

0036848  
10 of 27

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ATTACHMENT 75  
Page 1 of 32

GENERAL GC DATA VALIDATION SUMMARY FOR DATA PACKAGE:  
B09345-TMA-621 (923-E418/621GCK.UP2)

896075226116

MEMORANDUM

MAR 1994  
RECEIVED  
TDD

TO: 200-UP-2 Project QA Record

March 15, 1994

FR: Michael Higgins, Golder Associates Inc.

RE: GENERAL GC DATA VALIDATION SUMMARY FOR DATA PACKAGE B09345-TMA-621 (923-E418/621GCK.UP2)

INTRODUCTION

This memorandum presents the results of data validation on data package B09345-TMA-621 prepared by Thermo Analytical Inc. (TMA). 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
B09345	9/16/93	SOIL	SEE NOTES
B09346	9/16/93	SOIL	
B09349	9/16/93	SOIL	
B09350	9/17/93	SOIL	
B09351	9/17/93	SOIL	
B09352	9/17/93	SOIL	
B09353	9/17/93	SOIL	
B09354	9/17/93	SOIL	

- NOTES: 1. All samples were analyzed for extractable fuel hydrocarbons (kerosene range).  
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:

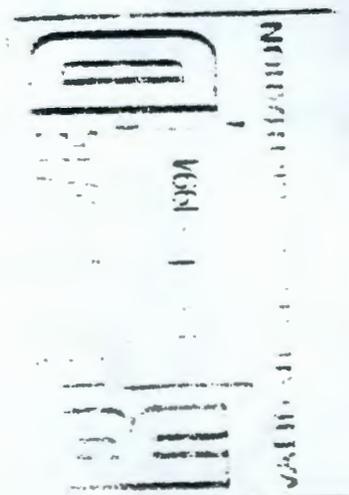
- Attachment 1. Glossary of Data Reporting Qualifiers
- Attachment 2. Summary of Data Qualifications
- Attachment 3. Qualified Data Summary and annotated Laboratory Reports
- Attachment 4. Laboratory Narrative and Chain-of-Custody Documentation
- Attachment 5. Data Validation Supporting Documentation

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.



9413225.0959

**Detection Limits.** Detection limit goals were met.

**Completeness.** The data package was complete for all requested analyses. A total of eight (8) samples were validated in this data package with a total of 8 determinations reported, all of which were deemed valid. This results in a completeness of 100 percent which meets normal work plan objectives.

#### 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.

9413225-0960

ATTACHMENT 1

GLOSSARY OF DATA REPORTING QUALIFIERS

9443225.0961

## GLOSSARY OF ORGANIC DATA REPORTING QUALIFIERS

- 9413225.0962
- 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 3

QUALIFIED DATA SUMMARY AND ANNOTATED LABORATORY REPORTS

9113225.0964

9443225.0965

Validated Data Summary, Data Package: B09345-TMA-621

Parameter	Units	B09345		B09346		B09349		B09350		B09351		B09352	
		Result	Q										
KEROSENE	MG/KG	5.000	U										

*Verified  
9/21/97*

94/3225.0966

Validated Data Summary, Data Package: B09345-TMA-621

Parameter	Samp#	B09353		B09354	
	Date	9-17-93		9-17-93	
	Location	299-W19-97		299-W19-97	
	Depth	---		156.00 - 158.50	
	Type	FLDBLK		---	
	Comments	---		---	
	Units	Result	Q	Result	Q
KEROSENE	MG/KG	5.000	U	5.000	U

*Handwritten:*  
 94/3225.0966  
 TMA

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TMA Inc.

REPORT

Work Order # A3-09-054

Received: 09/21/93

Results by Sample

SAMPLE ID B09345

FRACTION 01F

TEST CODE 8015MS

NAME EPA 8015M EXTRACT.

Date & Time Collected 09/16/93

Category \_\_\_\_\_

MODIFIED 8015 - EXTRACTABLE FUEL HYDROCARBONS

Matrix: SOIL

Date Analyzed: 10/10/93

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

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[Signature]

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TMA Inc.

REPORT

Work Order # A3-09-054

Received: 09/21/93

Results by Sample

SAMPLE ID B09346

FRACTION 03G

TEST CODE 8015MS

NAME EPA 8015M EXTRACT.

Date & Time Collected 09/16/93

Category \_\_\_\_\_

MODIFIED 8015 - EXTRACTABLE FUEL HYDROCARBONS

Matrix: SOIL

Date Analyzed: 10/10/93

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

8960-5725-146

*Verified  
9/22/93  
MLL*

TMA Inc.

REPORT

Work Order # A3-09-054

Received: 09/21/93

Results by Sample

SAMPLE ID B09349

FRACTION Q2E TEST CODE 8015MS NAME EPA 8015M EXTRACT.

Date & Time Collected 09/16/93

Category \_\_\_\_\_

MODIFIED 8015 - EXTRACTABLE FUEL HYDROCARBONS

Matrix: SOIL

Date Analyzed: 10/10/93

Dilution factor: 1.00

Concentration Units: mg/Kg

9413225.0969

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

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9/10/93  
[Signature]*

Received: 09/21/93

SAMPLE ID B09350 FRACTION 040 TEST CODE 8015MS NAME EPA 8015M EXTRACT.  
Date & Time Collected 09/17/93 Category \_\_\_\_\_

MODIFIED 8015 - EXTRACTABLE FUEL HYDROCARBONS

Matrix: SOIL  
Date Analyzed: 10/10/93  
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 1

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MWR*

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TMA Inc.

REPORT

Work Order # A3-09-054

Received: 09/21/93

Results by Sample

SAMPLE ID 809351

FRACTION 05D

TEST CODE 8015MS

NAME EPA 8015M EXTRACT.

Date & Time Collected 09/17/93

Category \_\_\_\_\_

MODIFIED 8015 - EXTRACTABLE FUEL HYDROCARBONS

Matrix: SOIL

Date Analyzed: 10/10/93

Dilution factor: 1.00

Concentration Units: mg/Kg

9443225.097

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

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9/23/93  
[Signature]*

TMA Inc.

REPORT

Work Order # A3-09-054

Received: 09/21/93

Results by Sample

SAMPLE ID B09352

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

Date & Time Collected 09/17/93

Category \_\_\_\_\_

MODIFIED 8015 - EXTRACTABLE FUEL HYDROCARBONS

Matrix: SOIL

Date Analyzed: 10/10/93

Dilution factor: 1.00

Concentration Units: mg/Kg

911325.072

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

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*9/10/93*  
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Received: 09/21/93

TMA Inc.

REPORT

Work Order # A3-09-054

Results by Sample

SAMPLE ID B09353

FRACTION 07D

TEST CODE 8015MS

NAME EPA 8015M EXTRACT.

Date & Time Collected 09/17/93

Category \_\_\_\_\_

MODIFIED 8015 - EXTRACTABLE FUEL HYDROCARBONS

Matrix: SOIL

Date Analyzed: 10/10/93

Dilution factor: 1.00

Concentration Units: mg/Kg

9475225-0973

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

*Handwritten signature and date: 9/10/93*

TMA Inc.

REPORT

Work Order # A3-09-054

Received: 09/21/93

Results by Sample

SAMPLE ID 809354

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

Date & Time Collected 09/17/93

Category \_\_\_\_\_

MODIFIED 8015 - EXTRACTABLE FUEL HYDROCARBONS

Matrix: SOIL

Date Analyzed: 10/10/93

Dilution factor: 1.00

Concentration Units: mg/Kg

9443225.0974

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

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9/22/93  
MLL*

ATTACHMENT 4

LABORATORY NARRATIVE AND CHAIN-OF-CUSTODY DOCUMENTATION

94/3225.0975

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CASE NARRATIVE

LABORATORY : TMA/ARLI

CASE : 09-054

CONTRACT ID : WESTINGHOUSE HANFORD COMPANY

SDG RECEIPT DATE : September 21, 1993

1.0 DESCRIPTION OF CASE :

Nine 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 :

<u>WESTINGHOUSE ID</u>	<u>LAB ID</u>	<u>ANALYSIS REQUESTED</u>	<u>MATRIX</u>
B09345	A3-09-054-01A	V	SOIL
B09345	A3-09-054-01B	SV	SOIL
B09345 MS	A3-09-054-01C	SV	SOIL
B09345 MSD	A3-09-054-01D	SV	SOIL
B09345	A3-09-054-01F	K	SOIL
B09349	A3-09-054-02A	V	SOIL
B09349	A3-09-054-02B	SV	SOIL
B09349	A3-09-054-02E	K	SOIL
B09349 MS	A3-09-054-02F	K	SOIL
B09349 MSD	A3-09-054-02G	K	SOIL
B09346	A3-09-054-03A	V	SOIL
B09346 MS	A3-09-054-03B	V	SOIL
B09346 MSD	A3-09-054-03C	V	SOIL
B09346	A3-09-054-03D	SV	SOIL
B09346	A3-09-054-03G	K	SOIL
B09350	A3-09-054-04A	V	SOIL
B09350	A3-09-054-04B	SV	SOIL
B09350	A3-09-054-04D	K	SOIL
B09351	A3-09-054-05A	V	SOIL
B09351	A3-09-054-05B	SV	SOIL
B09351	A3-09-054-05D	K	SOIL
B09352	A3-09-054-06A	V	SOIL
B09352	A3-09-054-06B	SV	SOIL
B09352	A3-09-054-06D	K	SOIL
B09353	A3-09-054-07A	V	SOIL
B09353	A3-09-054-07B	SV	SOIL
B09353	A3-09-054-07D	K	SOIL
B09354	A3-09-054-08A	V	SOIL
B09354	A3-09-054-08B	SV	SOIL
B09354	A3-09-054-08D	K	SOIL
B09358	A3-09-054-09A	V	SOIL

9443225-0976

000097e

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 contract required holding times.

The Terphenyl-d14 (TPH) surrogate recovery for sample B09353 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 10/05/93 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.

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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 ranged detected in any of the samples. Sample B09336 was spiked with Kerosene and the matrix spike recoveries were between 84% and 87%. The blank spike was prepared at the same time, and had a 75% 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*  
Nicole Roth 12/10/93  
CLP Program Manager

*Maureen Parrish*  
Maureen Parrish 12/10/93  
Project Manager

9113225.0978

000002A

Westinghouse  
Hanford Company

**CHAIN OF CUSTODY**

Custody Form Initiator L E ROGERS

Company Contact L E ROGERS Telephone 376-7690

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

Ice Chest No. SML 41 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) **809345**
- 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
- 809349**
- 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) **ER 9-16-93**
- 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: <u>9-20-93</u> <u>Terom E. Rogers DOS</u>	Received by: <u>H. NARCISO</u> <u>TMA/MORCAL</u>	Date/Time:	<u>9-21-93 12:35</u>
Relinquished by:	Received by:	Date/Time:	
Relinquished by:	Received by:	Date/Time:	
Relinquished by:	Received by:	Date/Time:	

Final Sample Disposition

Disposal Method: \_\_\_\_\_ Disposed by: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Comments: \_\_\_\_\_

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Westinghouse  
Hanford Company

### CHAIN OF CUSTODY

Custody Form Initiator L E ROGERS  
 Company Contact L E ROGERS Telephone 376-7690  
 Project Designation/Sampling Locations 200-UP-2 Collection Date 9-16-93  
 Ice Chest No. SML 283 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) 309346
- 1,250ml P:CLP;TAL Metals,Hg,Ti
  - 1,250ml Gs:VOA CLP
  - 1,250ml aG:Semi-VOA CLP
  - 1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
  - 1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
  - 1,125ml G:Cyanide CLP
  - 1,125ml Gw:Kerosene (8015M)
  - 1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154, Eu-155, K-40, Ru-106, Na-22 (RC-30), Total Uranium (EA-01C) U-235, U-234, U-238 (EP-70, EP-71, EP-5) Np-237, (RC-101A, RC-622, EP-5) Pu-238, Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241, Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79
- 2) ~~1,250ml P:CLP;TAL Metals,Hg,Ti~~  
~~1,250ml Gs:VOA CLP~~  
~~1,250ml aG:Semi-VOA CLP~~  
~~1,125ml G:Anions F,Cl,SO4 (EPA 300.0)~~  
~~1,125ml P/G:Anions NO2,NO3 (EPA 353.2)~~  
~~1,125ml G:Cyanide CLP~~  
~~1,125ml Gw:Kerosene (8015M)~~  
~~1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154, Eu-155, K-40, Ru-106, Na-22 (RC-30), Total Uranium (EA-01C) U-235, U-234, U-238 (EP-70, EP-71, EP-5) Np-237, (RC-101A, RC-622, EP-5) Pu-238, Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241, Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79~~
- 3) SEP 9-16-93
- 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

0860 5225 0980

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

Relinquished by: <u>L E ROGERS</u> <u>9-20-93</u> <u>1205</u>	Received by: <u>H. HARRIS</u>	Date/Time: <u>9-21-93 12:35</u>
Relinquished by: _____	Received by: _____	Date/Time: _____
Relinquished by: _____	Received by: _____	Date/Time: _____
Relinquished by: _____	Received by: _____	Date/Time: _____

#### Final Sample Disposition

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

DDDDDE

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 9-17-93

Ice Chest No. SML 372 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

1860-5226 (R)

- 1) B09350 EB
- ✓ 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 (8015H)
  - ✓ 1,1000ml P/G:Gross alpha/beta (EP-10), Gamm Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Nn-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) B09351
- ✓ 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 (8015H)
  - ✓ 1,1000ml P/G:Gross alpha/beta (EP-10), Gamm Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Nn-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) B09352
- ✓ 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 (8015H)
  - ✓ 1,1000ml P/G:Gross alpha/beta (EP-10), Gamm Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Nn-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: <u>L E ROGERS</u>	Date: <u>9-20-93</u>	Received by: <u>H. NARCISO</u>	Date/Time: <u>9-21-92</u>		
Relinquished by: _____	_____	Received by: _____	Date/Time: _____	_____	_____
Relinquished by: _____	_____	Received by: _____	Date/Time: _____	_____	_____
Relinquished by: _____	_____	Received by: _____	Date/Time: _____	_____	_____

Final Sample Disposition

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

0000026

Westinghouse  
Hanford Company

# CHAIN OF CUSTODY

Custody Form Initiator L E ROGERS

Company Contact L E ROGERS

Telephone 376-7690

Project Designation/Sampling Locations 200-UP-2

Collection Date 9-17-93

Ice Chest No. SML 283

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

9413275-0982

1) B09353

- 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

B09354

- 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) REC 9-17-93

- 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: <u>9-20-93</u> <u>[Signature]</u>	Received by: <u>H. NARCISO</u> <u>[Signature]</u>	Date/Time: <u>9-21-93 12:35</u>
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

### Final Sample Disposition

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

000001

Westinghouse  
Hanford Company

# CHAIN OF CUSTODY

Custody Form Initiator L E ROGERS  
 Company Contact L E ROGERS  
 Project Designation/Sampling Locations 200-UP-2  
 Ice Chest No. SML 283  
 Bill of Lading/Airbill No. \_\_\_\_\_  
 Method of Shipment OVERNIGHT AIR SERVICE  
 Shipped to TMA  
 Possible Sample Hazards/Remarks Keep samples at 4C (SOIL) NONE NOTED

Telephone 376-7690  
 Collection Date 9-20-93  
 Field Logbook No. EFL-1091  
 Offsite Property No. \_\_\_\_\_

### Sample Identification

- 1) 809358
- ~~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, SO<sub>4</sub> (EPA 300.0)~~
  - ~~1,125ml P/G:Anions NO<sub>2</sub>, NO<sub>3</sub> (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~~
- SEP 9-20-93
- 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, SO<sub>4</sub> (EPA 300.0)
  - 1,125ml P/G:Anions NO<sub>2</sub>, NO<sub>3</sub> (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, SO<sub>4</sub> (EPA 300.0)
  - 1,125ml P/G:Anions NO<sub>2</sub>, NO<sub>3</sub> (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

860-522916

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

Relinquished by: <u>9-20-93</u> <u>Juan E. Rogers</u>	Received by: <u>A. NARCISO</u> <u>Juan E. Rogers TMA/NORCAL</u>	Date/Time: <u>9-21-93 12:35</u>
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

### Final Sample Disposition

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

ATTACHMENT 5

DATA VALIDATION SUPPORTING DOCUMENTATION

9/13/25.0984

GENERAL GC DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	<u>E</u>
PROJECT: 200-UP-2			DATA PACKAGE: B09345-TMA-621		
VALIDATOR: M. HIGGINS		LAB: TMA		DATE: 9240309	
CASE: NA			SDG: NA		
ANALYSES PERFORMED					
<input type="checkbox"/> 8010	<input checked="" type="checkbox"/> 8015	<input type="checkbox"/> 8020	<input type="checkbox"/> 8021	8140	8141
<input type="checkbox"/> 8150	<input type="checkbox"/> 8151	<input type="checkbox"/> WTPH-HCID	<input type="checkbox"/> WTPH-G	<input type="checkbox"/> WTPH-D	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
SAMPLES/MATRIX: 8-SOIL					
B09345		B09352			
B09346		B09353			
B09349		B09354			
B09350					
B09351					

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: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

9443225.0985

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

SEE NOTE  
SEE NOTE

9860-522616  
9443225-0986

GENERAL GC DATA VALIDATION CHECKLIST

Comments: SURROGATE AND LABORATORY CONTROL SAMPLES WERE NOT ANALYZED, BUT NO ACTION WAS TAKEN. MS/MSD SPIKE RECOVERIES (%R WERE 84% + 87%) WERE CONSIDERED ACCEPTABLE. HOWEVER THE LABORATORY DID NOT PROVIDE CONTROL LIMITS FOR EVALUATION.

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: RPD WAS CONSIDERED ACCEPTABLE (RPD WAS 4%), HOWEVER THE LABORATORY DID NOT PROVIDE CONTROL LIMITS FOR EVALUATION. CONTROL LIMITS HAVE BEEN REQUESTED FOR BOTH ACCURACY + PRECISION

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: \_\_\_\_\_

9413225.0987

HOLDING TIME SUMMARY

SDG: NA		VALIDATOR: M. WILKINS MWh			DATE: 9/10/93		PAGE 1 OF 1	
COMMENTS: B09345.TMA.621 - GENERAL GC (8015M)								
FIELD SAMPLE ID	ANALYSIS TYPE	DATE SAMPLED	DATE PREPARED	DATE ANALYZED	PREP. HOLDING TIME, DAYS	ANALYSIS HOLDING TIME, DAYS	QUALIFIER	
B09345	(8015M)	9/16/93	9/29/93	10/10/93	≤ 14 days	≤ 14 days	NONE	
B09346		↓						
B09349		↓						
B09350		9/17/93						
B09351		↓						
B09352		↓						
B09353		↓						
B09354		↓						

B-1

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

94535490

~~94524750~~

ATTACHMENT 74  
Page 1 of 36

GENERAL CHEMISTRY DATA VALIDATION SUMMARY FOR DATA PACKAGE:  
B09345-TMA-621 (923-E418/621GEN.UP2)

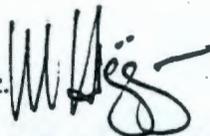
9473225.0989

MEMORANDUM

TO: 200-UP-2 Project QA Record

April 19, 1994

FR: Michael Higgins, Golder Associates Inc.



RE: GENERAL CHEMISTRY DATA VALIDATION SUMMARY FOR DATA PACKAGE B09345-TMA-621 (923-E418/621GEN.UP2)

INTRODUCTION

This memorandum presents the results of data validation on data package B09345-TMA-621 prepared by Thermo Analytical Inc. (TMA). 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
B09345	9/16/93	SOIL	SEE NOTES
B09346	9/16/93	SOIL	
B09349	9/16/93	SOIL	
B09350	9/17/93	SOIL	
B09351	9/17/93	SOIL	
B09352	9/17/93	SOIL	
B09353	9/17/93	SOIL	
B09354	9/17/93	SOIL	

- Notes: 1 All samples were analyzed for anions (chloride, flouride, sulfate), by ion chromatography (IC) and nitrate/nitrite.  
 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

This section presents a summary of the data quality in terms of the referenced validation criteria.

**Precision.** Goals for precision were met.

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

9413225.0990

Revised  
04/19/94  
MWH

**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 referenced analytical method.

**Completeness.** The data package was complete for all requested analyses. A total of eight (8) samples were validated in this data package with a total of 32 determinations reported, all of which were deemed valid. This results in a completeness of 100 percent which meets normal work plan objectives.

#### 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.

##### Holding Time

- The maximum holding times (MHT) for nitrate/nitrite were exceeded. Attachments 2 and 5 provides a summary of the sample affected, data qualifications and supporting documentation.

##### Matrix Spike

- Matrix spike recovery for fluoride was unacceptable. Attachment 2 provides a summary of the samples and data qualification applied.

#### REFERENCES

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

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

Revised  
04/19/94  
MML

-002

1660 5225 111  
944 3225 0991

ATTACHMENT 1

GLOSSARY OF DATA REPORTING QUALIFIERS

9443225.0992

## 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.

9413225-0993

ATTACHMENT 2  
SUMMARY OF DATA QUALIFICATIONS

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9443225.0996

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by 4/14/94

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ATTACHMENT 3

QUALIFIED DATA SUMMARY AND ANNOTATED LABORATORY REPORTS

9443225.0998

9413225.0999

Validated Data Summary, Data Package: B09345-TMA-621

Parameter	Sample Date Location Depth Type Comments	B09345 9-16-93 299-W19-95 140.00 - 142.50 --- ---	B09346 9-16-93 299-W19-97 130.00 - 132.50 --- ---	B09349 9-16-93 299-W19-97 165.00 - 167.50 --- ---	B09350 9-17-93 299-W19-97 0.00 - 0.00 EQTBLK ---	B09351 9-17-93 299-W19-97 146.00 - 148.50 --- ---	B09352 9-17-93 299-W19-97 146.00 - 148.50 DUPLICATE ---
	Units	Result Q	Result Q	Result Q	Result Q	Result Q	Result Q
CHLORIDE	MG/KG	9.400	6.100	5.200	6.000	5.600	5.300
FLUORIDE	MG/KG	1.800 J	1.100 J	3.200 J	0.600 J	1.000 J	0.900 J
SULFATE	MG/KG	13.000	9.000	33.000	8.000	9.000	10.000
NITRATE+NITRITE	MG-W/KG	2.470 UJ	2.500 UJ	2.440 UJ	2.480 UJ	2.440 UJ	2.460 UJ

*Validated  
9/20/94  
mmh*

9413225.1000

Validated Data Summary, Data Package: B09345-TMA-621

Parameter	Samp#		B09353		B09354	
	Units	Result	Q	Result	Q	
CHLORIDE	MG/KG	6.600		6.700		
FLUORIDE	MG/KG	0.600	J	1.400	J	
SULFATE	MG/KG	8.000		11.000		
NITRATE+NITRITE	MG-N/KG	2.500	UJ	2.490	UJ	

*Validated  
9/10/99  
Mik*

000009

TMA Inc.

REPORT

Work Order # A3-09-054

Received: 09/21/93

Results by Sample

SAMPLE ID 809345

FRACTION 01E TEST CODE WCCLPS NAME Anions in Solids

Date & Time Collected 09/16/93

Category \_\_\_\_\_

ANIONS AND WET CHEMISTRY - SOLIDS				
ANALYSIS	METHOD	RESULT	UNITS	LIMIT
Chloride	300.0	9.4	mg/kg	1.0
Fluoride	300.0	1.8	mg/kg	0.5
Sulfate	300.0	13	mg/kg	5

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FORM I

1001 5726 116

*Handwritten signature and date: 9/23/93*

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TMA Inc.

REPORT

Work Order # A3-09-054

Received: 09/21/93

Results by Sample

SAMPLE ID B09346

FRACTION 03E TEST CODE WCCLPS NAME Anions in Solids

Date & Time Collected 09/16/93

Category \_\_\_\_\_

ANIONS AND WET CHEMISTRY - SOLIDS				
ANALYSIS	METHOD	RESULT	UNITS	LIMIT
Chloride	300.0	6.1	mg/kg	1.0
Fluoride	300.0	1.1	mg/kg	0.5
Sulfate	300.0	9	mg/kg	5

Q

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FORM 1

9413225-1002

*Verified*  
940304  
*MM*

000010<sup>A</sup>

TMA Inc.

REPORT

Work Order # A3-09-054

Received: 09/21/93

Results by Sample

SAMPLE ID 809349

FRACTION 02C

TEST CODE WCCLPS

NAME Anions in Solids

Date & Time Collected 09/16/93

Category \_\_\_\_\_

ANIONS AND WET CHEMISTRY - SOLIDS				
ANALYSIS	METHOD	RESULT	UNITS	LIMIT
Chloride	300.0	5.2	mg/kg	1.0
Fluoride	300.0	3.2	mg/kg	0.5
Sulfate	300.0	33	mg/kg	5

62

J

FORM I

9413225.1003

*Verified*  
*9/20/93*  
*[Signature]*

000012

TMA Inc.

REPORT

Work Order # A3-09-054

Received: 09/21/93

Results by Sample

SAMPLE ID 809350

FRACTION 04C

TEST CODE WCCLPS

NAME Anions in Solids

Date & Time Collected 09/17/93

Category \_\_\_\_\_

ANIONS AND WET CHEMISTRY - SOLIDS				
ANALYSIS	METHOD	RESULT	UNITS	LIMIT
Chloride	300.0	6.0	mg/kg	1.0
Fluoride	300.0	0.6	mg/kg	0.5
Sulfate	300.0	8	mg/kg	5

6

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FORM 1

944 3225 1004

*Verified  
5/10/2004  
MWH*

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TMA Inc.

REPORT

Work Order # A3-09-054

Received: 09/21/93

Results by Sample

SAMPLE ID B09351

FRACTION OSC

TEST CODE WCCLPS

NAME Anions in Solids

Date & Time Collected 09/17/93

Category \_\_\_\_\_

ANIONS AND WET CHEMISTRY - SOLIDS				
<u>ANALYSIS</u>	<u>METHOD</u>	<u>RESULT</u>	<u>UNITS</u>	<u>LIMIT</u>
Chloride	300.0	5.6	mg/kg	1.0
Fluoride	300.0	1.0	mg/kg	0.5
Sulfate	300.0	9	mg/kg	5

6

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FORM I

9413225.1005

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TMA Inc.

REPORT

Work Order # A3-09-054

Received: 09/21/93

Results by Sample

SAMPLE ID 809352

FRACTION 06C

TEST CODE WCCLPS

NAME Anions in Solids

Date & Time Collected 09/17/93

Category \_\_\_\_\_

ANIONS AND WET CHEMISTRY - SOLIDS				
ANALYSIS	METHOD	RESULT	UNITS	LIMIT
Chloride	300.0	5.3	mg/kg	1.0
Fluoride	300.0	0.9	mg/kg	0.5
Sulfate	300.0	10	mg/kg	5

6

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FORM I

9413225.1006

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TMA Inc.

REPORT

Work Order # A3-09-054

Received: 09/21/93

Results by Sample

SAMPLE ID B09353

FRACTION 07C

TEST CODE WCCLPS

NAME Anions in Solids

Date & Time Collected 09/17/93

Category \_\_\_\_\_

ANIONS AND WET CHEMISTRY - SOLIDS				
<u>ANALYSIS</u>	<u>METHOD</u>	<u>RESULT</u>	<u>UNITS</u>	<u>LIMIT</u>
Chloride	300.0	6.6	mg/kg	1.0
Fluoride	300.0	0.6	mg/kg	0.5
Sulfate	300.0	8	mg/kg	5

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FORM I

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9/23/93  
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TMA Inc.

REPORT

Work Order # A3-09-054

Received: 09/21/93

Results by Sample

SAMPLE ID B09354

FRACTION 08C

TEST CODE UCCLPS

NAME Anions in Solids

Date & Time Collected 09/17/93

Category \_\_\_\_\_

ANIONS AND WET CHEMISTRY - SOLIDS				
<u>ANALYSIS</u>	<u>METHOD</u>	<u>RESULT</u>	<u>UNITS</u>	<u>LIMIT</u>
Chloride	300.0	6.7	mg/kg	1.0
Fluoride	300.0	1.4	mg/kg	0.5
Sulfate	300.0	11	mg/kg	5

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FORM 1

8001 5726 116  
911 325 1008

*Veronica*  
*546304*  
*MAR*

G

SAMPLE ID B09345 SAMPLE # 01 FRACTIONS: A  
Date & Time Collected 09/16/93 Category SOIL  
NITR\_S <2.47  
mg N/kg

UJ

SAMPLE ID B09346 SAMPLE # 02 FRACTIONS: A  
Date & Time Collected 09/16/93 Category SOIL  
NITR\_S <2.50  
mg N/kg

UJ

SAMPLE ID B09349 SAMPLE # 03 FRACTIONS: A  
Date & Time Collected 09/16/93 Category SOIL  
NITR\_S <2.44  
mg N/kg

UJ

SAMPLE ID B09350 SAMPLE # 04 FRACTIONS: A  
Date & Time Collected 09/17/93 Category SOIL  
NITR\_S <2.48  
mg N/kg

UJ

SAMPLE ID B09351 SAMPLE # 05 FRACTIONS: A  
Date & Time Collected 09/17/93 Category SOIL  
NITR\_S <2.44  
mg N/kg

UJ

SAMPLE ID B09352 SAMPLE # 06 FRACTIONS: A  
Date & Time Collected 09/17/93 Category SOIL  
NITR\_S <2.46  
mg N/kg

UJ

SAMPLE ID B09353 SAMPLE # 07 FRACTIONS: A  
Date & Time Collected 09/19/93 Category SOIL  
NITR\_S <2.50  
mg N/kg

UJ

-020

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9443225.1009

Q  
45

SAMPLE ID <u>B09354</u>	SAMPLE # <u>08</u> FRACTIONS: <u>A</u>
Date & Time Collected <u>09/19/93</u> Category <u>SOIL</u>	
NITR_S <u>&lt;2.49</u> mg N/kg	

SAMPLE ID <u>B09354D</u>	SAMPLE # <u>08</u> FRACTIONS: <u>B</u>
Date & Time Collected <u>09/19/93</u> Category <u>SOIL</u>	
NITR_S <u>3.71</u> mg N/kg	

SAMPLE ID <u>B09354S</u>	SAMPLE # <u>08</u> FRACTIONS: <u>C</u>
Date & Time Collected <u>09/19/93</u> Category <u>SOIL</u>	
NITR_S <u>20.9</u> mg N/kg	

SAMPLE ID <u>LCSS</u>	SAMPLE # <u>09</u> FRACTIONS: <u>A</u>
Date & Time Collected <u>not specified</u> Category <u>SOIL</u>	
NITR_S <u>1.97</u> mg N/L	

9413225.1010

021 *Verified*

ATTACHMENT 4

LABORATORY NARRATIVE AND CHAIN-OF-CUSTODY DOCUMENTATION

9413225.1011

Received: 09/22/93

Test Methodology

TEST CODE NITR S NAME Nitrate/Nitrite in Soils

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

9143225.1012

- 020

**TMA**

**Thermo Analytical Inc.**

**Skinner & Sherman Laboratories Inc.**

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

300 Second Avenue, P.O. Box 521, Waltham, Massachusetts 02254-0521 (617) 890-7200  
1-800-41-AR TEST FAX (617) 890-3883

9473225.1013

GENERAL CHEMISTRY RESULTS

CASE NO. 09-054

Soil Sample #:

- |        |        |
|--------|--------|
| B09345 | B09346 |
| B09349 | B09350 |
| B09351 | B09352 |
| B09353 | B09354 |

CASE NARRATIVE

The Fluoride Matrix Spike recovery for sample B09349 (A3-09-054-02D) was 71.0%. The low Fluoride recovery compared to our Laboratory Control Sample indicates the presence of matrix interferences.

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

Maureen Parrish 12-10-93

Maureen Parrish

000002A

Westinghouse  
Hanford Company

### CHAIN OF CUSTODY

Custody Form Initiator L E ROGERS

Company Contact L E ROGERS

Telephone 376-7690

Project Designation/Sampling Locations 200-UP-2

Collection Date 9-16-93

Ice Chest No. SML 41

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 **809345**
- 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

4101-5723R16

**809349**

- 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

**ER 9-16-93**

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

Relinquished by: <u>9-20-93</u> <u>Loren E. Rogers</u> <b>ROS</b>	Received by: <u>H. NARCISO</u> <u>TMA/HORCAL</u>	Date/Time: <u>9-21-93 12:35</u>
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

#### Final Sample Disposition

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

Comments:

DDDD002CA

Westinghouse  
Hanford Company

# CHAIN OF CUSTODY

Custody Form Initiator L E ROGERS  
 Company Contact L E ROGERS Telephone 376-7690  
 Project Designation/Sampling Locations 200-UP-2 Collection Date 9-16-93  
 Ice Chest No. SML 283 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

9413225.1015

1) 309346  
 1,250ml P:CLP;TAL Metals,Hg,Ti  
 1,250ml Gs:VOA CLP  
 1,250ml aG:Semi-VOA CLP  
 1,125ml G:Anions F,Cl,SO4 (EPA 300.0)  
 1,125ml P/G:Anions NO2,NO3 (EPA 353.2)  
 1,125ml G:Cyanide CLP  
 1,125ml Gw:Kerosene (8015M)  
 1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152,  
 Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-  
 237, (RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-  
 303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

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

3) SEP 9-16-93  
 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: <u>L E ROGERS</u> <u>9-20-93</u> <u>1205</u>	Received by: <u>H. MARCUS</u> <u>TMA/HORCAL</u>	Date/Time: <u>9-21-93</u> <u>12:35</u>
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

### Final Sample Disposition

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

DDDDDE

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 9-17-93  
 Ice Chest No. SML 372 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

9101 5225-1016

- 1) B09350 EB  
 -1,250ml P:CLP;TAL Metals,Ilg,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) Hp-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) B09351  
 -1,250ml P:CLP;TAL Metals,Ilg,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) Hp-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) B09352  
 -1,250ml P:CLP;TAL Metals,Ilg,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) Hp-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: <u>L E ROGERS</u> <u>1205</u> <u>9-20-93</u>	Received by: <u>H. NARCISO</u> <u>TMA/NORCAL</u>	Date/Time: <u>9-21-93</u> <u>12:35</u>
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

#### Final Sample Disposition

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

0000026

Westinghouse  
Hanford Company

# CHAIN OF CUSTODY

Custody Form Initiator L E ROGERS

Company Contact L E ROGERS

Telephone 376-7690

Project Designation/Sampling Locations 200-UP-2

Collection Date 9-17-93

Ice Chest No. SML283

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

943225-1017

1) B09353

- 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 (8015H)
- 1,1000ml P/G:Gross alpha/beta (EP-10), Gmmn 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) Hp-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

B09354

- 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 (8015H)
- 1,1000ml P/G:Gross alpha/beta (EP-10), Gmmn 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) Hp-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) REC 9-17-93

- 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 (8015H)
- 1,1000ml P/G:Gross alpha/beta (EP-10), Gmmn 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) Hp-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: <u>L E ROGERS</u> <u>1205</u> <u>9-20-93</u>	Received by: <u>H. NARCLO</u> <u>TMA/HORCAL</u>	Date/Time: <u>9-21-93 12:35</u>
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

### Final Sample Disposition

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

ATTACHMENT 5  
DATA VALIDATION SUPPORTING DOCUMENTATION

9443225.1018

GENERAL CHEMISTRY DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	(E)
PROJECT: 200-UP-2			DATA PACKAGE:		
VALIDATOR: M. HIGGINS		LAB: TMA		DATE: 940304	
CASE: B0945-TMA-621			SDG: NA		
ANALYSES PERFORMED					
<input checked="" type="checkbox"/> Anions/IC	<input type="checkbox"/> TOC	<input type="checkbox"/> TOX	<input type="checkbox"/> TPH-418.1	Oil and Grease	Alkalinity
<input type="checkbox"/> Ammonia	<input type="checkbox"/> BOD/COD	<input type="checkbox"/> Chloride	<input type="checkbox"/> Chromium-VI	<input type="checkbox"/> pH	<input checked="" type="checkbox"/> NO <sub>2</sub> /NO <sub>3</sub>
<input type="checkbox"/> Sulfate	<input type="checkbox"/> TDS	<input type="checkbox"/> TKN	<input type="checkbox"/> Phosphate	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
SAMPLES/MATRIX 8. SOILS					
B09345		B09352			
B09346		B09353			
B09349		B09354			
B09350					
B09351					

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: NO2/NO3 ANALYZED PAST MHT OF  
 28 DAYS BUT LESS THAN 2X MHT. RESULTS  
 WERE QUALIFIED AS ESTIMATED (UJ).  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

9413225.1019

GENERAL CHEMISTRY DATA VALIDATION CHECKLIST

3. INSTRUMENT CALIBRATION

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

Comments: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

4. BLANKS

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

Comments: FIELD QC, INCLUDING FIELD/TRIP BLANKS, IDENTICAL WAS NO PROVIDED AT THE TIME OF THIS REVIEW.  
FIELD QC DATA HAS BEEN REQUESTED AND WILL BE INCLUDED IN FINAL DATA SUMMARY.

5. ACCURACY

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

Comments: FLUORIDE SPIKE RECOVERY < 75% > 30%.  
FLUORIDE QUALIFIED ESTIMATED (I/US).

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

9413225.1020

GENERAL CHEMISTRY DATA VALIDATION CHECKLIST

Comments: SEE FIELD QC COMMENTS UNDER BLANKS

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: \_\_\_\_\_

9413225.1021

HOLDING TIME SUMMARY

SDG: NA		VALIDATOR: M. HIGGINS			DATE: 940304	PAGE 1 OF 1	
COMMENTS: B09345-TMA-621-GENERAL CHEMISTRY							
FIELD SAMPLE ID	ANALYSIS TYPE	DATE SAMPLED	DATE PREPARED	DATE ANALYZED	PREP. HOLDING TIME, DAYS	ANALYSIS HOLDING TIME, DAYS	QUALIFIER
B09345	IC IONS	9/16/93	10/4/93	10/5/93	≤ 28 days	≤ 28 days	NONE
B09346	Cl, F, SO <sub>4</sub>	↓	↓	↓	↓	↓	↓
B09349	↓	↓	↓	↓	↓	↓	↓
B09350	↓	9/17/93	↓	↓	↓	↓	↓
B09351	↓	↓	↓	↓	↓	↓	↓
B09352	↓	↓	↓	↓	↓	↓	↓
B09353	↓	↓	↓	↓	↓	↓	↓
B09354	↓	↓	↓	↓	↓	↓	↓
SDG	NO <sub>3</sub> /NO <sub>2</sub>	9/16-17/93	10/18/93	10/19/93	> 28 days	< 2X	J/4J

B-1

000019

TMA Inc.

REPORT

Work Order # A3-09-054

Received: 09/21/93

Results by Sample

SAMPLE ID B09349 MS

FRACTION 02D

TEST CODE UCQCS

NAME Quality Control Summary

Date & Time Collected 09/16/93

Category \_\_\_\_\_

SPIKE QC SUMMARY					
<u>ANALYSIS</u>	<u>SAMPLE ID</u>	<u>SAMPLE RESULT</u>	<u>SPIKE RESULT</u>	<u>AMOUNT ADDED</u>	<u>% R</u>
Chloride	B09349 MS	5.2	55.1	48.3	103
Fluoride	B09349 MS	3.2	37.3	48.3	71
Sulfate	B09349 MS	33	128	97.0	98

FORM V

9443225.1023

Fluoride  
Five  
Dec 1993  
475%

940304  
037  
Mum



9453549D

~~9452475D~~

ATTACHMENT 76

Page 1 of 36

METALS AND CYANIDE DATA VALIDATION SUMMARY FOR DATA PACKAGE:  
B09345-TMA-621 (923-E418/621MTL.UP2)

9473225.1025

MEMORANDUM

TO: 200-UP-2 Project QA Record

April 20, 1994

FR: Michael Higgins, Golder Associates Inc. *GH*

RE: METALS AND CYANIDE DATA VALIDATION SUMMARY FOR DATA PACKAGE  
B09345-TMA-621 (923-E418/621MTL.UP2)

INTRODUCTION

This memorandum presents the results of data validation on data package B09345-TMA-621 prepared by Thermo Analytical Inc. (TMA). 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
B09345	9/16/93	SOIL	SEE NOTES
B09346	9/16/93	SOIL	
B09349	9/16/93	SOIL	
B09350	9/17/93	SOIL	
B09351	9/17/93	SOIL	
B09352	9/17/93	SOIL	
B09353	9/17/93	SOIL	
B09354	9/17/93	SOIL	

Notes: 1 All samples were analyzed for Target Analyte List (TAL) metals/cyanide, and titanium.  
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

This section presents a summary of the data quality in terms of the referenced validation criteria.

**Precision.** Goals for precision were met.

*Revised Page  
940420  
MHL - 001*

9201 5725 1026

**Accuracy.** Goals for accuracy were met with the exception of the minor 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 referenced analytical method.

**Completeness.** The data package was complete for all requested analyses. A total of eight (8) samples were validated in this data package with a total of 200 determinations reported, all of which were deemed valid. This results in a completeness of 100 percent which meets normal work plan objectives.

## 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

**Positive Blanks.** Positive results were reported in the calibration or preparation blank(s). Attachment 2 provides a summary of the samples and data qualification applied.

**Negative Blanks.** Negative results were reported for the calibration or preparation blanks. Attachment 2 provides a summary of the samples and data qualification applied.

### Matrix Spike Recovery

- Matrix spike recoveries were unacceptable for antimony, arsenic, and selenium. Attachment 2 provides a summary of the samples and data qualification applied.

### Analytical Spike Recovery

- Analytical spike recoveries were unacceptable for lead, selenium, and thallium. Attachment 2 provides a summary of the samples and data qualification applied.

### Method of Standard Additions

- The method of standard additions (MSA) correlation coefficient was unacceptable for arsenic and selenium. Attachment 2 provides a summary of the samples and data qualification applied.

Revised 9/10/02  
Page 11/11  
002

201 522 116

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.

9413225-1000

ATTACHMENT 1  
GLOSSARY OF DATA REPORTING QUALIFIERS

9443225.1029

ATTACHMENT 2

SUMMARY OF DATA QUALIFICATIONS

9413225.1030

DATA QUALIFICATION SUMMARY - FORM B-7

SDG: NA	VALIDATOR: MCH	DATE: 940420	PAGE 1 OF 2
COMMENTS: B09345-TMA-621 METALS/CYANIDE			
PARAMETER	QUALIFIER	SAMPLES AFFECTED	REASON
BARIUM	U	B09350, B09353	PRESENT IN CALIBRATION BLANK
BERYLLIUM	U	B09345, B09346, B09349, B09351, B09352, B09354	PRESENT IN CALIBRATION BLANK
CALCIUM	BJ/UJ	B09350, B09353	NEGATIVE VALUE REPORTED IN CALIBRATION BLANK
CHROMIUM	U	B09350, B09353	PRESENT IN CALIBRATION BLANK
COPPER	U	B09350, B09353	PRESENT IN CALIBRATION BLANK
MAGNESIUM	U	B09350, B09353	PRESENT IN CALIBRATION BLANK
MANGANESE	U	B09350, B09353	PRESENT IN CALIBRATION BLANK
POTASSIUM	U	B09350, B09353	PRESENT IN CALIBRATION BLANK
SELENIUM	U	B09353	PRESENT IN CALIBRATION BLANK
SODIUM	U	ALL	PRESENT IN PREPARATION BLANK
TITANIUM	U	B09350, B09353	PRESENT IN CALIBRATION BLANK
ANTIMONY	J/BJ/UJ	ALL	MATRIX SPIKE RECOVERY < 75% > 30%
ARSENIC	J/BJ/UJ	ALL	MATRIX SPIKE RECOVERY < 75% > 30%
SELENIUM	J/UJ	ALL	MATRIX SPIKE RECOVERY < 75% > 30%
LEAD	UJ	B09353	ANALYTICAL SPIKE RECOVERY < 85% OR > 115%
SELENIUM	UJ	B09345, B09349, B09350, B09351, B09352, B09354	ANALYTICAL SPIKE RECOVERY < 85% OR > 115%

9413225.1031

*Revised Page  
940420  
MCH 007*

SDG: NA	VALIDATOR: MCH	DATE: 940315	PAGE 2 OF 2
COMMENTS: B09345-TMA-621 METALS/CYANIDE			
PARAMETER	QUALIFIER	SAMPLES AFFECTED	REASON
THALLIUM	UJ	B09345, B09346, B09351	ANALYTICAL SPIKE RECOVERY < 85% OR > 115%
ARSENIC	J	B09352	MSA CORR COEFF < 0.995
SELENIUM	J	B09346	MSA CORR COEFF < 0.995

9413225.1032

ATTACHMENT 3

QUALIFIED DATA SUMMARY AND ANNOTATED LABORATORY REPORTS

9M3225.1033

9413225.1034

Validated Data Summary, Data Package: B09345-TMA-621

Parameter	Samp#	B09345		B09346		B09349		B09350		B09351		B09352	
	Date	9-16-93		9-16-93		9-16-93		9-17-93		9-17-93		9-17-93	
	Location	299-W19-95		299-W19-97		299-W19-95		299-W19-97		299-W19-97		299-W19-97	
	Depth	140.00 - 142.50		130.00 - 132.50		165.00 - 167.50		0.00 - 0.00		146.00 - 148.50		146.00 - 148.50	
	Type	---		---		---		EQTBLK		---		DUPLICATE	
	Comments	---		---		---		---		---		---	
	Units	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
ALUMINUM	MG/KG	6800.000		6720.000		9070.000		54.300		7720.000		6740.000	
ANTIMONY	MG/KG	3.500	BJ	2.600	UJ	3.000	UJ	2.300	UJ	3.300	BJ	2.600	UJ
ARSENIC	MG/KG	3.400	J	3.600	J	4.700	J	0.690	BJ	3.600	J	2.700	J
BARIIUM	MG/KG	76.900		58.400		100.000		0.350	U	79.200		74.700	
BERYLLIUM	MG/KG	0.360	U	0.290	U	0.420	U	0.040	U	0.330	U	0.320	U
CADMIUM	MG/KG	0.270	U	0.260	U	0.300	U	0.240	U	0.280	U	0.260	U
CALCIUM	MG/KG	9260.000		8860.000		134000.000		55.600	BJ	10100.000		9040.000	
CHROMIUM	MG/KG	12.000		13.700		8.800		0.680	U	12.500		10.800	
COBALT	MG/KG	7.400	B	6.900	B	7.500	B	0.470	U	7.800	B	6.900	B
COPPER	MG/KG	14.100		13.400		20.100		1.200	U	13.100		11.000	
IRON	MG/KG	14600.000		14100.000		14700.000		132.000		15100.000		13400.000	
LEAD	MG/KG	5.200		4.700		4.400		0.440	B	5.200		5.200	
MAGNESIUM	MG/KG	5130.000		5220.000		6390.000		9.600	U	5260.000		4790.000	
MANGANESE	MG/KG	338.000		265.000		569.000		0.750	U	286.000		281.000	
MERCURY	MG/KG	0.050	U	0.050	U	0.050	U	0.040	U	0.050	U	0.050	U
NICKEL	MG/KG	10.900		12.200		10.000		0.620	U	10.200		8.500	
POTASSIUM	MG/KG	1640.000		1410.000		1100.000	B	30.800	U	1920.000		1770.000	
SELENIUM	MG/KG	2.400	UJ	2.600	J	0.550	UJ	0.460	UJ	0.470	UJ	0.470	UJ
SILVER	MG/KG	0.540	U	0.520	U	0.600	U	0.470	U	0.550	U	0.520	U
SODIUM	MG/KG	180.000	U	159.000	U	235.000	U	49.700	U	195.000	U	176.000	U
THALLIUM	MG/KG	0.220	UJ	0.220	UJ	0.250	U	0.210	U	0.220	UJ	0.220	U
VANADIUM	MG/KG	33.800		30.000		46.100		1.000	U	32.900		29.400	
ZINC	MG/KG	34.100		31.500		28.700		0.800	U	34.500		31.500	
CYANIDE	MG/KG	0.500	U	0.500	U	0.550	U	0.500	U	0.530	U	0.490	U
TITANIUM	MG/KG	918.000		736.000		1000.000		2.000	U	912.000		852.000	

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## Validated Data Summary, Data Package: 809345-TMA-621

Parameter	Sampl Date	809353		809354	
	Location	9-17-93	299-W19-97	9-17-93	299-W19-97
	Depth	0.00 - 0.00		156.00 - 158.50	
	Type	FLDBLK		---	
	Comments	---		---	
	Units	Result	Q	Result	Q
ALUMINUM	MG/KG	60.200		9490.000	
ANTIMONY	MG/KG	2.600	UJ	2.800	UJ
ARSENIC	MG/KG	0.400	UJ	7.700	J
BARIUM	MG/KG	0.250	U	96.500	
BERYLLIUM	MG/KG	0.040	U	0.460	U
CADMIUM	MG/KG	0.260	U	0.280	U
CALCIUM	MG/KG	11.700	UJ	12500.000	
CHROMIUM	MG/KG	0.620	U	15.000	
COBALT	MG/KG	0.510	U	9.200	B
COPPER	MG/KG	0.710	U	18.600	
IRON	MG/KG	137.000		17200.000	
LEAD	MG/KG	0.360	UJ	9.500	
MAGNESIUM	MG/KG	10.100	U	6790.000	
MANGANESE	MG/KG	0.630	U	317.000	
MERCURY	MG/KG	0.050	U	0.060	U
NICKEL	MG/KG	0.670	U	13.500	
POTASSIUM	MG/KG	23.500	U	2290.000	
SELENIUM	MG/KG	0.870	UJ	0.540	UJ
SILVER	MG/KG	0.510	U	0.570	U
SODIUM	MG/KG	54.500	U	195.000	U
THALLIUM	MG/KG	0.210	U	0.250	U
VANADIUM	MG/KG	1.100	U	35.300	
ZINC	MG/KG	0.870	U	45.700	
CYANIDE	MG/KG	0.480	U	0.550	U
TITANIUM	MG/KG	2.100	U	948.000	

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revised copy  
is 4/18/94

WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER:

B09345

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

Lab Code: SKINER Case No.: N3-09-085SAS No.: SDG No.: B09345

Matrix (soil/water): SOIL Lab Sample ID: S309177-01 S

Level (low/med): LOW Date Received: 09/22/93

Solids: 95.7

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	6800			P
7440-36-0	Antimony	3.5	B	N	P BJ
7440-38-2	Arsenic	3.4		SN	F J
7440-39-3	Barium	76.9			P
7440-41-7	Beryllium	0.36	B		P U
7440-43-9	Cadmium	0.27	U		P
7440-70-2	Calcium	9260			P
7440-47-3	Chromium	12.0			P
7440-48-4	Cobalt	7.4	B		P
7440-50-8	Copper	14.1			P
7439-89-6	Iron	14600			P
7439-92-1	Lead	5.2		S	F
7439-95-4	Magnesium	5130			P
7439-96-5	Manganese	338			P
7439-97-6	Mercury	0.05	U		P CV
7440-02-0	Nickel	10.9			P
7440-09-7	Potassium	1640			P
7782-49-2	Selenium	2.4	U	WN	F UJ
7440-22-4	Silver	0.54	U		P
7440-23-5	Sodium	180	B		P U
7440-28-0	Thallium	0.22	U	W	F UJ
7440-62-2	Vanadium	33.8			P
7440-66-6	Zinc	34.1			P
	Cyanide	0.50	U		P CA
7440-32-6	Titanium	918			P J

*Verified  
11/03/94  
MWH*

9/15/94

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

*Verified case  
9/15/94*

012

9413225.1036

WESTINGHOUSE/HANFORD

1

SAMPLE NUMBER:

INORGANIC ANALYSIS DATA SHEET

B09346

Lab Name: SKINNER & SHERMAN LABS.

Contract: 68-D0-0108

Lab Code: SKINER

Case No.: N3-09-085SAS No.:

SDG No.: B09345

Matrix (soil/water): SOIL

Lab Sample ID: S309177-02 S

Level (low/med): LOW

Date Received: 09/22/93

% Solids: 93.5

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

CAS No.	Analyte	Concentration	C	G	M
7429-90-5	Aluminum	6720			P
7440-36-0	Antimony	2.6	W	N	P UJ
7440-38-2	Arsenic	3.6		N	F J
7440-39-3	Barium	58.4			P
7440-41-7	Beryllium	0.29	B		P U
7440-43-9	Cadmium	0.26	U		P
7440-70-2	Calcium	8860			P
7440-47-3	Chromium	13.7			P
7440-48-4	Cobalt	6.9	B		P
7440-50-8	Copper	13.4			P
7439-89-6	Iron	14100			P
7439-92-1	Lead	4.7		S	F
7439-95-4	Magnesium	5220			P
7439-96-5	Manganese	265			P
7439-97-6	Mercury	0.05	U		CV
7440-02-0	Nickel	12.2			P
7440-09-7	Potassium	1410			P
7782-49-2	Selenium	2.6		+N	F J
7440-22-4	Silver	0.52	U		P
7440-23-5	Sodium	159	B		P U
7440-28-0	Thallium	0.22	W		F UJ
7440-62-2	Vanadium	30.0			P
7440-66-6	Zinc	31.5			P
	Cyanide	0.50	U		CA
7440-32-6	Titanium	736	✓		P J

*Verified  
9/23/93  
JMK*

*9/18/94*

Color Before: BROWN

Clarity Before:

Texture: FINE

Color After: BROWN

Clarity After:

Artifacts:

Comments:

*revised plate  
9/18/94*

013

9413225-1037

WESTINGHOUSE/HANFORD

1

SAMPLE NUMBER:

INORGANIC ANALYSIS DATA SHEET

B09349

Lab Name: SKINNER & SHERMAN LABS.

Contract: 68-D0-0108

Lab Code: SKINER

Case No.: N3-09-085SAS No.:

SDG No.: B09345

Matrix (soil/water): SOIL

Lab Sample ID: S309177-03 S

Level (low/med): LOW

Date Received: 09/22/93

% Solids: 84.7

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	9070			P
7440-36-0	Antimony	3.0	U	N	P UJ
7440-38-2	Arsenic	4.7		SN	F J
7440-39-3	Barium	100			P
7440-41-7	Beryllium	0.42	B		P U
7440-43-9	Cadmium	0.30	U		P
7440-70-2	Calcium	134000			P
7440-47-3	Chromium	8.8			P
7440-48-4	Cobalt	7.5	B		P
7440-50-8	Copper	20.1			P
7439-89-6	Iron	14700			P
7439-92-1	Lead	4.4			F
7439-95-4	Magnesium	6390			P
7439-96-5	Manganese	569			P
7439-97-6	Mercury	0.05	U		CV
7440-02-0	Nickel	10.0			P
7440-09-7	Potassium	1100	B		P
7782-49-2	Selenium	0.55	U	WN	F UJ
7440-22-4	Silver	0.60	U		P
7440-23-5	Sodium	235	B		P U
7440-28-0	Thallium	0.25	U		F
7440-62-2	Vanadium	46.1			P
7440-66-6	Zinc	28.7			P
	Cyanide	0.55	U		CA
7440-32-6	Titanium	1000			P

*Verified  
9/10/94  
MM*

*J  
9/11/94*

Color Before: BROWN

Clarity Before:

Texture: MEDIUM

Color After: BROWN

Clarity After:

Artifacts:

Comments:

*verified page  
9/11/94*

9/11/3225.1038

WESTINGHOUSE/HANFORD

1

SAMPLE NUMBER:

INORGANIC ANALYSIS DATA SHEET

B09350

Lab Name: SKINNER & SHERMAN LABS.

Contract: 68-D0-0108

Lab Code: SKINER

Case No.: N3-09-085SAS No.:

SDG No.: B09345

Matrix (soil/water): SOIL

Lab Sample ID: S309177-04 S

Level (low/med): LOW

Date Received: 09/22/93

% Solids: 100.0

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	54.3			P
7440-36-0	Antimony	2.3	BT	N	P UJ
7440-38-2	Arsenic	0.69	BT	N	F BJ
7440-39-3	Barium	0.35	BT		P U
7440-41-7	Beryllium	0.04	U		P
7440-43-9	Cadmium	0.24	U		P
7440-70-2	Calcium	55.6	BT		P U BJ
7440-47-3	Chromium	0.68	BT		P U
7440-48-4	Cobalt	0.47	U		P
7440-50-8	Copper	1.2	BT		P U
7439-89-6	Iron	132			P
7439-92-1	Lead	0.44	B		F
7439-95-4	Magnesium	9.6	BT		P U
7439-96-5	Manganese	0.75	BT		P U
7439-97-6	Mercury	0.04	U		CV
7440-02-0	Nickel	0.62	U		P
7440-09-7	Potassium	30.8	BT		P U
7782-49-2	Selenium	0.46	BT	WN	F UJ
7440-22-4	Silver	0.47	U		P
7440-23-5	Sodium	49.7	BT		P U
7440-28-0	Thallium	0.21	U		F
7440-62-2	Vanadium	1.0	U		P
7440-66-6	Zinc	0.80	U		P
	Cyanide	0.50	U		CA
7440-32-6	Titanium	2.0	BT		P U

9413225.1039

*Verified  
4/10/94  
MWH*

Color Before: WHITE

Clarity Before:

Texture: FINE

Color After: WHITE

Clarity After:

Artifacts:

Comments:

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WESTINGHOUSE/HANFORD

1

SAMPLE NUMBER:

INORGANIC ANALYSIS DATA SHEET

B09351

Lab Name: SKINNER & SHERMAN LABS.

Contract: 68-D0-0108

Lab Code: SKINER

Case No.: N3-09-085SAS No.:

SDG No.: B09345

Matrix (soil/water): SOIL

Lab Sample ID: S309177-05 S

Level (low/med): LOW

Date Received: 09/22/93

% Solids: 93.1

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	7720			P
7440-36-0	Antimony	3.3	B	N	P BJ
7440-38-2	Arsenic	3.6		SN	F J
7440-39-3	Barium	79.2			P
7440-41-7	Beryllium	0.33	B		P U
7440-43-9	Cadmium	0.28	U		P
7440-70-2	Calcium	10100			P
7440-47-3	Chromium	12.5			P
7440-48-4	Cobalt	7.8	B		P
7440-50-8	Copper	13.1			P
7439-89-6	Iron	15100			P
7439-92-1	Lead	5.2		S	F
7439-95-4	Magnesium	5260			P
7439-96-5	Manganese	286			P
7439-97-6	Mercury	0.05	U		CV
7440-02-0	Nickel	10.2			P
7440-09-7	Potassium	1920			P
7782-49-2	Selenium	0.47	B	WN	F US
7440-22-4	Silver	0.55	U		P
7440-23-5	Sodium	195	B		P U
7440-28-0	Thallium	0.22	B	W	F US
7440-62-2	Vanadium	32.9			P
7440-66-6	Zinc	34.5			P
	Cyanide	0.53	U		CA
7440-32-6	Titanium	912	/		P J

*Verified  
4/18/94  
[Signature]*

5/18/94

Color Before: BROWN

Clarity Before:

Texture: FINE

Color After: BROWN

Clarity After:

Artifacts:

Comments:

*Revised page  
5/18/94*

9M3225-1040

WESTINGHOUSE/HANFORD

1

SAMPLE NUMBER:

INORGANIC ANALYSIS DATA SHEET

B09352

Lab Name: SKINNER & SHERMAN LABS.

Contract: 68-D0-0108

Lab Code: SKINER

Case No.: N3-09-085SAS No.:

SDG No.: B09345

Matrix (soil/water): SOIL

Lab Sample ID: S309177-06 S

Level (low/med): LOW

Date Received: 09/22/93

% Solids: 94.7

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	6740			P
7440-36-0	Antimony	2.6	BT	N	P US
7440-38-2	Arsenic	2.7		+N	F J
7440-39-3	Barium	74.7			P
7440-41-7	Beryllium	0.32	B		P U
7440-43-9	Cadmium	0.26	U		P
7440-70-2	Calcium	9040			P
7440-47-3	Chromium	10.8			P
7440-48-4	Cobalt	6.9	B		P
7440-50-8	Copper	11.0			P
7439-89-6	Iron	13400			P
7439-92-1	Lead	5.2			F
7439-95-4	Magnesium	4790			P
7439-96-5	Manganese	281			P
7439-97-6	Mercury	0.05	U		CV
7440-02-0	Nickel	8.5			P
7440-09-7	Potassium	1770			P
7782-49-2	Selenium	0.47	BT	WN	F US
7440-22-4	Silver	0.52	U		P
7440-23-5	Sodium	176	B		P U
7440-28-0	Thallium	0.22	U		F
7440-62-2	Vanadium	29.4			P
7440-66-6	Zinc	31.5			P
	Cyanide	0.49	U		CA
7440-32-6	Titanium	852	/		P

Color Before: BROWN

Clarity Before:

Texture: FINE

Color After: BROWN

Clarity After:

Artifacts:

Comments:

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\_\_\_\_\_ *Wisc page*

\_\_\_\_\_ *5/11/94*

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9413225.1041

*Verified  
9/23/93  
JMS*

WESTINGHOUSE/HANFORD

1

SAMPLE NUMBER:

INORGANIC ANALYSIS DATA SHEET

B09353

Lab Name: SKINNER & SHERMAN LABS.

Contract: 68-D0-0108

Lab Code: SKINER

Case No.: N3-09-085SAS No.:

SDG No.: B09345

Matrix (soil/water): SOIL

Lab Sample ID: S309177-07 S

Level (low/med): LOW

Date Received: 09/22/93

% Solids: 100.0

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	60.2			P
7440-36-0	Antimony	2.6	BT	N	P UJ
7440-38-2	Arsenic	0.40	BT	N	F UJ
7440-39-3	Barium	0.25	BT		P U
7440-41-7	Beryllium	0.04	U		P
7440-43-9	Cadmium	0.26	U		P
7440-70-2	Calcium	11.7	BT		P UJ
7440-47-3	Chromium	0.62	BT		P U
7440-48-4	Cobalt	0.51	U		P
7440-50-8	Copper	0.71	BT		P U
7439-89-6	Iron	137			P
7439-92-1	Lead	0.36	BT		F UJ
7439-95-4	Magnesium	10.1	BT		P U
7439-96-5	Manganese	0.63	BT		P U
7439-97-6	Mercury	0.05	U		CV
7440-02-0	Nickel	0.67	U		P
7440-09-7	Potassium	23.5	BT		P U
7782-49-2	Selenium	0.87	BT	N	F UJ
7440-22-4	Silver	0.51	U		P
7440-23-5	Sodium	54.5	BT		P U
7440-28-0	Thallium	0.21	U		F
7440-62-2	Vanadium	1.1	U		P
7440-66-6	Zinc	0.87	U		P
	Cyanide	0.48	U		CA
7440-32-6	Titanium	2.1	BT		P U

*Verified  
9/23/93  
[Signature]*

Color Before: WHITE

Clarity Before:

Texture: FINE

Color After: WHITE

Clarity After:

Artifacts:

Comments:

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\_\_\_\_\_  
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2401-522616  
9413225-1042

WESTINGHOUSE/HANFORD

1

SAMPLE NUMBER:

INORGANIC ANALYSIS DATA SHEET

B09354

Lab Name: SKINNER & SHERMAN LABS.

Contract: 68-D0-0108

Lab Code: SKINER

Case No.: N3-09-085SAS No.:

SDG No.: B09345

Matrix (soil/water): SOIL

Lab Sample ID: S309177-08 S

Level (low/med): LOW

Date Received: 09/22/93

% Solids: 85.7

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

9113225.1043

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	9490			P
7440-36-0	Antimony	2.8	BT	N	P UJ
7440-38-2	Arsenic	7.7		SN	F J
7440-39-3	Barium	96.5			P
7440-41-7	Beryllium	0.46	BT		P U
7440-43-9	Cadmium	0.28	U		P
7440-70-2	Calcium	12500			P
7440-47-3	Chromium	15.0			P
7440-48-4	Cobalt	9.2	B		P
7440-50-8	Copper	18.6			P
7439-89-6	Iron	17200			P
7439-92-1	Lead	9.5			F
7439-95-4	Magnesium	6790			P
7439-96-5	Manganese	317			P
7439-97-6	Mercury	0.06	U		CV
7440-02-0	Nickel	13.5			P
7440-09-7	Potassium	2290			P
7782-49-2	Selenium	0.54	BT	WN	F UJ
7440-22-4	Silver	0.57	U		P
7440-23-5	Sodium	195	BT		P U
7440-28-0	Thallium	0.25	U		F
7440-62-2	Vanadium	35.3			P
7440-66-6	Zinc	45.7			P
	Cyanide	0.55	U		CA
7440-32-6	Titanium	948	/		P J 5418194

*Verified  
9/30/93  
MMH*

Color Before: BROWN

Clarity Before:

Texture: FINE

Color After: BROWN

Clarity After:

Artifacts:

Comments:

\_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

ATTACHMENT 4

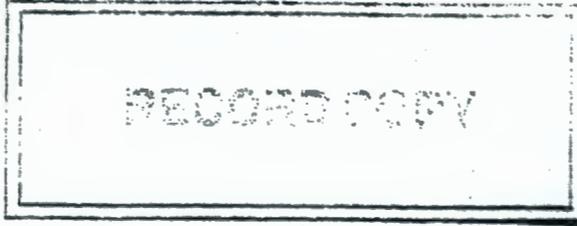
LABORATORY NARRATIVE AND CHAIN-OF-CUSTODY DOCUMENTATION

9113225.1044

**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



November 1, 1993

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

Quality Control Narrative

Scope

Eight (8) soil samples were submitted to TMA/Skinner & Sherman Laboratories, Inc. on September 22, 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 S309177.

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 digestion spike recovery for antimony, arsenic, and selenium 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

9413225.1045

000002A e

Westinghouse  
Hanford Company

# CHAIN OF CUSTODY

Custody Form Initiator L E ROGERS

Company Contact L E ROGERS Telephone 376-7690

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

Ice Chest No. SML 41 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

9401-5276-1046

- 1) **809345**
- 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 (8015H)
  - 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
- 809349**
- 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 (8015H)
  - 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) **AR 9-16-93**
- 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 (8015H)
  - 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: <u>9-20-93</u> <u>L E Rogers</u>	Received by: <u>H. NARCIS</u> <u>TMA/HORCAL</u>	Date/Time: <u>9-21-93 12:35</u>
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

### Final Sample Disposition

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

000002C

Westinghouse  
Hanford Company

## CHAIN OF CUSTODY

Custody Form Initiator L E ROGERS

Company Contact L E ROGERS Telephone 376-7690

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

Ice Chest No. SML283 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

9413225.1047

- 1) B09346
- 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 (8015H)
  - 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
- 2) SER 9-16-93
- 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 (8015H)
  - 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)
- 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 (8015H)
  - 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: <u>Jacene E. Rogers</u> <u>9-20-93</u> <u>1205</u>	Received by: <u>H. MARCUS</u> <u>TMA/HORCAL</u>	Date/Time: <u>9-21-93 12:35</u>
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

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

Comments:

000002E

Westinghouse  
Hanford Company

# CHAIN OF CUSTODY

Custody Form Initiator L E ROGERS

Company Contact L E ROGERS

Telephone 376-7690

Project Designation/Sampling Locations 200-UP-2

Collection Date 9-17-93

Ice Chest No. SML 372

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

9401-5226716

1) B09350 EB

- ✓ 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 (8015H)
- ✓ 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,Nn-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

B09351

- ✓ 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 (8015H)
- ✓ 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,Nn-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) B09352

- ✓ 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 (8015H)
- ✓ 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,Nn-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: <u>L E ROGERS</u> <u>9-20-93</u> <u>1205</u>	Received by: <u>H. NARCISO</u> <u>TMA/NORCAL</u>	Date/Time: <u>9-21-92</u> <u>12:35</u>
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

### Final Sample Disposition

Disposal Method: \_\_\_\_\_ Disposed by: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Comments:

ADD 0026

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 9-17-93

Ice Chest No. SML 283

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

6401 527616  
9/13/25 1049

1) 809353

- 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

809354

- 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) SEP 9-17-93

- 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: <u>9-20-93</u> <u>Leon E Rogers</u> 1205	Received by: <u>H. MARCELO TMA/HORCAL</u>	Date/Time: <u>9-21-93 12:35</u>
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

#### Final Sample Disposition

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

ATTACHMENT 5

DATA VALIDATION SUPPORTING DOCUMENTATION

9113225.1050

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	<b>E</b>
PROJECT: 200-UP-2			DATA PACKAGE: B09345-TMA-621		
VALIDATOR: M. HIGGINS		LAB: TMA		DATE: 3/01/94	
CASE: NA			SDG: NA		
ANALYSES PERFORMED					
<input checked="" type="checkbox"/> CLP/ICP	<input checked="" type="checkbox"/> CLP/GFAA	<input checked="" type="checkbox"/> CLP/Hg	<input checked="" type="checkbox"/> CLP/Cyanide	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/> SW-846/ICP	<input type="checkbox"/> SW-846/GFAA	<input type="checkbox"/> SW-846/Hg	<input type="checkbox"/> SW-846 Cyanide	<input type="checkbox"/>	<input type="checkbox"/>
SAMPLES/MATRIX <span style="float: right;">8-SOILS</span>					
B09345		B09352			
B09346		B09353			
B09349		B09354			
B09350					
B09351					

9/13/25.1051

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

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

Comments: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

2. HOLDING TIMES

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

Comments: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_



INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

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

*11/6/99*

Comments: SEE QUALIFICATION SUMMARY INITIAL %RSD REVIEW INDICATED  
Duplicate injection was outside control limit. Subsequent calibration  
established that the result was not greater than the CRDL and qualification  
was not required, validation specialist has been notified.

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: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

*Revised 9/10/99*

9413225-1053

HOLDING TIME SUMMARY

SDG: NA		VALIDATOR: M. HIGGINS			DATE: 03/01/94		PAGE 1 OF 1	
COMMENTS: B09345.TMA.621 - METAL/CYANIDE								
FIELD SAMPLE ID	ANALYSIS TYPE	DATE SAMPLED	DATE PREPARED	DATE ANALYZED	PREP. HOLDING TIME, DAYS	ANALYSIS HOLDING TIME, DAYS	QUALIFIER	
B09345	CN	9/16/93	9/28/93	9/28/93	≤ 14 days	≤ 14 days	NONE	
B09346		↓		9/28/93				
B09349		↓						
B09350		9/17/93						
B09351		↓						
B09352		↓						
B09353		↓						
B09354		↓						
SDG	Hg/CV	9/16-17/93	10/11/93	10/12/93	≤ 28 days	≤ 28 days	NONE	
SDG	MPL/GFAA	9/16-17/93	10/21/93	10/25-29/93	≤ 180 days	≤ 180 days	NONE	
SDG	MPL/ICP	9/16-17/93	10/21/93	10/22/93	≤ 180 days	≤ 180 days	NONE	

B-1

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

9413225.1055

BLANK AND SAMPLE DATA SUMMARY

SDG: NA		VALIDATOR: X. HIGGINS		DATE: 9/30/01		PAGE 1 OF 1			
COMMENTS: B09345-TMA-621 METALS/CYANIDE - FROM RAW DATA									
SAMPLE ID	COMPOUND	RESULT	Q	RT	UNITS (ppm)	5X RESULT	10X RESULT	SAMPLES AFFECTED	QUALIFIER
CCBZ	BARIUM	.00195	B			.00975		B09353 B09350	U
CCBZ	BERYLLIUM	.0047	B			.0235		B09345, B09346 B09347, B09351	↓
"	"	"	"			"		B09352 B09354	↓
ICB	CALCIUM	0.1677	B			2x = 0.3354		B09350, B09353	J
CCBZ	CHROMIUM	.00250	B			0.0125		B09350 B09353	U
CCBT	COPPER	.01031	B			0.05155		B09350 B09353	↓
CCBI	MAGNESIUM	.03683	B			0.18415		B09350 B09353	↓
CCBI	MANHANESE	.00171	B			0.0855		B09350 B09353	↓
CCBZ	POTASSIUM	.007169	B			.35845		B09350 B09353	↓
PBLK.	SODIUM	0.22106	B			1.1053		B09345 B09346	U
↓	↓	↓	↓			↓		B09349 B09350 B09351 B09352 B09353 B09354	↓
CCBT	TITANIUM	.00281	B			0.01405		B09350 B09353	↓
ICB	SELENIUM	2.4790	B			12.3900		B09353	

B-3

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

031

ACCURACY DATA SUMMARY

SDG: B09345	VALIDATOR: M. HIGGINS	DATE: 930314	PAGE 1 OF 1	
COMMENTS: B09345.TMA.C21 - METALS/CYANIDE				
SAMPLE ID	COMPOUND	% RECOVERY	SAMPLE(S) AFFECTED	QUALIFIER REQUIRED
B093545	ANTIMONY	48.1	ALL	J/BS/US
	ARSENIC	67.7		J/BS/US
	SELENIUM	47.9		J/US
<del> </del>	<del>TITANIUM</del>	<del>139.2</del>	<del> </del>	<del>J</del>
B09353	LEAD	>115	B09353	US
B09345, 49, 50, 51, 52, 54	SELIUM	LE5	B09345, B09349, B09350 B09351, B09352, B09353	US
B09345, 46, 51	THALLIUM	7115/LE5	B09345, B09346, B09351	US
B09352	ARSENIC	EL < 0.995	B09352	J
B09346	SELENIUM	EL < 0.995	B09346	J

5/4/18/94

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

B-4

Nursing staff  
C. Williams

032

WESTINGHOUSE/HANFORD

5A

SAMPLE NUMBER:

SPIKE SAMPLE RECOVERY

B09354S

Lab Name: SKINNER & SHERMAN LABS.

Contract: 68-D0-0108

Lab Code: SKINER

Case No.: N3-09-0855AS No.:

SDG No.: B09345

Matrix (soil/water): SOIL

Level (low/med): LOW

% Solids for Sample: 85.7

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

Analyte	Control Limit %R	Spiked Sample Result (SSR) C	Sample Result (SR) C	Spike Added (SA)	%R	Q M
Aluminum						NR
Antimony	75-125	53.9965	2.8136 U	112.20	48.1	N P
Arsenic	75-125	13.5659	7.6582	8.72	67.7	N F
Barium	75-125	527.8925	96.4678	448.79	96.1	P
Beryllium	75-125	11.0717	0.4558 B	11.22	94.6	P
Cadmium	75-125	9.6760	0.2835 U	11.22	86.2	P
Calcium						NR
Chromium	75-125	57.4791	14.9991	44.88	94.7	P
Cobalt	75-125	110.2302	9.1669 B	112.20	90.1	P
Copper	75-125	72.2691	18.6371	56.10	95.6	P
Iron						NR
Lead	75-125	14.0990	9.4570	4.36	106.5	F
Magnesium						NR
Manganese	75-125	425.3882	317.4080	112.20	96.2	P
Mercury	75-125	0.5946	0.0556 U	0.58	102.5	CV
Nickel	75-125	115.8020	13.4702	112.20	91.2	P
Potassium						NR
Selenium	75-125	1.0449 B	0.5438 U	2.18	47.9	N F
Silver	75-125	10.6678	0.5671 U	11.22	95.1	P
Sodium						NR
Thallium	75-125	11.9313	0.2192 U	10.91	109.4	F
Vanadium	75-125	141.0174	35.317	112.20	94.2	P
Zinc	75-125	150.0830	45.003	112.20	93.1	P
Cyanide	75-125	29.0739	0.5153 U	29.17	99.7	CA
Titanium		1104.6360	948.4191	112.20	139.2	P

Comments:

*SPIKE RECOVERY* 5b, As, Se J/US  
 Ti ~~DETECTS~~ J 4/18/94  
 FORM V (Part 1) - IN  
 no qualifier for Ti, results x4 spike added.  
 revised page 6/11/94  
 940302  
 nhr  
 ILM02.1  
 022-033..



WESTINGHOUSE/HANFORD

3  
BLANKS

Lab Name: SKINNER & SHERMAN LABS.

Contract: 68-D0-0108

Lab Code: SKINER

Case No.: N3-09-085SAS No.:

SDG No.: B09345

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)						Preparation Blank	C	M
			1	C	2	C	3	C			
Aluminum ✓	10.6	U	28.2	B	26.3	B	23.8	B	6.588	B	P
Antimony ✓	12.9	U	12.9	U	12.9	U	14.6	B	2.580	U	P
Arsenic	2.1	U	2.1	U	2.1	U	2.1	U	0.420	U	F
Barium ✓	1.2	U	1.8	B	1.9	B	1.8	B	0.240	U	P
Beryllium ✓	0.2	U	0.5	B	0.5	B	0.5	B	0.040	U	P
Cadmium ✓	1.3	U	1.3	B	2.0	B	1.9	B	0.260	U	P
Calcium ✓	-167.7	B	-79.5	B	59.0	U	-138.3	B	-14.126	B	P
Chromium ✓	2.1	U	2.1	U	2.5	B	2.1	U	0.420	U	P
Cobalt ✓	2.6	U	2.6	U	2.6	U	2.6	U	0.520	U	P
Copper ✓	9.5	B	10.3	B	6.3	B	6.5	B	3.180	B	P
Iron ✓	5.3	U	17.1	B	17.4	B	9.3	B	9.504	B	P
Lead	1.9	U	1.9	U	1.9	U	1.9	U	0.380	U	F
Magnesium ✓	22.9	U	36.8	B	23.6	B	22.9	U	7.218	B	P
Manganese ✓	0.8	U	1.7	B	1.4	B	1.8	B	0.300	B	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	71.7	B	68.5	U	13.946	B	P
Selenium ✓	2.5	B	2.4	U	2.4	U	2.4	U	0.480	U	F
Silver	2.6	U	2.6	U	2.6	U	2.6	U	0.520	U	P
Sodium ✓	114.4	U	114.4	U	114.4	U	114.4	U	44.212	B	P
Thallium	1.1	U	1.1	U	1.1	U	1.1	U	0.220	U	F
Vanadium	5.5	U	5.5	U	5.5	U	5.5	U	1.100	U	P
Zinc	4.4	U	4.4	U	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 ✓	1.1	U	2.0	B	2.8	B	1.5	B	0.220	U	P

ICP Sp 9345  
9346  
9349  
9350  
9351  
9352  
9353

B09354  
+QC

0100

9453549D

~~9452475B~~

ATTACHMENT 73

Page 1 of 55

SEMIVOLATILE ORGANIC DATA VALIDATION SUMMARY FOR DATA PACKAGE:  
B09345-TMA-621 (923-E418/621SVOA.UP2)

945325.060

MEMORANDUM

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TO: 200-UP-2 Project QA Record

February 11, 1994

FR: Michael Higgins, Golder Associates Inc.

*WHC*

RE: SEMIVOLATILE ORGANIC ANALYSIS DATA VALIDATION SUMMARY FOR  
DATA PACKAGE B09345-TMA-621 (923-E418/621SVOA.UP2)

INTRODUCTION

This memo presents the results of data validation on data package B09345-TMA-621 prepared by Thermo Analytical, Inc (TMA). A list of samples validated along with the analyses reported and the method(s) of analysis is provided in the following table.

SAMPLE ID	SAMPLE DATE	MEDIA	ANALYSIS
B09345	9/16/93	SOIL	SEE NOTES
B09346	9/16/93	SOIL	
B09349	9/16/93	SOIL	
B09350	9/17/93	SOIL	
B09351	9/17/93	SOIL	
B09352	9/17/93	SOIL	
B09353	9/17/93	SOIL	
B09354	9/17/93	SOIL	

- Notes: 1 All samples were analyzed for Target Compound List Semivolatile Organics.  
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, with the exceptions of the minor deficiencies identified below.

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

9413225-1061

**Accuracy.** Goals for accuracy were met, with the exceptions of the minor 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 eight (8) samples were validated in this data package with a total of 512 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

- Bis (2-ethylhexyl) phthalate, and di-n-butylphthalate were detected in the method blank. Attachments 2 and 5 provide a summary of the samples affected, data qualification applied and supporting documentation.

### TENTATIVELY IDENTIFIED COMPOUND EVALUATION

Tentatively identified compounds (TICs) reported by the laboratory were evaluated during validation and qualified as follows:

- TICs were detected in the sample(s) and associated laboratory blank and were common laboratory contaminants, resulting in qualification of the TICs as unusable (UR) as shown in Attachment 3.
- TICs were detected in the sample(s) and associated laboratory blank and have been qualified due to associated blank contamination and have been determined to be presumptive and valid (UJN).
- TICs were detected in the sample(s) and determined to be valid, resulting in qualification of the results as presumptive and valid (JN).

Revised  
6/4/10  
002

9413225.062

REFERENCES

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

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

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ATTACHMENT 1

GLOSSARY OF DATA REPORTING QUALIFIERS

9413225.1064

## GLOSSARY OF ORGANIC DATA REPORTING QUALIFIERS

- 9413225-1065
- 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  
5/4/20/94

ATTACHMENT 2  
SUMMARY OF DATA QUALIFICATIONS

9413225.1066

DATA QUALIFICATION SUMMARY - FORM B-7

SDG: NA	REVIEWER: M. HIGGINS	DATE: 940419	PAGE 1 OF 2
COMMENTS: SVOA B09345-TMA-621			
PARAMETER	QUALIFIER	SAMPLES AFFECTED	REASON
BIS (2-ETHYLHEXYL) PHTHALATE	U	B09350 B09352 B09353	PRESENT IN BLANK
DI-N-BUTYLPHTHALATE	U	B09345 B09346 B09349 B09351 B09354	PRESENT IN BLANK

9413225.1067

*Revised  
940419  
M.H.*

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Validated Data Summary, Data Package: B09345-TMA-621

	Samp#	B09345	B09346	B09349	B09350	B09351	B09352
	Date	9-16-93	9-16-93	9-16-93	9-17-93	9-17-93	9-17-93
	Location	299-W19-95	299-W19-97	299-W19-97	299-W19-97	299-W19-97	299-W19-97
	Depth	140.00 - 142.50	130.00 - 132.50	165.00 - 167.50	0.00 - 0.00	146.00 - 148.50	146.00 - 148.50

ATTACHMENT 3

QUALIFIED DATA SUMMARY AND ANNOTATED LABORATORY REPORTS

9443225.1069

Validated Data Summary, Data Package: B09345-TMA-621

Parameter	Samp#	B09353		B09354	
	Date	9-17-93		9-17-93	
	Location	299-W19-97		299-W19-97	
	Depth	0.00 - 0.00		156.00 - 158.50	
	Type	FLDBLK		---	
	Comments	---		---	
	Units	Result	Q	Result	Q
PHENOL	UG/KG	330.000	U	390.000	U
BIS(2-CHLOROETHYL)ETHER	UG/KG	330.000	U	390.000	U
2-CHLOROPHENOL	UG/KG	330.000	U	390.000	U
1,3-DICHLOROBENZENE	UG/KG	330.000	U	390.000	U
1,4-DICHLOROBENZENE	UG/KG	330.000	U	390.000	U
1,2-DICHLOROBENZENE	UG/KG	330.000	U	390.000	U
2-METHYLPHENOL	UG/KG	330.000	U	390.000	U
2,2'-OXYBIS(1-CHLOROPROPANE)	UG/KG	330.000	U	390.000	U
4-METHYLPHENOL	UG/KG	330.000	U	390.000	U
N-NITROSO-DI-N-PROPYLAMINE	UG/KG	330.000	U	390.000	U
HEXACHLOROETHANE	UG/KG	330.000	U	390.000	U
NITROBENZENE	UG/KG	330.000	U	390.000	U
ISOPHORONE	UG/KG	330.000	U	390.000	U
2-NITROPHENOL	UG/KG	330.000	U	390.000	U
2,4-DIMETHYLPHENOL	UG/KG	330.000	U	390.000	U
BIS(2-CHLOROETHOXY)METHANE	UG/KG	330.000	U	390.000	U
2,4-DICHLOROPHENOL	UG/KG	330.000	U	390.000	U
1,2,4-TRICHLOROBENZENE	UG/KG	330.000	U	390.000	U
NAPHTHALENE	UG/KG	330.000	U	390.000	U
4-CHLOROANILINE	UG/KG	330.000	U	390.000	U
HEXACHLOROBUTADIENE	UG/KG	330.000	U	390.000	U
4-CHLORO-3-METHYLPHENOL	UG/KG	330.000	U	390.000	U
2-METHYLNAPHTHALENE	UG/KG	330.000	U	390.000	U
HEXACHLOROCYCLOPENTADIENE	UG/KG	330.000	U	390.000	U
2,4,6-TRICHLOROPHENOL	UG/KG	330.000	U	390.000	U
2,4,5-TRICHLOROPHENOL	UG/KG	790.000	U	940.000	U
2-CHLORONAPHTHALENE	UG/KG	330.000	U	390.000	U
2-NITROANILINE	UG/KG	790.000	U	940.000	U
DIMETHYLPHTHALATE	UG/KG	330.000	U	390.000	U
ACENAPHTHYLENE	UG/KG	330.000	U	390.000	U
3-NITROANILINE	UG/KG	790.000	U	940.000	U
ACENAPHTHENE	UG/KG	330.000	U	390.000	U

*Verified  
5/10/310  
mu*

9475225.1070

Validated Data Summary, Data Package: B09345-TMA-621

Parameter	B09353		B09354		
	Units	Result	Q	Result	Q
2,4-DINITROPHENOL	UG/KG	790.000	U	940.000	U
4-NITROPHENOL	UG/KG	790.000	U	940.000	U
DIBENZOFURAN	UG/KG	330.000	U	390.000	U
2,4-DINITROTOLUENE	UG/KG	330.000	U	390.000	U
2,6-DINITROTOLUENE	UG/KG	330.000	U	390.000	U
DIETHYLPHTHALATE	UG/KG	330.000	U	390.000	U
4-CHLOROPHENYL-PHENYLETHER	UG/KG	330.000	U	390.000	U
FLUORENE	UG/KG	330.000	U	390.000	U
4-NITROANILINE	UG/KG	790.000	U	940.000	U
4,6-DINITRO-2-METHYLPHENOL	UG/KG	790.000	U	940.000	U
N-NITROSODIPHENYLAMINE	UG/KG	330.000	U	390.000	U
4-BROMOPHENYL-PHENYLETHER	UG/KG	330.000	U	390.000	U
HEXACHLOROBENZENE	UG/KG	330.000	U	390.000	U
PENTACHLOROPHENOL	UG/KG	790.000	U	940.000	U
PHENANTHRENE	UG/KG	330.000	U	390.000	U
ANTHRACENE	UG/KG	330.000	U	390.000	U
CARBAZOLE	UG/KG	330.000	U	390.000	U
DI-N-BUTYLPHTHALATE	UG/KG	110.000	J	390.000	U
FLUORANTHENE	UG/KG	330.000	U	390.000	U
PYRENE	UG/KG	330.000	U	390.000	U
BUTYLBENZYLPHTHALATE	UG/KG	330.000	U	390.000	U
3,3'-DICHLOROBENZIDINE	UG/KG	330.000	U	390.000	U
BENZO(A)ANTHRACENE	UG/KG	330.000	U	390.000	U
BIS(2-ETHYLHEXYL)PHTHALATE	UG/KG	330.000	U	390.000	U
CHRYSENE	UG/KG	330.000	U	390.000	U
DI-N-OCTYLPHTHALATE	UG/KG	330.000	U	390.000	U
BENZO(B)FLUORANTHENE	UG/KG	330.000	U	390.000	U
BENZO(K)FLUORANTHENE	UG/KG	330.000	U	390.000	U
BENZO(A)PYRENE	UG/KG	330.000	U	390.000	U
INDENO(1,2,3-CD)PYRENE	UG/KG	330.000	U	390.000	U
DIBENZ(A,H)ANTHRACENE	UG/KG	330.000	U	390.000	U
BENZO(G,H,I)PERYLENE	UG/KG	330.000	U	390.000	U

*Verified  
9/14/03/10  
mm*

9/14/03/10

000349

1B  
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B09345

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 09054 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A309054-01B

Sample wt/vol: 30.4 (g/mL) G Lab File ID: 30929S05

Level: (low/med) LOW Date Received: 09/21/93

% Moisture: 12 decanted: (Y/N) N Date Extracted: 09/24/93

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 09/29/93

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

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

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) <u>UG/KG</u>	Q
108-95-2	Phenol	370	U
111-44-4	bis(2-Chloroethyl) Ether	370	U
95-57-8	2-Chlorophenol	370	U
541-73-1	1,3-Dichlorobenzene	370	U
106-46-7	1,4-Dichlorobenzene	370	U
95-50-1	1,2-Dichlorobenzene	370	U
95-48-7	2-Methylphenol	370	U
108-60-1	2,2'-oxybis(1-Chloropropane)	370	U
106-44-5	4-Methylphenol	370	U
621-64-7	N-Nitroso-Di-n-Propylamine	370	U
67-72-1	Hexachloroethane	370	U
98-95-3	Nitrobenzene	370	U
78-59-1	Isophorone	370	U
88-75-5	2-Nitrophenol	370	U
105-67-9	2,4-Dimethylphenol	370	U
111-91-1	bis(2-Chloroethoxy) Methane	370	U
120-83-2	2,4-Dichlorophenol	370	U
120-82-1	1,2,4-Trichlorobenzene	370	U
91-20-3	Naphthalene	370	U
106-47-8	4-Chloroaniline	370	U
87-68-3	Hexachlorobutadiene	370	U
59-50-7	4-Chloro-3-Methylphenol	370	U
91-57-6	2-Methylnaphthalene	370	U
77-47-4	Hexachlorocyclopentadiene	370	U
88-06-2	2,4,6-Trichlorophenol	370	U
95-95-4	2,4,5-Trichlorophenol	900	U
91-58-7	2-Chloronaphthalene	370	U
88-74-4	2-Nitroaniline	900	U
131-11-3	Dimethylphthalate	370	U
208-96-8	Acenaphthylene	370	U
99-09-2	3-Nitroaniline	900	U
83-32-9	Acenaphthene	370	U
51-28-5	2,4-Dinitrophenol	900	U

*Verified  
9/30/93  
MML*

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000350

1C  
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B09345

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 09054 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A309054-01B

Sample wt/vol: 30.4 (g/mL) G Lab File ID: 30929S05

Level: (low/med) LOW Date Received: 09/21/93

% Moisture: 12 decanted: (Y/N) N Date Extracted: 09/24/93

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 09/29/93

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

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

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

CAS NO. COMPOUND Q

CAS NO.	COMPOUND	UG/KG	Q
100-02-7	4-Nitrophenol	900	U
132-64-9	Dibenzofuran	370	U
121-14-2	2,4-Dinitrotoluene	370	U
606-20-2	2,6-Dinitrotoluene	370	U
84-66-2	Diethylphthalate	370	U
7005-72-3	4-Chlorophenyl-phenylether	370	U
86-73-7	Fluorene	370	U
100-01-6	4-Nitroaniline	900	U
534-52-1	4,6-Dinitro-2-methylphenol	900	U
86-30-6	N-Nitrosodiphenylamine (1)	370	U
101-55-3	4-Bromophenyl-phenylether	370	U
118-74-1	Hexachlorobenzene	370	U
87-86-5	Pentachlorophenol	900	U
85-01-8	Phenanthrene	370	U
120-12-7	Anthracene	370	U
86-74-8	Carbazole	370	U
84-74-2	Di-n-Butylphthalate	370	U
206-44-0	Fluoranthene	370	U
129-00-0	Pyrene	370	U
85-68-7	Butylbenzylphthalate	370	U
91-94-1	3,3'-Dichlorobenzidine	370	U
56-55-3	Benzo(a)Anthracene	370	U
117-81-7	bis(2-Ethylhexyl) Phthalate	370	U
218-01-9	Chrysene	370	U
117-84-0	Di-n-Octyl Phthalate	370	U
205-99-2	Benzo(b) Fluoranthene	370	U
207-08-9	Benzo(k) Fluoranthene	370	U
50-32-8	Benzo(a) Pyrene	370	U
193-39-5	Indeno(1,2,3-cd) Pyrene	370	U
53-70-3	Dibenz(a,h) Anthracene	370	U
191-24-2	Benzo(g,h,i) Perylene	370	U

370 41

4

(1) - Cannot be separated from Diphenylamine

*Handwritten notes:*  
10/30/93  
JMC

91132251003

000351e

1F  
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET  
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B09345

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 09054 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A309054-01B

Sample wt/vol: 30.4 (g/mL) G Lab File ID: 30929S05

Level: (low/med) LOW Date Received: 09/21/93

% Moisture: 12 decanted: (Y/N) N Date Extracted: 09/24/93

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 09/29/93

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

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

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

Number TICs found: 6

9143225 1074  
42015725146

New @  
will  
9/30

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 123-42-2	4-HYDROXY-4-METHYL-2-PENTANO	6.13	61000	BAJN
2.	UNKNOWN HYDROCARBON	6.28	110	BJ
3.	UNKNOWN HYDROCARBON	6.77	75	BJ
4.	UNKNOWN HYDROCARBON	7.37	1100	BJ
5.	UNKNOWN HYDROCARBON	8.70	110	J
6.	HEXANEDIOIC ACID ESTER ISOME	26.23	18000	BJ

UR  
UJN  
UJN  
UJN  
UJN  
UJN

Revised  
04/19/94  
K. L. L.

Verified  
09/29/93  
[Signature]

000371

EPA SAMPLE NO.

1B SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

B09346

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 09054 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A309054-03D

Sample wt/vol: 30.2 (g/mL) G Lab File ID: 30930S02

Level: (low/med) LOW Date Received: 09/21/93

% Moisture: 7 decanted: (Y/N) N Date Extracted: 09/24/93

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 09/30/93

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

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

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

94132255105

CAS NO.	COMPOUND	CONCENTRATION UNITS:	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
37-68-3	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

Verified  
9/30/93  
Wah

1C  
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

000372  
EPA SAMPLE NO.

B09346

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 09054 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A309054-03D

Sample wt/vol: 30.2 (g/mL) G Lab File ID: 30930S02

Level: (low/med) LOW Date Received: 09/21/93

% Moisture: 7 decanted: (Y/N) N Date Extracted: 09/24/93

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 09/30/93

Injection Volume: 2.0(uL) Dilution Factor: 1.0

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

9/11/3226 1026

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) <u>UG/KG</u>	Q
100-02-7	4-Nitrophenol	850	U
132-64-9	Dibenzofuran	350	U
121-14-2	2,4-Dinitrotoluene	350	U
606-20-2	2,6-Dinitrotoluene	350	U
84-66-2	Diethylphthalate	350	U
7005-72-3	4-Chlorophenyl-phenylether	350	U
86-73-7	Fluorene	350	U
100-01-6	4-Nitroaniline	850	U
534-52-1	4,6-Dinitro-2-methylphenol	850	U
86-30-6	N-Nitrosodiphenylamine (1)	350	U
101-55-3	4-Bromophenyl-phenylether	350	U
118-74-1	Hexachlorobenzene	350	U
87-86-5	Pentachlorophenol	850	U
85-01-8	Phenanthrene	350	U
120-12-7	Anthracene	350	U
86-74-8	Carbazole	350	U
84-74-2	Di-n-Butylphthalate	350 <del>58</del>	U
206-44-0	Fluoranthene	350	U
129-00-0	Pyrene	350	U
85-68-7	Butylbenzylphthalate	350	U
91-94-1	3,3'-Dichlorobenzidine	350	U
56-55-3	Benzo(a)Anthracene	350	U
117-81-7	bis(2-Ethylhexyl) Phthalate	350	U
218-01-9	Chrysene	350	U
117-84-0	Di-n-Octyl Phthalate	350	U
205-99-2	Benzo(b)Fluoranthene	350	U
207-08-9	Benzo(k)Fluoranthene	350	U
50-32-8	Benzo(a)Pyrene	350	U
193-39-5	Indeno(1,2,3-cd)Pyrene	350	U
53-70-3	Dibenz(a,h)Anthracene	350	U
191-24-2	Benzo(g,h,i)Perylene	350	U

*Verified  
40910  
mm*

(1) - Cannot be separated from Diphenylamine



000395

1B  
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B09349

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 09054 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A309054-02B

Sample wt/vol: 30.4 (g/mL) G Lab File ID: 30929S08

Level: (low/med) LOW Date Received: 09/21/93

% Moisture: 20 decanted: (Y/N) N Date Extracted: 09/24/93

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 09/29/93

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

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

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

94132251028

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

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1C  
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B09349

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 09054 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A309054-02B

Sample wt/vol: 30.4 (g/mL) G Lab File ID: 30929S08

Level: (low/med) LOW Date Received: 09/21/93

% Moisture: 20 decanted: (Y/N) N Date Extracted: 09/24/93

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 09/29/93

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

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

9/13/25 10:19

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) <u>UG/KG</u>	Q
100-02-7	4-Nitrophenol	990	U
132-64-9	Dibenzofuran	410	U
121-14-2	2,4-Dinitrotoluene	410	U
606-20-2	2,6-Dinitrotoluene	410	U
84-66-2	Diethylphthalate	410	U
7005-72-3	4-Chlorophenyl-phenylether	410	U
86-73-7	Fluorene	410	U
100-01-6	4-Nitroaniline	990	U
534-52-1	4,6-Dinitro-2-methylphenol	990	U
86-30-6	N-Nitrosodiphenylamine (1)	410	U
101-55-3	4-Bromophenyl-phenylether	410	U
118-74-1	Hexachlorobenzene	410	U
87-86-5	Pentachlorophenol	990	U
85-01-8	Phenanthrene	410	U
120-12-7	Anthracene	410	U
86-74-8	Carbazole	410	U
84-74-2	Di-n-Butylphthalate	410 <del>240</del>	U
206-44-0	Fluoranthene	410	U
129-00-0	Pyrene	410	U
85-68-7	Butylbenzylphthalate	410	U
91-94-1	3,3'-Dichlorobenzidine	410	U
56-55-3	Benzo(a)Anthracene	410	U
117-81-7	bis(2-Ethylhexyl) Phthalate	410	U
218-01-9	Chrysene	410	U
117-84-0	Di-n-Octyl Phthalate	410	U
205-99-2	Benzo(b) Fluoranthene	410	U
207-08-9	Benzo(k) Fluoranthene	410	U
50-32-8	Benzo(a) Pyrene	410	U
193-39-5	Indeno(1,2,3-cd) Pyrene	410	U
53-70-3	Dibenz(a,h) Anthracene	410	U
191-24-2	Benzo(g,h,i) Perylene	410	U

(1) - Cannot be separated from Diphenylamine

Verified  
9/30/93  
MM

000397e

1F  
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET  
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B09349

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 09054 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A309054-02B

Sample wt/vol: 30.4 (g/mL) G Lab File ID: 30929S08

Level: (low/med) LOW Date Received: 09/21/93

% Moisture: 20 decanted: (Y/N) N Date Extracted: 09/24/93

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 09/29/93

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

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

Number TICs found: 11

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	6.15	72000	BAJN
2.	UNKNOWN HYDROCARBON	6.30	82	BJ
3.	UNKNOWN HYDROCARBON	6.78	82	BJ
4.	UNKNOWN HYDROCARBON	7.37	1300	BJ
5.	UNKNOWN HYDROCARBON	8.72	120	BJ
6.	PROPANOIC ACID ESTER ISOMER	18.10	160	J
7.	UNKNOWN CARBOXYLIC ACID ESTE	21.32	82	J
8.	UNKNOWN HYDROCARBON	23.65	120	J
9.	UNKNOWN HYDROCARBON	24.15	82	J
10.	UNKNOWN HYDROCARBON	24.23	120	J
11.	HEXANEDIOIC ACID ESTER ISOME	26.22	2900	BJ

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9/30/93  
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1B  
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

000423e  
EPA SAMPLE NO.

B09350

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 09054 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A309054-04B

Sample wt/vol: 30.2 (g/mL) G Lab File ID: 30929S10

Level: (low/med) LOW Date Received: 09/21/93

% Moisture: 0 decanted: (Y/N) N Date Extracted: 09/24/93

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 09/29/93

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

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

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) <u>UG/KG</u>	Q
108-95-2	Phenol	330	U
111-44-4	bis(2-Chloroethyl) Ether	330	U
95-57-8	2-Chlorophenol	330	U
541-73-1	1,3-Dichlorobenzene	330	U
106-46-7	1,4-Dichlorobenzene	330	U
95-50-1	1,2-Dichlorobenzene	330	U
95-48-7	2-Methylphenol	330	U
108-60-1	2,2'-oxybis(1-Chloropropane)	330	U
106-44-5	4-Methylphenol	330	U
621-64-7	N-Nitroso-Di-n-Propylamine	330	U
67-72-1	Hexachloroethane	330	U
98-95-3	Nitrobenzene	330	U
78-59-1	Isophorone	330	U
88-75-5	2-Nitrophenol	330	U
105-67-9	2,4-Dimethylphenol	330	U
111-91-1	bis(2-Chloroethoxy)Methane	330	U
120-83-2	2,4-Dichlorophenol	330	U
120-82-1	1,2,4-Trichlorobenzene	330	U
91-20-3	Naphthalene	330	U
106-47-8	4-Chloroaniline	330	U
37-68-3	Hexachlorobutadiene	330	U
59-50-7	4-Chloro-3-Methylphenol	330	U
91-57-6	2-Methylnaphthalene	330	U
77-47-4	Hexachlorocyclopentadiene	330	U
88-06-2	2,4,6-Trichlorophenol	330	U
95-95-4	2,4,5-Trichlorophenol	790	U
91-58-7	2-Chloronaphthalene	330	U
88-74-4	2-Nitroaniline	790	U
131-11-3	Dimethylphthalate	330	U
208-96-8	Acenaphthylene	330	U
99-09-2	3-Nitroaniline	790	U
83-32-9	Acenaphthene	330	U
51-28-5	2,4-Dinitrophenol	790	U

*Verified  
9/30/93  
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1C  
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

000424  
EPA SAMPLE NO.

B09350

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 09054 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A309054-04B

Sample wt/vol: 30.2 (g/mL) G Lab File ID: 30929S10

Level: (low/med) LOW Date Received: 09/21/93

% Moisture: 0 decanted: (Y/N) N Date Extracted: 09/24/93

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 09/29/93

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

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

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

CAS NO. COMPOUND UG/KG Q

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

(1) - Cannot be separated from Diphenylamine

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9/30/93  
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1B  
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B09351

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 09054 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A309054-05B

Sample wt/vol: 30.6 (g/mL) G Lab File ID: 30929S11

Level: (low/med) LOW Date Received: 09/21/93

% Moisture: 6 decanted: (Y/N) N Date Extracted: 09/24/93

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 09/29/93

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

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

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) <u>UG/KG</u>	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

FORM I SV-1

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 [Signature]

1C SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B09351

Lab Name: TMA/ARLI Contract: WHC
Lab Code: TMALA Case No.: 09054 SAS No.: NA SDG No.: NA
Matrix: (soil/water) SOIL Lab Sample ID: A309054-05B
Sample wt/vol: 30.6 (g/mL) G Lab File ID: 30929S11
Level: (low/med) LOW Date Received: 09/21/93
% Moisture: 6 decanted: (Y/N) N Date Extracted: 09/24/93
Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 09/29/93
Injection Volume: 2.0(uL) Dilution Factor: 1.0
GPC Cleanup: (Y/N) Y pH: 9.2

91132251085

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

Table with 4 columns: CAS NO., COMPOUND, UG/KG, and Q. Lists various organic compounds and their concentrations, such as 4-Nitrophenol (830 UG/KG) and Dibenzo(a,h)Anthracene (340 UG/KG).

(1) - Cannot be separated from Diphenylamine

Handwritten signature and date: 5-7-93

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1F  
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET  
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B09351

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 09054 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A309054-05B

Sample wt/vol: 30.6 (g/mL) G Lab File ID: 30929S11

Level: (low/med) LOW Date Received: 09/21/93

% Moisture: 6 decanted: (Y/N) N Date Extracted: 09/24/93

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 09/29/93

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

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

Number TICs found: 11

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	6.13	66000	BAJN	UR
2.	UNKNOWN HYDROCARBON	6.27	170	BJ	UR
3.	UNKNOWN HYDROCARBON	6.75	100	BJ	UR
4.	UNKNOWN HYDROCARBON	7.33	1300	BJ	UR
5.	UNKNOWN HYDROCARBON	8.67	140	BJ	UR
6.	UNKNOWN HYDROCARBON	9.05	70	BJ	UR
7.	UNKNOWN HYDROCARBON	12.27	70	BJ	UR
8.	PROPANOIC ACID ESTER ISOMER	18.07	170	BJ	UR
9.	UNKNOWN CARBOXYLIC ACID ESTE	21.27	100	BJ	UR
10.	UNKNOWN HYDROCARBON	24.20	70	BJ	UR
11.	HEXANEDIOIC ACID ESTER ISOME	26.18	590	BJ	UR

Handwritten notes: *Handwritten initials and numbers, possibly '940412'*

Handwritten note: *Revised 9/24/94*

Handwritten note: *Handwritten initials and numbers, possibly '40310'*

1B  
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

~~000473~~  
EPA SAMPLE NO.

B09352

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 09054 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A309054-06B

Sample wt/vol: 30.7 (g/mL) G Lab File ID: 30929S12

Level: (low/med) LOW Date Received: 09/21/93

% Moisture: 6 decanted: (Y/N) N Date Extracted: 09/24/93

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 09/30/93

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

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

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) <u>UG/KG</u>	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

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*Verified*  
9/30/93  
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EPA SAMPLE NO.

1C SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

B09352

Lab Name: TMA/ARLI Contract: WHC
Lab Code: TMALA Case No.: 09054 SAS No.: NA SDG No.: NA
Matrix: (soil/water) SOIL Lab Sample ID: A309054-06B
Sample wt/vol: 30.7 (g/mL) G Lab File ID: 30929S12
Level: (low/med) LOW Date Received: 09/21/93
% Moisture: 6 decanted: (Y/N) N Date Extracted: 09/24/93
Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 09/30/93
Injection Volume: 2.0(uL) Dilution Factor: 1.0
GPC Cleanup: (Y/N) Y pH: 9.1

9/13/93 1088

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

Table with 4 columns: CAS NO., COMPOUND, CONCENTRATION UNITS, and Q. Lists various organic compounds like 4-Nitrophenol, Dibenzofuran, etc., with their respective CAS numbers and detection results.

Q

(1) - Cannot be separated from Diphenylamine

Verified 7/10/10

~~000475~~

1F  
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET  
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B09352

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 09054 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A309054-06B

Sample wt/vol: 30.7 (g/mL) G Lab File ID: 30929S12

Level: (low/med) LOW Date Received: 09/21/93

% Moisture: 6 decanted: (Y/N) N Date Extracted: 09/24/93

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 09/30/93

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

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

Number TICs found: 9 CONCENTRATION UNITS:  
(ug/L or ug/Kg) UG/KG

9143225 1089

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 123-42-2	4-HYDROXY-4-METHYL-2-PENTANO	6.17	74000	BAJN
2.	UNKNOWN HYDROCARBON	6.30	69	BJ
3.	UNKNOWN HYDROCARBON	6.80	100	BJ
4.	UNKNOWN HYDROCARBON	7.37	1300	BJ
5.	UNKNOWN HYDROCARBON	8.72	140	BJ
6.	UNKNOWN HYDROCARBON	12.32	69	J
7.	PROPANOIC ACID ESTER ISOMER	18.10	240	J
8.	UNKNOWN CARBOXYLIC ACID ESTE	21.32	100	J
9.	HEXANEDIOIC ACID ESTER ISOME	26.22	310	BJ

UR  
UJH  
UJH  
UJH  
UJH  
JN  
JN  
UJH

*Handwritten signature*  
190412

*Received 09/19/94*

*Verified 940310*

000500<sup>2</sup>

1B  
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B09353

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 09054 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A309054-07B

Sample wt/vol: 30.2 (g/mL) G Lab File ID: 30929S13

Level: (low/med) LOW Date Received: 09/21/93

% Moisture: 0 decanted: (Y/N) N Date Extracted: 09/24/93

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 09/30/93

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

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

9/11/32/25/10/0

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

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

*Verified  
40311  
M*

000501

1C SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B09353

Lab Name: TMA/ARLI

Contract: WHC

Lab Code: TMA LA

Case No.: 09054

SAS No.: NA

SDG No.: NA

Matrix: (soil/water) SOIL

Lab Sample ID: A309054-07B

Sample wt/vol: 30.2 (g/mL) G

Lab File ID: 30929S13

Level: (low/med) LOW

Date Received: 09/21/93

% Moisture: 0 decanted: (Y/N) N

Date Extracted: 09/24/93

Concentrated Extract Volume: 500.0 (uL)

Date Analyzed: 09/30/93

Injection Volume: 2.0 (uL)

Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y

pH: 9.1

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

CAS NO.

COMPOUND

Q

62

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	110	J
206-44-0	Fluoranthene	330	U
129-00-0	Pyrene	330	U
85-68-7	Butylbenzylphthalate	330	U
91-94-1	3,3'-Dichlorobenzidine	330	U
56-55-3	Benzo(a)Anthracene	330	U
117-81-7	bis(2-Ethylhexyl) Phthalate	330	U
218-01-9	Chrysene	330	U
117-84-0	Di-n-Octyl Phthalate	330	U
205-99-2	Benzo(b) Fluoranthene	330	U
207-08-9	Benzo(k) Fluoranthene	330	U
50-32-8	Benzo(a) Pyrene	330	U
193-39-5	Indeno(1,2,3-cd) Pyrene	330	U
53-70-3	Dibenz(a,h)Anthracene	330	U
191-24-2	Benzo(g,h,i) Perylene	330	U

330 48 BJ

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(1) - Cannot be separated from Diphenylamine

94132251091



000530

EPA SAMPLE NO.

1B SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

B09354

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 09054 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A309054-08B

Sample wt/vol: 30.2 (g/mL) G Lab File ID: 30929S14

Level: (low/med) LOW Date Received: 09/21/93

% Moisture: 15 decanted: (Y/N) N Date Extracted: 09/24/93

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 09/30/93

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 8.5

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

CAS NO.	COMPOUND	(ug/L or ug/Kg) UG/KG	Q
108-95-2	Phenol	390	U
111-44-4	bis(2-Chloroethyl) Ether	390	U
95-57-8	2-Chlorophenol	390	U
541-73-1	1,3-Dichlorobenzene	390	U
106-46-7	1,4-Dichlorobenzene	390	U
95-50-1	1,2-Dichlorobenzene	390	U
95-48-7	2-Methylphenol	390	U
108-60-1	2,2'-oxybis(1-Chloropropane)	390	U
106-44-5	4-Methylphenol	390	U
621-64-7	N-Nitroso-Di-n-Propylamine	390	U
67-72-1	Hexachloroethane	390	U
98-95-3	Nitrobenzene	390	U
78-59-1	Isophorone	390	U
88-75-5	2-Nitrophenol	390	U
105-67-9	2,4-Dimethylphenol	390	U
111-91-1	bis(2-Chloroethoxy)Methane	390	U
120-83-2	2,4-Dichlorophenol	390	U
120-82-1	1,2,4-Trichlorobenzene	390	U
91-20-3	Naphthalene	390	U
106-47-8	4-Chloroaniline	390	U
87-68-3	Hexachlorobutadiene	390	U
59-50-7	4-Chloro-3-Methylphenol	390	U
91-57-6	2-Methylnaphthalene	390	U
77-47-4	Hexachlorocyclopentadiene	390	U
88-06-2	2,4,6-Trichlorophenol	390	U
95-95-4	2,4,5-Trichlorophenol	940	U
91-58-7	2-Chloronaphthalene	390	U
88-74-4	2-Nitroaniline	940	U
131-11-3	Dimethylphthalate	390	U
208-96-8	Acenaphthylene	390	U
99-09-2	3-Nitroaniline	940	U
83-32-9	Acenaphthene	390	U
51-28-5	2,4-Dinitrophenol	940	U

9413225-0995

*Handwritten signature and date: 9/30/93*

000531

1C  
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B09354

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 09054 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A309054-08B

Sample wt/vol: 30.2 (g/mL) G Lab File ID: 30929S14

Level: (low/med) LOW Date Received: 09/21/93

% Moisture: 15 decanted: (Y/N) N Date Extracted: 09/24/93

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 09/30/93

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 8.5

9443225-09

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

Q

G2

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) <u>UG/KG</u>	Q
100-02-7	4-Nitrophenol	940	U
132-64-9	Dibenzofuran	390	U
121-14-2	2,4-Dinitrotoluene	390	U
606-20-2	2,6-Dinitrotoluene	390	U
84-66-2	Diethylphthalate	390	U
7005-72-3	4-Chlorophenyl-phenylether	390	U
86-73-7	Fluorene	390	U
100-01-6	4-Nitroaniline	940	U
534-52-1	4,6-Dinitro-2-methylphenol	940	U
86-30-6	N-Nitrosodiphenylamine (1)	390	U
101-55-3	4-Bromophenyl-phenylether	390	U
118-74-1	Hexachlorobenzene	390	U
87-86-5	Pentachlorophenol	940	U
85-01-8	Phenanthrene	390	U
120-12-7	Anthracene	390	U
86-74-8	Carbazole	390	U
84-74-2	Di-n-Butylphthalate	390	U
206-44-0	Fluoranthene	390	U
129-00-0	Pyrene	390	U
85-68-7	Butylbenzylphthalate	390	U
91-94-1	3,3'-Dichlorobenzidine	390	U
56-55-3	Benzo(a)Anthracene	390	U
117-81-7	bis(2-Ethylhexyl) Phthalate	390	U
218-01-9	Chrysene	390	U
117-84-0	Di-n-Octyl Phthalate	390	U
205-99-2	Benzo(b)Fluoranthene	390	U
207-08-9	Benzo(k)Fluoranthene	390	U
50-32-8	Benzo(a)Pyrene	390	U
193-39-5	Indeno(1,2,3-cd)Pyrene	390	U
53-70-3	Dibenz(a,h)Anthracene	390	U
191-24-2	Benzo(g,h,i)Perylene	390	U

390 180

(1) - Cannot be separated from Diphenylamine

Handwritten signature and notes

000532

1F  
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET  
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B09354

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 09054 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A309054-08B

Sample wt/vol: 30.2 (g/mL) G Lab File ID: 30929S14

Level: (low/med) LOW Date Received: 09/21/93

% Moisture: 15 decanted: (Y/N) N Date Extracted: 09/24/93

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 09/30/93

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 8.5

Number TICs found: 8

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

5600  
9173225-1095  
5725716

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q	
1. 123-42-2	4-HYDROXY-4-METHYL-2-PENTANO	6.12	63000	BAJN	UR
2.	UNKNOWN HYDROCARBON	6.27	78	BJ	UJN
3.	UNKNOWN HYDROCARBON	6.75	78	BJ	UJN
4.	UNKNOWN HYDROCARBON	7.33	1200	BJ	UJN
5.	UNKNOWN HYDROCARBON	8.67	120	BJ	UJN
6.	PROPANOIC ACID ESTER ISOMER	18.07	230	J	JN
7.	HEXANEDIOIC ACID ESTER ISOME	26.18	350	BJ	UJN
8.	UNKNOWN ALKANE	31.78	120	J	JN

Q  
UR  
UJN  
UJN  
UJN  
UJN  
JN  
UJN  
JN  
New Q  
UJN  
94041

Checked  
94041  
UJN

UJN  
UJN  
UJN

ATTACHMENT 4

LABORATORY NARRATIVE AND CHAIN-OF-CUSTODY DOCUMENTATION

9113225.1096

000096

CASE NARRATIVE

LABORATORY : TMA/ARLI

CASE : 09-054

CONTRACT ID : WESTINGHOUSE HANFORD COMPANY

SDG RECEIPT DATE : September 21, 1993

1.0 DESCRIPTION OF CASE :

Nine 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.

911325.1997

2.0 SAMPLE LIST :

<u>WESTINGHOUSE ID</u>	<u>LAB ID</u>	<u>ANALYSIS REQUESTED</u>	<u>MATRIX</u>
B09345	A3-09-054-01A	V	SOIL
B09345	A3-09-054-01B	SV	SOIL
B09345 MS	A3-09-054-01C	SV	SOIL
B09345 MSD	A3-09-054-01D	SV	SOIL
B09345	A3-09-054-01F	K	SOIL
B09349	A3-09-054-02A	V	SOIL
B09349	A3-09-054-02B	SV	SOIL
B09349	A3-09-054-02E	K	SOIL
B09349 MS	A3-09-054-02F	K	SOIL
B09349 MSD	A3-09-054-02G	K	SOIL
B09346	A3-09-054-03A	V	SOIL
B09346 MS	A3-09-054-03B	V	SOIL
B09346 MSD	A3-09-054-03C	V	SOIL
B09346	A3-09-054-03D	SV	SOIL
B09346	A3-09-054-03G	K	SOIL
B09350	A3-09-054-04A	V	SOIL
B09350	A3-09-054-04B	SV	SOIL
B09350	A3-09-054-04D	K	SOIL
B09351	A3-09-054-05A	V	SOIL
B09351	A3-09-054-05B	SV	SOIL
B09351	A3-09-054-05D	K	SOIL
B09352	A3-09-054-06A	V	SOIL
B09352	A3-09-054-06B	SV	SOIL
B09352	A3-09-054-06D	K	SOIL
B09353	A3-09-054-07A	V	SOIL
B09353	A3-09-054-07B	SV	SOIL
B09353	A3-09-054-07D	K	SOIL
B09354	A3-09-054-08A	V	SOIL
B09354	A3-09-054-08B	SV	SOIL
B09354	A3-09-054-08D	K	SOIL
B09358	A3-09-054-09A	V	SOIL

~~000097~~

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 contract required holding times.

The Terphenyl-d14 (TPH) surrogate recovery for sample B09353 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 10/05/93 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.

9473225-099

000098

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 B09336 was spiked with Kerosene and the matrix spike recoveries were between 84% and 87%. The blank spike was prepared at the same time, and had a 75% 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*

Nicole Roth 12/10/93  
CLP Program Manager

*Maureen Parrish*

Maureen Parrish 12/10/93  
Project Manager

9473225.099

DDDD02C

Westinghouse  
Hanford Company

### CHAIN OF CUSTODY

Custody Form Initiator L E ROGERS

Company Contact L E ROGERS

Telephone 376-7690

Project Designation/Sampling Locations 200-UP-2

Collection Date 9-16-93

Ice Chest No. SML 283

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

001152225-1100

1) B09346

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

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

SEP 9-16-93

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,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: <u>9-20-93</u> <u>Jacene Rogers 1205</u>	Received by: <u>H. NARCISO</u> <u>TMA/HORCAU</u>	Date/Time: <u>9-21-93 12:35</u>
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

#### Final Sample Disposition

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

000002E

Westinghouse  
Hanford Company

# CHAIN OF CUSTODY

Custody Form Initiator L E ROGERS

Company Contact L E ROGERS Telephone 376-7690

Project Designation/Sampling Locations 200-UP-2 Collection Date 9-17-93

Ice Chest No. SML 372 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

1011-5228716

- 1) B09350 EB
- 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
- B09351
- 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) B09352
- 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: <u>L E ROGERS</u> <u>1205</u>	Received by: <u>H. NARCISO</u> <u>TMA/NORCAL</u>	Date/Time: <u>9-21-92</u> <u>12:35</u>
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

### Final Sample Disposition

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

0000026

Westinghouse  
Hanford Company

### CHAIN OF CUSTODY

Custody Form Initiator L E ROGERS

Company Contact L E ROGERS

Telephone 376-7690

Project Designation/Sampling Locations 200-UP-2

Collection Date 9-17-93

Ice Chest No. SML283

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

941325.1102

1) 809353

- 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

809354

- 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) REC 9-17-93

- 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: <u>L E ROGERS</u> <u>1205</u> <u>9-20-93</u>	Received by: <u>H. NARCISO</u> <u>TMA/HORCAL</u>	Date/Time: <u>9-21-93 12:35</u>
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

#### Final Sample Disposition

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

ATTACHMENT 5  
DATA VALIDATION SUPPORTING DOCUMENTATION

9473225.103

GC/MS ORGANIC DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	(E)
PROJECT:	200.CP.2		DATA PACKAGE: B09345.TMA.621		
VALIDATOR:	M. HIGGINS	LAB:	TMA	DATE: 940304	
CASE:	NA		SDG: B09345		
ANALYSES PERFORMED					
<input type="checkbox"/> CLP Volatiles	<input type="checkbox"/> SW-846 8240 (cap column)	<input type="checkbox"/> SW-846 8280 (packed column)	<input checked="" type="checkbox"/> CLP Semivolatiles	<input type="checkbox"/> SW-846 8270 (cap column)	<input type="checkbox"/> SW-846 (packed column)
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
SAMPLES/MATRIX 8 SOLLS					
B09345		B09352			
B09346		B09353			
B09349		B09354			
B09350					
B09351					

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: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

9413225.1104

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: FIELD BLANK CONTAINED ADDITIONAL TICS  
NOT PRESENT IN BLANK. LABORATORY BLANK  
GC will be evaluated in the final summary report  
TICS were detected in sample and associated laboratory blank  
and were common lab contaminants tagged UR

*[Signature]*  
 6/10/19

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: TERPHENYL-DIT WAS 1% AT ABOVE THE  
UPPER LIMIT. NO QUALIFICATION WAS APPLIED.

\_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

5011 2725.1105

*[Signature]*  
 6/10/19

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: FIELD GC IDENTIFICATION WAS NOT AVAILABLE AT THE TIME OF VALIDATION. FIELD GC ID HAS BEEN REQUESTED AND WILL BE INCLUDE IN FINAL DATA SUMMARY.

7. SYSTEM PERFORMANCE

Were internal standards analyzed? . . . . .  Yes No N/A

Are internal standard areas acceptable? . . . . .  Yes No N/A

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

Comments: \_\_\_\_\_

8. COMPOUND IDENTIFICATION AND QUANTITATION

Is compound identification acceptable? . . . . .  Yes No N/A

Is compound quantitation acceptable? . . . . .  Yes No N/A

Comments: \_\_\_\_\_

9. REPORTED RESULTS AND QUANTITATION LIMITS

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

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

Do results meet the CRQLs? . . . . .  Yes No N/A

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

Comments: \_\_\_\_\_

9113225.1106





000621

1C  
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SBLK0924S

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 09054 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A309054-BLK

Sample wt/vol: 30.2 (g/mL) G Lab File ID: 30929S04

Level: (low/med) LOW Date Received: \_\_\_\_\_

% Moisture: \_\_\_\_\_ decanted: (Y/N) N Date Extracted: 09/24/93

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 09/29/93

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: \_\_\_\_\_

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) <u>UG/KG</u>	Q
100-02-7	4-Nitrophenol	790	U
132-64-9	Dibenzofuran	330	U
121-14-2	2,4-Dinitrotoluene	330	U
606-20-2	2,6-Dinitrotoluene	330	U
84-66-2	Diethylphthalate	330	U
7005-72-3	4-Chlorophenyl-phenylether	330	U
86-73-7	Fluorene	330	U
100-01-6	4-Nitroaniline	790	U
534-52-1	4,6-Dinitro-2-methylphenol	790	U
86-30-6	N-Nitrosodiphenylamine (1)	330	U
101-55-3	4-Bromophenyl-phenylether	330	U
118-74-1	Hexachlorobenzene	330	U
87-86-5	Pentachlorophenol	790	U
85-01-8	Phenanthrene	330	U
120-12-7	Anthracene	330	U
86-74-8	Carbazole	330	U
84-74-2	Di-n-Butylphthalate	330	U
206-44-0	Fluoranthene	330	U
129-00-0	Pyrene	330	U
85-68-7	Butylbenzylphthalate	330	U
91-94-1	3,3'-Dichlorobenzidine	330	U
56-55-3	Benzo(a)Anthracene	330	U
117-81-7	bis(2-Ethylhexyl) Phthalate	110	J
218-01-9	Chrysene	330	U
117-84-0	Di-n-Octyl Phthalate	330	U
205-99-2	Benzo(b) Fluoranthene	330	U
207-08-9	Benzo(k) Fluoranthene	330	U
50-32-8	Benzo(a) Pyrene	330	U
193-39-5	Indeno(1,2,3-cd) Pyrene	330	U
53-70-3	Dibenz(a,h) Anthracene	330	U
191-24-2	Benzo(g,h,i) Perylene	330	U

(1) - Cannot be separated from Diphenylamine

FORM I SV-2

TOL ANALYTE  
PRESENT IN  
BLANK  
11X-U  
940307  
11/11/93

051



SOIL SEMIVOLATILE SURROGATE RECOVERY

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 09054 SAS No.: NA SDG No.: NA

Level: (low/med) LOW

9413225  
111  
5223116

	EPA SAMPLE NO.	S1 (NBZ) #	S2 (FBP) #	S3 (TPH) #	S4 (PHL) #	S5 (2FP) #	S6 (TBP) #	S7 (2CP) #	S8 (DCB) #	TOT OUT
01	B09345	86	92	127	91	96	101	86	83	0
02	B09346	82	85	121	87	93	86	86	84	0
03	B09349	89	96	131	93	99	96	88	88	0
04	B09350	94	93	129	96	103	105	92	91	0
05	B09351	89	92	123	91	102	103	88	89	0
06	B09352	89	95	120	91	98	93	88	88	0
07	B09353	95	98	138 *	95	102	105	91	91	1
08	B09354	76	79	109	76	83	89	73	74	0
09	B09345MS	76	76	107	78	83	85	75	72	0
10	B09345MSD	83	86	122	85	93	95	83	80	0
11	SBLK0924S	83	87	114	84	91	87	81	82	0

QC LIMITS

- S1 (NBZ) = Nitrobenzene-d5 ( 23-120)
- S2 (FBP) = 2-Fluorobiphenyl ( 30-115)
- S3 (TPH) = Terphenyl-d14 ( 18-137)
- S4 (PHL) = Phenol-d5 ( 24-113)
- S5 (2FP) = 2-Fluorophenol ( 25-121)
- S6 (TBP) = 2,4,6-Tribromophenol ( 19-122)
- S7 (2CP) = 2-Chlorophenol-d4 ( 20-130) (advisory)
- S8 (DCB) = 1,2-Dichlorobenzene-d4 ( 20-130) (advisory)

# Column to be used to flag recovery values  
 \* Values outside of contract required QC limits  
 D Surrogate diluted out

*High Surrogate Recovery  
 One compound  
 No Qualification  
 940307  
 [Signature]*

No	m/z	Scan	Time	Ref	RRT	Meth	Area(Hght)	Amount	%Tot
64	NOT FOUND								
65	NOT FOUND								
66	149	1766	22:18	4	1.072	A BB	7480.	0.913 NG/UL	0.16
67	NOT FOUND								
68	202	1935	24:26	5	0.889	A BB	522.	0.094 NG/UL	0.02
69	NOT FOUND								
70	NOT FOUND								
71	NOT FOUND								
72	NOT FOUND								
73	149	2178	27:30	5	1.000	A BB	13180.	3.239 NG/UL	0.57
74	NOT FOUND								
75	NOT FOUND								
76	NOT FOUND								
77	NOT FOUND								
78	NOT FOUND								
79	NOT FOUND								
80	NOT FOUND								

DI-N-BUTYL PHTHALATE  
IN BLANK  
= 30.2 µg/kg

F.H. 9/30/93

QW 3225-1112

No	Ret(L)	Ratio	RRT(L)	Ratio	Amnt	Amnt(L)	R. Fac	R. Fac(L)	Ratio
51	17:28		1.032						
52	16:24		0.969						
53	18:06		1.069						
54	17:27		1.031						
55	18:22		1.085						
56	18:23		1.086						
57	18:26		1.089						
58	18:30		0.890						
59	18:42		0.899						
60	19:39		0.945						
61	19:47		0.951						
62	20:17		0.976						
63	20:51		1.003						
64	20:59		1.009						
65	21:24		1.029						
66	22:18	1.00	1.072	1.00	0.91	25.00	0.048	1.321	0.04
67	23:51		1.147						
68	24:25	1.00	0.889	1.00	0.09	25.00	0.005	1.444	0.00
69	26:01		0.947						
70	27:21		0.996						
71	27:27		0.999						
72	27:33		1.003						
73	27:29	1.00	1.000	1.00	3.24	25.00	0.138	1.063	0.13
74	29:33		0.903						
75	31:03		0.948						
76	31:10		0.952						
77	32:28		0.992						
78	38:58		1.191						
79	39:10		1.197						
80	40:54		1.250						

DI-N-BUTYL PHTHALATE  
IN BLANK  
9/30/93

940307  
MWH