G:Anions NO2,NO3 (EPA 353.2)~~
~~1,125ml G:Cyanide CLP~~
~~1,125ml Gw:Kerosene (8015M)~~
~~1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79~~

2) B09WF7

~~1,250ml P:CLP;TAL Metals,Hg,Ti~~
~~1,250ml Gs:VOA CLP~~
~~1,250ml aG:Semi-VOA CLP~~
~~1,125ml G:Anions F,Cl,SO4 (EPA 300.0)~~
~~1,125ml P/G:Anions NO2,NO3 (EPA 353.2)~~ 1-17-94
~~1,125ml G:Cyanide CLP~~
~~1,125ml Gw:Kerosene (8015M)~~
~~1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79~~

3)

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2) 1-17-94
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

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

Relinquished by:	Received by:	Date/Time:
1-20-94 Loren E. Rogers 0955	[signature]	1-21-94 10:58
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

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

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ATTACHMENT 5

DATA VALIDATION SUPPORTING DOCUMENTATION

GC/MS ORGANIC DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E

PROJECT: 200-UP-2		DATA PACKAGE: B09DT4-TMA-690
VALIDATOR: T.Stapp	LAB: TMA/ARLI	DATE: 5-5-94
CASE:		SDG:

ANALYSES PERFORMED

☑ CLP Volatiles	☐ SW-846 8240 (cap column)	☐ SW-846 8260 (packed column)	☐ CLP Semivolatiles	☐ SW-846 8270 (cap column)	☐ SW-846 (packed column)
☐	☐	☐	☐	☐	☐

SAMPLES/MATRIX B09WF4, B09WF7 / SOIL

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Is technical verification documentation present? NOTE ① . . . . . Yes No N/A

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

Comments: ① Performed by WHC.

2. HOLDING TIMES

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

Comments:

	Collected	Prepared	Analyzed
B09WF4	1-17-94	N/A	1-27-94
B09WF7	1-17-94	↓	1-27-94

GC/MS ORGANIC DATA VALIDATION CHECKLIST

3. INSTRUMENT TUNING AND CALIBRATION

Is the GC/MS tuning/performance check acceptable? . . . . . Yes No N/A

Are initial calibrations acceptable? . . . . . Yes No N/A

Are continuing calibrations acceptable? . . . . . Yes No N/A

Comments:

4. BLANKS

Were laboratory blanks analyzed? . . . . . Yes No N/A

Are laboratory blank results acceptable? See note ① . . . . Yes No N/A

Were field/trip blanks analyzed? . . See note ② . . . . . Yes No N/A

Are field/trip blank results acceptable? . . . . . Yes No N/A

Comments: ① Common laboratory contaminants ~~found~~ detected in prep. blank and qualification is applied according to blank data Summary form B-3. ② Field QC was not identified with this sample set but has been requested. Field blanks will be evaluated with the final data Summary.

5-5-9

5. ACCURACY

Were surrogates/System Monitoring Compounds analyzed? . . . . Yes No N/A

Are surrogate/System Monitoring Compound recoveries acceptable? Yes No N/A

Were MS/MSD samples analyzed? . . . . . Yes No N/A

Are MS/MSD results acceptable? . . . . . Yes No N/A

Comments:

GC/MS ORGANIC DATA VALIDATION CHECKLIST

6. PRECISION

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

Are field duplicate RPD values acceptable? See Note ① . . . Yes No N/A

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

Comments: ① Field QC was not identified in this sample set, but has been requested. Field duplicates will be evaluated in the final data summary.

7. SYSTEM PERFORMANCE

Were internal standards analyzed? . . . . . Yes No N/A

Are internal standard areas acceptable? . . . . . Yes No N/A

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

Comments:

8. COMPOUND IDENTIFICATION AND QUANTITATION

Is compound identification acceptable? . . . . . Yes No N/A

Is compound quantitation acceptable? . . . . . Yes No N/A

Comments:

9. REPORTED RESULTS AND QUANTITATION LIMITS

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

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

Do results meet the CRQLs? . . . . . Yes No N/A

Has the laboratory properly identified and coded all TIC? . . Yes No ~~N/A Note ①~~

Comments: ~~① No TICS~~ 5-5-94

BLANK AND SAMPLE DATA SUMMARY

SDG: B09DT4-TMA-690	VALIDATOR: T. Stapp	DATE: 5-5-94	PAGE 1 OF 1
COMMENTS: VOLATILE ORGANICS ANALYSIS			

SAMPLE ID	COMPOUND	RESULT	Q	RT	UNITS	5X RESULT	10X RESULT	SAMPLES AFFECTED	QUALIFIER
~~VBLK0127~~	~~MeCl2~~	~~3~~			~~ug/kg~~		~~30~~	~~B09WF4~~ ~~B09WF5~~	~~13 U~~ ~~10 U~~
	~~Acetone~~	~~13~~			↓		~~130~~		
VBLK0127	MeCl2	3			ug/Kg	N/A	30	B09WF4	13 U
↓	"	3			↓	↓	30	B09WF7	10 U
	Acetone	13					130	B09WF4	17 U
	"	13					130	B09WF7	10 U

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1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

VBLK0127R

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 01038 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: SBLK0127

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 40127R04

Level: (low/med) LOW Date Received: _____

% Moisture: not dec. ____ Date Analyzed: 01/27/94

GC Column: PACK ID: 2.00 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
74-87-3	Chloromethane	10	U
74-83-9	Bromomethane	10	U
75-01-4	Vinyl Chloride	10	U
75-00-3	Chloroethane	10	U
75-09-2	Methylene Chloride	3	J
67-64-1	Acetone	13	
75-15-0	Carbon Disulfide	10	U
75-35-4	1,1-Dichloroethene	10	U
75-34-3	1,1-Dichloroethane	10	U
540-59-0	1,2-Dichloroethene (total)	10	U
67-66-3	Chloroform	10	U
107-06-2	1,2-Dichloroethane	10	U
78-93-3	2-Butanone	10	U
71-55-6	1,1,1-Trichloroethane	10	U
56-23-5	Carbon Tetrachloride	10	U
75-27-4	Bromodichloromethane	10	U
78-87-5	1,2-Dichloropropane	10	U
10061-01-5	cis-1,3-Dichloropropene	10	U
79-01-6	Trichloroethene	10	U
124-48-1	Dibromochloromethane	10	U
79-00-5	1,1,2-Trichloroethane	10	U
71-43-2	Benzene	10	U
10061-02-6	trans-1,3-Dichloropropene	10	U
75-25-2	Bromoform	10	U
108-10-1	4-Methyl-2-Pentanone	10	U
591-78-6	2-Hexanone	10	U
127-18-4	Tetrachloroethene	10	U
79-34-5	1,1,2,2-Tetrachloroethane	10	U
108-88-3	Toluene	10	U
108-90-7	Chlorobenzene	10	U
100-41-4	Ethylbenzene	10	U
100-42-5	Styrene	10	U
1330-20-7	Xylene (total)	10	U

9713517.2415

MEMORANDUM

MAY 1994 RECEIVED TQO

TO: 200 UP-2 Project QA Record

May 3, 1994

FR: Thomas Stapp, Golder Associates Inc.

RE: RADIOCHEMISTRY DATA VALIDATION SUMMARY FOR DATA PACKAGE B09DT4-TMA-690 (923-E418 690RAD.UP2)

INTRODUCTION

This memo presents the results of data validation on data package B09DT4-TMA-690 prepared by the TMA/Norcal laboratory under contract to Westinghouse/Hanford using WHC approved methods. Information concerning the samples validated along with the analyses reported and the methods of analysis is provided in the following table.

SAMPLE ID	SAMPLE DATE	MEDIA	ANALYSIS
B09DT4	1/11/94	SOIL	SEE NOTE 1
B09DT5	1/11/94	SOIL	
B09DT7	1/11/94	SOIL	
B09DT9	1/13/94	SOIL	
B09WF3	1/13/94	SOIL	
B09WF4	1/17/94	SOIL	
B09WF5	1/13/94	SOIL	
B09WF6	1/13/94	SOIL	

RECEIVED MAY 5 1994 VALIDATION DOCUMENTATION SDLA

NOTES:

1. Indicates the samples were analyzed for gross alpha/beta, strontium-90, technetium-99 (beta counting), selenium-79 (liquid scintillation), isotopic plutonium, uranium, curium-244, americium-241, and neptunium-237 (alpha spectroscopy), total uranium (laser fluorometry), and selected radioisotopes by gamma spectroscopy.

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

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

DATA QUALITY OBJECTIVES

This section presents a summary of the data quality in terms of the referenced validation criteria.

Precision. Goals for precision were met.

-001

Accuracy. Goals for accuracy were met except for the technetium-99 LCS spike level that was greater than the range of 5 to 30 times the RDL requirement, however no qualification is applied for this deficiency.

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

Detection Limits. Detection limit goals were met with the exception that several minimum detectable activities (MDA) exceeded the required detection limits (RDL) due to low chemical yield, insufficient sample size, and high uranium activity (necessitating a lower than normal aliquot taken for analysis). Attachments 4 and 5 provide additional supporting documentation.

Completeness. The data package was complete for all requested analyses. A total of eight (8) samples were validated in this data package with a total of 280 determinations reported, all of which were deemed valid. This results in a completeness of 100 percent, which meets the work plan objective of 90%.

MAJOR DEFICIENCIES

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

MINOR DEFICIENCIES

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

Chemical Recoveries

- Chemical carrier recovery for technetium-99, was below required limits for sample B09DT5, therefore the associated result has been qualified as estimated (UJ).

Tracer Recoveries

- The americium tracer recovery for neptunium-237 analysis was below the required limit for samples B09WF3 and B09WF5, therefore the associated results have been qualified as estimated (J/UJ). Attachments 2 and 5 provide a summary of the data qualification applied, and supporting documentation.

Laboratory Blanks

- Potassium-40 was detected in the laboratory blank, therefore associated results greater than the MDA and less than five times the blank result have been qualified as estimated. Attachments 2 and 5 provide a summary of the samples affected, qualification applied and supporting documentation.

DATA REPORTING

- For laboratory results reported below the MDA, the results have been crossed out on the report forms for clarification purposes, and the MDA values are reported in the validated data summary with a "U" qualifier.

REFERENCES

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

WHC 1993b, Data Validation Procedures for Radiochemical Analyses, WHC-SD-EN-SPP-001, Rev. 1, 1993. Westinghouse Hanford Company, Richland, Washington.

9713517.2418

ATTACHMENT 1

GLOSSARY OF DATA REPORTING QUALIFIERS

GLOSSARY OF RADIOCHEMISTRY DATA REPORTING QUALIFIERS

U - Indicates the constituent was analyzed for, but was not detected at a concentration above the minimum detectable activity (MDA). The concentration reported is the MDA corrected for sample aliquot size, dilution factors and percent solids (in the case of solid matrices) by the laboratory. The associated data should be considered usable for decision making purposes.

UJ - Indicates the constituent was analyzed for and was not detected at a concentration above the MDA. Due to a quality control deficiency identified during data validation, the concentration reported may not accurately reflect the sample MDA. The associated data should be considered usable for decision making purposes.

J - Indicates the constituent was analyzed for and detected. The concentration reported is qualified as estimated due to a quality control deficiency identified during data validation. The associated data should be considered usable for decision making purposes.

UR - Indicates the constituent was analyzed for and not detected. The concentration reported is qualified as unusable due to a quality control deficiency identified during data validation. The associated data should be considered unusable for decision making purposes.

R - Indicates the constituent was analyzed for and detected. The concentration reported is qualified as unusable due to a quality control deficiency identified during data validation. The associated data should be considered unusable for decision making purposes.

9713517.2420

ATTACHMENT 2

SUMMARY OF DATA QUALIFICATIONS

WHC-SD-EN-SPP-001, REV.1

DATA QUALIFICATION SUMMARY - FORM B-7

SDG: B09DT4-TMA-690	REVIEWER: T. STAPP	DATE: 5-02-94	PAGE 1 OF 1
COMMENTS: RADIOCHEMISTRY			
COMPOUND/ANALYTE	QUALIFIER	SAMPLES AFFECTED	REASON
TECHNETIUM-99	UJ	B09DT5	CHEMICAL CARRIER RECOVERY BELOW 30% BUT GREATER THAN 10% LIMIT
NEPTUNIUM-237	J/UJ	B09WF3 B09WF5	TRACER RECOVERY BELOW 20% BUT GREATER THAN 5% LIMIT
POTASSIUM-40	J	B09DT5	CONTAMINANT DETECTED IN LABORATORY BLANK

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ATTACHMENT 3

QUALIFIED DATA SUMMARY and ANNOTATED LABORATORY REPORTS

Validated Data Summary, Data Package: B09DT4-TMA-690

	Samp#	B09DT4		B09DT5		B09DT7		B09DT9		B09WF3		B09WF4	
	Date	1-11-94		1-11-94		1-11-94		1-13-94		1-13-94		1-17-94	
	Location	---		---		---		---		---		---	
	Depth	---		---		---		---		---		---	
	Type	---		---		---		---		---		---	
	Comments	---		---		---		---		---		---	
Parameter	Units	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
GROSS ALPHA	pCi/g	3.000	U	3.600		11.000		210.000		130.000		12.000	
GROSS BETA	pCi/g	5.000	U	5.000	U	26.000		970.000		700.000		600.000	
SELENIUM-79	pCi/g	1.000	U	2.000	U	3.000	U	2.000	U	4.000	U	3.000	U
STRONTIUM-90	pCi/g	0.500	U	0.500	U	0.500	U	410.000		93.000		270.000	
TECHNETIUM-99	pCi/g	0.200	U	0.200	UJ	0.200	U	0.200	U	0.300	U	0.300	U
IODINE-129	pCi/g	2.000	U	1.000	U	2.000	U	1.000	U	2.000	U	2.000	U
URANIUM-233/234	pCi/g	0.150		0.200	U	3.400		140.000		1.800		0.750	
URANIUM-235	pCi/g	0.200	U	0.200	U	0.250		6.700		0.120		0.100	U
URANIUM-238	pCi/g	0.100	U	0.200	U	4.000		150.000		1.600		0.750	
TOTAL URANIUM	ug/g	0.190		0.230		10.000		280.000		4.400		2.600	
NEPTUNIUM-237	pCi/g	0.007	U	0.019		0.057		0.092		0.210	J	0.020	U
PLUTONIUM-238	pCi/g	0.020	U	0.030	U	0.040	U	0.030	U	0.550		0.040	U
PLUTONIUM-239/240	pCi/g	0.020	U	0.020	U	0.030	U	0.020	U	0.610		0.020	U
AMERICIUM-241	pCi/g	0.030	U	0.020	U	0.010		0.160		0.150		0.030	U
CURIUM-244	pCi/g	0.040	U	0.025		0.020	U	0.110		0.064		0.030	U
SODIUM-22	pCi/g	0.100	U	0.100	U	0.200	U	0.200	U	0.400	U	0.300	U
POTASSIUM-40	pCi/g	3.000	U	0.980	J	19.000		8.600		12.000		11.000	
MANGANESE-54	pCi/g	0.100	U	0.100	U	0.200	U	0.200	U	0.200	U	0.300	U
IRON-59	pCi/g	0.300	U	0.300	U	0.500	U	0.400	U	0.600	U	0.500	U
COBALT-58	pCi/g	0.100	U	0.080	U	0.200	U	0.200	U	0.200	U	0.300	U
COBALT-60	pCi/g	0.200	U	0.200	U	0.200	U	0.200	U	0.960		0.200	U
NIOBIUM-94	pCi/g	0.100	U	0.070	U	0.200	U	0.200	U	0.200	U	0.200	U
RUTHENIUM-103	pCi/g	0.100	U	0.100	U	0.200	U	0.300	U	1.000	U	0.300	U
RUTHENIUM-106	pCi/g	1.000	U	0.900	U	2.000	U	2.000	U	7.000	U	2.000	U
TIN-113	pCi/g	0.100	U	0.100	U	0.200	U	0.300	U	2.000	U	0.300	U
CESIUM-134	pCi/g	0.100	U	0.100	U	0.200	U	0.300	U	0.300	U	0.300	U
CESIUM-137	pCi/g	0.100	U	0.100	U	0.200	U	0.200	U	420.000		0.300	U
CERIUM-144	pCi/g	0.400	U	0.500	U	0.700	U	1.000	U	4.000	U	1.000	U
EUROPIUM-152	pCi/g	0.200	U	0.200	U	0.300	U	0.600	U	1.100		0.500	U
EUROPIUM-154	pCi/g	0.100	U	0.100	U	0.200	U	0.500	U	0.640		0.300	U
EUROPIUM-155	pCi/g	0.200	U	0.200	U	0.300	U	1.000	U	2.000	U	0.700	U
RADIUM-226	pCi/g	0.240		0.200	U	1.000		0.590		0.910		0.600	U
RADIUM-228	pCi/g	0.400	U	0.500	U	1.300		0.710		1.600		1.600	
THORIUM-228	pCi/g	0.280		0.190		1.100		0.930		1.300		0.760	
THORIUM-232	pCi/g	0.400	U	0.500	U	1.300		0.710		1.600		1.600	

Verified 5-3-94

Validated Data Summary, Data Package: B09DT4-TMA-690

	Samp#	B09WF5		B09WF6	
	Date	1-13-94		1-13-94	
	Location	---		---	
	Depth	---		---	
	Type	---		---	
	Comments	---		---	
Parameter	Units	Result	Q	Result	Q
GROSS ALPHA	pCi/g	70.000		3.200	
GROSS BETA	pCi/g	6.000	U	6.000	U
SELENIUM-79	pCi/g	3.000	U	3.000	U
STRONTIUM-90	pCi/g	0.800	U	0.800	U
TECHNETIUM-99	pCi/g	0.400	U	0.300	U
IODINE-129	pCi/g	2.000	U	1.000	U
URANIUM-233/234	pCi/g	0.200	U	0.100	U
URANIUM-235	pCi/g	0.200	U	0.100	U
URANIUM-238	pCi/g	0.200	U	0.100	U
TOTAL URANIUM	ug/g	0.210		0.190	
NEPTUNIUM-237	pCi/g	0.060	UJ	0.010	U
PLUTONIUM-238	pCi/g	0.040	U	0.040	U
PLUTONIUM-239/240	pCi/g	0.020	U	0.020	U
AMERICIUM-241	pCi/g	0.020	U	0.010	U
CURIUM-244	pCi/g	0.021		0.110	
SODIUM-22	pCi/g	0.100	U	0.100	U
POTASSIUM-40	pCi/g	2.000	U	2.000	U
MANGANESE-54	pCi/g	0.100	U	0.090	U
IRON-59	pCi/g	0.200	U	0.300	U
COBALT-58	pCi/g	0.100	U	0.100	U
COBALT-60	pCi/g	0.100	U	0.100	U
NIOBIUM-94	pCi/g	0.090	U	0.100	U
RUTHENIUM-103	pCi/g	0.100	U	0.100	U
RUTHENIUM-106	pCi/g	0.700	U	0.900	U
TIN-113	pCi/g	0.100	U	0.100	U
CESIUM-134	pCi/g	0.100	U	0.100	U
CESIUM-137	pCi/g	0.100	U	0.100	U
CERIUM-144	pCi/g	0.400	U	0.400	U
EUROPIUM-152	pCi/g	0.200	U	0.200	U
EUROPIUM-154	pCi/g	0.100	U	0.100	U
EUROPIUM-155	pCi/g	0.200	U	0.300	U
RADIUM-226	pCi/g	0.200	U	0.200	U
RADIUM-228	pCi/g	0.500	U	0.300	
THORIUM-228	pCi/g	0.300	U	0.200	U
THORIUM-232	pCi/g	0.500	U	0.300	

Verified 5-3-94 fs

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TMA NORCAL
REPORTING GROUP 7313

DATA SHEET

N401051-01

B09DT4

SDG	7313	Client	Westinghouse Hanford
Contact	Julie D. Wose	Contract	MBH-SVV-069262
Lab sample id	N401051-01	Client sample id	B09DT4
Dept sample id	7313-001	Location/Matrix	200-UP-2 SOLID
Received	01/18/94	Collected	01/11/94
% moisture	2.0	Chain of custody id	EFL-1115

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Gross Alpha	Alpha	~~2.0~~	~~2.3~~	3	10	U	80A
Gross Beta	Beta	~~0.58~~	~~3.2~~	5	10	U	80B
Selenium 79	15758-45-9	~~0.36~~	~~0.85~~	1	10	U	SE
Strontium 90	10098-97-2	~~0~~	~~0.47~~	0.5	1	U	Y
Technetium 99	14133-76-7	~~-0.011~~	~~0.071~~	0.2	0.5	U	TC
Iodine 129	15046-84-1	~~0.013~~	~~0.85~~	2	2	U	I
Uranium 233/234		0.15	0.10	0.1	0.3	~~J~~	U
Uranium 235	15117-96-1	~~0.040~~	~~0.041~~	0.2	0.3	U	U
Uranium 238		~~0~~	~~0.033~~	0.1	0.3	U	U
Total Uranium (ug/g)	7440-61-1	0.19	0.037	0.002	0.1	~~X~~	U_T
Neptunium 237	13994-20-2	~~0.002~~	~~0.005~~	0.007	0.2	U	NP
Plutonium 238	13981-16-3	~~0.013~~	~~0.013~~	0.02	0.05	U	PU
Plutonium 239/240		~~0~~	~~0.006~~	0.02	0.05	U	PU
Americium 241	14596-10-2	~~0.005~~	~~0.009~~	0.03	0.05	U	TP
Curium 244	13981-15-2	~~0.018~~	~~0.018~~	0.04	0.05	U	TP
GAMMA SCAN ANALYTES							
Sodium 22	13966-32-0	U		0.1		U	GAM
Potassium 40	13966-00-2	U		3		U	GAM
Manganese 54	13966-31-9	U		0.1		U	GAM
Iron 59	14596-12-4	U		0.3	0.05	U	GAM
Cobalt 58	13981-38-9	U		0.1	0.05	U	GAM
Cobalt 60	10198-40-0	U		0.2	0.05	U	GAM
Niobium 94	14681-63-1	U		0.1		U	GAM
Ruthenium 103	13968-53-1	U		0.1		U	GAM
Ruthenium 106	13967-48-1	U		1		U	GAM
Tin 113	13966-06-8	U		0.1		U	GAM
Cesium 134	13967-70-9	U		0.1		U	GAM
Cesium 137	10045-97-3	U		0.1	0.05	U	GAM

Verified 5/3

Lab id	TMAN
Protocol	WHC-HASM
Version	Ver 1.0
Form	DVD-DS
Version	2.28
Report date	03/22/94

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TMA NORCAL
REPORTING GROUP 7313

N401051-01

DATA SHEET, cont

B09DT4

SDG	7313	Client	Westinghouse Hanford
Contact	Julie D. Wose	Contract	MBH-SVV-069262
Lab sample id	N401051-01	Client sample id	B09DT4
Dept sample id	7313-001	Location/Matrix	200-UP-2 SOLID
Received	01/18/94	Collected	01/11/94
% moisture	2.0	Chain of custody id	EFL-1115

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Cerium 144	14762-78-8	U		0.4		U	GAM
Europium 152	14683-23-9	U		0.2	0.1	U	GAM
Europium 154	15585-10-1	U		0.1	0.1	U	GAM
Europium 155	14391-16-3	U		0.2	0.1	U	GAM
Radium 226	13982-63-3	0.24	0.23				GAM
Radium 228	15262-20-1	U		0.4		U	GAM
Thorium 228	14274-82-9	0.28	0.16				GAM
Thorium 232	7440-29-1	U		0.4		U	GAM

Verified 5/3/94

Lab id	TMAN
Protocol	WHC-HASM
Version	Ver 1.0
Form	DVD-DS
Version	2.28
Report date	03/22/94

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N401051-02

TMA NORCAL
REPORTING GROUP 7313

DATA SHEET

B09DT5

SDG	7313	Client	Westinghouse Hanford
Contact	Julie D. Wose	Contract	MBH-SVV-069262
Lab sample id	N401051-02	Client sample id	B09DT5
Dept sample id	7313-002	Location/Matrix	200-UP-2 SOLID
Received	01/18/94	Collected	01/11/94
% moisture	1.2	Chain of custody id	EFL-1115

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Gross Alpha	Alpha	3.6	2.3	3	10	~~J~~	80A
Gross Beta	Beta	~~1.6~~	~~3.3~~	5	10	U	80B
Selenium 79	15758-45-9	~~0.54~~	~~1.0~~	2	10	U	SE
Strontium 90	10098-97-2	~~0.054~~	~~0.46~~	0.5	1	U	Y
Technetium 99	14133-76-7	~~0.081~~	~~0.11~~	0.2	0.5	~~U~~ UJ	TC
Iodine 129	15046-84-1	~~0.002~~	~~0.63~~	1	2	U	I
Uranium 233/234		~~0.11~~	~~0.14~~	0.2	0.3	U	U
Uranium 235	15117-96-1	~~0~~	~~0.055~~	0.2	0.3	U	U
Uranium 238		~~0~~	~~0.045~~	0.2	0.3	U	U
Total Uranium (ug/g)	7440-61-1	0.23	0.044	0.002	0.1	~~X~~	U_T
Neptunium 237	13994-20-2	0.019	0.015	0.01	0.2	~~J~~	NP
Plutonium 238	13981-16-3	~~0.002~~	~~0.015~~	0.03	0.05	U	PU
Plutonium 239/240		~~0.007~~	~~0.010~~	0.02	0.05	U	PU
Americium 241	14596-10-2	~~0.003~~	~~0.011~~	0.02	0.05	U	TP
Curium 244	13981-15-2	0.025	0.016	0.02	0.05	~~J~~	TP
GAMMA SCAN ANALYTES							
Sodium 22	13966-32-0	U		0.1		U	GAM
Potassium 40	13966-00-2	0.98	0.85			~~B~~ J	GAM
Manganese 54	13966-31-9	U		0.1		U	GAM
Iron 59	14596-12-4	U		0.3	0.05	U	GAM
Cobalt 58	13981-38-9	U		0.08	0.05	U	GAM
Cobalt 60	10198-40-0	U		0.2	0.05	U	GAM
Niobium 94	14681-63-1	U		0.07		U	GAM
Ruthenium 103	13968-53-1	U		0.1		U	GAM
Ruthenium 106	13967-48-1	U		0.9		U	GAM
Tin 113	13966-06-8	U		0.1		U	GAM
Cesium 134	13967-70-9	U		0.1		U	GAM
Cesium 137	10045-97-3	U		0.1	0.05	U	GAM

Verified ~~FS~~ 5-3-94

Lab id	TMAN
Protocol	WHC-HASM
Version	Ver 1.0
Form	DVD-DS
Version	2.28
Report date	03/22/94

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TMA NORCAL
REPORTING GROUP 7313

N401051-02

DATA SHEET, cont

B09DT5

SDG	7313	Client	Westinghouse Hanford
Contact	Julie D. Wose	Contract	MBH-SVV-069262
Lab sample id	N401051-02	Client sample id	B09DT5
Dept sample id	7313-002	Location/Matrix	200-UP-2 SOLID
Received	01/18/94	Collected	01/11/94
% moisture	1.2	Chain of custody id	EFL-1115

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Cerium 144	14762-78-8	U		0.5		U	GAM
Europium 152	14683-23-9	U		0.2	0.1	U	GAM
Europium 154	15585-10-1	U		0.1	0.1	U	GAM
Europium 155	14391-16-3	U		0.2	0.1	U	GAM
Radium 226	13982-63-3	U		0.2		U	GAM
Radium 228	15262-20-1	U		0.5		U	GAM
Thorium 228	14274-82-9	0.19	0.11				GAM
Thorium 232	7440-29-1	U		0.5		U	GAM

Verified 5-3-94

Lab id	TMAN
Protocol	WHC-HASM
Version	Ver 1.0
Form	DVD-DS
Version	2.28
Report date	03/22/94

9713517.2429

N401051-03

TMA NORCAL
REPORTING GROUP 7313

DATA SHEET

B09DT7

SDG	7313	Client	Westinghouse Hanford
Contact	Julie D. Wose	Contract	MBH-SVV-069262
Lab sample id	N401051-03	Client sample id	B09DT7
Dept sample id	7313-003	Location/Matrix	200-UP-2 SOLID
Received	01/18/94	Collected	01/11/94
% moisture	4.4	Chain of custody id	EFL-1115

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Gross Alpha	Alpha	11	4.1	3	10		80A
Gross Beta	Beta	26	5.1	6	10		80B
Selenium 79	15758-45-9	~~1.4~~	~~1.6~~	3	10	U	SE
Strontium 90	10098-97-2	~~0.022~~	~~0.37~~	0.5	1	U	Y
Technetium 99	14133-76-7	~~0.062~~	~~0.089~~	0.2	0.5	U	TC
Iodine 129	15046-84-1	~~0.017~~	~~0.67~~	2	2	U	I
Uranium 233/234		3.4	0.69	0.2	0.3		U
Uranium 235	15117-96-1	0.25	0.14	0.2	0.3	~~J~~	U
Uranium 238		4.0	0.76	0.1	0.3		U
Total Uranium (ug/g)	7440-61-1	10	2.0	0.02	0.1		U_T
Neptunium 237	13994-20-2	0.057	0.032	0.04	0.2	~~J~~	NP
Plutonium 238	13981-16-3	~~0.004~~	~~0.015~~	0.04	0.05	U	PU
Plutonium 239/240		~~0.015~~	~~0.015~~	0.03	0.05	U	PU
Americium 241	14596-10-2	0.010	0.012	0.01	0.05	~~J~~	TP
Curium 244	13981-15-2	~~0.004~~	~~0.012~~	0.02	0.05	U	TP
GAMMA SCAN ANALYTES							
Sodium 22	13966-32-0	U		0.2		U	GAM
Potassium 40	13966-00-2	19	3.4				GAM
Manganese 54	13966-31-9	U		0.2		U	GAM
Iron 59	14596-12-4	U		0.5	0.05	U	GAM
Cobalt 58	13981-38-9	U		0.2	0.05	U	GAM
Cobalt 60	10198-40-0	U		0.2	0.05	U	GAM
Niobium 94	14681-63-1	U		0.2		U	GAM
Ruthenium 103	13968-53-1	U		0.2		U	GAM
Ruthenium 106	13967-48-1	U		2		U	GAM
Tin 113	13966-06-8	U		0.2		U	GAM
Cesium 134	13967-70-9	U		0.2		U	GAM
Cesium 137	10045-97-3	U		0.2	0.05	U	GAM

Verified 5-3-94

Lab id	TMAN
Protocol	WHC-HASM
Version	Ver 1.0
Form	DVD-DS
Version	2.28
Report date	03/22/94

9713512.2430

TMA NORCAL
REPORTING GROUP 7313

N401051-03

DATA SHEET, cont

B09DT7

SDG	7313	Client	Westinghouse Hanford
Contact	Julie D. Wose	Contract	MBH-SVV-069262
Lab sample id	N401051-03	Client sample id	B09DT7
Dept sample id	7313-003	Location/Matrix	200-UP-2 SOLID
Received	01/18/94	Collected	01/11/94
% moisture	4.4	Chain of custody id	EFL-1115

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Cerium 144	14762-78-8	U		0.7		U	GAM
Europium 152	14683-23-9	U		0.3	0.1	U	GAM
Europium 154	15585-10-1	U		0.2	0.1	U	GAM
Europium 155	14391-16-3	U		0.3	0.1	U	GAM
Radium 226	13982-63-3	1.0	0.41				GAM
Radium 228	15262-20-1	1.3	0.64				GAM
Thorium 228	14274-82-9	1.1	0.19				GAM
Thorium 232	7440-29-1	1.3	0.64				GAM

Verified 5-3-94

Lab id	TMAN
Protocol	WHC-HASM
Version	Ver 1.0
Form	DVD-DS
Version	2.28
Report date	03/22/94

9713517.2451

TMA NORCAL
REPORTING GROUP 7313

DATA SHEET

N401051-04

B09DT9

SDG	7313	Client	Westinghouse Hanford
Contact	Julie D. Wose	Contract	MBH-SVV-069262
Lab sample id	N401051-04	Client sample id	B09DT9
Dept sample id	7313-004	Location/Matrix	200-UP-2 SOLID
Received	01/17/94	Collected	01/13/94
% moisture	1.4	Chain of custody id	EFL-1091

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Gross Alpha	Alpha	210	19	4	10		80A
Gross Beta	Beta	970	21	5	10	~~B~~	80B
Selenium 79	15758-45-9	~~0~~	~~1.3~~	2	10	U	SE
Strontium 90	10098-97-2	410	17	1	1		Y
Technetium 99	14133-76-7	~~0.18~~	~~0.11~~	0.2	0.5	U	TC
Iodine 129	15046-84-1	~~0.35~~	~~0.47~~	1	2	U	I
Uranium 233/234		140	16	2	0.3		U
Uranium 235	15117-96-1	6.7	2.0	1	0.3		U
Uranium 238		150	17	1	0.3		U
Total Uranium (ug/g)	7440-61-1	280	56	2	0.1	~~X~~	U_T
Neptunium 237	13994-20-2	0.092	0.032	0.03	0.2	~~J~~	NP
Plutonium 238	13981-16-3	~~0.006~~	~~0.012~~	0.03	0.05	U	PU
Plutonium 239/240		~~0.006~~	~~0.012~~	0.02	0.05	U	PU
Americium 241	14596-10-2	0.16	0.042	0.03	0.05		TP
Curium 244	13981-15-2	0.11	0.033	0.03	0.05		TP
GAMMA SCAN ANALYTES							
Sodium 22	13966-32-0	U		0.2		U	GAM
Potassium 40	13966-00-2	8.6	2.5			~~B~~	GAM
Manganese 54	13966-31-9	U		0.2		U	GAM
Iron 59	14596-12-4	U		0.4	0.05	U	GAM
Cobalt 58	13981-38-9	U		0.2	0.05	U	GAM
Cobalt 60	10198-40-0	U		0.2	0.05	U	GAM
Niobium 94	14681-63-1	U		0.2		U	GAM
Ruthenium 103	13968-53-1	U		0.3		U	GAM
Ruthenium 106	13967-48-1	U		2		U	GAM
Tin 113	13966-06-8	U		0.3		U	GAM
Cesium 134	13967-70-9	U		0.3		U	GAM
Cesium 137	10045-97-3	U		0.2	0.05	U	GAM

Verified 5-3-94

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Lab id	TMAN
Protocol	WHC-HASM
Version	Ver 1.0
Form	DVD-DS
Version	2.28
Report date	03/22/94

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TMA NORCAL
REPORTING GROUP 7313

N401051-04

DATA SHEET, cont

B09DT9

SDG	7313	Client	Westinghouse Hanford
Contact	Julie D. Wose	Contract	MBH-SVV-069262
Lab sample id	N401051-04	Client sample id	B09DT9
Dept sample id	7313-004	Location/Matrix	200-UP-2 SOLID
Received	01/17/94	Collected	01/13/94
% moisture	1.4	Chain of custody id	EFL-1091

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Cerium 144	14762-78-8	U		1		U	GAM
Europium 152	14683-23-9	U		0.6	0.1	U	GAM
Europium 154	15585-10-1	U		0.5	0.1	U	GAM
Europium 155	14391-16-3	U		1	0.1	U	GAM
Radium 226	13982-63-3	0.59	0.30				GAM
Radium 228	15262-20-1	0.71	0.62				GAM
Thorium 228	14274-82-9	0.93	0.39				GAM
Thorium 232	7440-29-1	0.71	0.62				GAM

Verified 5-3-94

Lab id	TMAN
Protocol	WHC-HASM
Version	Ver 1.0
Form	DVD-DS
Version	2.28
Report date	03/22/94

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N401051-05

TMA NORCAL
REPORTING GROUP 7313

DATA SHEET

B09WF3

SDG 7313 Client Westinghouse Hanford
Contact Julie D. Wose Contract MBH-SVV-069262

Lab sample id N401051-05 Client sample id B09WF3
Dept sample id 7313-005 Location/Matrix 200-UP-2 SOLID
Received 01/18/94 Collected 01/13/94
% moisture 1.4 Chain of custody id EFL-1091

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Gross Alpha	Alpha	130	14	3	10		80A
Gross Beta	Beta	700	18	6	10	~~B~~	80B
Selenium 79	15758-45-9	~~0.71~~	~~2.4~~	4	10	U	SE
Strontium 90	10098-97-2	93	7.6	1	1		Y
Technetium 99	14133-76-7	~~0.15~~	~~0.11~~	0.3	0.5	U	TC
Iodine 129	15046-84-1	~~0.39~~	~~0.86~~	2	2	U	I
Uranium 233/234		1.8	0.36	0.1	0.3		U
Uranium 235	15117-96-1	0.12	0.092	0.1	0.3	~~J~~	U
Uranium 238		1.6	0.32	0.1	0.3		U
Total Uranium (ug/g)	7440-61-1	4.4	0.85	0.02	0.1		U_T
Neptunium 237	13994-20-2	0.21	0.077	0.05	0.2	/ J	NP
Plutonium 238	13981-16-3	0.55	0.078	0.03	0.05		PU
Plutonium 239/240		0.61	0.084	0.02	0.05		PU
Americium 241	14596-10-2	0.15	0.033	0.02	0.05		TP
Curium 244	13981-15-2	0.064	0.026	0.03	0.05		TP
GAMMA SCAN ANALYTES							
Sodium 22	13966-32-0	U		0.4		U	GAM
Potassium 40	13966-00-2	12	2.8			~~B~~	GAM
Manganese 54	13966-31-9	U		0.2		U	GAM
Iron 59	14596-12-4	U		0.6	0.05	U	GAM
Cobalt 58	13981-38-9	U		0.2	0.05	U	GAM
Cobalt 60	10198-40-0	0.96	0.26		0.05		GAM
Niobium 94	14681-63-1	U		0.2		U	GAM
Ruthenium 103	13968-53-1	U		1		U	GAM
Ruthenium 106	13967-48-1	U		7		U	GAM
Tin 113	13966-06-8	U		2		U	GAM
Cesium 134	13967-70-9	U		0.3		U	GAM
Cesium 137	10045-97-3	420	3.3		0.05		GAM

Verified 5-3-94

Lab id TMAN
Protocol WHC-HASM
Version Ver 1.0
Form DVD-DS
Version 2.28
Report date 03/22/94

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TMA NORCAL
REPORTING GROUP 7313

N401051-05

DATA SHEET, cont

B09WF3

SDG	7313	Client	Westinghouse Hanford
Contact	Julie D. Wose	Contract	MBH-SVV-069262
Lab sample id	N401051-05	Client sample id	B09WF3
Dept sample id	7313-005	Location/Matrix	200-UP-2 SOLID
Received	01/18/94	Collected	01/13/94
% moisture	1.4	Chain of custody id	EFL-1091

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Cerium 144	14762-78-8	U		4		U	GAM
Europium 152	14683-23-9	1.1	0.73		0.1		GAM
Europium 154	15585-10-1	0.64	0.61		0.1		GAM
Europium 155	14391-16-3	U		2	0.1	U	GAM
Radium 226	13982-63-3	0.91	0.85				GAM
Radium 228	15262-20-1	1.6	0.98				GAM
Thorium 228	14274-82-9	1.3	1.0				GAM
Thorium 232	7440-29-1	1.6	0.98				GAM

Verified RE 5-3-94

Lab id	TMAN
Protocol	WHC-HASM
Version	Ver 1.0
Form	DVD-DS
Version	2.28
Report date	03/22/94

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N401051-08

TMA NORCAL
REPORTING GROUP 7313

DATA SHEET

B09WF4

SDG	7313	Client	Westinghouse Hanford
Contact	Julie D. Wose	Contract	MBH-SVV-069262
Lab sample id	N401051-08	Client sample id	B09WF4
Dept sample id	7313-008	Location/Matrix	200-UP-2 SOLID
Received	01/21/94	Collected	01/17/94
% moisture	3.3	Chain of custody id	EFL-1091

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Gross Alpha	Alpha	12	5.9	3	10		80A
Gross Beta	Beta	600	16	5	10		80B
Selenium 79	15758-45-9	~~0.83~~	~~1.6~~	3	10	U	SE
Strontium 90	10098-97-2	270	7.0	1	1		Y
Technetium 99	14133-76-7	~~0.004~~	~~0.13~~	0.3	0.5	U	TC
Iodine 129	15046-84-1	~~0.52~~	~~0.71~~	2	2	U	I
Uranium 233/234		0.75	0.24	0.2	0.3		U
Uranium 235	15117-96-1	~~0.097~~	~~0.078~~	0.1	0.3	U	U
Uranium 238		0.75	0.24	0.1	0.3		U
Total Uranium (ug/g)	7440-61-1	2.6	0.50	0.002	0.1	~~X~~	U_T
Neptunium 237	13994-20-2	~~0.001~~	~~0.009~~	0.02	0.2	U	NP
Plutonium 238	13981-16-3	~~0.017~~	~~0.024~~	0.04	0.05	U	PU
Plutonium 239/240		~~0.002~~	~~0.009~~	0.02	0.05	U	PU
Americium 241	14596-10-2	~~0.008~~	~~0.016~~	0.03	0.05	U	TP
Curium 244	13981-15-2	~~0.004~~	~~0.016~~	0.03	0.05	U	TP
GAMMA SCAN ANALYTES							
Sodium 22	13966-32-0	U		0.3		U	GAM
Potassium 40	13966-00-2	11	3.7				GAM
Manganese 54	13966-31-9	U		0.3		U	GAM
Iron 59	14596-12-4	U		0.5	0.05	U	GAM
Cobalt 58	13981-38-9	U		0.3	0.05	U	GAM
Cobalt 60	10198-40-0	U		0.2	0.05	U	GAM
Niobium 94	14681-63-1	U		0.2		U	GAM
Ruthenium 103	13968-53-1	U		0.3		U	GAM
Ruthenium 106	13967-48-1	U		2		U	GAM
Tin 113	13966-06-8	U		0.3		U	GAM
Cesium 134	13967-70-9	U		0.3		U	GAM
Cesium 137	10045-97-3	U		0.3	0.05	U	GAM

Verified RS 5-3-94

Lab id	TMAN
Protocol	WHC-HASM
Version	Ver 1.0
Form	DVD-DS
Version	2.28
Report date	03/22/94

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TMA NORCAL
REPORTING GROUP 7313

N401051-08

DATA SHEET, cont

B09WF4

SDG	7313	Client	Westinghouse Hanford
Contact	Julie D. Wose	Contract	MBH-SVV-069262
Lab sample id	N401051-08	Client sample id	B09WF4
Dept sample id	7313-008	Location/Matrix	200-UP-2 SOLID
Received	01/21/94	Collected	01/17/94
% moisture	3.3	Chain of custody id	EFL-1091

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Cerium 144	14762-78-8	U		1		U	GAM
Europium 152	14683-23-9	U		0.5	0.1	U	GAM
Europium 154	15585-10-1	U		0.3	0.1	U	GAM
Europium 155	14391-16-3	U		0.7	0.1	U	GAM
Radium 226	13982-63-3	U		0.6		U	GAM
Radium 228	15262-20-1	1.6	0.98				GAM
Thorium 228	14274-82-9	0.76	0.37				GAM
Thorium 232	7440-29-1	1.6	0.98				GAM

Verified 5-3-94

Lab id	TMAN
Protocol	WHC-HASM
Version	Ver 1.0
Form	DVD-DS
Version	2.28
Report date	03/22/94

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N401051-06

TMA NORCAL
REPORTING GROUP 7313

DATA SHEET

B09WF5

SDG	7313	Client	Westinghouse Hanford
Contact	Julie D. Wose	Contract	MBH-SVV-069262
Lab sample id	N401051-06	Client sample id	B09WF5
Dept sample id	7313-006	Location/Matrix	200-UP-2 SOLID
Received	01/18/94	Collected	01/13/94
% moisture	1.1	Chain of custody id	EFL-1091

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Gross Alpha	Alpha	70	8.0	2	10		80A
Gross Beta	Beta	~~5.5~~	~~3.9~~	6	10	U	80B
Selenium 79	15758-45-9	~~0.22~~	~~1.6~~	3	10	U	SE
Strontium 90	10098-97-2	~~0.22~~	~~0.28~~	0.8	1	U	Y
Technetium 99	14133-76-7	~~0.022~~	~~0.13~~	0.4	0.5	U	TC
Iodine 129	15046-84-1	~~0.11~~	~~0.70~~	2	2	U	I
Uranium 233/234		~~0.12~~	~~0.12~~	0.2	0.3	U	U
Uranium 235	15117-96-1	~~0~~	~~0.049~~	0.2	0.3	U	U
Uranium 238		~~0.082~~	~~0.082~~	0.2	0.3	U	U
Total Uranium (ug/g)	7440-61-1	0.21	0.041	0.002	0.1	~~X~~	U_T
Neptunium 237	13994-20-2	~~0~~	~~0.014~~	0.06	0.2	~~U~~ UJ	NP
Plutonium 238	13981-16-3	~~0.006~~	~~0.020~~	0.04	0.05	U	PU
Plutonium 239/240		~~0.006~~	~~0.008~~	0.02	0.05	U	PU
Americium 241	14596-10-2	~~0.017~~	~~0.015~~	0.02	0.05	U	TP
Curium 244	13981-15-2	0.021	0.015	0.02	0.05	~~U~~	TP
GAMMA SCAN ANALYTES							
Sodium 22	13966-32-0	U		0.1		U	GAM
Potassium 40	13966-00-2	U		2		U	GAM
Manganese 54	13966-31-9	U		0.1		U	GAM
Iron 59	14596-12-4	U		0.2	0.05	U	GAM
Cobalt 58	13981-38-9	U		0.1	0.05	U	GAM
Cobalt 60	10198-40-0	U		0.1	0.05	U	GAM
Niobium 94	14681-63-1	U		0.09		U	GAM
Ruthenium 103	13968-53-1	U		0.1		U	GAM
Ruthenium 106	13967-48-1	U		0.7		U	GAM
Tin 113	13966-06-8	U		0.1		U	GAM
Cesium 134	13967-70-9	U		0.1		U	GAM
Cesium 137	10045-97-3	U		0.1	0.05	U	GAM

Lab id	TMAN
Protocol	WHC-HASM
Version	Ver 1.0
Form	DVD-DS
Version	2.28
Report date	03/22/94

Verified 5-3-94

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TMA NORCAL
REPORTING GROUP 7313

N401051-06

DATA SHEET, cont

B09WF5

SDG	7313	Client	Westinghouse Hanford
Contact	Julie D. Wose	Contract	MBH-SVV-069262
Lab sample id	N401051-06	Client sample id	B09WF5
Dept sample id	7313-006	Location/Matrix	200-UP-2 SOLID
Received	01/18/94	Collected	01/13/94
% moisture	1.1	Chain of custody id	EFL-1091

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Cerium 144	14762-78-8	U		0.4		U	GAM
Europium 152	14683-23-9	U		0.2	0.1	U	GAM
Europium 154	15585-10-1	U		0.1	0.1	U	GAM
Europium 155	14391-16-3	U		0.2	0.1	U	GAM
Radium 226	13982-63-3	U		0.2		U	GAM
Radium 228	15262-20-1	U		0.5		U	GAM
Thorium 228	14274-82-9	U		0.3		U	GAM
Thorium 232	7440-29-1	U		0.5		U	GAM

Verified 5-3-94

Lab id	TMAN
Protocol	WHC-HASM
Version	Ver 1.0
Form	DVD-DS
Version	2.28
Report date	03/22/94

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TMA NORCAL
REPORTING GROUP 7313

N401051-07

DATA SHEET

B09WF6

SDG	7313	Client	Westinghouse Hanford
Contact	Julie D. Wose	Contract	MBH-SVV-069262
Lab sample id	N401051-07	Client sample id	B09WF6
Dept sample id	7313-007	Location/Matrix	200-UP-2 SOLID
Received	01/18/94	Collected	01/13/94
% moisture	1.0	Chain of custody id	EFL-1091

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Gross Alpha	Alpha	3.2	2.2	2	10	~~J~~	80A
Gross Beta	Beta	~~1.3~~	~~3.7~~	6	10	U	80B
Selenium 79	15758-45-9	~~1.7~~	~~1.6~~	3	10	U	SE
Strontium 90	10098-97-2	~~0.065~~	~~0.25~~	0.8	1	U	Y
Technetium 99	14133-76-7	~~0.017~~	~~0.11~~	0.3	0.5	U	TC
Iodine 129	15046-84-1	~~0.21~~	~~0.63~~	1	2	U	I
Uranium 233/234		~~0.044~~	~~0.088~~	0.1	0.3	U	U
Uranium 235	15117-96-1	~~0.035~~	~~0.036~~	0.1	0.3	U	U
Uranium 238		~~0.044~~	~~0.059~~	0.1	0.3	U	U
Total Uranium (ug/g)	7440-61-1	0.19	0.038	0.002	0.1	~~X~~	U_T
Neptunium 237	13994-20-2	~~0~~	~~0.003~~	0.01	0.2	U	NP
Plutonium 238	13981-16-3	~~0.019~~	~~0.022~~	0.04	0.05	U	PU
Plutonium 239/240		~~0.009~~	~~0.009~~	0.02	0.05	U	PU
Americium 241	14596-10-2	~~0.004~~	~~0.006~~	0.01	0.05	U	TP
Curium 244	13981-15-2	0.11	0.026	0.01	0.05		TP
GAMMA SCAN ANALYTES							
Sodium 22	13966-32-0	U		0.1		U	GAM
Potassium 40	13966-00-2	U		2		U	GAM
Manganese 54	13966-31-9	U		0.09		U	GAM
Iron 59	14596-12-4	U		0.3	0.05	U	GAM
Cobalt 58	13981-38-9	U		0.1	0.05	U	GAM
Cobalt 60	10198-40-0	U		0.1	0.05	U	GAM
Niobium 94	14681-63-1	U		0.1		U	GAM
Ruthenium 103	13968-53-1	U		0.1		U	GAM
Ruthenium 106	13967-48-1	U		0.9		U	GAM
Tin 113	13966-06-8	U		0.1		U	GAM
Cesium 134	13967-70-9	U		0.1		U	GAM
Cesium 137	10045-97-3	U		0.1	0.05	U	GAM

Lab id	TMAN
Protocol	WHC-HASM
Version	Ver 1.0
Form	DVD-DS
Version	2.28
Report date	03/22/94

Verified 5-3-94

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TMA NORCAL
REPORTING GROUP 7313

N401051-07

DATA SHEET, cont

B09WF6

SDG	7313	Client	Westinghouse Hanford
Contact	Julie D. Wose	Contract	MBH-SVV-069262
Lab sample id	N401051-07	Client sample id	B09WF6
Dept sample id	7313-007	Location/Matrix	200-UP-2 SOLID
Received	01/18/94	Collected	01/13/94
% moisture	1.0	Chain of custody id	EFL-1091

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Cerium 144	14762-78-8	U		0.4		U	GAM
Europium 152	14683-23-9	U		0.2	0.1	U	GAM
Europium 154	15585-10-1	U		0.1	0.1	U	GAM
Europium 155	14391-16-3	U		0.3	0.1	U	GAM
Radium 226	13982-63-3	U		0.2		U	GAM
Radium 228	15262-20-1	0.30	0.26				GAM
Thorium 228	14274-82-9	U		0.2		U	GAM
Thorium 232	7440-29-1	0.30	0.26				GAM

Verified 5-3-94

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Lab id	TMAN
Protocol	WHC-HASM
Version	Ver 1.0
Form	DVD-DS
Version	2.28
Report date	03/22/94

9713517.2441

ATTACHMENT 4

LABORATORY NARRATIVE and CHAIN-OF-CUSTODY DOCUMENTATION

TMA/Norcal

Report N4-01-051-7313
Sample Delivery Group 7313

Westinghouse Hanford Company
P.O. MBH-SVV-069262

Case Narrative

March 23, 1994

1.0 GENERAL

TMA/Norcal Sample Delivery Group 7313 is comprised of eight soil samples from location 200-UP-2, delivered under Field Log Book #EFL-1091 and EFL-1115. Chain-of-Custody numbers were not provided.

One 1000 mL plastic bottle containing each sample was received for analysis.

Activity reports provided by the WHC indicated elevated activity in samples B09DT9 and B09WF4. All analyses for these samples were therefore processed in separate preparation batches in a lab area reserved for high level samples.

2.0 ANALYSIS NOTES

2.1 Gross Alpha Analyses

No problems were encountered by the laboratory in the analyses.

2.2 Gross Beta Analyses

Reagent blank 7313-013 shows beta activity at 14 pCi/L which is slightly above the 10 pCi/L RDL. This blank was run with the high level samples containing gross beta activity at levels 70 to 100 times the RDL, the slightly positive result does not affect the validity of the data.

2.3 Selenium-79 Analyses

No problems were encountered by the laboratory in the analyses.

2.4 Strontium-90 Analyses

No problems were encountered.

2.5 Technetium-99 Analyses

The duplicate analysis of B09DT4 had an MDA slightly over the RDL due to a low chemical recovery of 32%.

2.6 Iodine-129 Analyses

The original data sheets for reagent blank 7313-10 were misplaced. We have provided a backup copy from the QC Department files, which only include the first page.

4 5-3-94

TMA/Norcal
Report N4-01-051-7313
Sample Delivery Group 7313

Westinghouse Hanford Company
P.O. MBH-SVV-069262

Case Narrative

March 23, 1994

2.0 ANALYSIS NOTES (con't.)

2.7 Neptunium-237 Analyses

The neptunium-237 recoveries of laboratory control samples 7313-009 and 7313-012 are both 85% which is below the 3σ protocol limits (88-112)% but within the contractual limits (80-120)%. Samples BO9WF5 and BO9WF3 had low chemical yields (16% and 17% respectively). No cause could be determined for the low yields and there was not enough sample remaining for a reanalysis, however, MDA's met the RDL's.

2.8 Total Uranium Analyses

The MDA for sample B09DT9 was 2 μg/g which is higher than the RDL of 0.1 μg/g because of extra dilutions required to eliminate matrix interferences. The result of the analysis was 100 times the MDA and therefore there was no adverse impact on the data.

2.9 Isotopic Uranium Analyses

The count times for many samples were was less than the nominal count time of 150 minutes but the MDA's were not adversely affected. The MDA for sample B09DT9 was higher than the RDL due to a very small aliquot being used because of high uranium activity. The original data sheets for laboratory control sample 7313-009 were misplaced. We have provided a backup copy from the QC Department files, which only include the first page.

2.10 Isotopic Plutonium Analyses

Samples BO9DT9 and BO9WF3 had poor yields (13%). The samples were reanalyzed and satisfactory results were obtained. No cause could be determined for the initial low yields. The plutonium-238 MDA of the reagent blank is slightly higher than the RDL due to a higher detector background in the region of interest. The plutonium-239/240 MDA is well below the RDL.

2.11 Americium-241/Curium-244 Analyses

The americium-241 recovery of laboratory control sample 7313-009 is 122% which is within the 3σ limits (73-127)% but slightly above the contract limits (80-120)%. A low curium-244 recovery in the laboratory control sample associated with the first batch of samples indicated an apparent fractionation of the curium species from americium. The samples were reanalyzed with new QC and satisfactory results were obtained.

5-3-94

TMA/Norcal
Report N4-01-051-7313
Sample Delivery Group 7313

Westinghouse Hanford Company
P.O. MBH-SVV-069262

Case Narrative **March 23, 1994**

2.0 ANALYSIS NOTES (con't.)

2.12 Gamma Scan Analyses

Aliquot sizes ranged from 80 to 90 grams, which are smaller than the nominal 750 grams normally used for soil analyses. This was done because of concerns for high sample activity as indicated form the supplied activity reports. Several MDA's exceeded the RDL's as a result.

6 5-3-94

9213517.2445

Westinghouse Hanford Company	CHAIN OF CUSTODY

Custody Form Initiator: L E ROGERS / W.U. SETZER

Company Contact: L E ROGERS

Telephone: 376-7690

Project Designation/Sampling Locations: 200-UP-2

Collection Date: 1-11-94

Ice Chest No.: SML 342

Field Logbook No.: ~~EFL-1091~~ EFL-1115 HNR 1-13-94

Bill of Lading/Airbill No.: 2519008360

Offsite Property No.: W94-0-0216-1

Method of Shipment: AIR

Shipped to: TMA

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

Sample Identification

1) B09DT4
- 1,250ml P:CLP;TAL Metals,Hg,Ti
- 1,250ml Gs:VOA CLP
- 1,250ml aG:Semi-VOA CLP
- 1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
- 1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
- 1,125ml G:Cyanide CLP
- 1,125ml Gw:Kerosene (8015M)
- 1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

2) B09DT5
- 1,250ml P:CLP;TAL Metals,Hg,Ti
- 1,250ml Gs:VOA CLP
- 1,250ml aG:Semi-VOA CLP
- 1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
- 1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
- 1,125ml G:Cyanide CLP
- 1,125ml Gw:Kerosene (8015M)
- 1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

3) B09DT7
- 1,250ml P:CLP;TAL Metals,Hg,Ti
- 1,250ml Gs:VOA CLP
- 1,250ml aG:Semi-VOA CLP
- 1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
- 1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
- 1,125ml G:Cyanide CLP
- 1,125ml Gw:Kerosene (8015M)
- 1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

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

Relinquished by:	Received by:	Date/Time:
W.U. Setzer	Kermit Blum K. Blum	1-18-94 1330
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

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

~~86~~ RS 5-3-94

9213512.2446

Westinghouse Hanford Company	CHAIN OF CUSTODY

Custody Form Initiator: L E ROGERS

Company Contact: L E ROGERS — Telephone: 376-7690

Project Designation/Sampling Locations: 200-UP-2 — Collection Date: 1-13-94

Ice Chest No.: SML-335 — Field Logbook No.: EFL-1091

Bill of Lading/Airbill No.: 2519008448 — Offsite Property No.: W94-0-0216-3

Method of Shipment: AIR

Shipped to: TMA

Possible Sample Hazards/Remarks: Keep samples at 4C (SOIL) NONE NOTED

Sample Identification

1) B09WF5

4,250ml P:CLP;TAL Metals,Hg,Ti
4,250ml Gs:VOA CLP
4,250ml aG:Semi-VOA CLP
4,125ml G:Anions F,Cl,SO4 (EPA 300.0)
4,125ml P/G:Anions NO2,NO3 (EPA 353.2)
4,125ml G:Cyanide CLP
4,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

2) B09WF6

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

3)

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

1-17-94

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

Relinquished by:	Received by:	Date/Time:
0940 Joseph E. Rogers 1-17-94	W.V. Seltzer	1-17-94 0940
Relinquished by: W.V. Seltzer	Received by: Kermit Blum K. Blum	Date/Time: 1-18-94 1330
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

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

~~90~~ 5-3-94

9713517.2447

Westinghouse Hanford Company	CHAIN OF CUSTODY

Custody Form Initiator: L E ROGERS

Company Contact: L E ROGERS — Telephone: 376-7690

Project Designation/Sampling Locations: 200-UP-2 — Collection Date: 1-13-94

Ice Chest No.: SML-311 — Field Logbook No.: EFL-1091

Bill of Lading/Airbill No.: — Offsite Property No.: OSR-17394

Method of Shipment: AIR

Shipped to: TMA

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

Sample Identification

1) B09DT9

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

2) B09WF3

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

3)

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

1-17-94

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

Relinquished by:	Received by:	Date/Time:
1-17-94 0930 Loren E. Rogers	W.V. SETZER W.V. Setzer	1-17-94 0930
W.V. Setzer	[illegible]	1-18-94 10:35

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

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

~~92~~ 5-3-94

9213512.2448

Westinghouse Hanford Company	CHAIN OF CUSTODY

Custody Form Initiator: L E ROGERS

Company Contact: L E ROGERS — Telephone: 376-7690

Project Designation/Sampling Locations: 200-UP-2 — Collection Date: 1-17-94

Ice Chest No.: SNL-196 — Field Logbook No.: EFL-1091

Bill of Lading/Airbill No.: — Offsite Property No.:

Method of Shipment: AIR

Shipped to: TMA

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

Sample Identification

1) B09WF4

~~1~~,250ml P:CLP;TAL Metals,Hg,Ti
~~1~~,250ml Gs:VOA CLP
~~1~~,250ml aG:Semi-VOA CLP
~~1~~,125ml G:Anions F,Cl,SO4 (EPA 300.0)
~~1~~,125ml P/G:Anions NO2,NO3 (EPA 353.2)
~~1~~,125ml G:Cyanide CLP
~~1~~,125ml Gw:Kerosene (8015M)
~~1~~,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

2) B09WF7

~~1,250ml P:CLP;TAL Metals,Hg,Ti~~
~~1~~,250ml Gs:VOA CLP
~~1,250ml aG:Semi-VOA CLP~~
~~1,125ml G:Anions F,Cl,SO4 (EPA 300.0)~~
~~1,125ml P/G:Anions NO2,NO3 (EPA 353.2)~~ 1-17-94
~~1,125ml G:Cyanide CLP~~
~~1,125ml Gw:Kerosene (8015M)~~
~~1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79~~

3)

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml ~~Gs:VOA CLP~~
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 ~~(EPA 300.0)~~
1,125ml P/G:Anions NO2,NO3 (EPA 353.2) 1-17-94
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

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

Relinquished by:	Received by:	Date/Time:
1-20-94 Loren E. Rogers 0955	[signature]	1-21-94 10:58
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

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

~~94~~ 5-3-94

9713517.2449

ATTACHMENT 5

DATA VALIDATION SUPPORTING DOCUMENTATION

RADIOCHEMICAL DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E

PROJECT: 200-UP-2		DATA PACKAGE: B09DT4-TMA-690	
VALIDATOR: T. Stapp	LAB: TMA		DATE: 4-25-94
CASE:		SDG:	

ANALYSES PERFORMED

☑ Gross Alpha/Beta	☑ Strontium-90	☑ Technetium-99	☑ Alpha Spectroscopy	☑ Gamma Spectroscopy	
☑ Total Uranium	☐ Radium-22	☐ Tritium	☑ Se-79		

SAMPLES/MATRIX B09DT4, B09DT5, B09DT7, B09DT9, B09WF3, B09WF4, B09WF5, B09WF6 / SOIL

1. Completeness . . . . . ☐ N/A

Technical verification forms present? . . . . . (Yes) No N/A

Comments: Performed by WHC

2. Initial Calibration . . . . . ☐ N/A

Instruments/detectors calibrated within one year of sample analysis? . . . . . (Yes) No N/A

Initial calibration acceptable? . . . . . (Yes) No N/A

Standards NIST traceable? . . . . . (Yes) No N/A

Standards Expired? . . . . . Yes (No) N/A

Comments:

3. Continuing Calibration . . . . . ☐ N/A

Calibration checked within one week of sample analysis? . . . (Yes) No N/A
Calibration check acceptable? . . . . . (Yes) No N/A
Calibration check standards NIST traceable? . . . . . (Yes) No N/A
Calibration check standards expired? ~~SEE NOTE ①~~ . . . . Yes (No) N/A

Comments: ~~① Chemical carriers used for Tc 99 (02-18-94EN) and Np-237 (tracer; H-E2-C-(16)) were not documented in supplemental data, however this does not qualify associated sample results.~~ See item #7. 5-5-94

4. Blanks . . . . . ☐ N/A

Method blank analyzed? . . . . . (Yes) No N/A
Method blank results acceptable? . . . . . (Yes) No N/A
Analytes detected in method blank? . . . SEE NOTE ② . . (Yes) No N/A
Field blank(s) analyzed? . . . SEE NOTE ① . . . . . Yes No (N/A)
Field blank results acceptable? . . . . . Yes No (N/A)
Analytes detected in field blank(s)? . . . . . Yes No (N/A)
Transcription/Calculation Errors? . . . . . Yes (No) N/A

Comments: ① Field QC was not identified with this sample set, but it has been requested. Field blanks will be evaluated with the final data summary.
② K-40 was found in the method blank and qualification applies to all results above the MDA but less than 1.1 pCi/gm.

5. Matrix Spikes . . . . . ☒ N/A

Matrix spike analyzed? . . . . . Yes No N/A
Spike recoveries acceptable? . . . . . Yes No N/A
Spike source traceable? . . . . . Yes No N/A
Spike source expired? . . . . . Yes No N/A
Transcription/Calculation Errors? . . . . . Yes No N/A

Comments: ① MS + MSD analysis is not required when LCS analysis is present.

6. Laboratory Control Samples . . . . . ☐ N/A

LCS analyzed? . . . . . (Yes) No N/A
LCS recoveries acceptable? . . See Note ① . . . . . (Yes) No N/A
LCS traceable? . . . . . (Yes) No N/A
Transcription/Calculation Errors? . . . . . Yes (No) N/A

Comments: ① Tc-99 LCS spike level is greater than 30 times the RDL, however qualification does not apply.

7. Chemical Recovery . . . . . ☐ N/A

Chemical carrier added? . . . . . (Yes) No N/A
Chemical recovery acceptable? . See note ① . . . . . Yes (No) N/A
Chemical carrier traceable? . . . . See note ② . . . . Yes (No) N/A
Chemical carrier expired? . . . . . Yes (No) N/A
Transcription/Calculation errors? . . . . . Yes (No) N/A

Comments: ① Carrier yield for Tc-99 (29.9%) and tracer yields for Np 237 (B09WF3 @ 17% + B09WF5 @ 16%) were below req. limits of 30% + 20% respectively ∴ associated Smpls. are estimated.
② Tc-99 + Np237 Supporting documentation for carrier and tracer preparations were not provided, but qualification will not apply.

8. Duplicates . . . . . ☐ N/A

Duplicates Analyzed? . . . . . (Yes) No N/A
RPD Values Acceptable? . . See note ① . . . . . (Yes) No N/A
Transcription/Calculation Errors? . . . . . Yes (No) N/A

Comments: ① %RPD for Th-228 exceeded 35% for Soil Samples, but no RDL is specified for this analyte and therefore no qualification will be applied.

9. Field QC Samples . . . . . SEE NOTE ① . . . . . ☒ N/A

Field duplicate sample(s) analyzed? . . . . . Yes No N/A
Field duplicate RPD values acceptable? . . . . . Yes No N/A
Field split sample(s) analyzed? . . . . . Yes No N/A
Field split RPD values acceptable? . . . . . Yes No N/A
Performance audit sample(s) analyzed? . . . . . Yes No N/A
Performance audit sample results acceptable? . . . . . Yes No N/A

Comments: ① Field QC data was not identified in this sample set, but it has been requested. Field duplicates will be evaluated in the final data Summary.

10. Holding Times

Are sample holding times acceptable? . . . . . (Yes) No N/A

Comments: See Holding Time Summary on page A-5.

11. Results and Detection Limits (Levels D & E) . . . . . ☐ N/A

Results reported for all required sample analyses? . . . . . (Yes) No N/A
Results supported in raw data? . . . . . (Yes) No N/A
Results Acceptable? . . . . . (Yes) No N/A
Transcription/Calculation errors? . . . . . Yes (No) N/A
MDA's meet required detection limits? . SEE NOTE ① . . . . Yes (No) N/A
Transcription/calculation errors? . . . . . Yes (No) N/A

Comments: ① MDAs are greater than the RDL for selected analytes in all samples due to low carrier recovery, high U activity and matrix interferences. See table 1 and Laboratory case narrative.

Comments: HOLDING TIME SUMMARY

SAMPLES	Collected	α β	Se79	Sr90	Tc99	I129	U-233	35	38	Totl	Np	Pu238	239	Am	Cm	Gamr
B09DT4	1-11-94	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
B09DT5	1-11-94	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
B09DT7	1-11-94	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
B09DT9	1-13-94	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
B09WF3	1-13-94	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
B09WF4	1-17-94	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
B09WF5	1-13-94	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
B09WF6	1-13-94	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

✓ - Indicates analysis performed within 180 day maximum holding period and no qualification is applied.

Table 1. Detection Limit Deficiencies SDG: B09DT4-TMA-690

		SAMPLE ID/MDA							
Isotope	RDL	B09DT4	B09DT5	B09DT7	B09DT9	B09WF3	B09WF4	B09WF5	B09WF6
Tot-U	0.1	--	--	--	2	--	--	--	--
U-233/4	0.3	--	--	--	2	--	--	--	--
U-235	0.3	--	--	--	1	--	--	--	--
U-238	0.3	--	--	--	1	--	--	--	--
Fe-59	0.05	0.3	0.3	0.5	0.4	0.6	0.5	0.2	0.3
Co-58	0.05	0.1	0.08	0.2	0.2	0.2	0.3	0.1	0.1
Co-60	0.05	0.2	0.2	0.2	0.2	--	0.2	0.1	0.1
Cs-137	0.05	--	0.1	0.2	0.2	0.1	0.3	0.1	0.1
Eu-152	0.1	0.2	0.2	0.3	0.6	--	0.5	0.2	0.2
Eu-154	0.1	--	--	0.2	0.5	--	0.3	--	--
Eu-155	0.1	0.2	0.2	0.3	1	2	0.7	0.2	0.3

SAMPLE RESULT VERIFICATION, DATA PACKAGE: B09DT4-TMA-690

Gross Alpha/Beta							
Sample ID	B09DT4	B09DT5	B09DT7	B09DT9	B09WF3	B09WF4	B09WF5
Detector	115	116	102	103	105	103	102
Aliquot	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Count time	100	100	100	100	100	100	100
Alpha cpm	0.190	0.230	0.470	5.630	4.360	0.780	3.140
Alpha, Bkgd	0.097	0.063	0.059	0.040	0.049	0.054	0.044
Alpha, Xtalk	0.006	0.006	0.006	0.006	0.006	0.006	0.006
Alpha, Eff	0.206	0.208	0.160	0.111	0.136	0.140	0.201
Alpha Result Calc.	2.03	3.60	11.16	205.16	129.76	12.50	69.45
Alpha Result Rptd.	2.0	3.60	11.00	210.00	130.00	12.00	70
Alpha MDA Calc.	3.17	2.53	3.19	3.78	3.42	3.48	2.19
Alpha MDA Rptd.	3	3	3	4	3	3	2
Beta cpm	1.21	1.37	4.11	91.68	68.14	57.54	1.8
Bkgd	1.13	1.17	1.56	1.18	1.52	1.19	1.572
Xtalk	0.239	0.238	0.256	0.283	0.268	0.266	0.241
Eff	0.430	0.431	0.423	0.415	0.420	0.421	0.429
Beta Result Calc.	0.57	1.64	26.06	965.15	702.09	600.87	-5.45
Beta Result Rptd	0.58	1.6	26	970	700	600	-5.5
Beta MDA Calc	5.20	5.27	6.19	5.49	6.16	5.43	6.13
Beta MDA rptd	5	5	6	5	6	5	6

SAMPLE RESULT VERIFICATION, DATA PACKAGE: B09DT4-TMA-690

Gross Alpha/Beta						
Sample ID	B09WF6	QC-LCS	QC-LCS	QC-BLANK	QC-BLANK	B09DT4-DUP
Detector	105	111	108	112	115	113
Aliquot	0.10	0.10	0.10	0.10	0.10	0.10
Count time	100	100	100	100	100	100
Alpha cpm	0.200	4.400	5.120	0.070	0.070	0.270
Alpha, Bkgd	0.051	0.080	0.093	0.057	0.093	0.063
Alpha, Xtalk	0.006	0.006	0.006	0.006	0.006	0.006
Alpha, Eff	0.205	0.108	0.105	0.109	0.093	0.208
Alpha Result Calc.	3.26	176.58	211.10	0.59	-1.49	4.49
Alpha Result Rptd.	3.2	180	210.00	0.58	-1.5	4.5
Alpha MDA Calc.	2.31	5.50	6.10	4.60	6.88	2.53
Alpha MDA Rptd.	2	6	6	5	7	3
Beta cpm	1.66	16.89	20.33	1.78	2.38	1.16
Bkgd	1.499	1.265	1.20	1.98	1.08	1.19
Xtalk	0.239	0.288	0.293	0.285	0.306	0.238
Eff	0.430	0.414	0.413	0.415	0.409	0.431
Beta Result Calc.	1.31	156.45	192.61	-2.16	14.40	-0.83
Beta Result Rptd	1.3	160	190	-2	14	-0.83
Beta MDA Calc	5.98	5.70	5.56	7.11	5.33	5.31
Beta MDA rptd	6	6	6	7	5	5

SAMPLE RESULT VERIFICATION, DATA PACKAGE: B09DT4-TMA-690

Selenium 79							
Sample ID	B09DT4	B09DT5	B09DT7	B09DT9	B09WF3	B09WF4	B09WF5
Detector	5	5	5	5	5	5	5
Gross Counts	948	867	834	911	937	867	923
Count Time	150	150	150	150	150	150	150
Sample Amount	0.5	0.52	0.51	0.501	0.503	0.511	0.51
Bkgd cpm	6.07	6.07	6.07	6.07	6.07	6.07	6.07
Decay Factor	1	1	1	1	1	1	1
Detector Eff.	0.693	0.727	0.744	0.723	0.754	0.709	0.741
Yield	0.8821	0.6464	0.4224	0.5452	0.2888	0.4391	0.4283
Result Calc.	0.368	-0.53	-1.43	0.01	0.73	-0.82	0.23
Result Rptd	0.360	-0.54	-1.40	0	0.71	-0.83	0.22
MDA Calc.	1.38	1.73	2.63	2.14	3.86	2.65	2.61
MDA Rptd.	1	2	3	2	4	3	3

SAMPLE RESULT VERIFICATION, DATA PACKAGE: B09DT4-TMA-690

Selenium 79			
Sample ID	B09WF6	QC-BLANK	B09DT4-DUP
Detector	5	5	5
Gross Counts	823	815	990
Count Time	150	150	150
Sample Amount	0.52	1	0.502
Bkgd cpm	6.07	6.07	6.07
Decay Factor	1	1	1
Detector Eff.	0.75	0.945	0.666
Yield	0.4106	0.749	0.45
Result Calc.	-1.64	-0.41	1.59
Result Rptd	-1.7	-0.82	1.6
MDA Calc.	2.64	0.60	2.81
MDA Rptd.	3	1	3

SAMPLE RESULT VERIFICATION, DATA PACKAGE: B09DT4-TMA-690

Strontium 90							
Sample ID	B09DT4	B09DT5	B09DT7	B09DT9	B09WF3	B09WF4	B09WF5
Detector	GRB201	GRB203	GRB204	GRB201	GRB202	GRB208	GRB205
Bkg	0.4522	0.4276	0.4310	0.4505	0.4185	0.5262	0.3677
Count Time	79.710	79.710	79.710	33.000	33.000	27.040	33.000
Y90 cpm	0.001	0.058	0.042	0.329	6.59	0	0
Elapsed Time, days	31.419	31.419	31.419	48.423	48.423	25.419	29.419
Lambda	6.86E-05	6.86E-05	6.86E-05	6.86E-05	6.86E-05	6.86E-05	6.86E-05
Decay	0.9978	0.9978	0.9978	0.9967	0.9967	0.9983	0.9980
Yield	0.8905	0.9032	0.9026	0.6405	0.6277	0.8414	0.8427
PPT. corr.	1	1	1	1	1	1	1
Aliquot	1	1	1	1	1	1	1
Product	0.8886	0.9013	0.9007	0.6384	0.6256	0.8399	0.8410
C-zero	1.12E-09	-6.50E-02	-0.0264	484.000	111.400	322.680	0.262
P-Factor	1.859	1.859	1.859	1.859	1.859	1.859	1.859
Result, calc.	0.000	-0.054	-0.022	405.295	93.285	270.208	0.219
Result, rptd.	0.000	-0.054	-0.022	410.000	93.000	270.000	0.220
MDA, calc.	0.580	0.572	0.574	0.646	0.610	1.015	0.769
MDA, rptd.	0.500	0.500	0.500	1.000	1.000	1.000	0.8

SAMPLE RESULT VERIFICATION, DATA PACKAGE: B09DT4-TMA-690

Strontium 90						
Sample ID	B09WF6	QC-LCS	QC-LCS	QC-BLANK	QC-BLANK	B09DT4-DUP
Detector	GRB207	GRB203	GRB210	GRB211	GRB204	GRB212
Bkg	0.4364	0.4142	0.4294	0.5721	0.4259	0.4489
Count Time	33.000	33	79.750	79.75	33	79.75
Y90 cpm	0.000	0	0.000	0.077	0.615	0
Elapsed Time, days	29.419	0	0.000	0.000	0	31.419
Lambda	6.86E-05	6.86E-05	6.86E-05	6.86E-05	6.86E-05	6.86E-05
Decay	0.9980	1.0000	1.0000	1.0000	1.0000	0.9978
Yield	0.8690	0.8051	0.8589	0.8824	0.7977	0.8407
PPT. corr.	1	1	1	1	1	1
Aliquot	1	1	1	1	1	1
Product	0.8672	0.8051	0.8589	0.8824	0.7977	0.8389
C-zero	0.078	12.379	11.750	-0.129	-1	0.244
P-Factor	1.859	1.859	1.859	1.859	1.859	1.859
Result, calc.	0.065	10.366	9.839	-0.108	-0.837	0.204
Result, rptd.	0.065	10	9.800	-0.110	-0.84	0.200
MDA, calc.	0.864	0.781	0.546	0.647	0.785	0.545
MDA, rptd.	0.800	0.9	0.500	0.5	0.9	0.5

SAMPLE RESULT VERIFICATION, DATA PACKAGE: B09DT4-TMA-690

Technetium 99							
Sample ID	B09DT4	B09DT5	B09DT7	B09DT9	B09WF3	B09WF4	B09WF5
Detector	LBG 13	LBG 14	LBG 15	LBG 9	LBG 13	LBG 15	LBG 16
Aliquot	2.000	2.000	2.000	2.000	2.000	2.000	2
P-Factor	2.340	2.340	2.340	2.340	2.340	2.340	2.340
Yield	0.424	0.299	0.377	0.409	0.430	0.380	0.391
Days	42.773	42.773	42.773	41.923	41.625	37.625	41.47
Lambda	8.91E-09	8.91E-09	8.91E-09	8.91E-09	8.91E-09	8.91E-09	8.91E-09
Decay	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Net, cpm	-0.010	0.050	0.040	0.140	0.120	0.020	0.020
Count, time	751.900	751.900	751.900	670.300	302.600	302.600	199.900
Bkg., cpm	0.530	0.600	0.620	0.530	0.530	0.620	0.62
Result, calc.	-0.012	0.088	0.056	0.181	0.147	0.028	0.027
Result, rptd.	-0.011	0.081	0.062	0.180	0.150	0.004	0.022
MDA, calc.	0.154	0.232	0.187	0.169	0.239	0.293	0.350
MDA, rptd.	0.200	0.200	0.200	0.200	0.300	0.300	0.4

SAMPLE RESULT VERIFICATION, DATA PACKAGE: B09DT4-TMA-690

Technetium 99						
Sample ID	B09WF6	QC-LCS	QC-LCS	QC-BLANK	QC-BLANK	B09DT4-DUP
Detector	LBG 14	LBG 16	LBG 11	LBG 9	LBG 13	LBG 15
Aliquot	2	2	2	2	2	2
P-Factor	2.340	2.340	2.340	2.340	2.340	2.340
Yield	0.4215	0.3856	0.6301	0.4664	0.5467	0.3212
Days	41.625	0	0	0	0	43.84
Lambda	8.91E-09	8.91E-09	8.91E-09	8.91E-09	8.91E-09	8.91E-09
Decay	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Net, cpm	0.010	17.970	17.780	-0.040	0.050	-0.010
Count, time	302.600	302.600	117.100	117.100	117.100	117.100
Bkg., cpm	0.6	0.62	0.5	0.53	0.53	0.6
Result, calc.	0.013	24.561	14.872	-0.045	0.048	-0.016
Result, rptd.	0.017	25	15	-0.044	0.049	-0.012
MDA, calc.	0.259	0.288	0.255	0.354	0.302	0.547
MDA, rptd.	0.3	0.3	0.3	0.4	0.3	0.6

SAMPLE RESULT VERIFICATION, DATA PACKAGE: B09DT4-TMA-690

Uranium 233/4/5/8							
Sample ID:	B09DT4	B09DT5	B09DT7	B09DT9	B09WF3	B09WF4	B09WF5
Detector:	19	20	21	23	24	21	19
Sample count time:	140.87	140.87	140.87	142.65	142.65	157.28	157.28
GMT count:	49.619	49.619	49.619	64.992	64.992	49.838	49.838
Zero time:	11.334	11.334	11.334	13.334	13.334	17.334	13.334
Corr. tracer dpm:	10.45	10.45	10.45	10.45	10.45	10.45	10.45
Bkgd count time:	2308.88	2308.88	2308.88	2423.17	2423.17	2308.88	2308.88
Net tracer counts:	282	209	250	432	374	295	231
Detector eff.:	0.2714	0.2854	0.2661	0.3152	0.3239	0.2666	0.275
Yield:	0.7058	0.4975	0.6382	0.9194	0.7746	0.6732	0.5111
Aliquot:	1	1	1	0.1	1	1	1
U-238, gross counts:	1	0	212	1377	126	48	5
U-238, bkgd counts:	1	0	1	5	1	1	1
tracer interference counts:	0	0	0	0	0	0	0
tracer std.dev.:	0	0	0	0	0	0	0
U-235 interference counts:	0	0	1	5	1	1	0
U-238, net counts:	0	0	211	1372	125	47	4
U-238, Lambda:	4.23E-13	4.23E-13	4.23E-13	4.23E-13	4.23E-13	4.23E-13	4.23E-13
U-238, Decay corr:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
U-235, gross counts:	2	0	11	51	8	5	0
U-235, bkgd counts:	0	0	0	0	0	0	0
tracer interference counts:	0	0	0	0	0	0	0
tracer std.dev.:	0	0	0	0	0	0	0
U-235 interference counts:	0	0	0	0	0	0	0
U-235, net counts:	2	0	11	51	8	5	0
U-235, Lambda:	2.67E-12	2.67E-12	2.67E-12	2.67E-12	2.67E-12	2.67E-12	2.67E-12
U-235, Decay corr:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
U-235, branch ratio:	0.826	0.826	0.826	0.826	0.826	0.826	0.826
U-233/4, gross counts:	10	7	184	1321	150	49	7
U-233/4, bkgd counts:	1	2	2	8	4	2	1
tracer interference counts:	0	0	0	1	1	0	0
tracer std.dev.:	0	0	0	0	0	0	0
U-235 interference counts:	0	0	1	6	1	1	0
U-233/4, net counts:	9	5	182	1313	146	47	6
U-233/4, Lambda:	1.17E-08	1.17E-08	1.17E-08	1.17E-08	1.17E-08	1.17E-08	1.17E-08
U-233/4, Decay corr:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
U-238, result calc.:	0.000	0.000	3.973	149.497	1.573	0.750	0.082
U-238, result rptd:	0.000	0.000	4.000	150.000	1.600	0.750	0.082
U-238 MDA calc.:	0.123	0.061	0.175	1.898	0.117	0.148	0.150
U-238, MDA rptd.:	0.100	0.200	0.100	1.000	0.100	0.100	0.200
U-235, result calc.:	0.040	0.000	0.251	6.728	0.122	0.097	0.000
U-235, result rptd.:	0.040	0.000	0.250	6.700	0.120	0.097	0.000
U-235, MDA calc.:	0.155	0.209	0.175	1.012	0.117	0.148	0.189
U-235, MDA rptd.:	0.200	0.200	0.200	1.000	0.100	0.100	0.200
U-233/4, result calc.:	0.150	0.113	3.427	143.069	1.838	0.750	0.122
U-233/4, result rptd.:	0.150	0.110	3.400	140.000	1.800	0.750	0.120
U-233/4, MDA calc.:	0.123	0.209	0.203	2.191	0.165	0.172	0.150
U-233/4, MDA rptd.:	0.100	0.200	0.200	2.000	0.100	0.200	0.200

SAMPLE RESULT VERIFICATION, DATA PACKAGE: B09DT4-TMA-690

Uranium 233/4/5/8						
Sample ID:	B09WF6	QC-LCS	QC-LCS	QC-BLANK	QC-BLANK	B09DT4-DUP
Detector:	20	23	25	24	26	25
Sample count time:	157.28	157.28	142.65	157.28	142.65	157.28
GMT count:	49.838	49.838	64.992	49.838	64.992	49.838
Zero time:	13.334	49.838	64.992	49.838	64.992	11.334
Corr. tracer dpm:	10.45	10.45	10.45	10.45	10.45	10.45
Bkgd count time:	2308.88	1166.7	2423.17	1166.7	2423.17	1166.7
Net tracer counts:	322	347	410	293	373	342
Detector eff.:	0.2853	0.3173	0.3157	0.3289	0.3196	0.3112
Yield:	0.6867	0.6654	0.8712	0.5420	0.7829	0.6686
Aliquot:	1	1	1	1	1	1
U-238, gross counts:	3	292	325	0	3	1
U-238, bkgd counts:	0	22	22	1	0	0
tracer interference counts:	0	0	0	0	0	0
tracer std.dev.:	0	0	0	0	0	0
U-235 interference counts:	0	21	22	0	0	0
U-238, net counts:	3	270	303	-1	3	1
U-238, Lambda:	4.23E-13	4.23E-13	4.23E-13	4.23E-13	4.23E-13	4.23E-13
U-238, Decay corr:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
U-235, gross counts:	2	205	217	1	1	1
U-235, bkgd counts:	0	0	0	0	0	0
tracer interference counts:	0	0	0	0	0	0
tracer std.dev.:	0	0	0	0	0	0
U-235 interference counts:	0	0	0	0	0	0
U-235, net counts:	2	205	217	1	1	1
U-235, Lambda:	2.67E-12	2.67E-12	2.67E-12	2.67E-12	2.67E-12	2.67E-12
U-235, Decay corr:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
U-235, branch ratio:	0.826	0.826	0.826	0.826	0.826	0.826
U-233/4, gross counts:	6	263	329	4	1	10
U-233/4, bkgd counts:	3	26	26	2	2	3
tracer interference counts:	1	1	1	0	1	1
tracer std.dev.:	0	0	0	0	0	0
U-235 interference counts:	0	23	24	0	0	0
U-233/4, net counts:	3	237	303	2	-1	7
U-233/4, Lambda:	1.17E-08	1.17E-08	1.17E-08	1.17E-08	1.17E-08	1.17E-08
U-233/4, Decay corr:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
U-238, result calc.:	0.044	3.663	3.479	-0.016	0.038	0.014
U-238, result rptd:	0.044	3.70	3.50	-0.016	0.038	0.014
U-238 MDA calc.:	0.040	0.450	0.385	0.118	0.034	0.037
U-238, MDA rptd.:	0.100	0.30	0.30	0.1	0.1	0.1
U-235, result calc.:	0.035	3.367	3.016	0.019	0.015	0.017
U-235, result rptd.:	0.035	3.40	3.00	0.019	0.015	0.017
U-235, MDA calc.:	0.136	0.126	0.107	0.149	0.117	0.128
U-235, MDA rptd.:	0.100	0.10	0.10	0.1	0.1	0.1
U-233/4, result calc.:	0.044	3.215	3.479	0.032	-0.013	0.096
U-233/4, result rptd.:	0.044	3.20	3.50	0.032	-0.013	0.096
U-233/4, MDA calc.:	0.157	0.478	0.409	0.149	0.117	0.148
U-233/4, MDA rptd.:	0.100	0.40	0.3	0.2	0.1	0.1

SAMPLE RESULT VERIFICATION, DATA PACKAGE: B09DT4-TMA-690

Total Uranium	Standard	Intensity			Calc	UG/L	Prep/Dsvl	Final	Rptd
	0.049	394	Sample ID	Intens.	Result		Volume	Rslt	Rslt
	0.156	1119	B09DT4	15051	2.329	2.394	0.08	0.19	0.19
	0.521	3110	B09DT5	16699	2.584	2.83	0.08	0.23	0.23
	0.976	6453	B09DT7	75873	11.742	130.14	0.08	10.41	10
	2.603	15850	B09DT9	86281	13.353	1382.691	0.2	276.54	280
	4.881	29622	B09WF3	30284	4.687	54.371	0.08	4.35	4.4
	16.27	94730	B09WF4	18524	2.867	31.954	0.08	2.56	2.6
			B09WF5	16606	2.570	2.623	0.08	0.21	0.21
			B09WF6	14487	2.242	2.435	0.08	0.19	0.19
			QC-LCS	10788	1.670	16.689	0.08	1.34	1.30
			QC-BLANK	-126	-0.019	0	0.08	0.00	0
			B09DT4-DUP	15808	2.446	2.509	0.08	0.20	0.20
			QC-LCS	10785	1.669	16.779	0.08	1.34	1.3
			QC-BLANK	-239	-0.037	0	0.08	0.0	0
	Slope:	1.5E-04							

SAMPLE RESULT VERIFICATION, DATA PACKAGE: B09DT4-TMA-690

Plutonium 238/239							
Sample ID	B09DT4	B09DT5	B09DT7	B09DT9	B09WF3	B09WF4	B09WF5
Detector	63	30	30	64	30	33	31
Count time	794.53	745.52	478.5	794.53	738.82	728.13	728.13
GMT, count:	81.077	56.294	49.287	81.077	71.319	49.287	49.287
Zero time:	11.334	11.334	11.334	13.334	13.334	17.334	13.334
Corr, tracer dpm	4.86	4.86	4.86	4.86	4.86	4.86	4.86
Bkgd, count time	2690.3	3811.23	2300	2690.3	2438.88	2300	2300
Net, tracer counts	673	890	593	741	1006	926	1080
Detector Eff	0.4051	0.3975	0.3975	0.4063	0.3973	0.4164	0.4107
Yield	0.4302	0.6180	0.6415	0.4723	0.7052	0.6284	0.7431
Pu239, gross counts	1	3	4	3	283	1	3
Pu239, bkgd counts	1	0	0	1	1	2	0
Pu-239, Lambda:	7.78E-08	7.78E-08	7.78E-08	7.78E-08	7.78E-08	7.78E-08	7.78E-08
Pu239 decay	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Pu238, gross counts	5	4	1	4	256	17	14
Pu238, bkgd counts	1	3	2	2	4	10	11
Pu-238, Lambda:	2.20E-05	2.20E-05	2.20E-05	2.20E-05	2.20E-05	2.20E-05	2.20E-05
Pu238 decay	0.9985	0.9990	0.9992	0.9985	0.9987	0.9993	0.9992
Aliquot	1	1	1	1	1	1	1
Pu239, Result calc.	0.000	0.007	0.015	0.006	0.614	-0.002	0.006
Pu239, Result rptd	0.000	0.007	0.015	0.006	0.61	-0.002	0.006
Pu239, MDA calc.	0.025	0.019	0.028	0.023	0.017	0.018	0.016
Pu239, MDA rptd.	0.02	0.02	0.03	0.02	0.02	0.02	0.02
Pu238, Result calc.	0.013	0.002	-0.004	0.006	0.549	0.017	0.006
Pu238, Result rptd.	0.013	0.002	-0.004	0.006	0.55	0.017	0.006
Pu238, MDA calc.	0.025	0.020	0.028	0.023	0.020	0.035	0.031
Pu238, MDA rptd	0.02	0.03	0.04	0.03	0.03	0.04	0.04

SAMPLE RESULT VERIFICATION, DATA PACKAGE: B09DT4-TMA-690

Plutonium 238/239						
Sample ID	B09WF6	QC-LCS	QC-LCS	QC-BLANK	QC-BLANK	B09DT4-DUP
Detector	32	34	51	65	52	48
Count time	728.13	728.13	909.08	794.53	909.08	726.18
GMT, count:	49.287	49.287	69.219	81.077	69.219	49.287
Zero time:	13.334	49.287	69.219	81.077	69.219	11.334
Corr, tracer dpm	4.86	4.86	4.86	4.86	4.86	4.86
Bkgd, count time	2300	2300	2499.05	2690.3	2499.05	2307.53
Net, tracer counts	1012	540	871	659	1019	783
Detector Eff	0.3723	0.417	0.397	0.4214	0.398	0.4044
Yield	0.7681	0.3659	0.4966	0.4050	0.5800	0.5486
Pu239, gross counts	5	230	379	2	1	0
Pu239, bkgd counts	1	3	0	0	0	0
Pu-239, Lambda:	7.78E-08	7.78E-08	7.78E-08	7.78E-08	7.78E-08	7.78E-08
Pu239 decay	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Pu238, gross counts	18	13	381	5	0	8
Pu238, bkgd counts	9	14	0	1	2	5
Pu-238, Lambda:	2.20E-05	2.20E-05	2.20E-05	2.20E-05	2.20E-05	2.20E-05
Pu238 decay	0.9992	1.0000	1.0000	1.0000	1.0000	0.9992
Aliquot	1	1	1	1	1	1
Pu239, Result calc.	0.009	0.920	0.953	0.007	0.002	0.000
Pu239, Result rptd	0.009	0.920	0.950	0.007	0.002	0.000
Pu239, MDA calc.	0.017	0.033	0.019	0.025	0.016	0.021
Pu239, MDA rptd.	0.02	0.04	0.02	0.03	0.02	0.02
Pu238, Result calc.	0.019	-0.004	0.958	0.013	-0.004	0.008
Pu238, Result rptd.	0.019	-0.004	0.960	0.013	-0.004	0.008
Pu238, MDA calc.	0.030	0.071	0.019	0.025	0.016	0.029
Pu238, MDA rptd	0.04	0.08	0.02	0.03	0.02	0.04

SAMPLE RESULT VERIFICATION, DATA PACKAGE: B09DT4-TMA-690

Americium/Curium							
Sample ID	B09DT4	B09DT5	B09DT7	B09DT9	B09WF3	B09WF4	B09WF5
Detector	62	62	63	44	46	66	64
Count Time	794.53	731.27	731.27	743.42	743.42	731.27	731.27
GMT, count:	81.077	57.289	57.289	62.335	62.335	57.289	57.289
Zero time:	11.334	11.334	11.334	13.334	13.334	13.334	13.334
Tracer dpm	4.95	4.95	4.95	4.95	4.95	4.95	4.95
Bkgd count time	2690.3	3837.72	3837.72	2435.07	2435.07	3837.72	3837.72
Net tracer counts	491	821	1155	1097	1407	570	1168
Detector eff.	0.3823	0.395	0.3953	0.4093	0.4046	0.4113	0.4027
Yield	0.3266	0.5742	0.8072	0.7283	0.9450	0.3829	0.8013
Aliquot	1	1	1	1	1	1	1
Am241 gross counts	1	4	8	90	102	4	13
Am241 bkgd. counts	1	3	3	11	10	2	4
Am241 Lambda	4.03E-06	4.03E-06	4.03E-06	4.03E-06	4.03E-06	4.03E-06	4.03E-06
Am241 decay	0.9997	0.9998	0.9998	0.9998	0.9998	0.9998	0.9998
Cm244 gross counts	5	11	5	63	49	2	14
Cm244 bkgd counts	1	2	3	10	9	1	3
Cm244 Lambda	1.06E-04	1.06E-04	1.06E-04	1.06E-04	1.06E-04	1.06E-04	1.06E-04
Cm244 decay	0.9926	0.9951	0.9951	0.9948	0.9948	0.9954	0.9954
Am241 result calc.	0.000	0.003	0.010	0.161	0.146	0.008	0.017
Am241 result rptd.	-0.005	0.003	0.010	0.16	0.150	0.008	0.017
Am241 MDA calc.	0.035	0.022	0.016	0.031	0.023	0.030	0.018
Am241 MDA rptd	0.03	0.02	0.01	0.03	0.02	0.03	0.02
Cm244 result calc.	0.018	0.025	0.004	0.108	0.064	0.004	0.021
Cm244 result rptd	0.018	0.025	0.004	0.11	0.064	0.004	0.021
Cm244 MDA calc.	0.035	0.021	0.016	0.030	0.022	0.030	0.015
Cm244 MDA rptd.	0.04	0.02	0.02	0.03	0.03	0.03	0.02

SAMPLE RESULT VERIFICATION, DATA PACKAGE: B09DT4-TMA-690

Americium/Curium						
Sample ID	B09WF6	QC-LCS	QC-LCS	QC-BLANK	QC-BLANK	B09DT4-DUP
Detector	53	47	47	48	48	66
Count Time	1031.6	735.75	743.42	735.75	743.42	794.53
GMT, count:	60.075	57.287	62.335	57.287	62.335	81.077
Zero time:	13.334	57.287	62.335	57.287	62.335	11.334
Tracer dpm	4.95	4.95	4.95	4.95	4.95	4.95
Bkgd count time	2424.17	3838.45	2435.07	3838.45	2435.07	2690.3
Net tracer counts	1603	674	1000	1215	1254	277
Detector eff.	0.4056	0.3857	0.3745	0.4044	0.4062	0.4158
Yield	0.7740	0.4798	0.7256	0.8250	0.8389	0.1694
Aliquot	1	1	1	1	1	1
Am241 gross counts	6	329	459	15	7	3
Am241 bkgd. counts	3	7	8	5	8	2
Am241 Lambda	4.03E-06	4.03E-06	4.03E-06	4.03E-06	4.03E-06	4.03E-06
Am241 decay	0.9998	1.0000	1.0000	1.0000	1.0000	0.9997
Cm244 gross counts	82	204	325	11	3	6
Cm244 bkgd counts	2	9	7	7	6	1
Cm244 Lambda	1.06E-04	1.06E-04	1.06E-04	1.06E-04	1.06E-04	1.06E-04
Cm244 decay	0.9951	1.0000	1.0000	1.0000	1.0000	0.9926
Am241 result calc.	0.004	1.065	1.006	0.018	-0.002	0.008
Am241 result rptd.	0.004	1.100	1.000	0.018	-0.002	0.008
Am241 MDA calc.	0.011	0.041	0.029	0.019	0.023	0.062
Am241 MDA rptd	0.01	0.05	0.03	0.02	0.03	0.06
Cm244 result calc.	0.112	0.645	0.709	0.007	-0.005	0.041
Cm244 result rptd	0.110	0.650	0.710	0.007	-0.005	0.041
Cm244 MDA calc.	0.011	0.046	0.027	0.023	0.020	0.062
Cm244 MDA rptd.	0.01	0.05	0.03	0.03	0.02	0.06

SAMPLE RESULT VERIFICATION, DATA PACKAGE: B09DT4-TMA-690

Neptunium							
Sample ID	B09DT4	B09DT5	B09DT7	B09DT9	B09WF3	B09WF4	B09WF5
Detector	40	41	42	64	65	61	59
Np239 cpm	30.72	19.69	29.86	30.34	12.47	50.68	11.2
Inst. eff.	0.721	0.721	0.721	0.721	0.721	0.721	0.721
Am243 added	99.08	99.08	99.08	99.08	99.08	99.08	99.08
Yield	0.4300	0.2756	0.4180	0.4247	0.1746	0.7094	0.1568
Aliquot	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Count time	1019.72	1019.72	1019.72	996.68	996.68	986.25	1033.57
Np237 gross counts	1	5	26	37	34	4	1
Np237 bkgd counts	0	0	5	2	1	3	1
Np237 aspec. eff	0.432	0.42	0.391	0.403	0.416	0.419	0.384
Np237 result calc.	0.002	0.019	0.057	0.092	0.205	0.002	0.000
Np237 result rptd.	0.002	0.019	0.057	0.092	0.210	0.001	0.000
Np237 MDA calc.	0.007	0.011	0.036	0.025	0.048	0.017	0.055
Np237 MDA rptd.	0.007	0.010	0.040	0.030	0.050	0.020	0.06

SAMPLE RESULT VERIFICATION, DATA PACKAGE: B09DT4-TMA-690

Neptunium						
Sample ID	B09WF6	QC-LCS	QC-LCS	QC-BLANK	QC-BLANK	B09DT4-DUP
Detector	60	62	66	43	39	63
Np239 cpm	47.56	39.36	31.31	34.78	20.98	33.29
Inst. eff.	0.721	0.721	0.721	0.721	0.721	0.721
Am243 added	99.08	99.08	99.08	99.08	99.08	99.08
Yield	0.6658	0.5510	0.4383	0.4869	0.2937	0.4660
Aliquot	1.000	1.000	1.000	1.000	1.000	1.000
Count time	1033.57	1033.57	996.68	1019.75	839.97	1033.57
Np237 gross counts	1	1292	1050	7	1	2
Np237 bkgd counts	1	1	2	3	0	1
Np237 aspec. eff	0.405	0.388	0.411	0.41	0.4	0.398
Np237 result calc.	0.000	2.632	2.629	0.009	0.005	0.002
Np237 result rptd.	0.000	2.600	2.600	0.009	0.005	0.002
Np237 MDA calc.	0.012	0.016	0.024	0.024	0.014	0.018
Np237 MDA rptd.	0.01	0.02	0.02	0.02	0.01	0.02

SAMPLE RESULT VERIFICATION, DATA PACKAGE: B09DT4-TMA-690

Iodine-129							
Sample ID	B09DT4	B09DT5	B09DT7	B09DT9	B09WF3	B09WF4	B09WF5
Detector	XSPEC14	XSPEC14	XSPEC14	XSPEC14	XSPEC14	XSPEC14	XSPEC14
Count Time	407.87	544.43	767.97	922.17	402.52	483.85	413.67
Gross cpm	0.515	0.553	0.552	0.53	0.529	0.513	0.5
Bkg cpm	0.643	0.686	0.679	0.522	0.779	0.489	0.593
% Bkg Std. Dev.:	18.95	15.21	12.94	12.87	17.49	18.7	18.82
Blank cpm	-0.132	-0.132	-0.132	-0.117	-0.117	-0.132	-0.132
% Blank Std. Dev.:	30.99	30.99	30.99	35.53	35.53	30.99	30.99
Net cpm	0.004	-0.001	0.005	0.125	-0.133	0.156	0.039
Lambda	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Corr. Days	36.01	36.54	36.92	47.75	48.39	32.37	35.46
Decay	1	1	1	1	1	1	1
Yield	0.6477	0.7655	0.6185	0.7085	0.6791	0.6146	0.728
Aliquot	1	1	1	1.02	1.03	1	1
PPT. Corr.	1	1	1	1	1	1	1
Product	6.48E-01	7.65E-01	6.19E-01	7.23E-01	6.99E-01	6.15E-01	7.28E-01
P-factor	4.57	4.57	4.57	4.57	4.57	4.57	4.57
Result Calc.	0.013	-0.003	0.017	0.356	-0.391	0.523	0.110
Result Rptd.	0.013	-0.002	0.017	0.350	-0.390	0.520	0.110
MDA Calc.	1.92	1.41	1.51	1.05	1.97	1.58	1.58
MDA Rptd.	2.000	1.000	2.000	1.000	2.000	2.000	2.000

SAMPLE RESULT VERIFICATION, DATA PACKAGE: B09DT4-TMA-690

Iodine-129						
Sample ID	B09WF6	QC-LCS	QC-LCS	QC-BLANK	QC-BLANK	B09DT4-DUP
Detector	XSPEC14	XSPEC14	XSPEC14	XSPEC14	XSPEC14	XSPEC14
Count Time	493.75	397.63	446.42	408.47	727.08	549.02
Gross cpm	0.523	13.221	13.906	0.512	0.602	0.543
Bkg cpm	0.577	1.039	0.76	0.656	0.561	0.779
% Bkg Std. Dev.:	17.89	14.22	16.23	19.56	14.35	14.61
Blank cpm	-0.132	-0.132	-0.117	-0.132	-0.117	-0.132
% Blank Std. Dev.:	30.99	30.99	35.53	30.99	35.53	30.99
Net cpm	0.078	12.314	13.263	-0.012	0.158	-0.104
Lambda	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Corr. Days	36.02	0.00	0.00	0.00E+00	0.00	38.99
Decay	1	1	1	1	1	1
Yield	0.7513	0.8387	0.8701	0.8436	0.8824	0.6266
Aliquot	1	1	1	1	1	1
PPT. Corr.	1	1	1	1	1	1
Product	7.51E-01	8.39E-01	8.70E-01	8.44E-01	8.82E-01	6.27E-01
P-factor	4.57	4.57	4.57	4.57	4.57	4.57
Result Calc.	0.214	30.224	31.379	-0.029	0.369	-0.342
Result Rptd.	0.210	30.000	31.000	-0.029	0.370	-0.340
MDA Calc.	1.43	1.77	1.45	1.54	0.99	1.86
MDA Rptd.	1.000	2.000	1.000	2.000	1.000	2.000