START 9713524.1920

BOBFF9-TMA-726

0046423

TMA

645

RECORD COPY

MAY 1994
RECEIVED
SDLA

WESTINGHOUSE HANFORD COMPANY

Results of Analyses For:

GENERAL CHEMISTRY & ORGANICS
Case No. 03-039
(TMA/ARLI W.O. No. A4-03-039)

METALS & NITRATE/NITRITE
Case No. N4-03-042
(TMA/Skinner & Sherman W.O. Nos. S4-03-123 & S4-03-124)

JAN 1997
RECEIVED
EDMC

May 2, 1994

TMA Master Work Order N4-03-042

8-6-96
NC

9713524.1921

FROM THE DESK OF: **DORIS E. AYRES**
SAMPLE & DATA MANAGEMENT
372-9022/B1-35

TO: **File B0BFF9-TMA-726** **DATE:** August 6, 1996

SUBJECT: **Incorrect Sample Numbers**

While processing package B0BFF9 for transmittal to the Records Holding Area it was discovered that samples B0BFF9, B0BFG2, B0BFH2 and B0BFH4 were reported as 808FF9, 808FG2, 808FH2, and 808FH4 respectively in the metals portion only.

9713524.1922

000002

PAGE 1 TMA/Norcal CHAIN OF CUSTODY ORD # N4-03-042

RCVD: 03/09/94 DUE: 04/13/94 03/09/94 12:38:09 KEEP: 04/13/95 DISP: S

DASH	SAMPLE IDENTIFICATION	STORED	TESTS for FRACTIONS with work in DEPT: SU and CATEGORY			
01A-S	BOBFH2	ARLI	WH014	WH016	WH195	WH232
01C-S	BOBFH2 MS	ARLI	WH014	WH016	WH195	WH232
01D-S	BOBFH2 MSD	ARLI	WH014	WH016	WH195	
01E-S	BOBFH2 DUP	ARLI	WH232			
02A-S	BOBFH4	ARLI	WH014	WH016	WH195	WH232
03A-S	BOBFL4	ARLI	WH014			

RELEASED BY	DATE	TRANSFERRED TO	DATE	RECEIVED BY	DATE
Yyamanuoto	3/9/94	ARLI	3/9/94	PS	3/10/94

Westinghouse Hanford Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	Page 1 of 1
		006226

Collector R.T. Sickle
Company Contact C.A. Rowley
Telephone 372-3293
SAF No. 93-263
Project Designation 216-U-8 Vitrified Clay Pipeline
Sampling Locations 216-U-8 Crib
Ice Chest No.
Bill of Lading/Airbill No.
Offsite Property No.
Method of Shipment Air Overnight
Field Logbook No.
Shipped to TMA
SPECIAL INSTRUCTIONS
Possible Sample Hazards/Remarks None Detected
Special Handling and/or Storage Keep cool

Sample Number	*	Date Collected	Time	Number and Type of Containers	Analysis Required		Preservative
B0BFH4	S	3-1-94	0800	(1) 250ml Gs	VOA	clp	
BOBFH2	S		0820	(1) 250ml Gs	VOA	CLP	
BOBFH2	S			(1) 250ml aG	Semi-VOA	CLP	
BOBFH2	S			(1) 250ml Poly	Metals -CLP TAL Titanium Mercury	CPL	
BOBFH2	S			(1) 125ml G	Anions F, Cl, SO_4	EPA 300.0	
BOBFH2	S			(1) 125ml P/G	NO_2 NO_3	EPA 353.2	
~~BOBFH2~~	~~S~~			~~(1) 250ml aGs~~	~~PCB/Pest~~ 2-27-94	~~8080~~	
BOBFH2	S			(1) 125ml G	Cyanide	CPL	
BOBFH2	S			(1) 125ml Gs	Kerosene	8015M	
BOBFH2	S			(1) 1000ml Poly	Gross Alpha/Beta EP-10; Gamma Spec. Cs-134/137, Co-60, K-40, Eu-152/154/155, Ru-106, Na-22 RC-30; Total Uranium EA-01C; U-235/234/238 EP-70, 71, 5; Np-237 RC-101A, 622, EP-5; Pu-238/239/240 EP-80, 81, 5; I-129 RC-25, 603; Sr-90 RC-306, 303, 309, 304; Tc-99 RC-24, 604; Am-241, Cm-244 EP-80, 91, 92, 93, 5; Se-79 Lab Specific		

Chain of Possession Relinquished By (Sign and Print Names)	Date	Time	Received By
R.T. Sickle	3/7/94	0740	DR Edwards
3/8/94 DR Edwards	3/8/94	0630	
	3-9-94	1015	Kermit Blum K. Blum

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

LABORATORY SECTION	Received By	Title	Date/Time
Final Sample Disposition	Disposal Method:	Disposed by:	Date/Time:

9713524.1923

000002A

Westinghouse Hanford Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	Page 1 of 1 006228

Collector R.T. Sickle
Company Contact C.A. Rowley
Telephone 372-3293
SAF No. 93-263
Project Designation 216-U-8 Vitrified Clay Pipeline
Sampling Locations 216-U-8 Crib
Ice Chest No.
Bill of Lading/Airbill No.
Offsite Property No.
Method of Shipment Air Overnight
Field Logbook No.
Shipped to TMA
SPECIAL INSTRUCTIONS
Possible Sample Hazards/Remarks None Detected
Special Handling and/or Storage Keep cool

Sample Number	*	Date Collected	Time	Number and Type of Containers	Analysis Required		Preservative
BOBFH4	S	3-2-94	0850	(1) 250ml Gs ✓	VOA	CLP	
BOBFH4	S			(1) 250ml aG ✓	Semi-VOA	CLP	
BOBFH4	S			(1) 250ml Poly ✓	Metals -CLP TAL Titanium Mercury	CPL	
BOBFH4	S			(1) 125ml G ✓	Anions F, Cl, SO_4	EPA 300.0	
BOBFH4	S			(1) 125ml P/G ✓	NO_2 NO_3	EPA 353.2	
~~BOBFH4~~	~~S~~			~~(1) 250ml aGs~~	~~PCB/Pest~~ RHH 2-23-94	~~8080~~	
BOBFH4	S			(1) 125ml G ✓	Cyanide	CPL	
BOBFH4	S			(1) 125ml Gs ✓	Kerosene	8015M	
BOBFH4	S			(1) 1000ml Poly ✓	Gross Alpha/Beta EP-10; Gamma Spec. Cs-134/137, Co-60, K-40, Eu-152/154/155, Ru-106, Na-22 RC-30; Total Uranium EA-01C; U-235/234/238 EP-70, 71, 5; Np-237 RC-101A, 622, EP-5; Pu-238/239/240 EP-80, 81, 5; I-129 RC-25, 603; Sr-90 RC-306, 303, 309, 304; Tc-99 RC-24, 604; Am-241, Cm-244 EP-80, 91, 92, 93, 5; Se-79 Lab Specific		

Chain of Possession Relinquished By (Sign and Print Names)	Date	Time	Received By
R.T. Sickle R.T. SICKLE	3/7/94	0740	D.L. Edwards
D.L. Edwards	3/8/94	0930	Kermit Blum K. Blum
	3-9-94	1015	

***Matrix**

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

LABORATORY SECTION	Received By	Title	Date/Time
Final Sample Disposition	Disposal Method:	Disposed by:	Date/Time:

9713524.1924

000002B

9713524.1925

000003

SAMPLE LOG-IN SHEET WHC

LAB NAME : TMA/ARL

PAGE : 1 OF 1

RECEIVED BY (PRINT NAME): KAYAM SHAIDI

LOG-IN-DATE : 3/10/94

RECEIVED BY (SIGNATURE): Kayam Shaidi

ICE CHEST NO. SW 5106

REMARKS:

1. Custody Seal(s) Present / Absent* Intact / Broken
2. Custody Seal Nos: N/A
3. Chain of Custody Records Present / Absent*
4. Traffic Reports or Packing List Present / Absent*
5. Airbill Airbill / Sticker Present / Absent*
6. Airbill No.: 7289155650
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: 3/10/94
12. Temp of ice chest 4 °C
13. Time Recieved: 9:30AM

SAMPLE TRANSFER

Fraction: N/A

Area #: N/A

By: N/A

On: N/A

EPA SAMPLE #	CORRESPONDING SAMPLE TAG #	CORRESPONDING ASSIGNED LAB #	REMARKS: CONDITION OF SAMPLE SHIPMENT, ETC
	BOBFH2	A4-03-039	Good
	BOBFH4		
	BOBPL4		

Contact SWO and attach record of resolution

Reviewed By:

Date:

Logbook No.: N/A

Logbook Page No.: N/A

FORM DC-1

P.S.

0000004

9713524.1926

FEDERAL EXPRESS

QUESTIONS? CALL 800-238-5355 TOLL FREE.

AIRBILL PACKAGE TRACKING NUMBER 7289155650

7289155650

RECIPIENT'S COPY

1 Date 3/9/94

From (Your Name) Please Print: SAMPLE CONTROL

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

Company: T M A /NORCAL

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 3247

Company: TMA ARLI

Department/Floor No.:

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

City: MONROVIA State: CA ZIP Required: 91016

YOUR INTERNAL BILLING REFERENCE INFORMATION (optional) (First 24 characters will appear on invoice.)
Z340-6406 RADIOACTIVE MATERIAL, EXCEPTED PACKAGE LIMITED QUANITY OF MATERIAL UN2910

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** (reservation required)
80 [ ] TWO-DAY FREIGHT**
†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	39	
Total 1	Total 39	Total

DIM 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

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 11/92
PART #137204 FXEM 3/93
FORMAT #155
155
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BEST COPY AVAILABLE

9713524.1927

TMA/ARLI
Thermo Analytical Inc.

000005

RADIATION DOSE RATE SURVEY FORM

Date 3/10/94 COMPANY WHC OTHER ORD # 7789155650

Surveyor's Name Robert MAZUREK

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		27.0			0.0				
Consistency		6990	0.270		4910	0.181			
Smears:									
6WS-106		56.0			3.0				
Activity	Report TMA/Norcal								
	BOBFH2	12.9 nCi/g	1200gr				= 15.48 uCi/gr Total		
	BOBFH4	15.3 nCi/g	1200gr				= 18.36 uCi/gr Total		
T 2°C Rec. in Bad Room		; Confirm release to Lab in DUK 3/10/94							

Comments: Victoreen Levels of 75 to 200 mR/h

All OK ✓ Approved RMM 3/10/94

Not OK Date

FORM SOP-075.1

"quality environmental services"

GENERAL CHEMISTRY RESULTS

CASE NO. 03-039

Sample #s:

B0BFH2 B0BFH4

CASE NARRATIVE

Sample B0BFH4 Matrix Spike (A4-03-039-01F) yielded a 57% recovery for Fluoride analysis which is out of TMA/ARLI control limits of 80-120%. The low recovery compared to our laboratory control sample indicated the presence of matrix interference.

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

Maureen Parrish 4/29/94

Maureen Parrish

9713524.1929

TMA Inc. REPORT Work Order # A4-03-039

Received: 03/09/94 04/29/94 11:50:22

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

ATTEN: Ms. Briana Colley

CLIENT: WHC SAMPLES: 4
COMPANY: Westinghouse Hanford Company
FACILITY:

WORK ID: SAF # 93-263 CLP
TAKEN: By Westinghouse Staff
TRANS: Federal Express
TYPE: Soil
P.O. #: N4-03-042-SU-AR
INVOICE: under separate cover

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

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.

SAMPLE IDENTIFICATION

01	B0BFH4	
01	B0BFH4	MS
01	B0BFH4	MSD
01	B0BFH4	
01	B0BFH4	MS
01	B0BFH4	
02	B0BFL4	
02	B0BFL4	MS
02	B0BFL4	MSD
03	B0BFH2	
03	B0BFH2	Duplicate
03	B0BFH2	
03	B0BFH2	MS
03	B0BFH2	MSD
04	KBLK0315	
04	Lab Blank	
04	LCS	

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
WCCLPL	Anions & Wet Chem.
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)

9713524.1930

000009

TMA Inc. REPORT Work Order # A4-03-039

Received: 03/09/94

Results by Sample

SAMPLE ID B0BFH4 FRACTION 01E TEST CODE WCCLPS NAME Anions in Solids

Date & Time Collected 03/02/94 Category

ANIONS AND WET CHEMISTRY - SOLIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT
Chloride	300.0	3.9	mg/kg	1.0
Fluoride	300.0	<0.5	mg/kg	0.5
Sulfate	300.0	11	mg/kg	5

FORM I

9713524.1931

TMA Inc. REPORT Work Order # A4-03-039 000010

Received: 03/09/94

Results by Sample

SAMPLE ID B0BFH2 FRACTION 03C TEST CODE WCCLPS NAME Anions in Solids

Date & Time Collected 03/01/94 Category

ANIONS AND WET CHEMISTRY - SOLIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT
Chloride	300.0	5.3	mg/kg	1.0
Fluoride	300.0	<0.5	mg/kg	0.5
Sulfate	300.0	13	mg/kg	5

FORM I

000072

CASE NARRATIVE

LABORATORY : TMA/ARLI

CASE : 03-039

CONTRACT ID : WESTINGHOUSE HANFORD COMPANY

SDG RECEIPT DATE : March 09, 1994

1.0 DESCRIPTION OF CASE :

Three 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
B0BFH4	A4-03-039-01A	V	SOIL
B0BFH4	A4-03-039-01B	SV	SOIL
B0BFH4 MS	A4-03-039-01C	SV	SOIL
B0BFH4 MSD	A4-03-039-01D	SV	SOIL
B0BFH4	A4-03-039-01G	K	SOIL
B0BFL4	A4-03-039-02A	V	SOIL
B0BFL4 MS	A4-03-039-02B	V	SOIL
B0BFL4 MSD	A4-03-039-02C	V	SOIL
B0BFH2	A4-03-039-03A	V	SOIL
B0BFH2	A4-03-039-03B	SV	SOIL
B0BFH2	A4-03-039-03E	K	SOIL
B0BFH2 MS	A4-03-039-03F	K	SOIL
B0BFH2 MSD	A4-03-039-03G	K	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.

Several TCL analytes were detected at various concentrations above or below the CRQL in each of the samples, including the blank, MS, and MSD.

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

TUNES :

All BFB tunes were injected directly into the GC/MS instrument.

3.2.2 SEMIVOLATILE ANALYSIS COMMENTS :

LOW LEVEL SOIL :

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

Pentachlorophenol was detected at a concentration that exceeded the calibration range of the instrument in sample B0BFH4MSD. Therefore, the analyte was "E" qualified.

The matrix spike recoveries of 2,4-Dinitrotoluene were slightly above the QC limits for both the MS and the MSD samples. The high recoveries were attributed to an efficient extraction and analysis. 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.

3.2.3 EXTRACTABLE HYDROCARBONS "KEROSENE RANGE" COMMENTS :

SEQUENCE NOTES :

The sequence was started on 03/26/94 and was analyzed according to the SW-846 Method 8015M. The %RSD in the all of the initial calibrations and the %D in the continuing calibrations were below their 20% and 15% limits, respectively.

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

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 surrogate o-Terphenyl was added to each sample, and the recoveries ranged from 68% to 77%.

- The matrix spike and matrix spike duplicate recoveries for Kerosene were 73% and 77%, respectively.

  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 5/2/94
Program Manager

Maureen Parrish
Program Manager

9713524.1935

000075

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B0BFH2

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 03039 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A403039-03A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 40314R10

Level: (low/med) LOW Date Received: 03/09/94

% Moisture: not dec. 14 Date Analyzed: 03/14/94

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	8	BJ
67-64-1	Acetone	16	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	3	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	12	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

9713524.1936

000076

EPA SAMPLE NO.

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

B0BFH2

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 03039 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A403039-03A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 40314R10

Level: (low/med) LOW Date Received: 03/09/94

% Moisture: not dec. 14 Date Analyzed: 03/14/94

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.

B0BFH4

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 03039 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A403039-01A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 40314R09

Level: (low/med) LOW Date Received: 03/09/94

% Moisture: not dec. 7 Date Analyzed: 03/14/94

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	5	BJ
67-64-1	Acetone	9	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

9713524.1933

000078
EPA SAMPLE NO.

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

B0BFH4

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 03039 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A403039-01A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 40314R09

Level: (low/med) LOW Date Received: 03/09/94

% Moisture: not dec. 7 Date Analyzed: 03/14/94

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

9713524.1939

000079

EPA SAMPLE NO.

B0BFL4

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 03039 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A403039-02A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 40314R06

Level: (low/med) LOW Date Received: 03/09/94

% Moisture: not dec. 0 Date Analyzed: 03/14/94

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	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	1	BJ
107-06-2	1,2-Dichloroethane	10	U
78-93-3	2-Butanone	10	U
71-55-6	1,1,1-Trichloroethane	2	BJ
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	3	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

9713524.1940

000080

EPA SAMPLE NO.

B0BFL4

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 03039 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A403039-02A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 40314R06

Level: (low/med) LOW Date Received: 03/09/94

% Moisture: not dec. 0 Date Analyzed: 03/14/94

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	26.70	13	J

9713524.1941

000081
EPA SAMPLE NO.

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

B0BFH2

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 03039 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A403039-03B

Sample wt/vol: 30.5 (g/mL) G Lab File ID: 40330I18

Level: (low/med) LOW Date Received: 03/09/94

% Moisture: 14 decanted: (Y/N) N Date Extracted: 03/15/94

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 03/31/94

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 5.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-95-2	Phenol	380	U
111-44-4	bis(2-Chloroethyl)Ether	380	U
95-57-8	2-Chlorophenol	380	U
541-73-1	1,3-Dichlorobenzene	380	U
106-46-7	1,4-Dichlorobenzene	380	U
95-50-1	1,2-Dichlorobenzene	380	U
95-48-7	2-Methylphenol	380	U
108-60-1	2,2'-oxybis(1-Chloropropane)	380	U
106-44-5	4-Methylphenol	380	U
621-64-7	N-Nitroso-Di-n-Propylamine	380	U
67-72-1	Hexachloroethane	380	U
98-95-3	Nitrobenzene	380	U
78-59-1	Isophorone	380	U
88-75-5	2-Nitrophenol	380	U
105-67-9	2,4-Dimethylphenol	380	U
111-91-1	bis(2-Chloroethoxy)Methane	380	U
120-83-2	2,4-Dichlorophenol	380	U
120-82-1	1,2,4-Trichlorobenzene	380	U
91-20-3	Naphthalene	380	U
106-47-8	4-Chloroaniline	380	U
87-68-3	Hexachlorobutadiene	380	U
59-50-7	4-Chloro-3-Methylphenol	380	U
91-57-6	2-Methylnaphthalene	380	U
77-47-4	Hexachlorocyclopentadiene	380	U
88-06-2	2,4,6-Trichlorophenol	380	U
95-95-4	2,4,5-Trichlorophenol	920	U
91-58-7	2-Chloronaphthalene	380	U
88-74-4	2-Nitroaniline	920	U
131-11-3	Dimethylphthalate	380	U
208-96-8	Acenaphthylene	380	U
99-09-2	3-Nitroaniline	920	U
83-32-9	Acenaphthene	380	U
51-28-5	2,4-Dinitrophenol	920	U

9713524.1942

000082
EPA SAMPLE NO.

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

B0BFH2

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 03039 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A403039-03B

Sample wt/vol: 30.5 (g/mL) G Lab File ID: 40330I18

Level: (low/med) LOW Date Received: 03/09/94

% Moisture: 14 decanted: (Y/N) N Date Extracted: 03/15/94

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 03/31/94

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 5.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-02-7	4-Nitrophenol	920	U
132-64-9	Dibenzofuran	380	U
121-14-2	2,4-Dinitrotoluene	380	U
606-20-2	2,6-Dinitrotoluene	380	U
84-66-2	Diethylphthalate	380	U
7005-72-3	4-Chlorophenyl-phenylether	380	U
86-73-7	Fluorene	380	U
100-01-6	4-Nitroaniline	920	U
534-52-1	4,6-Dinitro-2-methylphenol	920	U
86-30-6	N-Nitrosodiphenylamine (1)	380	U
101-55-3	4-Bromophenyl-phenylether	380	U
118-74-1	Hexachlorobenzene	380	U
87-86-5	Pentachlorophenol	41	J
85-01-8	Phenanthrene	380	U
120-12-7	Anthracene	380	U
86-74-8	Carbazole	380	U
84-74-2	Di-n-Butylphthalate	520	B
206-44-0	Fluoranthene	380	U
129-00-0	Pyrene	380	U
85-68-7	Butylbenzylphthalate	380	U
91-94-1	3,3'-Dichlorobenzidine	380	U
56-55-3	Benzo(a)Anthracene	380	U
117-81-7	bis(2-Ethylhexyl)Phthalate	380	U
218-01-9	Chrysene	380	U
117-84-0	Di-n-Octyl Phthalate	380	U
205-99-2	Benzo(b)Fluoranthene	380	U
207-08-9	Benzo(k)Fluoranthene	380	U
50-32-8	Benzo(a)Pyrene	380	U
193-39-5	Indeno(1,2,3-cd)Pyrene	380	U
53-70-3	Dibenz(a,h)Anthracene	380	U
191-24-2	Benzo(g,h,i)Perylene	380	U

(1) - Cannot be separated from Diphenylamine

1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B0BFH2

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 03039 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A403039-03B

Sample wt/vol: 30.5 (g/mL) G Lab File ID: 40330I18

Level: (low/med) LOW Date Received: 03/09/94

% Moisture: 14 decanted: (Y/N) N Date Extracted: 03/15/94

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 03/31/94

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 5.0

Number TICs found: 20

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN HYDROCARBON	5.53	1900	BJ
2.	UNKNOWN HYDROCARBON	5.77	2000	J
3.	UNKNOWN KETONE	6.03	720	BJ
4.	UNKNOWN HYDROCARBON	7.65	230	J
5.	UNKNOWN HYDROCARBON	7.90	270	J
6.	PROPANOIC ACID ESTER ISOMER	10.17	230	J
7.	UNKNOWN ALKANE	11.35	270	J
8.	UNKNOWN ALKANE	13.17	530	J
9.	UNKNOWN ALKANE	13.98	800	J
10.	UNKNOWN ALKANE	14.50	500	J
11. 126-73-8	PHOSPHORIC ACID TRIBUTYL EST	16.27	270	JN
12.	UNKNOWN PCB	21.03	530	J
13.	UNKNOWN HYDROCARBON	21.20	690	J
14.	UNKNOWN PCB	21.50	650	J
15.	UNKNOWN PCB	22.03	270	J
16.	UNKNOWN PCB	22.67	190	J
17.	UNKNOWN PCB	22.75	340	J
18.	UNKNOWN PCB	23.25	190	J
19.	UNKNOWN PCB	23.68	270	J
20.	UNKNOWN ALKANE	27.93	190	J

9713524.1944

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B0BFH4

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 03039 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A403039-01B

Sample wt/vol: 30.2 (g/mL) G Lab File ID: 40330I15

Level: (low/med) LOW Date Received: 03/09/94

% Moisture: 7 decanted: (Y/N) N Date Extracted: 03/15/94

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 03/30/94

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 4.2

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.

B0BFH4

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 03039 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A403039-01B

Sample wt/vol: 30.2 (g/mL) G Lab File ID: 40330I15

Level: (low/med) LOW Date Received: 03/09/94

% Moisture: 7 decanted: (Y/N) N Date Extracted: 03/15/94

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 03/30/94

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 4.2

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	490	B
206-44-0	Fluoranthene	350	U
129-00-0	Pyrene	350	U
85-68-7	Butylbenzylphthalate	350	U
91-94-1	3,3'-Dichlorobenzidine	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

9713524.1946

000086
EPA SAMPLE NO.

1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

B0BFH4

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 03039 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A403039-01B

Sample wt/vol: 30.2 (g/mL) G Lab File ID: 40330I15

Level: (low/med) LOW Date Received: 03/09/94

% Moisture: 7 decanted: (Y/N) N Date Extracted: 03/15/94

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 03/30/94

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 4.2

Number TICs found: 10

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN HYDROCARBON	5.55	1900	BJ
2.	UNKNOWN HYDROCARBON	5.82	180	BJ
3.	UNKNOWN HYDROCARBON	6.05	390	BJ
4.	PROPANOIC ACID ESTER ISOMER	15.65	1000	BJ
5. 126-73-8	PHOSPHORIC ACID TRIBUTYL EST	16.28	390	JN
6.	UNKNOWN HYDROCARBON	21.22	820	J
7.	UNKNOWN HYDROCARBON	25.22	110	J
8.	UNKNOWN ALKANE	26.40	110	J
9.	UNKNOWN ALKANE	27.95	210	J
10.	UNKNOWN ALKANE	29.92	71	J

TMA Inc. REPORT Work Order # A4-03-039

Received: 03/09/94

Results by Sample

SAMPLE ID B0BFH2 FRACTION 03E TEST CODE 8015MS NAME EPA 8015M EXTRACT.

Date & Time Collected 03/01/94 Category

MODIFIED 8015 - EXTRACTABLE FUEL HYDROCARBONS

Matrix: SOIL
Date Analyzed: 03/27/94
Dilution factor: 1.00
Concentration Units: mg/Kg

Compound	Sample Result	PQL
Kerosene Range	ND	5
C10 - C16 Jet Fuel Range	NA	NA
C9 - C22 Diesel Range	NA	NA
Hydraulic Range	NA	NA

ND = Not detected at the specified limits

% RECOVERY SURROGATES COMPOUNDS
o-Terphenyl 77

Form I

TMA Inc. REPORT Work Order # A4-03-039

Received: 03/09/94

Results by Sample

SAMPLE ID B0BFH4 FRACTION 01G TEST CODE 8015MS NAME EPA 8015M EXTRACT.

Date & Time Collected 03/02/94 Category

MODIFIED 8015 - EXTRACTABLE FUEL HYDROCARBONS

Matrix: SOIL
Date Analyzed: 03/27/94
Dilution factor: 1.00
Concentration Units: mg/Kg

Compound	Sample Result	PQL
Kerosene Range	ND	5
C10 - C16 Jet Fuel Range	NA	NA
C9 - C22 Diesel Range	NA	NA
Hydraulic Range	NA	NA

ND = Not detected at the specified limits

% RECOVERY SURROGATES COMPOUNDS
o-Terphenyl 68

Form I

9713524.1949

 *** T M A *** REPORT Work Order # S4-03-124

Received: 03/10/94 04/11/94 08:55:10

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

ATTEN Dan Steurmer

PREPARED Thermo Analytical, Inc.
BY 300 Second Avenue
P.O. Box 521
Waltham, MA 02254

ATTEN Client Services
PHONE (617) 890-7200

CERTIFIED BY

CONTACT DP

CLIENT HANFORD NOR SAMPLES 3
COMPANY TMA/NORCAL Hanford
FACILITY Richmond, CA

WORK ID N4-03-042
TAKEN By Client
TRANS Fedex
TYPE 2 soils
P.O. # N4-03-042
INVOICE under separate cover

SAMPLE IDENTIFICATION		TEST CODES and NAMES used on this workorder	
01	BOBFH2	NITR S	Nitrate/Nitrite in Soils
01	BOBFH2D		
01	BOBFH2S		
02	BOBFH4		
03	LCSS		

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

9713524.1950

 *** T M A *** REPORT Work Order # S4-03-124

Received: 03/10/94 Results by Sample

SAMPLE ID BOBFH2 SAMPLE # 01 FRACTIONS: A
Date & Time Collected 03/01/94 08:00:00 Category SOIL

NITR_S 48.9
mg N/kg

SAMPLE ID BOBFH2D SAMPLE # 01 FRACTIONS: B
Date & Time Collected 03/01/94 08:00:00 Category SOIL

NITR_S 50.1
mg N/kg

SAMPLE ID BOBFH2S SAMPLE # 01 FRACTIONS: C
Date & Time Collected 03/01/94 08:00:00 Category SOIL

NITR_S 67.5
mg N/kg

SAMPLE ID BOBFH4 SAMPLE # 02 FRACTIONS: A
Date & Time Collected 03/02/94 08:50:00 Category SOIL

NITR_S 66.4
mg N/kg

SAMPLE ID LCSS SAMPLE # 03 FRACTIONS: A
Date & Time Collected not specified Category SOIL

NITR_S 2.07
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

9713524.1951

Received: 03/10/94 04/11/94 08:55:10

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
S403124-01	48.9 mg/kg	19.9 mg/kg	67.5 mg/kg	93.5

DUPLICATE

Sample ID	Sample result	Duplicate Result	Relative % Difference
S403124-01	48.9 mg/kg	50.1 mg/kg	2.4

QUALITY CONTROL SAMPLES

Sample ID	True Value	Found Value	Percent Recovery
LCS	2.00 mg/L	2.07 mg/L	103.5
Prep blank	--	<0.25 mg/L	--

TMA
Thermo Analytical Inc.
Skinner & Sherman Laboratories Inc.

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

9713524.1952

Received: 03/10/94 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.
Skinner & Sherman Laboratories Inc.

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

9713524.1953

TMA/Skinner & Sherman Laboratories
Sample Login Sheet

Workorder S4-03-124 Client Hanford WM Number/Type of Samples 2 soils
Protocol CLP Turnaround 33 days Cooler Temp: 2.8 °C, or N/A Cooler Yes/No
Custodian: a marineau Shipper & # Fedex SDG/Batch#
Custody Seal: Present/Absent/Intact/Not Client Case# W4-03042
Purchase Order/Contract# W4-03-042 Client Contact D. Sandney
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: 3/10/94
List any date with paperwork/shipment problems & specify the problem:
* use samples #1, and #2 from case S4-03-123 for Testing.

	Client ID	Matrix	Received	pH*	Test(s) & QC	Holding Times
*1	BOBFH2	soil	3/10/94	n/A	NO3 NO2	(D,S)
*2	BOBFH4	↓	↓	↓	↓	
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						

Complete
DRM 3/10/94

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

* EPA/CLP required

Rev 1.7

9713524.1954

PAGE 1 TMA/Norcal CHAIN OF CUSTODY ORD # N4-03-042

RCVD: 03/09/94 DUE: 04/13/94 03/09/94 12:38:13 KEEP: 04/13/95 DISP: S

DASH	SAMPLE IDENTIFICATION	STORED	TESTS for FRACTIONS with work in DEPT: SV and CATEGORY				
01B-S	BOBFH2	S&S	WH001	WH002	WH004	WH005	WH233
01F-S	BOBFH2 MS	S&S	WH001	WH002	WH004	WH005	WH233
01G-S	BOBFH2 DUP	S&S	WH001	WH002	WH004	WH005	WH233
01H-S	L C S	S&S	WH001	WH002	WH004	WH005	WH233
02B-S	BOBFH4	S&S	WH001	WH002	WH004	WH005	WH233

RELEASED BY	DATE	TRANSFERRED TO	DATE	RECEIVED BY	DATE
Yamamoto	3/9/94	Skinner	3/9/94	D. Martinez	3/10/94

9713524.1955

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

MAY 1994
RECEIVED
SDLA

April 11, 1994

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

Quality Control Narrative

Scope
Two soil samples were submitted to TMA/Skinner & Sherman Laboratories, Inc. on March 10, 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 S403123.

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 matrix spike recovery for antimony exceeded the control limit requirement.

The laboratory duplicates for aluminum and lead 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

9713524.1956

WESTINGHOUSE/HANFORD

COVER PAGE - INORGANIC ANALYSES DATA PACKAGE

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

Lab Code: SKINER Case No.: N4-03-042 SAS No.: SDG No.: B0BFH2

SOW No.: ILM02.1

SAMPLE NUMBER:	Lab Sample ID.
B0BFH2	03123-01S
B0BFH4	03123-02S
B0BFH4D	03123-02S2
B0BFH4S	03123-02DS

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: 4/11/94 Title: Lead Chemist

SAMPLE NUMBER:

B0BFH2

INORGANIC ANALYSIS DATA SHEET

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

Lab Code: SKINER Case No.: N4-03-042SAS No.: SDG No.: B0BFH2

Matrix (soil/water): SOIL Lab Sample ID: 03123-01S

Level (low/med): LOW Date Received: 03/10/94

% Solids: 88.3

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	2620		*	P
7440-36-0	Antimony	2.6	U	N	P
7440-38-2	Arsenic	1.8	B		P
7440-39-3	Barium	28.8	B		P
7440-41-7	Beryllium	0.18	B		P
7440-43-9	Cadmium	0.36	U		P
7440-70-2	Calcium	2790			P
7440-47-3	Chromium	6.0			P
7440-48-4	Cobalt	4.4	B		P
7440-50-8	Copper	5.4			P
7439-89-6	Iron	9580			P
7439-92-1	Lead	2.5		*	P
7439-95-4	Magnesium	1810			P
7439-96-5	Manganese	128			P
7439-97-6	Mercury	0.06	B		CV
7440-02-0	Nickel	3.0	B		P
7440-09-7	Potassium	647	B		P
7782-49-2	Selenium	0.59	U		P
7440-22-4	Silver	1.1	B		P
7440-23-5	Sodium	458	B		P
7440-28-0	Thallium	0.78	U		P
7440-62-2	Vanadium	25.9			P
7440-66-6	Zinc	21.4			P
	Cyanide	0.53	U		CA
7440-32-6	Titanium	829			P

Color Before: GREY Clarity Before: Texture: MEDIUM

Color After: GREY Clarity After: Artifacts:

Comments:

9713524.1953

WESTINGHOUSE/HANFORD

1

SAMPLE NUMBER:

B0BFH4

INORGANIC ANALYSIS DATA SHEET

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

Lab Code: SKINER Case No.: N4-03-042SAS No.: SDG No.: B0BFH2

Matrix (soil/water): SOIL Lab Sample ID: 03123-02S

Level (low/med): LOW Date Received: 03/10/94

% Solids: 92.3

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	5230		*	P
7440-36-0	Antimony	2.5	U	N	P
7440-38-2	Arsenic	10.1			P
7440-39-3	Barium	42.7			P
7440-41-7	Beryllium	0.34	B		P
7440-43-9	Cadmium	0.41	B		P
7440-70-2	Calcium	2060			P
7440-47-3	Chromium	10.5			P
7440-48-4	Cobalt	9.3	B		P
7440-50-8	Copper	12.6			P
7439-89-6	Iron	22100			P
7439-92-1	Lead	4.4		*	P
7439-95-4	Magnesium	3140			P
7439-96-5	Manganese	238			P
7439-97-6	Mercury	1.9			CV
7440-02-0	Nickel	6.5	B		P
7440-09-7	Potassium	713	B		P
7782-49-2	Selenium	0.58	U		P
7440-22-4	Silver	1.9	B		P
7440-23-5	Sodium	545	B		P
7440-28-0	Thallium	0.76	U		P
7440-62-2	Vanadium	63.9			P
7440-66-6	Zinc	51.6			P
	Cyanide	0.54	U		CA
7440-32-6	Titanium	2250			P

Color Before: GREY Clarity Before: Texture: MEDIUM

Color After: GREY Clarity After: Artifacts:

Comments:

003

9713524.1959

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 7289155646

7 2 8 9 1 5 5 6 4 6

3C95M 7289155646

SENDER'S FEDERAL EXPRESS ACCOUNT NUMBER: 0941-5760-9

Date: 3/9/94

From (Your Name) Please Print: SAMPLE CONTROL

Your Phone Number (Very important): 510-235-2633

Company: T M A /NORCAL

Department/Floor No.:

Street Address: 2030 WRIGHT AVE

City: RICHMOND State: CA ZIP Required: 94804

To (Recipient's Name) Please Print: ANTONIA

Recipient's Phone Number (Very important): (617) 890-720

Company: SKINNER & SHERMAN

Department/Floor No.:

Exact Street Address (We Cannot Deliver to P.O. Boxes or P.O. Zip Codes.): 300 SECOND AVENUE

City: WALTHAM State: MA ZIP Required: 02254

YOUR INTERNAL BILLING REFERENCE INFORMATION (optional) (First 24 characters will appear on invoice.)
2340-6406 RADIOACTIVE MATERIAL, EXCEPTED PACKAGE-LIMITED QUANITY OF MATERIAL UN 2910

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

PAYMENT: X Recipient's FedEx Account Number / Sender's FedEx Account Number / Third Party FedEx Account Number / X Credit Card / Cash / Check
Credit Card No. / Exp. Date

SERVICES (Check only one box)

Priority Overnight: X OTHER PACKAGING; FEDEX LETTER*; FEDEX PAK*; FEDEX BOX; FEDEX TUBE
Standard Overnight: OTHER PACKAGING; FEDEX LETTER*; FEDEX PAK*; FEDEX BOX; FEDEX TUBE
Economy Two-Day: ECONOMY*
Government Overnight: GOV'T LETTER; GOV'T PACKAGE
Freight Service: SPRINT; TWO-DAY FREIGHT**

DELIVERY AND SPECIAL HANDLING (Check services required)

1 HOLD FOR PICK-UP
2 X DELIVER WEEKDAY
3 DELIVER SATURDAY (Extra charge)
4 DANGEROUS GOODS
5
6 DRY ICE
7 OTHER SPECIAL SERVICE
8
9 SATURDAY PICK-UP
HOLIDAY DELIVERY

PACKAGES: 1 WEIGHT: 35 Total: 1 Total: 35

DIM SHIPMENT (Chargeable Weight) lbs. X X

Received At: X Regular Stop; Drop Box; B.S.C.; 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

Release Signature

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

REVISION DATE 11/92
PART #137204 FXEM 3
FORMAT #155
155
©1992-93 FEDEX
PRINTED IN U.S.A.

9713524.1960

RECORD COPY

APR 1994
RECEIVED
SDLA

WESTINGHOUSE HANFORD COMPANY

Results of Analyses For:

GENERAL CHEMISTRY & ORGANICS
Case No. 03-028
(TMA/ARLI W.O. No. A4-03-028)

METALS & NITRATE/NITRITE
Case No. N4-03-026
(TMA/Skinner & Sherman W.O. Nos. S4-03-116 & S4-03-101)

April 22, 1994

TMA Master Work Order N4-03-026

 8-6-96 MC

9713524.1961

000002

PAGE 1 TMA/Norcal CHAIN OF CUSTODY ORD # N4-03-026

RCVD: 03/04/94 DUE: 04/08/94 03/04/94 14:06:13 KEEP: 04/08/95 DISP: S

DASH	SAMPLE IDENTIFICATION		STORED	TESTS for FRACTIONS with work in DEPT: SU and CATEGORY			
01A-S	BOBFF9		ARLI	WH014	WH016	WH195	WH232
01C-S	BOBFF9	MS	ARLI	WH014	WH016	WH195	WH232
01D-S	BOBFF9	MSD	ARLI	WH014	WH016	WH195	
01E-S	BOBFF9	DUP	ARLI	WH232			
02A-S	BOBFG2		ARLI	WH014	WH016	WH195	WH232
03A-S	BOBFN3		ARLI	WH014			

RELEASED BY	DATE	TRANSFERRED TO	DATE	RECEIVED BY	DATE
tyamamoto	3/4/94	ARLI	3/4/94	P.S	3/7/94

Sample was received on Saturday 3/5/94 but the ice chest was opened on 3/7/94. (P.S)

000024

Westinghouse Hanford Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	Page 1 of 1
		006481

Collector R.T. Sickle
Company Contact C.A. Rowley
Telephone 372-3293
SAF No. 93-263
Project Designation 216-U-8 Vitrified Clay Pipeline
Sampling Locations 216-U-8 Crib
Ice Chest No.
Bill of Lading/Airbill No.
Offsite Property No.
Method of Shipment Air Overnight
Field Logbook No.
Shipped to TMA
SPECIAL INSTRUCTIONS
Possible Sample Hazards/Remarks None Detected
Special Handling and/or Storage Keep cool

Sample Number	*	Date Collected	Time	Number and Type of Containers	Analysis Required	Preservative
BOBFF9	S	2-24-94	1315	(1) 250ml Gs ✓	VOA CLP	
BOBFF9	S			(1) 250ml aG ✓	Semi-VOA CLP	
BOBFF9	S			(1) 250ml Poly ✓	Metals -CLP TAL Titanium Mercury 500 ml - KB CPL	
BOBFF9	S			(1) 125ml G ✓	Anions F, Cl, SO_4 EPA 300.0	
BOBFF9	S			(1) 125ml P/G ✓	NO_2 NO_3 EPA 353.2	
~~BOBFF9~~	~~S~~			~~(1) 250ml aGs~~	~~PCB/Pest~~ ~~RHA 2-24-94~~ 8080	
BOBFF9	S			(1) 125ml G ✓	Cyanide CPL	
BOBFF9	S			(1) 125ml Gs ✓	Kerosene 8015M	
BOBFF9	S			(1) 1000ml Poly ✓	Gross Alpha/Beta EP-10; Gamma Spec. Cs-134/137, Co-60, K-40, Eu-152/154/155, Ru-106, Na-22 RC-30; Total Uranium EA-01C; U-235/234/238 EP-70, 71, 5; Np-237 RC-101A, 622, EP-5; Pu-238/239/240 EP-80, 81, 5; I-129 RC-25, 603; Sr-90 RC-306, 303, 309, 304; Tc-99 RC-24, 604; Am-241, Cm-244 EP-80, 91, 92, 93, 5; Se-79 Lab Specific	

Chain of Possession Relinquished By (Sign and Print Names)	Date	Time	Received By
R.T. Sickle R.T. Sickle	3/1/94	1200	D.L. Edwards
D.L. Edwards	3/3/94	0945	Kermit Blum K. Blum
	3-4-94	1000	

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

LABORATORY SECTION	Received By	Title	Date/Time
Final Sample Disposition	Disposal Method:	Disposed by:	Date/Time:

9713524.1962

0000028

Westinghouse Hanford Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	Page 1 of 1 006484

Collector R.T. Sickle
Company Contact C.A. Rowley
Telephone 372-3293
SAF No. 93-263
Project Designation 216-U-8 Vitrified Clay Pipeline
Sampling Locations 216-U-8 Crib
Ice Chest No.
Bill of Lading/Airbill No.
Offsite Property No.
Method of Shipment Air Overnight
Field Logbook No.
Shipped to TMA
SPECIAL INSTRUCTIONS
Possible Sample Hazards/Remarks None detected
Special Handling and/or Storage Keep cool

Sample Number	*	Date Collected	Time	Number and Type of Containers	Analysis Required		Preservative
BOBFN3	S	2-25-94	0815	(1) 250ml aGs ✓	VOA	CLP	
BOBFG2	S	2-25-94	1200	(1) 250ml Gs ✓	VOA	CLP	
BOBFG2	S			(1) 250ml aG ✓	Semi-VOA	CLP	
BOBFG2	S			(1) 250ml Poly ✓	Metals -CLP TAL Titanium Mercury	CPL	
BOBFG2	S			(1) 125ml G ✓	Anions F, Cl, SO_4	EPA 300.0	
BOBFG2	S			(1) 125ml P/G ✓	NO_2 NO_3	EPA 353.2	
~~BOBFG2~~	~~S~~			(1) 250ml aGs —	PCB/Pest — [illegible] 2-25-94	8080	
BOBFG2	S			(1) 125ml G ✓	Cyanide	CPL	
BOBFG2	S			(1) 125ml Gs ✓	Kerosene	8015M	
BOBFG2	S			(1) 1000ml Poly ✓	Gross Alpha/Beta EP-10; Gamma Spec. Cs-134/137, Co-60, K-40, Eu-152/154/155, Ru-106, Na-22 RC-30; Total Uranium EA-01C; U-235/234/238 EP-70, 71, 5; Np-237 RC-101A, 622, EP-5; Pu-238/239/240 EP-80, 81, 5; I-129 RC-25, 603; Sr-90 RC-306, 303, 309, 304; Tc-99 RC-24, 604; Am-241, Cm-244 EP-80, 91, 92, 93, 5; Se-79 Lab Specific		

Chain of Possession Relinquished By (Sign and Print Names)	Date	Time	Received By
[signature] R.T. Sickle	3/1/94	1200	D L Edwards
D L Edwards	3/3/94	0945	
	3-4-94	1000	Kermit Blum K. Blum

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

LABORATORY SECTION	Received By	Title	Date/Time
Final Sample Disposition	Disposal Method:	Disposed by:	Date/Time:

9713524.1963

9713524.1964

000003

SAMPLE LOG-IN SHEET WHC

LAB NAME : TMA/ARL

PAGE : 1 OF 1

RECEIVED BY (PRINT NAME): PAYAM SHADI

LOG-IN-DATE : 3/7/94

RECEIVED BY (SIGNATURE): payam shadi

ICE CHEST NO. SML 417

REMARKS:

1. Custody Seal(s) Present / Absent* Intact / Broken
2. Custody Seal Nos: N/A ~~728 9456173~~ P.S
3. Chain of Custody Records Present / Absent*
4. Traffic Reports or Packing List Present / Absent*
5. Airbill Airbill / Sticker Present / Absent*
6. Airbill No.: ~~N/A~~ P.S 728 9456173
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: SATURDAY 3/5/94
12. Temp of ice chest 4 °C
13. Time Recieved: 9:30

SAMPLE TRANSFER

Fraction: N/A

Area #: N/A

By: N/A

On: N/A

EPA SAMPLE #	CORRESPONDING SAMPLE TAG #	CORRESPONDING ASSIGNED LAB #	REMARKS: CONDITION OF SAMPLE SHIPMENT, ETC
	B0BFG2	A4-03-028	good
	B0BFN3	A4-03-028	
	B0BFF9	A4-03-028	

PS

* Contact SMO and attach record of resolution

Reviewed By:

Date:

Logbook No.: N/A

Logbook Page No.: N/A

FORM DC-1

000004

9713524.1965

FEDERAL EXPRESS

QUESTIONS? CALL 800-238-5355 TOLL FREE.

AIRBILL PACKAGE TRACKING NUMBER 7289156173

3095M 7289156173

RECIPIENT'S COPY

1 Date 3/4/94

From (Your Name) Please Print: SAMPLE CONTROL
Your Phone Number (Very Important): 610-235-2639
Company: T M A /NORCAL
Department/Floor No.:
Street Address: 2030 WRIGHT AVE
City: RICHMOND State: CA ZIP Required: 9 4 8 0 4

2 To (Recipient's Name) Please Print: CAROLE HARRIS
Recipient's Phone Number (Very Important): 818 3573247
Company: TMA ARLI
Department/Floor No.:
Exact Street Address (We Cannot Deliver to P.O. Boxes or P.O. Zip Codes.): 160 TAYLOR ST
City: MONROVIA State: CA ZIP Required: 91016

YOUR INTERNAL BILLING REFERENCE INFORMATION (optional) (First 24 characters will appear on invoice.)
2310-RQ RADIOACTIVE MATERIAL, EXCEPTED PACKAGE-LIMITED QUANTITY OF MATERIAL UN2910

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

3 PAYMENT 1 ☒ 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 ☒ 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 commitments 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 ☐ 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 _____ 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	48	
Total 1	Total 48	Total

DIM SHIPMENT (Chargeable Weight) ☐ _____ lbs.
L x W x H
Received At: 1 ☐ Regular Stop 3 ☐ Drop Box 2 ☐ On-Call Stop 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 #155
155
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9713524.1966

000005

TMA/ARLI
Thermo Analytical Inc.

RADIATION DOSE RATE SURVEY FORM

Date 3/7/94 COMPANY NORC (WHC) OTHER ORD # 7289156173

Surveyor's Name Michael D. Williams

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		36.0			1.0				
Consistency		7280	0.281		4930	0.181			
Smears:									
Sml 417		35.0			7.0				
Reported	(NORC)	BOBFF9 = 870 Ci/g.							
		BOBFG2 = 2.13 mCi/g							

All OK ____ Approved M. W. Comments: Victoreen

Not OK ____ Date 3/7/94 BOB FG2 → 200 μR/h

BOB FF9 = 50 μR/h

BOB FN3 < 15 μR/h

FORM SOP-075.1

"quality environmental services"

GENERAL CHEMISTRY RESULTS

CASE NO. 03-028

Sample #s:

B0BFF9 B0BFG2

CASE NARRATIVE

Duplicate analysis on sample B0BFF9 (A4-03-028-03D) revealved a % RPD for Chloride and Fluoride of 36.8% and 35.3% respectively and 17.4 for Sulfate. In addition, the matrix spike for Fluoride (A4-03-028-02F) yielded a 77% recovery. The high RPDs and the low % recovery can be attributed to an inhomogeneous sample and matrix interference.

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

Maureen Parrish 4/21/94

Maureen Parrish

9713524.1963

000007

TMA Inc. REPORT Work Order # A4-03-028

Received: 03/04/94 04/21/94 13:59:29

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

ATTEN: Ms. Briana Colley

CLIENT: WHC SAMPLES: 4
COMPANY: Westinghouse Hanford Company
FACILITY:

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

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. #: N4-03-026-SU-AR
INVOICE: under separate cover

SAMPLE IDENTIFICATION

01	B0BFN3	
01	B0BFN3	MS
01	B0BFN3	MSD
02	B0BFG2	
02	B0BFG2	MS
02	B0BFG2	MSD
02	B0BFG2	
02	B0BFG2	MS
02	B0BFG2	
03	B0BFF9	
03	B0BFF9	Duplicate
03	B0BFF9	
03	B0BFF9	MS
03	B0BFF9	MSD
04	Lab blank	
04	LCS	
04	KBLK0311	

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
WCCLPL	Anions & Wet Chem.
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)

TMA Inc. REPORT Work Order # A4-03-028

Received: 03/04/94

Results by Sample

SAMPLE ID B0BFG2 FRACTION 02E TEST CODE WCCLPS NAME Anions in Solids

Date & Time Collected 02/25/94 Category

ANIONS AND WET CHEMISTRY - SOLIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT
Chloride	300.0	3.1	mg/kg	1.0
Fluoride	300.0	<0.5	mg/kg	0.5
Sulfate	300.0	10	mg/kg	5

FORM I

TMA Inc. REPORT Work Order # A4-03-028

Received: 03/04/94

Results by Sample

SAMPLE ID B0BFF9 FRACTION 03C TEST CODE WCCLPS NAME Anions in Solids

Date & Time Collected 02/24/94 Category

ANIONS AND WET CHEMISTRY - SOLIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT
Chloride	300.0	4.5	mg/kg	1.0
Fluoride	300.0	4.0	mg/kg	0.5
Sulfate	300.0	10	mg/kg	5

FORM I

CASE NARRATIVE

LABORATORY : TMA/ARLI

CASE : 03-028

CONTRACT ID : WESTINGHOUSE HANFORD COMPANY

SDG RECEIPT DATE : March 04, 1994

1.0 DESCRIPTION OF CASE :

Three 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
B0BFN3	A4-03-028-01A	V	SOIL
B0BFN3 MS	A4-03-028-01B	V	SOIL
B0BFN3 MSD	A4-03-028-01C	V	SOIL
B0BFG2	A4-03-028-02A	V	SOIL
B0BFG2	A4-03-028-02B	SV	SOIL
B0BFG2 MS	A4-03-028-02C	SV	SOIL
B0BFG2 MSD	A4-03-028-02D	SV	SOIL
B0BFG2	A4-03-028-02G	K	SOIL
B0BFF9	A4-03-028-03A	V	SOIL
B0BFF9	A4-03-028-03B	SV	SOIL
B0BFF9	A4-03-028-03E	K	SOIL
B0BFF9 MS	A4-03-028-03F	K	SOIL
B0BFF9 MSD	A4-03-028-03G	K	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.

Acetone was detected at concentrations above the CRQL in several samples, including the MS and MSD. Chloroform,

4-Methyl-2-pentanone, Chloromethane, and Methylene Chloride were detected in several samples at concentrations below the CRQL.

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

TUNES :

All BFB tunes were injected directly into the GC/MS instrument.

3.2.2 SEMIVOLATILE ANALYSIS COMMENTS :

LOW LEVEL SOIL :

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

Di-n-butylphthalate was detected at concentrations above the CRQL in several samples, including the blank, MS, and MSD.

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

3.2.3 EXTRACTABLE HYDROCARBONS "KEROSENE RANGE" COMMENTS :

SEQUENCE NOTES :

The sequence was started on 03/05/94 and was analyzed according to the SW-846 Method 8015M. The %RSD in the all of the initial calibrations and the %D in the continuing calibrations were below their 20% and 15% limits, respectively.

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

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 surrogate o-Terphenyl was added to each sample, and the recoveries ranged from 78% to 88%. However, since the reporting forms could not accommodate the surrogate recovery results, the data was included in the "Additional Raw Data" poriton of the package.

The matrix spike and matrix spike duplicate recovery for Kerosene was 80%. The LCS, KLCS0311, was prepared at the same time and had a Kerosene spike recovery of 80%. The LCS results were included in the "Additional Raw Data" portion of the package. No Kerosene was detected in any of the unspiked samples.

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

Nicole Roth 4/20/94
Program Manager

Maureen Parrish

Maureen Parrish 4/20/94
Program Manager

9713524.1974

000075
EPA SAMPLE NO.

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

B0BFF9

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 03028 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A403028-03A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 40309R11

Level: (low/med) LOW Date Received: 03/04/94

% Moisture: not dec. 4 Date Analyzed: 03/09/94

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	BJ
67-64-1	Acetone	20	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

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B0BFF9

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 03028 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A403028-03A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 40309R11

Level: (low/med) LOW Date Received: 03/04/94

% Moisture: not dec. 4 Date Analyzed: 03/09/94

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 ALKENE	26.62	9	J

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B0BFG2

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 03028 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A403028-02A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 40309R10

Level: (low/med) LOW Date Received: 03/04/94

% Moisture: not dec. 5 Date Analyzed: 03/09/94

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	11	U
75-01-4	Vinyl Chloride	11	U
75-00-3	Chloroethane	11	U
75-09-2	Methylene Chloride	3	BJ
67-64-1	Acetone	19	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	2	J
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

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B0BFG2

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 03028 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A403028-02A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 40309R10

Level: (low/med) LOW Date Received: 03/04/94

% Moisture: not dec. 5 Date Analyzed: 03/09/94

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.

B0BFN3

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 03028 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A403028-01A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 40309R07

Level: (low/med) LOW Date Received: 03/04/94

% Moisture: not dec. 0 Date Analyzed: 03/09/94

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	BJ
67-64-1	Acetone	10	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	1	J
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

9713524.1979

000080

EPA SAMPLE NO.

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

B0BFN3

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 03028 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A403028-01A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 40309R07

Level: (low/med) LOW Date Received: 03/04/94

% Moisture: not dec. 0 Date Analyzed: 03/09/94

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	26.67	6	J

9713524.1980

000081

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B0BFF9

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 03028 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A403028-03B

Sample wt/vol: 30.5 (g/mL) G Lab File ID: 40330I06

Level: (low/med) LOW Date Received: 03/04/94

% Moisture: 4 decanted: (Y/N) N Date Extracted: 03/09/94

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 03/30/94

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	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

1C

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B0BFF9

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 03028 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A403028-03B

Sample wt/vol: 30.5 (g/mL) G Lab File ID: 40330I06

Level: (low/med) LOW Date Received: 03/04/94

% Moisture: 4 decanted: (Y/N) N Date Extracted: 03/09/94

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 03/30/94

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	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	780	B
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

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B0BFF9

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 03028 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A403028-03B

Sample wt/vol: 30.5 (g/mL) G Lab File ID: 40330I06

Level: (low/med) LOW Date Received: 03/04/94

% Moisture: 4 decanted: (Y/N) N Date Extracted: 03/09/94

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 03/30/94

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

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

Number TICs found: 5

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN HYDROCARBON	5.55	1500	BJ
2.	UNKNOWN HYDROCARBON	5.82	380	J
3.	UNKNOWN HYDROCARBON	6.05	240	BJ
4. 541-02-6	DECAMETHYLCYCLOPENTASILOXANE	9.18	170	JN
5.	UNKNOWN ALKANE	27.95	170	J

9713524.1983

000084

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B0BFG2

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 03028 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A403028-02B

Sample wt/vol: 30.4 (g/mL) G Lab File ID: 40330I03

Level: (low/med) LOW Date Received: 03/04/94

% Moisture: 5 decanted: (Y/N) N Date Extracted: 03/09/94

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 03/30/94

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 4.4

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	830	U
91-58-7	2-Chloronaphthalene	340	U
88-74-4	2-Nitroaniline	830	U
131-11-3	Dimethylphthalate	340	U
208-96-8	Acenaphthylene	340	U
99-09-2	3-Nitroaniline	830	U
83-32-9	Acenaphthene	340	U
51-28-5	2,4-Dinitrophenol	830	U

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B0BFG2

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 03028 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A403028-02B

Sample wt/vol: 30.4 (g/mL) G Lab File ID: 40330I03

Level: (low/med) LOW Date Received: 03/04/94

% Moisture: 5 decanted: (Y/N) N Date Extracted: 03/09/94

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 03/30/94

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 4.4

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-02-7	4-Nitrophenol	830	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	830	U
534-52-1	4,6-Dinitro-2-methylphenol	830	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	830	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	760	B
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

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B0BFG2

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 03028 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A403028-02B

Sample wt/vol: 30.4 (g/mL) G Lab File ID: 40330I03

Level: (low/med) LOW Date Received: 03/04/94

% Moisture: 5 decanted: (Y/N) N Date Extracted: 03/09/94

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 03/30/94

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 4.4

Number TICs found: 11

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN HYDROCARBON	5.53	17000	BJ
2.	UNKNOWN KETONE	5.82	380	BJ
3.	UNKNOWN HYDROCARBON	6.05	420	BJ
4.	UNKNOWN HYDROCARBON	7.90	140	J
5. 541-02-6	DECAMETHYLCYCLOPENTASILOXANE	9.18	100	JN
6.	UNKNOWN HYDROCARBON	15.65	620	BJ
7. 126-73-8	PHOSPHORIC ACID TRIBUTYL EST	16.30	550	JN
8.	UNKNOWN HYDROCARBON	17.62	100	J
9. 10544-50-0	MOLECULAR SULFUR	21.18	240	JN
10.	UNKNOWN HYDROCARBON	21.77	140	J
11.	UNKNOWN CARBOXYLIC ACID ESTE	25.07	170	J

TMA Inc. REPORT Work Order # A4-03-028

Received: 03/04/94

Results by Sample

SAMPLE ID B0BFG2 FRACTION 02G TEST CODE 8015MS NAME EPA 8015M EXTRACT.

Date & Time Collected 02/25/94 Category

MODIFIED 8015 - EXTRACTABLE FUEL HYDROCARBONS

Matrix: SOIL
Date Analyzed: 03/13/94
Dilution factor: 1.00
Concentration Units: mg/Kg

Compound	Sample Result	PQL
Kerosene Range	ND	10
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 # A4-03-028

Received: 03/04/94

Results by Sample

SAMPLE ID B0BFF9 FRACTION 03E TEST CODE 8015MS NAME EPA 8015M EXTRACT.

Date & Time Collected 02/24/94 Category

MODIFIED 8015 - EXTRACTABLE FUEL HYDROCARBONS

Matrix: SOIL
Date Analyzed: 03/13/94
Dilution factor: 1.00
Concentration Units: mg/Kg

Compound	Sample Result	PQL
Kerosene Range	ND	10
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

9713524.1983

 *** T M A *** REPORT Work Order # S4-03-101

Received: 03/08/94 04/11/94 08:58:15

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

ATTEN Dan Steurmer

PREPARED Thermo Analytical, Inc.
BY 300 Second Avenue
P.O. Box 521
Waltham, MA 02254

ATTEN Client Services
PHONE (617) 890-7200

CERTIFIED BY

CONTACT DP

CLIENT HANFORD NOR SAMPLES 3
COMPANY TMA/NORCAL Hanford
FACILITY Richmond, CA

WORK ID N4-03-026
TAKEN By Client
TRANS Fedex
TYPE 2 SOILS
P.O. # N4-03-026
INVOICE under separate cover

SAMPLE IDENTIFICATION

01 BOBFF9
01 BOBFF9D
01 BOBFF9S
02 BOBFG2
03 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

9713524.1989

Received: 03/08/94

Results by Sample

SAMPLE ID B0BFF9 SAMPLE # 01 FRACTIONS: A
Date & Time Collected 02/24/94 13:15:00 Category SOIL

NITR_S 47.1
mg N/kg

SAMPLE ID B0BFF9D SAMPLE # 01 FRACTIONS: B
Date & Time Collected 02/24/94 13:15:00 Category SOIL

NITR_S 48.8
mg N/kg

SAMPLE ID B0BFF9S SAMPLE # 01 FRACTIONS: C
Date & Time Collected 02/24/94 13:15:00 Category SOIL

NITR_S 69.6
mg N/kg

SAMPLE ID B0BFG2 SAMPLE # 02 FRACTIONS: A
Date & Time Collected 02/25/94 12:00:00 Category SOIL

NITR_S 47.7
mg N/kg

SAMPLE ID LCSS SAMPLE # 03 FRACTIONS: A
Date & Time Collected not specified Category SOIL

NITR_S 2.07
mg N/L

TMA
Thermo Analytical Inc.
Skinner & Sherman Laboratories Inc.

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

9713524.1990

Received: 03/08/94 04/11/94 08:58:15

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
S403101-01	47.1 mg/kg	19.8 mg/kg	69.6 mg/kg	113.7

DUPLICATE

Sample ID	Sample result	Duplicate Result	Relative % Difference
S403101-01	47.1 mg/kg	48.8 mg/kg	3.6

QUALITY CONTROL SAMPLES

Sample ID	True Value	Found Value	Percent Recovery
LCS	2.00 mg/L	2.07 mg/L	103.5
Prep blank	--	<0.25 mg/L	--

TMA
Thermo Analytical Inc.
Skinner & Sherman Laboratories Inc.

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

9713524.1991

Received: 03/08/94 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

9713524.1992

TMA/Skinner & Sherman Laboratories
Sample Login Sheet

Workorder 94-03-101 Client Hanford WCH Number/Type of Samples 2 soil
Protocol CLP Turnaround 33 days Cooler Temp: 4 °C or N/A Cooler Yes/No
Custodian: D. Montreau Shipper & # Fedex SDG/Batch# WM
Custody Seal: Present/Absent/Intact/Not Client Case# W4-03-026
Purchase Order/Contract# W4-03-026 Client Contact D. Sanchez
Tag#: Present/Absent/NA/(See COC) Chain of Custody: Present/Absent/NA,#

Sample Containers - Intact/Broken Comment: 1 Broken sample, but still tested
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: 3/8/94
List any date with paperwork/shipment problems & specify the problem:

	Client ID	Matrix	Received	pH*	Test(s) & QC	Holding Times
1	BOBFF9	soil	3/8/94	NA	NO3 NO2 (DS)	
2	BOBFG0	↓	↓	↓	↓	
3						
4						
5						
6						
7						
8						
9					Complete	
10						
11						
12					DRM 3/8/94	
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

* EPA/CLP required

Rev 1.7

9713524.1993

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

APR 1994 RECEIVED SDLA

April 8, 1994

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

Quality Control Narrative

Scope
Two soil samples were submitted to TMA/Skinner & Sherman Laboratories, Inc. on March 8, 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 S403116.

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 matrix spike recovery for antimony exceeded the control limit requirement.

The ICP serial dilution for calcium 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

i 4-26-94

9713524.1994

WESTINGHOUSE/HANFORD

COVER PAGE - INORGANIC ANALYSES DATA PACKAGE

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

Lab Code: SKINER Case No.: N4-03-026 SAS No.: SDG No.: B0BFF9

SOW No.: ILM02.1

SAMPLE NUMBER:	Lab Sample ID.
B0BFF9	03116-01S
B0BFG2	03116-02S
B0BFG2D	03116-02S2
B0BFG2S	03116-02DS

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: 4/8/94 Title: Lead Chemist

9713524.1995

WESTINGHOUSE/HANFORD

1

SAMPLE NUMBER:

INORGANIC ANALYSIS DATA SHEET

B0BFF9

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

Lab Code: SKINER Case No.: N4-03-026SAS No.: SDG No.: B0BFF9

Matrix (soil/water): SOIL Lab Sample ID: 03116-01S

Level (low/med): LOW Date Received: 03/08/94

% Solids: 95.7

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	6610			P
7440-36-0	Antimony	2.5	U	N	P
7440-38-2	Arsenic	5.2			P
7440-39-3	Barium	96.5			P
7440-41-7	Beryllium	0.51	B		P
7440-43-9	Cadmium	0.36	U		P
7440-70-2	Calcium	7310		E	P
7440-47-3	Chromium	7.6			P
7440-48-4	Cobalt	12.0			P
7440-50-8	Copper	14.7			P
7439-89-6	Iron	26100			P
7439-92-1	Lead	4.1			P
7439-95-4	Magnesium	5120			P
7439-96-5	Manganese	426			P
7439-97-6	Mercury	0.05	U		CV
7440-02-0	Nickel	8.6			P
7440-09-7	Potassium	1150			P
7782-49-2	Selenium	0.59	U		P
7440-22-4	Silver	2.2			P
7440-23-5	Sodium	602	B		P
7440-28-0	Thallium	0.77	U		P
7440-62-2	Vanadium	60.4			P
7440-66-6	Zinc	49.2			P
	Cyanide	0.52	U		CA
7440-32-6	Titanium	1800			P

Color Before: GREY Clarity Before: Texture: MEDIUM

Color After: GREY Clarity After: Artifacts:

Comments:

002

9713524.1996

WESTINGHOUSE/HANFORD

1

SAMPLE NUMBER:

INORGANIC ANALYSIS DATA SHEET

B0BFG2

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

Lab Code: SKINER Case No.: N4-03-026SAS No.: SDG No.: B0BFF9

Matrix (soil/water): SOIL Lab Sample ID: 03116-02S

Level (low/med): LOW Date Received: 03/08/94

% Solids: 92.2

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	2930			P
7440-36-0	Antimony	2.6	U	N	P
7440-38-2	Arsenic	3.1			P
7440-39-3	Barium	15.7	B		P
7440-41-7	Beryllium	0.25	B		P
7440-43-9	Cadmium	0.37	U		P
7440-70-2	Calcium	1700		E	P
7440-47-3	Chromium	6.1			P
7440-48-4	Cobalt	7.5	B		P
7440-50-8	Copper	6.0			P
7439-89-6	Iron	16600			P
7439-92-1	Lead	1.5			P
7439-95-4	Magnesium	1470			P
7439-96-5	Manganese	122			P
7439-97-6	Mercury	0.11			CV
7440-02-0	Nickel	3.0	B		P
7440-09-7	Potassium	367	B		P
7782-49-2	Selenium	0.60	U		P
7440-22-4	Silver	1.4	B		P
7440-23-5	Sodium	593	B		P
7440-28-0	Thallium	0.79	U		P
7440-62-2	Vanadium	62.0			P
7440-66-6	Zinc	32.8			P
	Cyanide	0.52	U		CA
7440-32-6	Titanium	2350			P

Color Before: GREY Clarity Before: Texture: COARSE

Color After: GREY Clarity After: Artifacts: YES

Comments:
STONES

003

FORM I - IN ILM02.1

PAGE 1 9TMA/N0C24 1997 CHAIN OF CUSTODY ORD # N4-03-026

RCVD: 03/04/94 DUE: 04/08/94 03/04/94 14:06:15 KEEP: 04/08/95 DISP: S

DASH	SAMPLE IDENTIFICATION		STORED	TESTS for FRACTIONS with work in DEPT: SU and CATEGORY					
01B-S	BOBFF9		S&S	WH001	WH002	WH004	WH005	WH233	WH390
01F-S	BOBFF9	MS	S&S	WH001	WH002	WH004	WH005	WH233	WH390
01G-S	BOBFF9	DUP	S&S	WH001	WH002	WH004	WH005	WH233	WH390
01H-S	L C S		S&S	WH001	WH002	WH004	WH005	WH233	WH390
02B-S	BOBFG2		S&S	WH001	WH002	WH004	WH005	WH233	WH390

RELEASED BY	DATE	TRANSFERRED TO	DATE	RECEIVED BY	DATE
Yamamoto	3/7/94	Skinner	3/7/94	D. Martinez	3/8/94

171

9713524.1993

RECORD COPY

APR 1994
RECEIVED
SDLA

WESTINGHOUSE HANFORD COMPANY

Results of Analyses For:

GENERAL CHEMISTRY & ORGANICS
Case No. 03-029
(TMA/ARLI W.O. No. A4-03-029)

METALS & NITRATE/NITRITE
Case No. N4-03-032
(TMA/Skinner & Sherman W.O. Nos. S4-03-097 & S4-03-098)

April 22, 1994

TMA Master Work Order N4-03-032

9713524.1999

000002

PAGE 1 TMA/Norcal CHAIN OF CUSTODY ORD # N4-03-032
RCVD: 03/07/94 DUE: 04/11/94 03/07/94 11:52:23 KEEP: 04/11/95 DISP: S

DASH	SAMPLE IDENTIFICATION		STORED	TESTS for FRACTIONS with work in DEPT: SU and CATEGORY			
01A-S	B0BFH1		ARLI	WH014	WH016	WH195	WH232
01C-S	B0BFH1	MS	ARLI	WH014	WH016	WH195	WH232
01D-S	B0BFH1	MSD	ARLI	WH014	WH016	WH195	
01E-S	B0BFH1	DUP	ARLI	WH232			
02A-S	B0BFH5		ARLI	WH014	WH016	WH195	WH232
03A-S	B0BFH6		ARLI	WH014	WH016	WH195	WH232
04A-S	B09WF8		ARLI	WH014	WH016	WH195	WH232
05A-S	B0BFH8		ARLI	WH232			
06A-S	B0BFM6		ARLI	WH014			
07A-S	B0BFM7		ARLI	WH014			
08A-S	B09WG1		ARLI	WH014			

RELEASED BY	DATE	TRANSFERRED TO	DATE	RECEIVED BY	DATE
Yamamoto	3/7/94	ARLI	3/7/94	RS	3/8/94

000002A

Westinghouse Hanford Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	Page 1 of 1
		006225

Collector R.T. Sickle
Company Contact C.A. Rowley
Telephone 372-3293
SAF No. 93-263
Project Designation 216-U-8 Vitrified Clay Pipeline
Sampling Locations 216-U-8 Crib
Ice Chest No.
Bill of Lading/Airbill No.
Offsite Property No.
Method of Shipment Air Overnight
Field Logbook No.
Shipped to TMA
SPECIAL INSTRUCTIONS
Possible Sample Hazards/Remarks None Detected
Special Handling and/or Storage Keep cool

Sample Number	*	Date Collected	Time	Number and Type of Containers	Analysis Required		Preservative
BOBFH7	S	2-28-94	0800	(1) 250ml aGs ✓	VOA	CLP	
BOBFH1	S	2-28-94	1115	(1) 250ml Gs ✓	VOA	CLP	
BOBFH1	S			(1) 250ml aG ✓	Semi-VOA	CLP	
BOBFH1	S			(1) 250ml Poly ✓	Metals -CLP TAL Titanium Mercury	CPL	
BOBFH1	S			(1) 125ml G ✓	Anions F, Cl, SO_4	EPA 300.0	
BOBFH1	S			(1) 125ml P/G ✓	NO_2 NO_3	EPA 353.2	
~~BOBFH1~~	~~S~~			~~(1) 250ml aGs~~	~~PGB/Pest~~ [illegible] 2-23-94	~~8080~~	
BOBFH1	S			(1) 125ml G ✓	Cyanide	CPL	
BOBFH1	S			(1) 125ml Gs ✓	Kerosene	8015M	
BOBFH1	S	2-28-94	1115	(1) 1000ml Poly ✓	Gross Alpha/Beta EP-10; Gamma Spec. Cs-134/137, Co-60, K-40, Eu-152/154/155, Ru-106, Na-22 RC-30; Total Uranium EA-01C; U-235/234/238 EP-70, 71, 5; Np-237 RC-101A, 622, EP-5; Pu-238/239/240 EP-80, 81, 5; I-129 RC-25, 603; Sr-90 RC-306, 303, 309, 304; Tc-99 RC-24, 604; Am-241, Cm-244 EP-80, 91, 92, 93, 5; Se-79 Lab Specific		

Chain of Possession Relinquished By (Sign and Print Names)	Date	Time	Received By
[signature] R.T. Sickle	3/1/94	1200	[signature]
[signature]	3/4/94	0810	
	3-7-94	*	Kermit Blum K. Blum

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

LABORATORY SECTION	Received By	Title	Date/Time
Final Sample Disposition	Disposal Method:	Disposed by:	Date/Time:

* Received @ TMA/NORCAL 3-5-94; opened 3-7-94 .KB

9713524.2000

Westinghouse Hanford Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

006229

Collector R.T. Sickle
Company Contact C.A. Rowley
Telephone 372-3293
SAF No. 93-263
Project Designation 216-U-8 Vitrified Clay Pipeline
Sampling Locations 216-U-8 Crib
Ice Chest No.
Bill of Lading/Airbill No. 140 213 8144
Offsite Property No.
Method of Shipment Air Overnight
Field Logbook No.
Shipped to TMA
SPECIAL INSTRUCTIONS
Possible Sample Hazards/Remarks None Detected
Special Handling and/or Storage Keep cool

Sample Number	*	Date Collected	Time	Number and Type of Containers	Analysis Required		Preservative
BOBFM6	S	3-2-94	0800	(1) 250ml Gs ✓	VOA	CLP	
BOBFH5	S	3-2-94	1325	(1) 250ml Gs ✓	VOA	CLP	
BOBFH5	S			(1) 250ml aG ✓	Semi-VOA	CLP	
BOBFH5	S			(1) 250ml Poly ✓	Metals -CLP TAL Titanium Mercury	CPL	
BOBFH5	S			(1) 125ml G ✓	Anions F, Cl, SO_4	EPA 300.0	
BOBFH5	S			(1) 125ml P/G ✓	NO_2 NO_3	EPA 353.2	
~~BOBFH5~~	~~S~~			~~(1) 250ml aGs~~	~~PCB/Pest~~ RJL 2-23-94	~~8080~~	
BOBFH5	S			(1) 125ml G ✓	Cyanide	CPL	
BOBFH5	S			(1) 125ml Gs ✓	Kerosene	8015M	
BOBFH5	S			(1) 1000ml Poly ✓	Gross Alpha/Beta EP-10; Gamma Spec. Cs-134/137, Co-60, K-40, Eu-152/154/155, Ru-106, Na-22 RC-30; Total Uranium EA-01C; U-235/234/238 EP-70, 71, 5; Np-237 RC-101A, 622, EP-5; Pu-238/239/240 EP-80, 81, 5; I-129 RC-25, 603; Sr-90 RC-306, 303, 309, 304; Tc-99 RC-24, 604; Am-241, Cm-244 EP-80, 91, 92, 93, 5; Se-79 Lab Specific		

Chain of Possession Relinquished By (Sign and Print Names)	Date	Time	Received By
R.T. Sickle R.T. Sickle	3/3/94	0800	D.L. Edwards
D.L. Edwards	3/4/94	0810	Kermit Blum K. Blum
	3-7-94	*	

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

LABORATORY SECTION	Received By	Title	Date/Time
Final Sample Disposition	Disposal Method:	Disposed by:	Date/Time:

* Received @ TMA/NORCAL 3-5-94; opened 3-7-94 · KB

9213524.2001

Westinghouse Hanford Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

006230

Collector R.T. Sickle
Company Contact C.A. Rowley
Telephone 372-3293
SAF No. 93-263
Project Designation 216-U-8 Vitrified Clay Pipeline
Sampling Locations 216-U-8 Crib
Ice Chest No. RT5
Bill of Lading/Airbill No. 140 213 8144
Offsite Property No.
Method of Shipment Air Overnight
Field Logbook No.
Shipped to TMA
SPECIAL INSTRUCTIONS
Possible Sample Hazards/Remarks None Detected
Special Handling and/or Storage Keep cool

Sample Number	*	Date Collected	Time	Number and Type of Containers	Analysis Required		Preservative
BOBFH6	S	3-2-94	1450	(1) 250ml Gs ✓	VOA	CLP	
BOBFH6	S			(1) 250ml aG ✓	Semi-VOA	CLP	
BOBFH6	S			(1) 250ml Poly ✓	Metals -CLP TAL Titanium Mercury	CPL	
BOBFH6	S			(1) 125ml G ✓	Anions F, Cl, SO_4	EPA 300.0	
BOBFH6	S			(1) 125ml P/G ✓	NO_2 NO_3	EPA 353.2	
~~BOBFH6~~	~~S~~			~~(1) 250ml aGs~~	~~PCB/Pest~~ RDH 2-23-94	~~8080~~	
BOBFH6	S			(1) 125ml G ✓	Cyanide	CPL	
BOBFH6	S			(1) 125ml Gs ✓	Kerosene	8015M	
BOBFH6	S			(1) 1000ml Poly ✓	Gross Alpha/Beta EP-10; Gamma Spec. Cs-134/137, Co-60, K-40, Eu-152/154/155, Ru-106, Na-22 RC-30; Total Uranium EA-01C; U-235/234/238 EP-70, 71, 5; Np-237 RC-101A, 622, EP-5; Pu-238/239/240 EP-80, 81, 5; I-129 RC-25, 603; Sr-90 RC-306, 303, 309, 304; Tc-99 RC-24, 604; Am-241, Cm-244 EP-80, 91, 92, 93, 5; Se-79 Lab Specific		

Chain of Possession Relinquished By (Sign and Print Names)	Date	Time	Received By
R.T. Sickle	3/3/94	0800	D.L. Edwards
D.L. Edwards	3/4/94	0810	
	3-7-94	*	Kermit Blum K. Blum

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

LABORATORY SECTION	Received By	Title	Date/Time
Final Sample Disposition	Disposal Method:	Disposed by:	Date/Time:

* Received @ TMA/NorCal 3-5-94; opened 3-7-94 KB

9713524.2002

000002D

Westinghouse Hanford Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	Page 1 of 1 006490

Collector R.T. Sickle
Company Contact C.A. Rowley
Telephone 372-3293
SAF No. 93-263
Project Designation 216-U-8 Vitrified Clay Pipeline
Sampling Locations 216-U-8 Crib
Ice Chest No.
Bill of Lading/Airbill No. 140 213 8144
Offsite Property No.
Method of Shipment Air Overnight
Field Logbook No.
Shipped to TMA
SPECIAL INSTRUCTIONS
Possible Sample Hazards/Remarks None Detected
Special Handling and/or Storage Keep cool

Sample Number	*	Date Collected	Time	Number and Type of Containers	Analysis Required		Preservative
			1300	3-2-94			
BOBFH8	S	3-2-94	~~0850~~	~~(1) 250ml Gs~~	~~VOA~~ RJK 3-2-94	CLP	
BOBFH8	S			~~(1) 250ml aG~~	~~Semi-VOA~~ RJK 3-2-94	CLP	
BOBFH8	S			(1) 250ml Poly ✓	Metals -CLP TAL Titanium Mercury	CPL	
BOBFH8	S			(1) 125ml G ✓	Anions F, Cl, SO_4	EPA 300.0	
BOBFH8	S			(1) 125ml P/G ✓	NO_2 NO_3	EPA 353.2	
~~BOBFH8~~	~~S~~			~~(1) 250ml aGs~~	~~PCB/Pest~~ RJK 2-23-94	~~0000~~	
BOBFH8	S			(1) 125ml G ✓	Cyanide	CPL	
BOBFH8	S			~~(1) 125ml Gs~~	~~Kerosene~~ RJK 3-2-94	8015M	
BOBFH8	S			(1) 1000ml Poly ✓	Gross Alpha/Beta EP-10; Gamma Spec. Cs-134/137, Co-60, K-40, Eu-152/154/155, Ru-106, Na-22 RC-30; Total Uranium EA-01C; U-235/234/238 EP-70, 71, 5; Np-237 RC-101A, 622, EP-5; Pu-238/239/240 EP-80, 81, 5; I-129 RC-25, 603; Sr-90 RC-306, 303, 309, 304; Tc-99 RC-24, 604; Am-241, Cm-244 EP-80, 91, 92, 93, 5; Se-79 Lab Specific		

Chain of Possession Relinquished By (Sign and Print Names)	Date	Time	Received By
R.T. Sickle R.T. Sickle	3/3/94	0800	DR Edwards
DR Edwards	3/4/94	0810	
	3-7-94 *		Kermit Blum K. Blum

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

LABORATORY SECTION	Received By	Title	Date/Time
Final Sample Disposition	Disposal Method:	Disposed by:	Date/Time:

* Received @ TMA/NORCAL 3-5-94; opened 3-7-94 KB

SURFACE

9713524.2003

9713524.2004

000002

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: 3-2-94

Ice Chest No.:

Field Logbook No.: EFL-1115

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) B0W0F8

- ✓ 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)~~

- ~~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:
3-4-94 Jerome E Rogers 1033	Kermit Blum K-Blum	3-7-94 *
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:

* Received @ TMA/NORCAL 3-5-94; opened 3-7-94 KB

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

9713524.2005

0000021

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
B09WF8	S	3-2-94	0930	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
			3-2-94	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

9713524.2006

000002C

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: 3-4-94

Ice Chest No.:

Field Logbook No.: EFL-1115

Bill of Lading/Airbill No.:

Offsite Property No.:

Method of Shipment: AIR

Shipped to: TMA

Possible Sample Hazards/Remarks: Keep samples at 4C (SOIL) NONE NOTED

Sample Identification

1) B09WG1

~~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)~~

~~1,250ml aGs:PCB/Pest (8080)~~

~~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)

~~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)

1,250ml aGs:PCB/Pest (8080)

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:
3-4-94 Loren E. Rogers 1033	Kermit Blum K. Blum	3-7-94 *
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:

* Received @ TMA/NORCAL 3-5-94; opened 3-7-94 · KB

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

9713524.2007

000006

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
B09W61	S	3-4-94	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)~~ ~~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),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~~ SER 3-4-94
			SER 3-4-94	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

9713524.2003

000003

SAMPLE LOG-IN SHEET WHC

LAB NAME : TMA/ARLI

PAGE : 1 OF 1

RECEIVED BY (PRINT NAME): PAYAM SHADI

LOG-IN-DATE : 3/8/94

RECEIVED BY (SIGNATURE):

ICE CHEST NO. SML 410

REMARKS:

1. Custody Seal(s) — Present / Absent* — Intact / Broken
2. Custody Seal Nos: N/A
3. Chain of Custody Records — Present / Absent*
4. Traffic Reports or Packing List — Present / Absent*
5. Airbill — Airbill / Sticker Present / Absent*
6. Airbill No.: 7289158391
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: 3/8/94
12. Temp of ice chest 4 °C
13. Time Recieved: 9:30 AM

SAMPLE TRANSFER

Fraction: N/A

Area #: N/A

By: N/A

On: N/A

EPA SAMPLE #	CORRESPONDING SAMPLE TAG #	CORRESPONDING ASSIGNED LAB #	REMARKS: CONDITION OF SAMPLE SHIPMENT, ETC
	B09WF8	A4-03-029	
	B0BFM7	A4-03-~~026~~	029 P/S
	B0BPH6	A4-03-~~027~~	029 P/S
	B0BFM6	A4-03-~~028~~	029 P/S
	B0BPH5	A4-03-~~029~~	029 P/S
	B09WG1	A4-03-029	
	B0BPH8	A4-03-~~030~~	029 P/S

Contact SMO and attach record of resolution

Reviewed By:

Date:

Logbook No.: N/A

Logbook Page No.: N/A

FORM DC-1

9713524.2009

000004

SAMPLE LOG-IN SHEET WHC

LAB NAME : TMA/ARLI

PAGE : 1 OF 1

RECEIVED BY (PRINT NAME): D. WHITAKER

LOG-IN-DATE : 3-8-94

RECEIVED BY (SIGNATURE): D Whitaker

ICE CHEST NO. SML-405

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.: 7289562 6
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: 3-8-94
12. Temp of ice chest 4 °C
13. Time Recieved: 09a

SAMPLE TRANSFER

Fraction: N/A
Area #: N/A
By: N/A
On: N/A

EPA SAMPLE #	CORRESPONDING SAMPLE TAG #	CORRESPONDING ASSIGNED LAB #	REMARKS: CONDITION OF SAMPLE SHIPMENT, ETC
	B03FH1	A4-03 ~~028~~ 029	DS

Contact SMO and attach record of resolution

eviewed By:

ate:

Logbook No.: N/A

Logbook Page No.: N/A

FORM OC-1

000005

FEDERAL EXPRESS

QUESTIONS? CALL 800-238-5355 TOLL FREE.

AIRBILL PACKAGE TRACKING NUMBER 7289158391

3095M 7289158391

RECIPIENT'S COPY

1 Date 3/2/94

From (Your Name) Please Print: SAMPLE CONTROL

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

Company: T M A /NORCAL

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.): 22340-6406

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 by authorized users only)
46 [ ] GOV'T LETTER
41 [ ] GOV'T PACKAGE

Freight Service (for packages over 150 lbs.)
70 [ ] OVERNIGHT FREIGHT** (Confirmed reservation required)
80 [X] 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. 954 III
7 [ ] OTHER SPECIAL SERVICE
8 [ ]
9 [ ] SATURDAY PICK-UP (Extra charge)
[ ]
12 [ ] HOLIDAY DELIVERY (Extra charge)

6

PACKAGES	WEIGHT In Pounds Only	YOUR DECLARED VALUE (See right)
1	56	
Total	Total	Total
1	56	

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

Received At
1 [X] Regular Stop 3 [ ] Drop Box
2 [ ] On-Call Stop 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 ITEM 3/93
FORMAT #156
155
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9713524.2010

000000

7289156206

3/7/94

From (Your Name) Please Print: SAMPLE CONTROL

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

Company: T M A /NORCAL

Department/Floor No.:

Street Address: 2030 WRIGHT AVE

City: RICHMOND State: CA ZIP Required: 94804

2 To (Recipient's Name) Please Print: CARDIO HARRIS

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

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 8403 RADIOACTIVE MATERIAL, EXCEPTED PACKAGE LIMITED QUANTITY OF MATERIAL UN2910

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 [ ] GOV'T LETTER
41 [ ] GOV'T PACKAGE

Freight Service (for packages over 150 lbs.)
70 [ ] OVERNIGHT FREIGHT** (Confirmed 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	44	
Total 1	Total 44	Total

DIM 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/
PART #137204 F
FORMAT #155
155
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U.S.A.

9713524-2011

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9713524.2012

000007

TMA/ARLI
Thermo Analytical Inc.

RADIATION DOSE RATE SURVEY FORM

Date 3/8/94 COMPANY NORC (WHC) OTHER ORD # 7289158391

Surveyor's Name Michael D. Williams

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		42.0			0.0				
Consistency		7260	0.280		5040	0.185			
Smears:									
Smr 410		51.0			2.0				
	NO RAD DATA SHEET OBSERVED								

All OK ✓ Approved mr Comments: victoreen all sample < 15 cpm = < 1 mR/h

Not OK Date

FORM SOP-075.1

"quality environmental services"

9213524.2013

TMA/ARLI
Thermo Analytical Inc.

000008

RADIATION DOSE RATE SURVEY FORM

Date 3/8/94 COMPANY NORC (WHC) OTHER ORD # 7289156206

Surveyor's Name Michael D. Williams

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		42.0			0.0				
Consistency		7260	0.280		5040	0.185			
Smears:									
SmL 405		52.0			4.0				4.8×10^{-2} a
~~410~~ "									
WHC Activity report one sample 2.95 uCi/g									
			8 sampled						

All OK ✓ Approved mr

Comments: Sample BOBFH1 2.95 nCi/g
others < 50 pCi/g
Victoreen 410 μR/h

Not OK Date

FORM SOP-075.1

"quality environmental services"

GENERAL CHEMISTRY RESULTS

CASE NO. 03-029

Sample #s:

B0BFH1	B0BFH5	B0BFH6
B0BFH8	B0BWF8	

CASE NARRATIVE

Duplicate analysis on sample B0BFH1 (A4-03-029-04D) revealed a 22.2% RPD for Sulfate. The high RPD can be attributed to an inhomogeneous sample matrix.

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

Maureen Parrish 4/21/94

Maureen Parrish

9713524.2015

000010

TMA Inc. REPORT Work Order # A4-03-029

Received: 03/07/94 04/21/94 13:59:57

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

ATTEN: Ms. Briana Colley

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

WORK ID: SAF # 93-263 CLP
TAKEN: By Westinghouse Staff
TRANS: Federal Express
TYPE: Soil
P.O. #: N4-03-032-SU-AR
INVOICE: under separate cover

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

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.

SAMPLE IDENTIFICATION

01	B09WF8	
01	B09WF8	MS
01	B09WF8	MSD
01	B09WF8	
01	B09WF8	MS
01	B09WF8	
01	B09WF8	MS
01	B09WF8	MSD
02	B09WG1	
02	B09WG1	MS
02	B09WG1	MSD
03	B0BFM7	
04	B0BFH1	
04	B0BFH1	Duplicate
04	B0BFH1	
05	B0BFM6	
06	B0BFH5	
07	B0BFH6	
08	B0BFH8	
09	Lab Blank	
09	LCS	
09	KBLK0311	

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
WCCLPL	Anions & Wet Chem.
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)

9713524.2016

000012

TMA Inc. REPORT Work Order # A4-03-029

Received: 03/07/94

Results by Sample

SAMPLE ID B09WF8 FRACTION 01E TEST CODE WCCLPS NAME Anions in Solids

Date & Time Collected 03/02/94 Category

ANIONS AND WET CHEMISTRY - SOLIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT
Chloride	300.0	3.0	mg/kg	1.0
Fluoride	300.0	<0.5	mg/kg	0.5
Sulfate	300.0	6	mg/kg	5

FORM I

9713524.2017

000013

TMA Inc. REPORT Work Order # A4-03-029

Received: 03/07/94

Results by Sample

SAMPLE ID B0BFH1 FRACTION 04C TEST CODE WCCLPS NAME Anions in Solids

Date & Time Collected 02/28/94 Category

ANIONS AND WET CHEMISTRY - SOLIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT
Chloride	300.0	2.8	mg/kg	1.0
Fluoride	300.0	1.5	mg/kg	0.5
Sulfate	300.0	18	mg/kg	5

FORM I

9713524.2013

000014

TMA Inc. REPORT Work Order # A4-03-029

Received: 03/07/94

Results by Sample

SAMPLE ID B0BFH5 FRACTION 06C TEST CODE WCCLPS NAME Anions in Solids

Date & Time Collected 03/02/94 Category

ANIONS AND WET CHEMISTRY - SOLIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT
Chloride	300.0	11.4	mg/kg	1.0
Fluoride	300.0	2.1	mg/kg	0.5
Sulfate	300.0	44	mg/kg	5

FORM I

9713524.2019

000015

TMA Inc. REPORT Work Order # A4-03-029

Received: 03/07/94

Results by Sample

SAMPLE ID B0BFH6 FRACTION 07C TEST CODE WCCLPS NAME Anions in Solids

Date & Time Collected 03/02/94 Category

ANIONS AND WET CHEMISTRY - SOLIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT
Chloride	300.0	5.0	mg/kg	1.0
Fluoride	300.0	1.9	mg/kg	0.5
Sulfate	300.0	17	mg/kg	5

FORM I

9213524.2020

000016

TMA Inc. REPORT Work Order # A4-03-029

Received: 03/07/94

Results by Sample

SAMPLE ID B0BFH8 FRACTION 08A TEST CODE WCCLPS NAME Anions in Solids

Date & Time Collected 03/02/94 Category

ANIONS AND WET CHEMISTRY - SOLIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT
Chloride	300.0	12.0	mg/kg	1.0
Fluoride	300.0	1.0	mg/kg	0.5
Sulfate	300.0	12	mg/kg	5

FORM I

9713524.2021

000081

CASE NARRATIVE

LABORATORY : TMA/ARLI

CASE : 03-029

CONTRACT ID : WESTINGHOUSE HANFORD COMPANY

SDG RECEIPT DATE : March 07, 1994

1.0 DESCRIPTION OF CASE :

Seven 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
B09WF8	A4-03-029-01A	V	SOIL
B09WF8	A4-03-029-01B	SV	SOIL
B09WF8 MS	A4-03-029-01C	SV	SOIL
B09WF8 MSD	A4-03-029-01D	SV	SOIL
B09WF8	A4-03-029-01G	K	SOIL
B09WF8 MS	A4-03-029-01H	K	SOIL
B09WF8 MSD	A4-03-029-01I	K	SOIL
B09WG1	A4-03-029-02A	V	SOIL
B09WG1 MS	A4-03-029-02B	V	SOIL
B09WG1 MSD	A4-03-029-02C	V	SOIL
B0BFM7	A4-03-029-03A	V	SOIL
B0BFH1	A4-03-029-04A	V	SOIL
B0BFH1	A4-03-029-04B	SV	SOIL
B0BFH1	A4-03-029-04E	K	SOIL
B0BFM6	A4-03-029-05A	V	SOIL
B0BFH5	A4-03-029-06A	V	SOIL
B0BFH5	A4-03-029-06B	SV	SOIL
B0BFH5	A4-03-029-06D	K	SOIL
B0BFH6	A4-03-029-07A	V	SOIL
B0BFH6	A4-03-029-07B	SV	SOIL
B0BFH6	A4-03-029-07D	K	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.

Acetone was detected at concentrations above the CRQL in several samples, including the blank, VBLK0314R.

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

TUNES :

All BFB tunes were injected directly into the GC/MS instrument.

3.2.2 SEMIVOLATILE ANALYSIS COMMENTS :

LOW LEVEL SOIL :

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

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

3.2.3 EXTRACTABLE HYDROCARBONS "KEROSENE RANGE" COMMENTS :

SEQUENCE NOTES :

The sequence was started on 03/05/94 and was analyzed according to the SW-846 Method 8015M. The %RSD in the all of the initial calibrations and the %D in the continuing calibrations were below their 20% and 15% limits, respectively.

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

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.

In sample B0BFH1, Kerosene was detected at approximately 23 mg/Kg. In addition, a compound heavier than the Diesel Range was detected at approximately 30 mg/Kg. The concentration for the compound was calculated using a Diesel standard.

The surrogate o-Terphenyl was added to each sample, and the recoveries ranged from 80% to 94%. However, since the reporting forms could not accommodate the surrogate recovery results, the data was included in the "Additional Raw Data" poriton of the package.

The matrix spike and matrix spike duplicate recoveries for Kerosene were 90% and 86%, respectively.

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
Nicole Roth 4/21/94
Program Manager

Maureen Parrish
Maureen Parrish 4/21/94
Program Manager

9713524.2024

000084

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B09WF8

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 03029 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A403029-01A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 40314R14

Level: (low/med) LOW Date Received: 03/07/94

% Moisture: not dec. 4 Date Analyzed: 03/14/94

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	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	3	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

9713524.2025

000085

EPA SAMPLE NO.

B09WF8

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 03029 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A403029-01A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 40314R14

Level: (low/med) LOW Date Received: 03/07/94

% Moisture: not dec. 4 Date Analyzed: 03/14/94

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	24.28	10	J
2.	UNKNOWN HYDROCARBON	26.62	33	J

9713524.2026

000086

EPA SAMPLE NO.

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

B09WG1

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 03029 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A403029-02A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 40315R05

Level: (low/med) LOW Date Received: 03/07/94

% Moisture: not dec. 19 Date Analyzed: 03/15/94

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	8	BJ
67-64-1	Acetone	57	
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	1	J
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	2	J
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	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

9713524.2027

000087
EPA SAMPLE NO.

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

B09WG1

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 03029 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A403029-02A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 40315R05

Level: (low/med) LOW Date Received: 03/07/94

% Moisture: not dec. 19 Date Analyzed: 03/15/94

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	26.70	9	J

9713524.2023

000088

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B0BFH1

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 03029 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A403029-04A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 40314R05

Level: (low/med) LOW Date Received: 03/07/94

% Moisture: not dec. 10 Date Analyzed: 03/14/94

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	3	BJ
67-64-1	Acetone	20	B
75-15-0	Carbon Disulfide	11	U
75-35-4	1,1-Dichlorcethene	11	U
75-34-3	1,1-Dichlorcethane	11	U
540-59-0	1,2-Dichlorcethene (total)	11	U
67-66-3	Chloroform	3	BJ
107-06-2	1,2-Dichlorcethane	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-Dichlorcpropane	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	1	J
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

9713524.2029

000089

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B0BFH1

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 03029 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A403029-04A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 40314R05

Level: (low/med) LOW Date Received: 03/07/94

% Moisture: not dec. 10 Date Analyzed: 03/14/94

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

9713524.2030

000090

EPA SAMPLE NO.

B0BFH5

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 03029 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A403029-06A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 40314R12

Level: (low/med) LOW Date Received: 03/07/94

% Moisture: not dec. 4 Date Analyzed: 03/14/94

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	4	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	1	BJ
107-06-2	1,2-Dichloroethane	10	U
78-93-3	2-Butanone	10	U
71-55-6	1,1,1-Trichloroethane	1	BJ
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

9713524.2031

000091

EPA SAMPLE NO.

B0BFH5

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 03029 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A403029-06A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 40314R12

Level: (low/med) LOW Date Received: 03/07/94

% Moisture: not dec. 4 Date Analyzed: 03/14/94

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

9713524.2032

000092

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

30BFH6

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 03029 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A403029-07A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 40314R11

Level: (low/med) LOW Date Received: 03/07/94

% Moisture: not dec. 5 Date Analyzed: 03/14/94

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	4	BJ
67-64-1	Acetone	13	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

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B0BFH6

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 03029 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A403029-07A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 40314R11

Level: (low/med) LOW Date Received: 03/07/94

% Moisture: not dec. 5 Date Analyzed: 03/14/94

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

9713524.2034

000094

EPA SAMPLE NO.

B0BFM6

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 03029 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A403029-05A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 40314R13

Level: (low/med) LOW Date Received: 03/07/94

% Moisture: not dec. 0 Date Analyzed: 03/14/94

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	BJ
67-64-1	Acetone	12	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	3	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

9713524.2035

000095

EPA SAMPLE NO.

B0BFM6

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 03029 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A403029-05A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 40314R13

Level: (low/med) LOW Date Received: 03/07/94

% Moisture: not dec. 0 Date Analyzed: 03/14/94

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	26.62	16	J

9713524.2036

000096

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B0BFM7

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 03029 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A403029-03A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 40314R04

Level: (low/med) LOW Date Received: 03/07/94

% Moisture: not dec. 0 Date Analyzed: 03/14/94

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	16	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	2	BJ
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	BJ
591-78-6	2-Hexanone	4	J
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

9713524.2037

000097

EPA SAMPLE NO.

B0BFM7

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 03029 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A403029-03A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 40314R04

Level: (low/med) LOW Date Received: 03/07/94

% Moisture: not dec. 0 Date Analyzed: 03/14/94

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

9713524.2033

000098

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B09WF8

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 03029 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A403029-01B

Sample wt/vol: 30.4 (g/mL) G Lab File ID: 40330I08

Level: (low/med) LOW Date Received: 03/07/94

% Moisture: 4 decanted: (Y/N) N Date Extracted: 03/16/94

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 03/30/94

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

9713524.2039

000099

1C

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B09WF8

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 03029 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A403029-01B

Sample wt/vol: 30.4 (g/mL) G Lab File ID: 40330I08

Level: (low/med) LOW Date Received: 03/07/94

% Moisture: 4 decanted: (Y/N) N Date Extracted: 03/16/94

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 03/30/94

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	240	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

9713524.2040

000100

EPA SAMPLE NO.

B09WF8

1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 03029 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A403029-01B

Sample wt/vol: 30.4 (g/mL) G Lab File ID: 40330I08

Level: (low/med) LOW Date Received: 03/07/94

% Moisture: 4 decanted: (Y/N) N Date Extracted: 03/16/94

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 03/30/94

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

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

Number TICs found: 5

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN HYDROCARBON	5.50	1500	BJ
2.	UNKNOWN HYDROCARBON	5.58	69	J
3.	UNKNOWN HYDROCARBON	5.80	210	BJ
4.	UNKNOWN HYDROCARBON	6.03	580	BJ
5.	HEXANEDIOIC ACID ESTER ISOME	23.82	170	BJ

9713524.2041

000101

EPA SAMPLE NO.

B0BFH1

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 03029 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A403029-04B

Sample wt/vol: 30.4 (g/mL) G Lab File ID: 40330I11

Level: (low/med) LOW Date Received: 03/07/94

% Moisture: 10 decanted: (Y/N) N Date Extracted: 03/16/94

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 03/30/94

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	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	880	U
91-58-7	2-Chloronaphthalene	360	U
88-74-4	2-Nitroaniline	880	U
131-11-3	Dimethylphthalate	360	U
208-96-8	Acenaphthylene	360	U
99-09-2	3-Nitroaniline	880	U
83-32-9	Acenaphthene	360	U
51-28-5	2,4-Dinitrophenol	880	U

9713524.2042

000102

1C

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B0BFH1

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 03029 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A403029-04B

Sample wt/vol: 30.4 (g/mL) G Lab File ID: 40330I11

Level: (low/med) LOW Date Received: 03/07/94

% Moisture: 10 decanted: (Y/N) N Date Extracted: 03/16/94

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 03/30/94

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	880	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	880	U
534-52-1	4,6-Dinitro-2-methylphenol	880	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	45	J
85-01-8	Phenanthrene	360	U
120-12-7	Anthracene	360	U
86-74-8	Carbazole	360	U
84-74-2	Di-n-Butylphthalate	160	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	270	J
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

9713524.2043

000103

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B0BFH1

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 03029 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A403029-04B

Sample wt/vol: 30.4 (g/mL) G Lab File ID: 40330I11

Level: (low/med) LOW Date Received: 03/07/94

% Moisture: 10 decanted: (Y/N) N Date Extracted: 03/16/94

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 03/30/94

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

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

Number TICs found: 20

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN HYDROCARBON	5.52	1800	BJ
2.	UNKNOWN ALKANE	11.37	4600	J
3.	UNKNOWN ALKANE	11.78	3200	J
4.	UNKNOWN ALKANE	12.88	14000	J
5.	UNKNOWN HYDROCARBON	13.07	1500	J
6.	UNKNOWN ALKANE	13.23	15000	J
7.	UNKNOWN ALKANE	14.05	20000	J
8.	UNKNOWN ALKANE	14.27	2200	J
9.	UNKNOWN ALKANE	14.58	19000	J
10.	UNKNOWN ALKANE	15.18	5000	J
11.	UNKNOWN ALKANE	15.33	2200	J
12.	UNKNOWN ALKANE	15.82	9000	J
13.	UNKNOWN ALKANE	16.35	6900	J
14.	UNKNOWN ALKANE	17.02	8900	J
15.	UNKNOWN ALKANE	19.20	3000	J
16.	UNKNOWN ALKANE	20.23	4100	J
17.	UNKNOWN ALKANE	21.23	3300	J
18.	UNKNOWN ALKANE	22.17	3900	J
19.	UNKNOWN ALKANE	23.08	2600	J
20.	UNKNOWN ALKANE	23.95	2700	J

9713524.2044

000104
EPA SAMPLE NO.

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

B0BFH5

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 03029 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A403029-06B

Sample wt/vol: 30.4 (g/mL) G Lab File ID: 40330I12

Level: (low/med) LOW Date Received: 03/07/94

% Moisture: 4 decanted: (Y/N) N Date Extracted: 03/16/94

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 03/30/94

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 8.9

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

9713524.2045

000105

EPA SAMPLE NO.

B0BFH5

1C

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 03029 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A403029-06B

Sample wt/vol: 30.4 (g/mL) G Lab File ID: 40330I12

Level: (low/med) LOW Date Received: 03/07/94

% Moisture: 4 decanted: (Y/N) N Date Extracted: 03/16/94

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 03/30/94

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 8.9

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	200	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

9713524.2046

000106
EPA SAMPLE NO.

1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

B0BFH5

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 03029 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A403029-06B

Sample wt/vol: 30.4 (g/mL) G Lab File ID: 40330I12

Level: (low/med) LOW Date Received: 03/07/94

% Moisture: 4 decanted: (Y/N) N Date Extracted: 03/16/94

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 03/30/94

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 8.9

Number TICs found: 11

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN HYDROCARBON	5.52	1500	BJ
2.	UNKNOWN HYDROCARBON	5.60	69	J
3.	UNKNOWN HYDROCARBON	5.80	550	J
4.	UNKNOWN HYDROCARBON	6.03	480	BJ
5.	UNKNOWN HYDROCARBON	7.88	170	J
6.	UNKNOWN HYDROCARBON	9.17	310	J
7. 540-97-6	DODECAMETHYLCYCLOHEXASILOXAN	11.70	100	JN
8.	HEXANEDIOIC ACID ESTER ISOME	23.83	210	BJ
9.	UNKNOWN ALKANE	26.38	140	J
10.	UNKNOWN ALKANE	27.93	410	J
11.	UNKNOWN ALKANE	29.90	140	J

9713524.2047

000107

1B

EPA SAMPLE NO.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

B0BFH6

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 03029 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A403029-07B

Sample wt/vol: 30.4 (g/mL) G Lab File ID: 40330I13

Level: (low/med) LOW Date Received: 03/07/94

% Moisture: 5 decanted: (Y/N) N Date Extracted: 03/16/94

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 03/30/94

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	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	830	U
91-58-7	2-Chloronaphthalene	340	U
88-74-4	2-Nitroaniline	830	U
131-11-3	Dimethylphthalate	340	U
208-96-8	Acenaphthylene	340	U
99-09-2	3-Nitroaniline	830	U
83-32-9	Acenaphthene	340	U
51-28-5	2,4-Dinitrophenol	830	U

9713524.2043

000108

EPA SAMPLE NO.

B0BFH6

1C

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 03029 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A403029-07B

Sample wt/vol: 30.4 (g/mL) G Lab File ID: 40330I13

Level: (low/med) LOW Date Received: 03/07/94

% Moisture: 5 decanted: (Y/N) N Date Extracted: 03/16/94

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 03/30/94

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	830	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	830	U
534-52-1	4,6-Dinitro-2-methylphenol	830	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	830	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	190	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

9713524.2049

000109
EPA SAMPLE NO.

1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

B0BFH6

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 03029 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A403029-07B

Sample wt/vol: 30.4 (g/mL) G Lab File ID: 40330I13

Level: (low/med) LOW Date Received: 03/07/94

% Moisture: 5 decanted: (Y/N) N Date Extracted: 03/16/94

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 03/30/94

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

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

Number TICs found: 12

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN HYDROCARBON	5.52	1400	BJ
2.	UNKNOWN HYDROCARBON	5.60	69	BJ
3.	UNKNOWN HYDROCARBON	5.82	170	J
4.	UNKNOWN HYDROCARBON	6.03	380	BJ
5.	UNKNOWN HYDROCARBON	7.88	170	J
6. 541-02-6	DECAMETHYLCYCLOPENTASILOXANE	9.17	100	JN
7.	PROPANOIC ACID ESTER ISOMER	15.65	100	J
8.	HEXANEDIOIC ACID ESTER ISOME	23.83	170	BJ
9.	UNKNOWN ALKANE	26.38	100	J
10.	UNKNOWN HYDROCARBON	27.13	69	J
11.	UNKNOWN ALKANE	27.93	240	J
12.	UNKNOWN ALKANE	29.90	100	J

TMA Inc. REPORT Work Order # A4-03-029

Received: 03/05/94

Results by Sample

SAMPLE ID B09WF8 FRACTION 01G TEST CODE 8015MS NAME EPA 8015M EXTRACT.

Date & Time Collected 03/02/94 Category

MODIFIED 8015 - EXTRACTABLE FUEL HYDROCARBONS

Matrix: SOIL
Date Analyzed: 03/14/94
Dilution factor: 1.00
Concentration Units: mg/Kg

Compound	Sample Result	PQL
Kerosene Range	ND	10
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

9713524.2051

000572

TMA Inc. REPORT Work Order # A4-03-029

Received: 03/05/94

Results by Sample

SAMPLE ID B0BFH1 FRACTION 04E TEST CODE 8015MS NAME EPA 8015M EXTRACT.

Date & Time Collected 02/28/94 Category

MODIFIED 8015 - EXTRACTABLE FUEL HYDROCARBONS

Matrix: SOIL
Date Analyzed: 03/14/94
Dilution factor: 1.00
Concentration Units: mg/Kg

Compound	Sample Result	PQL
Kerosene Range	23	10
C10 - C16 Jet Fuel Range	NA	NA
C9 - C22 Diesel Range	NA	NA
Hydraulic Range	NA	NA
HEAVIER THAN DIESEL	30	10

ND = Not detected at the specified limits

Form I

9713524.2052

000576

TMA Inc. REPORT Work Order # A4-03-029

Received: 03/05/94

Results by Sample

SAMPLE ID B0BFH5 FRACTION 06D TEST CODE 8015MS NAME EPA 8015M EXTRACT.

Date & Time Collected 03/02/94 Category

MODIFIED 8015 - EXTRACTABLE FUEL HYDROCARBONS

Matrix: SOIL
Date Analyzed: 03/14/94
Dilution factor: 1.00
Concentration Units: mg/Kg

Compound	Sample Result	PQL
Kerosene Range	ND	10
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

9713524.2053

000578

TMA Inc. REPORT Work Order # A4-03-029

Received: 03/05/94

Results by Sample

SAMPLE ID B0BFH6 FRACTION 07D TEST CODE 8015MS NAME EPA 8015M EXTRACT.

Date & Time Collected 03/02/94 Category

MODIFIED 8015 - EXTRACTABLE FUEL HYDROCARBONS

Matrix: SOIL
Date Analyzed: 03/14/94
Dilution factor: 1.00
Concentration Units: mg/Kg

Compound	Sample Result	PQL
Kerosene Range	ND	10
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

9713524.2054

 *** T M A *** REPORT Work Order # S4-03-098

Received: 03/08/94 04/11/94 09:01:40

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

ATTEN Dan Steurmer

CLIENT HANFORD NOR SAMPLES 6
COMPANY TMA/NORCAL Hanford
FACILITY Richmond, CA

PREPARED Thermo Analytical, Inc.
BY 300 Second Avenue
P.O. Box 521
Waltham, MA 02254

ATTEN Client Services
PHONE (617) 890-7200

CERTIFIED BY

CONTACT DP

WORK ID N4-03-032
TAKEN By Client
TRANS Fedex
TYPE 5 soils
P.O. # N4-03-032
INVOICE under separate cover

SAMPLE IDENTIFICATION	TEST CODES and NAMES used on this workorder
01 B0BFH1	NITR S Nitrate/Nitrite in Soils
02 B0BFH5	
03 B0BFH6	
04 B09WF8	
05 B0BFH8	
05 B0BFH80	
05 B0BFH8S	
06 LCSS	

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

9713524.2055

Received: 03/08/94 Results by Sample

SAMPLE ID B0BFH1 SAMPLE # 01 FRACTIONS: A
Date & Time Collected 02/28/94 11:15:00 Category SOIL

NITR_S 116
mg N/kg

SAMPLE ID B0BFH5 SAMPLE # 02 FRACTIONS: A
Date & Time Collected 03/02/94 13:25:00 Category SOIL

NITR_S 101
mg N/kg

SAMPLE ID B0BFH6 SAMPLE # 03 FRACTIONS: A
Date & Time Collected 03/02/94 14:50:00 Category SOIL

NITR_S 18.7
mg N/kg

SAMPLE ID B09WF8 SAMPLE # 04 FRACTIONS: A
Date & Time Collected 03/02/94 09:30:00 Category SOIL

NITR_S <2.49
mg N/kg

SAMPLE ID B0BFH8 SAMPLE # 05 FRACTIONS: A
Date & Time Collected 03/02/94 13:00:00 Category SOIL

NITR_S 31.9
mg N/kg

SAMPLE ID B0BFH8D SAMPLE # 05 FRACTIONS: B
Date & Time Collected 03/02/94 13:00:00 Category SOIL

NITR_S 30.3
mg N/kg

SAMPLE ID B0BFH8S SAMPLE # 05 FRACTIONS: C
Date & Time Collected 03/02/94 13:00:00 Category SOIL

NITR_S 50.5
mg N/kg

TMA
Thermo Analytical Inc.
Skinner & Sherman Laboratories Inc.

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9713524.2056

 *** T M A *** REPORT Work Order # S4-03-098

Received: 03/08/94 Results by Sample

SAMPLE ID LCSS SAMPLE # 06 FRACTIONS: A

Date & Time Collected not specified Category SOIL

NITR_S 2.07
mg N/L

TMA
Thermo Analytical Inc.
Skinner & Sherman Laboratories Inc.

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

9713524.2057

Received: 03/08/94 04/11/94 09:01:40

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
S403098-05	31.9 mg/kg	20.0 mg/kg	50.5 mg/kg	93.0

DUPLICATE

Sample ID	Sample result	Duplicate Result	Relative % Difference
S403098-05	31.9 mg/kg	30.3 mg/kg	5.1

QUALITY CONTROL SAMPLES

Sample ID	True Value	Found Value	Percent Recovery
LCS	2.00 mg/L	2.07 mg/L	103.5
Prep blank	--	<0.25 mg/L	--

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TMA
Thermo Analytical Inc.
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

9713524.2053

Received: 03/08/94 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.
Skinner & Sherman Laboratories Inc.

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

9713524.2059

TMA/Skinner & Sherman Laboratories
-- Sample Login Sheet

Workorder 94-03-098 Client Hanford WCS Number/Type of Samples [illegible]
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# WU-03 [illegible]
Purchase Order/Contract# WU-03-031 Client Contact D. Sanchez
Tag#: Present/Absent/NA/(See COC) Chain of Custody: Present/Absent/NA, # [illegible]

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: 3/8/94
List any date with paperwork/shipment problems & specify the problem:

	Client ID	Matrix	Received	pH*	Test(s) & QC	Holding Times
1	BØBFH1	soil	3/8/94	NA	NO_3 NO_2	
2	BØBFH5	↓	↓	↓	↓	
3	BØBFH6	↓	↓	↓	↓	
4	BØ9WF8	↓	↓	↓	↓	
5	BØBFH8	↓	↓	↓	↓ (1.5)	
6						
7						
8						
9						
10					Complete	
11						
12						
13					DRM 3/8/94	
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 ____

* EPA/CLP required

Rev 1.7

 9713524 2060 TMA/Nortel

CHAIN OF CUSTODY

ORD # N4-03-032

RCVD: 03/07/94 DUE: 04/11/94 03/07/94 11:52:26 KEEP: 04/11/95 DISP: S

DASH	SAMPLE IDENTIFICATION		STORED	TESTS for FRACTIONS with work in DEPT: SU and CATEGORY					
01B-S	B0BFH1		S&S	WH001	WH002	WH004	WH005	WH233	WH390
01F-S	B0BFH1	MS	S&S	WH001	WH002	WH004	WH005	WH233	WH390
01G-S	B0BFH1	DUP	S&S	WH001	WH002	WH004	WH005	WH233	WH390
01H-S	L C S		S&S	WH001	WH002	WH004	WH005	WH233	WH390
02B-S	B0BFH5		S&S	WH001	WH002	WH004	WH005	WH233	WH390
03B-S	B0BFH6		S&S	WH001	WH002	WH004	WH005	WH233	WH390
04B-S	B09WF8		S&S	WH001	WH002	WH004	WH005	WH233	WH390
05B-S	B0BFH8		S&S	WH001	WH002	WH004	WH005	WH233	WH390

RELEASED BY	DATE	TRANSFERRED TO	DATE	RECEIVED BY	DATE
Eyamamoto	3/7/94	Skinner	3/7/94	D. Marineau	3/8/94

24
JC 4/29/94

9713524.2061

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

APR 1994
RECEIVED
SDLA

April 8, 1994

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

Quality Control Narrative

Scope
Five soil samples were submitted to TMA/Skinner & Sherman Laboratories, Inc. on March 8, 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 S403097.

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 matrix spike recovery for antimony exceeded the control limit requirement.

The laboratory duplicate for lead exceeded the control limit requirement.

The ICP serial dilution for sodium 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

9713524.2062

WESTINGHOUSE/HANFORD

COVER PAGE - INORGANIC ANALYSES DATA PACKAGE

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

Lab Code: SKINER Case No.: N4-03-032 SAS No.: SDG No.: B09WF8

SOW No.: ILM02.1

SAMPLE NUMBER:	Lab Sample ID.
B09WF8	03097-04S
B0BFH1	03097-01S
B0BFH5	03097-02S
B0BFH6	03097-03S
B0BFH8	03097-05S
B0BFH8D	03097-05S2
B0BFH8S	03097-05DS

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: 4/8/94 Title: Lead Chemist

9213524.2063

WESTINGHOUSE/HANFORD

1

SAMPLE NUMBER:

B09WF8

INORGANIC ANALYSIS DATA SHEET

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

Lab Code: SKINER Case No.: N4-03-032SAS No.: SDG No.: B09WF8

Matrix (soil/water): SOIL Lab Sample ID: C3097-04S

Level (low/med): LOW Date Received: 03/08/94

% Solids: 94.6

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	4010			P
7440-36-0	Antimony	2.5	U	N	P
7440-38-2	Arsenic	1.7	B		P
7440-39-3	Barium	60.3			P
7440-41-7	Beryllium	0.28	B		P
7440-43-9	Cadmium	0.35	U		P
7440-70-2	Calcium	6410			P
7440-47-3	Chromium	4.8			P
7440-48-4	Cobalt	9.1	B		P
7440-50-8	Copper	15.0			P
7439-89-6	Iron	19500			P
7439-92-1	Lead	2.2		*	P
7439-95-4	Magnesium	3870			P
7439-96-5	Manganese	268			P
7439-97-6	Mercury	0.18			CV
7440-02-0	Nickel	7.1	B		P
7440-09-7	Potassium	621	B		P
7782-49-2	Selenium	0.58	U		P
7440-22-4	Silver	1.6	B		P
7440-23-5	Sodium	586	B	E	P
7440-28-0	Thallium	0.77	U		P
7440-62-2	Vanadium	38.1			P
7440-66-6	Zinc	35.0			P
	Cyanide	0.49	U		CA
7440-32-6	Titanium	1300			P

Color Before: GREY Clarity Before: Texture: COARSE

Color After: GREY Clarity After: Artifacts: YES

Comments:
STONES

002

SAMPLE NUMBER:

INORGANIC ANALYSIS DATA SHEET

B0BFH1

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

Lab Code: SKINER Case No.: N4-03-032SAS No.: SDG No.: B09WF8

Matrix (soil/water): SOIL Lab Sample ID: 03097-01S

Level (low/med): LOW Date Received: 03/08/94

% Solids: 87.2

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	4070			P
7440-36-0	Antimony	2.7	U	N	P
7440-38-2	Arsenic	19.1			P
7440-39-3	Barium	33.2	B		P
7440-41-7	Beryllium	0.40	B		P
7440-43-9	Cadmium	0.38	U		P
7440-70-2	Calcium	3400			P
7440-47-3	Chromium	33.1			P
7440-48-4	Cobalt	6.7	B		P
7440-50-8	Copper	14.7			P
7439-89-6	Iron	18200			P
7439-92-1	Lead	9.7		*	P
7439-95-4	Magnesium	2560			P
7439-96-5	Manganese	163			P
7439-97-6	Mercury	0.65			CV
7440-02-0	Nickel	6.6	B		P
7440-09-7	Potassium	812	B		P
7782-49-2	Selenium	0.63	U		P
7440-22-4	Silver	2.5			P
7440-23-5	Sodium	576	B	E	P
7440-28-0	Thallium	0.83	U		P
7440-62-2	Vanadium	43.3			P
7440-66-6	Zinc	42.3			P
	Cyanide	0.55	U		CA
7440-32-6	Titanium	1670			P

Color Before: GREY Clarity Before: Texture: MEDIUM

Color After: GREY Clarity After: Artifacts:

Comments:

003

SAMPLE NUMBER:

INORGANIC ANALYSIS DATA SHEET

B0BFH5

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

Lab Code: SKINER Case No.: N4-03-032SAS No.: SDG No.: B09WF8

Matrix (soil/water): SOIL Lab Sample ID: 03097-02S

Level (low/med): LOW Date Received: 03/08/94

% Solids: 95.8

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	6820			P
7440-36-0	Antimony	2.4	U	N	P
7440-38-2	Arsenic	6.4			P
7440-39-3	Barium	92.2			P
7440-41-7	Beryllium	0.41	B		P
7440-43-9	Cadmium	0.34	U		P
7440-70-2	Calcium	10200			P
7440-47-3	Chromium	7.9			P
7440-48-4	Cobalt	11.6			P
7440-50-8	Copper	15.1			P
7439-89-6	Iron	23700			P
7439-92-1	Lead	6.1		*	P
7439-95-4	Magnesium	5670			P
7439-96-5	Manganese	351			P
7439-97-6	Mercury	0.05	U		CV
7440-02-0	Nickel	8.5			P
7440-09-7	Potassium	1290			P
7782-49-2	Selenium	0.56	U		P
7440-22-4	Silver	1.8	B		P
7440-23-5	Sodium	793	B	E	P
7440-28-0	Thallium	0.74	U		P
7440-62-2	Vanadium	52.5			P
7440-66-6	Zinc	44.7			P
	Cyanide	0.52	U		CA
7440-32-6	Titanium	1720			P

Color Before: GREY Clarity Before: Texture: MEDIUM

Color After: GREY Clarity After: Artifacts: YES

Comments:
STONES

004

SAMPLE NUMBER:

INORGANIC ANALYSIS DATA SHEET

B0BFH6

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

Lab Code: SKINER Case No.: N4-03-032SAS No.: SDG No.: B09WF8

Matrix (soil/water): SOIL Lab Sample ID: 03097-03S

Level (low/med): LOW Date Received: 03/08/94

% Solids: 94.9

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	5880			P
7440-36-0	Antimony	2.4	U	N	P
7440-38-2	Arsenic	5.6			P
7440-39-3	Barium	94.4			P
7440-41-7	Beryllium	0.45	B		P
7440-43-9	Cadmium	0.35	B		P
7440-70-2	Calcium	8700			P
7440-47-3	Chromium	7.8			P
7440-48-4	Cobalt	10.8			P
7440-50-8	Copper	15.7			P
7439-89-6	Iron	22600			P
7439-92-1	Lead	4.2		*	P
7439-95-4	Magnesium	5100			P
7439-96-5	Manganese	344			P
7439-97-6	Mercury	0.05	U		CV
7440-02-0	Nickel	9.1			P
7440-09-7	Potassium	1060			P
7782-49-2	Selenium	0.56	U		P
7440-22-4	Silver	2.0			P
7440-23-5	Sodium	553	B	E	P
7440-28-0	Thallium	0.74	U		P
7440-62-2	Vanadium	47.4			P
7440-66-6	Zinc	41.6			P
	Cyanide	0.49	U		CA
7440-32-6	Titanium	1550			P

Color Before: GREY Clarity Before: Texture: MEDIUM

Color After: GREY Clarity After: Artifacts:

Comments:

SAMPLE NUMBER:

INORGANIC ANALYSIS DATA SHEET

B0BFH8

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

Lab Code: SKINER Case No.: N4-03-032SAS No.: SDG No.: B09WF8

Matrix (soil/water): SOIL Lab Sample ID: 03097-05S

Level (low/med): LOW Date Received: 03/08/94

% Solids: 94.2

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	6800			P
7440-36-0	Antimony	2.6	B	N	P
7440-38-2	Arsenic	5.6			P
7440-39-3	Barium	83.3			P
7440-41-7	Beryllium	0.47	B		P
7440-43-9	Cadmium	0.34	U		P
7440-70-2	Calcium	9260			P
7440-47-3	Chromium	8.3			P
7440-48-4	Cobalt	11.6			P
7440-50-8	Copper	13.8			P
7439-89-6	Iron	24000			P
7439-92-1	Lead	6.8		*	P
7439-95-4	Magnesium	5890			P
7439-96-5	Manganese	352			P
7439-97-6	Mercury	0.05	U		CV
7440-02-0	Nickel	10.6			P
7440-09-7	Potassium	2060			P
7782-49-2	Selenium	0.57	U		P
7440-22-4	Silver	1.8	B		P
7440-23-5	Sodium	564	B	E	P
7440-28-0	Thallium	0.75	U		P
7440-62-2	Vanadium	54.8			P
7440-66-6	Zinc	46.4			P
	Cyanide	0.53	U		CA
7440-32-6	Titanium	1780			P

Color Before: GREY Clarity Before: Texture: MEDIUM

Color After: GREY Clarity After: Artifacts: YES

Comments:
ROOTS,STONES

006

9713524.2063

FEDERAL EXPRESS

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AIRBILL PACKAGE TRACKING NUMBER 7269158365

7269158365

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Street Address

City | State | ZIP Required

2 To (Recipient's Name) Please Print | Recipient's Phone Number (Very

(617) 890 7

Company | Department/

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City | State | ZIP Required

3 PAYMENT 1 ☐ 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 afternoon)
11 ☐ OTHER PACKAGING
16 ☐ FEDEX LETTER*
12 ☐ FEDEX PAK*
13 ☐ FEDEX BOX
14 ☐ FEDEX TUBE

Standard Overnight (Delivery by next business afternoon for 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** (Continuous examination required)
80 ☐ TWO-DAY FREIGHT**
† Delivery commitments 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 ☒ DELIVER WEEKDAY
3 DELIVER SATURDAY (Extra charge) ☐ (Not available to all locations)
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5 ☐
6 ☐ DRY ICE (Dangerous Goods Shipper's Declaration not required)
Dry Ice, 9, UN 1845 ____ X ____ kg. ____ ☐
7 ☐ OTHER SPECIAL SERVICE ____
8 ☐
9 ☐ SATURDAY PICK-UP (Extra charge)
☐
12 ☐ HOLIDAY DELIVERY (If offered) (Extra charge)

6

PACKAGES	WEIGHT In Pounds Only	TOTAL DECLARED VALUE (See right)
	47	
Total	Total 47	Total

DIM SHIPMENT (Chargeable Weight)
☐ ____ lbs.
L x W x H

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1 ☒ Regular Stop 3 ☐ Drop Box
4 ☐ B.S.C.
2 ☐ On-Call Stop 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
Base Charges
Declared Value C
Other 1
Other 2
Total Charges

REVISION DATE 11/9
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177

9713524.2069

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

RECORD COPY

May 4, 1994

MAY 1994
RECEIVED
SDLA

Ref: TMA/Norcal N4-03-051-7342

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

Dear Ms. Colley:

Enclosed is the data report for four soil samples received March 5, 1994 and designated as SAF #93-263. Results are given for gross alpha, gross beta, selenium-79, strontium-90, technetium-99, iodine-129, isotopic uranium, total uranium, neptunium-237, isotopic plutonium, americium-241/curium-244, and gamma scan analyses.

The data package is paginated 1 through 529.

Please call if you have any questions concerning this data.

Sincerely,

N. Joseph Verville

N. Joseph Verville
Nuclear Program Manager
TMA/Norcal

NJV/ss

Enclosure: Data Package

TMA/Norcal

Report N4-03-051-7342
Sample Delivery Group 7342

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

Case Narrative **May 4, 1994**

1.0 GENERAL

TMA/Norcal Sample Delivery Group 7342 is comprised of four soil samples designated as SAF #93-263, delivered under Chain-of-Custody documents 006229, 006230, 006490, and Field Logbook No. EFL-1115.

One 1000 mL poly bottle containing each sample was received for analyses.

2.0 ANALYSIS NOTES

2.1 Gross Alpha Analyses

The recovery for the laboratory control sample was 123%, slightly higher than the contract limit of 120%, but within the 3σ protocol limits of 59-141%.

2.2 Gross Beta Analyses

No problems were encountered by the laboratory in the analyses.

2.3 Selenium-79 Analyses

No problems were encountered by the laboratory in the analyses.

2.4 Strontium-90 Analyses

No problems were encountered by the laboratory in the analyses.

2.5 Technetium-99 Analyses

No problems were encountered by the laboratory in the analyses.

2.6 Iodine-129 Analyses

No problems were encountered by the laboratory in the analyses.

2.7 Uranium-233/234, 235, and 238 Analyses

No problems were encountered by the laboratory in the analyses.

2.8 Total Uranium Analyses

No problems were encountered by the laboratory in the analyses.

2.9 Neptunium-237 Analyses

Reagent blank 7342-006 shows neptunium-237 activity at 0.019 pCi/g which is higher than the 0.011 pCi/g MDA. Both the result and MDA are below the RDL and, therefore, there is no adverse impact on the data.

2.10 Plutonium-238 and 239/240 Analyses

No problems were encountered by the laboratory in the analyses.

2.11 Americium-241/Curium-244 Analyses

Sample B09WF8 contained americium-241 activity at 200 pCi/g. Americium-241 activity at this level caused spectral interference between the americium-241 and americium-243 (tracer) peaks. As a consequence the error for the americium-241 result was hand calculated to reflect the spectral interference. The MDA for curium-244 is greater than the RDL because the sample was counted on a low efficiency counter to accommodate the americium-241 activity. Also the counter background was high in the region of interest. No curium-244 activity was detected above the MDA.

Reagent blank 7342-006 shows americium-241 at 0.028 pCi/g which is higher than the 0.02 pCi/g MDA. Both the result and MDA are below the RDL, therefore, there is no adverse impact on the data.

2.12 Gamma Scan Analyses

Aliquot sizes ranged from 210 to 241 grams, which are smaller than the nominal 750 grams normally used for soil analyses. Cobalt-58 and 60, and europium-152, 154, and europium-155 MDA's exceeded the RDL's as a result. The iron-59 MDA's for all samples are higher than the RDL due to the short half-life of iron-59.

9713524.2072

N403051-04

TMA NORCAL
SAMPLE DELIVERY GROUP 7342

DATA SHEET

B09WF8

SDG 7342 | Client Westinghouse Hanford
Contact N. Joseph Verville | Contract MBH-SVV-069262

Lab sample id N403051-04 | Client sample id B09WF8
Dept sample id 7342-004 | Location/Matrix 216-U-8 Crib SOLID
Received 03/07/94 | Collected 03/02/94
% moisture 3.7 | 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	180	15	4	10		80A
Gross Beta	Beta	110	8.2	6	10		80B
Selenium 79	15758-45-9	-5.4	1.3	2	10	U	SE_L
Strontium 90	10098-97-2	40	4.4	0.8	1		Y
Technetium 99	14133-76-7	0.095	0.14	0.4	0.5	U	TC
Iodine 129	15046-84-1	-0.27	0.77	2	2	U	I
Uranium 233/234		0.87	0.25	0.1	0.3		U
Uranium 235	15117-96-1	0.18	0.097	0.1	0.3	J	U
Uranium 238		1.1	0.29	0.1	0.3		U
Total Uranium (ug/g)	7440-61-1	3.0	0.61	0.03	0.1		U_T
Neptunium 237	13994-20-2	0.045	0.026	0.03	0.2	J	NP
Plutonium 238	13981-16-3	0.41	0.057	0.02	0.05		PU
Plutonium 239/240		0.43	0.060	0.01	0.05		PU
Americium 241	14596-10-2	200	110	0.6	0.05		TP
Curium 244	13981-15-2	-0.041	0.33	0.7	0.05	U	TP
GAMMA SCAN ANALYTES							
Sodium 22	13966-32-0	U		0.09		U	GAM
Potassium 40	13966-00-2	7.2	1.1				GAM
Manganese 54	13966-31-9	U		0.07		U	GAM
Iron 59	14596-12-4	U		0.2	0.05	U	GAM
Cobalt 58	13981-38-9	U		0.07	0.05	U	GAM
Cobalt 60	10198-40-0	U		0.1	0.05	U	GAM
Niobium 94	14681-63-1	U		0.06		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		0.08		U	GAM
Cesium 137	10045-97-3	5.0	0.22		0.05		GAM

Lab id TMAN
Protocol WHC-HASM
Version Ver 1.0
Form DVD-DS
Version 2.30
Report date 05/04/94

9713524.2073

TMA NORCAL

SAMPLE DELIVERY GROUP 7342

N403051-04

DATA SHEET, cont

B09WF8

SDG	7342	Client	Westinghouse Hanford
Contact	N. Joseph Verville	Contract	MBH-SVV-069262
Lab sample id	N403051-04	Client sample id	B09WF8
Dept sample id	7342-004	Location/Matrix	216-U-8 Crib SOLID
Received	03/07/94	Collected	03/02/94
% moisture	3.7	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		0.3	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	0.37	0.17				GAM
Radium 228	15262-20-1	0.55	0.34				GAM
Thorium 228	14274-82-9	0.29	0.12				GAM
Thorium 232	7440-29-1	0.55	0.34				GAM

Lab id	TMAN
Protocol	WHC-HASM
Version	Ver 1.0
Form	DVD-DS
Version	2.30
Report date	05/04/94

9713524.2074

N403051-01

TMA NORCAL
SAMPLE DELIVERY GROUP 7342

DATA SHEET

B0BFH5

SDG 7342 Client Westinghouse Hanford
Contact N. Joseph Verville Contract MBH-SVV-069262

Lab sample id N403051-01 Client sample id B0BFH5
Dept sample id 7342-001 Location/Matrix 216-U-8 Crib SOLID
Received 03/07/94 Collected 03/02/94
% moisture 8.2 Chain of custody id 006229

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Gross Alpha	Alpha	12	4.6	5	10		80A
Gross Beta	Beta	40	5.4	6	10		80B
Selenium 79	15758-45-9	-2.2	1.9	3	10	U	SE_L
Strontium 90	10098-97-2	1.5	0.68	0.7	1		Y
Technetium 99	14133-76-7	0.14	0.046	0.1	0.5	J	TC
Iodine 129	15046-84-1	-0.41	0.99	2	2	U	I
Uranium 233/234		2.9	0.51	0.2	0.3		U
Uranium 235	15117-96-1	0.25	0.14	0.1	0.3	J	U
Uranium 238		2.9	0.52	0.1	0.3		U
Total Uranium (ug/g)	7440-61-1	7.8	1.6	0.03	0.1		U_T
Neptunium 237	13994-20-2	0.008	0.008	0.02	0.2	U	NP
Plutonium 238	13981-16-3	0	0.013	0.03	0.05	U	PU
Plutonium 239/240		0.030	0.016	0.01	0.05	J	PU
Americium 241	14596-10-2	0.012	0.019	0.03	0.05	U	TP
Curium 244	13981-15-2	0.002	0.019	0.03	0.05	U	TP
GAMMA SCAN ANALYTES							
Sodium 22	13966-32-0	U		0.05		U	GAM
Potassium 40	13966-00-2	12	0.92				GAM
Manganese 54	13966-31-9	U		0.04		U	GAM
Iron 59	14596-12-4	U		0.1	0.05	U	GAM
Cobalt 58	13981-38-9	U		0.05	0.05	U	GAM
Cobalt 60	10198-40-0	U		0.04	0.05	U	GAM
Niobium 94	14681-63-1	U		0.04		U	GAM
Ruthenium 103	13968-53-1	U		0.09		U	GAM
Ruthenium 106	13967-48-1	U		0.5		U	GAM
Tin 113	13966-06-8	U		0.1		U	GAM
Cesium 134	13967-70-9	U		0.05		U	GAM
Cesium 137	10045-97-3	8.9	0.18		0.05		GAM

Lab id TMAN
Protocol WHC-HASM
Version Ver 1.0
Form DVD-DS
Version 2.30
Report date 05/04/94

TMA NORCAL

SAMPLE DELIVERY GROUP 7342

N403051-01

DATA SHEET, cont

B0BFH5

SDG 7342 Client Westinghouse Hanford
Contact N. Joseph Verville Contract MBH-SVV-069262

Lab sample id N403051-01 Client sample id B0BFH5
Dept sample id 7342-001 Location/Matrix 216-U-8 Crib SOLID
Received 03/07/94 Collected 03/02/94
% moisture 8.2 Chain of custody id 006229

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		0.1	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	0.61	0.11				GAM
Radium 228	15262-20-1	0.74	0.21				GAM
Thorium 228	14274-82-9	0.78	0.068				GAM
Thorium 232	7440-29-1	0.74	0.21				GAM

Lab id TMAN
Protocol WHC-HASM
Version Ver 1.0
Form DVD-DS
Version 2.30
Report date 05/04/94

9713524.2076

TMA NORCAL

SAMPLE DELIVERY GROUP 7342

DATA SHEET

N403051-02

B0BFH6

SDG	7342	Client	Westinghouse Hanford
Contact	N. Joseph Verville	Contract	MBH-SVV-069262
Lab sample id	N403051-02	Client sample id	B0BFH6
Dept sample id	7342-002	Location/Matrix	216-U-8 Crib SOLID
Received	03/07/94	Collected	03/02/94
% moisture	5.0	Chain of custody id	006230

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Gross Alpha	Alpha	15	4.8	4	10		80A
Gross Beta	Beta	62	6.2	6	10		80B
Selenium 79	15758-45-9	-2.5	1.6	3	10	U	SE_L
Strontium 90	10098-97-2	19	2.7	0.7	1		Y
Technetium 99	14133-76-7	0.63	0.19	0.4	0.5		TC
Iodine 129	15046-84-1	0.28	0.61	1	2	U	I
Uranium 233/234		2.8	0.48	0.1	0.3		U
Uranium 235	15117-96-1	0.28	0.13	0.1	0.3	J	U
Uranium 238		2.9	0.49	0.1	0.3		U
Total Uranium (ug/g)	7440-61-1	7.5	1.5	0.03	0.1		U_T
Neptunium 237	13994-20-2	0.022	0.014	0.02	0.2	J	NP
Plutonium 238	13981-16-3	0.001	0.006	0.01	0.05	U	PU
Plutonium 239/240		0.010	0.008	0.01	0.05	J	PU
Americium 241	14596-10-2	0.005	0.014	0.03	0.05	U	TP
Curium 244	13981-15-2	0.005	0.018	0.03	0.05	U	TP
GAMMA SCAN ANALYTES							
Sodium 22	13966-32-0	U		0.06		U	GAM
Potassium 40	13966-00-2	12	0.96				GAM
Manganese 54	13966-31-9	U		0.05		U	GAM
Iron 59	14596-12-4	U		0.1	0.05	U	GAM
Cobalt 58	13981-38-9	U		0.06	0.05	U	GAM
Cobalt 60	10198-40-0	U		0.05	0.05	U	GAM
Niobium 94	14681-63-1	U		0.04		U	GAM
Ruthenium 103	13968-53-1	U		0.07		U	GAM
Ruthenium 106	13967-48-1	U		0.5		U	GAM
Tin 113	13966-06-8	U		0.07		U	GAM
Cesium 134	13967-70-9	U		0.06		U	GAM
Cesium 137	10045-97-3	2.9	0.12		0.05		GAM

Lab id	TMAN
Protocol	WHC-HASM
Version	Ver 1.0
Form	DVD-DS
Version	2.30
Report date	05/04/94

TMA NORCAL
SAMPLE DELIVERY GROUP 7342

N403051-02

DATA SHEET, cont

B0BFH6

SDG 7342 Client Westinghouse Hanford
Contact N. Joseph Verville Contract MBH-SVV-069262

Lab sample id N403051-02 Client sample id B0BFH6
Dept sample id 7342-002 Location/Matrix 216-U-8 Crib SOLID
Received 03/07/94 Collected 03/02/94
% moisture 5.0 Chain of custody id 006230

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Cerium 144	14762-78-8	U		0.3		U	GAM
Europium 152	14683-23-9	U		0.1	0.1	U	GAM
Europium 154	15585-10-1	U		0.08	0.1	U	GAM
Europium 155	14391-16-3	U		0.2	0.1	U	GAM
Radium 226	13982-63-3	0.55	0.10				GAM
Radium 228	15262-20-1	0.84	0.18				GAM
Thorium 228	14274-82-9	0.70	0.063				GAM
Thorium 232	7440-29-1	0.84	0.18				GAM

Lab id TMAN
Protocol WHC-HASM
Version Ver 1.0
Form DVD-DS
Version 2.30
Report date 05/04/94

9713524.2073

N403051-03

TMA NORCAL
SAMPLE DELIVERY GROUP 7342

DATA SHEET

B0BFH8

SDG 7342 Client Westinghouse Hanford
Contact N. Joseph Verville Contract MBH-SVV-069262

Lab sample id N403051-03 Client sample id B0BFH8
Dept sample id 7342-003 Location/Matrix 216-U-8 Crib SOLID
Received 03/07/94 Collected 03/02/94
% moisture 5.4 Chain of custody id 006490

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Gross Alpha	Alpha	13	4.2	3	10		80A
Gross Beta	Beta	22	4.6	6	10		80B
Selenium 79	15758-45-9	-2.4	2.1	4	10	U	SE_L
Strontium 90	10098-97-2	0.63	0.59	0.7	1	U	Y
Technetium 99	14133-76-7	0.22	0.097	0.3	0.5	U	TC
Iodine 129	15046-84-1	-0.35	0.60	1	2	U	I
Uranium 233/234		0.72	0.26	0.1	0.3		U
Uranium 235	15117-96-1	0.021	0.043	0.2	0.3	U	U
Uranium 238		0.49	0.19	0.1	0.3		U
Total Uranium (ug/g)	7440-61-1	1.5	0.31	0.03	0.1		U_T
Neptunium 237	13994-20-2	0.035	0.022	0.02	0.2	J	NP
Plutonium 238	13981-16-3	-0.003	0.003	0.01	0.05	U	PU
Plutonium 239/240		0.045	0.018	0.01	0.05	J	PU
Americium 241	14596-10-2	0.004	0.015	0.03	0.05	U	TP
Curium 244	13981-15-2	0.004	0.015	0.03	0.05	U	TP
GAMMA SCAN ANALYTES							
Sodium 22	13966-32-0	U		0.06		U	GAM
Potassium 40	13966-00-2	13	0.92				GAM
Manganese 54	13966-31-9	U		0.05		U	GAM
Iron 59	14596-12-4	U		0.1	0.05	U	GAM
Cobalt 58	13981-38-9	U		0.05	0.05	U	GAM
Cobalt 60	10198-40-0	U		0.05	0.05	U	GAM
Niobium 94	14681-63-1	U		0.04		U	GAM
Ruthenium 103	13968-53-1	U		0.07		U	GAM
Ruthenium 106	13967-48-1	U		0.4		U	GAM
Tin 113	13966-06-8	U		0.07		U	GAM
Cesium 134	13967-70-9	U		0.05		U	GAM
Cesium 137	10045-97-3	1.7	0.092		0.05		GAM

Lab id TMAN
Protocol WHC-HASM
Version Ver 1.0
Form DVD-DS
Version 2.30
Report date 05/04/94

9713524.2079

!A NORCAL
E DELIVERY GROUP 7342

SHEET, cont

BOBFH8

Client Westinghouse Hanford
Contract MBH-SVV-069262

:lient sample id BOBFH8
Location/Matrix 216-U-8 Crib SOLID
Collected 03/02/94
in of custody id 006490

RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
U		0.2		U	GAM
U		0.1	0.1	U	GAM
U		0.07	0.1	U	GAM
U		0.1	0.1	U	GAM
0.57	0.095				GAM
0.86	0.17				GAM
0.93	0.079				GAM
0.86	0.17				GAM

Lab id TMAN
Protocol WHC-HASM
Version Ver 1.0
Form DVD-DS
Version 2.30
Report date 05/04/94

SATURDAY DELIVERY SATURDAY DELIVERY

Contractor	OFF-SITE PROPERTY CONTROL	CONTROL NO. (To be obtained from PROPERTY MANAGEMENT)
WESTINGHOUSE HANFORD		W94-0-0369 6

PART I - TO BE COMPLETED BY ORIGINATOR

Department	Section	Unit
Processing & Analytical Lab	Analytical Chemistry	Sampling & Mobile Lab

The following items are to be shipped from ☒ Contractor ☐ Vendor

Routing EMERY AIR EXPRESS ☒ Prepaid ☐ Collect

Shipped to
Company TMA/NORCAL
Address 2030 Wright Av
City Richmond State CA Zip Code 94804
Country

Off-site Custodian: Delores Sanchez

On-site Custodian: Payroll No.

Qty.	Property No.	Description (include Manufacture Name, Model, Serial No.)	Acquisition Cost
1		POLYCOOLER. SAMPLES PACKED IN PLASTIC BAGS AND STORED ON WET ICE WEIGHT 62 COOLER # PT5	

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

Necessity for the off-site use of this property

☒ Required for Project Work. List Project No. SAF #93-263 ; COC #006269 006239 3/4/94 SAMPLE #BOBFH5 ; BOBFM6 3/4/94
006230 BOBFH6
006490 BOBFH8

☐ Business Trip

☐ Off-site Assignment

☐ Shipment to Subcontractor. List Subcontract No.

☐ Other (Please specify)

Samples require analysis that are not presently available at this site.

BILL OF LADING #140 213 8144

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

RM Clearance for Public Release	RM Survey No.	Date
S. H. Crider	467 485	3/4/94

Location of and Contact for Property (Name/Phone No./Bldg./Area)
200 WEST / 202-S C. D. Hayes / 373-7074 / 6269 / 600

Date Ready for Shipment	Cost Code to be Charged	Approximate Date This Property will be Returned
03/04/94	PT2BL / Org Code: 12910 & time z 502132	N/A

Originated By	Date	Authorized By	Date
R. T. Sickle	3/4/94 0930	Jeannette E. Hyatt	03/04/94

Property Management Approval	Date
J. Hankel	3/4/94

PART II - TO BE COMPLETED BY SHIPPING

Authorized Shipping Signature	Date
C. R. Nelson	3-11-94

DISTRIBUTION (AFTER FINAL SIGNATURES)

White - Property Management Yellow - Shipping Green - Accounts Payable Pink - Originator Goldenrod - Property Management

54-3000-479 (05/93)

Emergency Contact: (509) 375-5800 PAG#61 Overnight delivery Air bill #

OFFSITE RADIOACTIVE SHIPMENT RECORD

– EXTERIOR INSPECTION PERMITTED –

17896

SHIPPING INST.

SHIP TO:

Company: IMA/Nbrical

Address: 2030 Wright

City, State, Zip: Richmond, CA 94804

Attention: Dolores Sanchez

Contractor: ☐ PNL ☐ KEH ☒ WHC

Site Carrier: Loren Rogers

PR No. 04682 Veh. No. 16-1582

Ship: ☒ Prepaid ☐ Collect Via:

☐ Motor-Rail ☒ Air Pasr.

☐ 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. ☒ 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. LIMITED QUANTITY OF MATERIAL ☒ UN 2910

Material Form: ☐ Special (A1) ☒ Normal (A2)

Labels Applied: ☐ Empty ☐ Radioactive LSA a ☐ White I ☐ Yellow II ☐ Yellow III ☒ None ☐ Danger (Air Cargo) ☐ Secondary 1

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. Req. ☐ NA ☒

~~Pu, EU > 1 g ☐ NU, DU > 1 Kg ☐~~

Security Escorts Req. ☐ Not Req. ☒

External Cask Temperature N/A ☒ (Max. 122°F LTL; 180°F Ex. Use) °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. RCFR 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 SML 437	N/A	Sr-90, Cs-137	182nCi	N/A	50 lbs
Soil samples in glass bottles. Bottles are double bagged and packed in wet ice surrounded by vermiculite absorbent. Sample # B8PW F8, B8PW G1								
(Shipper may describe package in detail on one of unused lines above)					TOTAL	182nCi	NA	50 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: Loren E. Rogers Date: 3-4-94 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: Michael S. Jones Bldg. N/A Survey No. 157423 Date 3-4-94

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: M.A. Sams Printed Name: M.A. SAMS Date: 3-4-94

APPROVED FOR OFFSITE SHIPMENT

TRAFFIC

B. L. No.: RMW-X513 Date Shipped: 3/4/94 E.T.A.: 3/5/94 Routing: FED X / SAT. DEL. ☐ N/A

Placards: ☐ Yes ☒ No

Surveyed By: Date: 3-4-94 Approved for Shipment: Westinghouse Hanford Company Greg Bennett Date: 3/4/94

Route Plan: ☐ Yes ☒ No

*U.S. GPO: 1991-691-714/40068 54-6000-088 (10/88)

9713524.2082

FORM OF PAYMENT

☐ GBL ☐ _____ FCCOD ☐

[X] Bill to Consignee ☐ Third Party Billing ☐

Shipper's Account Number: 50281545

EMERY WORLDWIDE — A CF Company

SERVICES * *

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

INTERNATIONAL: Express ☐ Standard Plus ☐ Preferred ☐ Standard ☐ Business Documents ☐ Customs Clearance ☐ Delivery ☐

Date	Origin	Shipment Number
03-04-94	PSC	140213814 4

TINGHOUSE SHIPPING DEPT (509) 376-6665
. DEPARTMENT OF ENERGY C/O
STINGHOUSE HANFORD
UG 1153
55 STEVENS DRIVE
ICHLAND WA

Canada ☐ ☐

To:
TMA/NORCAL
TMA/NORCAL DELORES SANCHEZ
2030 WRIGHT AVENUE
RICHMOND CA USA

Hold for Pick Up ☐

Canada ☐ ☐

Tariff Dest. | Gateway

EMERY WORLDWIDE will accept Consignee's check with all risks being assumed by Shipper, including but not limited to non-payment, fraud and misrepresentation.

Customer's Reference Numbers: 2910 PT2BL W94-0-0369#6 99332

E — Consignee's Account Number: 94804

Description	Pcs.	L	W	H	Total Pieces	Total Weight (in Lbs.)
SICKLE COOLER # RTS 62# MPLES	1	24	16	16	1	62

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

Declared Value $

140213814 4

Remarks: URDAY DELIVERY

x C.R. Klein 3-4-94

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 ☒

International Shipments: Free Vehicle ☐ Commodity Code

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

International Customs Value | International Insurance

Charge

Total Transportation Charges | Other Charges/Advance at Origin ☐ OC/AO- $

1-OAK 5A

Terms and Conditions on Back

9713524.2083

FEDERAL EXPRESS

QUESTIONS? CALL 800-238-5355 TOLL FREE.

AIRBILL PACKAGE TRACKING NUMBER 4230853863

4230853863

RECIPIENT'S COPY

Date 3-4-94

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: 9 9 3 5 2

To (Recipient's Name) Please Print: DELORES SANCHEZ

Recipient's Phone Number (Very Important): ( )

Company: TMA / NORCAL

Department/Floor No.

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-8513 RADIOACTIVE MATERIAL, EXCEPTED PACKAGE - LIMITED QUANTITY OF MATERIAL 88400 PT28A DOT EMERGENCY RESPONSE GUIDE #61 ATTACHED

IF HOLD FOR PICK-UP, Print FEDEX Address Here (Not available at all locations)

Street Address

City State ZIP Required

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 first 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.)

0 [ ] OVERNIGHT FREIGHT ** (Confirmed reservation required) delivery commitment may vary in some areas.

80 [ ] TWO-DAY FREIGHT **

*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 [ ] DELIVER WEEKDAY

3 DELIVER SATURDAY (Extra charge) (Not available at all locations) [X]

4 [X] DANGEROUS GOODS (Extra charge)

6 [ ] DRY ICE Lbs.

- Dangerous Goods Shipper's Declaration not required
- Dry Ice, UN 1845. kg.

7 [ ] OTHER SPECIAL SERVICE

11 [ ]

12 [ ] HOLIDAY DELIVERY (If offered) (Extra charge)

PACKAGES	WEIGHT - In Pounds Only
1	50
Total 1	Total 50

DIM SHIPMENT (Chargeable Weight) [ ] lbs.

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

FedEx Emp. No

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

SIGNATURE RELEASE UNAVAILABLE

Date/Time

Federal Express Use

Base Charges

Declared Value Charge

Other 1

Other 2

Total Charges

REVISION DATE 2/91 PART # 137211 FORMAT #069 MBFAN 1/92

069

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9713524.2084

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

RECORD COPY

MAY 1994
RECEIVED
SDLA

May 5, 1994

Ref: TMA/Norcal N4-03-028-7341

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

Dear Ms. Colley:

Enclosed is the data report for five soil samples received March 4,5, and 9, 1994 and designated as SAF #93-263. Results are given for gross alpha, gross beta, selenium-79, strontium-90, technetium-99, iodine-129, isotopic uranium, total uranium, neptunium-237, isotopic plutonium, americium-241/curium-244, and gamma scan analyses.

The data package is paginated 1 through 629.

Please call if you have any questions concerning this data.

Sincerely,

N. Joseph Verville

N. Joseph Verville
Nuclear Program Manager
TMA/Norcal

NJV/ss

Enclosure: Data Package

TMA/Norcal
Report N4-03-028-7341
Sample Delivery Group 7341

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

Case Narrative **May 5, 1994**

1.0 GENERAL

TMA/Norcal Sample Delivery Group 7341 is comprised of five soil samples designated as SAF #93-263, delivered under Chain-of-Custody documents 006481, 006484, 006225, 006226, and 006228.

One 1000 mL poly bottle containing each sample was received for analyses.

2.0 ANALYSIS NOTES

2.1 Gross Alpha Analyses
No problems were encountered by the laboratory with the analyses.

2.2 Gross Beta Analyses
No problems were encountered by the laboratory with the analyses.

2.3 Selenium-79 Analyses
No problems were encountered by the laboratory with the analyses.

2.4 Strontium-90 Analyses
No problems were encountered by the laboratory with the analyses.

2.5 Technetium-99 Analyses
Due to the high cesium activity of the samples the analyses were performed in our hot laboratory. During the analyses the samples became contaminated with zirconium and cobalt, resulting very low yields and spectral interference. The samples were reanalyzed. No problems were encountered with the reanalyses.

2.6 Iodine-129 Analyses
No problems were encountered by the laboratory with the analyses.

2.7 Uranium-233/234, 235, and 238 Analyses
Sample B0BFH2 contained uranium activity great enough that it was necessary to count it on a low efficiency detector to achieve good peak re solution. As a result the MDA is greater than the RDL. Since the sample contained uranium activity many times greater than the RDL the relatively high MDA is not a problem.

2.8 Total Uranium Analyses

All samples contained uranium in sufficient quantity that successive dilution of the original aliquot had to be performed in order to get a response from the laser phosphorimeter (KPA) within the calibration range. As a result of the dilutions the sample MDA's were increased beyond the protocol limits. The increased MDA's are not considered a problem.

2.9 Neptunium-237 Analyses

No problems were encountered by the laboratory with the analyses.

2.10 Plutonium-238 and 239/240 Analyses

The plutonium-239/240 results for sample B0BFF9 and the duplicate are not a good match, however since both sample results are below the RDL there is no adverse effect on the quality of the data.

2.11 Americium-241/Curium-244 Analyses

No problems were encountered by the laboratory with the analyses.

2.12 Gamma Scan Analyses

Due to the amount of sample received the aliquot sizes for all the samples were less than the protocol requirement of 750 g and as result the sample MDA's are greater than the protocol limits.

9713524.2087

N403028-01

TMA NORCAL
SAMPLE DELIVERY GROUP 7341

DATA SHEET

B0BFF9

Case/SDG 93-263/7341 Client Westinghouse Hanford
Contact N. Joseph Verville Contract MBH-SVV-069262

Lab sample id N403028-01 Client sample id B0BFF9
Dept sample id 7341-001 Location/Matrix 216-U-8 Crib SOLID
Received 03/04/94 Collected 02/24/94
% moisture 3.3 Chain of custody id 006481

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Gross Alpha	Alpha	9.7	5.1	4	10	J	80A
Gross Beta	Beta	410	14	6	10		80B
Selenium 79	15758-45-9	-5.3	2.0	3	10	U	SE_L
Strontium 90	10098-97-2	180	12	0.6	1		Y
Technetium 99	14133-76-7	0.88	0.14	0.4	0.5		TC
Iodine 129	15046-84-1	0.13	0.77	2	2	U	I
Uranium 233/234		1.8	0.39	0.1	0.3		U
Uranium 235	15117-96-1	0.051	0.068	0.1	0.3	U	U
Uranium 238		1.6	0.36	0.1	0.3		U
Total Uranium (ug/g)	7440-61-1	7.9	1.8	0.3	0.1		U_T
Neptunium 237	13994-20-2	0.004	0.008	0.02	0.2	U	NP
Plutonium 238	13981-16-3	0.003	0.003	0.01	0.05	U	PU
Plutonium 239/240		-0.002	0.007	0.02	0.05	U	PU
Americium 241	14596-10-2	0.007	0.015	0.03	0.05	U	TP
Curium 244	13981-15-2	0	0.015	0.04	0.05	U	TP
GAMMA SCAN ANALYTES							
Sodium 22	13966-32-0	U		0.05		U	GAM
Potassium 40	13966-00-2	9.9	0.89				GAM
Manganese 54	13966-31-9	U		0.05		U	GAM
Iron 59	14596-12-4	U		0.1	0.05	U	GAM
Cobalt 58	13981-38-9	U		0.06	0.05	U	GAM
Cobalt 60	10198-40-0	U		0.06	0.05	U	GAM
Niobium 94	14681-63-1	U		0.05		U	GAM
Ruthenium 103	13968-53-1	U		0.06		U	GAM
Ruthenium 106	13967-48-1	U		0.4		U	GAM
Tin 113	13966-06-8	U		0.06		U	GAM
Cesium 134	13967-70-9	U		0.07		U	GAM
Cesium 137	10045-97-3	U		0.06	0.05	U	GAM

Lab id TMAN
Protocol WHC-HASM
Version Ver 1.0
Form DVD-DS
Version 2.30
Report date 05/05/94

TMA NORCAL
SAMPLE DELIVERY GROUP 7341

N403028-01

DATA SHEET, cont

B0BFF9

Case/SDG 93-263/7341 Client Westinghouse Hanford
Contact N. Joseph Verville Contract MBH-SVV-069262

Lab sample id N403028-01 Client sample id B0BFF9
Dept sample id 7341-001 Location/Matrix 216-U-8 Crib SOLID
Received 03/04/94 Collected 02/24/94
% moisture 3.3 Chain of custody id 006481

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	0.37	0.092				GAM
Radium 228	15262-20-1	0.46	0.19				GAM
Thorium 228	14274-82-9	0.54	0.056				GAM
Thorium 232	7440-29-1	0.46	0.19				GAM

Lab id TMAN
Protocol WHC-HASM
Version Ver 1.0
Form DVD-DS
Version 2.30
Report date 05/05/94

9713524.2089

TMA NORCAL

SAMPLE DELIVERY GROUP 7341

N403028-02

DATA SHEET

B0BFG2

Case/SDG	93-263/7341	Client	Westinghouse Hanford
Contact	N. Joseph Verville	Contract	MBH-SVV-069262
Lab sample id	N403028-02	Client sample id	B0BFG2
Dept sample id	7341-002	Location/Matrix	216-U-8 Crib SOLID
Received	03/04/94	Collected	02/25/94
% moisture	4.2	Chain of custody id	006484

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Gross Alpha	Alpha	20	5.1	4	10		80A
Gross Beta	Beta	3000	36	6	10		80B
Selenium 79	15758-45-9	-2.8	3.1	5	10	U	SE_L
Strontium 90	10098-97-2	81	7.3	0.6	1		Y
Technetium 99	14133-76-7	1.6	0.14	0.3	0.5		TC
Iodine 129	15046-84-1	-0.083	0.80	2	2	U	I
Uranium 233/234		9.9	1.3	0.2	0.3		U
Uranium 235	15117-96-1	1.1	0.30	0.1	0.3		U
Uranium 238		8.4	1.1	0.2	0.3		U
Total Uranium (ug/g)	7440-61-1	33	7.2	0.3	0.1		U_T
Neptunium 237	13994-20-2	0.023	0.017	0.02	0.2	J	NP
Plutonium 238	13981-16-3	0.005	0.007	0.01	0.05	U	PU
Plutonium 239/240		0.039	0.017	0.01	0.05	J	PU
Americium 241	14596-10-2	0.010	0.013	0.02	0.05	U	TP
Curium 244	13981-15-2	0.003	0.013	0.02	0.05	U	TP
GAMMA SCAN ANALYTES							
Sodium 22	13966-32-0	U		0.06		U	GAM
Potassium 40	13966-00-2	11	0.93				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		0.05	0.05	U	GAM
Niobium 94	14681-63-1	U		0.1		U	GAM
Ruthenium 103	13968-53-1	U		2		U	GAM
Ruthenium 106	13967-48-1	U		6		U	GAM
Tin 113	13966-06-8	U		2		U	GAM
Cesium 134	13967-70-9	U		0.1		U	GAM
Cesium 137	10045-97-3	2500	3.0		0.05		GAM

Lab id	TMAN
Protocol	WHC-HASM
Version	Ver 1.0
Form	DVD-DS
Version	2.30
Report date	05/05/94

9713524.2090

TMA NORCAL

SAMPLE DELIVERY GROUP 7341

N403028-02

DATA SHEET, cont

BOBFG2

Case/SDG	93-263/7341	Client	Westinghouse Hanford
Contact	N. Joseph Verville	Contract	MBH-SVV-069262
Lab sample id	N403028-02	Client sample id	BOBFG2
Dept sample id	7341-002	Location/Matrix	216-U-8 Crib SOLID
Received	03/04/94	Collected	02/25/94
% moisture	4.2	Chain of custody id	006484

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	U		2	0.1	U	GAM
Europium 154	15585-10-1	U		1	0.1	U	GAM
Europium 155	14391-16-3	U		2	0.1	U	GAM
Radium 226	13982-63-3	U		1		U	GAM
Radium 228	15262-20-1	0.79	0.36				GAM
Thorium 228	14274-82-9	U		1		U	GAM
Thorium 232	7440-29-1	0.79	0.36				GAM

Lab id	TMAN
Protocol	WHC-HASM
Version	Ver 1.0
Form	DVD-DS
Version	2.30
Report date	05/05/94

9713524.2091

TMA NORCAL

SAMPLE DELIVERY GROUP 7341

DATA SHEET

N403028-03

B0BFH1

Case/SDG 93-263/7341
Client Westinghouse Hanford
Contact N. Joseph Verville
Contract MBH-SVV-069262

Lab sample id N403028-03
Client sample id B0BFH1
Dept sample id 7341-003
Location/Matrix 216-U-8 Crib SOLID
Received 03/07/94
Collected 02/28/94
% moisture 10.1
Chain of custody id 006225

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Gross Alpha	Alpha	75	9.7	4	10		80A
Gross Beta	Beta	24000	100	5	10		80B
Selenium 79	15758-45-9	-5.0	1.8	3	10	U	SE_L
Strontium 90	10098-97-2	15	2.1	0.6	1		Y
Technetium 99	14133-76-7	2.4	0.17	0.3	0.5		TC
Iodine 129	15046-84-1	0.28	0.83	2	2	U	I
Uranium 233/234		21	2.9	0.3	0.3		U
Uranium 235	15117-96-1	1.6	0.42	0.2	0.3		U
Uranium 238		21	2.9	0.3	0.3		U
Total Uranium (ug/g)	7440-61-1	97	21	0.3	0.1		U_T
Neptunium 237	13994-20-2	0.018	0.013	0.02	0.2	U	NP
Plutonium 238	13981-16-3	0.30	0.048	0.03	0.05		PU
Plutonium 239/240		12	0.69	0.01	0.05		PU
Americium 241	14596-10-2	0.20	0.042	0.02	0.05		TP
Curium 244	13981-15-2	0.009	0.007	0.01	0.05	U	TP
GAMMA SCAN ANALYTES							
Sodium 22	13966-32-0	U		1		U	GAM
Potassium 40	13966-00-2	14	8.2				GAM
Manganese 54	13966-31-9	U		2		U	GAM
Iron 59	14596-12-4	U		5	0.05	U	GAM
Cobalt 58	13981-38-9	U		3	0.05	U	GAM
Cobalt 60	10198-40-0	U		1	0.05	U	GAM
Niobium 94	14681-63-1	U		2		U	GAM
Ruthenium 103	13968-53-1	U		20		U	GAM
Ruthenium 106	13967-48-1	U		80		U	GAM
Tin 113	13966-06-8	U		20		U	GAM
Cesium 134	13967-70-9	U		3		U	GAM
Cesium 137	10045-97-3	28000	60		0.05		GAM

Lab id TMAN
Protocol WHC-HASM
Version Ver 1.0
Form DVD-DS
Version 2.30
Report date 05/05/94

TMA NORCAL

SAMPLE DELIVERY GROUP 7341

N403028-03

DATA SHEET, cont

B0BFH1

Case/SDG	93-263/7341	Client	Westinghouse Hanford
Contact	N. Joseph Verville	Contract	MBH-SVV-069262
Lab sample id	N403028-03	Client sample id	B0BFH1
Dept sample id	7341-003	Location/Matrix	216-U-8 Crib SOLID
Received	03/07/94	Collected	02/28/94
% moisture	10.1	Chain of custody id	006225

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Cerium 144	14762-78-8	U		40		U	GAM
Europium 152	14683-23-9	U		20	0.1	U	GAM
Europium 154	15585-10-1	U		10	0.1	U	GAM
Europium 155	14391-16-3	U		20	0.1	U	GAM
Radium 226	13982-63-3	U		20		U	GAM
Radium 228	15262-20-1	U		9		U	GAM
Thorium 228	14274-82-9	U		20		U	GAM
Thorium 232	7440-29-1	U		9		U	GAM

Lab id	TMAN
Protocol	WHC-HASM
Version	Ver 1.0
Form	DVD-DS
Version	2.30
Report date	05/05/94

9713524.2093

TMA NORCAL

SAMPLE DELIVERY GROUP 7341

N403028-04

DATA SHEET

B0BFH2

Case/SDG	93-263/7341	Client	Westinghouse Hanford
Contact	N. Joseph Verville	Contract	MBH-SVV-069262
Lab sample id	N403028-04	Client sample id	B0BFH2
Dept sample id	7341-004	Location/Matrix	216-U-8 Crib SOLID
Received	03/09/94	Collected	03/01/94
% moisture	11.4	Chain of custody id	006226

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Gross Alpha	Alpha	72	9.3	5	10		80A
Gross Beta	Beta	6900	55	6	10		80B
Selenium 79	15758-45-9	0.13	2.9	5	10	U	SE_L
Strontium 90	10098-97-2	3.9	2.2	0.2	1		Y
Technetium 99	14133-76-7	1.1	0.15	0.3	0.5		TC
Iodine 129	15046-84-1	0.14	0.62	1	2	U	I
Uranium 233/234		38	6.8	0.6	0.3		U
Uranium 235	15117-96-1	3.1	0.90	0.3	0.3		U
Uranium 238		43	7.6	0.5	0.3		U
Total Uranium (ug/g)	7440-61-1	160	37	3	0.1		U_T
Neptunium 237	13994-20-2	0.086	0.043	0.05	0.2	J	NP
Plutonium 238	13981-16-3	0.038	0.018	0.02	0.05	J	PU
Plutonium 239/240		1.4	0.13	0.01	0.05		PU
Americium 241	14596-10-2	0.033	0.027	0.04	0.05	U	TP
Curium 244	13981-15-2	0	0.007	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	2.6				GAM
Manganese 54	13966-31-9	U		0.4		U	GAM
Iron 59	14596-12-4	U		0.8	0.05	U	GAM
Cobalt 58	13981-38-9	U		0.5	0.05	U	GAM
Cobalt 60	10198-40-0	U		0.1	0.05	U	GAM
Niobium 94	14681-63-1	U		0.4		U	GAM
Ruthenium 103	13968-53-1	U		5		U	GAM
Ruthenium 106	13967-48-1	U		30		U	GAM
Tin 113	13966-06-8	U		5		U	GAM
Cesium 134	13967-70-9	U		0.5		U	GAM
Cesium 137	10045-97-3	5900	12		0.05		GAM

Lab id	TMAN
Protocol	WHC-HASM
Version	Ver 1.0
Form	DVD-DS
Version	2.30
Report date	05/05/94

9713524.2094

TMA NORCAL

SAMPLE DELIVERY GROUP 7341

N403028-04

DATA SHEET, cont

BOBFH2

Case/SDG	93-263/7341	Client	Westinghouse Hanford
Contact	N. Joseph Verville	Contract	MBH-SVV-069262
Lab sample id	N403028-04	Client sample id	BOBFH2
Dept sample id	7341-004	Location/Matrix	216-U-8 Crib SOLID
Received	03/09/94	Collected	03/01/94
% moisture	11.4	Chain of custody id	006226

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Cerium 144	14762-78-8	U		10		U	GAM
Europium 152	14683-23-9	U		5	0.1	U	GAM
Europium 154	15585-10-1	U		4	0.1	U	GAM
Europium 155	14391-16-3	U		7	0.1	U	GAM
Radium 226	13982-63-3	U		5		U	GAM
Radium 228	15262-20-1	U		3		U	GAM
Thorium 228	14274-82-9	U		4		U	GAM
Thorium 232	7440-29-1	U		3		U	GAM

Lab id	TMAN
Protocol	WHC-HASM
Version	Ver 1.0
Form	DVD-DS
Version	2.30
Report date	05/05/94

9713524.2095

TMA NORCAL

SAMPLE DELIVERY GROUP 7341

DATA SHEET

N403028-05

B0BFH4

Case/SDG	93-263/7341	Client	Westinghouse Hanford
Contact	N. Joseph Verville	Contract	MBH-SVV-069262
Lab sample id	N403028-05	Client sample id	B0BFH4
Dept sample id	7341-005	Location/Matrix	216-U-8 Crib SOLID
Received	03/09/94	Collected	03/02/94
% moisture	6.8	Chain of custody id	006228

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Gross Alpha	Alpha	48	8.1	4	10		80A
Gross Beta	Beta	9600	65	6	10		80B
Selenium 79	15758-45-9	-2.4	1.6	3	10	U	SE_L
Strontium 90	10098-97-2	83	2.2	0.6	1		Y
Technetium 99	14133-76-7	0.93	0.12	0.3	0.5		TC
Iodine 129	15046-84-1	0.84	0.61	1	2	U	I
Uranium 233/234		30	3.4	0.3	0.3		U
Uranium 235	15117-96-1	3.3	0.57	0.1	0.3		U
Uranium 238		28	3.2	0.3	0.3		U
Total Uranium (ug/g)	7440-61-1	94	21	0.3	0.1		U_T
Neptunium 237	13994-20-2	0.025	0.017	0.02	0.2	J	NP
Plutonium 238	13981-16-3	0.030	0.017	0.02	0.05	J	PU
Plutonium 239/240		1.2	0.11	0.01	0.05		PU
Americium 241	14596-10-2	1.1	0.11	0.01	0.05		TP
Curium 244	13981-15-2	0.009	0.011	0.02	0.05	U	TP
GAMMA SCAN ANALYTES							
Sodium 22	13966-32-0	U		3		U	GAM
Potassium 40	13966-00-2	14	9.8				GAM
Manganese 54	13966-31-9	U		1		U	GAM
Iron 59	14596-12-4	U		2	0.05	U	GAM
Cobalt 58	13981-38-9	U		1	0.05	U	GAM
Cobalt 60	10198-40-0	U		0.7	0.05	U	GAM
Niobium 94	14681-63-1	U		1		U	GAM
Ruthenium 103	13968-53-1	U		10		U	GAM
Ruthenium 106	13967-48-1	U		80		U	GAM
Tin 113	13966-06-8	U		20		U	GAM
Cesium 134	13967-70-9	U		1		U	GAM
Cesium 137	10045-97-3	14000	40		0.05		GAM

Lab id	TMAN
Protocol	WHC-HASM
Version	Ver 1.0
Form	DVD-DS
Version	2.30
Report date	05/05/94

TMA NORCAL

SAMPLE DELIVERY GROUP 7341

N403028-05

DATA SHEET, cont

B0BFH4

Case/SDG	93-263/7341	Client	Westinghouse Hanford
Contact	N. Joseph Verville	Contract	MBH-SVV-069262
Lab sample id	N403028-05	Client sample id	B0BFH4
Dept sample id	7341-005	Location/Matrix	216-U-8 Crib SOLID
Received	03/09/94	Collected	03/02/94
% moisture	6.8	Chain of custody id	006228

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Cerium 144	14762-78-8	U		30		U	GAM
Europium 152	14683-23-9	U		10	0.1	U	GAM
Europium 154	15585-10-1	5.1	2.8		0.1		GAM
Europium 155	14391-16-3	U		20	0.1	U	GAM
Radium 226	13982-63-3	U		10		U	GAM
Radium 228	15262-20-1	U		4		U	GAM
Thorium 228	14274-82-9	U		10		U	GAM
Thorium 232	7440-29-1	U		4		U	GAM

Lab id	TMAN
Protocol	WHC-HASM
Version	Ver 1.0
Form	DVD-DS
Version	2.30
Report date	05/05/94

EMERGENCY CONTACT: (509) 373-3800 ERG #61 Attached

OFFSITE RADIOACTIVE SHIPMENT RECORD

– EXTERIOR INSPECTION PERMITTED –

19708

SHIPPING INST.

SHIP TO:
Company: TMA/NORCAL
Address: 2030 Wright Ave.
City, State, Zip: Richmond, CA 94804
Attention: Delores Sanchez

Contractor: ☐ PNL ☐ KEH ☒ WHC
Site Carrier: JM Steele
PR No. 64432 Veh. No. 4558

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. ☐ 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. Limited Quantity of Material ☒ UN 2910

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 > 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) °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 49CFR173.421 Authorization No. N/A

No. Pkgs.	Model Package	COC/Spec. No.	Serial No.	Seal No.	Isotopes	Curies/Pkg	T.I.	Gr. Wt.
1	Poly Cooler	N/A	SML394	Tape Applied	Cs-137, Sr-90	48.72 μCi	NA	53 lbs
	(Strong Tight)	* LTD QTY STATEMENT IN COOLER						
	SAF 93-263	COC # 006481, # 006484						
	(7) 250 mL bottles, (8) 125 mL bottles, (2) 1000 mL bottles							
(Shipper may describe package in detail on one of unused lines above)					TOTAL	48.72 μCi	NA	53 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: 3/3/94 Organization: Sampling & Mobile Labs Complete Cost Code (inc. end function): 12911 / PT2WA

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) N/A

Additional Data and Instructions (inc. Readings on Internal Packaging): SURVEY CONTAINER ONLY TRUCK LOAD INFO N/A

Signature - Radiation Monitoring: [signature] Bldg. 2025 PNNL Survey No. 167479 Date 3/3/94

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 ▶ M. A. Sams Printed Name ▶ M. A. SAMS Date ▶ 3-3-94

APPROVED FOR OFFSITE SHIPMENT

TRAFFIC

B. L. No. RMW-8509 Date Shipped 3/3/94 E.T.A. 3/4/94 Routing FED-X ☐ N/A
Surveyed By [signature] Date 3-3-94 Approved for Shipment Westinghouse Hanford Company [signature] Date 3/3/94
Placards ☐ Yes ☒ No
Route Plan ☐ Yes ☒ No

*U.S. GPO: 1992-791-064/80001 54-6000-088 (10/88)

EMERGENCY CONTACT (509) 373-3800 ERG #61 Attached

OFFSITE RADIOACTIVE SHIPMENT RECORD

– EXTERIOR INSPECTION PERMITTED –

19709

SHIPPING INST.

Company: TMA Norcal
Address: 2030 Wright Ave.
City, State, Zip: Richmond, CA 94804
Attention: Delores Sanchez

Contractor: ☐ PNL ☐ KEH ☒ WHC
Site Carrier: DL Edwards
PR No. 82800 Veh. No.

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. ☐ 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. Limited Quantity of Material ☒ UN2910

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. 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) °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 49CFR173.421 Authorization No. N/A

No. Pkgs.	Model Package	COC/Spec. No.	Serial No.	Seal No.	Isotopes	Curies/Pkg	T.I.	Gr. Wt.
1	Poly Cooler (Strong Tight)	N/A	SML530	Tape Applied	Cs-137, Sr-90	.115mCi	N/A	36 lbs
	* LTD. QTY. STATEMENT IN COOLER *							
	Cooler Contains: (4) 250 ml bottles, (4) 125 ml bottles, (1) 1000 ml bottle							
	SAF: 93-263 COC # 006225							
	(Shipper may describe package in detail on one of unused lines above)				TOTAL	.115mCi	N/A	36 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: 3/4/94 Organization: Sampling + Mobile Labs Complete Cost Code (inc. end function): 12910 / PT2WA

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) N/A

Additional Data and Instructions (inc. Readings on Internal Packaging): TRUCK LOAD INFORMATION DOES NOT APPLY*

Signature - Radiation Monitoring: [signature] Bldg. 2025 ANNEX Survey No. 167489 Date 3/4/94

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 ▸ 3-4-94

APPROVED FOR OFFSITE SHIPMENT

TRAFFIC

B. L. No. RMW-8514 Date Shipped 3/4/94 E.T.A. 3/5/94 Routing FED X SAT. DEL. ☐ N/A Placards ☐ Yes ☒ No
Surveyed By [signature] Date 3-4-94 Approved for Shipment Westinghouse Hanford Company [signature] Date 3/4/94 Route Plan ☐ Yes ☒ No

*U.S. GPO: 1992-791-064/80001 54-6000-088 (10/88)

EMERG PHONE # (509) 373-3800 ERG #61 ATTACHED

OFFSITE RADIOACTIVE SHIPMENT RECORD

– EXTERIOR INSPECTION PERMITTED –

19711

SHIPPING INST.

SHIP TO:

Company: TMA/NorCAL

Address: 2030 Wright Ave.

City, State, Zip: Richmond, CA 94804

Attention: Delores Sanchez

Contractor: ☐ PNL ☐ KEH ☒ WHC

Site Carrier: RZ Stoffler ~~DL EDWARDS~~ RC 3/8/94

PR No. C 358 ~~92800~~ DLE

Veh. No. ~~#929~~ 68B4626 DLE 3/8/94

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 Excepted Package	☐ UN 2908
2. Low Specific Activity, n.o.s	☐ UN 2912
3. Limited quantity, n.o.s.	☐ 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. Limited Quantity of Material, 7	☒ UN 2910

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. Req. ☐ NA ☒

Pu, EU > 1 g ☐ N/A NU, DU > 1 Kg ☐ N/A

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 173.421 Authorization No. N/A

No. Pkgs.	Model Package	COC/Spec. No.	Serial No.	Seal No.	Isotopes	Curies/Pkg	T.I.	Gr. Wt.
1	Poly Cooler (Strong Tight)	NA	SMI-441	Tape Applied	Cs-137, Sr-90	~~515 uCi~~ 151.3 uCi	NA	49 LBS
	*Ltd Qty Statement in Cooler							
	Cooler Contains: (10) 250 ML bottles, (12) 125 mL bottles (3) 1000 mL bottles; SAF 93-263; COC #006228, 006226, ~~006227~~ DLE 3-8					151.3 uC		
	(Shipper may describe package in detail on one of unused lines above)				TOTAL	~~515 uCi~~ 151.3 uCi	NA	49 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: Samuel D. Edwards Date: 3-8-94 Organization: Sampling & Mobile Labs Complete Cost Code (inc. end function): 12910 / PT2WA

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) N/A

Additional Data and Instructions (inc. Readings on Internal Packaging): TRUCK LOAD INFO N/A

Signature - Radiation Monitoring: S.J. [illegible] Bldg. 202S ANNEX Survey No. 167506 Date 3/8/94

APPROVAL

AUTHORIZATION FOR SHIPMENT

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: NA

Traffic has inspected and verified preshipment compliance to DOT regulations.

Authorized Signature: M. A. Sams Printed Name: M.A. SAMS Date: 3-8-94

APPROVED FOR OFFSITE SHIPMENT

TRAFFIC

B. L. No. RMW-8519 Date Shipped 3/8/94 E.T.A. 3/9/94 Routing FED X ☐ N/A

Placards ☐ Yes ☒ No

Surveyed By [illegible] Date 3-8-94 Approved for Shipment Westinghouse Hanford Company [illegible] Date 3/8/94

Route Plan ☐ Yes ☒ No

82

9713524.2100

FEDERAL EXPRESS

QUESTIONS? CALL 800-238-5355 TOLL FREE.

AIRBILL PACKAGE TRACKING NUMBER 4230853911

4230853911

RECIPIENT'S COPY

Date 3-8-94

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 509-373-3300)

City: RICHLAND State: WA ZIP Required: 9 9 3 5 2

To (Recipient's Name) Please Print: DELORES SANCHEZ

Recipient's Phone Number (Very Important): ( )

Company: TMA / NORCAL

Department/Floor No.

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-8519 RADIOACTIVE MATERIAL, EXCEPTED PACKAGE - LIMITED QUANTITY OF MATERIAL
12910 PIZMA DOT EMERGENCY RESPONSE GUIDE #61 ATTACHED

IF HOLD FOR PICK-UP, Print FEDEX Address Here (Not available at all locations)
Street Address
City State ZIP Required

PAYMENT: 1 [X] Bill Sender 2 [ ] Bill Recipient's FedEx Acct. No. 3 [ ] Bill Other 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 (Not available at all locations)
2 [ ] DELIVER WEEKDAY
3 DELIVER SATURDAY (Extra charge) (Not available to all locations) [ ]
4 [X] DANGEROUS GOODS (Extra charge)
5 [ ] DRY ICE ____ Lbs.
- Dangerous Goods Shipper's Declaration not required
- Dry Ice, UN 1845, ____ x ____ kg. III
7 [ ] OTHER SPECIAL SERVICE
11 [ ]
12 [ ] HOLIDAY DELIVERY (If offered) (Extra charge)

Packages	Weight in Pounds Only
1	49
Total 1	Total 49

DIM SHIPMENT (Chargeable Weight) ____ lbs.

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

FedEx Emp. No.

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

SIGNATURE RELEASE UNAVAILABLE

Date/Time

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

REVISION DATE 2/91
PART # 137211 MBF-1/9
FORMAT #069
069
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9213524.2101

FEDERAL EXPRESS

QUESTIONS? CALL 800-238-5355 TOLL FREE.

AIRBILL PACKAGE TRACKING NUMBER 4230853874

4230853874

RECIPIENT'S COPY

Date 3-4-94

From (Your Name) Please Print: G.O. BONESS

Your Phone Number (Very important): (509) 376-7627

Department/Floor No.

Company: DOE/WESTINGHOUSE HANFORD

Street Address: 1100 AREA 1163 BLDG (EMERGENCY CONTACT PHONE NUMBER 509-373-3800)

City: RICHLAND State: WA ZIP Required: 9 9 3 5 2

To (Recipient's Name) Please Print: DELORES SANCHEZ

Recipient's Phone Number (Very important): ( )

Department/Floor No.

Company: TMA / NORCAL

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.)

RMH-8514 RADIOACTIVE MATERIAL, EXCEPTED PACKAGE - LIMITED QUANTITY OF MATERIAL DOT EMERGENCY RESPONSE GUIDE #61 ATTACHED

IF HOLD FOR PICK-UP, Print FEDEX Address Here (Not available at all locations)

Street Address

City State ZIP Required

PAYMENT: 1 ☐ 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.

DELIVERY AND SPECIAL HANDLING (Check services required)

1 ☐ HOLD FOR PICK-UP (Fill in Box H)

2 ☐ DELIVER WEEKDAY

3 DELIVER SATURDAY (Extra charge) *Not available to all locations [X]

4 [X] DANGEROUS GOODS (Enclosed)

6 ☐ DRY ICE ____ Lbs.

- Dangerous Goods Shipper's Declaration not required
- Dry Ice, 9, UN 1845.

____ x ____ kg. ☐

7 ☐ OTHER SPECIAL SERVICE

11 ☐

12 ☐ HOLIDAY DELIVERY (If offered) (Extra charge)

PACKAGES	WEIGHT In Pounds Only
1	36
Total 1	Total 36

DIM SHIPMENT (Chargeable Weight) ☐ ____ lbs.

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

FedEx Emp. No. Date/Time

INSTRUCTIONS (Mark appropriate boxes)

- Dangerous Goods as per attached Shipper's Declaration ☐
- Dangerous Goods Shipper's Declaration not required [X]
- Cargo Aircraft only ☐

Emp. No. Date

☐ Cash Received

☐ Return Shipment

☐ Third Party ☐ Chg. To Dest. ☐ Chg. To Hold

Street Address

City State Zip

Received By: X

Date/Time Received FedEx Employee Number

SIGNATURE RELEASE UNAVAILABLE

Federal Express Use

Base Charges

Declared Value Charge

Other 1

Other 2

Total Charges

REVISION DATE 2/91 PART # 137211 FORMAT #069 MB 1

069

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9713524.2102

FEDERAL EXPRESS

[redacted] of 2

QUESTIONS? CALL 800-238-5355 TOLL FREE.

AIRBILL PACKAGE TRACKING NUMBER 4230853830

4230853830

RECIPIENT'S COPY

Date 3-3-94

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 / MORCAL

Department/Floor No.

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.)

RMH-8509 RADIOACTIVE MATERIAL, EXCEPTED PACKAGE - LIMITED QUANTITY
12911/PT2M 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

4 SERVICES (Check only one box)

Priority Overnight (Delivery by next business morning) 11 [X]

Standard Overnight (Delivery by last business afternoon) 51 [ ]

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

Government Overnight (Available above 48 states only) [ ]

Freight Service (for Extra Large or any lbs. over 150 lbs.) 70 [ ] OVERNIGHT FREIGHT** 80 [ ] TWO-DAY FREIGHT**

† Delivery commitment may be later in some areas.

**Declared Value Limit $100.

*Call for delivery schedule.

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)

5 [ ] DRY ICE ____ Lbs.

- Dangerous Goods Shipper's Declaration not required
- Dry Ice, 9, UN 1845,

____ x ____ kg. III

7 [ ] OTHER SPECIAL SERVICE

11 [ ]

12 [ ] HOLIDAY DELIVERY (If offered) (Extra charge)

PACKAGES	WEIGHT In Pounds Only
1	53
Total 1	Total 53

DIM SHIPMENT (Chargeable Weight) [ ] ____ lbs.

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

FedEx Emp. No.

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

Date/Time

SIGNATURE RELEASE UNAVAILABLE

Federal Express Use

Base Charges

Declared Value Charge

Other 1

Other 2

Total Charges

REVISION DATE 2/91 PART # 137211 FORMAT #069 MBF 1/9

069

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INSTRUCTIONS (Mark appropriate boxes)

- Dangerous Goods as per attached Shipper's Declaration [ ]
- Dangerous Goods Shipper's Declaration not required [X]
- Cargo Aircraft only [ ]

9713524.2103

B0BFF9-TMA-726

MEMORANDUM

JUN 1994 RECEIVED TQO

TO: 200-UP-2 Project QA Record

June 10, 1994

FR: Susan Winter, Golder Associates Inc.

RE: RADIOCHEMISTRY DATA VALIDATION SUMMARY FOR DATA PACKAGE: B0BFF9-TMA-726 (923-E418, Filename B0BFF9R.UP2)

INTRODUCTION

This memo presents the results of data validation on data package B0BFF9-TMA-726 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
B0BFF9	02/24/94	SOIL	SEE NOTE 1
B0BFG2	02/25/94	SOIL	
B0BFH1	02/25/94	SOIL	
B0BFH2	03/01/94	SOIL	
B0BFH4	03/02/94	SOIL	
B0BFH5	03/02/94	SOIL	
B0BFH6	03/02/94	SOIL	
B0BFH8	03/02/94	SOIL	
B09WF8	03/02/94	SOIL	

RECEIVED JUN 13 1994 VALIDATION DOCUMENTATION SDLA

Note 1. All samples were analyzed for gross alpha, gross beta, selenium-79, strontium-90, technetium-99, iodine-129, alpha spectroscopy (uranium 233/234, uranium 235, uranium-238, plutonium-238, plutonium-239/240, americium-241, and curium-244), total uranium, and 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 with the exception of the deficiencies identified below.

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

Sample Result Verification. All sample results were supported in the raw data with the exception of the gross beta results for samples B0BFH2 and B0BFH4. The associated results have been corrected on the laboratory report forms as a result of the recalculations.

Detection Limits. Detection limit goals were met for all results with the exception of the following analytes summarized in the table below. The detection limit goals were exceeded due to required dilutions performed for total uranium, a low efficiency detector for isotopic uranium and limited sample amounts for gamma spectroscopy analytes.

SAMPLE ID	ANALYTE	MDA (pCi/g)	RDL (pCi/g)
B0BFF9	TOTAL URANIUM	0.3 (µg/g)	0.1 (µg/g)
	IRON-59	0.1	0.05
	COBALT-58	0.06	0.05
	COBALT-60	0.06	0.05
	CESIUM-137	0.06	0.05
	EUROPIUM-152	0.2	0.1
	EUROPIUM-155	0.3	0.1
B0BFG2	TOTAL URANIUM	0.3 (µg/g)	0.1 (µg/g)
	IRON-59	0.2	0.05
	COBALT-58	0.1	0.05
	EUROPIUM-152	2	0.1
	EUROPIUM-154	1	0.1
	EUROPIUM-155	2	0.1
B0BFH1	TOTAL URANIUM	0.3 (µg/g)	0.1 (µg/g)
	IRON-59	5	0.05
	COBALT-58	3	0.05
	COBALT-60	1	0.05
	EUROPIUM-152	20	0.1
	EUROPIUM-154	10	0.1
	EUROPIUM-155	20	0.1
B0BFH2	TOTAL URANIUM	3 (µg/g)	0.1 (µg/g)
	URANIUM-233/234	0.6	0.3
	URANIUM-238	0.5	0.3
	IRON-59	0.8	0.05
	COBALT-58	0.5	0.05
	COBALT-60	0.1	0.05
	EUROPIUM-152	5	0.1
	EUROPIUM-154	4	0.1
	EUROPIUM-155	7	0.1
B0BFH4	TOTAL URANIUM	0.3 (µg/g)	0.1 (µg/g)
	IRON-59	2	0.05
	COBALT-58	1	0.05
	COBALT-60	0.7	0.05
	EUROPIUM-152	10	0.1
	EUROPIUM-155	20	0.1
B0BFH5	IRON-59	0.1	0.05
	EUROPIUM-155	0.2	0.1
B0BFH6	IRON-59	0.1	0.05
	COBALT-58	0.06	0.05
	EUROPIUM-155	0.2	0.1
B0BFH8	IRON-59	0.1	0.05

revised [illegible] 6/17/94

SAMPLE ID	ANALYTE	MDA (pCi/g)	RDL (pCi/g)
B09WF8	AMERICIUM-241	0.6	0.05
	CURIUM-244	0.7	0.05
	IRON-59	0.2	0.05
	COBALT-58	0.07	0.05
	COBALT-60	0.1	0.05
	EUROPIUM-152	0.3	0.1
	EUROPIUM-154	0.2	0.1
	EUROPIUM-155	0.3	0.1

Completeness. The data package was complete for all requested analyses. A total of nine samples were validated in this data package with a total of 315 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.

Continuing Calibration

- The efficiency calibration checks for iodine-129 were performed more than one month from the date of sample analysis. Attachments 2 and 5 provide a summary of the samples affected, data qualifications applied and supporting documentation.

Laboratory Blanks

- Neptunium-237 was present in the laboratory blank at a positive concentration. Attachments 2 and 5 provide a summary of the samples affected, data qualifications applied and supporting documentation.

Accuracy

- Americium-243 tracer recovery for sample B0BFF9 was unacceptable. Therefore, the americium-241 and curium-244 results for the associated sample have been qualified as estimated (UJ).

Precision

- The duplicate results for uranium-238, radium-228 and thorium-232 were unacceptable. Attachments 2 and 5 provide a summary of the samples affected, data qualifications applied and supporting documentation.

Gamma Spectroscopy

- Samples B0BFH1, B0BFH4, B09WF8, and B0BFH5 duplicate were analyzed in different geometries than the associated blank and laboratory control samples for the gamma spectroscopy analysis. Attachments 2 and 5 provide a summary of the affected sample results, 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 Radiochemical Analyses, WHC-SD-EN-SPP-001, Rev. 1, 1993. Westinghouse Hanford Company, Richland, Washington.

9713524.2107

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.

9713524.2109

ATTACHMENT 2

SUMMARY OF DATA QUALIFICATIONS

DATA QUALIFICATION SUMMARY

SDG: B0BFF9-TMA-726	VALIDATOR: [illegible]	DATE: June 6, 1994	PAGE 1 OF 1
COMMENTS: RADIOCHEMISTRY			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
IODINE-129	J - DETECTS UJ - NONDETECTS	B0BFH2 B0BFH4 QC-LCS QC-BLANK B0BFF9 DUPLICATE	CALIBRATION CHECKS WERE PERFORMED MORE THAN ONE MONTH PRIOR TO SAMPLE ANALYSIS
AMERICIUM-241	UJ	B0BFF9	TRACER %R < 20% BUT > 5%
CURIUM-244	UJ	B0BFF9	TRACER %R < 20% BUT > 5%
URANIUM-238	J	B0BFF9 B0BFG2 B0BFH1 B0BFH2 B0BFH4	DUPLICATE RPD > 35% AND SAMPLE RESULT > 5xRDL
RADIUM-228	J - DETECTS UJ - NONDETECTS	B0BFF9 B0BFG2 B0BFH1 B0BFH2 B0BFH4	DUPLICATE RPD > 35% AND SAMPLE RESULT > 5xMDA FOR BLANK
THORIUM-232	J - DETECTS UJ - NONDETECTS	B0BFF9 B0BFG2 B0BFH1 B0BFH2 B0BFH4	DUPLICATE RPD > 35% AND SAMPLE RESULT > 5xMDA FOR BLANK
NEPTUNIUM-237	J	B0BFH6 B0BFH8 B09WF8	PRESENT IN BLANK AT A POSITIVE CONCENTRATION
ALL GAMMA SPECTROSCOPY ANALYTES	J - DETECTS UJ - NONDETECTS	B0BFH1 B0BFH4 B09WF8 B0BFH5 DUPLICATE	SAMPLES WERE ANALYZED IN DIFFERENT GEOMETRIES THAN THE ASSOCIATED BLANK AND LCS

9713524.2111

ATTACHMENT 3

QUALIFIED DATA SUMMARY AND ANNOTATED LABORATORY REPORTS

Validated Data Summary, Data Package: B0BFF9-TMA-726

	Samp#	B09WF8		B0BFF9		B0BFG2		B0BFH1		B0BFH2		B0BFH4	
	Date	3-2-94		2-24-94		2-25-94		2-25-94		3-1-94		3-2-94	
	Location	---		216-U-8		216-U-8		---		---		---	
	Depth	---		---		---		---		---		---	
	Type	SOIL		SOIL		SOIL		SOIL		SOIL		SOIL	
	Comments	---		---		---		---		---		---	
Parameter	Units	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
GROSS ALPHA	pCi/g	180.000		9.700		20.000		75.000		72.000		48.000	
GROSS BETA	pCi/g	110.000		410.000		3000.000		24000.000		6800.000		9400.000	
SELENIUM-79	pCi/g	2.000	U	3.000	U	5.000	U	3.000	U	5.000	U	3.000	U
STRONTIUM-90	pCi/g	40.000		180.000		81.000		15.000		3.900		83.000	
TECHNETIUM-99	pCi/g	0.400	U	0.880		1.600		2.400		1.100		0.930	
IODINE-129	pCi/g	2.000	U	2.000	U	2.000	U	2.000	U	1.000	UJ	1.000	UJ
URANIUM-233/234	pCi/g	0.870		1.800		9.900		21.000		38.000		30.000	
URANIUM-235	pCi/g	0.180		0.100	U	1.100		1.600		3.100		3.300	
URANIUM-238	pCi/g	1.100		1.600	J	8.400	J	21.000	J	43.000	J	28.000	J
TOTAL URANIUM	ug/g	3.000		7.900		33.000		97.000		160.000		94.000	
NEPTUNIUM-237	pCi/g	0.045	J	0.020	U	0.023		0.020	U	0.086		0.025	
PLUTONIUM-238	pCi/g	0.410		0.010	U	0.010	U	0.300		0.038		0.030	
PLUTONIUM-239/240	pCi/g	0.430		0.020	U	0.039		12.000		1.400		1.200	
AMERICIUM-241	pCi/g	200.000		0.030	UJ	0.020	U	0.200		0.040	U	1.100	
CURIUM-244	pCi/g	0.700	U	0.040	UJ	0.020	U	0.010	U	0.030	U	0.020	U
SODIUM-22	pCi/g	0.090	UJ	0.050	U	0.060	U	1.000	UJ	0.300	U	3.000	UJ
POTASSIUM-40	pCi/g	7.200	J	9.900		11.000		14.000	J	11.000		14.000	J
MANGANESE-54	pCi/g	0.070	UJ	0.050	U	0.100	U	2.000	UJ	0.400	U	1.000	UJ
IRON-59	pCi/g	0.200	UJ	0.100	U	0.200	U	5.000	UJ	0.800	U	2.000	UJ
COBALT-58	pCi/g	0.070	UJ	0.060	U	0.100	U	3.000	UJ	0.500	U	1.000	UJ
COBALT-60	pCi/g	0.100	UJ	0.060	U	0.050	U	1.000	UJ	0.100	U	0.700	UJ
NIOBIUM-94	pCi/g	0.060	UJ	0.050	U	0.100	U	2.000	UJ	0.400	U	1.000	UJ
RUTHENIUM-103	pCi/g	0.100	UJ	0.060	U	2.000	U	20.000	UJ	5.000	U	10.000	UJ
RUTHENIUM-106	pCi/g	0.700	UJ	0.400	U	6.000	U	80.000	UJ	30.000	U	80.000	UJ
TIN-113	pCi/g	0.100	UJ	0.060	U	2.000	U	20.000	UJ	5.000	U	20.000	UJ
CESIUM-134	pCi/g	0.080	UJ	0.070	U	0.100	U	3.000	UJ	0.500	U	1.000	UJ
CESIUM-137	pCi/g	5.000	J	0.060	U	2500.000		28000.000	J	5900.000		14000.000	J
CERIUM-144	pCi/g	0.500	UJ	0.400	U	4.000	U	40.000	UJ	10.000	U	30.000	UJ
EUROPIUM-152	pCi/g	0.300	UJ	0.200	U	2.000	U	20.000	UJ	5.000	U	10.000	UJ
EUROPIUM-154	pCi/g	0.200	UJ	0.100	U	1.000	U	10.000	UJ	4.000	U	5.100	J
EUROPIUM-155	pCi/g	0.300	UJ	0.300	U	2.000	U	20.000	UJ	7.000	U	20.000	UJ
RADIUM-226	pCi/g	0.370	J	0.370		1.000	U	20.000	UJ	5.000	U	10.000	UJ
RADIUM-228	pCi/g	0.550	J	0.460	J	0.790	J	9.000	UJ	3.000	UJ	4.000	UJ
THORIUM-228	pCi/g	0.290	J	0.540		1.000	U	20.000	UJ	4.000	U	10.000	UJ
THORIUM-232	pCi/g	0.550	J	0.460	J	0.790	J	9.000	UJ	3.000	UJ	4.000	UJ

9713524.2112

Verified
6/10/94

0010

Validated Data Summary, Data Package: B0BFF9-TMA-726

	Samp#	B0BFH5		B0BFH6		B0BFH8	
	Date	3-2-94		3-2-94		3-2-94	
	Location	---		---		---	
	Depth	---		---		---	
	Type	SOIL		SOIL		SOIL	
	Comments	---		---		---	
Parameter	Units	Result	Q	Result	Q	Result	Q
GROSS ALPHA	pCi/g	12.000		15.000		13.000	
GROSS BETA	pCi/g	40.000		62.000		22.000	
SELENIUM-79	pCi/g	3.000	U	3.000	U	4.000	U
STRONTIUM-90	pCi/g	1.500		19.000		0.700	U
TECHNETIUM-99	pCi/g	0.140		0.630		0.300	U
IODINE-129	pCi/g	2.000	U	1.000	U	1.000	U
URANIUM-233/234	pCi/g	2.900		2.800		0.720	
URANIUM-235	pCi/g	0.250		0.280		0.200	U
URANIUM-238	pCi/g	2.900		2.900		0.490	
TOTAL URANIUM	ug/g	7.800		7.500		1.500	
NEPTUNIUM-237	pCi/g	0.020	U	0.022	J	0.035	J
PLUTONIUM-238	pCi/g	0.030	U	0.010	U	0.010	U
PLUTONIUM-239/240	pCi/g	0.030		0.010		0.045	
AMERICIUM-241	pCi/g	0.030	U	0.030	U	0.030	U
CURIUM-244	pCi/g	0.030	U	0.030	U	0.030	U
SODIUM-22	pCi/g	0.050	U	0.060	U	0.060	U
POTASSIUM-40	pCi/g	12.000		12.000		13.000	
MANGANESE-54	pCi/g	0.040	U	0.050	U	0.050	U
IRON-59	pCi/g	0.100	U	0.100	U	0.100	U
COBALT-58	pCi/g	0.050	U	0.060	U	0.050	U
COBALT-60	pCi/g	0.040	U	0.050	U	0.050	U
NIOBIUM-94	pCi/g	0.040	U	0.040	U	0.040	U
RUTHENIUM-103	pCi/g	0.090	U	0.070	U	0.070	U
RUTHENIUM-106	pCi/g	0.500	U	0.500	U	0.400	U
TIN-113	pCi/g	0.100	U	0.070	U	0.070	U
CESIUM-134	pCi/g	0.050	U	0.060	U	0.050	U
CESIUM-137	pCi/g	8.900		2.900		1.700	
CERIUM-144	pCi/g	0.400	U	0.300	U	0.200	U
EUROPIUM-152	pCi/g	0.100	U	0.100	U	0.100	U
EUROPIUM-154	pCi/g	0.100	U	0.080	U	0.070	U
EUROPIUM-155	pCi/g	0.200	U	0.200	U	0.100	U
RADIUM-226	pCi/g	0.610		0.550		0.570	
RADIUM-228	pCi/g	0.740		0.840		0.860	
THORIUM-228	pCi/g	0.780		0.700		0.930	
THORIUM-232	pCi/g	0.740		0.840		0.860	

Verified
[illegible] 6/10/94

9713524.2113

9713524.2114

TMA NORCAL

SAMPLE DELIVERY GROUP 7342

N403051-04

B09WF8

DATA SHEET

SDG 7342 Client Westinghouse Hanford
Contact N. Joseph Verville Contract MBH-SVV-069262

Lab sample id N403051-04 Client sample id B09WF8
Dept sample id 7342-004 Location/Matrix 216-U-8 Crib SOLID
Received 03/07/94 Collected 03/02/94
% moisture 3.7 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	180	15	4	10		80A
Gross Beta	Beta	110	8.2	6	10		80B
Selenium 79	15758-45-9	-5.4	1.3	2	10	U	SE_L
Strontium 90	10098-97-2	40	4.4	0.8	1		Y
Technetium 99	14133-76-7	0.095	0.14	0.4	0.5	U	TC
Iodine 129	15046-84-1	-0.27	0.77	2	2	U	I
Uranium 233/234		0.87	0.25	0.1	0.3		U
Uranium 235	15117-96-1	0.18	0.097	0.1	0.3	J	U
Uranium 238		1.1	0.29	0.1	0.3		U
Total Uranium (ug/g)	7440-61-1	3.0	0.61	0.03	0.1		U_T
Neptunium 237	13994-20-2	0.045	0.026	0.03	0.2	J	NP
Plutonium 238	13981-16-3	0.41	0.057	0.02	0.05		PU
Plutonium 239/240		0.43	0.060	0.01	0.05		PU
Americium 241	14596-10-2	200	110	0.6	0.05		TP
Curium 244	13981-15-2	-0.041	0.33	0.7	0.05	U	TP
GAMMA SCAN ANALYTES							
Sodium 22	13966-32-0	U		0.09		U	GAM
Potassium 40	13966-00-2	7.2	1.1				GAM
Manganese 54	13966-31-9	U		0.07		U	GAM
Iron 59	14596-12-4	U		0.2	0.05	U	GAM
Cobalt 58	13981-38-9	U		0.07	0.05	U	GAM
Cobalt 60	10198-40-0	U		0.1	0.05	U	GAM
Niobium 94	14681-63-1	U		0.06		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		0.08		U	GAM
Cesium 137	10045-97-3	5.0	0.22		0.05		GAM

Verified

5/31/94

Lab id TMAN
Protocol WHC-HASM
Version Ver 1.0
Form DVD-DS
Version 2.30
Report date 05/04/94

9713524.2115

TMA NORCAL

SAMPLE DELIVERY GROUP 7342

N403051-04

DATA SHEET, cont

B09WF8

SDG	7342	Client	Westinghouse Hanford
Contact	N. Joseph Verville	Contract	MBH-SVV-069262
Lab sample id	N403051-04	Client sample id	B09WF8
Dept sample id	7342-004	Location/Matrix	216-U-8 Crib SOLID
Received	03/07/94	Collected	03/02/94
% moisture	3.7	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		0.3	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	0.37	0.17				GAM
Radium 228	15262-20-1	0.55	0.34				GAM
Thorium 228	14274-82-9	0.29	0.12				GAM
Thorium 232	7440-29-1	0.55	0.34				GAM

Q

Verified

5/31/94

Lab id TMAN
Protocol WHC-HASM
Version Ver 1.0
Form DVD-DS
Version 2.30
Report date 05/04/94

0013

9713524.2116

TMA NORCAL

SAMPLE DELIVERY GROUP 7341

N403028-01

DATA SHEET

B0BFF9

Case/SDG	93-263/7341	Client	Westinghouse Hanford
Contact	N. Joseph Verville	Contract	MBH-SVV-069262
Lab sample id	N403028-01	Client sample id	B0BFF9
Dept sample id	7341-001	Location/Matrix	216-U-8 Crib SOLID
Received	03/04/94	Collected	02/24/94
% moisture	3.3	Chain of custody id	006481

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Gross Alpha	Alpha	9.7	5.1	4	10	~~U~~	80A
Gross Beta	Beta	410	14	6	10		80B
Selenium 79	15758-45-9	-5.3	2.0	3	10	U	SE_L
Strontium 90	10098-97-2	180	12	0.6	1		Y
Technetium 99	14133-76-7	0.88	0.14	0.4	0.5		TC
Iodine 129	15046-84-1	0.13	0.77	2	2	U	I
Uranium 233/234		1.8	0.39	0.1	0.3		U
Uranium 235	15117-96-1	0.051	0.068	0.1	0.3	U	U
Uranium 238		1.6	0.36	0.1	0.3	—	U
Total Uranium (ug/g)	7440-61-1	7.9	1.8	0.3	0.1		U_T
Neptunium 237	13994-20-2	0.004	0.008	0.02	0.2	U	NP
Plutonium 238	13981-16-3	0.003	0.003	0.01	0.05	U	PU
Plutonium 239/240		-0.002	0.007	0.02	0.05	U	PU
Americium 241	14596-10-2	0.007	0.015	0.03	0.05	~~U~~	TP
Curium 244	13981-15-2	0	0.015	0.04	0.05	~~U~~	TP
GAMMA SCAN ANALYTES							
Sodium 22	13966-32-0	U		0.05		U	GAM
Potassium 40	13966-00-2	9.9	0.89				GAM
Manganese 54	13966-31-9	U		0.05		U	GAM
Iron 59	14596-12-4	U		0.1	0.05	U	GAM
Cobalt 58	13981-38-9	U		0.06	0.05	U	GAM
Cobalt 60	10198-40-0	U		0.06	0.05	U	GAM
Niobium 94	14681-63-1	U		0.05		U	GAM
Ruthenium 103	13968-53-1	U		0.06		U	GAM
Ruthenium 106	13967-48-1	U		0.4		U	GAM
Tin 113	13966-06-8	U		0.06		U	GAM
Cesium 134	13967-70-9	U		0.07		U	GAM
Cesium 137	10045-97-3	U		0.06	0.05	U	GAM

Verified

Lab id	TMAN
Protocol	WHC-HASM
Version	Ver 1.0
Form	DVD-DS
Version	2.30
Report date	05/05/94

6/3/94

9713524.2117

TMA NORCAL

SAMPLE DELIVERY GROUP 7341

N403028-01

DATA SHEET, cont

B0BFF9

Case/SDG	93-263/7341	Client	Westinghouse Hanford
Contact	N. Joseph Verville	Contract	MBH-SVV-069262
Lab sample id	N403028-01	Client sample id	B0BFF9
Dept sample id	7341-001	Location/Matrix	216-U-8 Crib SOLID
Received	03/04/94	Collected	02/24/94
% moisture	3.3	Chain of custody id	006481

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	0.37	0.092				GAM
Radium 228	15262-20-1	0.46	0.19			—	GAM
Thorium 228	14274-82-9	0.54	0.056				GAM
Thorium 232	7440-29-1	0.46	0.19			—	GAM

Verified

6/3/94

Lab id TMAN
Protocol WHC-HASM
Version Ver 1.0
Form DVD-DS
Version 2.30
Report date 05/05/94

0015

DATA SHEETS
Page 2
SUMMARY DATA SECTION
Page 19

9713524.2113

TMA NORCAL

SAMPLE DELIVERY GROUP 7341

N403028-02

DATA SHEET

B0BFG2

Case/SDG	93-263/7341	Client	Westinghouse Hanford
Contact	N. Joseph Verville	Contract	MBH-SVV-069262
Lab sample id	N403028-02	Client sample id	B0BFG2
Dept sample id	7341-002	Location/Matrix	216-U-8 Crib SOLID
Received	03/04/94	Collected	02/25/94
% moisture	4.2	Chain of custody id	006484

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Gross Alpha	Alpha	20	5.1	4	10		80A
Gross Beta	Beta	3000	36	6	10		80B
Selenium 79	15758-45-9	-2.8	3.1	5	10	U	SE_L
Strontium 90	10098-97-2	81	7.3	0.6	1		Y
Technetium 99	14133-76-7	1.6	0.14	0.3	0.5		TC
Iodine 129	15046-84-1	-0.083	0.80	2	2	U	I
Uranium 233/234		9.9	1.3	0.2	0.3		U
Uranium 235	15117-96-1	1.1	0.30	0.1	0.3		U
Uranium 238		8.4	1.1	0.2	0.3	—	U
Total Uranium (ug/g)	7440-61-1	33	7.2	0.3	0.1		U_T
Neptunium 237	13994-20-2	0.023	0.017	0.02	0.2	J	NP
Plutonium 238	13981-16-3	0.005	0.007	0.01	0.05	U	PU
Plutonium 239/240		0.039	0.017	0.01	0.05	J	PU
Americium 241	14596-10-2	0.010	0.013	0.02	0.05	U	TP
Curium 244	13981-15-2	0.003	0.013	0.02	0.05	U	TP
GAMMA SCAN ANALYTES							
Sodium 22	13966-32-0	U		0.06		U	GAM
Potassium 40	13966-00-2	11	0.93				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		0.05	0.05	U	GAM
Niobium 94	14681-63-1	U		0.1		U	GAM
Ruthenium 103	13968-53-1	U		2		U	GAM
Ruthenium 106	13967-48-1	U		6		U	GAM
Tin 113	13966-06-8	U		2		U	GAM
Cesium 134	13967-70-9	U		0.1		U	GAM
Cesium 137	10045-97-3	2500	3.0		0.05		GAM

Verified

6/3/94

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Lab id	TMAN
Protocol	WHC-HASM
Version	Ver 1.0
Form	DVD-DS
Version	2.30
Report date	05/05/94

9213524.2119

TMA NORCAL

SAMPLE DELIVERY GROUP 7341

N403028-02

DATA SHEET, cont

B0BFG2

Case/SDG	93-263/7341	Client	Westinghouse Hanford
Contact	N. Joseph Verville	Contract	MBH-SVV-069262
Lab sample id	N403028-02	Client sample id	B0BFG2
Dept sample id	7341-002	Location/Matrix	216-U-8 Crib SOLID
Received	03/04/94	Collected	02/25/94
% moisture	4.2	Chain of custody id	006484

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	U		2	0.1	U	GAM
Europium 154	15585-10-1	U		1	0.1	U	GAM
Europium 155	14391-16-3	U		2	0.1	U	GAM
Radium 226	13982-63-3	U		1		U	GAM
Radium 228	15262-20-1	0.79	0.36				GAM
Thorium 228	14274-82-9	U		1		U	GAM
Thorium 232	7440-29-1	0.79	0.36				GAM

Verified

6/3/94

Lab id TMAN
Protocol WHC-HASM
Version Ver 1.0
Form DVD-DS
Version 2.30
Report date 05/05/94

9713524.2120

TMA NORCAL

SAMPLE DELIVERY GROUP 7341

N403028-03

DATA SHEET

B0BFH1

Case/SDG	93-263/7341	Client	Westinghouse Hanford
Contact	N. Joseph Verville	Contract	MBH-SVV-069262
Lab sample id	N403028-03	Client sample id	B0BFH1
Dept sample id	7341-003	Location/Matrix	216-U-8 Crib SOLID
Received	03/07/94	Collected	02/28/94
% moisture	10.1	Chain of custody id	006225

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALIFIERS	TEST
Gross Alpha	Alpha	75	9.7	4	10		80A
Gross Beta	Beta	24000	100	5	10		80B
Selenium 79	15758-45-9	-5.0	1.8	3	10	U	SE_L
Strontium 90	10098-97-2	15	2.1	0.6	1		Y
Technetium 99	14133-76-7	2.4	0.17	0.3	0.5		TC
Iodine 129	15046-84-1	0.28	0.83	2	2	U	I
Uranium 233/234		21	2.9	0.3	0.3		U
Uranium 235	15117-96-1	1.6	0.42	0.2	0.3		U
Uranium 238		21	2.9	0.3	0.3	—	U
Total Uranium (ug/g)	7440-61-1	97	21	0.3	0.1		U_T
Neptunium 237	13994-20-2	0.018	0.013	0.02	0.2	U	NP
Plutonium 238	13981-16-3	0.30	0.048	0.03	0.05		PU
Plutonium 239/240		12	0.69	0.01	0.05		PU
Americium 241	14596-10-2	0.20	0.042	0.02	0.05		TP
Curium 244	13981-15-2	0.009	0.007	0.01	0.05	U	TP
GAMMA SCAN ANALYTES							
Sodium 22	13966-32-0	U		1		U	GAM
Potassium 40	13966-00-2	14	8.2			—	GAM
Manganese 54	13966-31-9	U		2		U	GAM
Iron 59	14596-12-4	U		5	0.05	U	GAM
Cobalt 58	13981-38-9	U		3	0.05	U	GAM
Cobalt 60	10198-40-0	U		1	0.05	U	GAM
Niobium 94	14681-63-1	U		2		U	GAM
Ruthenium 103	13968-53-1	U		20		U	GAM
Ruthenium 106	13967-48-1	U		80		U	GAM
Tin 113	13966-06-8	U		20		U	GAM
Cesium 134	13967-70-9	U		3		U	GAM
Cesium 137	10045-97-3	28000	60		0.05	—	GAM

Verified

6/3/94

Lab id	TMAN
Protocol	WHC-HASM
Version	Ver 1.0
Form	DVD-DS
Version	2.30
Report date	05/05/94

9713524.2121

TMA NORCAL

SAMPLE DELIVERY GROUP 7341

N403028-03

DATA SHEET, cont

BOBFH1

Case/SDG	93-263/7341	Client	Westinghouse Hanford
Contact	N. Joseph Verville	Contract	MBH-SVV-069262
Lab sample id	N403028-03	Client sample id	BOBFH1
Dept sample id	7341-003	Location/Matrix	216-U-8 Crib SOLID
Received	03/07/94	Collected	02/28/94
% moisture	10.1	Chain of custody id	006225

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Cerium 144	14762-78-8	U		40		~~U~~	GAM
Europium 152	14683-23-9	U		20	0.1	~~U~~	GAM
Europium 154	15585-10-1	U		10	0.1	~~U~~	GAM
Europium 155	14391-16-3	U		20	0.1	~~U~~	GAM
Radium 226	13982-63-3	U		20		~~U~~	GAM
Radium 228	15262-20-1	U		9		~~U~~	GAM
Thorium 228	14274-82-9	U		20		~~U~~	GAM
Thorium 232	7440-29-1	U		9		~~U~~	GAM

Q 13333333

Verified

Lab id TMAN
Protocol WHC-HASM
Version Ver 1.0
Form DVD-DS
Version 2.30
Report date 05/05/94

6/3/94

9713524.2122

TMA NORCAL

SAMPLE DELIVERY GROUP 7341

N403028-04

DATA SHEET

BOBFH2

Case/SDG	93-263/7341	Client	Westinghouse Hanford
Contact	N. Joseph Verville	Contract	MBH-SVV-069262
Lab sample id	N403028-04	Client sample id	BOBFH2
Dept sample id	7341-004	Location/Matrix	216-U-8 Crib SOLID
Received	03/09/94	Collected	03/01/94
% moisture	11.4	Chain of custody id	006226

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST	Q
Gross Alpha	Alpha	72	9.3	5	10		80A	
Gross Beta 6/16/94	Beta	6800 ~~6900~~	55	6	10		80B	
Selenium 79	15758-45-9	0.13	2.9	5	10	U	SE_L	
Strontium 90	10098-97-2	3.9	2.2	0.2	1		Y	
Technetium 99	14133-76-7	1.1	0.15	0.3	0.5		TC	
Iodine 129	15046-84-1	0.14	0.62	1	2	~~U~~	I	UJ
Uranium 233/234		38	6.8	0.6	0.3		U	
Uranium 235	15117-96-1	3.1	0.90	0.3	0.3		U	
Uranium 238		43	7.6	0.5	0.3	—	U	J
Total Uranium (ug/g)	7440-61-1	160	37	3	0.1		U_T	
Neptunium 237	13994-20-2	0.086	0.043	0.05	0.2	~~J~~	NP	
Plutonium 238	13981-16-3	0.038	0.018	0.02	0.05	~~J~~	PU	
Plutonium 239/240		1.4	0.13	0.01	0.05		PU	
Americium 241	14596-10-2	0.033	0.027	0.04	0.05	U	TP	
Curium 244	13981-15-2	0	0.007	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	2.6				GAM	
Manganese 54	13966-31-9	U		0.4		U	GAM	
Iron 59	14596-12-4	U		0.8	0.05	U	GAM	
Cobalt 58	13981-38-9	U		0.5	0.05	U	GAM	
Cobalt 60	10198-40-0	U		0.1	0.05	U	GAM	
Niobium 94	14681-63-1	U		0.4		U	GAM	
Ruthenium 103	13968-53-1	U		5		U	GAM	
Ruthenium 106	13967-48-1	U		30		U	GAM	
Tin 113	13966-06-8	U		5		U	GAM	
Cesium 134	13967-70-9	U		0.5		U	GAM	
Cesium 137	10045-97-3	5900	12		0.05		GAM	

Verified

Lab id	TMAN
Protocol	WHC-HASM
Version	Ver 1.0
Form	DVD-DS
Version	2.30
Report date	05/05/94

6/3/94

0020

9713524.2123

TMA NORCAL

SAMPLE DELIVERY GROUP 7341

N403028-04

DATA SHEET, cont

B0BFH2

Case/SDG	93-263/7341	Client	Westinghouse Hanford
Contact	N. Joseph Verville	Contract	MBH-SVV-069262
Lab sample id	N403028-04	Client sample id	B0BFH2
Dept sample id	7341-004	Location/Matrix	216-U-8 Crib SOLID
Received	03/09/94	Collected	03/01/94
% moisture	11.4	Chain of custody id	006226

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Cerium 144	14762-78-8	U		10		U	GAM
Europium 152	14683-23-9	U		5	0.1	U	GAM
Europium 154	15585-10-1	U		4	0.1	U	GAM
Europium 155	14391-16-3	U		7	0.1	U	GAM
Radium 226	13982-63-3	U		5		U	GAM
Radium 228	15262-20-1	U		3		~~U~~	GAM
Thorium 228	14274-82-9	U		4		U	GAM
Thorium 232	7440-29-1	U		3		~~U~~	GAM

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Verified

6/3/94

~~32~~

Lab id TMAN
Protocol WHC-HASM
Version Ver 1.0
Form DVD-DS
Version 2.30
Report date 05/05/94

9713524.2124

TMA NORCAL

SAMPLE DELIVERY GROUP 7341

N403028-05 | **B0BFH4**

DATA SHEET

Case/SDG	93-263/7341	Client	Westinghouse Hanford
Contact	N. Joseph Verville	Contract	MBH-SVV-069262
Lab sample id	N403028-05	Client sample id	B0BFH4
Dept sample id	7341-005	Location/Matrix	216-U-8 Crib SOLID
Received	03/09/94	Collected	03/02/94
% moisture	6.8	Chain of custody id	006228

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Gross Alpha	Alpha	48	8.1	4	10		80A
Gross Beta	Beta	~~9600~~ 9400	65	6	10		80B
Selenium 79	15758-45-9	-2.4	1.6	3	10	U	SE_L
Strontium 90	10098-97-2	83	2.2	0.6	1		Y
Technetium 99	14133-76-7	0.93	0.12	0.3	0.5		TC
Iodine 129	15046-84-1	0.84	0.61	1	2	~~U~~	I
Uranium 233/234		30	3.4	0.3	0.3		U
Uranium 235	15117-96-1	3.3	0.57	0.1	0.3		U
Uranium 238		28	3.2	0.3	0.3		U
Total Uranium (ug/g)	7440-61-1	94	21	0.3	0.1		U_T
Neptunium 237	13994-20-2	0.025	0.017	0.02	0.2	~~J~~	NP
Plutonium 238	13981-16-3	0.030	0.017	0.02	0.05	~~J~~	PU
Plutonium 239/240		1.2	0.11	0.01	0.05		PU
Americium 241	14596-10-2	1.1	0.11	0.01	0.05		TP
Curium 244	13981-15-2	0.009	0.011	0.02	0.05	U	TP
GAMMA SCAN ANALYTES							
Sodium 22	13966-32-0	U		3		~~U~~	GAM
Potassium 40	13966-00-2	14	9.8				GAM
Manganese 54	13966-31-9	U		1		~~U~~	GAM
Iron 59	14596-12-4	U		2	0.05	~~U~~	GAM
Cobalt 58	13981-38-9	U		1	0.05	~~U~~	GAM
Cobalt 60	10198-40-0	U		0.7	0.05	~~U~~	GAM
Niobium 94	14681-63-1	U		1		~~U~~	GAM
Ruthenium 103	13968-53-1	U		10		~~U~~	GAM
Ruthenium 106	13967-48-1	U		80		~~U~~	GAM
Tin 113	13966-06-8	U		20		~~U~~	GAM
Cesium 134	13967-70-9	U		1		~~U~~	GAM
Cesium 137	10045-97-3	14000	40		0.05		GAM

Verified

Lab id	TMAN
Protocol	WHC-HASM
Version	Ver 1.0
Form	DVD-DS
Version	2.30
Report date	05/05/94

6/3/94

9713524.2125

TMA NORCAL

SAMPLE DELIVERY GROUP 7341

N403028-05

DATA SHEET, cont

BOBFH4

Case/SDG	93-263/7341	Client	Westinghouse Hanford
Contact	N. Joseph Verville	Contract	MBH-SVV-069262
Lab sample id	N403028-05	Client sample id	BOBFH4
Dept sample id	7341-005	Location/Matrix	216-U-8 Crib SOLID
Received	03/09/94	Collected	03/02/94
% moisture	6.8	Chain of custody id	006228

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Cerium 144	14762-78-8	U		30		~~U~~	GAM
Europium 152	14683-23-9	U		10	0.1	~~U~~	GAM
Europium 154	15585-10-1	5.1	2.8		0.1	—	GAM
Europium 155	14391-16-3	U		20	0.1	~~U~~	GAM
Radium 226	13982-63-3	U		10		~~U~~	GAM
Radium 228	15262-20-1	U		4		~~U~~	GAM
Thorium 228	14274-82-9	U		10		~~U~~	GAM
Thorium 232	7440-29-1	U		4		~~U~~	GAM

Verified

Lab id TMAN
Protocol WHC-HASM
Version Ver 1.0
Form DVD-DS
Version 2.30
Report date 05/05/94

6/3/94

9713524.2126

N403051-01

TMA NORCAL
SAMPLE DELIVERY GROUP 7342

DATA SHEET

BOBFH5

SDG 7342 Client Westinghouse Hanford
Contact N. Joseph Verville Contract MBH-SVV-069262

Lab sample id N403051-01 Client sample id BOBFH5
Dept sample id 7342-001 Location/Matrix 216-U-8 Crib SOLID
Received 03/07/94 Collected 03/02/94
% moisture 8.2 Chain of custody id 006229

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Gross Alpha	Alpha	12	4.6	5	10		80A
Gross Beta	Beta	40	5.4	6	10		80B
Selenium 79	15758-45-9	-2.2	1.9	3	10	U	SE_L
Strontium 90	10098-97-2	1.5	0.68	0.7	1		Y
Technetium 99	14133-76-7	0.14	0.046	0.1	0.5	J	TC
Iodine 129	15046-84-1	-0.41	0.99	2	2	U	I
Uranium 233/234		2.9	0.51	0.2	0.3		U
Uranium 235	15117-96-1	0.25	0.14	0.1	0.3	J	U
Uranium 238		2.9	0.52	0.1	0.3		U
Total Uranium (ug/g)	7440-61-1	7.8	1.6	0.03	0.1		U_T
Neptunium 237	13994-20-2	0.008	0.008	0.02	0.2	U	NP
Plutonium 238	13981-16-3	0	0.013	0.03	0.05	U	PU
Plutonium 239/240		0.030	0.016	0.01	0.05	J	PU
Americium 241	14596-10-2	0.012	0.019	0.03	0.05	U	TP
Curium 244	13981-15-2	0.002	0.019	0.03	0.05	U	TP
GAMMA SCAN ANALYTES							
Sodium 22	13966-32-0	U		0.05		U	GAM
Potassium 40	13966-00-2	12	0.92				GAM
Manganese 54	13966-31-9	U		0.04		U	GAM
Iron 59	14596-12-4	U		0.1	0.05	U	GAM
Cobalt 58	13981-38-9	U		0.03	0.05	U	GAM
Cobalt 60	10198-40-0	U		0.04	0.05	U	GAM
Niobium 94	14681-63-1	U		0.04		U	GAM
Ruthenium 103	13968-53-1	U		0.09		U	GAM
Ruthenium 106	13967-48-1	U		0.5		U	GAM
Tin 113	13966-06-8	U		0.1		U	GAM
Cesium 134	13967-70-9	U		0.05		U	GAM
Cesium 137	10045-97-3	8.9	0.18		0.05		GAM

Verified

5/31/94

Lab id TMAN
Protocol WHC-HASM
Version Ver 1.0
Form DVD-DS
Version 2.30
Report date 05/04/94

9713524.2127

TMA NORCAL

SAMPLE DELIVERY GROUP 7342

N403051-01

DATA SHEET, cont

B0BFH5

SDG	7342	Client	Westinghouse Hanford
Contact	N. Joseph Verville	Contract	MBH-SVV-069262
Lab sample id	N403051-01	Client sample id	B0BFH5
Dept sample id	7342-001	Location/Matrix	216-U-8 Crib SOLID
Received	03/07/94	Collected	03/02/94
% moisture	8.2	Chain of custody id	006229

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		0.1	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	0.61	0.11				GAM
Radium 228	15262-20-1	0.74	0.21				GAM
Thorium 228	14274-82-9	0.78	0.068				GAM
Thorium 232	7440-29-1	0.74	0.21				GAM

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Verified

5/31/94

Lab id	TMAN
Protocol	WHC-HASM
Version	Ver 1.0
Form	DVD-DS
Version	2.30
Report date	05/04/94

9713524.2123

TMA NORCAL

SAMPLE DELIVERY GROUP 7342

N403051-02

DATA SHEET

B0BFH6

SDG 7342 Client Westinghouse Hanford
Contact N. Joseph Verville Contract MBH-SVV-069262

Lab sample id N403051-02 Client sample id B0BFH6
Dept sample id 7342-002 Location/Matrix 216-U-8 Crib SOLID
Received 03/07/94 Collected 03/02/94
% moisture 5.0 Chain of custody id 006230

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Gross Alpha	Alpha	15	4.8	4	10		80A
Gross Beta	Beta	62	6.2	6	10		80B
Selenium 79	15758-45-9	-2.5	1.6	3	10	U	SE_L
Strontium 90	10098-97-2	19	2.7	0.7	1		Y
Technetium 99	14133-76-7	0.63	0.19	0.4	0.5		TC
Iodine 129	15046-84-1	0.28	0.61	1	2	U	I
Uranium 233/234		2.8	0.48	0.1	0.3		U
Uranium 235	15117-96-1	0.28	0.13	0.1	0.3	J	U
Uranium 238		2.9	0.49	0.1	0.3		U
Total Uranium (ug/g)	7440-61-1	7.5	1.5	0.03	0.1		U_T
Neptunium 237	13994-20-2	0.022	0.014	0.02	0.2	J	NP
Plutonium 238	13981-16-3	0.001	0.006	0.01	0.05	U	PU
Plutonium 239/240		0.010	0.008	0.01	0.05	J	PU
Americium 241	14596-10-2	0.005	0.014	0.03	0.05	U	TP
Curium 244	13981-15-2	0.005	0.018	0.03	0.05	U	TP
GAMMA SCAN ANALYTES							
Sodium 22	13966-32-0	U		0.06		U	GAM
Potassium 40	13966-00-2	12	0.96				GAM
Manganese 54	13966-31-9	U		0.05		U	GAM
Iron 59	14596-12-4	U		0.1	0.05	U	GAM
Cobalt 58	13981-38-9	U		0.06	0.05	U	GAM
Cobalt 60	10198-40-0	U		0.05	0.05	U	GAM
Niobium 94	14681-63-1	U		0.04		U	GAM
Ruthenium 103	13968-53-1	U		0.07		U	GAM
Ruthenium 106	13967-48-1	U		0.5		U	GAM
Tin 113	13966-06-8	U		0.07		U	GAM
Cesium 134	13967-70-9	U		0.06		U	GAM
Cesium 137	10045-97-3	2.9	0.12		0.05		GAM

Verified

6/3/94

Lab id TMAN
Protocol WHC-HASM
Version Ver 1.0
Form DVD-DS
Version 2.30
Report date 05/04/94

9713524.2129

TMA NORCAL

SAMPLE DELIVERY GROUP 7342

N403051-02

DATA SHEET, cont

B0BFH6

SDG	7342	Client	Westinghouse Hanford
Contact	N. Joseph Verville	Contract	MBH-SVV-069262
Lab sample id	N403051-02	Client sample id	B0BFH6
Dept sample id	7342-002	Location/Matrix	216-U-8 Crib SOLID
Received	03/07/94	Collected	03/02/94
% moisture	5.0	Chain of custody id	006230

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Cerium 144	14762-78-8	U		0.3		U	GAM
Europium 152	14683-23-9	U		0.1	0.1	U	GAM
Europium 154	15585-10-1	U		0.08	0.1	U	GAM
Europium 155	14391-16-3	U		0.2	0.1	U	GAM
Radium 226	13982-63-3	0.55	0.10				GAM
Radium 228	15262-20-1	0.84	0.18				GAM
Thorium 228	14274-82-9	0.70	0.063				GAM
Thorium 232	7440-29-1	0.84	0.18				GAM

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Verified

5/31/94

Lab id	TMAN
Protocol	WHC-HASM
Version	Ver 1.0
Form	DVD-DS
Version	2.30
Report date	05/04/94

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9713524.2130

N403051-03

TMA NORCAL
SAMPLE DELIVERY GROUP 7342

DATA SHEET

BOBFH8

SDG 7342 Client Westinghouse Hanford
Contact N. Joseph Verville Contract MBH-SVV-069262

Lab sample id N403051-03 Client sample id BOBFH8
Dept sample id 7342-003 Location/Matrix 216-U-8 Crib SOLID
Received 03/07/94 Collected 03/02/94
% moisture 5.4 Chain of custody id 006490

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALIFIERS	TEST
Gross Alpha	Alpha	13	4.2	3	10		80A
Gross Beta	Beta	22	4.6	6	10		80B
Selenium 79	15758-45-9	-2.4	2.1	4	10	U	SE_L
Strontium 90	10098-97-2	0.63	0.59	0.7	1	U	Y
Technetium 99	14133-76-7	0.22	0.097	0.3	0.5	U	TC
Iodine 129	15046-84-1	-0.35	0.60	1	2	U	I
Uranium 233/234		0.72	0.26	0.1	0.3		U
Uranium 235	15117-96-1	0.021	0.043	0.2	0.3	U	U
Uranium 238		0.49	0.19	0.1	0.3		U
Total Uranium (ug/g)	7440-61-1	1.5	0.31	0.03	0.1		U_T
Neptunium 237	13994-20-2	0.035	0.022	0.02	0.2	J	NP
Plutonium 238	13981-16-3	-0.003	0.003	0.01	0.05	U	PU
Plutonium 239/240		0.045	0.018	0.01	0.05	J	PU
Americium 241	14596-10-2	0.004	0.015	0.03	0.05	U	TP
Curium 244	13981-15-2	0.004	0.015	0.03	0.05	U	TP
GAMMA SCAN ANALYTES							
Sodium 22	13966-32-0	U		0.06		U	GAM
Potassium 40	13966-00-2	13	0.92				GAM
Manganese 54	13966-31-9	U		0.05		U	GAM
Iron 59	14596-12-4	U		0.1	0.05	U	GAM
Cobalt 58	13981-38-9	U		0.05	0.05	U	GAM
Cobalt 60	10198-40-0	U		0.05	0.05	U	GAM
Niobium 94	14681-63-1	U		0.04		U	GAM
Ruthenium 103	13968-53-1	U		0.07		U	GAM
Ruthenium 106	13967-48-1	U		0.4		U	GAM
Tin 113	13966-06-8	U		0.07		U	GAM
Cesium 134	13967-70-9	U		0.05		U	GAM
Cesium 137	10045-97-3	1.7	0.092		0.05		GAM

Verified

5/31/94

Lab id TMAN
Protocol WHC-HASM
Version Ver 1.0
Form DVD-DS
Version 2.30
Report date 05/04/94

9713524.2131

TMA NORCAL
SAMPLE DELIVERY GROUP 7342

N403051-03

DATA SHEET, cont

B0BFH8

SDG	7342	Client	Westinghouse Hanford
Contact	N. Joseph Verville	Contract	MBH-SVV-069262
Lab sample id	N403051-03	Client sample id	B0BFH8
Dept sample id	7342-003	Location/Matrix	216-U-8 Crib SOLID
Received	03/07/94	Collected	03/02/94
% moisture	5.4	Chain of custody id	006490

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Cerium 144	14762-78-8	U		0.2		U	GAM
Europium 152	14683-23-9	U		0.1	0.1	U	GAM
Europium 154	15585-10-1	U		0.07	0.1	U	GAM
Europium 155	14391-16-3	U		0.1	0.1	U	GAM
Radium 226	13982-63-3	0.57	0.095				GAM
Radium 228	15262-20-1	0.86	0.17				GAM
Thorium 228	14274-82-9	0.93	0.079				GAM
Thorium 232	7440-29-1	0.86	0.17				GAM

Q

Verified

5/31/94

Lab id	TMAN
Protocol	WHC-HASM
Version	Ver 1.0
Form	DVD-DS
Version	2.30
Report date	05/04/94

0029

9713524.2132

ATTACHMENT 4

LABORATORY NARRATIVE AND CHAIN-OF-CUSTODY DOCUMENTATION

TMA/Norcal

Report N4-03-028-7341
Sample Delivery Group 7341

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

Case Narrative **May 5, 1994**

Associated with samples B0BFF9, B0BFG2, B0BFH1, B0BFH2, and B0BFH4. 6/3/94

1.0 GENERAL

TMA/Norcal Sample Delivery Group 7341 is comprised of five soil samples designated as SAF #93-263, delivered under Chain-of-Custody documents 006481, 006484, 006225, 006226, and 006228.

One 1000 mL poly bottle containing each sample was received for analyses.

2.0 ANALYSIS NOTES

2.1 Gross Alpha Analyses

No problems were encountered by the laboratory with the analyses.

2.2 Gross Beta Analyses

No problems were encountered by the laboratory with the analyses.

2.3 Selenium-79 Analyses

No problems were encountered by the laboratory with the analyses.

2.4 Strontium-90 Analyses

No problems were encountered by the laboratory with the analyses.

2.5 Technetium-99 Analyses

Due to the high cesium activity of the samples the analyses were performed in our hot laboratory. During the analyses the samples became contaminated with zirconium and cobalt, resulting very low yields and spectral interference. The samples were reanalyzed. No problems were encountered with the reanalyses.

2.6 Iodine-129 Analyses

No problems were encountered by the laboratory with the analyses.

2.7 Uranium-233/234, 235, and 238 Analyses

Sample B0BFH2 contained uranium activity great enough that it was necessary to count it on a low efficiency detector to achieve good peak re solution. As a result the MDA is greater than the RDL. Since the sample contained uranium activity many times greater than the RDL the relatively high MDA is not a problem.

TMA/Norcal
Report N4-03-028-7341
Sample Delivery Group 7341

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

Case Narrative **May 5, 1994**

2.8 Total Uranium Analyses
All samples contained uranium in sufficient quantity that successive dilution of the original aliquot had to be performed in order to get a response from the laser phosphorimeter (KPA) within the calibration range. As a result of the dilutions the sample MDA's were increased beyond the protocol limits. The increased MDA's are not considered a problem.

2.9 Neptunium-237 Analyses
No problems were encountered by the laboratory with the analyses.

2.10 Plutonium-238 and 239/240 Analyses
The plutonium-239/240 results for sample B0BFF9 and the duplicate are not a good match, however since both sample results are below the RDL there is no adverse effect on the quality of the data.

2.11 Americium-241/Curium-244 Analyses
No problems were encountered by the laboratory with the analyses.

2.12 Gamma Scan Analyses
Due to the amount of sample received the aliquot sizes for all the samples were less than the protocol requirement of 750 g and as result the sample MDA's are greater than the protocol limits.

TMA/Norcal

Report N4-03-051-7342
Sample Delivery Group 7342

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

Case Narrative Associated with Samples **May 4, 1994**
BOBFH5, BOBFH6, BOBFH8, and BOBWF8.
6/3/94

1.0 GENERAL

TMA/Norcal Sample Delivery Group 7342 is comprised of four soil samples designated as SAF #93-263, delivered under Chain-of-Custody documents 006229, 006230, 006490, and Field Logbook No. EFL-1115.

One 1000 mL poly bottle containing each sample was received for analyses.

2.0 ANALYSIS NOTES

2.1 Gross Alpha Analyses

The recovery for the laboratory control sample was 123%, slightly higher than the contract limit of 120%, but within the 3σ protocol limits of 59-141%.

2.2 Gross Beta Analyses

No problems were encountered by the laboratory in the analyses.

2.3 Selenium-79 Analyses

No problems were encountered by the laboratory in the analyses.

2.4 Strontium-90 Analyses

No problems were encountered by the laboratory in the analyses.

2.5 Technetium-99 Analyses

No problems were encountered by the laboratory in the analyses.

2.6 Iodine-129 Analyses

No problems were encountered by the laboratory in the analyses.

2.7 Uranium-233/234, 235, and 238 Analyses

No problems were encountered by the laboratory in the analyses.

2.8 Total Uranium Analyses

No problems were encountered by the laboratory in the analyses.

2.9 Neptunium-237 Analyses

Reagent blank 7342-006 shows neptunium-237 activity at 0.019 pCi/g which is higher than the 0.011 pCi/g MDA. Both the result and MDA are below the RDL and, therefore, there is no adverse impact on the data.

2.10 Plutonium-238 and 239/240 Analyses

No problems were encountered by the laboratory in the analyses.

2.11 Americium-241/Curium-244 Analyses

Sample B09WF8 contained americium-241 activity at 200 pCi/g. Americium-241 activity at this level caused spectral interference between the americium-241 and americium-243 (tracer) peaks. As a consequence the error for the americium-241 result was hand calculated to reflect the spectral interference. The MDA for curium-244 is greater than the RDL because the sample was counted on a low efficiency counter to accommodate the americium-241 activity. Also the counter background was high in the region of interest. No curium-244 activity was detected above the MDA.

Reagent blank 7342-006 shows americium-241 at 0.028 pCi/g which is higher than the 0.02 pCi/g MDA. Both the result and MDA are below the RDL, therefore, there is no adverse impact on the data.

2.12 Gamma Scan Analyses

Aliquot sizes ranged from 210 to 241 grams, which are smaller than the nominal 750 grams normally used for soil analyses. Cobalt-58 and 60, and europium-152, 154, and europium-155 MDA's exceeded the RDL's as a result. The iron-59 MDA's for all samples are higher than the RDL due to the short half-life of iron-59.

Westinghouse Hanford Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	Page 1 of 1 006481

Collector R.T. Sickle
Company Contact C.A. Rowley
Telephone 372-3293
SAF No. 93-263
Project Designation 216-U-8 Vitrified Clay Pipeline
Sampling Locations 216-U-8 Crib
Ice Chest No.
Bill of Lading/Airbill No.
Offsite Property No.
Method of Shipment Air Overnight
Field Logbook No.
Shipped to TMA
SPECIAL INSTRUCTIONS
Possible Sample Hazards/Remarks None Detected
Special Handling and/or Storage Keep cool

Sample Number	*	Date Collected	Time	Number and Type of Containers	Analysis Required	Preservative
BOBFF9	S	2-24-94	1315	(1) 250ml Gs ✓	VOA CLP	
BOBFF9	S			(1) 250ml aG ✓	Semi-VOA CLP	
BOBFF9	S			(1) 250ml Poly ✓	Metals -CLP TAL Titanium Mercury 500 ml - KB CPL	
BOBFF9	S			(1) 125ml G ✓	Anions F, Cl, SO_4 EPA 300.0	
BOBFF9	S			(1) 125ml P/G ✓	NO_2 NO_3 EPA 353.2	
~~BOBFF9~~	~~S~~			~~(1) 250ml aGs~~	~~PCB/Pest~~ RTS 2-24-94 8080	
BOBFF9	S			(1) 125ml G ✓	Cyanide CPL	
BOBFF9	S			(1) 125ml Gs ✓	Kerosene 8015M	
BOBFF9	S			(1) 1000ml Poly ✓	Gross Alpha/Beta EP-10; Gamma Spec. Cs-134/137, Co-60, K-40, Eu-152/154/155, Ru-106, Na-22 RC-30; Total Uranium EA-01C; U-235/234/238 EP-70, 71, 5; Np-237 RC-101A, 622, EP-5; Pu-238/239/240 EP-80, 81, 5; I-129 RC-25, 603; Sr-90 RC-306, 303, 309, 304; Tc-99 RC-24, 604; Am-241, Cm-244 EP-80, 91, 92, 93, 5; Se-79 Lab Specific	

Chain of Possession Relinquished By (Sign and Print Names)	Date	Time	Received By
R.T. Sickle R.T. Sickle	3/1/94	1200	D.L. Edwards
D.L. Edwards	3/3/94	0945	Kermit Blum K. Blum
	3-4-94	1000	

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

LABORATORY SECTION	Received By	Title	Date/Time
Final Sample Disposition	Disposal Method:	Disposed by:	Date/Time:

9713524.2137

0035

Westinghouse Hanford Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	Page 1 of 1 006484

Collector R.T. Sickle
Company Contact C.A. Rowley
Telephone 372-3293
SAF No. 93-263
Project Designation 216-U-8 Vitrified Clay Pipeline
Sampling Locations 216-U-8 Crib
Ice Chest No.
Bill of Lading/Airbill No.
Offsite Property No.
Method of Shipment Air Overnight
Field Logbook No.
Shipped to TMA
SPECIAL INSTRUCTIONS
Possible Sample Hazards/Remarks None detected
Special Handling and/or Storage Keep cool

Sample Number	*	Date Collected	Time	Number and Type of Containers	Analysis Required		Preservative
~~BOBFN3~~	S	~~2-25-94~~	0815	(1) 250ml aGs ✓	VOA	CLP	
BOBFG2	S	2-25-94	1200	(1) 250ml Gs ✓	VOA	CLP	
BOBFG2	S			(1) 250ml aG ✓	Semi-VOA	CLP	
BOBFG2	S			(1) 250ml Poly ✓	Metals -CLP TAL Titanium Mercury	CPL	
BOBFG2	S			(1) 125ml G ✓	Anions F, Cl, SO_4	EPA 300.0	
BOBFG2	S			(1) 125ml P/G ✓	NO_2 NO_3	EPA 353.2	
~~BOBFG2~~	~~S~~			(1) 250ml aGs —	PCB/Pest ~~RHF 2-25-94~~	8080	
BOBFG2	S			(1) 125ml G ✓	Cyanide	CPL	
BOBFG2	S			(1) 125ml Gs ✓	Kerosene	8015M	
BOBFG2	S			(1) 1000ml Poly ✓	Gross Alpha/Beta EP-10; Gamma Spec. Cs-134/137, Co-60, K-40, Eu-152/154/155, Ru-106, Na-22 RC-30; Total Uranium EA-01C; U-235/234/238 EP-70, 71, 5; Np-237 RC-101A, 622, EP-5; Pu-238/239/240 EP-80, 81, 5; I-129 RC-25, 603; Sr-90 RC-306, 303, 309, 304; Tc-99 RC-24, 604; Am-241, Cm-244 EP-80, 91, 92, 93, 5; Se-79 Lab Specific		

Chain of Possession Relinquished By (Sign and Print Names)	Date	Time	Received By
R.T. Sickle	3/1/94	1200	D L Edwards
D L Edwards	3/3/94	0945	
	3-4-94	1000	Kermit Blum K. Blum

***Matrix**

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

LABORATORY SECTION	Received By	Title	Date/Time
Final Sample Disposition	Disposal Method:	Disposed by:	Date/Time:

9713524.2139 Rev 0

0036

Westinghouse Hanford Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	Page 1 of 1 006225

Collector R.T. Sickle
Company Contact C.A. Rowley
Telephone 372-3293
SAF No. 93-263
Project Designation 216-U-8 Vitrified Clay Pipeline
Sampling Locations 216-U-8 Crib
Ice Chest No.
Bill of Lading/Airbill No.
Offsite Property No.
Method of Shipment Air Overnight
Field Logbook No.
Shipped to TMA
SPECIAL INSTRUCTIONS
Possible Sample Hazards/Remarks None Detected
Special Handling and/or Storage Keep cool

Sample Number	*	Date Collected	Time	Number and Type of Containers	Analysis Required		Preservative
BOBFH17	S	2-28-94	0800	(1) 250ml aGs ✓	VOA	CLP	
BOBFH1	S	2-28-94	1115	(1) 250ml Gs ✓	VOA	CLP	
BOBFH1	S			(1) 250ml aG ✓	Semi-VOA	CLP	
BOBFH1	S			(1) 250ml Poly ✓	Metals -CLP TAL Titanium Mercury	CPL	
BOBFH1	S			(1) 125ml G ✓	Anions F, Cl, SO_4	EPA 300.0	
BOBFH1	S			(1) 125ml P/G ✓	NO_2 NO_3	EPA 353.2	
~~BOBFH1~~	~~S~~			~~(1) 250ml aGs~~	~~PCB/Pest~~ RJ 2-23-94	~~8080~~	
BOBFH1	S			(1) 125ml G ✓	Cyanide	CPL	
BOBFH1	S			(1) 125ml Gs ✓	Kerosene	8015M	
BOBFH1	S	2-28-94	1115	(1) 1000ml Poly ✓	Gross Alpha/Beta EP-10; Gamma Spec. Cs-134/137, Co-60, K-40, Eu-152/154/155, Ru-106, Na-22 RC-30; Total Uranium EA-01C; U-235/234/238 EP-70, 71, 5; Np-237 RC-101A, 622, EP-5; Pu-238/239/240 EP-80, 81, 5; I-129 RC-25, 603; Sr-90 RC-306, 303, 309, 304; Tc-99 RC-24, 604; Am-241, Cm-244 EP-80, 91, 92, 93, 5; Se-79 Lab Specific		

Chain of Possession Relinquished By (Sign and Print Names)	Date	Time	Received By
R.T. Sickle	3/1/94	1200	DL Edwards
DL Edwards	3/4/94	0810	
	3-7-94	*	Kermit Blum K. Blum

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

LABORATORY SECTION	Received By	Title	Date/Time
Final Sample Disposition	Disposal Method:	Disposed by:	Date/Time:

* Received @ TMA/NORCAL 3-5-94; opened 3-7-94 .KB

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0037

Westinghouse Hanford Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	Page 1 of 1 006226

Collector R.T. Sickle
Company Contact C.A. Rowley
Telephone 372-3293
SAF No. 93-263
Project Designation 216-U-8 Vitrified Clay Pipeline
Sampling Locations 216-U-8 Crib
Ice Chest No.
Bill of Lading/Airbill No.
Offsite Property No.
Method of Shipment Air Overnight
Field Logbook No.
Shipped to TMA
SPECIAL INSTRUCTIONS
Possible Sample Hazards/Remarks None Detected
Special Handling and/or Storage Keep cool

Sample Number	*	Date Collected	Time	Number and Type of Containers	Analysis Required		Preservative
30131F4	S	3-1-94	0800	(1) 250ml Gs	VOA	CLP	
BOBFH2	S		08/20	(1) 250ml Gs	VOA	CLP	
BOBFH2	S			(1) 250ml aG	Semi-VOA	CLP	
BOBFH2	S			(1) 250ml Poly	Metals -CLP TAL Titanium Mercury	CPL	
BOBFH2	S			(1) 125ml G	Anions F, Cl, SO_4	EPA 300.0	
BOBFH2	S			(1) 125ml P/G	NO_2 NO_3	EPA 353.2	
~~BOBFH2~~	~~S~~			~~(1) 250ml aGs~~	~~PCB/Pest~~ 2-23-94	~~8080~~	
BOBFH2	S			(1) 125ml G	Cyanide	CPL	
BOBFH2	S			(1) 125ml Gs	Kerosene	8015M	
BOBFH2	S			(1) 1000ml Poly	Gross Alpha/Beta EP-10; Gamma Spec. Cs-134/137, Co-60, K-40, Eu-152/154/155, Ru-106, Na-22 RC-30; Total Uranium EA-01C; U-235/234/238 EP-70, 71, 5; Np-237 RC-101A, 622, EP-5; Pu-238/239/240 EP-80, 81, 5; I-129 RC-25, 603; Sr-90 RC-306, 303, 309, 304; Tc-99 RC-24, 604; Am-241, Cm-244 EP-80, 91, 92, 93, 5; Se-79 Lab Specific		

Chain of Possession (Sign and Print Names) Relinquished By	Date	Time	Received By
R.T. Sickle	3/7/94	0740	D.R. Edwards
3/8/94 D.R. Edwards	3/8/94	0630	
	3-9-94	1015	Kermit Blum K. Blum

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

LABORATORY SECTION	Received By	Title	Date/Time
Final Sample Disposition	Disposal Method:	Disposed by:	Date/Time:

0038

9713524.2140

Westinghouse Hanford Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	Page 1 of 1 006228

Collector R.T. Sickle
Company Contact C.A. Rowley
Telephone 372-3293
SAF No. 93-263
Project Designation 216-U-8 Vitrified Clay Pipeline
Sampling Locations 216-U-8 Crib
Ice Chest No.
Bill of Lading/Airbill No.
Offsite Property No.
Method of Shipment Air Overnight
Field Logbook No.
Shipped to TMA
SPECIAL INSTRUCTIONS
Possible Sample Hazards/Remarks None Detected
Special Handling and/or Storage Keep cool

Sample Number	*	Date Collected	Time	Number and Type of Containers	Analysis Required		Preservative
BOBFH4	S	3-2-94	0850	(1) 250ml Gs ✓	VOA	CLP	
BOBFH4	S			(1) 250ml aG ✓	Semi-VOA	CLP	
BOBFH4	S			(1) 250ml Poly ✓	Metals -CLP TAL Titanium Mercury	CPL	
BOBFH4	S			(1) 125ml G ✓	Anions F, Cl, SO_4	EPA 300.0	
BOBFH4	S			(1) 125ml P/G ✓	NO_2 NO_3	EPA 353.2	
~~BOBFH4~~	~~S~~			~~(1) 250ml aGs~~	~~PCB/Pest~~ RHH 2-23-94	~~8080~~	
BOBFH4	S			(1) 125ml G ✓	Cyanide	CPL	
BOBFH4	S			(1) 125ml Gs ✓	Kerosene	8015M	
BOBFH4	S			(1) 1000ml Poly ✓	Gross Alpha/Beta EP-10; Gamma Spec. Cs-134/137, Co-60, K-40, Eu-152/154/155, Ru-106, Na-22 RC-30; Total Uranium EA-01C; U-235/234/238 EP-70, 71, 5; Np-237 RC-101A, 622, EP-5; Pu-238/239/240 EP-80, 81, 5; I-129 RC-25, 603; Sr-90 RC-306, 303, 309, 304; Tc-99 RC-24, 604; Am-241, Cm-244 EP-80, 91, 92, 93, 5; Se-79 Lab Specific		

Chain of Possession Relinquished By (Sign and Print Names)	Date	Time	Received By
R.T. Sickle R.T. Sickle	3/7/94	0740	D.L. Edwards
D.L. Edwards	3/8/94	0830	Kermit Blum K. Blum
	3-9-94	1015	

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

LABORATORY SECTION	Received By	Title	Date/Time
Final Sample Disposition	Disposal Method:	Disposed by:	Date/Time:

9713524.2141

0039

Westinghouse Hanford Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	Page 1 of 1
		006229

Collector R.T. Sickle
Company Contact C.A. Rowley
Telephone 372-3293
SAF No. 93-263
Project Designation 216-U-8 Vitrified Clay Pipeline
Sampling Locations 216-U-8 Crib
Ice Chest No.
Bill of Lading/Airbill No. 140 213 8144
Offsite Property No.
Method of Shipment Air Overnight
Field Logbook No.
Shipped to TMA
SPECIAL INSTRUCTIONS
Possible Sample Hazards/Remarks None Detected
Special Handling and/or Storage Keep cool

Sample Number	*	Date Collected	Time	Number and Type of Containers	Analysis Required		Preservative
BOBFM6	S	3-2-94	0800	(1) 250ml Gs ✓	VOA	CLP	
BOBFH5	S	3-2-94	1325	(1) 250ml Gs ✓	VOA	CLP	
BOBFH5	S			(1) 250ml aG ✓	Semi-VOA	CLP	
BOBFH5	S			(1) 250ml Poly ✓	Metals -CLP TAL Titanium Mercury	CPL	
BOBFH5	S			(1) 125ml G ✓	Anions F, Cl, SO_4	EPA 300.0	
BOBFH5	S			(1) 125ml P/G ✓	NO_2 NO_3	EPA 353.2	
~~BOBFH5~~	~~S~~			~~(1) 250ml aGs~~	~~PCB/Pest~~ 2-23-94	~~8080~~	
BOBFH5	S			(1) 125ml G ✓	Cyanide	CPL	
BOBFH5	S			(1) 125ml Gs ✓	Kerosene	8015M	
BOBFH5	S			(1) 1000ml Poly ✓	Gross Alpha/Beta EP-10; Gamma Spec. Cs-134/137, Co-60, K-40, Eu-152/154/155, Ru-106, Na-22 RC-30; Total Uranium EA-01C; U-235/234/238 EP-70, 71, 5; Np-237 RC-101A, 622, EP-5; Pu-238/239/240 EP-80, 81, 5; I-129 RC-25, 603; Sr-90 RC-306, 303, 309, 304; Tc-99 RC-24, 604; Am-241, Cm-244 EP-80, 91, 92, 93, 5; Se-79 Lab Specific		

Chain of Possession Relinquished By (Sign and Print Names)	Date	Time	Received By
R.T. Sickle	3/3/94	0800	D.L. Edwards
D.L. Edwards	3/4/94	0810	Kermit Blum K. Blum
	3-7-94	*	

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

LABORATORY SECTION	Received By	Title	Date/Time
Final Sample Disposition	Disposal Method:	Disposed by:	Date/Time:

* Received @ TMA/NORCAL 3-5-94; opened 3-7-94 · KB

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0040

9713524.2142

Westinghouse Hanford Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	Page 1 of 1 006230

Collector R.T. Sickle
Company Contact C.A. Rowley
Telephone 372-3293
SAF No. 93-263
Project Designation 216-U-8 Vitrified Clay Pipeline
Sampling Locations 216-U-8 Crib
Ice Chest No. RTS
Bill of Lading/Airbill No. 140 213 8144
Offsite Property No.
Method of Shipment Air Overnight
Field Logbook No.
Shipped to TMA
SPECIAL INSTRUCTIONS
Possible Sample Hazards/Remarks None Detected
Special Handling and/or Storage Keep cool

Sample Number	*	Date Collected	Time	Number and Type of Containers	Analysis Required		Preservative
BOBFH6	S	3-2-94	1450	(1) 250ml Gs ✓	VOA	CLP	
BOBFH6	S			(1) 250ml aG ✓	Semi-VOA	CLP	
BOBFH6	S			(1) 250ml Poly ✓	Metals -CLP TAL Titanium Mercury	CPL	
BOBFH6	S			(1) 125ml G ✓	Anions F, Cl, SO_4	EPA 300.0	
BOBFH6	S			(1) 125ml P/G ✓	NO_2 NO_3	EPA 353.2	
~~BOBFH6~~	~~S~~			~~(1) 250ml aGs~~	~~PCB/Pest~~ RJH 2-23-94	~~8080~~	
BOBFH6	S			(1) 125ml G ✓	Cyanide	CPL	
BOBFH6	S			(1) 125ml Gs ✓	Kerosene	8015M	
BOBFH6	S			(1) 1000ml Poly ✓	Gross Alpha/Beta EP-10; Gamma Spec. Cs-134/137, Co-60, K-40, Eu-152/154/155, Ru-106, Na-22 RC-30; Total Uranium EA-01C; U-235/234/238 EP-70, 71, 5; Np-237 RC-101A, 622, EP-5; Pu-238/239/240 EP-80, 81, 5; I-129 RC-25, 603; Sr-90 RC-306, 303, 309, 304; Tc-99 RC-24, 604; Am-241, Cm-244 EP-80, 91, 92, 93, 5; Se-79 Lab Specific		

Chain of Possession Relinquished By (Sign and Print Names)	Date	Time	Received By
R.T. Sickle	3/3/94	0800	D.L. Edwards
D.L. Edwards	3/4/94	0810	
	3-7-94	*	Kermit Blum K. Blum

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

LABORATORY SECTION	Received By	Title	Date/Time
Final Sample Disposition	Disposal Method:	Disposed by:	Date/Time:

* Received @ TMA/NORCAL 3-5-94; opened 3-7-94 · KB

9413524.2143

0041

Westinghouse Hanford Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	Page 1 of 1 006490

Collector R.T. Sickle
Company Contact C.A. Rowley
Telephone 372-3293
SAF No. 93-263
Project Designation 216-U-8 Vitrified Clay Pipeline
Sampling Locations 216-U-8 Crib
Ice Chest No.
Bill of Lading/Airbill No. 140 213 8144
Offsite Property No.
Method of Shipment Air Overnight
Field Logbook No.
Shipped to TMA
SPECIAL INSTRUCTIONS
Possible Sample Hazards/Remarks None Detected
Special Handling and/or Storage Keep cool

Sample Number	*	Date Collected	Time	Number and Type of Containers	Analysis Required		Preservative
			1300	3-2-94			
BOBFH8	S	3-2-94	~~0850~~	~~(1) 250ml Gs~~	~~VOA~~ RHK 3-2-94	CLP	
BOBFH8	S			~~(1) 250ml aG~~	~~Semi-VOA~~ RHK 3-2-94	CLP	
BOBFH8	S			(1) 250ml Poly ✓	Metals -CLP TAL Titanium Mercury	CPL	
BOBFH8	S			(1) 125ml G ✓	Anions F, Cl, SO_4	EPA 300.0	
BOBFH8	S			(1) 125ml P/G ✓	NO_2 NO_3	EPA 353.2	
~~BOBFH8~~	~~S~~			~~(1) 250ml aGs~~	~~PCB/Pest~~ RHK 2-23-94	~~8080~~	
BOBFH8	S			(1) 125ml G ✓	Cyanide	CPL	
BOBFH8	S			~~(1) 125ml Gs~~	~~Kerosene~~ RHK 3-2-94	8015M	
BOBFH8	S			(1) 1000ml Poly ✓	Gross Alpha/Beta EP-10; Gamma Spec. Cs-134/137, Co-60, K-40, Eu-152/154/155, Ru-106, Na-22 RC-30; Total Uranium EA-01C; U-235/234/238 EP-70, 71, 5; Np-237 RC-101A, 622, EP-5; Pu-238/239/240 EP-80, 81, 5; I-129 RC-25, 603; Sr-90 RC-306, 303, 309, 304; Tc-99 RC-24, 604; Am-241, Cm-244 EP-80, 91, 92, 93, 5; Se-79 Lab Specific		

Chain of Possession Relinquished By (Sign and Print Names)	Date	Time	Received By
R.T. Sickle R.T. Sickle	3/3/94	0800	DK Edwards
DK Edwards	3/4/94	0810	
	3-7-94 *		Kermit Blum K. Blum

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

LABORATORY SECTION	Received By	Title	Date/Time
Final Sample Disposition	Disposal Method:	Disposed by:	Date/Time:

* Received @ TMA/NORCAL 3-5-94; opened 3-7-94 KB

SURFACE

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0042

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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: 3-2-94

Ice Chest No.:

Field Logbook No.: EFL-1115

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) B0W0F8

- ✓ 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)~~

- ~~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~~

3-2-94

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

Relinquished by:	Received by:	Date/Time:
3-4-94 1033	Kermit Blum K. Blum	3-7-94 *
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:

* Received @ TMA/NORCAL 3-5-94; opened 3-7-94 KB

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

0043

~~62~~

9713524.2146

ATTACHMENT 5

DATA VALIDATION SUPPORTING DOCUMENTATION

RADIOCHEMICAL DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E

PROJECT: 200-UP-2		DATA PACKAGE: BOBFF9-TMA-726	
VALIDATOR: [illegible]	LAB: TMA	DATE: 6/02/94	
CASE:		SDG: BOBFF9-TMA-726	

ANALYSES PERFORMED

☒ Gross Alpha/Beta	☒ Strontium-90	☒ Technetium-99	☒ Alpha Spectroscopy	☒ Gamma Spectroscopy	* Se-79
☒ Total Uranium	☐ Radium-22	☐ Tritium	☒ I-129	* Np-237	

SAMPLES/MATRIX Soils
BOBFF9
BOBFG2
BOBFH1
BOBFH2
BOBFH4

1. Completeness . . . . . ☐ N/A

Technical verification forms present? . . . . . (Yes) No N/A

Comments:

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: Initial calibration for associated detectors was performed more than 1 year prior to sample analysis, however, no qualification is required for this deficiency. Also, the continuing cal checks are all within the lab control limits.

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? . . . . . Yes (No) N/A

Comments: The efficiency checks for iodine-129 analysis were performed more than one month from sample analysis for B0BFH2, B0BFH4, LCS, Blank, and B0BFF9 Duplicate. The assoc. results have been qual. as estimated (J/UJ).

4. Blanks . . . . . ☐ N/A

Method blank analyzed? . . . . . (Yes) No N/A
Method blank results acceptable? . . . . . (Yes) No N/A
Analytes detected in method blank? . . . . . Yes (No) N/A
Field blank(s) analyzed? . . . . . 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~~ 6/26/91

Comments: No qualification is required for blank adjustment. All blank results are nondetects.

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: LCS was performed instead of a matrix spike.

6. Laboratory Control Samples . . . . . ☐ N/A

LCS analyzed? . . . . . Yes No N/A
LCS recoveries acceptable? . . . . . Yes No N/A
LCS traceable? . . . . . Yes No N/A
Transcription/Calculation Errors? . . . . . Yes No N/A

Comments: All LCS recoveries are acceptable. No qual is required.

7. Chemical Recovery . . . . . ☐ N/A

Chemical carrier added? . . . . . Yes No N/A
Chemical recovery acceptable? . . . . . Yes No N/A
Chemical carrier traceable? . . . . . Yes No N/A
Chemical carrier expired? . . . . . Yes No N/A
Transcription/Calculation errors? . . . . . Yes No N/A

Comments: All chemical & tracer recoveries are acceptable with the one exception of the americium-243 tracer for sample B2BFF9 which had a recovery of 14%. The assoc. Am-241 and Cm-244 results have been qualified as estimated (UJ).

8. Duplicates . . . . . ☐ N/A

Duplicates Analyzed? . . . . . Yes No N/A
RPD Values Acceptable? . . . . . Yes No N/A
Transcription/Calculation Errors? . . . . . Yes No N/A

Comments: The duplicate RPDs for Uranium-238, radium-228 and thorium-232 are >35%. ~~The~~ 4/3/97
The associated results have been qualified as estimated (J/UJ).

9. Field QC Samples . . . . . ☒ 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: Sample locations are not currently available. Field QC will be evaluated in the final summary report.

10. Holding Times

Are sample holding times acceptable? . . . . . (Yes) No N/A

Comments: All samples were analyzed within 180 days of sample collection. No qualification is required.

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? . . . . . Yes (No) N/A
Transcription/calculation errors? . . . . . Yes (No) N/A

Comments: The laboratory reported "J" qualifiers for several sample results. These qualifiers have been crossed off the laboratory result forms for clarification purposes and are not considered appropriate for radiochemistry validation.

Comments: All MDAs meet the RDLs with the exception of the following:

Sample	Analyte	MDA (pCi/g)	RDL (pCi/g)
BOBFF9	Total U	0.3 ug/g	0.1 ug/g
	Iron-59	0.1	0.05
	Cobalt-58	0.06	0.05
	Cobalt-60	0.06	0.05
	Cesium-137	0.06	0.05
	Europium-152	0.2	0.1
	Europium-155	0.3	0.1
BOBFG2	Total U	0.3 ug/g	0.1 ug/g
	Iron-59	0.2	0.05
	Cobalt-58	0.1	0.05
	Europium-152	2	0.1
	Europium-154	1	0.1
	Europium-155	2	0.1
BOBFH1	Total U	0.3 ug/g	0.1 ug/g
	Iron-59	5	0.05
	Cobalt-58	3	0.05
	Cobalt-60	1	0.05
	Europium-152	20	0.1
	Europium-154	10	0.1
	Europium-155	20	0.1
BOBFH2	Uranium-233/234	0.6	0.3
	Uranium-238	0.5	0.3
	Total U	3 ug/g	0.1 ug/g
	Iron-59	0.8	0.05
	Cobalt-58	0.5	0.05
	Cobalt-60	0.1	0.05
	Europium-152	5	0.1
	Europium-154	4	0.1
	Europium-155	7	0.1

Comments:

Sample	Analyte	MDA (pCi/g)	RDL (pCi/g)
BoBFH4	Total U	0.3 ug/g	0.1 ug/g
	Iron-59	2	0.05
	Cobalt-58	1	0.05
	Cobalt-60	0.7	0.05
	Europium-152	10	0.1
	Europium-155	20	0.1

No qualification is required.

[illegible] 4/3/94

Samples BoBFH1 and BoBFH4 were analyzed in different geometries than the associated blank and LCS for gamma spectroscopy. Therefore, the assoc. sample results have been qualified as estimated (J/UJ).

[illegible] 6/6/94

9213524.2153

TMA NORCAL

SAMPLE DELIVERY GROUP 7341

WORK SUMMARY

Case/SDG 93-263/7341
Contact N. Joseph Verville

Client Westinghouse Hanford
Contract MBH-SVV-069262

CLIENT SAMPLE ID / LOCATION / CUSTODY	SAS NO	MATRIX	LAB SAMPLE ID / COLLECTED / RECEIVED	PLANCHET	TEST	SUF-FIX	ANALYZED	REVIEWED BY	METHOD
B0BFF9			N403028-01	7341-001	80A/80		04/21/94	56	Gross Alpha in Soil
216-U-8 Crib		SOLID	02/24/94	7341-001	80B/80		04/21/94	56	Gross Beta in Soil
006481			03/04/94	7341-001	GAM		03/22/94	26	Gamma Scan
				7341-001	I		04/15/94	50	Iodine 129 in Soil
				7341-001	NP		04/21/94	56	Neptunium in Soil
				7341-001	PU		04/21/94	56	Plutonium, Isotopic in Soil
				7341-001	SE_L		04/08/94	43	Selenium 79 in Soil
				7341-001	TC	A1	04/19/94	54	Technetium 99 in Soil
				7341-001	TP		04/21/94	56	Americium 241/Curium in Solids
				7341-001	U		04/21/94	56	Uranium, Isotopic in Soil
				7341-001	U_T		04/22/94	57	Uranium, Total in Soil
				7341-001	Y		04/20/94	55	Strontium 90 in Soil
B0BFG2			N403028-02	7341-002	80A/80		05/02/94	66	Gross Alpha in Soil
216-U-8 Crib		SOLID	02/25/94	7341-002	80B/80		04/22/94	56	Gross Beta in Soil
006484			03/04/94	7341-002	GAM		03/22/94	25	Gamma Scan
				7341-002	I		04/15/94	49	Iodine 129 in Soil
				7341-002	NP		04/21/94	55	Neptunium in Soil
				7341-002	PU		04/21/94	55	Plutonium, Isotopic in Soil
				7341-002	SE_L		04/08/94	42	Selenium 79 in Soil
				7341-002	TC	A1	04/18/94	52	Technetium 99 in Soil
				7341-002	TP		04/21/94	55	Americium 241/Curium in Solids
				7341-002	U		04/21/94	55	Uranium, Isotopic in Soil
				7341-002	U_T		04/22/94	56	Uranium, Total in Soil
				7341-002	Y		04/20/94	54	Strontium 90 in Soil
B0BFH1			N403028-03	7341-003	80A/80		05/02/94	63 43	Gross Alpha in Soil
216-U-8 Crib		SOLID	02/28/94	7341-003	80B/80		04/22/94	~~112~~ 53	Gross Beta in Soil
006225			03/07/94	7341-003	GAM	A01	03/23/94	23	Gamma Scan
				7341-003	I		04/16/94	47	Iodine 129 in Soil
				7341-003	NP		04/21/94	52	Neptunium in Soil
				7341-003	PU		04/21/94	52	Plutonium, Isotopic in Soil
				7341-003	SE_L		04/08/94	39	Selenium 79 in Soil
				7341-003	TC	A1	04/20/94	51	Technetium 99 in Soil
				7341-003	TP		04/21/94	52	Americium 241/Curium in Solids
				7341-003	U		04/21/94	52	Uranium, Isotopic in Soil
				7341-003	U_T		04/22/94	53	Uranium, Total in Soil
				7341-003	Y		04/20/94	51	Strontium 90 in Soil

0051

6/3/94

Lab id TMAN
Protocol WHC-HASM
Version Ver 1.0
Form DVD-CWS
Version 2.30
Report date 05/05/94

9713524.2154

TMA NORCAL

SAMPLE DELIVERY GROUP 7341

Case/SDG 93-263/7341
Contact N. Joseph Verville

WORK SUMMARY, cont.

Client Westinghouse Hanford
Contract MBH-SVV-069262

CLIENT SAMPLE ID / LOCATION / CUSTODY	SAS NO	MATRIX	LAB SAMPLE ID / COLLECTED / RECEIVED	PLANCHET	TEST	SUF-FIX	ANALYZED	REVIEWED BY	METHOD
B0BFH2			N403028-04	7341-004	80A/80		05/02/94	62	Gross Alpha in Soil
216-U-8 Crib		SOLID	03/01/94	7341-004	80B/80		04/22/94	52	Gross Beta in Soil
006226			03/09/94	7341-004	GAM		03/23/94	22	Gamma Scan
				7341-004	I		04/25/94	55	Iodine 129 in Soil
				7341-004	NP		04/22/94	52	Neptunium in Soil
				7341-004	PU		04/21/94	51	Plutonium, Isotopic in Soil
				7341-004	SE_L		04/08/94	38	Selenium 79 in Soil
				7341-004	TC	A1	04/19/94	49	Technetium 99 in Soil
				7341-004	TP		04/21/94	51	Americium 241/Curium in Solids
				7341-004	U		04/28/94	58	Uranium, Isotopic in Soil
				7341-004	U_T		04/22/94	52	Uranium, Total in Soil
				7341-004	Y		04/20/94	50	Strontium 90 in Soil
B0BFH4			N403028-05	7341-005	80A/80		05/02/94	~~61~~ 61 6/3/94	Gross Alpha in Soil
216-U-8 Crib		SOLID	03/02/94	7341-005	80B/80		04/22/94	51	Gross Beta in Soil
006228			03/09/94	7341-005	GAM	A01	03/23/94	21	Gamma Scan
				7341-005	I		04/26/94	55	Iodine 129 in Soil
				7341-005	NP		04/22/94	51	Neptunium in Soil
				7341-005	PU		04/21/94	50	Plutonium, Isotopic in Soil
				7341-005	SE_L		04/08/94	37	Selenium 79 in Soil
				7341-005	TC	A1	04/18/94	47	Technetium 99 in Soil
				7341-005	TP		04/21/94	50	Americium 241/Curium in Solids
				7341-005	U		04/21/94	50	Uranium, Isotopic in Soil
				7341-005	U_T		04/22/94	51	Uranium, Total in Soil
				7341-005	Y	6/3/94	4/20/94	49	Strontium 90 in Soil
Reagent Blank			N403028-07	7341-007	80A/80		04/22/94		Gross Alpha in Soil
		SOLID		7341-007	80B/80		04/22/94		Gross Beta in Soil
				7341-007	GAM		03/23/94		Gamma Scan
				7341-007	I		04/27/94		Iodine 129 in Soil
				7341-007	NP		04/22/94		Neptunium in Soil
				7341-007	PU		04/21/94		Plutonium, Isotopic in Soil
				7341-007	SE_L		04/08/94		Selenium 79 in Soil
				7341-007	TP		04/21/94		Americium 241/Curium in Solids
				7341-007	U		04/21/94		Uranium, Isotopic in Soil
				7341-007	U_T		04/22/94		Uranium, Total in Soil
				7341-007	Y		04/20/94		Strontium 90 in Soil

0052

6/3/94

Lab id TMAN
Protocol WHC-HASM
Version Ver 1.0
Form DVD-CWS
Version 2.30
Report date 05/05/94

9713524.2155

N403028-08

TMA NORCAL

SAMPLE DELIVERY GROUP 7341

DUPLICATE

B0BFF9

Assoc with samples B0BFF9, B0BFG2, B0BFH1, B0BFH2, and B0BFH4. 6/3/94

Case/SDG 93-263/7341 Client Westinghouse Hanford

Contact N. Joseph Verville Contract MBH-SVV-069262

DUPLICATE	ORIGINAL	
Lab sample id N403028-08	Lab sample id N403028-01	Client sample id B0BFF9
Dept sample id 7341-008	Dept sample id 7341-001	Location/Matrix 216-U-8 Crib SOLID
	Received 03/04/94	Collected 02/24/94
% moisture 3.3	% moisture 3.3	Chain of custody id 006481

ANALYTE	DUPLICATE pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALIFIERS Q	TEST	ORIGINAL pCi/g	2σ ERR (COUNT)	MDA pCi/g	QUALIFIERS	RPD %	3σ TOT	PROT LIMIT
Gross Alpha	4.3	4.0	4	10	J	80A	9.7	5.1	4	J	77	146	
Gross Beta	310	12	6	10		80B	410	14	6		28	33	
Selenium 79	-1.2	3.1	5	10	U	SE_L	-5.3	2.0	3	U	-		
Strontium 90	150	4.6	1	1		Y	180	12	0.6		18	25	
Technetium 99	0.69	0.099	0.3	0.5		TC	0.88	0.14	0.4		24	39	
Iodine 129	0.20	0.72	2	2	~~U~~ UJ	I	0.13	0.77	2	U	-		
Uranium 233/234	2.2	0.44	0.2	0.3		U	1.8	0.39	0.1		20	46	
Uranium 235	0.26	0.14	0.1	0.3	J	U	0.051	0.068	0.1	U	134	151	
Uranium 238	2.3	0.44	0.1	0.3		U	1.6	0.36	0.1		36	45	
Total Uranium (ug/g)	6.7	1.5	0.3	0.1		U_T	7.9	1.8	0.3		16	52	
Neptunium 237	0	0.006	0.008	0.2	U	NP	0.004	0.008	0.02	U	-		
Plutonium 238	0.006	0.011	0.02	0.05	U	PU	0.003	0.003	0.01	U	-		
Plutonium 239/240	0.040	0.019	0.01	0.05	J	PU	-0.002	0.007	0.02	U	200	145	
Americium 241	0	0.012	0.02	0.05	U	TP	0.007	0.015	0.03	U	-		
Curium 244	0.012	0.012	0.02	0.05	U	TP	0	0.015	0.04	U	-		
GAMMA SCAN ANALYTES													
Sodium 22	U		0.1		U	GAM	U		0.05	U	-		
Potassium 40	9.0	1.5				GAM	9.9	0.89			10	42	
Manganese 54	U		0.08		U	GAM	U		0.05	U	-		
Iron 59	U		0.2	0.05	U	GAM	U		0.1	U	-		
Cobalt 58	U		0.09	0.05	U	GAM	U		0.06	U	-		
Cobalt 60	U		0.1	0.05	U	GAM	U		0.06	U	-		
Niobium 94	U		0.09		U	GAM	U		0.05	U	-		
Ruthenium 103	U		0.1		U	GAM	U		0.06	U	-		
Ruthenium 106	U		0.7		U	GAM	U		0.4	U	-		
Tin 113	U		0.1		U	GAM	U		0.06	U	-		
Cesium 134	U		0.1		U	GAM	U		0.07	U	-		
Cesium 137	U		0.1	0.05	U	GAM	U		0.06	U	-		

0053

Lab id TMAN
Protocol WHC-HASM
Version Ver 1.0
Form DVD-DUP
Version 2.30
Report date 05/05/94

6/3/94

DUPLICATES
Page 1
SUMMARY DATA SECTION
Page 16

9713524.2156

N403028-08

TMA NORCAL

SAMPLE DELIVERY GROUP 7341

DUPLICATE, cont.

B0BFF9

Case/SDG	93-263/7341			Client	Westinghouse Hanford
Contact	N. Joseph Verville			Contract	MBH-SVV-069262
DUPLICATE		ORIGINAL			
Lab sample id	N403028-08	Lab sample id	N403028-01	Client sample id	B0BFF9
Dept sample id	7341-008	Dept sample id	7341-001	Location/Matrix	216-U-8 Crib SOLID
		Received	03/04/94	Collected	02/24/94
% moisture	3.3	% moisture	3.3	Chain of custody id	006481

ANALYTE	DUPLICATE pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST	ORIGINAL pCi/g	2σ ERR (COUNT)	MDA pCi/g	QUALI-FIERS	RPD %	3σ PROT TOT LIMIT
Cerium 144	U		0.7		U	GAM	U		0.4	U	-	
Europium 152	U		0.3	0.1	U	GAM	U		0.2	U	-	
Europium 154	U		0.2	0.1	U	GAM	U		0.1	U	-	
Europium 155	U		0.4	0.1	U	GAM	U		0.3	U	-	
Radium 226	0.44	0.15				GAM	0.37	0.092			17	73
Radium 228	0.85	0.34				GAM	0.46	0.19			60	95
Thorium 228	0.49	0.097				GAM	0.54	0.056			10	46
Thorium 232	0.85	0.34				GAM	0.46	0.19			60	95

QC 18237-46,18549 REP#1
QC 18237-18246 REP #1

The RDLs for radium-228 and thorium-232 are not assigned. The ~~MDA~~ 6/3/94 MDAs assoc. with the blank are 0.06 pCi/g for both parameters. The blank MDA of 0.06 pCi/g will be used ~~instead~~ in place of the RDL for Ra-228 & Th-232.

0054

6/3/94

Lab id	TMAN
Protocol	WHC-HASM
Version	Ver 1.0
Form	DVD-DUP
Version	2.30
Report date	05/05/94

SAMPLE RESULT CALCULATION SHEET, DATA PACKAGE B0BFF9-TMA-726

B0BFF9-TMA-726
Gross Alpha/Beta

Sample ID:	B0BFF9	B0BFG2*	B0BFG2*	B0BFH1*	B0BFH1*	B0BFH2*	B0BFH2*	B0BFH4*	B0BFH4*	QC-LCS	QC-BLANK	B0BFF9-DUP
Lab ID:	7341-001	7341-002	7341-002	7341-003	7341-003	7341-004	7341-004	7341-005	7341-005	7341-006	7341-007	7341-008
Aliquot:	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Detector:	104	113	114	114	116	115	105	116	106	108	113	114
Count time:	100	100	100	100	100	100	100	100	100	100	100	100
Alpha cpm:	0.58	0.74	2.46	2.59	21.23	2.61	5.67	1.56	5.56	5.33	0.06	0.35
Alpha, Bkgd:	0.041	0.045	0.34	0.052	0.055	0.081	0.024	0.041	0.032	0.081	0.069	0.034
Alpha, Xtalk:	0.006	0	0.006	0	0.006	0	0.006	0	0.006	0.006	0.006	0.006
Alpha, Eff:	0.138	0.16	0.16	0.156	0.156	0.16	0.16	0.142	0.142	0.102	0.088	0.144
Alpha Result Calc.:	10	20	---	73	---	71	---	48	---	226	-1	4
Alpha Result Rptd.:	10	20	---	75	---	72	---	48	---	228	-1	4
Alpha MDA Calc.:	3	3	---	3	---	4	---	3	---	6	6	3
Alpha MDA Rptd.:	4	4	---	4	---	5	---	4	---	7	8	4
Beta cpm:	40.2	---	280.51	---	2245.27	---	636.62	---	885.21	24.57	1.51	30.59
Bkgd:	1.253	---	1.414	---	1.088	---	1.337	---	1.257	1.09	1.164	1.414
Xtalk:	0.267	---	0.256	---	0.258	---	0.256	---	0.265	0.297	0.316	0.264
Eff:	0.42	---	0.423	---	0.422	---	0.423	---	0.421	0.412	0.407	0.421
Beta Result Calc.:	416	---	2966	---	23896	---	6750	---	9442	240	4	311
Beta Result Rptd:	412	---	3002	---	24390	---	6854	---	9648	237	4	315
Beta MDA Calc:	6	---	6	---	5	---	6	---	6	5	6	6
Beta MDA rptd:	6	---	6	---	5	---	6	---	6	6	6	6

*SEPARATE RUNS FOR GROSS ALPHA ND GROSS BETA ANALYSES WERE PERFORMED ON SAMPLES B0BFG2, B0BFH1, B0BFH2, B0BFH4. NO QUALIFICATION IS REQUIRED.

9713524.2157

0055

SAMPLE RESULT CALCULATION SHEET, DATA PACKAGE B0BFF9-TMA-726

Selenium-79							
Sample ID:	B0BFF9	B0BFG2	B0BFH1	B0BFH2	B0BFH4	QC-BLANK	0BFF9-DUP
Lab ID:	7341-001	7341-002	7341-003	7341-004	7341-005	7341-007	7341-008
Detector, LSC:	4	4	4	4	4	4	4
Count time:	150	150	150	150	150	150	150
Detector Eff:	0.669	0.338	0.659	0.406	0.572	0.516	0.513
Sample cpm:	12.75	14.24	12.65	15.09	13.76	14.95	14.71
Bkgd cpm:	15.05	15.05	15.05	15.05	15.05	15.05	15.05
Yield:	0.5403	0.7564	0.6582	0.6876	0.8251	0.8644	0.501
Decay Corr:	1	1	1	1	1	1	1
Aliquot:	0.5452	0.5045	0.5029	0.5015	0.5075	0.5	0.5012
Result calc:	-5.26	-2.83	-4.96	0.13	-2.43	-0.20	-1.19
Result rptd:	-5.26	-2.84	-4.96	0.13	-2.43	-0.20	-1.19
MDA calc:	3.4	5.2	3.0	4.7	2.8	3.0	5.2
MDA rptd:	3.4	5.2	3.1	4.8	2.8	3.0	5.2

9713524.2153

SAMPLE RESULT CALCULATION SHEET, DATA PACKAGE B0BFF9-TMA-726

Strontium 90								
Sample ID:	B0BFF9	B0BFG2	B0BFH1	B0BFH2	B0BFH4	QC-LCS	QC-BLANK	B0BFF9-DUP
Lab ID:	7341-001	7341-002	7341-003	7341-004	7341-005	7341-006	7341-007	7341-008
Detector:	205	206	213	211	215	206	210	201
Bkg:	0.368	0.443	0.487	0.756	0.399	0.443	0.419	0.432
Count Time:	50	50	50	660.35	50	622.67	660.35	47.22
Y90 cpm:	168.739	79.359	14.842	3.844	72.295	12.377	-0.786	95.416
Elapsed Time, days:	54.412	53.412	50.412	49.412	48.412	0	0	54.412
Lambda:	6.86E-05	6.86E-05	6.86E-05	6.86E-05	6.86E-05	6.86E-05	6.86E-05	6.86E-05
Decay:	0.9963	0.9963	0.9965	0.9966	0.9967	1.0000	1.0000	0.9963
Yield:	0.7867	0.8262	0.8413	0.8381	0.7294	0.846	0.8407	0.5194
PPT. corr.:	1	1	1	1	1	1	1	1
Aliquot:	1	1	1	1	1	1	1	1
Product:	0.7838	0.8232	0.8384	0.8353	0.7270	0.8460	0.8407	0.5175
C-zero:	215.2921	96.4058	17.7029	4.6021	99.4456	14.6300	-0.9349	184.3916
P-Factor:	1.859	1.859	1.859	1.859	1.859	1.859	1.859	1.859
Result, calc.:	180.28	80.73	14.82	3.85	83.27	12.25	-0.78	154.41
Result, rptd.:	180.28	80.73	14.82	3.85	83.27	12.60	-0.78	154.40
MDA, calc.:	0.43	0.45	0.46	0.16	0.48	0.12	0.12	0.72
MDA, rptd.:	0.57	0.59	0.60	0.24	0.63	0.19	0.18	1.31

97135 24.2159

SAMPLE RESULT CALCULATION SHEET, DATA PACKAGE B0BFF9-TMA-726

Technetium 99								
Sample ID:	B0BFF9	B0BFG2	B0BFH1	B0BFH2	B0BFH4	B0BFF9-DUP	QC-LCS	QC-BLANK
Lab ID:	7341-001	7341-002	7341-003	7341-004	7341-005	7341-008	7341-009	7341-010
Detector:	LBG 15	LBG 10	LBG 11	LBG 11	LBG 15	LBG 16	LBG 9	LBG 9
Net, cpm:	0.61	1.69	2.99	1.35	1.16	0.8	21.11	0.04
Days:	53.482	52.482	50.712	49.712	47.482	53.482	0	0
Lambda:	8.91E-09	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	1.0000
Yield:	0.3643	0.5487	0.6613	0.662	0.6495	0.6061	0.4974	0.5776
Aliquot:	2.01	2.02	2	2.01	2.02	2.02	2	2
P-Factor:	2.340	2.340	2.340	2.340	2.340	2.340	2.340	2.340
Count, time:	208.1	141.7	107.4	104	141.7	141.7	237.8	178.6
Bkg., cpm:	0.6	0.54	0.48	0.48	0.6	0.57	0.54	0.54
Result, calc.:	0.88	1.61	2.38	1.07	0.93	0.69	22.37	0.04
Result, rptd.:	0.88	1.61	2.38	1.07	0.93	0.69	22.37	0.03
MDA, calc.:	0.36	0.27	0.25	0.25	0.24	0.25	0.24	0.23
MDA, rptd.:	0.40	0.30	0.27	0.27	0.27	0.28	0.25	0.25

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0058

SAMPLE RESULT CALCULATION SHEET, DATA PACKAGE B0BFF9-TMA-726

Iodine-129								
Sample ID:	B0BFF9	B0BFG2	B0BFH1	B0BFH2	B0BFH4	QC-LCS	QC-BLANK	B0BFF9-DUP
Lab ID:	7341-001	7341-002	7341-003	7341-004	7341-005	7341-006	7341-007	7341-008
Detector:	XSPEC 14	XSPEC 14	XSPEC 14	XSPEC 14	XSPEC 14	XSPEC 14	XSPEC 14	XSPEC 14
Count Time:	400.3	403.88	425.27	116.045	116.749	117.057	805.55	485.95
Gross cpm:	0.5	0.552	0.611	0.623	0.536	23.412	0.569	0.533
Bkg cpm:	0.584	0.706	0.65	0.676	0.356	0.992	0.616	0.57
% Bkg Std. Dev.:	19.44	17.03	17.83	11.56	20.33	15.53	12.83	16.69
Blank cpm:	-0.126	-0.126	-0.126	-0.099	-0.099	-0.099	-0.099	-0.103
% Blank Std. Dev.:	35.42	35.42	35.42	61.08	61.08	61.08	61.08	58.63
Net cpm:	0.042	-0.028	0.087	0.046	0.279	22.519	0.052	0.066
Lambda:	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Corr. Days:	50.409	49.688	46.972	55.711	55.415	0	0	67.401
Decay:	1	1	1	1	1	1	1	1
Yield:	0.6736	0.671	0.6347	0.6444	0.6593	0.9032	0.9657	0.6632
Aliquot:	1.01	1.02	1.01	1.04	1.03	1	1	1.01
PPT. Corr.:	1	1	1	1	1	1	1	1
Product:	6.80E-01	6.84E-01	6.41E-01	6.70E-01	6.79E-01	9.03E-01	9.66E-01	6.70E-01
P-factor:	4.57	4.57	4.57	4.57	4.57	4.57	4.57	4.57
Result Calc.:	0.13	-0.08	0.28	0.14	0.85	51.32	0.11	0.20
Result Rptd.:	0.13	-0.08	0.28	0.14	0.84	51.32	0.11	0.20
MDA Calc.:	1.74	1.81	1.87	1.48	1.40	1.81	0.99	1.63
MDA Rptd.:	1.74	1.82	1.88	1.42	1.35	1.77	0.99	1.63

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0059

9713524.2162

SAMPLE RESULT CALCULATION SHEET, DATA PACKAGE B0BFF9-TMA-726

Uranium 233/4/5/8								
Sample ID:	B0BFF9	B0BFG2	B0BFH1	B0BFH2	B0BFH4	QC-LCS	QC-BLANK	B0BFF9-DUP
Lab ID:	7341-001	7341-002	7341-003	7341-004	7341-005	7341-006	7341-007	7341-008
Detector:	SS-37	SS-19	SS-20	SS-27	SS-23	SS-24	SS-25	SS-26
Sample count time:	160.95	150.85	150.85	517.43	150.85	150.85	150.85	150.85
GMT count:	112.012	112.128	112.128	119.283	112.128	112.128	112.128	112.128
Zero time:	55.334	56.334	59.334	60.334	61.334	112.128	112.128	55.334
Corr. tracer dpm:	10.43	10.43	10.43	10.43	10.43	10.43	10.43	10.43
Bkgd count time:	2694.47	2656.93	2656.93	2464.7	2682.32	2682.32	2682.32	2682.32
Net tracer counts:	335	336	276	141	358	399	286	333
Detector eff.:	0.4172	0.2784	0.287	0.0345	0.3196	0.3221	0.3074	0.3236
Yield:	0.4783	0.7671	0.6112	0.7573	0.7119	0.7873	0.5913	0.6540
U-238, gross counts:	117	607	1246	1285	2153	477	1	164
U-238, bkgd counts:	0	0	0	0	0	0	0	0
tracer interference counts:	0	0	0	0	0	0	0	0
tracer std.dev.:	0	0	0	0	0	0	0	0
U-235 interference counts:	0	7	8	8	21	28	0	2
U-238, net counts:	117	600	1238	1277	2132	449	1	162
U-238, Lambda:	4.23E-13	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	1.0000
U-235, gross counts:	3	65	77	79	208	282	0	15
U-235, bkgd counts:	0	0	0	1	1	1	0	0
tracer interference counts:	0	0	0	0	0	0	0	0
tracer std.dev.:	0	0	0	0	0	0	0	0
U-235 interference counts:	0	0	0	0	0	0	0	0
U-235, net counts:	3	65	77	78	207	281	0	15
U-235, Lambda:	2.67E-12	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	1.0000
U-235, branch ratio:	0.826	0.826	0.826	0.826	0.826	0.826	0.826	0.826
U-233/4, gross counts:	132	715	1248	1149	2283	438	2	160
U-233/4, bkgd counts:	1	2	1	2	2	1	2	1
tracer interference counts:	1	1	0	0	1	1	0	1
tracer std.dev.:	0	0	0	0	0	0	0	0
U-235 interference counts:	0	7	8	9	23	31	0	2
U-233/4, net counts:	130	705	1239	1138	2257	405	0	156
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	1.17E-08
U-233/4, Decay corr:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Aliquot:	1	1	1	1	1	1	1	1
U-238, result calc.:	1.64	8.39	21.07	42.55	27.98	5.29	0.02	2.29
U-238, result rptd:	1.64	8.39	21.08	42.56	27.99	5.29	0.02	2.29
U-238 MDA calc.:	0.04	0.21	0.27	0.53	0.32	0.32	0.04	0.13
U-238, MDA rptd.:	0.11	0.21	0.28	0.05	0.32	0.33	0.13	0.14
U-235, result calc.:	0.05	1.10	1.59	3.15	3.29	4.01	0.00	0.26
U-235, result rptd.:	0.05	1.10	1.59	3.15	3.29	4.01	0.00	0.26
U-235, MDA calc.:	0.13	0.13	0.16	0.31	0.12	0.11	0.15	0.13
U-235, MDA rptd.:	0.13	0.13	0.16	0.31	0.12	0.11	0.15	0.13
U-233/4, result calc.:	1.82	9.86	21.09	37.92	29.62	4.77	0.00	2.20
U-233/4, result rptd.:	1.82	9.86	21.10	37.93	39.63	4.77	0.00	2.20
U-233/4, MDA calc.:	0.10	0.23	0.28	0.60	0.34	0.34	0.15	0.15
U-233/4, MDA rptd.:	0.11	0.24	0.29	0.61	0.35	0.35	0.16	0.16

SAMPLE RESULT CALCULATION SHEET, DATA PACKAGE B0BFF9-TMA-726

Total Uranium

Standard	Intensity	Sample ID:	Lab ID:	Intens.	ug/L Calc.	ug/L Rptd	Dilution	Amount of Smpl	Prep. Volume	Calc Result	Rptd Rslt
0.049	285										
0.156	776	B0BFF9	7341-001	4726	0.95	0.9877	100	0.25	0.02	7.90	7.90
0.521	2567	B0BFG2	7341-002	20120	4.04	4.10597	100	0.25	0.02	32.85	32.85
0.976	4981	B0BFH1	7341-003	59348	11.91	12.11221	100	0.25	0.02	96.90	96.90
2.603	12729	B0BFH2	7341-004	9828	1.97	1.96931	1000	0.25	0.02	157.54	157.55
4.881	23435	B0BFH4	7341-005	57712	11.58	11.71956	100	0.25	0.02	93.76	93.76
16.27	73960	QC-LCS	7341-006	16403	3.29	3.28117	10	0.25	0.02	2.62	2.62
		QC-BLANK	7341-007	-241	-0.05	0.036	1	0.25	0.02	0.003	0.003
Slope:	2.0E-04	B0BFF9-DUP	7341-008	4131	0.83	0.83	100	0.25	0.02	6.66	6.66

9713524.2163

0061

SAMPLE RESULT CALCULATION SHEET, DATA PACKAGE B0BFF9-TMA-726

Neptunium								
Sample ID:	B0BFF9	B0BFG2	B0BFH1	B0BFH2	B0BFH4	QC-LCS	QC-BLANK	B0BFF9-DUP
Lab ID:	7341-001	7341-002	7341-003	7341-004	7341-005	7341-006	7341-007	7341-008
Detector:	SS-51	SS-52	SS-53	SS-51	SS-52	SS-54	SS-53	SS-54
Np239 cpm:	38.17	37.31	33.59	14.59	28.07	36.16	33.78	27.77
Inst. eff.:	0.721	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	99.08
Yield:	0.5343	0.5223	0.4702	0.2042	0.3929	0.5062	0.4729	0.3887
Aliquot:	1	1	1	1	1	1	1	1
Count time:	1036.02	1036.02	1036.02	1041.35	1041.35	1036.02	1041.35	1041.35
Np237 gross counts:	4	12	10	18	10	2318	7	0
Np237 bkgd counts:	2	1	2	2	1	0	2	0
Np237 aspec. eff:	0.396	0.398	0.416	0.396	0.398	0.404	0.416	0.404
Np237 result calc.:	0.004	0.023	0.018	0.086	0.025	4.928	0.011	0.000
Np237 result rptd.:	0.004	0.023	0.018	0.086	0.025	4.925	0.011	0.000
Np237 MDA calc.:	0.020	0.016	0.021	0.051	0.021	0.006	0.021	0.008
Np237 MDA rptd.:	0.020	0.016	0.021	0.051	0.021	0.006	0.021	0.008

9713524.2164

0062

SAMPLE RESULT CALCULATION SHEET, DATA PACKAGE B0BFF9-TMA-726

Plutonium 238/239								
Sample ID:	B0BFF9	B0BFG2	B0BFH1	B0BFH2	B0BFH4	QC-LCS	QC-BLANK	B0BFF9-DUP
Lab ID:	7341-001	7341-002	7341-003	7341-004	7341-005	7341-006	7341-007	7341-008
Detector:	SS-55	SS-56	SS-39	SS-57	SS-58	SS-59	SS-60	SS-61
Count time:	859.75	859.75	837.02	859.75	859.75	859.75	859.75	859.75
GMT, count:	112.001	112.001	112.014	112.001	112.001	112.001	112.001	112.001
Zero time:	55.334	56.334	59.334	60.334	61.334	112.001	112.001	55.334
Corr, tracer dpm:	4.86	4.86	4.86	4.86	4.86	4.86	4.86	4.86
Bkgd, count time:	2700.88	2700.88	2695.7	2700.88	2700.88	2700.88	2700.88	2700.88
Net, tracer counts:	1321	1285	1443	1202	1310	887	1075	1163
Detector Eff:	0.4191	0.385	0.4	0.4035	0.4062	1	1	1
Yield:	0.7544	0.7988	0.8868	0.7129	0.7718	0.2123	0.2573	0.2783
Pu239, gross counts:	2	23	7966	780	723	474	0	21
Pu239, bkgd counts:	3	0	1	1	1	1	1	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	7.78E-08
Pu239 decay:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Pu238, gross counts:	2	4	209	23	20	623	1	6
Pu238, bkgd counts:	0	1	10	2	2	0	1	3
Pu-238, Lambda:	2.20E-05	2.20E-05	2.20E-05	2.20E-05	2.20E-05	2.20E-05	2.20E-05	2.20E-05
Pu238 decay:	0.9988	0.9988	0.9988	0.9989	0.9989	1.0000	1.0000	0.9988
Aliquot:	1	1	1	1	1	1	1	1
Pu239, Result calc.:	-0.002	0.039	12.084	1.419	1.207	1.167	-0.002	0.040
Pu239, Result rptd:	-0.002	0.039	12.070	1.419	1.208	1.168	-0.002	0.040
Pu239, MDA calc.:	0.013	0.013	0.012	0.014	0.013	0.019	0.016	0.014
Pu239, MDA rptd.:	0.018	0.013	0.012	0.014	0.013	0.019	0.016	0.014
Pu238, Result calc.:	0.003	0.005	0.302	0.038	0.030	1.538	0.000	0.006
Pu238, Result rptd.:	0.003	0.005	0.302	0.038	0.030	1.538	0.000	0.006
Pu238, MDA calc.:	0.013	0.013	0.022	0.014	0.013	0.019	0.016	0.015
Pu238, MDA rptd:	0.013	0.013	0.027	0.018	0.016	0.019	0.016	0.021

9713524.2165

SAMPLE RESULT CALCULATION SHEET, DATA PACKAGE B0BFF9-TMA-726

Americium/Curium								
Sample ID:	B0BFF9	B0BFG2	B0BFH1	B0BFH2	B0BFH4	QC-BLANK	0BFF9-DUP	QC-LCS
Lab ID:	7341-001	7341-002	7341-003	7341-004	7341-005	7341-007	7341-008	7341-009
Detector:	SS-62	SS-63	SS-64	SS-65	SS-66	SS-41	SS-54	SS-55
Count Time:	859.75	859.75	859.75	859.75	859.75	837.02	1045.23	1045.23
GMT, count:	112.001	112.001	112.001	112.001	112.001	112.014	116.037	116.037
Zero time:	55.334	56.334	59.334	60.334	61.334	112.014	55.334	116.037
Tracer dpm:	4.85	4.85	4.85	4.85	4.85	4.85	4.85	4.85
Bkgd count time:	2700.88	2700.88	2700.88	2700.88	2700.88	2695.7	2469.92	2469.92
Net tracer counts:	593	673	1202	657	1226	1453	713	805
Detector eff.:	1	0.3863	0.4017	0.4195	0.4266	0.4199	0.4072	0.3866
Yield:	0.1422	0.4178	0.7176	0.3756	0.6892	0.8524	0.3454	0.4108
Aliquot:	1	1	1	1	1	1	1	1
Am241 gross counts:	4	5	112	14	600	15	2	348
Am241 bkgd. counts:	1	1	2	3	1	8	1	1
Tracer Interference Counts:	1	1	2	1	2	2	1	1
Tracer std. deviation:	0	0	0	0	0	0	0	0
Am241, Net counts:	2	3	108	10	597	5	0	346
Am-241, Lambda:	4.03E-06	4.03E-06	4.03E-06	4.03E-06	4.03E-06	4.03E-06	4.03E-06	4.03E-06
Am241 decay:	0.9998	0.9998	0.9998	0.9998	0.9998	1.0000	0.9998	1.0000
Cm244 gross counts:	2	2	6	1	8	5	5	237
Cm244 bkgd counts:	2	1	0	1	2	9	1	1
Tracer Interference Counts:	0	0	1	0	1	1	0	1
Tracer std. deviation:	0	0	0	0	0	0	0	0
Cm244, Net counts:	0	1	5	0	5	-5	4	235
Cm-244, Lambda:	1.06E-04	1.06E-04	1.06E-04	1.06E-04	1.06E-04	1.06E-04	1.06E-04	1.06E-04
Cm244 decay:	0.9940	0.9941	0.9944	0.9945	0.9946	1.0000	0.9936	1.0000
Am241 result calc.:	0.007	0.010	0.196	0.033	1.064	0.008	0.000	0.939
Am241 result rptd.:	0.007	0.010	0.196	0.033	1.064	0.008	0.000	0.938
Am241 MDA calc.:	0.034	0.030	0.022	0.040	0.019	0.026	0.028	0.025
Am241 MDA rptd:	0.028	0.025	0.017	0.037	0.014	0.024	0.023	0.021
Cm244 result calc.:	0.000	0.003	0.009	0.000	0.009	-0.008	0.012	0.638
Cm244 result rptd:	0.000	0.003	0.009	0.000	0.009	-0.008	0.012	0.637
Cm244 MDA calc.:	0.034	0.024	0.013	0.024	0.019	0.026	0.023	0.025
Cm244 MDA rptd.:	0.036	0.025	0.014	0.026	0.017	0.026	0.024	0.021

9713524.2166

SAMPLE RESULT CALCULATION SHEET, DATA PACKAGE B0BFF9-TMA-726

Gamma Spectroscopy								
Sample ID:	B0BFF9	B0BFG2	B0BFH1	B0BFH2	B0BFH4	QC-LCS	QC-BLANK	B0BFF9-DUP
Lab ID:	7341-001	7341-002	7341-003	7341-004	7341-005	7341-006	7341-007	7341-008
Detector:	G-2	G-5	G-1	G-3	G-3	G-3	G-5	G-2
Count Time:	470.6	463.22	100.27	104.82	100.18	111.82	111.9	151.27
Geometry:	100 ML	100 ML	15 ML	100 ML	15 ML	100 ML	100 ML	100 ML

9713524.2167

0065

RADIOCHEMICAL DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E

PROJECT: 200-UP-2		DATA PACKAGE: B0BFF9-TMA-726
VALIDATOR: [illegible]	LAB: TMA	DATE: 05/31/94
CASE:		SDG: B0BFF9-TMA-726

ANALYSES PERFORMED

☒ Gross Alpha/Beta	☒ Strontium-90	☒ Technetium-99	☒ Alpha Spectroscopy	☒ Gamma Spectroscopy	X Se-79
☒ Total Uranium	☐ Radium-22	☐ Tritium	☒ I-129	X Np-237	

SAMPLES/MATRIX Soils
B0BFH5
B0BFH6
B0BFH8
B09WF8

1. Completeness . . . . . ☐ N/A

Technical verification forms present? . . . . . (Yes) No N/A

Comments: _____

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? . . . . . Yes No N/A

Comments:

4. Blanks . . . . . ☐ N/A

Method blank analyzed? . . . . . Yes No N/A
Method blank results acceptable? . . . . . Yes No N/A
Analytes detected in method blank? . . . . . Yes No N/A
Field blank(s) analyzed? . . . . . 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: ~~All blank results are nondetects. No qualification is required~~ 6/3/94

See last page of checklist for comments.

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: An LCS was performed instead of a matrix spike.

6. Laboratory Control Samples . . . . . ☐ N/A

LCS analyzed? . . . . . (Yes) No N/A
LCS recoveries acceptable? . . . . . (Yes) No N/A
LCS traceable? . . . . . (Yes) No N/A
Transcription/Calculation Errors? . . . . . Yes (No) N/A

Comments: The narrative states that the LCS 3R for gross alpha is out of the lab control limits. However, the gross alpha 3R of 123% is with the DV limits of 70% to 130%. No qualification is required.

7. Chemical Recovery . . . . . ☐ N/A

Chemical carrier added? . . . . . (Yes) No N/A
Chemical recovery acceptable? . . . . . (Yes) No N/A
Chemical carrier traceable? . . . . . (Yes) No N/A
Chemical carrier expired? . . . . . Yes (No) N/A
Transcription/Calculation errors? . . . . . Yes (No) N/A

Comments: All carrier/tracer recoveries are acceptable. No qualification is required.

8. Duplicates . . . . . ☐ N/A

Duplicates Analyzed? . . . . . (Yes) No N/A
RPD Values Acceptable? . . . . . (Yes) No N/A
Transcription/Calculation Errors? . . . . . Yes (No) N/A

Comments:

9. Field QC Samples . . . . . ☒ 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: Sample locations are not currently available. Field QC will be evaluated in the final summary report.

10. Holding Times

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

Comments:

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? . . . . . Yes No N/A
Transcription/calculation errors? . . . . . Yes No N/A

Comments: The laboratory reported "J" qualifiers for several sample results. These qualifiers have been crossed off the lab report forms for clarification purposes and are not considered appropriate for radiochemistry validation.

(See next page for further comments)

Comments: All MDAs meet the RDLs with the exception of the following:

Sample	Analyte	MDA (pCi/g)	RDL (pCi/g)
~~Iron 5~~			
B0BFH5	Iron-59	0.1	0.05
	Europium-155	0.2	0.1
B0BFH6	Iron-59	0.1	0.05
	Cobalt-58	0.06	0.05
	Europium-155	0.2	0.1
B0BFH8	Iron-59	0.1	0.05
B09WF8	Americium-241	0.6	0.05
	Curium-244	0.7	0.05
	Iron-59	0.2	0.05
	Cobalt-58	0.07	0.05
	Cobalt-60	0.1	0.05
	Europium-152	0.3	0.1
	Europium-154	0.2	0.1
	Europium-155	0.3	0.1

6/3/94

No qualification is required.

6/3/94

Comments to Item 4:

Blanks

6/3/94 - Np-237 was present in the blank at 0.019 pCi/g. Therefore, all positive results < 5x blank conc. have been qualified as estimated (J).

6/3/94 - Am-241 was present in the blank at 0.028 pCi/g. However, the sample results are either non-detects or > 5x blank conc. Therefore, no qualification is required.

- Thorium-228 was present in the blank at 0.019 pCi/g. However, all sample results are > 5x blank conc. Therefore, no qualification is required.

6/3/94

Comments:

Gamma Spectroscopy

Samples B09WF8 and B0BFH5 duplicate were analyzed in different geometries than the associated blank and LCS for gamma spectroscopy analysis. Therefore, the associated sample results have been qualified as estimated (J/UJ).

6/6/94

6/06/94

9713524.2174

TMA NORCAL

SAMPLE DELIVERY GROUP 7342

WORK SUMMARY

SDG 7342
Contact N. Joseph Verville

Client Westinghouse Hanford
Contract MBH-SVV-069262

CLIENT SAMPLE ID / LOCATION / CUSTODY	SAS NO	MATRIX	LAB SAMPLE ID / COLLECTED / RECEIVED	PLANCHET	TEST	SUF-FIX	ANALYZED	# Days REVIEWED BY 6/3/94	METHOD
B09WF8			N403051-04	7342-004	80A/80		04/12/94	41	Gross Alpha in Soil
216-U-8 Crib		SOLID	03/02/94	7342-004	80B/80		04/12/94	41	Gross Beta in Soil
EFL-1115			03/07/94	7342-004	GAM		03/24/94	22	Gamma Scan
				7342-004	I		04/08/94	37	Iodine 129 in Soil
				7342-004	NP		04/06/94	35	Neptunium in Soil
				7342-004	PU		04/04/94	33	Plutonium, Isotopic in Soil
				7342-004	SE_L		04/02/94	31	Selenium 79 in Soil
				7342-004	TC		04/02/94	31	Technetium 99 in Soil
				7342-004	TP		04/22/94	51	Americium 241/Curium in Solids
				7342-004	U		04/13/94	42	Uranium, Isotopic in Soil
				7342-004	U_T		04/05/94	34	Uranium, Total in Soil
				7342-004	Y		04/05/94	34	Strontium 90 in Soil
B0BFH5			N403051-01	7342-001	80A/80		04/12/94	41	Gross Alpha in Soil
216-U-8 Crib		SOLID	03/02/94	7342-001	80B/80		04/12/94	41	Gross Beta in Soil
006229			03/07/94	7342-001	GAM		03/24/94	22	Gamma Scan
				7342-001	I		04/07/94	36	Iodine 129 in Soil
				7342-001	NP		04/22/94	51	Neptunium in Soil
				7342-001	PU		04/01/94	30	Plutonium, Isotopic in Soil
				7342-001	SE_L		04/01/94	30	Selenium 79 in Soil
				7342-001	TC		04/04/94	33	Technetium 99 in Soil
				7342-001	TP		04/12/94	41	Americium 241/Curium in Solids
				7342-001	U		04/13/94	42	Uranium, Isotopic in Soil
				7342-001	U_T		04/05/94	34	Uranium, Total in Soil
				7342-001	Y		04/05/94	34	Strontium 90 in Soil
B0BFH6			N403051-02	7342-002	80A/80		04/12/94	41	Gross Alpha in Soil
216-U-8 Crib		SOLID	03/02/94	7342-002	80B/80		04/12/94	41	Gross Beta in Soil
006230			03/07/94	7342-002	GAM		03/24/94	22	Gamma Scan
				7342-002	I		04/08/94	37	Iodine 129 in Soil
				7342-002	NP		04/02/94	31	Neptunium in Soil
				7342-002	PU		04/04/94	33	Plutonium, Isotopic in Soil
				7342-002	SE_L		04/01/94	30	Selenium 79 in Soil
				7342-002	TC		04/05/94	34	Technetium 99 in Soil
				7342-002	TP		04/12/94	41	Americium 241/Curium in Solids
				7342-002	U		04/13/94	42	Uranium, Isotopic in Soil
				7342-002	U_T		04/05/94	34	Uranium, Total in Soil
				7342-002	Y		04/05/94	34	Strontium 90 in Soil

0072

6/3/94

Lab id TMAN
Protocol WHC-HASM
Version Ver 1.0
Form DVT-CWS
Version 2.30
Report date 05/04/94

9713524.2175

TMA NORCAL

SAMPLE DELIVERY GROUP 7342

SDG 7342
Contact N. Joseph Verville

WORK SUMMARY, cont.

Client Westinghouse Hanford
Contract MBH-SVV-069262

CLIENT SAMPLE ID / LOCATION / CUSTODY	SAS NO	MATRIX	LAB SAMPLE ID / COLLECTED / RECEIVED	PLANCHET	TEST	SUF-FIX	ANALYZED	#Days REVIEWED 6/13/94	BY	METHOD
B0BFH8			N403051-03	7342-003	80A/80		04/12/94	41		Gross Alpha in Soil
216-U-8 Crib		SOLID	03/02/94	7342-003	80B/80		04/12/94	41		Gross Beta in Soil
006490			03/07/94	7342-003	GAM		03/24/94	22		Gamma Scan
				7342-003	I		04/08/94	37		Iodine 129 in Soil
				7342-003	NP		04/02/94	31		Neptunium in Soil
				7342-003	PU		04/04/94	33		Plutonium, Isotopic in Soil
				7342-003	SE_L		04/01/94	30		Selenium 79 in Soil
				7342-003	TC		04/07/94	36		Technetium 99 in Soil
				7342-003	TP		04/12/94	41		Americium 241/Curium in Solids
				7342-003	U		04/13/94	42		Uranium, Isotopic in Soil
				7342-003	U_T		04/05/94	34		Uranium, Total in Soil
				7342-003	Y		04/05/94	34		Strontium 90 in Soil
:agent Blank			N403051-06	7342-006	80A/80		04/12/94			Gross Alpha in Soil
		SOLID		7342-006	80B/80		04/12/94			Gross Beta in Soil
				7342-006	GAM		03/24/94			Gamma Scan
				7342-006	I		04/08/94			Iodine 129 in Soil
				7342-006	NP		04/02/94			Neptunium in Soil
				7342-006	PU		04/04/94			Plutonium, Isotopic in Soil
				7342-006	SE_L		04/02/94			Selenium 79 in Soil
				7342-006	TC		04/02/94			Technetium 99 in Soil
				7342-006	TP		04/14/94			Americium 241/Curium in Solids
				7342-006	U		04/13/94			Uranium, Isotopic in Soil
				7342-006	U_T		04/05/94			Uranium, Total in Soil
				7342-006	Y		04/05/94			Strontium 90 in Soil
Lab Control Sample			N403051-05	7342-005	80A/80		04/12/94			Gross Alpha in Soil
		SOLID		7342-005	80B/80		04/12/94			Gross Beta in Soil
				7342-005	GAM		03/24/94			Gamma Scan
				7342-005	I		04/12/94			Iodine 129 in Soil
				7342-005	NP		04/06/94			Neptunium in Soil
				7342-005	PU		04/05/94			Plutonium, Isotopic in Soil
				7342-005	TC		04/02/94			Technetium 99 in Soil
				7342-005	TP		04/12/94			Americium 241/Curium in Solids
				7342-005	U		04/13/94			Uranium, Isotopic in Soil
				7342-005	U_T		04/05/94			Uranium, Total in Soil
				7342-005	Y		04/05/94			Strontium 90 in Soil

0073

6/3/94

Lab id TMAN
Protocol WHC-HASM
Version Ver 1.0
Form DVD-CWS
Version 2.30
Report date 05/04/94

9713524.2176

TMA NORCAL

SAMPLE DELIVERY GROUP 7342

N403051-06

REAGENT BLANK

Reagent Blank

Assoc. with samples BoBFH5, BoBFH6, BoBFH8, and BoBW F8.

SDG 7342 Client Westinghouse Hanford
Contact N. Joseph Verville Contract MBH-SVV-069262

Lab sample id N403051-06 Client sample id Reagent Blank
Dept sample id 7342-006 Material/Matrix SOLID

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Gross Alpha	Alpha	0.34	2.1	4	10	U	80A
Gross Beta	Beta	0.61	3.3	6	10	U	80B
Selenium 79	15758-45-9	-1.2	1.8	3	10	U	SE_L
Strontium 90	10098-97-2	0	1.0	1	1	U	Y
Technetium 99	14133-76-7	0.062	0.12	0.3	0.5	U	TC
Iodine 129	15046-84-1	0.15	0.57	1	2	U	I
Uranium 233/234		0.018	0.072	0.1	0.3	U	U
Uranium 235	15117-96-1	-0.022	0.044	0.2	0.3	U	U
Uranium 238		0.036	0.036	0.1	0.3	U	U
Total Uranium (ug/g)	7440-61-1	U		0.003	0.1	U	U_T
Neptunium 237	13994-20-2	0.019	0.011	0.006	0.2	J	NP
Plutonium 238	13981-16-3	0.006	0.007	0.01	0.05	U	PU
Plutonium 239/240		0.004	0.007	0.01	0.05	U	PU
Americium 241	14596-10-2	0.028	0.019	0.02	0.05	J	TP
Curium 244	13981-15-2	0	0.005	0.02	0.05	U	TP
GAMMA SCAN ANALYTES							
Sodium 22	13966-32-0	U		0.01		U	GAM
Potassium 40	13966-00-2	U		0.2		U	GAM
Manganese 54	13966-31-9	U		0.01		U	GAM
Iron 59	14596-12-4	U		0.03	0.05	U	GAM
Cobalt 58	13981-38-9	U		0.009	0.05	U	GAM
Cobalt 60	10198-40-0	U		0.01	0.05	U	GAM
Niobium 94	14681-63-1	U		0.01		U	GAM
Ruthenium 103	13968-53-1	U		0.01		U	GAM
Ruthenium 106	13967-48-1	U		0.1		U	GAM
Tin 113	13966-06-8	U		0.01		U	GAM
Cesium 134	13967-70-9	U		0.01		U	GAM
Cesium 137	10045-97-3	U		0.01	0.05	U	GAM
Cerium 144	14762-78-8	U		0.05		U	GAM
Europium 152	14683-23-9	U		0.03	0.1	U	GAM

0074

6/3/94

Lab id TMAN
Protocol WIC-MASM
Version Ver 1.0
Form DVD-DS
Version 2.3f
Report date 05/04/94

REAGENT BLANKS
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9713524.2177

TMA NORCAL

SAMPLE DELIVERY GROUP 7342

N403051-06

BLANK, cont.

Reagent Blank

SDG	7342	Client	Westinghouse Hanford
Contact	N. Joseph Verville	Contract	MBH-SVV-069262
Lab sample id	N403051-06	Client sample id	Reagent Blank
Dept sample id	7342-006	Material/Matrix	SOLID

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Europium 154	15585-10-1	U		0.02	0.1	U	GAM
Europium 155	14391-16-3	U		0.03	0.1	U	GAM
Radium 226	13982-63-3	U		0.03		U	GAM
Radium 228	15262-20-1	U		0.05		U	GAM
Thorium 228	14274-82-9	0.019	0.017				GAM
Thorium 232	7440-29-1	U		0.05		U	GAM

QC BLANK 18270-18279

0075

REAGENT BLANKS
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SUMMARY DATA SECTION
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6/3/94

Lab id	TMAN
Protocol	WHC-HASM
Version	Ver 1.0
Form	DVD-DS
Version	2.30
Report date	05/04/94

SAMPLE RESULT CALCULATION SHEET, DATA PACKAGE B0BFF9-TMA-726

B0BFF9-TMA-726							
Gross Alpha/Beta							
Sample ID:	B0BFH5	B0BFH6	B0BFH8	B09WF8	QC-LCS	QC-BLANK	B0BFH5-DUP
Lab ID:	7342-001	7342-002	7342-003	7342-004	7342-005	7342-006	7342-007
Aliquot:	0.10	0.10	0.10	0.10	0.1	0.1	0.1
Detector:	102	104	105	106	108	113	114
Count time:	100	100	100	100	100	100	100
Alpha cpm:	0.47	0.54	0.43	5.58	5.2	0.05	0.5
Alpha, Bkgd:	0.07	0.04	0.02	0.03	0.071	0.04	0.045
Alpha, Xtalk:	0.006	0.006	0.006	0.006	0.006	0.006	0.006
Alpha, Eff:	0.146	0.143	0.144	0.140	0.105	0.129	0.15
Alpha Result Calc.:	12	15	13	176.5	215.6	0.3	13.0
Alpha Result Rptd.:	12	15	13	178.0	215	0.3	13
Alpha MDA Calc.:	4	3	2	2.7	5.3	3.3	3.0
Alpha MDA Rptd.:	5	4	3	3.6	7	4	4
Beta cpm:	5.13	7.23	3.30	13.12	19.98	1.13	5.19
Bkgd:	1.26	1.26	1.24	1.16	1.097	1.07	1.417
Xtalk:	0.262	0.264	0.264	0.266	0.293	0.273	0.26
Eff:	0.42	0.42	0.42	0.42	0.413	0.42	0.422
Beta Result Calc.:	40	62	21	112	190	1	39
Beta Result Rptd:	40	62	22	115	188	1	39.5
Beta MDA Calc:	6	6	6	5	5	5	6
Beta MDA rptd:	6	6	6	6	6	6	6

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0076

SAMPLE RESULT CALCULATION SHEET, DATA PACKAGE B0BFF9-TMA-726

Selenium-79						
Sample ID:	B0BFH5	B0BFH6	B0BFH8	B09WF8	QC-BLANK	B0BFH5-DUP
Lab ID:	7342-001	7342-002	7342-003	7342-004	7342-006	7342-007
Detector, LSC:	4	4	4	4	4	4
Count time:	150	150	150	150	150	150
Detector Eff:	0.643	0.668	0.647	0.759	0.661	0.604
Sample cpm:	13.01	12.68	13.01	10.69	13.4	13.23
Bkgd cpm:	13.99	13.99	13.99	13.99	13.99	13.99
Yield:	0.6287	0.7073	0.5501	0.7171	0.6582	0.4617
Decay Corr:	1	1	1	1	1	1
Aliquot:	0.5054	0.5071	0.5064	0.5022	0.5	0.5085
Result calc:	-2.16	-2.5	-2.4	-5.4	-1.2	-2.4
Result rptd:	-2.16	-2.5	-0.2	-5.4	-1.2	-2.4
MDA calc:	3.1	2.7	3.6	2.3	2.9	4.5
MDA rptd:	3.2	2.7	3.6	2.4	3.0	4.6

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0077

SAMPLE RESULT CALCULATION SHEET, DATA PACKAGE B0BFF9-TMA-726

Strontium 90							
Sample ID:	B0BFH5	B0BFH6	B0BFH8	B09WF8	QC-LCS	QC-BLANK	B0BFH5-DUP
Lab ID:	7342-001	7342-002	7342-003	7342-004	7342-005	7342-006	7342-007
Detector:	203	204	205	207	207	207	203
Bkg:	0.402	0.4300	0.3690	0.3940	0.394	0.3940	0.402
Count Time:	43.000	43.000	33.000	95.930	33	33.000	100
Y90 cpm:	1.475	19.353	0.652	40.503	9.793	0.000	1.475
Elapsed Time, days:	33.437	33.437	33.437	33.437	0	0.000	33.437
Lambda:	6.86E-05	6.86E-05	6.86E-05	6.86E-05	6.86E-05	6.86E-05	6.86E-05
Decay:	0.9977	0.9977	0.9977	0.9977	1.0000	1.0000	0.9977
Yield:	0.8293	0.8367	0.8710	0.8427	0.8676	0.6815	0.8253
PPT. corr.:	1	1	1	1	1	1	1
Aliquot:	1	1	1	1	1	1	1
Product:	0.8274	0.8348	0.8690	0.8408	0.8676	0.6815	0.8234
C-zero:	1.7827	23.1833	0.7503	48.1738	11.2875	0.0000	1.7913
P-Factor:	1.859	1.859	1.859	1.859	1.859	1.859	1.859
Result, calc.:	1.493	19.41	0.628	40.34	9.45	0.00	1.50
Result, rptd.:	1.493	19.41	0.629	40.34	9.45	0.00	1.50
MDA, calc.:	0.46	0.47	0.47	0.30	0.49	0.63	0.30
MDA, rptd.:	0.68	0.70	0.73	0.79	0.75	1.07	0.63

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SAMPLE RESULT CALCULATION SHEET, DATA PACKAGE B0BFF9-TMA-726

Technetium 99							
Sample ID:	B0BFH5	B0BFH6	B0BFH8	B09WF8	QC-LCS	QC-BLANK	B0BFH5-DUP
Lab ID:	7342-001	7342-002	7342-003	7342-004	7342-005	7342-006	7342-007
Detector:	LBG 16	LBG 11	LBG 11	LBG 10	LBG 14	LBG 11	LBG 11
Net, cpm:	0.180	0.490	0.24	0.090	15.38	0.06	0.12
Days:	30.821	31.592	31.674	30.821	0	0	30.894
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
Yield:	0.698	0.409	0.545	0.4813	0.5246	0.5281	0.4957
Aliquot:	2.010	2.020	2.05	2.01	2	2	2.01
P-Factor:	2.340	2.340	2.340	2.340	2.34	2.34	2.340
Count, time:	884.500	101.700	113.7	102.300	111.6	102.3	102.3
Bkg., cpm:	0.580	0.480	0.48	0.57	0.59	0.49	0.48
Result, calc.:	0.14	0.63	0.23	0.10	15.45	0.06	0.13
Result, rptd.:	0.14	0.63	0.22	0.10	15.45	0.06	0.12
MDA, calc.:	0.09	0.41	0.29	0.38	0.34	0.32	0.34
MDA, rptd.:	0.10	0.44	0.31	0.42	0.38	0.35	0.37

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0079

SAMPLE RESULT CALCULATION SHEET, DATA PACKAGE B0BFF9-TMA-726

Iodine-129							
Sample ID:	B0BFH5	B0BFH6	B0BFH8	B09WF8	QC-LCS	QC-BLANK	B0BFH5-DUP
Lab ID:	7342-001	7342-002	7342-003	7342-004	7342-005	7342-006	7342-007
Detector:	XSPEC 15	XSPEC 14	XSPEC 14	XSPEC 15	XSPEC 14	XSPEC 15	XSPEC 14
Count Time:	604.63	740.57	623.23	623.37	400.4	740.67	638.37
Gross cpm:	0.66	0.52	0.497	0.597	19.138	0.629	0.5
Bkg cpm:	0.962	0.557	0.759	0.873	0.833	0.754	0.54
% Bkg Std. Dev.:	11.89	14.14	13.68	11.55	16.42	11.54	15.39
Blank cpm:	-0.186	-0.125	-0.125	-0.186	-0.126	-0.186	-0.126
% Blank Std. Dev.:	37.65	35.3	35.3	37.65	35.42	37.65	35.42
Net cpm:	-0.116	0.088	-0.137	-0.090	18.431	0.061	0.086
Lambda:	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Corr. Days:	36.82	0.00	37.40	37.40	0.00	0.00	41.97
Decay:	1	1	1	1	1	1	1
Yield:	0.6023	0.6195	0.7494	0.7098	0.9252	0.8918	0.726
Aliquot:	1.02	1.03	1.06	1.02	1	1	1.03
PPT. Corr.:	1	1	1	1	1	1	1
Product:	6.14E-01	6.38E-01	7.94E-01	7.24E-01	9.25E-01	8.92E-01	7.48E-01
P-factor:	4.87	4.57	4.57	4.87	4.57	4.87	4.57
Result Calc.:	-0.41	0.28	-0.36	-0.27	41.01	0.15	0.24
Result Rptd.:	-0.41	0.28	-0.35	-0.27	41.01	0.15	0.23
MDA Calc.:	2.24	1.37	1.37	1.74	1.50	1.29	1.22
MDA Rptd.:	2.24	1.37	1.37	1.75	1.50	1.29	1.22

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SAMPLE RESULT CALCULATION SHEET, DATA PACKAGE B0BFF9-TMA-726

Uranium 233/4/5/8							
Sample ID:	B0BFH5	B0BFH6	B0BFH8	B09WF8	QC-LCS	QC-BLANK	B0BFH5-DUP
Lab ID:	7342-001	7342-002	7342-003	7342-004	7342-005	7342-006	7342-007
Detector:	SS-19	SS-20	SS-21	SS-23	SS-24	SS-25	SS-26
Sample count time:	161.92	161.92	161.92	161.92	161.92	161.92	161.92
GMT count:	103.807	103.807	103.782	103.807	103.807	103.807	103.807
Zero time:	61.334	61.334	61.334	61.334	103.807	103.807	61.334
Corr. tracer dpm:	10.44	10.44	10.44	10.44	10.44	10.44	10.44
Bkgd count time:	2248	2248	2248	2248	2248	2248	2248
Net tracer counts:	340	365	267	357	390	262	386
Detector eff.:	0.2711	0.2871	0.2684	0.3216	0.3223	0.3123	0.3223
Yield:	0.7419	0.7521	0.5885	0.6567	0.7158	0.4927	0.7087
U-238, gross counts:	212	224	28	89	344	2	223
U-238, bkgd counts:	0	0	0	1	1	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:	2	2	0	1	20	0	2
U-238, net counts:	210	222	28	87	323	2	221
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:	15	18	1	11	199	0	18
U-235, bkgd counts:	0	0	0	0	0	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	0	0	0	0	0
U-235, net counts:	15	18	1	11	199	-1	17
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:	212	221	42	70	317	2	234
U-233/4, bkgd counts:	1	1	1	2	2	1	1
tracer interference counts:	1	1	0	1	1	0	1
tracer std.dev.:	0	0	0	0	0	0	0
U-235 interference counts:	2	2	0	1	22	0	2
U-233/4, net counts:	208	217	41	66	292	1	230
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
Aliquot:	1	1	1	1	1	1	1
U-238, result calc.:	2.90	2.86	0.49	1.15	3.89	0.04	2.69
U-238, result rptd:	2.90	2.86	0.49	1.15	3.89	0.04	2.69
U-238 MDA calc.:	0.13	0.12	0.05	0.12	0.29	0.05	0.11
U-238, MDA rptd.:	0.13	0.12	0.14	0.13	0.29	0.14	0.12
U-235, result calc.:	0.25	0.28	0.02	0.18	2.91	-0.02	0.25
U-235, result rptd.:	0.25	0.28	0.02	0.18	2.90	-0.02	0.25
U-235, MDA calc.:	0.13	0.12	0.16	0.12	0.11	0.17	0.11
U-235, MDA rptd.:	0.13	0.12	0.16	0.12	0.11	0.17	0.11
U-233/4, result calc.:	2.88	2.80	0.72	0.87	3.52	0.02	2.80
U-233/4, result rptd.:	2.88	2.80	0.72	0.87	3.52	0.02	2.80
U-233/4, MDA calc.:	0.15	0.14	0.13	0.14	0.31	0.13	0.13
U-233/4, MDA rptd.:	0.15	0.14	0.14	0.15	0.31	0.14	0.14

SAMPLE RESULT CALCULATION SHEET, DATA PACKAGE B0BFF9-TMA-726

Total Uranium

Standard	Intensity	Sample ID:	Lab ID:	Intens.	ug/L Calc.	ug/L Rptd	Dilution	Amount of Smpl	Prep. Volume	Calc Result	Rptd Rslt
0.049	301	B0BFH5	7342-001	45227	9.08	9.73	10	0.25	0.02	7.785	7.785
0.156	783	B0BFH6	7342-002	43883	8.81	9.39	10	0.25	0.02	7.51	7.51
0.521	2596	B0BFH8	7342-003	9315	1.87	1.91	10	0.25	0.02	1.530	1.530
0.976	5123	B09WF8	7342-004	17601	3.53	3.75	10	0.25	0.02	3.00	3.00
2.603	13459	QC-LCS	7342-005	8739	1.75	1.66	10	0.25	0.02	1.33	1.33
4.881	24619	QC-BLANK	7342-006	-289	-0.06	0.04	1	0.25	0.02	0.003	0.003
16.27	79132	B0BFH5-DU	7342-007	46957	9.42	10.15	10	0.25	0.02	8.12	8.12
Slope:	1.9E-04										

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SAMPLE RESULT CALCULATION SHEET, DATA PACKAGE B0BFF9-TMA-726

Neptunium							
Sample ID:	B0BFH5	B0BFH6	B0BFH8	B09WF8	QC-LCS	QC-BLANK	B0BFH5-DUP
Lab ID:	7342-001	7342-002	7342-003	7342-004	7342-005	7342-006	7342-007
Detector:	SS-55	SS-56	SS-57				
Np239 cpm:	39.51	32.16	34.16	22.12	48.33	37.1	32.94
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:	0.5531	0.4502	0.4782	0.3096	0.6765	0.5193	0.4611
Aliquot:	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Count time:	1085.13	1085.13	1085.13	1139.35	1139.35	1085.13	1139.35
Np237 gross counts:	5	10	19	16	2088	10	6
Np237 bkgd counts:	1	1	3	2	2	0	3
Np237 aspec. eff:	0.378	0.383	0.403	0.396	0.39	0.419	0.387
Np237 result calc.:	0.008	0.022	0.034	0.045	3.126	0.019	0.007
Np237 result rptd.:	0.008	0.022	0.035	0.045	3.127	0.019	0.007
Np237 MDA calc.:	0.015	0.018	0.024	0.031	0.014	0.006	0.024
Np237 MDA rptd.:	0.015	0.018	0.024	0.031	0.014	0.006	0.024

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SAMPLE RESULT CALCULATION SHEET, DATA PACKAGE B0BFF9-TMA-726

Plutonium 238/239							
Sample ID:	B0BFH5	B0BFH6	B0BFH8	B09WF8	QC-LCS	QC-BLANK	B0BFH5-DUP
Lab ID:	7342-001	7342-002	7342-003	7342-004	7342-005	7342-006	7342-007
Detector:	SS-46	SS-61	SS-62	SS-63	SS-62	SS-65	SS-66
Count time:	865.65	1085.13	1085.13	1085.13	1023.6	1085.13	1085.13
GMT, count:	92.321	95.043	95.043	95.043	96.011	95.043	95.043
Zero time:	61.334	61.334	61.334	61.334	96.011	95.043	61.334
Corr, tracer dpm:	4.86	4.86	4.86	4.86	4.86	4.86	4.86
Bkgd, count time:	2110.4	2268.05	2268.05	2268.05	2268.05	2268.05	2268.05
Net, tracer counts:	1370	1573	1510	1263	809	1177	1661
Detector Eff:	0.4028	0.4204	0.3953	0.381	0.3812	0.4212	0.414
Yield:	0.8084	0.7095	0.7243	0.6286	0.4266	0.5299	0.7608
Pu239, gross counts:	20	7	32	247	300	3	26
Pu239, bkgd counts:	1	0	1	1	1	1	1
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:	9	3	0	237	369	4	1
Pu238, bkgd counts:	9	2	2	3	2	1	1
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:	0.9993	0.9993	0.9993	0.9993	1.0000	1.0000	0.9993
Aliquot:	1	1	1	1	1	1	1
Pu239, Result calc.:	0.030	0.010	0.045	0.426	0.809	0.004	0.033
Pu239, Result rptd:	0.030	0.010	0.045	0.426	0.808	0.004	0.033
Pu239, MDA calc.:	0.012	0.011	0.011	0.013	0.021	0.014	0.010
Pu239, MDA rptd.:	0.012	0.011	0.011	0.013	0.021	0.014	0.010
Pu238, Result calc.:	0.000	0.001	-0.003	0.406	0.993	0.006	0.000
Pu238, Result rptd.:	0.000	0.001	-0.003	0.406	0.992	0.006	0.000
Pu238, MDA calc.:	0.022	0.011	0.011	0.014	0.021	0.014	0.010
Pu238, MDA rptd:	0.027	0.013	0.014	0.019	0.026	0.014	0.0101

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0084

SAMPLE RESULT CALCULATION SHEET, DATA PACKAGE B0BFF9-TMA-726

Americium/Curium							
Sample ID:	B0BFH5	B0BFH6	B0BFH8	B09WF8	QC-LCS	QC-BLANK	B0BFH5-DUP
Lab ID:	7342-001	7342-002	7342-003	7342-004	7342-005	7342-006	7342-007
Detector:	SS-35	SS-39	SS-40	SS-27	SS-41	SS-65	SS-43
Count Time:	833.05	834.12	834.12	439.75	834.12	1100	828.27
GMT, count:	103.256	103.256	103.256	112.640	103.256	104.986	103.256
Zero time:	61.334	61.334	61.334	61.334	103.256	104.986	61.334
Tracer dpm:	4.85	4.85	4.85	4.85	4.85	4.85	4.85
Bkgd count time:	2263.55	2263.55	2263.55	2694.47	2263.55	2340.6	2267.67
Net tracer counts:	1415	1213	1142	53	1065	937	1102
Detector eff.:	0.4115	0.3893	0.4158	0.0362	0.4125	0.4163	0.4221
Yield:	0.8511	0.7702	0.6789	0.6865	0.6382	0.4219	0.6499
Aliquot:	1	1	1	1	1	1	1
Am241 gross counts:	26	12	12	4888	453	15	17
Am241 bkgd. counts:	16	7	8	6	9	1	9
Tracer Interference Counts:	2	2	2	0	2	2	2
Tracer std. deviation:	0	0	0	0	0	0	0
Am241, Net counts:	8	3	2	4882	442	12	6
Am-241, Lambda:	4.03E-06	4.03E-06	4.03E-06	4.03E-06	4.03E-06	4.03E-06	4.03E-06
Am241 decay:	0.9998	0.9998	0.9998	0.9998	1.0000	1.0000	0.9998
Cm244 gross counts:	18	14	9	7	302	1	7
Cm244 bkgd counts:	16	10	6	8	8	0	14
Tracer Interference Counts:	1	1	1	0	1	1	1
Tracer std. deviation:	0	0	0	0	0	0	0
Cm244, Net counts:	1	3	2	-1	293	0	-8
Cm-244, Lambda:	1.06E-04	1.06E-04	1.06E-04	1.06E-04	1.06E-04	1.06E-04	1.06E-04
Cm244 decay:	0.9956	0.9956	0.9956	0.9946	1.0000	1.0000	0.9956
Am241 result calc.:	0.012	0.005	0.004	201.280	0.907	0.028	0.012
Am241 result rptd.:	0.012	0.005	0.004	201.100	0.906	0.028	0.012
Am241 MDA calc.:	0.035	0.030	0.033	0.581	0.037	0.025	0.036
Am241 MDA rptd:	0.033	0.028	0.031	0.593	0.035	0.018	0.034
Cm244 result calc.:	0.002	0.005	0.004	-0.041	0.601	0.000	-0.016
Cm244 result rptd:	0.002	0.005	0.004	-0.041	0.601	0.000	-0.016
Cm244 MDA calc.:	0.034	0.033	0.029	0.654	0.034	0.017	0.041
Cm244 MDA rptd.:	0.034	0.032	0.028	0.669	0.033	0.018	0.041

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SAMPLE RESULT CALCULATION SHEET, DATA PACKAGE B0BFF9-TMA-726

Gamma Spectroscopy							
Sample ID:	B0BFH5	B0BFH6	B0BFH8	B09WF8	QC-LCS	QC-BLANK	B0BFH5-DUP
Lab ID:	7342-001	7342-002	7342-003	7342-004	7342-005	7342-006	7342-007
Detector:	G-2	G-3	G-5	G-2	G-3	G-5	G-1
Count Time:	106.67	106.75	106.85	160.95	161	161.1	572.07
Geometry:	MARINELLI	MARINELLI	MARINELLI	100 ML	MARINELLI	MARINELLI	100 ML

9713524.2183

9213524.2189

Golder Associates Inc.

4104-148th Avenue, NE
Redmond, WA 98052
Telephone (206) 883-0777
Fax (206) 882-5498

Golder Associates

MAY 1994 RECEIVED TQO

May 17, 1994

Our ref: 923-E418
S/O/3077

Westinghouse Hanford Company
Hanford Analytical Services
P.O. Box 1970
Richland, Washington 99352

ATTENTION: Jeanette Duncan

RE: TRANSMITTAL OF DATA 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:

- B09WF8-TMA-727

Please call if you have questions concerning the above at 206/883-0777.

Sincerely,

GOLDER ASSOCIATES INC.

Christina I. Jensen
Christina I. Jensen
Task Manager

Kent M. Angelos
For Kent M. Angelos
Project Manager

RECEIVED
MAY 18 1994
VALIDATION DOCUMENTATION
SDLA

cc: P.K. Brockman, SAIC

9713524.2190

MEMORANDUM

MAY 1994 RECEIVED TQO

TO: 200-UP-2 Project QA Record

May 13, 1994

FR: Susan Winter, Golder Associates Inc.

RE: GENERAL GC DATA VALIDATION SUMMARY FOR DATA PACKAGE: B09WF8-TMA-727 (923-E418, Filename B09WF8GC.UP2)

INTRODUCTION

This memo presents the results of data validation on data package B09WF8-TMA-727 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
B09WF8	03/02/94	SOIL	SEE NOTE 1
B0BFH1	02/28/94	SOIL	
B0BFH5	03/02/94	SOIL	
B0BFH6	03/02/94	SOIL	

Note 1. All samples were analyzed for kerosene using Method 8015 modified.

RECEIVED MAY 18 1994 VALIDATION DOCUMENTATION SDLA

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.

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 four samples were validated in this data package with a total of 4 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.

COMPOUND IDENTIFICATION

- A hydrocarbon identified as "heavier than diesel" was reported by the laboratory for sample B0BFH1. Supporting laboratory QC for hydrocarbons at the same retention time was not provided, however, the laboratory narrative indicates that a diesel calibration check was performed. Therefore, the associated hydrocarbon result has been qualified as estimated (J). The associated telecon memo and a copy of the raw data are included in Attachment 5.

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.

9713524.2194

ATTACHMENT 2

SUMMARY OF DATA QUALIFICATIONS

DATA QUALIFICATION SUMMARY

SDG: B09WF8-TMA-727	VALIDATOR: [illegible]	DATE: May 17, 1994	PAGE 1 OF 1
COMMENTS: GENERAL GC AS KEROSENE			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
NO QUALIFICATION IS REQUIRED			

9713524.2196

ATTACHMENT 3

QUALIFIED DATA SUMMARY AND ANNOTATED LABORATORY REPORTS

Validated Data Summary, Data Package: B09WF8-TMA-727

	Samp#	B09WF8		B0BFH1		B0BFH5		B0BFH6	
	Date	3-2-94		2-28-94		3-2-94		3-2-94	
	Location	---		---		---		---	
	Depth	---		---		---		---	
	Type	SOIL		SOIL		SOIL		SOIL	
	Comments	---		---		---		---	
Parameter	Units	Result	Q	Result	Q	Result	Q	Result	Q
KEROSENE	MG/KG	10.000	U	23.000		10.000	U	10.000	U

Verified

[illegible] 5/17/94

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9713524.2193

~~000570~~

TMA Inc. REPORT Work Order # A4-03-029

Received: 03/05/94

Results by Sample

SAMPLE ID B09WF8 FRACTION 01G TEST CODE 8015MS NAME EPA 8015M EXTRACT.

Date & Time Collected 03/02/94 Category

MODIFIED 8015 - EXTRACTABLE FUEL HYDROCARBONS

Matrix: SOIL
Date Analyzed: 03/14/94
Dilution factor: 1.00
Concentration Units: mg/Kg

Compound	Sample Result	PQL	Q
Kerosene Range	ND	10	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

5/12/94

9713524.2199

~~000572~~

TMA Inc. REPORT Work Order # A4-03-029

Received: 03/05/94

Results by Sample

SAMPLE ID B0BFH1 FRACTION 04E TEST CODE 8015MS NAME EPA 8015M EXTRACT.

Date & Time Collected 02/28/94 Category

MODIFIED 8015 - EXTRACTABLE FUEL HYDROCARBONS

Matrix: SOIL
Date Analyzed: 03/14/94
Dilution factor: 1.00
Concentration Units: mg/Kg

Compound	Sample Result	PQL	G
Kerosene Range	23	10	
C10 - C16 Jet Fuel Range	NA	NA	
C9 - C22 Diesel Range	NA	NA	
Hydraulic Range	NA	NA	
HEAVIER THAN DIESEL	30	10	J

ND = Not detected at the specified limits

Form I

Verified
5/12/94

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~~000576~~

TMA Inc. REPORT Work Order # A4-03-029

Received: 03/05/94

Results by Sample

SAMPLE ID B0BFH5 FRACTION 06D TEST CODE 8015MS NAME EPA 8015M EXTRACT.

Date & Time Collected 03/02/94 Category

MODIFIED 8015 - EXTRACTABLE FUEL HYDROCARBONS

Matrix: SOIL
Date Analyzed: 03/14/94
Dilution factor: 1.00
Concentration Units: mg/Kg

Compound	Sample Result	PQL	Q
Kerosene Range	ND	10	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

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5/12/94

011

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~~000578~~

TMA Inc. REPORT Work Order # A4-03-029

Received: 03/05/94

Results by Sample

SAMPLE ID B0BFH6 FRACTION 07D TEST CODE 8015MS NAME EPA 8015M EXTRACT.

Date & Time Collected 03/02/94 Category

MODIFIED 8015 - EXTRACTABLE FUEL HYDROCARBONS

Matrix: SOIL
Date Analyzed: 03/14/94
Dilution factor: 1.00
Concentration Units: mg/Kg

Compound	Sample Result	PQL	Q
Kerosene Range	ND	10	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
[illegible] 5/12/94

ATTACHMENT 4

LABORATORY NARRATIVE AND CHAIN-OF-CUSTODY DOCUMENTATION

CASE NARRATIVE

LABORATORY : TMA/ARLI

CASE : 03-029

CONTRACT ID : WESTINGHOUSE HANFORD COMPANY

SDG RECEIPT DATE : March 07, 1994

1.0 DESCRIPTION OF CASE :

Seven 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
B09WF8	A4-03-029-01A	V	SOIL
B09WF8	A4-03-029-01B	SV	SOIL
B09WF8 MS	A4-03-029-01C	SV	SOIL
B09WF8 MSD	A4-03-029-01D	SV	SOIL
B09WF8	A4-03-029-01G	K	SOIL
B09WF8 MS	A4-03-029-01H	K	SOIL
B09WF8 MSD	A4-03-029-01I	K	SOIL
B09WG1	A4-03-029-02A	V	SOIL
B09WG1 MS	A4-03-029-02B	V	SOIL
B09WG1 MSD	A4-03-029-02C	V	SOIL
B0BFM7	A4-03-029-03A	V	SOIL
B0BFH1	A4-03-029-04A	V	SOIL
B0BFH1	A4-03-029-04B	SV	SOIL
B0BFH1	A4-03-029-04E	K	SOIL
B0BFM6	A4-03-029-05A	V	SOIL
B0BFH5	A4-03-029-06A	V	SOIL
B0BFH5	A4-03-029-06B	SV	SOIL
B0BFH5	A4-03-029-06D	K	SOIL
B0BFH6	A4-03-029-07A	V	SOIL
B0BFH6	A4-03-029-07B	SV	SOIL
B0BFH6	A4-03-029-07D	K	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.

Acetone was detected at concentrations above the CRQL in several samples, including the blank, VBLK0314R.

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

TUNES :

All BFB tunes were injected directly into the GC/MS instrument.

3.2.2 SEMIVOLATILE ANALYSIS COMMENTS :

LOW LEVEL SOIL :

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

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

3.2.3 EXTRACTABLE HYDROCARBONS "KEROSENE RANGE" COMMENTS :

SEQUENCE NOTES :

The sequence was started on 03/05/94 and was analyzed according to the SW-846 Method 8015M. The %RSD in the all of the initial calibrations and the %D in the continuing calibrations were below their 20% and 15% limits, respectively.

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

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.

In sample B0BFH1, Kerosene was detected at approximately 23 mg/Kg. In addition, a compound heavier than the Diesel Range was detected at approximately 30 mg/Kg. The concentration for the compound was calculated using a Diesel standard.

The surrogate o-Terphenyl was added to each sample, and the recoveries ranged from 80% to 94%. However, since the reporting forms could not accommodate the surrogate recovery results, the data was included in the "Additional Raw Data" poriton of the package.

The matrix spike and matrix spike duplicate recoveries for Kerosene were 90% and 86%, respectively.

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
Nicole Roth 4/21/94
Program Manager

Maureen Parrish
Maureen Parrish 4/21/94
Program Manager

9713524.2206

~~000002~~

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: 3-2-94

Ice Chest No.:

Field Logbook No.: EFL-1115

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) B0W0F8

- ✓ 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)~~

- ~~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~~

3-2-94

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

Relinquished by:	Received by:	Date/Time:
3-4-94 Jerome E Rogers 1033	Kermit Blum K-Blum	3-7-94 *
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:

* Received @ TMA/NORCAL 3-5-94; opened 3-7-94 KB

017

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

Westinghouse Hanford Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

006225

Collector R.T. Sickle
Company Contact C.A. Rowley
Telephone 372-3293
SAF No. 93-263
Project Designation 216-U-8 Vitrified Clay Pipeline
Sampling Locations 216-U-8 Crib
Ice Chest No.
Bill of Lading/Airbill No.
Offsite Property No.
Method of Shipment Air Overnight
Field Logbook No.
Shipped to TMA
SPECIAL INSTRUCTIONS
Possible Sample Hazards/Remarks None Detected
Special Handling and/or Storage Keep cool

Sample Number	*	Date Collected	Time	Number and Type of Containers	Analysis Required		Preservative
BOBFH7	S	2-28-94	0800	(1) 250ml aGs ✓	VOA	CLP	
BOBFH1	S	2-28-94	1115	(1) 250ml Gs ✓	VOA	CLP	
BOBFH1	S			(1) 250ml aG ✓	Semi-VOA	CLP	
BOBFH1	S			(1) 250ml Poly ✓	Metals -CLP TAL Titanium Mercury	CPL	
BOBFH1	S			(1) 125ml G ✓	Anions F, Cl, SO_4	EPA 300.0	
BOBFH1	S			(1) 125ml P/G ✓	NO_2 NO_3	EPA 353.2	
~~BOBFH1~~	~~S~~			~~(1) 250ml aGs~~	~~PCB/Pest~~ ~~2-23-94~~	~~8080~~	
BOBFH1	S			(1) 125ml G ✓	Cyanide	CPL	
BOBFH1	S			(1) 125ml Gs ✓	Kerosene	8015M	
BOBFH1	S	2-28-94	1115	(1) 1000ml Poly ✓	Gross Alpha/Beta EP-10; Gamma Spec. Cs-134/137, Co-60, K-40, Eu-152/154/155, Ru-106, Na-22 RC-30; Total Uranium EA-01C; U-235/234/238 EP-70, 71, 5; Np-237 RC-101A, 622, EP-5; Pu-238/239/240 EP-80, 81, 5; I-129 RC-25, 603; Sr-90 RC-306, 303, 309, 304; Tc-99 RC-24, 604; Am-241, Cm-244 EP-80, 91, 92, 93, 5; Se-79 Lab Specific		

Chain of Possession Relinquished By (Sign and Print Names)	Date	Time	Received By
R.T. Sickle	3/1/94	1200	D.L. Edwards
D.L. Edwards	3/4/94	0810	
	3-7-94	*	Kermit Blum K. Blum

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

LABORATORY SECTION	Received By	Title	Date/Time
Final Sample Disposition	Disposal Method:	Disposed by:	Date/Time:

* Received @ TMA/NORCAL 3-5-94; opened 3-7-94 .KB

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L018

Westinghouse Hanford Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

006229

Collector R.T. Sickle
Company Contact C.A. Rowley
Telephone 372-3293
SAF No. 93-263
Project Designation 216-U-8 Vitrified Clay Pipeline
Sampling Locations 216-U-8 Crib
Ice Chest No.
Bill of Lading/Airbill No. 140 213 8144
Offsite Property No.
Method of Shipment Air Overnight
Field Logbook No.
Shipped to TMA
SPECIAL INSTRUCTIONS
Possible Sample Hazards/Remarks None Detected
Special Handling and/or Storage Keep cool

Sample Number	*	Date Collected	Time	Number and Type of Containers	Analysis Required		Preservative
BOBFM6	S	3-2-94	0800	(1) 250ml Gs ✓	VOA	CLP	
BOBFH5	S	3-2-94	1325	(1) 250ml Gs ✓	VOA	CLP	
BOBFH5	S			(1) 250ml aG ✓	Semi-VOA	CLP	
BOBFH5	S			(1) 250ml Poly ✓	Metals -CLP TAL Titanium Mercury	CPL	
BOBFH5	S			(1) 125ml G ✓	Anions F, Cl, SO_4	EPA 300.0	
BOBFH5	S			(1) 125ml P/G ✓	NO_2 NO_3	EPA 353.2	
~~BOBFH5~~	~~S~~			~~(1) 250ml aGs~~	~~PCB/Pest~~ RTL 2-23-94	~~8080~~	
BOBFH5	S			(1) 125ml G ✓	Cyanide	CPL	
BOBFH5	S			(1) 125ml Gs ✓	Kerosene	8015M	
BOBFH5	S			(1) 1000ml Poly ✓	Gross Alpha/Beta EP-10; Gamma Spec. Cs-134/137, Co-60, K-40, Eu-152/154/155, Ru-106, Na-22 RC-30; Total Uranium EA-01C; U-235/234/238 EP-70, 71, 5; Np-237 RC-101A, 622, EP-5; Pu-238/239/240 EP-80, 81, 5; I-129 RC-25, 603; Sr-90 RC-306, 303, 309, 304; Tc-99 RC-24, 604; Am-241, Cm-244 EP-80, 91, 92, 93, 5; Se-79 Lab Specific		

Chain of Possession Relinquished By (Sign and Print Names)	Date	Time	Received By
R.T. Sickle R.T. Sickle	3/3/94	0800	D.L. Edwards
D.L. Edwards	3/4/94	0810	Kermit Blum K. Blum
	3-7-94	*	

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

LABORATORY SECTION	Received By	Title	Date/Time
Final Sample Disposition	Disposal Method:	Disposed by:	Date/Time:

* Received @ TMA/NORCAL 3-5-94; opened 3-7-94 · KB

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019

Westinghouse Hanford Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

006230

Collector R.T. Sickle
Company Contact C.A. Rowley
Telephone 372-3293
SAF No. 93-263
Project Designation 216-U-8 Vitrified Clay Pipeline
Sampling Locations 216-U-8 Crib
Ice Chest No. RTS
Bill of Lading/Airbill No. 140 213 8144
Offsite Property No.
Method of Shipment Air Overnight
Field Logbook No.
Shipped to TMA
SPECIAL INSTRUCTIONS
Possible Sample Hazards/Remarks None Detected
Special Handling and/or Storage Keep cool

Sample Number	*	Date Collected	Time	Number and Type of Containers	Analysis Required		Preservative
BOBFH6	S	3-2-94	1450	(1) 250ml Gs ✓	VOA	CLP	
BOBFH6	S			(1) 250ml aG ✓	Semi-VOA	CLP	
BOBFH6	S			(1) 250ml Poly ✓	Metals -CLP TAL Titanium Mercury	CPL	
BOBFH6	S			(1) 125ml G ✓	Anions F, Cl, SO_4	EPA 300.0	
BOBFH6	S			(1) 125ml P/G ✓	NO_2 NO_3	EPA 353.2	
~~BOBFH6~~	~~S~~			~~(1) 250ml aGs~~	~~PCB/Pest~~ RJH 2-23-94	~~8080~~	
BOBFH6	S			(1) 125ml G ✓	Cyanide	CPL	
BOBFH6	S			(1) 125ml Gs ✓	Kerosene	8015M	
BOBFH6	S			(1) 1000ml Poly ✓	Gross Alpha/Beta EP-10; Gamma Spec. Cs-134/137, Co-60, K-40, Eu-152/154/155, Ru-106, Na-22 RC-30; Total Uranium EA-01C; U-235/234/238 EP-70, 71, 5; Np-237 RC-101A, 622, EP-5; Pu-238/239/240 EP-80, 81, 5; I-129 RC-25, 603; Sr-90 RC-306, 303, 309, 304; Tc-99 RC-24, 604; Am-241, Cm-244 EP-80, 91, 92, 93, 5; Se-79 Lab Specific		

Chain of Possession Relinquished By (Sign and Print Names)	Date	Time	Received By
R.T. Sickle	3/3/94	0800	DL Edwards
DL Edwards	3/4/94	0810	
	3-7-94	*	Kermit Blum K. Blum

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

LABORATORY SECTION	Received By	Title	Date/Time
Final Sample Disposition	Disposal Method:	Disposed by:	Date/Time:

* Received @ TMA/NORCAL 3-5-94; opened 3-7-94 KB

020

9713524.2210

ATTACHMENT 5

DATA VALIDATION SUPPORTING DOCUMENTATION

GENERAL GC DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E

PROJECT: 200-UP-2		DATA PACKAGE: B09WF8-TMA-727	
VALIDATOR: [illegible]	LAB: TMA		DATE: 05/12/94
CASE:		SDG: B09WF8-TMA-727	

ANALYSES PERFORMED

☐ 8010	☒ 8015 as Ferrous	☐ 8020	☐ 8021	8140	8141
☐ 8150	☐ 8151	☐ WTPH-HCID	☐ WTPH-G	☐ WTPH-D	☐
☐	☐	☐	☐	☐	☐

SAMPLES/MATRIX: Soils

B09WF8
B0BFH1
B0BFH5
B0BFH6

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:

022

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

for requested parameters 5/12/94

Was a continuing calibration check performed? . . . . . Yes No N/A

Are %D values for calibration or response factors acceptable? . Yes No N/A

Comments: See last page of checklist for 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:

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

023

GENERAL GC DATA VALIDATION CHECKLIST

Comments: See last page of checklist for comments.

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: Sample locations are currently not available. Field QC will be evaluated in the final summary report.

7. COMPOUND IDENTIFICATION AND QUANTITATION

Is compound identification acceptable? . . . . . Yes No N/A

Is compound quantitation acceptable? . . . . . Yes No N/A

Comments: See last page of checklist for 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:

GENERAL GC DATA VALIDATION CHECKLIST

- Comments: A hydrocarbon identified as "heavier than diesel" was ~~reported~~ 5/12/94 reported by the laboratory for sample B0BFH1, however, it was not requested on the chain of custody record. A continuing calibration check (CCC) was not provided for hydrocarbons at the same retention time, however, a CCC ~~was performed~~ 5/12/94 for kerosene was performed with the samples and the lab narrative indicates that a diesel calibration check was performed. Therefore, the associated result was qualified as estimated (J). A copy of the raw data is attached for supporting documentation. The telecon memo is also attached. 5/17/94

- The MS/MSD %R are 90% and 86%, respectively. ~~No lab~~ Lab control limits were not provided, however, in general, limits of 50% to 150% for GC parameters is acceptable. No qualification is required.

- The surrogate %R range from 80% to 94%. No qualification is required since %R of 50-150% is acceptable.

- The LCS %R is 80%. ~~Acceptable recoveries~~ Recoveries between 50-150% are considered acceptable. Therefore, no qualification is required.

5/12/94

HOLDING TIME SUMMARY

B09WF8-TMA-727

SDG:	VALIDATOR: [illegible]	DATE: 5/12/94	PAGE 1 OF 1

COMMENTS: GC as Kerosene

FIELD SAMPLE ID	ANALYSIS TYPE	DATE SAMPLED	DATE PREPARED	DATE ANALYZED	PREP. HOLDING TIME, DAYS	ANALYSIS HOLDING TIME, DAYS	QUALIFIER
B09WF8	GC as Kerosene	3/02/94	3/10/94	3/14/94	8	4	None
B0BFH1	↓	2/28/94	↓	↓	10	4	↓
B0BFH5	↓	3/02/94	↓	↓	8	4	↓
B0BFH6	↓	3/02/94	↓	↓	8	4	↓

9713524.2216

Golder Associates

TELECON/ CONTACT MEMORANDUM

☐ Personal Visit
☒ Telephone: ☐ Incoming ☐ Outgoing

ROUTE TO:
Files
☐ Project
☐ Business Development
☐ Mailing List

Company Name: WHC HAZM
Address:

Job No. 923EHS

Person: Carrie Smith
Telephone: 1-509-373-0066
Job/subject: UPR plug, PSD/NESHAPS-TMH-727

Date: 5/12/94
Time: 2:45

Remarks: Discussed:
Next permit reported by the plug:
Carrie will also PM the importance of permit
comments & call us tomorrow.

5/17/94 per WHC instruction, treat heavy
diesel as a TTC.

Action/Next Contact:
Provide information to validator, include telecon in DI.

027

BY: C Jensen

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~~000573~~

BOBFH1 - Raw data pg 1 of 3

***** EXTERNAL STANDARD TABLE *****

********** 03-14-1996 13:25:11 Version 4.1 **********

* Sample Name: B0BFH1/A40Z029-04E Data File: E:L031248 *
* Date: 03-14-1996 04:12:31 Method: E:HYDROC 03-07-1996 13:03:43 # 248 *
* Interface: 2 94 Cycle#: 348 Operator LV Channel#: 0 Vial#: N.A. *
* Starting Peak Width: 10 Threshold: 1 Area Threshold: 100 *

* Instrument Type: HP-5890 (EVA) Column Type: RTx-200 / RTx-5 *
* Solvent Description: diChloroMethane(Cl2CH2) *
* Conditions: 40D, 4M, 15D/M, 257D (35MRUN) *
* Detector 0: Detector 1: FID *
* Misc. Information: Carrier Gas: He *

gh 3/29/94

Starting Delay: 0.00 Ending retention time: 35.00
Area reject: 2000 One sample per 1.000 sec.
Amount injected: 1.00 Dilution factor: 1.00
Sample Weight: 1.000000

PEAK NUM	RET TIME	PEAK NAME	CONCENTRATION in ug/ml	NORMALIZED CONC	AREA	HEIGHT	AREA/ HEIGHT	BL	REF PEAK	% DELTA RET TIME	CONC/AREA
1	12.950		393634.0000	30.2470%	393634	9544	41.2	1			1.0000E+00
2	14.650	O-TERPHENYL(SURR.)	801879.9400	61.6168%	801880	269032	3.0	3	0	-1.013	1.0000E+00
6	15.833		5218.6875	0.4010%	5219	1211	4.3	2			1.0000E+00
7	16.083		2646.5469	0.2034%	2647	333	8.0	2			1.0000E+00
8	16.417		2780.4375	0.2137%	2780	666	4.2	2			1.0000E+00
9	16.600		3558.5000	0.2734%	3559	530	6.7	2			1.0000E+00
13	17.517		6032.3438	0.4635%	6032	636	9.5	2			1.0000E+00
15	18.017		3477.0000	0.2672%	3477	490	7.1	1			1.0000E+00
16	18.333		4864.8750	0.3738%	4865	881	5.5	2			1.0000E+00
19	18.833		7560.0156	0.5809%	7560	1089	6.9	2			1.0000E+00
20	19.000		4024.8281	0.3093%	4025	841	4.8	2			1.0000E+00
21	19.100		4918.5156	0.3779%	4919	673	7.3	2			1.0000E+00
22	19.267		12519.9062	0.9620%	12520	1327	9.4	2			1.0000E+00
23	19.450		5344.0156	0.4106%	5344	954	5.6	2			1.0000E+00
24	19.617		17215.8438	1.3229%	17216	1694	10.2	2			1.0000E+00
25	19.800		6377.9062	0.4901%	6378	1082	5.9	2			1.0000E+00
27	20.150		3981.0000	0.3059%	3981	559	7.1	1			1.0000E+00
28	20.600		2329.5000	0.1790%	2330	369	6.3	1			1.0000E+00
29	20.917		5555.0000	0.4268%	5555	864	6.4	1			1.0000E+00
30	21.500		7479.0312	0.5747%	7479	1086	6.9	1			1.0000E+00

1083 TOTAL AMOUNT = 1301398.0000

5/12/94

028

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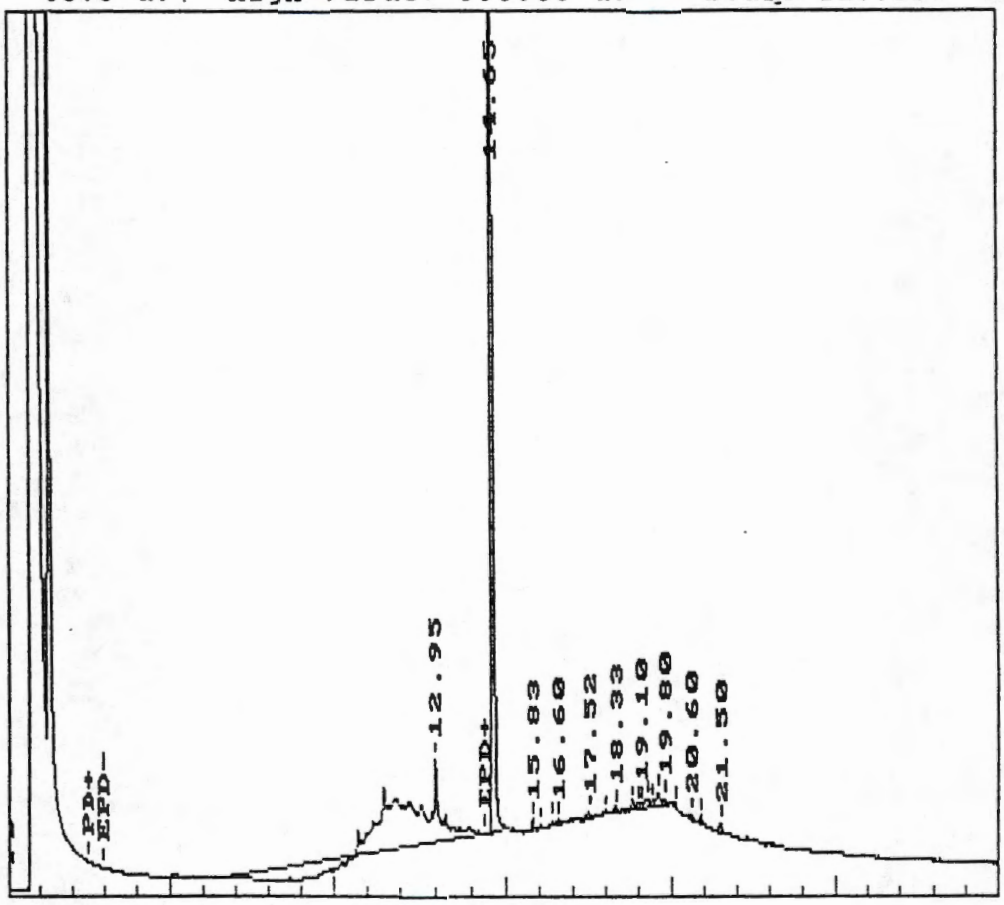
~~000574~~

BOBFH1-Raw Data pg 2 of 3

Areas, times, and heights stored in: E:L031248.ATB
Data File = E:L031248.PTS Printed on 03-14-1996 at 13:25:17
Start time: 0.00 min. Stop time: 30.00 min. Offset: 0 mv.
Low Value: 8373 uv High Value: 999999 uv Scale factor: 10.0

~~1 of 2~~
2 of 3



4/29/96

5/12/94

029

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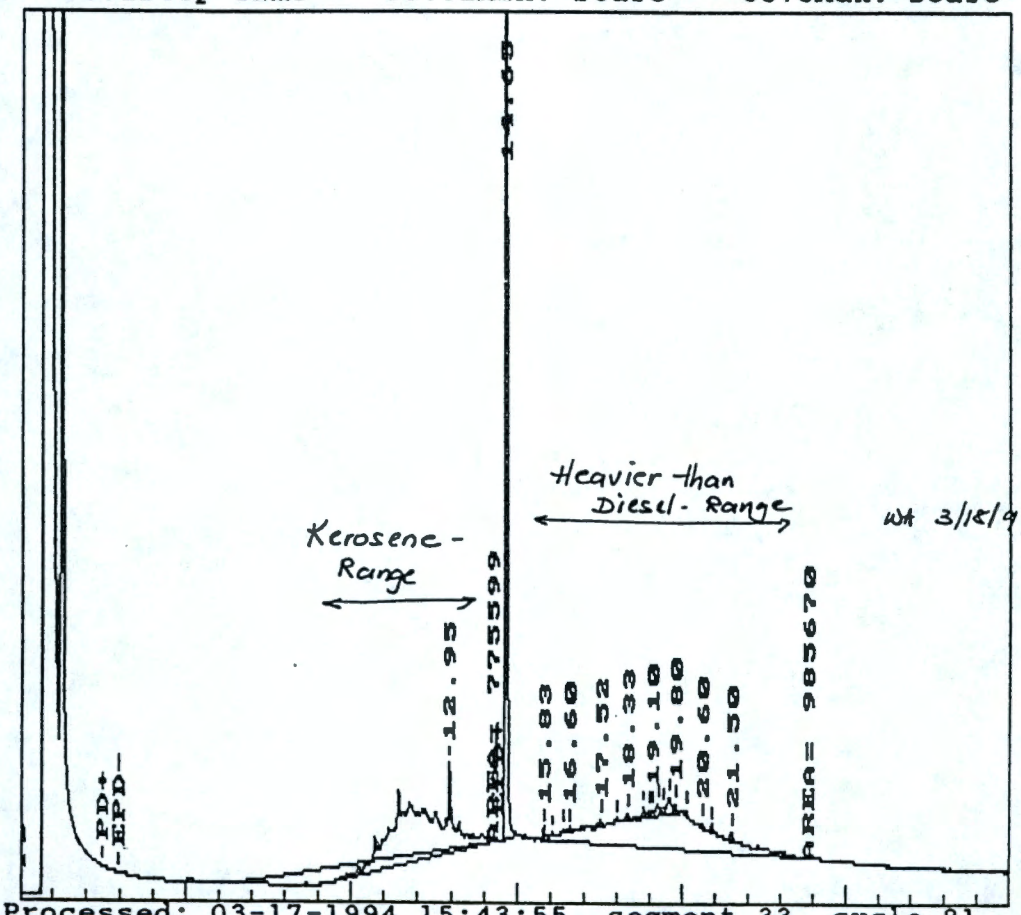
~~000575~~

START TIME= 9.033 START HEIGHT= 9563
STOP TIME= 14.433 STOP HEIGHT= 14656
AREA = 775599
START TIME= 15.367 START HEIGHT= 14954
STOP TIME= 24.033 STOP HEIGHT= 12815
AREA = 985670
Plot of data file: E:L031248.PTS
Date: 03-17-1994 Time: 15:43:32
Sample Name: BOBFH1/A402029-04E
Start Time= 0.02Stop Time = 30.02Min. Scale= 8373Max. Scale= 107536

BOBFH1 - Raw Data
Page 3 of 3.

3 of 3



WA 3/18/94

DIESEL Processed: 03-17-1994 15:43:55, segment 33, cycle 81
End of sequence file reached at cycle 81
RAW DATA SAVED IN FILE E:L031281.PTS

LU 3/17/94

Average CF for ~~kerso~~ SD stdst kerosene is 8296.

5/12/94

-030

9713524.2220

MEMORANDUM

TO: 200-UP-2 Project QA Record May 10, 1994

FR: Susan Winter, Golder Associates Inc.

RE: METALS DATA VALIDATION SUMMARY FOR DATA PACKAGE: B09WF8-TMA-727 (923-E418, Filename B09WF8M.UP2)

INTRODUCTION

This memo presents the results of data validation on data package B09WF8-TMA-727 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
B09WF8	03/02/94	SOIL	SEE NOTE 1
B0BFH1	02/28/94	SOIL	
B0BFH5	03/02/94	SOIL	
B0BFH6	03/02/94	SOIL	
B0BFH8	03/02/94	SOIL	

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

RECEIVED
MAY 18 1994
VALIDATION DOCUMENTATION
SDLA

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.

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

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

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

Completeness. The data package was complete for all requested analyses. A total of five samples were validated in this data package with a total of 125 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

- Beryllium, cadmium, and sodium were detected at positive concentrations in the associated calibration and/or preparation blanks. Attachments 2 and 5 provide a summary of the data qualifications applied and supporting documentation.

Matrix Spike

- Matrix spike percent recovery (MS %R) for antimony was unacceptable. Attachments 2 and 5 provide a summary of the 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.

9713524.2222

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.

9713524.2224

ATTACHMENT 2

SUMMARY OF DATA QUALIFICATIONS

DATA QUALIFICATION SUMMARY

SDG: B09WF8-TMA-727	VALIDATOR:	DATE: May 12, 1994	PAGE 1 OF 1
COMMENTS: METALS			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
BERYLLIUM	U	B09WF8 B0BFH1 B0BFH5	PRESENT IN CCB AT POSITIVE CONCENTRATIONS
CADMIUM	U	B0BFH6	PRESENT IN CCB AT A POSITIVE CONCENTRATION
SODIUM	U	B09WF8 B0BFH1 B0BFH5 B0BFH6 B0BFH8	PRESENT IN PREP. BLANK AT A POSITIVE CONCENTRATION
ANTIMONY	UJ	B09WF8 B0BFH1 B0BFH5 B0BFH6	MS %R < 75% BUT > 30%
ANTIMONY	BJ	B0BFH8	MS %R < 75% BUT > 30%

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ATTACHMENT 3

QUALIFIED DATA SUMMARY AND ANNOTATED LABORATORY REPORTS

Validated Data Summary, Data Package: B09WF8-TMA-727

	Samp#	B09WF8		B0BFH1		B0BFH5		B0BFH6		B0BFH8	
	Date	3-2-94		2-28-94		3-2-94		3-2-94		3-2-94	
	Location	---		---		---		---		---	
	Depth	---		---		---		---		---	
	Type	SOIL		SOIL		SOIL		SOIL		SOIL	
	Comments	---		---		---		---		---	
Parameter	Units	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
ALUMINUM	MG/KG	4010.000		4070.000		6820.000		5880.000		6800.000	
ANTIMONY	MG/KG	2.500	UJ	2.700	UJ	2.400	UJ	2.400	UJ	2.600	BJ
ARSENIC	MG/KG	1.700	B	19.100		6.400		5.600		5.600	
BARIUM	MG/KG	60.300		33.200	B	92.200		94.400		83.300	
BERYLLIUM	MG/KG	0.280	U	0.400	U	0.410	U	0.450	B	0.470	B
CADMIUM	MG/KG	0.350	U	0.380	U	0.340	U	0.350	U	0.340	U
CALCIUM	MG/KG	6410.000		3400.000		10200.000		8700.000		9260.000	
CHROMIUM	MG/KG	4.800		33.100		7.900		7.800		8.300	
COBALT	MG/KG	9.100	B	6.700	B	11.600		10.800		11.600	
COPPER	MG/KG	15.000		14.700		15.100		15.700		13.800	
IRON	MG/KG	19500.000		18200.000		23700.000		22600.000		24000.000	
LEAD	MG/KG	2.200		9.700		6.100		4.200		6.800	
MAGNESIUM	MG/KG	3870.000		2560.000		5670.000		5100.000		5890.000	
MANGANESE	MG/KG	268.000		163.000		351.000		344.000		352.000	
MERCURY	MG/KG	0.180		0.650		0.050	U	0.050	U	0.050	U
NICKEL	MG/KG	7.100	B	6.600	B	8.500		9.100		10.600	
POTASSIUM	MG/KG	621.000	B	812.000	B	1290.000		1060.000		2060.000	
SELENIUM	MG/KG	0.580	U	0.630	U	0.560	U	0.560	U	0.570	U
SILVER	MG/KG	1.600	B	2.500		1.800	B	2.000		1.800	B
SODIUM	MG/KG	586.000	U	576.000	U	793.000	U	553.000	U	564.000	U
THALLIUM	MG/KG	0.770	U	0.830	U	0.740	U	0.740	U	0.750	U
VANADIUM	MG/KG	38.100		43.300		52.500		47.400		54.800	
ZINC	MG/KG	35.000		42.300		44.700		41.600		46.400	
CYANIDE	MG/KG	0.490	U	0.550	U	0.520	U	0.490	U	0.530	U
TITANIUM	MG/KG	1300.000		1670.000		1720.000		1550.000		1780.000	

Verified
[illegible] 5/12/94

9713524.2227

008

SAMPLE NUMBER:

B09WF8

INORGANIC ANALYSIS DATA SHEET

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

Lab Code: SKINER Case No.: N4-03-032SAS No.: SDG No.: B09WF8

Matrix (soil/water): SOIL Lab Sample ID: 03097-04S

Level (low/med): LOW Date Received: 03/08/94

% Solids: 94.6

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

CAS No.	Analyte	Concentration	C	Q	M	Q
7429-90-5	Aluminum	4010			P	
7440-36-0	Antimony	2.5	~~U~~	N	P	u
7440-38-2	Arsenic	1.7	B		P	
7440-39-3	Barium	60.3			P	
7440-41-7	Beryllium	0.28	~~B~~		P	u
7440-43-9	Cadmium	0.35	U		P	
7440-70-2	Calcium	6410			P	
7440-47-3	Chromium	4.8			P	
7440-48-4	Cobalt	9.1	B		P	
7440-50-8	Copper	15.0			P	
7439-89-6	Iron	19500			P	
7439-92-1	Lead	2.2		*	P	
7439-95-4	Magnesium	3870			P	
7439-96-5	Manganese	268			P	
7439-97-6	Mercury	0.18			CV	
7440-02-0	Nickel	7.1	B		P	
7440-09-7	Potassium	621	B		P	
7782-49-2	Selenium	0.58	U		P	
7440-22-4	Silver	1.6	B		P	
7440-23-5	Sodium	586	~~B~~	E	P	u
7440-28-0	Thallium	0.77	U		P	
7440-62-2	Vanadium	38.1			P	
7440-66-6	Zinc	35.0			P	
	Cyanide	0.49	U		CA	
7440-32-6	Titanium	1300			P	

Color Before: GREY Clarity Before: Texture: COARSE

Color After: GREY Clarity After: Artifacts: YES

Comments:
STONES

Verified
[signature] 5/10/94

~~002~~

SAMPLE NUMBER:

INORGANIC ANALYSIS DATA SHEET

B0BFH1

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

Lab Code: SKINER Case No.: N4-03-032SAS No.: SDG No.: B09WF8

Matrix (soil/water): SOIL Lab Sample ID: 03097-01S

Level (low/med): LOW Date Received: 03/08/94

% Solids: 87.2

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

CAS No.	Analyte	Concentration	C	Q	M	Q
7429-90-5	Aluminum	4070			P	
7440-36-0	Antimony	2.7	~~U~~	N	P	
7440-38-2	Arsenic	19.1			P	
7440-39-3	Barium	33.2	B		P	
7440-41-7	Beryllium	0.40	~~B~~		P	U
7440-43-9	Cadmium	0.38	U		P	
7440-70-2	Calcium	3400			P	
7440-47-3	Chromium	33.1			P	
7440-48-4	Cobalt	6.7	B		P	
7440-50-8	Copper	14.7			P	
7439-89-6	Iron	18200			P	
7439-92-1	Lead	9.7		*	P	
7439-95-4	Magnesium	2560			P	
7439-96-5	Manganese	163			P	
7439-97-6	Mercury	0.65			CV	
7440-02-0	Nickel	6.6	B		P	
7440-09-7	Potassium	812	B		P	
7782-49-2	Selenium	0.63	U		P	
7440-22-4	Silver	2.5			P	
7440-23-5	Sodium	576	~~B~~	E	P	U
7440-28-0	Thallium	0.83	U		P	
7440-62-2	Vanadium	43.3			P	
7440-66-6	Zinc	42.3			P	
	Cyanide	0.55	U		CA	
7440-32-6	Titanium	1670			P	

Color Before: GREY Clarity Before: Texture: MEDIUM

Color After: GREY Clarity After: Artifacts:

Comments:

Verified
[illegible] 5/10/94

~~003~~

SAMPLE NUMBER:

INORGANIC ANALYSIS DATA SHEET

B0BFH5

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

Lab Code: SKINER Case No.: N4-03-032SAS No.: SDG No.: B09WF8

Matrix (soil/water): SOIL Lab Sample ID: 03097-02S

Level (low/med): LOW Date Received: 03/08/94

% Solids: 95.8

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

CAS No.	Analyte	Concentration	C	Q	M	Q
7429-90-5	Aluminum	6820			P	
7440-36-0	Antimony	2.4	~~U~~	N	P	u
7440-38-2	Arsenic	6.4			P	
7440-39-3	Barium	92.2			P	
7440-41-7	Beryllium	0.41	~~B~~		P	u
7440-43-9	Cadmium	0.34	U		P	
7440-70-2	Calcium	10200			P	
7440-47-3	Chromium	7.9			P	
7440-48-4	Cobalt	11.6			P	
7440-50-8	Copper	15.1			P	
7439-89-6	Iron	23700			P	
7439-92-1	Lead	6.1		*	P	
7439-95-4	Magnesium	5670			P	
7439-96-5	Manganese	351			P	
7439-97-6	Mercury	0.05	U		CV	
7440-02-0	Nickel	8.5			P	
7440-09-7	Potassium	1290			P	
7782-49-2	Selenium	0.56	U		P	
7440-22-4	Silver	1.8	B		P	
7440-23-5	Sodium	793	~~B~~	E	P	u
7440-28-0	Thallium	0.74	U		P	
7440-62-2	Vanadium	52.5			P	
7440-66-6	Zinc	44.7			P	
	Cyanide	0.52	U		CA	
7440-32-6	Titanium	1720			P	

Color Before: GREY Clarity Before: Texture: MEDIUM

Color After: GREY Clarity After: Artifacts: YES

Comments:
STONES

Verified
[signature] 5/10/94

~~004~~

SAMPLE NUMBER:

B0BFH6

INORGANIC ANALYSIS DATA SHEET

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

Lab Code: SKINER Case No.: N4-03-032SAS No.: SDG No.: B09WF8

Matrix (soil/water): SOIL Lab Sample ID: 03097-03S

Level (low/med): LOW Date Received: 03/08/94

% Solids: 94.9

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

CAS No.	Analyte	Concentration	C	Q	M	Q
7429-90-5	Aluminum	5880			P	
7440-36-0	Antimony	2.4	~~U~~	N	P	U
7440-38-2	Arsenic	5.6			P	
7440-39-3	Barium	94.4			P	
7440-41-7	Beryllium	0.45	B		P	
7440-43-9	Cadmium	0.35	~~B~~		P	U
7440-70-2	Calcium	8700			P	
7440-47-3	Chromium	7.8			P	
7440-48-4	Cobalt	10.8			P	
7440-50-8	Copper	15.7			P	
7439-89-6	Iron	22600			P	
7439-92-1	Lead	4.2		*	P	
7439-95-4	Magnesium	5100			P	
7439-96-5	Manganese	344			P	
7439-97-6	Mercury	0.05	U		CV	
7440-02-0	Nickel	9.1			P	
7440-09-7	Potassium	1060			P	
7782-49-2	Selenium	0.56	U		P	
7440-22-4	Silver	2.0			P	
7440-23-5	Sodium	553	~~B~~	E	P	U
7440-28-0	Thallium	0.74	U		P	
7440-62-2	Vanadium	47.4			P	
7440-66-6	Zinc	41.6			P	
	Cyanide	0.49	U		CA	
7440-32-6	Titanium	1550			P	

Color Before: GREY Clarity Before: Texture: MEDIUM

Color After: GREY Clarity After: Artifacts:

Comments:

Verified
[illegible] 5/10/94

9213524.2232
WESTINGHOUSE/HANFORD
1

SAMPLE NUMBER:

INORGANIC ANALYSIS DATA SHEET

B0BFH8

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

Lab Code: SKINER Case No.: N4-03-032SAS No.: SDG No.: B09WF8

Matrix (soil/water): SOIL Lab Sample ID: 03097-05S

Level (low/med): LOW Date Received: 03/08/94

% Solids: 94.2

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

CAS No.	Analyte	Concentration	C	Q	M	Q
7429-90-5	Aluminum	6800			P	
7440-36-0	Antimony	2.6	~~B~~	N	P	BJ
7440-38-2	Arsenic	5.6			P	
7440-39-3	Barium	83.3			P	
7440-41-7	Beryllium	0.47	B		P	
7440-43-9	Cadmium	0.34	U		P	
7440-70-2	Calcium	9260			P	
7440-47-3	Chromium	8.3			P	
7440-48-4	Cobalt	11.6			P	
7440-50-8	Copper	13.8			P	
7439-89-6	Iron	24000			P	
7439-92-1	Lead	6.8		*	P	
7439-95-4	Magnesium	5890			P	
7439-96-5	Manganese	352			P	
7439-97-6	Mercury	0.05	U		CV	
7440-02-0	Nickel	10.6			P	
7440-09-7	Potassium	2060			P	
7782-49-2	Selenium	0.57	U		P	
7440-22-4	Silver	1.8	B		P	
7440-23-5	Sodium	564	~~B~~	E	P	U
7440-28-0	Thallium	0.75	U		P	
7440-62-2	Vanadium	54.8			P	
7440-66-6	Zinc	46.4			P	
	Cyanide	0.53	U		CA	
7440-32-6	Titanium	1780			P	

Color Before: GREY Clarity Before: Texture: MEDIUM

Color After: GREY Clarity After: Artifacts: YES

Comments:
ROOTS,STONES

Verified
[illegible] 5/12/94

~~006~~

FORM I - IN ILM02.1

013

9713524.2233

ATTACHMENT 4

LABORATORY NARRATIVE AND CHAIN-OF-CUSTODY DOCUMENTATION

TMA 9713524.2234
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

APR 1994
RECEIVED
SDLA

April 8, 1994

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

Quality Control Narrative

Scope
Five soil samples were submitted to TMA/Skinner & Sherman Laboratories, Inc. on March 8, 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 S403097.

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 matrix spike recovery for antimony exceeded the control limit requirement.

The laboratory duplicate for lead exceeded the control limit requirement.

The ICP serial dilution for sodium 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

9713524.2235

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: 3-2-94

Ice Chest No.:

Field Logbook No.: EFL-1115

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) B09W F8

- ✓ 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)~~

- ~~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~~

3-2-94

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

Relinquished by:	Received by:	Date/Time:
3-4-94 Jerome E Rogers 1033	Kermit Blum K-Blum	3-7-94 *
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:

* Received @ TMA/NORCAL 3-5-94; opened 3-7-94 KB

016

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

Westinghouse Hanford Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

006225

Collector R.T. Sickle
Company Contact C.A. Rowley
Telephone 372-3293
SAF No. 93-263
Project Designation 216-U-8 Vitrified Clay Pipeline
Sampling Locations 216-U-8 Crib
Ice Chest No.
Bill of Lading/Airbill No.
Offsite Property No.
Method of Shipment Air Overnight
Field Logbook No.
Shipped to TMA
SPECIAL INSTRUCTIONS
Possible Sample Hazards/Remarks None Detected
Special Handling and/or Storage Keep cool

Sample Number	*	Date Collected	Time	Number and Type of Containers	Analysis Required		Preservative
BOBFH7	S	2-28-94	0800	(1) 250ml aGs ✓	VOA	CLP	
BOBFH1	S	2-28-94	1115	(1) 250ml Gs ✓	VOA	CLP	
BOBFH1	S			(1) 250ml aG ✓	Semi-VOA	CLP	
BOBFH1	S			(1) 250ml Poly ✓	Metals -CLP TAL Titanium Mercury	CPL	
BOBFH1	S			(1) 125ml G ✓	Anions F, Cl, SO_4	EPA 300.0	
BOBFH1	S			(1) 125ml P/G ✓	NO_2 NO_3	EPA 353.2	
~~BOBFH1~~	~~S~~			~~(1) 250ml aGs~~	~~PGB/Pest~~ RJS 2-23-94	~~8080~~	
BOBFH1	S			(1) 125ml G ✓	Cyanide	CPL	
BOBFH1	S			(1) 125ml Gs ✓	Kerosene	8015M	
BOBFH1	S	2-28-94	1115	(1) 1000ml Poly ✓	Gross Alpha/Beta EP-10; Gamma Spec. Cs-134/137, Co-60, K-40, Eu-152/154/155, Ru-106, Na-22 RC-30; Total Uranium EA-01C; U-235/234/238 EP-70, 71, 5; Np-237 RC-101A, 622, EP-5; Pu-238/239/240 EP-80, 81, 5; I-129 RC-25, 603; Sr-90 RC-306, 303, 309, 304; Tc-99 RC-24, 604; Am-241, Cm-244 EP-80, 91, 92, 93, 5; Se-79 Lab Specific		

Chain of Possession Relinquished By (Sign and Print Names)	Date	Time	Received By
R.T. Sickle	3/1/94	1200	DL Edwards
DL Edwards	3/4/94	0810	
	3-7-94	*	Kermit Blum K. Blum

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

LABORATORY SECTION	Received By	Title	Date/Time
Final Sample Disposition	Disposal Method:	Disposed by:	Date/Time:

* Received @ TMA/NORCAL 3-5-94; opened 3-7-94 .KB

U017

Westinghouse Hanford Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

006229

Collector R.T. Sickle
Company Contact C.A. Rowley
Telephone 372-3293
SAF No. 93-263
Project Designation 216-U-8 Vitrified Clay Pipeline
Sampling Locations 216-U-8 Crib
Ice Chest No.
Bill of Lading/Airbill No. 140 213 8144
Offsite Property No.
Method of Shipment Air Overnight
Field Logbook No.
Shipped to TMA
SPECIAL INSTRUCTIONS
Possible Sample Hazards/Remarks None Detected
Special Handling and/or Storage Keep cool

Sample Number	*	Date Collected	Time	Number and Type of Containers	Analysis Required		Preservative
BOBFM6	S	3-2-94	0800	(1) 250ml Gs ✓	VOA	CLP	
BOBFH5	S	3-2-94	1325	(1) 250ml Gs ✓	VOA	CLP	
BOBFH5	S			(1) 250ml aG ✓	Semi-VOA	CLP	
BOBFH5	S			(1) 250ml Poly ✓	Metals -CLP TAL Titanium Mercury	CPL	
BOBFH5	S			(1) 125ml G ✓	Anions F, Cl, SO_4	EPA 300.0	
BOBFH5	S			(1) 125ml P/G ✓	NO_2 NO_3	EPA 353.2	
~~BOBFH5~~	~~S~~			~~(1) 250ml aGs~~	~~PCB/Pest~~ RJL 2-23-94	~~8080~~	
BOBFH5	S			(1) 125ml G ✓	Cyanide	CPL	
BOBFH5	S			(1) 125ml Gs ✓	Kerosene	8015M	
BOBFH5	S			(1) 1000ml Poly ✓	Gross Alpha/Beta EP-10; Gamma Spec. Cs-134/137, Co-60, K-40, Eu-152/154/155, Ru-106, Na-22 RC-30; Total Uranium EA-01C; U-235/234/238 EP-70, 71, 5; Np-237 RC-101A, 622, EP-5; Pu-238/239/240 EP-80, 81, 5; I-129 RC-25, 603; Sr-90 RC-306, 303, 309, 304; Tc-99 RC-24, 604; Am-241, Cm-244 EP-80, 91, 92, 93, 5; Se-79 Lab Specific		

Chain of Possession Relinquished By (Sign and Print Names)	Date	Time	Received By
R.T. Sickle R.T. Sickle	3/3/94	0800	DL Edwards
DL Edwards	3/4/94	0810	Kermit Blum K. Blum
	3-7-94	*	

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

LABORATORY SECTION	Received By	Title	Date/Time
Final Sample Disposition	Disposal Method:	Disposed by:	Date/Time:

* Received @ TMA/NORCAL 3-5-94; opened 3-7-94 · KB

9115241.2297

000028

0018

Westinghouse Hanford Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

006230

Collector R.T. Sickle
Company Contact C.A. Rowley
Telephone 372-3293
SAF No. 93-263
Project Designation 216-U-8 Vitrified Clay Pipeline
Sampling Locations 216-U-8 Crib
Ice Chest No. RTS
Bill of Lading/Airbill No. 140 213 8144
Offsite Property No.
Method of Shipment Air Overnight
Field Logbook No.
Shipped to TMA
SPECIAL INSTRUCTIONS
Possible Sample Hazards/Remarks None Detected
Special Handling and/or Storage Keep cool

Sample Number	*	Date Collected	Time	Number and Type of Containers	Analysis Required		Preservative
B0BFH6	S	3-2-94	1450	(1) 250ml Gs ✓	VOA	CLP	
B0BFH6	S			(1) 250ml aG ✓	Semi-VOA	CLP	
B0BFH6	S			(1) 250ml Poly ✓	Metals -CLP TAL Titanium Mercury	CPL	
B0BFH6	S			(1) 125ml G ✓	Anions F, Cl, SO_4	EPA 300.0	
B0BFH6	S			(1) 125ml P/G ✓	NO_2 NO_3	EPA 353.2	
~~B0BFH6~~	~~S~~			~~(1) 250ml aGs~~	~~PCB/Pest~~ RDE 2-23-94	~~8080~~	
B0BFH6	S			(1) 125ml G ✓	Cyanide	CPL	
B0BFH6	S			(1) 125ml Gs ✓	Kerosene	8015M	
B0BFH6	S			(1) 1000ml Poly ✓	Gross Alpha/Beta EP-10; Gamma Spec. Cs-134/137, Co-60, K-40, Eu-152/154/155, Ru-106, Na-22 RC-30; Total Uranium EA-01C; U-235/234/238 EP-70, 71, 5; Np-237 RC-101A, 622, EP-5; Pu-238/239/240 EP-80, 81, 5; I-129 RC-25, 603; Sr-90 RC-306, 303, 309, 304; Tc-99 RC-24, 604; Am-241, Cm-244 EP-80, 91, 92, 93, 5; Se-79 Lab Specific		

Chain of Possession Relinquished By (Sign and Print Names)	Date	Time	Received By
R.T. Sickle	3/3/94	0800	DL Edwards
DL Edwards	3/4/94	0810	
	3-7-94	*	Kermit Blum K. Blum

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

LABORATORY SECTION	Received By	Title	Date/Time
Final Sample Disposition	Disposal Method:	Disposed by:	Date/Time:

* Received @ TMA/NORCAL 3-5-94; opened 3-7-94 KB

Westinghouse Hanford Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

006490

Collector R.T. Sickle
Company Contact C.A. Rowley
Telephone 372-3293
SAF No. 93-263
Project Designation 216-U-8 Vitrified Clay Pipeline
Sampling Locations 216-U-8 Crib
Ice Chest No.
Bill of Lading/Airbill No. 140 213 8144
Offsite Property No.
Method of Shipment Air Overnight
Field Logbook No.
Shipped to TMA
SPECIAL INSTRUCTIONS
Possible Sample Hazards/Remarks None Detected
Special Handling and/or Storage Keep cool

Sample Number	*	Date Collected	Time	Number and Type of Containers	Analysis Required		Preservative
			1300	3-2-94			
BOBFH8	S	3-2-94	~~0850~~	~~(1) 250ml Gs~~	~~VOA~~ RHR 3-2-94	CLP	
BOBFH8	S			~~(1) 250ml aG~~	~~Semi-VOA~~ RHR 3-2-94	CLP	
BOBFH8	S			(1) 250ml Poly ✓	Metals -CLP TAL Titanium Mercury	CPL	
BOBFH8	S			(1) 125ml G ✓	Anions F, Cl, SO_4	EPA 300.0	
BOBFH8	S			(1) 125ml P/G ✓	NO_2 NO_3	EPA 353.2	
~~BOBFH8~~	~~S~~			~~(1) 250ml aGs~~	~~PCB/Pest~~ RHR 2-23-94	~~8080~~	
BOBFH8	S			(1) 125ml G ✓	Cyanide	CPL	
BOBFH8	S			~~(1) 125ml Gs~~	~~Kerosene~~ RHR 3-2-94	8015M	
BOBFH8	S			(1) 1000ml Poly ✓	Gross Alpha/Beta EP-10; Gamma Spec. Cs-134/137, Co-60, K-40, Eu-152/154/155, Ru-106, Na-22 RC-30; Total Uranium EA-01C; U-235/234/238 EP-70, 71, 5; Np-237 RC-101A, 622, EP-5; Pu-238/239/240 EP-80, 81, 5; I-129 RC-25, 603; Sr-90 RC-306, 303, 309, 304; Tc-99 RC-24, 604; Am-241, Cm-244 EP-80, 91, 92, 93, 5; Se-79 Lab Specific		

Chain of Possession Relinquished By (Sign and Print Names)	Date	Time	Received By
R.T. Sickle R.T. Sickle	3/3/94	0800	DK Edwards
DK Edwards	3/4/94	0810	
	3-7-94 *		Kermit Blum K. Blum

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

LABORATORY SECTION	Received By	Title	Date/Time
Final Sample Disposition	Disposal Method:	Disposed by:	Date/Time:

* Received @ TMA/NORCAL 3-5-94; opened 3-7-94 KB

SURFACE

0020

9713524.2240

ATTACHMENT 5

DATA VALIDATION SUPPORTING DOCUMENTATION

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E

PROJECT: 200-UP-2		DATA PACKAGE: B09WF8-TMA-727
VALIDATOR: [illegible]	LAB: TMA	DATE: 05/10/94
CASE:		SDG: B09WF8-TMA-727

ANALYSES PERFORMED 5/10/94

☒ CLP/ICP	☐ CLP/GFAA	☒ CLP/Hg	☒ CLP/Cyanide	☒ Titration-ICP	☐
☐ SW-846/ICP	☐ SW-846/GFAA	☐ SW-846/Hg	☐ SW-846 Cyanide	☐	☐

SAMPLES/MATRIX Soils

B09WF8

5/10/94 ~~B0BF8~~ B0BFH1

B0BFH5

B0BFH6

B0BFH8

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? . . . . . SINGLY 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 lab blank form for analytes detected in the blank. Sample results <5X blank conc. have been qualified as undetected (U).

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: MS % R for antimony is 50%. Qualify associated results as estimated (UJ/BJ).

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: See last page of checklist for comments.

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: As, Pb, Se, and Tl were analyzed by ICP.

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:

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

Comments (attach additional sheets as necessary):

The narrative states that the lab. dup. RPD for lead exceeded the control limit. However, both the sample and duplicate results are less than 5x the CRDL for lead and the difference between the results is less than 2x the CRDL. Therefore, the duplicate result is acceptable and no qualification is required. 5/17/94

The ICP serial dilution for sodium exceeded the control limits since the result is >50xIDL and the %D>10%. However, all associated sodium results have been qualified as undetected (U) due to lab blank adjustment. Therefore, no qualification is required. 5/17/94

5/17/94

L025 ~~L026~~ 5/17/94

HOLDING TIME SUMMARY

B09WF8-TMA-727

SDG:	VALIDATOR:	DATE: 5/10/94	PAGE 1 OF 2
COMMENTS: Metals			

FIELD SAMPLE ID	ANALYSIS TYPE	DATE SAMPLED	DATE PREPARED	DATE ANALYZED	PREP. HOLDING TIME, DAYS	ANALYSIS HOLDING TIME, DAYS	QUALIFIER
B09WF8	ICP	3/02/94		3/30/94		28	None
B0BFH1	↓	2/28/94		↓		30	↓
B0BFH5	↓	3/02/94		↓		28	↓
B0BFH6	↓	3/02/94		↓		28	↓
B0BFH8	↓	3/02/94		↓		28	↓
B09WF8	As, Tl, Se, Pb	3/02/94		4/07/94		36	↓
B0BFH1	↓	2/28/94		↓		38	↓
B0BFH5	↓	3/02/94		↓		36	↓
B0BFH6	↓	3/02/94		↓		36	↓
B0BFH8	↓	3/02/94		↓		36	↓
B09WF8	CN	3/02/94		3/11/94		9	↓
B0BFH1	↓	2/28/94		↓		11	↓
B0BFH5	↓	3/02/94		↓		9	↓
B0BFH6	↓	3/02/94		↓		9	↓
B0BFH8	↓	3/02/94		↓		9	↓

HOLDING TIME SUMMARY

B09WF8-TMA-727

SDG:	VALIDATOR:	DATE: 5/10/94	PAGE 2 OF 2
COMMENTS: Metals			

FIELD SAMPLE ID	ANALYSIS TYPE	DATE SAMPLED	DATE PREPARED	DATE ANALYZED	PREP. HOLDING TIME, DAYS	ANALYSIS HOLDING TIME, DAYS	QUALIFIER
B09WF8	Hg	3/02/94		3/17/94		15	None
B0BFH1		2/28/94				17	
B0BFH5		3/02/94				15	
B0BFH6		3/02/94				15	
B0BFH8		3/02/94				15	

WESTINGHOUSE/HANFORD

3
BLANKS

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

Lab Code: SKINER Case No.: N4-03-032SAS No.: SDG No.: B09WF8

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
			5x		5x						
Aluminum	15.0	U	39.8	B	17.1	B	26.6	B	6.970	B	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	0.8	U	1.2	B	2.1	B	0.646	B	P
Beryllium	0.3	U	2.0 0.4	B	2.0 0.4	B	0.3	U	0.060	U	P
Cadmium	1.7	U	9.0 1.8	B	1.7	U	2.5	B	0.340	U	P
Calcium	543.3	B	133.8	B	83.4	U	83.4	U	186.878	B	P
Chromium	2.5	U	2.5	U	2.5	U	2.5	U	0.500	U	P
Cobalt	2.9	U	2.9	U	2.9	U	2.9	U	0.580	U	P
Copper	4.8	B	7.0	B	1.6	U	1.6	U	1.098	B	P
Iron	13.4	U	16.2	B	29.0	B	55.4	B	7.066	B	P
Lead	1.8	U	1.8	U	1.8	U	1.8	U	0.360	U	P
Magnesium	32.2	U	34.3	B	32.2	U	32.2	U	73.844	B	P
Manganese	0.8	U	0.8	B	1.7	B	2.2	B	0.722	B	P
Mercury	0.1	U	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	62.928	B	P
Selenium	2.8	U	2.8	U	2.8	U	2.8	U	0.560	U	P
Silver	2.1	U	2.1	U	2.1	U	2.1	U	0.420	U	P
Sodium	39.6	U	39.6	U	39.6	U	39.6	U	362.560	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	14.3	B	5.8	B	4.6	U	4.6	U	2.690	B	P
Cyanide	10.0	U	10.0	U	10.0	U	10.0	U	0.500	U	CA
Titanium	1.2	U	1.7	B	2.8	B	3.6	B	0.240	U	P

KS = 1812.8
5/10/94

Qualify results < 5x blank conc. as undetected (U).

Assoc. with
B09WF8
B0BFH1
B0BFH5
B0BFH6
B0BFH8

5/10/94

~~011~~

5A

SPIKE SAMPLE RECOVERY

SAMPLE NUMBER: B0BFH8S

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

Lab Code: SKINER Case No.: N4-03-032SAS No.: SDG No.: B09WF8

Matrix (soil/water): SOIL Level (low/med): LOW

% Solids for Sample: 94.2

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	53.1615		2.5781	B	101.10	50.0	N	P
Arsenic	75-125	391.4468		5.6395		404.41	95.4		P
Barium	75-125	474.3302		83.2717		404.41	96.7		P
Beryllium	75-125	10.1547		0.4711	B	10.11	95.8		P
Cadmium	75-125	9.6714		0.3437	U	10.11	95.7		P
Calcium									NR
Chromium	75-125	46.4544		8.3065		40.44	94.3		P
Cobalt	75-125	105.8841		11.6348		101.10	93.2		P
Copper	75-125	61.8805		13.7762		50.55	95.2		P
Iron									NR
Lead	75-125	101.5004		6.7748		101.10	93.7		P
Magnesium									NR
Manganese	75-125	452.1080		351.6732		101.10	99.3		P
Mercury	75-125	0.4972		0.0483	U	0.46	108.1		CV
Nickel	75-125	103.3970		10.5692		101.10	91.8		P
Potassium									NR
Selenium	75-125	380.7300		0.5662	U	404.41	94.1		P
Silver	75-125	10.8341		1.8461	B	10.11	88.9		P
Sodium									NR
Thallium	75-125	372.6620		0.7482	U	404.41	92.1		P
Vanadium	75-125	143.5244		54.8478		101.10	87.7		P
Zinc	75-125	135.9033		46.3512		101.10	88.6		P
Cyanide	75-125	2.5961		0.5255	U	2.65	98.0		CA
Titanium		1723.1827		1778.0204		101.10	-54.2		P

Comments:
Qualify Sb results as estimated (US/BJ)

5/10/94

SAMPLE NUMBER:

B0BFH8L

ICP SERIAL DILUTIONS

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

Lab Code: SKINER Case No.: N4-03-032SAS No.: SDG No.: B09WF8

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	33645.00		32366.00		3.8		P
Antimony	12.75	B	61.00	U	100.0		P
Arsenic	27.89		27.04	B	3.0		P
Barium	411.82		398.50	B	3.2		P
Beryllium	2.33	B	2.05	B	12.0		P
Cadmium	1.70	U	8.50	U			P
Calcium	45811.00		46860.00		2.3		P
Chromium	41.08		46.60	B	13.4		P
Cobalt	57.54		59.35	B	3.1		P
Copper	68.13		73.20	B	7.4		P
Iron	118800.00		115950.00		2.4		P
Lead	33.50		34.16		2.0		P
Magnesium	29122.00		28271.50		2.9		P
Manganese	1739.20		1691.30		2.8		P
Mercury							NR
Nickel	52.27		61.05	B	16.8		P
Potassium	10194.00		9883.00	B	3.1		P
Selenium	2.80	U	14.00	U			P
Silver	9.13	B	16.30	B	78.5		P
Sodium	2787.40	B	3256.25	B	16.8	E	P
Thallium	3.70	U	18.50	U			P
Vanadium	271.25		268.40		1.1		P
Zinc	229.23		266.85		16.4		P
Titanium	8793.20		8391.00		4.6		P

Greater than 50x IDL and %D>10%. However, all associated Sodium results have been qualified as undetected (U) due to blank contamination. Therefore, no qualification for ICP serial dilution is required.

FORM IX - IN 5/10/94 ILM02.1

9713524.2250

MEMORANDUM

TO: 200-UP-2 Project QA Record May 11, 1994

FR: Susan Winter, Golder Associates Inc.

RE: VOLATILE ORGANICS DATA VALIDATION SUMMARY FOR DATA PACKAGE: B09WF8-TMA-727 (923-E418, Filename B09WF8V.UP2)

MAY 1994 RECEIVED TOO

INTRODUCTION

This memo presents the results of data validation on data package B09WF8-TMA-727 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
B09WF8	03/02/94	SOIL	SEE NOTE 1
B09WG1	03/04/94	SOIL	
B0BFH1	02/28/94	SOIL	
B0BFH5	03/02/94	SOIL	
B0BFH6	03/02/94	SOIL	
B0BFM6	03/02/94	SOIL	
B0BFM7	02/28/94	SOIL	

RECEIVED MAY 18 1994 VALIDATION DOCUMENTATION SDLA

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

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 231 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.

Calibration

- Continuing calibration check percent difference (CCC %D) for bromomethane was greater than the 25% control limit. Attachments 2 and 5 provide a summary of the samples affected, data qualifications applied and supporting documentation.

Laboratory Blanks

- Methylene chloride, acetone, 4-methyl-2-pentanone, chloroform, toluene, and 1,1,1-trichloroethane 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 samples 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.

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.

9713524.2253

ATTACHMENT 2

SUMMARY OF DATA QUALIFICATIONS

DATA QUALIFICATION SUMMARY

SDG: B09WF8-TMA-727	VALIDATOR: DATE: May 11, 1994	PAGE 1 OF 1
COMMENTS: VOLATILE ORGANICS		

COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
BROMOMETHANE	UJ	B09WF8 B09WG1 B0BFH1 B0BFH5 B0BFH6 B0BFM6 B0BFM7	CCC %D > 25%
METHYLENE CHLORIDE	U	B09WF8 B09WG1 B0BFH1 B0BFH5 B0BFH6 B0BFM6	PRESENT IN ASSOCIATED BLANK
ACETONE	U	B09WF8 B0BFH1 B0BFH5 B0BFH6 B0BFM6 B0BFM7	PRESENT IN ASSOCIATED BLANK
4-METHYL-2-PENTANONE	U	B09WF8 B09WG1 B0BFM6 B0BFM7	PRESENT IN ASSOCIATED BLANK
CHLOROFORM	U	B09WG1 B0BFH1 B0BFH5	PRESENT IN ASSOCIATED BLANK
TOLUENE	U	B0BFH1	PRESENT IN ASSOCIATED BLANK
1,1,1-TRICHLOROETHANE	U	B0BFH5 B0BFM7	PRESENT IN ASSOCIATED BLANK

9713524.2255

ATTACHMENT 3

QUALIFIED DATA SUMMARY AND ANNOTATED LABORATORY REPORTS

Validated Data Summary, Data Package: B09WF8-TMA-727

	Samp#	B09WF8		B09WG1		B0BFH1		B0BFH5		B0BFH6		B0BFM6	
	Date	3-2-94		3-4-94		2-28-94		3-2-94		3-2-94		3-2-94	
	Location	---		---		---		---		---		---	
	Depth	---		---		---		---		---		---	
	Type	SOIL		SOIL		SOIL		SOIL		SOIL		SOIL	
	Comments	---		---		---		---		---		---	
Parameter	Units	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
CHLOROMETHANE	UG/KG	10.000	U	12.000	U	11.000	U	10.000	U	11.000	U	10.000	U
BROMOMETHANE	UG/KG	10.000	UJ	12.000	UJ	11.000	UJ	10.000	UJ	11.000	UJ	10.000	UJ
VINYL CHLORIDE	UG/KG	10.000	U	12.000	U	11.000	U	10.000	U	11.000	U	10.000	U
CHLOROETHANE	UG/KG	10.000	U	12.000	U	11.000	U	10.000	U	11.000	U	10.000	U
METHYLENE CHLORIDE	UG/KG	10.000	U	12.000	U	11.000	U	10.000	U	11.000	U	10.000	U
ACETONE	UG/KG	10.000	U	57.000		20.000	U	18.000	U	13.000	U	12.000	U
CARBON DISULFIDE	UG/KG	10.000	U	12.000	U	11.000	U	10.000	U	11.000	U	10.000	U
1,1-DICHLOROETHENE	UG/KG	10.000	U	12.000	U	11.000	U	10.000	U	11.000	U	10.000	U
1,1-DICHLOROETHANE	UG/KG	10.000	U	12.000	U	11.000	U	10.000	U	11.000	U	10.000	U
1,2-DICHLOROETHENE (TOTAL)	UG/KG	10.000	U	12.000	U	11.000	U	10.000	U	11.000	U	10.000	U
CHLOROFORM	UG/KG	10.000	U	12.000	U	11.000	U	10.000	U	11.000	U	10.000	U
1,2-DICHLOROETHANE	UG/KG	10.000	U	12.000	U	11.000	U	10.000	U	11.000	U	10.000	U
2-BUTANONE	UG/KG	10.000	U	12.000	U	11.000	U	10.000	U	11.000	U	10.000	U
1,1,1-TRICHLOROETHANE	UG/KG	10.000	U	12.000	U	11.000	U	10.000	U	11.000	U	10.000	U
CARBON TETRACHLORIDE	UG/KG	10.000	U	12.000	U	11.000	U	10.000	U	11.000	U	10.000	U
BROMODICHLOROMETHANE	UG/KG	10.000	U	12.000	U	11.000	U	10.000	U	11.000	U	10.000	U
1,2-DICHLOROPROPANE	UG/KG	10.000	U	12.000	U	11.000	U	10.000	U	11.000	U	10.000	U
CIS-1,3-DICHLOROPROPENE	UG/KG	10.000	U	12.000	U	11.000	U	10.000	U	11.000	U	10.000	U
TRICHLOROETHENE	UG/KG	10.000	U	12.000	U	11.000	U	10.000	U	11.000	U	10.000	U
DIBROMOCHLOROMETHANE	UG/KG	10.000	U	12.000	U	11.000	U	10.000	U	11.000	U	10.000	U
1,1,2-TRICHLOROETHANE	UG/KG	10.000	U	12.000	U	11.000	U	10.000	U	11.000	U	10.000	U
BENZENE	UG/KG	10.000	U	12.000	U	11.000	U	10.000	U	11.000	U	10.000	U
TRANS-1,3-DICHLOROPROPENE	UG/KG	10.000	U	12.000	U	11.000	U	10.000	U	11.000	U	10.000	U
BROMOFORM	UG/KG	10.000	U	12.000	U	11.000	U	10.000	U	11.000	U	10.000	U
4-METHYL-2-PENTANONE	UG/KG	10.000	U	12.000	U	11.000	U	10.000	U	11.000	U	10.000	U
2-HEXANONE	UG/KG	10.000	U	12.000	U	11.000	U	10.000	U	11.000	U	10.000	U
TETRACHLOROETHENE	UG/KG	10.000	U	12.000	U	11.000	U	10.000	U	11.000	U	10.000	U
1,1,2,2-TETRACHLOROETHANE	UG/KG	10.000	U	12.000	U	11.000	U	10.000	U	11.000	U	10.000	U
TOLUENE	UG/KG	10.000	U	12.000	U	11.000	U	10.000	U	11.000	U	10.000	U
CHLOROBENZENE	UG/KG	10.000	U	12.000	U	11.000	U	10.000	U	11.000	U	10.000	U
ETHYLBENZENE	UG/KG	10.000	U	12.000	U	11.000	U	10.000	U	11.000	U	10.000	U
STYRENE	UG/KG	10.000	U	12.000	U	11.000	U	10.000	U	11.000	U	10.000	U
XYLENES (TOTAL)	UG/KG	10.000	U	12.000	U	11.000	U	10.000	U	11.000	U	10.000	U

Verified
5/12/94

9713524.2256

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Validated Data Summary, Data Package: B09WF8-TMA-727

	Samp#	B0BFM7	
	Date	2-28-94	
	Location	---	
	Depth	---	
	Type	SOIL	
	Comments	---	
Parameter	Units	Result	Q
CHLOROMETHANE	UG/KG	10.000	U
BROMOMETHANE	UG/KG	10.000	UJ
VINYL CHLORIDE	UG/KG	10.000	U
CHLOROETHANE	UG/KG	10.000	U
METHYLENE CHLORIDE	UG/KG	10.000	U
ACETONE	UG/KG	16.000	U
CARBON DISULFIDE	UG/KG	10.000	U
1,1-DICHLOROETHENE	UG/KG	10.000	U
1,1-DICHLOROETHANE	UG/KG	10.000	U
1,2-DICHLOROETHENE (TOTAL)	UG/KG	10.000	U
CHLOROFORM	UG/KG	10.000	U
1,2-DICHLOROETHANE	UG/KG	10.000	U
2-BUTANONE	UG/KG	10.000	U
1,1,1-TRICHLOROETHANE	UG/KG	10.000	U
CARBON TETRACHLORIDE	UG/KG	10.000	U
BROMODICHLOROMETHANE	UG/KG	10.000	U
1,2-DICHLOROPROPANE	UG/KG	10.000	U
CIS-1,3-DICHLOROPROPENE	UG/KG	10.000	U
TRICHLOROETHENE	UG/KG	10.000	U
DIBROMOCHLOROMETHANE	UG/KG	10.000	U
1,1,2-TRICHLOROETHANE	UG/KG	10.000	U
BENZENE	UG/KG	10.000	U
TRANS-1,3-DICHLOROPROPENE	UG/KG	10.000	U
BROMOFORM	UG/KG	10.000	U
4-METHYL-2-PENTANONE	UG/KG	10.000	U
2-HEXANONE	UG/KG	4.000	J
TETRACHLOROETHENE	UG/KG	10.000	U
1,1,2,2-TETRACHLOROETHANE	UG/KG	10.000	U
TOLUENE	UG/KG	10.000	U
CHLOROBENZENE	UG/KG	10.000	U
ETHYLBENZENE	UG/KG	10.000	U
STYRENE	UG/KG	10.000	U
XYLENES (TOTAL)	UG/KG	10.000	U

Verified
[illegible] 5/12/94

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1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B09WF8

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 03029 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A403029-01A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 40314R14

Level: (low/med) LOW Date Received: 03/07/94

% Moisture: not dec. 4 Date Analyzed: 03/14/94

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~~	B
75-01-4	Vinyl Chloride	10	U	
75-00-3	Chloroethane	10	U	
75-09-2	Methylene Chloride	10 ~~3~~	~~BJ~~	J
67-64-1	Acetone	10 ~~9~~	~~BJ~~	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 ~~3~~	~~BJ~~	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	

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9713524.2259

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1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B09WF8

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 03029 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A403029-01A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 40314R14

Level: (low/med) LOW Date Received: 03/07/94

% Moisture: not dec. 4 Date Analyzed: 03/14/94

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	24.28	10	~~J~~	NJ
2.	UNKNOWN HYDROCARBON	26.62	33	~~J~~	NJ

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5/11/94

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9713524.2260

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1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B09WG1

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 03029 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A403029-02A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 40315R05

Level: (low/med) LOW Date Received: 03/07/94

% Moisture: not dec. 19 Date Analyzed: 03/15/94

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~~	U
75-01-4	Vinyl Chloride	12	U	
75-00-3	Chloroethane	12	U	
75-09-2	Methylene Chloride	12 ~~8~~	~~BJ~~	U
67-64-1	Acetone	57		
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 ~~1~~	~~J~~	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 ~~2~~	~~J~~	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	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	

Verified [illegible] 5/11/94

9713524.2261

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1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B09WG1

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 03029 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A403029-02A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 40315R05

Level: (low/med) LOW Date Received: 03/07/94

% Moisture: not dec. 19 Date Analyzed: 03/15/94

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	Q
1.	UNKNOWN HYDROCARBON	26.70	9	~~J~~	NJ

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1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B0BFH1

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 03029 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A403029-04A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 40314R05

Level: (low/med) LOW Date Received: 03/07/94

% Moisture: not dec. 10 Date Analyzed: 03/14/94

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~~	U
75-01-4	Vinyl Chloride	11	U	
75-00-3	Chloroethane	11	U	
75-09-2	Methylene Chloride	11 ~~3~~	~~BJ~~	U
67-64-1	Acetone	20	~~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 ~~3~~	~~BJ~~	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 ~~1~~	~~J~~	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	

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9713524.2263

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1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B0BFH1

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 03029 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A403029-04A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 40314R05

Level: (low/med) LOW Date Received: 03/07/94

% Moisture: not dec. 10 Date Analyzed: 03/14/94

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.

B0BFH5

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 03029 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A403029-06A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 40314R12

Level: (low/med) LOW Date Received: 03/07/94

% Moisture: not dec. 4 Date Analyzed: 03/14/94

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	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 ~~4~~	~~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 ~~1~~	~~BJ~~	
107-06-2	1,2-Dichloroethane	10	U	
78-93-3	2-Butanone	10	U	
71-55-6	1,1,1-Trichloroethane	10 ~~1~~	~~BJ~~	
56-23-5	Carbon Tetrachloride	10	U	
75-27-4	Bromodichloromethane	10	U	
78-87-5	1,2-Dichloropropane	10	U	
10061-01-5	cis-1,3-Dichloropropene	10	U	
79-01-6	Trichloroethene	10	U	
124-48-1	Dibromochloromethane	10	U	
79-00-5	1,1,2-Trichloroethane	10	U	
71-43-2	Benzene	10	U	
10061-02-6	trans-1,3-Dichloropropene	10	U	
75-25-2	Bromoform	10	U	
108-10-1	4-Methyl-2-Pentanone	10	U	
591-78-6	2-Hexanone	10	U	
127-18-4	Tetrachloroethene	10	U	
79-34-5	1,1,2,2-Tetrachloroethane	10	U	
108-88-3	Toluene	10	U	
108-90-7	Chlorobenzene	10	U	
100-41-4	Ethylbenzene	10	U	
100-42-5	Styrene	10	U	
1330-20-7	Xylene (total)	10	U	

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9713524.2265

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1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B0BFH5

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 03029 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A403029-06A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 40314R12

Level: (low/med) LOW Date Received: 03/07/94

% Moisture: not dec. 4 Date Analyzed: 03/14/94

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.

B0BFH6

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 03029 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A403029-07A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 40314R11

Level: (low/med) LOW Date Received: 03/07/94

% Moisture: not dec. 5 Date Analyzed: 03/14/94

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~~	33
75-01-4	Vinyl Chloride	11	U	
75-00-3	Chloroethane	11	U	
75-09-2	Methylene Chloride	11 ~~4~~	~~BJ~~	33
67-64-1	Acetone	13	~~B~~	33
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 5/11/94 3/90

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B0BFH6

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 03029 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A403029-07A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 40314R11

Level: (low/med) LOW Date Received: 03/07/94

% Moisture: not dec. 5 Date Analyzed: 03/14/94

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
[illegible] 5/11/94

9213524.2263

~~000219~~

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B0BFM6

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 03029 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A403029-05A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 40314R13

Level: (low/med) LOW Date Received: 03/07/94

% Moisture: not dec. 0 Date Analyzed: 03/14/94

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	10	U	
74-83-9	Bromomethane	10	~~U~~	33
75-01-4	Vinyl Chloride	10	U	
75-00-3	Chloroethane	10	U	
75-09-2	Methylene Chloride	10 ~~3~~	~~BJ~~	33
67-64-1	Acetone	12	~~B~~	33
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 ~~3~~	~~BJ~~	3
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	020
100-42-5	Styrene	10	U	
1330-20-7	Xylene (total)	10	U	

FORM I VOA Verified [illegible] 5/11/94 3/90

9713524.2269

~~000220~~

EPA SAMPLE NO.

B0BFM6

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 03029 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A403029-05A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 40314R13

Level: (low/med) LOW Date Received: 03/07/94

% Moisture: not dec. 0 Date Analyzed: 03/14/94

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	26.62	16	~~J~~

Q
JN

Verified
5/11/94

-021

9713524.2270

~~000234~~

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B0BFM7

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 03029 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A403029-03A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 40314R04

Level: (low/med) LOW Date Received: 03/07/94

% Moisture: not dec. 0 Date Analyzed: 03/14/94

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~~	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	16	~~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 ~~2~~	~~BJ~~	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 ~~2~~	~~BJ~~	U
591-78-6	2-Hexanone	4	J	
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	

022

FORM I VOA Verified 5/11/94 3/90

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B0BFM7

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 03029 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A403029-03A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 40314R04

Level: (low/med) LOW Date Received: 03/07/94

% Moisture: not dec. 0 Date Analyzed: 03/14/94

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
[illegible] 5/11/94

9713524.2272

ATTACHMENT 4

LABORATORY NARRATIVE AND CHAIN-OF-CUSTODY DOCUMENTATION

CASE NARRATIVE

LABORATORY : TMA/ARLI

CASE : 03-029

CONTRACT ID : WESTINGHOUSE HANFORD COMPANY

SDG RECEIPT DATE : March 07, 1994

1.0 DESCRIPTION OF CASE :

Seven 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
B09WF8	A4-03-029-01A	V	SOIL
B09WF8	A4-03-029-01B	SV	SOIL
B09WF8 MS	A4-03-029-01C	SV	SOIL
B09WF8 MSD	A4-03-029-01D	SV	SOIL
B09WF8	A4-03-029-01G	K	SOIL
B09WF8 MS	A4-03-029-01H	K	SOIL
B09WF8 MSD	A4-03-029-01I	K	SOIL
B09WG1	A4-03-029-02A	V	SOIL
B09WG1 MS	A4-03-029-02B	V	SOIL
B09WG1 MSD	A4-03-029-02C	V	SOIL
B0BFM7	A4-03-029-03A	V	SOIL
B0BFH1	A4-03-029-04A	V	SOIL
B0BFH1	A4-03-029-04B	SV	SOIL
B0BFH1	A4-03-029-04E	K	SOIL
B0BFM6	A4-03-029-05A	V	SOIL
B0BFH5	A4-03-029-06A	V	SOIL
B0BFH5	A4-03-029-06B	SV	SOIL
B0BFH5	A4-03-029-06D	K	SOIL
B0BFH6	A4-03-029-07A	V	SOIL
B0BFH6	A4-03-029-07B	SV	SOIL
B0BFH6	A4-03-029-07D	K	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.

Acetone was detected at concentrations above the CRQL in several samples, including the blank, VBLK0314R.

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

TUNES :

All BFB tunes were injected directly into the GC/MS instrument.

3.2.2 SEMIVOLATILE ANALYSIS COMMENTS :

LOW LEVEL SOIL :

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

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

3.2.3 EXTRACTABLE HYDROCARBONS "KEROSENE RANGE" COMMENTS :

SEQUENCE NOTES :

The sequence was started on 03/05/94 and was analyzed according to the SW-846 Method 8015M. The %RSD in the all of the initial calibrations and the %D in the continuing calibrations were below their 20% and 15% limits, respectively.

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

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.

In sample B0BFH1, Kerosene was detected at approximately 23 mg/Kg. In addition, a compound heavier than the Diesel Range was detected at approximately 30 mg/Kg. The concentration for the compound was calculated using a Diesel standard.

The surrogate o-Terphenyl was added to each sample, and the recoveries ranged from 80% to 94%. However, since the reporting forms could not accommodate the surrogate recovery results, the data was included in the "Additional Raw Data" poriton of the package.

The matrix spike and matrix spike duplicate recoveries for Kerosene were 90% and 86%, respectively.

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
Nicole Roth 4/21/94
Program Manager

Maureen Parrish
Maureen Parrish 4/21/94
Program Manager

9713524.2276

~~0000021~~

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: 3-2-94

Ice Chest No.:

Field Logbook No.: EFL-1115

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) B09W F8

- ✓ 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)~~

- ~~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~~

3-2-94

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

Relinquished by:	Received by:	Date/Time:
3-4-94 Jerome E Rogers 1033	Kermit Blum K-Blum	3-7-94 *
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:

* Received @ TMA/NORCAL 3-5-94; opened 3-7-94 KB

028

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

9713524.2277

~~000002~~

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: 3-4-94

Ice Chest No.:

Field Logbook No.: EFL-1115

Bill of Lading/Airbill No.:

Offsite Property No.:

Method of Shipment: AIR

Shipped to: TMA

Possible Sample Hazards/Remarks: Keep samples at 4C (SOIL) NONE NOTED

Sample Identification

1) B09WG1

~~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)~~

~~1,250ml aGs:PCB/Pest (8080)~~

~~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)

~~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)

1,250ml aGs:PCB/Pest (8080)

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: 3-4-94 Loren E. Rogers 1033	Received by: Kermit Blum K-Blum	Date/Time: 3-7-94 *
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:

* Received @ TMA/NORCAL 3-5-94; opened 3-7-94 · KB

-029

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

Westinghouse Hanford Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

006225

Collector R.T. Sickle
Company Contact C.A. Rowley
Telephone 372-3293
SAF No. 93-263
Project Designation 216-U-8 Vitrified Clay Pipeline
Sampling Locations 216-U-8 Crib
Ice Chest No.
Bill of Lading/Airbill No.
Offsite Property No.
Method of Shipment Air Overnight
Field Logbook No.
Shipped to TMA
SPECIAL INSTRUCTIONS
Possible Sample Hazards/Remarks None Detected
Special Handling and/or Storage Keep cool

Sample Number	*	Date Collected	Time	Number and Type of Containers	Analysis Required		Preservative
BOBFH7	S	2-28-94	0800	(1) 250ml aGs ✓	VOA	CLP	
BOBFH1	S	2-28-94	1115	(1) 250ml Gs ✓	VOA	CLP	
BOBFH1	S			(1) 250ml aG ✓	Semi-VOA	CLP	
BOBFH1	S			(1) 250ml Poly ✓	Metals -CLP TAL Titanium Mercury	CPL	
BOBFH1	S			(1) 125ml G ✓	Anions F, Cl, SO_4	EPA 300.0	
BOBFH1	S			(1) 125ml P/G ✓	NO_2 NO_3	EPA 353.2	
~~BOBFH1~~	~~S~~			~~(1) 250ml aGs~~	~~PCB/Pest~~ RBL 2-23-94	~~8080~~	
BOBFH1	S			(1) 125ml G ✓	Cyanide	CPL	
BOBFH1	S			(1) 125ml Gs ✓	Kerosene	8015M	
BOBFH1	S	2-28-94	1115	(1) 1000ml Poly ✓	Gross Alpha/Beta EP-10; Gamma Spec. Cs-134/137, Co-60, K-40, Eu-152/154/155, Ru-106, Na-22 RC-30; Total Uranium EA-01C; U-235/234/238 EP-70, 71, 5; Np-237 RC-101A, 622, EP-5; Pu-238/239/240 EP-80, 81, 5; I-129 RC-25, 603; Sr-90 RC-306, 303, 309, 304; Tc-99 RC-24, 604; Am-241, Cm-244 EP-80, 91, 92, 93, 5; Se-79 Lab Specific		

Chain of Possession Relinquished By (Sign and Print Names)	Date	Time	Received By
R.T. Sickle	3/1/94	1200	DL Edwards
DL Edwards	3/4/94	0810	
	3-7-94	*	Kermit Blum K. Blum

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

LABORATORY SECTION	Received By	Title	Date/Time
Final Sample Disposition	Disposal Method:	Disposed by:	Date/Time:

* Received @ TMA/NORCAL 3-5-94; opened 3-7-94 .KB

030

Westinghouse Hanford Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

006229

Collector R.T. Sickle
Company Contact C.A. Rowley
Telephone 372-3293
SAF No. 93-263
Project Designation 216-U-8 Vitrified Clay Pipeline
Sampling Locations 216-U-8 Crib
Ice Chest No.
Bill of Lading/Airbill No. 140 213 8144
Offsite Property No.
Method of Shipment Air Overnight
Field Logbook No.
Shipped to TMA
SPECIAL INSTRUCTIONS
Possible Sample Hazards/Remarks None Detected
Special Handling and/or Storage Keep cool

Sample Number	*	Date Collected	Time	Number and Type of Containers	Analysis Required		Preservative
BOBFM6	S	3-2-94	0800	(1) 250ml Gs ✓	VOA	CLP	
BOBFH5	S	3-2-94	1325	(1) 250ml Gs ✓	VOA	CLP	
BOBFH5	S			(1) 250ml aG ✓	Semi-VOA	CLP	
BOBFH5	S			(1) 250ml Poly ✓	Metals -CLP TAL Titanium Mercury	CPL	
BOBFH5	S			(1) 125ml G ✓	Anions F, Cl, SO_4	EPA 300.0	
BOBFH5	S			(1) 125ml P/G ✓	NO_2 NO_3	EPA 353.2	
~~BOBFH5~~	~~S~~			~~(1) 250ml aGs~~	~~PCB/Pest~~ RJL 2-23-94	~~8080~~	
BOBFH5	S			(1) 125ml G ✓	Cyanide	CPL	
BOBFH5	S			(1) 125ml Gs ✓	Kerosene	8015M	
BOBFH5	S			(1) 1000ml Poly ✓	Gross Alpha/Beta EP-10; Gamma Spec. Cs-134/137, Co-60, K-40, Eu-152/154/155, Ru-106, Na-22 RC-30; Total Uranium EA-01C; U-235/234/238 EP-70, 71, 5; Np-237 RC-101A, 622, EP-5; Pu-238/239/240 EP-80, 81, 5; I-129 RC-25, 603; Sr-90 RC-306, 303, 309, 304; Tc-99 RC-24, 604; Am-241, Cm-244 EP-80, 91, 92, 93, 5; Se-79 Lab Specific		

Chain of Possession Relinquished By (Sign and Print Names)	Date	Time	Received By
R.T. Sickle R.T. Sickle	3/3/94	0800	D.L. Edwards
D.L. Edwards	3/4/94	0810	Kermit Blum K. Blum
	3-7-94	*	

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

LABORATORY SECTION	Received By	Title	Date/Time
Final Sample Disposition	Disposal Method:	Disposed by:	Date/Time:

* Received @ TMA/NORCAL 3-5-94; opened 3-7-94 · KB

L031

Westinghouse Hanford Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

006230

Collector R.T. Sickle
Company Contact C.A. Rowley
Telephone 372-3293
SAF No. 93-263
Project Designation 216-U-8 Vitrified Clay Pipeline
Sampling Locations 216-U-8 Crib
Ice Chest No. RTS
Bill of Lading/Airbill No. 140 213 8144
Offsite Property No.
Method of Shipment Air Overnight
Field Logbook No.
Shipped to TMA
SPECIAL INSTRUCTIONS
Possible Sample Hazards/Remarks None Detected
Special Handling and/or Storage Keep cool

Sample Number	*	Date Collected	Time	Number and Type of Containers	Analysis Required		Preservative
B0BFH6	S	3-2-94	1450	(1) 250ml Gs ✓	VOA	CLP	
B0BFH6	S			(1) 250ml aG ✓	Semi-VOA	CLP	
B0BFH6	S			(1) 250ml Poly ✓	Metals -CLP TAL Titanium Mercury	CPL	
B0BFH6	S			(1) 125ml G ✓	Anions F, Cl, SO_4	EPA 300.0	
B0BFH6	S			(1) 125ml P/G ✓	NO_2 NO_3	EPA 353.2	
~~B0BFH6~~	~~S~~			~~(1) 250ml aGs~~	~~PCB/Pest~~ RDB 2-23-94	~~8080~~	
B0BFH6	S			(1) 125ml G ✓	Cyanide	CPL	
B0BFH6	S			(1) 125ml Gs ✓	Kerosene	8015M	
B0BFH6	S			(1) 1000ml Poly ✓	Gross Alpha/Beta EP-10; Gamma Spec. Cs-134/137, Co-60, K-40, Eu-152/154/155, Ru-106, Na-22 RC-30; Total Uranium EA-01C; U-235/234/238 EP-70, 71, 5; Np-237 RC-101A, 622, EP-5; Pu-238/239/240 EP-80, 81, 5; I-129 RC-25, 603; Sr-90 RC-306, 303, 309, 304; Tc-99 RC-24, 604; Am-241, Cm-244 EP-80, 91, 92, 93, 5; Se-79 Lab Specific		

Chain of Possession Relinquished By (Sign and Print Names)	Date	Time	Received By
R.T. Sickle	3/3/94	0800	D L Edwards
D L Edwards	3/4/94	0816	
	3-7-94	*	Kermit Blum K. Blum

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

LABORATORY SECTION	Received By	Title	Date/Time
Final Sample Disposition	Disposal Method:	Disposed by:	Date/Time:

* Received @ TMA/NorCal 3-5-94; opened 3-7-94 KB

032

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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: B09WF8-TMA-727
VALIDATOR: [signature]	LAB: TMA	DATE: 05/10/94
CASE:		SDG: B09WF8-TMA-727

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

B09WF8 B0BFM6
B09WG1 B0BFM7
B0BFH1
B0BFH5
B0BFH6

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Is technical verification documentation present? . . . . . (Yes) No N/A

Is a case narrative present? . . . . . (Yes) No N/A

Comments:

2. HOLDING TIMES

Are sample holding times acceptable? . . . . . (Yes) No N/A

Comments:

GC/MS ORGANIC DATA VALIDATION CHECKLIST

3. INSTRUMENT TUNING AND CALIBRATION

Is the GC/MS tuning/performance check acceptable? . . . . . Yes No N/A

Are initial calibrations acceptable? . . . . . Yes No N/A

Are continuing calibrations acceptable? . . . . . Yes No N/A

Comments: ccc %D for bromomethane is >25% for both continuing cal checks. Assoc. results have been qualified as estimated (UJ).

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 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: Sample locations are currently not available. Field QC will be evaluated in the Final Summary report.

7. SYSTEM PERFORMANCE

Were internal standards analyzed? . . . . . Yes No N/A

Are internal standard areas acceptable? . . . . . Yes No N/A

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

Comments:

8. COMPOUND IDENTIFICATION AND QUANTITATION

Is compound identification acceptable? . . . . . Yes No N/A

Is compound quantitation acceptable? . . . . . Yes No N/A

Comments:

9. REPORTED RESULTS AND QUANTITATION LIMITS

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

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

Do results meet the CRQLs? . . . . . Yes No N/A

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

Comments:

036

GC/MS ORGANIC DATA VALIDATION CHECKLIST

Comments (attach additional sheets as necessary):

~~Toluene~~ 5/11/94
Toluene was detected in the blank analyzed on 3/14/94 (VBLK0314R), however, was not reported by the laboratory since the blank conc. was slightly less than one. All assoc. results less than 10 times the blank conc. have been qualified as undetected (U). Attached is the corrected lab blank form, quant report, ~~and~~ with calc. summary. 5/11/94

Chloroform and 4-Methyl-2-~~pentanone~~ pentanone were detected in the blank analyzed on 3/15/94 (VBLK0315R), however, were not reported by the laboratory. Attached is the ~~to~~ 5/11/94 corrected lab blank form, quant. report, and calculation summary. All results less than 5x the blank conc. have been qualified as undetected (U). 5/11/94

5/11/94

HOLDING TIME SUMMARY

B09WF8-TMA-727

SDG:	VALIDATOR: [signature]	DATE: 5/11/94	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
B09WF8	VOA	3/02/94		3/14/94		12	None
B09WG1		3/04/94		3/15/94		11	
B0BFH1		2/28/94		3/14/94		14	
B0BFH5		3/02/94		3/14/94		12	
B0BFH6		3/02/94		3/14/94		12	
B0BFM6		3/02/94		3/14/94		12	
B0BFM7		2/28/94		3/14/94		14	

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~~000271~~

7A
VOLATILE CONTINUING CALIBRATION CHECK

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 03029 SAS No.: NA SDG No.: NA

Instrument ID: 4500 Calibration date: 03/14/94 Time: 834

Lab File ID: 40314R01 Init. Calib. Date(s): 02/02/94 02/02/94

Heated Purge: (Y/N) Y Init. Calib. Times: 1140 1459

GC Column: PACK ID: 2.00 (mm)

Assoc. with B0BFM7, B0BFH1, B0BFH6, B0BFH5, B0BFM6, & B0BWF8 5/10/94

COMPOUND	RRF	RRF50	MIN RRF	%D	MAX %D	
Chloromethane	1.842	1.902	0.010	-3.3		
Bromomethane	1.284	0.923	0.100	28.1	25.0	US
Vinyl Chloride	1.585	1.466	0.100	7.5	25.0	
Chloroethane	0.873	0.923	0.010	-5.7		
Methylene Chloride	1.375	1.360	0.010	1.1		
Acetone	0.754	0.813	0.010	-7.8		
Carbon Disulfide	4.081	3.828	0.010	6.2		
1,1-Dichloroethene	1.371	1.308	0.100	4.6	25.0	
1,1-Dichloroethane	2.990	2.811	0.200	6.0	25.0	
1,2-Dichloroethene (total)	1.402	1.465	0.010	-4.5		
Chloroform	2.811	2.655	0.200	5.6	25.0	
1,2-Dichloroethane	1.836	1.614	0.100	12.1	25.0	
2-Butanone	1.485	1.459	0.010	1.8		
1,1,1-Trichloroethane	0.614	0.484	0.100	21.2	25.0	
Carbon Tetrachloride	0.495	0.426	0.100	13.9	25.0	
Bromodichloromethane	0.804	0.663	0.200	17.5	25.0	
1,2-Dichloropropane	0.507	0.458	0.010	9.7		
cis-1,3-Dichloropropene	0.651	0.618	0.200	5.1	25.0	
Trichloroethene	0.443	0.438	0.300	1.1	25.0	
Dibromochloromethane	0.621	0.639	0.100	-2.9	25.0	
1,1,2-Trichloroethane	0.395	0.373	0.100	5.6	25.0	
Benzene	0.934	0.933	0.500	0.1	25.0	
trans-1,3-Dichloropropene	0.600	0.531	0.100	11.5	25.0	
Bromoform	0.429	0.439	0.100	-2.3	25.0	
4-Methyl-2-Pentanone	0.976	1.064	0.010	-9.0		
2-Hexanone	0.759	0.824	0.010	-8.6		
Tetrachloroethene	0.381	0.425	0.200	-11.6	25.0	
1,1,2,2-Tetrachloroethane	0.860	0.982	0.500	-14.2	25.0	
Toluene	1.049	1.223	0.400	-16.6	25.0	
Chlorobenzene	0.950	1.027	0.500	-8.1	25.0	
Ethylbenzene	0.458	0.471	0.100	-2.8	25.0	
Styrene	0.912	0.956	0.300	-4.8	25.0	
Xylene (total)	0.483	0.482	0.300	0.2	25.0	
Toluene-d8	0.851	0.979	0.010	-15.0		
Bromofluorobenzene	0.670	0.778	0.200	-16.1	25.0	
1,2-Dichloroethane-d4	1.458	1.136	0.010	22.1		

All other compounds must meet a minimum RRF of 0.010.

5/10/94

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7A

VOLATILE CONTINUING CALIBRATION CHECK

~~000276~~

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 03029 SAS No.: NA SDG No.: NA

Instrument ID: 4500 Calibration date: 03/15/94 Time: 943

Lab File ID: 40315R02 Init. Calib. Date(s): 02/02/94 02/02/94

Heated Purge: (Y/N) Y Init. Calib. Times: 1140 1459

GC Column: PACK ID: 2.00 (mm)

Assoc with B09W61

COMPOUND	$\overline{RRF}$	RRF50	MIN RRF	%D	MAX %D	
Chloromethane	1.842	2.051	0.010	-11.4		
Bromomethane	1.284	0.935	0.100	27.2	25.0	US
Vinyl Chloride	1.585	1.654	0.100	-4.4	25.0	
Chloroethane	0.873	0.976	0.010	-11.8		
Methylene Chloride	1.375	1.507	0.010	-9.6		
Acetone	0.754	0.607	0.010	19.5		
Carbon Disulfide	4.081	4.425	0.010	-8.4		
1,1-Dichloroethene	1.371	1.447	0.100	-5.5	25.0	
1,1-Dichloroethane	2.990	2.934	0.200	1.9	25.0	
1,2-Dichloroethene (total)	1.402	1.521	0.010	-8.5		
Chloroform	2.811	2.612	0.200	7.1	25.0	
1,2-Dichloroethane	1.836	1.584	0.100	13.7	25.0	
2-Butanone	1.485	1.035	0.010	30.3		
1,1,1-Trichloroethane	0.614	0.490	0.100	20.2	25.0	
Carbon Tetrachloride	0.495	0.434	0.100	12.3	25.0	
Bromodichloromethane	0.804	0.669	0.200	16.8	25.0	
1,2-Dichloropropane	0.507	0.473	0.010	6.7		
cis-1,3-Dichloropropene	0.651	0.629	0.200	3.4	25.0	
Trichloroethene	0.443	0.439	0.300	0.9	25.0	
Dibromochloromethane	0.621	0.630	0.100	-1.4	25.0	
1,1,2-Trichloroethane	0.395	0.372	0.100	5.8	25.0	
Benzene	0.934	1.015	0.500	-8.7	25.0	
trans-1,3-Dichloropropene	0.600	0.547	0.100	8.8	25.0	
Bromoform	0.429	0.394	0.100	8.2	25.0	
4-Methyl-2-Pentanone	0.976	0.774	0.010	20.7		
2-Hexanone	0.759	0.570	0.010	24.9		
Tetrachloroethene	0.381	0.407	0.200	-6.8	25.0	
1,1,2,2-Tetrachloroethane	0.860	0.981	0.500	-14.1	25.0	
Toluene	1.049	1.180	0.400	-12.5	25.0	
Chlorobenzene	0.950	1.009	0.500	-6.2	25.0	
Ethylbenzene	0.458	0.486	0.100	-6.1	25.0	
Styrene	0.912	1.054	0.300	-15.6	25.0	
Xylene (total)	0.483	0.508	0.300	-5.2	25.0	
Toluene-d8	0.851	0.954	0.010	-12.1		
Bromofluorobenzene	0.670	0.695	0.200	-3.7	25.0	
1,2-Dichloroethane-d4	1.458	1.193	0.010	18.2		

All other compounds must meet a minimum RRF of 0.010.

5/10/94

Assoc. with B0BFM7, B0BFH1, B0BFH6, B0BFH5, B0BFM6, & B0QWF8

~~000290~~

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

VBLK0314R

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 03029 SAS No.: _____ SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: SBLK0314

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 40314R03

Level: (low/med) LOW Date Received: _____

% Moisture: not dec. _____ Date Analyzed: 03/14/94

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	J	x10=10
67-64-1	Acetone	14		x10=140
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	2	J	x5=10
107-06-2	1,2-Dichloroethane	10	U	
78-93-3	2-Butanone	10	U	
71-55-6	1,1,1-Trichloroethane	2	J	x5=10
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	1 ~~10~~	~~U~~	5
108-90-7	Chlorobenzene	10	U	1x10=10
100-41-4	Ethylbenzene	10	U	
100-42-5	Styrene	10	U	
1330-20-7	Xylene (total)	10	U	

Shifted

041

FORM I VOA 5/11/94 3/90

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VBLK0314R

~~000295~~

No	m/z	Scan	Time	Ref	RRT	Meth	Area(Hght)	Amount	%Tot
1	128	180	7:30	1	1.000	A BB	21330.	50.000 PPB	15.47
2	114	381	15:52	2	1.000	A BB	95212.	50.000 PPB	15.47
3	117	479	19:57	3	1.000	A BB	82327.	50.000 PPB	15.47
4	65	234	9:45	1	1.300	A BB	24938.	51.438 PPB	15.91
5	98	454	18:55	3	0.948	A BB	79435.	49.269 PPB	15.24
6	95	561	23:22	3	1.171	A BB	61634.	48.127 PPB	14.89
7	NOT FOUND								
8	NOT FOUND								
9	NOT FOUND								
10	NOT FOUND								
11	84	111	4:37	1	0.617	A BB	662.	1.141 PPB	0.35
12	43	124	5:10	1	0.689	A BV	4734.	13.649 PPB	4.22
13	NOT FOUND								
14	NOT FOUND								
15	NOT FOUND								
16	NOT FOUND								
17	83	222	9:15	1	1.233	A VB	1863.	1.645 PPB	0.51
~~18~~	~~43~~	~~235~~	~~9:47~~	~~1~~	~~1.306~~	~~A VB~~	~~775.~~	~~1.245 PPB~~	~~0.39~~
19	NOT FOUND								
20	97	260	10:50	2	0.682	A BB	1771.	1.923 PPB	0.59
21	NOT FOUND								
22	NOT FOUND								
23	NOT FOUND								
24	NOT FOUND								
25	NOT FOUND								
26	NOT FOUND								
27	NOT FOUND								
~~28~~	~~78~~	~~331~~	~~13:47~~	~~2~~	~~0.869~~	~~A BB~~	~~574.~~	~~0.323 PPB~~	~~0.10~~
29	NOT FOUND								
30	NOT FOUND								
31	NOT FOUND								
32	NOT FOUND								
33	43	396	16:30	3	0.827	A VB	3608.	2.060 PPB	0.64
34	NOT FOUND								
~~35~~	~~83~~	~~432~~	~~18:00~~	~~3~~	~~0.902~~	~~A VV~~	~~926.~~	~~0.573 PPB~~	~~0.18~~
36	NOT FOUND								
~~37~~	~~91~~	~~459~~	~~19:07~~	~~3~~	~~0.958~~	~~A BB~~	~~1876.~~	~~0.931 PPB~~	~~0.29~~
38	NOT FOUND								
39	NOT FOUND								
40	NOT FOUND								
41	NOT FOUND								
42	NOT FOUND								

Toluene

Toluene

$\frac{ug}{kg}$ ~~Tolu~~ $= \frac{(1876)(50)}{(82327)(1.223)}$

5/11/94

$= 0.932 \frac{ug}{kg} = 1 \, ug/kg$

No	Ret(L)	Ratio	RRT(L)	Ratio	Amnt	Amnt(L)	R.Fac	R.Fac(L)	Ratio
1	7:22	1.02	1.000	1.00	50.00	50.00	1.000	1.000	1.00
2	15:55	1.00	1.000	1.00	50.00	50.00	1.000	1.000	1.00
3	20:00	1.00	1.000	1.00	50.00	50.00	1.000	1.000	1.00
4	9:42	1.00	1.316	0.99	51.44	50.00	1.169	1.136	1.03
5	18:57	1.00	0.948	1.00	49.27	50.00	0.965	0.979	0.99
6	23:22	1.00	1.169	1.00	48.13	50.00	0.749	0.778	0.96
7	0:52		0.119						
8	1:30		0.203						
9	1:55		0.260						
10	2:37		0.356						
11	4:22	1.06	0.593	1.04	1.14	50.00	0.031	1.360	0.02
12	4:55	1.05	0.667	1.03	13.65	50.00	0.222	0.813	0.27

.042

5/11/94

03/18/94

Assoc. 9213524.2291 GRK 809W G1

~~000308~~

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

VBLK0315R

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 03029 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: SBLK0315

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 40315R04

Level: (low/med) LOW Date Received: _____

% Moisture: not dec. ____ Date Analyzed: 03/15/94

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	
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		4	J	MQL=40
67-64-1	Acetone		10	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	stuldy	~~10~~ 1	~~U~~	J 1x5=5
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	stuldy	~~10~~	U	
108-10-1	4-Methyl-2-Pentanone		~~10~~ 2	~~U~~	J 2x5=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	

5/10/94

9713524.2292

VBLK0315R

~~000313~~

No	m/z	Scan	Time	Ref	RRT	Meth	Area(Hght)	Amount	%Tot
1	128	176	7:20	1	1.000	A BB	23881.	50.000 PPB	15.81
2	114	382	15:55	2	1.000	A BB	104434.	50.000 PPB	15.81
3	117	479	19:57	3	1.000	A BB	80788.	50.000 PPB	15.81
4	65	232	9:40	1	1.318	A BB	28204.	49.477 PPB	15.64
5	98	455	18:57	3	0.950	A BB	79306.	51.452 PPB	16.27
6	95	562	23:25	3	1.173	A BB	56412.	50.233 PPB	15.88
7	NOT FOUND								
8	NOT FOUND								
9	NOT FOUND								
10	NOT FOUND								
11	84	102	4:15	1	0.580	A BB	2837.	3.940 PPB	1.25
12	NOT FOUND								
13	NOT FOUND								
14	NOT FOUND								
15	NOT FOUND								
16	NOT FOUND								
~~17~~	~~83~~	~~220~~	~~7:10~~	~~1~~	~~1.250~~	~~A BV~~	~~931.~~	~~0.746 PPB~~	~~0.24~~
~~18~~	~~43~~	~~232~~	~~9:40~~	~~1~~	~~1.318~~	~~A BV~~	~~2374.~~	~~4.802 PPB~~	~~1.52~~
19	NOT FOUND								
20	NOT FOUND								
21	NOT FOUND								
~~22~~	~~43~~	~~274~~	~~11:25~~	~~2~~	~~0.717~~	~~A VB~~	~~1106.~~	~~0.476 PPB~~	~~0.15~~
~~23~~	~~83~~	~~278~~	~~11:35~~	~~2~~	~~0.728~~	~~A BV~~	~~297.~~	~~0.213 PPB~~	~~0.07~~
24	NOT FOUND								
25	NOT FOUND								
26	NOT FOUND								
27	NOT FOUND								
~~28~~	~~78~~	~~331~~	~~13:47~~	~~2~~	~~0.866~~	~~A BB~~	~~448.~~	~~0.211 PPB~~	~~0.07~~
~~29~~	~~97~~	~~334~~	~~13:55~~	~~2~~	~~0.874~~	~~A VB~~	~~564.~~	~~0.726 PPB~~	~~0.23~~
30	NOT FOUND								
31	NOT FOUND								
32	NOT FOUND								
~~33~~	~~43~~	~~397~~	~~16:32~~	~~3~~	~~0.829~~	~~A VV~~	~~2804.~~	~~2.242 PPB~~	~~0.71~~
~~34~~	~~43~~	~~427~~	~~17:47~~	~~3~~	~~0.891~~	~~A VV~~	~~852.~~	~~0.925 PPB~~	~~0.29~~
~~35~~	~~83~~	~~434~~	~~18:05~~	~~3~~	~~0.906~~	~~A BB~~	~~348.~~	~~0.219 PPB~~	~~0.07~~
36	NOT FOUND								
~~37~~	~~91~~	~~458~~	~~19:05~~	~~3~~	~~0.956~~	~~A BB~~	~~1193.~~	~~0.626 PPB~~	~~0.20~~
38	NOT FOUND								
39	NOT FOUND								
40	NOT FOUND								
41	NOT FOUND								
42	NOT FOUND								

chloroform

~~Acetone~~ 5/11/94

4-Methyl-2-pentanone

3-17-94

No	Ret(L)	Ratio	RRT(L)	Ratio	Amnt	Amnt(L)	R.Fac	R.Fac(L)	Ratio
1	7:27	0.98	1.000	1.00	50.00	50.00	1.000	1.000	1.00
2	15:55	1.00	1.000	1.00	50.00	50.00	1.000	1.000	1.00
3	19:57	1.00	1.000	1.00	50.00	50.00	1.000	1.000	1.00
4	9:45	0.99	1.307	1.01	49.48	50.00	1.181	1.193	0.99
5	18:55	1.00	0.948	1.00	51.45	50.00	0.982	0.954	1.03
6	23:22	1.00	1.171	1.00	50.23	50.00	0.698	0.695	1.00
7	0:52		0.117						
8	1:32		0.207						
9	1:57		0.263						
10	2:42		0.363						
11	4:30	0.94	0.603	0.96	3.94	50.00	0.119	1.507	0.08
12	5:07		0.687						

044

5/11/94

03/18/94

CALCULATION SUMMARY

B09WF8-TMA-727

SDG:	REVIEWER: [signature]	DATE: 5/11/94	PAGE 1 OF 1

COMMENTS: VBLK031SR = Blank concentrations

$\frac{ug}{kg}$ Chloroform $= \frac{(931)(50)}{(23881)(2.612)} = 0.746 \frac{ug}{kg}$

$\approx 1 \frac{ug}{kg}$

$\frac{ug}{kg}$ 4-Methyl-2-Pentanone $= \frac{(2804)(50)}{(80788)(0.774)}$

$= 2.242 \frac{ug}{kg} = 2 \frac{ug}{kg}$

~~$\frac{ug}{kg}$ Acetone $= \frac{(2374)(50)}{(23881)(0.607)}$~~ 5/11/94 5/11/94

9713524.2294

MEMORANDUM

MAY 1994 RECEIVED TQO

TO: 200-UP-2 Project QA Record

May 12, 1994

FR: Susan Winter, Golder Associates Inc.

RE: SEMIVOLATILE ORGANICS DATA VALIDATION SUMMARY FOR DATA PACKAGE: B09WF8-TMA-727 (923-E418, Filename B09WF8SV.UP2)

INTRODUCTION

This memo presents the results of data validation on data package B09WF8-TMA-727 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
B09WF8	03/02/94	SOIL		SEE NOTE 1
B0BFH1	02/28/94	SOIL		
B0BFH5	03/02/94	SOIL		
B0BFH6	03/02/94	SOIL		

Note 1. All samples were analyzed for CLP TCL semivolatile organics.

RECEIVED MAY 18 1994 VALIDATION DOCUMENTATION SDLA

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.

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

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.

9713524.2296

ATTACHMENT 1

GLOSSARY OF DATA REPORTING QUALIFIERS

9713524.2297

ATTACHMENT 2

SUMMARY OF DATA QUALIFICATIONS

DATA QUALIFICATION SUMMARY

SDG: B09WF8-TMA-727	VALIDATOR: [illegible]	DATE: May 12, 1994	PAGE 1 OF 1
COMMENTS: SEMIVOLATILE ORGANICS			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
ALL TCL CONSTITUENTS	J - DETECTS UJ - NONDETECTS	B0BFH1	EXTRACTED OUT OF THE REQUIRED HOLDING TIME
DI-N-BUTYLPHTHALATE	U	B09WF8 B0BFH1 B0BFH5 B0BFH6	PRESENT IN BLANK

9713524.2299

ATTACHMENT 3

QUALIFIED DATA SUMMARY AND ANNOTATED LABORATORY REPORTS

Validated Data Summary, Data Package: B09WF8-TMA-727

	Samp#	B09WF8		B0BFH1		B0BFH5		B0BFH6	
	Date	3-2-94		2-28-94		3-2-94		3-2-94	
	Location	---		---		---		---	
	Depth	---		---		---		---	
	Type	SOIL		SOIL		SOIL		SOIL	
	Comments	---		---		---		---	
Parameter	Units	Result	Q	Result	Q	Result	Q	Result	Q
PHENOL	UG/KG	340.000	U	360.000	UJ	340.000	U	340.000	U
BIS(2-CHLOROETHYL)ETHER	UG/KG	340.000	U	360.000	UJ	340.000	U	340.000	U
2-CHLOROPHENOL	UG/KG	340.000	U	360.000	UJ	340.000	U	340.000	U
1,3-DICHLOROBENZENE	UG/KG	340.000	U	360.000	UJ	340.000	U	340.000	U
1,4-DICHLOROBENZENE	UG/KG	340.000	U	360.000	UJ	340.000	U	340.000	U
1,2-DICHLOROBENZENE	UG/KG	340.000	U	360.000	UJ	340.000	U	340.000	U
2-METHYLPHENOL	UG/KG	340.000	U	360.000	UJ	340.000	U	340.000	U
2,2'-OXYBIS(1-CHLOROPROPANE)	UG/KG	340.000	U	360.000	UJ	340.000	U	340.000	U
4-METHYLPHENOL	UG/KG	340.000	U	360.000	UJ	340.000	U	340.000	U
N-NITROSO-DI-N-PROPYLAMINE	UG/KG	340.000	U	360.000	UJ	340.000	U	340.000	U
HEXACHLOROETHANE	UG/KG	340.000	U	360.000	UJ	340.000	U	340.000	U
NITROBENZENE	UG/KG	340.000	U	360.000	UJ	340.000	U	340.000	U
ISOPHORONE	UG/KG	340.000	U	360.000	UJ	340.000	U	340.000	U
2-NITROPHENOL	UG/KG	340.000	U	360.000	UJ	340.000	U	340.000	U
2,4-DIMETHYLPHENOL	UG/KG	340.000	U	360.000	UJ	340.000	U	340.000	U
BIS(2-CHLOROETHOXY)METHANE	UG/KG	340.000	U	360.000	UJ	340.000	U	340.000	U
2,4-DICHLOROPHENOL	UG/KG	340.000	U	360.000	UJ	340.000	U	340.000	U
1,2,4-TRICHLOROBENZENE	UG/KG	340.000	U	360.000	UJ	340.000	U	340.000	U
NAPHTHALENE	UG/KG	340.000	U	360.000	UJ	340.000	U	340.000	U
4-CHLOROANILINE	UG/KG	340.000	U	360.000	UJ	340.000	U	340.000	U
HEXACHLOROBUTADIENE	UG/KG	340.000	U	360.000	UJ	340.000	U	340.000	U
4-CHLORO-3-METHYLPHENOL	UG/KG	340.000	U	360.000	UJ	340.000	U	340.000	U
2-METHYLNAPHTHALENE	UG/KG	340.000	U	360.000	UJ	340.000	U	340.000	U
HEXACHLOROCYCLOPENTADIENE	UG/KG	340.000	U	360.000	UJ	340.000	U	340.000	U
2,4,6-TRICHLOROPHENOL	UG/KG	340.000	U	360.000	UJ	340.000	U	340.000	U
2,4,5-TRICHLOROPHENOL	UG/KG	820.000	U	880.000	UJ	820.000	U	830.000	U
2-CHLORONAPHTHALENE	UG/KG	340.000	U	360.000	UJ	340.000	U	340.000	U
2-NITROANILINE	UG/KG	820.000	U	880.000	UJ	820.000	U	830.000	U
DIMETHYLPHTHALATE	UG/KG	340.000	U	360.000	UJ	340.000	U	340.000	U
ACENAPHTHYLENE	UG/KG	340.000	U	360.000	UJ	340.000	U	340.000	U
3-NITROANILINE	UG/KG	820.000	U	880.000	UJ	820.000	U	830.000	U
ACENAPHTHENE	UG/KG	340.000	U	360.000	UJ	340.000	U	340.000	U
2,4-DINITROPHENOL	UG/KG	820.000	U	880.000	UJ	820.000	U	830.000	U

Verified
5/12/94

9713524.2300

Validated Data Summary, Data Package: B09WF8-TMA-727

	Samp#	B09WF8		B0BFH1		B0BFH5		B0BFH6	
	Date	3-2-94		2-28-94		3-2-94		3-2-94	
	Location	---		---		---		---	
	Depth	---		---		---		---	
	Type	SOIL		SOIL		SOIL		SOIL	
	Comments	---		---		---		---	
Parameter	Units	Result	Q	Result	Q	Result	Q	Result	Q
4-NITROPHENOL	UG/KG	820.000	U	880.000	UJ	820.000	U	830.000	U
DIBENZOFURAN	UG/KG	340.000	U	360.000	UJ	340.000	U	340.000	U
2,4-DINITROTOLUENE	UG/KG	340.000	U	360.000	UJ	340.000	U	340.000	U
2,6-DINITROTOLUENE	UG/KG	340.000	U	360.000	UJ	340.000	U	340.000	U
DIETHYLPHTHALATE	UG/KG	340.000	U	360.000	UJ	340.000	U	340.000	U
4-CHLOROPHENYL-PHENYLETHER	UG/KG	340.000	U	360.000	UJ	340.000	U	340.000	U
FLUORENE	UG/KG	340.000	U	360.000	UJ	340.000	U	340.000	U
4-NITROANILINE	UG/KG	820.000	U	880.000	UJ	820.000	U	830.000	U
4,6-DINITRO-2-METHYLPHENOL	UG/KG	820.000	U	880.000	UJ	820.000	U	830.000	U
N-NITROSODIPHENYLAMINE	UG/KG	340.000	U	360.000	UJ	340.000	U	340.000	U
4-BROMOPHENYL-PHENYLETHER	UG/KG	340.000	U	360.000	UJ	340.000	U	340.000	U
HEXACHLOROBENZENE	UG/KG	340.000	U	360.000	UJ	340.000	U	340.000	U
PENTACHLOROPHENOL	UG/KG	820.000	U	45.000	J	820.000	U	830.000	U
PHENANTHRENE	UG/KG	340.000	U	360.000	UJ	340.000	U	340.000	U
ANTHRACENE	UG/KG	340.000	U	360.000	UJ	340.000	U	340.000	U
CARBAZOLE	UG/KG	340.000	U	360.000	UJ	340.000	U	340.000	U
DI-N-BUTYLPHTHALATE	UG/KG	340.000	U	360.000	UJ	340.000	U	340.000	U
FLUORANTHENE	UG/KG	340.000	U	360.000	UJ	340.000	U	340.000	U
PYRENE	UG/KG	340.000	U	360.000	UJ	340.000	U	340.000	U
BUTYLBENZYLPHTHALATE	UG/KG	340.000	U	360.000	UJ	340.000	U	340.000	U
3,3'-DICHLOROBENZIDINE	UG/KG	340.000	U	360.000	UJ	340.000	U	340.000	U
BENZO(A)ANTHRACENE	UG/KG	340.000	U	360.000	UJ	340.000	U	340.000	U
BIS(2-ETHYLHEXYL)PHTHALATE	UG/KG	340.000	U	270.000	J	340.000	U	340.000	U
CHRYSENE	UG/KG	340.000	U	360.000	UJ	340.000	U	340.000	U
DI-N-OCTYLPHTHALATE	UG/KG	340.000	U	360.000	UJ	340.000	U	340.000	U
BENZO(B)FLUORANTHENE	UG/KG	340.000	U	360.000	UJ	340.000	U	340.000	U
BENZO(K)FLUORANTHENE	UG/KG	340.000	U	360.000	UJ	340.000	U	340.000	U
BENZO(A)PYRENE	UG/KG	340.000	U	360.000	UJ	340.000	U	340.000	U
INDENO(1,2,3-CD)PYRENE	UG/KG	340.000	U	360.000	UJ	340.000	U	340.000	U
DIBENZ(A,H)ANTHRACENE	UG/KG	340.000	U	360.000	UJ	340.000	U	340.000	U
BENZO(G,H,I)PERYLENE	UG/KG	340.000	U	360.000	UJ	340.000	U	340.000	U

Verified
[illegible] 5/12/94

9713524.2301

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9713524.2302

~~000342~~

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B09WF8

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 03029 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A403029-01B

Sample wt/vol: 30.4 (g/mL) G Lab File ID: 40330I08

Level: (low/med) LOW Date Received: 03/07/94

% Moisture: 4 decanted: (Y/N) N Date Extracted: 03/16/94

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 03/30/94

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
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	

011

Verified 5/11/94

9713524.2303

~~000343~~

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B09WF8

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 03029 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A403029-01B

Sample wt/vol: 30.4 (g/mL) G Lab File ID: 40330I08

Level: (low/med) LOW Date Received: 03/07/94

% Moisture: 4 decanted: (Y/N) N Date Extracted: 03/16/94

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 03/30/94

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 ~~240~~	~~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 [illegible] 5/11/94

FORM I SV-2 3/90

9713524.2304

~~000344~~

EPA SAMPLE NO.

B09WF8

1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 03029 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A403029-01B

Sample wt/vol: 30.4 (g/mL) G Lab File ID: 40330I08

Level: (low/med) LOW Date Received: 03/07/94

% Moisture: 4 decanted: (Y/N) N Date Extracted: 03/16/94

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 03/30/94

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

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

Number TICs found: 5

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q	Q
1.	UNKNOWN HYDROCARBON	5.50	1500	~~BJ~~	UR
2.	UNKNOWN HYDROCARBON	5.58	69	~~J~~	UN
3.	UNKNOWN HYDROCARBON	5.80	210	~~BJ~~	UR
4.	UNKNOWN HYDROCARBON	6.03	580	~~BJ~~	UR
5.	HEXANEDIOIC ACID ESTER ISOME	23.82	170	~~BJ~~	UN

Verified
[illegible] 5/11/94

013

9713524.2305

~~000363~~

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B0BFH1

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 03029 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A403029-04B

Sample wt/vol: 30.4 (g/mL) G Lab File ID: 40330I11

Level: (low/med) LOW Date Received: 03/07/94

% Moisture: 10 decanted: (Y/N) N Date Extracted: 03/16/94

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 03/30/94

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	Q
108-95-2	Phenol	360	U	U
111-44-4	bis(2-Chloroethyl)Ether	360	U	U
95-57-8	2-Chlorophenol	360	U	U
541-73-1	1,3-Dichlorobenzene	360	U	U
106-46-7	1,4-Dichlorobenzene	360	U	U
95-50-1	1,2-Dichlorobenzene	360	U	U
95-48-7	2-Methylphenol	360	U	U
108-60-1	2,2'-oxybis(1-Chloropropane)	360	U	U
106-44-5	4-Methylphenol	360	U	U
621-64-7	N-Nitroso-Di-n-Propylamine	360	U	U
67-72-1	Hexachloroethane	360	U	U
98-95-3	Nitrobenzene	360	U	U
78-59-1	Isophorone	360	U	U
88-75-5	2-Nitrophenol	360	U	U
105-67-9	2,4-Dimethylphenol	360	U	U
111-91-1	bis(2-Chloroethoxy)Methane	360	U	U
120-83-2	2,4-Dichlorophenol	360	U	U
120-82-1	1,2,4-Trichlorobenzene	360	U	U
91-20-3	Naphthalene	360	U	U
106-47-8	4-Chloroaniline	360	U	U
87-68-3	Hexachlorobutadiene	360	U	U
59-50-7	4-Chloro-3-Methylphenol	360	U	U
91-57-6	2-Methylnaphthalene	360	U	U
77-47-4	Hexachlorocyclopentadiene	360	U	U
88-06-2	2,4,6-Trichlorophenol	360	U	U
95-95-4	2,4,5-Trichlorophenol	880	U	U
91-58-7	2-Chloronaphthalene	360	U	U
88-74-4	2-Nitroaniline	880	U	U
131-11-3	Dimethylphthalate	360	U	U
208-96-8	Acenaphthylene	360	U	U
99-09-2	3-Nitroaniline	880	U	U
83-32-9	Acenaphthene	360	U	U
51-28-5	2,4-Dinitrophenol	880	U	U

Verified [signature] 5/11/94

9713524.2306

~~000364~~

1C

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B0BFH1

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 03029 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A403029-04B

Sample wt/vol: 30.4 (g/mL) G Lab File ID: 40330I11

Level: (low/med) LOW Date Received: 03/07/94

% Moisture: 10 decanted: (Y/N) N Date Extracted: 03/16/94

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 03/30/94

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	Q
100-02-7	4-Nitrophenol	880	~~U~~	U
132-64-9	Dibenzofuran	360	~~U~~	U
121-14-2	2,4-Dinitrotoluene	360	~~U~~	U
606-20-2	2,6-Dinitrotoluene	360	~~U~~	U
84-66-2	Diethylphthalate	360	~~U~~	U
7005-72-3	4-Chlorophenyl-phenylether	360	~~U~~	U
86-73-7	Fluorene	360	~~U~~	U
100-01-6	4-Nitroaniline	880	~~U~~	U
534-52-1	4,6-Dinitro-2-methylphenol	880	~~U~~	U
86-30-6	N-Nitrosodiphenylamine (1)	360	~~U~~	U
101-55-3	4-Bromophenyl-phenylether	360	~~U~~	U
118-74-1	Hexachlorobenzene	360	~~U~~	U
87-86-5	Pentachlorophenol	45	~~U~~	J
85-01-8	Phenanthrene	360	~~U~~	U
120-12-7	Anthracene	360	~~U~~	U
86-74-8	Carbazole	360	~~U~~	U
84-74-2	Di-n-Butylphthalate	360 ~~160~~	~~BJ~~	BJ
206-44-0	Fluoranthene	360	~~U~~	U
129-00-0	Pyrene	360	~~U~~	U
85-68-7	Butylbenzylphthalate	360	~~U~~	U
91-94-1	3,3'-Dichlorobenzidine	360	~~U~~	U
56-55-3	Benzo(a)Anthracene	360	~~U~~	U
117-81-7	bis(2-Ethylhexyl)Phthalate	270	~~U~~	J
218-01-9	Chrysene	360	~~U~~	U
117-84-0	Di-n-Octyl Phthalate	360	~~U~~	U
205-99-2	Benzo(b)Fluoranthene	360	~~U~~	U
207-08-9	Benzo(k)Fluoranthene	360	~~U~~	U
50-32-8	Benzo(a)Pyrene	360	~~U~~	U
193-39-5	Indeno(1,2,3-cd)Pyrene	360	~~U~~	U
53-70-3	Dibenz(a,h)Anthracene	360	~~U~~	U
191-24-2	Benzo(g,h,i)Perylene	360	~~U~~	U

(1) - Cannot be separated from Diphenylamine

Verified

FORM I SV-2 3/90

5/11/94

9713524.2307

~~000365~~

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B0BFH1

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 03029 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A403029-04B

Sample wt/vol: 30.4 (g/mL) G Lab File ID: 40330I11

Level: (low/med) LOW Date Received: 03/07/94

% Moisture: 10 decanted: (Y/N) N Date Extracted: 03/16/94

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 03/30/94

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

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

Number TICs found: 20

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN HYDROCARBON	5.52	1800	~~BJ~~
2.	UNKNOWN ALKANE	11.37	4600	~~J~~
3.	UNKNOWN ALKANE	11.78	3200	~~J~~
4.	UNKNOWN ALKANE	12.88	14000	~~J~~
5.	UNKNOWN HYDROCARBON	13.07	1500	~~J~~
6.	UNKNOWN ALKANE	13.23	15000	~~J~~
7.	UNKNOWN ALKANE	14.05	20000	~~J~~
8.	UNKNOWN ALKANE	14.27	2200	~~J~~
9.	UNKNOWN ALKANE	14.58	19000	~~J~~
10.	UNKNOWN ALKANE	15.18	5000	~~J~~
11.	UNKNOWN ALKANE	15.33	2200	~~J~~
12.	UNKNOWN ALKANE	15.82	9000	~~J~~
13.	UNKNOWN ALKANE	16.35	6900	~~J~~
14.	UNKNOWN ALKANE	17.02	8900	~~J~~
15.	UNKNOWN ALKANE	19.20	3000	~~J~~
16.	UNKNOWN ALKANE	20.23	4100	~~J~~
17.	UNKNOWN ALKANE	21.23	3300	~~J~~
18.	UNKNOWN ALKANE	22.17	3900	~~J~~
19.	UNKNOWN ALKANE	23.08	2600	~~J~~
20.	UNKNOWN ALKANE	23.95	2700	~~J~~

Q | 3 R

Stilk 4 Total Unknown Hydrocarbon 1500 ~~3300~~ Stilk 4 JN

Stilk 4 Total Unknown Alkane 129600 JN

Verified Stilk 4

016

FORM I SV-TIC 3/90

9713524.2303

~~000408~~

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B0BFH5

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 03029 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A403029-06B

Sample wt/vol: 30.4 (g/mL) G Lab File ID: 40330I12

Level: (low/med) LOW Date Received: 03/07/94

% Moisture: 4 decanted: (Y/N) N Date Extracted: 03/16/94

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 03/30/94

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 8.9

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

Q

017

Verified [signature] 5/11/94

9713524.2309

~~000409~~

1C

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B0BFH5

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 03029 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A403029-06B

Sample wt/vol: 30.4 (g/mL) G Lab File ID: 40330I12

Level: (low/med) LOW Date Received: 03/07/94

% Moisture: 4 decanted: (Y/N) N Date Extracted: 03/16/94

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 03/30/94

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 8.9

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 ~~200~~	~~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 [illegible] 5/11/94

9713524.2310

000410

1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B0BFH5

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 03029 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A403029-06B

Sample wt/vol: 30.4 (g/mL) G Lab File ID: 40330I12

Level: (low/med) LOW Date Received: 03/07/94

% Moisture: 4 decanted: (Y/N) N Date Extracted: 03/16/94

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 03/30/94

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 8.9

Number TICs found: 11

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q	Q
1.	UNKNOWN HYDROCARBON	5.52	1500	~~BJ~~	JR
2.	UNKNOWN HYDROCARBON	5.60	69	~~J~~	JN
3.	UNKNOWN HYDROCARBON	5.80	550	~~J~~	JR
4.	UNKNOWN HYDROCARBON	6.03	480	~~BJ~~	JR
5.	UNKNOWN HYDROCARBON	7.88	170	~~J~~	JN
6.	UNKNOWN HYDROCARBON	9.17	310	~~J~~	JR
7. 540-97-6	DODECAMETHYLCYCLOHEXASILOXAN	11.70	100	~~JN~~	JR
8.	HEXANEDIOIC ACID ESTER ISOME	23.83	210	~~BJ~~	JN
9.	UNKNOWN ALKANE	26.38	140	~~J~~	JN
10.	UNKNOWN ALKANE	27.93	410	~~J~~	JN
11.	UNKNOWN ALKANE	29.90	140	~~J~~	JN

Total Unknown Hydrocarbon 789 JN
Total Unknown Alkane 690 JN

Verified
[illegible] 5/12/94

-019

9713524.2311

~~000435~~

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B0BFH6

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 03029 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A403029-07B

Sample wt/vol: 30.4 (g/mL) G Lab File ID: 40330I13

Level: (low/med) LOW Date Received: 03/07/94

% Moisture: 5 decanted: (Y/N) N Date Extracted: 03/16/94

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 03/30/94

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	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	830	U
91-58-7	2-Chloronaphthalene	340	U
88-74-4	2-Nitroaniline	830	U
131-11-3	Dimethylphthalate	340	U
208-96-8	Acenaphthylene	340	U
99-09-2	3-Nitroaniline	830	U
83-32-9	Acenaphthene	340	U
51-28-5	2,4-Dinitrophenol	830	U

Q

020

Verified 5/11/94

9713524.2312

~~000436~~

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B0BFH6

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 03029 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A403029-07B

Sample wt/vol: 30.4 (g/mL) G Lab File ID: 40330I13

Level: (low/med) LOW Date Received: 03/07/94

% Moisture: 5 decanted: (Y/N) N Date Extracted: 03/16/94

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 03/30/94

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	830	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	830	U	
534-52-1	4,6-Dinitro-2-methylphenol	830	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	830	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 ~~190~~	~~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

FORM I SV-2 5/11/94 3/90

L021

9713524.2313

~~000437~~

1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B0BFH6

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 03029 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A403029-07B

Sample wt/vol: 30.4 (g/mL) G Lab File ID: 40330I13

Level: (low/med) LOW Date Received: 03/07/94

% Moisture: 5 decanted: (Y/N) N Date Extracted: 03/16/94

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 03/30/94

Injection Volume: 2.0(uL) Dilution Factor: 1.0

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

Number TICs found: 12

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q	Q
1.	UNKNOWN HYDROCARBON	5.52	1400	~~BJ~~	UR
2.	UNKNOWN HYDROCARBON	5.60	69	~~BJ~~	JN
3.	UNKNOWN HYDROCARBON	5.82	170	~~J~~	UR
4.	UNKNOWN HYDROCARBON	6.03	380	~~BJ~~	UR
5.	UNKNOWN HYDROCARBON	7.88	170	~~J~~	JN
6. 541-02-6	DECAMETHYLCYCLOPENTASILOXANE	9.17	100	~~JN~~	R
7.	PROPANOIC ACID ESTER ISOMER	15.65	100	~~J~~	JN
8.	HEXANEDIOIC ACID ESTER ISOME	23.83	170	~~BJ~~	UJN
9.	UNKNOWN ALKANE	26.38	100	~~J~~	JN
10.	UNKNOWN HYDROCARBON	27.13	69	~~J~~	JN
11.	UNKNOWN ALKANE	27.93	240	~~J~~	JN
12.	UNKNOWN ALKANE	29.90	100	~~J~~	JN

5/12/94	Total Unknown Hydrocarbon	308	JN
5/12/94	Total Unknown Alkane	440	JN

Verified
5/12/94

022

9713524.2314

ATTACHMENT 4

LABORATORY NARRATIVE AND CHAIN-OF-CUSTODY DOCUMENTATION

CASE NARRATIVE

LABORATORY : TMA/ARLI

CASE : 03-029

CONTRACT ID : WESTINGHOUSE HANFORD COMPANY

SDG RECEIPT DATE : March 07, 1994

1.0 DESCRIPTION OF CASE :

Seven 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
B09WF8	A4-03-029-01A	V	SOIL
B09WF8	A4-03-029-01B	SV	SOIL
B09WF8 MS	A4-03-029-01C	SV	SOIL
B09WF8 MSD	A4-03-029-01D	SV	SOIL
B09WF8	A4-03-029-01G	K	SOIL
B09WF8 MS	A4-03-029-01H	K	SOIL
B09WF8 MSD	A4-03-029-01I	K	SOIL
B09WG1	A4-03-029-02A	V	SOIL
B09WG1 MS	A4-03-029-02B	V	SOIL
B09WG1 MSD	A4-03-029-02C	V	SOIL
B0BFM7	A4-03-029-03A	V	SOIL
B0BFH1	A4-03-029-04A	V	SOIL
B0BFH1	A4-03-029-04B	SV	SOIL
B0BFH1	A4-03-029-04E	K	SOIL
B0BFM6	A4-03-029-05A	V	SOIL
B0BFH5	A4-03-029-06A	V	SOIL
B0BFH5	A4-03-029-06B	SV	SOIL
B0BFH5	A4-03-029-06D	K	SOIL
B0BFH6	A4-03-029-07A	V	SOIL
B0BFH6	A4-03-029-07B	SV	SOIL
B0BFH6	A4-03-029-07D	K	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.

Acetone was detected at concentrations above the CRQL in several samples, including the blank, VBLK0314R.

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

TUNES :

All BFB tunes were injected directly into the GC/MS instrument.

3.2.2 SEMIVOLATILE ANALYSIS COMMENTS :

LOW LEVEL SOIL :

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

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

3.2.3 EXTRACTABLE HYDROCARBONS "KEROSENE RANGE" COMMENTS :

SEQUENCE NOTES :

The sequence was started on 03/05/94 and was analyzed according to the SW-846 Method 8015M. The %RSD in the all of the initial calibrations and the %D in the continuing calibrations were below their 20% and 15% limits, respectively.

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

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.

In sample B0BFH1, Kerosene was detected at approximately 23 mg/Kg. In addition, a compound heavier than the Diesel Range was detected at approximately 30 mg/Kg. The concentration for the compound was calculated using a Diesel standard.

The surrogate o-Terphenyl was added to each sample, and the recoveries ranged from 80% to 94%. However, since the reporting forms could not accommodate the surrogate recovery results, the data was included in the "Additional Raw Data" poriton of the package.

The matrix spike and matrix spike duplicate recoveries for Kerosene were 90% and 86%, respectively.

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

Nicole Roth 4/21/94
Program Manager

Maureen Parrish

Maureen Parrish 4/21/94
Program Manager

9213524.2313

~~0000021~~

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: 3-2-94

Ice Chest No.:

Field Logbook No.: EFL-1115

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) B09WF8

- ✓ 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)~~

- ~~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~~

3-2-94

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

Relinquished by:	Received by:	Date/Time:
3-4-94 1033	Kermit Blum K-Blum	3-7-94 *
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:

* Received @ TMA/NORCAL 3-5-94; opened 3-7-94 KB

027

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

000027A

Westinghouse Hanford Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	Page 1 of 1
		006225

Collector R.T. Sickle
Company Contact C.A. Rowley
Telephone 372-3293
SAF No. 93-263
Project Designation 216-U-8 Vitrified Clay Pipeline
Sampling Locations 216-U-8 Crib
Ice Chest No.
Bill of Lading/Airbill No.
Offsite Property No.
Method of Shipment Air Overnight
Field Logbook No.
Shipped to TMA
SPECIAL INSTRUCTIONS
Possible Sample Hazards/Remarks None Detected
Special Handling and/or Storage Keep cool

Sample Number	*	Date Collected	Time	Number and Type of Containers	Analysis Required		Preservative
BOBFH17	S	2-28-94	0800	(1) 250mL aGs ✓	VOA	CLP	
BOBFH1	S	2-28-94	1115	(1) 250ml Gs ✓	VOA	CLP	
BOBFH1	S			(1) 250ml aG ✓	Semi-VOA	CLP	
BOBFH1	S			(1) 250ml Poly ✓	Metals -CLP TAL Titanium Mercury	CPL	
BOBFH1	S			(1) 125ml G ✓	Anions F, Cl, SO_4	EPA 300.0	
BOBFH1	S			(1) 125ml P/G ✓	NO_2 NO_3	EPA 353.2	
~~BOBFH1~~	~~S~~			~~(1) 250ml aGs~~	~~PCB/Pest~~ [illegible] ~~2-23-94~~	~~8080~~	
BOBFH1	S			(1) 125ml G ✓	Cyanide	CPL	
BOBFH1	S			(1) 125ml Gs ✓	Kerosene	8015M	
BOBFH1	S	2-28-94	1115	(1) 1000ml Poly ✓	Gross Alpha/Beta EP-10; Gamma Spec. Cs-134/137, Co-60, K-40, Eu-152/154/155, Ru-106, Na-22 RC-30; Total Uranium EA-01C; U-235/234/238 EP-70, 71, 5; Np-237 RC-101A, 622, EP-5; Pu-238/239/240 EP-80, 81, 5; I-129 RC-25, 603; Sr-90 RC-306, 303, 309, 304; Tc-99 RC-24, 604; Am-241, Cm-244 EP-80, 91, 92, 93, 5; Se-79 Lab Specific		

Chain of Possession Relinquished By (Sign and Print Names)	Date	Time	Received By
R.T. Sickle	3/1/94	1200	D.L. Edwards
D.L. Edwards	3/4/94	0810	
	3-7-94	*	Kermit Blum K. Blum

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

LABORATORY SECTION	Received By	Title	Date/Time
Final Sample Disposition	Disposal Method:	Disposed by:	Date/Time:

* Received @ TMA/NORCAL 3-5-94; opened 3-7-94 .KB

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028

Westinghouse Hanford Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

006229

Collector R.T. Sickle
Company Contact C.A. Rowley
Telephone 372-3293
SAF No. 93-263
Project Designation 216-U-8 Vitrified Clay Pipeline
Sampling Locations 216-U-8 Crib
Ice Chest No.
Bill of Lading/Airbill No. 140 213 8144
Offsite Property No.
Method of Shipment Air Overnight
Field Logbook No.
Shipped to TMA
SPECIAL INSTRUCTIONS
Possible Sample Hazards/Remarks None Detected
Special Handling and/or Storage Keep cool

Sample Number	*	Date Collected	Time	Number and Type of Containers	Analysis Required		Preservative
BOBFM6	S	3-2-94	0800	(1) 250ml Gs ✓	VOA	CLP	
BOBFH5	S	3-2-94	1325	(1) 250ml Gs ✓	VOA	CLP	
BOBFH5	S			(1) 250ml aG ✓	Semi-VOA	CLP	
BOBFH5	S			(1) 250ml Poly ✓	Metals -CLP TAL Titanium Mercury	CPL	
BOBFH5	S			(1) 125ml G ✓	Anions F, Cl, SO_4	EPA 300.0	
BOBFH5	S			(1) 125ml P/G ✓	NO_2 NO_3	EPA 353.2	
~~BOBFH5~~	~~S~~			~~(1) 250ml aGs~~	~~PCB/Pest~~ RJL 2-23-94	~~8080~~	
BOBFH5	S			(1) 125ml G ✓	Cyanide	CPL	
BOBFH5	S			(1) 125ml Gs ✓	Kerosene	8015M	
BOBFH5	S			(1) 1000ml Poly ✓	Gross Alpha/Beta EP-10; Gamma Spec. Cs-134/137, Co-60, K-40, Eu-152/154/155, Ru-106, Na-22 RC-30; Total Uranium EA-01C; U-235/234/238 EP-70, 71, 5; Np-237 RC-101A, 622, EP-5; Pu-238/239/240 EP-80, 81, 5; I-129 RC-25, 603; Sr-90 RC-306, 303, 309, 304; Tc-99 RC-24, 604; Am-241, Cm-244 EP-80, 91, 92, 93, 5; Se-79 Lab Specific		

Chain of Possession Relinquished By (Sign and Print Names)	Date	Time	Received By
R.T. Sickle R.T. Sickle	3/3/94	0800	D.L. Edwards
D.L. Edwards	3/4/94	0810	Kermit Blum K. Blum
	3-7-94	*	

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

LABORATORY SECTION	Received By	Title	Date/Time
Final Sample Disposition	Disposal Method:	Disposed by:	Date/Time:

* Received @ TMA/NORCAL 3-5-94; opened 3-7-94 · KB

9413241.2320

029

Westinghouse Hanford Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

006230

Collector R.T. Sickle
Company Contact C.A. Rowley
Telephone 372-3293
SAF No. 93-263
Project Designation 216-U-8 Vitrified Clay Pipeline
Sampling Locations 216-U-8 Crib
Ice Chest No. RTS
Bill of Lading/Airbill No. 140 213 8144
Offsite Property No.
Method of Shipment Air Overnight
Field Logbook No.
Shipped to TMA
SPECIAL INSTRUCTIONS
Possible Sample Hazards/Remarks None Detected
Special Handling and/or Storage Keep cool

Sample Number	*	Date Collected	Time	Number and Type of Containers	Analysis Required		Preservative
B0BFH6	S	3-2-94	1450	(1) 250ml Gs ✓	VOA	CLP	
B0BFH6	S			(1) 250ml aG ✓	Semi-VOA	CLP	
B0BFH6	S			(1) 250ml Poly ✓	Metals -CLP TAL Titanium Mercury	CPL	
B0BFH6	S			(1) 125ml G ✓	Anions F, Cl, SO_4	EPA 300.0	
B0BFH6	S			(1) 125ml P/G ✓	NO_2 NO_3	EPA 353.2	
~~B0BFH6~~	~~S~~			~~(1) 250ml aGs~~	~~PCB/Pest~~ RDH 2-23-94	~~8080~~	
B0BFH6	S			(1) 125ml G ✓	Cyanide	CPL	
B0BFH6	S			(1) 125ml Gs ✓	Kerosene	8015M	
B0BFH6	S			(1) 1000ml Poly ✓	Gross Alpha/Beta EP-10; Gamma Spec. Cs-134/137, Co-60, K-40, Eu-152/154/155, Ru-106, Na-22 RC-30; Total Uranium EA-01C; U-235/234/238 EP-70, 71, 5; Np-237 RC-101A, 622, EP-5; Pu-238/239/240 EP-80, 81, 5; I-129 RC-25, 603; Sr-90 RC-306, 303, 309, 304; Tc-99 RC-24, 604; Am-241, Cm-244 EP-80, 91, 92, 93, 5; Se-79 Lab Specific		

Chain of Possession Relinquished By (Sign and Print Names)	Date	Time	Received By
R.T. Sickle	3/3/94	0800	D.L. Edwards
D.L. Edwards	3/4/94	0810	
	3-7-94	*	Kermit Blum K. Blum

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

LABORATORY SECTION	Received By	Title	Date/Time
Final Sample Disposition	Disposal Method:	Disposed by:	Date/Time:

* Received @ TMS/NORCAL 3-5-94; opened 3-7-94 KB

030

9713524.2322

ATTACHMENT 5

DATA VALIDATION SUPPORTING DOCUMENTATION

GC/MS ORGANIC DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E

PROJECT: ~~B09W~~ 200-UP-2		DATA PACKAGE: B09WF8-TMA-727
VALIDATOR:	LAB: TMA	DATE: 05/11/94
CASE:		SDG: B09WF8-TMA-727

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

B09WF8

B0BFH1

B0BFH5

B0BFH6

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: Sample B0BFH1 was extracted out of holding time. All results have been qualified as estimated (J/UJ).

L032

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: Di-n-butylphthalate is present in the blank at 200 ug/L. Therefore, assoc. results <10x blank conc. have been qual. as undetected (U). Pentachlorophenol is not present in the blank and bis(2-ethylhexyl) phthalate is present at 8 ug/L, however, the result for sample B3BF1H1 is greater than 10x blank conc. Therefore, no qualification was applied. 05/12/94

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: Sample locations are not currently available. Field QC will be evaluated in the Final Summary report.

7. SYSTEM PERFORMANCE

Were internal standards analyzed? . . . . . Yes No N/A

Are internal standard areas acceptable? . . . . . Yes No N/A

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

Comments:

8. COMPOUND IDENTIFICATION AND QUANTITATION

Is compound identification acceptable? . . . . . Yes No N/A

Is compound quantitation acceptable? . . . . . Yes No N/A

Comments:

9. REPORTED RESULTS AND QUANTITATION LIMITS

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

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

Do results meet the CRQLs? . . . . . Yes No N/A

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

Comments:

HOLDING TIME SUMMARY

B09WF8-TMA-727

SDG:	VALIDATOR: [illegible]	DATE: 5/11/94	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
B09WF8	SVOA	3/02/94	3/16/94	3/30/94	14	14	None
B0BFH1	↓	2/28/94	↓	↓	16	14	J/UJ
B0BFH5	↓	3/02/94	↓	↓	14	14	None
B0BFH6	↓	3/02/94	↓	↓	14	14	None

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~~000518~~

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SBLK0316S1

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 03029 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A403029-BLK

Sample wt/vol: 30.3 (g/mL) G Lab File ID: 40330I07

Level: (low/med) LOW Date Received: _____

% Moisture: _____ decanted: (Y/N) N Date Extracted: 03/16/94

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 03/30/94

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	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	200	J XIC=2000
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

036

(1) - Cannot be separated from Diphenylamine

5/11/94

FORM I SV-2 3/90

9713524.2323

~~000519~~

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

SBLK0316S1

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 03029 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A403029-BLK

Sample wt/vol: 30.3 (g/mL) G Lab File ID: 40330I07

Level: (low/med) LOW Date Received: _____

% Moisture: _____ decanted: (Y/N) N Date Extracted: 03/16/94

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 03/30/94

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

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

Number TICs found: 7

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN HYDROCARBON	5.08	99	~~J~~
2.	UNKNOWN HYDROCARBON	5.53	1600	~~J~~
3.	UNKNOWN HYDROCARBON	5.82	99	~~J~~
4.	UNKNOWN HYDROCARBON	6.07	200	~~J~~
5.	UNKNOWN KETONE	7.93	66	~~J~~
6.	HEXANEDIOIC ACID ESTER ISOME	23.83	160	~~J~~
7.	UNKNOWN HYDROCARBON	24.53	99	~~J~~

Q
NJ
NJ
NJ
NJ
NJ
NJ

037

5/11/94

9713524.2329

MEMORANDUM

MAY 1994 RECEIVED TQO

TO: 200-UP-2 Project QA Record

May 10, 1994

FR: Susan Winter, Golder Associates Inc.

RE: GENERAL CHEMISTRY DATA VALIDATION SUMMARY FOR DATA PACKAGE: B09WF8-TMA-727 (923-E418, Filename B09WF8CH.UP2)

INTRODUCTION

This memo presents the results of data validation on data package B09WF8-TMA-727 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
B09WF8	03/02/94	SOIL	SEE NOTE 1
B0BFH1	02/28/94	SOIL	
B0BFH5	03/02/94	SOIL	
B0BFH6	03/02/94	SOIL	
B0BFH8	03/02/94	SOIL	

Note 1. All samples were analyzed for anions (chloride, fluoride, and sulfate) and nitrate+nitrite-N.

RECEIVED MAY 18 1994 VALIDATION DOCUMENTATION SDLA

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.

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 five samples were validated in this data package with a total of 20 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.

9713524.2331

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.

9713524.2333

ATTACHMENT 2

SUMMARY OF DATA QUALIFICATIONS

DATA QUALIFICATION SUMMARY

SDG: B09WF8-TMA-727	VALIDATOR:	DATE: May 10, 1994	PAGE 1 OF 1
COMMENTS: GENERAL CHEMISTRY			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
NO QUALIFICATION REQUIRED			

9713524.2335

ATTACHMENT 3

QUALIFIED DATA SUMMARY AND ANNOTATED LABORATORY REPORTS

Validated Data Summary, Data Package: B09WF8-TMA-727

	Samp#	B09WF8		B0BFH1		B0BFH5		B0BFH6		B0BFH8	
	Date	3-2-94		2-28-94		3-2-94		3-2-94		3-2-94	
	Location	---		---		---		---		---	
	Depth	---		---		---		---		---	
	Type	SOIL		SOIL		SOIL		SOIL		SOIL	
	Comments	---		---		---		---		---	
Parameter	Units	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
CHLORIDE	MG/KG	3.000		2.800		11.400		5.000		12.000	
FLUORIDE	MG/KG	0.500	U	1.500		2.100		1.900		1.000	
SULFATE	MG/KG	6.000		18.000		44.000		17.000		12.000	
NITRATE+NITRITE	MG-N/KG	2.490	U	116.000		101.000		18.700		31.900	

Verified
5/11/94

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008

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~~000012~~

TMA Inc. REPORT Work Order # A4-03-029

Received: 03/07/94 Results by Sample

SAMPLE ID B09WF8 FRACTION 01E TEST CODE WCCLPS NAME Anions in Solids

Date & Time Collected 03/02/94 Category

ANIONS AND WET CHEMISTRY - SOLIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT	Q
Chloride	300.0	3.0	mg/kg	1.0	
Fluoride	300.0	<0.5	mg/kg	0.5	u
Sulfate	300.0	6	mg/kg	5	

FORM I

Verified

5/10/94

TMA Inc. REPORT Work Order # A4-03-029

Received: 03/07/94

Results by Sample

SAMPLE ID B0BFH1 FRACTION 04C TEST CODE WCCLPS NAME Anions in Solids

Date & Time Collected 02/28/94 Category

ANIONS AND WET CHEMISTRY - SOLIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT	Q
Chloride	300.0	2.8	mg/kg	1.0	
Fluoride	300.0	1.5	mg/kg	0.5	
Sulfate	300.0	18	mg/kg	5	

FORM I

Verified

5/10/94

9713524.2339

~~000014~~

TMA Inc. REPORT Work Order # A4-03-029

Received: 03/07/94

Results by Sample

SAMPLE ID B0BFH5 FRACTION 06C TEST CODE WCCLPS NAME Anions in Solids

Date & Time Collected 03/02/94 Category

ANIONS AND WET CHEMISTRY - SOLIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT
Chloride	300.0	11.4	mg/kg	1.0
Fluoride	300.0	2.1	mg/kg	0.5
Sulfate	300.0	44	mg/kg	5

Q

FORM I

Verified

[illegible] 5/10/94

9713524.2340

~~000015~~

TMA Inc. REPORT Work Order # A4-03-029

Received: 03/07/94

Results by Sample

SAMPLE ID B0BFH6 FRACTION 07C TEST CODE WCCLPS NAME Anions in Solids

Date & Time Collected 03/02/94 Category

ANIONS AND WET CHEMISTRY - SOLIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT	Q
Chloride	300.0	5.0	mg/kg	1.0	
Fluoride	300.0	1.9	mg/kg	0.5	
Sulfate	300.0	17	mg/kg	5	

FORM I

Verified

5/10/94

9713524.2341

~~000016~~

TMA Inc. REPORT Work Order # A4-03-029

Received: 03/07/94

Results by Sample

SAMPLE ID B0BFH8 FRACTION 08A TEST CODE WCCLPS NAME Anions in Solids

Date & Time Collected 03/02/94 Category

ANIONS AND WET CHEMISTRY - SOLIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT	Q
Chloride	300.0	12.0	mg/kg	1.0	
Fluoride	300.0	1.0	mg/kg	0.5	
Sulfate	300.0	12	mg/kg	5	

FORM I

Verified

[illegible] 5/10/94

9713524.2342

Received: 03/08/94 Results by Sample

SAMPLE ID B0BFH1 SAMPLE # 01 FRACTIONS: A
Date & Time Collected 02/28/94 11:15:00 Category SOIL

NITR_S 116
mg N/kg

SAMPLE ID B0BFH5 SAMPLE # 02 FRACTIONS: A
Date & Time Collected 03/02/94 13:25:00 Category SOIL

NITR_S 101
mg N/kg

SAMPLE ID B0BFH6 SAMPLE # 03 FRACTIONS: A
Date & Time Collected 03/02/94 14:50:00 Category SOIL

NITR_S 18.7
mg N/kg

SAMPLE ID B09WF8 SAMPLE # 04 FRACTIONS: A
Date & Time Collected 03/02/94 09:30:00 Category SOIL

NITR_S <2.49
mg N/kg

SAMPLE ID B0BFH8 SAMPLE # 05 FRACTIONS: A
Date & Time Collected 03/02/94 13:00:00 Category SOIL

NITR_S 31.9
mg N/kg

SAMPLE ID B0BFH8D SAMPLE # 05 FRACTIONS: B
Date & Time Collected 03/02/94 13:00:00 Category SOIL

NITR_S 30.3
mg N/kg

SAMPLE ID B0BFH8S SAMPLE # 05 FRACTIONS: C
Date & Time Collected 03/02/94 13:00:00 Category SOIL

NITR_S 50.5
mg N/kg

0014

Verified [illegible] 5/11/94

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
1-800-4 LAB TEST FAX (617) 890-3883

9713524.2343

ATTACHMENT 4

LABORATORY NARRATIVE AND CHAIN-OF-CUSTODY DOCUMENTATION

GENERAL CHEMISTRY RESULTS

CASE NO. 03-029

Sample #s:

B0BFH1	B0BFH5	B0BFH6
B0BFH8	B0BWF8	

CASE NARRATIVE

Duplicate analysis on sample B0BFH1 (A4-03-029-04D) revealed a 22.2% RPD for Sulfate. The high RPD can be attributed to an inhomogeneous sample matrix.

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

Maureen Parrish 4/21/94

Maureen Parrish

Received: 03/08/94 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.
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

9713524.2346

~~0000021~~

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: 3-2-94

Ice Chest No.:

Field Logbook No.: EFL-1115

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) B0W0F8

- ✓ 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)~~

- ~~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~~

3-2-94

[] Field Transfer of Custody

Chain of Possession (Sign and Print Names)		
Relinquished by: 3-4-94 Jerome E Rogers 1033	Received by: Kermit Blum K-Blum	Date/Time: 3-7-94 *
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:

* Received @ TMA/NORCAL 3-5-94; opened 3-7-94 KB

0018

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

000002A

Westinghouse Hanford Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	Page 1 of 1
		006225

Collector R.T. Sickle
Company Contact C.A. Rowley
Telephone 372-3293
SAF No. 93-263
Project Designation 216-U-8 Vitrified Clay Pipeline
Sampling Locations 216-U-8 Crib
Ice Chest No.
Bill of Lading/Airbill No.
Offsite Property No.
Method of Shipment Air Overnight
Field Logbook No.
Shipped to TMA
SPECIAL INSTRUCTIONS
Possible Sample Hazards/Remarks None Detected
Special Handling and/or Storage Keep cool

Sample Number	*	Date Collected	Time	Number and Type of Containers	Analysis Required		Preservative
BOBFH17	S	2-28-94	0800	(1) 250ml aGs ✓	VOA	CLP	
BOBFH1	S	2-28-94	1115	(1) 250ml Gs ✓	VOA	CLP	
BOBFH1	S			(1) 250ml aG ✓	Semi-VOA	CLP	
BOBFH1	S			(1) 250ml Poly ✓	Metals -CLP TAL Titanium Mercury	CPL	
BOBFH1	S			(1) 125ml G ✓	Anions F, Cl, SO_4	EPA 300.0	
BOBFH1	S			(1) 125ml P/G ✓	NO_2 NO_3	EPA 353.2	
~~BOBFH1~~	~~S~~			~~(1) 250ml aGs~~	~~PCB/Pest~~ [illegible] 2-23-94	~~8080~~	
BOBFH1	S			(1) 125ml G ✓	Cyanide	CPL	
BOBFH1	S			(1) 125ml Gs ✓	Kerosene	8015M	
BOBFH1	S	2-28-94	1115	(1) 1000ml Poly ✓	Gross Alpha/Beta EP-10; Gamma Spec. Cs-134/137, Co-60, K-40, Eu-152/154/155, Ru-106, Na-22 RC-30; Total Uranium EA-01C; U-235/234/238 EP-70, 71, 5; Np-237 RC-101A, 622, EP-5; Pu-238/239/240 EP-80, 81, 5; I-129 RC-25, 603; Sr-90 RC-306, 303, 309, 304; Tc-99 RC-24, 604; Am-241, Cm-244 EP-80, 91, 92, 93, 5; Se-79 Lab Specific		

Chain of Possession Relinquished By (Sign and Print Names)	Date	Time	Received By
R.T. Sickle	3/1/94	1200	DL Edwards
DL Edwards	3/4/94	0810	
	3-7-94	*	Kermit Blum K. Blum

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

LABORATORY SECTION	Received By	Title	Date/Time
Final Sample Disposition	Disposal Method:	Disposed by:	Date/Time:

* Received @ TMA/NORCAL 3-5-94; opened 3-7-94 .KB

0019

Westinghouse Hanford Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

006229

Collector R.T. Sickle
Company Contact C.A. Rowley
Telephone 372-3293
SAF No. 93-263
Project Designation 216-U-8 Vitrified Clay Pipeline
Sampling Locations 216-U-8 Crib
Ice Chest No.
Bill of Lading/Airbill No. 140 213 8144
Offsite Property No.
Method of Shipment Air Overnight
Field Logbook No.
Shipped to TMA
SPECIAL INSTRUCTIONS
Possible Sample Hazards/Remarks None Detected
Special Handling and/or Storage Keep cool

Sample Number	*	Date Collected	Time	Number and Type of Containers	Analysis Required		Preservative
BOBFM6	S	3-2-94	0800	(1) 250ml Gs ✓	VOA	CLP	
BOBFH5	S	3-2-94	1325	(1) 250ml Gs ✓	VOA	CLP	
BOBFH5	S			(1) 250ml aG ✓	Semi-VOA	CLP	
BOBFH5	S			(1) 250ml Poly ✓	Metals -CLP TAL Titanium Mercury	CPL	
BOBFH5	S			(1) 125ml G ✓	Anions F, Cl, SO_4	EPA 300.0	
BOBFH5	S			(1) 125ml P/G ✓	NO_2 NO_3	EPA 353.2	
~~BOBFH5~~	~~S~~			~~(1) 250ml aGs~~	~~PCB/Pest~~ 2-23-94	~~8080~~	
BOBFH5	S			(1) 125ml G ✓	Cyanide	CPL	
BOBFH5	S			(1) 125ml Gs ✓	Kerosene	8015M	
BOBFH5	S			(1) 1000ml Poly ✓	Gross Alpha/Beta EP-10; Gamma Spec. Cs-134/137, Co-60, K-40, Eu-152/154/155, Ru-106, Na-22 RC-30; Total Uranium EA-01C; U-235/234/238 EP-70, 71, 5; Np-237 RC-101A, 622, EP-5; Pu-238/239/240 EP-80, 81, 5; I-129 RC-25, 603; Sr-90 RC-306, 303, 309, 304; Tc-99 RC-24, 604; Am-241, Cm-244 EP-80, 91, 92, 93, 5; Se-79 Lab Specific		

Chain of Possession Relinquished By (Sign and Print Names)	Date	Time	Received By
R.T. Sickle	3/3/94	0800	D.L. Edwards
D.L. Edwards	3/4/94	0810	Kermit Blum K. Blum
	3-7-94	*	

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

LABORATORY SECTION	Received By	Title	Date/Time
Final Sample Disposition	Disposal Method:	Disposed by:	Date/Time:

* Received @ TMA/NORCAL 3-5-94; opened 3-7-94 · KB

0020

Westinghouse Hanford Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

006230

Collector R.T. Sickle
Company Contact C.A. Rowley
Telephone 372-3293
SAF No. 93-263
Project Designation 216-U-8 Vitrified Clay Pipeline
Sampling Locations 216-U-8 Crib
Ice Chest No. RTS
Bill of Lading/Airbill No. 140 213 8144
Offsite Property No.
Method of Shipment Air Overnight
Field Logbook No.
Shipped to TMA
SPECIAL INSTRUCTIONS
Possible Sample Hazards/Remarks None Detected
Special Handling and/or Storage Keep cool

Sample Number	*	Date Collected	Time	Number and Type of Containers	Analysis Required		Preservative
BOBFH6	S	3-2-94	1450	(1) 250ml Gs ✓	VOA	CLP	
BOBFH6	S			(1) 250ml aG ✓	Semi-VOA	CLP	
BOBFH6	S			(1) 250ml Poly ✓	Metals -CLP TAL Titanium Mercury	CPL	
BOBFH6	S			(1) 125ml G ✓	Anions F, Cl, SO_4	EPA 300.0	
BOBFH6	S			(1) 125ml P/G ✓	NO_2 NO_3	EPA 353.2	
~~BOBFH6~~	~~S~~			~~(1) 250ml aGs~~	~~PCB/Pest~~ RDH 2-23-94	~~8080~~	
BOBFH6	S			(1) 125ml G ✓	Cyanide	CPL	
BOBFH6	S			(1) 125ml Gs ✓	Kerosene	8015M	
BOBFH6	S			(1) 1000ml Poly ✓	Gross Alpha/Beta EP-10; Gamma Spec. Cs-134/137, Co-60, K-40, Eu-152/154/155, Ru-106, Na-22 RC-30; Total Uranium EA-01C; U-235/234/238 EP-70, 71, 5; Np-237 RC-101A, 622, EP-5; Pu-238/239/240 EP-80, 81, 5; I-129 RC-25, 603; Sr-90 RC-306, 303, 309, 304; Tc-99 RC-24, 604; Am-241, Cm-244 EP-80, 91, 92, 93, 5; Se-79 Lab Specific		

Chain of Possession Relinquished By (Sign and Print Names)	Date	Time	Received By
R.T. Sickle	3/3/94	0800	D.L. Edwards
D.L. Edwards	3/4/94	0810	
	3-7-94	*	Kermit Blum K. Blum

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

LABORATORY SECTION	Received By	Title	Date/Time
Final Sample Disposition	Disposal Method:	Disposed by:	Date/Time:

* Received @ TMS/NORCAL 3-5-94; opened 3-7-94 KB

L021

Westinghouse Hanford Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

006490

Collector R.T. Sickle
SAF No. 93-263
Company Contact C.A. Rowley
Project Designation 216-U-8 Vitrified Clay Pipeline
Telephone 372-3293
Sampling Locations 216-U-8 Crib
Ice Chest No.
Bill of Lading/Airbill No. 140 213 8144
Offsite Property No.
Method of Shipment Air Overnight
Field Logbook No.
Shipped to TMA
SPECIAL INSTRUCTIONS
Possible Sample Hazards/Remarks None Detected
Special Handling and/or Storage Keep cool

Sample Number	*	Date Collected	Time	Number and Type of Containers	Analysis Required		Preservative
			1300	3-2-94			
B0BFH8	S	3-2-94	~~0850~~	~~(1) 250ml Gs~~	~~VOA~~ RHR 3-2-94	CLP	
B0BFH8	S			~~(1) 250ml aG~~	~~Semi-VOA~~ RHR 3-2-94	CLP	
B0BFH8	S			(1) 250ml Poly ✓	Metals -CLP TAL Titanium Mercury	CPL	
B0BFH8	S			(1) 125ml G ✓	Anions F, Cl, SO_4	EPA 300.0	
B0BFH8	S			(1) 125ml P/G ✓	NO_2 NO_3	EPA 353.2	
~~B0BFH8~~	~~S~~			~~(1) 250ml aGs~~	~~PCB/Pest~~ RHR 2-23-94	~~8080~~	
B0BFH8	S			(1) 125ml G ✓	Cyanide	CPL	
B0BFH8	S			~~(1) 125ml Gs~~	~~Kerosene~~ RHR 3-2-94	8015M	
B0BFH8	S			(1) 1000ml Poly ✓	Gross Alpha/Beta EP-10; Gamma Spec. Cs-134/137, Co-60, K-40, Eu-152/154/155, Ru-106, Na-22 RC-30; Total Uranium EA-01C; U-235/234/238 EP-70, 71, 5; Np-237 RC-101A, 622, EP-5; Pu-238/239/240 EP-80, 81, 5; I-129 RC-25, 603; Sr-90 RC-306, 303, 309, 304; Tc-99 RC-24, 604; Am-241, Cm-244 EP-80, 91, 92, 93, 5; Se-79 Lab Specific		

Chain of Possession Relinquished By (Sign and Print Names)	Date	Time	Received By
R.T. Sickle R.T. Sickle	3/3/94	0800	DL Edwards
DL Edwards	3/4/94	0810	
	3-7-94 *		Kermit Blum K. Blum

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

LABORATORY SECTION	Received By	Title	Date/Time
Final Sample Disposition	Disposal Method:	Disposed by:	Date/Time:

* Received @ TMA/NORCAL 3-5-94; opened 3-7-94 KB

SURFACE

0022

9713524.2351

ATTACHMENT 5

DATA VALIDATION SUPPORTING DOCUMENTATION

GENERAL CHEMISTRY DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E

PROJECT: 200-UP-2		DATA PACKAGE: B09WF8-TMA-727	
VALIDATOR: [illegible]	LAB: TMA	DATE: 05/10/94	
CASE:		SDG: B09WF8-TMA-727	

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

B09WF8

B0BFH1

B0BFH5

B0BFH6

B0BFH8

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:

0024

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:

5. ACCURACY

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

6. PRECISION

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

GENERAL CHEMISTRY DATA VALIDATION CHECKLIST

Comments: See comments on last page of checklist.

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:

GENERAL CHEMISTRY DATA VALIDATION CHECKLIST

Comments (attach additional sheets as necessary):

lab dup 5/10/94

The lab narrative states that the RPD for sulfate was exceeded. However, the sample result is less than 5x CRDL (CRDL=5mg/kg) and the difference between the sample and duplicate result is less than 2xCRDL. Therefore, the duplicate result is acceptable and no qualification is required.

Sample locations are not currently available. Field QC will be validated in the final summary report.

5/10/94

HOLDING TIME SUMMARY

B09WF8-TMA-727

SDG:	VALIDATOR:	DATE: 5/10/94	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
B09WF8	Anions	3/02/94	3/24/94	3/24/94	22	Ø	None
B0BFH1	↓	2/28/94	↓	↓	24	↓	↓
B0BFH5	↓	3/02/94	↓	↓	22	↓	↓
B0BFH6	↓	3/02/94	↓	↓	22	↓	↓
5/10/94 B0BF~~8~~H8	↓	3/02/94	↓	↓	22	↓	↓
B09WF8	NO_2/NO_3	3/02/94	3/16/94	3/17/94	14	1	None
B0BFH1	↓	2/28/94	↓	↓	16	1	↓
B0BFH5	↓	3/02/94	↓	↓	14	1	↓
B0BFH6	↓	3/02/94	↓	↓	14	1	↓
B0BFH8	↓	3/02/94	↓	↓	14	1	↓

9713524.2357

MEMORANDUM

MAY 1994
RECEIVED
TQO

TO: 200-UP-2 Project QA Record

March 18, 1994

FR: Christina Jensen, Golder Associates Inc.

RE: GENERAL CHEMISTRY DATA VALIDATION SUMMARY FOR DATA PACKAGE ~~B0BFF4-TMA-733~~ (923-E418 TMA733W.UP2)
B0BFH4-TMA-733 JMD 6/21/94

INTRODUCTION

This memo presents the results of data validation on data package B0BFF4-TMA-733 prepared by the Thermo Analytical laboratory. The samples validated along with the analyses reported and the methods of analysis are provided in the following table.

SAMPLE ID	SAMPLE DATE	MEDIA	ANALYSIS
B0BFH2 B0BFH4	03/01/94 03/02/94	SOIL SOIL	SEE NOTE 1

Notes: 1. The sample were analyzed for nitrate/nitrite and anions (chloride, fluoride 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 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.

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

Data Package ID: B0BFH4-TMA-733 Analysis: GENERAL CHEMISTRY

Completeness. The data package was complete for all requested analyses. A total of two samples were validated in this data package with a total of 8 determinations reported, all of which were deemed valid. This results in a completeness of 100 percent which meets normal work plan objectives 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.

Matrix Spike Recovery

- The matrix spike recovery was unacceptable for fluoride. Attachment 2 provides a summary of the data qualification applied.

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.

9713524.2359

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.

9713524.2361

Attachment 2

Summary of Data Qualifications

DATA QUALIFICATION SUMMARY

SDG:	VALIDATOR: Clausen	DATE: 5/18/94	PAGE 1 OF 1
COMMENTS: Ammo / NO2/NO3 plug B0FFH4-TMA-733			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Fluoride	UJ	B0FFH4, B0FFH2	MS %R < 75>32

06

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Attachment 3

Qualified Data Summary and Annotated Laboratory Reports

Validated Data Summary, Data Package: BOBFH4-TMA-733

	Samp#	BOBFH2		BOBFH4	
	Date	3-1-94		3-2-94	
	Location	---		---	
	Depth	---		---	
	Type	SOIL		SOIL	
	Comments	---		---	
Parameter	Units	Result	Q	Result	Q
CHLORIDE	MG/KG	5.300		3.900	
FLUORIDE	MG/KG	0.500	UJ	0.500	UJ
SULFATE	MG/KG	13.000		11.000	
NITRATE+NITRITE	MG-N/KG	48.900		66.400	

Verified
5/20/94

9713524.2364

.08

9713524.2365

 *** T M A *** REPORT Work Order # S4-03-124

Received: 03/10/94 Results by Sample

①

SAMPLE ID B0BFH2 SAMPLE # 01 FRACTIONS: A
Date & Time Collected 03/01/94 08:00:00 Category SOIL

NITR_S 48.9 mg N/kg 4.86 5/18/94

SAMPLE ID B0BFH2D SAMPLE # 01 FRACTIONS: B
Date & Time Collected 03/01/94 08:00:00 Category SOIL

NITR_S 50.1 mg N/kg

SAMPLE ID B0BFH2S SAMPLE # 01 FRACTIONS: C
Date & Time Collected 03/01/94 08:00:00 Category SOIL

NITR_S 67.5 mg N/kg

SAMPLE ID B0BFH4 SAMPLE # 02 FRACTIONS: A
Date & Time Collected 03/02/94 08:50:00 Category SOIL

NITR_S 66.4 mg N/kg

SAMPLE ID LCSS SAMPLE # 03 FRACTIONS: A
Date & Time Collected not specified Category SOIL

NITR_S 2.07 mg N/L

Verified 5/18/94

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) 890-3883

9713524.2366

TMA Inc. REPORT Work Order # A4-03-039 ~~000010~~

Received: 03/09/94

Results by Sample

SAMPLE ID B0BFH2 FRACTION 03C TEST CODE WCCLPS NAME Anions in Solids

Date & Time Collected 03/01/94 Category

Q

ANIONS AND WET CHEMISTRY - SOLIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT
Chloride	300.0	5.3	mg/kg	1.0
Fluoride	300.0	<0.5	mg/kg	0.5
Sulfate	300.0	13	mg/kg	5

UJ

FORM I

verified
5/18/94

10

9713524.2367

000009

TMA Inc. REPORT Work Order # A4-03-039

Received: 03/09/94

Results by Sample

SAMPLE ID B0BFH4 FRACTION 01R TEST CODE WCCLPS NAME Anions in Solids

Date & Time Collected 03/02/94 Category

①

ANIONS AND WET CHEMISTRY - SOLIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT
Chloride	300.0	3.9	mg/kg	1.0
Fluoride	300.0	<0.5	mg/kg	0.5
Sulfate	300.0	11	mg/kg	5

UJ

FORM I

Verified
5/18/94

11

9713524.2363

Attachment 4

Laboratory Narrative and Chain-of-Custody Documentation

GENERAL CHEMISTRY RESULTS

CASE NO. 03-039

Sample #s:

B0BFH2 B0BFH4

CASE NARRATIVE

Sample B0BFH4 Matrix Spike (A4-03-039-01F) yielded a 57% recovery for Fluoride analysis which is out of TMA/ARLI control limits of 80-120%. The low recovery compared to our laboratory control sample indicated the presence of matrix interference.

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

Maureen Parrish 4/29/97

Maureen Parrish

9713524.2370

Received: 03/10/94 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.
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 has been 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
1-800-4LAB TEST FAX (617) 890-7883

Westinghouse Hanford Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	Page 1 of 1
		006226

Collector R.T. Sickle
Company Contact C.A. Rowley
Telephone 372-3293
SAF No. 93-263
Project Designation 216-U-8 Vitrified Clay Pipeline
Sampling Locations 216-U-8 Crib
Ice Chest No.
Bill of Lading/Airbill No.
Offsite Property No.
Method of Shipment Air Overnight
Field Logbook No.
Shipped to TMA
SPECIAL INSTRUCTIONS
Possible Sample Hazards/Remarks None Detected
Special Handling and/or Storage Keep cool

Sample Number	*	Date Collected	Time	Number and Type of Containers	Analysis Required		Preservative
B013F44	S	3-1-94	0800	(1) 250ml Gs	VOA	clp	
BOBFH2	S		0820	(1) 250ml Gs	VOA	CLP	
BOBFH2	S			(1) 250ml aG	Semi-VOA	CLP	
BOBFH2	S			(1) 250ml Poly	Metals -CLP TAL Titanium Mercury	CPL	
BOBFH2	S			(1) 125ml G	Anions F, Cl, SO_4	EPA 300.0	
BOBFH2	S			(1) 125ml P/G	NO_2 NO_3	EPA 353.2	
~~BOBFH2~~	~~S~~			~~(1) 250ml aGs~~	~~PCB/Pest~~ 2-27-94	~~8080~~	
BOBFH2	S			(1) 125ml G	Cyanide	CPL	
BOBFH2	S			(1) 125ml Gs	Kerosene	8015M	
BOBFH2	S			(1) 1000ml Poly	Gross Alpha/Beta EP-10; Gamma Spec. Cs-134/137, Co-60, K-40, Eu-152/154/155, Ru-106, Na-22 RC-30; Total Uranium EA-01C; U-235/234/238 EP-70, 71, 5; Np-237 RC-101A, 622, EP-5; Pu-238/239/240 EP-80, 81, 5; I-129 RC-25, 603; Sr-90 RC-306, 303, 309, 304; Tc-99 RC-24, 604; Am-241, Cm-244 EP-80, 91, 92, 93, 5; Se-79 Lab Specific		

Chain of Possession Relinquished By (Sign and Print Names)	Date	Time	Received By
R.T. Sickle	3/7/94	0740	DR Edwards
3/8/94 DR Edwards	3/8/94	0630	
	3-9-94	1015	Kermit Blum K. Blum

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

LABORATORY SECTION	Received By	Title	Date/Time
Final Sample Disposition	Disposal Method:	Disposed by:	Date/Time:

9713524.2371

0000024

Westinghouse Hanford Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	Page 1 of 1
		006228

Collector R.T. Sickle
Company Contact C.A. Rowley
Telephone 372-3293
SAF No. 93-263
Project Designation 216-U-8 Vitrified Clay Pipeline
Sampling Locations 216-U-8 Crib
Ice Chest No.
Bill of Lading/Airbill No.
Offsite Property No.
Method of Shipment Air Overnight
Field Logbook No.
Shipped to TMA
SPECIAL INSTRUCTIONS
Possible Sample Hazards/Remarks None Detected
Special Handling and/or Storage Keep cool

Sample Number	*	Date Collected	Time	Number and Type of Containers	Analysis Required		Preservative
BOBFH4	S	3-2-94	0850	(1) 250ml Gs ✓	VOA	CLP	
BOBFH4	S			(1) 250ml aG ✓	Semi-VOA	CLP	
BOBFH4	S			(1) 250ml Poly ✓	Metals -CLP TAL Titanium Mercury	CPL	
BOBFH4	S			(1) 125ml G ✓	Anions F, Cl, SO_4	EPA 300.0	
BOBFH4	S			(1) 125ml P/G ✓	NO_2 NO_3	EPA 353.2	
~~BOBFH4~~	~~S~~			~~(1) 250ml aGs~~	~~PCB/Pest~~ RLH 2-23-94	~~8080~~	
BOBFH4	S			(1) 125ml G ✓	Cyanide	CPL	
BOBFH4	S			(1) 125ml Gs ✓	Kerosene	8015M	
BOBFH4	S			(1) 1000ml Poly ✓	Gross Alpha/Beta EP-10; Gamma Spec. Cs-134/137, Co-60, K-40, Eu-152/154/155, Ru-106, Na-22 RC-30; Total Uranium EA-01C; U-235/234/238 EP-70, 71, 5; Np-237 RC-101A, 622, EP-5; Pu-238/239/240 EP-80, 81, 5; I-129 RC-25, 603; Sr-90 RC-306, 303, 309, 304; Tc-99 RC-24, 604; Am-241, Cm-244 EP-80, 91, 92, 93, 5; Se-79 Lab Specific		

Chain of Possession Relinquished By (Sign and Print Names)	Date	Time	Received By
R.T. Sickle R.T. Sickle	3/7/94	0740	D.L. Edwards
D.L. Edwards	3/8/94	0830	Kermit Blum K. Blum
	3-9-94	1015	

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

LABORATORY SECTION	Received By	Title	Date/Time
Final Sample Disposition	Disposal Method:	Disposed by:	Date/Time:

9713524.2372

000028

6

9713524.2373

Attachment 5

Data Validation Supporting Documentation

GENERAL CHEMISTRY DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	(E)

PROJECT: 200ID2	DATA PACKAGE: BOBFH4-TMA-733	
VALIDATOR: CJ Lewis	LAB: TMA	DATE: 5/18/94
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 BOBFH2, BOBFH4, ~~BOBFL4~~ 9514941 / Soils

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: Verification performed by WHC.

2. HOLDING TIMES

Are sample holding times acceptable? . . . . . (Yes) No N/A

Comments:

18

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: Anion initial calibration performed on 3/2/94, however sufficient QC samples were analyzed with the samples, all within control limits / %R.

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:

5. ACCURACY

Were spike samples analyzed at the required frequency? . . . . (Yes) No N/A
Are spike recoveries acceptable? . . . . . Yes (No) N/A
Were LCS analyses performed at the required frequency? . . . . (Yes) No N/A
Are LCS recoveries acceptable? . . . . . (Yes) No N/A
Comments: The Fl spike recovery was 57% and the laboratory case narrative indicated possible matrix interference, sample results qualified 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)

19

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:

HOLDING TIME SUMMARY

SDG:		VALIDATOR: C. Jensen			DATE: 5/18/94		PAGE 1 OF 1
COMMENTS: Pkg BOBFH4-TWA-733 TWP7							
FIELD SAMPLE ID	ANALYSIS TYPE	DATE SAMPLED	DATE PREPARED	DATE ANALYZED	PREP. HOLDING TIME, DAYS	ANALYSIS HOLDING TIME, DAYS	QUALIFIER
BOBFH2	IC	3/1/94	3/27/94	3/27/94	26	0	none
BOBFH4	Anions	3/2/94	↓	↓	↓	↓	↓
BOBFH2	NO2/NO3	3/1/94	3/16/94	3/18/94	15	2	none
BOBFH4	↓	3/2/94	↓	↓	↓	↓	↓

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9713524.2378

000013

TMA Inc. REPORT Work Order # A4-03-039

Received: 03/09/94

Results by Sample

SAMPLE ID B0BFH4 MS FRACTION 01F TEST CODE WCQCS NAME Quality Control Summary

Date & Time Collected 03/02/94 Category

SPIKE QC SUMMARY

ANALYSIS	SAMPLE ID	SAMPLE RESULT	SPIKE RESULT	AMOUNT ADDED	% R
Chloride	B0BFH4 MS	3.9	31.8	25.0	112
Fluoride	B0BFH4 MS	0.4	14.6	25.0	57
Sulfate	B0BFH4 MS	11	119	99.9	108

FORM V

matrix spike for Fl outside limits

5/18/94

22

9713524.2379

MEMORANDUM

MAY 1994 RECEIVED TQO

TO: 200-UP-2 Project QA Record

May 19, 1994

FR: Christina Jensen, Golder Associates Inc.

RE: SEMIVOLATILE ORGANIC DATA VALIDATION SUMMARY FOR DATA PACKAGE: B0BFH4-TMA-733 (923-E418 TMA733S.UP2)

INTRODUCTION

This memorandum presents the results of data validation on data package B0BFH4-TMA-733 prepared by Thermo Analytical 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
B0BFH2 B0BFH4	03/01/94 03/02/94	SOIL SOIL SOIL	SEE NOTE 1

Notes: 1. All samples were analyzed for CLP 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.

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.

RECEIVED MAY 31 1994 VALIDATION DOCUMENTATION SDLA

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

- Di-n-butylphthalate was 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 sample(s) and determined to be valid, resulting in qualification of the results as presumptive and valid (JN).
- TICs were detected in the sample(s) 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 sample(s) 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 sample(s) and identified as common laboratory contaminants, resulting in qualification of the results as unusable (R) as shown in Attachment 3.
- Two TICs reported by the laboratory as "unknown hydrocarbon" have been corrected to "sulfur" following review of the spectra and qualified as estimated and presumptive (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 INORGANIC DATA REPORTING QUALIFIERS

B - Indicates the constituent was analyzed for and detected. The concentration reported is less than the contract required detection limit (CRDL) but greater than the instrument detection limit (IDL). The associated data should be considered usable for decision making purposes.

U - Indicates the constituent was analyzed for and not detected. The concentration reported is the sample detection limit corrected for aliquot size, dilution and percent solids (in the case of solid matrices) by the laboratory. The associated data should be considered usable for decision making purposes.

UJ - Indicates the constituent was analyzed for and not detected. Due to a minor quality control deficiency identified during data validation the concentration may not accurately reflect the sample detection limit. The associated data have been qualified as estimated but should be considered usable for decision making purposes.

BJ - Indicates the constituent was analyzed for and detected at a concentration less than the contract required detection limit (CRDL) but greater than the instrument detection limit (IDL). Due to a minor quality control deficiency identified during data validation the associated data have been qualified as estimated, but should be considered usable for decision making purposes.

J - Indicates the constituent was analyzed for and detected. Due to a minor quality control deficiency identified during data validation the associated data have been qualified as estimated, but should be considered usable for decision making purposes.

UR - Indicates the constituent was analyzed for and not detected. Due to a major quality control deficiency identified during data validation, the associated data have been qualified as unusable for decision making purposes.

R - Indicates the constituent was analyzed for and detected. Due to a major quality control deficiency identified during data validation, the associated data have been qualified as unusable for decision making purposes.

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Attachment 2

Summary of Data Qualifications

DATA QUALIFICATION SUMMARY

SDG:	VALIDATOR: C Ellison	DATE: 5/19/94	PAGE 1 OF 1
COMMENTS: SVOA BOBFH4 - TMA-733			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Di-n-butylphthalate	U	BOBFH2, BOBFH4	Blank Contaminant

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Attachment 3

Qualified Data Summary and Annotated Laboratory Reports

Validated Data Summary, Data Package: BOBFH4-TMA-733

	Samp#	BOBFH2		BOBFH4	
	Date	3-1-94		3-2-94	
	Location	---		---	
	Depth	---		---	
	Type	SOIL		SOIL	
	Comments	---		---	
Parameter	Units	Result	Q	Result	Q
PHENOL	UG/KG	380.000	U	350.000	U
BIS(2-CHLOROETHYL)ETHER	UG/KG	380.000	U	350.000	U
2-CHLOROPHENOL	UG/KG	380.000	U	350.000	U
1,3-DICHLOROBENZENE	UG/KG	380.000	U	350.000	U
1,4-DICHLOROBENZENE	UG/KG	380.000	U	350.000	U
1,2-DICHLOROBENZENE	UG/KG	380.000	U	350.000	U
2-METHYLPHENOL	UG/KG	380.000	U	350.000	U
2,2'-OXYBIS(1-CHLOROPROPANE)	UG/KG	380.000	U	350.000	U
4-METHYLPHENOL	UG/KG	380.000	U	350.000	U
N-NITROSO-DI-N-PROPYLAMINE	UG/KG	380.000	U	350.000	U
HEXACHLOROETHANE	UG/KG	380.000	U	350.000	U
NITROBENZENE	UG/KG	380.000	U	350.000	U
ISOPHORONE	UG/KG	380.000	U	350.000	U
2-NITROPHENOL	UG/KG	380.000	U	350.000	U
2,4-DIMETHYLPHENOL	UG/KG	380.000	U	350.000	U
BIS(2-CHLOROETHOXY)METHANE	UG/KG	380.000	U	350.000	U
2,4-DICHLOROPHENOL	UG/KG	380.000	U	350.000	U
1,2,4-TRICHLOROBENZENE	UG/KG	380.000	U	350.000	U
NAPHTHALENE	UG/KG	380.000	U	350.000	U
4-CHLOROANILINE	UG/KG	380.000	U	350.000	U
HEXACHLOROBUTADIENE	UG/KG	380.000	U	350.000	U
4-CHLORO-3-METHYLPHENOL	UG/KG	380.000	U	350.000	U
2-METHYLNAPHTHALENE	UG/KG	380.000	U	350.000	U
HEXACHLOROCYCLOPENTADIENE	UG/KG	380.000	U	350.000	U
2,4,6-TRICHLOROPHENOL	UG/KG	380.000	U	350.000	U
2,4,5-TRICHLOROPHENOL	UG/KG	920.000	U	850.000	U
2-CHLORONAPHTHALENE	UG/KG	380.000	U	350.000	U
2-NITROANILINE	UG/KG	920.000	U	850.000	U
DIMETHYLPHTHALATE	UG/KG	380.000	U	350.000	U
ACENAPHTHYLENE	UG/KG	380.000	U	350.000	U
3-NITROANILINE	UG/KG	920.000	U	850.000	U
ACENAPHTHENE	UG/KG	380.000	U	350.000	U

Verified
5/20/94

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Validated Data Summary, Data Package: BOBFH4-TMA-733

	Samp#	BOBFH2		BOBFH4	
	Date	3-1-94		3-2-94	
	Location	---		---	
	Depth	---		---	
	Type	SOIL		SOIL	
	Comments	---		---	
Parameter	Units	Result	Q	Result	Q
2,4-DINITROPHENOL	UG/KG	920.000	U	850.000	U
4-NITROPHENOL	UG/KG	920.000	U	850.000	U
DIBENZOFURAN	UG/KG	380.000	U	350.000	U
2,4-DINITROTOLUENE	UG/KG	380.000	U	350.000	U
2,6-DINITROTOLUENE	UG/KG	380.000	U	350.000	U
DIETHYLPHTHALATE	UG/KG	380.000	U	350.000	U
4-CHLOROPHENYL-PHENYLETHER	UG/KG	380.000	U	350.000	U
FLUORENE	UG/KG	380.000	U	350.000	U
4-NITROANILINE	UG/KG	920.000	U	850.000	U
4,6-DINITRO-2-METHYLPHENOL	UG/KG	920.000	U	850.000	U
N-NITROSODIPHENYLAMINE	UG/KG	380.000	U	350.000	U
4-BROMOPHENYL-PHENYLETHER	UG/KG	380.000	U	350.000	U
HEXACHLOROBENZENE	UG/KG	380.000	U	350.000	U
PENTACHLOROPHENOL	UG/KG	41.000	J	850.000	U
PHENANTHRENE	UG/KG	380.000	U	350.000	U
ANTHRACENE	UG/KG	380.000	U	350.000	U
CARBAZOLE	UG/KG	380.000	U	350.000	U
DI-N-BUTYLPHTHALATE	UG/KG	520.000	U	490.000	U
FLUORANTHENE	UG/KG	380.000	U	350.000	U
PYRENE	UG/KG	380.000	U	350.000	U
BUTYLBENZYLPHTHALATE	UG/KG	380.000	U	350.000	U
3,3'-DICHLOROBENZIDINE	UG/KG	380.000	U	350.000	U
BENZO(A)ANTHRACENE	UG/KG	380.000	U	350.000	U
BIS(2-ETHYLHEXYL)PHTHALATE	UG/KG	380.000	U	350.000	U
CHRYSENE	UG/KG	380.000	U	350.000	U
DI-N-OCTYLPHTHALATE	UG/KG	380.000	U	350.000	U
BENZO(B)FLUORANTHENE	UG/KG	380.000	U	350.000	U
BENZO(K)FLUORANTHENE	UG/KG	380.000	U	350.000	U
BENZO(A)PYRENE	UG/KG	380.000	U	350.000	U
INDENO(1,2,3-CD)PYRENE	UG/KG	380.000	U	350.000	U
DIBENZ(A,H)ANTHRACENE	UG/KG	380.000	U	350.000	U
BENZO(G,H,I)PERYLENE	UG/KG	380.000	U	350.000	U

Verified
5/20/94

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1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B0BFH2

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 03039 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A403039-03B

Sample wt/vol: 30.5 (g/mL) G Lab File ID: 40330I18

Level: (low/med) LOW Date Received: 03/09/94

% Moisture: 14 decanted: (Y/N) N Date Extracted: 03/15/94

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 03/31/94

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 5.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-95-2	Phenol	380	U
111-44-4	bis(2-Chloroethyl)Ether	380	U
95-57-8	2-Chlorophenol	380	U
541-73-1	1,3-Dichlorobenzene	380	U
106-46-7	1,4-Dichlorobenzene	380	U
95-50-1	1,2-Dichlorobenzene	380	U
95-48-7	2-Methylphenol	380	U
108-60-1	2,2'-oxybis(1-Chloropropane)	380	U
106-44-5	4-Methylphenol	380	U
621-64-7	N-Nitroso-Di-n-Propylamine	380	U
67-72-1	Hexachloroethane	380	U
98-95-3	Nitrobenzene	380	U
78-59-1	Isophorone	380	U
88-75-5	2-Nitrophenol	380	U
105-67-9	2,4-Dimethylphenol	380	U
111-91-1	bis(2-Chloroethoxy)Methane	380	U
120-83-2	2,4-Dichlorophenol	380	U
120-82-1	1,2,4-Trichlorobenzene	380	U
91-20-3	Naphthalene	380	U
106-47-8	4-Chloroaniline	380	U
87-68-3	Hexachlorobutadiene	380	U
59-50-7	4-Chloro-3-Methylphenol	380	U
91-57-6	2-Methylnaphthalene	380	U
77-47-4	Hexachlorocyclopentadiene	380	U
88-06-2	2,4,6-Trichlorophenol	380	U
95-95-4	2,4,5-Trichlorophenol	920	U
91-58-7	2-Chloronaphthalene	380	U
88-74-4	2-Nitroaniline	920	U
131-11-3	Dimethylphthalate	380	U
208-96-8	Acenaphthylene	380	U
99-09-2	3-Nitroaniline	920	U
83-32-9	Acenaphthene	380	U
51-28-5	2,4-Dinitrophenol	920	U

verified 5/19/94

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1C

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B0BFH2

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 03039 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A403039-03B

Sample wt/vol: 30.5 (g/mL) G Lab File ID: 40330I18

Level: (low/med) LOW Date Received: 03/09/94

% Moisture: 14 decanted: (Y/N) N Date Extracted: 03/15/94

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 03/31/94

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 5.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-02-7	4-Nitrophenol	920	U
132-64-9	Dibenzofuran	380	U
121-14-2	2,4-Dinitrotoluene	380	U
606-20-2	2,6-Dinitrotoluene	380	U
84-66-2	Diethylphthalate	380	U
7005-72-3	4-Chlorophenyl-phenylether	380	U
86-73-7	Fluorene	380	U
100-01-6	4-Nitroaniline	920	U
534-52-1	4,6-Dinitro-2-methylphenol	920	U
86-30-6	N-Nitrosodiphenylamine (1)	380	U
101-55-3	4-Bromophenyl-phenylether	380	U
118-74-1	Hexachlorobenzene	380	U
87-86-5	Pentachlorophenol	41	J
85-01-8	Phenanthrene	380	U
120-12-7	Anthracene	380	U
86-74-8	Carbazole	380	U
84-74-2	Di-n-Butylphthalate	520	~~B~~ U
206-44-0	Fluoranthene	380	U
129-00-0	Pyrene	380	U
85-68-7	Butylbenzylphthalate	380	U
91-94-1	3,3'-Dichlorobenzidine	380	U
56-55-3	Benzo(a)Anthracene	380	U
117-81-7	bis(2-Ethylhexyl)Phthalate	380	U
218-01-9	Chrysene	380	U
117-84-0	Di-n-Octyl Phthalate	380	U
205-99-2	Benzo(b)Fluoranthene	380	U
207-08-9	Benzo(k)Fluoranthene	380	U
50-32-8	Benzo(a)Pyrene	380	U
193-39-5	Indeno(1,2,3-cd)Pyrene	380	U
53-70-3	Dibenz(a,h)Anthracene	380	U
191-24-2	Benzo(g,h,i)Perylene	380	U

(1) - Cannot be separated from Diphenylamine

Q

FORM I SV-2

Verified 95/19/94

3/90 012

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1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B0BFH2

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 03039 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A403039-03B

Sample wt/vol: 30.5 (g/mL) G Lab File ID: 40330I18

Level: (low/med) LOW Date Received: 03/09/94

% Moisture: 14 decanted: (Y/N) N Date Extracted: 03/15/94

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 03/31/94

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 5.0

Number TICs found: 20

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q	Q
1.	UNKNOWN HYDROCARBON	5.53	1900	~~BJ~~	UR
2.	UNKNOWN HYDROCARBON	5.77	2000	~~J~~	~~UR~~
3.	UNKNOWN KETONE	6.03	720	~~BJ~~	UR
4.	UNKNOWN HYDROCARBON	7.65	230	~~J~~	JN
5.	UNKNOWN HYDROCARBON	7.90	270	~~J~~	JN
6.	PROPANOIC ACID ESTER ISOMER	10.17	230	~~J~~	R
7.	UNKNOWN ALKANE	11.35	270	~~J~~	JN
8.	UNKNOWN ALKANE	13.17	530	~~J~~	JN
9.	UNKNOWN ALKANE	13.98	800	~~J~~	JN
10.	UNKNOWN ALKANE	14.50	500	~~J~~	JN
11. 126-73-8	PHOSPHORIC ACID TRIBUTYL EST	16.27	270	JN	
12.	UNKNOWN PCB	21.03	530	~~J~~	JN
13.	~~UNKNOWN HYDROCARBON~~ Sulfur	21.20	690	~~J~~	JN
14.	UNKNOWN PCB	21.50	650	~~J~~	JN
15.	UNKNOWN PCB	22.03	270	~~J~~	JN
16.	UNKNOWN PCB	22.67	190	~~J~~	JN
17.	UNKNOWN PCB	22.75	340	~~J~~	JN
18.	UNKNOWN PCB	23.25	190	~~J~~	JN
19.	UNKNOWN PCB	23.68	270	~~J~~	JN
20.	UNKNOWN ALKANE	27.93	190	~~J~~	JN

verified
GS 1/9/94

FORM I SV-TIC 3/90

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1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B0BFH4

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 03039 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A403039-01B

Sample wt/vol: 30.2 (g/mL) G Lab File ID: 40330I15

Level: (low/med) LOW Date Received: 03/09/94

% Moisture: 7 decanted: (Y/N) N Date Extracted: 03/15/94

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 03/30/94

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 4.2

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

0-14

verified 5/19/94

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1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B0BFH4

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 03039 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A403039-01B

Sample wt/vol: 30.2 (g/mL) G Lab File ID: 40330I15

Level: (low/med) LOW Date Received: 03/09/94

% Moisture: 7 decanted: (Y/N) N Date Extracted: 03/15/94

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 03/30/94

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 4.2

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	490	~~B~~ 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 5/16/94

FORM I SV-2

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~~000086~~
EPA SAMPLE NO.

1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

B0BFH4

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 03039 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A403039-01B

Sample wt/vol: 30.2 (g/mL) G Lab File ID: 40330I15

Level: (low/med) LOW Date Received: 03/09/94

% Moisture: 7 decanted: (Y/N) N Date Extracted: 03/15/94

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 03/30/94

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 4.2

Number TICs found: 10

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q	Q
1.	UNKNOWN HYDROCARBON	5.55	1900	~~BJ~~	UR
2.	UNKNOWN HYDROCARBON	5.82	180	~~BJ~~	UR
3.	UNKNOWN HYDROCARBON	6.05	390	~~BJ~~	UR
4.	PROPANOIC ACID ESTER ISOMER	15.65	1000	~~BJ~~	UJN
5. 126-73-8	PHOSPHORIC ACID TRIBUTYL EST	16.28	390	JN	
6.	~~UNKNOWN HYDROCARBON~~ Sulfur	21.22	820	~~J~~	JN
7.	UNKNOWN HYDROCARBON	25.22	110	~~J~~	R
8.	UNKNOWN ALKANE	26.40	110	~~J~~	JN
9.	UNKNOWN ALKANE	27.95	210	~~J~~	JN
10.	UNKNOWN ALKANE	29.92	71	~~J~~	JN

Q

Verified
5/19/94

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Attachment 4

Laboratory Narrative and Chain-of-Custody Documentation

Westinghouse Hanford Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	Page 1 of 1
		006226

Collector R.T. Sickle
Company Contact C.A. Rowley
Telephone 372-3293
SAF No. 93-263
Project Designation 216-U-8 Vitrified Clay Pipeline
Sampling Locations 216-U-8 Crib
Ice Chest No.
Bill of Lading/Airbill No.
Offsite Property No.
Method of Shipment Air Overnight
Field Logbook No.
Shipped to TMA
SPECIAL INSTRUCTIONS
Possible Sample Hazards/Remarks None Detected
Special Handling and/or Storage Keep cool

Sample Number	*	Date Collected	Time	Number and Type of Containers	Analysis Required		Preservative
B0BFH4	S	3-1-94	0800	(1) 250ml Gs	VOA	CLP	
B0BFH2	S		0820	(1) 250ml Gs	VOA	CLP	
B0BFH2	S			(1) 250ml aG	Semi-VOA	CLP	
B0BFH2	S			(1) 250ml Poly	Metals -CLP TAL Titanium Mercury	CPL	
B0BFH2	S			(1) 125ml G	Anions F, Cl, SO_4	EPA 300.0	
B0BFH2	S			(1) 125ml P/G	NO_2 NO_3	EPA 353.2	
~~B0BFH2~~	~~S~~			~~(1) 250ml aGs~~	~~PCB/Pest~~ 2-27-94	~~8080~~	
B0BFH2	S			(1) 125ml G	Cyanide	CPL	
B0BFH2	S			(1) 125ml Gs	Kerosene	8015M	
B0BFH2	S			(1) 1000ml Poly	Gross Alpha/Beta EP-10; Gamma Spec. Cs-134/137, Co-60, K-40, Eu-152/154/155, Ru-106, Na-22 RC-30; Total Uranium EA-01C; U-235/234/238 EP-70, 71, 5; Np-237 RC-101A, 622, EP-5; Pu-238/239/240 EP-80, 81, 5; I-129 RC-25, 603; Sr-90 RC-306, 303, 309, 304; Tc-99 RC-24, 604; Am-241, Cm-244 EP-80, 91, 92, 93, 5; Se-79 Lab Specific		

Chain of Possession (Sign and Print Names) Relinquished By	Date	Time	Received By
R.T. Sickle	3/7/94	0740	D.R. Edwards
3/8/94 D.R. Edwards	3/8/94	0930	
	3-9-94	1015	Kermit Blum K. Blum

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

LABORATORY SECTION	Received By	Title	Date/Time
Final Sample Disposition	Disposal Method:	Disposed by:	Date/Time:

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8 of 18

Westinghouse Hanford Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	Page 1 of 1 006228

Collector R.T. Sickle
Company Contact C.A. Rowley
Telephone 372-3293
SAF No. 93-263
Project Designation 216-U-8 Vitrified Clay Pipeline
Sampling Locations 216-U-8 Crib
Ice Chest No.
Bill of Lading/Airbill No.
Offsite Property No.
Method of Shipment Air Overnight
Field Logbook No.
Shipped to TMA
SPECIAL INSTRUCTIONS
Possible Sample Hazards/Remarks None Detected
Special Handling and/or Storage Keep cool

Sample Number	*	Date Collected	Time	Number and Type of Containers	Analysis Required		Preservative
B0BFH4	S	3-2-94	0850	(1) 250ml Gs ✓	VOA	CLP	
B0BFH4	S			(1) 250ml aG ✓	Semi-VOA	CLP	
B0BFH4	S			(1) 250ml Poly ✓	Metals -CLP TAL Titanium Mercury	CPL	
B0BFH4	S			(1) 125ml G ✓	Anions F, Cl, SO_4	EPA 300.0	
B0BFH4	S			(1) 125ml P/G ✓	NO_2 NO_3	EPA 353.2	
~~B0BFH4~~	~~S~~			~~(1) 250ml aGs~~	~~PCB/Pest~~ RHH 3-23-94	~~8080~~	
B0BFH4	S			(1) 125ml G ✓	Cyanide	CPL	
B0BFH4	S			(1) 125ml Gs ✓	Kerosene	8015M	
B0BFH4	S			(1) 1000ml Poly ✓	Gross Alpha/Beta EP-10; Gamma Spec. Cs-134/137, Co-60, K-40, Eu-152/154/155, Ru-106, Na-22 RC-30; Total Uranium EA-01C; U-235/234/238 EP-70, 71, 5; Np-237 RC-101A, 622, EP-5; Pu-238/239/240 EP-80, 81, 5; I-129 RC-25, 603; Sr-90 RC-306, 303, 309, 304; Tc-99 RC-24, 604; Am-241, Cm-244 EP-80, 91, 92, 93, 5; Se-79 Lab Specific		

Chain of Possession Relinquished By (Sign and Print Names)	Date	Time	Received By
R.T. Sickle R.T. Sickle	3/7/94	0740	D.L. Edwards
D.L. Edwards	3/8/94	0830	Kermit Blum K. Blum
	3-9-94	1015	

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

LABORATORY SECTION	Received By	Title	Date/Time
Final Sample Disposition	Disposal Method:	Disposed by:	Date/Time:

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CASE NARRATIVE

LABORATORY : TMA/ARLI

CASE : 03-039

CONTRACT ID : WESTINGHOUSE HANFORD COMPANY

SDG RECEIPT DATE : March 09, 1994

1.0 DESCRIPTION OF CASE :

Three 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
B0BFH4	A4-03-039-01A	V	SOIL
B0BFH4	A4-03-039-01B	SV	SOIL
B0BFH4 MS	A4-03-039-01C	SV	SOIL
B0BFH4 MSD	A4-03-039-01D	SV	SOIL
B0BFH4	A4-03-039-01G	K	SOIL
B0BFL4	A4-03-039-02A	V	SOIL
B0BFL4 MS	A4-03-039-02B	V	SOIL
B0BFL4 MSD	A4-03-039-02C	V	SOIL
B0BFH2	A4-03-039-03A	V	SOIL
B0BFH2	A4-03-039-03B	SV	SOIL
B0BFH2	A4-03-039-03E	K	SOIL
B0BFH2 MS	A4-03-039-03F	K	SOIL
B0BFH2 MSD	A4-03-039-03G	K	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.

Several TCL analytes were detected at various concentrations above or below the CRQL in each of the samples, including the blank, MS, and MSD.

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

TUNES :

All BFB tunes were injected directly into the GC/MS instrument.

3.2.2 SEMIVOLATILE ANALYSIS COMMENTS :

LOW LEVEL SOIL :

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

Pentachlorophenol was detected at a concentration that exceeded the calibration range of the instrument in sample B0BFH4MSD. Therefore, the analyte was "E" qualified.

The matrix spike recoveries of 2,4-Dinitrotoluene were slightly above the QC limits for both the MS and the MSD samples. The high recoveries were attributed to an efficient extraction and analysis. 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.

3.2.3 EXTRACTABLE HYDROCARBONS "KEROSENE RANGE" COMMENTS :

SEQUENCE NOTES :

The sequence was started on 03/26/94 and was analyzed according to the SW-846 Method 8015M. The %RSD in the all of the initial calibrations and the %D in the continuing calibrations were below their 20% and 15% limits, respectively.

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

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 surrogate o-Terphenyl was added to each sample, and the recoveries ranged from 68% to 77%.

000074

- The matrix spike and matrix spike duplicate recoveries for Kerosene were 73% and 77%, respectively.

  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 5/2/94
Program Manager

Maureen Parrish
Program Manager

9713524.2401

Attachment 5

Data Validation Supporting Documentation

GC/MS ORGANIC DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E

PROJECT: 200-UP2	DATA PACKAGE:	
VALIDATOR: C Jensen	LAB: TMA	DATE: 5/19/94
~~CAS#~~ RKA: B0BFH4-TMA-733	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 soils B0BFH2, B0BFH4

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: Verification performed by WHC.

2. HOLDING TIMES

Are sample holding times acceptable? . . . . . (Yes) No N/A

Comments:

GC/MS ORGANIC DATA VALIDATION CHECKLIST

3. INSTRUMENT TUNING AND CALIBRATION

Is the GC/MS tuning/performance check acceptable? . . . . . (Yes) No N/A

Are initial calibrations acceptable? . . . . . (Yes) No N/A

Are continuing calibrations acceptable? . . . . . (Yes) No N/A

Comments:

4. BLANKS

Were laboratory blanks analyzed? . . . . . (Yes) No N/A

Are laboratory blank results acceptable? . . . . . Yes (No) N/A

Were field/trip blanks analyzed? . . . . . Yes No (N/A)

Are field/trip blank results acceptable? . . . . . Yes No (N/A)

Comments: The SBLK reported dibutylphthalate and bis2ethylhexylphthalate and TICs.
TIC @ 5.5 min was ~~tentatively~~ qualified R, Retone; aldol product of acetone.
TIC @ 5.4 min was qualified R, cyclohexenone-1-one by product
~~same~~ above for TIC @ 6.03 min, R qualified.

5. ACCURACY

Were surrogates/System Monitoring Compounds analyzed? . . . . . (Yes) No N/A

Are surrogate/System Monitoring Compound recoveries acceptable? (Yes) No N/A

Were MS/MSD samples analyzed? . . . . . (Yes) No N/A

Are MS/MSD results acceptable? . . . . . (Yes) No N/A

Comments: The MS %Rs for 2,4-Dinitrotoluene were slightly >UCL and the surrogates are within limits, no qualification will be applied.

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: The laboratory reported Sulfur as an unknown hydrocarbon. The Form 1s have been corrected.

HOLDING TIME SUMMARY

SDG:	VALIDATOR: C Jensen	DATE: 5/19/94	PAGE 1 OF 1
COMMENTS: SVOA BOBFH4 THRU-733			

FIELD SAMPLE ID	ANALYSIS TYPE	DATE SAMPLED	DATE PREPARED	DATE ANALYZED	PREP. HOLDING TIME, DAYS	ANALYSIS HOLDING TIME, DAYS	QUALIFIER
9 5/19/94 ~~BOBFH4~~	SVOA	3/2/94	3/15/94	03/30/94	13	15	none
BOBFH2	SVOA	3/1/94	3/15/94	03/31/94	14	16	none.

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

9713524.2406

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1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SBLK0315S

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 03039 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A403039-BLK

Sample wt/vol: 30.3 (g/mL) G Lab File ID: 40330I14

Level: (low/med) LOW Date Received: _____

% Moisture: _____ decanted: (Y/N) N Date Extracted: 03/15/94

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 03/30/94

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
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

Verified 5/19/94

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1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SBLK0315S

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 03039 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A403039-BLK

Sample wt/vol: 30.3 (g/mL) G Lab File ID: 40330I14

Level: (low/med) LOW Date Received: _____

% Moisture: _____ decanted: (Y/N) N Date Extracted: 03/15/94

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 03/30/94

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	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	160	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	93	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

x10 = 1600

x 1930

(1) - Cannot be separated from Diphenylamine

Verified 05/19/94

FORM I SV-2

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1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

SBLK0315S

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 03039 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A403039-BLK

Sample wt/vol: 30.3 (g/mL) G Lab File ID: 40330I14

Level: (low/med) LOW Date Received: _____

% Moisture: _____ decanted: (Y/N) N Date Extracted: 03/15/94

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 03/30/94

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

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

Number TICs found: 4

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q	Q1
1. 4hydroxy4Methyl 2 pentanone	~~UNKNOWN HYDROCARBON~~	5.50	1600	~~J~~	R
2. ~cyclohexanone	~~UNKNOWN HYDROCARBON~~ SJ 5/23/94	5.80	99	~~J~~	R
3. hexanone	~~UNKNOWN HYDROCARBON~~	6.03	160	~~J~~	R
4.	PROPANOIC ACID ESTER ISOMER	15.62	460	~~J~~	JN

Unknowns at 5.5, 5.8 and 6.03 min. are common laboratory contaminants, therefore qualified as R. SJ 5/23/94

verified SJ 5/19/94

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MAY 1994
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MEMORANDUM

TO: 200-UP-2 Project QA Record May 19, 1994

FR: Christina Jensen, Golder Associates Inc.

RE: INORGANIC DATA VALIDATION SUMMARY FOR DATA PACKAGE: B0BFH4-TMA-733 (923-E418 TMA733M.UP2)

INTRODUCTION

This memorandum presents the results of data validation on data package B0BFH4-TMA-733 prepared by Thermo Analytical 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
B0BFH2 B0BFH4	03/01/94 03/02/94	SOIL SOIL SOIL	SEE NOTE 1

Notes: 1. All samples were analyzed for CLP target analyte list (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

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MAY 31 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 deficiencies identified below.

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

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

0 01

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

- Sodium and arsenic were detected in the laboratory preparation blank. Attachments 2 and 5 provide a summary of the samples affected, data qualifications applied and supporting documentation.

Spike Sample Recovery

- The spike sample recovery for antimony 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.

9713524.2411

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.

9713524.2413

Attachment 2

Summary of Data Qualifications

9713524.2414

WHC-SD-EN-SPP-002

DATA QUALIFICATION SUMMARY

SDG:	VALIDATOR: C.JENSEN	DATE: 05/20/94	PAGE 1 OF 1
COMMENTS: INORGANIC PACKAGE, B0BFH4-TMA-733			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
SODIUM	U	B0BFH2, B0BFH4	DETECTED IN PBLK
ARSENIC	J	B0BFH2	DETECTED IN PBLK AT NEG. CONCENTRATION
ANTIMONY	UJ	B0BFH2, B0BFH4	SSR <75% BUT >30%

9713524.2415

Attachment 3

Qualified Data Summary and Annotated Laboratory Reports

Validated Data Summary, Data Package: BOBFH4-TMA-733

	Samp#	BOBFH2		BOBFH4	
	Date	3-1-94		3-2-94	
	Location	---		---	
	Depth	---		---	
	Type	SOIL		SOIL	
	Comments	---		---	
Parameter	Units	Result	Q	Result	Q
ALUMINUM	MG/KG	2620.000		5230.000	
ANTIMONY	MG/KG	2.600	UJ	2.500	UJ
ARSENIC	MG/KG	1.800	BJ	10.100	
BARIUM	MG/KG	28.800	B	42.700	
BERYLLIUM	MG/KG	0.180	B	0.340	B
CADMIUM	MG/KG	0.360	U	0.410	B
CALCIUM	MG/KG	2790.000		2060.000	
CHROMIUM	MG/KG	6.000		10.500	
COBALT	MG/KG	4.400	B	9.300	B
COPPER	MG/KG	5.400		12.600	
IRON	MG/KG	9580.000		22100.000	
LEAD	MG/KG	2.500		4.400	
MAGNESIUM	MG/KG	1810.000		3140.000	
MANGANESE	MG/KG	128.000		238.000	
MERCURY	MG/KG	0.060	B	1.900	
NICKEL	MG/KG	3.000	B	6.500	B
POTASSIUM	MG/KG	647.000	B	713.000	B
SELENIUM	MG/KG	0.590	U	0.580	U
SILVER	MG/KG	1.100	B	1.900	B
SODIUM	MG/KG	458.000	U	545.000	U
THALLIUM	MG/KG	0.780	U	0.760	U
VANADIUM	MG/KG	25.900		63.900	
ZINC	MG/KG	21.400		51.600	
CYANIDE	MG/KG	0.530	U	0.540	U
TITANIUM	MG/KG	829.000		2250.000	

Verified 5/20/94

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WESTINGHOUSE/HANFORD

1

SAMPLE NUMBER:

B0BFH2

INORGANIC ANALYSIS DATA SHEET

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

Lab Code: SKINER Case No.: N4-03-042SAS No.: SDG No.: B0BFH2

Matrix (soil/water): SOIL Lab Sample ID: 03123-01S

Level (low/med): LOW Date Received: 03/10/94

% Solids: 88.3

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	2620		*	P	
7440-36-0	Antimony	2.6	~~U~~	N	P	UJ
7440-38-2	Arsenic	1.8	~~B~~		P	BJ
7440-39-3	Barium	28.8	B		P	
7440-41-7	Beryllium	0.18	B		P	
7440-43-9	Cadmium	0.36	U		P	
7440-70-2	Calcium	2790			P	
7440-47-3	Chromium	6.0			P	
7440-48-4	Cobalt	4.4	B		P	
7440-50-8	Copper	5.4			P	
7439-89-6	Iron	9580			P	
7439-92-1	Lead	2.5		*	P	
7439-95-4	Magnesium	1810			P	
7439-96-5	Manganese	128			P	
7439-97-6	Mercury	0.06	B		CV	
7440-02-0	Nickel	3.0	B		P	
7440-09-7	Potassium	647	B		P	
7782-49-2	Selenium	0.59	U		P	
7440-22-4	Silver	1.1	B		P	
7440-23-5	Sodium	458	~~B~~		P	U
7440-28-0	Thallium	0.78	U		P	
7440-62-2	Vanadium	25.9			P	
7440-66-6	Zinc	21.4			P	
	Cyanide	0.53	U		CA	
7440-32-6	Titanium	829			P	

Color Before: GREY Clarity Before: Texture: MEDIUM

Color After: GREY Clarity After: Artifacts:

Comments:

Verified
gj 5/20/94

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9713524.2413

WESTINGHOUSE/HANFORD

1

SAMPLE NUMBER:

INORGANIC ANALYSIS DATA SHEET

B0BFH4

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

Lab Code: SKINER Case No.: N4-03-042SAS No.: SDG No.: B0BFH2

Matrix (soil/water): SOIL Lab Sample ID: 03123-02S

Level (low/med): LOW Date Received: 03/10/94

% Solids: 92.3

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	5230		*	P	
7440-36-0	Antimony	2.5	~~UJ~~	N	P	UJ
7440-38-2	Arsenic	10.1			P	
7440-39-3	Barium	42.7			P	
7440-41-7	Beryllium	0.34	B		P	
7440-43-9	Cadmium	0.41	B		P	
7440-70-2	Calcium	2060			P	
7440-47-3	Chromium	10.5			P	
7440-48-4	Cobalt	9.3	B		P	
7440-50-8	Copper	12.6			P	
7439-89-6	Iron	22100			P	
7439-92-1	Lead	4.4		*	P	
7439-95-4	Magnesium	3140			P	
7439-96-5	Manganese	238			P	
7439-97-6	Mercury	1.9			CV	
7440-02-0	Nickel	6.5	B		P	
7440-09-7	Potassium	713	B		P	
7782-49-2	Selenium	0.58	U		P	
7440-22-4	Silver	1.9	B		P	
7440-23-5	Sodium	545	~~B~~		P	U
7440-28-0	Thallium	0.76	U		P	
7440-62-2	Vanadium	63.9			P	
7440-66-6	Zinc	51.6			P	
	Cyanide	0.54	U		CA	
7440-32-6	Titanium	2250			P	

Color Before: GREY Clarity Before: Texture: MEDIUM

Color After: GREY Clarity After: Artifacts:

Comments:

verified 5/20/94

~~003~~

0-10

FORM I - IN ILM02.1

9713524.2419

Attachment 4

Laboratory Narrative and Chain-of-Custody Documentation

9713524.2420

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

MAY 1994
RECEIVED
SDLA

April 11, 1994

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

Quality Control Narrative

Scope
Two soil samples were submitted to TMA/Skinner & Sherman Laboratories, Inc. on March 10, 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 S403123.

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 matrix spike recovery for antimony exceeded the control limit requirement.

The laboratory duplicates for aluminum and lead 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

Westinghouse Hanford Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	Page 1 of 1 006226

Collector R.T. Sickle
Company Contact C.A. Rowley
Telephone 372-3293
SAF No. 93-263
Project Designation 216-U-8 Vitrified Clay Pipeline
Sampling Locations 216-U-8 Crib
Ice Chest No.
Bill of Lading/Airbill No.
Offsite Property No.
Method of Shipment Air Overnight
Field Logbook No.
Shipped to TMA
SPECIAL INSTRUCTIONS
Possible Sample Hazards/Remarks None Detected
Special Handling and/or Storage Keep cool

Sample Number	*	Date Collected	Time	Number and Type of Containers	Analysis Required		Preservative
B0BFH4	S	3-1-94	0800	(1) 250ml Gs	VOA	CLP	
B0BFH2	S		0820	(1) 250ml Gs	VOA	CLP	
B0BFH2	S			(1) 250ml aG	Semi-VOA	CLP	
B0BFH2	S			(1) 250ml Poly	Metals -CLP TAL Titanium Mercury	CPL	
B0BFH2	S			(1) 125ml G	Anions F, Cl, SO_4	EPA 300.0	
B0BFH2	S			(1) 125ml P/G	NO_2 NO_3	EPA 353.2	
~~B0BFH2~~	~~S~~			~~(1) 250ml aGs~~	~~PCB/Pest~~ 2-27-94	~~8080~~	
B0BFH2	S			(1) 125ml G	Cyanide	CPL	
B0BFH2	S			(1) 125ml Gs	Kerosene	8015M	
B0BFH2	S			(1) 1000ml Poly	Gross Alpha/Beta EP-10; Gamma Spec. Cs-134/137, Co-60, K-40, Eu-152/154/155, Ru-106, Na-22 RC-30; Total Uranium EA-01C; U-235/234/238 EP-70, 71, 5; Np-237 RC-101A, 622, EP-5; Pu-238/239/240 EP-80, 81, 5; I-129 RC-25, 603; Sr-90 RC-306, 303, 309, 304; Tc-99 RC-24, 604; Am-241, Cm-244 EP-80, 91, 92, 93, 5; Se-79 Lab Specific		

Chain of Possession Relinquished By (Sign and Print Names)	Date	Time	Received By
R.T. Sickle	3/7/94	0740	DR Edwards
3/8/94 DR Edwards	3/8/94	0930	
	3-9-94	1015	Kermit Blum K. Blum

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

LABORATORY SECTION	Received By	Title	Date/Time
Final Sample Disposition	Disposal Method:	Disposed by:	Date/Time:

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Westinghouse Hanford Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	Page 1 of 1 006228

Collector R.T. Sickle
Company Contact C.A. Rowley
Telephone 372-3293
SAF No. 93-263
Project Designation 216-U-8 Vitrified Clay Pipeline
Sampling Locations 216-U-8 Crib
Ice Chest No.
Bill of Lading/Airbill No.
Offsite Property No.
Method of Shipment Air Overnight
Field Logbook No.
Shipped to TMA
SPECIAL INSTRUCTIONS
Possible Sample Hazards/Remarks None Detected
Special Handling and/or Storage Keep cool

Sample Number	*	Date Collected	Time	Number and Type of Containers	Analysis Required		Preservative
BOBFH4	S	3-2-94	0850	(1) 250ml Gs ✓	VOA	CLP	
BOBFH4	S			(1) 250ml aG ✓	Semi-VOA	CLP	
BOBFH4	S			(1) 250ml Poly ✓	Metals -CLP TAL Titanium Mercury	CPL	
BOBFH4	S			(1) 125ml G ✓	Anions F, Cl, SO_4	EPA 300.0	
BOBFH4	S			(1) 125ml P/G ✓	NO_2 NO_3	EPA 353.2	
~~BOBFH4~~	~~S~~			~~(1) 250ml aGs~~	~~PCB/Pest~~ RHH 3-23-94	~~8080~~	
BOBFH4	S			(1) 125ml G ✓	Cyanide	CPL	
BOBFH4	S			(1) 125ml Gs ✓	Kerosene	8015M	
BOBFH4	S			(1) 1000ml Poly ✓	Gross Alpha/Beta EP-10; Gamma Spec. Cs-134/137, Co-60, K-40, Eu-152/154/155, Ru-106, Na-22 RC-30; Total Uranium EA-01C; U-235/234/238 EP-70, 71, 5; Np-237 RC-101A, 622, EP-5; Pu-238/239/240 EP-80, 81, 5; I-129 RC-25, 603; Sr-90 RC-306, 303, 309, 304; Tc-99 RC-24, 604; Am-241, Cm-244 EP-80, 91, 92, 93, 5; Se-79 Lab Specific		

Chain of Possession Relinquished By (Sign and Print Names)	Date	Time	Received By
R.T. Sickle R.T. Sickle	3/7/94	0740	D.L. Edwards
D.L. Edwards	3/8/94	0830	Kermit Blum K. Blum
	3-9-94	1015	

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

LABORATORY SECTION	Received By	Title	Date/Time
Final Sample Disposition	Disposal Method:	Disposed by:	Date/Time:

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Attachment 5

Data Validation Supporting Documentation

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E

PROJECT: 5/19/94 200-UP-2		DATA PACKAGE: BOBFH4-TMA-733
VALIDATOR: C Jensen	LAB: TMA	DATE: 5/19/94
CASE:		SDG:

ANALYSES PERFORMED

☒ CLP/ICP	☐ CLP/GFAA	☐ CLP/Hg	☒ CLP/Cyanide	☒ Ti	☐
☐ SW-846/ICP	☐ SW-846/GFAA	☐ SW-846/Hg	☐ SW-846 Cyanide	☐	☐

SAMPLES/MATRIX Soils BOBFH2, BOBFH4

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: Verification performed by WHC.

2. HOLDING TIMES

Are sample holding times acceptable? . . . . . (Yes) No N/A

Comments:

0-17

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:

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: Sb SSR < 75,

G 5/27/94

LCS for Ti not reported on Form 7 ~~(true value)~~ However, 291 mg/kg were found. The laboratory limits are 250-324, the LCS is within these limits, no qualification is required.

0-18

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: The laboratory indicated that Al and Pb were unacceptable for duplicate analysis however, the limit of 35 applies for soil; results are acceptable.

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: All samples analyzed by ICP, CA, CV

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:

0 19

HOLDING TIME SUMMARY

SDG:	VALIDATOR: C. Jensen	DATE: 5/9/94	PAGE 1 OF 1
COMMENTS: Metals pkg BOBFH4-TMA-733			

FIELD SAMPLE ID	ANALYSIS TYPE	DATE SAMPLED	DATE PREPARED	DATE ANALYZED	PREP. HOLDING TIME, DAYS	ANALYSIS HOLDING TIME, DAYS	QUALIFIER
BOBFH2	ICP	3/1/94	3/21/94	3/31/94	20	10	none
BOBFH4	↓	3/2/94	↓	↓	~~20~~ 19	10	↓
BOBFH2	Cu	3/1/94	3/14/94	3/14/94	13	0	none
BOBFH4	↓	3/2/94	↓	↓	~~13~~ 12	0	↓
BOBFH2	Hg	3/1/94	3/16/94	3/17/94	15	1	none
BOBFH4	↓	3/2/94	↓	↓	↓	1	↓

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WESTINGHOUSE/HANFORD

3

BLANKS

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

Lab Code: SKINER Case No.: N4-03-042SAS No.: SDG No.: B0BFH2

Preparation Blank Matrix (soil/water): SOIL

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

Q

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Preparation Blank	C	M	
Aluminum	15.0	U	22.8	B	15.0	U	24.1	B	4.634	B	P	
Antimony	12.2	U	12.2	U	12.2	U	12.2	U	2.440	U	P	
Arsenic	3.0	U	~~4.25~~ -3.4	B	3.0	U	3.0	U	-0.619	B	P	J
Barium	0.8	U	0.8	U	0.8	U	0.8	U	0.478	B	P	
Beryllium	0.3	U	0.3	U	0.3	U	0.3	U	0.060	U	P	
Cadmium	1.7	U	1.7	U	1.7	U	1.7	U	0.340	U	P	
Calcium	83.4	U	83.4	U	83.4	U	83.4	U	101.090	B	P	
Chromium	2.5	U	2.5	U	2.5	U	2.5	U	0.500	U	P	
Cobalt	2.9	U	2.9	U	2.9	U	2.9	U	0.580	U	P	
Copper	2.3	B	2.8	B	1.6	U	1.6	U	0.320	U	P	
Iron	13.4	U	13.4	U	13.4	U	13.4	U	8.554	B	P	
Lead	1.8	U	1.8	U	1.8	U	1.8	U	0.360	U	P	
Magnesium	32.2	U	32.2	U	32.2	U	32.2	U	43.188	B	P	
Manganese	0.8	U	0.8	U	1.0	B	1.5	B	0.492	B	P	
Mercury	0.1	U	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	-60.8	B	-90.0	B	41.734	B	P	
Selenium	2.8	U	2.8	U	2.8	U	2.8	U	0.560	U	P	
Silver	2.1	U	2.1	U	2.1	U	2.1	U	0.420	U	P	
Sodium	39.6	U	39.6	U	39.6	U	39.6	U	228.040	B	P	u
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	4.9	B	4.6	U	4.6	U	2.886	B	P	
Cyanide	10.0	U	10.0	U	10.0	U			0.500	U	CA	
Titanium	1.2	U	1.2	U	1.4	B	1.2	U	0.288	B	P	

B0BFH2
B0BFH4

FH2, FH4
for As

5/20/94

~~008~~

FORM III - IN ILM02.1

0021

9713524.2430

WESTINGHOUSE/HANFORD

5A

SPIKE SAMPLE RECOVERY

SAMPLE NUMBER:

B0BFH4S

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

Lab Code: SKINER Case No.: N4-03-042SAS No.: SDG No.: B0BFH2

Matrix (soil/water): SOIL Level (low/med): LOW

% Solids for Sample: 92.3

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	58.6400		2.5177	U	107.27	54.7	N	P
Arsenic	75-125	403.9776		10.1074		429.08	91.8		P
Barium	75-125	436.7163		42.6869		429.08	91.8		P
Beryllium	75-125	10.4674		0.3364	B	10.73	94.4		P
Cadmium	75-125	10.2614		0.4148	B	10.73	91.8		P
Calcium									NR
Chromium	75-125	51.6503		10.5020		42.91	95.9		P
Cobalt	75-125	109.3464		9.3133	B	107.27	93.3		P
Copper	75-125	66.2562		12.6379		53.63	100.0		P
Iron									NR
Lead	75-125	104.6587		4.4389		107.27	93.4		P
Magnesium									NR
Manganese	75-125	319.9425		238.3738		107.27	76.0		P
Mercury	75-125	2.3357		1.9102		0.54	78.8		CV
Nickel	75-125	105.5920		6.5439	B	107.27	92.3		P
Potassium									NR
Selenium	75-125	392.7572		0.5778	U	429.08	91.5		P
Silver	75-125	12.1215		1.8532	B	10.73	95.7		P
Sodium									NR
Thallium	75-125	375.5511		0.7636	U	429.08	87.5		P
Vanadium	75-125	162.5972		63.8890		107.27	92.0		P
Zinc	75-125	158.7377		51.5524		107.27	99.9		P
Cyanide	75-125	28.2092		0.5417	U	27.09	104.1		CA
Titanium		2257.8119		2253.5211		107.27	4.0		P

Comments:

5/20/94

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MEMORANDUM

MAY 1994 RECEIVED TQO

TO: 200-UP-2 Project QA Record

May 19, 1994

FR: Christina Jensen, Golder Associates Inc. CJ

RE: VOLATILE ORGANIC DATA VALIDATION SUMMARY FOR DATA PACKAGE: B0BFH4-TMA-733 (923-E418 TMA733S.UP2)

INTRODUCTION

This memorandum presents the results of data validation on data package B0BFH4-TMA-733 prepared by Thermo Analytical laboratory. A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

RECEIVED MAY 31 1994 VALIDATION DOCUMENTATION SDLA

SAMPLE ID	SAMPLE DATE	MEDIA	ANALYSIS
B0BFH2	03/01/94	SOIL	SEE NOTE 1
B0BFH4	03/02/94	SOIL	
B0BFL4	03/01/94	SOIL	

Notes: 1. All samples were analyzed for CLP 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.

Precision. Goals for precision were met.

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

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

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

CJ 5/27/94

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

Calibration

- The continuing calibration percent difference for bromomethane was unacceptable. Attachments 2 and 5 provide a summary of the data qualification applied, samples affected and supporting documentation.

Laboratory Blanks

- Methylene chloride, acetone, 4-methyl-2-pentanone, chloroform and 1,1,1-trichloroethane 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 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:	VALIDATOR: C Jensen	DATE: 5/18/94	PAGE 1 OF 1
COMMENTS: VOA BOBFH4-TMA - 733			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Bromomethane	J, UJ	all	Calibration %D > 25
Methylene Chloride	U	BOBFH2, BOBFH4, BOBFL4	Detected in blank.
Acetone	U	all	
4Methyl2Pentanone	U	BOBFH2 BOBFL4	
Chloroform	U	BOBFL4	
111TCA	U	BOBFL4	

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Attachment 3

Qualified Data Summary and Annotated Laboratory Reports

Validated Data Summary, Data Package: BOBFH4-TMA-733

	Samp#	BOBFH2		BOBFH4		BOBFL4	
	Date	3-1-94		3-2-94		3-2-94	
	Location	---		---		---	
	Depth	---		---		---	
	Type	SOIL		SOIL		SOIL	
	Comments	---		---		---	
Parameter	Units	Result	Q	Result	Q	Result	Q
CHLOROMETHANE	UG/KG	12.000	U	11.000	U	10.000	U
BROMOMETHANE	UG/KG	12.000	UJ	11.000	UJ	10.000	UJ
VINYL CHLORIDE	UG/KG	12.000	U	11.000	U	10.000	U
CHLOROETHANE	UG/KG	12.000	U	11.000	U	10.000	U
METHYLENE CHLORIDE	UG/KG	12.000	U	11.000	U	10.000	U
ACETONE	UG/KG	16.000	U	11.000	U	13.000	U
CARBON DISULFIDE	UG/KG	12.000	U	11.000	U	10.000	U
1,1-DICHLOROETHENE	UG/KG	12.000	U	11.000	U	10.000	U
1,1-DICHLOROETHANE	UG/KG	12.000	U	11.000	U	10.000	U
1,2-DICHLOROETHENE (TOTAL)	UG/KG	12.000	U	11.000	U	10.000	U
CHLOROFORM	UG/KG	12.000	U	11.000	U	10.000	U
1,2-DICHLOROETHANE	UG/KG	12.000	U	11.000	U	10.000	U
2-BUTANONE	UG/KG	12.000	U	11.000	U	10.000	U
1,1,1-TRICHLOROETHANE	UG/KG	12.000	U	11.000	U	10.000	U
CARBON TETRACHLORIDE	UG/KG	12.000	U	11.000	U	10.000	U
BROMODICHLOROMETHANE	UG/KG	12.000	U	11.000	U	10.000	U
1,2-DICHLOROPROPANE	UG/KG	12.000	U	11.000	U	10.000	U
CIS-1,3-DICHLOROPROPENE	UG/KG	12.000	U	11.000	U	10.000	U
TRICHLOROETHENE	UG/KG	12.000	U	11.000	U	10.000	U
DIBROMOCHLOROMETHANE	UG/KG	12.000	U	11.000	U	10.000	U
1,1,2-TRICHLOROETHANE	UG/KG	12.000	U	11.000	U	10.000	U
BENZENE	UG/KG	12.000	U	11.000	U	10.000	U
TRANS-1,3-DICHLOROPROPENE	UG/KG	12.000	U	11.000	U	10.000	U
BROMOFORM	UG/KG	12.000	U	11.000	U	10.000	U
4-METHYL-2-PENTANONE	UG/KG	12.000	U	11.000	U	10.000	U
2-HEXANONE	UG/KG	12.000	U	11.000	U	10.000	U
TETRACHLOROETHENE	UG/KG	12.000	U	11.000	U	10.000	U
1,1,2,2-TETRACHLOROETHANE	UG/KG	12.000	U	11.000	U	10.000	U
TOLUENE	UG/KG	12.000	U	11.000	U	10.000	U
CHLOROBENZENE	UG/KG	12.000	U	11.000	U	10.000	U
ETHYLBENZENE	UG/KG	12.000	U	11.000	U	10.000	U
STYRENE	UG/KG	12.000	U	11.000	U	10.000	U
XYLENES (TOTAL)	UG/KG	12.000	U	11.000	U	10.000	U

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5/20/94

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1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B0BFH2

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 03039 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A403039-03A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 40314R10

Level: (low/med) LOW Date Received: 03/09/94

% Moisture: not dec. 14 Date Analyzed: 03/14/94

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~~	UJ
75-01-4	Vinyl Chloride	12	U	
75-00-3	Chloroethane	12	U	
75-09-2	Methylene Chloride	12 ~~8~~	~~BJ~~	U
67-64-1	Acetone	16	~~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 ~~3~~	~~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	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	

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EPA SAMPLE NO.

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

B0BFH2

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 03039 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A403039-03A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 40314R10

Level: (low/med) LOW Date Received: 03/09/94

% Moisture: not dec. 14 Date Analyzed: 03/14/94

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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05/19/94

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B0BFH4

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 03039 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A403039-01A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 40314R09

Level: (low/med) LOW Date Received: 03/09/94

% Moisture: not dec. 7 Date Analyzed: 03/14/94

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~~	UJ
75-01-4	Vinyl Chloride	11	U	
75-00-3	Chloroethane	11	U	
75-09-2	Methylene Chloride	11 ~~5~~	~~BJ~~	U
67-64-1	Acetone	11 ~~9~~	~~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	

verified 5/19/94

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EPA SAMPLE NO.

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

B0BFH4

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 03039 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A403039-01A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 40314R09

Level: (low/med) LOW Date Received: 03/09/94

% Moisture: not dec. 7 Date Analyzed: 03/14/94

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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EPA SAMPLE NO.

B0BFL4

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 03039 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A403039-02A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 40314R06

Level: (low/med) LOW Date Received: 03/09/94

% Moisture: not dec. 0 Date Analyzed: 03/14/94

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~~	UJ
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	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 ~~1~~	~~BJ~~	u
107-06-2	1,2-Dichloroethane	10	U	
78-93-3	2-Butanone	10	U	
71-55-6	1,1,1-Trichloroethane	10 ~~2~~	~~BJ~~	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 ~~3~~	~~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	

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verified 5/19/94

FORM I VOA 3/90

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EPA SAMPLE NO.

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

B0BFL4

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 03039 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A403039-02A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 40314R06

Level: (low/med) LOW Date Received: 03/09/94

% Moisture: not dec. 0 Date Analyzed: 03/14/94

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	26.70	13	~~J~~

Q

JN

FORM I VOA-TIC

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Attachment 4

Laboratory Narrative and Chain-of-Custody Documentation

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CASE NARRATIVE

LABORATORY : TMA/ARLI

CASE : 03-039

CONTRACT ID : WESTINGHOUSE HANFORD COMPANY

SDG RECEIPT DATE : March 09, 1994

1.0 DESCRIPTION OF CASE :

Three 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
B0BFH4	A4-03-039-01A	V	SOIL
B0BFH4	A4-03-039-01B	SV	SOIL
B0BFH4 MS	A4-03-039-01C	SV	SOIL
B0BFH4 MSD	A4-03-039-01D	SV	SOIL
B0BFH4	A4-03-039-01G	K	SOIL
B0BFL4	A4-03-039-02A	V	SOIL
B0BFL4 MS	A4-03-039-02B	V	SOIL
B0BFL4 MSD	A4-03-039-02C	V	SOIL
B0BFH2	A4-03-039-03A	V	SOIL
B0BFH2	A4-03-039-03B	SV	SOIL
B0BFH2	A4-03-039-03E	K	SOIL
B0BFH2 MS	A4-03-039-03F	K	SOIL
B0BFH2 MSD	A4-03-039-03G	K	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.

Several TCL analytes were detected at various concentrations above or below the CRQL in each of the samples, including the blank, MS, and MSD.

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

TUNES :

All BFB tunes were injected directly into the GC/MS instrument.

3.2.2 SEMIVOLATILE ANALYSIS COMMENTS :

LOW LEVEL SOIL :

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

Pentachlorophenol was detected at a concentration that exceeded the calibration range of the instrument in sample B0BFH4MSD. Therefore, the analyte was "E" qualified.

The matrix spike recoveries of 2,4-Dinitrotoluene were slightly above the QC limits for both the MS and the MSD samples. The high recoveries were attributed to an efficient extraction and analysis. 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.

3.2.3 EXTRACTABLE HYDROCARBONS "KEROSENE RANGE" COMMENTS :

SEQUENCE NOTES :

The sequence was started on 03/26/94 and was analyzed according to the SW-846 Method 8015M. The %RSD in the all of the initial calibrations and the %D in the continuing calibrations were below their 20% and 15% limits, respectively.

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

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 surrogate o-Terphenyl was added to each sample, and the recoveries ranged from 68% to 77%.

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- The matrix spike and matrix spike duplicate recoveries for Kerosene were 73% and 77%, respectively.

  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
Nicole Roth 5/2/94
Program Manager

Maureen Parrish
Maureen Parrish
Program Manager

0-18

Westinghouse Hanford Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	Page 1 of 1 006226

Collector R.T. Sickle
Company Contact C.A. Rowley
Telephone 372-3293
SAF No. 93-263
Project Designation 216-U-8 Vitrified Clay Pipeline
Sampling Locations 216-U-8 Crib
Ice Chest No.
Bill of Lading/Airbill No.
Offsite Property No.
Method of Shipment Air Overnight
Field Logbook No.
Shipped to TMA
SPECIAL INSTRUCTIONS
Possible Sample Hazards/Remarks None Detected
Special Handling and/or Storage Keep cool

Sample Number	*	Date Collected	Time	Number and Type of Containers	Analysis Required		Preservative
B0BFH4	S	3-1-94	0800	(1) 250ml Gs	VOA	CLP	
BOBFH2	S		0820	(1) 250ml Gs	VOA	CLP	
BOBFH2	S			(1) 250ml aG	Semi-VOA	CLP	
BOBFH2	S			(1) 250ml Poly	Metals -CLP TAL Titanium Mercury	CPL	
BOBFH2	S			(1) 125ml G	Anions F, Cl, SO_4	EPA 300.0	
BOBFH2	S			(1) 125ml P/G	NO_2 NO_3	EPA 353.2	
~~BOBFH2~~	~~S~~			~~(1) 250ml aGs~~	~~PCB/Pest~~ 2-23-94	~~8080~~	
BOBFH2	S			(1) 125ml G	Cyanide	CPL	
BOBFH2	S			(1) 125ml Gs	Kerosene	8015M	
BOBFH2	S			(1) 1000ml Poly	Gross Alpha/Beta EP-10; Gamma Spec. Cs-134/137, Co-60, K-40, Eu-152/154/155, Ru-106, Na-22 RC-30; Total Uranium EA-01C; U-235/234/238 EP-70, 71, 5; Np-237 RC-101A, 622, EP-5; Pu-238/239/240 EP-80, 81, 5; I-129 RC-25, 603; Sr-90 RC-306, 303, 309, 304; Tc-99 RC-24, 604; Am-241, Cm-244 EP-80, 91, 92, 93, 5; Se-79 Lab Specific		

Chain of Possession Relinquished By (Sign and Print Names)	Date	Time	Received By
R.T. Sickle	3/7/94	0740	D.R. Edwards
3/8/94 D.R. Edwards	3/8/94	0830	
	3-9-94	1015	Kermit Blum K. Blum

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

LABORATORY SECTION	Received By	Title	Date/Time
Final Sample Disposition	Disposal Method:	Disposed by:	Date/Time:

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Westinghouse Hanford Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	Page 1 of 1 006228

Collector R.T. Sickle
Company Contact C.A. Rowley
Telephone 372-3293
SAF No. 93-263
Project Designation 216-U-8 Vitrified Clay Pipeline
Sampling Locations 216-U-8 Crib
Ice Chest No.
Bill of Lading/Airbill No.
Offsite Property No.
Method of Shipment Air Overnight
Field Logbook No.
Shipped to TMA
SPECIAL INSTRUCTIONS
Possible Sample Hazards/Remarks None Detected
Special Handling and/or Storage Keep cool

Sample Number	*	Date Collected	Time	Number and Type of Containers	Analysis Required		Preservative
BOBFH4	S	3-2-94	0850	(1) 250ml Gs ✓	VOA	CLP	
BOBFH4	S			(1) 250ml aG ✓	Semi-VOA	CLP	
BOBFH4	S			(1) 250ml Poly ✓	Metals -CLP TAL Titanium Mercury	CPL	
BOBFH4	S			(1) 125ml G ✓	Anions F, Cl, SO_4	EPA 300.0	
BOBFH4	S			(1) 125ml P/G ✓	NO_2 NO_3	EPA 353.2	
~~BOBFH4~~	~~S~~			~~(1) 250ml aGs~~	~~PCB/Pest~~ RHH 2-23-94	~~8080~~	
BOBFH4	S			(1) 125ml G ✓	Cyanide	CPL	
BOBFH4	S			(1) 125ml Gs ✓	Kerosene	8015M	
BOBFH4	S			(1) 1000ml Poly ✓	Gross Alpha/Beta EP-10; Gamma Spec. Cs-134/137, Co-60, K-40, Eu-152/154/155, Ru-106, Na-22 RC-30; Total Uranium EA-01C; U-235/234/238 EP-70, 71, 5; Np-237 RC-101A, 622, EP-5; Pu-238/239/240 EP-80, 81, 5; I-129 RC-25, 603; Sr-90 RC-306, 303, 309, 304; Tc-99 RC-24, 604; Am-241, Cm-244 EP-80, 91, 92, 93, 5; Se-79 Lab Specific		

Chain of Possession Relinquished By (Sign and Print Names)	Date	Time	Received By
R.T. Sickle R.T. Sickle	3/7/94	0740	D.L. Edwards
D.L. Edwards	3/8/94	0930	Kermit Blum K. Blum
	3-9-94	1015	

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

LABORATORY SECTION	Received By	Title	Date/Time
Final Sample Disposition	Disposal Method:	Disposed by:	Date/Time:

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Attachment 5

Data Validation Supporting Documentation

GC/MS ORGANIC DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E

PROJECT: UPJ	DATA PACKAGE:	
VALIDATOR: C. Jensen	LAB: TMA/ALI	DATE: 5/18/94
CASE: BOBFH4-TMA-733	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 Soils BOBFH2, BOBFH4, BOBEL4

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: Verification performed by WHC.

2. HOLDING TIMES

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

Comments:

GC/MS ORGANIC DATA VALIDATION CHECKLIST

3. INSTRUMENT TUNING AND CALIBRATION

Is the GC/MS tuning/performance check acceptable? . . . . . (Yes) No N/A

Are initial calibrations acceptable? . . . . . (Yes) No N/A

Are continuing calibrations acceptable? . . . . . Yes (No) N/A

Comments: The %D for bromomethane was 28.1, the limit is 25. Qualification for all samples will be J, UJ.

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: MeCl2, Acetone, Chloroform, 111TCA and 4 Methyl 2 Pentanone were detected in the VBLK. Results qualified U if <5x the blank result.

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: There were no TCL detected.

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:

0-24

HOLDING TIME SUMMARY

SDG:	VALIDATOR: C Jensen	DATE: 5/18/94	PAGE 1 OF 1
COMMENTS: VOA pkg BOBFH4-TMA-733			

FIELD SAMPLE ID	ANALYSIS TYPE	DATE SAMPLED	DATE PREPARED	DATE ANALYZED	PREP. HOLDING TIME, DAYS	ANALYSIS HOLDING TIME, DAYS	QUALIFIER
BOBFH2	VOA	3/1/94	/	3/14/94	/	13	none
BOBFH4	↓	3/2/94	↓	↓	↓	12	↓
BOBFL4	↓	3/1/94	↓	↓	↓	13	↓

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7A
VOLATILE CONTINUING CALIBRATION CHECK

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 03039 SAS No.: NA SDG No.: NA

Instrument ID: 4500 Calibration date: 03/14/94 Time: 834

Lab File ID: 40314R01 Init. Calib. Date(s): 02/02/94 02/02/94

Heated Purge: (Y/N) Y Init. Calib. Times: 1140 1459

GC Column: PACK ID: 2.00 (mm)

COMPOUND	$\overline{RRF}$	RRF50	MIN RRF	%D	MAX %D
Chloromethane	1.842	1.902	0.010	-3.3	
Bromomethane	1.284	0.923	0.100	28.1	25.0
Vinyl Chloride	1.585	1.466	0.100	7.5	25.0
Chloroethane	0.873	0.923	0.010	-5.7	
Methylene Chloride	1.375	1.360	0.010	1.1	
Acetone	0.754	0.813	0.010	-7.8	
Carbon Disulfide	4.081	3.828	0.010	6.2	
1,1-Dichloroethene	1.371	1.308	0.100	4.6	25.0
1,1-Dichloroethane	2.990	2.811	0.200	6.0	25.0
1,2-Dichloroethene (total)	1.402	1.465	0.010	-4.5	
Chloroform	2.811	2.655	0.200	5.6	25.0
1,2-Dichloroethane	1.836	1.614	0.100	12.1	25.0
2-Butanone	1.485	1.459	0.010	1.8	
1,1,1-Trichloroethane	0.614	0.484	0.100	21.2	25.0
Carbon Tetrachloride	0.495	0.426	0.100	13.9	25.0
Bromodichloromethane	0.804	0.663	0.200	17.5	25.0
1,2-Dichloropropane	0.507	0.458	0.010	9.7	
cis-1,3-Dichloropropene	0.651	0.618	0.200	5.1	25.0
Trichloroethene	0.443	0.438	0.300	1.1	25.0
Dibromochloromethane	0.621	0.639	0.100	-2.9	25.0
1,1,2-Trichloroethane	0.395	0.373	0.100	5.6	25.0
Benzene	0.934	0.933	0.500	0.1	25.0
trans-1,3-Dichloropropene	0.600	0.531	0.100	11.5	25.0
Bromoform	0.429	0.439	0.100	-2.3	25.0
4-Methyl-2-Pentanone	0.976	1.064	0.010	-9.0	
2-Hexanone	0.759	0.824	0.010	-8.6	
Tetrachloroethene	0.381	0.425	0.200	-11.6	25.0
1,1,2,2-Tetrachloroethane	0.860	0.982	0.500	-14.2	25.0
Toluene	1.049	1.223	0.400	-16.6	25.0
Chlorobenzene	0.950	1.027	0.500	-8.1	25.0
Ethylbenzene	0.458	0.471	0.100	-2.8	25.0
Styrene	0.912	0.956	0.300	-4.8	25.0
Xylene (total)	0.483	0.482	0.300	0.2	25.0
Toluene-d8	0.851	0.979	0.010	-15.0	
Bromofluorobenzene	0.670	0.778	0.200	-16.1	25.0
1,2-Dichloroethane-d4	1.458	1.136	0.010	22.1	

All other compounds must meet a minimum RRF of 0.010.

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1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

VBLK0314R

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 03039 SAS No.: _____ SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: SBLK0314

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 40314R03

Level: (low/med) LOW Date Received: _____

% Moisture: not dec. _____ Date Analyzed: 03/14/94

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	J	x10=10
67-64-1	Acetone	14		x10=140
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	2	J	x5=10
107-06-2	1,2-Dichloroethane	10	U	
78-93-3	2-Butanone	10	U	
71-55-6	1,1,1-Trichloroethane	2	J	x5=10
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	x10=20
591-78-6	2-Hexanone	10	U	
127-18-4	Tetrachloroethene	10	U	
79-34-5	1,1,2,2-Tetrachloroethane	10	U	
108-88-3	Toluene	10	U	
108-90-7	Chlorobenzene	10	U	
100-41-4	Ethylbenzene	10	U	
100-42-5	Styrene	10	U	
1330-20-7	Xylene (total)	10	U	

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MEMORANDUM

MAY 1994
RECEIVED
TQO

TO: 200-UP-2 Project QA Record

May 19, 1994

FR: Christina Jensen, Golder Associates Inc. CJ

RE: GENERAL GC DATA VALIDATION SUMMARY FOR DATA PACKAGE: B0BFH4-TMA-733 (923-E418 TMA733G.UP2)

INTRODUCTION

This memorandum presents the results of data validation on data package B0BFH4-TMA-733 prepared by Thermo Analytical 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
B0BFH2 B0BFH4	03/01/94 03/02/94	SOIL SOIL SOIL	SEE NOTE 1

Notes: 1. All samples were analyzed for kerosene using modified EPA method 8015.

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.

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.

RECEIVED
MAY 31 1994
VALIDATION DOCUMENTATION
SDLA

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

MAJOR DEFICIENCIES

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

MINOR DEFICIENCIES

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

REFERENCES

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

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

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Attachment 1

Glossary of Data Reporting Qualifiers

GLOSSARY OF 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

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WHC-SD-EN-SPP-002

DATA QUALIFICATION SUMMARY

SDG:	VALIDATOR: C.JENSEN	DATE: 05/20/94	PAGE 1 OF 1
COMMENTS: General GC Package B0BFH4-TMA-733			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
no data qualification applied			

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Attachment 3

Qualified Data Summary and Annotated Laboratory Reports

Validated Data Summary, Data Package: BOBFH4-TMA-733

	Samp#	BOBFH2		BOBFH4	
	Date	3-1-94		3-2-94	
	Location	---		---	
	Depth	---		---	
	Type	SOIL		SOIL	
	Comments	---		---	
Parameter	Units	Result	Q	Result	Q
KEROSENE	MG/KG	5.000	U	5.000	U

Verified
5/20/94

BOB-4

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~~000403~~

TMA Inc. REPORT Work Order # A4-03-039

Received: 03/09/94

Results by Sample

SAMPLE ID B0BFH2 FRACTION 03E TEST CODE 8015MS NAME EPA 8015M EXTRACT.

Date & Time Collected 03/01/94 Category

MODIFIED 8015 - EXTRACTABLE FUEL HYDROCARBONS

Matrix: SOIL
Date Analyzed: 03/27/94
Dilution factor: 1.00
Concentration Units: mg/Kg

Compound	Sample Result	PQL
Kerosene Range	ND	5
C10 - C16 Jet Fuel Range	NA	NA
C9 - C22 Diesel Range	NA	NA
Hydraulic Range	NA	NA

ND = Not detected at the specified limits

% RECOVERY SURROGATES COMPOUNDS
o-Terphenyl 77

Form I

5/20/94

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~~000405~~

TMA Inc. REPORT Work Order # A4-03-039

Received: 03/09/94

Results by Sample

SAMPLE ID B0BFH4 FRACTION 01G TEST CODE 8015MS NAME EPA 8015M EXTRACT.

Date & Time Collected 03/02/94 Category

MODIFIED 8015 - EXTRACTABLE FUEL HYDROCARBONS

Matrix: SOIL
Date Analyzed: 03/27/94
Dilution factor: 1.00
Concentration Units: mg/Kg

Compound	Sample Result	PQL
Kerosene Range	ND	5
C10 - C16 Jet Fuel Range	NA	NA
C9 - C22 Diesel Range	NA	NA
Hydraulic Range	NA	NA

Q

u

ND = Not detected at the specified limits

% RECOVERY SURROGATES COMPOUNDS
o-Terphenyl 68

Form I

5/20/94

0~10

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Attachment 4

Laboratory Narrative and Chain-of-Custody Documentation

CASE NARRATIVE

LABORATORY : TMA/ARLI

CASE : 03-039

CONTRACT ID : WESTINGHOUSE HANFORD COMPANY

SDG RECEIPT DATE : March 09, 1994

1.0 DESCRIPTION OF CASE :

Three 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
B0BFH4	A4-03-039-01A	V	SOIL
B0BFH4	A4-03-039-01B	SV	SOIL
B0BFH4 MS	A4-03-039-01C	SV	SOIL
B0BFH4 MSD	A4-03-039-01D	SV	SOIL
B0BFH4	A4-03-039-01G	K	SOIL
B0BFL4	A4-03-039-02A	V	SOIL
B0BFL4 MS	A4-03-039-02B	V	SOIL
B0BFL4 MSD	A4-03-039-02C	V	SOIL
B0BFH2	A4-03-039-03A	V	SOIL
B0BFH2	A4-03-039-03B	SV	SOIL
B0BFH2	A4-03-039-03E	K	SOIL
B0BFH2 MS	A4-03-039-03F	K	SOIL
B0BFH2 MSD	A4-03-039-03G	K	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.

Several TCL analytes were detected at various concentrations above or below the CRQL in each of the samples, including the blank, MS, and MSD.

n°12

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

TUNES :

All BFB tunes were injected directly into the GC/MS instrument.

3.2.2 SEMIVOLATILE ANALYSIS COMMENTS :

LOW LEVEL SOIL :

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

Pentachlorophenol was detected at a concentration that exceeded the calibration range of the instrument in sample B0BFH4MSD. Therefore, the analyte was "E" qualified.

The matrix spike recoveries of 2,4-Dinitrotoluene were slightly above the QC limits for both the MS and the MSD samples. The high recoveries were attributed to an efficient extraction and analysis. 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.

3.2.3 EXTRACTABLE HYDROCARBONS "KEROSENE RANGE" COMMENTS :

SEQUENCE NOTES :

The sequence was started on 03/26/94 and was analyzed according to the SW-846 Method 8015M. The %RSD in the all of the initial calibrations and the %D in the continuing calibrations were below their 20% and 15% limits, respectively.

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

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 surrogate o-Terphenyl was added to each sample, and the recoveries ranged from 68% to 77%.

- The matrix spike and matrix spike duplicate recoveries for Kerosene were 73% and 77%, respectively.

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
Program Manager

5/2/94

Maureen Parrish
Program Manager

Westinghouse Hanford Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	Page 1 of 1 006226

Collector R.T. Sickle
Company Contact C.A. Rowley
Telephone 372-3293
SAF No. 93-263
Project Designation 216-U-8 Vitrified Clay Pipeline
Sampling Locations 216-U-8 Crib
Ice Chest No.
Bill of Lading/Airbill No.
Offsite Property No.
Method of Shipment Air Overnight
Field Logbook No.
Shipped to TMA
SPECIAL INSTRUCTIONS
Possible Sample Hazards/Remarks None Detected
Special Handling and/or Storage Keep cool

Sample Number	*	Date Collected	Time	Number and Type of Containers	Analysis Required		Preservative
B0B3F44	S	3-1-94	0800	(1) 250ml Gs	VOA	clp	
BOBFH2	S		0820	(1) 250ml Gs	VOA	CLP	
BOBFH2	S			(1) 250ml aG	Semi-VOA	CLP	
BOBFH2	S			(1) 250ml Poly	Metals -CLP TAL Titanium Mercury	CPL	
BOBFH2	S			(1) 125ml G	Anions F, Cl, SO_4	EPA 300.0	
BOBFH2	S			(1) 125ml P/G	NO_2 NO_3	EPA 353.2	
~~BOBFH2~~	~~S~~			~~(1) 250ml aGs~~	~~PCB/Pest~~ 2-27-94	~~8080~~	
BOBFH2	S			(1) 125ml G	Cyanide	CPL	
BOBFH2	S			(1) 125ml Gs	Kerosene	8015M	
BOBFH2	S			(1) 1000ml Poly	Gross Alpha/Beta EP-10; Gamma Spec. Cs-134/137, Co-60, K-40, Eu-152/154/155, Ru-106, Na-22 RC-30; Total Uranium EA-01C; U-235/234/238 EP-70, 71, 5; Np-237 RC-101A, 622, EP-5; Pu-238/239/240 EP-80, 81, 5; I-129 RC-25, 603; Sr-90 RC-306, 303, 309, 304; Tc-99 RC-24, 604; Am-241, Cm-244 EP-80, 91, 92, 93, 5; Se-79 Lab Specific		

Chain of Possession Relinquished By (Sign and Print Names)	Date	Time	Received By
R.T. Sickle	3/7/94	0740	D.R. Edwards
3/8/94 D.R. Edwards	3/8/94	0830	
	3-9-94	1015	Kermit Blum K. Blum

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

LABORATORY SECTION	Received By	Title	Date/Time
Final Sample Disposition	Disposal Method:	Disposed by:	Date/Time:

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3-15

Westinghouse Hanford Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	Page 1 of 1
		006228

Collector R.T. Sickle
Company Contact C.A. Rowley
Telephone 372-3293
SAF No. 93-263
Project Designation 216-U-8 Vitrified Clay Pipeline
Sampling Locations 216-U-8 Crib
Ice Chest No.
Bill of Lading/Airbill No.
Offsite Property No.
Method of Shipment Air Overnight
Field Logbook No.
Shipped to TMA
SPECIAL INSTRUCTIONS
Possible Sample Hazards/Remarks None Detected
Special Handling and/or Storage Keep cool

Sample Number	*	Date Collected	Time	Number and Type of Containers	Analysis Required		Preservative
BOBFH4	S	3-2-94	0850	(1) 250ml Gs ✓	VOA	CLP	
BOBFH4	S			(1) 250ml aG ✓	Semi-VOA	CLP	
BOBFH4	S			(1) 250ml Poly ✓	Metals -CLP TAL Titanium Mercury	CPL	
BOBFH4	S			(1) 125ml G ✓	Anions F, Cl, SO_4	EPA 300.0	
BOBFH4	S			(1) 125ml P/G ✓	NO_2 NO_3	EPA 353.2	
~~BOBFH4~~	~~S~~			~~(1) 250ml aGs~~	~~PCB/Pest~~ RJH 2-23-94	~~8080~~	
BOBFH4	S			(1) 125ml G ✓	Cyanide	CPL	
BOBFH4	S			(1) 125ml Gs ✓	Kerosene	8015M	
BOBFH4	S			(1) 1000ml Poly ✓	Gross Alpha/Beta EP-10; Gamma Spec. Cs-134/137, Co-60, K-40, Eu-152/154/155, Ru-106, Na-22 RC-30; Total Uranium EA-01C; U-235/234/238 EP-70, 71, 5; Np-237 RC-101A, 622, EP-5; Pu-238/239/240 EP-80, 81, 5; I-129 RC-25, 603; Sr-90 RC-306, 303, 309, 304; Tc-99 RC-24, 604; Am-241, Cm-244 EP-80, 91, 92, 93, 5; Se-79 Lab Specific		

Chain of Possession Relinquished By (Sign and Print Names)	Date	Time	Received By
R.T. Sickle R.T. Sickle	3/7/94	0740	D.L. Edwards
D.L. Edwards	3/8/94	0830	Kermit Blum K. Blum
	3-9-94	1015	

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

LABORATORY SECTION	Received By	Title	Date/Time
Final Sample Disposition	Disposal Method:	Disposed by:	Date/Time:

000062B

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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: B0BFH4-TMA-733
VALIDATOR: C. Jensen	LAB: TMA	DATE: 5/20/94
CASE:		SDG:

ANALYSES PERFORMED

☐ 8010	☑ 8015 modified	☐ 8020	☐ 8021	8140	8141
☐ 8150	☐ 8151	☐ WTPH-HCID	☐ WTPH-G	☐ WTPH-D	☐
☐	☐	☐	☐	☐	☐

SAMPLES/MATRIX: Soils B0BFH4, B0BFH2

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: Verification performed by WHC.

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: ICAL 3/26/94

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:

5. ACCURACY

Were surrogates analyzed? . . . . . Yes ~~No~~ N/A cj 5/20/94

Are surrogate recoveries acceptable? . . . . . Yes No ~~N/A~~ cj 5/20/94

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: MS/MSD limits were not specified by the laboratory. General limits of 50-150%R and RPD of 20 used. Acceptable results, no qualification necessary.

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:

HOLDING TIME SUMMARY

SDG:	VALIDATOR: C Jensen	DATE: 5/20/94	PAGE 1 OF 1
COMMENTS: GC pkg BOBFH4-PMA-733			

FIELD SAMPLE ID	ANALYSIS TYPE	DATE SAMPLED	DATE PREPARED	DATE ANALYZED	PREP. HOLDING TIME, DAYS	ANALYSIS HOLDING TIME, DAYS	QUALIFIER
BOBFH4	8015M	3/2/94	3/15/94	3/27/94	13	12	none
BOBFH2	8015M	3/1/94	3/15/94	3/27/94	14	12	none

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Golder Associates Inc.

4104-148th Avenue, NE
Redmond, WA 98052
Telephone (206) 883-0777
Fax (206) 882-5498

Golder Associates

JUN 1994 RECEIVED TQO

May 31, 1994

Our ref: 923-E418
S/O/3111

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:

- B0BFF9-TMA-726

Please call if you have questions concerning the above at 206/883-0777.

Sincerely,

GOLDER ASSOCIATES INC.

Christina I. Jensen

Christina I. Jensen
Task Manager

Kent M. Angelos
Project Manager

RECEIVED
JUN 1 1994
VALIDATION DOCUMENTATION
SDLA

cc: P.K. Brockman, SAIC

9713524.2480

Golder Associates Inc.

4104-148th Avenue, NE
Redmond, WA 98052
Telephone (206) 883-0777
Fax (206) 882-5498

Golder Associates

June 13, 1994

JUN 1994 RECEIVED TQO

Our ref: 923-E418
S/O/3148

Westinghouse Hanford Company
Hanford Analytical Services Management
345 Hills, MSIN H4-29
Richland, Washington 99352

ATTENTION: Ms. Jeanette Duncan

RE: TRANSMITTAL OF REVISED DATA VALIDATION PACKAGES AND COMMENT RESPONSES, 200-UP-2 DATA VALIDATION PROJECT, TASK ORDER S94-18, CONTRACT MJK-SVV-M073750

Dear Ms. Duncan:

Enclosed are revised data validation memo pages and comment responses for the 200-UP-2 data validation project. The following data validation packages are included:

- B0BFH4-TMA-733
- BOBFF9-TMA-726

Please call us if you have questions concerning the above.

Sincerely,

GOLDER ASSOCIATES INC.

Christina I. Jensen
Task Manager

Kent M. Angelos
Project Manager

CJ\KMA\ah

cc: P.K. Brockman, SAIC

9713524.2481

MEMORANDUM

JUN 1994
RECEIVED
TQO

TO: 200 UP-2 Project QA Record

May 24, 1994

FR: Thomas Stapp, Golder Associates Inc.

RE: SEMIVOLATILE DATA VALIDATION SUMMARY FOR DATA PACKAGE B0BFF9-TMA-726 (923-E418 726SEMI.UP2)

INTRODUCTION

This memo presents the results of data validation on data package B0BFF9-TMA-726 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.

RECEIVED
JUN 1 1994
VALIDATION DOCUMENTATIO
SDLA

SAMPLE ID	SAMPLE DATE	MEDIA	ANALYSES
B0BFF9 B0BFG2	2/24/94 2/25/94	SOIL 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.

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

- 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 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 associated laboratory blank and were common laboratory contaminants, resulting in qualification of the results as unusable (UR) 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.

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

Revised
RK 6-11-94

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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	B0BFF9 B0BFG2	CONTAMINANT DETECTED IN METHOD BLANK

9713524.2487

ATTACHMENT 3

QUALIFIED DATA SUMMARY and ANNOTATED LABORATORY REPORTS

Validated Data Summary, Data Package: BOBFF9-TMA-726

	Samp#	BOBFF9		BOBFG2	
	Date	2-24-94		2-25-94	
	Location	216-U-8		216-U-8	
	Depth	---		---	
	Type	SOIL		SOIL	
	Comments	---		---	
Parameter	Units	Result	Q	Result	Q
PHENOL	UG/KG	340.000	U	340.000	U
BIS(2-CHLOROETHYL)ETHER	UG/KG	340.000	U	340.000	U
2-CHLOROPHENOL	UG/KG	340.000	U	340.000	U
1,3-DICHLOROBENZENE	UG/KG	340.000	U	340.000	U
1,4-DICHLOROBENZENE	UG/KG	340.000	U	340.000	U
1,2-DICHLOROBENZENE	UG/KG	340.000	U	340.000	U
2-METHYLPHENOL	UG/KG	340.000	U	340.000	U
2,2'-OXYBIS(1-CHLOROPROPANE)	UG/KG	340.000	U	340.000	U
4-METHYLPHENOL	UG/KG	340.000	U	340.000	U
N-NITROSO-DI-N-PROPYLAMINE	UG/KG	340.000	U	340.000	U
HEXACHLOROETHANE	UG/KG	340.000	U	340.000	U
NITROBENZENE	UG/KG	340.000	U	340.000	U
ISOPHORONE	UG/KG	340.000	U	340.000	U
2-NITROPHENOL	UG/KG	340.000	U	340.000	U
2,4-DIMETHYLPHENOL	UG/KG	340.000	U	340.000	U
BIS(2-CHLOROETHOXY)METHANE	UG/KG	340.000	U	340.000	U
2,4-DICHLOROPHENOL	UG/KG	340.000	U	340.000	U
1,2,4-TRICHLOROBENZENE	UG/KG	340.000	U	340.000	U
NAPHTHALENE	UG/KG	340.000	U	340.000	U
4-CHLOROANILINE	UG/KG	340.000	U	340.000	U
HEXACHLOROBUTADIENE	UG/KG	340.000	U	340.000	U
4-CHLORO-3-METHYLPHENOL	UG/KG	340.000	U	340.000	U
2-METHYLNAPHTHALENE	UG/KG	340.000	U	340.000	U
HEXACHLOROCYCLOPENTADIENE	UG/KG	340.000	U	340.000	U
2,4,6-TRICHLOROPHENOL	UG/KG	340.000	U	340.000	U
2,4,5-TRICHLOROPHENOL	UG/KG	820.000	U	830.000	U
2-CHLORONAPHTHALENE	UG/KG	340.000	U	340.000	U
2-NITROANILINE	UG/KG	820.000	U	830.000	U
DIMETHYLPHTHALATE	UG/KG	340.000	U	340.000	U
ACENAPHTHYLENE	UG/KG	340.000	U	340.000	U
3-NITROANILINE	UG/KG	820.000	U	830.000	U
ACENAPHTHENE	UG/KG	340.000	U	340.000	U

Verified [illegible] 5-25-94

9713524.2483

008

Validated Data Summary, Data Package: BOBFF9-TMA-726

	Samp#	BOBFF9		BOBFG2	
	Date	2-24-94		2-25-94	
	Location	216-U-8		216-U-8	
	Depth	---		---	
	Type	SOIL		SOIL	
	Comments	---		---	
Parameter	Units	Result	Q	Result	Q
2,4-DINITROPHENOL	UG/KG	820.000	U	830.000	U
4-NITROPHENOL	UG/KG	820.000	U	830.000	U
DIBENZOFURAN	UG/KG	340.000	U	340.000	U
2,4-DINITROTOLUENE	UG/KG	340.000	U	340.000	U
2,6-DINITROTOLUENE	UG/KG	340.000	U	340.000	U
DIETHYLPHTHALATE	UG/KG	340.000	U	340.000	U
4-CHLOROPHENYL-PHENYLETHER	UG/KG	340.000	U	340.000	U
FLUORENE	UG/KG	340.000	U	340.000	U
4-NITROANILINE	UG/KG	820.000	U	830.000	U
4,6-DINITRO-2-METHYLPHENOL	UG/KG	820.000	U	830.000	U
N-NITROSODIPHENYLAMINE	UG/KG	340.000	U	340.000	U
4-BROMOPHENYL-PHENYLETHER	UG/KG	340.000	U	340.000	U
HEXACHLOROBENZENE	UG/KG	340.000	U	340.000	U
PENTACHLOROPHENOL	UG/KG	820.000	U	830.000	U
PHENANTHRENE	UG/KG	340.000	U	340.000	U
ANTHRACENE	UG/KG	340.000	U	340.000	U
CARBAZOLE	UG/KG	340.000	U	340.000	U
DI-N-BUTYLPHTHALATE	UG/KG	780.000	U	760.000	U
FLUORANTHENE	UG/KG	340.000	U	340.000	U
PYRENE	UG/KG	340.000	U	340.000	U
BUTYLBENZYLPHTHALATE	UG/KG	340.000	U	340.000	U
3,3'-DICHLOROBENZIDINE	UG/KG	340.000	U	340.000	U
BENZO(A)ANTHRACENE	UG/KG	340.000	U	340.000	U
BIS(2-ETHYLHEXYL)PHTHALATE	UG/KG	340.000	U	340.000	U
CHRYSENE	UG/KG	340.000	U	340.000	U
DI-N-OCTYLPHTHALATE	UG/KG	340.000	U	340.000	U
BENZO(B)FLUORANTHENE	UG/KG	340.000	U	340.000	U
BENZO(K)FLUORANTHENE	UG/KG	340.000	U	340.000	U
BENZO(A)PYRENE	UG/KG	340.000	U	340.000	U
INDENO(1,2,3-CD)PYRENE	UG/KG	340.000	U	340.000	U
DIBENZ(A,H)ANTHRACENE	UG/KG	340.000	U	340.000	U
BENZO(G,H,I)PERYLENE	UG/KG	340.000	U	340.000	U

Verified RS 5-25-94

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9713524.2490

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B0BFG2

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 03028 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A403028-02B

Sample wt/vol: 30.4 (g/mL) G Lab File ID: 40330I03

Level: (low/med) LOW Date Received: 03/04/94

% Moisture: 5 decanted: (Y/N) N Date Extracted: 03/09/94

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 03/30/94

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 4.4

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	830	U
91-58-7	2-Chloronaphthalene	340	U
88-74-4	2-Nitroaniline	830	U
131-11-3	Dimethylphthalate	340	U
208-96-8	Acenaphthylene	340	U
99-09-2	3-Nitroaniline	830	U
83-32-9	Acenaphthene	340	U
51-28-5	2,4-Dinitrophenol	830	U

Verified 5-24-94

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TC 5-24-94 ~~000247~~

1C

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B0BFG2

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 03028 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A403028-02B

Sample wt/vol: 30.4 (g/mL) G Lab File ID: 40330I03

Level: (low/med) LOW Date Received: 03/04/94

% Moisture: 5 decanted: (Y/N) N Date Extracted: 03/09/94

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 03/30/94

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 4.4

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-02-7	4-Nitrophenol	830	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	830	U
534-52-1	4,6-Dinitro-2-methylphenol	830	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	830	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	760	~~B~~ 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 TC 5-24-94

U011

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~~FS 5-24-94 000248~~

1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B0BFG2

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 03028 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A403028-02B

Sample wt/vol: 30.4 (g/mL) G Lab File ID: 40330I03

Level: (low/med) LOW Date Received: 03/04/94

% Moisture: 5 decanted: (Y/N) N Date Extracted: 03/09/94

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 03/30/94

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 4.4

Number TICs found: 11

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q	Q
1. Aldol Reactn Product	~~UNKNOWN HYDROCARBON~~ FS 5-25-94	5.53	17000	~~BJ~~	R
2. Aldol Product	~~UNKNOWN KETONE~~ FS "	5.82	380	~~BJ~~	UR
3. Aldol Product	~~UNKNOWN HYDROCARBON~~ FS "	6.05	420	~~BJ~~	UR
4.	UNKNOWN HYDROCARBON	7.90	140	~~J~~	JN
5. 541-02-6	DECAMETHYLCYCLOPENTASILOXANE	9.18	100	~~JN~~	R
6.	UNKNOWN HYDROCARBON	15.65	620	~~BJ~~	UJN
7. 126-73-8	PHOSPHORIC ACID TRIBUTYL EST	16.30	550	JN	
8.	UNKNOWN HYDROCARBON	17.62	100	~~J~~	JN
9. 10544-50-0	MOLECULAR SULFUR	21.18	240	JN	
10.	UNKNOWN HYDROCARBON	21.77	140	~~J~~	JN
11.	UNKNOWN CARBOXYLIC ACID ESTE	25.07	170	~~J~~	JN

Summation of like Compounds:

Unknown Hydrocarbons ——— 380 JN

" " ——— 1040 UJN

Verified FS 6-11-94 5-24-94

Revised 6-11-94 FS 3/90

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1B

5-24-94

000225

EPA SAMPLE NO.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

B0BFF9

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 03028 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A403028-03B

Sample wt/vol: 30.5 (g/mL) G Lab File ID: 40330I06

Level: (low/med) LOW Date Received: 03/04/94

% Moisture: 4 decanted: (Y/N) N Date Extracted: 03/09/94

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 03/30/94

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	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

Q

Verified 5-24

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5-24-94

EPA SAMPLE NO.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

B0BFF9

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 03028 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A403028-03B

Sample wt/vol: 30.5 (g/mL) G Lab File ID: 40330I06

Level: (low/med) LOW Date Received: 03/04/94

% Moisture: 4 decanted: (Y/N) N Date Extracted: 03/09/94

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 03/30/94

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	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	780	~~B~~ 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

Q

Verified 5-24-

(1) - Cannot be separated from Diphenylamine

014

FORM I SV-2

3/90

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EPA SAMPLE NO.

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

B0BFF9

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 03028 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A403028-03B

Sample wt/vol: 30.5 (g/mL) G Lab File ID: 40330I06

Level: (low/med) LOW Date Received: 03/04/94

% Moisture: 4 decanted: (Y/N) N Date Extracted: 03/09/94

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 03/30/94

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

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

Number TICs found: 5

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q	Q
1 Aldol Reaction Prod	~~UNKNOWN HYDROCARBON~~ 5-25-94	5.55	1500	~~BJ~~	UR
2. Aldol Product	~~UNKNOWN HYDROCARBON~~	5.82	380	~~J~~	UR
3. Aldol Product	~~UNKNOWN HYDROCARBON~~	6.05	240	~~BJ~~	UR
4. 541-02-6	DECAMETHYLCYCLOPENTASILOXANE	9.18	170	~~JN~~	R
5.	UNKNOWN ALKANE	27.95	170	~~J~~	JN

Verified 6-11-94

Revised 6-11-94

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FORM I SV-TIC

3/90

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ATTACHMENT 4

LABORATORY NARRATIVE and CHAIN-OF-CUSTODY DOCUMENTATION

9713524.2497

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5-23-94

CASE NARRATIVE

LABORATORY : TMA/ARLI

CASE : 03-028

CONTRACT ID : WESTINGHOUSE HANFORD COMPANY

SDG RECEIPT DATE : March 04, 1994

1.0 DESCRIPTION OF CASE :

Three 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
B0BFN3	A4-03-028-01A	V	SOIL
B0BFN3 MS	A4-03-028-01B	V	SOIL
B0BFN3 MSD	A4-03-028-01C	V	SOIL
B0BFG2	A4-03-028-02A	V	SOIL
B0BFG2	A4-03-028-02B	SV	SOIL
B0BFG2 MS	A4-03-028-02C	SV	SOIL
B0BFG2 MSD	A4-03-028-02D	SV	SOIL
B0BFG2	A4-03-028-02G	K	SOIL
B0BFF9	A4-03-028-03A	V	SOIL
B0BFF9	A4-03-028-03B	SV	SOIL
B0BFF9	A4-03-028-03E	K	SOIL
B0BFF9 MS	A4-03-028-03F	K	SOIL
B0BFF9 MSD	A4-03-028-03G	K	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.

Acetone was detected at concentrations above the CRQL in several samples, including the MS and MSD. Chloroform,

4-Methyl-2-pentanone, Chloromethane, and Methylene Chloride were detected in several samples at concentrations below the CRQL.

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

TUNES :

All BFB tunes were injected directly into the GC/MS instrument.

3.2.2 SEMIVOLATILE ANALYSIS COMMENTS :

LOW LEVEL SOIL :

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

Di-n-butylphthalate was detected at concentrations above the CRQL in several samples, including the blank, MS, and MSD.

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

3.2.3 EXTRACTABLE HYDROCARBONS "KEROSENE RANGE" COMMENTS :

SEQUENCE NOTES :

The sequence was started on 03/05/94 and was analyzed according to the SW-846 Method 8015M. The %RSD in the all of the initial calibrations and the %D in the continuing calibrations were below their 20% and 15% limits, respectively.

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

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 surrogate o-Terphenyl was added to each sample, and the recoveries ranged from 78% to 88%. However, since the reporting forms could not accommodate the surrogate recovery results, the data was included in the "Additional Raw Data" poriton of the package.

5-23-94
000074

The matrix spike and matrix spike duplicate recovery for Kerosene was 80%. The LCS, KLCS0311, was prepared at the same time and had a Kerosene spike recovery of 80%. The LCS results were included in the "Additional Raw Data" portion of the package. No Kerosene was detected in any of the unspiked samples.

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
Nicole Roth 4/20/94
Program Manager

Maureen Parrish
Maureen Parrish 4/20/94
Program Manager

~~000012A~~

5-24-94

Westinghouse Hanford Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	Page 1 of 1
		006481

Collector R.T. Sickle
Company Contact C.A. Rowley
Telephone 372-3293
SAF No. 93-263
Project Designation 216-U-8 Vitrified Clay Pipeline
Sampling Locations 216-U-8 Crib
Ice Chest No.
Bill of Lading/Airbill No.
Offsite Property No.
Method of Shipment Air Overnight
Field Logbook No.
Shipped to TMA
SPECIAL INSTRUCTIONS
Possible Sample Hazards/Remarks None Detected
Special Handling and/or Storage Keep cool

Sample Number	*	Date Collected	Time	Number and Type of Containers	Analysis Required		Preservative
BOBFF9	S	2-24-94	1315	(1) 250ml Gs ✓	VOA	CLP	
BOBFF9	S			(1) 250ml aG ✓	Semi-VOA	CLP	
BOBFF9	S			(1) 250ml Poly ✓	Metals -CLP TAL Titanium Mercury 500 ml - KB	CPL	
BOBFF9	S			(1) 125ml G ✓	Anions F, Cl, SO_4	EPA 300.0	
BOBFF9	S			(1) 125ml P/G ✓	NO_2 NO_3	EPA 353.2	
~~BOBFF9~~	~~S~~			~~(1) 250ml aGs~~	~~PCB/Pest~~ ~~RHA 2-24-94~~	~~8080~~	
BOBFF9	S			(1) 125ml G ✓	Cyanide	CPL	
BOBFF9	S			(1) 125ml Gs ✓	Kerosene	8015M	
BOBFF9	S			(1) 1000ml Poly ✓	Gross Alpha/Beta EP-10; Gamma Spec. Cs-134/137, Co-60, K-40, Eu-152/154/155, Ru-106, Na-22 RC-30; Total Uranium EA-01C; U-235/234/238 EP-70, 71, 5; Np-237 RC-101A, 622, EP-5; Pu-238/239/240 EP-80, 81, 5; I-129 RC-25, 603; Sr-90 RC-306, 303, 309, 304; Tc-99 RC-24, 604; Am-241, Cm-244 EP-80, 91, 92, 93, 5; Se-79 Lab Specific		

Chain of Possession Relinquished By (Sign and Print Names)	Date	Time	Received By
R.T. Sickle R.T. Sickle	3/1/94	1200	D.L. Edwards
D.L. Edwards	3/3/94	0945	Kermit Blum K. Blum
	3-4-94	1000	

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

LABORATORY SECTION	Received By	Title	Date/Time
Final Sample Disposition	Disposal Method:	Disposed by:	Date/Time:

9413524.0500

020

Westinghouse Hanford Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

006484

Collector R.T. Sickle
Company Contact C.A. Rowley
Telephone 372-3293
SAF No. 93-263
Project Designation 216-U-8 Vitrified Clay Pipeline
Sampling Locations 216-U-8 Crib
Ice Chest No.
Bill of Lading/Airbill No.
Offsite Property No.
Method of Shipment Air Overnight
Field Logbook No.
Shipped to TMA
SPECIAL INSTRUCTIONS
Possible Sample Hazards/Remarks None detected
Special Handling and/or Storage Keep cool

Sample Number	*	Date Collected	Time	Number and Type of Containers	Analysis Required		Preservative
BOBFN3	S	2-25-94	0815	(1) 250ml aGs ✓	VOA	CLP	
BOBFG2	S	2-25-94	1200	(1) 250ml Gs ✓	VOA	CLP	
BOBFG2	S			(1) 250ml aG ✓	Semi-VOA	CLP	
BOBFG2	S			(1) 250ml Poly ✓	Metals -CLP TAL Titanium Mercury	CPL	
BOBFG2	S			(1) 125ml G ✓	Anions F, Cl, SO_4	EPA 300.0	
BOBFG2	S			(1) 125ml P/G ✓	NO_2 NO_3	EPA 353.2	
~~BOBFG2~~	~~S~~			(1) 250ml aGs —	PCB/Pest	8080	
BOBFG2	S			(1) 125ml G ✓	Cyanide	CPL	
BOBFG2	S			(1) 125ml Gs ✓	Kerosene	8015M	
BOBFG2	S			(1) 1000ml Poly ✓	Gross Alpha/Beta EP-10; Gamma Spec. Cs-134/137, Co-60, K-40, Eu-152/154/155, Ru-106, Na-22 RC-30; Total Uranium EA-01C; U-235/234/238 EP-70, 71, 5; Np-237 RC-101A, 622, EP-5; Pu-238/239/240 EP-80, 81, 5; I-129 RC-25, 603; Sr-90 RC-306, 303, 309, 304; Tc-99 RC-24, 604; Am-241, Cm-244 EP-80, 91, 92, 93, 5; Se-79 Lab Specific		

Chain of Possession (Sign and Print Names) Relinquished By	Date	Time	Received By
R.T. Sickle	3/1/94	1200	D L Edwards
D L Edwards	3/3/94	0945	
	3-4-94	1000	Kermit Blum K. Blum

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

LABORATORY SECTION	Received By	Title	Date/Time
Final Sample Disposition	Disposal Method:	Disposed by:	Date/Time:

5-24-94

0021

9713524.2502

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: BOBFF9-TMA-726	
VALIDATOR: T. Stapp	LAB: TMA/ARLI	DATE: 5-23-94
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 BØBFF9, BØBFG2 / 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	Extracted	Analyzed	Days	
BOBFF9	2-24-94	3-9-94 ✓	3-30-94	21	≤40
BOBFG2	2-25-94	3-9-94 ✓	3-30 94	21	≤40

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? 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 Di-n-butyl phthalate was detected in the Lab blank qualifying associated results as non-detect (U). 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. 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? Note ① . . . . . Yes No N/A

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

Comments: ① Field duplicates and other Field QC was not identified with this Sample set, but it has been requested. Field duplic. 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

Comments:

BOBFF9-TMA-726 9713524.2506 1C

5-24-94 ~~000328~~

EPA SAMPLE NO.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

SBLK0309S

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 03028 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A403028-BLK

Sample wt/vol: 30.7 (g/mL) G Lab File ID: 40330I02

Level: (low/med) LOW Date Received: _____

% Moisture: _____ decanted: (Y/N) N Date Extracted: 03/09/94

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 03/30/94

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	330	
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

BOBFF9-TMA-726 5-24-94 000327

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SBLK0309S

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 03028 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A403028-BLK

Sample wt/vol: 30.7 (g/mL) G Lab File ID: 40330I02

Level: (low/med) LOW Date Received: _____

% Moisture: _____ decanted: (Y/N) N Date Extracted: 03/09/94

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 03/30/94

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
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

BOBFF9-TMA-726 9713524.2503

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1F

EPA SAMPLE NO.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

SBLK0309S

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 03028 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A403028-BLK

Sample wt/vol: 30.7 (g/mL) G Lab File ID: 40330I02

Level: (low/med) LOW Date Received: _____

% Moisture: _____ decanted: (Y/N) N Date Extracted: 03/09/94

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 03/30/94

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

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

Number TICs found: 4

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q	Q
1. Aldol reaction product	~~UNKNOWN HYDROCARBON~~ TE 5-25-94	5.52	1000	~~J~~	R
2. Aldol product	~~UNKNOWN KETONE~~	5.82	98	~~J~~	R
3. Aldol product	~~UNKNOWN HYDROCARBON~~	6.05	130	~~J~~	R
4.	UNKNOWN HYDROCARBON	15.65	230	~~J~~	JN

Associated TIC results found in Samples with similar spectral match and retention times are qualified as non-detect. TE 5-24-94

9713524.2509

JUN 1994
RECEIVED
TQO

MEMORANDUM

TO: 200 UP-2 Project QA Record

May 25, 1994

FR: Thomas Stapp, Golder Associates Inc.

RE: VOLATILES DATA VALIDATION SUMMARY FOR DATA PACKAGE B0BFF9-TMA-726 (923-E418 726VOA.UP2)

INTRODUCTION

This memo presents the results of data validation on data package B0BFF9-TMA-726 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
B0BFF9 B0BFG2 B0BFN3	2/24/94 2/25/94 2/25/94	SOIL SOIL SOIL		SEE NOTE 1

Notes:

1. Indicates the samples were analyzed for target compound list (TCL) volatile organics

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JUN 1 1994
VALIDATION DOCUMENTATION
SDLA

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.

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 three (3) samples were validated in this data package with a total of ninety-nine (99) 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, acetone, chloroform, and 4-methyl-2-pentanone were detected in the laboratory method blank. Attachments 2 and 5 provide a summary of samples affected, qualification applied and supporting documentation.

Calibration

- The bromomethane continuing calibration percent difference was unacceptable. Attachments 2 and 5 provide a summary of samples affected, 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 samples 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

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

DATA QUALIFICATION SUMMARY - FORM B-7

SDG: B0BFF9-TMA-726	REVIEWER: T. STAPP	DATE: 5-23-94	PAGE 1 OF 1
COMMENTS: VOLATILE ORGANICS			
COMPOUND/ ANALYTE	QUALIFIER	SAMPLES AFFECTED	REASON
METHYLENE CHLORIDE	U	B0BFF9 B0BFG2 B0BFN3	CONTAMINANT DETECTED IN LABORATORY BLANK
ACETONE	U	B0BFF9 B0BFG2	CONTAMINANT DETECTED IN LABORATORY BLANK
CHLOROFORM	U	B0BFG2 B0BFN3	CONTAMINANT DETECTED IN LABORATORY BLANK
4-METHYL-2-PENTANONE	U	B0BFN3	CONTAMINANT DETECTED IN LABORATORY BLANK
BROMOMETHANE	UJ	B0BFF9 B0BFG2 B0BFN3	%DIFFERENCE FOR CONTINUING CALIBRATION IS >25%

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ATTACHMENT 3

QUALIFIED DATA SUMMARY and ANNOTATED LABORATORY REPORTS

Validated Data Summary, Data Package: BOBFF9-TMA-726

	Samp#	BOBFF9		BOBFG2		BOBFN3	
	Date	2-24-94		2-25-94		2-25-94	
	Location	216-U-8		216-U-8		216-U-8	
	Depth	---		---		---	
	Type	SOIL		SOIL		SOIL	
	Comments	---		---		---	
Parameter	Units	Result	Q	Result	Q	Result	Q
CHLOROMETHANE	UG/KG	10.000	U	1.000	J	10.000	U
BROMOMETHANE	UG/KG	10.000	UJ	11.000	UJ	10.000	UJ
VINYL CHLORIDE	UG/KG	10.000	U	11.000	U	10.000	U
CHLOROETHANE	UG/KG	10.000	U	11.000	U	10.000	U
METHYLENE CHLORIDE	UG/KG	10.000	U	11.000	U	10.000	U
ACETONE	UG/KG	20.000	U	19.000	U	10.000	U
CARBON DISULFIDE	UG/KG	10.000	U	11.000	U	10.000	U
1,1-DICHLOROETHENE	UG/KG	10.000	U	11.000	U	10.000	U
1,1-DICHLOROETHANE	UG/KG	10.000	U	11.000	U	10.000	U
1,2-DICHLOROETHENE (TOTAL)	UG/KG	10.000	U	11.000	U	10.000	U
CHLOROFORM	UG/KG	10.000	U	11.000	U	10.000	U
1,2-DICHLOROETHANE	UG/KG	10.000	U	11.000	U	10.000	U
2-BUTANONE	UG/KG	10.000	U	11.000	U	10.000	U
1,1,1-TRICHLOROETHANE	UG/KG	10.000	U	11.000	U	10.000	U
CARBON TETRACHLORIDE	UG/KG	10.000	U	11.000	U	10.000	U
BROMODICHLOROMETHANE	UG/KG	10.000	U	11.000	U	10.000	U
1,2-DICHLOROPROPANE	UG/KG	10.000	U	11.000	U	10.000	U
CIS-1,3-DICHLOROPROPENE	UG/KG	10.000	U	11.000	U	10.000	U
TRICHLOROETHENE	UG/KG	10.000	U	11.000	U	10.000	U
DIBROMOCHLOROMETHANE	UG/KG	10.000	U	11.000	U	10.000	U
1,1,2-TRICHLOROETHANE	UG/KG	10.000	U	11.000	U	10.000	U
BENZENE	UG/KG	10.000	U	11.000	U	10.000	U
TRANS-1,3-DICHLOROPROPENE	UG/KG	10.000	U	11.000	U	10.000	U
BROMOFORM	UG/KG	10.000	U	11.000	U	10.000	U
4-METHYL-2-PENTANONE	UG/KG	10.000	U	11.000	U	10.000	U
2-HEXANONE	UG/KG	10.000	U	11.000	U	10.000	U
TETRACHLOROETHENE	UG/KG	10.000	U	11.000	U	10.000	U
1,1,2,2-TETRACHLOROETHANE	UG/KG	10.000	U	11.000	U	10.000	U
TOLUENE	UG/KG	10.000	U	11.000	U	10.000	U
CHLOROBENZENE	UG/KG	10.000	U	11.000	U	10.000	U
ETHYLBENZENE	UG/KG	10.000	U	11.000	U	10.000	U
STYRENE	UG/KG	10.000	U	11.000	U	10.000	U
XYLENES (TOTAL)	UG/KG	10.000	U	11.000	U	10.000	U

Verified RC 5-25-94

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5-23-94

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EPA SAMPLE NO.

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

B0BFF9

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 03028 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A403028-03A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 40309R11

Level: (low/med) LOW Date Received: 03/04/94

% Moisture: not dec. 4 Date Analyzed: 03/09/94

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		10	U	
74-83-9	Bromomethane		10	~~U~~	UJ
75-01-4	Vinyl Chloride		10	U	
75-00-3	Chloroethane		10	U	
75-09-2	Methylene Chloride	10	~~3~~	~~BU~~	U
67-64-1	Acetone		20	~~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	

FORM I VOA

Verified 5-23-94

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5-23-94 ~~000076~~

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B0BFF9

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 03028 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A403028-03A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 40309R11

Level: (low/med) LOW Date Received: 03/04/94

% Moisture: not dec. 4 Date Analyzed: 03/09/94

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	Q
1.	UNKNOWN ALKENE	26.62	9	~~J~~	JN

Verified 5-23-94

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5-23-94 000077

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B0BFG2

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 03028 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A403028-02A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 40309R10

Level: (low/med) LOW Date Received: 03/04/94

% Moisture: not dec. 5 Date Analyzed: 03/09/94

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	1	J	
74-83-9	Bromomethane	11	~~U~~	UJ
75-01-4	Vinyl Chloride	11	U	
75-00-3	Chloroethane	11	U	
75-09-2	Methylene Chloride	11 ~~3~~	~~BU~~	U
67-64-1	Acetone	19	~~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 ~~2~~	~~J~~	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	

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FORM I VOA

Verified 5-23-94

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1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B0BFG2

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 03028 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A403028-02A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 40309R10

Level: (low/med) LOW Date Received: 03/04/94

% Moisture: not dec. 5 Date Analyzed: 03/09/94

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

012

9713524.2521

5-23-94 000079

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B0BFN3

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 03028 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A403028-01A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 40309R07

Level: (low/med) LOW Date Received: 03/04/94

% Moisture: not dec. 0 Date Analyzed: 03/09/94

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~~	UJ
75-01-4	Vinyl Chloride	10	U	
75-00-3	Chloroethane	10	U	
75-09-2	Methylene Chloride	10 ~~3~~	~~BU~~	U
67-64-1	Acetone	10	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 ~~1~~	~~J~~	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 ~~2~~	~~J~~	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	

013

FORM I VOA Verified 5-23-94 3/90

9713524.2522

5-23-94 000080

EPA SAMPLE NO.

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

B0BFN3

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 03028 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A403028-01A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 40309R07

Level: (low/med) LOW Date Received: 03/04/94

% Moisture: not dec. 0 Date Analyzed: 03/09/94

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	Q
1.	UNKNOWN HYDROCARBON	26.67	6	~~J~~	JN

Verified 5-23-94

014

9713524.2523

ATTACHMENT 4

LABORATORY NARRATIVE and CHAIN-OF-CUSTODY DOCUMENTATION

000072
5-23-94

CASE NARRATIVE

LABORATORY : TMA/ARLI

CASE : 03-028

CONTRACT ID : WESTINGHOUSE HANFORD COMPANY

SDG RECEIPT DATE : March 04, 1994

1.0 DESCRIPTION OF CASE :

Three 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
B0BFN3	A4-03-028-01A	V	SOIL
B0BFN3 MS	A4-03-028-01B	V	SOIL
B0BFN3 MSD	A4-03-028-01C	V	SOIL
B0BFG2	A4-03-028-02A	V	SOIL
B0BFG2	A4-03-028-02B	SV	SOIL
B0BFG2 MS	A4-03-028-02C	SV	SOIL
B0BFG2 MSD	A4-03-028-02D	SV	SOIL
B0BFG2	A4-03-028-02G	K	SOIL
B0BFF9	A4-03-028-03A	V	SOIL
B0BFF9	A4-03-028-03B	SV	SOIL
B0BFF9	A4-03-028-03E	K	SOIL
B0BFF9 MS	A4-03-028-03F	K	SOIL
B0BFF9 MSD	A4-03-028-03G	K	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.

Acetone was detected at concentrations above the CRQL in several samples, including the MS and MSD. Chloroform,

4-Methyl-2-pentanone, Chloromethane, and Methylene Chloride were detected in several samples at concentrations below the CRQL.

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

TUNES :

All BFB tunes were injected directly into the GC/MS instrument.

3.2.2 SEMIVOLATILE ANALYSIS COMMENTS :

LOW LEVEL SOIL :

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

Di-n-butylphthalate was detected at concentrations above the CRQL in several samples, including the blank, MS, and MSD.

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

3.2.3 EXTRACTABLE HYDROCARBONS "KEROSENE RANGE" COMMENTS :

SEQUENCE NOTES :

The sequence was started on 03/05/94 and was analyzed according to the SW-846 Method 8015M. The %RSD in the all of the initial calibrations and the %D in the continuing calibrations were below their 20% and 15% limits, respectively.

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

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 surrogate o-Terphenyl was added to each sample, and the recoveries ranged from 78% to 88%. However, since the reporting forms could not accommodate the surrogate recovery results, the data was included in the "Additional Raw Data" poriton of the package.

5-23-94
000074

The matrix spike and matrix spike duplicate recovery for Kerosene was 80%. The LCS, KLCS0311, was prepared at the same time and had a Kerosene spike recovery of 80%. The LCS results were included in the "Additional Raw Data" portion of the package. No Kerosene was detected in any of the unspiked samples.

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
Nicole Roth 4/20/94
Program Manager

Maureen Parrish
Maureen Parrish 4/20/94
Program Manager

5-23-94 0000024

Westinghouse Hanford Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	Page 1 of 1
		006481

Collector R.T. Sickle
Company Contact C.A. Rowley
Telephone 372-3293
SAF No. 93-263
Project Designation 216-U-8 Vitrified Clay Pipeline
Sampling Locations 216-U-8 Crib
Ice Chest No.
Bill of Lading/Airbill No.
Offsite Property No.
Method of Shipment Air Overnight
Field Logbook No.
Shipped to TMA
SPECIAL INSTRUCTIONS
Possible Sample Hazards/Remarks None Detected
Special Handling and/or Storage Keep cool

9213524.2527

Sample Number	*	Date Collected	Time	Number and Type of Containers	Analysis Required		Preservative
BOBFF9	S	2-24-94	1315	(1) 250ml Gs ✓	VOA	CLP	
BOBFF9	S			(1) 250ml aG ✓	Semi-VOA	CLP	
BOBFF9	S			(1) 250ml Poly ✓	Metals -CLP TAL Titanium Mercury 500 ml - KB	CPL	
BOBFF9	S			(1) 125ml G ✓	Anions F, Cl, SO_4	EPA 300.0	
BOBFF9	S			(1) 125ml P/G ✓	NO_2 NO_3	EPA 353.2	
~~BOBFF9~~	~~S~~			~~(1) 250ml aGs~~	~~PCB/Pest~~ RTS 2-24-94	8080	
BOBFF9	S			(1) 125ml G ✓	Cyanide	CPL	
BOBFF9	S			(1) 125ml Gs ✓	Kerosene	8015M	
BOBFF9	S			(1) 1000ml Poly ✓	Gross Alpha/Beta EP-10; Gamma Spec. Cs-134/137, Co-60, K-40, Eu-152/154/155, Ru-106, Na-22 RC-30; Total Uranium EA-01C; U-235/234/238 EP-70, 71, 5; Np-237 RC-101A, 622, EP-5; Pu-238/239/240 EP-80, 81, 5; I-129 RC-25, 603; Sr-90 RC-306, 303, 309, 304; Tc-99 RC-24, 604; Am-241, Cm-244 EP-80, 91, 92, 93, 5; Se-79 Lab Specific		

Chain of Possession Relinquished By (Sign and Print Names)	Date	Time	Received By
R.T. Sickle	3/1/94	1200	DL Edwards
DL Edwards	3/3/94	0045	Kermit Blum K. Blum
	3-4-94	1000	

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

LABORATORY SECTION	Received By	Title	Date/Time
Final Sample Disposition	Disposal Method:	Disposed by:	Date/Time:

015

Westinghouse Hanford Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

006484

Collector R.T. Sickle
Company Contact C.A. Rowley
Telephone 372-3293
SAF No. 93-263
Project Designation 216-U-8 Vitrified Clay Pipeline
Sampling Locations 216-U-8 Crib
Ice Chest No.
Bill of Lading/Airbill No.
Offsite Property No.
Method of Shipment Air Overnight
Field Logbook No.
Shipped to TMA
SPECIAL INSTRUCTIONS
Possible Sample Hazards/Remarks None detected
Special Handling and/or Storage Keep cool

Sample Number	*	Date Collected	Time	Number and Type of Containers	Analysis Required		Preservative
BOBFN3	S	2-25-94	0815	(1) 250ml aGs ✓	VOA	CLP	
BOBFG2	S	2-25-94	1200	(1) 250ml Gs ✓	VOA	CLP	
BOBFG2	S			(1) 250ml aG ✓	Semi-VOA	CLP	
BOBFG2	S			(1) 250ml Poly ✓	Metals -CLP TAL Titanium Mercury	CPL	
BOBFG2	S			(1) 125ml G ✓	Anions F, Cl, SO_4	EPA 300.0	
BOBFG2	S			(1) 125ml P/G ✓	NO_2 NO_3	EPA 353.2	
~~BOBFG2~~	~~S~~			(1) 250ml aGs —	PCB/Pest	8080	
BOBFG2	S			(1) 125ml G ✓	Cyanide	CPL	
BOBFG2	S			(1) 125ml Gs ✓	Kerosene	8015M	
BOBFG2	S			(1) 1000ml Poly ✓	Gross Alpha/Beta EP-10; Gamma Spec. Cs-134/137, Co-60, K-40, Eu-152/154/155, Ru-106, Na-22 RC-30; Total Uranium EA-01C; U-235/234/238 EP-70, 71, 5; Np-237 RC-101A, 622, EP-5; Pu-238/239/240 EP-80, 81, 5; I-129 RC-25, 603; Sr-90 RC-306, 303, 309, 304; Tc-99 RC-24, 604; Am-241, Cm-244 EP-80, 91, 92, 93, 5; Se-79 Lab Specific		

Chain of Possession Relinquished By (Sign and Print Names)	Date	Time	Received By
R.T. Sickle	3/1/94	1200	D L Edwards
D L Edwards	3/3/94	0945	
	3-4-94	1000	Kermit Blum K. Blum

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

LABORATORY SECTION	Received By	Title	Date/Time
Final Sample Disposition	Disposal Method:	Disposed by:	Date/Time:

5-23-94

0020

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9713524.2529

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: BOBFF9-TMA-726	
VALIDATOR: T. Stapp	LAB: TMA / ARLI	DATE: May 23, 1994
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 BOBFF9, BOBFG2, BOBFN3 / 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	Analyzed	DAYS
BOBFF9	2-24-94	3-9-94	13
BOBFG2	2-25-94	↓	12
BOBFN3	2-25-94	↓	12

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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? . See Note ① . . . . Yes No N/A

Comments: ① % Difference of CCal. RRF for Bromomethane exceeds 25% requirmt. Associated results qualif. (J/UJ).

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 $MeCl_2$ and acetone in the method blank qualify assoc. Samples as non-detect for like cmpnds. See Blank Summary page.
② 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/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? . Note ① . . . . . Yes No N/A

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

Comments: ① Field QC was not identified with this sample set, but has been requested. Field Duplicates will be evaluated with 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

Comments:

SDG: BOBFF9-TMA-726

CALIBRATION SUMMARY

~~000177~~ 5-23-9.

7A
VOLATILE CONTINUING CALIBRATION CHECK

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 03028 SAS No.: NA - SDG No.: NA

Instrument ID: 4500 Calibration date: 03/09/94 Time: 1138

Lab File ID: 40309R05 Init. Calib. Date(s): 02/02/94 02/02/94

Heated Purge: (Y/N) Y Init. Calib. Times: 1140 1459

GC Column: PACK ID: 2.00 (mm)

COMPOUND	$\overline{RRF}$	RRF50	MIN RRF	%D	MAX %D
Chloromethane	1.842	1.789	0.010	2.9	
Bromomethane	1.284	0.897	0.100	30.1	25.0
Vinyl Chloride	1.585	1.243	0.100	21.6	25.0
Chloroethane	0.873	0.890	0.010	-1.9	
Methylene Chloride	1.375	1.416	0.010	-3.0	
Acetone	0.754	0.855	0.010	-13.4	
Carbon Disulfide	4.081	4.134	0.010	-1.3	
1,1-Dichloroethene	1.371	1.377	0.100	-0.4	25.0
1,1-Dichloroethane	2.990	2.867	0.200	4.1	25.0
1,2-Dichloroethene (total)	1.402	1.441	0.010	-2.8	
Chloroform	2.811	2.618	0.200	6.9	25.0
1,2-Dichloroethane	1.836	1.616	0.100	12.0	25.0
2-Butanone	1.485	1.442	0.010	2.9	
1,1,1-Trichloroethane	0.614	0.484	0.100	21.2	25.0
Carbon Tetrachloride	0.495	0.442	0.100	10.7	25.0
Bromodichloromethane	0.804	0.672	0.200	16.4	25.0
1,2-Dichloropropane	0.507	0.458	0.010	9.7	
cis-1,3-Dichloropropene	0.651	0.628	0.200	3.5	25.0
Trichloroethene	0.443	0.430	0.300	2.9	25.0
Dibromochloromethane	0.621	0.632	0.100	-1.8	25.0
1,1,2-Trichloroethane	0.395	0.380	0.100	3.8	25.0
Benzene	0.934	0.944	0.500	-1.1	25.0
trans-1,3-Dichloropropene	0.600	0.554	0.100	7.7	25.0
Bromoform	0.429	0.435	0.100	-1.4	25.0
4-Methyl-2-Pentanone	0.976	0.991	0.010	-1.5	
2-Hexanone	0.759	0.716	0.010	5.7	
Tetrachloroethene	0.381	0.379	0.200	0.5	25.0
1,1,2,2-Tetrachloroethane	0.860	0.929	0.500	-8.0	25.0
Toluene	1.049	1.122	0.400	-7.0	25.0
Chlorobenzene	0.950	1.010	0.500	-6.3	25.0
Ethylbenzene	0.458	0.488	0.100	-6.6	25.0
Styrene	0.912	0.996	0.300	-9.2	25.0
Xylene (total)	0.483	0.502	0.300	-3.9	25.0
Toluene-d8	0.851	0.902	0.010	-6.0	
Bromofluorobenzene	0.670	0.746	0.200	-11.3	25.0
1,2-Dichloroethane-d4	1.458	1.156	0.010	20.7	

All other compounds must meet a minimum RRF of 0.010.

0025

SDG: BLANK SUMMARY

BOBFF9-TMA-786 2

9/13524.2551

5-23-94 ~~000092~~

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

VBLK0309R1

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 03028 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: SBLK0309

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 40309R06

Level: (low/med) LOW Date Received: _____

% Moisture: not dec. ____ Date Analyzed: 03/09/94

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	10xRe
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	20
67-64-1	Acetone	8	J	80
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	

n2

SDG: BOBFF9-TMA-726 9213524.2535 BLANK SUMMARY 5-23-94 ~~000093~~

1E

EPA SAMPLE NO.

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

VBLK0309R1

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 03028 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: SBLK0309

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 40309R06

Level: (low/med) LOW Date Received: _____

% Moisture: not dec. ____ Date Analyzed: 03/09/94

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

027

Blank Summary

9713524.2556

EPA Sample No.: VBLK0309R1

3-21-97

~~000193~~

SDG: BOBFF9-TMA-726

No	m/z	Scan	Time	Ref	RRT	Meth	Area(Hght)	Amount	%Tot
1	128	181	7:32	1	1.000	A BB	22826.	50.000 PPB	15.32
2	114	382	15:55	2	1.000	A BB	93192.	50.000 PPB	15.32
3	117	480	20:00	3	1.000	A BB	80925.	50.000 PPB	15.32
4	65	235	9:47	1	1.298	A BB	26642.	50.492 PPB	15.47
5	98	455	18:57	3	0.948	A BB	78607.	53.869 PPB	16.51
6	95	562	23:25	3	1.171	A BB	63007.	52.157 PPB	15.98
7	NOT FOUND								
8	NOT FOUND								
9	NOT FOUND								
10	NOT FOUND								
11	84	113	4:42	1	0.624	A BB	1602.	2.478 PPB	0.76
12	43	126	5:15	1	0.696	A BB	2964.	7.598 PPB	2.33
13	NOT FOUND								
14	NOT FOUND								
15	NOT FOUND								
16	NOT FOUND								
~~17~~	~~83~~	~~224~~	~~9:20~~	~~1~~	~~1.238~~	~~A VB~~	~~1134.~~	~~0.949 PPB~~	~~0.29~~
~~18~~	~~43~~	~~235~~	~~9:47~~	~~1~~	~~1.298~~	~~A BV~~	~~2661.~~	~~4.042 PPB~~	~~1.24~~
19	NOT FOUND								
20	NOT FOUND								
21	NOT FOUND								
~~22~~	~~43~~	~~235~~	~~9:47~~	~~2~~	~~0.615~~	~~A BB~~	~~2668.~~	~~1.277 PPB~~	~~0.39~~
~~23~~	~~83~~	~~280~~	~~11:40~~	~~2~~	~~0.733~~	~~A VB~~	~~640.~~	~~0.511 PPB~~	~~0.16~~
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~~	~~397~~	~~16:32~~	~~3~~	~~0.827~~	~~A BB~~	~~1402.~~	~~0.875 PPB~~	~~0.27~~
34	NOT FOUND								
~~35~~	~~83~~	~~435~~	~~18:07~~	~~3~~	~~0.906~~	~~A BB~~	~~512.~~	~~0.341 PPB~~	~~0.10~~
36	NOT FOUND								
~~37~~	~~91~~	~~459~~	~~19:07~~	~~3~~	~~0.956~~	~~A BB~~	~~1246.~~	~~0.686 PPB~~	~~0.21~~
38	NOT FOUND								
39	NOT FOUND								
40	NOT FOUND								
41	NOT FOUND								
42	NOT FOUND								

Chloroform x5 = 4.7u

3-14-97

4-methyl-2-pentanone x5 = 4.4u

No	Ret(L)	Ratio	RRT(L)	Ratio	Amnt	Amnt(L)	R.Fac	R.Fac(L)	Ratio
1	7:22	1.02	1.000	1.00	50.00	50.00	1.000	1.000	1.00
2	15:55	1.00	1.000	1.00	50.00	50.00	1.000	1.000	1.00
3	20:00	1.00	1.000	1.00	50.00	50.00	1.000	1.000	1.00
4	9:42	1.01	1.316	0.99	50.49	50.00	1.167	1.156	1.01
5	18:57	1.00	0.948	1.00	53.87	50.00	0.971	0.902	1.08
6	23:22	1.00	1.169	1.00	52.16	50.00	0.779	0.746	1.04
7	0:52		0.119						
8	1:30		0.203						
9	1:55		0.260						
10	2:37		0.356						
11	4:22	1.08	0.593	1.05	2.48	50.00	0.070	1.416	0.05
12	4:55	1.07	0.667	1.04	7.60	50.00	0.130	0.855	0.15

n28

03/15/94

9713524.2537

MEMORANDUM

JUN 1994
RECEIVED
TQO

TO: 200 UP-2 Project QA Record

May 25, 1994

FR: Thomas Stapp, Golder Associates Inc.

RE: GENERAL GC DATA VALIDATION SUMMARY FOR DATA PACKAGE B0BFF9-TMA-726 (923-E418 726EXTR.UP2)

INTRODUCTION

This memo presents the results of data validation on data package B0BFF9-TMA-726 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.

RECEIVED
JUN 1 1994
VALIDATION DOCUMENTATION
85LA

SAMPLE ID	SAMPLE DATE	MEDIA	ANALYSES
B0BFF9 B0BFG2	2/24/94 2/25/94	SOIL SOIL	SEE NOTE 1

Notes:

1. Indicates the samples were 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.

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 two (2) determinations reported, 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

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

REFERENCES

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

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

9713524.2539

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.

9713524.2541

ATTACHMENT 2

SUMMARY OF DATA QUALIFICATIONS

DATA QUALIFICATION SUMMARY - FORM B-7

SDG: B0BFF9-TMA-726	REVIEWER: T. STAPP	DATE: 5-24-94	PAGE 1 OF 1
COMMENTS: EXTRACTABLE FUEL HYDROCARBONS			
COMPOUND/ANALYTE	QUALIFIER	SAMPLES AFFECTED	REASON
NO QUALIFICATION REQUIRED			

9713524.2543

ATTACHMENT 3

QUALIFIED DATA SUMMARY and ANNOTATED LABORATORY REPORTS

Validated Data Summary, Data Package: B0BFF9-TMA-726

	Samp#	B0BFF9		B0BFG2	
	Date	2-24-94		2-25-94	
	Location	216-U-8		216-U-8	
	Depth	---		---	
	Type	SOIL		SOIL	
	Comments	---		---	
Parameter	Units	Result	Q	Result	Q
KEROSENE	MG/KG	10.000	U	10.000	U

Verified [illegible] 5-25-94

9713524.2544

U-08

9713524.2545

~~XS 5-24-94~~ ~~UUU378~~

TMA Inc. REPORT Work Order # A4-03-028

Received: 03/04/94

Results by Sample

SAMPLE ID B0BFF9 FRACTION 03E TEST CODE 8015MS NAME EPA 8015M EXTRACT.

Date & Time Collected 02/24/94 Category

MODIFIED 8015 - EXTRACTABLE FUEL HYDROCARBONS

Matrix: SOIL
Date Analyzed: 03/13/94
Dilution factor: 1.00
Concentration Units: mg/kg

Compound	Sample Result	PQL	Q
Kerosene Range	ND	10	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
XS 5-24-94

9713524.2546

~~85-24-44 000376~~

TMA Inc. REPORT Work Order # A4-03-028

Received: 03/04/94

Results by Sample

SAMPLE ID B0BFG2 FRACTION 02G TEST CODE 8015MS NAME EPA 8015M EXTRACT.

Date & Time Collected 02/25/94 Category

MODIFIED 8015 - EXTRACTABLE FUEL HYDROCARBONS

Matrix: SOIL
Date Analyzed: 03/13/94
Dilution factor: 1.00
Concentration Units: mg/Kg

Compound	Sample Result	PQL
Kerosene Range	ND	10
C10 - C16 Jet Fuel Range	NA	NA
C9 - C22 Diesel Range	NA	NA
Hydraulic Range	NA	NA

G
U

ND = Not detected at the specified limits

Verified
5-24-94

Form I

9713524.2547

ATTACHMENT 4

LABORATORY NARRATIVE and CHAIN-OF-CUSTODY DOCUMENTATION

CASE NARRATIVE

LABORATORY : TMA/ARLI

CASE : 03-028

CONTRACT ID : WESTINGHOUSE HANFORD COMPANY

SDG RECEIPT DATE : March 04, 1994

1.0 DESCRIPTION OF CASE :

Three 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
B0BFN3	A4-03-028-01A	V	SOIL
B0BFN3 MS	A4-03-028-01B	V	SOIL
B0BFN3 MSD	A4-03-028-01C	V	SOIL
B0BFG2	A4-03-028-02A	V	SOIL
B0BFG2	A4-03-028-02B	SV	SOIL
B0BFG2 MS	A4-03-028-02C	SV	SOIL
B0BFG2 MSD	A4-03-028-02D	SV	SOIL
B0BFG2	A4-03-028-02G	K	SOIL
B0BFF9	A4-03-028-03A	V	SOIL
B0BFF9	A4-03-028-03B	SV	SOIL
B0BFF9	A4-03-028-03E	K	SOIL
B0BFF9 MS	A4-03-028-03F	K	SOIL
B0BFF9 MSD	A4-03-028-03G	K	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.

Acetone was detected at concentrations above the CRQL in several samples, including the MS and MSD. Chloroform,

4-Methyl-2-pentanone, Chloromethane, and Methylene Chloride were detected in several samples at concentrations below the CRQL.

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

TUNES :

All BFB tunes were injected directly into the GC/MS instrument.

3.2.2 SEMIVOLATILE ANALYSIS COMMENTS :

LOW LEVEL SOIL :

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

Di-n-butylphthalate was detected at concentrations above the CRQL in several samples, including the blank, MS, and MSD.

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

3.2.3 EXTRACTABLE HYDROCARBONS "KEROSENE RANGE" COMMENTS :

SEQUENCE NOTES :

The sequence was started on 03/05/94 and was analyzed according to the SW-846 Method 8015M. The %RSD in the all of the initial calibrations and the %D in the continuing calibrations were below their 20% and 15% limits, respectively.

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

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 surrogate o-Terphenyl was added to each sample, and the recoveries ranged from 78% to 88%. However, since the reporting forms could not accommodate the surrogate recovery results, the data was included in the "Additional Raw Data" poriton of the package.

5-24-94
000074

The matrix spike and matrix spike duplicate recovery for Kerosene was 80%. The LCS, KLCS0311, was prepared at the same time and had a Kerosene spike recovery of 80%. The LCS results were included in the "Additional Raw Data" portion of the package. No Kerosene was detected in any of the unspiked samples.

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
Nicole Roth 4/20/94
Program Manager

Maureen Parrish
Maureen Parrish 4/20/94
Program Manager

Westinghouse Hanford Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	Page 1 of 1
		006481

Collector R.T. Sickle
Company Contact C.A. Rowley
Telephone 372-3293
SAF No. 93-263
Project Designation 216-U-8 Vitrified Clay Pipeline
Sampling Locations 216-U-8 Crib
Ice Chest No.
Bill of Lading/Airbill No.
Offsite Property No.
Method of Shipment Air Overnight
Field Logbook No.
Shipped to TMA
SPECIAL INSTRUCTIONS
Possible Sample Hazards/Remarks None Detected
Special Handling and/or Storage Keep cool

Sample Number	*	Date Collected	Time	Number and Type of Containers	Analysis Required		Preservative
BOBFF9	S	2-24-94	1315	(1) 250ml Gs ✓	VOA	CLP	
BOBFF9	S			(1) 250ml aG ✓	Semi-VOA	CLP	
BOBFF9	S			(1) 250ml Poly ✓	Metals -CLP TAL Titanium Mercury 500 ml - KB	CPL	
BOBFF9	S			(1) 125ml G ✓	Anions F, Cl, SO_4	EPA 300.0	
BOBFF9	S			(1) 125ml P/G ✓	NO_2 NO_3	EPA 353.2	
~~BOBFF9~~	~~S~~			~~(1) 250ml aGs~~	~~PCB/Pest~~ RTS 2-24-94	8080	
BOBFF9	S			(1) 125ml G ✓	Cyanide	CPL	
BOBFF9	S			(1) 125ml Gs ✓	Kerosene	8015M	
BOBFF9	S			(1) 1000ml Poly ✓	Gross Alpha/Beta EP-10; Gamma Spec. Cs-134/137, Co-60, K-40, Eu-152/154/155, Ru-106, Na-22 RC-30; Total Uranium EA-01C; U-235/234/238 EP-70, 71, 5; Np-237 RC-101A, 622, EP-5; Pu-238/239/240 EP-80, 81, 5; I-129 RC-25, 603; Sr-90 RC-306, 303, 309, 304; Tc-99 RC-24, 604; Am-241, Cm-244 EP-80, 91, 92, 93, 5; Se-79 Lab Specific		

Chain of Possession Relinquished By (Sign and Print Names)	Date	Time	Received By
R.T. Sickle R.T. Sickle	3/1/94	1200	D.L. Edwards
D.L. Edwards	3/3/94	0945	Kermit Blum K. Blum
	3-4-94	1000	

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

LABORATORY SECTION	Received By	Title	Date/Time
Final Sample Disposition	Disposal Method:	Disposed by:	Date/Time:

5-24-94 RS 0000224

9415214.0551

C-15

Westinghouse Hanford Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

006484

Collector R.T. Sickle
Company Contact C.A. Rowley
Telephone 372-3293
SAF No. 93-263
Project Designation 216-U-8 Vitrified Clay Pipeline
Sampling Locations 216-U-8 Crib
Ice Chest No.
Bill of Lading/Airbill No.
Offsite Property No.
Method of Shipment Air Overnight
Field Logbook No.
Shipped to TMA
SPECIAL INSTRUCTIONS
Possible Sample Hazards/Remarks None detected
Special Handling and/or Storage Keep cool

Sample Number	*	Date Collected	Time	Number and Type of Containers	Analysis Required		Preservative
BOBFN3	S	2-25-94	0815	(1) 250ml aGs ✓	VOA	CLP	
BOBFG2	S	2-25-94	1200	(1) 250ml Gs ✓	VOA	CLP	
BOBFG2	S			(1) 250ml aG ✓	Semi-VOA	CLP	
BOBFG2	S			(1) 250ml Poly ✓	Metals -CLP TAL Titanium Mercury	CPL	
BOBFG2	S			(1) 125ml G ✓	Anions F, Cl, SO_4	EPA 300.0	
BOBFG2	S			(1) 125ml P/G ✓	NO_2 NO_3	EPA 353.2	
~~BOBFG2~~	~~S~~			(1) 250ml aGs —	PCB/Pest — 2-25-94	8080	
BOBFG2	S			(1) 125ml G ✓	Cyanide	CPL	
BOBFG2	S			(1) 125ml Gs ✓	Kerosene	8015M	
BOBFG2	S			(1) 1000ml Poly ✓	Gross Alpha/Beta EP-10; Gamma Spec. Cs-134/137, Co-60, K-40, Eu-152/154/155, Ru-106, Na-22 RC-30; Total Uranium EA-01C; U-235/234/238 EP-70, 71, 5; Np-237 RC-101A, 622, EP-5; Pu-238/239/240 EP-80, 81, 5; I-129 RC-25, 603; Sr-90 RC-306, 303, 309, 304; Tc-99 RC-24, 604; Am-241, Cm-244 EP-80, 91, 92, 93, 5; Se-79 Lab Specific		

Chain of Possession (Sign and Print Names)

Relinquished By	Date	Time	Received By
R.T. Sickle	3/1/94	1200	D.L. Edwards
D.L. Edwards	3/3/94	0945	
	3-4-94	1000	Kermit Blum K. Blum

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

LABORATORY SECTION	Received By	Title	Date/Time
Final Sample Disposition	Disposal Method:	Disposed by:	Date/Time:

5-24-94

9413231.0905

16

9713524.2553

ATTACHMENT 5

DATA VALIDATION SUPPORTING DOCUMENTATION

GENERAL GC DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E

PROJECT: 200 UP-2		DATA PACKAGE: BOBFF9-TMA-726	
VALIDATOR:	LAB: TMA / ARLI	DATE: 5-24-94	
CASE:		SDG:	

ANALYSES PERFORMED

☐ 8010	☑ 8015 Mod.	☐ 8020	☐ 8021	8140	8141
☐ 8150	☐ 8151	☐ WTPH-HCID	☐ WTPH-G	☐ WTPH-D	☐
☐	☐	☐	☐	☐	☐

SAMPLES/MATRIX: BOBFF9, BOBFG2 / 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	Extracted	Analyzed	DAYS
BOBFF9	2-24-94	3-10-94	3-13-94	≤14
BOBFG2	2-25-94	3-10-94	3-13-94	≤14

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? . . . . Note ① . . . . . Yes No N/A

Are field/trip blank results acceptable? . . . . . Yes No N/A

Comments: ① 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. 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:

6. PRECISION

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

Are field duplicate RPD values acceptable? . . 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:

9713524.2557

MEMORANDUM

TO: 200 UP-2 Project QA Record

May 25 1994

FR: Thomas Stapp, Golder Associates Inc.

RE: INORGANIC DATA VALIDATION SUMMARY FOR DATA PACKAGE B0BFF9-TMA-726 (923-E418 726MET.UP2)

JUN 1994
RECEIVED
TQO

INTRODUCTION

This memo presents the results of data validation on data package B0BFF9-TMA-726 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
B0BFF9 B0BFG2	2/24/94 2/25/94	SOIL SOIL	SEE NOTE 1

RECEIVED
JUN 1 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 with the exception of 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 two samples were validated in this data package with a total of 50 determinations reported, all of which were deemed valid. This results in a completeness of 100 percent which meets 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

- Beryllium, silver and sodium were detected in the preparation blank. 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 calcium serial dilution percent difference 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.

9713524.2559

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.

9713524.2561

ATTACHMENT 2

SUMMARY OF DATA QUALIFICATIONS

DATA QUALIFICATION SUMMARY - FORM B-7

SDG: B0BFF9-TMA-726	REVIEWER: T. STAPP	DATE: 5-20-94	PAGE 1 OF 1
COMMENTS: INORGANIC ANALYSIS			
COMPOUND/ANALYTE	QUALIFIER	SAMPLES AFFECTED	REASON
ANTIMONY	UJ	B0BFF9 B0BFG2	MATRIX SPIKE RECOVERY IS <75% BUT >30%
BERYLLIUM, SILVER, SODIUM	U	B0BFF9 B0BFG2	DETECTED IN PREPARATION BLANK
CALCIUM	J	B0BFF9 B0BFG2	ICP SERIAL DILUTION %D >10%

9713524.2563

ATTACHMENT 3

QUALIFIED DATA SUMMARY and ANNOTATED LABORATORY REPORTS

Validated Data Summary, Data Package: BOBFF9-TMA-726

	Samp#	BOBFF9		BOBFG2	
	Date	2-24-94		2-25-94	
	Location	216-U-8		216-U-8	
	Depth	---		---	
	Type	SOIL		SOIL	
	Comments	---		---	
Parameter	Units	Result	Q	Result	Q
ALUMINUM	MG/KG	6610.000		2930.000	
ANTIMONY	MG/KG	2.500	UJ	2.600	UJ
ARSENIC	MG/KG	5.200		3.100	
BARIUM	MG/KG	96.500		15.700	B
BERYLLIUM	MG/KG	0.510	U	0.250	U
CADMIUM	MG/KG	0.360	U	0.370	U
CALCIUM	MG/KG	7310.000	J	1700.000	J
CHROMIUM	MG/KG	7.600		6.100	
COBALT	MG/KG	12.000		7.500	B
COPPER	MG/KG	14.700		6.000	
IRON	MG/KG	26100.000		16600.000	
LEAD	MG/KG	4.100		1.500	
MAGNESIUM	MG/KG	5120.000		1470.000	
MANGANESE	MG/KG	426.000		122.000	
MERCURY	MG/KG	0.050	U	0.110	
NICKEL	MG/KG	8.600		3.000	B
POTASSIUM	MG/KG	1150.000		367.000	B
SELENIUM	MG/KG	0.590	U	0.600	U
SILVER	MG/KG	2.200	U	1.400	U
SODIUM	MG/KG	602.000	U	593.000	U
THALLIUM	MG/KG	0.770	U	0.790	U
VANADIUM	MG/KG	60.400		62.000	
ZINC	MG/KG	49.200		32.800	
CYANIDE	MG/KG	0.520	U	0.520	U
TITANIUM	MG/KG	1800.000		2350.000	

Verified 5-25-94

9713524.2564

008

9713524.2565

WESTINGHOUSE/HANFORD

1

SAMPLE NUMBER:

INORGANIC ANALYSIS DATA SHEET

B0BFG2

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

Lab Code: SKINER Case No.: N4-03-026SAS No.: SDG No.: B0BFF9

Matrix (soil/water): SOIL Lab Sample ID: 03116-02S

Level (low/med): LOW Date Received: 03/08/94

% Solids: 92.2

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

CAS No.	Analyte	Concentration	C	Q	M	Q
7429-90-5	Aluminum	2930			P	
7440-36-0	Antimony	2.6	~~U~~	N	P	UJ
7440-38-2	Arsenic	3.1			P	
7440-39-3	Barium	15.7	B		P	
7440-41-7	Beryllium	0.25	~~B~~		P	U
7440-43-9	Cadmium	0.37	U		P	
7440-70-2	Calcium	1700	~~/~~	E	P	J
7440-47-3	Chromium	6.1			P	
7440-48-4	Cobalt	7.5	B		P	
7440-50-8	Copper	6.0			P	
7439-89-6	Iron	16600			P	
7439-92-1	Lead	1.5			P	
7439-95-4	Magnesium	1470			P	
7439-96-5	Manganese	122			P	
7439-97-6	Mercury	0.11			CV	
7440-02-0	Nickel	3.0	B		P	
7440-09-7	Potassium	367	B		P	
7782-49-2	Selenium	0.60	U		P	
7440-22-4	Silver	1.4	~~B~~		P	U
7440-23-5	Sodium	593	~~B~~		P	U
7440-28-0	Thallium	0.79	U		P	
7440-62-2	Vanadium	62.0			P	
7440-66-6	Zinc	32.8			P	
	Cyanide	0.52	U		CA	
7440-32-6	Titanium	2350			P	

Color Before: GREY Clarity Before: Texture: COARSE

Color After: GREY Clarity After: Artifacts: YES

Comments:
STONES

5-20-94
~~003~~

FORM I - IN ILM02.1

9713524.2566

WESTINGHOUSE/HANFORD

1

SAMPLE NUMBER:

INORGANIC ANALYSIS DATA SHEET

B0BFF9

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

Lab Code: SKINER Case No.: N4-03-026SAS No.: SDG No.: B0BFF9

Matrix (soil/water): SOIL Lab Sample ID: 03116-01S

Level (low/med): LOW Date Received: 03/08/94

% Solids: 95.7

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

CAS No.	Analyte	Concentration	C	Q	M	Q
7429-90-5	Aluminum	6610			P	
7440-36-0	Antimony	2.5	~~UN~~	N	P	UJ
7440-38-2	Arsenic	5.2			P	
7440-39-3	Barium	96.5			P	
7440-41-7	Beryllium	0.51	~~B~~		P	U
7440-43-9	Cadmium	0.36	U		P	
7440-70-2	Calcium	7310	~~/~~	E	P	J
7440-47-3	Chromium	7.6			P	
7440-48-4	Cobalt	12.0			P	
7440-50-8	Copper	14.7			P	
7439-89-6	Iron	26100			P	
7439-92-1	Lead	4.1			P	
7439-95-4	Magnesium	5120			P	
7439-96-5	Manganese	426			P	
7439-97-6	Mercury	0.05	U		CV	
7440-02-0	Nickel	8.6			P	
7440-09-7	Potassium	1150			P	
7782-49-2	Selenium	0.59	U		P	
7440-22-4	Silver	2.2	~~/~~		P	U
7440-23-5	Sodium	602	~~B~~		P	U
7440-28-0	Thallium	0.77	U		P	
7440-62-2	Vanadium	60.4			P	
7440-66-6	Zinc	49.2			P	
	Cyanide	0.52	U		CA	
7440-32-6	Titanium	1800			P	

Color Before: GREY Clarity Before: Texture: MEDIUM

Color After: GREY Clarity After: Artifacts:

Comments:

5-20-94

002

FORM I - IN ILM02.1

010

9713524.2567

ATTACHMENT 4

LABORATORY NARRATIVE and CHAIN-OF-CUSTODY DOCUMENTATION

9713524.2563

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

APR 1994
RECEIVED
SDLA

April 8, 1994

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

Quality Control Narrative

Scope
Two soil samples were submitted to TMA/Skinner & Sherman Laboratories, Inc. on March 8, 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 S403116.

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 matrix spike recovery for antimony exceeded the control limit requirement.

The ICP serial dilution for calcium 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

Westinghouse Hanford Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	Page 1 of 1
		006484

Collector R.T. Sickle
Company Contact C.A. Rowley
Telephone 372-3293
SAF No. 93-263
Project Designation 216-U-8 Vitrified Clay Pipeline
Sampling Locations 216-U-8 Crib
Ice Chest No.
Bill of Lading/Airbill No.
Offsite Property No.
Method of Shipment Air Overnight
Field Logbook No.
Shipped to TMA
SPECIAL INSTRUCTIONS
Possible Sample Hazards/Remarks None detected
Special Handling and/or Storage Keep cool

Sample Number	*	Date Collected	Time	Number and Type of Containers	Analysis Required		Preservative
BOBFN3	S	2-25-94	0815	(1) 250ml aGs ✓	VOA	CLP	
BOBFG2	S	2-25-94	1200	(1) 250ml Gs ✓	VOA	CLP	
BOBFG2	S			(1) 250ml aG ✓	Semi-VOA	CLP	
BOBFG2	S			(1) 250ml Poly ✓	Metals -CLP TAL Titanium Mercury	CPL	
BOBFG2	S			(1) 125ml G ✓	Anions F, Cl, SO_4	EPA 300.0	
BOBFG2	S			(1) 125ml P/G ✓	NO_2 NO_3	EPA 353.2	
~~BOBFG2~~	~~S~~			(1) 250ml aGs –	PCB/Pest	8080	
BOBFG2	S			(1) 125ml G ✓	Cyanide	CPL	
BOBFG2	S			(1) 125ml Gs ✓	Kerosene	8015M	
BOBFG2	S			(1) 1000ml Poly ✓	Gross Alpha/Beta EP-10; Gamma Spec. Cs-134/137, Co-60, K-40, Eu-152/154/155, Ru-106, Na-22 RC-30; Total Uranium EA-01C; U-235/234/238 EP-70, 71, 5; Np-237 RC-101A, 622, EP-5; Pu-238/239/240 EP-80, 81, 5; I-129 RC-25, 603; Sr-90 RC-306, 303, 309, 304; Tc-99 RC-24, 604; Am-241, Cm-244 EP-80, 91, 92, 93, 5; Se-79 Lab Specific		

Chain of Possession (Sign and Print Names) Relinquished By	Date	Time	Received By
R.T. Sickle	3/1/94	1200	D L Edwards
D L Edwards	3/3/94	0945	
	3-4-94	1000	Kermit Blum K. Blum

***Matrix**

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

LABORATORY SECTION	Received By	Title	Date/Time
Final Sample Disposition	Disposal Method:	Disposed by:	Date/Time:

5-20-94

0000028

9713524.2569

013

Westinghouse Hanford Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

006481

Collector R.T. Sickle
Company Contact C.A. Rowley
Telephone 372-3293
SAF No. 93-263
Project Designation 216-U-8 Vitrified Clay Pipeline
Sampling Locations 216-U-8 Crib
Ice Chest No.
Bill of Lading/Airbill No.
Offsite Property No.
Method of Shipment Air Overnight
Field Logbook No.
Shipped to TMA
SPECIAL INSTRUCTIONS
Possible Sample Hazards/Remarks None Detected
Special Handling and/or Storage Keep cool

Sample Number	*	Date Collected	Time	Number and Type of Containers	Analysis Required		Preservative
BOBFF9	S	2-24-94	1315	(1) 250ml Gs ✓	VOA	CLP	
BOBFF9	S			(1) 250ml aG ✓	Semi-VOA	CLP	
BOBFF9	S			(1) 250ml Poly ✓	Metals -CLP TAL Titanium Mercury 500 ml - KB	CPL	
BOBFF9	S			(1) 125ml G ✓	Anions F, Cl, SO_4	EPA 300.0	
BOBFF9	S			(1) 125ml P/G ✓	NO_2 NO_3	EPA 353.2	
~~BOBFF9~~	~~S~~			~~(1) 250ml aGs~~	~~PCB/Pest~~ RTS 2-24-94	~~8080~~	
BOBFF9	S			(1) 125ml G ✓	Cyanide	CPL	
BOBFF9	S			(1) 125ml Gs ✓	Kerosene	8015M	
BOBFF9	S			(1) 1000ml Poly ✓	Gross Alpha/Beta EP-10; Gamma Spec. Cs-134/137, Co-60, K-40, Eu-152/154/155, Ru-106, Na-22 RC-30; Total Uranium EA-01C; U-235/234/238 EP-70, 71, 5; Np-237 RC-101A, 622, EP-5; Pu-238/239/240 EP-80, 81, 5; I-129 RC-25, 603; Sr-90 RC-306, 303, 309, 304; Tc-99 RC-24, 604; Am-241, Cm-244 EP-80, 91, 92, 93, 5; Se-79 Lab Specific		

Chain of Possession Relinquished By (Sign and Print Names)	Date	Time	Received By
R.T. Sickle	3/1/94	1200	DL Edwards
DL Edwards	3/3/94	0945	Kermit Blum K. Blum
	3-4-94	1000	

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

LABORATORY SECTION	Received By	Title	Date/Time
Final Sample Disposition	Disposal Method:	Disposed by:	Date/Time:

9713524.2570

S-20-94 ~~000022A~~

014

9713524.2571

ATTACHMENT 5

DATA VALIDATION SUPPORTING DOCUMENTATION

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E

PROJECT: 200-UP-2		DATA PACKAGE: BOBFF9-TMA-726	
VALIDATOR: T. Stapp	LAB: TMA/Skinner & Sherm.	DATE: 5-20-94	
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 BØBFF9, BØBFG2 / SOILS

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: See Holding Times Summary page B-1.

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? . . Note ① . . . . . Yes No N/A RS 5-25-9
Were preparation blanks analyzed? . . . . . Yes No N/A
Are preparation 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 Contaminants detected in preparatory blank only will qualify associated analytes in samples since contam. in ICB and CCB were not at a high enough level to affect assoc. sample results. See Blank Summary page. ② Field QC not identified, but ID has been requested. Field blanks will be evaluated in the final data summary.

5. ACCURACY

Were spike samples analyzed? . . . . . Yes No N/A
Are spike sample recoveries acceptable? . . Note ① . . . . . Yes No N/A
Were laboratory control samples (LCS) analyzed? . . . . . Yes No N/A
Are LCS recoveries acceptable? . . . . . Note ② . . . . . Yes No N/A
Comments: ① See accuracy data summary page B-4.
~~② Titanium amount added to LCS was not provided but has been requested.~~ RS 5-27-
② Titanium LCS recovery is within limits set by laboratory.

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? . Note ① . . . Yes No N/A
Are field duplicate RPD values acceptable? . Note ② . . . . Yes No N/A
Are field split RPD values acceptable? . . . . . Yes No N/A

Comments: ① See ICP Serial dilution Summary page.
② Field QC was not identified in this sample set, but has been requested. Field Duplicates will be evaluated in the final data summary.

7. FURNACE AA QUALITY CONTROL

Were duplicate injections performed as required? . Note ① . . 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: ① GFAA was not performed on this sample set.

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

SDG: BOBFF9-TMA-726 | VALIDATOR: T. Stapp | DATE: 5-20-94 | PAGE 1 OF 1

COMMENTS: SOIL SAMPLES

FIELD SAMPLE ID	ANALYSIS TYPE	DATE SAMPLED	DATE PREPARED	DATE ANALYZED	PREP. HOLDING TIME, DAYS	ANALYSIS HOLDING TIME, DAYS	QUALIFIER
BOBFF9	CN	2-24-94	3-10-94	3-10-94	14	14 ≤14	NONE
BOBFG2	CN	2-25-94	"	"	13	13 ≤14	
BOBFF9	Hg	2-24	3-15-94	3-18-94	19	22 ≤28	
BOBFG2	Hg	2-25	"	"	18	21 ≤28	
BOBFF9	ICP	2-24	3-21-94	3-30-94	25	34 ≤180	
BOBFG2	ICP	2-25	"	"	24	33	
BOBFF9	As, Pb, Tl, Se	2-24	3-21-94	4-07-94	25	42	
BOBFG2	"	2-25	3-21-94	"	24	41	

9713524.2575

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

BLANK CONTAMINANT SUMMARY

WESTINGHOUSE/HANFORD

SDG: B0BFF9-TMA-72

3
BLANKS

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

Lab Code: SKINER Case No.: N4-03-026SAS No.: SDG No.: B0BFF9

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	ug/L	5X
Aluminum	15.0	U	39.8	B	17.1	B	26.6	B	6.312	B	P	31.6	158
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	0.8	U	1.2	B	2.1	B	0.712	B	P	3.6	18
Beryllium	0.3	U	0.4	B	0.4	B	0.3	U	0.100	B	P	0.5	2.5 ✓
Cadmium	1.7	U	1.8	B	1.7	U	2.5	B	0.340	U	P		12.5
Calcium	543.3	B	133.8	B	83.4	U	83.4	U	183.922	B	P	920.	4600
Chromium	2.5	U	2.5	U	2.5	U	2.5	U	0.500	U	P		
Cobalt	2.9	U	2.9	U	2.9	U	2.9	U	0.580	U	P		
Copper	4.8	B	7.0	B	1.6	U	1.6	U	0.712	B	P		24
Iron	13.4	U	16.2	B	29.0	B	55.4	B	15.848	B	P	79.2	396
Lead	1.8	U	1.8	U	1.8	U	1.8	U	0.360	U	P		
Magnesium	32.2	U	34.3	B	32.2	U	32.2	U	76.812	B	P	384.	1920
Manganese	0.8	U	0.8	B	1.7	B	2.2	B	0.932	B	P	4.7	23.5
Mercury	0.1	U	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	63.130	B	P	316.	1580
Selenium	2.8	U	2.8	U	2.8	U	2.8	U	0.560	U	P		
Silver	2.1	U	2.1	U	2.1	U	2.1	U	0.534	B	P	2.7	13.5 ✓
Sodium	39.6	U	39.6	U	39.6	U	39.6	U	380.000	B	P	1900.	9500 ✓
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	14.3	B	5.8	B	4.6	U	4.6	U	3.520	B	P	17.6	88
Cyanide	10.0	U	10.0	U	10.0	U	10.0	U	0.500	U	CA		
Titanium	1.2	U	1.7	B	2.8	B	3.6	B	0.718	B	P	3.6	18
	*				*		*		*				

✓ – Analytes that qualify samples as non-detect.
* – Associated with samples in this SDG.

~~008~~

FORM III - IN ILM02.1 5-20-94

ACCURACY DATA SUMMARY

BOBFF9-TMA-726

SDG:	VALIDATOR: T. Stapp	DATE: 5-20-94	PAGE 1 OF 1	
COMMENTS:				
SAMPLE ID	COMPOUND	% RECOVERY	SAMPLE(S) AFFECTED	QUALIFIER REQUIRED
BOBFG2 MS	Antimony	74.3	BOBFF9,	UJ
"	"	"	BOBFG2	UJ

9713524.2573

WESTINGHOUSE/HANFORD

SDG: B0BFF9-TMA-726

9

SAMPLE NUMBER:

B0BFG2L

ICP SERIAL DILUTIONS

Summary

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

Lab Code: SKINER Case No.: N4-03-026SAS No.: SDG No.: B0BFF9

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	13638.00		13444.00		1.4		P
Antimony	12.20	U	61.00	U			P
Arsenic	14.56		15.00	U	100.0		P
Barium	72.98	B	75.75	B	3.8		P
Beryllium	1.18	B	1.50	U	100.0		P
Cadmium	1.70	U	8.50	U			P
Calcium	7919.10		13156.00	B	66.1	E	P
Chromium	28.26		37.90	B	34.1		P
Cobalt	35.09	B	33.40	B	4.8		P
Copper	27.96		37.05	B	32.5		P
Iron	77401.00		76085.00		1.7		P
Lead	6.90		9.00	U	100.0		P
Magnesium	6862.70		6828.50	B	0.5		P
Manganese	567.54		564.90		0.5		P
Mercury							NR
Nickel	13.85	B	28.45	B	105.4		P
Potassium	1711.10	B	1607.50	B	6.1		P
Selenium	2.80	U	14.00	U			P
Silver	6.75	B	16.55	B	145.2		P
Sodium	2762.70	B	2696.65	B	2.4		P
Thallium	3.70	U	18.50	U			P
Vanadium	288.49		291.50		1.0		P
Zinc	152.95		210.05		37.3		P
Titanium	10937.00		10565.50		3.4		P

Circled % Difference result qualifies assoc. samples as estimated for positive Ca results.

5-20-94

FORM IX - IN ILM02.1

9713524.2579

MEMORANDUM

JUN 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 B0BFF9-TMA-726 (923-E418 726GEN.UP2)

INTRODUCTION

This memo presents the results of data validation on data package B0BFF9-TMA-726 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.

RECEIVED JUN 1 1994 VALIDATION DOCUMENTATION

SAMPLE ID	SAMPLE DATE	MEDIA	ANALYSES
B0BFF9 B0BFG2	02/24/94 02/25/94	SOIL SOIL	SEE NOTE 1

Notes:

1. Indicates the samples were 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

DATA QUALITY OBJECTIVES

The following section presents a summary of the data quality in terms of the referenced data validation criteria.

Precision. Goals for precision were met with the exception of RPD results as indicated below.

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 eight (8) 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 Duplicates

- The relative percent difference (RPD) for fluoride was unacceptable. 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.

9713524.2581

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.

9713524.2583

ATTACHMENT 2

SUMMARY OF DATA QUALIFICATIONS

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

DATA QUALIFICATION SUMMARY - FORM B-7

SDG: B0BFF9-TMA-726	REVIEWER: T. STAPP	DATE: 5-19-94	PAGE 1 OF 1
COMMENTS: WET CHEMISTRY			
COMPOUND/ANALYTE	QUALIFIER	SAMPLES AFFECTED	REASON
FLUORIDE	J/UJ	B0BFF9 B0BFG2	RPD IS >35% FOR SOILS

9713524.2585

ATTACHMENT 3

QUALIFIED DATA SUMMARY and ANNOTATED LABORATORY REPORTS

Validated Data Summary, Data Package: B0BFF9-TMA-726

	Samp#	B0BFF9		B0BFG2	
	Date	2-24-94		2-25-94	
	Location	216-U-8		216-U-8	
	Depth	---		---	
	Type	SOIL		SOIL	
	Comments	---		---	
Parameter	Units	Result	Q	Result	Q
CHLORIDE	MG/KG	4.500		3.100	
FLUORIDE	MG/KG	4.000	J	0.500	UJ
SULFATE	MG/KG	10.000		10.000	
NITRATE+NITRITE	MG-N/KG	47.100		47.700	

Verified RS 5-25-94

9713524.2586

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5-19-94 ~~000010~~

TMA Inc. REPORT Work Order # A4-03-028

Received: 03/04/94

Results by Sample

SAMPLE ID B0BFF9 FRACTION 03C TEST CODE WCCLPS NAME Anions in Solids

Date & Time Collected 02/24/94 Category

ANIONS AND WET CHEMISTRY - SOLIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT	Q
Chloride	300.0	4.5	mg/kg	1.0	~~J~~ J
Fluoride	300.0	4.0	mg/kg	0.5	
Sulfate	300.0	10	mg/kg	5	

5-25-94

FORM I

Verified 5-19-94

9713524.2583

5-19-94 ~~000009~~

TMA Inc. REPORT Work Order # A4-03-028

Received: 03/04/94

Results by Sample

SAMPLE ID B0BFG2 FRACTION 02E TEST CODE WCCLPS NAME Anions in Solids

Date & Time Collected 02/25/94 Category

ANIONS AND WET CHEMISTRY - SOLIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT	
Chloride	300.0	3.1	mg/kg	1.0	Q
Fluoride	300.0	<0.5	mg/kg	0.5	UJ
Sulfate	300.0	10	mg/kg	5	

5-25-94

FORM I

Verified 5-19-94

9713524.2589

5-19-94

*** T M A *** REPORT Work Order # S4-03-101

Received: 03/08/94 Results by Sample

SAMPLE ID B0BFF9 SAMPLE # 01 FRACTIONS: A
Date & Time Collected 02/24/94 13:15:00 Category SOIL

NITR_S 47.1
mg N/kg

SAMPLE ID B0BFF9D SAMPLE # 01 FRACTIONS: B
Date & Time Collected 02/24/94 13:15:00 Category SOIL

NITR_S 48.8
mg N/kg

SAMPLE ID B0BFF9S SAMPLE # 01 FRACTIONS: C
Date & Time Collected 02/24/94 13:15:00 Category SOIL

NITR_S 69.6
mg N/kg

SAMPLE ID B0BFG2 SAMPLE # 02 FRACTIONS: A
Date & Time Collected 02/25/94 12:00:00 Category SOIL

NITR_S 47.7
mg N/kg

SAMPLE ID LCSS SAMPLE # 03 FRACTIONS: A
Date & Time Collected not specified Category SOIL

NITR_S 2.07
mg N/L

Verified 5-19-94

-011

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 issued 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) 890-7300

ATTACHMENT 4

LABORATORY NARRATIVE and CHAIN-OF-CUSTODY DOCUMENTATION

5-19-94

~~000006~~

GENERAL CHEMISTRY RESULTS

CASE NO. 03-028

Sample #s:

B0BFF9 B0BFG2

CASE NARRATIVE

Duplicate analysis on sample B0BFF9 (A4-03-028-03D) revealved a % RPD for Chloride and Fluoride of 36.8% and 35.3% respectively and 17.4 for Sulfate. In addition, the matrix spike for Fluoride (A4-03-028-02F) yielded a 77% recovery. The high RPDs and the low % recovery can be attributed to an inhomogeneous sample and matrix interference.

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

Maureen Parrish 4/21/94

Maureen Parrish

Westinghouse Hanford Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	Page 1 of 1
		006481

Collector R.T. Sickle
Company Contact C.A. Rowley
Telephone 372-3293
SAF No. 93-263
Project Designation 216-U-8 Vitrified Clay Pipeline
Sampling Locations 216-U-8 Crib
Ice Chest No.
Bill of Lading/Airbill No.
Offsite Property No.
Method of Shipment Air Overnight
Field Logbook No.
Shipped to TMA
SPECIAL INSTRUCTIONS
Possible Sample Hazards/Remarks None Detected
Special Handling and/or Storage Keep cool

Sample Number	*	Date Collected	Time	Number and Type of Containers	Analysis Required		Preservative
BOBFF9	S	2-24-94	1315	(1) 250ml Gs ✓	VOA	CLP	
BOBFF9	S			(1) 250ml aG ✓	Semi-VOA	CLP	
BOBFF9	S			(1) 250ml Poly ✓	Metals -CLP TAL Titanium Mercury 500 ml - KB	CPL	
BOBFF9	S			(1) 125ml G ✓	Anions F, Cl, SO_4	EPA 300.0	
BOBFF9	S			(1) 125ml P/G ✓	NO_2 NO_3	EPA 353.2	
~~BOBFF9~~	~~S~~			~~(1) 250ml aGs~~	~~PCB/Pest~~ RHK 2-24-94	~~8080~~	
BOBFF9	S			(1) 125ml G ✓	Cyanide	CPL	
BOBFF9	S			(1) 125ml Gs ✓	Kerosene	8015M	
BOBFF9	S			(1) 1000ml Poly ✓	Gross Alpha/Beta EP-10; Gamma Spec. Cs-134/137, Co-60, K-40, Eu-152/154/155, Ru-106, Na-22 RC-30; Total Uranium EA-01C; U-235/234/238 EP-70, 71, 5; Np-237 RC-101A, 622, EP-5; Pu-238/239/240 EP-80, 81, 5; I-129 RC-25, 603; Sr-90 RC-306, 303, 309, 304; Tc-99 RC-24, 604; Am-241, Cm-244 EP-80, 91, 92, 93, 5; Se-79 Lab Specific		

Chain of Possession (Sign and Print Names) Relinquished By	Date	Time	Received By
R.T. Sickle	3/1/94	1200	D.L. Edwards
D.L. Edwards	3/3/94	0945	Kermit Blum K. Blum
	3-4-94	1000	

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

LABORATORY SECTION	Received By	Title	Date/Time
Final Sample Disposition	Disposal Method:	Disposed by:	Date/Time:

5-19-94 RS
0000024
014

~~000028~~

5-19-94

Westinghouse Hanford Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	Page 1 of 1
		006484

Collector R.T. Sickle
Company Contact C.A. Rowley
Telephone 372-3293
SAF No. 93-263
Project Designation 216-U-8 Vitrified Clay Pipeline
Sampling Locations 216-U-8 Crib
Ice Chest No.
Bill of Lading/Airbill No.
Offsite Property No.
Method of Shipment Air Overnight
Field Logbook No.
Shipped to TMA
SPECIAL INSTRUCTIONS
Possible Sample Hazards/Remarks None detected
Special Handling and/or Storage Keep cool

Sample Number	*	Date Collected	Time	Number and Type of Containers	Analysis Required		Preservative
BOBFN3	S	2-25-94	0815	(1) 250ml aGs ✓	VOA	CLP	
BOBFG2	S	2-25-94	1200	(1) 250ml Gs ✓	VOA	CLP	
BOBFG2	S			(1) 250ml aG ✓	Semi-VOA	CLP	
BOBFG2	S			(1) 250ml Poly ✓	Metals -CLP TAL Titanium Mercury	CPL	
BOBFG2	S			(1) 125ml G ✓	Anions F, Cl, SO_4	EPA 300.0	
BOBFG2	S			(1) 125ml P/G ✓	NO_2 NO_3	EPA 353.2	
~~BOBFG2~~	~~S~~			(1) 250ml aGs —	PCB/Pest	8080	
BOBFG2	S			(1) 125ml G ✓	Cyanide	CPL	
BOBFG2	S			(1) 125ml Gs ✓	Kerosene	8015M	
BOBFG2	S			(1) 1000ml Poly ✓	Gross Alpha/Beta EP-10; Gamma Spec. Cs-134/137, Co-60, K-40, Eu-152/154/155, Ru-106, Na-22 RC-30; Total Uranium EA-01C; U-235/234/238 EP-70, 71, 5; Np-237 RC-101A, 622, EP-5; Pu-238/239/240 EP-80, 81, 5; I-129 RC-25, 603; Sr-90 RC-306, 303, 309, 304; Tc-99 RC-24, 604; Am-241, Cm-244 EP-80, 91, 92, 93, 5; Se-79 Lab Specific		

Chain of Possession Relinquished By (Sign and Print Names)	Date	Time	Received By
R.T. Sickle	3/1/94	1200	D L Edwards
D L Edwards	3/3/94	0945	
	3-4-94	1000	Kermit Blum K. Blum

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

LABORATORY SECTION	Received By	Title	Date/Time
Final Sample Disposition	Disposal Method:	Disposed by:	Date/Time:

9413624.2503

015

9713524.2594

ATTACHMENT 5

DATA VALIDATION SUPPORTING DOCUMENTATION

GENERAL CHEMISTRY DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E

PROJECT: 200-UP-2	DATA PACKAGE: BOBFF9-TMA-726
VALIDATOR: T. Stapp	LAB: TMA / Skinner & Sherm. DATE: 5-19-94
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 BOBFF9, BOBFG2 / SOIL

Sample Location: 216-U-8 CRIB

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Is technical verification documentation present? . . . . . Note① . . (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	Prep.	Analyzed		DAYS
BOBFF9	2-24-94	3-24-94	3-24-94	(F^- Cl^- $SO_4^=$)	≤28
BOBFG2	2-25-94	3-24-94	3-24-94	(F^- Cl^- $SO_4^=$)	≤28
BOBFF9	"	3-16-94	3-17-94	(NO_2/NO_3)	≤28
BOBFG2	"	3-16-94	3-17-94	(NO_2/NO_3)	≤28

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 was not identified with this sample set, but it has been requested. Field blanks 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? . . . . . Yes No N/A

Were LCS analyses performed at the required frequency? . . . Yes No N/A

Are LCS recoveries acceptable? . . . . Note ① . . . . . Yes No N/A

Comments: ① LCS raw data not provided for NO_2/NO_3 analysis, however ICV recovery is acceptable.

6. PRECISION

Were laboratory duplicate samples analyzed at the required frequency? . . . . . Yes No N/A

Are laboratory duplicate sample RPD values acceptable? 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

GENERAL CHEMISTRY DATA VALIDATION CHECKLIST

Comments: ① RPD for fluoride analysis was above limits (35%) for soil samples >5xCRQL. Therefore assoc. sample results are qualified (J/UJ).
② Field QC not identified in this sample set, but has been requested. Field dups. will be evaluated in 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? . . . . . Yes No N/A

Are results calculated properly? . . . . . Yes No N/A

Do results meet the CRDLs? . . . . . Note ① YES . . . ~~Yes No N/A~~ ~~5-25~~

Comments:

~~① CRDL's of 0.1 mg/L for fluoride, chloride, and sulfate were not met according to data validation procedures (WHC, 1993. Rev. 2) This will be stated in the validation memorandum.~~

① CRDL's for these parameters in soil are not specified and no qualification or narrative will result. 5-27-94

Precision Summary

5-25-94

000014

TMA Inc. REPORT Work Order # A4-03-028

Peceived: 03/04/94 Results by Sample

SAMPLE ID B0BFF9 Duplicate FRACTION 03D TEST CODE WCQCD NAME Quality Control Summary

Date & Time Collected 02/24/94 Category

DUPLICATE QC SUMMARY

ANALYSIS	SAMPLE ID	SAMPLE RESULT	DUPL. RESULT	RPD
Chloride	B0BFF9 DUP	4.5	3.1	36.8
Fluoride	B0BFF9 DUP	* 4.0	2.8	35.3
Sulfate	B0BFF9 DUP	10	8.4	17.4

* Sample result is > 5 x CRQL and associated Sample results are qualified (J/UJ).

FORM VI