START

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2688
1 of 27
9403687

Department of Energy
Richland Operations Office
P.O. Box 550
Richland, Washington 99352

94-ERB-144

JUN 16 1994

RECEIVED
JUN 21 1994
CORRESPONDENCE CONTROL

Mr. Dave C. Nylander
Nuclear Waste Program
State of Washington
Department of Ecology
P.O. Box 1386, MSIN N1-05
Richland, Washington 99352-0539

Mr. Douglas R. Sherwood
Hanford Project Manager
U.S. Environmental Protection Agency
712 Swift Boulevard, Suite 5
Richland, Washington 99352

Dear Messrs. Nylander and Sherwood:

SUBMITTAL OF 200-UP-2 VALIDATED DATA PACKAGES

Attatched are validated data packages from the 200-UP-2 Limited Field Investigation (LFI). The validated data packages represent data from the 200-UP-2 vadose zone boreholes. This transmittal does not represent all of the data packages from the 200-UP-2 LFI. Submittal of these validated data packages partially fulfills pending Hanford Federal Facility Agreement and Consent Order Interim Milestone of M-15-15A. As other data packages become available, they will be transmitted under separate cover.

If you have any questions, please contact Mr. Paul M. Pak at 376-4798.

Sincerely,

Patrick W. Willison
Acting Hanford Project Manager

END:PMP

Attachment

cc w/attach:
B. Austin, WHC

cc w/o attach:
L. Arnold, WHC
~~H. Downey, WHC~~
N. Uziemblo, Ecology
M. Wasewmiller, WHC
T. Wintczak, WHC

JUN 1994
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9413225.0002

CORRESPONDENCE DISTRIBUTION COVERSHEET

Author	Addressee	Correspondence No.
P. W. Willison, RL (M. A. Wasemiller, WHC)	D. C. Nylander, Ecology D. R. Sherwood, EPA	Incoming: 9403687 Xref: 9453549D

Subject: SUBMITTAL OF 200-UP-2 VALIDATED DATA PACKAGES

INTERNAL DISTRIBUTION

Approval	Date	Name	Location	w/att
		Correspondence Control	A3-01	
		L. D. Arnold	B2-35	
		R. A. Carlson	H6-03	
		W. T. Dixon	H6-21	
		H. D. Downey	H6-27	
		M. J. Galgoul	H6-04	
		G. C. Henckel III	H6-04	
		M. C. Hughes	X5-55	
		P. J. Mackey	B3-15	
		H. E. McGuire, Sr. Staff	B3-63	
		S. R. Moreno	B3-06	
		J. A. Rivera	B2-16	
		M. A. Wasemiller	H6-04	
		T. M. Wintczak, Assignee	H6-27	
		EPIC	H6-08	
		200-UP-2 OU Project File	H6-08	
		MAW:LB	H6-04	

Enclosures are the same as external letter #9453549D, kla 6-1843.

GENERAL GC DATA VALIDATION SUMMARY FOR DATA PACKAGE:
B09325-TMA-620 (923-E418,Filename B09325.GC)

MEMORANDUM

TO: 200-UP-2 Project QA Record March 1, 1994

FR: Susan Winter, Golder Associates Inc.

RE: GENERAL GC DATA VALIDATION SUMMARY FOR DATA PACKAGE: B09325-TMA-620 (923-E418, Filename B09325.GC)

INTRODUCTION

This memo presents the results of data validation on data package B09325-TMA-620 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
B09325	09/07/93	SOIL	SEE NOTE 1
B09326	09/07/93	SOIL	
B09327	09/08/93	SOIL	
B09328	09/08/93	SOIL	
B09329	09/08/93	SOIL	
B09330	09/08/93	SOIL	

Note 1. All samples were analyzed for kerosene according to the 8015 Modified method.

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

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

DATA QUALITY OBJECTIVES

Precision. Goals for precision were met.

Accuracy. Goals for accuracy were met.

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

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

Completeness. The data package was complete for all requested analyses. A total of six samples were validated in this data package with a total of 6 determinations reported, all of

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

MAJOR DEFICIENCIES

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

MINOR DEFICIENCIES

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

REFERENCES

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

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

ATTACHMENT 1

GLOSSARY OF DATA REPORTING QUALIFIERS

GLOSSARY OF ORGANIC DATA REPORTING QUALIFIERS

B - Indicates the constituent was analyzed for and detected in the associated laboratory blank. This qualifier is applied by the laboratory. During the process of data validation this qualifier may be replaced by other appropriate qualifiers as defined by the validation procedures. The associated data should be considered usable for decision making purposes.

U - Indicates the constituent was analyzed for and not detected. The concentration reported is the sample quantitation limit corrected for aliquot size, dilution and percent solids (in the case of solid matrices) by the laboratory. The associated data should be considered usable for decision making purposes.

UJ - Indicates the constituent was analyzed for and not detected. Due to a minor quality control deficiency identified during data validation the concentration reported may not accurately reflect the sample quantitation limit. The associated data should be considered usable for decision making purposes.

J - Indicates the constituent was analyzed for and detected. This qualifier may be applied by the laboratory to indicate a concentration which is less than the contract required quantitation limit (CRQL) but greater than the instrument detection limit (IDL). During data validation this qualifier may be applied to indicate a minor quality control deficiency. However in either case, the associated data should be considered usable for decision making purposes.

NJ - Indicates presumptive evidence of a constituent at an estimated value. This qualifier is normally applied to GC analysis data (such as organochlorine pesticide and PCB data). The associated data should be considered usable for decision making purposes.

N - Indicates presumptive evidence of a constituent. This qualifier is normally applied to GC analysis data (such as organochlorine pesticide and PCB data). The associated data should be considered usable for decision making purposes.

JN - Indicates a tentatively identified compound (TIC) whose concentration and identification have been determined to be valid as a result of data validation. The associated data should be considered usable for decision making purposes.

UR - Indicates the constituent was analyzed for and not detected. The concentration reported has been qualified as unusable due to a major quality control deficiency identified during data validation. The associated data should be considered unusable for decision making purposes.

R - Indicates the constituent was analyzed for and detected. The concentration reported has been qualified as unusable due to a major quality control deficiency identified during data validation. The associated data should be considered unusable for decision making purposes.

ATTACHMENT 2

SUMMARY OF DATA QUALIFICATIONS

DATA QUALIFICATION SUMMARY

SDG: B09325-TMA-620	VALIDATOR:	DATE: March 1, 1994	PAGE 1 OF 1
COMMENTS: GENERAL GC FOR KEROSENE			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
NO QUALIFICATIONS REQUIRED			

ATTACHMENT 3

QUALIFIED DATA SUMMARY AND ANNOTATED LABORATORY REPORTS

Validated Data Summary, Data Package: B09325-TMA-620

	Samp#	B09325		B09326		B09327		B09328		B09329		B09330	
	Date	9-7-93		9-7-93		9-8-93		9-8-93		9-8-93		9-8-93	
	Location	299-W19-97		299-W19-95		299-W19-97		299-W19-97		299-W19-95		299-W19-97	
	Depth	4.00 - 6.00		30.00 - 32.50		10.00 - 12.50		20.00 - 22.50		45.00 - 47.50		30.00 - 32.00	
	Type	---		---		---		---		---		---	
	Comments	---		---		---		---		---		---	
Parameter	Units	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
KEROSENE	MG/KG	5.000	U	5.000	U	5.000	U	5.000	U	5.000	U	5.000	U

Verified
03/01/94

800

SOG-809325-TMA-620

TMA Inc. REPORT Work Order # A3-09-021

Received: 09/10/93 Results by Sample

~~000510~~

SAMPLE ID 809325 FRACTION 01F TEST CODE 8015MS NAME EPA 8015M EXTRACT.

Date & Time Collected 09/07/93 Category

299-W19-97
4.00-6.00'

MODIFIED 8015 - EXTRACTABLE FUEL HYDROCARBONS

Matrix: SOIL
Date Analyzed: 09/24/93
Dilution factor: 1.00
Concentration Units: mg/Kg

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

ND = Not detected at the specified limits

Form I

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3/c/94

009

TMA Inc. REPORT Work Order # A3-09-021

Received: 09/10/93

Results by Sample

SAMPLE ID 809326 FRACTION 02F TEST CODE 8015MS NAME EPA 8015M EXTRACT.

Date & Time Collected 09/07/93 Category

299-W19-95
30.0-32.5'

~~000512~~

MODIFIED 8015 - EXTRACTABLE FUEL HYDROCARBONS

Matrix: SOIL
Date Analyzed: 09/24/93
Dilution factor: 1.00
Concentration Units: mg/Kg

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

ND = Not detected at the specified limits

Form I

Verified
3/21/94

-010

TMA Inc. REPORT Work Order # A3-09-021

Received: 09/10/93

Results by Sample

SAMPLE ID 809327 FRACTION 03E TEST CODE 8015MS NAME EPA 8015M EXTRACT.

Date & Time Collected 09/08/93 Category

~~000514~~

299-W19-97
10.00-12.50'

MODIFIED 8015 - EXTRACTABLE FUEL HYDROCARBONS

Matrix: SOIL
Date Analyzed: 09/24/93
Dilution factor: 1.00
Concentration Units: mg/Kg

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

ND = Not detected at the specified limits

Form I

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3/2/94

011

9113225.8015

TMA Inc. REPORT Work Order # A3-09-021

Received: 09/10/93

Results by Sample

SAMPLE ID B09328 FRACTION 04E TEST CODE 8015MS NAME EPA 8015M EXTRACT.

Date & Time Collected 09/08/93 Category

299-W19-97
20.00-22.50'

~~000516~~

MODIFIED 8015 - EXTRACTABLE FUEL HYDROCARBONS

Matrix: SOIL
Date Analyzed: 09/24/93
Dilution factor: 1.00
Concentration Units: mg/Kg

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

ND = Not detected at the specified limits

Form I

Verified
3/21/94

-012

TMA Inc. REPORT Work Order # A3-09-021

Received: 09/10/93

Results by Sample

SAMPLE ID B09329 FRACTION 06D TEST CODE 8015MS NAME EPA 8015M EXTRACT.

Date & Time Collected 09/08/93 Category

299-W19-95
45.00-47.50'

~~000520~~

MODIFIED 8015 - EXTRACTABLE FUEL HYDROCARBONS

Matrix: SOIL
Date Analyzed: 09/24/93
Dilution factor: 1.00
Concentration Units: mg/Kg

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

ND = Not detected at the specified limits

Form I

Verified

3/2/94

TMA Inc. REPORT Work Order # A3-09-021

Received: 09/10/93

Results by Sample

SAMPLE ID B09330 FRACTION 050 TEST CODE 8015MS NAME EPA 8015M EXTRACT.

Date & Time Collected 09/08/93 Category

299-W19-97
30.00 - 32.00

~~000518~~

MODIFIED 8015 - EXTRACTABLE FUEL HYDROCARBONS

Matrix: SOIL
Date Analyzed: 09/24/93
Dilution factor: 1.00
Concentration Units: mg/Kg

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

ND = Not detected at the specified limits

Form I

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3/1/94

014

ATTACHMENT 4

LABORATORY NARRATIVE AND CHAIN-OF-CUSTODY DOCUMENTATION

CASE NARRATIVE

LABORATORY : TMA/ARLI

CASE : 09-021

CONTRACT ID : WESTINGHOUSE HANFORD COMPANY

SDG RECEIPT DATE : September 10, 1993

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
B09325	A3-09-021-01A	V	SOIL
B09325 MS	A3-09-021-01B	V	SOIL
B09325 MSD	A3-09-021-01C	V	SOIL
B09325	A3-09-021-01D	SV	SOIL
B09325	A3-09-021-01F	K	SOIL
B09326	A3-09-021-02A	V	SOIL
B09326	A3-09-021-02B	SV	SOIL
B09326 MS	A3-09-021-02C	SV	SOIL
B09326 MSD	A3-09-021-02D	SV	SOIL
B09326	A3-09-021-02F	K	SOIL
B09327	A3-09-021-03A	V	SOIL
B09327	A3-09-021-03B	SV	SOIL
B09327	A3-09-021-03E	K	SOIL
B09328	A3-09-021-04A	V	SOIL
B09328	A3-09-021-04B	SV	SOIL
B09328	A3-09-021-04E	K	SOIL
B09330	A3-09-021-05A	V	SOIL
B09330	A3-09-021-05B	SV	SOIL
B09330	A3-09-021-05D	K	SOIL
B09330 MS	A3-09-021-05E	K	SOIL
B09330 MSD	A3-09-021-05F	K	SOIL
B09329	A3-09-021-06A	V	SOIL
B09329	A3-09-021-06B	SV	SOIL
B09329	A3-09-021-06D	K	SOIL
B09331	A3-09-021-07A	V	SOIL

3.0 COMMENTS :

3.1 SHIPPING AND DOCUMENTATION :

All of the samples were received intact and properly documented.

3.2 ANALYSIS

3.2.1 VOLATILE ANALYSIS COMMENTS :

LOW LEVEL SOIL :

The samples were analyzed by heated purge within the CLP SOW holding times.

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 CLP SOW holding times.

Sample B09327 had a Terphenyl-d14 surrogate recovery slightly above the QC limits. Sample B09326MSD had matrix spike recoveries for Phenol and 2,4-Dinitrotoluene that were slightly above the QC limits. In accordance with CLP protocol, no further action was required.

Pyrene was detected in sample B09327 at a concentration below the CRQL.

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 09/16/93 and was analyzed according to the SW-846 Method 8015M. The initial calibration consisted of 5 different levels of the Kerosene standard that ranged from 200ppm to 2000ppm. The continuing calibration at the 1000ppm level was injected amongst a series of samples, in order to verify the instrument stability. The %RSD in the initial calibration and the %D in the continuing calibration were below their 20% and 15% limits, respectively.

SAMPLE NOTES :

LOW LEVEL SOIL :

The samples were extracted and analyzed for extractable hydrocarbons in the Kerosene range within the required holding times. Approximately 20 g of each sample was extracted and concentrated to 5 mL.

There were no hydrocarbons in the Kerosene range detected in any of the samples. Sample B09330 was spiked with Kerosene and the matrix spike recoveries were between 81% and 84%. A blank spike was prepared at the same time, and had an 86% recovery.

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 designee, as verified by the following signatures.

Nicole Roth 12/10/93
Nicole Roth
CLP Program Manager

Maureen Parrish 12/10/93
Maureen Parrish
Project Manager

Westinghouse Hanford Company

CHAIN OF CUSTODY ~~0000024~~

Custody Form Initiator: L E ROGERS

Company Contact: L E ROGERS

Telephone: 376-7690

Project Designation/Sampling Locations: 200-UP-2

Collection Date: 9-7-93

Ice Chest No. ~~Rusty Dusty~~ VOA 9/9/93 SML-271

Field Logbook No.: EFL-1091

Bill of Lading/Airbill No.:

Offsite Property No.:

Method of Shipment: OVERNIGHT AIR SERVICE

Shipped to: TMA

Possible Sample Hazards/Remarks: Keep samples at 4C (SOIL) None noted

Sample Identification

1)

B09325

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

9W3325.0023

B09326

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)

SER 9-7-93

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:
1510 Lorene E. Rogers 9-7-93	IG HOGAN IG Hogan	9-7-93 / 1510
IG HOGAN IG Hogan	J.D. Fowler J.D. Fowler	9/9/93 1030
J.D. Fowler J.D. Fowler 9/9/93 1030	Toby Yamamoto	9/10/93 11:15 AM

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

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

Westinghouse Hanford Company	CHAIN OF CUSTODY ~~0000026~~

Custody Form Initiator: L E ROGERS

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

Project Designation/Sampling Locations: 200-UP-2 — Collection Date: 9-8-93

Ice Chest No.: SML-352 — Field Logbook No.: EFL-1091

Bill of Lading/Airbill No.: — Offsite Property No.:

Method of Shipment: OVERNIGHT AIR SERVICE

Shipped to: TMA

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

Sample Identification

1) B09327

1,250ml	P:CLP;TAL Metals,Hg,Ti
~~1,250ml~~ 1250ml	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

9413225.0026

2) B09328

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) B09330

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:
Susan E. Rogers 1400 9-8-93	Ryan T. Skyrme	9-8-93 1400
Ryan T. Skyrme 9.9.93 1030	J.D. Franklin	9/9/93 1030
J.D. Franklin 9/9/93 1050	Ellen L. Yamamoto	9/10/93 11:15 AM
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

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

020

Westinghouse Hanford Company	CHAIN OF CUSTODY	~~0000025~~

Custody Form Initiator: L E ROGERS

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

Project Designation/Sampling Locations: 200-UP-2 — Collection Date: 9-8-93

Ice Chest No.: SML-352 — Field Logbook No.: EFL-1091

Bill of Lading/Airbill No.: — Offsite Property No.:

Method of Shipment: OVERNIGHT AIR SERVICE

Shipped to: TMA

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

Sample Identification

1) B09329

1,250ml	P:CLP;TAL Metals,Hg,Ti
~~1,250ml~~ 120ml	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

R 9-8-93

9413225.0025

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) LLR 9-8-93

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:
1400 Lorne E Rogers 9-8-93	Ray T Sickle Ray T Sickle	1400 9-8-93
Ray T Sickle RT. Sickle 9-9-93 1030	J.D. Franklin J.D. Franklin	9/9/93 1130
J.D. Franklin J.D. Franklin 9/9/93 1050	Toby Y. Yamamoto	9/10/93 11:15 AM
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

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

ATTACHMENT 5

DATA VALIDATION SUPPORTING DOCUMENTATION

GENERAL GC DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E

PROJECT: 200-UP-2		DATA PACKAGE: B-9325-TMA-620	
VALIDATOR: [signature]	LAB: TMA		DATE: 03/01/94
CASE:		SDG: B-9325-TMA-620	

ANALYSES PERFORMED

☐ 8010	☒ 8015	☐ 8020	☐ 8021	8140	8141
☐ 8150	☐ 8151	☐ WTPH-HCID	☐ WTPH-G	☐ WTPH-D	☐
☐	☐	☐	☐	☐	☐

SAMPLES/MATRIX: Soils

B-9325 B09330

B-9326

B-9327

B-9328

B-9329

9H13225.0027

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: _____

023

GENERAL GC DATA VALIDATION CHECKLIST

3. INSTRUMENT CALIBRATION

3.1 INITIAL CALIBRATION

Was an initial calibration performed? . . . . . (Yes) No N/A

Are %RSD values for calibration or response factors acceptable? . . . . . (Yes) No N/A

Comments:_____

_____

_____

_____

_____

3.2 CONTINUING CALIBRATION

Was a continuing calibration check performed? . . . . . (Yes) No N/A

Are %D values for calibration or response factors acceptable? . (Yes) No N/A

Comments:_____

_____

_____

_____

_____

4. BLANKS

Were laboratory blanks analyzed? . . . . . (Yes) No N/A

Are laboratory blank results acceptable? . . . . . (Yes) No N/A

Were field/trip blanks analyzed? . . . . . Yes (No) N/A

Are field/trip blank results acceptable? . . . . . Yes No (N/A)

Comments:_____

_____

_____

_____

_____

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)

024

GENERAL GC DATA VALIDATION CHECKLIST

Comments: Control limits for the MS/MSD analysis have been requested and were not available at the time of validation. No qualification of the data was required.

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

B-9325-TMA-620

SDG:	VALIDATOR:	DATE: 2/28/94	PAGE 1 OF 1

COMMENTS: 8015-Mod. Sird Soil Fraction

FIELD SAMPLE ID	ANALYSIS TYPE	DATE SAMPLED	DATE PREPARED	DATE ANALYZED	PREP. HOLDING TIME, DAYS	ANALYSIS HOLDING TIME, DAYS	QUALIFIER
B-9325	8015-Mod.	9/7/93	9/14/93	9/24/93	7	10	None
B-9326	↓	9/7/93	↓	↓	7	10	↓
B-9327		9/8/93			6	10	
B-9328		9/8/93			6	10	
B-9330		9/8/93			6	10	
B-9329	↓	9/8/93	↓	↓	6	10	↓

GENERAL GC DATA VALIDATION SUMMARY FOR DATA PACKAGE:
B09325-TMA-620 (923-E418, Filename B09325.GC)

MEMORANDUM

TO: 200-UP-2 Project QA Record March 1, 1994

FR: Susan Winter, Golder Associates Inc.

RE: GENERAL GC DATA VALIDATION SUMMARY FOR DATA PACKAGE: B09325-TMA-620 (923-E418, Filename B09325.GC)

INTRODUCTION

This memo presents the results of data validation on data package B09325-TMA-620 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
B09325	09/07/93	SOIL	SEE NOTE 1
B09326	09/07/93	SOIL	
B09327	09/08/93	SOIL	
B09328	09/08/93	SOIL	
B09329	09/08/93	SOIL	
B09330	09/08/93	SOIL	

Note 1. All samples were analyzed for kerosene according to the 8015 Modified method.

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

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

DATA QUALITY OBJECTIVES

Precision. Goals for precision were met.

Accuracy. Goals for accuracy were met.

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

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

Completeness. The data package was complete for all requested analyses. A total of six samples were validated in this data package with a total of 6 determinations reported, all of

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

MAJOR DEFICIENCIES

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

MINOR DEFICIENCIES

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

REFERENCES

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

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

ATTACHMENT 1

GLOSSARY OF DATA REPORTING QUALIFIERS

GLOSSARY OF ORGANIC DATA REPORTING QUALIFIERS

B - Indicates the constituent was analyzed for and detected in the associated laboratory blank. This qualifier is applied by the laboratory. During the process of data validation this qualifier may be replaced by other appropriate qualifiers as defined by the validation procedures. The associated data should be considered usable for decision making purposes.

U - Indicates the constituent was analyzed for and not detected. The concentration reported is the sample quantitation limit corrected for aliquot size, dilution and percent solids (in the case of solid matrices) by the laboratory. The associated data should be considered usable for decision making purposes.

UJ - Indicates the constituent was analyzed for and not detected. Due to a minor quality control deficiency identified during data validation the concentration reported may not accurately reflect the sample quantitation limit. The associated data should be considered usable for decision making purposes.

J - Indicates the constituent was analyzed for and detected. This qualifier may be applied by the laboratory to indicate a concentration which is less than the contract required quantitation limit (CRQL) but greater than the instrument detection limit (IDL). During data validation this qualifier may be applied to indicate a minor quality control deficiency. However in either case, the associated data should be considered usable for decision making purposes.

NJ - Indicates presumptive evidence of a constituent at an estimated value. This qualifier is normally applied to GC analysis data (such as organochlorine pesticide and PCB data). The associated data should be considered usable for decision making purposes.

N - Indicates presumptive evidence of a constituent. This qualifier is normally applied to GC analysis data (such as organochlorine pesticide and PCB data). The associated data should be considered usable for decision making purposes.

JN - Indicates a tentatively identified compound (TIC) whose concentration and identification have been determined to be valid as a result of data validation. The associated data should be considered usable for decision making purposes.

UR - Indicates the constituent was analyzed for and not detected. The concentration reported has been qualified as unusable due to a major quality control deficiency identified during data validation. The associated data should be considered unusable for decision making purposes.

R - Indicates the constituent was analyzed for and detected. The concentration reported has been qualified as unusable due to a major quality control deficiency identified during data validation. The associated data should be considered unusable for decision making purposes.

ATTACHMENT 2

SUMMARY OF DATA QUALIFICATIONS

DATA QUALIFICATION SUMMARY

SDG: B09325-TMA-620	VALIDATOR:	DATE: March 1, 1994	PAGE 1 OF 1
COMMENTS: GENERAL GC FOR KEROSENE			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
NO QUALIFICATIONS REQUIRED			

ATTACHMENT 3

QUALIFIED DATA SUMMARY AND ANNOTATED LABORATORY REPORTS

Validated Data Summary, Data Package: B09325-TMA-620

	Samp#	B09325	B09326	B09327	B09328	B09329	B09330
	Date	9-7-93	9-7-93	9-8-93	9-8-93	9-8-93	9-8-93
	Location	299-W19-97	299-W19-95	299-W19-97	299-W19-97	299-W19-95	299-W19-97
	Depth	4.00 - 6.00	30.00 - 32.50	10.00 - 12.50	20.00 - 22.50	45.00 - 47.50	30.00 - 32.00
	Type	---	---	---	---	---	---
	Comments	---	---	---	---	---	---
Parameter	Units	Result Q	Result Q	Result Q	Result Q	Result Q	Result Q
KEROSENE	MG/KG	5.000 U	5.000 U	5.000 U	5.000 U	5.000 U	5.000 U

Verified
03/01/94

800-

SOGB09325-TMA-620

TMA Inc. REPORT Work Order # A3-09-021

Received: 09/10/93 Results by Sample ~~000510~~

SAMPLE ID B09325 FRACTION 01F TEST CODE 8015MS NAME EPA 8015M EXTRACT.

Date & Time Collected 09/07/93 Category

299-W19-97
4.00-6.00'

MODIFIED 8015 - EXTRACTABLE FUEL HYDROCARBONS

Matrix: SOIL
Date Analyzed: 09/24/93
Dilution factor: 1.00
Concentration Units: mg/Kg

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

ND = Not detected at the specified limits

Form I

Verified 3/21/94

009

TMA Inc. REPORT Work Order # A3-09-021

Received: 09/10/93

Results by Sample

SAMPLE ID 809326 FRACTION 02F TEST CODE 8015MS NAME EPA 8015M EXTRACT.

Date & Time Collected 09/07/93 Category

299-W19-95
30.0-32.5'

~~000512~~

MODIFIED 8015 - EXTRACTABLE FUEL HYDROCARBONS

Matrix: SOIL
Date Analyzed: 09/24/93
Dilution factor: 1.00
Concentration Units: mg/Kg

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

ND = Not detected at the specified limits

Form I

Verified

3/2/94

-010

TMA Inc. REPORT Work Order # A3-09-021

Received: 09/10/93

Results by Sample

SAMPLE ID 809327 FRACTION 03E TEST CODE 8015MS NAME EPA 8015M EXTRACT.

Date & Time Collected 09/08/93 Category

~~000514~~

299-MW9-97
10.00-12.50'

MODIFIED 8015 - EXTRACTABLE FUEL HYDROCARBONS

Matrix: SOIL
Date Analyzed: 09/24/93
Dilution factor: 1.00
Concentration Units: mg/Kg

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

ND = Not detected at the specified limits

Form I

809327.5012

Verified
3/21/94

011

TMA Inc. REPORT Work Order # A3-09-021

Received: 09/10/93

Results by Sample

SAMPLE ID 809328 FRACTION 04E TEST CODE 8015MS NAME EPA 8015M EXTRACT.

Date & Time Collected 09/08/93 Category

299-W19-97
20.00-22.50'

~~000516~~

MODIFIED 8015 - EXTRACTABLE FUEL HYDROCARBONS

Matrix: SOIL
Date Analyzed: 09/24/93
Dilution factor: 1.00
Concentration Units: mg/Kg

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

ND = Not detected at the specified limits

Form :

Verified.
3/21/94

-012

9W3225.0043

TMA Inc. REPORT Work Order # A3-09-021

Received: 09/10/93 Results by Sample

SAMPLE ID 809329 FRACTION 06D TEST CODE 8015MS NAME EPA 8015M EXTRACT.

Date & Time Collected 09/08/93 Category

299-W19-95
45.00-47.50'

~~000520~~

MODIFIED 8015 - EXTRACTABLE FUEL HYDROCARBONS

Matrix: SOIL
Date Analyzed: 09/24/93
Dilution factor: 1.00
Concentration Units: mg/Kg

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

ND = Not detected at the specified limits

Form I

Verified
3/2/94

013

TMA Inc. REPORT Work Order # A3-09-021

Received: 09/10/93

Results by Sample

SAMPLE ID 809330 FRACTION 05D TEST CODE 8015MS NAME EPA 8015M EXTRACT.

Date & Time Collected 09/08/93 Category

299-W19-97
30.00 - 32.00

~~000518~~

MODIFIED 8015 - EXTRACTABLE FUEL HYDROCARBONS

Matrix: SOIL
Date Analyzed: 09/24/93
Dilution factor: 1.00
Concentration Units: mg/Kg

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

ND = Not detected at the specified limits

Form I

Verified.
3/1/94

014

9413225.0045

ATTACHMENT 4

LABORATORY NARRATIVE AND CHAIN-OF-CUSTODY DOCUMENTATION

CASE NARRATIVE

LABORATORY : TMA/ARLI

CASE : 09-021

CONTRACT ID : WESTINGHOUSE HANFORD COMPANY

SDG RECEIPT DATE : September 10, 1993

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
B09325	A3-09-021-01A	V	SOIL
B09325 MS	A3-09-021-01B	V	SOIL
B09325 MSD	A3-09-021-01C	V	SOIL
B09325	A3-09-021-01D	SV	SOIL
B09325	A3-09-021-01F	K	SOIL
B09326	A3-09-021-02A	V	SOIL
B09326	A3-09-021-02B	SV	SOIL
B09326 MS	A3-09-021-02C	SV	SOIL
B09326 MSD	A3-09-021-02D	SV	SOIL
B09326	A3-09-021-02F	K	SOIL
B09327	A3-09-021-03A	V	SOIL
B09327	A3-09-021-03B	SV	SOIL
B09327	A3-09-021-03E	K	SOIL
B09328	A3-09-021-04A	V	SOIL
B09328	A3-09-021-04B	SV	SOIL
B09328	A3-09-021-04E	K	SOIL
B09330	A3-09-021-05A	V	SOIL
B09330	A3-09-021-05B	SV	SOIL
B09330	A3-09-021-05D	K	SOIL
B09330 MS	A3-09-021-05E	K	SOIL
B09330 MSD	A3-09-021-05F	K	SOIL
B09329	A3-09-021-06A	V	SOIL
B09329	A3-09-021-06B	SV	SOIL
B09329	A3-09-021-06D	K	SOIL
B09331	A3-09-021-07A	V	SOIL

3.0 COMMENTS :

3.1 SHIPPING AND DOCUMENTATION :

All of the samples were received intact and properly documented.

3.2 ANALYSIS

3.2.1 VOLATILE ANALYSIS COMMENTS :

LOW LEVEL SOIL :

The samples were analyzed by heated purge within the CLP SOW holding times.

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 CLP SOW holding times.

Sample B09327 had a Terphenyl-d14 surrogate recovery slightly above the QC limits. Sample B09326MSD had matrix spike recoveries for Phenol and 2,4-Dinitrotoluene that were slightly above the QC limits. In accordance with CLP protocol, no further action was required.

Pyrene was detected in sample B09327 at a concentration below the CRQL.

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 09/16/93 and was analyzed according to the SW-846 Method 8015M. The initial calibration consisted of 5 different levels of the Kerosene standard that ranged from 200ppm to 2000ppm. The continuing calibration at the 1000ppm level was injected amongst a series of samples, in order to verify the instrument stability. The %RSD in the initial calibration and the %D in the continuing calibration were below their 20% and 15% limits, respectively.

SAMPLE NOTES :

LOW LEVEL SOIL :

The samples were extracted and analyzed for extractable hydrocarbons in the Kerosene range within the required holding times. Approximately 20 g of each sample was extracted and concentrated to 5 mL.

There were no hydrocarbons in the Kerosene range detected in any of the samples. Sample B09330 was spiked with Kerosene and the matrix spike recoveries were between 81% and 84%. A blank spike was prepared at the same time, and had an 86% recovery.

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 designee, as verified by the following signatures.

Nicole Roth 12/10/93
Nicole Roth
CLP Program Manager

Maureen Parrish 12/10/93
Maureen Parrish
Project Manager

Westinghouse Hanford Company

CHAIN OF CUSTODY ~~000002A~~

Custody Form Initiator: L E ROGERS

Company Contact: L E ROGERS

Telephone: 376-7690

Project Designation/Sampling Locations: 200-UP-2

Collection Date: 9-7-93

Ice Chest No. ~~Rusty Dusty~~ VOA 9/9/93 SML-271

Field Logbook No.: EFL-1091

Bill of Lading/Airbill No.:

Offsite Property No.:

Method of Shipment: OVERNIGHT AIR SERVICE

Shipped to: TMA

Possible Sample Hazards/Remarks: Keep samples at 4C (SOIL) None noted

Sample Identification

1) B09325

1,250ml	P:CLP;TAL Metals,Hg,Ti
1,250ml	G: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:Cynnide 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) B09326

1,250ml	P:CLP;TAL Metals,Hg,Ti
1,250ml	G: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:Cynnide 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) JGR 9-7-93

1,250ml	P:CLP;TAL Metals,Hg,Ti
1,250ml	G: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:Cynnide 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:
1510 Lorene E. Rogers 9-7-93	J G Hogan J G Hogan	9-7-93 / 1510
J G Hogan J G Hogan	J.D. Franklin J.D. Franklin	9/9/93 1030
J.D. Franklin J.D. Franklin 9/9/93 1030	Toby H. Yamamoto	9/10/93 11:15 AM
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

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

Westinghouse Hanford Company	CHAIN OF CUSTODY ~~0000026~~

Custody Form Initiator: L E ROGERS

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

Project Designation/Sampling Locations: 200-UP-2 — Collection Date: 9-8-93

Ice Chest No.: SML-353 — Field Logbook No.: EFL-1091

Bill of Lading/Airbill No.: — Offsite Property No.:

Method of Shipment: OVERNIGHT AIR SERVICE

Shipped to: TMA

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

Sample Identification

1) B09327

1,250ml	P:CLP;TAL Metals,Hg,Ti
~~1,250ml~~ 1250ml	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:Cynnide 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

9413225.0095

2) B09328

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:Cynnide 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) B09330

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:Cynnide 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:
Susan E Rogers 1400 9-8-93	Ray T Skiehle	9-8-93 1400
Ray T Skiehle 9.9.93 1030	J.D.Franklin	9/9/93 1030
J.D. Franklin 9/9/93 1056	Ellen L. Yamamoto	9/10/93 11:15 AM
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

Westinghouse Hanford Company

CHAIN OF CUSTODY ~~0000025~~

Custody Form Initiator: L E ROGERS

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

Project Designation/Sampling Locations: 200-UP-2 — Collection Date: 9-8-93

Ice Chest No.: SMC-352 — Field Logbook No.: EFL-1091

Bill of Lading/Airbill No.: — Offsite Property No.:

Method of Shipment: OVERNIGHT AIR SERVICE

Shipped to: TMA

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

Sample Identification

1) B09329

1,250ml	P:CLP;TAL Metals,Hg,Ti
120ml ~~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:Cynnide 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,Mn-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

9W3225.005 — LER 9-8-93

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,Mn-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) LER 9-8-93

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,Mn-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:
1400 L E Rogers 9-8-93	Roy T Sickle	1400 9-8-93
Roy T Sickle R.T. Sickle 9-9-93 1030	J.D. Franklin	9/9/93 1130
J.D. Franklin 9/10/93 1050	Y. Yamamoto	9/10/93 11:15 AM
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

ATTACHMENT 5

DATA VALIDATION SUPPORTING DOCUMENTATION

GENERAL GC DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: 200-UP-2			DATA PACKAGE: B-9325-TMA-620		
VALIDATOR: [signature]		LAB: TMA		DATE: 03/01/94	
CASE:			SDG: B-9325-TMA-620		

ANALYSES PERFORMED					
☐ 8010	☒ 8015	☐ 8020	☐ 8021	8140	8141
☐ 8150	☐ 8151	☐ WTPH-HCID	☐ WTPH-G	☐ WTPH-D	☐
☐	☐	☐	☐	☐	☐

SAMPLES/MATRIX: Soils

B-9325 B09330

B-9326

B-9327

B-9328

B-9329

9413225.0054

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: _____

023

GENERAL GC DATA VALIDATION CHECKLIST

3. INSTRUMENT CALIBRATION

3.1 INITIAL CALIBRATION

Was an initial calibration performed? . . . . . (Yes) No N/A

Are %RSD values for calibration or response factors acceptable? . . . . . (Yes) No N/A

Comments:_____

3.2 CONTINUING CALIBRATION

Was a continuing calibration check performed? . . . . . (Yes) No N/A

Are %D values for calibration or response factors acceptable? . (Yes) No N/A

Comments:_____

4. BLANKS

Were laboratory blanks analyzed? . . . . . (Yes) No N/A

Are laboratory blank results acceptable? . . . . . (Yes) No N/A

Were field/trip blanks analyzed? . . . . . Yes (No) N/A

Are field/trip blank results acceptable? . . . . . Yes No (N/A)

Comments:_____

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)

024

GENERAL GC DATA VALIDATION CHECKLIST

Comments: Control limits for the MS/MSD analysis have been requested and were not available at the time of validation. No qualification of the data was required.

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

B-9325-TMA-620

SDG:	VALIDATOR:	DATE: 2/28/94	PAGE 1 OF 1

COMMENTS: 8015-Mod. Sed Soil Reading

FIELD SAMPLE ID	ANALYSIS TYPE	DATE SAMPLED	DATE PREPARED	DATE ANALYZED	PREP. HOLDING TIME, DAYS	ANALYSIS HOLDING TIME, DAYS	QUALIFIER
B-9325	8015-Mod	9/7/93	9/14/93	9/24/93	7	10	None
B-9326	↓	9/7/93	↓	↓	7	10	↓
B-9327		9/8/93			6	10	
B-9328		9/8/93			6	10	
B-9330		9/8/93			6	10	
B-9329	↓	9/8/93	↓	↓	6	10	↓

9453549D
~~9452475D~~

GENERAL GC DATA VALIDATION SUMMARY FOR DATA PACKAGE:
B09325-TMA-620 (923-E418, Filename B09325.GC)

COPY

MEMORANDUM

TO: 200-UP-2 Project QA Record April 20, 1994

FR: Susan Winter, Golder Associates Inc

RE: GENERAL GC DATA VALIDATION SUMMARY FOR DATA PACKAGE: B09325-TMA-620 (923-E418, Filename B09325.GC)

INTRODUCTION

This memo presents the results of data validation on data package B09325-TMA-620 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
B09325	09/07/93	SOIL	SEE NOTE 1
B09326	09/07/93	SOIL	
B09327	09/08/93	SOIL	
B09328	09/08/93	SOIL	
B09329	09/08/93	SOIL	
B09330	09/08/93	SOIL	
Note 1. All samples were analyzed for kerosene according to the 8015 Modified method.			

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

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

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.

Revised 4/20/94

001

Completeness. The data package was complete for all requested analyses. A total of six samples were validated in this data package with a total of 6 determinations reported, all of which were deemed valid. This results in a completeness of 100 percent, which meets normal work plan objectives of 90%.

MAJOR DEFICIENCIES

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

MINOR DEFICIENCIES

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

REFERENCES

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

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

Revised 4/26/94

ATTACHMENT 1

GLOSSARY OF DATA REPORTING QUALIFIERS

GLOSSARY OF ORGANIC DATA REPORTING QUALIFIERS

B - Indicates the constituent was analyzed for and detected in the associated laboratory blank. This qualifier is applied by the laboratory. During the process of data validation this qualifier may be replaced by other appropriate qualifiers as defined by the validation procedures. The associated data should be considered usable for decision making purposes.

U - Indicates the constituent was analyzed for and not detected. The concentration reported is the sample quantitation limit corrected for aliquot size, dilution and percent solids (in the case of solid matrices) by the laboratory. The associated data should be considered usable for decision making purposes.

UJ - Indicates the constituent was analyzed for and not detected. Due to a minor quality control deficiency identified during data validation the concentration reported may not accurately reflect the sample quantitation limit. The associated data should be considered usable for decision making purposes.

J - Indicates the constituent was analyzed for and detected. This qualifier may be applied by the laboratory to indicate a concentration which is less than the contract required quantitation limit (CRQL) but greater than the instrument detection limit (IDL). During data validation this qualifier may be applied to indicate a minor quality control deficiency. However in either case, the associated data should be considered usable for decision making purposes.

NJ - Indicates presumptive evidence of a constituent at an estimated value. This qualifier is normally applied to GC analysis data (such as organochlorine pesticide and PCB data). The associated data should be considered usable for decision making purposes.

N - Indicates presumptive evidence of a constituent. This qualifier is normally applied to GC analysis data (such as organochlorine pesticide and PCB data). The associated data should be considered usable for decision making purposes.

JN - Indicates a tentatively identified compound (TIC) whose concentration and identification have been determined to be valid as a result of data validation. The associated data should be considered usable for decision making purposes.

UR - Indicates the constituent was analyzed for and not detected. The concentration reported has been qualified as unusable due to a major quality control deficiency identified during data validation. The associated data should be considered unusable for decision making purposes.

R - Indicates the constituent was analyzed for and detected. The concentration reported has been qualified as unusable due to a major quality control deficiency identified during data validation. The associated data should be considered unusable for decision making purposes.

ATTACHMENT 2

SUMMARY OF DATA QUALIFICATIONS

DATA QUALIFICATION SUMMARY

SDG: B09332-TMA-611	VALIDATOR:	DATE: March 3, 1994	PAGE 1 OF 1
COMMENTS: GENERAL GC FOR KEROSENE			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
NO QUALIFICATIONS REQUIRED			

ATTACHMENT 3

QUALIFIED DATA SUMMARY AND ANNOTATED LABORATORY REPORTS

Validated Data Summary, Data Package: B09332-TMA-611

	Samp#	B09332		B09333		B09336	
	Date	9-9-93		9-10-93		9-10-93	
	Location	299-W19-95		299-W19-97		299-W19-95	
	Depth	60.00 - 62.50		50.00 - 52.50		74.80 - 77.30	
	Type	---		---		---	
	Comments	---		---		---	
Parameter	Units	Result	Q	Result	Q	Result	Q
KEROSENE	MG/KG	5.000	U	5.000	U	5.000	U

Verified
3/03/94

~~000368~~

TMA Inc. REPORT Work Order # A3-09-028

Received: 09/14/93

Results by Sample

SAMPLE ID 809332 FRACTION 01G TEST CODE 8015MS NAME EPA 8015M EXTRACT.

Date & Time Collected 09/09/93 Category

299-MW9-95
60-62.5'

MODIFIED 8015 - EXTRACTABLE FUEL HYDROCARBONS

Matrix: SOIL
Date Analyzed: 09/24/93
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

Form I

Verified
3-3-94

-009

TMA Inc. REPORT Work Order # A3-09-028

Received: 09/14/93 Results by Sample

SAMPLE ID B09333 FRACTION 02G TEST CODE 8015MS NAME EPA 8015M EXTRACT.

Date & Time Collected 09/10/93 Category

299-W19-97
50-52.5'

MODIFIED 8015 - EXTRACTABLE FUEL HYDROCARBONS

Matrix: SOIL
Date Analyzed: 09/24/93
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

Form I

Verified
3/03/94

~~000372~~

TMA Inc. REPORT Work Order # A3-09-028

Received: 09/14/93

Results by Sample

SAMPLE ID 809336 FRACTION 03D TEST CODE 8015MS NAME EPA 8015M EXTRACT.

Date & Time Collected 09/10/93 Category

299-W19-95
74.8-77.3

MODIFIED 8015 - EXTRACTABLE FUEL HYDROCARBONS

Matrix: SOIL
Date Analyzed: 09/24/93
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

Form I

Received
3/03/94

011

ATTACHMENT 4

LABORATORY NARRATIVE AND CHAIN-OF-CUSTODY DOCUMENTATION

CASE NARRATIVE

LABORATORY : TMA/ARLI

CASE : 09-028

CONTRACT ID : WESTINGHOUSE HANFORD COMPANY

SDG RECEIPT DATE : September 14, 1993

1.0 DESCRIPTION OF CASE :

Four 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 in the Kerosene Range (K) were analyzed according to the SW-846 Method 8015M.

2.0 SAMPLE LIST :

WESTINGHOUSE ID	LAB ID	ANALYSIS REQUESTED	MATRIX
B09332	A3-09--028-01A	V	SOIL
B09332 MS	A3-09--028-01B	V	SOIL
B09332 MSD	A3-09--028-01C	V	SOIL
B09332	A3-09--028-01D	SV	SOIL
B09332	A3-09--028-01G	K	SOIL
B09333	A3-09--028-02A	V	SOIL
B09333	A3-09--028-02B	SV	SOIL
B09333 MS	A3-09--028-02C	SV	SOIL
B09333 MSD	A3-09--028-02D	SV	SOIL
B09333	A3-09--028-02G	K	SOIL
B09336	A3-09--028-03A	V	SOIL
B09336	A3-09--028-03B	SV	SOIL
B09336	A3-09--028-03D	K	SOIL
B09336 MS	A3-09-028-03E	K	SOIL
B09336 MSD	A3-09-028-03F	K	SOIL
B09335	A3-09-028-04A	V	SOIL

3.0 COMMENTS :

3.1 SHIPPING AND DOCUMENTATION :

All of the samples were received intact and properly documented.

3.2 ANALYSIS

3.2.1 VOLATILE ANALYSIS COMMENTS :

LOW LEVEL SOIL :

The samples were analyzed by heated purge within the CLP SOW holding times.

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 CLP SOW holding times. Phenol was detected in sample B09336 at a concentration that was below the CRQL.

The matrix spike recovery of 2,4-Dinitrotoluene in sample B09333MS was slightly above the QC limits. 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 09/16/93 and was analyzed according to the SW-846 Method 8015M. The initial calibration consisted of 5 different levels of the Kerosene standard that ranged from 200ppm to 2000ppm. The continuing calibration at the 1000ppm level was injected amongst a series of samples, in order to verify the instrument stability. The %RSD in the initial calibration and the %D in the continuing calibration were below their 20% and 15% limits, respectively.

SAMPLE NOTES :

LOW LEVEL SOIL :

The samples were extracted and analyzed for extractable hydrocarbons in the Kerosene range within the required holding times. Approximately 20 g of each sample was extracted and concentrated to 5 mL.

There were no hydrocarbons detected in any of the samples. Sample B09336 was spiked with Kerosene and the matrix spike recoveries were 85% and 93%. A blank spike was prepared at the same time, and had an 79% recovery.

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 designee, as verified by the following signatures.

Nicole Roth 11/29/93
Nicole Roth
CLP Program Manager

Maureen Parrish 11/29/93
Maureen Parrish
Project Manager

~~0000C2A~~

Westinghouse Hanford Company	CHAIN OF CUSTODY

Custody Form Initiator: L E ROGERS

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

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

Ice Chest No.: SML 366 — Field Logbook No.: EFL-1091

Bill of Lading/Airbill No.: _____ — Offsite Property No.: _____

Method of Shipment: OVERNIGHT AIR SERVICE

Shipped to: TMA

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

Sample Identification

1) B09332

~~1,250ml~~ 1,250ml P:CLP;TAL Metals,Hg,Ti
~~1,250ml~~ Gs:VOA CLP
1,250ml nG: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) ~~B09334~~ B09335 9-10-93

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

3)

1,250ml P:CLP;TAL Metals,Hg,Ti
~~1,250ml~~ Gs:VOA CLP
1,250ml nG: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:
1040 Lorene E. Rogers 9-10-93	Roy T. Steele	1040 9-10-93
Roy T. Steele 1054 9-10-93	H. Narciso	9-14-93 10:50

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

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

000102C

Westinghouse Hanford Company

CHAIN OF CUSTODY

Custody Form Initiator: L E ROGERS

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

Project Designation/Sampling Locations: 200-UP-2 — Collection Date: 9-10-93

Ice Chest No.: SML 366 — Field Logbook No.: EFL-1091

Bill of Lading/Airbill No.: — Offsite Property No.:

Method of Shipment: OVERNIGHT AIR SERVICE

Shipped to: TMA

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

Sample Identification

1)

1,250ml	P:CLP;TAL Metals,Hg,Ti B09333
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 B09336
~~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

0-0075 3825

250ml

9-10-93

3)

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

JER 9-10-93

[] Field Transfer of Custody

Chain of Possession (Sign and Print Names)

Relinquished by:	Received by:	Date/Time:
1040 Norm E. Rogers 9-10-93	P.W.T Sicnle	9-10-93 1040
Relinquished by: P.W.T Sicnle 1054 9-10-93	Received by: A. HARRIS	Date/Time: 9-14-93 10:50
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

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

017

ATTACHMENT 5

DATA VALIDATION SUPPORTING DOCUMENTATION

GENERAL GC DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: 200-UP-2			DATA PACKAGE: B-9332-TMA-611		
VALIDATOR: [illegible]		LAB: TMA		DATE: 03/03/94	
CASE:			SDG: B-9332-TMA-611		

ANALYSES PERFORMED					
☐ 8010	☒ 8015 (Mod)	☐ 8020	☐ 8021	8140	8141
☐ 8150	☐ 8151	☐ WTPH-HCID	☐ WTPH-G	☐ WTPH-D	☐
☐	☐	☐	☐	☐	☐

SAMPLES/MATRIX: Soils

B-9332

B-9333

B-9336

94132S.0077

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: _____

019

GENERAL GC DATA VALIDATION CHECKLIST

3. INSTRUMENT CALIBRATION

3.1 INITIAL CALIBRATION

Was an initial calibration performed? . . . . . (Yes) No N/A

Are %RSD values for calibration or response factors acceptable? . . . . . (Yes) No N/A

Comments:_____

_____

_____

_____

_____

3.2 CONTINUING CALIBRATION

Was a continuing calibration check performed? . . . . . (Yes) No N/A

Are %D values for calibration or response factors acceptable? . (Yes) No N/A

Comments:_____

_____

_____

_____

_____

4. BLANKS

Were laboratory blanks analyzed? . . . . . (Yes) No N/A

Are laboratory blank results acceptable? . . . . . (Yes) No N/A

Were field/trip blanks analyzed? . . . . . Yes (No) N/A

Are field/trip blank results acceptable? . . . . . Yes No (N/A)

Comments:_____

_____

_____

_____

_____

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)

-020

GENERAL GC DATA VALIDATION CHECKLIST

Comments: Control limits for the MS/MSD analysis have been requested and were not available at the time of validation. No qualification of the data was required. MS %R = 85% and MSD %R = 93%.

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

B0-9332-TMA-611

SDG:	VALIDATOR:	DATE: 3/3/94	PAGE 1 OF 1

COMMENTS: General GC Sat Fenzene (Method 8015 Mod. Sig)

FIELD SAMPLE ID	ANALYSIS TYPE	DATE SAMPLED	DATE PREPARED	DATE ANALYZED	PREP. HOLDING TIME, DAYS	ANALYSIS HOLDING TIME, DAYS	QUALIFIER
B09332	Soil Sed.	09/09/93	9/22/93	9/24/93	11	4	None
B01333	↓	09/09/93	↓	↓	10	4	↓
B09336	↓	09/10/93	↓	↓	10	4	↓
		TD 3/3/94					

9453549D
~~9452475D~~
ATTACHMENT 29
Page 1 of 26

GENERAL CHEMISTRY DATA VALIDATION SUMMARY FOR DATA PACKAGE:
B09325-TMA-620 (923-E418, Filename B09325.GCH)

MEMORANDUM

TO: 200-UP-2 Project QA Record March 4, 1994

FR: Susan Winter, Golder Associates Inc.

RE: GENERAL CHEMISTRY DATA VALIDATION SUMMARY FOR DATA PACKAGE: B09325-TMA-620 (923-E418, Filename B09325.GCH)

INTRODUCTION

This memo presents the results of data validation on data package B09325-TMA-611 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
B09325	09/07/93	SOIL	SEE NOTE 1
B09326	09/07/93	SOIL	
B09327	09/08/93	SOIL	
B09328	09/08/93	SOIL	
B09329	09/08/93	SOIL	
B09330	09/08/93	SOIL	

Note 1. All samples were analyzed for chloride, fluoride, and sulfate using Method 300.0 (ion chromatography) and nitrate+nitrite-N using Method 353.2 modified.

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

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

DATA QUALITY OBJECTIVES

Precision. Goals for precision were met.

Accuracy. Goals for accuracy were met.

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

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

Completeness. The data package was complete for all requested analyses. A total of six samples were validated in this data package with a total of 24 determinations reported, all of

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

MAJOR DEFICIENCIES

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

MINOR DEFICIENCIES

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

REFERENCES

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

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

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.

ATTACHMENT 2

SUMMARY OF DATA QUALIFICATIONS

DATA QUALIFICATION SUMMARY

SDG: B09325-TMA-620	VALIDATOR:	DATE: March 1, 1994	PAGE 1 OF 1
COMMENTS: GENERAL CHEMISTRY			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
NO QUALIFICATIONS REQUIRED			

006
~~005~~
3/4/93

ATTACHMENT 3

QUALIFIED DATA SUMMARY AND ANNOTATED LABORATORY REPORTS

Validated Data Summary, Data Package: B09325-TMA-620

	Samp#	B09325		B09326		B09327		B09328		B09329		B09330	
	Date	9-7-93		9-7-93		9-8-93		9-8-93		9-8-93		9-8-93	
	Location	299-W19-97		299-W19-95		299-W19-97		299-W19-97		299-W19-95		299-W19-97	
	Depth	4.00 - 6.00		30.00 - 32.50		10.00 - 12.50		20.00 - 22.50		45.00 - 47.50		30.00 - 32.00	
	Comments	---		---		---		---		---		---	
	Type	---		---		---		---		---		---	
Parameter	Units	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
CHLORIDE	MG/KG	5.900		29.000		7.200		4.900		12.100		5.300	
FLUORIDE	MG/KG	2.400		1.300		1.400		1.000		1.300		1.000	
SULFATE	MG/KG	12.000		26.000		26.000		11.000		15.000		9.000	
NITRATE+NITRITE	MG-N/KG	9.540		3.080		6.850		3.520		2.460	U	2.480	U

Verified

3/01/94

800

TMA Inc. REPORT Work Order # A3-09-021

Received: 09/10/93

Results by Sample

SAMPLE ID 809325 FRACTION 01E TEST CODE WCCLPS NAME Anions in Solids

Date & Time Collected 09/07/93 Category

299-W19-97, 4-6'

~~000010~~

ANIONS AND WET CHEMISTRY - SOLIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT
Chloride	300.0	5.9	mg/kg	1.0
Fluoride	300.0	2.4	mg/kg	0.5
Sulfate	300.0	12	mg/kg	5

FORM I

9113225.0090

Verified

03/21/94

-009

TMA Inc. REPORT Work Order # A3-09-021

Received: 09/10/93

Results by Sample

SAMPLE ID B09326 FRACTION 02E TEST CODE WCCLPS NAME Anions in Solids

299-W19-95
30-32.5'

Date & Time Collected 09/07/93 Category

~~000011~~

ANIONS AND WET CHEMISTRY - SOLIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT
Chloride	300.0	29.0	mg/kg	1.0
Fluoride	300.0	1.3	mg/kg	0.5
Sulfate	300.0	26	mg/kg	5

FORM I

Verified

3/10/94

TMA Inc. REPORT Work Order # A3-09-021

Received: 09/10/93

Results by Sample

SAMPLE ID B09327 FRACTION 03C TEST CODE WCCLPS NAME Anions in Solids

299-W19-97
10-12.5'

Date & Time Collected 09/08/93 Category

000012

ANIONS AND WET CHEMISTRY - SOLIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT
Chloride	300.0	7.2	mg/kg	1.0
Fluoride	300.0	1.4	mg/kg	0.5
Sulfate	300.0	26	mg/kg	5

FORM I

Verified

3/1/94

011

TMA Inc. REPORT Work Order # A3-09-021

Received: 09/10/93

Results by Sample

SAMPLE ID B09328 FRACTION 04C TEST CODE WCCLPS NAME Anions in Solids

299-W19-97
20-22.5

Date & Time Collected 09/08/93 Category

ANIONS AND WET CHEMISTRY - SOLIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT
Chloride	300.0	4.9	mg/kg	1.0
Fluoride	300.0	1.0	mg/kg	0.5
Sulfate	300.0	11	mg/kg	5

~~000013~~

FORM I

SW7471.093

Verified

03/01/94

012

TMA Inc. REPORT Work Order # A3-09-021

Received: 09/10/93 Results by Sample

SAMPLE ID 809329 FRACTION 06C TEST CODE WCCLPS NAME Anions in Solids

299-W19-95
45-47.5'

Date & Time Collected 09/08/93 Category

ANIONS AND WET CHEMISTRY - SOLIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT
Chloride	300.0	12.1	mg/kg	1.0
Fluoride	300.0	1.3	mg/kg	0.5
Sulfate	300.0	15	mg/kg	5

~~000015~~

FORM I

9413225.0094

Verified.
3/01/94

-013

TMA Inc. REPORT Work Order # A3-09-021

Received: 09/10/93

Results by Sample

SAMPLE ID B09330 FRACTION 05C TEST CODE WCCLPS NAME Anions in Solids

299-W19-97
30-32'

Date & Time Collected 09/08/93 Category

ANIONS AND WET CHEMISTRY - SOLIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT
Chloride	300.0	5.3	mg/kg	1.0
Fluoride	300.0	1.0	mg/kg	0.5
Sulfate	300.0	9	mg/kg	5

~~000014~~

FORM I

9413225.0095

Verified

03/21/94

-014

Received: 09/14/93 Results by Sample

Analysis: Nitrate/Nitrite-N in Soils using Method 353.2 (mod. Fin

SAMPLE ID B09325 SAMPLE # 01 FRACTIONS: A
Date & Time Collected 09/07/93 Category SOIL

NITR_S 9.54
mg N/kg

SAMPLE ID B09326 SAMPLE # 02 FRACTIONS: A
Date & Time Collected 09/07/93 Category SOIL

NITR_S 3.08
mg N/kg

SAMPLE ID B09327 SAMPLE # 03 FRACTIONS: A
Date & Time Collected 09/08/93 Category SOIL

NITR_S 6.85
mg N/kg

SAMPLE ID B09328 SAMPLE # 04 FRACTIONS: A
Date & Time Collected 09/08/93 Category SOIL

NITR_S 3.52
mg N/kg

SAMPLE ID B09329 SAMPLE # 05 FRACTIONS: A
Date & Time Collected 09/08/93 Category SOIL

NITR_S <2.46
mg N/kg

SAMPLE ID B09330 SAMPLE # 06 FRACTIONS: A
Date & Time Collected 09/08/93 Category SOIL

NITR_S <2.48
mg N/kg

SAMPLE ID B09330 DUPL SAMPLE # 06 FRACTIONS: A
Date & Time Collected 09/08/93 Category SOIL

NITR_S <2.43
mg N/kg

Verified 9/22/94

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

ATTACHMENT 4

LABORATORY NARRATIVE AND CHAIN-OF-CUSTODY DOCUMENTATION

GENERAL CHEMISTRY RESULTS

CASE NO. 09-021

Soil Sample #:

B09325	B09326
B09327	B09328
B09329	B09330

CASE NARRATIVE

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

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

Maureen Parrish 12-10-93

Maureen Parrish

Westinghouse Hanford Company

CHAIN OF CUSTODY ~~DDDDD2A~~

Custody Form Initiator: L E ROGERS

Company Contact: L E ROGERS

Telephone: 376-7690

Project Designation/Sampling Locations: 200-UP-2

Collection Date: 9-7-93

Ice Chest No. ~~Rusty Dusty~~ 100-9/9/43 SML-27)

Field Logbook No.: EFL-1091

Bill of Lading/Airbill No.:

Offsite Property No.:

Method of Shipment: OVERNIGHT AIR SERVICE

Shipped to: TMA

Possible Sample Hazards/Remarks: Keep samples at 4C (SOIL) None noted

Sample Identification

1) B09325

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) B09326

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) JER 9-7-93

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

PNL 3225.0099

[ ] Field Transfer of Custody

Chain of Possession (Sign and Print Names)

Relinquished by:	Received by:	Date/Time:
1510 Lorne E. Rogers 9-7-93	JG Hogan JG Hogan	9-7-93 / 1510
JG Hogan JG Hogan	J.D. Franklin J.D. Franklin	9/9/93 1030
J.D. Franklin J.D. Franklin 9/9/93 1054	Toby H. Yamamoto	9/10/93 11:15 AM
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

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

Westinghouse Hanford Company	CHAIN OF CUSTODY ~~0000026~~

Custody Form Initiator: L E ROGERS

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

Project Designation/Sampling Locations: 200-UP-2 — Collection Date: 9-8-93

Ice Chest No.: SML-353 — Field Logbook No.: EFL-1091

Bill of Lading/Airbill No.: _____ — Offsite Property No.: _____

Method of Shipment: OVERNIGHT AIR SERVICE

Shipped to: TMA

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

Sample Identification

1) B09327

1,250ml	P:CLP;TAL Metals,Hg,Ti
~~1,250ml~~ 1250ml	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) B09328

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) B09330

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:
Lorene E Rogers 1400 9-8-93	[illegible]	9-8-93 1400
[illegible] 9-9-93 1030	J.D. Franklin	9/9/93 1030
J.D. Franklin 9/9/93 1050	Elly L. Yamamoto	9/10/93 11:15 AM
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

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

Westinghouse Hanford Company	CHAIN OF CUSTODY	~~0000025~~

Custody Form Initiator: L E ROGERS

Company Contact: L E ROGERS

Telephone: 376-7690

Project Designation/Sampling Locations: 200-UP-2

Collection Date: 9-8-93

Ice Chest No.: SMK-352

Field Logbook No.: EFL-1091

Bill of Lading/Airbill No.:

Offsite Property No.:

Method of Shipment: OVERNIGHT AIR SERVICE

Shipped to: TMA

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

Sample Identification

1) B09329

1,250ml	P:CLP;TAL Metals,Hg,Ti
120ml ~~1,250ml~~	Gs:VOA CLP
1,250ml	aG:Semi-VOA CLP
1,125ml	G:Anions F,Cl,SO4 (EPA 300.0)
R 9-8-93 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

9413225.0102

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) SER 9-8-93

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:
1400 Leon E Rogers 9-8-93	Ray T Sickle	1400 9-8-93
Ray T Sickle RT. Sickle 9-9-93 1080	J.D. Franklin	9/9/93 1130
J.D. Franklin J.D. Franklin 9/9/93 1050	Tiby Y. Yamamoto	9/10/93 11:15 AM
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

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

ATTACHMENT 5

DATA VALIDATION SUPPORTING DOCUMENTATION

GENERAL CHEMISTRY DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	(E)
PROJECT: 200-UP-2			DATA PACKAGE: B0-9325-TMA-620		
VALIDATOR: [signature]		LAB: TMA		DATE: 02/28/94	
CASE:			SDG: B0-9325-TMA-620		

ANALYSES PERFORMED					
☒ Anions/IC	☐ TOC	☐ TOX	☐ TPH-418.1	Oil and Grease	Alkalinity
☐ Ammonia	☐ BOD/COD	☐ Chloride	☐ Chromium-VI	☐ pH	☒ NO_3/NO_2 353.2
☐ Sulfate	☐ TDS	☐ TKN	☐ Phosphate	☐	☐
☐	☐	☐	☐	☐	☐

SAMPLES/MATRIX Soils

B0-9325 B0-9330
B0-9326
B0-9327
B0-9328
B0-9329

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Is technical verification documentation present? . . . . . (Yes) No N/A

Is a case narrative present? . . . . . (Yes) No N/A

Comments:

2. HOLDING TIMES

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

Comments:

GENERAL 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: The initial calibration for ion chromatography was performed on 8/28/93 and the samples were analyzed on 9/29/93. No qualification is required since a CCV was performed with the samples and was within limits.

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)

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023

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

B09325-TMA-620

SDG:	VALIDATOR:	DATE: 2/01/94	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
B09325	IC	9/07/93	09/27/93	09/29/93	~~20~~ 20	2	None
B09326	↓	9/07/93	↓	↓	20	↓	↓
B09327		9/08/93			19		
B09328		9/08/93			19		
B09329		9/08/93			19		
B09330	↓	9/08/93	↓	↓	19	↓	↓
					~~3~~/4/94		
B09325	NO_2/NO_3	9/07/93	10/04/93	10/06/93	27	2	None
B09326	↓	9/07/93	↓	↓	27	↓	↓
B09327		9/08/93			26		
B09328		9/08/93			26		
B09329		9/08/93			26		
B09330	↓	9/08/93	↓	↓	26	↓	↓

GENERAL CHEMISTRY DATA VALIDATION SUMMARY FOR DATA PACKAGE:
B09325-TMA-620 (923-E418, Filename B09325.GCH)

MEMORANDUM

TO: 200-UP-2 Project QA Record March 4, 1994

FR: Susan Winter, Golder Associates Inc.

RE: GENERAL CHEMISTRY DATA VALIDATION SUMMARY FOR DATA PACKAGE: B09325-TMA-620 (923-E418, Filename B09325.GCH)

INTRODUCTION

This memo presents the results of data validation on data package B09325-TMA-611 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
B09325	09/07/93	SOIL	SEE NOTE 1
B09326	09/07/93	SOIL	
B09327	09/08/93	SOIL	
B09328	09/08/93	SOIL	
B09329	09/08/93	SOIL	
B09330	09/08/93	SOIL	

Note 1. All samples were analyzed for chloride, fluoride, and sulfate using Method 300.0 (ion chromatography) and nitrate+nitrite-N using Method 353.2 modified.

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

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

DATA QUALITY OBJECTIVES

Precision. Goals for precision were met.

Accuracy. Goals for accuracy were met.

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

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

Completeness. The data package was complete for all requested analyses. A total of six samples were validated in this data package with a total of 24 determinations reported, all of

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

MAJOR DEFICIENCIES

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

MINOR DEFICIENCIES

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

REFERENCES

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

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

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.

ATTACHMENT 2

SUMMARY OF DATA QUALIFICATIONS

DATA QUALIFICATION SUMMARY

SDG: B09325-TMA-620	VALIDATOR:	DATE: March 1, 1994	PAGE 1 OF 1
COMMENTS: GENERAL CHEMISTRY			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
NO QUALIFICATIONS REQUIRED			

006
~~005~~
3/4/93

ATTACHMENT 3

QUALIFIED DATA SUMMARY AND ANNOTATED LABORATORY REPORTS

Validated Data Summary, Data Package: B09325-TMA-620

	Samp#	B09325		B09326		B09327		B09328		B09329		B09330	
	Date	9-7-93		9-7-93		9-8-93		9-8-93		9-8-93		9-8-93	
	Location	299-W19-97		299-W19-95		299-W19-97		299-W19-97		299-W19-95		299-W19-97	
	Depth	4.00 - 6.00		30.00 - 32.50		10.00 - 12.50		20.00 - 22.50		45.00 - 47.50		30.00 - 32.00	
	Comments	---		---		---		---		---		---	
	Type	---		---		---		---		---		---	
Parameter	Units	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
CHLORIDE	MG/KG	5.900		29.000		7.200		4.900		12.100		5.300	
FLUORIDE	MG/KG	2.400		1.300		1.400		1.000		1.300		1.000	
SULFATE	MG/KG	12.000		26.000		26.000		11.000		15.000		9.000	
NITRATE+NITRITE	MG-N/KG	9.540		3.080		6.850		3.520		2.460	U	2.480	U

Verified

3/21/94

800

TMA Inc. REPORT Work Order # A3-09-021

Received: 09/10/93

Results by Sample

SAMPLE ID B09325 FRACTION 01E TEST CODE WCCLPS NAME Anions in Solids

Date & Time Collected 09/07/93 Category

299-W19-97, 4-6'

~~000010~~

ANIONS AND WET CHEMISTRY - SOLIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT
Chloride	300.0	5.9	mg/kg	1.0
Fluoride	300.0	2.4	mg/kg	0.5
Sulfate	300.0	12	mg/kg	5

FORM I

B09325.5116

Verified

03/01/94

-009

TMA Inc. REPORT Work Order # A3-09-021

Received: 09/10/93

Results by Sample

SAMPLE ID 809326 FRACTION 02E TEST CODE VCCLPS NAME Anions in Solids

299-W19-95
30-32.5'

Date & Time Collected 09/07/93 Category

~~000011~~

ANIONS AND WET CHEMISTRY - SOLIDS				
ANALYSIS	METHOD	RESULT	UNITS	LIMIT
Chloride	300.0	29.0	mg/kg	1.0
Fluoride	300.0	1.3	mg/kg	0.5
Sulfate	300.0	26	mg/kg	5

FORM I

9W3725.017

Verified

3/01/94

010

TMA Inc. REPORT Work Order # A3-09-021

Received: 09/10/93

Results by Sample

SAMPLE ID B09327 FRACTION 03C TEST CODE VCCLPS NAME Anions in Solids

299-W19-97
10-12.5'

Date & Time Collected 09/08/93 Category

000012

ANIONS AND WET CHEMISTRY - SOLIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT
Chloride	300.0	7.2	mg/kg	1.0
Fluoride	300.0	1.4	mg/kg	0.5
Sulfate	300.0	26	mg/kg	5

FORM I

9407275.0118

Verified

3/24/94

011

TMA Inc. REPORT Work Order # A3-09-021

Received: 09/10/93

Results by Sample

SAMPLE ID 809328 FRACTION 04C TEST CODE WCCLPS NAME Anions in Solids

299-W19-97
20-22.5

Date & Time Collected 09/08/93 Category

ANIONS AND WET CHEMISTRY - SOLIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT
Chloride	300.0	4.9	mg/kg	1.0
Fluoride	300.0	1.0	mg/kg	0.5
Sulfate	300.0	11	mg/kg	5

~~000013~~

FORM I

9407225.0119

Verified

03/01/94

012

TMA Inc. REPORT Work Order # A3-09-021

Received: 09/10/93 Results by Sample

SAMPLE ID 809329 FRACTION 06C TEST CODE WCCLPS NAME Anions in Solids

299-W19-95
45-47.5'

Date & Time Collected 09/08/93 Category

ANIONS AND WET CHEMISTRY - SOLIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT
Chloride	300.0	12.1	mg/kg	1.0
Fluoride	300.0	1.3	mg/kg	0.5
Sulfate	300.0	15	mg/kg	5

~~000015~~

FORM I

9403250120

Verified.
3/01/94

-013

TMA Inc. REPORT Work Order # A3-09-021

Received: 09/10/93

Results by Sample

SAMPLE ID B09330 FRACTION 05C TEST CODE WCCLPS NAME Anions in Solids

299-W19-97
30-32'

Date & Time Collected 09/08/93 Category

000014

ANIONS AND WET CHEMISTRY - SOLIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT
Chloride	300.0	5.3	mg/kg	1.0
Fluoride	300.0	1.0	mg/kg	0.5
Sulfate	300.0	9	mg/kg	5

FORM I

9407270012

Verified

3/21/94

-014

Received: 09/14/93 Results by Sample

Analysis: Nitrate/Nitrite-N in Soils using Method 353.2 (mod. Final)

SAMPLE ID B09325 SAMPLE # 01 FRACTIONS: A
Date & Time Collected 09/07/93 Category SOIL

NITR_S 9.54
mg N/kg

SAMPLE ID B09326 SAMPLE # 02 FRACTIONS: A
Date & Time Collected 09/07/93 Category SOIL

NITR_S 3.08
mg N/kg

SAMPLE ID B09327 SAMPLE # 03 FRACTIONS: A
Date & Time Collected 09/08/93 Category SOIL

NITR_S 6.85
mg N/kg

SAMPLE ID B09328 SAMPLE # 04 FRACTIONS: A
Date & Time Collected 09/08/93 Category SOIL

NITR_S 3.52
mg N/kg

SAMPLE ID B09329 SAMPLE # 05 FRACTIONS: A
Date & Time Collected 09/08/93 Category SOIL

NITR_S <2.46
mg N/kg

SAMPLE ID B09330 SAMPLE # 06 FRACTIONS: A
Date & Time Collected 09/08/93 Category SOIL

NITR_S <2.48
mg N/kg

SAMPLE ID B09330 DUPL SAMPLE # 06 FRACTIONS: B
Date & Time Collected 09/08/93 Category SOIL

NITR_S <2.43
mg N/kg

9W3225.0122

-015

Verified

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

ATTACHMENT 4

LABORATORY NARRATIVE AND CHAIN-OF-CUSTODY DOCUMENTATION

GENERAL CHEMISTRY RESULTS

CASE NO. 09-021

Soil Sample #:

B09325	B09326
B09327	B09328
B09329	B09330

CASE NARRATIVE

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

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

Maureen Parrish 12-10-93

Maureen Parrisn

Westinghouse Hanford Company	CHAIN OF CUSTODY ~~DDDC02A~~

Custody Form Initiator L E ROGERS

Company Contact L E ROGERS

Telephone 376-7690

Project Designation/Sampling Locations 200-UP-2

Collection Date 9-7-93

Ice Chest No. ~~Rusty Dusty~~ (9/9/93 SML-27)

Field Logbook No. EFL-1091

Bill of Lading/Airbill No.

Offsite Property No.

Method of Shipment OVERNIGHT AIR SERVICE

Shipped to TMA

Possible Sample Hazards/Remarks Keep samples at 4C (SOIL) None noted

Sample Identification

1) B09325

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) B09326

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) SER 9-7-93

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

9113225.0125

[] Field Transfer of Custody

Chain of Possession (Sign and Print Names)

Relinquished by:	Received by:	Date/Time:
1510 Laura E. Rogers 9-7-93	IG Hogan IG Hogan	9-7-93 / 1510
Relinquished by: IG Hogan IG Hogan	Received by: J.D. Franklin J.D. Franklin	Date/Time: 9/9/93 1030
Relinquished by: J.D. Franklin J.D. Franklin 9/9/93 1030	Received by: Toby H Yamamoto	Date/Time: 9/10/93 11:15 AM
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

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

Westinghouse Hanford Company	CHAIN OF CUSTODY ~~0000022~~

Custody Form Initiator: L E ROGERS

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

Project Designation/Sampling Locations: 200-UP-2 — Collection Date: 9-8-93

Ice Chest No.: SML-353 — Field Logbook No.: EFL-1091

Bill of Lading/Airbill No.: — Offsite Property No.:

Method of Shipment: OVERNIGHT AIR SERVICE

Shipped to: TMA

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

Sample Identification

1)

1,250ml	P:CLP;TAL Metals,Hg,Ti B09327
1,250ml ~~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

1250ml 9-8-93 SR

9113225.0126

2)

1,250ml	P:CLP;TAL Metals,Hg,Ti B09328
1,250ml	Gs:VOA CLP
1,250ml	aG:Semi-VOA CLP
1,125ml	G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml	P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml	G:Cyanide CLP
1,125ml	Gw:Kerosene (8015M)
1,1000ml	P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

3)

1,250ml	P:CLP;TAL Metals,Hg,Ti B09330
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:
Laurent E. Rogers 1400 9-8-93	Paul T. Skyrme	9-8-93 1400
Relinquished by: J.D. Franklin 9.9.93 1030	Received by: J.D. Franklin	Date/Time: 9/9/93 1030
Relinquished by: J.D. Franklin 9/9/93 1056	Received by: Elly L. Yamamoto	Date/Time: 9/10/93 11:15 AM
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

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

Westinghouse Hanford Company	CHAIN OF CUSTODY	~~0000025~~

Custody Form Initiator: L E ROGERS

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

Project Designation/Sampling Locations: 200-UP-2 — Collection Date: 9-8-93

Ice Chest No.: SML-352 — Field Logbook No.: EFL-1091

Bill of Lading/Airbill No.: — Offsite Property No.:

Method of Shipment: OVERNIGHT AIR SERVICE

Shipped to: TMA

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

Sample Identification

1) B09329

1,250ml	P:CLP;TAL Metals,Hg,Ti
120ml ~~1,250ml~~	Gs:VOA CLP
1,250ml	aG:Semi-VOA CLP
1,125ml	G:Anions F,Cl,SO4 (EPA 300.0)
R 9-8-93 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

9H3225.0127

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) SER 9-8-93

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:
1400 Leon Rogers 9-8-93	Ray Sickle Ray Sickle	1400 9-8-93
Relinquished by: RT. Sickle Ray Sickle 9-9-93 1030	Received by: J.D. Franklin J.D. Franklin	Date/Time: 9/9/93 1130
Relinquished by: J.D. Franklin J.D. Franklin 9/9/93 1050	Received by: Toby Y. Yamamoto	Date/Time: 9/10/93 11:15 AM
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

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

ATTACHMENT 5

DATA VALIDATION SUPPORTING DOCUMENTATION

GENERAL CHEMISTRY DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	(E)
PROJECT: 200-UP-2			DATA PACKAGE: B0-9325-TMA-620		
VALIDATOR: [signature]		LAB: TMA		DATE: 02/28/94	
CASE:			SDG: B0-9325-TMA-620		

ANALYSES PERFORMED					
☒ Anions/IC	☐ TOC	☐ TOX	☐ TPH-418.1	Oil and Grease	Alkalinity
☐ Ammonia	☐ BOD/COD	☐ Chloride	☐ Chromium-VI	☐ pH	☒ NO_3/NO_2 353.2
☐ Sulfate	☐ TDS	☐ TKN	☐ Phosphate	☐	☐
☐	☐	☐	☐	☐	☐

SAMPLES/MATRIX Soils

B09325 B09330
B09326
B09327
B09328
B09329

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:

Revised [signature] 4/21/94

GENERAL CHEMISTRY DATA VALIDATION CHECKLIST

3. INSTRUMENT CALIBRATION

Was initial calibration performed for all applicable analyses? (Yes) No N/A
Are initial calibration results acceptable? . . . . . (Yes) No N/A
Was a calibration check performed for all applicable analyses? (Yes) No N/A
Are calibration check results acceptable? . . . . . (Yes) No N/A
Comments: The initial calibration for ion chromatography was performed on 8/28/93 and the samples were analyzed on 9/29/93. No qualification is required since a CCV was performed with the samples and was within limits.

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)

9413225.0130

023

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

B9325-TMA-620

SDG:	VALIDATOR:	DATE: 3/01/94	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
B0325	IC	9/07/93	09/27/93	09/29/93	~~20~~ 20	2	None
B0326	↓	9/07/93	↓	↓	20	↓	↓
B0327	↓	9/08/93	↓	↓	19	↓	↓
B0328	↓	9/08/93	↓	↓	19	↓	↓
B0329	↓	9/08/93	↓	↓	19	↓	↓
B0330	↓	9/08/93	↓	↓	19	↓	↓
					~~3~~ 4/4/94		
B0325	NO_2/NO_3	9/07/93	10/04/93	10/06/93	27	2	None
B0326	↓	9/07/93	↓	↓	27	↓	↓
B0327	↓	9/08/93	↓	↓	26	↓	↓
B0328	↓	9/08/93	↓	↓	26	↓	↓
B0329	↓	9/08/93	↓	↓	26	↓	↓
B0330	↓	9/08/93	↓	↓	26	↓	↓

METALS DATA VALIDATION SUMMARY FOR DATA PACKAGE:
B09325-TMA-620 (923-E418,Filename B09325.MET)

MEMORANDUM

TO: 200-UP-2 Project QA Record March 3, 1994

FR: Susan Winter, Golder Associates Inc.

RE: METALS DATA VALIDATION SUMMARY FOR DATA PACKAGE: B09325-TMA-620 (923-E418, Filename B09325.MET)

INTRODUCTION

This memo presents the results of data validation on data package B09325-TMA-620 prepared by the Thermo Analyticals (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
B09325	09/07/93	SOIL	SEE NOTE 1
B09326	09/07/93	SOIL	
B09327	09/08/93	SOIL	
B09328	09/08/93	SOIL	
B09329	09/08/93	SOIL	
B09330	09/08/93	SOIL	

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

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

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

DATA QUALITY OBJECTIVES

Precision. Goals for precision were met.

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

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

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

Completeness. The data package was complete for all requested analyses. A total of two samples were validated in this data package with a total of 150 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

- Copper, antimony and beryllium were detected in the laboratory blanks at concentrations greater than the IDL but less than the CRDL. Attachments 2 and 5 provide a summary of the sample affected, data qualification applied and supporting documentation.

Matrix Spike

- The matrix spike percent recovery (MS %R) for 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.

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.

ATTACHMENT 2

SUMMARY OF DATA QUALIFICATIONS

DATA QUALIFICATION SUMMARY

SDG: B09325-TMA-620	VALIDATOR: [signature] DATE: March 3, 1994	PAGE 1 OF 1
COMMENTS: METALS		

COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
COPPER	U	B09328 B09329 B09330	PRESENT IN ICB, CCB, AND PREP BLANK
ANTIMONY	U	B09326 B09327 B09328 B09330	PRESENT IN CCB
BERYLLIUM	U	B09329 B09330	PRESENT IN CCB
ANTIMONY	UJ	B09325 B09326 B09327 B09328 B09329 B09330	SPIKE %R <75% BUT >30%

ATTACHMENT 3

QUALIFIED DATA SUMMARY AND ANNOTATED LABORATORY REPORTS

Validated Data Summary, Data Package: B09325-TMA-620

	Samp#	B09325		B09326		B09327		B09328		B09329		B09330	
	Date	9-7-93		9-7-93		9-8-93		9-8-93		9-8-93		9-8-93	
	Location	299-W19-97		299-W19-95		299-W19-97		299-W19-97		299-W19-95		299-W19-97	
	Depth	4.00 - 6.00		30.00 - 32.50		10.00 - 12.50		20.00 - 22.50		45.00 - 47.50		30.00 - 32.00	
	Type	---		---		---		---		---		---	
	Comments	---		---		---		---		---		---	
Parameter	Units	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
ALUMINUM	MG/KG	6160.000		6390.000		4780.000		5030.000		4730.000		4060.000	
ANTIMONY	MG/KG	2.600	UJ	2.900	UJ	2.800	UJ	2.900	UJ	2.600	UJ	2.900	UJ
ARSENIC	MG/KG	5.400		4.800		4.900		3.600		3.100		2.600	
BARIUM	MG/KG	77.900		106.000		63.400		74.600		75.900		62.200	
BERYLLIUM	MG/KG	0.340	B	0.380	B	0.320	B	0.330	B	0.220	U	0.210	U
CADMIUM	MG/KG	0.260	U	0.260	U	0.260	U	0.270	U	0.260	U	0.260	U
CALCIUM	MG/KG	11300.000		10500.000		5900.000		6870.000		21900.000		6110.000	
CHROMIUM	MG/KG	8.400		7.900		5.700		6.400		7.400		4.700	
COBALT	MG/KG	10.500		12.000		10.300		8.800	B	5.800	B	8.600	B
COPPER	MG/KG	15.300		13.700		12.700		11.700	U	8.300	U	10.200	U
IRON	MG/KG	19400.000		20900.000		18800.000		18400.000		12600.000		16800.000	
LEAD	MG/KG	4.800		3.600		2.400		4.200		2.200		1.400	
MAGNESIUM	MG/KG	5020.000		4780.000		4330.000		3840.000		3810.000		3090.000	
MANGANESE	MG/KG	321.000		384.000		344.000		273.000		213.000		255.000	
MERCURY	MG/KG	0.050	U	0.050	U	0.050	U	0.050	U	0.050	U	0.050	U
NICKEL	MG/KG	10.000		8.700		6.500	B	6.800	B	6.300	B	5.200	B
POTASSIUM	MG/KG	1060.000		1130.000		763.000	B	839.000	B	764.000	B	656.000	B
SELENIUM	MG/KG	0.460	U	0.460	U	0.460	U	0.470	U	0.470	U	0.460	U
SILVER	MG/KG	0.520	U	0.770	B	0.890	B	0.600	B	0.550	B	0.520	U
SODIUM	MG/KG	213.000	B	236.000	B	186.000	B	192.000	B	167.000	B	185.000	B
THALLIUM	MG/KG	0.440	U	0.440	U	0.440	U	0.450	U	0.450	U	0.440	U
VANADIUM	MG/KG	44.000		48.700		41.800		42.800		27.200		45.200	
ZINC	MG/KG	38.800		37.300		34.500		34.100		25.700		31.100	
CYANIDE	MG/KG	0.520	U	0.520	U	0.520	U	0.510	U	0.490	U	0.490	U
TITANIUM	MG/KG	1370.000		1470.000		1380.000		1400.000		803.000		1520.000	

Verified
3/03/94

SDG B09325-TMA-620

WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B09325

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N3-09-036SAS No.: SDG No.: B09325

Matrix (soil/water): SOIL Lab Sample ID: 09093-01S

Level (low/med): LOW Date Received: 09/14/93

% Solids: 93.2

299-W19-97
4-6'

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	6160			P
7440-36-0	Antimony	2.6	U	N	P
7440-38-2	Arsenic	5.4			P
7440-39-3	Barium	77.9			P
7440-41-7	Beryllium	0.34	B		P
7440-43-9	Cadmium	0.26	U		P
7440-70-2	Calcium	11300			P
7440-47-3	Chromium	8.4			P
7440-48-4	Cobalt	10.5			P
7440-50-8	Copper	15.3			P
7439-89-6	Iron	19400			P
7439-92-1	Lead	4.8			P
7439-95-4	Magnesium	5020			P
7439-96-5	Manganese	321			P
7439-97-6	Mercury	0.05	U		CV
7440-02-0	Nickel	10.0			P
7440-09-7	Potassium	1060			P
7782-49-2	Selenium	0.46	U		P
7440-22-4	Silver	0.52	U		P
7440-23-5	Sodium	213	B		P
7440-28-0	Thallium	0.44	U		P
7440-62-2	Vanadium	44.0			P
7440-66-6	Zinc	38.3			P
	Cyanide	0.52	U		CA
7440-32-6	Titanium	1370			P

No qualifier is required for titanium

Color Before: BROWN Clarity Before: Texture: COARSE

Color After: BROWN Clarity After: Artifacts: YES

Comments:
STONES

verified.
2/24/94

2

WESTINGHOUSE/HANFORD
1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B09326

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N3-09-036SAS No.: SDG No.: B09325

Matrix (soil/water): SOIL Lab Sample ID: 09093-02S

Level (low/med): LOW Date Received: 09/14/93

% Solids: 94.1

299-W19-95
30-32.5'

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	6390			P
7440-36-0	Antimony	2.9	B	N	P
7440-38-2	Arsenic	4.8			P
7440-39-3	Barium	106			P
7440-41-7	Beryllium	0.38	B		P
7440-43-9	Cadmium	0.26	U		P
7440-70-2	Calcium	10500			P
7440-47-3	Chromium	7.9			P
7440-48-4	Cobalt	12.0			P
7440-50-8	Copper	13.7			P
7439-89-6	Iron	20900			P
7439-92-1	Lead	3.6			P
7439-95-4	Magnesium	4780			P
7439-96-5	Manganese	384			P
7439-97-6	Mercury	0.05	U		CV
7440-02-0	Nickel	8.7			P
7440-09-7	Potassium	1130			P
7782-49-2	Selenium	0.46	U		P
7440-22-4	Silver	0.77	B		P
7440-23-5	Sodium	236	B		P
7440-28-0	Thallium	0.44	U		P
7440-62-2	Vanadium	48.7			P
7440-66-6	Zinc	37.3			P
	Cyanide	0.52	U		CA
7440-32-6	Titanium	1470			P

Color Before: BROWN Clarity Before: Texture: COARSE

Color After: BROWN Clarity After: Artifacts: YES

Comments:
STONES

verified

2/24/94

3

FORM I - IN ILM02.1

010

9113225.0143

WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: 809327

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N3-09-036SAS No.: SDG No.: B09325

Matrix (soil/water): SOIL Lab Sample ID: 09093-03S

Level (low/med): LOW Date Received: 09/14/93

% Solids: 94.3

299-W19-97
10-12.5

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	4780			P
7440-36-0	Antimony	2.8	B	N	P
7440-38-2	Arsenic	4.9			P
7440-39-3	Barium	63.4			P
7440-41-7	Beryllium	0.32	B		P
7440-43-9	Cadmium	0.26	U		P
7440-70-2	Calcium	5900			P
7440-47-3	Chromium	5.7			P
7440-48-4	Cobalt	10.3			P
7440-50-8	Copper	12.7			P
7439-89-6	Iron	18800			P
7439-92-1	Lead	2.4			P
7439-95-4	Magnesium	4330			P
7439-96-5	Manganese	344			P
7439-97-6	Mercury	0.05	U		CV
7440-02-0	Nickel	6.5	B		P
7440-09-7	Potassium	763	B		P
7782-49-2	Selenium	0.46	U		P
7440-22-4	Silver	0.39	B		P
7440-23-5	Sodium	186	B		P
7440-28-0	Thallium	0.44	U		P
7440-62-2	Vanadium	41.3			P
7440-66-6	Zinc	34.5			P
	Cyanide	0.52	U		CA
7440-32-6	Titanium	1380			P

No qualifier is required for titanium

Color Before: BROWN Clarity Before: Texture: COARSE

Color After: BROWN Clarity After: Artifacts: YES

Comments:
STONES

verified

1/3/94

FORM I - IN ILM02.1

011

WESTINGHOUSE/HANFORD
1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B09328

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N3-09-036SAS No.: SDG No.: B09325

Matrix (soil/water): SOIL Lab Sample ID: 09093-04S

Level (low/med): LOW Date Received: 09/14/93

% Solids: 95.3

299-W19-97
20-22.5'

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	5030			P	
7440-36-0	Antimony	2.9	B	N	P	
7440-38-2	Arsenic	3.6			P	
7440-39-3	Barium	74.6			P	
7440-41-7	Beryllium	0.33	B		P	
7440-43-9	Cadmium	0.27	U		P	
7440-70-2	Calcium	6870			P	
7440-47-3	Chromium	6.4			P	
7440-48-4	Cobalt	8.8	B		P	
7440-50-8	Copper	11.7			P	
7439-89-6	Iron	18400			P	
7439-92-1	Lead	4.2			P	
7439-95-4	Magnesium	3840			P	
7439-96-5	Manganese	273			P	
7439-97-6	Mercury	0.05	U		CV	
7440-02-0	Nickel	6.8	B		P	
7440-09-7	Potassium	839	B		P	
7782-49-2	Selenium	0.47	U		P	
7440-22-4	Silver	0.60	B		P	
7440-23-5	Sodium	192	B		P	
7440-28-0	Thallium	0.45	U		P	
7440-62-2	Vanadium	42.8			P	
7440-66-6	Zinc	34.1			P	
	Cyanide	0.51	U		CA	
7440-32-6	Titanium	1400			P	

9W3225.0145

No qual sec is required for titanium 2/3/94

Color Before: BROWN Clarity Before: Texture: COARSE

Color After: BROWN Clarity After: Artifacts: YES

Comments:
STONES

verified
2/24/94

WESTINGHOUSE/HANFORD
1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B09329

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N3-09-036SAS No.: SDG No.: B09325

Matrix (soil/water): SOIL Lab Sample ID: 09093-05S

Level (low/med): LOW Date Received: 09/14/93

% Solids: 96.9

299-W19-95
45-47.5'

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	4730			P
7440-36-0	Antimony	2.6	U	N	P
7440-38-2	Arsenic	3.1			P
7440-39-3	Barium	75.9			P
7440-41-7	Beryllium	0.22	B		P
7440-43-9	Cadmium	0.26	U		P
7440-70-2	Calcium	21900			P
7440-47-3	Chromium	7.4			P
7440-48-4	Cobalt	5.8	B		P
7440-50-8	Copper	8.3			P
7439-89-6	Iron	12600			P
7439-92-1	Lead	2.2			P
7439-95-4	Magnesium	3810			P
7439-96-5	Manganese	213			P
7439-97-6	Mercury	0.05	U		CV
7440-02-0	Nickel	6.3	B		P
7440-09-7	Potassium	764	B		P
7782-49-2	Selenium	0.47	U		P
7440-22-4	Silver	0.55	B		P
7440-23-5	Sodium	167	B		P
7440-28-0	Thallium	0.45	U		P
7440-62-2	Vanadium	27.2			P
7440-66-6	Zinc	25.7			P
	Cyanide	0.49	U		CA
7440-32-6	Titanium	803			P

no qualifier is required for titanium 2/24/94

Color Before: BROWN Clarity Before: Texture: COARSE

Color After: BROWN Clarity After: Artifacts: YES

Comments:
STONES

verified

2/24/94

9113225.0146

WESTINGHOUSE/HANFORD
1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: 809330

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N3-09-036SAS No.: SDG No.: B09325

Matrix (soil/water): SOIL Lab Sample ID: 09093-06S

Level (low/med): LOW Date Received: 09/14/93

% Solids: 96.3

299-W19-97
30-32'

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

9413225.0147

CAS No.	Analyte	Concentration	C	Q	M	R
7429-90-5	Aluminum	4060			P	
7440-36-0	Antimony	2.9	B	N	P	UJ
7440-38-2	Arsenic	2.6			P	
7440-39-3	Barium	62.2			P	
7440-41-7	Beryllium	0.21	B		P	U
7440-43-9	Cadmium	0.26	U		P	
7440-70-2	Calcium	6110			P	
7440-47-3	Chromium	4.7			P	
7440-48-4	Cobalt	8.6	B		P	
7440-50-8	Copper	10.2			P	U
7439-89-6	Iron	16800			P	
7439-92-1	Lead	1.4			P	
7439-95-4	Magnesium	3090			P	
7439-96-5	Manganese	255			P	
7439-97-6	Mercury	0.05	U		CV	
7440-02-0	Nickel	5.2	B		P	
7440-09-7	Potassium	656	B		P	
7782-49-2	Selenium	0.46	U		P	
7440-22-4	Silver	0.52	U		P	
7440-23-5	Sodium	185	B		P	
7440-28-0	Thallium	0.44	U		P	
7440-62-2	Vanadium	45.2			P	
7440-66-6	Zinc	31.1			P	
	Cyanide	0.49	U		CA	
7440-32-6	Titanium	1520			P	

No qualifier is required for titanium

Color Before: BROWN Clarity Before: Texture: COARSE

Color After: BROWN Clarity After: Artifacts: YES

Comments:
STONES

verified

2/24/94

ATTACHMENT 4

LABORATORY NARRATIVE AND CHAIN-OF-CUSTODY DOCUMENTATION

TMA
Thermo Analytical Inc.

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

RECORD COPY

October 21, 1993

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

94/3225.0149

Quality Control Narrative

Scope
Six (6) soil samples were submitted to TMA/Skinner & Sherman Laboratories, Inc. on September 14, 1993 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 S309093.

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 antimony digestion spike recovery exceeded 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 ~~DDDDD2A~~

Custody Form Initiator: L E ROGERS

Company Contact: L E ROGERS

Telephone: 376-7690

Project Designation/Sampling Locations: 200-UP-2

Collection Date: 9-7-93

Ice Chest No: ~~Rusty Dusty~~ (9/9/93 SMK-27)

Field Logbook No.: EFL-1091

Bill of Lading/Airbill No.:

Offsite Property No.:

Method of Shipment: OVERNIGHT AIR SERVICE

Shipped to: TMA

Possible Sample Hazards/Remarks: Keep samples at 4C (SOIL) None noted

Sample Identification

1) B09325

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:Cynnide 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) B09326

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) JGR 9-7-93

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

94325.0150

[] Field Transfer of Custody

Chain of Possession (Sign and Print Names)

Relinquished by:	Received by:	Date/Time:
1510 Laura E. Rogers 9-7-93	JG Hogan JG Hogan	9-7-93 / 1510
JG Hogan JG Hogan	J.D. Franklin J.D. Franklin	9/9/93 1030
J.D. Franklin J.D. Franklin 9/9/93 1030	Abby Y. Yamamoto	9/10/93 11:15 AM
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

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

Westinghouse Hanford Company	CHAIN OF CUSTODY ~~0001025~~

Custody Form Initiator: L E ROGERS

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

Project Designation/Sampling Locations: 200-UP-2 — Collection Date: 9-8-93

Ice Chest No.: SML-352 — Field Logbook No.: EFL-1091

Bill of Lading/Airbill No.: — Offsite Property No.:

Method of Shipment: OVERNIGHT AIR SERVICE

Shipped to: TMA

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

Sample Identification

1) B09327

1,250ml	P:CLP;TAL Metals,Hg,Ti
~~1,250ml~~ 1200ml	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) B09328

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) B09330

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:
Lmon E Rogers 1400 9-8-93	[signature]	9-8-93 1400
[signature] 9.9.93 1030	[signature] J.D. Franklin	9/9/93 1030
J.D. Franklin 9/9/93 1056	Ellen L. Yamamoto	9/10/93 11:15 AM
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

9443225.0158

Westinghouse Hanford Company	CHAIN OF CUSTODY	~~DDDDD2E~~

Custody Form Initiator: L E ROGERS

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

Project Designation/Sampling Locations: 200-UP-2 — Collection Date: 9-8-93

Ice Chest No.: SML-352 — Field Logbook No.: EFL-1091

Bill of Lading/Airbill No.: — Offsite Property No.:

Method of Shipment: OVERNIGHT AIR SERVICE

Shipped to: TMA

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

Sample Identification

1) B09329

1,250ml	P:CLP;TAL Metals,Hg,Ti
~~1,250ml~~ (120ml)	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

9411225.0158 & 9-8-93

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
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3) SER 9-8-93

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:
1400 Loren E Rogers 9-8-93	Ray T. Sickle Ray T. Sickle	1400 9-8-93
Ray T. Sickle RT. Sickle 9-9-93 1030	J.D. Fincher J.D. Fincher	9/9/93 1130
J.D. Fincher J.D. Fincher 9/9/93 1050	E. Yamamoto E. Yamamoto	9/10/93 11:15 AM
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

ATTACHMENT 5

DATA VALIDATION SUPPORTING DOCUMENTATION

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	(E)
PROJECT: 200-UP-2			DATA PACKAGE: B0925-TMA-620		
VALIDATOR: [illegible]		LAB: TMA		DATE: 02/24/94	
CASE:			SDG: B0925-TMA-620		

02/24/94 ANALYSES PERFORMED

☒ CLP/ICP	~~☒ CLP/GFAA~~	☒ CLP/Hg	☒ CLP/Cyanide	☒ Titanium by ICP	☐
☐ SW-846/ICP	☐ SW-846/GFAA	☐ SW-846/Hg	☐ SW-846 Cyanide	☐	☐

SAMPLES/MATRIX Soils

B0925 B0930
B0926
B0927
B0928
B0929

9113225.0154

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: _____

021

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 (3) 3/31/94
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: several analytes were detected in the lab blanks. However, only copper, and antimony (Sb) (3) 3/31/94 sample results required qualification as undetected (U). See Attachment 2 for specific samples and qualifications.

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: The LCS %R for iron was 46.8%, however the LCS result for iron is within the specific laboratory limits. Therefore, no qualification is required. Also, the LCS %R for Cr was 72.3% and Mg was 79.1%. However, since the LCS is within the laboratory limits, no qualification is required.

9413225.0155

·022

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:

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: The analytes As, Pb, Se and Tl were analyzed by ICP. A quantification is supplied since the required detection limits have been met.

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

B0g325-TMA-620

SDG:	VALIDATOR:	DATE: 2/24/94	PAGE 1 OF 1

COMMENTS: Metals

FIELD SAMPLE ID	ANALYSIS TYPE	DATE SAMPLED	DATE PREPARED	DATE ANALYZED	PREP. HOLDING TIME, DAYS	ANALYSIS HOLDING TIME, DAYS	QUALIFIER
B0g325	ICP	09/07/93		10/5/93		38	None
↓	Hg	↓		10/04/93		27	↓
↓	CN	↓		09/17/93		10	↓
B0g326	ICP	09/07/93		10/5/93		38	
↓	Hg	↓		10/04/93		27	↓
↓	CN	↓		9/17/93		10	↓
B0g327	ICP	09/09/93		10/5/93		37	
↓	Hg	↓		10/04/93		26	↓
↓	CN	↓		9/17/93		9	↓
B0g328	ICP	09/08/93		10/5/93		37	
↓	Hg	↓		10/04/93		26	↓
↓	CN	↓		9/17/93		9	↓
B0g329	ICP	09/08/93		10/5/93		37	
↓	Hg	↓		10/04/93		26	↓
↓	CN	↓		9/17/93		9	↓
B0g330	ICP	09/08/93		10/5/93		37	
↓	Hg	↓		10/04/93		26	↓
↓	CN	↓		9/17/93		9	↓

WESTINGHOUSE/HANFORD

3
BLANKS

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N3-09-036SAS No.: SDG No.: B09325

Preparation Blank Matrix (soil/water): SOIL

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

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Prepa-ration Blank	C	M
Aluminum	10.6	U	32.4	B	23.5	B	19.6	B	6.408	B	P
Antimony	12.9	U	13.7	B	12.9	U	12.9	U	2.580	U	P
Arsenic	1.7	U	1.7	U	1.7	U	1.7	U	0.437	B	P
Barium	1.2	U	1.4	B	1.5	B	1.2	U	0.240	U	P
Beryllium	0.2	U	0.2	B	0.2	B	0.2	U	0.040	U	P
Cadmium	1.6	B	1.3	U	1.7	B	1.4	B	0.260	U	P
Calcium	59.0	U	59.0	U	59.0	U	59.0	U	11.800	U	P
Chromium	-2.6	B	2.1	U	2.1	U	2.1	U	0.526	B	P
Cobalt	2.6	U	2.6	U	2.6	U	2.6	U	0.520	U	P
Copper	10.1	B	10.8	B	2.5	U	-3.5	B	2.350	B	P
Iron	5.3	U	12.8	B	26.8	B	16.2	B	1.060	U	P
Lead	1.1	U	1.1	U	1.1	U	1.1	U	0.220	U	P
Magnesium	22.9	U	36.7	B	22.9	U	23.5	B	4.580	U	P
Manganese	0.8	U	0.8	U	1.3	B	1.4	B	0.160	U	P
Mercury	0.1	U	0.1	U	0.1	U	0.1	U	0.050	U	CV
Nickel	3.4	U	3.4	U	3.4	U	3.4	U	0.680	U	P
Potassium	68.5	U	68.5	U	68.5	U	78.6	B	13.700	U	P
Selenium	2.3	U	2.3	U	2.3	U	2.3	U	0.460	U	P
Silver	2.6	U	2.6	U	2.6	U	3.0	B	0.520	U	P
Sodium	114.4	U	114.4	U	114.4	U	114.4	U	26.152	B	P
Thallium	2.2	U	2.2	U	2.3	B	2.2	U	0.440	U	P
Vanadium	5.5	U	5.5	U	5.5	U	5.5	U	1.100	U	P
Zinc	7.8	B	5.3	B	4.4	U	4.4	U	0.880	U	P
Cyanide	10.0	U	10.0	U	10.0	U	10.0	U	0.500	U	CA
Titanium	1.3	B	1.8	B	3.4	B	3.1	B	0.220	U	P

SK 68.5 54.0 11.75

94/3225.0158

The Be concentration in the blank according to the raw data is 0.24 mg/L.

0.24 ug/L x 5 = 1.25 ug/L.

3/3/94

2/24/94

WESTINGHOUSE/HANFORD

5A

SPIKE SAMPLE RECOVERY

SAMPLE NUMBER: 809330S

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N3-09-036SAS No.: SDG No.: B09325

Matrix (soil/water): SOIL Level (low/med): LOW

% Solids for Sample: 96.3

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	64.7330		2.8652	B	100.82	61.4	N	P
Arsenic	75-125	383.3490		2.5876		403.27	94.4		P
Barium	75-125	435.0684		62.1843		403.27	92.5		P
Beryllium	75-125	9.5172		0.2137	B	10.08	92.3		P
Cadmium	75-125	8.4646		0.2621	U	10.08	84.0		P
Calcium									NR
Chromium	75-125	42.2910		4.6578		40.33	93.3		P
Cobalt	75-125	100.9064		8.5997	B	100.82	91.6		P
Copper	75-125	58.3149		10.1967		50.41	95.5		P
Iron									NR
Lead	75-125	95.4420		1.3942		100.82	93.3		P
Magnesium									NR
Manganese	75-125	334.9363		254.8266		100.82	79.5		P
Mercury	75-125	0.5426		0.0494	U	0.49	110.7		CV
Nickel	75-125	98.4605		5.2445	B	100.82	92.5		P
Potassium									NR
Selenium	75-125	374.5980		0.4638	U	403.27	92.9		P
Silver	75-125	11.3097		0.5243	U	10.08	112.2		P
Sodium									NR
Thallium	75-125	373.4083		0.4436	U	403.27	92.6		P
Vanadium	75-125	140.6144		45.2409		100.82	94.6		P
Zinc	75-125	121.3824		31.0881		100.82	89.6		P
Cyanide	75-125	25.7278		0.4898	U	24.96	103.1		CA
Titanium		1816.6127		1523.9391		100.82	290.3		P

3/3/94

Comments: ~~The MS&R for titanium is acceptable since the sample result is~~ no qualification is required for titanium since the sample result is greater than 4 times the amount of spike added.

3/3/94

2/24/94

FORM V (Part 1) - IN ILM02.1

~~16~~ 026

METALS DATA VALIDATION SUMMARY FOR DATA PACKAGE:
B09325-TMA-620 (923-E418, Filename B09325.MET)

MEMORANDUM

TO: 200-UP-2 Project QA Record March 3, 1994

FR: Susan Winter, Golder Associates Inc.

RE: METALS DATA VALIDATION SUMMARY FOR DATA PACKAGE: B09325-TMA-620 (923-E418, Filename B09325.MET)

INTRODUCTION

This memo presents the results of data validation on data package B09325-TMA-620 prepared by the Thermo Analyticals (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
B09325	09/07/93	SOIL	SEE NOTE 1
B09326	09/07/93	SOIL	
B09327	09/08/93	SOIL	
B09328	09/08/93	SOIL	
B09329	09/08/93	SOIL	
B09330	09/08/93	SOIL	

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

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

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

DATA QUALITY OBJECTIVES

Precision. Goals for precision were met.

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

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

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

Completeness. The data package was complete for all requested analyses. A total of two samples were validated in this data package with a total of 150 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

- Copper, antimony and beryllium were detected in the laboratory blanks at concentrations greater than the IDL but less than the CRDL. Attachments 2 and 5 provide a summary of the sample affected, data qualification applied and supporting documentation.

Matrix Spike

- The matrix spike percent recovery (MS %R) for 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.

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.

ATTACHMENT 2

SUMMARY OF DATA QUALIFICATIONS

DATA QUALIFICATION SUMMARY

SDG: B09325-TMA-620	VALIDATOR: [signature] DATE: March 3, 1994	PAGE 1 OF 1
COMMENTS: METALS		

COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
COPPER	U	B09328 B09329 B09330	PRESENT IN ICB, CCB, AND PREP BLANK
ANTIMONY	U	B09326 B09327 B09328 B09330	PRESENT IN CCB
BERYLLIUM	U	B09329 B09330	PRESENT IN CCB
ANTIMONY	UJ	B09325 B09326 B09327 B09328 B09329 B09330	SPIKE %R <75% BUT >30%

ATTACHMENT 3

QUALIFIED DATA SUMMARY AND ANNOTATED LABORATORY REPORTS

Validated Data Summary, Data Package: B09325-TMA-620

Parameter	Units	Sample #	B09325		B09326		B09327		B09328		B09329		B09330	
		Date	9-7-93		9-7-93		9-8-93		9-8-93		9-8-93		9-8-93	
		Location	299-W19-97		299-W19-95		299-W19-97		299-W19-97		299-W19-95		299-W19-97	
		Depth	4.00 - 6.00		30.00 - 32.50		10.00 - 12.50		20.00 - 22.50		45.00 - 47.50		30.00 - 32.00	
		Type	---		---		---		---		---		---	
		Comments	---		---		---		---		---		---	
			Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
ALUMINUM	MG/KG		6160.000		6390.000		4780.000		5030.000		4730.000		4060.000	
ANTIMONY	MG/KG		2.600	UJ	2.900	UJ	2.800	UJ	2.900	UJ	2.600	UJ	2.900	UJ
ARSENIC	MG/KG		5.400		4.800		4.900		3.600		3.100		2.600	
BARIUM	MG/KG		77.900		106.000		63.400		74.600		75.900		62.200	
BERYLLIUM	MG/KG		0.340	B	0.380	B	0.320	B	0.330	B	0.220	U	0.210	U
CADMIUM	MG/KG		0.260	U	0.260	U	0.260	U	0.270	U	0.260	U	0.260	U
CALCIUM	MG/KG		11300.000		10500.000		5900.000		6870.000		21900.000		6110.000	
CHROMIUM	MG/KG		8.400		7.900		5.700		6.400		7.400		4.700	
COBALT	MG/KG		10.500		12.000		10.300		8.800	B	5.800	B	8.600	B
COPPER	MG/KG		15.300		13.700		12.700		11.700	U	8.300	U	10.200	U
IRON	MG/KG		19400.000		20900.000		18800.000		18400.000		12600.000		16800.000	
LEAD	MG/KG		4.800		3.600		2.400		4.200		2.200		1.400	
MAGNESIUM	MG/KG		5020.000		4780.000		4330.000		3840.000		3810.000		3090.000	
MANGANESE	MG/KG		321.000		384.000		344.000		273.000		213.000		255.000	
MERCURY	MG/KG		0.050	U	0.050	U	0.050	U	0.050	U	0.050	U	0.050	U
NICKEL	MG/KG		10.000		8.700		6.500	B	6.800	B	6.300	B	5.200	B
POTASSIUM	MG/KG		1060.000		1130.000		763.000	B	839.000	B	764.000	B	656.000	B
SELENIUM	MG/KG		0.460	U	0.460	U	0.460	U	0.470	U	0.470	U	0.460	U
SILVER	MG/KG		0.520	U	0.770	B	0.890	B	0.600	B	0.550	B	0.520	U
SODIUM	MG/KG		213.000	B	236.000	B	186.000	B	192.000	B	167.000	B	185.000	B
THALLIUM	MG/KG		0.440	U	0.440	U	0.440	U	0.450	U	0.450	U	0.440	U
VANADIUM	MG/KG		44.000		48.700		41.800		42.800		27.200		45.200	
ZINC	MG/KG		38.800		37.300		34.500		34.100		25.700		31.100	
CYANIDE	MG/KG		0.520	U	0.520	U	0.520	U	0.510	U	0.490	U	0.490	U
TITANIUM	MG/KG		1370.000		1470.000		1380.000		1400.000		803.000		1520.000	

Verified
3/03/94

SDG B09325-TMA-62C

WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B09325

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N3-09-036SAS No.: SDG No.: B09325

Matrix (soil/water): SOIL Lab Sample ID: 09093-01S

Level (low/med): LOW Date Received: 09/14/93

% Solids: 93.2

299-W19-97
4-6'

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	6160			P
7440-36-0	Antimony	2.6	U	N	P
7440-38-2	Arsenic	5.4			P
7440-39-3	Barium	77.9			P
7440-41-7	Beryllium	0.34	B		P
7440-43-9	Cadmium	0.26	U		P
7440-70-2	Calcium	11300			P
7440-47-3	Chromium	8.4			P
7440-48-4	Cobalt	10.5			P
7440-50-8	Copper	15.3			P
7439-89-6	Iron	19400			P
7439-92-1	Lead	4.3			P
7439-95-4	Magnesium	5020			P
7439-96-5	Manganese	321			P
7439-97-6	Mercury	0.05	U		CV
7440-02-0	Nickel	10.3			P
7440-09-7	Potassium	1060			P
7782-49-2	Selenium	0.46	U		P
7440-22-4	Silver	0.52	U		P
7440-23-5	Sodium	213	B		P
7440-28-0	Thallium	0.44	U		P
7440-62-2	Vanadium	44.3			P
7440-66-6	Zinc	38.3			P
	Cyanide	0.52	U		CA
7440-32-6	Titanium	1370			P

No qualifier is required for titanium

Color Before: BROWN Clarity Before: Texture: COARSE

Color After: BROWN Clarity After: Artifacts: YES

Comments:
STONES

verified.

2/24/94

2

FORM I - IN ILM02.1

009

9W3225.0169

WESTINGHOUSE/HANFORD
1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B09326

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N3-09-036SAS No.: SDG No.: B09325

Matrix (soil/water): SOIL Lab Sample ID: 09093-02S

Level (low/med): LOW Date Received: 09/14/93

% Solids: 94.1

299-W19-95
30-32.5'

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	6390			P
7440-36-0	Antimony	2.9	B	N	P
7440-38-2	Arsenic	4.8			P
7440-39-3	Barium	106			P
7440-41-7	Beryllium	0.38	B		P
7440-43-9	Cadmium	0.26	U		P
7440-70-2	Calcium	10500			P
7440-47-3	Chromium	7.9			P
7440-48-4	Cobalt	12.0			P
7440-50-8	Copper	13.7			P
7439-89-6	Iron	20900			P
7439-92-1	Lead	3.6			P
7439-95-4	Magnesium	4780			P
7439-96-5	Manganese	384			P
7439-97-6	Mercury	0.05	U		CV
7440-02-0	Nickel	8.7			P
7440-09-7	Potassium	1130			P
7782-49-2	Selenium	0.46	U		P
7440-22-4	Silver	0.77	B		P
7440-23-5	Sodium	236	B		P
7440-28-0	Thallium	0.44	U		P
7440-62-2	Vanadium	18.7			P
7440-66-6	Zinc	37.3			P
	Cyanide	0.52	U		CA
7440-32-6	Titanium	1470			P

no qualifier is required for titanium 9/24/94

Color Before: BROWN Clarity Before: Texture: COARSE

Color After: BROWN Clarity After: Artifacts: YES

Comments:
STONES

verified

3/24/94

3

WESTINGHOUSE/HANFORD
1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B09327

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N3-09-036SAS No.: SDG No.: B09325

Matrix (soil/water): SOIL Lab Sample ID: 09093-03S

Level (low/med): LOW Date Received: 09/14/93

% Solids: 94.3

299-W19-97
10-12.5

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	4780			P
7440-36-0	Antimony	2.8	B	N	P
7440-38-2	Arsenic	4.9			P
7440-39-3	Barium	63.4			P
7440-41-7	Beryllium	0.32	B		P
7440-43-9	Cadmium	0.26	U		P
7440-70-2	Calcium	5900			P
7440-47-3	Chromium	5.7			P
7440-48-4	Cobalt	10.3			P
7440-50-8	Copper	12.7			P
7439-89-6	Iron	18800			P
7439-92-1	Lead	2.4			P
7439-95-4	Magnesium	4330			P
7439-96-5	Manganese	344			P
7439-97-6	Mercury	0.05	U		CV
7440-02-0	Nickel	6.5	B		P
7440-09-7	Potassium	763	B		P
7782-49-2	Selenium	0.46	U		P
7440-22-4	Silver	0.39	B		P
7440-23-5	Sodium	186	B		P
7440-28-0	Thallium	0.44	U		P
7440-62-2	Vanadium	41.3			P
7440-66-6	Zinc	34.5			P
	Cyanide	0.52	U		CA
7440-32-6	Titanium	1380			P

a
W5
No qualifier is required for titanium
3/3/94

9413225.0171

Color Before: BROWN Clarity Before: Texture: COARSE

Color After: BROWN Clarity After: Artifacts: YES

Comments:
STONES

verified
12/4/94

1

WESTINGHOUSE/HANFORD
1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B09328

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N3-09-036SAS No.: SDG No.: B09325

Matrix (soil/water): SOIL Lab Sample ID: 09093-04S

Level (low/med): LOW Date Received: 09/14/93

% Solids: 95.3

299-W19-97
20-22.5'

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	5030			P	
7440-36-0	Antimony	2.9	B	N	P	
7440-38-2	Arsenic	3.6			P	
7440-39-3	Barium	74.6			P	
7440-41-7	Beryllium	0.33	B		P	
7440-43-9	Cadmium	0.27	U		P	
7440-70-2	Calcium	6870			P	
7440-47-3	Chromium	6.4			P	
7440-48-4	Cobalt	8.8	B		P	
7440-50-8	Copper	11.7			P	
7439-89-6	Iron	18400			P	
7439-92-1	Lead	4.2			P	
7439-95-4	Magnesium	3840			P	
7439-96-5	Manganese	273			P	
7439-97-6	Mercury	0.05	U		CV	
7440-02-0	Nickel	5.8	B		P	
7440-09-7	Potassium	839	B		P	
7782-49-2	Selenium	0.47	U		P	
7440-22-4	Silver	0.60	B		P	
7440-23-5	Sodium	192	B		P	
7440-28-0	Thallium	0.45	U		P	
7440-62-2	Vanadium	42.3			P	
7440-66-6	Zinc	34.1			P	
	Cyanide	0.51	U		CA	
7440-32-6	Titanium	1400			P	

94/3225.0172

No qualifier is required for titanium 2/3/94

Color Before: BROWN Clarity Before: Texture: COARSE

Color After: BROWN Clarity After: Artifacts: YES

Comments:
STONES

verified

2/24/94

5

SAMPLE NUMBER: B09329

INORGANIC ANALYSIS DATA SHEET

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N3-09-036SAS No.: SDG No.: B09325

Matrix (soil/water): SOIL Lab Sample ID: 09093-05S

Level (low/med): LOW Date Received: 09/14/93

% Solids: 96.9

299-W19-95
45-47.5'

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	4730			P
7440-36-0	Antimony	2.6	U	N	P
7440-38-2	Arsenic	3.1			P
7440-39-3	Barium	75.9			P
7440-41-7	Beryllium	0.22	B		P
7440-43-9	Cadmium	0.26	U		P
7440-70-2	Calcium	21900			P
7440-47-3	Chromium	7.4			P
7440-48-4	Cobalt	5.8	B		P
7440-50-8	Copper	8.3			P
7439-89-6	Iron	12600			P
7439-92-1	Lead	2.2			P
7439-95-4	Magnesium	3810			P
7439-96-5	Manganese	213			P
7439-97-6	Mercury	0.05	U		CV
7440-02-0	Nickel	6.3	B		P
7440-09-7	Potassium	764	B		P
7782-49-2	Selenium	0.47	U		P
7440-22-4	Silver	0.55	B		P
7440-23-5	Sodium	167	B		P
7440-28-0	Thallium	0.45	U		P
7440-62-2	Vanadium	27.2			P
7440-66-6	Zinc	25.7			P
	Cyanide	0.49	U		CA
7440-32-6	Titanium	303			P

No qualifier is required for titanium 9/24/94

Color Before: BROWN Clarity Before: Texture: COARSE

Color After: BROWN Clarity After: Artifacts: YES

Comments:
STONES

verified

9/24/94

9W3225.0173

WESTINGHOUSE/HANFORD
1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B09330

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N3-09-036SAS No.: SDG No.: B09325

Matrix (soil/water): SOIL Lab Sample ID: 09093-06S

Level (low/med): LOW Date Received: 09/14/93

% Solids: 96.3

299-W19-97
30-32'

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	4060			P	
7440-36-0	Antimony	2.9	B	N	P	UJ
7440-38-2	Arsenic	2.6			P	
7440-39-3	Barium	62.2			P	
7440-41-7	Beryllium	0.21	B		P	U
7440-43-9	Cadmium	0.26	U		P	
7440-70-2	Calcium	6110			P	
7440-47-3	Chromium	4.7			P	
7440-48-4	Cobalt	8.6	B		P	
7440-50-8	Copper	10.2			P	U
7439-89-6	Iron	16800			P	
7439-92-1	Lead	1.4			P	
7439-95-4	Magnesium	3090			P	
7439-96-5	Manganese	255			P	
7439-97-6	Mercury	0.05	U		CV	
7440-02-0	Nickel	5.2	B		P	
7440-09-7	Potassium	656	B		P	
7782-49-2	Selenium	0.46	U		P	
7440-22-4	Silver	0.52	U		P	
7440-23-5	Sodium	185	B		P	
7440-28-0	Thallium	0.44	U		P	
7440-62-2	Vanadium	45.2			P	
7440-66-6	Zinc	31.1			P	
	Cyanide	0.49	U		CA	
7440-32-6	Titanium	1520			P	

No qualifier is required for titanium

Color Before: BROWN Clarity Before: Texture: COARSE

Color After: BROWN Clarity After: Artifacts: YES

Comments:
STONES

verified

2/24/94

ATTACHMENT 4

LABORATORY NARRATIVE AND CHAIN-OF-CUSTODY DOCUMENTATION

TMA
Thermo Analytical Inc.

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

RECORD COPY

October 21, 1993

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

Quality Control Narrative

Scope
Six (6) soil samples were submitted to TMA/Skinner & Sherman Laboratories, Inc. on September 14, 1993 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 S309093.

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 antimony digestion spike recovery exceeded 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	~~DDDDD2A~~

Custody Form Initiator L E ROGERS

Company Contact L E ROGERS

Telephone 376-7690

Project Designation/Sampling Locations 200-UP-2

Collection Date 9-7-93

Ice Chest No. ~~Rusty Dusty~~ 9/9/93 SMK-271

Field Logbook No. EFL-1091

Bill of Lading/Airbill No.

Offsite Property No.

Method of Shipment OVERNIGHT AIR SERVICE

Shipped to TMA

Possible Sample Hazards/Remarks Keep samples at 4C (SOIL) None noted

Sample Identification

1) B09325

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

9413225.0177

2) B09326

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) SCR 9-7-93

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:
1510 L E Rogers 9-7-93	I G Hogan	9-7-93 / 1510
I G Hogan	J.D. Fancher	9/9/93 1030
J.D. Fancher 9/9/93 1030	Cathy H. Yamamoto	9/10/93 11:15 AM

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

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

Westinghouse Hanford Company	CHAIN OF CUSTODY ~~0000026~~

Custody Form Initiator L E ROGERS

Company Contact L E ROGERS — Telephone 376-7690

Project Designation/Sampling Locations 200-UP-2 — Collection Date 9-8-93

Ice Chest No. SML-353 — Field Logbook No. EFL-1091

Bill of Lading/Airbill No. — Offsite Property No.

Method of Shipment OVERNIGHT AIR SERVICE

Shipped to TMA

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

Sample Identification

1) B09327

1,250ml	P:CLP;TAL Metals,Hg,Ti
~~1,250ml~~ 1250ml	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

9443225.0078

2) B09328

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) B09330

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:
1400 Laura E Rogers 9-8-93		1400 9-8-93
9.9.93 1030	J.D Franklin	9/9/93 1030
J-D-Franklin 9/9/93 1050	Ellen L. Yamamoto	9/10/93 11:15 AM

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

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

Westinghouse Hanford Company	CHAIN OF CUSTODY	~~DDDDD2E~~

Custody Form Initiator: L E ROGERS

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

Project Designation/Sampling Locations: 200-UP-2 — Collection Date: 9-8-93

Ice Chest No.: SML-352 — Field Logbook No.: EFL-1091

Bill of Lading/Airbill No.: — Offsite Property No.:

Method of Shipment: OVERNIGHT AIR SERVICE

Shipped to: TMA

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

Sample Identification

1) B09329

1,250ml	P:CLP;TAL Metals,Hg,Ti
120ml ~~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

R 9-8-93

9W3225.017

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

SER 9-8-93

3)

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

[ ] Field Transfer of Custody

Chain of Possession (Sign and Print Names)

Relinquished by:	Received by:	Date/Time:
1400 Leon E Rogers 9-8-93	Roy T Sickle Jan T Sickle	1400 9-8-93
Relinquished by: RT Sickle 9-9-93 1030	Received by: J.D. Franklin	Date/Time: 9/9/93 11:30
Relinquished by: J.D. Franklin 9/9/93 1050	Received by: Becky Y. Yamamoto	Date/Time: 9/10/93 11:15 AM
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

ATTACHMENT 5

DATA VALIDATION SUPPORTING DOCUMENTATION

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E (circled)

PROJECT: 200-UP-2		DATA PACKAGE: B0925-TMA-620	
VALIDATOR: [signature]	LAB: TMA		DATE: 02/24/94
CASE:		SDG: B0925-TMA-620	

02/24/94

ANALYSES PERFORMED

☒ CLP/ICP	~~☒ CLP/GFAA~~	☒ CLP/Hg	☒ CLP/Cyanide	☒ Titanium by ICP	☐
☐ SW-846/ICP	☐ SW-846/GFAA	☐ SW-846/Hg	☐ SW-846 Cyanide	☐	☐

SAMPLES/MATRIX Soils

B0925 B0930
B0926
B0927
B0928
B0929

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: _____

021

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 (2)2b4fH
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: Several analytes were detected in the lab blanks therefore only coppers and antimony sample results required qualification as undetected (U). See Attachment 2 for specific samples and qualifications. (2) 3B3/5

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: The LCS %R for iron was 66.9%, however the LCS result for iron is within the specific laboratory limits. Therefore, no qualification is required. Also the LCS %R for Cs was 71.3% and Mg was 79.1%. However since the LCS is within the laboratory limits, no qualification is required.

9W3225.0182

·022

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: _____

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: The analytes As, Pb, Se and Tl were analyzed by ICP-MS. No qualification is required since the required detection limits have been met.

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: _____

9W3225.0183

023

HOLDING TIME SUMMARY

B0(325 · TMA-60

SDG:	VALIDATOR:	DATE: 2/24/94	PAGE 1 OF 1
COMMENTS: Metals			

FIELD SAMPLE ID	ANALYSIS TYPE	DATE SAMPLED	DATE PREPARED	DATE ANALYZED	PREP. HOLDING TIME, DAYS	ANALYSIS HOLDING TIME, DAYS	QUALIFIER
B0(325	ICP	09/07/93		10/15/93		38	None
↓	Hg	↓		10/04/93		27	
↓	CN	↓		09/17/93		10	
B0(326	ICP	09/07/93		10/15/93		38	
↓	Hg	↓		10/04/93		27	
↓	CN	↓		9/17/93		10	
B0(327	ICP	09/07/93		10/15/93		37	
↓	Hg	↓		10/04/93		26	
↓	CN	↓		9/17/93		9	
B0(328	ICP	09/08/93		10/15/93		37	
↓	Hg	↓		10/04/93		26	
↓	CN	↓		9/17/93		9	
B0(329	ICP	09/08/93		10/15/93		37	
↓	Hg	↓		10/04/93		26	
↓	CN	↓		9/17/93		9	
B0(330	ICP	09/08/93		10/15/93		37	
↓	Hg	↓		10/04/93		26	
↓	CN	↓		9/17/93		9	↓

WESTINGHOUSE/HANFORD

3
BLANKS

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N3-09-036SAS No.: SDG No.: B09325

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	Preparation Blank	C	M
Aluminum	10.6	U	32.4	B	23.5	B	19.6	B	6.408	B	P
Antimony	12.9	U	13.7	B	12.9	U	12.9	U	2.580	U	P
Arsenic	1.7	U	1.7	U	1.7	U	1.7	U	0.437	B	P
Barium	1.2	U	1.4	B	1.5	B	1.2	U	0.240	U	P
Beryllium	0.2	U	0.2	B	0.2	B	0.2	U	0.040	U	P
Cadmium	1.6	B	1.3	U	1.7	B	1.4	B	0.260	U	P
Calcium	59.0	U	59.0	U	59.0	U	59.0	U	11.800	U	P
Chromium	-2.6	B	2.1	U	2.1	U	2.1	U	0.526	B	P
Cobalt	2.6	U	2.6	U	2.6	U	2.6	U	0.520	U	P
Copper	10.1	B	10.8	B	2.5	U	-3.5	B	2.350	B	P
Iron	5.3	U	12.8	B	26.8	B	16.2	B	1.060	U	P
Lead	1.1	U	1.1	U	1.1	U	1.1	U	0.220	U	P
Magnesium	22.9	U	36.7	B	22.9	U	23.5	B	4.580	U	P
Manganese	0.8	U	0.8	U	1.3	B	1.4	B	0.160	U	P
Mercury	0.1	U	0.1	U	0.1	U	0.1	U	0.050	U	CV
Nickel	3.4	U	3.4	U	3.4	U	3.4	U	0.680	U	P
Potassium	68.5	U	68.5	U	68.5	U	78.6	B	13.700	U	P
Selenium	2.3	U	2.3	U	2.3	U	2.3	U	0.460	U	P
Silver	2.6	U	2.6	U	2.6	U	3.0	B	0.520	U	P
Sodium	114.4	U	114.4	U	114.4	U	114.4	U	26.152	B	P
Thallium	2.2	U	2.2	U	2.3	B	2.2	U	0.440	U	P
Vanadium	5.5	U	5.5	U	5.5	U	5.5	U	1.100	U	P
Zinc	7.3	B	5.3	B	4.4	U	4.4	U	0.880	U	P
Cyanide	10.0	U	10.0	U	10.0	U	10.0	U	0.500	U	CA
Titanium	1.3	B	1.3	B	3.4	B	3.1	B	0.220	U	P

5K
68.5
50.5
54.0
11.75

The Be concentration in the blank according to the raw data is 0.24 mg/L.

0.24 ug/L x 5 = 1.25 ug/L.

3/3/94

2/24/94

WESTINGHOUSE/HANFORD

5A

SPIKE SAMPLE RECOVERY

SAMPLE NUMBER: B09330S

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N3-09-036SAS No.: SDG No.: B09325

Matrix (soil/water): SOIL Level (low/med): LOW

% Solids for Sample: 96.3

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	64.7330		2.8652	B	100.82	61.4	N	P
Arsenic	75-125	383.3490		2.5876		403.27	94.4		P
Barium	75-125	435.0684		62.1843		403.27	92.5		P
Beryllium	75-125	9.5172		0.2137	B	10.08	92.3		P
Cadmium	75-125	8.4646		0.2621	U	10.08	84.0		P
Calcium									NR
Chromium	75-125	42.2910		4.6578		40.33	93.3		P
Cobalt	75-125	100.9064		8.5997	B	100.82	91.6		P
Copper	75-125	58.3149		10.1967		50.41	95.5		P
Iron									NR
Lead	75-125	95.4420		1.3942		100.32	93.3		P
Magnesium									NR
Manganese	75-125	334.9363		254.3266		100.32	79.5		P
Mercury	75-125	0.5426		0.0494	U	0.49	110.7		CV
Nickel	75-125	98.4605		5.2445	B	100.82	92.5		P
Potassium									NR
Selenium	75-125	374.5980		0.4638	U	403.27	92.9		P
Silver	75-125	11.3097		0.5243	U	10.08	112.2		P
Sodium									NR
Thallium	75-125	373.4083		0.4436	U	403.27	92.6		P
Vanadium	75-125	140.6144		45.2409		100.32	94.6		P
Zinc	75-125	121.3824		31.0881		100.82	89.6		P
Cyanide	75-125	25.7278		0.4898	U	24.96	103.1		CA
Titanium		1816.6127		1523.9391		100.32	290.3		P

3/3/94

Comments: ~~The MS%R for titanium is acceptable since the Sample result is~~ ~~No qualification is required for titanium since the Sample result is greater than 4 times the amount of spike added.~~

3/3/94

2/24/94

FORM V (Part 1) - IN ILM02.1

~~16~~

026

0W3225.0186

SEMIVOLATILE ORGANIC DATA VALIDATION SUMMARY FOR DATA PACKAGE:
B09325-TMA-620 (923-E418, Filename B09325.BNA)

RECORD COPY

MEMORANDUM

TO: 200-UP-2 Project QA Record April 21, 1994

FR: Susan Winter, Golder Associates Inc.

RE: SEMIVOLATILE ORGANIC DATA VALIDATION SUMMARY FOR DATA PACKAGE: B09325-TMA-620 (923-E418, Filename B09325.BNA)

INTRODUCTION

This memo presents the results of data validation on data package B09325-TMA-620 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
B09325	09/07/93	SOIL	~~SEE NOTE 1~~
B09326	09/07/93	SOIL	
B09327	09/08/93	SOIL	
B09328	09/08/93	SOIL	
B09329	09/08/93	SOIL	
B09330	09/08/93	SOIL	

Note 1. All samples were analyzed for CLP TCL Semivolatile Organic Constituents.

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 and properly reported with the exception of the results for 2-chlorophenol, 1,4-dichlorobenzene, 4-chloro-3-methylphenol, and acenaphthene in sample B09327 which were reported as undetected. Attachments 3 and 5 provide a summary of the laboratory results, corrected laboratory report forms and supporting documentation.

Revised 4/21/94

-001

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

Completeness. The data package was complete for all requested analyses. A total of six samples were validated in this data package with a total of 384 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.

Laboratory Blanks

- Di-n-butylphthalate, bis(2-ethylhexyl)phthalate, and pyrene 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 associated laboratory blank and were common laboratory contaminants, resulting in qualification of the TICs as unusable (UR) as shown in Attachment 3.
- TICs were detected in the samples and associated laboratory blank and have been qualified due to associated blank contamination and have been determined to be presumptive and valid (UJN).
- TICs were detected in the samples and determined to be valid, resulting in qualification of the results as presumptive and valid (JN).

Revised 4/21/94

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 4/21/94

ATTACHMENT 1

GLOSSARY OF DATA REPORTING QUALIFIERS

Revised
4/21/94

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.

Revised

4/31/94

005

ATTACHMENT 2

SUMMARY OF DATA QUALIFICATIONS

Revised
4/21/94

DATA QUALIFICATION SUMMARY

SDG: B09325-TMA-620	VALIDATOR:	DATE: April 21, 1994	PAGE 1 OF 1
COMMENTS: SEMIVOLATILE ORGANICS			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
DI-N-BUTYLPHTHALATE	U	B09325 B09326 B09327 B09328 B09329 B09330	PRESENT IN LABORATORY BLANK
BIS(2-ETHYLHEXYL)PHTHALATE	U	B09325 B09326 B09327 B09328 B09329 B09330	PRESENT IN LABORATORY BLANK
PYRENE	U	B09327	PRESENT IN LABORATORY BLANK
2-CHLOROPHENOL	J	B09327	DETECTED IN SAMPLE BELOW THE CRQL
1,4-DICHLOROBENZENE	J	B09327	DETECTED IN SAMPLE BELOW THE CRQL
4-CHLORO-3-METHYLPHENOL	J	B09327	DETECTED IN SAMPLE BELOW THE CRQL
ACENAPHTHENE	J	B09327	DETECTED IN SAMPLE BELOW THE CRQL

Revised

4/21/94

ATTACHMENT 3

QUALIFIED DATA SUMMARY AND ANNOTATED LABORATORY REPORTS

Validated Data Summary, Data Package: B09325-TMA-620

Parameter	Units	Samp# / Date / Location / Depth / Type / Comments	B09325 9-7-93 299-W19-97 4.00 - 6.00 --- ---		B09326 9-7-93 299-W19-95 30.00 - 32.50 --- ---		B09327 9-8-93 299-W19-97 10.00 - 12.50 --- ---		B09328 9-8-93 299-W19-97 20.00 - 22.50 --- ---		B09329 9-8-93 299-W19-95 45.00 - 47.50 --- ---		B09330 9-8-93 299-W19-97 30.00 - 32.00 --- ---	
			Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
PHENOL	UG/KG		350.000	U	350.000	U	350.000	U	340.000	U	360.000	U	340.000	U
BIS(2-CHLOROETHYL)ETHER	UG/KG		350.000	U	350.000	U	350.000	U	340.000	U	360.000	U	340.000	U
2-CHLOROPHENOL	UG/KG		350.000	U	350.000	U	31.000	J	340.000	U	360.000	U	340.000	U
1,3-DICHLOROBENZENE	UG/KG		350.000	U	350.000	U	350.000	U	340.000	U	360.000	U	340.000	U
1,4-DICHLOROBENZENE	UG/KG		350.000	U	350.000	U	20.000	J	340.000	U	360.000	U	340.000	U
1,2-DICHLOROBENZENE	UG/KG		350.000	U	350.000	U	350.000	U	340.000	U	360.000	U	340.000	U
2-METHYLPHENOL	UG/KG		350.000	U	350.000	U	350.000	U	340.000	U	360.000	U	340.000	U
2,2'-OXYBIS(1-CHLOROPROPANE)	UG/KG		350.000	U	350.000	U	350.000	U	340.000	U	360.000	U	340.000	U
4-METHYLPHENOL	UG/KG		350.000	U	350.000	U	350.000	U	340.000	U	360.000	U	340.000	U
N-NITROSO-DI-N-PROPYLAMINE	UG/KG		350.000	U	350.000	U	350.000	U	340.000	U	360.000	U	340.000	U
HEXACHLOROETHANE	UG/KG		350.000	U	350.000	U	350.000	U	340.000	U	360.000	U	340.000	U
NITROBENZENE	UG/KG		350.000	U	350.000	U	350.000	U	340.000	U	360.000	U	340.000	U
ISOPHORONE	UG/KG		350.000	U	350.000	U	350.000	U	340.000	U	360.000	U	340.000	U
2-NITROPHENOL	UG/KG		350.000	U	350.000	U	350.000	U	340.000	U	360.000	U	340.000	U
2,4-DIMETHYLPHENOL	UG/KG		350.000	U	350.000	U	350.000	U	340.000	U	360.000	U	340.000	U
BIS(2-CHLOROETHOXY)METHANE	UG/KG		350.000	U	350.000	U	350.000	U	340.000	U	360.000	U	340.000	U
2,4-DICHLOROPHENOL	UG/KG		350.000	U	350.000	U	350.000	U	340.000	U	360.000	U	340.000	U
1,2,4-TRICHLOROBENZENE	UG/KG		350.000	U	350.000	U	350.000	U	340.000	U	360.000	U	340.000	U
NAPHTHALENE	UG/KG		350.000	U	350.000	U	350.000	U	340.000	U	360.000	U	340.000	U
4-CHLOROANILINE	UG/KG		350.000	U	350.000	U	350.000	U	340.000	U	360.000	U	340.000	U
HEXACHLOROBUTADIENE	UG/KG		350.000	U	350.000	U	350.000	U	340.000	U	360.000	U	340.000	U
4-CHLORO-3-METHYLPHENOL	UG/KG		350.000	U	350.000	U	27.000	J	340.000	U	360.000	U	340.000	U
2-METHYLNAPHTHALENE	UG/KG		350.000	U	350.000	U	350.000	U	340.000	U	360.000	U	340.000	U
HEXACHLOROCYCLOPENTADIENE	UG/KG		350.000	U	350.000	U	350.000	U	340.000	U	360.000	U	340.000	U
2,4,6-TRICHLOROPHENOL	UG/KG		350.000	U	350.000	U	350.000	U	340.000	U	360.000	U	340.000	U
2,4,5-TRICHLOROPHENOL	UG/KG		850.000	U	840.000	U	840.000	U	830.000	U	880.000	U	820.000	U
2-CHLORONAPHTHALENE	UG/KG		350.000	U	350.000	U	350.000	U	340.000	U	360.000	U	340.000	U
2-NITROANILINE	UG/KG		850.000	U	840.000	U	840.000	U	830.000	U	880.000	U	820.000	U
DIMETHYLPHTHALATE	UG/KG		350.000	U	350.000	U	350.000	U	340.000	U	360.000	U	340.000	U
ACENAPHTHYLENE	UG/KG		350.000	U	350.000	U	350.000	U	340.000	U	360.000	U	340.000	U
3-NITROANILINE	UG/KG		850.000	U	840.000	U	840.000	U	830.000	U	880.000	U	820.000	U
ACENAPHTHENE	UG/KG		350.000	U	350.000	U	23.000	J	340.000	U	360.000	U	340.000	U

Verified

3/01/94

600

Validated Data Summary, Data Package: B09325-TMA-620

	Samp#	B09325		B09326		B09327		B09328		B09329		B09330	
	Date	9-7-93		9-7-93		9-8-93		9-8-93		9-8-93		9-8-93	
	Location	299-W19-97		299-W19-95		299-W19-97		299-W19-97		299-W19-95		299-W19-97	
	Depth	4.00 - 6.00		30.00 - 32.50		10.00 - 12.50		20.00 - 22.50		45.00 - 47.50		30.00 - 32.00	
	Type	---		---		---		---		---		---	
	Comments	---		---		---		---		---		---	
Parameter	Units	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
2,4-DINITROPHENOL	UG/KG	850.000	U	840.000	U	840.000	U	830.000	U	880.000	U	820.000	U
4-NITROPHENOL	UG/KG	850.000	U	840.000	U	840.000	U	830.000	U	880.000	U	820.000	U
DIBENZOFURAN	UG/KG	350.000	U	350.000	U	350.000	U	340.000	U	360.000	U	340.000	U
2,4-DINITROTOLUENE	UG/KG	350.000	U	350.000	U	350.000	U	340.000	U	360.000	U	340.000	U
2,6-DINITROTOLUENE	UG/KG	350.000	U	350.000	U	350.000	U	340.000	U	360.000	U	340.000	U
DIETHYLPHTHALATE	UG/KG	350.000	U	350.000	U	350.000	U	340.000	U	360.000	U	340.000	U
4-CHLOROPHENYL-PHENYLETHER	UG/KG	350.000	U	350.000	U	350.000	U	340.000	U	360.000	U	340.000	U
FLUORENE	UG/KG	350.000	U	350.000	U	350.000	U	340.000	U	360.000	U	340.000	U
4-NITROANILINE	UG/KG	850.000	U	840.000	U	840.000	U	830.000	U	880.000	U	820.000	U
4,6-DINITRO-2-METHYLPHENOL	UG/KG	850.000	U	840.000	U	840.000	U	830.000	U	880.000	U	820.000	U
N-NITROSODIPHENYLAMINE	UG/KG	350.000	U	350.000	U	350.000	U	340.000	U	360.000	U	340.000	U
4-BROMOPHENYL-PHENYLETHER	UG/KG	350.000	U	350.000	U	350.000	U	340.000	U	360.000	U	340.000	U
HEXACHLOROBENZENE	UG/KG	350.000	U	350.000	U	350.000	U	340.000	U	360.000	U	340.000	U
PENTACHLOROPHENOL	UG/KG	850.000	U	840.000	U	840.000	U	830.000	U	880.000	U	820.000	U
PHENANTHRENE	UG/KG	350.000	U	350.000	U	350.000	U	340.000	U	360.000	U	340.000	U
ANTHRACENE	UG/KG	350.000	U	350.000	U	350.000	U	340.000	U	360.000	U	340.000	U
CARBAZOLE	UG/KG	350.000	U	350.000	U	350.000	U	340.000	U	360.000	U	340.000	U
DI-N-BUTYLPHTHALATE	UG/KG	400.000	U	350.000	U	400.000	U	350.000	U	370.000	U	340.000	U
FLUORANTHENE	UG/KG	350.000	U	350.000	U	350.000	U	340.000	U	360.000	U	340.000	U
PYRENE	UG/KG	350.000	U	350.000	U	350.000	U	340.000	U	360.000	U	340.000	U
BUTYLBENZYLPHTHALATE	UG/KG	350.000	U	350.000	U	350.000	U	340.000	U	360.000	U	340.000	U
3,3'-DICHLOROBENZIDINE	UG/KG	350.000	U	350.000	U	350.000	U	340.000	U	360.000	U	340.000	U
BENZO(A)ANTHRACENE	UG/KG	350.000	U	350.000	U	350.000	U	340.000	U	360.000	U	340.000	U
BIS(2-ETHYLHEXYL)PHTHALATE	UG/KG	350.000	U	350.000	U	350.000	U	340.000	U	360.000	U	340.000	U
CHRYSENE	UG/KG	350.000	U	350.000	U	350.000	U	340.000	U	360.000	U	340.000	U
DI-N-OCTYLPHTHALATE	UG/KG	350.000	U	350.000	U	350.000	U	340.000	U	360.000	U	340.000	U
BENZO(B)FLUORANTHENE	UG/KG	350.000	U	350.000	U	350.000	U	340.000	U	360.000	U	340.000	U
BENZO(K)FLUORANTHENE	UG/KG	350.000	U	350.000	U	350.000	U	340.000	U	360.000	U	340.000	U
BENZO(A)PYRENE	UG/KG	350.000	U	350.000	U	350.000	U	340.000	U	360.000	U	340.000	U
INDENO(1,2,3-CD)PYRENE	UG/KG	350.000	U	350.000	U	350.000	U	340.000	U	360.000	U	340.000	U
DIBENZ(A,H)ANTHRACENE	UG/KG	350.000	U	350.000	U	350.000	U	340.000	U	360.000	U	340.000	U
BENZO(G,H,I)PERYLENE	UG/KG	350.000	U	350.000	U	350.000	U	340.000	U	360.000	U	340.000	U

Verified

3/24/94

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
299-W9-97

~~000272~~

B09325
4-6'

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 09021 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A309021-01D

Sample wt/vol: 30.1 (g/mL) G Lab File ID: 30927S07

Level: (low/med) LOW Date Received: 09/10/93

% Moisture: 6 decanted: (Y/N) N Date Extracted: 09/13/93

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 09/27/93

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 9.2

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

Reviewed 3/24/94

1C

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO. 299-W19-97

~~000273~~ B09325 4-6'

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 09021 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A309021-01D

Sample wt/vol: 30.1 (g/mL) G Lab File ID: 30927S07

Level: (low/med) LOW Date Received: 09/10/93

% Moisture: 6 decanted: (Y/N) N Date Extracted: 09/13/93

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 09/27/93

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 9.2

9W3225.0199

CAS NO.	COMPOUND	CONCENTRATION UNITS:; (ug/L or ug/Kg) UG/KG	Q	Q
100-02-7	4-Nitrophenol	850	U	
132-64-9	Dibenzofuran	350	U	
121-14-2	2,4-Dinitrotoluene	350	U	
606-20-2	2,6-Dinitrotoluene	350	U	
84-66-2	Diethylphthalate	350	U	
7005-72-3	4-Chlorophenyl-phenylether	350	U	
86-73-7	Fluorene	350	U	
100-01-6	4-Nitroaniline	850	U	
534-52-1	4,6-Dinitro-2-methylphenol	850	U	
86-30-6	N-Nitrosodiphenylamine (1)	350	U	
101-55-3	4-Bromophenyl-phenylether	350	U	
118-74-1	Hexachlorobenzene	350	U	
87-86-5	Pentachlorophenol	850	U	
85-01-8	Phenanthrene	350	U	
120-12-7	Anthracene	350	U	
86-74-8	Carbazole	350	U	
84-74-2	Di-n-Butylphthalate	400	~~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 ~~140~~	~~BJ~~	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

Ves. ed

FORM I SV-2 3/90

2/22/94

012

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

~~000274~~

EPA SAMPLE NO.
299-W19-97
B09325
4-6'

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 09021 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A309021-01D

Sample wt/vol: 30.1 (g/mL) G Lab File ID: 30927S07

Level: (low/med) LOW Date Received: 09/10/93

% Moisture: 6 decanted: (Y/N) N Date Extracted: 09/13/93

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 09/27/93

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 9.2

Number TICs found: 10

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

Q

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
~~1. 123-42-2~~	~~4-HYDROXY-4-METHYL-2-PENTANO~~	~~6.30~~	~~65000~~	~~BAJN~~
2.	UNKNOWN HYDROCARBON	6.43	110	~~BJ~~
3.	UNKNOWN HYDROCARBON	7.47	810	~~BJ~~
4.	UNKNOWN HYDROCARBON	8.78	71	~~J~~
5.	HEXANEDIOIC ACID ESTER ISOME	26.25	110	~~J~~
6.	UNKNOWN ALKANE (Total Unknown Alkanes)	27.20	110	~~J~~
7.	UNKNOWN ALKANE	28.13	71	~~J~~
8.	UNKNOWN ALKANE	29.18	140	~~J~~
9.	UNKNOWN ALKANE	30.43	110	~~J~~
10.	UNKNOWN ALKANE	31.90	250	~~J~~

Summation of Unknown Alkane concentration = 681 SN

3/3/94

Revised 4/21/94

Verified 4/22/94

FORM I SV-TIC 3/90

013

9W3225.0200

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
299-W19-95
~~000300~~
B09326
30-32.5'

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 09021 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A309021-02B

Sample wt/vol: 30.3 (g/mL) G Lab File ID: 30927S08

Level: (low/med) LOW Date Received: 09/10/93

% Moisture: 6 decanted: (Y/N) N Date Extracted: 09/13/93

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 09/27/93

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 9.3

GW13225.0201

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	840	U
91-58-7	2-Chloronaphthalene	350	U
88-74-4	2-Nitroaniline	840	U
131-11-3	Dimethylphthalate	350	U
208-96-8	Acenaphthylene	350	U
99-09-2	3-Nitroaniline	840	U
83-32-9	Acenaphthene	350	U
51-28-5	2,4-Dinitrophenol	840	U

Verified 10/28/94

1C

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
299-W19-95

~~000301~~

B09326
3-32.5'

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 09021 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A309021-02B

Sample wt/vol: 30.3 (g/mL) G Lab File ID: 30927S08

Level: (low/med) LOW Date Received: 09/10/93

% Moisture: 6 decanted: (Y/N) N Date Extracted: 09/13/93

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 09/27/93

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 9.3

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q	C
100-02-7	4-Nitrophenol	840	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	840	U	
534-52-1	4,6-Dinitro-2-methylphenol	840	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	840	U	
85-01-8	Phenanthrene	350	U	
120-12-7	Anthracene	350	U	
86-74-8	Carbazole	350	U	
84-74-2	Di-n-Butylphthalate	350 ~~280~~	~~BJ~~	L
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 ~~93~~	~~BJ~~	L
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

FORM I SV-2 3/90

Verified 2/22/94

015

PW3225.0202

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS ~~000302~~

EPA SAMPLE NO.
299-W19-95
B09326
3C-32.5'

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 09021 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A309021-02B

Sample wt/vol: 30.3 (g/mL) G Lab File ID: 30927S08

Level: (low/med) LOW Date Received: 09/10/93

% Moisture: 6 decanted: (Y/N) N Date Extracted: 09/13/93

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 09/27/93

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 9.3

Number TICs found: 4 CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG Q

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
~~1. 123-42-2~~	~~4-HYDROXY-4-METHYL-2-PENTANO~~	~~6.33~~	~~68000~~	~~BAJN~~ JB
2.	UNKNOWN HYDROCARBON	7.48	950	~~BJ~~
3.	UNKNOWN HYDROCARBON	8.82	110	~~J~~
4.	PROPANOIC ACID ESTER	18.18	280	~~J~~

Revised 4/21/94

Verified 2/23/94

FORM I SV-TIC 3/90

016

DW3225.0203

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET ~~000322~~

EPA SAMPLE NO. 299-W.9-97

B09327 10-12.5'

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 09021 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A309021-03B

Sample wt/vol: 30.5 (g/mL) G Lab File ID: 30927S11

Level: (low/med) LOW Date Received: 09/10/93

% Moisture: 6 decanted: (Y/N) N Date Extracted: 09/13/93

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 09/27/93

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 9.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q	CR
108-95-2	Phenol	350	U	
111-44-4	bis(2-Chloroethyl)Ether	350	U	
95-57-8	2-Chlorophenol	31 ~~350~~	~~U~~	J
541-73-1	1,3-Dichlorobenzene	350	U	
106-46-7	1,4-Dichlorobenzene	20 ~~350~~	~~U~~	J
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	27 ~~350~~	~~U~~	J
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	840	U	
91-58-7	2-Chloronaphthalene	350	U	
88-74-4	2-Nitroaniline	840	U	
131-11-3	Dimethylphthalate	350	U	
208-96-8	Acenaphthylene	350	U	
99-09-2	3-Nitroaniline	840	U	
83-32-9	Acenaphthene	23 ~~350~~	~~U~~	J
51-28-5	2,4-Dinitrophenol	840	U	

FORM I SV-1 3/90

Verified 10/28/94

017

1C

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

~~000323~~

EPA SAMPLE NO.
299-W19-97

B09327
10-12.5'

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 09021 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A309021-03B

Sample wt/vol: 30.5 (g/mL) G Lab File ID: 30927S11

Level: (low/med) LOW Date Received: 09/10/93

% Moisture: 6 decanted: (Y/N) N Date Extracted: 09/13/93

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 09/27/93

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 9.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q	Q
100-02-7	4-Nitrophenol	840	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	840	U	
534-52-1	4,6-Dinitro-2-methylphenol	840	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	840	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	400	~~B~~	J
206-44-0	Fluoranthene	350	U	
129-00-0	Pyrene	350 ~~42~~	~~J~~	J
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 ~~42~~	~~B~~	J
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

FORM I SV-2 3/90

2/28/94

-018

9413225.0205

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

~~000324~~

EPA SAMPLE NO.
299-W19-97
B09327
12-12.5'

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 09021 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A309021-03B

Sample wt/vol: 30.5 (g/mL) G Lab File ID: 30927S11

Level: (low/med) LOW Date Received: 09/10/93

% Moisture: 6 decanted: (Y/N) N Date Extracted: 09/13/93

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 09/27/93

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 9.0

Number TICs found: 2

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

Q

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
~~1. 123-42-2~~	~~4-HYDROXY-4-METHYL-2-PENTANO~~	~~6.32~~	~~76000~~	~~BAJN~~
2.	UNKNOWN HYDROCARBON	7.50	940	~~BJ~~

UR
UN

9413225.0206

Revised 4/21/94

FORM I SV-TIC Verified 4/23/94 3/90

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
299-W19-97

~~000344~~

B09328
20-22.5'

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 09021 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A309021-04B

Sample wt/vol: 30.4 (g/mL) G Lab File ID: 30927S12

Level: (low/med) LOW Date Received: 09/10/93

% Moisture: 5 decanted: (Y/N) N Date Extracted: 09/13/93

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 09/27/93

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

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

9113225.0207

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

Jeri Sied 2/22/94

020

1C

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
299-W19-97

~~000345~~

B09328
20-22.5'

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 09021 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A309021-04B

Sample wt/vol: 30.4 (g/mL) G Lab File ID: 30927S12

Level: (low/med) LOW Date Received: 09/10/93

% Moisture: 5 decanted: (Y/N) N Date Extracted: 09/13/93

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 09/27/93

Injection Volume: 2.0(uL) Dilution Factor: 1.0

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

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

CAS NO.	COMPOUND		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	350	~~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 ~~46~~	~~BJ~~	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 2/23/94

021

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.
299-W19-97

~~000346~~ B09328
20-22.5'

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 09021 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A309021-04B

Sample wt/vol: 30.4 (g/mL) G Lab File ID: 30927S12

Level: (low/med) LOW Date Received: 09/10/93

% Moisture: 5 decanted: (Y/N) N Date Extracted: 09/13/93

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 09/27/93

Injection Volume: 2.0(uL) Dilution Factor: 1.0

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

Number TICs found: 4 CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

Q

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
~~1. 123-42-2~~	~~4-HYDROXY-4-METHYL-2-PENTANO~~	~~6.30~~	~~62000~~	~~BAJN~~
2.	UNKNOWN HYDROCARBON	6.43	100	~~BJ~~
3.	UNKNOWN HYDROCARBON	7.48	800	~~BJ~~
4.	UNKNOWN HYDROCARBON	8.82	69	~~J~~

Revised
4/21/94

Verified 4/28/94

FORM I SV-TIC 3/90

022

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET ~~000366~~

EPA SAMPLE NO.
299-W9-95
B09329
45-47.5'

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 09021 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A309021-06B

Sample wt/vol: 30.2 (g/mL) G Lab File ID: 30927S14

Level: (low/med) LOW Date Received: 09/10/93

% Moisture: 10 decanted: (Y/N) N Date Extracted: 09/13/93

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 09/27/93

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 9.5

94J3225.0210

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

Verified 2/22/94

023

1C

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

~~000367~~

EPA SAMPLE NO.
299-W9-9S
B09329
45-47.5'

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 09021 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A309021-06B

Sample wt/vol: 30.2 (g/mL) G Lab File ID: ~~30927S14~~

Level: (low/med) LOW Date Received: 09/10/93

% Moisture: 10 decanted: (Y/N) N Date Extracted: 09/13/93

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 09/27/93

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 9.5

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

CAS NO.	COMPOUND	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	880 U
85-01-8	Phenanthrene	360 U
120-12-7	Anthracene	360 U
86-74-8	Carbazole	360 U
84-74-2	Di-n-Butylphthalate	370 ~~B~~
206-44-0	Fluoranthene	360 U
129-00-0	Pyrene	360 U
85-68-7	Butylbenzylphthalate	360 U
91-94-1	3,3'-Dichlorobenzidine	360 U
56-55-3	Benzo(a)Anthracene	360 U
117-81-7	bis(2-Ethylhexyl)Phthalate	360 ~~140~~ ~~BJ~~
218-01-9	Chrysene	360 U
117-84-0	Di-n-Octyl Phthalate	360 U
205-99-2	Benzo(b)Fluoranthene	360 U
207-08-9	Benzo(k)Fluoranthene	360 U
50-32-8	Benzo(a)Pyrene	360 U
193-39-5	Indeno(1,2,3-cd)Pyrene	360 U
53-70-3	Dibenz(a,h)Anthracene	360 U
191-24-2	Benzo(g,h,i)Perylene	360 U

(1) - Cannot be separated from Diphenylamine

Verified

FORM I SV-2 3/90

3/22/94

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS ~~000368~~

EPA SAMPLE NO.
299-W9-95

B09329
45-47.5'

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 09021 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A309021-06B

Sample wt/vol: 30.2 (g/mL) G Lab File ID: ~~3~~0927S14

Level: (low/med) LOW Date Received: 09/10/93

% Moisture: 10 decanted: (Y/N) N Date Extracted: 09/13/93

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 09/27/93

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 9.5

Number TICs found: 1

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

Q

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
~~1. 123-42-2~~	~~4-HYDROXY-4-METHYL-2-PENTANO~~	~~6.33~~	~~77000~~	~~BAJN~~

ER
ER

09/3225.0212

FORM I SV-TIC Ver. 2.1 3/90

4/22/94

025

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
299-W9-97
~~000385~~
B09330
3C-32

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 09021 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A309021-05B

Sample wt/vol: 30.6 (g/mL) G Lab File ID: B0927S13

Level: (low/med) LOW Date Received: 09/10/93

% Moisture: 4 decanted: (Y/N) N Date Extracted: 09/13/93

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 09/27/93

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 9.5

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

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

Certified 12/21/94

1C

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

~~000386~~

EPA SAMPLE NO.
299-W19-97

B09330
30-32

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 09021 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A309021-05B

Sample wt/vol: 30.6 (g/mL) G Lab File ID: 30927S13

Level: (low/med) LOW Date Received: 09/10/93

% Moisture: 4 decanted: (Y/N) N Date Extracted: 09/13/93

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 09/27/93

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 9.5

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

CAS NO.	COMPOUND		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 ~~310~~	~~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 ~~72~~	~~BJ~~	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

9/27/94

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS ~~000387~~

EPA SAMPLE NO.
299-W19-97

B09330
30-321

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 09021 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A309021-05B

Sample wt/vol: 30.6 (g/mL) G Lab File ID: 30927S13

Level: (low/med) LOW Date Received: 09/10/93

% Moisture: 4 decanted: (Y/N) N Date Extracted: 09/13/93

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 09/27/93

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 9.5

Number TICs found: 1

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

Q

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
~~1. 123-42-2~~	~~4-HYDROXY-4-METHYL-2-PENTANO~~	~~6.32~~	~~76000~~	~~BAJN~~ JN

9413225.0215

FORM I SV-TIC Verified 2/28/94 3/90

028

ATTACHMENT 4

LABORATORY NARRATIVE AND CHAIN-OF-CUSTODY DOCUMENTATION

CASE NARRATIVE

LABORATORY : TMA/ARLI

CASE : 09-021

CONTRACT ID : WESTINGHOUSE HANFORD COMPANY

SDG RECEIPT DATE : September 10, 1993

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
B09325	A3-09-021-01A	V	SOIL
B09325 MS	A3-09-021-01B	V	SOIL
B09325 MSD	A3-09-021-01C	V	SOIL
B09325	A3-09-021-01D	SV	SOIL
B09325	A3-09-021-01F	K	SOIL
B09326	A3-09-021-02A	V	SOIL
B09326	A3-09-021-02B	SV	SOIL
B09326 MS	A3-09-021-02C	SV	SOIL
B09326 MSD	A3-09-021-02D	SV	SOIL
B09326	A3-09-021-02F	K	SOIL
B09327	A3-09-021-03A	V	SOIL
B09327	A3-09-021-03B	SV	SOIL
B09327	A3-09-021-03E	K	SOIL
B09328	A3-09-021-04A	V	SOIL
B09328	A3-09-021-04B	SV	SOIL
B09328	A3-09-021-04E	K	SOIL
B09330	A3-09-021-05A	V	SOIL
B09330	A3-09-021-05B	SV	SOIL
B09330	A3-09-021-05D	K	SOIL
B09330 MS	A3-09-021-05E	K	SOIL
B09330 MSD	A3-09-021-05F	K	SOIL
B09329	A3-09-021-06A	V	SOIL
B09329	A3-09-021-06B	SV	SOIL
B09329	A3-09-021-06D	K	SOIL
B09331	A3-09-021-07A	V	SOIL

3.0 COMMENTS :

3.1 SHIPPING AND DOCUMENTATION :

All of the samples were received intact and properly documented.

3.2 ANALYSIS

3.2.1 VOLATILE ANALYSIS COMMENTS :

LOW LEVEL SOIL :

The samples were analyzed by heated purge within the CLP SOW holding times.

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 CLP SOW holding times.

Sample B09327 had a Terphenyl-d14 surrogate recovery slightly above the QC limits. Sample B09326MSD had matrix spike recoveries for Phenol and 2,4-Dinitrotoluene that were slightly above the QC limits. In accordance with CLP protocol, no further action was required.

Pyrene was detected in sample B09327 at a concentration below the CRQL.

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 09/16/93 and was analyzed according to the SW-846 Method 8015M. The initial calibration consisted of 5 different levels of the Kerosene standard that ranged from 200ppm to 2000ppm. The continuing calibration at the 1000ppm level was injected amongst a series of samples, in order to verify the instrument stability. The %RSD in the initial calibration and the %D in the continuing calibration were below their 20% and 15% limits, respectively.

SAMPLE NOTES :

LOW LEVEL SOIL :

The samples were extracted and analyzed for extractable hydrocarbons in the Kerosene range within the required holding times. Approximately 20 g of each sample was extracted and concentrated to 5 mL.

There were no hydrocarbons in the Kerosene range detected in any of the samples. Sample B09330 was spiked with Kerosene and the matrix spike recoveries were between 81% and 84%. A blank spike was prepared at the same time, and had an 86% recovery.

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 designee, as verified by the following signatures.

Nicole Roth 12/10/93
Nicole Roth
CLP Program Manager

Maureen Parrish 12/10/93
Maureen Parrish
Project Manager

Westinghouse Hanford Company

CHAIN OF CUSTODY ~~000002A~~

Custody Form Initiator: L E ROGERS

Company Contact: L E ROGERS

Telephone: 376-7690

Project Designation/Sampling Locations: 200-UP-2

Collection Date: 9-7-93

Ice Chest No. ~~Rusty Dusty~~ 9/9/93 SML-27)

Field Logbook No.: EFL-1091

Bill of Lading/Airbill No.:

Offsite Property No.:

Method of Shipment: OVERNIGHT AIR SERVICE

Shipped to: TMA

Possible Sample Hazards/Remarks: Keep samples at 4C (SOIL) None noted

Sample Identification

1)

B09325

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

9403325.0220

B09326

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)

JER 9-7-93

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:
1510 Laura E. Rogers 9-7-93	JG Hogan JG Hogan	9-7-93 / 1510
JG Hogan JG Hogan	J.D. Fowler J.D. Fowler	9/8/93 1030
J.D. Fowler J.D. Fowler 9/8/93 1054	Celly M Zamarripa	9/10/93 11:15 AM
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

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

Westinghouse Hanford Company	CHAIN OF CUSTODY ~~0007026~~

Custody Form Initiator: L E ROGERS

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

Project Designation/Sampling Locations: 200-UR-2 — Collection Date: 9-8-93

Ice Chest No.: SML-353 — Field Logbook No.: EFL-1091

Bill of Lading/Airbill No.: — Offsite Property No.:

Method of Shipment: OVERNIGHT AIR SERVICE

Shipped to: TMA

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

Sample Identification

1) B09327

1,250ml	P:CLP;TAL Metals,Hg,Ti
~~1,250ml~~ 1250ml	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) B09328

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) B09330

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:
1400 Laura E Rogers 9-8-93	Ray T Skyrme	1400 9-8-93
9.9.93 1030	J.D Franklin	9/9/93 1630
J-D-Franklin 9/9/93 1656	Keith L. Yamamoto	9/10/93 11:15 AM

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

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

Westinghouse Hanford Company

CHAIN OF CUSTODY ~~DDDDD2E~~

Custody Form Initiator: L E ROGERS

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

Project Designation/Sampling Locations: 200-UP-2 — Collection Date: 9-8-93

Ice Chest No.: SMC-352 — Field Logbook No.: EFL-1091

Bill of Lading/Airbill No.: — Offsite Property No.:

Method of Shipment: OVERNIGHT AIR SERVICE

Shipped to: TMA

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

Sample Identification

1) B09329

1,250ml	P:CLP;TAL Metals,Hg,Ti
~~1,250ml~~ 120ml	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

R 9-8-93

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

SLR 9-8-93

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

[ ] Field Transfer of Custody

Chain of Possession (Sign and Print Names)

Relinquished by:	Received by:	Date/Time:
1400 Joan E Rogers 9-8-93	Roy T Schlie Roy T Schlie	1400 9-8-93
Roy T Schlie RT Schlie 9-9-93 1050	J.D. Franklin J.D. Franklin	9/9/93 13:30
J.D. Franklin J.D. Franklin 9/9/93 1050	Y. Yamamoto Y. Yamamoto	9/10/93 11:15 AM
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

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

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: B09325-TMA-620		
VALIDATOR: [signature]		LAB: TMA		DATE: 02/28/94	
CASE:			SDG: B09325-TMA-620		

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

B09325 B09330

B09326

B09327

B09328

B09329

FW3225.0224

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: _____

037

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 amount of internal~~ H.S. for the amount of standard stated in the SOW was used for the ICV and CCV. The ratio of Internal std to ICV and CCV standards are the same as required therefore, no qualification was required. See comments on last page of checklist for further explanation.

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: Dysene was detected in SBLKC91353 at 15 5 ug/kg. Therefore, the sample result for B-9327 has been qualified as undetected (U). 03/3/94

5. ACCURACY

Were surrogates/System Monitoring Compounds analyzed? . . . . . (Yes) No N/A

Are surrogate/System Monitoring Compound recoveries acceptable? Yes (No) N/A See (1)

Were MS/MSD samples analyzed? . . . . . (Yes) No N/A

Are MS/MSD results acceptable? . . . . . Yes (No) N/A See (2)

Comments: The surrogate terphenyl-d14 had a high recovery of 144% (upper limit 137%) in sample B-9327. No qualification was required since 2 surrogates of the same group (base/neutrals) need to be out of control limits to validate data qualification.

The MSD %R for phenol and 2,4-dinitrotoluene were 94% and 98%, respectively, above the upper control limits. However, no qualification was applied since the surrogates for the spiked sample were in control limits and 94% and 95% are close to 100% recovery.

038

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: TICs have been qualified according to the DV procedure.

Revised 4/21/94 · 039

GC/MS ORGANIC DATA VALIDATION CHECKLIST

Comments (attach additional sheets as necessary):

the minimum RRF for surrogate 1,2-Dichlorobenzene-d4 was recorded by the laboratory as 0.850, however, it is 0.700 according to the SOW. No qualification is required. ~~Attached Information is provided, see attachments.~~ 3/3/94

3/25/94

HOLDING TIME SUMMARY

B09325-TMA-620

SDG:	VALIDATOR:	DATE: 2/25/94	PAGE 1 OF 1

COMMENTS: Semi volatiles

FIELD SAMPLE ID	ANALYSIS TYPE	DATE SAMPLED	DATE PREPARED	DATE ANALYZED	PREP. HOLDING TIME, DAYS	ANALYSIS HOLDING TIME, DAYS	QUALIFIER
B0F335	BNA	9/07/93	09/13/93	09/27/93	6	14	None
B0F336	"	9/07/93	09/13/93	09/27/93	6	14	"
B0F337	"	9/08/93	09/13/93	09/27/93	5	14	"
B0F338	"	9/08/93	09/13/93	09/27/93	5	14	"
B0F339	"	9/08/93	09/13/93	09/27/93	5	14	"
B0F330	"	9/08/93	09/13/93	09/27/93	5	14	"

1C

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

~~000459~~ SBLK0913S3

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 09021 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A309021-BLK

Sample wt/vol: 30.4 (g/mL) G Lab File ID: ~~3~~0927S06

Level: (low/med) LOW Date Received: _____

% Moisture: _____ decanted: (Y/N) N Date Extracted: 09/13/93

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 09/27/93

Injection Volume: 2.0(uL) Dilution Factor: 1.0

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

PM3225.0229

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	290	J
206-44-0	Fluoranthene	330	U
129-00-0	Pyrene	IS ~~330~~	~~U~~ J
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	360	
218-01-9	Chrysene	330	U
117-84-0	Di-n-Octyl Phthalate	330	U
205-99-2	Benzo(b)Fluoranthene	330	U
207-08-9	Benzo(k)Fluoranthene	330	U
50-32-8	Benzo(a)Pyrene	330	U
193-39-5	Indeno(1,2,3-cd)Pyrene	330	U
53-70-3	Dibenz(a,h)Anthracene	330	U
191-24-2	Benzo(g,h,i)Perylene	330	U

(1) - Cannot be separated from Diphenylamine

2/22/94

1F

EPA SAMPLE NO.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

~~000460~~ SBLK0913S3

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 09021 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A309021-BLK

Sample wt/vol: 30.4 (g/mL) G Lab File ID: 30927S06

Level: (low/med) LOW Date Received: _____

% Moisture: _____ decanted: (Y/N) N Date Extracted: 09/13/93

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 09/27/93

Injection Volume: 2.0(uL) Dilution Factor: 1.0

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

Number TICs found: 3

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 123-42-2	4-HYDROXY-4-METHYL-2-PENTANO	6.33	61000	AJN
2.	UNKNOWN HYDROCARBON	6.43	66	J
3.	UNKNOWN HYDROCARBON	7.50	820	J

FORM I SV-TIC 3/90

4/28/94

CALCULATION SUMMARY

B09325-TMA-620

SDG:	REVIEWER:	DATE: 2/15/94	PAGE 1 OF 1

COMMENTS: Sample B09327 Calculations

$$\frac{ug}{kg} = \frac{(A_x)(I_s)(V_t)}{(A_i)(RRF)(V_i)(w_s)(D)} \times 2 \text{ for C-PC} \times 2 \text{ for Internal Standard Dilution}$$

ug/kg 2-Chlorophenol (B09327)

$$= \frac{(1338)(20)(500)(2)(2)}{(25202)(1.173)(2)(30.5)(0.94)} \quad 31.4 = 31 \text{ ug/kg}$$

~~62.9 = 63 ug/kg~~

ug/kg 1,4-Dichlorobenzene (B09327)

$$= \frac{(948)(20)(500)(2)(2)}{(25202)(1.307)(2)(30.5)(0.94)} = 20 \text{ ug/kg}$$

ug/kg 4-Chloro-3-Methylphenol (B09327)

$$= \frac{(1098)(20)(500)(2)(1)}{(97462)(0.298)(2)(30.5)(0.94)} = 27 \text{ ug/kg}$$

ug/kg Acenaphthene (B09327)

$$= \frac{(1628)(20)(500)(2)(2)}{(51718)(0.963)(2)(30.5)(0.94)} = 23 \text{ ug/kg}$$

9413225.0231

044

Quantitation Report File: 30927S11

B09327

~~000329~~

Data: 30927S11.TI
09/27/93 19:54:00
Sample: CLP,09021,,B09327,L,S,A309021-03B,BNA,EPA
Conds.: CAP/.25,30927S01,3DFT0927S01,30927S06
Formula: 30920SAVG90 Instrument: SHERMA Weight: 0.000
Submitted by: 30G:0.5M Analyst: FH#33S Acct. No.: CALTAB

AMOUNT=AREA * REF AMNT/(REF AREA * RESP FACT)
Resp. fac. from Library Entry

No	Name	
1	CI30	*IS1* 1,4-DICHLOROBENZENE-D4
2	CI40	*IS2* NAPHTHALENE-D8
3	CI50	*IS3* ACENAPHTHENE-D10
4	CI60	*IS4* PHENANTHRENE-D10
5	CI70	*IS5* CHRYSENE-D12
6	CI75	*IS6* PERYLENE-D12
7	CS50	*SU1* 2-FLUOROPHENOL
8	CS45	*SU2* PHENOL-D5
9	CS55	*SU3* 2,4,6,-TRIBROMOPHENOL
10	CS20	*SU4* NITROBENZENE-D5
11	CS25	*SU5* 2-FLUOROBIPHENYL
12	CS30	*SU6* TERPHENYL-D14
13	CS70	2-CHLOROPHENOL-D4
14	CS75	1,2-DICHLOROBENZENE-D4
15	C315	PHENOL
16	C325	BIS(2-CHLOROETHYL)ETHER
17	C330	2-CHLOROPHENOL
18	C335	1,3-DICHLOROBENZENE
19	C340	1,4-DICHLOROBENZENE
20	C345	BENZYL ALCOHOL
21	C350	1,2-DICHLOROBENZENE
22	C355	2-METHYLPHENOL
23	C360	BIS(2-CHLOROISOPROPYL)ETHER
24	C365	4-METHYLPHENOL
25	C370	N-NITROSO-DI-N-PROPYLAMINE
26	C375	HEXACHLOROETHANE
27	C410	NITROBENZENE
28	C415	ISOPHORONE
29	C420	2-NITROPHENOL
30	C425	2,4-DIMETHYLPHENOL
31	C435	BIS(2-CHLOROETHOXY)METHANE
32	C430	BENZOIC ACID
33	C440	2,4-DICHLOROPHENOL
34	C445	1,2,4-TRICHLOROBENZENE
35	C450	NAPHTHALENE
36	C455	4-CHLOROANILINE
37	C460	HEXACHLOROBUTADIENE
38	C465	4-CHLORO-3-METHYLPHENOL
39	C470	2-METHYLNAPHTHALENE
40	C510	HEXACHLOROCYCLOPENTADIENE
41	C515	2,4,6-TRICHLOROPHENOL
42	C520	2,4,5-TRICHLOROPHENOL
43	C525	2-CHLORONAPHTHALENE
44	C530	2-NITROANILINE
45	C535	DIMETHYL PHTHALATE
46	C540	ACENAPHTHYLENE
47	C545	3-NITROANILINE

9W43225.0232

9/27/93

BC9327

~~000330~~

No	Name	
48	C550	ACENAPHTHENE
49	C555	2,4-DINITROPHENOL
50	C560	4-NITROPHENOL

No	m/z	Scan	Time	Ref	RRT	Meth	Area(Hght)	Amount	%Tot
1	152	747	9:26	1	1.000	A BB	25202.	20.000 NG/UL	2.93
2	136	991	12:31	2	1.000	A BB	97462.	20.000 NG/UL	2.93
3	164	1351	17:03	3	1.000	A BB	51718.	20.000 NG/UL	2.93
4	188	1656	20:54	4	1.000	A BV	74700.	20.000 NG/UL	2.93
5	240	2186	27:36	5	1.000	A BB	42964.	20.000 NG/UL	2.93
6	264	2609	32:56	6	1.000	A BB	35967.	20.000 NG/UL	2.93
7	112	530	6:41	1	0.710	A BB	119170.	84.722 NG/UL	12.43
8	99	681	8:36	1	0.912	A BV	151866.	80.751 NG/UL	11.85
9	330	1514	19:07	3	1.121	A BB	27052.	70.143 NG/UL	10.29
10	82	851	10:45	2	0.859	A BB	100218.	49.881 NG/UL	7.32
11	172	1212	15:18	3	0.897	A BB	139252.	51.967 NG/UL	7.62
12	244	1974	24:55	5	0.903	A BB	136408.	72.173 NG/UL	10.59 *
13	132	707	8:56	1	0.946	A BB	115378.	79.382 NG/UL	11.65
14	152	775	9:47	1	1.037	A BB	52336.	52.682 NG/UL	7.73
15	NOT FOUND								
16	NOT FOUND								
~~17~~	~~128~~	~~709~~	~~8:57~~	~~1~~	~~0.949~~	~~A BB~~	~~1338.~~	~~0.701 NG/UL~~	~~0.13~~
18	NOT FOUND								
~~19~~	~~146~~	~~750~~	~~9:28~~	~~1~~	~~1.004~~	~~A BB~~	~~948.~~	~~0.576 NG/UL~~	~~0.08~~
20	NOT FOUND								
21	NOT FOUND								
22	NOT FOUND								
23	NOT FOUND								
24	NOT FOUND								
~~25~~	~~70~~	~~821~~	~~10:22~~	~~1~~	~~1.099~~	~~A BB~~	~~528.~~	~~0.394 NG/UL~~	~~0.06~~
26	NOT FOUND								
27	NOT FOUND								
28	NOT FOUND								
29	NOT FOUND								
30	NOT FOUND								
31	NOT FOUND								
32	NOT FOUND								
33	NOT FOUND								
~~34~~	~~180~~	~~979~~	~~12:22~~	~~2~~	~~0.788~~	~~A BB~~	~~556.~~	~~0.430 NG/UL~~	~~0.06~~
35	NOT FOUND								
36	NOT FOUND								
37	NOT FOUND								
~~38~~	~~107~~	~~1105~~	~~13:57~~	~~2~~	~~1.115~~	~~A BB~~	~~1090~~	~~0.774 NG/UL~~	~~0.11~~
39	NOT FOUND								
40	NOT FOUND								
41	NOT FOUND								
42	NOT FOUND								
43	NOT FOUND								
44	NOT FOUND								
45	NOT FOUND								
46	NOT FOUND								
47	NOT FOUND								
~~48~~	~~153~~	~~1357~~	~~17:08~~	~~3~~	~~1.064~~	~~A BB~~	~~1628.~~	~~0.554 NG/UL~~	~~0.10~~
49	NOT FOUND								
50	NOT FOUND								

FH 9/28/94

x2 = 1.802

x2 = 1.152

2.5 ppt

NG/L 0.778 < 1 Do not Report

2.5 ppt

x2 = NG/L 0.860 < 1 Do not Report

x2 = 1.552

x2 = 1.308

2/28/94

9/29/94

FH 3225.0233

B09327

Quantitation Report File: 30927S11

~~000332~~

Data: 30927S11.TI
09/27/93 19:54:00
Sample: CLP,09021,,B09327,L,S,A309021-03B,BNA,EPA
Conds.: CAP/.25,30927S01,3DFT0927S01,30927S06
Formula: 30920SAVG90 Instrument: SHERMA Weight: 0.000
Submitted by: 30G:0.5M Analyst: FH#33S Acct. No.: CALTAB

AMOUNT=AREA * REF AMNT/(REF AREA * RESP FACT)
Resp. fac. from Library Entry

No	Name	
51	C565	DIBENZOFURAN
52	C575	2,6-DINITROTOLUENE
53	C580	DIETHYLPHTHALATE
54	C570	2,4-DINITROTOLUENE
55	C590	FLUORENE
56	C585	4-CHLOROPHENYL-PHENYLETHER
57	C595	4-NITROANILINE
58	C610	4,6-DINITRO-2-METHYLPHENOL
59	C615	N-NITROSODIPHENYLAMINE
60	C625	4-BROMOPHENYL-PHENYLETHER
61	C630	HEXACHLOROBENZENE
62	C635	PENTACHLOROPHENOL
63	C640	PHENANTHRENE
64	C645	ANTHRACENE
65	C648	CARBAZOLE
66	C650	DI-N-BUTYLPHTHALATE
67	C655	FLUORANTHENE
68	C715	PYRENE
69	C720	BUTYLBENZYLPHTHALATE
70	C725	3,3'-DICHLOROBENZIDINE
71	C730	BENZO(A)ANTHRACENE
72	C740	CHRYSENE
73	C735	BIS(2-ETHYLHEXYL)PHTHALATE
74	C760	DI-N-OCTYLPHTHALATE
75	C765	BENZO(B)FLUROANTHENE
76	C770	BENZO(K)FLUORANTHENE
77	C775	BENZO(A)PYRENE
78	C780	INDENO(1,2,3-CD)PYRENE
79	C785	DIBENZO(A,H)ANTHRACENE
80	C790	BENZO(GHI)PERYLENE

No	m/z	Scan	Time	Ref	RRT	Meth	Area(Hght)	Amount	%Tot
51	NOT FOUND								
52	NOT FOUND								
53	~~149~~	~~1443~~	~~18:13~~	~~3~~	~~1.068~~	~~A BB~~	~~510.~~	~~0.162 NG/UL~~	~~0.02~~
54	NOT FOUND								
55	NOT FOUND								
56	NOT FOUND								
57	NOT FOUND								
58	NOT FOUND								
59	NOT FOUND								
60	NOT FOUND								
61	NOT FOUND								
62	NOT FOUND								
63	NOT FOUND								

9/28/93
FH

-047

B09327

~~000333~~

No	m/z	Scan	Time	Ref	RRT	Meth	Area(Hght)	Amount	%Tot
64	NOT FOUND								
65	NOT FOUND								
66	149	1774	22:24	4	1.071	A BB	61276.	11.613 NG/UL	1.70
67	NOT FOUND								
68	202	1943	24:32	5	0.889	A BB	3554.	1.205 NG/UL	0.18
~~69~~	~~149~~	~~2068~~	~~26:06~~	~~5~~	~~0.946~~	~~A BB~~	~~606.~~	~~0.372 NG/UL~~	~~0.05~~
70	NOT FOUND								
71	NOT FOUND								
72	NOT FOUND								
73	149	2185	27:35	5	1.000	A BB	2476.	1.160 NG/UL	0.17
74	NOT FOUND								
75	NOT FOUND								
76	NOT FOUND								
77	NOT FOUND								
78	NOT FOUND								
79	NOT FOUND								
80	NOT FOUND								

Found in Blank at
0.447 NG/UL x 5 = 2.235 NG/UL

No	Ret(L)	Ratio	RRT(L)	Ratio	Amnt	Amnt(L)	R. Fac	R. Fac(L)	Ratio
51	17:34		1.032						
52	16:31		0.970						
53	18:12	1.00	1.069	1.00	0.16	25.00	0.008	1.218	0.01
54	17:33		1.030						
55	18:29		1.085						
56	18:29		1.085						
57	18:32		1.088						
58	18:37		0.891						
59	18:48		0.900						
60	19:45		0.946						
61	19:53		0.952						
62	20:23		0.976						
63	20:57		1.004						
64	21:05		1.010						
65	21:29		1.029						
66	22:22	1.00	1.071	1.00	11.61	25.00	0.656	1.413	0.46
67	23:56		1.146						
68	24:30	1.00	0.889	1.00	1.21	25.00	0.066	1.373	0.05
69	26:05	1.00	0.946	1.00	0.37	25.00	0.011	0.759	0.01
70	27:27		0.995						
71	27:32		0.999						
72	27:38		1.002						
73	27:33	1.00	0.999	1.00	1.16	25.00	0.046	0.993	0.05
74	29:38		0.901						
75	31:11		0.948						
76	31:18		0.952						
77	32:37		0.992						
78	39:10		1.191						
79	39:23		1.198						
80	41:08		1.251						

Qualifier B09327 result for pygmy is rejected (J).

2/25/94

9/29/93

-048

CALCULATION SUMMARY

B-9325-TMA-620

SDG:	REVIEWER:	DATE: 2/28/94	PAGE 1 OF 1

COMMENTS: Pyrene Result in Laboratory Blank

$$ug/kg_i = \frac{(A_x)(I_s)(V_t)(2\ \text{for RPC})(2\ \text{for sediment sh. d. factor})}{(A_is)(RRF)(V_i)(W_s)(D)}$$

$$ug/kg\ Pyrene = \frac{(1810)(20)(500)(2)(2)}{(59170)(1.373)(2)(30.4)(1)}$$

$$= 15\ ug/kg\ Pyrene$$

9413225.0236

-049

Laboratory Blank

~~000466~~

No	Name	
48	C550	ACENAPHTHENE
49	C555	2,4-DINITROPHENOL
50	C560	4-NITROPHENOL

No	m/z	Scan	Time	Ref	RRT	Meth	Area(Hgh't)	Amount	%Tot
1	152	747	9:26	1	1.000	A BB	32318.	20.000 NG/UL	3.63
2	136	991	12:31	2	1.000	A BB	121920.	20.000 NG/UL	3.63
3	164	1352	17:04	3	1.000	A BB	66648.	20.000 NG/UL	3.63
4	188	1657	20:55	4	1.000	A BV	92540.	20.000 NG/UL	3.63
5	240	2184	27:34	5	1.000	A BB	59170.	20.000 NG/UL	3.63
6	264	2607	32:55	6	1.000	A BB	49861.	20.000 NG/UL	3.63
7	112	530	6:41	1	0.710	A BB	111994.	62.089 NG/UL	11.26
8	99	681	8:36	1	0.912	A BB	146503.	60.747 NG/UL	11.02
9	330	1515	19:08	3	1.121	A BB	25928.	52.169 NG/UL	9.46
10	82	851	10:45	2	0.859	A BB	99392.	39.546 NG/UL	7.17
11	172	1213	15:19	3	0.897	A BB	140392.	40.656 NG/UL	7.37
12	244	1973	24:54	5	0.903	A BB	135670.	52.122 NG/UL	9.45
13	132	707	8:56	1	0.946	A BB	111768.	59.966 NG/UL	10.87
14	152	775	9:47	1	1.037	A BB	52956.	41.569 NG/UL	7.54
15	~~94~~	~~682~~	~~8:37~~	~~1~~	~~0.913~~	~~A BB~~	~~1378~~	~~0.565 NG/UL~~	~~0.10~~
16	NOT FOUND								
17	NOT FOUND								
18	NOT FOUND								
19	NOT FOUND								
20	NOT FOUND								
21	NOT FOUND								
22	NOT FOUND								
23	NOT FOUND								
24	NOT FOUND								
25	NOT FOUND								
26	NOT FOUND								
27	NOT FOUND								
28	NOT FOUND								
29	NOT FOUND								
30	NOT FOUND								
31	NOT FOUND								
32	NOT FOUND								
33	NOT FOUND								
34	NOT FOUND								
35	NOT FOUND								
36	NOT FOUND								
37	NOT FOUND								
38	NOT FOUND								
39	NOT FOUND								
40	NOT FOUND								
41	NOT FOUND								
42	NOT FOUND								
43	NOT FOUND								
44	NOT FOUND								
45	NOT FOUND								
46	NOT FOUND								
47	NOT FOUND								
48	NOT FOUND								
49	NOT FOUND								
50	NOT FOUND								

F.H. 9/28/

Internal Standard area used to calculate the pyrene concentration.

3/3/94

09/29/93

2/28/94

94/3225.0237

050

Laboratory Blank
~~000469~~

No	m/z	Scan	Time	Ref	RRT	Meth	Area(Hght)	Amount	%Tot
64	NOT FOUND								
65	NOT FOUND								
66	149	1774	22:24	4	1.071	A BB	58078.	8.885 NG/UL	1.61
67	NOT FOUND								
~~68~~	~~202~~	~~1943~~	~~24:32~~	~~3~~	~~0.890~~	~~A BB~~	~~1813.~~	~~0.447 NG/UL~~	~~0.08~~
~~69~~	~~149~~	~~2067~~	~~26:06~~	~~5~~	~~0.946~~	~~A BB~~	~~562.~~	~~0.253 NG/UL~~	~~0.05~~
70	NOT FOUND								
71	NOT FOUND								
72	NOT FOUND								
73	149	2184	27:34	5	1.000	A BB	31754.	10.806 NG/UL	1.96
74	NOT FOUND								
75	NOT FOUND								
76	NOT FOUND								
77	NOT FOUND								
78	NOT FOUND								
79	NOT FOUND								
80	NOT FOUND								

F.H. 9/27/93

No	Ret(L)	Ratio	RRT(L)	Ratio	Amnt	Amnt(L)	R. Fac	R. Fac(L)	Ratio
51	17:34		1.032						
52	16:31		0.970						
53	18:12		1.069						
54	17:33		1.030						
55	18:29		1.085						
56	18:29		1.085						
57	18:32		1.088						
58	18:37		0.891						
59	18:48		0.900						
60	19:45		0.946						
61	19:53		0.952						
62	20:23		0.976						
63	20:57		1.004						
64	21:05		1.010						
65	21:29		1.029						
66	22:22	1.00	1.071	1.00	8.89	25.00	0.502	1.413	0.36
67	23:56		1.146						
68	24:30	1.00	0.889	1.00	0.45	25.00	0.025	1.373	0.02
69	26:05	1.00	0.946	1.00	0.25	25.00	0.008	0.759	0.01
70	27:27		0.995						
71	27:32		0.999						
72	27:38		1.002						
73	27:33	1.00	0.999	1.00	10.81	25.00	0.429	0.993	0.43
74	29:38		0.901						
75	31:11		0.948						
76	31:18		0.952						
77	32:37		0.992						
78	39:10		1.191						
79	39:23		1.198						
80	41:08		1.251						

09/29/93

SEMIVOLATILE ORGANIC DATA VALIDATION SUMMARY FOR DATA PACKAGE:
B09325-TMA-620 (923-E418, Filename B09325.BNA)

MEMORANDUM

TO: 200-UP-2 Project QA Record March 3, 1994

FR: Susan Winter, Golder Associates Inc.

RE: SEMIVOLATILE ORGANIC DATA VALIDATION SUMMARY FOR DATA PACKAGE: B09325-TMA-620 (923-E418, Filename B09325.BNA)

INTRODUCTION

This memo presents the results of data validation on data package B09325-TMA-620 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
B09325	09/07/93	SOIL	SEE NOTE 1
B09326	09/07/93	SOIL	
B09327	09/08/93	SOIL	
B09328	09/08/93	SOIL	
B09329	09/08/93	SOIL	
B09330	09/08/93	SOIL	

Note 1. All samples were analyzed for CLP TCL Semivolatile Organic Constituents.

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

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

DATA QUALITY OBJECTIVES

Precision. Goals for precision were met.

Accuracy. Goals for accuracy were met.

Sample Result Verification. All sample results were supported in the raw data and properly reported with the exception of the results for 2-chlorophenol, 1,4-dichlorobenzene, 4-chloro-3-methylphenol, and acenaphthene in sample B09327 which were reported as undetected. Attachments 3 and 5 provide a summary of the laboratory results, corrected laboratory report forms and supporting documentation.

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 six samples were validated in this data package with a total of 384 determinations reported, all of which were deemed valid. This results in a completeness of 100 percent, which meets normal work plan objectives of 90%.

MAJOR DEFICIENCIES

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

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

MINOR DEFICIENCIES

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

Laboratory Blanks

- Di-n-butylphthalate, bis(2-ethylhexyl)phthalate, pyrene, and three TICs, as listed in Attachment 2, were detected in the associated laboratory blanks. Attachments 2 and 5 provide a summary of the samples affected, data qualifications applied and supporting documentation.

REFERENCES

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

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

ATTACHMENT 1

GLOSSARY OF DATA REPORTING QUALIFIERS

GLOSSARY OF ORGANIC DATA REPORTING QUALIFIERS

B - Indicates the constituent was analyzed for and detected in the associated laboratory blank. This qualifier is applied by the laboratory. During the process of data validation this qualifier may be replaced by other appropriate qualifiers as defined by the validation procedures. The associated data should be considered usable for decision making purposes.

U - Indicates the constituent was analyzed for and not detected. The concentration reported is the sample quantitation limit corrected for aliquot size, dilution and percent solids (in the case of solid matrices) by the laboratory. The associated data should be considered usable for decision making purposes.

UJ - Indicates the constituent was analyzed for and not detected. Due to a minor quality control deficiency identified during data validation the concentration reported may not accurately reflect the sample quantitation limit. The associated data should be considered usable for decision making purposes.

J - Indicates the constituent was analyzed for and detected. This qualifier may be applied by the laboratory to indicate a concentration which is less than the contract required quantitation limit (CRQL) but greater than the instrument detection limit (IDL). During data validation this qualifier may be applied to indicate a minor quality control deficiency. However in either case, the associated data should be considered usable for decision making purposes.

NJ - Indicates presumptive evidence of a constituent at an estimated value. This qualifier is normally applied to GC analysis data (such as organochlorine pesticide and PCB data). The associated data should be considered usable for decision making purposes.

N - Indicates presumptive evidence of a constituent. This qualifier is normally applied to GC analysis data (such as organochlorine pesticide and PCB data). The associated data should be considered usable for decision making purposes.

JN - Indicates a tentatively identified compound (TIC, whose concentration and identification have been determined to be valid as a result of data validation. The associated data should be considered usable for decision making purposes.

UR - Indicates the constituent was analyzed for and not detected. The concentration reported has been qualified as unusable due to a major quality control deficiency identified during data validation. The associated data should be considered unusable for decision making purposes.

R - Indicates the constituent was analyzed for and detected. The concentration reported has been qualified as unusable due to a major quality control deficiency identified during data validation. The associated data should be considered unusable for decision making purposes.

ATTACHMENT 2

SUMMARY OF DATA QUALIFICATIONS

DATA QUALIFICATION SUMMARY

SDG: B09325-TMA-620	VALIDATOR: [illegible] DATE: March 3, 1994	PAGE 1 OF 2
COMMENTS: SEMIVOLATILE ORGANICS		

COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
DI-N-BUTYLPHTHALATE	U	B09325 B09326 B09327 B09328 B09329 B09330	PRESENT IN LABORATORY BLANK
BIS(2-ETHYLHEXYL)PHTHALATE	U	B09325 B09326 B09327 B09328 B09329 B09330	PRESENT IN LABORATORY BLANK
PYRENE	U	B09327	PRESENT IN LABORATORY BLANK
4-HYDROXY-4-METHYL-2-PENTANONE	U	B09325 B09326 B09327 B09328 B09329 B09330	PRESENT IN LABORATORY BLANK
4-HYDROXY-4-METHYL-2-PENTANONE	UR	B09325 B09326 B09327 B09328 B09329 309330	SUSPECTED LABORATORY CONTAMINANT (ALDOL CONDENSATE)
UNKNOWN HYDROCARBON @ RT 6.43 AND 7.47 MINUTES	U	309325	PRESENT IN BLANK
UNKNOWN HYDROCARBON @ RT 7.48 MINUTES	U	309326	PRESENT IN BLANK
UNKNOWN HYDROCARBON @ RT 7.50 MINUTES	U	309327	PRESENT IN BLANK
UNKNOWN HYDROCARBON @ 6.43 AND 7.48 MINUTES	U	309328	PRESENT IN BLANK
2-CHLOROPHENOL	J	309327	DETECTED IN SAMPLE BELOW THE CRQL
1,4-DICHLOROBENZENE	J	309327	DETECTED IN SAMPLE BELOW THE CRQL
4-CHLORO-3-METHYLPHENOL	J	B09327	DETECTED IN SAMPLE BELOW THE CRQL
ACENAPHTHENE	J	309327	DETECTED IN SAMPLE BELOW THE CRQL
UNKNOWN HYDROCARBON @ RT 8.78 MINUTES	N	B09325	IDENTIFIED AS A VALID RESULT USING DATA VALIDATION PROCEDURES

DATA QUALIFICATION SUMMARY

SDG: B09325-TMA-620	VALIDATOR: [illegible] DATE: March 3, 1994		PAGE 2 OF 2
COMMENTS: SEMIVOLATILE ORGANICS			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
HEXANEDIOIC ACID ESTER ISOMER @ RT 26.25 MINUTES	JN	B09325	IDENTIFIED AS A VALID RESULT USING DATA VALIDATION PROCEDURES
TOTAL UNKNOWN ALKANES AT RT 27.2 - 31.9 MINUTES	JN	B09325	IDENTIFEID AS VALID RESULTS USING DATA VALIDATION PROCEDURES
UNKNOWN HYDROCARBON @ RT 8.82 MINUTES	JN	B09326	IDENTIFIED AS A VALID RESULT USING DATA VALIDATION PROCEDURES
PROPANOIC ACID ESTER @ RT 18.18 MINUTES	JN	B09326	IDENTIFIED AS A VALID RESULT USING DATA VALIDATION PROCEDURES
UNKNOWN HYDROCARBON @ RT 8.82 MINUTES	JN	B09328	IDENTIFIED AS A VALID RESULT USING DATA VALIDATION PROCEDURES

ATTACHMENT 3

QUALIFIED DATA SUMMARY AND ANNOTATED LABORATORY REPORTS

Validated Data Summary, Data Package: B09325-IMA-620

Parameter	Units	Samp# / Date / Location / Depth / Type / Comments	B09325 9-7-93 299-W19-97 4.00 - 6.00 --- ---		B09326 9-7-93 299-W19-95 30.00 - 32.50 --- ---		B09327 9-8-93 299-W19-97 10.00 - 12.50 --- ---		B09328 9-8-93 299-W19-97 20.00 - 22.50 --- ---		B09329 9-8-93 299-W19-95 45.00 - 47.50 --- ---		B09330 9-8-93 299-W19-97 30.00 - 32.00 --- ---	
			Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
PHENOL	UG/KG		350.000	U	350.000	U	350.000	U	340.000	U	360.000	U	340.000	U
BIS(2-CHLOROETHYL)ETHER	UG/KG		350.000	U	350.000	U	350.000	U	340.000	U	360.000	U	340.000	U
2-CHLOROPHENOL	UG/KG		350.000	U	350.000	U	31.000	J	340.000	U	360.000	U	340.000	U
1,3-DICHLOROBENZENE	UG/KG		350.000	U	350.000	U	350.000	U	340.000	U	360.000	U	340.000	U
1,4-DICHLOROBENZENE	UG/KG		350.000	U	350.000	U	20.000	J	340.000	U	360.000	U	340.000	U
1,2-DICHLOROBENZENE	UG/KG		350.000	U	350.000	U	350.000	U	340.000	U	360.000	U	340.000	U
2-METHYLPHENOL	UG/KG		350.000	U	350.000	U	350.000	U	340.000	U	360.000	U	340.000	U
2,2'-OXYBIS(1-CHLOROPROPANE)	UG/KG		350.000	U	350.000	U	350.000	U	340.000	U	360.000	U	340.000	U
4-METHYLPHENOL	UG/KG		350.000	U	350.000	U	350.000	U	340.000	U	360.000	U	340.000	U
N-NITROSO-DI-N-PROPYLAMINE	UG/KG		350.000	U	350.000	U	350.000	U	340.000	U	360.000	U	340.000	U
HEXACHLOROETHANE	UG/KG		350.000	U	350.000	U	350.000	U	340.000	U	360.000	U	340.000	U
NITROBENZENE	UG/KG		350.000	U	350.000	U	350.000	U	340.000	U	360.000	U	340.000	U
ISOPHORONE	UG/KG		350.000	U	350.000	U	350.000	U	340.000	U	360.000	U	340.000	U
2-NITROPHENOL	UG/KG		350.000	U	350.000	U	350.000	U	340.000	U	360.000	U	340.000	U
2,4-DIMETHYLPHENOL	UG/KG		350.000	U	350.000	U	350.000	U	340.000	U	360.000	U	340.000	U
BIS(2-CHLOROETHOXY)METHANE	UG/KG		350.000	U	350.000	U	350.000	U	340.000	U	360.000	U	340.000	U
2,4-DICHLOROPHENOL	UG/KG		350.000	U	350.000	U	350.000	U	340.000	U	360.000	U	340.000	U
1,2,4-TRICHLOROBENZENE	UG/KG		350.000	U	350.000	U	350.000	U	340.000	U	360.000	U	340.000	U
NAPHTHALENE	UG/KG		350.000	U	350.000	U	350.000	U	340.000	U	360.000	U	340.000	U
4-CHLOROANILINE	UG/KG		350.000	U	350.000	U	350.000	U	340.000	U	360.000	U	340.000	U
HEXACHLOROBUTADIENE	UG/KG		350.000	U	350.000	U	350.000	U	340.000	U	360.000	U	340.000	U
4-CHLORO-3-METHYLPHENOL	UG/KG		350.000	U	350.000	U	27.000	J	340.000	U	360.000	U	340.000	U
2-METHYLNAPHTHALENE	UG/KG		350.000	U	350.000	U	350.000	U	340.000	U	360.000	U	340.000	U
HEXACHLOROCYCLOPENTADIENE	UG/KG		350.000	U	350.000	U	350.000	U	340.000	U	360.000	U	340.000	U
2,4,6-TRICHLOROPHENOL	UG/KG		350.000	U	350.000	U	350.000	U	340.000	U	360.000	U	340.000	U
2,4,5-TRICHLOROPHENOL	UG/KG		850.000	U	840.000	U	840.000	U	830.000	U	880.000	U	820.000	U
2-CHLORONAPHTHALENE	UG/KG		350.000	U	350.000	U	350.000	U	340.000	U	360.000	U	340.000	U
2-NITROANILINE	UG/KG		850.000	U	840.000	U	840.000	U	830.000	U	880.000	U	820.000	U
DIMETHYLPHTHALATE	UG/KG		350.000	U	350.000	U	350.000	U	340.000	U	360.000	U	340.000	U
ACENAPHTHYLENE	UG/KG		350.000	U	350.000	U	350.000	U	340.000	U	360.000	U	340.000	U
3-NITROANILINE	UG/KG		850.000	U	840.000	U	840.000	U	830.000	U	880.000	U	820.000	U
ACENAPHTHENE	UG/KG		350.000	U	350.000	U	23.000	J	340.000	U	360.000	U	340.000	U

Verified

3/01/94

600

Validated Data Summary, Data Package: B09325-TMA-620

	Samp#	B09325		B09326		B09327		B09328		B09329		B09330	
	Date	9-7-93		9-7-93		9-8-93		9-8-93		9-8-93		9-8-93	
	location	299-W19-97		299-W19-95		299-W19-97		299-W19-97		299-W19-95		299-W19-97	
	Depth	4.00 - 6.00		30.00 - 32.50		10.00 - 12.50		20.00 - 22.50		45.00 - 47.50		30.00 - 32.00	
	Type	---		---		---		---		---		---	
	Comments	---		---		---		---		---		---	
Parameter	Units	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
2,4-DINITROPHENOL	UG/KG	850.000	U	840.000	U	840.000	U	830.000	U	880.000	U	820.000	U
4-NITROPHENOL	UG/KG	850.000	U	840.000	U	840.000	U	830.000	U	880.000	U	820.000	U
DIBENZOFURAN	UG/KG	350.000	U	350.000	U	350.000	U	340.000	U	360.000	U	340.000	U
2,4-DINITROTOLUENE	UG/KG	350.000	U	350.000	U	350.000	U	340.000	U	360.000	U	340.000	U
2,6-DINITROTOLUENE	UG/KG	350.000	U	350.000	U	350.000	U	340.000	U	360.000	U	340.000	U
DIETHYLPHTHALATE	UG/KG	350.000	U	350.000	U	350.000	U	340.000	U	360.000	U	340.000	U
4-CHLOROPHENYL-PHENYLETHER	UG/KG	350.000	U	350.000	U	350.000	U	340.000	U	360.000	U	340.000	U
FLUORENE	UG/KG	350.000	U	350.000	U	350.000	U	340.000	U	360.000	U	340.000	U
4-NITROANILINE	UG/KG	850.000	U	840.000	U	840.000	U	830.000	U	880.000	U	820.000	U
4,6-DINITRO-2-METHYLPHENOL	UG/KG	850.000	U	840.000	U	840.000	U	830.000	U	880.000	U	820.000	U
N-NITROSODIPHENYLAMINE	UG/KG	350.000	U	350.000	U	350.000	U	340.000	U	360.000	U	340.000	U
4-BROMOPHENYL-PHENYLETHER	UG/KG	350.000	U	350.000	U	350.000	U	340.000	U	360.000	U	340.000	U
HEXACHLOROBENZENE	UG/KG	350.000	U	350.000	U	350.000	U	340.000	U	360.000	U	340.000	U
PENTACHLOROPHENOL	UG/KG	850.000	U	840.000	U	840.000	U	830.000	U	880.000	U	820.000	U
PHENANTHRENE	UG/KG	350.000	U	350.000	U	350.000	U	340.000	U	360.000	U	340.000	U
ANTHRACENE	UG/KG	350.000	U	350.000	U	350.000	U	340.000	U	360.000	U	340.000	U
CARBAZOLE	UG/KG	350.000	U	350.000	U	350.000	U	340.000	U	360.000	U	340.000	U
DI-N-BUTYLPHTHALATE	UG/KG	400.000	U	350.000	U	400.000	U	350.000	U	370.000	U	340.000	U
FLUORANTHENE	UG/KG	350.000	U	350.000	U	350.000	U	340.000	U	360.000	U	340.000	U
PYRENE	UG/KG	350.000	U	350.000	U	350.000	U	340.000	U	360.000	U	340.000	U
BUTYLBENZYLPHTHALATE	UG/KG	350.000	U	350.000	U	350.000	U	340.000	U	360.000	U	340.000	U
3,3'-DICHLOROBENZIDINE	UG/KG	350.000	U	350.000	U	350.000	U	340.000	U	360.000	U	340.000	U
BENZO(A)ANTHRACENE	UG/KG	350.000	U	350.000	U	350.000	U	340.000	U	360.000	U	340.000	U
BIS(2-ETHYLHEXYL)PHTHALATE	UG/KG	350.000	U	350.000	U	350.000	U	340.000	U	360.000	U	340.000	U
CHRYSENE	UG/KG	350.000	U	350.000	U	350.000	U	340.000	U	360.000	U	340.000	U
DI-N-OCTYLPHTHALATE	UG/KG	350.000	U	350.000	U	350.000	U	340.000	U	360.000	U	340.000	U
BENZO(B)FLUORANTHENE	UG/KG	350.000	U	350.000	U	350.000	U	340.000	U	360.000	U	340.000	U
BENZO(K)FLUORANTHENE	UG/KG	350.000	U	350.000	U	350.000	U	340.000	U	360.000	U	340.000	U
BENZO(A)PYRENE	UG/KG	350.000	U	350.000	U	350.000	U	340.000	U	360.000	U	340.000	U
INDENO(1,2,3-CD)PYRENE	UG/KG	350.000	U	350.000	U	350.000	U	340.000	U	360.000	U	340.000	U
DIBENZ(A,H)ANTHRACENE	UG/KG	350.000	U	350.000	U	350.000	U	340.000	U	360.000	U	340.000	U
BENZO(G,H,I)PERYLENE	UG/KG	350.000	U	350.000	U	350.000	U	340.000	U	360.000	U	340.000	U

Verified

3/24/94

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

~~000272~~

EPA SAMPLE NO.
299-W9-97
B09325
4-6'

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 09021 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A309021-01D

Sample wt/vol: 30.1 (g/mL) G Lab File ID: 30927S07

Level: (low/med) LOW Date Received: 09/10/93

% Moisture: 6 decanted: (Y/N) N Date Extracted: 09/13/93

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 09/27/93

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 9.2

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
38-75-5	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

2/22/94

011

1C

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO. 299-W19-97

~~000273~~ B09325 4-6'

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 09021 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A309021-01D

Sample wt/vol: 30.1 (g/mL) G Lab File ID: ~~3~~0927S07

Level: (low/med) LOW Date Received: 09/10/93

% Moisture: 6 decanted: (Y/N) N Date Extracted: 09/13/93

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 09/27/93

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 9.2

CAS NO.	COMPOUND	CONCENTRATION UNITS:; (ug/L or ug/Kg) UG/KG	Q	Q
100-02-7	4-Nitrophenol	850	U	
132-64-9	Dibenzofuran	350	U	
121-14-2	2,4-Dinitrotoluene	350	U	
606-20-2	2,6-Dinitrotoluene	350	U	
84-66-2	Diethylphthalate	350	U	
7005-72-3	4-Chlorophenyl-phenylether	350	U	
86-73-7	Fluorene	350	U	
100-01-6	4-Nitroaniline	850	U	
534-52-1	4,6-Dinitro-2-methylphenol	850	U	
86-30-6	N-Nitrosodiphenylamine (1)	350	U	
101-55-3	4-Bromophenyl-phenylether	350	U	
118-74-1	Hexachlorobenzene	350	U	
87-86-5	Pentachlorophenol	850	U	
85-01-8	Phenanthrene	350	U	
120-12-7	Anthracene	350	U	
86-74-8	Carbazole	350	U	
84-74-2	Di-n-Butylphthalate	400	~~B~~	L
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 ~~140~~	~~BJ~~	L
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

FORM I SV-2 3/90

9413225.0251

·012

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS ~~000274~~

EPA SAMPLE NO.
299-W9-97
B09325
4-6'

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 09021 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A309021-01D

Sample wt/vol: 30.1 (g/mL) G Lab File ID: 30927S07

Level: (low/med) LOW Date Received: 09/10/93

% Moisture: 6 decanted: (Y/N) N Date Extracted: 09/13/93

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 09/27/93

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 9.2

Number TICs found: 10 CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

Q

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
~~1. 123-42-2~~	~~4-HYDROXY-4-METHYL-2-PENTANO~~	~~6.30~~	~~65000~~	~~BAJN~~
2.	UNKNOWN HYDROCARBON	6.43	110	~~BJ~~
3.	UNKNOWN HYDROCARBON	7.47	810	~~BJ~~
4.	UNKNOWN HYDROCARBON	8.78	71	~~J~~
5.	HEXANEDIOIC ACID ESTER ISOME	26.25	110	~~J~~
6.	UNKNOWN ALKANE (Total Unknown Alkanes)	27.20	110	~~J~~
7.	UNKNOWN ALKANE	28.13	71	~~J~~
8.	UNKNOWN ALKANE	29.18	140	~~J~~
9.	UNKNOWN ALKANE	30.43	110	~~J~~
10.	UNKNOWN ALKANE	31.90	250	~~J~~

Summation of Unknown Alkane concentration = 581 SN

3/3/94

94A3225.0252

FORM I SV-TIC 3/90

Verified 2/22/94

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
299-W19-95
~~000300~~
B09326
30-32.5'

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 09021 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A309021-02B

Sample wt/vol: 30.3 (g/mL) G Lab File ID: 30927S08

Level: (low/med) LOW Date Received: 09/10/93

% Moisture: 6 decanted: (Y/N) N Date Extracted: 09/13/93

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 09/27/93

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 9.3

9413225.0253

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	840	U
91-58-7	2-Chloronaphthalene	350	U
88-74-4	2-Nitroaniline	840	U
131-11-3	Dimethylphthalate	350	U
208-96-8	Acenaphthylene	350	U
99-09-2	3-Nitroaniline	840	U
83-32-9	Acenaphthene	350	U
51-28-5	2,4-Dinitrophenol	840	U

Verified 9/28/94

1C

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
299-W19-95

~~000301~~

B09326
3 - 32.5'

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 09021 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A309021-02B

Sample wt/vol: 30.3 (g/mL) G Lab File ID: ~~3~~0927S08

Level: (low/med) LOW Date Received: 09/10/93

% Moisture: 6 decanted: (Y/N) N Date Extracted: 09/13/93

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 09/27/93

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 9.3

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

CAS NO.	COMPOUND		Q	
100-02-7	4-Nitrophenol	840	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	840	U	
534-52-1	4,6-Dinitro-2-methylphenol	840	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	840	U	
85-01-8	Phenanthrene	350	U	
120-12-7	Anthracene	350	U	
86-74-8	Carbazole	350	U	
84-74-2	Di-n-Butylphthalate	350 ~~280~~	~~BJ~~	C
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 ~~93~~	~~BJ~~	C
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

FORM I SV-2 3/90

Verified 2/23/94

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

~~000302~~

EPA SAMPLE NO.
299-W19-95
B09326
30-32.5'

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 09021 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A309021-02B

Sample wt/vol: 30.3 (g/mL) G Lab File ID: 30927S08

Level: (low/med) LOW Date Received: 09/10/93

% Moisture: 6 decanted: (Y/N) N Date Extracted: 09/13/93

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 09/27/93

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 9.3

Number TICs found: 4

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

Q

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
~~1. 123-42-2~~	~~4-HYDROXY-4-METHYL-2-PENTANO~~	~~6.33~~	~~68000~~	~~BAJN~~ JR
2.	UNKNOWN HYDROCARBON	7.48	950	~~BJ~~
3.	UNKNOWN HYDROCARBON	8.82	110	~~J~~
4.	PROPANOIC ACID ESTER	18.18	280	~~J~~

9W3225.0255

Verified 2/25/94

FORM I SV-TIC 3/90

016

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

~~000322~~

EPA SAMPLE NO.
299-W.9-97

B09327
10-12.5'

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 09021 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A309021-03B

Sample wt/vol: 30.5 (g/mL) G Lab File ID: 30927S11

Level: (low/med) LOW Date Received: 09/10/93

% Moisture: 6 decanted: (Y/N) N Date Extracted: 09/13/93

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 09/27/93

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 9.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q	Q
108-95-2	Phenol	350	U	
111-44-4	bis(2-Chloroethyl)Ether	350	U	
95-57-8	2-Chlorophenol	31 ~~350~~	~~U~~	J
541-73-1	1,3-Dichlorobenzene	350	U	
106-46-7	1,4-Dichlorobenzene	20 ~~350~~	~~U~~	J
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	27 ~~350~~	~~U~~	J
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	840	U	
91-58-7	2-Chloronaphthalene	350	U	
88-74-4	2-Nitroaniline	840	U	
131-11-3	Dimethylphthalate	350	U	
208-96-8	Acenaphthylene	350	U	
99-09-2	3-Nitroaniline	840	U	
83-32-9	Acenaphthene	23 ~~350~~	~~U~~	J
51-28-5	2,4-Dinitrophenol	840	U	

FORM I SV-1 3/90

Verified 10/21/94

-017

BW3225-0256

1C

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

~~000323~~

EPA SAMPLE NO.
299-W19-97

B09327
10-12.5'

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 09021 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A309021-03B

Sample wt/vol: 30.5 (g/mL) G Lab File ID: 30927S11

Level: (low/med) LOW Date Received: 09/10/93

% Moisture: 6 decanted: (Y/N) N Date Extracted: 09/13/93

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 09/27/93

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 9.0

9W3225.0257

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q	Q
100-02-7	4-Nitrophenol	840	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	840	U	
534-52-1	4,6-Dinitro-2-methylphenol	840	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	840	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	400	~~B~~	4
206-44-0	Fluoranthene	350	U	
129-00-0	Pyrene	350 ~~42~~	~~J~~	4
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 ~~40~~	~~B~~	4
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

FORM I SV-2

3/90

2/22/94

-013

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

~~000324~~

EPA SAMPLE NO.
299-W19-97
B09327
10-12.5'

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 09021 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A309021-03B

Sample wt/vol: 30.5 (g/mL) G Lab File ID: 30927S11

Level: (low/med) LOW Date Received: 09/10/93

% Moisture: 6 decanted: (Y/N) N Date Extracted: 09/13/93

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 09/27/93

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 9.0

Number TICs found: 2

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

Q

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
~~1. 123-42-2~~	~~4-HYDROXY-4-METHYL-2-PENTANO~~	~~6.32~~	~~76000~~	~~BAJN~~ UR
2.	UNKNOWN HYDROCARBON	7.50	940	~~BJ~~ J

FORM I SV-TIC Verified 2/23/94 3/90

019

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
299-W9-97
~~000344~~
B09328
20-22.5'

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 09021 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A309021-04B

Sample wt/vol: 30.4 (g/mL) G Lab File ID: 30927S12

Level: (low/med) LOW Date Received: 09/10/93

% Moisture: 5 decanted: (Y/N) N Date Extracted: 09/13/93

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 09/27/93

Injection Volume: 2.0(uL) Dilution Factor: 1.0

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

9443225.0259

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 2/22/94

020

1C

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
299-W19-97

~~000345~~

B09328
20-22.5'

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 09021 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A309021-04B

Sample wt/vol: 30.4 (g/mL) G Lab File ID: ~~3~~0927S12

Level: (low/med) LOW Date Received: 09/10/93

% Moisture: 5 decanted: (Y/N) N Date Extracted: 09/13/93

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 09/27/93

Injection Volume: 2.0(uL) Dilution Factor: 1.0

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

9413225.0260

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q	CR
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	350	~~B~~	3
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 ~~16~~	~~37~~	3
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

2/23/94

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.
299-W9-97
~~000346~~ B09328
20-22.5'

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 09021 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A309021-04B

Sample wt/vol: 30.4 (g/mL) G Lab File ID: 30927S12

Level: (low/med) LOW Date Received: 09/10/93

% Moisture: 5 decanted: (Y/N) N Date Extracted: 09/13/93

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 09/27/93

Injection Volume: 2.0(uL) Dilution Factor: 1.0

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

Number TICs found: 4

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

Q

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
~~1. 123-42-2~~	~~4-HYDROXY-4-METHYL-2-PENTANO~~	~~6.30~~	~~62000~~	~~BAJN~~ R
2.	UNKNOWN HYDROCARBON	6.43	100	~~BJ~~
3.	UNKNOWN HYDROCARBON	7.48	800	~~BJ~~
4.	UNKNOWN HYDROCARBON	8.82	69	~~J~~

9W3225.0261

FORM I SV-TIC

Verified 2/22/94

3/90

022

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET ~~000366~~

EPA SAMPLE NO.
299-W9-95
B09329
45-47.5'

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 09021 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A309021-06B

Sample wt/vol: 30.2 (g/mL) G Lab File ID: 30927S14

Level: (low/med) LOW Date Received: 09/10/93

% Moisture: 10 decanted: (Y/N) N Date Extracted: 09/13/93

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 09/27/93

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 9.5

914322S.0262

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

Verified 2/22/94

1C

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

~~000367~~

EPA SAMPLE NO.
299-W9-95
B09329
45-47.5'

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 09021 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A309021-06B

Sample wt/vol: 30.2 (g/mL) G Lab File ID: ~~3~~0927S14

Level: (low/med) LOW Date Received: 09/10/93

% Moisture: 10 decanted: (Y/N) N Date Extracted: 09/13/93

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 09/27/93

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 9.5

9W1325.0263

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q	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	880	U	
85-01-8	Phenanthrene	360	U	
120-12-7	Anthracene	360	U	
86-74-8	Carbazole	360	U	
84-74-2	Di-n-Butylphthalate	370	~~B~~	u
206-44-0	Fluoranthene	360	U	
129-00-0	Pyrene	360	U	
85-68-7	Butylbenzylphthalate	360	U	
91-94-1	3,3'-Dichlorobenzidine	360	U	
56-55-3	Benzo(a)Anthracene	360	U	
117-81-7	bis(2-Ethylhexyl) Phthalate	360 ~~140~~	~~B~~	u
218-01-9	Chrysene	360	U	
117-84-0	Di-n-Octyl Phthalate	360	U	
205-99-2	Benzo(b)Fluoranthene	360	U	
207-08-9	Benzo(k)Fluoranthene	360	U	
50-32-8	Benzo(a)Pyrene	360	U	
193-39-5	Indeno(1,2,3-cd)Pyrene	360	U	
53-70-3	Dibenz(a,h)Anthracene	360	U	
191-24-2	Benzo(g,h,i)Perylene	360	U	

(1) - Cannot be separated from Diphenylamine

Verified

FORM I SV-2 3/90

2/22/94

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS ~~000368~~

EPA SAMPLE NO.
299-W19-95
B09329
45-47.5'

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 09021 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A309021-06B

Sample wt/vol: 30.2 (g/mL) G Lab File ID: ~~3~~0927S14

Level: (low/med) LOW Date Received: 09/10/93

% Moisture: 10 decanted: (Y/N) N Date Extracted: 09/13/93

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 09/27/93

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 9.5

Number TICs found: 1 CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG Q

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
~~1. 123-42-2~~	~~4-HYDROXY-4-METHYL-2-PENTANO~~	~~6.33~~	~~77000~~	~~BAJN~~ JR

9413225.0264

FORM I SV-TIC 3/90

Ver'd 2/2/94

-025

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
299-W9-97
~~000385~~
B09330
30-32'

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 09021 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A309021-05B

Sample wt/vol: 30.6 (g/mL) G Lab File ID: ~~B0927S13~~

Level: (low/med) LOW Date Received: 09/10/93

% Moisture: 4 decanted: (Y/N) N Date Extracted: 09/13/93

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 09/27/93

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 9.5

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

CAS NO.	COMPOUND		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

PM 3225.0265

Verified 12/1/94

1C

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO. 299-W19-97

~~000386~~ B09330 30-32'

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 09021 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A309021-05B

Sample wt/vol: 30.6 (g/mL) G Lab File ID: 30927S13

Level: (low/med) LOW Date Received: 09/10/93

% Moisture: 4 decanted: (Y/N) N Date Extracted: 09/13/93

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 09/27/93

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 9.5

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	34.0 ~~310~~	~~BJ~~	4
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	34.0 ~~72~~	~~BJ~~	4
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 3/90

4/28/94

·027

9413275.0266

1F

EPA SAMPLE NO.
299-W19-97

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS ~~000387~~

B09330
30-32

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 09021 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A309021-05B

Sample wt/vol: 30.6 (g/mL) G Lab File ID: 30927S13

Level: (low/med) LOW Date Received: 09/10/93

% Moisture: 4 decanted: (Y/N) N Date Extracted: 09/13/93

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 09/27/93

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 9.5

Number TICs found: 1 CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

Q

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
~~1. 123-42-2~~	~~4-HYDROXY-4-METHYL-2-PENTANO~~	~~6.32~~	~~76000~~	~~BAJN~~ JR

FORM I SV-TIC Verified 2/22/94 3/90

028

ATTACHMENT 4

LABORATORY NARRATIVE AND CHAIN-OF-CUSTODY DOCUMENTATION

CASE NARRATIVE

LABORATORY : TMA/ARLI

CASE : 09-021

CONTRACT ID : WESTINGHOUSE HANFORD COMPANY

SDG RECEIPT DATE : September 10, 1993

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
B09325	A3-09-021-01A	V	SOIL
B09325 MS	A3-09-021-01B	V	SOIL
B09325 MSD	A3-09-021-01C	V	SOIL
B09325	A3-09-021-01D	SV	SOIL
B09325	A3-09-021-01F	K	SOIL
B09326	A3-09-021-02A	V	SOIL
B09326	A3-09-021-02B	SV	SOIL
B09326 MS	A3-09-021-02C	SV	SOIL
B09326 MSD	A3-09-021-02D	SV	SOIL
B09326	A3-09-021-02F	K	SOIL
B09327	A3-09-021-03A	V	SOIL
B09327	A3-09-021-03B	SV	SOIL
B09327	A3-09-021-03E	K	SOIL
B09328	A3-09-021-04A	V	SOIL
B09328	A3-09-021-04B	SV	SOIL
B09328	A3-09-021-04E	K	SOIL
B09330	A3-09-021-05A	V	SOIL
B09330	A3-09-021-05B	SV	SOIL
B09330	A3-09-021-05D	K	SOIL
B09330 MS	A3-09-021-05E	K	SOIL
B09330 MSD	A3-09-021-05F	K	SOIL
B09329	A3-09-021-06A	V	SOIL
B09329	A3-09-021-06B	SV	SOIL
B09329	A3-09-021-06D	K	SOIL
B09331	A3-09-021-07A	V	SOIL

3.0 COMMENTS :

3.1 SHIPPING AND DOCUMENTATION :

All of the samples were received intact and properly documented.

3.2 ANALYSIS

3.2.1 VOLATILE ANALYSIS COMMENTS :

LOW LEVEL SOIL :

The samples were analyzed by heated purge within the CLP SOW holding times.

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 CLP SOW holding times.

Sample B09327 had a Terphenyl-d14 surrogate recovery slightly above the QC limits. Sample B09326MSD had matrix spike recoveries for Phenol and 2,4-Dinitrotoluene that were slightly above the QC limits. In accordance with CLP protocol, no further action was required.

Pyrene was detected in sample B09327 at a concentration below the CRQL.

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 09/16/93 and was analyzed according to the SW-846 Method 8015M. The initial calibration consisted of 5 different levels of the Kerosene standard that ranged from 200ppm to 2000ppm. The continuing calibration at the 1000ppm level was injected amongst a series of samples, in order to verify the instrument stability. The %RSD in the initial calibration and the %D in the continuing calibration were below their 20% and 15% limits, respectively.

SAMPLE NOTES :

LOW LEVEL SOIL :

The samples were extracted and analyzed for extractable hydrocarbons in the Kerosene range within the required holding times. Approximately 20 g of each sample was extracted and concentrated to 5 mL.

There were no hydrocarbons in the Kerosene range detected in any of the samples. Sample B09330 was spiked with Kerosene and the matrix spike recoveries were between 81% and 84%. A blank spike was prepared at the same time, and had an 86% recovery.

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 designee, as verified by the following signatures.

Nicole Roth 12/10/93
Nicole Roth
CLP Program Manager

Maureen Parrish 12/10/93
Maureen Parrish
Project Manager

Westinghouse Hanford Company	CHAIN OF CUSTODY	~~DC00002A~~

Custody Form Initiator: L E ROGERS

Company Contact: L E ROGERS

Telephone: 376-7690

Project Designation/Sampling Locations: 200-UP-2

Collection Date: 9-7-93

Ice Chest No. ~~Rusty Dusty~~ Yellow (9/9/93 SML:27)

Field Logbook No.: EFL-1091

Bill of Lading/Airbill No.:

Offsite Property No.:

Method of Shipment: OVERNIGHT AIR SERVICE

Shipped to: TMA

Possible Sample Hazards/Remarks: Keep samples at 4C (SOIL) None noted

Sample Identification

1) B09325

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:Cynnide 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

9411325.0272

2) B09326

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:Cynnide 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) SER 9-7-93

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:Cynnide 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:
1510 Laura E. Rogers 9-7-93	JG Hogan JG Hogan	9-7-93 / 1510
JG Hogan	J.D. Fannin J.D. Fannin	9/9/93 1030
J.D. Fannin J.D. Fannin 9/9/93 1045	Toby M Yamamoto	9/10/93 11.15 AM

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

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

Westinghouse Hanford Company	CHAIN OF CUSTODY ~~0000026~~

Custody Form Initiator: L E ROGERS

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

Project Designation/Sampling Locations: 200-UP-2 — Collection Date: 9-8-93

Ice Chest No.: SML-352 — Field Logbook No.: EFL-1091

Bill of Lading/Airbill No.: — Offsite Property No.:

Method of Shipment: OVERNIGHT AIR SERVICE

Shipped to: TMA

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

Sample Identification

1) B09327

1,250ml	P:CLP;TAL Metals,Hg,Ti
~~1,250ml~~ 1250ml	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:Cynnide 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

9443225.0278

2) B09328

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:Cynnide 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) B09330

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:Cynnide 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:
Laurence E. Rogers 1400 9-9-93	[signature]	9-9-93 1400
[signature] 9.9.93 1030	J.D. Franklin	9/9/93 1030
J.D. Franklin 9/9/93 1056	Elisa L. Yamamoto	9/10/93 11:15 AM
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

A-6000-407 (12/90) (EF) WEI061
Chain of Custody

Westinghouse Hanford Company

CHAIN OF CUSTODY ~~000002E~~

Custody Form Initiator: L E ROGERS

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

Project Designation/Sampling Locations: 200-UP-2 — Collection Date: 9-8-93

Ice Chest No.: SML-352 — Field Logbook No.: EFL-1091

Bill of Lading/Airbill No.: _____ — Offsite Property No.: _____

Method of Shipment: OVERNIGHT AIR SERVICE

Shipped to: TMA

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

Sample Identification

1) B09329

1,250ml	P:CLP;TAL Metals,Hg,Ti
120ml ~~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

R 9-8-93

9413225.0274

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) SER 9-8-93

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:
1400 Leon E Rogers 9-8-93	R.J.T. Sickle	1400 9-9-93
R.J.T. Sickle 9-9-93 1030	J.D. Fowler	9/9/93 1130
J.D. Fowler 9/9/93 1050	Elly Y. Yamamoto	9/10/93 11:15 AM

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

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: B09325-TMA-620
VALIDATOR: [signature]	LAB: TMA	DATE: 02/28/94
CASE:		SDG: B09325-TMA-620

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

B09325 B09330

B09326

B09327

B09328

B09329

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: _____

037

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 amount of Internal Standard~~ Half of the amount of standard stated in the SOW was used for the ICV and CCV. The ratio of Internal std. to ICV and CCV standards are the same as required, therefore, no qualification was required. See comments on last page of checklist for further information.

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: Toluene was detected in SBLKC91353 at 15.5 ug/kg. Therefore, the sample result for B-9327 has been qualified as undetected (U). 03/3/94

5. ACCURACY

Were surrogates/System Monitoring Compounds analyzed? . . . . . (Yes) No N/A

Are surrogate/System Monitoring Compound recoveries acceptable? Yes (No) N/A See (1)

Were MS/MSD samples analyzed? . . . . . (Yes) No N/A

Are MS/MSD results acceptable? . . . . . Yes (No) N/A See (2)

Comments: (1) The Surrogate terphenyl-d14 had a high recovery of 144% (upper limit 137%) in sample B-9327. No qualification was required since 2 surrogates of the same group (base/neutrals) need to be out of control limits to justify data qualification.

(2) The MS/MSD %R for phenol and 2,4-dinitrotoluene were 94% and 98%, respectively, which are less than the upper control limits. Therefore, no qualification was applied since the surrogates for the spiked sample were in control limits and 94% and 95% are close to 100% recovery.

038

GC/MS ORGANIC DATA VALIDATION CHECKLIST

6. PRECISION

Are MS/MSD RPD values acceptable? . . . . . (Yes) No N/A
Are field duplicate RPD values acceptable? . . . . . Yes No (N/A)
Are field split RPD values acceptable? . . . . . Yes No (N/A)
Comments:_____

7. SYSTEM PERFORMANCE

Were internal standards analyzed? . . . . . (Yes) No N/A
Are internal standard areas acceptable? . . . . . (Yes) No N/A
Are internal standard retention times acceptable? . . . . . (Yes) No N/A
Comments:_____

8. COMPOUND IDENTIFICATION AND QUANTITATION

Is compound identification acceptable? . . . . . (Yes) No N/A
Is compound quantitation acceptable? . . . . . (Yes) No N/A
Comments:_____

9. REPORTED RESULTS AND QUANTITATION LIMITS

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

GC/MS ORGANIC DATA VALIDATION CHECKLIST

Comments (attach additional sheets as necessary):

the minimum RRF for surrogate 1,2-Dichlorobenzene-d4 was recorded by the laboratory as 0.800, however it is 0.400 according to the SOW. No qualification is required ~~Attached Information is provided, See Attachments~~ 3/3/94

2/25/94

9413225.0279

HOLDING TIME SUMMARY

B09325-TMA-620

SDG:	VALIDATOR:	DATE: 2/15/94	PAGE 1 OF 1
COMMENTS: Semi volatiles			

FIELD SAMPLE ID	ANALYSIS TYPE	DATE SAMPLED	DATE PREPARED	DATE ANALYZED	PREP. HOLDING TIME, DAYS	ANALYSIS HOLDING TIME, DAYS	QUALIFIER
B09325	BNA	9/07/93	09/13/93	09/27/93	6	14	None
B09326	↓	9/07/93	09/13/93	09/27/93	6	14	↓
B09327		9/08/93	09/13/93	09/27/93	5	14	
B09328		9/08/93	09/13/93	09/27/93	5	14	
B09329		9/08/93	09/13/93	09/27/93	5	14	
B09330	↓	9/08/93	09/13/93	09/27/93	5	14	↓

1C

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

~~000459~~ SBLK0913S3

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 09021 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A309021-BLK

Sample wt/vol: 30.4 (g/mL) G Lab File ID: ~~3~~0927S06

Level: (low/med) LOW Date Received: _____

% Moisture: _____ decanted: (Y/N) N Date Extracted: 09/13/93

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 09/27/93

Injection Volume: 2.0(uL) Dilution Factor: 1.0

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

9W3225.0281

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	290	J
206-44-0	Fluoranthene	330	U
129-00-0	Pyrene	IS ~~330~~	~~U~~ S
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	360	
218-01-9	Chrysene	330	U
117-84-0	Di-n-Octyl Phthalate	330	U
205-99-2	Benzo(b)Fluoranthene	330	U
207-08-9	Benzo(k)Fluoranthene	330	U
50-32-8	Benzo(a)Pyrene	330	U
193-39-5	Indeno(1,2,3-cd)Pyrene	330	U
53-70-3	Dibenz(a,h)Anthracene	330	U
191-24-2	Benzo(g,h,i)Perylene	330	U

(1) - Cannot be separated from Diphenylamine

2/23/94

1F

EPA SAMPLE NO.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

~~000460~~ SBLK0913S3

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 09021 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A309021-BLK

Sample wt/vol: 30.4 (g/mL) G Lab File ID: 30927S06

Level: (low/med) LOW Date Received: _____

% Moisture: _____ decanted: (Y/N) N Date Extracted: 09/13/93

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 09/27/93

Injection Volume: 2.0(uL) Dilution Factor: 1.0

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

Number TICs found: 3 CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 123-42-2	4-HYDROXY-4-METHYL-2-PENTANO	6.33	61000	AJN
2.	UNKNOWN HYDROCARBON	6.43	66	J
3.	UNKNOWN HYDROCARBON	7.50	820	J

OU 3225.0282 #16

4/28/94

CALCULATION SUMMARY

B09325-TMA-620

SDG:	REVIEWER:	DATE: 2/25/94	PAGE 1 OF 1

COMMENTS: Sample B09327 Calculations

$$\frac{ug}{kg} = \frac{(A_x)(I_s)(V_t)}{(A_i)(RRF)(V_i)(W_s)(D)} \times 2 \text{ for GPC} \times 2 \text{ for Internal Standard Dilution}$$

ug/kg 2-Chlorophenol (B09327)

$$= \frac{(1338)(20)(500)(2)(2)}{(25202)(1.173)(2)(30.5)(0.94)} \quad 31.4 = 31 \text{ ug/kg}$$

~~62.8 = 63 ug/kg~~

ug/kg 1,4-Dichlorobenzene (B09327)

$$= \frac{(948)(20)(500)(2)(2)}{(25202)(1.307)(2)(30.5)(0.94)} = 20 \text{ ug/kg}$$

ug/kg 4-Chloro-3-Methylphenol (B09327)

$$= \frac{(1090)(20)(500)(2)(2)}{(97462)(0.288)(2)(30.5)(0.94)} = 27 \text{ ug/kg}$$

ug/kg Acenaphthene (B09327)

$$= \frac{(1628)(20)(500)(2)(2)}{(51718)(0.963)(2)(30.5)(0.94)} = 23 \text{ ug/kg}$$

Quantitation Report File: 30927S11

B09327

~~000329~~

Data: 30927S11.TI
09/27/93 19:54:00
Sample: CLP,09021,,B09327,L,S,A309021-03B,BNA,EPA
Conds.: CAP/.25,30927S01,3DFT0927S01,30927S06
Formula: 30920SAVG90 Instrument: SHERMA Weight: 0.000
Submitted by: 30G:0.5M Analyst: FH#33S Acct. No.: CALTAB

AMOUNT=AREA * REF AMNT/(REF AREA * RESP FACT)
Resp. fac. from Library Entry

No	Name	
1	CI30	*IS1* 1,4-DICHLOROBENZENE-D4
2	CI40	*IS2* NAPHTHALENE-D8
3	CI50	*IS3* ACENAPHTHENE-D10
4	CI60	*IS4* PHENANTHRENE-D10
5	CI70	*IS5* CHRYSENE-D12
6	CI75	*IS6* PERYLENE-D12
7	CS50	*SU1* 2-FLUOROPHENOL
8	CS45	*SU2* PHENOL-D5
9	CS55	*SU3* 2,4,6,-TRIBROMOPHENOL
10	CS20	*SU4* NITROBENZENE-D5
11	CS25	*SU5* 2-FLUOROBIPHENYL
12	CS30	*SU6* TERPHENYL-D14
13	CS70	2-CHLOROPHENOL-D4
14	CS75	1,2-DICHLOROBENZENE-D4
15	C315	PHENOL
16	C325	BIS(2-CHLOROETHYL)ETHER
17	C330	2-CHLOROPHENOL
18	C335	1,3-DICHLOROBENZENE
19	C340	1,4-DICHLOROBENZENE
20	C345	BENZYL ALCOHOL
21	C350	1,2-DICHLOROBENZENE
22	C355	2-METHYLPHENOL
23	C360	BIS(2-CHLOROISOPROPYL)ETHER
24	C365	4-METHYLPHENOL
25	C370	N-NITROSO-DI-N-PROPYLAMINE
26	C375	HEXACHLOROETHANE
27	C410	NITROBENZENE
28	C415	ISOPHORONE
29	C420	2-NITROPHENOL
30	C425	2,4-DIMETHYLPHENOL
31	C435	BIS(2-CHLOROETHOXY)METHANE
32	C430	BENZOIC ACID
33	C440	2,4-DICHLOROPHENOL
34	C445	1,2,4-TRICHLOROBENZENE
35	C450	NAPHTHALENE
36	C455	4-CHLOROANILINE
37	C460	HEXACHLOROBUTADIENE
38	C465	4-CHLORO-3-METHYLPHENOL
39	C470	2-METHYLNAPHTHALENE
40	C510	HEXACHLOROCYCLOPENTADIENE
41	C515	2,4,6-TRICHLOROPHENOL
42	C520	2,4,5-TRICHLOROPHENOL
43	C525	2-CHLORONAPHTHALENE
44	C530	2-NITROANILINE
45	C535	DIMETHYL PHTHALATE
46	C540	ACENAPHTHYLENE
47	C545	3-NITROANILINE

9413225.0284

9/27/93

BC9327

~~000330~~

No	Name	
48	C550	ACENAPHTHENE
49	C555	2,4-DINITROPHENOL
50	C560	4-NITROPHENOL

No	m/z	Scan	Time	Ref	RRT	Meth	Area(Hght)	Amount	%Tot
1	152	747	9:26	1	1.000	A BB	25202.	20.000 NG/UL	2.93
2	136	991	12:31	2	1.000	A BB	97462.	20.000 NG/UL	2.93
3	164	1351	17:03	3	1.000	A BB	51718.	20.000 NG/UL	2.93
4	188	1656	20:54	4	1.000	A BV	74700.	20.000 NG/UL	2.93
5	240	2186	27:36	5	1.000	A BB	42964.	20.000 NG/UL	2.93
6	264	2609	32:56	6	1.000	A BB	35967.	20.000 NG/UL	2.93
7	112	530	6:41	1	0.710	A BB	119170.	84.722 NG/UL	12.43
8	99	681	8:36	1	0.912	A BV	151866.	80.751 NG/UL	11.85
9	330	1514	19:07	3	1.121	A BB	27052.	70.143 NG/UL	10.29
10	82	851	10:45	2	0.859	A BB	100218.	49.881 NG/UL	7.32
11	172	1212	15:18	3	0.897	A BB	139252.	51.967 NG/UL	7.62
12	244	1974	24:55	5	0.903	A BB	136408.	72.173 NG/UL	10.59
13	132	707	8:56	1	0.946	A BB	115378.	79.382 NG/UL	11.65
14	152	775	9:47	1	1.037	A BB	52336.	52.682 NG/UL	7.73
15	NOT FOUND								
16	NOT FOUND								
~~17~~	~~128~~	~~709~~	~~8:57~~	~~1~~	~~0.949~~	~~A BB~~	~~1338.~~	~~0.701 NG/UL~~	~~0.13~~
18	NOT FOUND								
~~19~~	~~146~~	~~750~~	~~9:28~~	~~1~~	~~1.004~~	~~A BB~~	~~948.~~	~~0.576 NG/UL~~	~~0.08~~
20	NOT FOUND								
21	NOT FOUND								
22	NOT FOUND								
23	NOT FOUND								
24	NOT FOUND								
~~25~~	~~70~~	~~821~~	~~10:22~~	~~1~~	~~1.099~~	~~A BB~~	~~528.~~	~~0.394 NG/UL~~	~~0.06~~
26	NOT FOUND								
27	NOT FOUND								
28	NOT FOUND								
29	NOT FOUND								
30	NOT FOUND								
31	NOT FOUND								
32	NOT FOUND								
33	NOT FOUND								
~~34~~	~~180~~	~~979~~	~~12:22~~	~~2~~	~~0.788~~	~~A BB~~	~~556.~~	~~0.430 NG/UL~~	~~0.06~~
35	NOT FOUND								
36	NOT FOUND								
37	NOT FOUND								
~~38~~	~~107~~	~~1105~~	~~13:57~~	~~2~~	~~1.115~~	~~A BB~~	~~1090~~	~~0.774 NG/UL~~	~~0.11~~
39	NOT FOUND								
40	NOT FOUND								
41	NOT FOUND								
42	NOT FOUND								
43	NOT FOUND								
44	NOT FOUND								
45	NOT FOUND								
46	NOT FOUND								
47	NOT FOUND								
~~48~~	~~153~~	~~1357~~	~~17:08~~	~~3~~	~~1.004~~	~~A BB~~	~~1628.~~	~~0.554 NG/UL~~	~~0.10~~
49	NOT FOUND								
50	NOT FOUND								

F.H. 9/28/94

x2 = 1.802

x2 = 1.152

slight ⊖ NS ~~x~~ 0.778 < 1 Do not Report

~~slight~~

x2 = ~~x~~ 0.860 < 1 Do not Report

x2 = 1.552

x2 = 1.308

9/28/94

9/29/94

·046

9W3225.0285

B09327

Quantitation Report File: 30927S11

~~000332~~

Data: 30927S11.TI
09/27/93 19:54:00
Sample: CLP,09021,,B09327,L,S,A309021-03B,BNA,EPA
Conds.: CAP/.25,30927S01,3DFT0927S01,30927S06
Formula: 30920SAVG90 Instrument: SHERMA Weight: 0.000
Submitted by: 30G:0.5M Analyst: FH#33S Acct. No.: CALTAB

AMOUNT=AREA * REF AMNT/(REF AREA * RESP FACT).
Resp. fac. from Library Entry

No	Name
51	C565 DIBENZOFURAN
52	C575 2,6-DINITROTOLUENE
53	C580 DIETHYLPHTHALATE
54	C570 2,4-DINITROTOLUENE
55	C590 FLUORENE
56	C585 4-CHLOROPHENYL-PHENYLETHER
57	C595 4-NITROANILINE
58	C610 4,6-DINITRO-2-METHYLPHENOL
59	C615 N-NITROSODIPHENYLAMINE
60	C625 4-BROMOPHENYL-PHENYLETHER
61	C630 HEXACHLOROBENZENE
62	C635 PENTACHLOROPHENOL
63	C640 PHENANTHRENE
64	C645 ANTHRACENE
65	C648 CARBAZOLE
66	C650 DI-N-BUTYLPHTHALATE
67	C655 FLUORANTHENE
68	C715 PYRENE
69	C720 BUTYLBENZYLPHTHALATE
70	C725 3,3'-DICHLOROBENZIDINE
71	C730 BENZO(A)ANTHRACENE
72	C740 CHRYSENE
73	C735 BIS(2-ETHYLHEXYL)PHTHALATE
74	C760 DI-N-OCTYLPHTHALATE
75	C765 BENZO(B)FLUROANTHENE
76	C770 BENZO(K)FLUORANTHENE
77	C775 BENZO(A)PYRENE
78	C780 INDENO(1,2,3-CD)PYRENE
79	C785 DIBENZO(A,H)ANTHRACENE
80	C790 BENZO(GHI)PERYLENE

No	m/z	Scan	Time	Ref	RRT	Meth	Area(Hght)	Amount	%Tot
51	NOT FOUND								
52	NOT FOUND								
53	~~149~~	~~1443~~	~~18:13~~	~~3~~	~~1.068~~	~~A 3B~~	~~510.~~	~~0.162 NG/UL~~	~~0.02~~
54	NOT FOUND								
55	NOT FOUND								
56	NOT FOUND								
57	NOT FOUND								
58	NOT FOUND								
59	NOT FOUND								
60	NOT FOUND								
61	NOT FOUND								
62	NOT FOUND								
63	NOT FOUND								

9/28/93 FSH

-047

B09327

~~000333~~

No	m/z	Scan	Time	Ref	RRT	Meth	Area(Hght)	Amount	%Tot
64	NOT FOUND								
65	NOT FOUND								
66	149	1774	22:24	4	1.071	A BB	61276.	11.613 NG/UL	1.70
67	NOT FOUND		— Pyrene						
68	202	1943	24:32	5	0.889	A BB	3554.	1.205 NG/UL	0.18
69	~~149~~	~~2068~~	~~26:06~~	~~5~~	~~0.946~~	~~A BB~~	~~606.~~	~~0.372 NG/UL~~	~~0.05~~
70	NOT FOUND								
71	NOT FOUND								
72	NOT FOUND								
73	149	2185	27:35	5	1.000	A BB	2476.	1.160 NG/UL	0.17
74	NOT FOUND								
75	NOT FOUND								
76	NOT FOUND								
77	NOT FOUND								
78	NOT FOUND								
79	NOT FOUND								
80	NOT FOUND								

Found in Blank at
0.447 NG/UL x 5 = 2.235 NG/UL
Qmc

No	Ret(L)	Ratio	RRT(L)	Ratio	Amnt	Amnt(L)	R. Fac	R. Fac(L)	Ratio
51	17:34		1.032						
52	16:31		0.970						
53	18:12	1.00	1.069	1.00	0.16	25.00	0.008	1.218	0.01
54	17:33		1.030						
55	18:29		1.085						
56	18:29		1.085						
57	18:32		1.088						
58	18:37		0.891						
59	18:48		0.900						
60	19:45		0.946						
61	19:53		0.952						
62	20:23		0.976						
63	20:57		1.004						
64	21:05		1.010						
65	21:29		1.029						
66	22:22	1.00	1.071	1.00	11.61	25.00	0.656	1.413	0.46
67	23:56		1.146						
68	24:30	1.00	0.889	1.00	1.21	25.00	0.066	1.373	0.05
69	26:05	1.00	0.946	1.00	0.37	25.00	0.011	0.759	0.01
70	27:27		0.995						
71	27:32		0.999						
72	27:38		1.002						
73	27:33	1.00	0.999	1.00	1.16	25.00	0.046	0.993	0.05
74	29:38		0.901						
75	31:11		0.948						
76	31:18		0.952						
77	32:37		0.992						
78	39:10		1.191						
79	39:23		1.198						
80	41:08		1.251						

Qualifier B09327 result for pyrene is undetected (U).

Ag 9/29/93

2/25/94

-048

CALCULATION SUMMARY

BC9325-TMA-620

SDG:	REVIEWER:	DATE: 2/28/94	PAGE 1 OF 1

COMMENTS: Pyrene Result in Laboratory Blank

$$ug/kg = \frac{(A_x)(I_s)(V_t)(2\ \text{for GPC})(2\ \text{for extract dilution})}{(A_i)(RRF)(V_i)(W_s)(D)}$$

$$ug/kg\ Pyrene = \frac{(1810)(20)(500)(2)(2)}{(5917)(1.373)(2)(30.4)(1)}$$

$$= 15\ ug/kg\ Pyrene$$

9413225.0288

-049

Laboratory Blank

~~000466~~

No	Name	
48	C550	ACENAPHTHENE
49	C555	2,4-DINITROPHENOL
50	C560	4-NITROPHENOL

No	m/z	Scan	Time	Ref	RRT	Meth	Area(Hgh't)	Amount	%Tot
1	152	747	9:26	1	1.000	A BB	32318.	20.000 NG/UL	3.63
2	136	991	12:31	2	1.000	A BB	121920.	20.000 NG/UL	3.63
3	164	1352	17:04	3	1.000	A BB	66648.	20.000 NG/UL	3.63
4	188	1657	20:55	4	1.000	A BV	92540.	20.000 NG/UL	3.63
5	240	2184	27:34	5	1.000	A BB	59170.	20.000 NG/UL	3.63
6	264	2607	32:55	6	1.000	A BB	49861.	20.000 NG/UL	3.63
7	112	530	6:41	1	0.710	A BB	111994.	62.089 NG/UL	11.26
8	99	681	8:36	1	0.912	A BB	146503.	60.747 NG/UL	11.02
9	330	1515	19:08	3	1.121	A BB	25928.	52.169 NG/UL	9.46
10	82	851	10:45	2	0.859	A BB	99392.	39.546 NG/UL	7.17
11	172	1213	15:19	3	0.897	A BB	140392.	40.656 NG/UL	7.37
12	244	1973	24:54	5	0.903	A BB	135670.	52.122 NG/UL	9.45
13	132	707	8:56	1	0.946	A BB	111768.	59.966 NG/UL	10.87
14	152	775	9:47	1	1.037	A BB	52956.	41.569 NG/UL	7.54
15	~~94~~	~~682~~	~~8:37~~	~~1~~	~~0.913~~	~~A BB~~	~~1378.~~	~~0.565 NG/UL~~	~~0.10~~
16	NOT FOUND								
17	NOT FOUND								
18	NOT FOUND								
19	NOT FOUND								
20	NOT FOUND								
21	NOT FOUND								
22	NOT FOUND								
23	NOT FOUND								
24	NOT FOUND								
25	NOT FOUND								
26	NOT FOUND								
27	NOT FOUND								
28	NOT FOUND								
29	NOT FOUND								
30	NOT FOUND								
31	NOT FOUND								
32	NOT FOUND								
33	NOT FOUND								
34	NOT FOUND								
35	NOT FOUND								
36	NOT FOUND								
37	NOT FOUND								
38	NOT FOUND								
39	NOT FOUND								
40	NOT FOUND								
41	NOT FOUND								
42	NOT FOUND								
43	NOT FOUND								
44	NOT FOUND								
45	NOT FOUND								
46	NOT FOUND								
47	NOT FOUND								
48	NOT FOUND								
49	NOT FOUND								
50	NOT FOUND								

F.H. 9/28/94

94W3225.0289

Internal Standard area used to calculate the pyrene excentration.

3/3/94

09/29/94

2/28/94

050

Laboratory Blank

~~000469~~

No	m/z	Scan	Time	Ref	RRT	Meth	Area(Hght)	Amount	%Tot
64	NOT FOUND								
65	NOT FOUND								
66	149	1774	22:24	4	1.071	A BB	58078.	8.885 NG/UL	1.61
67	NOT FOUND								
~~68~~	~~202~~	~~1743~~	~~24:32~~	~~5~~	~~0.890~~	~~A BB~~	~~1815.~~	~~0.447 NG/UL~~	~~0.08~~
~~69~~	~~149~~	~~2067~~	~~26:06~~	~~5~~	~~0.946~~	~~A BB~~	~~568.~~	~~0.253 NG/UL~~	~~0.05~~
70	NOT FOUND								
71	NOT FOUND								
72	NOT FOUND								
73	149	2184	27:34	5	1.000	A BB	31754.	10.806 NG/UL	1.96
74	NOT FOUND								
75	NOT FOUND								
76	NOT FOUND								
77	NOT FOUND								
78	NOT FOUND								
79	NOT FOUND								
80	NOT FOUND								

Pyrene

F.H. 9/27/93

No	Ret(L)	Ratio	RRT(L)	Ratio	Amnt	Amnt(L)	R.Fac	R.Fac(L)	Ratio
51	17:34		1.032						
52	16:31		0.970						
53	18:12		1.069						
54	17:33		1.030						
55	18:29		1.085						
56	18:29		1.085						
57	18:32		1.088						
58	18:37		0.891						
59	18:48		0.900						
60	19:45		0.946						
61	19:53		0.952						
62	20:23		0.976						
63	20:57		1.004						
64	21:05		1.010						
65	21:29		1.029						
66	22:22	1.00	1.071	1.00	8.89	25.00	0.502	1.413	0.36
67	23:56		1.146						
68	24:30	1.00	0.889	1.00	0.45	25.00	0.025	1.373	0.02
69	26:05	1.00	0.946	1.00	0.25	25.00	0.008	0.759	0.01
70	27:27		0.995						
71	27:32		0.999						
72	27:38		1.002						
73	27:33	1.00	0.999	1.00	10.81	25.00	0.429	0.993	0.43
74	29:38		0.901						
75	31:11		0.948						
76	31:18		0.952						
77	32:37		0.992						
78	39:10		1.191						
79	39:23		1.198						
80	41:08		1.251						

09/29/93

9/28/93

-051

FW13225.0290

VOLATILE ORGANIC DATA VALIDATION SUMMARY FOR DATA PACKAGE:
B09325-TMA-620 (923-E418,Filename B09325.VOA)

MEMORANDUM

TO: 200-UP-2 Project QA Record

March 3, 1994

FR: Susan Winter, Golder Associates Inc.

RE: VOLATILE ORGANIC DATA VALIDATION SUMMARY FOR DATA PACKAGE: B09325-TMA-620 (923-E418, Filename B09325.VOA)

INTRODUCTION

This memo presents the results of data validation on data package B09325-TMA-620 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
B09325	09/07/93	SOIL	SEE NOTE 1
B09326	09/07/93	SOIL	
B09327	09/08/93	SOIL	
B09328	09/08/93	SOIL	
B09329	09/08/93	SOIL	
B09330	09/08/93	SOIL	
B09331	09/08/93	SOIL	

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

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

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

DATA QUALITY OBJECTIVES

Precision. Goals for precision were met.

Accuracy. Goals for accuracy were met.

Sample Result Verification. All sample results were supported in the raw data with the exception of acetone which was detected in sample B09329 at a concentration of 12 µg/kg. Attachments 2 and 5 provide summaries of the corrected result and supporting documentation.

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 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%.

Sample B09331 was identified as a solid trip blank in which all results were verified as nondetects with the exception of two TCL compounds, acetone and toluene at concentrations of 8 µg/kg and 9 µg/kg, respectively, and one tentatively identified compound (TIC) labeled as an unknown hydrocarbon, 8 µg/kg, at retention time 27.50. This sample, B09331, is the only sample in this data package in which a TIC was detected.

MAJOR DEFICIENCIES

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

MINOR DEFICIENCIES

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

Laboratory Blanks

- Methylene chloride and acetone were present in the associated laboratory blanks. Attachments 2 and 5 provide a summary of the affected samples, data qualifications applied and supporting documentation.

REFERENCES

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

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

ATTACHMENT 1

GLOSSARY OF DATA REPORTING QUALIFIERS

GLOSSARY OF ORGANIC DATA REPORTING QUALIFIERS

B - Indicates the constituent was analyzed for and detected in the associated laboratory blank. This qualifier is applied by the laboratory. During the process of data validation this qualifier may be replaced by other appropriate qualifiers as defined by the validation procedures. The associated data should be considered usable for decision making purposes.

U - Indicates the constituent was analyzed for and not detected. The concentration reported is the sample quantitation limit corrected for aliquot size, dilution and percent solids (in the case of solid matrices) by the laboratory. The associated data should be considered usable for decision making purposes.

UJ - Indicates the constituent was analyzed for and not detected. Due to a minor quality control deficiency identified during data validation the concentration reported may not accurately reflect the sample quantitation limit. The associated data should be considered usable for decision making purposes.

J - Indicates the constituent was analyzed for and detected. This qualifier may be applied by the laboratory to indicate a concentration which is less than the contract required quantitation limit (CRQL) but greater than the instrument detection limit (IDL). During data validation this qualifier may be applied to indicate a minor quality control deficiency. However in either case, the associated data should be considered usable for decision making purposes.

NJ - Indicates presumptive evidence of a constituent at an estimated value. This qualifier is normally applied to GC analysis data (such as organochlorine pesticide and PCB data). The associated data should be considered usable for decision making purposes.

N - Indicates presumptive evidence of a constituent. This qualifier is normally applied to GC analysis data (such as organochlorine pesticide and PCB data). The associated data should be considered usable for decision making purposes.

JN - Indicates a tentatively identified compound (TIC) whose concentration and identification have been determined to be valid as a result of data validation. The associated data should be considered usable for decision making purposes.

UR - Indicates the constituent was analyzed for and not detected. The concentration reported has been qualified as unusable due to a major quality control deficiency identified during data validation. The associated data should be considered unusable for decision making purposes.

R - Indicates the constituent was analyzed for and detected. The concentration reported has been qualified as unusable due to a major quality control deficiency identified during data validation. The associated data should be considered unusable for decision making purposes.

ATTACHMENT 2

SUMMARY OF DATA QUALIFICATIONS

DATA QUALIFICATION SUMMARY

SDG: B09325-TMA-620	VALIDATOR:	DATE: March 3, 1994	PAGE 1 OF 1
COMMENTS: VOLATILES			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
ACETONE	U	B09325 B09326	PRESENT IN ASSOCIATED LABORATORY BLANK
METHYLENE CHLORIDE	U	B09328 B09330 B09331	PRESENT IN ASSOCIATED LABORATORY BLANK
ACETONE	POSITIVE IDENTIFICATION	B09329	DETECTED IN SAMPLE

ATTACHMENT 3

QUALIFIED DATA SUMMARY AND ANNOTATED LABORATORY REPORTS

Validated Data Summary, Data Package: B09325-IMA 620

Parameter	Units	Samp# / Date / Location / Depth / Type / Comments	B09325 9-7-93 299-W19-97 4.00 - 6.00 --- ---		B09326 9-7-93 299-W19-95 30.00 - 32.50 --- ---		B09327 9-8-93 299-W19-97 10.00 - 12.50 --- ---		B09328 9-8-93 299-W19-97 20.00 - 22.50 --- ---		B09329 9-8-93 299-W19-95 45.00 - 47.50 --- ---		B09330 9-8-93 299-W19-97 30.00 - 32.00 --- ---	
			Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
CHLOROMETHANE	UG/KG		11.000	U	11.000	U	11.000	U	11.000	U	11.000	U	10.000	U
BROMOMETHANE	UG/KG		11.000	U	11.000	U	11.000	U	11.000	U	11.000	U	10.000	U
VINYL CHLORIDE	UG/KG		11.000	U	11.000	U	11.000	U	11.000	U	11.000	U	10.000	U
CHLOROETHANE	UG/KG		11.000	U	11.000	U	11.000	U	11.000	U	11.000	U	10.000	U
METHYLENE CHLORIDE	UG/KG		11.000	U	11.000	U	11.000	U	11.000	U	11.000	U	10.000	U
ACETONE	UG/KG		11.000	U	11.000	U	11.000	U	7.000	J	12.000		10.000	U
CARBON DISULFIDE	UG/KG		11.000	U	11.000	U	11.000	U	11.000	U	11.000	U	10.000	U
1,1-DICHLOROETHENE	UG/KG		11.000	U	11.000	U	11.000	U	11.000	U	11.000	U	10.000	U
1,1-DICHLOROETHANE	UG/KG		11.000	U	11.000	U	11.000	U	11.000	U	11.000	U	10.000	U
1,2-DICHLOROETHENE (TOTAL)	UG/KG		11.000	U	11.000	U	11.000	U	11.000	U	11.000	U	10.000	U
CHLOROFORM	UG/KG		11.000	U	11.000	U	11.000	U	11.000	U	11.000	U	10.000	U
1,2 DICHLOROETHANE	UG/KG		11.000	U	11.000	U	11.000	U	11.000	U	11.000	U	10.000	U
2-BUTANONE	UG/KG		11.000	U	11.000	U	11.000	U	11.000	U	11.000	U	10.000	U
1,1,1-TRICHLOROETHANE	UG/KG		11.000	U	11.000	U	11.000	U	11.000	U	11.000	U	10.000	U
CARBON TETRACHLORIDE	UG/KG		11.000	U	11.000	U	11.000	U	11.000	U	11.000	U	10.000	U
BROMODICHLOROMETHANE	UG/KG		11.000	U	11.000	U	11.000	U	11.000	U	11.000	U	10.000	U
1,2-DICHLOROPROPANE	UG/KG		11.000	U	11.000	U	11.000	U	11.000	U	11.000	U	10.000	U
CIS-1,3-DICHLOROPROPENE	UG/KG		11.000	U	11.000	U	11.000	U	11.000	U	11.000	U	10.000	U
TRICHLOROETHENE	UG/KG		11.000	U	11.000	U	11.000	U	11.000	U	11.000	U	10.000	U
DIBROMOCHLOROMETHANE	UG/KG		11.000	U	11.000	U	11.000	U	11.000	U	11.000	U	10.000	U
1,1,2-TRICHLOROETHANE	UG/KG		11.000	U	11.000	U	11.000	U	11.000	U	11.000	U	10.000	U
BENZENE	UG/KG		11.000	U	11.000	U	11.000	U	11.000	U	11.000	U	10.000	U
TRANS-1,3-DICHLOROPROPENE	UG/KG		11.000	U	11.000	U	11.000	U	11.000	U	11.000	U	10.000	U
BROMOFORM	UG/KG		11.000	U	11.000	U	11.000	U	11.000	U	11.000	U	10.000	U
4-METHYL-2-PENTANONE	UG/KG		11.000	U	11.000	U	11.000	U	11.000	U	11.000	U	10.000	U
2-HEXANONE	UG/KG		11.000	U	11.000	U	11.000	U	11.000	U	11.000	U	10.000	U
TETRACHLOROETHENE	UG/KG		11.000	U	11.000	U	11.000	U	11.000	U	11.000	U	10.000	U
1,1,2,2-TETRACHLOROETHANE	UG/KG		11.000	U	11.000	U	11.000	U	11.000	U	11.000	U	10.000	U
TOLUENE	UG/KG		11.000	U	2.000	J	11.000	U	11.000	U	11.000	U	1.000	J
CHLOROBENZENE	UG/KG		11.000	U	11.000	U	11.000	U	11.000	U	11.000	U	10.000	U
ETHYLBENZENE	UG/KG		11.000	U	11.000	U	11.000	U	11.000	U	11.000	U	10.000	U
STYRENE	UG/KG		11.000	U	11.000	U	11.000	U	11.000	U	11.000	U	10.000	U
XYLENES (TOTAL)	UG/KG		11.000	U	11.000	U	11.000	U	11.000	U	11.000	U	10.000	U

Verified 3/04/94

800-

Validated Data Summary, Data Package: B09325-TMA-620

Parameter	Units	Samp# B09331	Q
Date		9-8-95	
Location		299-W19-95	
Depth		0.00 - 0.00	
Type		TRIP BLK	
Comments			
CHLOROMETHANE	UG/KG	13.000	U
BROMOMETHANE	UG/KG	13.000	U
VINYL CHLORIDE	UG/KG	13.000	U
CHLOROETHANE	UG/KG	13.000	U
METHYLENE CHLORIDE	UG/KG	13.000	U
ACETONE	UG/KG	8.000	J
CARBON DISULFIDE	UG/KG	13.000	U
1,1-DICHLOROETHENE	UG/KG	13.000	U
1,1-DICHLOROETHANE	UG/KG	13.000	U
1,2-DICHLOROETHENE (TOTAL)	UG/KG	13.000	U
CHLOROFORM	UG/KG	13.000	U
1,2-DICHLOROETHANE	UG/KG	13.000	U
2-BUTANONE	UG/KG	13.000	U
1,1,1-TRICHLOROETHANE	UG/KG	13.000	U
CARBON TETRACHLORIDE	UG/KG	13.000	U
BROMODICHLOROMETHANE	UG/KG	13.000	U
1,2-DICHLOROPROPANE	UG/KG	13.000	U
CIS-1,3-DICHLOROPROPENE	UG/KG	13.000	U
TRICHLOROETHENE	UG/KG	13.000	U
DIBROMOCHLOROMETHANE	UG/KG	13.000	U
1,1,2-TRICHLOROETHANE	UG/KG	13.000	U
BENZENE	UG/KG	13.000	U
TRANS-1,3-DICHLOROPROPENE	UG/KG	13.000	U
BROMOFORM	UG/KG	13.000	U
4-METHYL-2-PENTANONE	UG/KG	13.000	U
2-HEXANONE	UG/KG	13.000	U
TETRACHLOROETHENE	UG/KG	13.000	U
1,1,2,2-TETRACHLOROETHANE	UG/KG	13.000	U
TOLUENE	UG/KG	9.000	J
CHLOROBENZENE	UG/KG	13.000	U
ETHYLBENZENE	UG/KG	13.000	U
STYRENE	UG/KG	13.000	U
XYLENES (TOTAL)	UG/KG	13.000	U

Verified

3/20/96

600-

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

~~000110~~

EPA SAMPLE NO.
299-W19-97

B09325
4-6'

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 09021 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A309021-01A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 30916R09

Level: (low/med) LOW Date Received: 09/10/93

% Moisture: not dec. 6 Date Analyzed: 09/16/93

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

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

9443225.0301

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
74-87-3	Chloromethane	11	U
74-83-9	Bromomethane	11	U
75-01-4	Vinyl Chloride	11	U
75-00-3	Chloroethane	11	U
75-09-2	Methylene Chloride	11	U
67-64-1	Acetone	11 ~~8~~	~~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

Q

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Received
2/24/94

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VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS ~~000111~~

EPA SAMPLE NO.
299-WS19-97
B09325
4-6'

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 09021 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A309021-01A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 30916R09

Level: (low/med) LOW Date Received: 09/10/93

% Moisture: not dec. 6 Date Analyzed: 09/16/93

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

9172E.302

011

FORM I VOA-TIC 3/90

Reviewed
2/24/94

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VOLATILE ORGANICS ANALYSIS DATA SHEET ~~000120~~

EPA SAMPLE NO.
299-W19-95
B09326
3--32.5

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 09021 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A309021-02A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 30916R08

Level: (low/med) LOW Date Received: 09/10/93

% Moisture: not dec. 6 Date Analyzed: 09/16/93

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

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

9443225.0303

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
74-87-3	Chloromethane	11	U
74-83-9	Bromomethane	11	U
75-01-4	Vinyl Chloride	11	U
75-00-3	Chloroethane	11	U
75-09-2	Methylene Chloride	11	U
67-64-1	Acetone	~~4~~ 11	~~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	2	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

2/24/94

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VOLATILE ORGANICS ANALYSIS DATA SHEET ~~000121~~
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.
299-W19-95
B09326
30-32.5

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 09021 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A309021-02A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 30916R08

Level: (low/med) LOW Date Received: 09/10/93

% Moisture: not dec. 6 Date Analyzed: 09/16/93

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

9HW275.03004

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2/23/94

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VOLATILE ORGANICS ANALYSIS DATA SHEET

~~000132~~

EPA SAMPLE NO.
299-W19-97

B09327
10-12.5'

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 09021 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A309021-03A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 30916R07

Level: (low/med) LOW Date Received: 09/10/93

% Moisture: not dec. 6 Date Analyzed: 09/16/93

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

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

PW1325.0305

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

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2/24/94

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VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS ~~000133~~

EPA SAMPLE NO.
299-W19-97
B09327
10-12.5'

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 09021 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A309021-03A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 30916R07

Level: (low/med) LOW Date Received: 09/10/93

% Moisture: not dec. 6 Date Analyzed: 09/16/93

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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VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
299-W19-97

~~000140~~

B09328
20-22.5'

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 09021 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A309021-04A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 30915R23

Level: (low/med) LOW Date Received: 09/10/93

% Moisture: not dec. 5 Date Analyzed: 09/15/93

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	~~1~~ 11	~~B~~ U
67-64-1	Acetone	7	J
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

FORM I VOA

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2/24/94

3/90

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VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS ~~000141~~

EPA SAMPLE NO.
299-W19-97
B09328
20-22.5'

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 09021 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A309021-04A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 30915R23

Level: (low/med) LOW Date Received: 09/10/93

% Moisture: not dec. 5 Date Analyzed: 09/15/93

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

9113225.0308

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2/24/94

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VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
299-W19-95

~~000152~~ B09329

45-47.5

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 09021 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A309021-06A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 30915R15

Level: (low/med) LOW Date Received: 09/10/93

% Moisture: not dec. 10 Date Analyzed: 09/15/93

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

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

9W3225.0309

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG ;	Q
74-87-3	Chloromethane	11	U
74-83-9	Bromomethane	11	U
75-01-4	Vinyl Chloride	11	U
75-00-3	Chloroethane	11	U
75-09-2	Methylene Chloride	11	U
67-64-1	Acetone	12 ~~11~~	~~U~~
75-15-0	Carbon Disulfide	11	U
75-35-4	1,1-Dichloroethene	11	U
75-34-3	1,1-Dichloroethane	11	U
540-59-0	1,2-Dichloroethene (total)	11	U
67-66-3	Chloroform	11	U
107-06-2	1,2-Dichloroethane	11	U
78-93-3	2-Butanone	11	U
71-55-6	1,1,1-Trichloroethane	11	U
56-23-5	Carbon Tetrachloride	11	U
75-27-4	Bromodichloromethane	11	U
78-87-5	1,2-Dichloropropane	11	U
10061-01-5	cis-1,3-Dichloropropene	11	U
79-01-6	Trichloroethene	11	U
124-48-1	Dibromochloromethane	11	U
79-00-5	1,1,2-Trichloroethane	11	U
71-43-2	Benzene	11	U
10061-02-6	trans-1,3-Dichloropropene	11	U
75-25-2	Bromoform	11	U
108-10-1	4-Methyl-2-Pentanone	11	U
591-78-6	2-Hexanone	11	U
127-18-4	Tetrachloroethene	11	U
79-34-5	1,1,2,2-Tetrachloroethane	11	U
108-88-3	Toluene	11	U
108-90-7	Chlorobenzene	11	U
100-41-4	Ethylbenzene	11	U
100-42-5	Styrene	11	U
1330-20-7	Xylene (total)	11	U

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS ~~000153~~

EPA SAMPLE NO.
299-W19-95

B09329
45-47.5

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 09021 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A309021-06A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 30915R15

Level: (low/med) LOW Date Received: 09/10/93

% Moisture: not dec. 10 Date Analyzed: 09/15/93

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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VOLATILE ORGANICS ANALYSIS DATA SHEET

~~000160~~

EPA SAMPLE NO.
299-W-9-97
B09330
30-32'

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 09021 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A309021-05A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 30915R21

Level: (low/med) LOW Date Received: 09/10/93

% Moisture: not dec. 4 Date Analyzed: 09/15/93

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

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

9443225.0311

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG ;	Q	C
74-87-3	Chloromethane	10	U	
74-83-9	Bromomethane	10	U	
75-01-4	Vinyl Chloride	10	U	
75-00-3	Chloroethane	10	U	
75-09-2	Methylene Chloride	10 ~~1~~	~~BJ~~	J
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	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	1	J	
108-90-7	Chlorobenzene	10	U	
100-41-4	Ethylbenzene	10	U	
100-42-5	Styrene	10	U	
1330-20-7	Xylene (total)	10	U	

020

FORM I VOA verified 3/90

2/24/94

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS ~~000161~~

EPA SAMPLE NO.
299-W19-97
B09330
3C-32

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 09021 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A309021-05A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 30915R21

Level: (low/med) LOW Date Received: 09/10/93

% Moisture: not dec. 4 Date Analyzed: 09/15/93

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

9F3225.0312

-021

FORM I VOA-TIC

Verified
2/24/94

3/90

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET ~~000172~~ 299-W.9-95

EPA SAMPLE NO.

B09331

Solid Trip Blank

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 09021 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A309021-07A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 30915R13

Level: (low/med) LOW Date Received: 09/10/93

% Moisture: not dec. 23 Date Analyzed: 09/15/93

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

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

9W3225.0313

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
74-87-3	Chloromethane	13	U
74-83-9	Bromomethane	13	U
75-01-4	Vinyl Chloride	13	U
75-00-3	Chloroethane	13	U
75-09-2	Methylene Chloride	13 ~~1~~	~~BJ~~
67-64-1	Acetone	8	J
75-15-0	Carbon Disulfide	13	U
75-35-4	1,1-Dichloroethene	13	U
75-34-3	1,1-Dichloroethane	13	U
540-59-0	1,2-Dichloroethene (total)	13	U
67-66-3	Chloroform	13	U
107-06-2	1,2-Dichloroethane	13	U
78-93-3	2-Butanone	13	U
71-55-6	1,1,1-Trichloroethane	13	U
56-23-5	Carbon Tetrachloride	13	U
75-27-4	Bromodichloromethane	13	U
78-87-5	1,2-Dichloropropane	13	U
10061-01-5	cis-1,3-Dichloropropene	13	U
79-01-6	Trichloroethene	13	U
124-48-1	Dibromochloromethane	13	U
79-00-5	1,1,2-Trichloroethane	13	U
71-43-2	Benzene	13	U
10061-02-6	trans-1,3-Dichloropropene	13	U
75-25-2	Bromoform	13	U
108-10-1	4-Methyl-2-Pentanone	13	U
591-78-6	2-Hexanone	13	U
127-18-4	Tetrachloroethene	13	U
79-34-5	1,1,2,2-Tetrachloroethane	13	U
108-88-3	Toluene	9	J
108-90-7	Chlorobenzene	13	U
100-41-4	Ethylbenzene	13	U
100-42-5	Styrene	13	U
1330-20-7	Xylene (total)	13	U

G

U

022

Verified

2/24/94

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET ~~000173~~ 299-U-19-95
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.
B09331
Solid Trip Blank

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 09021 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A309021-07A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 30915R13

Level: (low/med) LOW Date Received: 09/10/93

% Moisture: not dec. 23 Date Analyzed: 09/15/93

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

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

Number TICs found: 1 CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN HYDROCARBON	27.50	8	J

9H2275.314

023

FORM I VOA-TIC 3/90

Verified
2/24/94

ATTACHMENT 4

LABORATORY NARRATIVE AND CHAIN-OF-CUSTODY DOCUMENTATION

CASE NARRATIVE

LABORATORY : TMA/ARLI

CASE : 09-021

CONTRACT ID : WESTINGHOUSE HANFORD COMPANY

SDG RECEIPT DATE : September 10, 1993

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
B09325	A3-09-021-01A	V	SOIL
B09325 MS	A3-09-021-01B	V	SOIL
B09325 MSD	A3-09-021-01C	V	SOIL
B09325	A3-09-021-01D	SV	SOIL
B09325	A3-09-021-01F	K	SOIL
B09326	A3-09-021-02A	V	SOIL
B09326	A3-09-021-02B	SV	SOIL
B09326 MS	A3-09-021-02C	SV	SOIL
B09326 MSD	A3-09-021-02D	SV	SOIL
B09326	A3-09-021-02F	K	SOIL
B09327	A3-09-021-03A	V	SOIL
B09327	A3-09-021-03B	SV	SOIL
B09327	A3-09-021-03E	K	SOIL
B09328	A3-09-021-04A	V	SOIL
B09328	A3-09-021-04B	SV	SOIL
B09328	A3-09-021-04E	K	SOIL
B09330	A3-09-021-05A	V	SOIL
B09330	A3-09-021-05B	SV	SOIL
B09330	A3-09-021-05D	K	SOIL
B09330 MS	A3-09-021-05E	K	SOIL
B09330 MSD	A3-09-021-05F	K	SOIL
B09329	A3-09-021-06A	V	SOIL
B09329	A3-09-021-06B	SV	SOIL
B09329	A3-09-021-06D	K	SOIL
B09331	A3-09-021-07A	V	SOIL

3.0 COMMENTS :

3.1 SHIPPING AND DOCUMENTATION :

All of the samples were received intact and properly documented.

3.2 ANALYSIS

3.2.1 VOLATILE ANALYSIS COMMENTS :

LOW LEVEL SOIL :

The samples were analyzed by heated purge within the CLP SOW holding times.

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 CLP SOW holding times.

Sample B09327 had a Terphenyl-d14 surrogate recovery slightly above the QC limits. Sample B09326MSD had matrix spike recoveries for Phenol and 2,4-Dinitrotoluene that were slightly above the QC limits. In accordance with CLP protocol, no further action was required.

Pyrene was detected in sample B09327 at a concentration below the CRQL.

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 09/16/93 and was analyzed according to the SW-846 Method 3015M. The initial calibration consisted of 5 different levels of the Kerosene standard that ranged from 200ppm to 2000ppm. The continuing calibration at the 1000ppm level was injected amongst a series of samples, in order to verify the instrument stability. The %RSD in the initial calibration and the %D in the continuing calibration were below their 20% and 15% limits, respectively.

SAMPLE NOTES :

LOW LEVEL SOIL :

The samples were extracted and analyzed for extractable hydrocarbons in the Kerosene range within the required holding times. Approximately 20 g of each sample was extracted and concentrated to 5 mL.

There were no hydrocarbons in the Kerosene range detected in any of the samples. Sample B09330 was spiked with Kerosene and the matrix spike recoveries were between 81% and 84%. A blank spike was prepared at the same time, and had an 86% recovery.

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 designee, as verified by the following signatures.

Nicole Roth 12/10/93
Nicole Roth
CLP Program Manager

Maureen Parrish 12/10/93
Maureen Parrish
Project Manager

Westinghouse Hanford Company	CHAIN OF CUSTODY ~~000002A~~

Custody Form Initiator: L E ROGERS

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

Project Designation/Sampling Locations: 200-UP-2 — Collection Date: 9-7-93

Ice Chest No. ~~Rusty Dusty~~ (9/7/93 SMK-27) — Field Logbook No.: EFL-1091

Bill of Lading/Airbill No.: — Offsite Property No.:

Method of Shipment: OVERNIGHT AIR SERVICE

Shipped to: TMA

Possible Sample Hazards/Remarks: Keep samples at 4C (SOIL) None noted

Sample Identification

1) B09325

1,250ml	P:CLP;TAL Metals,Hg,Ti
1,250ml	G: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

9407325.0319

2) B09326

1,250ml	P:CLP;TAL Metals,Hg,Ti
1,250ml	G: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) SER 9-7-93

1,250ml	P:CLP;TAL Metals,Hg,Ti
1,250ml	G: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: 1510 Laura E. Rogers 9-7-93	Received by: J G Hogan J G Hogan	Date/Time: 9-7-93 / 1510
Relinquished by: J G Hogan J G Hogan	Received by: J.D. Fraine J.D. Fraine	Date/Time: 9/9/93 1036
Relinquished by: J.D. Fraine J.D. Fraine 9/9/93 1056	Received by: Toby M Yamamoto	Date/Time: 9/10/93 11:15 AM
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

Westinghouse Hanford Company	CHAIN OF CUSTODY ~~0000026~~

Custody Form Initiator: L E ROGERS

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

Project Designation/Sampling Locations: 200-UP-2 — Collection Date: 9-8-93

Ice Chest No.: SML-352 — Field Logbook No.: EFL-1091

Bill of Lading/Airbill No.: — Offsite Property No.:

Method of Shipment: OVERNIGHT AIR SERVICE

Shipped to: TMA

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

Sample Identification

1) B09327

1,250ml	P:CLP;TAL Metals,Hg,Ti
~~1,250ml~~ 1250ml	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:Cynnide 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) B09328

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:Cynnide 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) B09330

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:
1400 Susan E Rogers 9-9-93	Ron T Shuttle	9-9-93 1400
Relinquished by: 9.9.93 1030	Received by: J.D.Franklin	Date/Time: 9/9/93 1030
Relinquished by: J-D-Franklin 9/9/93 1550	Received by: Ellen L. Hamamoto	Date/Time: 9/10/93 11:15 AM
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

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

Westinghouse Hanford Company	CHAIN OF CUSTODY	~~000002E~~

Custody Form Initiator: L E ROGERS

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

Project Designation/Sampling Locations: 200-UP-2 — Collection Date: 9-8-93

Ice Chest No.: SMC-352 — Field Logbook No.: EFL-1091

Bill of Lading/Airbill No.: — Offsite Property No.:

Method of Shipment: OVERNIGHT AIR SERVICE

Shipped to: TMA

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

Sample Identification

1) B09329

1,250ml	P:CLP;TAL Metals,Hg,Ti
120ml ~~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

9113225.0301 R 9-8-93

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

SER 9-8-93

3)

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

[ ] Field Transfer of Custody

Chain of Possession (Sign and Print Names)		
Relinquished by: 1400	Received by: R.J.T. Sickle	Date/Time: 1400 9-8-93
Relinquished by: R.J.T. Sickle 9-9-93 1030	Received by: J.D. Fancher	Date/Time: 9/9/93 1130
Relinquished by: J.D. Fancher 9/9/93 1050	Received by: Libby G. Jamieson	Date/Time: 9/10/93 11:15 AM
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

Westinghouse Hanford Company	CHAIN OF CUSTODY ~~0000029~~

Custody Form Initiator L E ROGERS

Company Contact L E ROGERS

Telephone 376-7690

Project Designation/Sampling Locations 200-UP-2

Collection Date 9-8-93

Ice Chest No. SML-271

Field Logbook No. EFL-1091

Bill of Lading/Airbill No. _____

Offsite Property No. _____

Method of Shipment OVERNIGHT AIR SERVICE

Shipped to TMA

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

Sample Identification

1) B09331

~~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,Co-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~~

120ml

9113225.0082

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

VOR 9-8-93

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

[ ] Field Transfer of Custody

Chain of Possession (Sign and Print Names)

Relinquished by:	Received by:	Date/Time:
1400 Lorna E. Rogers 9-8-93	R. J. Schulte	1400 9-9-93
Relinquished by: RT E.C.Nie	Received by: 1031 J.D. Fowler 9-9-93 J.D. Fowler	Date/Time: 9/9/93 1030
Relinquished by: J.D. Fowler 9/9/93 1056 J.D. Fowler	Received by: E. Hammond	Date/Time: 9/10/93 11.15 AM
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

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: B0935-TMA-620		
VALIDATOR: [illegible]		LAB: TMA		DATE: 02/24/94	
CASE:			SDG: B0935-TMA-620		

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

B09325 Soil	B09330 Soil
B09326	B09331 "
B09327	
B09328	
B09329 "	

GW3225.0324

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: _____

033

GC/MS ORGANIC DATA VALIDATION CHECKLIST

3. INSTRUMENT TUNING AND CALIBRATION

Is the GC/MS tuning/performance check acceptable? . . . . . (Yes) No N/A
Are initial calibrations acceptable? . . . . . (Yes) No N/A
Are continuing calibrations acceptable? . . . . . (Yes) No N/A
Comments:

4. BLANKS

Were laboratory blanks analyzed? . . . . . (Yes) No N/A
Are laboratory blank results acceptable? . . . . . Yes (No) N/A
Were field/trip blanks analyzed? . . . . . (Yes) No N/A
Are field/trip blank results acceptable? . . . . . Yes (No) N/A
Comments: See comments on last page of checklist.

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:

9W3225.0325

034

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? See comments. . . . . (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: Acetone was detected in sample B0C9R29 at 12 ug/kg. See attached raw data for verification.

9113225.0326

035

GC/MS ORGANIC DATA VALIDATION CHECKLIST

Comments (attach additional sheets as necessary):

Methylene Chloride and acetone were detected in the lab blank associated with samples B09325, B09326, and B09327.

Methylene chloride was detected in the lab blank associated with samples B09328, B09329, B09330, and B09331.

Sample B09331 was identified as a solid trip blank and contains acetone, toluene, and a TIC identified as an unknown hydrocarbon at P.T. 27.50 minutes.

2/24/94

HOLDING TIME SUMMARY

B0935-TMA-000

SDG:	VALIDATOR:	DATE: 2/24/94	PAGE 1 OF 1
COMMENTS: Volatiles			

FIELD SAMPLE ID	ANALYSIS TYPE	DATE SAMPLED	DATE PREPARED	DATE ANALYZED	PREP. HOLDING TIME, DAYS	ANALYSIS HOLDING TIME, DAYS	QUALIFIER
B0935	VOA	09/07/93		09/16/93		9 ~~7~~ 8 2/24/94	None
B0936		09/07/93		09/16/93		9	
B0937		09/08/93		09/16/93		8	
B0938		09/08/93		09/15/93		7	
B0939		09/08/93		09/15/93		7	
B0940		09/08/93		09/15/93		7	
B0941		09/08/93		09/15/93		7	

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

~~000237~~

EPA SAMPLE NO.

VBLK0916R

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 09021 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: SBLK0916

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 30916R03

Level: (low/med) LOW Date Received:

% Moisture: not dec. Date Analyzed: 09/16/93

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

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

Assoc w/ B09325, B09326, B09327

CONCENTRATION UNITS:

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

U=20

U=30

9W3225.0329

2/24/94

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS ~~000238~~

EPA SAMPLE NO.

VBLK0916R

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 09021 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: SBLK0916

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 30916R03

Level: (low/med) LOW Date Received: _____

% Moisture: not dec. ____ Date Analyzed: 09/16/93

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

~~000227~~

EPA SAMPLE NO.

VBLK0915R

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 09021 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: SBLK0915

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 30915R10

Level: (low/med) LOW Date Received: _____

% Moisture: not dec. ____ Date Analyzed: 09/15/93

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

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

Assoc w/ B-9328, B-9329, B-9330, B-9331

94A225.033I

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 NB=10
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	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

3/24/94

1E

EPA SAMPLE NO.

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS ~~000228~~

VBLK0915R

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 09021 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: SBLK0915

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 30915R10

Level: (low/med) LOW Date Received: _____

% Moisture: not dec. ____ Date Analyzed: 09/15/93

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

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

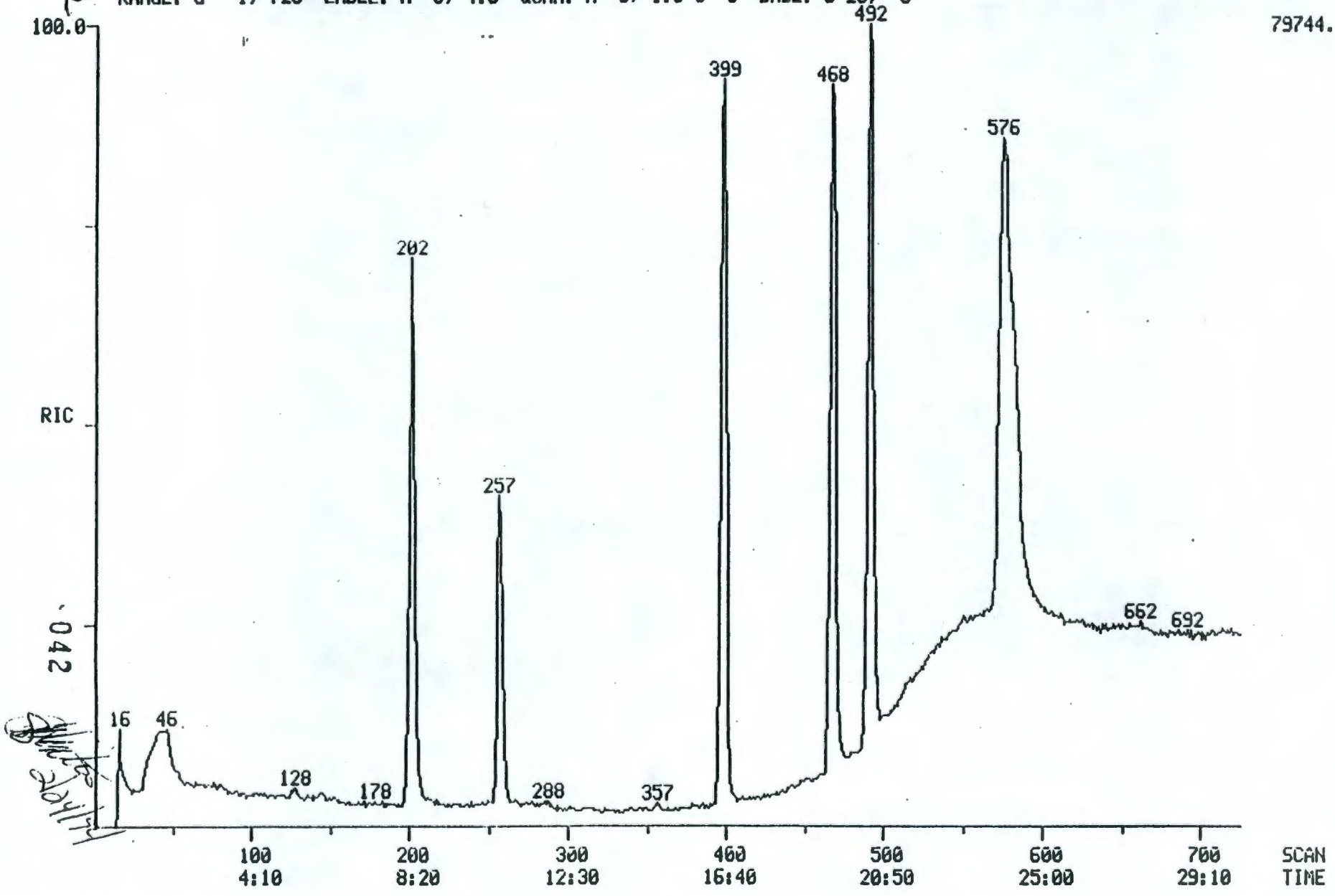
Number TICs found: 0 CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

RIC
09/15/93 18:07:00
SAMPLE: CLP,09021,,B09329,L,S,A309021-06A,VOA/H,EPA
CONDS.: PACK/2,30915R08,3BFB0915A,30915R10,,
RANGE: G 1, 725 LABEL: H 0, 4.0 QUAN: A 0, 1.0 J 0 BASE: U 20, 3

DATA: 30915R15 #1
CALI: 30915R15 #7

SCANS 1 TO 725



Sample B09329

Sample B09329

Quantitation Report File: 30915R15

Data: 30915R15.TI
09/15/93 18:07:00

~~000155~~

Sample: CLP,09021,,B09329,L,S,A309021-06A,VOA/H,EPA
Conds.: PACK/2,30915R08,3BFB0915A,30915R10,,
Formula: 0.000 Instrument: 4500 Weight: 5.000
Submitted by: TMA-ARLI Analyst: CY Acct. No.:

AMOUNT=AREA * REF AMNT/(REF AREA * RESP FACT)
Resp. fac. from Library Entry

No	Name	
1	CI01	BROMOCHLOROMETHANE(I.S)
2	CI10	1,4-DIFLUORBENZENE(I.S)
3	CI20	CHLOROBENZENE D-5(I.S)
4	CS15	D4-1,2-DICHLOROETHANE(SURR)
5	CS05	D8-TOLUENE(SURR)
6	CS10	BROMOFLUOROBENZENE(SURR)
~~7~~	~~C035~~	~~ACETONE~~

ynh 12/07/93

No	m/z	Scan	Time	Ref	RRT	Meth	Area(Hght)	Amount	%Tot
1	128	202	8:25	1	1.000	A BB	29567.	50.000 PPB	15.76
2	114	399	16:37	2	1.000	A BB	119618.	50.000 PPB	15.76
3	117	492	20:30	3	1.000	A BB	101789.	50.000 PPB	15.76
4	65	257	10:42	1	1.272	A BB	39346.	51.037 PPB	16.09
5	98	468	19:30	3	0.951	A BB	99400.	54.744 PPB	17.26
6	95	576	24:00	3	1.171	A BB	62961.	50.627 PPB	15.96
~~7~~	~~43~~	~~144~~	~~6:00~~	~~1~~	~~0.713~~	~~A VB~~	~~2790.~~	~~10.843 PPB~~	~~3.42~~

No	Ret(L)	Ratio	RRT(L)	Ratio	Amnt	Amnt(L)	R.Fac	R.Fac(L)	Ratio
1	8:25	1.00	1.000	1.00	50.00	50.00	1.000	1.000	1.00
2	16:35	1.00	1.000	1.00	50.00	50.00	1.000	1.000	1.00
3	20:30	1.00	1.000	1.00	50.00	50.00	1.000	1.000	1.00
4	10:42	1.00	1.272	1.00	51.04	50.00	1.331	1.304	1.02
5	19:30	1.00	0.951	1.00	54.74	50.00	0.977	0.892	1.09
6	23:57	1.00	1.169	1.00	50.63	50.00	0.619	0.611	1.01
7	6:02	0.99	0.718	0.99	10.84	50.00	0.092	0.426	0.22

OW3225.0334

2/24/94

043

Quantitation Report File: 30915R15

Sample B09329

Data: 30915R15.TI
09/15/93 18:07:00
Sample: CLP,09021,,B09329,L,S,A309021-06A,VOA/H,EPA ~~000156~~
Conds.: PACK/2,30915R08,38FB0915A,30915R10,,
Formula: 0.000 Instrument: 4500 Weight: 5.000
Submitted by: TMA-ARLI Analyst: CY Acct. No.:

AMOUNT=AREA * REF AMNT/(REF AREA * RESP FACT)
Resp. fac. from Library Entry

No	Name	
1	CI01	BROMOCHLOROMETHANE(I.S)
2	CI10	1,4-DIFLUORBENZENE(I.S)
3	CI20	CHLOROBENZENE D-5(I.S)
4	CS15	D4-1,2-DICHLOROETHANE(SURR)
5	CS05	D8-TOLUENE(SURR)
6	CS10	BROMOFLUOROBENZENE(SURR)
7	C010	CHLOROMETHANE
8	C015	BROMOMETHANE
9	C020	VINYL CHLORIDE
10	C025	CHLOROETHANE
11	C030	METHYLENE CHLORIDE
12	C035	ACETONE
13	C040	CARBON DISULFIDE
14	C045	1,1-DICHLOROETHENE
15	C050	1,1-DICHLOROETHANE
16	C053	1,2-DICHLOROETHENE(TOTAL)
17	C060	CHLOROFORM
18	C110	2-BUTANONE
19	C065	1,2-DICHLOROETHANE
20	C115	1,1,1-TRICHLOROETHANE
21	C120	CARBON TETRACHLORIDE
22	C125	VINYL ACETATE
23	C130	BROMODICHLOROMETHANE
24	C140	1,2-DICHLOROPROPANE
25	C143	CIS-1,3-DICHLOROPROPENE
26	C150	TRICHLOROETHENE
27	C155	DIBROMOCHLOROMETHANE
28	C165	BENZENE
29	C160	1,1,2-TRICHLOROETHANE
30	C172	TRANS-1,3-DICHLOROPROPENE
31	C175	2-CHLOROETHOXY ETHENE
32	C180	BROMOFORM
33	C205	4-METHYL-2-PENTANONE
34	C210	2-HEXANONE
35	C225	1,1,2,2-TETRACHLOROETHANE
36	C220	TETRACHLOROETHENE
37	C230	TOLUENE
38	C235	CHLOROBENZENE
39	C240	ETHYL BENZENE
40	C245	STYRENE
41	C255	M-XYLENE
42	C250	O,P-XYLENE

94/3225.0335

044

2/24/94

Sample B29329

~~000157~~

No	m/z	Scan	Time	Ref	RRT	Meth	Area(Hght)	Amount	%Tot
1	128	202	8:25	1	1.000	A BB	29567.	50.000 PPB	15.56
2	114	399	16:37	2	1.000	A BB	119618.	50.000 PPB	15.56
3	117	492	20:30	3	1.000	A BB	101789.	50.000 PPB	15.56
4	65	257	10:42	1	1.272	A BB	39346.	51.037 PPB	15.88
5	98	468	19:30	3	0.951	A BB	99400.	54.744 PPB	17.04
6	95	376	24:00	3	1.171	A BB	62961.	50.627 PPB	15.76
7	NOT FOUND								
8	NOT FOUND								
9	NOT FOUND								
10	NOT FOUND								
~~11~~	~~84~~	~~128~~	~~5:20~~	~~1~~	~~0.634~~	~~A BB~~	~~675.~~	~~0.878 PPB~~	~~0.27~~
~~12~~	~~43~~	~~144~~	~~6:00~~	~~1~~	~~0.713~~	~~A VB~~	~~2730.~~	~~10.843 PPB~~	~~3.37~~
13	NOT FOUND								
14	NOT FOUND								
15	NOT FOUND								
16	NOT FOUND								
17	NOT FOUND								
18	NOT FOUND								
19	NOT FOUND								
20	NOT FOUND								
21	NOT FOUND								
~~22~~	~~43~~	~~287~~	~~11:57~~	~~2~~	~~0.719~~	~~A BB~~	~~893.~~	~~0.467 PPB~~	~~0.15~~
23	NOT FOUND								
24	NOT FOUND								
25	NOT FOUND								
26	NOT FOUND								
27	NOT FOUND								
28	NOT FOUND								
29	NOT FOUND								
30	NOT FOUND								
31	NOT FOUND								
32	NOT FOUND								
33	NOT FOUND								
34	NOT FOUND								
35	NOT FOUND								
36	NOT FOUND								
~~37~~	~~91~~	~~472~~	~~19:40~~	~~3~~	~~0.759~~	~~A BB~~	~~1813.~~	~~0.845 PPB~~	~~0.26~~
38	NOT FOUND								
39	NOT FOUND								
40	NOT FOUND								
41	NOT FOUND								
42	NOT FOUND								

CCV RT is 6.02

fmb 12/07/93

9/21/93

$$\text{ug/kg Acetone} = \frac{(2730)(50)}{(29567)(0.426)(0.908 \text{ methanol})} = 12.04 = 12 \text{ ug/kg}$$

~~= 12.04 = 12 ug/kg~~

2/24/94

No	Ret(L)	Ratio	RRT(L)	Ratio	Amnt	Amnt(L)	R. Fac	R. Fac(L)	Ratio
1	8:32	0.99	1.000	1.00	50.00	50.00	1.000	1.000	1.00
2	16:35	1.00	1.000	1.00	50.00	50.00	1.000	1.000	1.00
3	20:27	1.00	1.000	1.00	50.00	50.00	1.000	1.000	1.00
4	10:45	1.00	1.259	1.01	51.04	50.00	1.331	1.304	1.02
5	19:27	1.00	0.951	1.00	54.74	50.00	0.977	0.992	1.09
6	23:57	1.00	1.171	1.00	50.63	50.00	0.619	0.611	1.01
7	1:07		0.132						
8	2:05		0.244						
9	2:42		0.317						
10	3:45		0.439						
11	5:42	0.93	0.668	0.95	0.88	50.00	0.023	1.301	0.02
12	6:22	0.94	0.746	0.96	10.84	50.00	0.092	0.426	0.22

2/24/94

045

09/21/93

Sample BC9329

000158

No	Ret(L)	Ratio	RRT(L)	Ratio	Amnt	Amnt(L)	R.Fac	R.Fac(L)	Ratio
13	6:57		0.815						
14	8:05		0.946						
15	9:10		1.073						
16	9:45		1.141						
17	10:17		1.205						
18	10:45		1.259						
19	10:50		1.268						
20	11:52		0.716						
21	12:10		0.734						
22	12:12	0.98	0.736	0.98	0.47	50.00	0.007	0.799	0.01
23	12:37		0.761						
24	13:40		0.824						
25	13:52		0.837						
26	14:15		0.859						
27	14:52		0.897						
28	14:35		0.879						
29	14:55		0.899						
30	14:52		0.897						
31	15:40		0.945						
32	16:57		1.023						
33	17:12		0.841						
34	18:25		0.900						
35	18:47		0.919						
36	18:40		0.912						
37	19:37	1.00	0.959	1.00	0.84	50.00	0.018	1.054	0.02
38	20:35		1.006						
39	22:02		1.077						
40	24:57		1.220						
41	25:07		1.228						
42	25:52		1.265						

12/4/94

VOLATILE ORGANIC DATA VALIDATION SUMMARY FOR DATA PACKAGE:
B09325-TMA-620 (923-E418, Filename B09325.VOA)

MEMORANDUM

TO: 200-UP-2 Project QA Record March 3, 1994

FR: Susan Winter, Golder Associates Inc.

RE: VOLATILE ORGANIC DATA VALIDATION SUMMARY FOR DATA PACKAGE: B09325-TMA-620 (923-E418, Filename B09325.VOA)

INTRODUCTION

This memo presents the results of data validation on data package B09325-TMA-620 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
B09325	09/07/93	SOIL	SEE NOTE 1
B09326	09/07/93	SOIL	
B09327	09/08/93	SOIL	
B09328	09/08/93	SOIL	
B09329	09/08/93	SOIL	
B09330	09/08/93	SOIL	
B09331	09/08/93	SOIL	

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

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

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

DATA QUALITY OBJECTIVES

Precision. Goals for precision were met.

Accuracy. Goals for accuracy were met.

Sample Result Verification. All sample results were supported in the raw data with the exception of acetone which was detected in sample B09329 at a concentration of 12 µg/kg. Attachments 2 and 5 provide summaries of the corrected result and supporting documentation.

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 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%.

Sample B09331 was identified as a solid trip blank in which all results were verified as nondetects with the exception of two TCL compounds, acetone and toluene at concentrations of 8 µg/kg and 9 µg/kg, respectively, and one tentatively identified compound (TIC) labeled as an unknown hydrocarbon, 8 µg/kg, at retention time 27.50. This sample, B09331, is the only sample in this data package in which a TIC was detected.

MAJOR DEFICIENCIES

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

MINOR DEFICIENCIES

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

Laboratory Blanks

- Methylene chloride and acetone were present in the associated laboratory blanks. Attachments 2 and 5 provide a summary of the affected samples, data qualifications applied and supporting documentation.

REFERENCES

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

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

ATTACHMENT 1

GLOSSARY OF DATA REPORTING QUALIFIERS

GLOSSARY OF ORGANIC DATA REPORTING QUALIFIERS

B - Indicates the constituent was analyzed for and detected in the associated laboratory blank. This qualifier is applied by the laboratory. During the process of data validation this qualifier may be replaced by other appropriate qualifiers as defined by the validation procedures. The associated data should be considered usable for decision making purposes.

U - Indicates the constituent was analyzed for and not detected. The concentration reported is the sample quantitation limit corrected for aliquot size, dilution and percent solids (in the case of solid matrices) by the laboratory. The associated data should be considered usable for decision making purposes.

UJ - Indicates the constituent was analyzed for and not detected. Due to a minor quality control deficiency identified during data validation the concentration reported may not accurately reflect the sample quantitation limit. The associated data should be considered usable for decision making purposes.

J - Indicates the constituent was analyzed for and detected. This qualifier may be applied by the laboratory to indicate a concentration which is less than the contract required quantitation limit (CRQL) but greater than the instrument detection limit (IDL). During data validation this qualifier may be applied to indicate a minor quality control deficiency. However in either case, the associated data should be considered usable for decision making purposes.

NJ - Indicates presumptive evidence of a constituent at an estimated value. This qualifier is normally applied to GC analysis data (such as organochlorine pesticide and PCB data). The associated data should be considered usable for decision making purposes.

N - Indicates presumptive evidence of a constituent. This qualifier is normally applied to GC analysis data (such as organochlorine pesticide and PCB data). The associated data should be considered usable for decision making purposes.

JN - Indicates a tentatively identified compound (TIC) whose concentration and identification have been determined to be valid as a result of data validation. The associated data should be considered usable for decision making purposes.

UR - Indicates the constituent was analyzed for and not detected. The concentration reported has been qualified as unusable due to a major quality control deficiency identified during data validation. The associated data should be considered unusable for decision making purposes.

R - Indicates the constituent was analyzed for and detected. The concentration reported has been qualified as unusable due to a major quality control deficiency identified during data validation. The associated data should be considered unusable for decision making purposes.

ATTACHMENT 2

SUMMARY OF DATA QUALIFICATIONS

DATA QUALIFICATION SUMMARY

SDG: B09325-TMA-620	VALIDATOR:	DATE: March 3, 1994	PAGE 1 OF 1
COMMENTS: VOLATILES			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
ACETONE	U	B09325 B09326	PRESENT IN ASSOCIATED LABORATORY BLANK
METHYLENE CHLORIDE	U	B09328 B09330 B09331	PRESENT IN ASSOCIATED LABORATORY BLANK
ACETONE	POSITIVE IDENTIFICATION	B09329	DETECTED IN SAMPLE

ATTACHMENT 3

QUALIFIED DATA SUMMARY AND ANNOTATED LABORATORY REPORTS

Validated Data Summary, Data Package: B09325-TMA-620

Parameter	Units	Samp# / Date / Location / Depth / Type / Comments	B09325 9-7-93 299-W19-97 4.00 - 6.00 --- ---		B09326 9-7-93 299-W19-95 30.00 - 32.50 --- ---		B09327 9-8-93 299-W19-97 10.00 - 12.50 --- ---		B09328 9-8-93 299-W19-97 20.00 - 22.50 --- ---		B09329 9-8-93 299-W19-95 45.00 - 47.50 --- ---		B09330 9-8-93 299-W19-97 30.00 - 32.00 --- ---	
			Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
CHLOROMETHANE	UG/KG		11.000	U	11.000	U	11.000	U	11.000	U	11.000	U	10.000	U
BROMOMETHANE	UG/KG		11.000	U	11.000	U	11.000	U	11.000	U	11.000	U	10.000	U
VINYL CHLORIDE	UG/KG		11.000	U	11.000	U	11.000	U	11.000	U	11.000	U	10.000	U
CHLOROETHANE	UG/KG		11.000	U	11.000	U	11.000	U	11.000	U	11.000	U	10.000	U
METHYLENE CHLORIDE	UG/KG		11.000	U	11.000	U	11.000	U	11.000	U	11.000	U	10.000	U
ACETONE	UG/KG		11.000	U	11.000	U	11.000	U	7.000	J	12.000		10.000	U
CARBON DISULFIDE	UG/KG		11.000	U	11.000	U	11.000	U	11.000	U	11.000	U	10.000	U
1,1-DICHLOROETHENE	UG/KG		11.000	U	11.000	U	11.000	U	11.000	U	11.000	U	10.000	U
1,1-DICHLOROETHANE	UG/KG		11.000	U	11.000	U	11.000	U	11.000	U	11.000	U	10.000	U
1,2-DICHLOROETHENE (TOTAL)	UG/KG		11.000	U	11.000	U	11.000	U	11.000	U	11.000	U	10.000	U
CHLOROFORM	UG/KG		11.000	U	11.000	U	11.000	U	11.000	U	11.000	U	10.000	U
1,2-DICHLOROETHANE	UG/KG		11.000	U	11.000	U	11.000	U	11.000	U	11.000	U	10.000	U
2-BUTANONE	UG/KG		11.000	U	11.000	U	11.000	U	11.000	U	11.000	U	10.000	U
1,1,1-TRICHLOROETHANE	UG/KG		11.000	U	11.000	U	11.000	U	11.000	U	11.000	U	10.000	U
CARBON TETRACHLORIDE	UG/KG		11.000	U	11.000	U	11.000	U	11.000	U	11.000	U	10.000	U
BROMODICHLOROMETHANE	UG/KG		11.000	U	11.000	U	11.000	U	11.000	U	11.000	U	10.000	U
1,2-DICHLOROPROPANE	UG/KG		11.000	U	11.000	U	11.000	U	11.000	U	11.000	U	10.000	U
CIS-1,3-DICHLOROPROPENE	UG/KG		11.000	U	11.000	U	11.000	U	11.000	U	11.000	U	10.000	U
TRICHLOROETHENE	UG/KG		11.000	U	11.000	U	11.000	U	11.000	U	11.000	U	10.000	U
DIBROMOCHLOROMETHANE	UG/KG		11.000	U	11.000	U	11.000	U	11.000	U	11.000	U	10.000	U
1,1,2-TRICHLOROETHANE	UG/KG		11.000	U	11.000	U	11.000	U	11.000	U	11.000	U	10.000	U
BENZENE	UG/KG		11.000	U	11.000	U	11.000	U	11.000	U	11.000	U	10.000	U
TRANS-1,3-DICHLOROPROPENE	UG/KG		11.000	U	11.000	U	11.000	U	11.000	U	11.000	U	10.000	U
BROMOFORM	UG/KG		11.000	U	11.000	U	11.000	U	11.000	U	11.000	U	10.000	U
4-METHYL-2-PENTANONE	UG/KG		11.000	U	11.000	U	11.000	U	11.000	U	11.000	U	10.000	U
2-HEXANONE	UG/KG		11.000	U	11.000	U	11.000	U	11.000	U	11.000	U	10.000	U
TETRACHLOROETHENE	UG/KG		11.000	U	11.000	U	11.000	U	11.000	U	11.000	U	10.000	U
1,1,2,2-TETRACHLOROETHANE	UG/KG		11.000	U	11.000	U	11.000	U	11.000	U	11.000	U	10.000	U
TOLUENE	UG/KG		11.000	U	2.000	J	11.000	U	11.000	U	11.000	U	1.000	J
CHLOROBENZENE	UG/KG		11.000	U	11.000	U	11.000	U	11.000	U	11.000	U	10.000	U
ETHYLBENZENE	UG/KG		11.000	U	11.000	U	11.000	U	11.000	U	11.000	U	10.000	U
STYRENE	UG/KG		11.000	U	11.000	U	11.000	U	11.000	U	11.000	U	10.000	U
XYLENES (TOTAL)	UG/KG		11.000	U	11.000	U	11.000	U	11.000	U	11.000	U	10.000	U

Verified 3/01/94

800-

Validated Data Summary, Data Package: B09325-TMA-620

Parameter	Units	Samp# B09331	Q
Date		9-8-93	
Location		299-W19-95	
Depth		0.00 - 0.00	
Type		TRIP BLK	
Comments		---	
CHLOROMETHANE	UG/KG	13.000	U
BROMOMETHANE	UG/KG	13.000	U
VINYL CHLORIDE	UG/KG	13.000	U
CHLOROETHANE	UG/KG	13.000	U
METHYLENE CHLORIDE	UG/KG	13.000	U
ACETONE	UG/KG	8.000	J
CARBON DISULFIDE	UG/KG	13.000	U
1,1-DICHLOROETHENE	UG/KG	13.000	U
1,1-DICHLOROETHANE	UG/KG	13.000	U
1,2-DICHLOROETHENE (TOTAL)	UG/KG	13.000	U
CHLOROFORM	UG/KG	13.000	U
1,2-DICHLOROETHANE	UG/KG	13.000	U
2-BUTANONE	UG/KG	13.000	U
1,1,1-TRICHLOROETHANE	UG/KG	13.000	U
CARBON TETRACHLORIDE	UG/KG	13.000	U
BROMODICHLOROMETHANE	UG/KG	13.000	U
1,2-DICHLOROPROPANE	UG/KG	13.000	U
CIS-1,3-DICHLOROPROPENE	UG/KG	13.000	U
TRICHLOROETHENE	UG/KG	13.000	U
DIBROMOCHLOROMETHANE	UG/KG	13.000	U
1,1,2-TRICHLOROETHANE	UG/KG	13.000	U
BENZENE	UG/KG	13.000	U
TRANS-1,3-DICHLOROPROPENE	UG/KG	13.000	U
BROMOFORM	UG/KG	13.000	U
4-METHYL-2-PENTANONE	UG/KG	13.000	U
2-HEXANONE	UG/KG	13.000	U
TETRACHLOROETHENE	UG/KG	13.000	U
1,1,2,2-TETRACHLOROETHANE	UG/KG	13.000	U
TOLUENE	UG/KG	9.000	J
CHLOROBENZENE	UG/KG	13.000	U
ETHYLBENZENE	UG/KG	13.000	U
STYRENE	UG/KG	13.000	U
XYLENES (TOTAL)	UG/KG	13.000	U

Verified

3/29/94

600-

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
299-WG9-97

~~000110~~

B09325
4-6'

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 09021 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A309021-01A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 30916R09

Level: (low/med) LOW Date Received: 09/10/93

% Moisture: not dec. 6 Date Analyzed: 09/16/93

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

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

9413225.0348

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
74-87-3	Chloromethane	11	U
74-83-9	Bromomethane	11	U
75-01-4	Vinyl Chloride	11	U
75-00-3	Chloroethane	11	U
75-09-2	Methylene Chloride	11	U
67-64-1	Acetone	11 ~~8~~	~~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

Q

Received
2/24/94

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS ~~000111~~

EPA SAMPLE NO.
299-W-19-97

B09325
4-6'

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 09021 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A309021-01A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 30916R09

Level: (low/med) LOW Date Received: 09/10/93

% Moisture: not dec. 6 Date Analyzed: 09/16/93

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 2/24/94

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET ~~000120~~

EPA SAMPLE NO.
299-W19-95
B09326
3-32.5

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 09021 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A309021-02A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 30916R08

Level: (low/med) LOW Date Received: 09/10/93

% Moisture: not dec. 6 Date Analyzed: 09/16/93

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

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

94A3225.0350

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
74-87-3	Chloromethane	11	U
74-83-9	Bromomethane	11	U
75-01-4	Vinyl Chloride	11	U
75-00-3	Chloroethane	11	U
75-09-2	Methylene Chloride	11	U
67-64-1	Acetone	~~4~~ 11	~~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	2	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

2/24/94

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET 000121
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.
299-W9-95
B09326
32-32.5

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 09021 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A309021-02A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 30916R08

Level: (low/med) LOW Date Received: 09/10/93

% Moisture: not dec. 6 Date Analyzed: 09/16/93

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

9413225.0351

013

FORM I VOA-TIC

Verified
2/28/94

3/90

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

~~000132~~

EPA SAMPLE NO.
299-W19-97
B09327
10-12.5'

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 09021 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A309021-03A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 30916R07

Level: (low/med) LOW Date Received: 09/10/93

% Moisture: not dec. 6 Date Analyzed: 09/16/93

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

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

9W3225.0352

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

Verified

2/24/94

3/90

-014

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS ~~000133~~

EPA SAMPLE NO.
299-W19-97
B09327
10-12.5'

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 09021 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A309021-03A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 30916R07

Level: (low/med) LOW Date Received: 09/10/93

% Moisture: not dec. 6 Date Analyzed: 09/16/93

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

9113225.0353

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
299-W19-97
~~000140~~
B09328
20-22.5'

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 09021 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A309021-04A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 30915R23

Level: (low/med) LOW Date Received: 09/10/93

% Moisture: not dec. 5 Date Analyzed: 09/15/93

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

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

9413225.0354

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	~~1~~ 11	~~BJ~~ U
67-64-1	Acetone	7	J
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

016

Verified
2/24/94

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS ~~000141~~

EPA SAMPLE NO.
299-W19-97
B09328
20-22.5'

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 09021 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A309021-04A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 30915R23

Level: (low/med) LOW Date Received: 09/10/93

% Moisture: not dec. 5 Date Analyzed: 09/15/93

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

9113225.0355

017

FORM I VOA-TIC

Verified
2/24/94

3/90

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
299-W19-95

~~000152~~ B09329
45-47.5

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 09021 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A309021-06A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 30915R15

Level: (low/med) LOW Date Received: 09/10/93

% Moisture: not dec. 10 Date Analyzed: 09/15/93

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

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

9113225.0356

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG :	Q
74-87-3	Chloromethane	11	U
74-83-9	Bromomethane	11	U
75-01-4	Vinyl Chloride	11	U
75-00-3	Chloroethane	11	U
75-09-2	Methylene Chloride	11	U
67-64-1	Acetone	12 ~~11~~	~~U~~
75-15-0	Carbon Disulfide	11	U
75-35-4	1,1-Dichloroethene	11	U
75-34-3	1,1-Dichloroethane	11	U
540-59-0	1,2-Dichloroethene (total)	11	U
67-66-3	Chloroform	11	U
107-06-2	1,2-Dichloroethane	11	U
78-93-3	2-Butanone	11	U
71-55-6	1,1,1-Trichloroethane	11	U
56-23-5	Carbon Tetrachloride	11	U
75-27-4	Bromodichloromethane	11	U
78-87-5	1,2-Dichloropropane	11	U
10061-01-5	cis-1,3-Dichloropropene	11	U
79-01-6	Trichloroethene	11	U
124-48-1	Dibromochloromethane	11	U
79-00-5	1,1,2-Trichloroethane	11	U
71-43-2	Benzene	11	U
10061-02-6	trans-1,3-Dichloropropene	11	U
75-25-2	Bromoform	11	U
108-10-1	4-Methyl-2-Pentanone	11	U
591-78-6	2-Hexanone	11	U
127-18-4	Tetrachloroethene	11	U
79-34-5	1,1,2,2-Tetrachloroethane	11	U
108-88-3	Toluene	11	U
108-90-7	Chlorobenzene	11	U
100-41-4	Ethylbenzene	11	U
100-42-5	Styrene	11	U
1330-20-7	Xylene (total)	11	U

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS ~~000153~~

EPA SAMPLE NO.
299-W9-95
B09329
45-47.5

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 09021 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A309021-06A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 30915R15

Level: (low/med) LOW Date Received: 09/10/93

% Moisture: not dec. 10 Date Analyzed: 09/15/93

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

94/3225.0357

Verified 2/24/94

FORM I VOA-TIC 3/90

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

~~000160~~

EPA SAMPLE NO.
299-W-9-97

B09330
30-32'

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 09021 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A309021-05A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 30915R21

Level: (low/med) LOW Date Received: 09/10/93

% Moisture: not dec. 4 Date Analyzed: 09/15/93

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	C
74-87-3	Chloromethane	10	U	
74-83-9	Bromomethane	10	U	
75-01-4	Vinyl Chloride	10	U	
75-00-3	Chloroethane	10	U	
75-09-2	Methylene Chloride	10 ~~1~~	~~BJ~~	S
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	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	1	J	
108-90-7	Chlorobenzene	10	U	
100-41-4	Ethylbenzene	10	U	
100-42-5	Styrene	10	U	
1330-20-7	Xylene (total)	10	U	

2/24/94

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS ~~000161~~

EPA SAMPLE NO.
299-W19-97

B09330
30-32

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 09021 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A309021-05A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 30915R21

Level: (low/med) LOW Date Received: 09/10/93

% Moisture: not dec. 4 Date Analyzed: 09/15/93

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

RH 3225.0359

-021

Verified
2/24/94

FORM I VOA-TIC 3/90

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET 000172

EPA SAMPLE NO. 299-W-9-95

B09331 Soil Trip Blank

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 09021 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A309021-07A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 30915R13

Level: (low/med) LOW Date Received: 09/10/93

% Moisture: not dec. 23 Date Analyzed: 09/15/93

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

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

9W13225.0360

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
74-87-3	Chloromethane	13	U
74-83-9	Bromomethane	13	U
75-01-4	Vinyl Chloride	13	U
75-00-3	Chloroethane	13	U
75-09-2	Methylene Chloride	13 ~~1~~	~~BJ~~
67-64-1	Acetone	8	J
75-15-0	Carbon Disulfide	13	U
75-35-4	1,1-Dichloroethene	13	U
75-34-3	1,1-Dichloroethane	13	U
540-59-0	1,2-Dichloroethene (total)	13	U
67-66-3	Chloroform	13	U
107-06-2	1,2-Dichloroethane	13	U
78-93-3	2-Butanone	13	U
71-55-6	1,1,1-Trichloroethane	13	U
56-23-5	Carbon Tetrachloride	13	U
75-27-4	Bromodichloromethane	13	U
78-87-5	1,2-Dichloropropane	13	U
10061-01-5	cis-1,3-Dichloropropene	13	U
79-01-6	Trichloroethene	13	U
124-48-1	Dibromochloromethane	13	U
79-00-5	1,1,2-Trichloroethane	13	U
71-43-2	Benzene	13	U
10061-02-6	trans-1,3-Dichloropropene	13	U
75-25-2	Bromoform	13	U
108-10-1	4-Methyl-2-Pentanone	13	U
591-78-6	2-Hexanone	13	U
127-18-4	Tetrachloroethene	13	U
79-34-5	1,1,2,2-Tetrachloroethane	13	U
108-88-3	Toluene	9	J
108-90-7	Chlorobenzene	13	U
100-41-4	Ethylbenzene	13	U
100-42-5	Styrene	13	U
1330-20-7	Xylene (total)	13	U

Q G

-022

Verified 2/24/94

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

~~000173~~

EPA SAMPLE NO.
299-W19-95
B09331
Solid Trip Blank

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 09021 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A309021-07A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 30915R13

Level: (low/med) LOW Date Received: 09/10/93

% Moisture: not dec. 23 Date Analyzed: 09/15/93

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

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

Number TICs found: 1

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN HYDROCARBON	27.50	8	J

9443225.0361

Verified
2/24/94

-023

FORM I VOA-TIC 3/90

ATTACHMENT 4

LABORATORY NARRATIVE AND CHAIN-OF-CUSTODY DOCUMENTATION

CASE NARRATIVE

LABORATORY : TMA/ARLI

CASE : 09-021

CONTRACT ID : WESTINGHOUSE HANFORD COMPANY

SDG RECEIPT DATE : September 10, 1993

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
B09325	A3-09-021-01A	V	SOIL
B09325 MS	A3-09-021-01B	V	SOIL
B09325 MSD	A3-09-021-01C	V	SOIL
B09325	A3-09-021-01D	SV	SOIL
B09325	A3-09-021-01F	K	SOIL
B09326	A3-09-021-02A	V	SOIL
B09326	A3-09-021-02B	SV	SOIL
B09326 MS	A3-09-021-02C	SV	SOIL
B09326 MSD	A3-09-021-02D	SV	SOIL
B09326	A3-09-021-02F	K	SOIL
B09327	A3-09-021-03A	V	SOIL
B09327	A3-09-021-03B	SV	SOIL
B09327	A3-09-021-03E	K	SOIL
B09328	A3-09-021-04A	V	SOIL
B09328	A3-09-021-04B	SV	SOIL
B09328	A3-09-021-04E	K	SOIL
B09330	A3-09-021-05A	V	SOIL
B09330	A3-09-021-05B	SV	SOIL
B09330	A3-09-021-05D	K	SOIL
B09330 MS	A3-09-021-05E	K	SOIL
B09330 MSD	A3-09-021-05F	K	SOIL
B09329	A3-09-021-06A	V	SOIL
B09329	A3-09-021-06B	SV	SOIL
B09329	A3-09-021-06D	K	SOIL
B09331	A3-09-021-07A	V	SOIL

3.0 COMMENTS :

3.1 SHIPPING AND DOCUMENTATION :

All of the samples were received intact and properly documented.

3.2 ANALYSIS

3.2.1 VOLATILE ANALYSIS COMMENTS :

LOW LEVEL SOIL :

The samples were analyzed by heated purge within the CLP SOW holding times.

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 CLP SOW holding times.

Sample B09327 had a Terphenyl-d14 surrogate recovery slightly above the QC limits. Sample B09326MSD had matrix spike recoveries for Phenol and 2,4-Dinitrotoluene that were slightly above the QC limits. In accordance with CLP protocol, no further action was required.

Pyrene was detected in sample B09327 at a concentration below the CRQL.

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 09/16/93 and was analyzed according to the SW-846 Method 3015M. The initial calibration consisted of 5 different levels of the Kerosene standard that ranged from 200ppm to 2000ppm. The continuing calibration at the 1000ppm level was injected amongst a series of samples, in order to verify the instrument stability. The %RSD in the initial calibration and the %D in the continuing calibration were below their 20% and 15% limits, respectively.

SAMPLE NOTES :

LOW LEVEL SOIL :

The samples were extracted and analyzed for extractable hydrocarbons in the Kerosene range within the required holding times. Approximately 20 g of each sample was extracted and concentrated to 5 mL.

There were no hydrocarbons in the Kerosene range detected in any of the samples. Sample B09330 was spiked with Kerosene and the matrix spike recoveries were between 81% and 84%. A blank spike was prepared at the same time, and had an 86% recovery.

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 designee, as verified by the following signatures.

Nicole Roth 12/10/93
Nicole Roth
CLP Program Manager

Maureen Parrish 12/10/93
Maureen Parrish
Project Manager

Westinghouse Hanford Company	CHAIN OF CUSTODY ~~9600002A~~

Custody Form Initiator: L E ROGERS

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

Project Designation/Sampling Locations: 200-UP-2 — Collection Date: 9-7-93

Ice Chest No. ~~Rusty Dusty~~ Yellow 9/7/93 SML-27 — Field Logbook No.: EFL-1091

Bill of Lading/Airbill No.: — Offsite Property No.:

Method of Shipment: OVERNIGHT AIR SERVICE

Shipped to: TMA

Possible Sample Hazards/Remarks: Keep samples at 4C (SOIL) None noted

Sample Identification

1) B09325

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) B09326

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

9413225.0366

3) JER 9-7-93

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:
1510 Laurie E. Rogers 9-7-93	JG Hogan JG Hogan	9-7-93 / 1510
JG Hogan JG Hogan	J.D. Franklin J.D. Franklin	9/8/93 1030
J.D. Franklin J.D. Franklin 9/8/93 1056	Libby L. Yamamoto	9/10/93 11:15 AM
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

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

028

Westinghouse Hanford Company	CHAIN OF CUSTODY ~~0000026~~

Custody Form Initiator: L E ROGERS

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

Project Designation/Sampling Locations: 200-UP-2 — Collection Date: 9-8-93

Ice Chest No.: SML-352 — Field Logbook No.: EFL-1091

Bill of Lading/Airbill No.: — Offsite Property No.:

Method of Shipment: OVERNIGHT AIR SERVICE

Shipped to: TMA

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

Sample Identification

1)

1,250ml	P:CLP;TAL Metals,Hg,Ti B09327
1250ml ~~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

9413225.0367

1,250ml	P:CLP;TAL Metals,Hg,Ti B09328
1,250ml	Gs:VOA CLP
1,250ml	aG:Semi-VOA CLP
1,125ml	G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml	P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml	G:Cyanide CLP
1,125ml	Gw:Kerosene (8015M)
1,1000ml	P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

3)

1,250ml	P:CLP;TAL Metals,Hg,Ti B09330
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:
1400 Susan E Rogers 9-8-93	Paul T Skyrme	1400 9-8-93
Relinquished by: 9.9.93 1030	Received by: J.D. Franklin	Date/Time: 9/9/93 1030
Relinquished by: J.D. Franklin 9/9/93 1056	Received by: Ellen L. Yamamoto	Date/Time: 9/10/93 11:15 AM
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

Westinghouse Hanford Company

CHAIN OF CUSTODY ~~000002E~~

Custody Form Initiator: L E ROGERS

Company Contact: L E ROGERS

Telephone: 376-7690

Project Designation/Sampling Locations: 200-UP-2

Collection Date: 9-8-93

Ice Chest No.: SML-352

Field Logbook No.: EFL-1091

Bill of Lading/Airbill No.:

Offsite Property No.:

Method of Shipment: OVERNIGHT AIR SERVICE

Shipped to: TMA

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

Sample Identification

1) B09329

1,250ml	P:CLP;TAL Metals,Hg,Ti
120ml ~~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

9-8-93

9411325.0368

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) SER 9-8-93

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:
1400 Leon E Rogers 9-8-93	Ray T Sickle	1400 9-9-93
Ray T Sickle RT. Sickle 9-9-93 1030	J.D. Franklin J.D. Franklin	9/9/93 1830
J.D. Franklin J.D. Franklin 9/9/93 1050	Ellen J. Jamieson	9/10/93 11:15 AM

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

A-6000-407 (12/90) (EF) WF1061
Chain of Custody

030

Westinghouse Hanford Company

CHAIN OF CUSTODY ~~0000029~~

Custody Form Initiator: L E ROGERS

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

Project Designation/Sampling Locations: 200-UP-2 — Collection Date: 9-8-93

Ice Chest No.: SML-271 — Field Logbook No.: EFL-1091

Bill of Lading/Airbill No.: — Offsite Property No.:

Method of Shipment: OVERNIGHT AIR SERVICE

Shipped to: TMA

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

Sample Identification

1) B09331

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

1,120ml

9W 3225.0363

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)

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

HEP 9-8-93

[ ] Field Transfer of Custody

Chain of Possession (Sign and Print Names)

Relinquished by:	Received by:	Date/Time:
1400 Loren E. Rogers 9-8-93	Ray T. Smith	1400 9.8.93
Relinquished by: 1RT E.c/N6	Received by: 1031 J.D. Fowler 9.9.93 J.D. Fowler	Date/Time: 9/9/93 1030
Relinquished by: J.D. Fowler 9/9/93 1056	Received by: Abby Y. Yamamoto	Date/Time: 9/10/93 11.15 AM
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

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: B0325-TMA-620	
VALIDATOR: [illegible]	LAB: TMA		DATE: 02/24/94
CASE:		SDG: B0325-TMA-620	

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	
B0325 Soil	B0330 Soil
B0326	B0331 "
B0327	
B0328	
B0329 "	

9113225.0371

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: _____

033

GC/MS ORGANIC DATA VALIDATION CHECKLIST

3. INSTRUMENT TUNING AND CALIBRATION

Is the GC/MS tuning/performance check acceptable? . . . . . (Yes) No N/A
Are initial calibrations acceptable? . . . . . (Yes) No N/A
Are continuing calibrations acceptable? . . . . . (Yes) No N/A
Comments:

4. BLANKS

Were laboratory blanks analyzed? . . . . . (Yes) No N/A
Are laboratory blank results acceptable? . . . . . Yes (No) N/A
Were field/trip blanks analyzed? . . . . . (Yes) No N/A
Are field/trip blank results acceptable? . . . . . Yes (No) N/A
Comments: See comments on last page of checklist.

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:

9413225.0372

034

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? See comments. . . . . 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: Acetone was detected in sample B=9329 at 12 wks. See attached cvr. Data See verification.

035

GC/MS ORGANIC DATA VALIDATION CHECKLIST

Comments (attach additional sheets as necessary):

Methylene Chloride and acetone were detected in the lab blank associated with samples B09325, B09326, and B09327.

Methylene chloride was detected in the lab blank associated with samples B09328, B09329, B09330, and B09331.

Sample B09331 was identified as a solid trip blank and contains acetone, toluene, and a TIC identified as an unknown hydrocarbon at RT 2.50 minutes.

2/24/94

HOLDING TIME SUMMARY

B-9325-TMA-610

SDG:	VALIDATOR:	DATE: 2/24/94	PAGE 1 OF 1

COMMENTS: Volatiles

FIELD SAMPLE ID	ANALYSIS TYPE	DATE SAMPLED	DATE PREPARED	DATE ANALYZED	PREP. HOLDING TIME, DAYS	ANALYSIS HOLDING TIME, DAYS	QUALIFIER
B-9325	VOA	09/07/93		09/16/93		9 ~~7~~ 10 days	None
B-9326		09/07/93		09/16/93		9	
B-9327		09/08/93		09/16/93		8	
B-9328		09/08/93		09/15/93		7	
B-9329		09/08/93		09/15/93		7	
B-9330		09/08/93		09/15/93		7	
B-9331		09/08/93		09/15/93		7	

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

~~000237~~

EPA SAMPLE NO.

VBLK0916R

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 09021 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: SBLK0916

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 30916R03

Level: (low/med) LOW Date Received:

% Moisture: not dec. Date Analyzed: 09/16/93

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

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

Assoc 4 B09325, B09326, B09327

CONCENTRATION UNITS:

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

MC=20

MC=30

9413225.0376

2/24/94

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

~~000238~~

EPA SAMPLE NO.

VBLK0916R

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 09021 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: SBLK0916

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 30916R03

Level: (low/med) LOW Date Received: _____

% Moisture: not dec. ____ Date Analyzed: 09/16/93

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

~~000227~~

EPA SAMPLE NO.

VBLK0915R

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 09021 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: SBLK0915

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 30915R10

Level: (low/med) LOW Date Received: _____

% Moisture: not dec. ____ Date Analyzed: 09/15/93

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

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

Assoc w/ B09328, B09329, B09330, B09331

CONCENTRATION UNITS:

CAS NO.	COMPOUND	(ug/L or ug/Kg) UG/KG	Q
74-87-3	Chloromethane	10	U
74-83-9	Bromomethane	10	U
75-01-4	Vinyl Chloride	10	U
75-00-3	Chloroethane	10	U
75-09-2	Methylene Chloride	1	J (MB=10)
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	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

EPA SAMPLE NO.

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS ~~000228~~

VBLK0915R

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 09021 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: SBLK0915

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 30915R10

Level: (low/med) LOW Date Received: _____

% Moisture: not dec. _____ Date Analyzed: 09/15/93

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

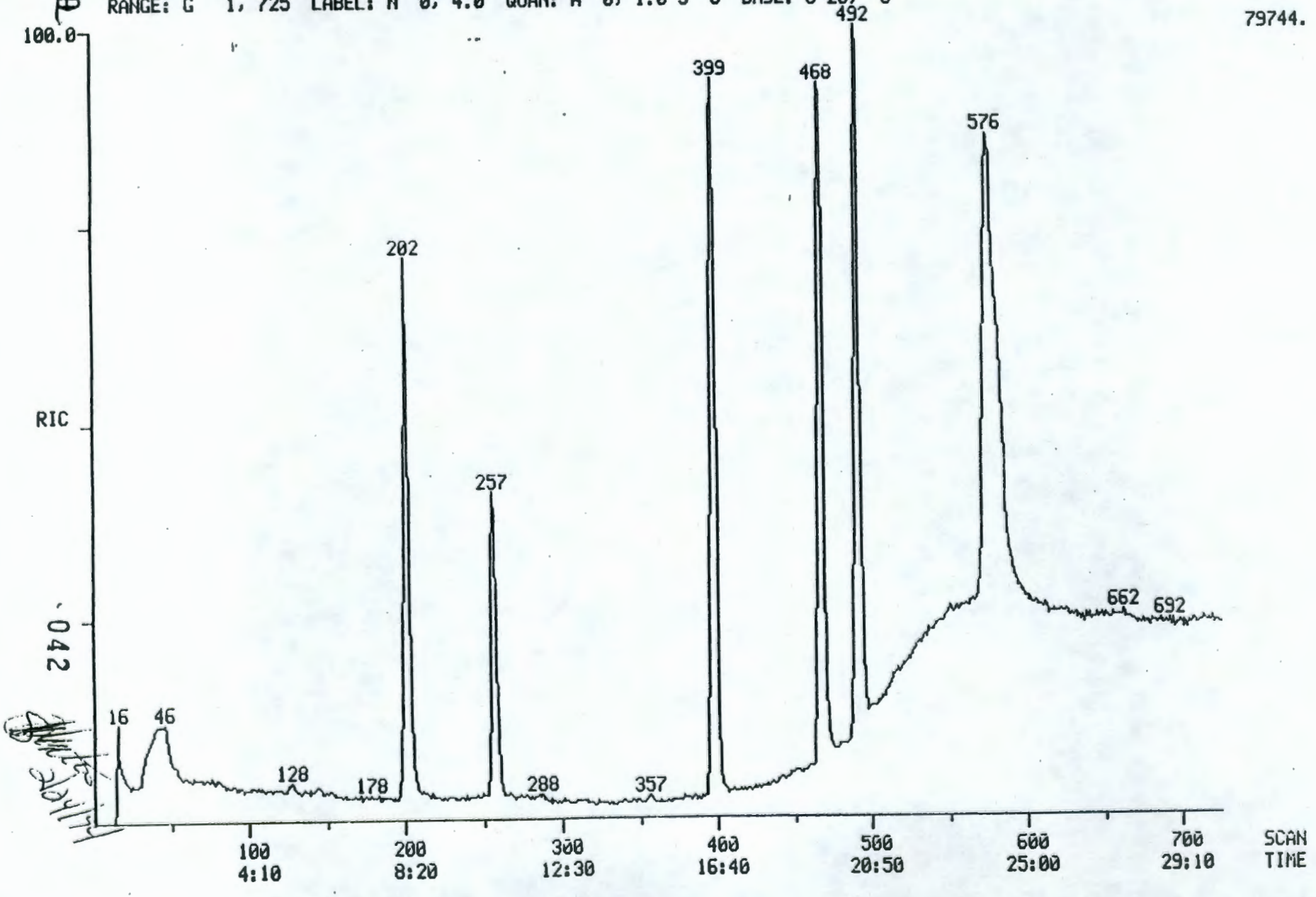
~~000154~~

RIC
09/15/93 18:07:00
SAMPLE: CLP,09021,,B09329,L,S,A309021-06A,VOA/H,EPA
CONDS.: PACK/2,30915R08,3BFB0915A,30915R10,,
RANGE: G 1, 725 LABEL: N 0, 4.0 QUAN: A 0, 1.0 J 0 BASE: U 20, 3

DATA: 30915R15 #1
CALI: 30915R15 #7

SCANS 1 TO 725

79744.



Sample B09329

Sample B=9329

Quantitation Report File: 30915R15

Data: 30915R15.TI
09/15/93 18:07:00

~~000155~~

Sample: CLP,09021,,B09329,L,S,A309021-06A,VOA/H,EPA
Conds.: PACK/2,30915R08,3BFB0915A,30915R10,,
Formula: 0.000 Instrument: 4500 Weight: 5.000
Submitted by: TMA-ARLI Analyst: CY Acct. No.:

AMOUNT=AREA * REF AMNT/(REF AREA * RESP FACT)
Resp. fac. from Library Entry

No	Name	
1	CI01	BROMOCHLOROMETHANE(I.S)
2	CI10	1,4-DIFLUORBENZENE(I.S)
3	CI20	CHLOROBENZENE D-5(I.S)
4	CS15	D4-1,2-DICHLOROETHANE(SURR)
5	CS05	D8-TOLUENE(SURR)
6	CS10	BROMOFLUOROBENZENE(SURR)
~~7~~	~~C035~~	~~ACETONE~~

jmh 12/07/93

No	m/z	Scan	Time	Ref	RRT	Meth	Area(Hght)	Amount	%Tot
1	128	202	8:25	1	1.000	A BB	29567.	50.000 PPB	15.76
2	114	399	16:37	2	1.000	A BB	119618.	50.000 PPB	15.76
3	117	492	20:30	3	1.000	A BB	101789.	50.000 PPB	15.76
4	65	257	10:42	1	1.272	A BB	39346.	51.037 PPB	16.09
5	98	468	19:30	3	0.951	A BB	99400.	54.744 PPB	17.26
6	95	576	24:00	3	1.171	A BB	62961.	50.627 PPB	15.96
~~7~~	~~43~~	~~144~~	~~6:00~~	~~1~~	~~0.718~~	~~A VB~~	~~2730.~~	~~10.843 PPB~~	~~3.42~~

No	Ret(L)	Ratio	RRT(L)	Ratio	Amnt	Amnt(L)	R.Fac	R.Fac(L)	Ratio
1	8:25	1.00	1.000	1.00	50.00	50.00	1.000	1.000	1.00
2	16:35	1.00	1.000	1.00	50.00	50.00	1.000	1.000	1.00
3	20:30	1.00	1.000	1.00	50.00	50.00	1.000	1.000	1.00
4	10:42	1.00	1.272	1.00	51.04	50.00	1.331	1.304	1.02
5	19:30	1.00	0.951	1.00	54.74	50.00	0.977	0.892	1.09
6	23:57	1.00	1.169	1.00	50.63	50.00	0.619	0.611	1.01
7	6:02	0.99	0.718	0.99	10.84	50.00	0.092	0.426	0.22

9W3225.0381

2/24/94

-043

Quantitation Report File: 30915R15

Sample B09329

Data: 30915R15.TI
09/15/93 18:07:00
Sample: CLP,09021,,B09329,L,S,A309021-06A,VOA/H,EPA ~~000156~~
Conds.: PACK/2,30915R08,3BFB0915A,30915R10,,
Formula: 0.000 Instrument: 4500 Weight: 5.000
Submitted by: TMA-ARLI Analyst: CY Acct. No.:

AMOUNT=AREA * REF AMNT/(REF AREA * RESP FACT)
Resp. fac. from Library Entry

No	Name	
1	CI01	BROMOCHLOROMETHANE(I.S)
2	CI10	1,4-DIFLUORBENZENE(I.S)
3	CI20	CHLOROBENZENE D-5(I.S)
4	CS15	D4-1,2-DICHLOROETHANE(SURR)
5	CS05	D8-TOLUENE(SURR)
6	CS10	BROMOFLUOROBENZENE(SURR)
7	C010	CHLOROMETHANE
8	C015	BROMOMETHANE
9	C020	VINYL CHLORIDE
10	C025	CHLOROETHANE
11	C030	METHYLENE CHLORIDE
12	C035	ACETONE
13	C040	CARBON DISULFIDE
14	C045	1,1-DICHLOROETHENE
15	C050	1,1-DICHLOROETHANE
16	C053	1,2-DICHLOROETHENE(TOTAL)
17	C060	CHLOROFORM
18	C110	2-BUTANONE
19	C065	1,2-DICHLOROETHANE
20	C115	1,1,1-TRICHLOROETHANE
21	C120	CARBON TETRACHLORIDE
22	C125	VINYL ACETATE
23	C130	BROMODICHLOROMETHANE
24	C140	1,2-DICHLOROPROPANE
25	C143	CIS-1,3-DICHLOROPROPENE
26	C150	TRICHLOROETHENE
27	C155	DIBROMOCHLOROMETHANE
28	C165	BENZENE
29	C160	1,1,2-TRICHLOROETHANE
30	C172	TRANS-1,3-DICHLOROPROPENE
31	C175	2-CHLOROETHOXY ETHENE
32	C180	BROMOFORM
33	C205	4-METHYL-2-PENTANONE
34	C210	2-HEXANONE
35	C225	1,1,2,2-TETRACHLOROETHANE
36	C220	TETRACHLOROETHENE
37	C230	TOLUENE
38	C235	CHLOROBENZENE
39	C240	ETHYL BENZENE
40	C245	STYRENE
41	C255	M-XYLENE
42	C250	O,P-XYLENE

9H4225.0382

2/24/94

Sample B09329

~~000157~~

No	m/z	Scan	Time	Ref	RRT	Meth	Area(Hght)	Amount	%Tot
1	128	202	8:25	1	1.000	A BB	29567.	50.000 PPB	15.56
2	114	399	16:37	2	1.000	A BB	119618.	50.000 PPB	15.56
3	117	492	20:30	3	1.000	A BB	101789.	50.000 PPB	15.56
4	65	257	10:42	1	1.272	A BB	39346.	51.037 PPB	15.88
5	98	468	19:30	3	0.951	A BB	99400.	54.744 PPB	17.04
6	95	576	24:00	3	1.171	A BB	62961.	50.627 PPB	15.76
7	NOT FOUND								
8	NOT FOUND								
9	NOT FOUND								
10	NOT FOUND								
~~11~~	~~84~~	~~128~~	~~5:20~~	~~1~~	~~0.634~~	~~A BB~~	~~675.~~	~~0.878 PPB~~	~~0.27~~
~~12~~	~~43~~	~~144~~	~~6:00~~	~~1~~	~~0.713~~	~~A VB~~	~~2730.~~	~~10.843 PPB~~	~~3.37~~
13	NOT FOUND								
14	NOT FOUND								
15	NOT FOUND								
16	NOT FOUND								
17	NOT FOUND								
18	NOT FOUND								
19	NOT FOUND								
20	NOT FOUND								
21	NOT FOUND								
~~22~~	~~43~~	~~287~~	~~11:57~~	~~2~~	~~0.719~~	~~A BB~~	~~893.~~	~~0.467 PPB~~	~~0.15~~
23	NOT FOUND								
24	NOT FOUND								
25	NOT FOUND								
26	NOT FOUND								
27	NOT FOUND								
28	NOT FOUND								
29	NOT FOUND								
30	NOT FOUND								
31	NOT FOUND								
32	NOT FOUND								
33	NOT FOUND								
34	NOT FOUND								
35	NOT FOUND								
36	NOT FOUND								
~~37~~	~~91~~	~~472~~	~~19:40~~	~~3~~	~~0.959~~	~~A BB~~	~~1813.~~	~~0.845 PPB~~	~~0.26~~
38	NOT FOUND								
39	NOT FOUND								
40	NOT FOUND								
41	NOT FOUND								
42	NOT FOUND								

CCV RT is 6.02

fnd) 12/07/93

9/21/93

$$\text{ug/kg Acetone} = \frac{(2730)(50)}{(2956)(0.426)(0.90\text{ moisture})} = 12.04 = 12 \text{ ug/kg}$$

~~= 12.04 = 12 mg/kg~~

2/24/94

No	Ret(L)	Ratio	RRT(L)	Ratio	Amnt	Amnt(L)	R.Fac	R.Fac(L)	Ratio
1	8:32	0.99	1.000	1.00	50.00	50.00	1.000	1.000	1.00
2	16:35	1.00	1.000	1.00	50.00	50.00	1.000	1.000	1.00
3	20:27	1.00	1.000	1.00	50.00	50.00	1.000	1.000	1.00
4	10:45	1.00	1.259	1.01	51.04	50.00	1.331	1.304	1.02
5	19:27	1.00	0.951	1.00	54.74	50.00	0.977	0.892	1.09
6	23:57	1.00	1.171	1.00	50.63	50.00	0.619	0.611	1.01
7	1:07		0.132						
8	2:05		0.244						
9	2:42		0.317						
10	3:45		0.439						
11	5:42	0.93	0.668	0.95	0.88	50.00	0.023	1.301	0.02
12	6:22	0.94	0.746	0.96	10.84	50.00	0.092	0.426	0.22

2/24/94

045

09/21/93

9W3225.0383

Sample BC9329

No	Ret(L)	Ratio	RRT(L)	Ratio	Amnt	Amnt(L)	R. Fac	R. Fac(L)	Ratio
13	6:57		0.815						
14	8:05		0.946						
15	9:10		1.073						
16	9:45		1.141						
17	10:17		1.205						
18	10:45		1.259						
19	10:50		1.268						
20	11:52		0.716						
21	12:10		0.734						
22	12:12	0.98	0.736	0.98	0.47	50.00	0.007	0.799	0.01
23	12:37		0.761						
24	13:40		0.824						
25	13:52		0.837						
26	14:15		0.859						
27	14:52		0.897						
28	14:35		0.879						
29	14:55		0.899						
30	14:52		0.897						
31	15:40		0.945						
32	16:57		1.023						
33	17:12		0.841						
34	18:25		0.900						
35	18:47		0.919						
36	18:40		0.912						
37	19:37	1.00	0.959	1.00	0.84	50.00	0.018	1.054	0.02
38	20:35		1.006						
39	22:02		1.077						
40	24:57		1.220						
41	25:07		1.228						
42	25:52		1.265						

~~000158~~

9411225-0384

RADIOCHEMISTRY DATA VALIDATION SUMMARY FOR DATA PACKAGE:
B09325-TMA-620 (923-E418 620RA.UP2)

MEMORANDUM

TO: 200 UP-2 Project QA Record

March 24, 1994

FR: Thomas Stapp, Golder Associates Inc.

RE: RADIOCHEMISTRY DATA VALIDATION SUMMARY FOR DATA PACKAGE B09325-TMA-620 (923-E418 620RAD.UP2)

INTRODUCTION

This memo presents the results of data validation on data package B09325-TMA-620 prepared by the TMA/Norcal laboratory under contract to Westinghouse/Hanford using WHC approved methods. Information concerning the samples validated along with the analyses reported and the methods of analysis is provided in the following table.

SAMPLE ID	SAMPLE DATE	MEDIA	ANALYSIS
B09325	9/7/93	SOIL	SEE NOTES
B09326	9/7/93	SOIL	
B09327	9/8/93	SOIL	
B09328	9/8/93	SOIL	
B09329	9/8/93	SOIL	
B09330	9/8/93	SOIL	

NOTES:

1. Indicates the samples were analyzed for gross alpha/beta, strontium-90, technetium-99 (beta counting), selenium-79 (liquid scintillation), isotopic plutonium, uranium, curium-244, americium-241, and neptunium-237 (alpha spectroscopy), total uranium (laser fluorometry), and selected radioisotopes by gamma spectroscopy.

2. All samples were 100% validated.

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

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

DATA QUALITY OBJECTIVES

Precision. Goals for precision were met.

Accuracy. Goals for accuracy were met.

Sample Result Verification. All sample results were supported in the raw data. However, sample results for total uranium and minimum detectable activities for neptunium-237 and iodine-129 could not be verified accurately by recalculation. No qualification was necessary since the sample results were supported in the raw data.

Detection Limits. Detection limit goals were acceptable for all sample results with the following exceptions.

SAMPLE ID	ANALYTE	MINIMUM DETECTABLE ACTIVITY REPORTED (pCi/g)	REQUIRED DETECTION LIMIT (pCi/g)
All Samples	Iron 59	ranged from 0.06 to 0.200	0.05
B09326	Cobalt 60	0.06	0.05
B09325	Cobalt-58	0.1	0.05
	Cobalt-60	0.1	0.05
	Europium-152	0.3	0.05
	Europium-154	0.2	0.05
	Europium-155	0.3	0.05

Completeness. The data package was complete for all requested analyses. A total of six samples were validated in this data package with a total of 210 determinations reported, of which 209 were deemed valid. This results in a completeness of 99.5 percent, which meets normal work plan data quality objectives of 90%.

MAJOR DEFICIENCIES

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

Continuing Calibration

- The calibration check analyzed after the sample analysis for technetium-99 on detector LBG-15 was unacceptable. Therefore the associated result for sample B09325 has been qualified as unusable (UR).

MINOR DEFICIENCIES

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

Laboratory Blanks

- Technetium-99 was detected in the laboratory blank. Attachments 2 and 5 provide a summary of the samples affected, data qualification and supporting documentation.

Laboratory Control Sample

- Laboratory control sample analysis was not performed for selenium-79, therefore, results for all samples have been qualified as estimated (J for detects, UJ for non-detects).

DATA REPORTING

- Sample results reported as less than (L.T.) by the laboratory have been qualified as undetected (U) on the laboratory result forms (see Attachment 3).

- Secondary results reported by the laboratory have been crossed out, initialed and dated to clarify reported laboratory results (see Attachment 3).

REFERENCES

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

WHC 1993b, Data Validation Procedures for Radiochemical Analyses, WHC-SD-EN-SPP-001, Rev. 1, 1993. Westinghouse Hanford Company, Richland, Washington.

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.

ATTACHMENT 2

SUMMARY OF DATA QUALIFICATIONS

DATA QUALIFICATION SUMMARY - FORM B-7

SDG: B09325-TMA-620	REVIEWER: T. STAPP	DATE: 3-2-94	PAGE 1 OF 1
COMMENTS: RADIOCHEMISTRY			
COMPOUND/ANALYTE	QUALIFIER	SAMPLES AFFECTED	REASON
ALL VALUES REPORTED AS LESS THAN (L.T.)	U	ALL	QUALIFIER APPLIED TO BE CONSISTENT WITH NORMAL REPORTING PRACTICE
ALL SECONDARY RESULTS	NONE	ALL	~~VALUES~~ HAVE BEEN LINED OUT TO CLARIFY REPORTING OF DATA
TECHNETIUM-99	J	B09327	CONTAMINANT FOUND IN BLANK
SELENIUM-79	J/UJ	ALL	BLANK SPIKE SAMPLE WAS NOT ANALYZED
TECHNETIUM-99	UR	B09325	CALIBRATION CHECK WAS OUT OF LABORATORY CONTROL LIMITS

ATTACHMENT 3

QUALIFIED DATA SUMMARY and ANNOTATED LABORATORY REPORTS

Validated Data Summary, Data Package: B09325-IMA-620

	Sample #	B09325		B09326		B09327		B09328		B09329		B09330	
	Date	9-7-93		9-7-93		9-8-93		9-8-93		9-8-93		9-8-93	
	Location	299-W19-97		299-W19-95		299-W19-97		299-W19-97		299-W19-95		299-W19-97	
	Depth	4.00 - 6.00		30.00 - 32.50		10.00 - 12.50		20.00 - 22.50		45.00 - 47.50		30.00 - 32.00	
	Type	---		---		---		---		---		---	
	Comments	---		---		---		---		---		---	
Parameter	Units	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
GROSS ALPHA	pCi/g	5.500		9.900		4.500		8.600		7.800		5.200	
GROSS BETA	pCi/g	38.000		15.000		11.000		13.000		22.000		14.000	
SELENIUM-79	pCi/g	2.000	UJ	3.000	UJ	2.000	UJ	4.500	J	2.000	UJ	3.000	UJ
STRONTIUM-90	pCi/g	3.300		0.800	U	0.800	U	0.900	U	0.800	U	0.900	U
TECHNETIUM-99	pCi/g	0.200	UR	0.200	U	0.430	J	0.200	U	0.300	U	0.300	U
IODINE-129	pCi/g	2.000	U	2.000	U	2.000	U	1.000	U	2.000	U	2.000	U
URANIUM-233/234	pCi/g	0.690		0.590		0.380		0.260		0.370		0.350	
URANIUM-235	pCi/g	0.090	U	0.080	U	0.080	U	0.090	U	0.100	U	0.100	U
URANIUM-238	pCi/g	0.640		0.480		0.430		0.360		0.440		0.330	
TOTAL URANIUM	pCi/g	2.000		1.800		1.600		1.400		1.600		1.500	
NEPTUNIUM-237	pCi/g	0.030	U	0.010	U	0.040	U	0.030	U	0.020	U	0.020	U
PLUTONIUM-238	pCi/g	0.020	U	0.020	U	0.020	U	0.020	U	0.040	U	0.020	U
PLUTONIUM-239/240	pCi/g	0.020	U	0.020	U	0.020	U	0.020	U	0.040	U	0.020	U
AMERICIUM-241	pCi/g	0.010	U	0.010	U	0.010	U	0.020	U	0.040	U	0.030	U
CURIUM-244	pCi/g	0.010	U	0.010	U	0.010	U	0.020	U	0.040	U	0.020	U
SODIUM-22	pCi/g	0.100	U	0.050	U	0.050	U	0.030	U	0.030	U	0.030	U
POTASSIUM-40	pCi/g	9.600		12.000		11.000		11.000		11.000		10.000	
MANGANESE-54	pCi/g	0.090	U	0.050	U	0.040	U	0.020	U	0.030	U	0.030	U
IRON-59	pCi/g	0.200	U	0.100	U	0.100	U	0.060	U	0.090	U	0.080	U
COBALT-58	pCi/g	0.100	U	0.050	U	0.030	U	0.020	U	0.030	U	0.030	U
COBALT-60	pCi/g	0.100	U	0.060	U	0.040	U	0.030	U	0.030	U	0.040	U
NIOBIUM-94	pCi/g	0.100	U	0.040	U	0.040	U	0.020	U	0.030	U	0.030	U
RUTHENIUM-103	pCi/g	0.200	U	0.050	U	0.040	U	0.020	U	0.030	U	0.030	U
RUTHENIUM-106	pCi/g	1.000	U	0.400	U	0.300	U	0.200	U	0.300	U	0.200	U
TIN-113	pCi/g	0.300	U	0.050	U	0.050	U	0.030	U	0.030	U	0.030	U
CESIUM-134	pCi/g	0.100	U	0.050	U	0.050	U	0.030	U	0.060	U	0.030	U
CESIUM-137	pCi/g	22.000		0.050	U	0.040	U	0.020	U	0.030	U	0.030	U
CERIUM-144	pCi/g	0.700	U	0.200	U	0.200	U	0.100	U	0.200	U	0.200	U
EUROPIUM-152	pCi/g	0.300	U	0.090	U	0.090	U	0.050	U	0.070	U	0.070	U
EUROPIUM-154	pCi/g	0.200	U	0.060	U	0.050	U	0.030	U	0.050	U	0.050	U
EUROPIUM-155	pCi/g	0.300	U	0.100	U	0.100	U	0.080	U	0.100	U	0.100	U
RADIUM-226	pCi/g	0.410		0.610		0.440		0.330		0.410		0.370	
RADIUM-228	pCi/g	0.680		0.910		0.740		0.530		0.530		0.580	
THORIUM-228	pCi/g	0.550		0.790		0.850		0.520		0.490		0.550	
THORIUM-232	pCi/g	0.680		0.910		0.740		0.530		0.530		0.580	

Verified 3-17-94

600

N309038-01

TMA NORCAL
REPORTING GROUP 7240

DATA SHEET

B09325

SDG 7240 Client Westinghouse Hanford
Contact Dinkar Kharkar Contract MBH-SVV-069262

Lab sample id N309038-01 Client sample id B09325
Dept sample id 7240-001 Location/Matrix 200-UP-2 SOLID
Received 09/10/93 Collected 09/07/93
% moisture 15.1 Chain of custody id NONE

94W325.0395

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALIFIERS	TEST
Gross Alpha	Alpha	5.5	3.8	4	10	~~J~~	80A
Gross Beta	Beta	38	5.2	5	10		80B
Selenium 79	15758-45-9	~~1.1~~	~~0.69~~	2	10	U J	SE
Strontium 90	10098-97-2	3.3	0.44	0.9	1		Y
Technetium 99	14133-76-7	~~0.003~~	~~0.072~~	0.2	0.5	U R	TC
Iodine 129	15046-84-1	~~0.51~~	~~0.66~~	2	2	U	I
Uranium 233/234		0.69	0.18	0.09	0.3		U
Uranium 235	15117-96-1	~~0.057~~	~~0.046~~	0.09	0.3	U	U
Uranium 238		0.64	0.16	0.07	0.3		U
Total Uranium (ug/g)	7440-61-1	2.0	0.37	0.03	0.1	~~X~~	U_T
Neptunium 237	13994-20-2	~~0.004~~	~~0.015~~	0.03	0.2	U	NP
Plutonium 238	13981-16-3	~~0.002~~	~~0.004~~	0.02	0.05	U	PU
Plutonium 239/240		~~0.009~~	~~0.009~~	0.02	0.05	U	PU
Americium 241	14596-10-2	~~0.004~~	~~0.004~~	0.01	0.05	U	TP
Curium 244	13981-15-2	~~0.002~~	~~0.004~~	0.01	0.05	U	TP
GAMMA SCAN ANALYTES							
Sodium 22	13966-32-0	U		0.1		U	GAM
Potassium 40	13966-00-2	9.6	1.8				GAM
Manganese 54	13966-31-9	U		0.09		U	GAM
Iron 59	14596-12-4	U		0.2	0.05	U	GAM
Cobalt 58	13981-38-9	U		0.1	0.05	U	GAM
Cobalt 60	10198-40-0	U		0.1	0.05	U	GAM
Niobium 94	14681-63-1	U		0.1		U	GAM
Ruthenium 103	13968-53-1	U		0.2		U	GAM
Ruthenium 106	13967-48-1	U		1		U	GAM
Tin 113	13966-06-8	U		0.3		U	GAM
Cesium 134	13967-70-9	U		0.1		U	GAM
Cesium 137	10045-97-3	22	0.56		0.05		GAM

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-010

SDG 7240 Client Westinghouse Hanford
Contact Dinkar Kharkar Contract MBH-SVV-069262

Lab sample id N309038-01 Client sample id B09325
Dept sample id 7240-001 Location/Matrix 200-UP-2 SOLID
Received 09/10/93 Collected 09/07/93
% moisture 15.1 Chain of custody id NONE

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Cerium 144	14762-78-8	U		0.7		U	GAM
Europium 152	14683-23-9	U		0.3	0.1	U	GAM
Europium 154	15585-10-1	U		0.2	0.1	U	GAM
Europium 155	14391-16-3	U		0.3	0.1	U	GAM
Radium 226	13982-63-3	0.41	0.22				GAM
Radium 228	15262-20-1	0.68	0.44				GAM
Thorium 228	14274-82-9	0.55	0.26				GAM
Thorium 232	7440-29-1	0.68	0.44				GAM

LAB SAMPLE	TEST	PLANCHET	SUFFIX	ALIQUOT	ANALYZED	REVIEWED	BY
N309038-01	80A/80	7240-001		0.100 g	10/12/93	10/13/93	DPK
N309038-01	80B/80	7240-001		0.100 g	10/12/93	10/13/93	DPK
N309038-01	SE	7240-001		0.520 g	11/04/93	11/18/93	DPK
N309038-01	Y	7240-001		1.00 g	10/05/93	10/12/93	DPK
N309038-01	TC	7240-001		2.04 g	10/11/93	10/13/93	DPK
N309038-01	I	7240-001		1.00 g	10/29/93	11/02/93	DPK
N309038-01	U	7240-001		1.00 g	10/12/93	10/13/93	DPK
N309038-01	U_T	7240-001		0.250 g	10/06/93	11/30/93	DPK
N309038-01	NP	7240-001	A1	1.00 g	11/03/93	11/11/93	DPK
N309038-01	PU	7240-001		1.00 g	10/11/93	10/12/93	DPK
N309038-01	TP	7240-001	A2	1.00 g	12/13/93	12/16/93	DPK
N309038-01	GAM	7240-001		191 g	09/22/93	09/28/93	DPK

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N309038-02

TMA NORCAL
REPORTING GROUP 7240

DATA SHEET

B09326

SDG 7240 Client Westinghouse Hanford
Contact Dinkar Kharkar Contract MBH-SVV-069262

Lab sample id N309038-02 Client sample id B09326
Dept sample id 7240-002 Location/Matrix 200-UP-2 SOLID
Received 09/10/93 Collected 09/07/93
% moisture 12.2 Chain of custody id NONE

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALIFIERS	TEST
Gross Alpha	Alpha	9.9	4.7	4	10	~~J~~	80A
Gross Beta	Beta	15	4.0	5	10		80B
Selenium 79	15758-45-9	~~0.85~~	~~1.1~~	3	10	U J	SE
Strontium 90	10098-97-2	~~0.13~~	~~0.21~~	0.8	1	U	Y
Technetium 99	14133-76-7	~~0.088~~	~~0.082~~	0.2	0.5	U	TC
Iodine 129	15046-84-1	~~0.15~~	~~0.74~~	2	2	U	I
Uranium 233/234		0.59	0.15	0.07	0.3		U
Uranium 235	15117-96-1	~~0.021~~	~~0.043~~	0.08	0.3	U	U
Uranium 238		0.48	0.13	0.07	0.3		U
Total Uranium (ug/g)	7440-61-1	1.8	0.32	0.03	0.1	~~K~~	U_T
Neptunium 237	13994-20-2	~~0.007~~	~~0.007~~	0.01	0.2	~~UK~~ U	NP
Plutonium 238	13981-16-3	~~0~~	~~0.004~~	0.02	0.05	U	PU
Plutonium 239/240		~~0.009~~	~~0.009~~	0.02	0.05	U	PU
Americium 241	14596-10-2	~~0.005~~	~~0.007~~	0.01	0.05	U	TP
Curium 244	13981-15-2	~~0.005~~	~~0.007~~	0.01	0.05	U	TP
GAMMA SCAN ANALYTES							
Sodium 22	13966-32-0	U		0.05		U	GAM
Potassium 40	13966-00-2	12	1.0				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		0.06	0.05	U	GAM
Niobium 94	14681-63-1	U		0.04		U	GAM
Ruthenium 103	13968-53-1	U		0.05		U	GAM
Ruthenium 106	13967-48-1	U		0.4		U	GAM
Tin 113	13966-06-3	U		0.05		U	GAM
Cesium 134	13967-70-9	U		0.05		U	GAM
Cesium 137	10045-97-3	U		0.05	0.05	U	GAM

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N309038-02

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B09326

SDG 7240 Client Westinghouse Hanford
Contact Dinkar Kharkar Contract MBH-SVV-069262

Lab sample id N309038-02 Client sample id B09326
Dept sample id 7240-002 Location/Matrix 200-UP-2 SOLID
Received 09/10/93 Collected 09/07/93
% moisture 12.2 Chain of custody id NONE

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALIFIERS	TEST
Cerium 144	14762-78-8	U		0.2		U	GAM
Europium 152	14683-23-9	U		0.09	0.1	U	GAM
Europium 154	15585-10-1	U		0.06	0.1	U	GAM
Europium 155	14391-16-3	U		0.1	0.1	U	GAM
Radium 226	13982-63-3	0.61	0.095				GAM
Radium 228	15262-20-1	0.91	0.20				GAM
Thorium 228	14274-82-9	0.79	0.060				GAM
Thorium 232	7440-29-1	0.91	0.20				GAM

LAB SAMPLE	TEST	PLANCHET	SUFFIX	ALIQUOT	ANALYZED	REVIEWED	BY
N309038-02	80A/80	7240-002		0.100 g	10/12/93	10/13/93	DPK
N309038-02	80B/80	7240-002		0.100 g	10/12/93	10/13/93	DPK
N309038-02	SE	7240-002		0.520 g	11/04/93	11/18/93	DPK
N309038-02	Y	7240-002		1.00 g	10/05/93	10/07/93	DPK
N309038-02	TC	7240-002		2.00 g	10/11/93	10/13/93	DPK
N309038-02	I	7240-002		1.00 g	10/15/93	10/28/93	DPK
N309038-02	U	7240-002		1.00 g	10/12/93	10/13/93	DPK
N309038-02	U_T	7240-002		0.250 g	10/06/93	11/30/93	DPK
N309038-02	NP	7240-002	A1	1.00 g	11/03/93	11/11/93	DPK
N309038-02	PU	7240-002		1.00 g	10/11/93	10/12/93	DPK
N309038-02	TP	7240-002	A2	1.00 g	12/13/93	12/16/93	DPK
N309038-02	GAM	7240-002		767 g	09/22/93	09/28/93	DPK

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N309038-03

TMA NORCAL
REPORTING GROUP 7240

DATA SHEET

B09327

SDG 7240 Client Westinghouse Hanford
Contact Dinkar Kharkar Contract MBH-SVV-069262

Lab sample id N309038-03 Client sample id B09327
Dept sample id 7240-003 Location/Matrix 200-UP-2 SOLID
Received 09/10/93 Collected 09/08/93
% moisture 11.2 Chain of custody id NONE

9413225.0399

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALIFIERS	TEST
Gross Alpha	Alpha	4.5	3.8	4	10	~~J~~	80A
Gross Beta	Beta	11	3.9	5	10		80B
Selenium 79	15758-45-9	~~2.5~~	~~1.4~~	2	10	~~U~~ UJ	SE
Strontium 90	10098-97-2	0.096	0.20	0.8	1	U	Y
Technetium 99	14133-76-7	0.43	0.26	0.3	0.5	J	TC
Iodine 129	15046-84-1	~~0.008~~	~~1.0~~	2	2	U	I
Uranium 233/234		0.38	0.13	0.1	0.3		U
Uranium 235	15117-96-1	~~0.053~~	~~0.064~~	0.08	0.3	U	U
Uranium 238		0.43	0.13	0.07	0.3		U
Total Uranium (ug/g)	7440-61-1	1.6	0.29	0.03	0.1	~~X~~	U_T
Neptunium 237	13994-20-2	~~0.003~~	~~0.021~~	0.04	0.2	U	NP
Plutonium 238	13981-16-3	~~0~~	~~0.005~~	0.02	0.05	U	PU
Plutonium 239/240		~~0.002~~	~~0.005~~	0.02	0.05	U	PU
Americium 241	14596-10-2	~~0.002~~	~~0.007~~	0.01	0.05	U	TP
Curium 244	13981-15-2	~~0.002~~	~~0.007~~	0.01	0.05	U	TP
GAMMA SCAN ANALYTES							
Sodium 22	13966-32-0	U		0.05		U	GAM
Potassium 40	13966-00-2	11	0.33				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		0.04		U	GAM
Ruthenium 106	13967-48-1	U		0.3		U	GAM
Tin 113	13966-06-8	U		0.05		U	GAM
Cesium 134	13967-70-9	U		0.05		U	GAM
Cesium 137	10045-97-3	U		0.04	0.05	U	GAM

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SDG 7240 Client Westinghouse Hanford
Contact Dinkar Kharkar Contract MBH-SVV-069262

Lab sample id N309038-03 Client sample id B09327
Dept sample id 7240-003 Location/Matrix 200-UP-2 SOLID
Received 09/10/93 Collected 09/08/93
% moisture 11.2 Chain of custody id NONE

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		0.09	0.1	U	GAM
Europium 154	15585-10-1	U		0.05	0.1	U	GAM
Europium 155	14391-16-3	U		0.1	0.1	U	GAM
Radium 226	13982-63-3	0.44	0.087				GAM
Radium 228	15262-20-1	0.74	0.18				GAM
Thorium 228	14274-82-9	0.85	0.075				GAM
Thorium 232	7440-29-1	0.74	0.18				GAM

LAB SAMPLE	TEST	PLANCHET	SUFFIX	ALIQUOT	ANALYZED	REVIEWED	BY
N309038-03	80A/80	7240-003		0.100 g	10/12/93	10/13/93	DPK
N309038-03	80B/80	7240-003		0.100 g	10/12/93	10/13/93	DPK
N309038-03	SE	7240-003		0.510 g	11/04/93	11/18/93	DPK
N309038-03	Y	7240-003		1.00 g	10/05/93	10/07/93	DPK
N309038-03	TC	7240-003		2.00 g	10/12/93	10/13/93	DPK
N309038-03	I	7240-003		1.00 g	11/12/93	11/16/93	DPK
N309038-03	U	7240-003		1.00 g	10/12/93	10/13/93	DPK
N309038-03	U_T	7240-003		0.250 g	10/06/93	11/30/93	DPK
N309038-03	NP	7240-003	A1	1.00 g	11/03/93	11/11/93	DPK
N309038-03	PU	7240-003		1.00 g	10/11/93	10/12/93	DPK
N309038-03	TP	7240-003	A2	1.00 g	12/13/93	12/16/93	DPK
N309038-03	GAM	7240-003		375 g	09/22/93	09/28/93	DPK

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N309038-04

TMA NORCAL
REPORTING GROUP 7240

DATA SHEET

B09328

SDG 7240 Client Westinghouse Hanford
Contact Dinkar Kharkar Contract MBH-SVV-069262

Lab sample id N309038-04 Client sample id B09328
Dept sample id 7240-004 Location/Matrix 299-UP-2 SOLID
Received 09/10/93 Collected 09/08/93
% moisture 11.8 Chain of custody id NONE

GW 3225.0401

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Gross Alpha	Alpha	8.6	4.5	4	10	~~J~~	80A
Gross Beta	Beta	13	4.0	5	10		80B
Selenium 79	15758-45-9	4.5	1.4	3	10	J	SE
Strontium 90	10098-97-2	~~0.003~~	~~0.61~~	0.9	1	U	Y
Technetium 99	14133-76-7	~~0.074~~	~~0.078~~	0.2	0.5	U	TC
Iodine 129	15046-84-1	~~0.12~~	~~0.55~~	1	2	U	I
Uranium 233/234		0.26	0.12	0.09	0.3	~~J~~	U
Uranium 235	15117-96-1	~~0~~	~~0.023~~	0.09	0.3	U	U
Uranium 238		0.36	0.12	0.07	0.3		U
Total Uranium (ug/g)	7440-61-1	1.4	0.25	0.03	0.1	~~X~~	U_T
Neptunium 237	13994-20-2	~~0~~	~~0.019~~	0.03	0.2	U	NP
Plutonium 238	13981-16-3	~~0~~	~~0.005~~	0.02	0.05	U	PU
Plutonium 239/240		~~0.009~~	~~0.009~~	0.02	0.05	U	PU
Americium 241	14596-10-2	~~0~~	~~0.008~~	0.02	0.05	U	TP
Curium 244	13981-15-2	~~0.008~~	~~0.008~~	0.02	0.05	U	TP
GAMMA SCAN ANALYTES							
Sodium 22	13966-32-0	U		0.03		U	GAM
Potassium 40	13966-00-2	11	0.56				GAM
Manganese 54	13966-31-9	U		0.02		U	GAM
Iron 59	14596-12-4	U		0.06	0.05	U	GAM
Cobalt 58	13981-38-9	U		0.02	0.05	U	GAM
Cobalt 60	10198-40-0	U		0.03	0.05	U	GAM
Niobium 94	14681-63-1	U		0.02		U	GAM
Ruthenium 103	13968-53-1	U		0.02		U	GAM
Ruthenium 106	13967-48-1	U		0.2		U	GAM
Tin 113	13966-06-8	U		0.03		U	GAM
Cesium 134	13967-70-9	U		0.03		U	GAM
Cesium 137	10045-97-3	U		0.02	0.05	U	GAM

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REPORTING GROUP 7240

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B09328

SDG 7240 Client Westinghouse Hanford
Contact Dinkar Kharkar Contract MBH-SVV-069262

Lab sample id N309038-04 Client sample id B09328
Dept sample id 7240-004 Location/Matrix 299-UP-2 SOLID
Received 09/10/93 Collected 09/08/93
% moisture 11.8 Chain of custody id NONE

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Cerium 144	14762-78-8	U		0.1		U	GAM
Europium 152	14683-23-9	U		0.05	0.1	U	GAM
Europium 154	15585-10-1	U		0.03	0.1	U	GAM
Europium 155	14391-16-3	U		0.08	0.1	U	GAM
Radium 226	13982-63-3	0.33	0.045				GAM
Radium 228	15262-20-1	0.53	0.11				GAM
Thorium 228	14274-82-9	0.52	0.030				GAM
Thorium 232	7440-29-1	0.53	0.11				GAM

LAB SAMPLE	TEST	PLANCHET	SUFFIX	ALIQUOT	ANALYZED	REVIEWED	BY
N309038-04	80A/80	7240-004		0.100 g	10/12/93	10/13/93	DPK
N309038-04	80B/80	7240-004		0.100 g	10/12/93	10/13/93	DPK
N309038-04	SE	7240-004		0.560 g	11/04/93	11/18/93	DPK
N309038-04	Y	7240-004		1.00 g	10/05/93	10/07/93	DPK
N309038-04	TC	7240-004		2.02 g	10/13/93	10/18/93	DPK
N309038-04	I	7240-004		1.00 g	10/29/93	11/02/93	DPK
N309038-04	U	7240-004		1.00 g	10/12/93	10/13/93	DPK
N309038-04	U_T	7240-004		0.250 g	10/06/93	11/30/93	DPK
N309038-04	NP	7240-004		1.00 g	10/15/93	10/27/93	DPK
N309038-04	PU	7240-004		1.00 g	10/11/93	10/12/93	DPK
N309038-04	TP	7240-004	A2	1.00 g	12/13/93	12/16/93	DPK
N309038-04	GAM	7240-004		875 g	09/22/93	09/28/93	DPK

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TMA NORCAL
REPORTING GROUP 7240

DATA SHEET

B09329

SDG 7240 Client Westinghouse Hanford
Contact Dinkar Kharkar Contract MBH-SVV-069262

Lab sample id N309038-05 Client sample id B09329
Dept sample id 7240-005 Location/Matrix 200-UP-2 SOLID
Received 09/10/93 Collected 09/08/93
% moisture 11.3 Chain of custody id NONE

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Gross Alpha	Alpha	7.8	4.5	5	10	~~J~~	80A
Gross Beta	Beta	22	4.4	5	10		80B
Selenium 79	15758-45-9	~~-2.3~~	~~1.1~~	2	10	~~U~~ UJ	SE
Strontium 90	10098-97-2	~~0~~	~~1.3~~	0.8	1	U	Y
Technetium 99	14133-76-7	~~0.10~~	~~0.098~~	0.3	0.5	U	TC
Iodine 129	15046-84-1	~~0.027~~	~~0.99~~	2	2	U	I
Uranium 233/234		0.37	0.14	0.08	0.3		U
Uranium 235	15117-96-1	~~0.026~~	~~0.027~~	0.1	0.3	U	U
Uranium 238		0.44	0.14	0.08	0.3		U
Total Uranium (ug/g)	7440-61-1	1.6	0.29	0.03	0.1	~~*~~	U_T
Neptunium 237	13994-20-2	~~0.006~~	~~0.013~~	0.02	0.2	U	NP
Plutonium 238	13981-16-3	~~0.005~~	~~0.010~~	0.04	0.05	U	PU
Plutonium 239/240		~~0.010~~	~~0.010~~	0.04	0.05	U	PU
Americium 241	14596-10-2	~~0.009~~	~~0.022~~	0.04	0.05	U	TP
Curium 244	13981-15-2	~~0.009~~	~~0.018~~	0.04	0.05	U	TP
GAMMA SCAN ANALYTES							
Sodium 22	13966-32-0	U		0.03		U	GAM
Potassium 40	13966-00-2	11	0.74				GAM
Manganese 54	13966-31-9	U		0.03		U	GAM
Iron 59	14596-12-4	U		0.09	0.05	U	GAM
Cobalt 58	13981-38-9	U		0.03	0.05	U	GAM
Cobalt 60	10198-40-0	U		0.03	0.05	U	GAM
Niobium 94	14681-63-1	U		0.03		U	GAM
Ruthenium 103	13968-53-1	U		0.03		U	GAM
Ruthenium 106	13967-48-1	U		0.3		U	GAM
Tin 113	13966-06-8	U		0.03		U	GAM
Cesium 134	13967-70-9	U		0.06		U	GAM
Cesium 137	10045-97-3	U		0.03	0.05	U	GAM

9HW325.0403

Verified
3-17-94

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~~38~~

Lab id TMAN
Protocol WHC-HASM
Version Ver 1.0
Form DVD-DS
Version 2.27
Report date 12/21/93

SDG 7240 Client Westinghouse Hanford
Contact Dinkar Kharkar Contract MBH-SVV-069262

Lab sample id N309038-05 Client sample id B09329
Dept sample id 7240-005 Location/Matrix 200-UP-2 SOLID
Received 09/10/93 Collected 09/08/93
% moisture 11.3 Chain of custody id NONE

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALIFIERS	TEST
Cerium 144	14762-78-8	U		0.2		U	GAM
Europium 152	14683-23-9	U		0.07	0.1	U	GAM
Europium 154	15585-10-1	U		0.05	0.1	U	GAM
Europium 155	14391-16-3	U		0.1	0.1	U	GAM
Radium 226	13982-63-3	0.41	0.060				GAM
Radium 228	15262-20-1	0.53	0.12				GAM
Thorium 228	14274-82-9	0.49	0.039				GAM
Thorium 232	7440-29-1	0.53	0.12				GAM

LAB SAMPLE	TEST	PLANCHET	SUFFIX	ALIQUOT	ANALYZED	REVIEWED	BY
N309038-05	80A/80	7240-005		0.100 g	10/12/93	10/13/93	DPK
N309038-05	80B/80	7240-005		0.100 g	10/12/93	10/13/93	DPK
N309038-05	SE	7240-005		0.520 g	11/05/93	11/18/93	DPK
N309038-05	Y	7240-005		1.00 g	10/05/93	10/12/93	DPK
N309038-05	TC	7240-005		2.00 g	10/12/93	10/13/93	DPK
N309038-05	I	7240-005		1.00 g	10/15/93	10/28/93	DPK
N309038-05	U	7240-005		1.00 g	10/12/93	10/13/93	DPK
N309038-05	U_T	7240-005		0.250 g	10/06/93	11/30/93	DPK
N309038-05	NP	7240-005		1.00 g	10/15/93	10/22/93	DPK
N309038-05	PU	7240-005		1.00 g	10/11/93	10/12/93	DPK
N309038-05	TP	7240-005	A2	1.00 g	12/13/93	12/16/93	DPK
N309038-05	GAM	7240-005		961 g	09/22/93	09/28/93	DPK

Verified
3-17-94

Lab id TMAN
Protocol WHC-HASM
Version Ver 1.0
Form DVD-DS
Version 2.27
Report date 12/21/93

N309038-06

TMA NORCAL
REPORTING GROUP 7240

DATA SHEET

B09330

SDG 7240 Client Westinghouse Hanford
Contact Dinkar Kharkar Contract MBH-SVV-069262

Lab sample id N309038-06 Client sample id B09330
Dept sample id 7240-006 Location/Matrix 200-UP-2 SOLID
Received 09/10/93 Collected 09/08/93
% moisture 10.3 Chain of custody id NONE

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Gross Alpha	Alpha	5.2	4.0	4	10	~~J~~	80A
Gross Beta	Beta	14	3.9	5	10		80B
Selenium 79	15758-45-9	~~1.4~~	~~1.9~~	3	10	~~U~~ UJ	SE
Strontium 90	10098-97-2	~~0.092~~	~~0.24~~	0.9	1	U	Y
Technetium 99	14133-76-7	~~0.26~~	~~0.11~~	0.3	0.5	U	TC
Iodine 129	15046-84-1	~~0.36~~	~~0.92~~	2	2	U	I
Uranium 233/234		0.35	0.16	0.1	0.3		U
Uranium 235	15117-96-1	~~0~~	~~0.037~~	0.1	0.3	U	U
Uranium 238		0.33	0.16	0.1	0.3		U
Total Uranium (ug/g)	7440-61-1	1.5	0.27	0.03	0.1	~~X~~	U_T
Neptunium 237	13994-20-2	~~0.011~~	~~0.011~~	0.02	0.2	U	NP
Plutonium 238	13981-16-3	~~0~~	~~0.005~~	0.02	0.05	U	PU
Plutonium 239/240		~~0~~	~~0.005~~	0.02	0.05	U	PU
Americium 241	14596-10-2	~~0~~	~~0.016~~	0.03	0.05	U	TP
Curium 244	13981-15-2	~~0.002~~	~~0.012~~	0.02	0.05	U	TP
GAMMA SCAN ANALYTES							
Sodium 22	13966-32-0	U		0.03		U	GAM
Potassium 40	13966-00-2	10	0.72				GAM
Manganese 54	13966-31-9	U		0.03		U	GAM
Iron 59	14596-12-4	U		0.08	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		0.03		U	GAM
Ruthenium 103	13968-53-1	U		0.03		U	GAM
Ruthenium 106	13967-48-1	U		0.2		U	GAM
Tin 113	13966-06-8	U		0.03		U	GAM
Cesium 134	13967-70-9	U		0.03		U	GAM
Cesium 137	10045-97-3	U		0.03	0.05	U	GAM

9414275.0805

Verified 3-17-94

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Lab id TMAN
Protocol WHC-HASM
Version Ver 1.0
Form DVD-DS
Version 2.27
Report date 12/21/93

SDG 7240 Client Westinghouse Hanford
Contact Dinkar Kharkar Contract MBH-SVV-069262

Lab sample id N309038-06 Client sample id B09330
Dept sample id 7240-006 Location/Matrix 200-UP-2 SOLID
Received 09/10/93 Collected 09/08/93
% moisture 10.3 Chain of custody id NONE

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		0.07	0.1	U	GAM
Europium 154	15585-10-1	U		0.05	0.1	U	GAM
Europium 155	14391-16-3	U		0.1	0.1	U	GAM
Radium 226	13982-63-3	0.37	0.061				GAM
Radium 228	15262-20-1	0.58	0.14				GAM
Thorium 228	14274-82-9	0.55	0.039				GAM
Thorium 232	7440-29-1	0.58	0.14				GAM

LAB SAMPLE	TEST	PLANCHET	SUFFIX	ALIQUOT	ANALYZED	REVIEWED	BY
N309038-06	80A/80	7240-006		0.100 g	10/12/93	10/13/93	DPK
N309038-06	80B/80	7240-006		0.100 g	10/12/93	10/13/93	DPK
N309038-06	SE	7240-006		0.520 g	11/05/93	11/18/93	DPK
N309038-06	Y	7240-006		1.00 g	10/05/93	10/07/93	DPK
N309038-06	TC	7240-006		2.00 g	10/12/93	10/13/93	DPK
N309038-06	I	7240-006		1.00 g	10/28/93	11/02/93	DPK
N309038-06	U	7240-006		1.00 g	10/18/93	10/20/93	DPK
N309038-06	U_T	7240-006		0.250 g	10/06/93	11/30/93	DPK
N309038-06	NP	7240-006		1.00 g	10/15/93	10/27/93	DPK
N309038-06	PU	7240-006		1.00 g	10/11/93	10/12/93	DPK
N309038-06	TP	7240-006	A2	1.00 g	12/13/93	12/16/93	DPK
N309038-06	GAM	7240-006		923 g	09/22/93	09/28/93	DPK

Verified 3-17-94

Lab id TMAN
Protocol WHC-HASM
Version Ver 1.0
Form DVD-DS
Version 2.27
Report date 12/21/93

ATTACHMENT 4

LABORATORY NARRATIVE and CHAIN-OF-CUSTODY DOCUMENTATION

SDG: 7240
Contact: Dinkar Kharkar

TMA NORCAL
REPORTING GROUP 7240

Client: Westinghouse Hanford
Contract: MBH-SVV-069262

CASE NARRATIVE

1.0 GENERAL

TMA/Norcal Sample Delivery Group 7240 is comprised of the samples listed on the chain-of-custody documents below. This sample group was processed under the Westinghouse Hanford Company Statement of Work P.O. MBH-SVV-069262.

1.1 Chains-of-Custody
This report includes data for the six soil samples from location 200-UP-2, delivered under Field Log Book #EFL-1091. Chain-of-Custody numbers were not provided.

1.2 Sample Volume
One thousand mL plastic bottles containing the samples were received for the analyses. These were not adequate volumes to obtain the required detection limits for the gamma scan analyses.

1.3 Missing Samples
All samples listed under Field Log Book #EFL-1091 were received.

1.4 Holding Times
The samples were collected on September 7 and 8, 1993 and sample processing was initiated within 180 days of collection.

2.0 QUALITY CONTROL

The internal quality control consisted of one sample each of a laboratory control sample, a blank, and a replicate. All original analyses were performed with QC samples 7240-07 through 7240-09. Neptunium-237 analyses were performed with QC samples 7240-09 through 7240-11. Americium-241 and curium-244 analyses were performed with QC samples 7240-09, 12, 13, and 14.

The QC samples were prepared by the Quality Control Department. Copies of the QC notebook pages are included in this data package.

2.1 Laboratory Control Samples
The LCS recoveries for all nuclides were acceptable. The MDA's of the results for all analyses met the RDL's.

3-2-94

SDG: 7240
Contact: Dinkar Kharkar

TMA NORCAL
REPORTING GROUP 7240

Client: Westinghouse Hanford
Contract: MBH-SVV-069262

2.0 QUALITY CONTROL (cont'd)

2.2 Reagent Blanks

The MDA's of the results for all analyses met the RDL's except for neptunium-237 on sample 7240-008 due to a low chemical yield. The neptunium-237 result for blank 7240-011 was higher than the MDA, but well below the RDL. The negative results of gross beta and selenium-79 were underlined because they were less than the negative of their 2 σ counting error. The technetium-99 result for blank 7240-008 was higher than the MDA but well below the RDL.

2.3 Duplicates

Results were satisfactory for all duplicate analyses. The MDA's of gamma nuclides for the original of sample BO9325 were underlined because they were less than the negative of their 2 σ counting error. The 2 σ counting error for neptunium-237 for the duplicate of sample BO9325 was underlined because it was larger than both the MDA and the result implying that the MDA may not be a good estimate of the "real" minimum detectable activity.

3.0 ANALYSIS NOTES

3.1 Gross Alpha Analyses

The average MDA for gross alpha was (4 ± 1) pCi/g. Gross alpha activity above the MDA but below the RDL was found in all of the samples.

3.2 Gross Beta Analyses

The average MDA for gross beta was (5 ± 0) pCi/g. Gross beta activity above the RDL was found in all of the samples.

3.3 Selenium-79 Analyses

The average yield for nine analyses was (74 ± 35)%. The lowest yield was 44% and the highest was 96%. The average MDA was (2 ± 1) pCi/g. Selenium-79 activity above the RDL was not found in any of the samples.

3.4 Strontium-90 Analyses

The average yield for nine analyses was (84 ± 6)%. The lowest yield was 78% and the highest was 88%. The average MDA was (0.8 ± 0.2) pCi/g. Strontium-90 activity above the RDL was found in sample BO9325.

3.5 Technetium-99 Analyses

The average yield for nine analyses was (66 ± 9)%. The lowest yield was 59% and the highest was 71%. The average MDA was (0.2 ± 0.2) pCi/g. Technetium-99 activity above the RDL was not found in any of the samples.

3-2-94

SDG: 7240
Contact: Dinkar Kharkar

TMA NORCAL
REPORTING GROUP 7240

Client: Westinghouse Hanford
Contract: MBH-SVV-069262

3.0 ANALYSIS NOTES (cont'd)

3.6 Iodine-129 Analyses
The average yield for nine analyses was (77 ± 19)%. The lowest yield was 65% and the highest was 93%. The average MDA was (2 ± 0.9) pCi/g. Iodine-129 activity above the RDL was not found in any of the samples.

3.7 Isotopic Uranium Analyses
The average yield for nine analyses was (74 ± 26)%. The lowest yield was 48% and the highest was 90%. The average MDA was (0.1 ± 0.1) pCi/g. Uranium-233/234 and uranium-238 activity above the RDL was found in all of the samples.

3.8 Total Uranium Analyses
The average MDA was (0.4 ± 0.2) μg/g. Uranium concentrations ranging from 1.4 to 2.0 μg/g were found in the samples.

3.9 Isotopic Plutonium Analyses
The average yield for nine analyses was (58 ± 27)%. The lowest yield was 30% and the highest was 74%. The average MDA was (0.02 ± 0.01) pCi/g. Plutonium-238 and plutonium-239/240 activity above the RDL's was not found in any of the samples.

3.10 Neptunium-237 Analyses
The average yield for eleven analyses was (31 ± 22)%. The lowest yield was 2% and the highest yield was 47%. The average MDA was (0.2 ± 0.7) pCi/g. Neptunium-237 activity above the RDL was not found in any of the samples.

3.11 Americium-241/Curium-244 Analyses
The average yield for eleven analyses was (73 ± 13)%. The lowest yield was 62% and the highest yield was 82%. The average MDA was (0.02 ± 0.02) pCi/g. Americium-241 and curium-244 activity above the RDL was not found in any of the samples.

3.12 Gamma Scan Analyses
A gamma scan analysis found cesium-137 in sample BO9325. The MDA of the results for iron-59 for all of the samples were higher than the RDL due to the short half-life of iron-59. Natural potassium-40, radium-226, radium-228, thorium-228, and thorium-232 activity was found in all of the samples.

3-2-94

Westinghouse Hanford Company	CHAIN OF CUSTODY

Custody Form Initiator: L E ROGERS

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

Project Designation/Sampling Locations: 200-UP-2 — Collection Date: 9-7-93

Ice Chest No. ~~Rusty Dusty~~ (9/9/93 SML-27) — Field Logbook No.: EFL-1091

Bill of Lading/Airbill No.: — Offsite Property No.:

Method of Shipment: OVERNIGHT AIR SERVICE

Shipped to: TMA

Possible Sample Hazards/Remarks: Keep samples at 4C (SOIL) None noted

Sample Identification

1) B09325

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) B09326

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) SER 9-7-93

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

9413225.0411

[ ] Field Transfer of Custody

Chain of Possession (Sign and Print Names)

Relinquished by:	Received by:	Date/Time:
1510 Jeanne E. Rogers 9-7-93	JG Hogan	9-7-93 / 1510
JG Hogan	J.D. Franker	9/9/93 1030
J.D. Franker 9/9/93 1030	Toby Y. Yamamoto	9/10/93 11:15 AM
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

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

~~80~~ 3-2-94

Westinghouse Hanford Company	CHAIN OF CUSTODY

Custody Form Initiator: L E ROGERS

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

Project Designation/Sampling Locations: 200-UP-2 — Collection Date: 9-8-93

Ice Chest No.: SML-353 — Field Logbook No.: EFL-1091

Bill of Lading/Airbill No.: — Offsite Property No.:

Method of Shipment: OVERNIGHT AIR SERVICE

Shipped to: TMA

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

Sample Identification

1) B09327

1,250ml	P:CLP;TAL Metals,Hg,Ti
~~1,250ml~~ 2,120ml	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

9HJ3225.04 KR 9-8-93

2) B09328

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) B09330

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: 1400 9-8-93	Received by:	Date/Time: 1400 9-8-93
Relinquished by: 9.9.93 1030	Received by: J.D.Franklin	Date/Time: 9/9/93 1030
Relinquished by: J-D-Franklin 9/9/93 1050	Received by: Eloy L. Yamamoto	Date/Time: 9/10/93 11:15 AM
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

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

~~82~~ 3-2-94

027

Westinghouse Hanford Company	CHAIN OF CUSTODY

Custody Form Initiator: L E ROGERS

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

Project Designation/Sampling Locations: 200-UP-2 — Collection Date: 9-8-93

Ice Chest No.: SML-352 — Field Logbook No.: EFL-1091

Bill of Lading/Airbill No.: _____ — Offsite Property No.: _____

Method of Shipment: OVERNIGHT AIR SERVICE

Shipped to: TMA

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

Sample Identification

1) B09329

1,250ml	P:CLP;TAL Metals,Hg,Ti
~~1,250ml~~ 2,120ml	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

SER 9-8-93

9413225.0411

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) SER 9-8-93

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:
1400 Leon E Rogers 9-8-93	Received by for Shipment Jan F Link	1400 9-8-93
Relinquished by: RT. Schlo 9-9-93 1030	Received by: J.D. Fancher	Date/Time: 9/9/93 1130
Relinquished by: J.D. Fancher 9/9/93 1050	Received by: Ebay G. Yamamoto	Date/Time: 9/10/93 11:15 AM
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

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

~~81~~ 3-2-94

ATTACHMENT 5

DATA VALIDATION SUPPORTING DOCUMENTATION

RADIOCHEMICAL DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E (circled)

PROJECT: 200 UP-2		DATA PACKAGE:	
VALIDATOR: T. Stapp	LAB: Thermo Analytic	DATE: Feb. 23 1994	
CASE:		SDG: B09325-TMA-620	

ANALYSES PERFORMED

☑ Gross Alpha/Beta	☑ Strontium-90	☑ Technetium-99	☑ Alpha Spectroscopy	☑ Gamma Spectroscopy	
☑ Total Uranium	☐ Radium-22	☐ Tritium	☑ Se-79 by LSC	☑ Iodine-129	☑ Neptunium-237

SAMPLES/MATRIX

1. Completeness . . . . . ☐ N/A

Technical verification forms present? . . . . . (Yes) No N/A

Comments: Performed by WHC

2. Initial Calibration . . . . . ☐ N/A

Instruments/detectors calibrated within one year of sample analysis? . . . . . (Yes) No N/A

Initial calibration acceptable? . . . . . (Yes) No N/A

Standards NIST traceable? . . . . . (Yes) No N/A

Standards Expired? . . . . . Yes (No) N/A

Comments:

3. Continuing Calibration . . . . . ☐ N/A

Calibration checked within one week of sample analysis? . . . (Yes) No N/A
Calibration check acceptable? . . . . NOTE ① . . . . . (Yes) (No) N/A
Calibration check standards NIST traceable? . . . . . (Yes) No N/A
Calibration check standards expired? . . . . . Yes (No) N/A

Comments: ① LBG-15 for Tc-99 contin. calib. check is outside control limits for date of analysis. See Calibration check summary page for this detector. Sample B0Q325 TC-99 result qualified UR.

4. Blanks . . . . . ☐ N/A

Method blank analyzed? . . . . . (Yes) No N/A
Method blank results acceptable? . . . . . Yes (No) N/A
Analytes detected in method blank? See note ① . . . . . (Yes) No N/A
Field blank(s) analyzed? . . . Note ② . . . . . 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? . . . . . pCi/g . . 3/24/94 . . Yes (No) N/A

Comments: ① Tc-99 blank result = 0.15 (MDA 0.1) Associated results < 5× blank and above MDA are qualified as estimated (J).
② Field QC is not identified in this sample set but sample identification has been requested. Field QC will be evaluated in the Final data Summary.

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:

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6. Laboratory Control Samples . . . . . ☐ N/A

LCS analyzed? . . Note ① and ② . . . . . (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: ① Blank Spike is considered an LCS.
② LCS analysis not performed for Se-79, associated results are qualified as estimated (J/UJ).

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:

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? . Note ① . . . . . Yes No (N/A)
Field duplicate RPD values acceptable? . . . . . Yes No (N/A)
Field split sample(s) analyzed? . . . . . Yes No (N/A)
Field split RPD values acceptable? . . . . . Yes No (N/A)
Performance audit sample(s) analyzed? . . . . . Yes No (N/A)
Performance audit sample results acceptable? . . . . . Yes No (N/A)

Comments: ① Field QC including duplicate and split field samples were not identified in this Sample set, but it has been requested. Field QC will be evaluated in the final data summary.

10. Holding Times

Are sample holding times acceptable? . . . Note ① . . . (Yes) No N/A

Comments: ① See Summary on comments page (A-5).

11. Results and Detection Limits (Levels D & E) . . . . . ☐ N/A

Results reported for all required sample analyses? . . . . . (Yes) No N/A
Results supported in raw data? . . . . . (Yes) No N/A
Results Acceptable? . . . . . (Yes) No N/A
Transcription/Calculation errors? . . . . . Yes (No) N/A
MDA's meet required detection limits? See Note ① and ③ . Yes (No) N/A
Transcription/calculation errors? . See Note ② . . . . . (Yes) No N/A

Comments: ① Lab blank MDA for neptunium-237 is greater than the RDL. No qualification applies to sample results.
② Recalculation of many MDA's do not check out which may be due to laboratory substitution of calculated background statistics, however verification of reported MDA's with raw data is correct and complete.
③ See note ③ on comments page A-5.

Comments:

HOLDING TIME SUMMARY:

Sample ID	Collect Date	Grs α/β	Se79	Sr90	Tc99	I129	U	Pu	Np	Am	Cm	Total	Gamma
BC9325	9-7-93	✓	✓	✓	✓	✓	✓	✓	✓	97	97	✓	✓
BC9326	-7-	✓	✓	✓	✓	✓	✓	✓	✓	97	97	✓	✓
BC9327	9-8-93	✓	✓	✓	✓	✓	✓	✓	✓	96	96	✓	✓
BC9328	-8-	✓	✓	✓	✓	✓	✓	✓	✓	96	96	✓	✓
BC9329	-8-	✓	✓	✓	✓	✓	✓	✓	✓	96	96	✓	✓
BC9330	9-8-93	✓	✓	✓	✓	✓	✓	✓	✓	96	96	✓	✓

✓ - Indicates compliance within 180 days maximum holding time requirement. No qualification applied.

(3) Fe-59 MDA above RDL on all samples. Co-60 ~~and is~~ MDA is above RDL for samples BC9325 and BC9326, and Co-58, Europium-152, 154, and -155 ~~are above~~ MDA's are above the RDL on sample BC9325 as indicated by underlined MDA values on laboratory report sheets. No qualifiers are applied.

9113225.0419

N309038-08

TMA NORCAL
REPORTING GROUP 7240

REAGENT BLANK

Reagent Blank

SDG 7240 Client Westinghouse Hanford
Contact Dinkar Kharkar Contract MBH-SVV-069262

Lab sample id N309038-08 Client sample id Reagent Blank
Dept sample id 7240-008 Material/Matrix SOLID

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Gross Alpha	Alpha	1.2	2.8	4	10	U	80A
Gross Beta	Beta	-3.3	2.8	5	10	U	80B
Selenium 79	15758-45-9	-2.1	1.3	2	10	U	SE
Strontium 90	10098-97-2	0.013	0.16	0.6	1	U	Y
Technetium 99	14133-76-7	0.15	0.052	0.1	0.5	J	TC
Iodine 129	15046-84-1	-0.78	1.1	2	2	U	I
Uranium 233/234		0.012	0.046	0.09	0.3	U	U
Uranium 235	15117-96-1	0.014	0.028	0.1	0.3	U	U
Uranium 238		0.035	0.046	0.09	0.3	U	U
Total Uranium (ug/g)	7440-61-1	U		0.003	0.1	UX	U_T
Neptunium 237	13994-20-2	-0.25	0.25	0.8	0.2	U	NP
Plutonium 238	13981-16-3	0.006	0.006	0.02	0.05	U	PU
Plutonium 239/240		0.014	0.017	0.02	0.05	U	PU
GAMMA SCAN ANALYTES							
Sodium 22	13966-32-0	U		0.02		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		0.02	0.05	U	GAM
Cobalt 58	13981-38-9	U		0.01	0.05	U	GAM
Cobalt 60	10198-40-0	U		0.02	0.05	U	GAM
Niobium 94	14681-63-1	U		0.02		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		0.02		U	GAM
Cesium 134	13967-70-9	U		0.02		U	GAM
Cesium 137	10045-97-3	U		0.01	0.05	U	GAM
Cerium 144	14762-78-8	U		0.06		U	GAM
Europium 152	14683-23-9	U		0.03	0.1	U	GAM
Europium 154	15585-10-1	U		0.02	0.1	U	GAM
Europium 155	14391-16-3	U		0.04	0.1	U	GAM

9413225.0420

(qualifies positive detects) Tc 99 Results no J

Initial 5/24/94

18

REAGENT BLANKS
Page 1
SUMMARY DATA SECTION
Page 10

Lab id TMAN
Protocol WHC-HASM
Version Ver 1.0
Form DVD-DS
Version 2.27
Report date 12/21/93

BETA .Efficiency QC 15:19:02 09-MAR-94
Parameter controlled is Ratio of assigned cpm to counted cpm
Data Summary

LBG 15 SF 68.772 94 1.038 +/- 0.006 last= 1.045 1.7

Low Abs Contr Val..	0.950	Check Source....	(use avg)
Upper Abs Contr Val	1.050	Assigned value..	2436.00 cpm
Minimum Std Dev....	0.010	Reference T1/2..	0.00 days
Maximum Std Dev....	0.030	Reference Date..	0.000 0
History Index.....	10 points	Min count time..	3.0 minutes

Date	Length of cnt	Cnts	Value	Lower CL	Upper CL	New Avg	Norm Dev	S
274.643 93	17.57	41543	1.030	1.007	1.050	1.038	-0.7	
275.703 93	17.07	39815	1.044	1.008	1.050	1.038	1.6	
277.729 93	28.12	66397	1.032	1.008	1.050	1.037	-0.6	
279.725 93	13.07	30623	1.040	1.007	1.050	1.039	0.5	
280.739 93	21.86	51673	1.031	1.009	1.050	1.038	-0.8	
282.695 93	11.03	25748	1.044	1.008	1.050	1.038	1.6	
284.910 93	29.26	67795	1.052	1.008	1.050	1.038	3.5	*H
284.932 93	10.01	23650	1.031	1.008	1.050	1.039	-0.7	
285.751 93	14.41	33664	1.043	1.009	1.050	1.038	1.2	
286.734 93	15.54	36341	1.042	1.008	1.050	1.037	1.0	
287.743 93	9.45	21847	1.054	1.007	1.050	1.037	4.0	*H
287.788 93	9.30	21770	1.041	1.007	1.050	1.038	0.9	
288.672 93	27.53	64165	1.045	1.008	1.050	1.039	1.9	th
289.676 93	18.04	42678	1.025	1.009	1.050	1.038	-1.4	
291.760 93	27.05	62968	1.047	1.008	1.050	1.039	2.2	th
292.743 93	10.98	25604	1.045	1.009	1.050	1.040	1.6	th
293.703 93	20.77	48993	1.033	1.010	1.050	1.040	-0.7	
294.736 93	26.76	62875	1.037	1.010	1.050	1.039	-0.3	
295.656 93	18.23	42944	1.035	1.009	1.050	1.039	-0.4	
296.717 93	16.27	38642	1.026	1.009	1.050	1.038	-1.4	

Status codes: wl = Low warning wh = High warning
tl = Low trend th = High trend
*L = Low failure *H = High failure
XX = Not evaluated RC = Reconfigured

Calibration Check Summary

BC9325 Sample analysis performed @ 284.767 (GMT)

3-17-94

~~237N~~

SAMPLE RESULT VERIFICATION, B09325-TMA-620

Gross Alpha/Beta

Sample ID:	B09325	B09326	B09327	B09328	B09329	B09330	QC-LCS	QC-BLANK	B09325 DUP
Aliquot:	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Detector:	102	104	109	112	113	114	115	116	112
Count time:	100	100	100	100	100	100	100	100	100
Alpha cpm:	0.25	0.32	0.15	0.26	0.31	0.18	5.43	0.07	0.36
Alpha, Bkgd:	0.066	0.054	0.04	0.043	0.079	0.049	0.084	0.043	0.043
Alpha, Xtalk:	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006
Alpha, Eff:	0.134	0.117	0.105	0.109	0.126	0.108	0.101	0.107	0.101
Alpha Result Calc.:	5.47	9.92	4.45	8.67	7.82	5.15	228.26	1.21	13.03
Alpha Result Rptd.:	5.46	9.92	4.45	8.63	7.81	5.15	230.00	1.20	13.00
Alpha MDA Calc.:	4.02	4.17	4.00	3.99	4.68	4.30	6.02	4.07	4.31
Alpha MDA Rptd.:	4.04	4.19	4.02	3.96	4.68	4.33	0.61	0.40	4.28
Beta cpm:	4.71	2.48	2.1	2.35	3.09	2.24	40.5	0.69	5.3
Bkgd:	1.123	1.025	1.021	1.09	1.008	0.936	1.005	0.985	1.091
Xtalk:	0.27	0.28	0.294	0.284	0.275	0.288	0.297	0.289	0.297
Eff:	0.42	0.416	0.413	0.415	0.418	0.414	0.412	0.414	0.412
Beta Result Calc.:	37.94	14.95	11.42	13.01	21.75	13.78	414.42	-3.29	44.99
Beta Result Rptd:	38.00	15.00	11.40	13.00	21.80	13.80	420.00	-3.30	45.10
Beta MDA Calc:	5.30	5.11	5.14	5.28	5.04	4.91	5.11	5.03	5.32
Beta MDA rptd:	5.30	5.10	5.14	5.29	5.04	4.90	0.51	0.50	5.32

Selenium 79

Sample ID:	B09325	B09326	B09327	B09328	B09329	B09330	BLANK	B09325DUP
Detector, LSC:	5	5	5	5	5	5	5	5
Count time:	150	150	150	150	150	150	150	150
Detector Eff:	0.622	0.547	0.701	0.311	0.712	0.693	0.622	0.581
Sample cpm:	8.09	9.20	7.47	10.50	7.30	8.15	7.60	8.91
Bkgd cpm:	8.82	8.82	8.66	8.82	8.66	8.66	8.66	8.82
Yield:	0.9573	0.712	0.5948	0.9705	0.7284	0.4381	0.7387	0.8065
Decay Corr:	1	1	1	1	1	1	1	1
Aliquot:	0.52	0.52	0.51	0.56	0.52	0.52	1	0.54
Result calc:	-1.06	0.85	-2.51	4.48	-2.27	-1.45	-1.04	0.17
Result rptd:	-1.06	0.85	-2.51	4.48	-2.27	-1.45	-1.04	0.17
MDA calc:	1.64	2.51	2.37	3.01	1.87	3.19	1.10	2.01
MDA rptd:	1.67	2.56	2.41	3.06	1.90	3.25	1.11	2.04

Strontium 90

Sample ID:	B09325	B09326	B09327	B09328	B09329	B09330	QC-LCS	QC-BLANK	B09325-DUP
Detector:	203	204	205	206	207	208	209	210	212
Bkg:	0.4414	0.4220	0.3625	0.4560	0.4068	0.5503	0.4621	0.4086	0.4453
Count Time:	33.000	33.000	33.000	33.000	33.000	33.000	33.000	33.000	33.000
Y90 cpm:	3.049	-0.165	0.096	-0.003	0.000	-0.1084	12.495	0.013	2.688
Elapsed Time, days:	27.449	27.449	26.449	26.449	26.449	26.449	0	0	27.449
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	6.86E-05
Decay:	0.9981	0.9981	0.9982	0.9982	0.9982	0.9982	1.0000	1.0000	0.9981
Yield:	0.7816	0.8777	0.8387	0.8253	0.8595	0.8347	0.8569	0.8441	0.7991
PPT. corr.:	1	1	1	1	1	1	1	1	1
Aliquot:	1	1	1	1	1	1	1	1	1
Product:	0.7801	0.8760	0.8372	0.8238	0.8579	0.8332	0.8569	0.8441	0.7976
C-zero:	3.9083	-0.1880	0.1147	-0.0036	0.0000	-0.1301	14.5816	0.0154	3.3701
P-Factor:	1.859	1.859	1.859	1.859	1.859	1.859	1.859	1.859	1.859
Result, calc.:	3.3	-0.2	0.1	-0.0	0.0	-0.1	12.2	0.0	2.8
Result, rptd.:	3.3	-0.1	0.1	-0.0	0.0	0.1	12.0	0.0	2.8
MDA, calc.:	0.8	0.9	0.8	0.8	0.8	0.9	0.9	0.8	0.8
MDA, rptd.:	0.9	0.8	0.8	0.9	0.8	0.9	0.8	0.6	0.7

911325.0422

SAMPLE RESULT VERIFICATION, B09325-TMA-620

Technetium 99

Sample ID:	B09325	B09326	B09327	B09328	B09329	B09330	QC-LCS	QC-BLANK	B09325-DUP
Detector:	10	16	11	13	13	14	13	11	12
Aliquot:	2.040	2.000	2.000	2.020	2.000	2.000	1.000	1.000	2.000
P-Factor:	2.340	2.340	2.340	2.340	2.340	2.340	2.340	2.340	2.340
Yield:	0.7040	0.6254	0.6368	0.6914	0.6001	0.6499	0.5925	0.6943	0.7075
Days:	34.475	34.475	30.907	34.495	30.907	30.907	0.000	0.000	31.985
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	8.91E-09
Decay:	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00
Net, cpm:	0.005	0.100	0.520	0.100	0.200	0.320	25.550	0.190	0.140
Bkgd Count Time:	179.1	179.1	108.3	120.2	126.0	126.0	126.0	583.3	583.3
Bkg., cpm:	0.650	0.490	0.480	0.460	0.460	0.470	0.480	0.480	0.530
Result, calc.:	0.004	0.084	0.430	0.075	0.176	0.259	45.453	0.288	0.104
Result, rptd.:	0.002	0.088	0.430	0.074	0.175	0.259	45.660	0.291	0.105
MDA, calc.:	0.206	0.205	0.257	0.218	0.247	0.231	0.512	0.203	0.105
MDA, rptd.:	0.226	0.226	0.257	0.239	0.271	0.254	0.511	0.209	0.107

Neptunium

Sample ID:	B09325	B09326	B09327	B09328	B09329	B09330	QC-LCS	QC-BLANK	B09325-DUP
Detector:	62	38	64	28	29	46	47	49	65
Np239 cpm:	20.31	23.22	21.4	22.46	33.34	21.14	23.1	1.36	24.91
Inst. eff.:	0.721	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	99.08
Yield:	0.2843	0.3250	0.2996	0.3144	0.4667	0.2959	0.3234	0.0190	0.3487
Aliquot:	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00
Aspec Count Time:	1054.18	1001.22	1054.18	387.48	387.48	1421.95	1240.05	1043.85	1054.18
Np237 gross counts:	2	4	4	0	1	5	1596	0	3
Np237 bkgd counts:	1	0	3	0	0	1	6	4	0
Np237 aspec. eff:	0.407	0.400	0.411	0.383	0.396	0.391	0.371	0.364	0.411
Np237 result calc.:	0.004	0.014	0.003	0.000	0.006	0.011	4.814	-0.249	0.009
Np237 result rptd.:	0.004	0.007	0.004	0.000	0.006	0.011	4.800	-0.250	0.009
Np237 MDA calc.:	0.028	0.027	0.028	0.074	0.048	0.021	0.035	0.580	0.023
Np237 MDA rptd.:	0.028	0.010	0.038	0.029	0.019	0.021	0.044	0.763	0.009

Iodine-129

Sample ID:	B09325	B09326	B09327	B09328	B09329	B09330	QC-LCS	QC-BLANK	B09325-DUP
Detector:	XSPEC14	XSPEC14	XSPEC15	XSPEC14	XSPEC15	XSPEC14	XSPEC15	XSPEC15	XSPEC14
Count Time:	746.73	401.97	442.38	768.6	1060.58	372.58	472.4	372.2	979.72
Gross cpm:	0.601	0.54	0.583	0.571	0.622	0.518	19.865	0.663	0.553
Bkg cpm:	0.817	0.624	0.767	0.645	0.714	0.665	0.976	1.095	0.544
Blank cpm:	-0.027	-0.027	-0.186	-0.027	-0.082	-0.027	-0.101	-0.123	-0.053
Net cpm:	-0.189	-0.057	0.002	-0.047	-0.010	-0.120	18.990	-0.309	0.062
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	0.00E+00
Corr. Days:	52.342	38.369	65.535	51.864	37.650	0.000	0.000	0.000	0.000
Decay:	1	1	1	1	1	1	1	1	1
Yield:	0.7545	0.7823	0.6724	0.7933	0.7668	0.6798	0.9272	0.8716	0.6452
Aliquot:	1	1	1	1	1	1	1	1	1
PPT. Corr.:	1	1	1	1	1	1	1	1	1
Product:	7.54E-01	7.82E-01	6.72E-01	7.93E-01	7.67E-01	6.80E-01	9.27E-01	8.72E-01	6.45E-01
P-factor:	4.87E+00	4.87E+00	4.87E+00	4.57E+00	4.87E+00	4.57E+00	4.87E+00	4.87E+00	4.87E+00
Result Calc.:	-0.550	-0.160	0.007	-0.122	-0.029	-0.363	44.929	-0.778	0.21
Result Rptd.:	-0.514	-0.150	0.008	-0.120	-0.027	-0.360	45.000	-0.780	0.197
MDA Calc.:	0.448	0.515	0.633	0.350	0.346	0.596	0.501	0.636	0.373
MDA Rptd.:	1.500	1.700	2.400	1.300	2.300	2.100	2.200	2.400	1.400

SAMPLE RESULT VERIFICATION, 809325-TMA-620

Uranium 233/4/5/8

Sample ID:	809325	809326	809327	809328	809329	809330	QC-LCS	QC-BLANK	809325 DUP
Detector:	SS-21	SS-23	SS-24	SS-25	SS-26	SS-26	SS-20	SS-4	SS-21
Sample count time:	214.33	214.33	214.33	214.33	214.33	220.12	152	193.28	152
GMT count:	293.790	293.790	293.790	293.790	293.790	293.790	293.790	293.790	293.790
Zero time:	252.292	252.292	252.292	252.292	252.292	252.292	252.292	252.292	252.292
Corr. tracer dpm:	10.49	10.49	10.49	10.49	10.49	10.58	10.49	10.49	10.49
Bkgd count time:	2366.75	2366.75	2366.75	2366.75	2366.75	2610.45	2610.82	2610.45	2610.82
Net tracer counts:	499	537	541	490	432	311	383	410	249
Detector eff.:	0.2469	0.3016	0.3125	0.3099	0.2803	0.2815	0.267	0.2612	0.2469
Yield:	0.9006	0.7946	0.7752	0.7046	0.6884	0.4787	0.9019	0.7777	0.6349
U-238, gross counts:	69	55	50	37	40	22	382	3	25
U-238, bkgd counts:	0	0	0	0	0	0	0	0	0
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	4.23E-13
U-238, Decay corr:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
U-235, gross counts:	5	3	6	0	2	0	253	1	1
U-235, bkgd counts:	0	1	1	0	0	0	0	0	1
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	2.67E-12
U-235, Decay corr:	1.0000	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	0.826
U-233/4, gross counts:	76	69	48	30	36	24	397	3	27
U-233/4, bkgd counts:	1	1	3	2	1	1	1	1	1
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	1.17E-08
U-233/4, Decay corr:	1.0000	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	1
U-238, result calc.:	0.652	0.482	0.434	0.356	0.436	0.334	4.701	0.034	0.473
U-238, result rptd:	0.644	0.484	0.428	0.357	0.437	0.334	4.400	0.035	0.474
U-238 MDA calc.:	0.073	0.067	0.067	0.074	0.084	0.116	0.094	0.088	0.145
U-238, MDA rptd.:	0.072	0.067	0.067	0.074	0.084	0.116	0.324	0.088	0.145
U-235, result calc.:	0.057	0.021	0.053	0.000	0.026	0.000	3.770	0.014	0.000
U-235, result rptd.:	0.057	0.021	0.053	0.000	0.026	0.000	3.777	0.014	0.000
U-235, MDA calc.:	0.088	0.081	0.081	0.089	0.101	0.141	0.114	0.107	0.176
U-235, MDA rptd.:	0.088	0.082	0.081	0.089	0.101	0.141	0.114	0.107	0.176
U-233/4, result calc.:	0.709	0.596	0.390	0.270	0.381	0.349	4.874	0.023	0.492
U-233/4, result rptd.:	0.691	0.589	0.376	0.260	0.371	0.349	4.526	0.012	0.493
U-233/4, MDA calc.:	0.073	0.067	0.070	0.074	0.084	0.116	0.094	0.088	0.145
U-233/4, MDA rptd.:	0.091	0.067	0.107	0.092	0.084	0.116	0.346	0.088	0.145

SAMPLE RESULT VERIFICATION, B09325-TMA-620

Plutonium 238/239

Sample ID:	B09325	B09326	B09327	B09328	B09329	B09330	QC-LCS	QC-BLANK	B09325 DUP
Detector:	SS-57	SS-58	SS-60	SS-61	SS-62	SS-63	SS-64	SS-65	SS-66
Count time:	767.37	767.37	767.37	767.37	767.37	767.37	767.37	767.37	767.37
GMT, count:	292.091	288.237	288.237	288.237	288.237	292.091	292.091	292.091	292.09
Zero time:	252.292	253.292	253.292	288.237	288.237	252.292	252.292	252.292	252.29
Corr, tracer dpm:	4.86	4.86	4.86	4.86	4.86	4.86	4.86	4.86	4.86
Bkgd, count time:	2390.63	2390.63	2390.63	2390.63	2390.63	2390.63	2390.63	2390.63	2390.63
Net, tracer counts:	991	1004	940	955	455	883	749	771	944
Detector Eff:	0.36	0.3737	0.3782	0.4146	0.4028	0.4034	0.4107	0.4076	0.4096
Yield:	0.7381	0.7202	0.6664	0.6176	0.3029	0.5867	0.4890	0.5072	0.6180
Pu239, gross counts:	4	4	0	4	2	1	390	6	2
Pu239, bkgd counts:	0	0	1	0	0	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	7.78E-08	7.78E-08
Pu239 decay:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Pu238, gross counts:	0	1	1	0	1	0	1	2	5
Pu238, bkgd counts:	1	1	1	0	0	0	2	0	0
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	2.20E-05
Pu238 decay:	0.9991	0.9992	0.9992	1.0000	1.0000	0.9991	0.9991	0.9991	0.9991
Aliquot:	1	1	1	1	1	1	1	1	1
Pu239, Result calc.:	0.009	0.009	-0.002	0.009	0.010	0.000	1.137	0.014	0.005
Pu239, Result rptd:	0.009	0.009	-0.002	0.009	0.010	0.000	1.136	0.014	0.005
Pu239, MDA calc.:	0.017	0.017	0.018	0.018	0.037	0.019	0.022	0.022	0.018
Pu239, MDA rptd.:	0.017	0.017	0.018	0.018	0.037	0.019	0.022	0.022	0.018
Pu238, Result calc.:	-0.002	0.000	0.000	0.000	0.005	0.000	-0.003	0.006	0.012
Pu238, Result rptd.:	-0.002	0.000	0.000	0.000	0.005	0.000	-0.003	0.006	0.012
Pu238, MDA calc.:	0.017	0.017	0.018	0.018	0.037	0.019	0.022	0.022	0.018
Pu238, MDA rptd:	0.017	0.017	0.018	0.018	0.037	0.019	0.028	0.022	0.018

Americium/Curium

Sample ID:	B09325	B09326	B09327	B09328	B09329	B09330	QC-LCS	QC-BLANK	B09325 DUP
Detector:	SS-63	SS-64	SS-65	SS-66	SS-38	SS-39	SS-62	SS-64	SS-40
Count Time:	784.6	784.6	784.6	784.6	726.37	726.37	973.58	973.58	726.37
GMT, count:	350.100	350.100	350.100	350.100	350.100	350.100	350.100	350.100	350.100
Zero time:	252.292	252.292	252.292	350.100	350.100	252.292	252.292	252.292	252.292
Tracer dpm:	4.95	4.95	4.95	4.95	4.95	4.95	4.95	4.95	4.95
Bkgd count time:	2380.13	2380.13	2380.13	2380.13	2375.67	2375.67	2380.13	2380.13	2375.67
Net tracer counts:	1172	1285	1271	1102	1000	1150	1178	1345	943
Detector eff.:	0.4006	0.4031	0.409	0.4068	0.3989	0.407	0.3932	0.4031	0.4107
Yield:	0.7529	0.8204	0.7996	0.6971	0.6969	0.7853	0.6213	0.6920	0.6397
Aliquot:	1	1	1	1	1	1	1	1	
Am241 gross counts:	1	5	4	4	15	9	533	3	
Am241 bkgd. counts:	1	0	1	2	9	7	1	0	
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	4.03E-06
Am241 decay:	0.9996	0.9996	0.9996	0.9996	0.9996	0.9996	1	1	0.9996
Cm244 gross counts:	0	5	3	0	5	6	353	5	
Cm244 bkgd counts:	0	0	1	3	8	4	0	1	
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	1.06E-04
Cm244 decay:	0.9897	0.9897	0.9898	0.9898	0.9898	0.9898	1.0000	0.9017	0.9257
Am241 result calc.:	0.000	0.009	0.005	0.004	0.013	0.004	1.008	0.005	0.005
Am241 result rptd.:	-0.004	0.005	0.002	0.000	0.009	0.000	1.004	0.002	0.000
Am241 MDA calc.:	0.015	0.013	0.013	0.016	0.031	0.024	0.015	0.013	0.027
Am241 MDA rptd:	0.015	0.013	0.013	0.019	0.038	0.030	0.015	0.013	0.034
Cm244 result calc.:	0.000	0.009	0.004	-0.006	-0.007	0.004	0.669	0.007	-0.003
Cm244 result rptd:	-0.002	0.005	0.002	-0.008	-0.009	0.002	0.670	0.005	-0.005
Cm244 MDA calc.:	0.015	0.013	0.014	0.017	0.030	0.018	0.015	0.014	0.024
Cm244 MDA rptd.:	0.015	0.013	0.014	0.023	0.036	0.024	0.010	0.013	0.029

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ATTACHMENT 66
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RADIOCHEMISTRY DATA VALIDATION SUMMARY FOR DATA PACKAGE:
B09325-TMA-620 (923-E418 620RAD.UP2)

MEMORANDUM

TO: 200 UP-2 Project QA Record

March 24, 1994

FR: Thomas Stapp, Golder Associates Inc.

RE: RADIOCHEMISTRY DATA VALIDATION SUMMARY FOR DATA PACKAGE B09325-TMA-620 (923-E418 620RAD.UP2)

INTRODUCTION

This memo presents the results of data validation on data package B09325-TMA-620 prepared by the TMA/Norcal laboratory under contract to Westinghouse/Hanford using WHC approved methods. Information concerning the samples validated along with the analyses reported and the methods of analysis is provided in the following table.

SAMPLE ID	SAMPLE DATE	MEDIA	ANALYSIS
B09325	9/7/93	SOIL	SEE NOTES
B09326	9/7/93	SOIL	
B09327	9/8/93	SOIL	
B09328	9/8/93	SOIL	
B09329	9/8/93	SOIL	
B09330	9/8/93	SOIL	

NOTES:

1. Indicates the samples were analyzed for gross alpha/beta, strontium-90, technetium-99 (beta counting), selenium-79 (liquid scintillation), isotopic plutonium, uranium, curium-244, americium-241, and neptunium-237 (alpha spectroscopy), total uranium (laser fluorometry), and selected radioisotopes by gamma spectroscopy.

2. All samples were 100% validated.

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

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

DATA QUALITY OBJECTIVES

Precision. Goals for precision were met.

Accuracy. Goals for accuracy were met.

Sample Result Verification. All sample results were supported in the raw data. However, sample results for total uranium and minimum detectable activities for neptunium-237 and iodine-129 could not be verified accurately by recalculation. No qualification was necessary since the sample results were supported in the raw data.

Detection Limits. Detection limit goals were acceptable for all sample results with the following exceptions.

SAMPLE ID	ANALYTE	MINIMUM DETECTABLE ACTIVITY REPORTED (pCi/g)	REQUIRED DETECTION LIMIT (pCi/g)
All Samples	Iron 59	ranged from 0.06 to 0.200	0.05
B09326	Cobalt 60	0.06	0.05
B09325	Cobalt-58	0.1	0.05
	Cobalt-60	0.1	0.05
	Europium-152	0.3	0.05
	Europium-154	0.2	0.05
	Europium-155	0.3	0.05

Completeness. The data package was complete for all requested analyses. A total of six samples were validated in this data package with a total of 210 determinations reported, of which 209 were deemed valid. This results in a completeness of 99.5 percent, which meets normal work plan data quality objectives of 90%.

MAJOR DEFICIENCIES

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

Continuing Calibration

- The calibration check analyzed after the sample analysis for technetium-99 on detector LBG-15 was unacceptable. Therefore the associated result for sample B09325 has been qualified as unusable (UR).

MINOR DEFICIENCIES

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

Laboratory Blanks

- Technetium-99 was detected in the laboratory blank. Attachments 2 and 5 provide a summary of the samples affected, data qualification and supporting documentation.

Laboratory Control Sample

- Laboratory control sample analysis was not performed for selenium-79, therefore, results for all samples have been qualified as estimated (J for detects, UJ for non-detects).

DATA REPORTING

- Sample results reported as less than (L.T.) by the laboratory have been qualified as undetected (U) on the laboratory result forms (see Attachment 3).

- Secondary results reported by the laboratory have been crossed out, initialed and dated to clarify reported laboratory results (see Attachment 3).

REFERENCES

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

WHC 1993b, Data Validation Procedures for Radiochemical Analyses, WHC-SD-EN-SPP-001, Rev. 1, 1993. Westinghouse Hanford Company, Richland, Washington.

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.

ATTACHMENT 2

SUMMARY OF DATA QUALIFICATIONS

DATA QUALIFICATION SUMMARY - FORM B-7

SDG: B09325-TMA-620	REVIEWER: T. STAPP	DATE: 3-2-94	PAGE 1 OF 1
COMMENTS: RADIOCHEMISTRY			
COMPOUND/ANALYTE	QUALIFIER	SAMPLES AFFECTED	REASON
ALL VALUES REPORTED AS LESS THAN (L.T.)	U	ALL	QUALIFIER APPLIED TO BE CONSISTENT WITH NORMAL REPORTING PRACTICE
ALL SECONDARY RESULTS	NONE	ALL	~~VALUES~~ HAVE BEEN LINED OUT TO CLARIFY REPORTING OF DATA
TECHNETIUM-99	J	B09327	CONTAMINANT FOUND IN BLANK
SELENIUM-79	J/UJ	ALL	BLANK SPIKE SAMPLE WAS NOT ANALYZED
TECHNETIUM-99	UR	B09325	CALIBRATION CHECK WAS OUT OF LABORATORY CONTROL LIMITS

ATTACHMENT 3

QUALIFIED DATA SUMMARY and ANNOTATED LABORATORY REPORTS

Validated Data Summary, Data Package: B09325-TMA-620

Parameter	Units	Samp# / Date / Location / Depth / Type / Comments	B09325 9-7-93 299-W19-97 4.00 - 6.00 --- --- Result	Q	B09326 9-7-93 299-W19-95 30.00 - 32.50 --- --- Result	Q	B09327 9-8-93 299-W19-97 10.00 - 12.50 --- --- Result	Q	B09328 9-8-93 299-W19-97 20.00 - 22.50 --- --- Result	Q	B09329 9-8-93 299-W19-95 45.00 - 47.50 --- --- Result	Q	B09330 9-8-93 299-W19-97 30.00 - 32.00 --- --- Result	Q
GROSS ALPHA	pCi/g		5.500		9.900		4.500		8.600		7.800		5.200	
GROSS BETA	pCi/g		38.000		15.000		11.000		13.000		22.000		14.000	
SELENIUM-79	pCi/g		2.000	UJ	3.000	UJ	2.000	UJ	4.500	J	2.000	UJ	3.000	UJ
STRONTIUM-90	pCi/g		3.300		0.800	U	0.800	U	0.900	U	0.800	U	0.900	U
TECHNETIUM-99	pCi/g		0.200	UR	0.200	U	0.430	J	0.200	U	0.300	U	0.300	U
IODINE-129	pCi/g		2.000	U	2.000	U	2.000	U	1.000	U	2.000	U	2.000	U
URANIUM-233/234	pCi/g		0.690		0.590		0.380		0.260		0.370		0.350	
URANIUM-235	pCi/g		0.090	U	0.080	U	0.080	U	0.090	U	0.100	U	0.100	U
URANIUM-238	pCi/g		0.640		0.480		0.430		0.360		0.440		0.330	
TOTAL URANIUM	pCi/g		2.000		1.800		1.600		1.400		1.600		1.500	
NEPTUNIUM-237	pCi/g		0.030	U	0.010	U	0.040	U	0.030	U	0.020	U	0.020	U
PLUTONIUM-238	pCi/g		0.020	U	0.020	U	0.020	U	0.020	U	0.040	U	0.020	U
PLUTONIUM-239/240	pCi/g		0.020	U	0.020	U	0.020	U	0.020	U	0.040	U	0.020	U
AMERICIUM-241	pCi/g		0.010	U	0.010	U	0.010	U	0.020	U	0.040	U	0.030	U
CURIUM-244	pCi/g		0.010	U	0.010	U	0.010	U	0.020	U	0.040	U	0.020	U
SODIUM-22	pCi/g		0.100	U	0.050	U	0.050	U	0.030	U	0.030	U	0.030	U
POTASSIUM-40	pCi/g		9.600		12.000		11.000		11.000		11.000		10.000	
MANGANESE-54	pCi/g		0.090	U	0.050	U	0.040	U	0.020	U	0.030	U	0.030	U
IRON-59	pCi/g		0.200	U	0.100	U	0.100	U	0.060	U	0.090	U	0.080	U
COBALT-58	pCi/g		0.100	U	0.050	U	0.030	U	0.020	U	0.030	U	0.030	U
COBALT-60	pCi/g		0.100	U	0.060	U	0.040	U	0.030	U	0.030	U	0.040	U
NIOBIUM-94	pCi/g		0.100	U	0.040	U	0.040	U	0.020	U	0.030	U	0.030	U
RUTHENIUM-103	pCi/g		0.200	U	0.050	U	0.040	U	0.020	U	0.030	U	0.030	U
RUTHENIUM-106	pCi/g		1.000	U	0.400	U	0.300	U	0.200	U	0.300	U	0.200	U
TIN-113	pCi/g		0.300	U	0.050	U	0.050	U	0.030	U	0.030	U	0.030	U
CESIUM-134	pCi/g		0.100	U	0.050	U	0.050	U	0.030	U	0.060	U	0.030	U
CESIUM-137	pCi/g		22.000		0.050	U	0.040	U	0.020	U	0.030	U	0.030	U
CERIUM-144	pCi/g		0.700	U	0.200	U	0.200	U	0.100	U	0.200	U	0.200	U
EUROPIUM-152	pCi/g		0.300	U	0.090	U	0.090	U	0.050	U	0.070	U	0.070	U
EUROPIUM-154	pCi/g		0.200	U	0.060	U	0.050	U	0.030	U	0.050	U	0.050	U
EUROPIUM-155	pCi/g		0.300	U	0.100	U	0.100	U	0.080	U	0.100	U	0.100	U
RADIUM-226	pCi/g		0.410		0.610		0.440		0.330		0.410		0.370	
RADIUM-228	pCi/g		0.680		0.910		0.740		0.530		0.530		0.580	
THORIUM-228	pCi/g		0.550		0.790		0.850		0.520		0.490		0.550	
THORIUM-232	pCi/g		0.680		0.910		0.740		0.530		0.530		0.580	

Verified [signature] 3-17-94

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N309038-01

TMA NORCAL
REPORTING GROUP 7240

DATA SHEET

B09325

SDG 7240 Client Westinghouse Hanford
Contact Dinkar Kharkar Contract MBH-SVV-069262

Lab sample id N309038-01 Client sample id B09325
Dept sample id 7240-001 Location/Matrix 200-UP-2 SOLID
Received 09/10/93 Collected 09/07/93
% moisture 15.1 Chain of custody id NONE

9413225.0436

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALIFIERS	TEST
Gross Alpha	Alpha	5.5	3.8	4	10	~~J~~	80A
Gross Beta	Beta	38	5.2	5	10		80B
Selenium 79	15758-45-9	~~1.1~~	~~0.69~~	2	10	U J	SE
Strontium 90	10098-97-2	3.3	0.44	0.9	1		Y
Technetium 99	14133-76-7	~~0.002~~	~~0.072~~	0.2	0.5	U R	TC
Iodine 129	15046-84-1	~~0.51~~	~~0.66~~	2	2	U	I
Uranium 233/234		0.69	0.18	0.09	0.3		U
Uranium 235	15117-96-1	~~0.057~~	~~0.046~~	0.09	0.3	U	U
Uranium 238		0.64	0.16	0.07	0.3		U
Total Uranium (ug/g)	7440-61-1	2.0	0.37	0.03	0.1	~~X~~	U_T
Neptunium 237	13994-20-2	~~0.004~~	~~0.015~~	0.03	0.2	U	NP
Plutonium 238	13981-16-3	~~0.002~~	~~0.004~~	0.02	0.05	U	PU
Plutonium 239/240		~~0.009~~	~~0.009~~	0.02	0.05	U	PU
Americium 241	14596-10-2	~~0.004~~	~~0.004~~	0.01	0.05	U	TP
Curium 244	13981-15-2	~~0.002~~	~~0.004~~	0.01	0.05	U	TP
GAMMA SCAN ANALYTES							
Sodium 22	13966-32-0	U		0.1		U	GAM
Potassium 40	13966-00-2	9.6	1.8				GAM
Manganese 54	13966-31-9	U		0.09		U	GAM
Iron 59	14596-12-4	U		0.2	0.05	U	GAM
Cobalt 58	13981-38-9	U		0.1	0.05	U	GAM
Cobalt 60	10198-40-0	U		0.1	0.05	U	GAM
Niobium 94	14681-63-1	U		0.1		U	GAM
Ruthenium 103	13968-53-1	U		0.2		U	GAM
Ruthenium 106	13967-48-1	U		1		U	GAM
Tin 113	13966-06-8	U		0.3		U	GAM
Cesium 134	13967-70-9	U		0.1		U	GAM
Cesium 137	10045-97-3	22	0.56		0.05		GAM

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Lab id TMAN
Protocol WHC-HASM
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N309038-01

DATA SHEET, cont

B09325

SDG 7240 Client Westinghouse Hanford
Contact Dinkar Kharkar Contract MBH-SVV-069262

Lab sample id N309038-01 Client sample id B09325
Dept sample id 7240-001 Location/Matrix 200-UP-2 SOLID
Received 09/10/93 Collected 09/07/93
% moisture 15.1 Chain of custody id NONE

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALIFIERS	TEST
Cerium 144	14762-78-8	U		0.7		U	GAM
Europium 152	14683-23-9	U		0.3	0.1	U	GAM
Europium 154	15585-10-1	U		0.2	0.1	U	GAM
Europium 155	14391-16-3	U		0.3	0.1	U	GAM
Radium 226	13982-63-3	0.41	0.22				GAM
Radium 228	15262-20-1	0.68	0.44				GAM
Thorium 228	14274-82-9	0.55	0.26				GAM
Thorium 232	7440-29-1	0.68	0.44				GAM

LAB SAMPLE	TEST	PLANCHET	SUFFIX	ALIQUOT	ANALYZED	REVIEWED	BY
N309038-01	80A/80	7240-001		0.100 g	10/12/93	10/13/93	DPK
N309038-01	80B/80	7240-001		0.100 g	10/12/93	10/13/93	DPK
N309038-01	SE	7240-001		0.520 g	11/04/93	11/18/93	DPK
N309038-01	Y	7240-001		1.00 g	10/05/93	10/12/93	DPK
N309038-01	TC	7240-001		2.04 g	10/11/93	10/13/93	DPK
N309038-01	I	7240-001		1.00 g	10/29/93	11/02/93	DPK
N309038-01	U	7240-001		1.00 g	10/12/93	10/13/93	DPK
N309038-01	U_T	7240-001		0.250 g	10/06/93	11/30/93	DPK
N309038-01	NP	7240-001	A1	1.00 g	11/03/93	11/11/93	DPK
N309038-01	PU	7240-001		1.00 g	10/11/93	10/12/93	DPK
N309038-01	TP	7240-001	A2	1.00 g	12/13/93	12/16/93	DPK
N309038-01	GAM	7240-001		191 g	09/22/93	09/28/93	DPK

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Lab id TMAN
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N309038-02

TMA NORCAL
REPORTING GROUP 7240

DATA SHEET

B09326

SDG 7240 — Client Westinghouse Hanford
Contact Dinkar Kharkar — Contract MBH-SVV-069262

Lab sample id N309038-02 — Client sample id B09326
Dept sample id 7240-002 — Location/Matrix 200-UP-2 SOLID
Received 09/10/93 — Collected 09/07/93
% moisture 12.2 — Chain of custody id NONE

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALIFIERS	TEST
Gross Alpha	Alpha	9.9	4.7	4	10	~~J~~	80A
Gross Beta	Beta	15	4.0	5	10		80B
Selenium 79	15758-45-9	~~0.85~~	~~1.1~~	3	10	U J	SE
Strontium 90	10098-97-2	~~0.13~~	~~0.21~~	0.8	1	U	Y
Technetium 99	14133-76-7	~~0.088~~	~~0.082~~	0.2	0.5	U	TC
Iodine 129	15046-84-1	~~0.15~~	~~0.74~~	2	2	U	I
Uranium 233/234		0.59	0.15	0.07	0.3		U
Uranium 235	15117-96-1	~~0.021~~	~~0.043~~	0.08	0.3	U	U
Uranium 238		0.48	0.13	0.07	0.3		U
Total Uranium (ug/g)	7440-61-1	1.8	0.32	0.03	0.1	~~X~~	U_T
Neptunium 237	13994-20-2	~~0.007~~	~~0.007~~	0.01	0.2	~~UX~~ U	NP
Plutonium 238	13981-16-3	~~0~~	~~0.004~~	0.02	0.05	U	PU
Plutonium 239/240		~~0.009~~	~~0.009~~	0.02	0.05	U	PU
Americium 241	14596-10-2	~~0.005~~	~~0.007~~	0.01	0.05	U	TP
Curium 244	13981-15-2	~~0.005~~	~~0.007~~	0.01	0.05	U	TP
GAMMA SCAN ANALYTES							
Sodium 22	13966-32-0	U		0.05		U	GAM
Potassium 40	13966-00-2	12	1.0				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		0.06	0.05	U	GAM
Niobium 94	14681-63-1	U		0.04		U	GAM
Ruthenium 103	13968-53-1	U		0.05		U	GAM
Ruthenium 106	13967-48-1	U		0.4		U	GAM
Tin 113	13966-06-8	U		0.05		U	GAM
Cesium 134	13967-70-9	U		0.05		U	GAM
Cesium 137	10045-97-3	U		0.05	0.05	U	GAM

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Lab id TMAN
Protocol WHC-HASM
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Version 2.27
Report date 12/21/93

SDG 7240 Client Westinghouse Hanford
Contact Dinkar Kharkar Contract MBH-SVV-069262

Lab sample id N309038-02 Client sample id B09326
Dept sample id 7240-002 Location/Matrix 200-UP-2 SOLID
Received 09/10/93 Collected 09/07/93
% moisture 12.2 Chain of custody id NONE

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALIFIERS	TEST
Cerium 144	14762-78-8	U		0.2		U	GAM
Europium 152	14683-23-9	U		0.09	0.1	U	GAM
Europium 154	15585-10-1	U		0.06	0.1	U	GAM
Europium 155	14391-16-3	U		0.1	0.1	U	GAM
Radium 226	13982-63-3	0.61	0.095				GAM
Radium 228	15262-20-1	0.91	0.20				GAM
Thorium 228	14274-82-9	0.79	0.060				GAM
Thorium 232	7440-29-1	0.91	0.20				GAM

LAB SAMPLE	TEST	PLANCHET	SUFFIX	ALIQUOT	ANALYZED	REVIEWED	BY
N309038-02	80A/80	7240-002		0.100 g	10/12/93	10/13/93	DPK
N309038-02	80B/80	7240-002		0.100 g	10/12/93	10/13/93	DPK
N309038-02	SE	7240-002		0.520 g	11/04/93	11/18/93	DPK
N309038-02	Y	7240-002		1.00 g	10/05/93	10/07/93	DPK
N309038-02	TC	7240-002		2.00 g	10/11/93	10/13/93	DPK
N309038-02	I	7240-002		1.00 g	10/15/93	10/28/93	DPK
N309038-02	U	7240-002		1.00 g	10/12/93	10/13/93	DPK
N309038-02	U_T	7240-002		0.250 g	10/06/93	11/30/93	DPK
N309038-02	NP	7240-002	A1	1.00 g	11/03/93	11/11/93	DPK
N309038-02	PU	7240-002		1.00 g	10/11/93	10/12/93	DPK
N309038-02	TP	7240-002	A2	1.00 g	12/13/93	12/16/93	DPK
N309038-02	GAM	7240-002		767 g	09/22/93	09/28/93	DPK

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Lab id TMAN
Protocol WHC-HASM
Version Ver 1.0
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N309038-03

TMA NORCAL
REPORTING GROUP 7240

DATA SHEET

B09327

SDG 7240 Client Westinghouse Hanford
Contact Dinkar Kharkar Contract MBH-SVV-069262

Lab sample id N309038-03 Client sample id B09327
Dept sample id 7240-003 Location/Matrix 200-UP-2 SOLID
Received 09/10/93 Collected 09/08/93
% moisture 11.2 Chain of custody id NONE

9413225.0440

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALIFIERS	TEST
Gross Alpha	Alpha	4.5	3.8	4	10	~~J~~	80A
Gross Beta	Beta	11	3.9	5	10		80B
Selenium 79	15758-45-9	~~2.5~~	~~1.4~~	2	10	~~U~~ UJ	SE
Strontium 90	10098-97-2	0.096	0.20	0.8	1	U	Y
Technetium 99	14133-76-7	0.43	0.26	0.3	0.5	J	TC
Iodine 129	15046-84-1	~~0.008~~	~~1.0~~	2	2	U	I
Uranium 233/234		0.38	0.13	0.1	0.3		U
Uranium 235	15117-96-1	~~0.053~~	~~0.064~~	0.08	0.3	U	U
Uranium 238		0.43	0.13	0.07	0.3		U
Total Uranium (ug/g)	7440-61-1	1.6	0.29	0.03	0.1	~~X~~	U_T
Neptunium 237	13994-20-2	~~0.003~~	~~0.021~~	0.04	0.2	U	NP
Plutonium 238	13981-16-3	~~0~~	~~0.005~~	0.02	0.05	U	PU
Plutonium 239/240		~~0.002~~	~~0.005~~	0.02	0.05	U	PU
Americium 241	14596-10-2	~~0.002~~	~~0.007~~	0.01	0.05	U	TP
Curium 244	13981-15-2	~~0.002~~	~~0.007~~	0.01	0.05	U	TP
GAMMA SCAN ANALYTES							
Sodium 22	13966-32-0	U		0.05		U	GAM
Potassium 40	13966-00-2	11	0.83				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		0.04		U	GAM
Ruthenium 106	13967-48-1	U		0.3		U	GAM
Tin 113	13966-06-8	U		0.05		U	GAM
Cesium 134	13967-70-9	U		0.05		U	GAM
Cesium 137	10045-97-3	U		0.04	0.05	U	GAM

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3-17-94

Lab id TMAN
Protocol WHC-HASM
Version Ver 1.0
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SDG 7240 Client Westinghouse Hanford
Contact Dinkar Kharkar Contract MBH-SVV-069262

Lab sample id N309038-03 Client sample id B09327
Dept sample id 7240-003 Location/Matrix 200-UP-2 SOLID
Received 09/10/93 Collected 09/08/93
% moisture 11.2 Chain of custody id NONE

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		0.09	0.1	U	GAM
Europium 154	15585-10-1	U		0.05	0.1	U	GAM
Europium 155	14391-16-3	U		0.1	0.1	U	GAM
Radium 226	13982-63-3	0.44	0.087				GAM
Radium 228	15262-20-1	0.74	0.18				GAM
Thorium 228	14274-82-9	0.85	0.075				GAM
Thorium 232	7440-29-1	0.74	0.18				GAM

LAB SAMPLE	TEST	PLANCHET	SUFFIX	ALIQUOT	ANALYZED	REVIEWED	BY
N309038-03	80A/80	7240-003		0.100 g	10/12/93	10/13/93	DPK
N309038-03	80B/80	7240-003		0.100 g	10/12/93	10/13/93	DPK
N309038-03	SE	7240-003		0.510 g	11/04/93	11/18/93	DPK
N309038-03	Y	7240-003		1.00 g	10/05/93	10/07/93	DPK
N309038-03	TC	7240-003		2.00 g	10/12/93	10/13/93	DPK
N309038-03	I	7240-003		1.00 g	11/12/93	11/16/93	DPK
N309038-03	U	7240-003		1.00 g	10/12/93	10/13/93	DPK
N309038-03	U_T	7240-003		0.250 g	10/06/93	11/30/93	DPK
N309038-03	NP	7240-003	A1	1.00 g	11/03/93	11/11/93	DPK
N309038-03	PU	7240-003		1.00 g	10/11/93	10/12/93	DPK
N309038-03	TP	7240-003	A2	1.00 g	12/13/93	12/16/93	DPK
N309038-03	GAM	7240-003		875 g	09/22/93	09/28/93	DPK

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Lab id TMAN
Protocol WHC-HASM
Version Ver 1.0
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N309038-04

TMA NORCAL
REPORTING GROUP 7240

DATA SHEET

B09328

SDG 7240 Client Westinghouse Hanford
Contact Dinkar Kharkar Contract MBH-SVV-069262

Lab sample id N309038-04 Client sample id B09328
Dept sample id 7240-004 Location/Matrix 299-UP-2 SOLID
Received 09/10/93 Collected 09/08/93
% moisture 11.8 Chain of custody id NONE

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Gross Alpha	Alpha	8.6	4.5	4	10	~~J~~	80A
Gross Beta	Beta	13	4.0	5	10		80B
Selenium 79	15758-45-9	4.5	1.4	3	10	J	SE
Strontium 90	10098-97-2	~~0.003~~	~~0.61~~	0.9	1	U	Y
Technetium 99	14133-76-7	~~0.074~~	~~0.078~~	0.2	0.5	U	TC
Iodine 129	15046-84-1	~~0.12~~	~~0.55~~	1	2	U	I
Uranium 233/234		0.26	0.12	0.09	0.3	~~J~~	U
Uranium 235	15117-96-1	~~0~~	~~0.023~~	0.09	0.3	U	U
Uranium 238		0.36	0.12	0.07	0.3		U
Total Uranium (ug/g)	7440-61-1	1.4	0.25	0.03	0.1	~~X~~	U_T
Neptunium 237	13994-20-2	~~0~~	~~0.019~~	0.03	0.2	U	NP
Plutonium 238	13981-16-3	~~0~~	~~0.005~~	0.02	0.05	U	PU
Plutonium 239/240		~~0.009~~	~~0.009~~	0.02	0.05	U	PU
Americium 241	14596-10-2	~~0~~	~~0.008~~	0.02	0.05	U	TP
Curium 244	13981-15-2	~~0.008~~	~~0.008~~	0.02	0.05	U	TP
GAMMA SCAN ANALYTES							
Sodium 22	13966-32-0	U		0.03		U	GAM
Potassium 40	13966-00-2	11	0.56				GAM
Manganese 54	13966-31-9	U		0.02		U	GAM
Iron 59	14596-12-4	U		0.06	0.05	U	GAM
Cobalt 58	13981-38-9	U		0.02	0.05	U	GAM
Cobalt 60	10198-40-0	U		0.03	0.05	U	GAM
Niobium 94	14681-63-1	U		0.02		U	GAM
Ruthenium 103	13968-53-1	U		0.02		U	GAM
Ruthenium 106	13967-48-1	U		0.2		U	GAM
Tin 113	13966-06-8	U		0.03		U	GAM
Cesium 134	13967-70-9	U		0.03		U	GAM
Cesium 137	10045-97-3	U		0.02	0.05	U	GAM

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3-17-94

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Lab id TMAN
Protocol WHC-HASM
Version Ver 1.0
Form DVD-DS
Version 2.27
Report date 12/21/93

N309038-04

DATA SHEET, cont

B09328

SDG 7240 Client Westinghouse Hanford
Contact Dinkar Kharkar Contract MBH-SVV-069262

Lab sample id N309038-04 Client sample id B09328
Dept sample id 7240-004 Location/Matrix 299-UP-2 SOLID
Received 09/10/93 Collected 09/08/93
% moisture 11.8 Chain of custody id NONE

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALIFIERS	TEST
Cerium 144	14762-78-8	U		0.1		U	GAM
Europium 152	14683-23-9	U		0.05	0.1	U	GAM
Europium 154	15585-10-1	U		0.03	0.1	U	GAM
Europium 155	14391-16-3	U		0.08	0.1	U	GAM
Radium 226	13982-63-3	0.33	0.045				GAM
Radium 228	15262-20-1	0.53	0.11				GAM
Thorium 228	14274-82-9	0.52	0.030				GAM
Thorium 232	7440-29-1	0.53	0.11				GAM

LAB SAMPLE	TEST	PLANCHET	SUFFIX	ALIQUOT	ANALYZED	REVIEWED	BY
N309038-04	80A/80	7240-004		0.100 g	10/12/93	10/13/93	DPK
N309038-04	80B/80	7240-004		0.100 g	10/12/93	10/13/93	DPK
N309038-04	SE	7240-004		0.560 g	11/04/93	11/18/93	DPK
N309038-04	Y	7240-004		1.00 g	10/05/93	10/07/93	DPK
N309038-04	TC	7240-004		2.02 g	10/13/93	10/18/93	DPK
N309038-04	I	7240-004		1.00 g	10/29/93	11/02/93	DPK
N309038-04	U	7240-004		1.00 g	10/12/93	10/13/93	DPK
N309038-04	U_T	7240-004		0.250 g	10/06/93	11/30/93	DPK
N309038-04	NP	7240-004		1.00 g	10/15/93	10/27/93	DPK
N309038-04	PU	7240-004		1.00 g	10/11/93	10/12/93	DPK
N309038-04	TP	7240-004	A2	1.00 g	12/13/93	12/16/93	DPK
N309038-04	GAM	7240-004		875 g	09/22/93	09/28/93	DPK

Verified RE
3-17-94

Lab id TMAN
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N309038-05

TMA NORCAL
REPORTING GROUP 7240

DATA SHEET

B09329

SDG 7240 Client Westinghouse Hanford
Contact Dinkar Kharkar Contract MBH-SVV-069262

Lab sample id N309038-05 Client sample id B09329
Dept sample id 7240-005 Location/Matrix 200-UP-2 SOLID
Received 09/10/93 Collected 09/08/93
% moisture 11.3 Chain of custody id NONE

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALIFIERS	TEST
Gross Alpha	Alpha	7.8	4.5	5	10	~~J~~	80A
Gross Beta	Beta	22	4.4	5	10		80B
Selenium 79	15758-45-9	~~2.3~~	~~1.1~~	2	10	~~U~~ UJ	SE
Strontium 90	10098-97-2	~~0~~	~~1.3~~	0.8	1	U	Y
Technetium 99	14133-76-7	~~0.18~~	~~0.098~~	0.3	0.5	U	TC
Iodine 129	15046-84-1	~~0.027~~	~~0.99~~	2	2	U	I
Uranium 233/234		0.37	0.14	0.08	0.3		U
Uranium 235	15117-96-1	~~0.026~~	~~0.027~~	0.1	0.3	U	U
Uranium 238		0.44	0.14	0.08	0.3		U
Total Uranium (ug/g)	7440-61-1	1.6	0.29	0.03	0.1	~~X~~	U_T
Neptunium 237	13994-20-2	~~0.006~~	~~0.013~~	0.02	0.2	U	NP
Plutonium 238	13981-16-3	~~0.005~~	~~0.010~~	0.04	0.05	U	PU
Plutonium 239/240		~~0.010~~	~~0.010~~	0.04	0.05	U	PU
Americium 241	14596-10-2	~~0.009~~	~~0.022~~	0.04	0.05	U	TP
Curium 244	13981-15-2	~~0.009~~	~~0.010~~	0.04	0.05	U	TP
GAMMA SCAN ANALYTES							
Sodium 22	13966-32-0	U		0.03		U	GAM
Potassium 40	13966-00-2	11	0.74				GAM
Manganese 54	13966-31-9	U		0.03		U	GAM
Iron 59	14596-12-4	U		0.09	0.05	U	GAM
Cobalt 58	13981-38-9	U		0.03	0.05	U	GAM
Cobalt 60	10198-40-0	U		0.03	0.05	U	GAM
Niobium 94	14681-63-1	U		0.03		U	GAM
Ruthenium 103	13968-53-1	U		0.03		U	GAM
Ruthenium 106	13967-48-1	U		0.3		U	GAM
Tin 113	13966-06-8	U		0.03		U	GAM
Cesium 134	13967-70-9	U		0.06		U	GAM
Cesium 137	10045-97-3	U		0.03	0.05	U	GAM

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Verified
3-17-94

N309038-05

DATA SHEET, cont

B09329

SDG 7240 Client Westinghouse Hanford
Contact Dinkar Kharkar Contract MBH-SVV-069262

Lab sample id N309038-05 Client sample id B09329
Dept sample id 7240-005 Location/Matrix 200-UP-2 SOLID
Received 09/10/93 Collected 09/08/93
% moisture 11.3 Chain of custody id NONE

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALIFIERS	TEST
Cerium 144	14762-78-8	U		0.2		U	GAM
Europium 152	14683-23-9	U		0.07	0.1	U	GAM
Europium 154	15585-10-1	U		0.05	0.1	U	GAM
Europium 155	14391-16-3	U		0.1	0.1	U	GAM
Radium 226	13982-63-3	0.41	0.060				GAM
Radium 228	15262-20-1	0.53	0.12				GAM
Thorium 228	14274-82-9	0.49	0.039				GAM
Thorium 232	7440-29-1	0.53	0.12				GAM

LAB SAMPLE	TEST	PLANCHET	SUFFIX	ALIQUOT	ANALYZED	REVIEWED	BY
N309038-05	80A/80	7240-005		0.100 g	10/12/93	10/13/93	DPK
N309038-05	80B/80	7240-005		0.100 g	10/12/93	10/13/93	DPK
N309038-05	SE	7240-005		0.520 g	11/05/93	11/18/93	DPK
N309038-05	Y	7240-005		1.00 g	10/05/93	10/12/93	DPK
N309038-05	TC	7240-005		2.00 g	10/12/93	10/13/93	DPK
N309038-05	I	7240-005		1.00 g	10/15/93	10/28/93	DPK
N309038-05	U	7240-005		1.00 g	10/12/93	10/13/93	DPK
N309038-05	U_T	7240-005		0.250 g	10/06/93	11/30/93	DPK
N309038-05	NP	7240-005		1.00 g	10/15/93	10/22/93	DPK
N309038-05	PU	7240-005		1.00 g	10/11/93	10/12/93	DPK
N309038-05	TP	7240-005	A2	1.00 g	12/13/93	12/16/93	DPK
N309038-05	GAM	7240-005		961 g	09/22/93	09/28/93	DPK

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Lab id TMAN
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N309038-06

TMA NORCAL
REPORTING GROUP 7240

DATA SHEET

B09330

SDG 7240 Client Westinghouse Hanford
Contact Dinkar Kharkar Contract MBH-SVV-069262

Lab sample id N309038-06 Client sample id B09330
Dept sample id 7240-006 Location/Matrix 200-UP-2 SOLID
Received 09/10/93 Collected 09/08/93
% moisture 10.3 Chain of custody id NONE

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALIFIERS	TEST
Gross Alpha	Alpha	5.2	4.0	4	10	~~J~~	80A
Gross Beta	Beta	14	3.9	5	10		80B
Selenium 79	15758-45-9	~~-1.4~~	~~1.9~~	3	10	~~U~~ UJ	SE
Strontium 90	10098-97-2	~~-0.092~~	~~0.24~~	0.9	1	U	Y
Technetium 99	14133-76-7	~~0.26~~	~~0.11~~	0.3	0.5	U	TC
Iodine 129	15046-84-1	~~-0.36~~	~~0.92~~	2	2	U	I
Uranium 233/234		0.35	0.16	0.1	0.3		U
Uranium 235	15117-96-1	~~0~~	~~0.037~~	0.1	0.3	U	U
Uranium 238		0.33	0.16	0.1	0.3		U
Total Uranium (ug/g)	7440-61-1	1.5	0.27	0.03	0.1	~~*~~	U_T
Neptunium 237	13994-20-2	~~0.011~~	~~0.011~~	0.02	0.2	U	NP
Plutonium 238	13981-16-3	~~0~~	~~0.005~~	0.02	0.05	U	PU
Plutonium 239/240		~~0~~	~~0.005~~	0.02	0.05	U	PU
Americium 241	14596-10-2	~~0~~	~~0.016~~	0.03	0.05	U	TP
Curium 244	13981-15-2	~~0.002~~	~~0.012~~	0.02	0.05	U	TP
GAMMA SCAN ANALYTES							
Sodium 22	13966-32-0	U		0.03		U	GAM
Potassium 40	13966-00-2	10	0.72				GAM
Manganese 54	13966-31-9	U		0.03		U	GAM
Iron 59	14596-12-4	U		0.08	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		0.03		U	GAM
Ruthenium 103	13968-53-1	U		0.03		U	GAM
Ruthenium 106	13967-48-1	U		0.2		U	GAM
Tin 113	13966-06-8	U		0.03		U	GAM
Cesium 134	13967-70-9	U		0.03		U	GAM
Cesium 137	10045-97-3	U		0.03	0.05	U	GAM

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SUMMARY DATA SECTION
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Lab id TMAN
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N309038-06

DATA SHEET, cont

B09330

SDG 7240 Client Westinghouse Hanford
Contact Dinkar Kharkar Contract MBH-SVV-069262

Lab sample id N309038-06 Client sample id B09330
Dept sample id 7240-006 Location/Matrix 200-UP-2 SOLID
Received 09/10/93 Collected 09/08/93
% moisture 10.3 Chain of custody id NONE

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALIFIERS	TEST
Cerium 144	14762-78-8	U		0.2		U	GAM
Europium 152	14683-23-9	U		0.07	0.1	U	GAM
Europium 154	15585-10-1	U		0.05	0.1	U	GAM
Europium 155	14391-16-3	U		0.1	0.1	U	GAM
Radium 226	13982-63-3	0.37	0.061				GAM
Radium 228	15262-20-1	0.58	0.14				GAM
Thorium 228	14274-82-9	0.55	0.039				GAM
Thorium 232	7440-29-1	0.58	0.14				GAM

LAB SAMPLE	TEST	PLANCHET	SUFFIX	ALIQUOT	ANALYZED	REVIEWED	BY
N309038-06	80A/80	7240-006		0.100 g	10/12/93	10/13/93	DPK
N309038-06	80B/80	7240-006		0.100 g	10/12/93	10/13/93	DPK
N309038-06	SE	7240-006		0.520 g	11/05/93	11/18/93	DPK
N309038-06	Y	7240-006		1.00 g	10/05/93	10/07/93	DPK
N309038-06	TC	7240-006		2.00 g	10/12/93	10/13/93	DPK
N309038-06	I	7240-006		1.00 g	10/28/93	11/02/93	DPK
N309038-06	U	7240-006		1.00 g	10/18/93	10/20/93	DPK
N309038-06	U_T	7240-006		0.250 g	10/06/93	11/30/93	DPK
N309038-06	NP	7240-006		1.00 g	10/15/93	10/27/93	DPK
N309038-06	PU	7240-006		1.00 g	10/11/93	10/12/93	DPK
N309038-06	TP	7240-006	A2	1.00 g	12/13/93	12/16/93	DPK
N309038-06	GAM	7240-006		923 g	09/22/93	09/29/93	DPK

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3-17-94

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Lab id TMAN
Protocol WHC-HASM
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ATTACHMENT 4

LABORATORY NARRATIVE and CHAIN-OF-CUSTODY DOCUMENTATION

SDG: 7240
Contact: Dinkar Kharkar

TMA NORCAL
REPORTING GROUP 7240

Client: Westinghouse Hanford
Contract: MBH-SVV-069262

CASE NARRATIVE

1.0 GENERAL

TMA/Norcal Sample Delivery Group 7240 is comprised of the samples listed on the chain-of-custody documents below. This sample group was processed under the Westinghouse Hanford Company Statement of Work P.O. MBH-SVV-069262.

1.1 Chains-of-Custody
This report includes data for the six soil samples from location 200-UP-2, delivered under Field Log Book #EFL-1091. Chain-of-Custody numbers were not provided.

1.2 Sample Volume
One thousand mL plastic bottles containing the samples were received for the analyses. These were not adequate volumes to obtain the required detection limits for the gamma scan analyses.

1.3 Missing Samples
All samples listed under Field Log Book #EFL-1091 were received.

1.4 Holding Times
The samples were collected on September 7 and 8, 1993 and sample processing was initiated within 180 days of collection.

2.0 QUALITY CONTROL

The internal quality control consisted of one sample each of a laboratory control sample, a blank, and a replicate. All original analyses were performed with QC samples 7240-07 through 7240-09. Neptunium-237 analyses were performed with QC samples 7240-09 through 7240-11. Americium-241 and curium-244 analyses were performed with QC samples 7240-09, 12, 13, and 14.

The QC samples were prepared by the Quality Control Department. Copies of the QC notebook pages are included in this data package.

2.1 Laboratory Control Samples
The LCS recoveries for all nuclides were acceptable. The MDA's of the results for all analyses met the RDL's.

3-2-94

SDG: 7240
Contact: Dinkar Kharkar

TMA NORCAL
REPORTING GROUP 7240

Client: Westinghouse Hanford
Contract: MBH-SVV-069262

2.0 QUALITY CONTROL (cont'd)

2.2 Reagent Blanks

The MDA's of the results for all analyses met the RDL's except for neptunium-237 on sample 7240-008 due to a low chemical yield. The neptunium-237 result for blank 7240-011 was higher than the MDA, but well below the RDL. The negative results of gross beta and selenium-79 were underlined because they were less than the negative of their 2 σ counting error. The technetium-99 result for blank 7240-008 was higher than the MDA but well below the RDL.

2.3 Duplicates

Results were satisfactory for all duplicate analyses. The MDA's of gamma nuclides for the original of sample BO9325 were underlined because they were less than the negative of their 2 σ counting error. The 2 σ counting error for neptunium-237 for the duplicate of sample BO9325 was underlined because it was larger than both the MDA and the result implying that the MDA may not be a good estimate of the "real" minimum detectable activity.

3.0 ANALYSIS NOTES

3.1 Gross Alpha Analyses

The average MDA for gross alpha was (4 $\pm$ 1) pCi/g. Gross alpha activity above the MDA but below the RDL was found in all of the samples.

3.2 Gross Beta Analyses

The average MDA for gross beta was (5 $\pm$ 0) pCi/g. Gross beta activity above the RDL was found in all of the samples.

3.3 Selenium-79 Analyses

The average yield for nine analyses was (74 $\pm$ 35)%. The lowest yield was 44% and the highest was 96%. The average MDA was (2 $\pm$ 1) pCi/g. Selenium-79 activity above the RDL was not found in any of the samples.

3.4 Strontium-90 Analyses

The average yield for nine analyses was (84 $\pm$ 6)%. The lowest yield was 78% and the highest was 88%. The average MDA was (0.8 $\pm$ 0.2) pCi/g. Strontium-90 activity above the RDL was found in sample BO9325.

3.5 Technetium-99 Analyses

The average yield for nine analyses was (66 $\pm$ 9)%. The lowest yield was 59% and the highest was 71%. The average MDA was (0.2 $\pm$ 0.2) pCi/g. Technetium-99 activity above the RDL was not found in any of the samples.

3-2-94

SDG: 7240
Contact: Dinkar Kharkar

TMA NORCAL
REPORTING GROUP 7240

Client: Westinghouse Hanford
Contract: MBH-SVV-069262

3.0 ANALYSIS NOTES (cont'd)

3.6 Iodine-129 Analyses

The average yield for nine analyses was (77 ± 19)%. The lowest yield was 65% and the highest was 93%. The average MDA was (2 ± 0.9) pCi/g. Iodine-129 activity above the RDL was not found in any of the samples.

3.7 Isotopic Uranium Analyses

The average yield for nine analyses was (74 ± 26)%. The lowest yield was 48% and the highest was 90%. The average MDA was (0.1 ± 0.1) pCi/g. Uranium-233/234 and uranium-238 activity above the RDL was found in all of the samples.

3.8 Total Uranium Analyses

The average MDA was (0.4 ± 0.2) μg/g. Uranium concentrations ranging from 1.4 to 2.0 μg/g were found in the samples.

3.9 Isotopic Plutonium Analyses

The average yield for nine analyses was (58 ± 27)%. The lowest yield was 30% and the highest was 74%. The average MDA was (0.02 ± 0.01) pCi/g. Plutonium-238 and plutonium-239/240 activity above the RDL's was not found in any of the samples.

3.10 Neptunium-237 Analyses

The average yield for eleven analyses was (31 ± 22)%. The lowest yield was 2% and the highest yield was 47%. The average MDA was (0.2 ± 0.7) pCi/g. Neptunium-237 activity above the RDL was not found in any of the samples.

3.11 Americium-241/Curium-244 Analyses

The average yield for eleven analyses was (73 ± 13)%. The lowest yield was 62% and the highest yield was 82%. The average MDA was (0.02 ± 0.02) pCi/g. Americium-241 and curium-244 activity above the RDL was not found in any of the samples.

3.12 Gamma Scan Analyses

A gamma scan analysis found cesium-137 in sample BO9325. The MDA of the results for iron-59 for all of the samples were higher than the RDL due to the short half-life of iron-59. Natural potassium-40, radium-226, radium-228, thorium-228, and thorium-232 activity was found in all of the samples.

3-2-94

Westinghouse Hanford Company	CHAIN OF CUSTODY

Custody Form Initiator: L E ROGERS

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

Project Designation/Sampling Locations: 200-UP-2 — Collection Date: 9-7-93

Ice Chest No: ~~Rusty Dusty~~ (9/9/93 SML-27) — Field Logbook No.: EFL-1091

Bill of Lading/Airbill No.: — Offsite Property No.:

Method of Shipment: OVERNIGHT AIR SERVICE

Shipped to: TMA

Possible Sample Hazards/Remarks: Keep samples at 4C (SOIL) None noted

Sample Identification

1) B09325

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) B09326

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) SER 9-7-93

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:
1510 Lorene E. Rogers 9-7-93	JG Hogan JG Hogan	9-7-93 / 1510
JG Hogan JG Hogan	J.D. Fancher J.D. Fancher	9/9/93 1030
J.D. Fancher J.D. Fancher 9/9/93 1030	Toby H. Yamamoto	9/10/93 11:15 AM
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

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

~~80~~ 3-2-94

026

9W3225.0452

Westinghouse Hanford Company	CHAIN OF CUSTODY

Custody Form Initiator: L E ROGERS

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

Project Designation/Sampling Locations: 200-UP-2 — Collection Date: 9-8-93

Ice Chest No.: SML-353 — Field Logbook No.: EFL-1091

Bill of Lading/Airbill No.: _____ — Offsite Property No.: _____

Method of Shipment: OVERNIGHT AIR SERVICE

Shipped to: TMA

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

Sample Identification

1) B09327

1,250ml	P:CLP;TAL Metals,Hg,Ti
2,1250ml ~~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

9-8-93

9HA3225.0453

2) B09328

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) B09330

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:
1400 Loren E Rogers 9-8-93	Ray T Schulte	1400 9-8-93
1st Ray T Schulte 9-9-93 1030	J.D. Franklin	9/9/93 1030
J-D-Franklin 9/9/93 1050	Elby L. Yasunaga	9/10/93 11:15 AM
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

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

~~82~~ 3-2-94

Westinghouse Hanford Company

CHAIN OF CUSTODY

Custody Form Initiator: L E ROGERS

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

Project Designation/Sampling Locations: 200-UP-2 — Collection Date: 9-8-93

Ice Chest No.: SML-352 — Field Logbook No.: EFL-1091

Bill of Lading/Airbill No.: — Offsite Property No.:

Method of Shipment: OVERNIGHT AIR SERVICE

Shipped to: TMA

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

Sample Identification

1) B09329

1,250ml	P:CLP;TAL Metals,Hg,Ti
~~1,250ml~~ 2,120ml	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) 9HA3225.0454

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) LER 9-8-93

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:
1400 Leon E Rogers 9-8-93	Ray T. Sickle Ray T. Sickle	1400 9-8-93
Ray T. Sickle 9-9-93 1030	J.D. Fancher J.D. Fancher	9/9/93 1030
J.D. Fancher 9/9/93 1050	Eloy H. Yamamoto	9/10/93 11:15 AM
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

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

~~81~~ 3-2-94

ATTACHMENT 5

DATA VALIDATION SUPPORTING DOCUMENTATION

RADIOCHEMICAL DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E (circled)
PROJECT: 200 UP-2			DATA PACKAGE:		
VALIDATOR: T. Stapp	LAB: Thermo Analytic		DATE: Feb. 23, 1994		
CASE:			SDG: B09325-TMA-620		

ANALYSES PERFORMED

☑ Gross Alpha/Beta	☑ Strontium-90	☑ Technetium-99	☑ Alpha Spectroscopy	☑ Gamma Spectroscopy	
☑ Total Uranium	☐ Radium-22	☐ Tritium	☑ Se-79 by LSC	☑ Iodine-129	☑ Neptunium-237

SAMPLES/MATRIX

9413225.0456

1. Completeness . . . . . ☐ N/A

Technical verification forms present? . . . . . (Yes) No N/A

Comments: Performed by WHC

2. Initial Calibration . . . . . ☐ N/A

Instruments/detectors calibrated within one year of sample analysis? . . . . . (Yes) No N/A

Initial calibration acceptable? . . . . . (Yes) No N/A

Standards NIST traceable? . . . . . (Yes) No N/A

Standards Expired? . . . . . Yes (No) N/A

Comments:

3. Continuing Calibration . . . . . ☐ N/A

Calibration checked within one week of sample analysis? . . . (Yes) No N/A
Calibration check acceptable? . . . . NOTE ① . . . . . (Yes) (No) N/A
Calibration check standards NIST traceable? . . . . . (Yes) No N/A
Calibration check standards expired? . . . . . Yes (No) N/A

Comments: ① LBG-15 for Tc-99 contin. calib. check is outside control limits for date of analysis. See Calibration check summary page for this detector. Sample B09325 Tc-99 result qualified UR.

4. Blanks . . . . . ☐ N/A

Method blank analyzed? . . . . . (Yes) No N/A
Method blank results acceptable? . . . . . Yes (No) N/A
Analytes detected in method blank? See note ① . . . . . (Yes) No N/A
Field blank(s) analyzed? . . . Note ② . . . . . Yes (No) N/A
Field blank results acceptable? . . . . . Yes No (N/A)
Analytes detected in field blank(s)? . . . . . Yes No (N/A)
Transcription/Calculation Errors? . . . . . Yes (No) N/A

Comments: ① Tc-99 blank result = 0.15 pCi/g (MDA C.I.) Associated results < 5x blank and above MDA are qualified as estimated (J).
② Field QC is not identified in this sample set but sample identification has been requested. Field QC will be evaluated in the final data summary.

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:

9413225.0457

6. Laboratory Control Samples . . . . . ☐ N/A

LCS analyzed? . . Note ① and ② . . . . . (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: ① Blank Spike is considered an LCS.
② LCS analysis not performed for Se-79, associated results are qualified as estimated (J/UJ).

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:

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? . Note ① . . . . . Yes No (N/A)
Field duplicate RPD values acceptable? . . . . . Yes No (N/A)
Field split sample(s) analyzed? . . . . . Yes No (N/A)
Field split RPD values acceptable? . . . . . Yes No (N/A)
Performance audit sample(s) analyzed? . . . . . Yes No (N/A)
Performance audit sample results acceptable? . . . . . Yes No (N/A)

Comments: ① Field QC including duplicate and split field samples were not identified in this Sample set, but it has been requested. Field QC will be evaluated in the final data summary.

10. Holding Times

Are sample holding times acceptable? . . . Note ① . . . (Yes) No N/A

Comments: ① See Summary on comments page (A-5).

11. Results and Detection Limits (Levels D & E) . . . . . ☐ N/A

Results reported for all required sample analyses? . . . . . (Yes) No N/A
Results supported in raw data? . . . . . (Yes) No N/A
Results Acceptable? . . . . See Note ④ on page A-5 . . (Yes) No N/A RS 4-20-94
Transcription/Calculation errors? . . . . . Yes (No) N/A
MDA's meet required detection limits? See Note ① and ③ . Yes (No) N/A
Transcription/calculation errors? . See Note ② . . . . . (Yes) No N/A

Comments: ① Lab blank MDA for neptunium-237 is greater than the RDL. No Qualification applies to sample results.
② Recalculation of many MDA's do not checkout which may be due to laboratory substitution of calculated background statistics, however verification of reported MDA's with raw data is correct and complete.
③ See note ③ on comments page A-5.

Revised RS 4-20-94

Comments:

HOLDING TIME SUMMARY:

Sample ID	Collect Date	Grs α/β	Se79	Sr90	Tc99	I129	U	Pu	Np	Am	Cm	Totl.	Gamma
B09325	9-7-93	✓	✓	✓	✓	✓	✓	✓	✓	97	97	✓	✓
B09326	-7-	✓	✓	✓	✓	✓	✓	✓	✓	97	97	✓	✓
B09327	9-8-93	✓	✓	✓	✓	✓	✓	✓	✓	96	96	✓	✓
B09328	-8-	✓	✓	✓	✓	✓	✓	✓	✓	96	96	✓	✓
B09329	-8-	✓	✓	✓	✓	✓	✓	✓	✓	96	96	✓	✓
B09330	9-8-93	✓	✓	✓	✓	✓	✓	✓	✓	96	96	✓	✓

✓ - Indicates compliance within 180 days maximum holding time requirement. No qualification applied.

(3) Fe-59 MDA above RDL on all samples. Co-60 ~~and is~~ MDA is above RDL for samples B09325 and B09326, and Co-58, Europium-152, 154, and -155 ~~are above~~ MDA's are above the RDL on sample B09325 as indicated by underlined MDA values on laboratory report sheets. No qualifiers are applied. Gamma scan MDA's have been verified with the raw data. 4-20-94

(4) J and X qualifiers have been applied to selected analytes on Lab report form of all samples by the participating laboratory. These qualifiers are not consistent with DV procedures for radiochemistry and have been eliminated where appropriate.

4/20/94

Revised 4-20-94

N309038-08

TMA NORCAL
REPORTING GROUP 7240

REAGENT BLANK

Reagent Blank

SDG 7240 Client Westinghouse Hanford
Contact Dinkar Kharkar Contract MBH-SVV-069262

Lab sample id N309038-08 Client sample id Reagent Blank
Dept sample id 7240-008 Material/Matrix SOLID

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Gross Alpha	Alpha	1.2	2.8	4	10	U	80A
Gross Beta	Beta	-3.3	2.8	5	10	U	80B
Selenium 79	15758-45-9	-2.1	1.3	2	10	U	SE
Strontium 90	10098-97-2	0.013	0.16	0.6	1	U	Y
Technetium 99	14133-76-7	0.15	0.052	0.1	0.5	J	TC
Iodine 129	15046-84-1	-0.78	1.1	2	2	U	I
Uranium 233/234		0.012	0.046	0.09	0.3	U	U
Uranium 235	15117-96-1	0.014	0.028	0.1	0.3	U	U
Uranium 238		0.035	0.046	0.09	0.3	U	U
Total Uranium (ug/g)	7440-61-1	U		0.003	0.1	UX	U_T
Neptunium 237	13994-20-2	-0.25	0.25	0.8	0.2	U	NP
Plutonium 238	13981-16-3	0.006	0.006	0.02	0.05	U	PU
Plutonium 239/240		0.014	0.017	0.02	0.05	U	PU
GAMMA SCAN ANALYTES							
Sodium 22	13966-32-0	U		0.02		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		0.02	0.05	U	GAM
Cobalt 58	13981-38-9	U		0.01	0.05	U	GAM
Cobalt 60	10198-40-0	U		0.02	0.05	U	GAM
Niobium 94	14681-63-1	U		0.02		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		0.02		U	GAM
Cesium 134	13967-70-9	U		0.02		U	GAM
Cesium 137	10045-97-3	U		0.01	0.05	U	GAM
Cerium 144	14762-78-8	U		0.06		U	GAM
Europium 152	14683-23-9	U		0.03	0.1	U	GAM
Europium 154	15585-10-1	U		0.02	0.1	U	GAM
Europium 155	14391-16-3	U		0.04	0.1	U	GAM

Validity Positive (detects) Verified 3/24/94
Tc 99 Results no J

Lab id TMAN
Protocol WHC-HASM
Version Ver 1.0
Form DVD-DS
Version 2.27
Report date 12/21/93

BETA Efficiency QC 15:19:02 09-MAR-94
Parameter controlled is Ratio of assigned cpm to counted cpm
Data Summary

LBG 15 SF 68.772 94 1.038 +/- 0.006 last= 1.045 1.7

Low Abs Contr Val..	0.950	Check Source....	(use avg)
Upper Abs Contr Val	1.050	Assigned value..	2436.00 cpm
Minimum Std Dev....	0.010	Reference T1/2..	0.00 days
Maximum Std Dev....	0.030	Reference Date..	0.000 0
History Index.....	10 points	Min count time..	3.0 minutes

Date	Length of cnt	Cnts	Value	Lower CL	Upper CL	New Avg	Norm Dev	S
274.643 93	17.57	41543	1.030	1.007	1.050	1.038	-0.7	
275.703 93	17.07	39815	1.044	1.008	1.050	1.038	1.6	
277.729 93	28.12	66397	1.032	1.008	1.050	1.037	-0.6	
279.725 93	13.07	30623	1.040	1.007	1.050	1.039	0.5	
280.739 93	21.86	51673	1.031	1.009	1.050	1.038	-0.8	
282.695 93	11.03	25748	1.044	1.008	1.050	1.038	1.6	
284.910 93	29.26	67795	1.052	1.008	1.050	1.038	3.5	*H
284.932 93	10.01	23650	1.031	1.008	1.050	1.039	-0.7	
285.751 93	14.41	33664	1.043	1.009	1.050	1.038	1.2	
286.734 93	15.54	36341	1.042	1.008	1.050	1.037	1.0	
287.743 93	9.45	21847	1.054	1.007	1.050	1.037	4.0	*H
287.788 93	9.30	21770	1.041	1.007	1.050	1.038	0.9	
288.672 93	27.53	64165	1.045	1.008	1.050	1.039	1.9	th
289.676 93	18.04	42878	1.025	1.009	1.050	1.038	-1.4	
291.760 93	27.05	62968	1.047	1.008	1.050	1.039	2.2	th
292.743 93	10.98	25604	1.045	1.009	1.050	1.040	1.6	th
293.703 93	20.77	48993	1.033	1.010	1.050	1.040	-0.7	
294.736 93	26.76	62875	1.037	1.010	1.050	1.039	-0.3	
295.656 93	18.23	42944	1.035	1.009	1.050	1.039	-0.4	
296.717 93	16.27	38642	1.026	1.009	1.050	1.038	-1.4	

Status codes:
wl = Low warning wh = High warning
tl = Low trend th = High trend
*L = Low failure *H = High failure
XX = Not evaluated RC = Reconfigured

PW3225.0462

Calibration Check Summary

BC9325 Sample analysis performed @ 284.767 (GMT).

3-17-94

~~231 N~~

SAMPLE RESULT VERIFICATION, B09325-TMA-620

Gross Alpha/Beta

Sample ID:	B09325	B09326	B09327	B09328	B09329	B09330	QC-LCS	QC-BLANK	B09325 DUP
Aliquot:	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Detector:	102	104	109	112	113	114	115	116	112
Count time:	100	100	100	100	100	100	100	100	100
Alpha cpm:	0.25	0.32	0.15	0.26	0.31	0.18	5.43	0.07	0.36
Alpha, Bkgd:	0.066	0.054	0.04	0.043	0.079	0.049	0.084	0.043	0.043
Alpha, Xtalk:	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006
Alpha, Eff:	0.134	0.117	0.105	0.109	0.126	0.108	0.101	0.107	0.101
Alpha Result Calc.:	5.47	9.92	4.45	8.67	7.82	5.15	228.26	1.21	13.03
Alpha Result Rptd.:	5.46	9.92	4.45	8.63	7.81	5.15	230.00	1.20	13.00
Alpha MDA Calc.:	4.02	4.17	4.00	3.99	4.68	4.30	6.02	4.07	4.31
Alpha MDA Rptd.:	4.04	4.19	4.02	3.96	4.68	4.33	0.61	0.40	4.28
Beta cpm:	4.71	2.48	2.1	2.35	3.09	2.24	40.5	0.69	5.3
Bkgd:	1.123	1.025	1.021	1.09	1.008	0.936	1.005	0.985	1.091
Xtalk:	0.27	0.28	0.294	0.284	0.275	0.288	0.297	0.289	0.297
Eff:	0.42	0.416	0.413	0.415	0.418	0.414	0.412	0.414	0.412
Beta Result Calc.:	37.94	14.95	11.42	13.01	21.75	13.78	414.42	-3.29	44.99
Beta Result Rptd:	38.00	15.00	11.40	13.00	21.80	13.80	420.00	-3.30	45.10
Beta MDA Calc:	5.30	5.11	5.14	5.28	5.04	4.91	5.11	5.03	5.32
Beta MDA rptd:	5.30	5.10	5.14	5.29	5.04	4.90	0.51	0.50	5.32

Selenium 79

Sample ID:	B09325	B09326	B09327	B09328	B09329	B09330	BLANK	B09325DUP
Detector, LSC:	5	5	5	5	5	5	5	5
Count time:	150	150	150	150	150	150	150	150
Detector Eff:	0.622	0.547	0.701	0.311	0.712	0.693	0.622	0.581
Sample cpm:	8.09	9.20	7.47	10.50	7.30	8.15	7.60	8.91
Bkgd cpm:	8.82	8.82	8.66	8.82	8.66	8.66	8.66	8.82
Yield:	0.9573	0.712	0.5948	0.9705	0.7284	0.4381	0.7387	0.8065
Decay Corr:	1	1	1	1	1	1	1	1
Aliquot:	0.52	0.52	0.51	0.56	0.52	0.52	1	0.54
Result calc:	-1.06	0.85	-2.51	4.48	-2.27	-1.45	-1.04	0.17
Result rptd:	-1.06	0.85	-2.51	4.48	-2.27	-1.45	-1.04	0.17
MDA calc:	1.64	2.51	2.37	3.01	1.87	3.19	1.10	2.01
MDA rptd:	1.67	2.56	2.41	3.06	1.90	3.25	1.11	2.04

Strontium 90

Sample ID:	B09325	B09326	B09327	B09328	B09329	B09330	QC-LCS	QC-BLANK	B09325-DUP
Detector:	203	204	205	206	207	208	209	210	212
Bkg:	0.4414	0.4220	0.3625	0.4560	0.4068	0.5503	0.4621	0.4086	0.4453
Count Time:	33.000	33.000	33.000	33.000	33.000	33.000	33.000	33.000	33.000
Y90 cpm:	3.049	-0.165	0.096	-0.003	0.000	-0.1084	12.495	0.013	2.688
Elapsed Time, days:	27.449	27.449	26.449	26.449	26.449	26.449	0	0	27.449
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	6.86E-05
Decay:	0.9981	0.9981	0.9982	0.9982	0.9982	0.9982	1.0000	1.0000	0.9981
Yield:	0.7816	0.8777	0.8387	0.8253	0.8595	0.8347	0.8569	0.8441	0.7991
PPT. corr.:	1	1	1	1	1	1	1	1	1
Aliquot:	1	1	1	1	1	1	1	1	1
Product:	0.7801	0.8760	0.8372	0.8238	0.8579	0.8332	0.8569	0.8441	0.7976
C-zero:	3.9083	-0.1880	0.1147	-0.0036	0.0000	-0.1301	14.5816	0.0154	3.3701
P-Factor:	1.859	1.859	1.859	1.859	1.859	1.859	1.859	1.859	1.859
Result, calc.:	3.3	-0.2	0.1	-0.0	0.0	-0.1	12.2	0.0	2.8
Result, rptd.:	3.3	-0.1	0.1	-0.0	0.0	0.1	12.0	0.0	2.8
MDA, calc.:	0.8	0.9	0.8	0.8	0.8	0.9	0.9	0.8	0.8
MDA, rptd.:	0.9	0.8	0.8	0.9	0.8	0.9	0.8	0.6	0.7

SAMPLE RESULT VERIFICATION, B09325-TMA-620

Technetium 99

Sample ID:	B09325	B09326	B09327	B09328	B09329	B09330	QC-LCS	QC-BLANK	B09325-DUP
Detector:	10	16	11	13	13	14	13	11	12
Aliquot:	2.040	2.000	2.000	2.020	2.000	2.000	1.000	1.000	2.000
P-Factor:	2.340	2.340	2.340	2.340	2.340	2.340	2.340	2.340	2.340
Yield:	0.7040	0.6254	0.6368	0.6914	0.6001	0.6499	0.5925	0.6943	0.7075
Days:	34.475	34.475	30.907	34.495	30.907	30.907	0.000	0.000	31.985
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	8.91E-09
Decay:	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00
Net, cpm:	0.005	0.100	0.520	0.100	0.200	0.320	25.550	0.190	0.140
Bkgd Count Time:	179.1	179.1	108.3	120.2	126.0	126.0	126.0	583.3	583.3
Bkg., cpm:	0.650	0.490	0.480	0.460	0.460	0.470	0.480	0.480	0.530
Result, calc.:	0.004	0.084	0.430	0.075	0.176	0.259	45.453	0.288	0.104
Result, rptd.:	0.002	0.088	0.430	0.074	0.175	0.259	45.660	0.291	0.105
MDA, calc.:	0.206	0.205	0.257	0.218	0.247	0.231	0.512	0.203	0.105
MDA, rptd.:	0.226	0.226	0.257	0.239	0.271	0.254	0.511	0.209	0.107

Neptunium

Sample ID:	B09325	B09326	B09327	B09328	B09329	B09330	QC-LCS	QC-BLANK	B09325-DUP
Detector:	62	38	64	28	29	46	47	49	65
Np239 cpm:	20.31	23.22	21.4	22.46	33.34	21.14	23.1	1.36	24.91
Inst. eff.:	0.721	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	99.08
Yield:	0.2843	0.3250	0.2996	0.3144	0.4667	0.2959	0.3234	0.0190	0.3487
Aliquot:	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00
Aspec Count Time:	1054.18	1001.22	1054.18	387.48	387.48	1421.95	1240.05	1043.85	1054.18
Np237 gross counts:	2	4	4	0	1	5	1596	0	3
Np237 bkgd counts:	1	0	3	0	0	1	6	4	0
Np237 aspec. eff:	0.407	0.400	0.411	0.383	0.396	0.391	0.371	0.364	0.411
Np237 result calc.:	0.004	0.014	0.003	0.000	0.006	0.011	4.814	-0.249	0.009
Np237 result rptd.:	0.004	0.007	0.004	0.000	0.006	0.011	4.800	-0.250	0.009
Np237 MDA calc.:	0.028	0.027	0.028	0.074	0.048	0.021	0.035	0.580	0.023
Np237 MDA rptd.:	0.028	0.010	0.038	0.029	0.019	0.021	0.044	0.763	0.009

Iodine-129

Sample ID:	B09325	B09326	B09327	B09328	B09329	B09330	QC-LCS	QC-BLANK	B09325-DUP
Detector:	XSPEC14	XSPEC14	XSPEC15	XSPEC14	XSPEC15	XSPEC14	XSPEC15	XSPEC15	XSPEC14
Count Time:	746.73	401.97	442.38	768.6	1060.58	372.58	472.4	372.2	979.72
Gross cpm:	0.601	0.54	0.583	0.571	0.622	0.518	19.865	0.663	0.553
Bkg cpm:	0.817	0.624	0.767	0.645	0.714	0.665	0.976	1.095	0.544
Blank cpm:	-0.027	-0.027	-0.186	-0.027	-0.082	-0.027	-0.101	-0.123	-0.053
Net cpm:	-0.189	-0.057	0.002	-0.047	-0.010	-0.120	18.990	-0.309	0.062
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	0.00E+00
Corr. Days:	52.342	38.369	65.535	51.864	37.650	0.000	0.000	0.000	0.000
Decay:	1	1	1	1	1	1	1	1	1
Yield:	0.7545	0.7823	0.6724	0.7933	0.7668	0.6798	0.9272	0.8716	0.6452
Aliquot:	1	1	1	1	1	1	1	1	1
PPT. Corr.:	1	1	1	1	1	1	1	1	1
Product:	7.54E-01	7.82E-01	6.72E-01	7.93E-01	7.67E-01	6.80E-01	9.27E-01	8.72E-01	6.45E-01
P-factor:	4.87E+00	4.87E+00	4.87E+00	4.57E+00	4.87E+00	4.57E+00	4.87E+00	4.87E+00	4.87E+00
Result Calc.:	-0.550	-0.160	0.007	-0.122	-0.029	-0.363	44.929	-0.778	0.211
Result Rptd.:	-0.514	-0.150	0.008	-0.120	-0.027	-0.360	45.000	-0.780	0.197
MDA Calc.:	0.448	0.515	0.633	0.350	0.346	0.596	0.501	0.636	0.373
MDA Rptd.:	1.500	1.700	2.400	1.300	2.300	2.100	2.200	2.400	1.400

SAMPLE RESULT VERIFICATION, B09325-TMA-620

Uranium 233/4/5/8

Sample ID:	B09325	B09326	B09327	B09328	B09329	B09330	QC-LCS	QC-BLANK	B09325 DUP
Detector:	SS-21	SS-23	SS-24	SS-25	SS-26	SS-26	SS-20	SS-4	SS-21
Sample count time:	214.33	214.33	214.33	214.33	214.33	220.12	152	193.28	152
GMT count:	293.790	293.790	293.790	293.790	293.790	293.790	293.790	293.790	293.790
Zero time:	252.292	252.292	252.292	252.292	252.292	252.292	252.292	252.292	252.292
Corr. tracer dpm:	10.49	10.49	10.49	10.49	10.49	10.58	10.49	10.49	10.49
Bkgd count time:	2366.75	2366.75	2366.75	2366.75	2366.75	2610.45	2610.82	2610.45	2610.82
Net tracer counts:	499	537	541	490	432	311	383	410	249
Detector eff.:	0.2469	0.3016	0.3125	0.3099	0.2803	0.2815	0.267	0.2612	0.2469
Yield:	0.9006	0.7946	0.7752	0.7046	0.6884	0.4787	0.9019	0.7777	0.6349
U-238, gross counts:	69	55	50	37	40	22	382	3	25
U-238, bkgd counts:	0	0	0	0	0	0	0	0	0
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	4.23E-13
U-238, Decay corr:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
U-235, gross counts:	5	3	6	0	2	0	253	1	1
U-235, bkgd counts:	0	1	1	0	0	0	0	0	1
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	2.67E-12
U-235, Decay corr:	1.0000	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	0.826
U-233/4, gross counts:	76	69	48	30	36	24	397	3	27
U-233/4, bkgd counts:	1	1	3	2	1	1	1	1	1
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	1.17E-08
U-233/4, Decay corr:	1.0000	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	1
U-238, result calc.:	0.652	0.482	0.434	0.356	0.436	0.334	4.701	0.034	0.473
U-238, result rptd:	0.644	0.484	0.428	0.357	0.437	0.334	4.400	0.035	0.474
U-238 MDA calc.:	0.073	0.067	0.067	0.074	0.084	0.116	0.094	0.088	0.145
U-238, MDA rptd.:	0.072	0.067	0.067	0.074	0.084	0.116	0.324	0.088	0.145
U-235, result calc.:	0.057	0.021	0.053	0.000	0.026	0.000	3.770	0.014	0.000
U-235, result rptd.:	0.057	0.021	0.053	0.000	0.026	0.000	3.777	0.014	0.000
U-235, MDA calc.:	0.088	0.081	0.081	0.089	0.101	0.141	0.114	0.107	0.176
U-235, MDA rptd.:	0.088	0.082	0.081	0.089	0.101	0.141	0.114	0.107	0.176
U-233/4, result calc.:	0.709	0.596	0.390	0.270	0.381	0.349	4.874	0.023	0.492
U-233/4, result rptd.:	0.691	0.589	0.376	0.260	0.371	0.349	4.526	0.012	0.493
U-233/4, MDA calc.:	0.073	0.067	0.070	0.074	0.084	0.116	0.094	0.088	0.145
U-233/4, MDA rptd.:	0.091	0.067	0.107	0.092	0.084	0.116	0.346	0.088	0.145

SAMPLE RESULT VERIFICATION, B09325-TMA-620

Plutonium 238/239

Sample ID:	B09325	B09326	B09327	B09328	B09329	B09330	QC-LCS	QC-BLANK	B09325 DUP
Detector:	SS-57	SS-58	SS-60	SS-61	SS-62	SS-63	SS-64	SS-65	SS-66
Count time:	767.37	767.37	767.37	767.37	767.37	767.37	767.37	767.37	767.37
GMT, count:	292.091	288.237	288.237	288.237	288.237	292.091	292.091	292.091	292.091
Zero time:	252.292	253.292	253.292	288.237	288.237	252.292	252.292	252.292	252.292
Corr, tracer dpm:	4.86	4.86	4.86	4.86	4.86	4.86	4.86	4.86	4.86
Bkgd, count time:	2390.63	2390.63	2390.63	2390.63	2390.63	2390.63	2390.63	2390.63	2390.63
Net, tracer counts:	991	1004	940	955	455	883	749	771	944
Detector Eff:	0.36	0.3737	0.3782	0.4146	0.4028	0.4034	0.4107	0.4076	0.4096
Yield:	0.7381	0.7202	0.6664	0.6176	0.3029	0.5867	0.4890	0.5072	0.6180
Pu239, gross counts:	4	4	0	4	2	1	390	6	2
Pu239, bkgd counts:	0	0	1	0	0	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	7.78E-08
Pu239 decay:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Pu238, gross counts:	0	1	1	0	1	0	1	2	5
Pu238, bkgd counts:	1	1	1	0	0	0	2	0	0
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	2.20E-05
Pu238 decay:	0.9991	0.9992	0.9992	1.0000	1.0000	0.9991	0.9991	0.9991	0.9991
Aliquot:	1	1	1	1	1	1	1	1	1
Pu239, Result calc.:	0.009	0.009	-0.002	0.009	0.010	0.000	1.137	0.014	0.005
Pu239, Result rptd:	0.009	0.009	-0.002	0.009	0.010	0.000	1.136	0.014	0.005
Pu239, MDA calc.:	0.017	0.017	0.018	0.018	0.037	0.019	0.022	0.022	0.018
Pu239, MDA rptd.:	0.017	0.017	0.018	0.018	0.037	0.019	0.022	0.022	0.018
Pu238, Result calc.:	-0.002	0.000	0.000	0.000	0.005	0.000	-0.003	0.006	0.012
Pu238, Result rptd.:	-0.002	0.000	0.000	0.000	0.005	0.000	-0.003	0.006	0.012
Pu238, MDA calc.:	0.017	0.017	0.018	0.018	0.037	0.019	0.022	0.022	0.018
Pu238, MDA rptd:	0.017	0.017	0.018	0.018	0.037	0.019	0.028	0.022	0.018

Americium/Curium

Sample ID:	B09325	B09326	B09327	B09328	B09329	B09330	QC-LCS	QC-BLANK	B09325 DUP
Detector:	SS-63	SS-64	SS-65	SS-66	SS-38	SS-39	SS-62	SS-64	SS-40
Count Time:	784.6	784.6	784.6	784.6	726.37	726.37	973.58	973.58	726.37
GMT, count:	350.100	350.100	350.100	350.100	350.100	350.100	350.100	350.100	350.100
Zero time:	252.292	252.292	252.292	350.100	350.100	252.292	252.292	252.292	252.292
Tracer dpm:	4.95	4.95	4.95	4.95	4.95	4.95	4.95	4.95	4.95
Bkgd count time:	2380.13	2380.13	2380.13	2380.13	2375.67	2375.67	2380.13	2380.13	2375.67
Net tracer counts:	1172	1285	1271	1102	1000	1150	1178	1345	943
Detector eff.:	0.4006	0.4031	0.409	0.4068	0.3989	0.407	0.3932	0.4031	0.410
Yield:	0.7529	0.8204	0.7996	0.6971	0.6969	0.7853	0.6213	0.6920	0.639
Aliquot:	1	1	1	1	1	1	1	1	
Am241 gross counts:	1	5	4	4	15	9	533	3	5
Am241 bkgd. counts:	1	0	1	2	9	7	1	0	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	4.03E-06	4.03E-06
Am241 decay:	0.9996	0.9996	0.9996	0.9996	0.9996	0.9996	1	1	0.9996
Cm244 gross counts:	0	5	3	0	5	6	353	5	3
Cm244 bkgd counts:	0	0	1	3	8	4	0	1	2
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	1.06E-04
Cm244 decay:	0.9897	0.9897	0.9898	0.9898	0.9898	0.9898	1.0000	0.9017	0.9257
Am241 result calc.:	0.000	0.009	0.005	0.004	0.013	0.004	1.008	0.005	0.005
Am241 result rptd.:	-0.004	0.005	0.002	0.000	0.009	0.000	1.004	0.002	0.000
Am241 MDA calc.:	0.015	0.013	0.013	0.016	0.031	0.024	0.015	0.013	0.027
Am241 MDA rptd:	0.015	0.013	0.013	0.019	0.038	0.030	0.015	0.013	0.034
Cm244 result calc.:	0.000	0.009	0.004	-0.006	-0.007	0.004	0.669	0.007	-0.003
Cm244 result rptd:	-0.002	0.005	0.002	-0.008	-0.009	0.002	0.670	0.005	-0.005
Cm244 MDA calc.:	0.015	0.013	0.014	0.017	0.030	0.018	0.015	0.014	0.024
Cm244 MDA rptd.:	0.015	0.013	0.014	0.023	0.036	0.024	0.010	0.013	0.029