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12 of 27

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ATTACHMENT 59

Page 1 of 25

GENERAL GC DATA VALIDATION SUMMARY FOR DATA PACKAGE:  
B09340-TMA-623 (923-E418, Filename B09340.GC)

9473225.164

MEMORANDUM



TO: 200-UP-2 Project QA Record

March 21, 1994

FR: Susan Winter, Golder Associates Inc. *S. Winter*

RE: GENERAL GC DATA VALIDATION SUMMARY FOR DATA PACKAGE: B09340-TMA-623 (923-E418, Filename B09340.GC)

INTRODUCTION

This memo presents the results of data validation on data package B09340-TMA-623 prepared by the Thermo Analytical (TMA) laboratory. A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

SAMPLE ID	SAMPLE DATE	MEDIA	ANALYSIS
B09337	09/15/93	SOIL	SEE NOTE 1
B09339	09/13/93	SOIL	
B09340	09/15/93	SOIL	
B09341	09/13/93	SOIL	
B09344	09/15/93	SOIL	

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

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

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

DATA QUALITY OBJECTIVES

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

**Accuracy.** Goals for accuracy were met.

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

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

**Completeness.** The data package was complete for all requested analyses. A total of five samples were validated in this data package with a total of 5 determinations reported, all of which were deemed valid. This results in a completeness of 100 percent, which meets normal work plan objectives of 90%.

9413225.1165

### MAJOR DEFICIENCIES

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

### MINOR DEFICIENCIES

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

### REFERENCES

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

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

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ATTACHMENT 1

GLOSSARY OF DATA REPORTING QUALIFIERS

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## GLOSSARY OF ORGANIC DATA REPORTING QUALIFIERS

- B - Indicates the constituent was analyzed for and detected in the associated laboratory blank. This qualifier is applied by the laboratory. During the process of data validation this qualifier may be replaced by other appropriate qualifiers as defined by the validation procedures. The associated data should be considered usable for decision making purposes.
- U - Indicates the constituent was analyzed for and not detected. The concentration reported is the sample quantitation limit corrected for aliquot size, dilution and percent solids (in the case of solid matrices) by the laboratory. The associated data should be considered usable for decision making purposes.
- UJ - Indicates the constituent was analyzed for and not detected. Due to a minor quality control deficiency identified during data validation the concentration reported may not accurately reflect the sample quantitation limit. The associated data should be considered usable for decision making purposes.
- J - Indicates the constituent was analyzed for and detected. This qualifier may be applied by the laboratory to indicate a concentration which is less than the contract required quantitation limit (CRQL) but greater than the instrument detection limit (IDL). During data validation this qualifier may be applied to indicate a minor quality control deficiency. However in either case, the associated data should be considered usable for decision making purposes.
- NJ - Indicates presumptive evidence of a constituent at an estimated value. This qualifier is normally applied to GC analysis data (such as organochlorine pesticide and PCB data). The associated data should be considered usable for decision making purposes.
- N - Indicates presumptive evidence of a constituent. This qualifier is normally applied to GC analysis data (such as organochlorine pesticide and PCB data). The associated data should be considered usable for decision making purposes.
- JN - Indicates a tentatively identified compound (TIC) whose concentration and identification have been determined to be valid as a result of data validation. The associated data should be considered usable for decision making purposes.
- UR - Indicates the constituent was analyzed for and not detected. The concentration reported has been qualified as unusable due to a major quality control deficiency identified during data validation. The associated data should be considered unusable for decision making purposes.
- R - Indicates the constituent was analyzed for and detected. The concentration reported has been qualified as unusable due to a major quality control deficiency identified during data validation. The associated data should be considered unusable for decision making purposes.

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891  
522  
116

9413225.1169

ATTACHMENT 2  
SUMMARY OF DATA QUALIFICATIONS



ATTACHMENT 3

QUALIFIED DATA SUMMARY AND ANNOTATED LABORATORY REPORTS

9413225.1171

9413225.1172

Validated Data Summary, Data Package: B09340-TMA-623

Parameter	Sampl#	B09337		B09339		B09340		B09341		B09344	
	Date	9-15-93		9-13-93		9-15-93		9-13-93		9-15-93	
	Location	299-W19-95		299-W19-97		299-W19-95		299-W19-97		299-W19-95	
	Depth	90.25 - 92.25		70.00 - 72.50		105.00 - 107.50		101.00 - 103.30		120.00 - 122.50	
	Type	---		---		---		---		---	
	Comments	---		---		---		---		---	
	Units	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
KEROSENE	MG/KG	5.000	U	5.000	U	5.000	U	5.000	U	5.000	U

Verified  
*[Signature]* 3/21/94

8007

Received: 09/17/93

Results by Sample

~~000463~~

SAMPLE ID B09337

FRACTION 03D

TEST CODE 8015MS

NAME EPA 8015M EXTRACT.

Date & Time Collected 09/13/93

Category \_\_\_\_\_

299-W19-95  
90.25-92.25'

MODIFIED 8015 - EXTRACTABLE FUEL HYDROCARBONS

Matrix: SOIL

Date Analyzed: 10/09/93

Dilution factor: 1.00

Concentration Units: mg/Kg

9443225.1173

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

u  
u

ND = Not detected at the specified limits

Form I

verified  
*[Signature]*  
3/07/94

Received: 09/17/93

Results by Sample

SAMPLE ID B09339

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

Date & Time Collected 09/13/93

Category \_\_\_\_\_

299-W19-97  
70-72.5'

~~000465~~

MODIFIED 8015 - EXTRACTABLE FUEL HYDROCARBONS

Matrix: SOIL

Date Analyzed: 10/09/93

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

2  
3

ND = Not detected at the specified limits

Form 1

Verified  
3/07/94

94325.77

Received: 09/17/93

Results by Sample

SAMPLE ID 809340

FRACTION 01G

TEST CODE 8015MS

NAME EPA 8015M EXTRACT.

Date & Time Collected 09/15/93

Category \_\_\_\_\_

299-W19-95  
105-107.5'

MODIFIED 8015 - EXTRACTABLE FUEL HYDROCARBONS

~~000467~~

Matrix: SOIL

Date Analyzed: 10/09/93

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

u  
u

ND = Not detected at the specified limits

Form 1

Verified  
*[Signature]* 3/07/94

941925.175

Received: 09/17/93

TMA Inc.

REPORT

Work Order # A3-09-045

Results by Sample

SAMPLE ID 809341

FRACTION 05D

TEST CODE 8015MS

NAME EPA 8015# EXTRACT.

Date & Time Collected 09/15/93

Category \_\_\_\_\_

299-w, a-97  
101-103.3'

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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

Q  
3

ND = Not detected at the specified limits

Form I

Verified

White 3/07/94

9473225.176

Received: 09/17/93

Results by Sample

SAMPLE ID 809344 FRACTION 02G TEST CODE 8015MS NAME EPA 8015M EXTRACT.  
Date & Time Collected 09/15/93 Category \_\_\_\_\_

299-619-95  
120-122.5'

~~000471~~

MODIFIED 8015 - EXTRACTABLE FUEL HYDROCARBONS

Matrix: SOIL  
Date Analyzed: 10/09/93  
Dilution factor: 1.00  
Concentration Units: mg/Kg

9473225.177

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

Q  
u

ND = Not detected at the specified limits

Form I

Verified  
J. White 3/07/94

ATTACHMENT 4

LABORATORY NARRATIVE AND CHAIN-OF-CUSTODY DOCUMENTATION

9413225.1178

CASE NARRATIVE

LABORATORY : TMA/ARLI

CASE : 09-045

CONTRACT ID : WESTINGHOUSE HANFORD COMPANY

SDG RECEIPT DATE : September 17, 1993

1.0 DESCRIPTION OF CASE :

Six 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>
B09340	A3-09-045-01A	V	SOIL
B09340	A3-09-045-01B	SV	SOIL
B09340 MS	A3-09-045-01C	SV	SOIL
B09340 MSD	A3-09-045-01D	SV	SOIL
B09340	A3-09-045-01G	K	SOIL
B09344	A3-09-045-02A	V	SOIL
B09344 MS	A3-09-045-02B	V	SOIL
B09344 MSD	A3-09-045-02C	V	SOIL
B09344	A3-09-045-02D	SV	SOIL
B09344	A3-09-045-02G	K	SOIL
B09337	A3-09-045-03A	V	SOIL
B09337	A3-09-045-03B	SV	SOIL
B09337	A3-09-045-03D	K	SOIL
B09337 MS	A3-09-045-03E	K	SOIL
B09337 MSD	A3-09-045-03F	K	SOIL
B09339	A3-09-045-04A	V	SOIL
B09339	A3-09-045-04B	SV	SOIL
B09339	A3-09-045-04D	K	SOIL
B09341	A3-09-045-05A	V	SOIL
B09341	A3-09-045-05B	SV	SOIL
B09341	A3-09-045-05D	K	SOIL
B09347	A3-09-045-06A	V	SOIL

3.0 COMMENTS :

3.1 SHIPPING AND DOCUMENTATION :

All of the samples were received intact and properly documented.

9413225.1179

3.2 ANALYSIS

3.2.1 VOLATILE ANALYSIS COMMENTS :

LOW LEVEL SOIL :

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

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

TUNES :

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

3.2.2 SEMIVOLATILE ANALYSIS COMMENTS :

LOW LEVEL SOIL :

The samples were extracted and analyzed within the CLP SOW holding times.

Sample B09340 had low surrogate recoveries. However, the following surrogate recoveries were below the QC limits: Nitrobenzene-d5 and 2-Fluorophenol, as well as the advisory surrogate, 1,2-Dichlorobenzene-d4. In accordance with CLP protocol, no reanalysis was required if one base/neutral surrogate recovery and one acid surrogate recovery was outside of the QC limits. Sample B09340 was also spiked with the matrix spike compounds and analyzed accordingly. The MS and the MSD samples exhibited very good surrogate recoveries, and in accordance with the protocol, were treated as the reextract of sample B09340.

The matrix spike recoveries of 2,4-Dinitrotoluene for samples B09340MS and B09340MSD were slightly above the QC limits. Sample B09340MS also had a matrix spike recovery of Phenol that was slightly above the QC limit. Although the MS and MSD samples had 4-Nitrophenol spike recoveries within the QC limits, the actual concentration detected in the samples exceeded the calibration of the instrument. Hence, the results for 4-Nitrophenol have been "E" qualified. In accordance with CLP protocol, no further action was required for any of the aforementioned occurrences.

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

9413225.180

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.

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 B09337 was spiked with Kerosene and the matrix spike recoveries were between 90% and 101%. The blank spike was prepared at the same time, and had a 92% recovery.

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

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

  
Nicole Roth 12/10/93  
CLP Program Manager

  
Maureen Parrish 12/10/93  
Project Manager

9443225.1181

000002A

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 319  
 Bill of Lading/Airbill No. 253695 6191  
 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 9-15-93  
 Field Logbook No. EFL-1091  
 Offsite Property No. \_\_\_\_\_

#### Sample Identification

9443225.1182

- 1) **BO9340**
- 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,S04 (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) 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
- BO9344**
- 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,S04 (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) 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) **BO9337**
- 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,S04 (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) 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>LOSO</u> <u>Robert Rogers 9-16-93</u>	Received by: <u>17 NORTON</u> <u>TMA/NORCAL</u>	Date/Time: <u>9-17-93</u> <u>11:30</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:
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Comments:

NOTE: TMA/NORCAL RECEIVED THE 1,250 ML TAL METALS, Hg, Ti BOTTLE ALSO

0000020

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 9-13-93

Ice Chest No. SML 365

Field Logbook No. EFL-1091

Bill of Lading/Airbill No. 253 695 6191

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

9413225-1183

1) B09339

- 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) 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

B09341

- 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) 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) PER 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) 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 Name)

Relinquished by: <u>1050</u> <u>L E Rogers 9-16-93</u>	Received by: <u>H. NARCISO</u> <u>Kimberly TMA/NRCAL</u>	Date/Time: <u>9/17/93</u> <u>11:30</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:
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Comments:

ATTACHMENT 5

DATA VALIDATION SUPPORTING DOCUMENTATION

9443225.1184

GENERAL GC DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	<u>E</u>
PROJECT: 200-UP-2	DATA PACKAGE: B-9340-TMA-623				
VALIDATOR: <i>[Signature]</i>	LAB: TMA		DATE: 03/07/94		
CASE:	SDG: B-9340-TMA-623				
ANALYSES PERFORMED					
<input type="checkbox"/> 8010	<input checked="" type="checkbox"/> 8015 (Mud)	<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: Soils					
B-9337					
B-9339					
B-9340					
B-9341					
B-9344					

9443225.1185  
3/7/94

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: There is a discrepancy for samples B-9337 and B-9341 between the collection date on the chain of custody and the sample analysis request forms. The collection dates recorded on the chain of custody forms were used for validation.

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? *See note below* . . . . .  Yes No N/A

Were LCS samples analyzed? . . . . . Yes  No N/A

Are LCS recoveries acceptable? . . . . . Yes No  N/A

9413225.1186

GENERAL GC DATA VALIDATION CHECKLIST

Comments: The control limits for the MS/MSD %R are not currently available, but have been requested. The MS/MSD %R are 90% and 101%, respectively. Therefore, no qualification was required since the recoveries are considered acceptable.

6. PRECISION

Are MS/MSD sample RPD values acceptable? . . . . .  Yes No N/A

Are field duplicate RPD values acceptable? . . . . . Yes No  N/A

Are field split RPD values acceptable? . . . . . Yes No  N/A

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

7. COMPOUND IDENTIFICATION AND QUANTITATION

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

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

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

8. REPORTED RESULTS AND DETECTION LIMITS

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

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

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

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

9443225.1187



9453549D

~~9452475B~~

ATTACHMENT 60  
Page 1 of 25

GENERAL CHEMISTRY DATA VALIDATION SUMMARY FOR DATA PACKAGE:  
B09340-TMA-623 (923-E418, Filename B09340.GCH)

9453225.1189

MEMORANDUM



TO: 200-UP-2 Project QA Record

March 21, 1994

FR: Susan Winter, Golder Associates Inc.

*Susan Winter*

RE: GENERAL CHEMISTRY DATA VALIDATION SUMMARY FOR DATA PACKAGE:  
B09340-TMA-623 (923-E418, Filename B09340.GCH)

INTRODUCTION

This memo presents the results of data validation on data package B09340-TMA-623 prepared by the Thermo Analytical (TMA) laboratory. A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

SAMPLE ID	SAMPLE DATE	MEDIA	ANALYSIS
B09337	09/15/93	SOIL	SEE NOTE 1
B09339	09/13/93	SOIL	
B09340	09/15/93	SOIL	
B09341	09/13/93	SOIL	
B09344	09/15/93	SOIL	

Note 1. All samples were analyzed for anions (chloride, fluoride, and sulfate) and nitrate+nitrite-N.

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

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

DATA QUALITY OBJECTIVES

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

**Accuracy.** Goals for accuracy were met.

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

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

**Completeness.** The data package was complete for all requested analyses. A total of five samples were validated in this data package with a total of 20 determinations reported, all of which were deemed valid. This results in a completeness of 100 percent, which meets normal work plan objectives of 90%.

9443225.1190

### 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.

9473225 19

ATTACHMENT 1  
GLOSSARY OF DATA REPORTING QUALIFIERS

9413225.1192

## GLOSSARY OF INORGANIC DATA REPORTING QUALIFIERS

- 9413225.1193
- B - Indicates the constituent was analyzed for and detected. The concentration reported is less than the contract required detection limit (CRDL) but greater than the instrument detection limit (IDL). The associated data should be considered usable for decision making purposes.
  - U - Indicates the constituent was analyzed for and not detected. The concentration reported is the sample detection limit corrected for aliquot size, dilution and percent solids (in the case of solid matrices) by the laboratory. The associated data should be considered usable for decision making purposes.
  - UJ - Indicates the constituent was analyzed for and not detected. Due to a minor quality control deficiency identified during data validation the concentration may not accurately reflect the sample detection limit. The associated data have been qualified as estimated but should be considered usable for decision making purposes.
  - BJ - Indicates the constituent was analyzed for and detected at a concentration less than the contract required detection limit (CRDL) but greater than the instrument detection limit (IDL). Due to a minor quality control deficiency identified during data validation the associated data have been qualified as estimated, but should be considered usable for decision making purposes.
  - J - Indicates the constituent was analyzed for and detected. Due to a minor quality control deficiency identified during data validation the associated data have been qualified as estimated, but should be considered usable for decision making purposes.
  - UR - Indicates the constituent was analyzed for and not detected. Due to a major quality control deficiency identified during data validation, the associated data have been qualified as unusable for decision making purposes.
  - R - Indicates the constituent was analyzed for and detected. Due to a major quality control deficiency identified during data validation, the associated data have been qualified as unusable for decision making purposes.

ATTACHMENT 2  
SUMMARY OF DATA QUALIFICATIONS

9413225.1194



ATTACHMENT 3

QUALIFIED DATA SUMMARY AND ANNOTATED LABORATORY REPORTS

9473225.1196

9413225.1197

Validated Data Summary, Data Package: B09340-TMA-623

Parameter	Samp#	B09337		B09339		B09340		B09341		B09344	
	Date	9-15-93		9-13-93		9-15-93		9-13-93		9-15-93	
	Location	299-W19-95		299-W19-97		299-W19-95		299-W19-97		299-W19-95	
	Depth	90.25 - 92.25		70.00 - 72.50		105.00 - 107.50		101.00 - 103.30		120.00 - 122.50	
	Type	---		---		---		---		---	
	Comments	---		---		---		---		---	
	Units	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
CHLORIDE	MG/KG	9.700		5.000		5.800		5.500		5.900	
FLUORIDE	MG/KG	1.000		0.700		0.900		0.900		1.500	
SULFATE	MG/KG	18.000		12.000		10.000		9.000		15.000	
NITRATE+NITRITE-N	MG-N/KG	2.430	U	2.480	U	2.500	U	2.460	U	2.500	U

Verified

*[Signature]*

3/21/94

Received: 09/17/93

TMA Inc.

REPORT

Work Order # A3-09-045

Results by Sample

~~000012~~

SAMPLE ID B09337

FRACTION 03C

TEST CODE VCCLPS

NAME Anions in Solids

299-w19-95  
90.25-92.25'

Date & Time Collected 09/13/93

Category \_\_\_\_\_

ANIONS AND WET CHEMISTRY - SOLIDS				
ANALYSIS	METHOD	RESULT	UNITS	LIMIT
Chloride	300.0	9.7	mg/kg	1.0
Fluoride	300.0	1.0	mg/kg	0.5
Sulfate	300.0	18	mg/kg	5

FORM I

Verified  
Miller 3/07/94

Verified  
Miller 3/07/94

9413225.1198

Received: 09/17/93

TMA Inc.

REPORT

Work Order # A3-09-045

Results by Sample

~~000013~~

SAMPLE ID B09339

FRACTION 04C

TEST CODE WCCLPS

NAME Anions in Solids

Date & Time Collected 09/13/93

Category \_\_\_\_\_

299-619-97  
70-72.5'

ANIONS AND WET CHEMISTRY - SOLIDS				
ANALYSIS	METHOD	RESULT	UNITS	LIMIT
Chloride	300.0	5.0	mg/kg	1.0
Fluoride	300.0	0.7	mg/kg	0.5
Sulfate	300.0	12	mg/kg	5

FORM I

Verified  
Minto 3/07/94

9443225.1199

Received: 09/17/93

Results by Sample

~~000010~~

SAMPLE ID B09340

FRACTION 01E

TEST CODE UCCLPS

NAME Anions in Solids

Date & Time Collected 09/15/93

Category \_\_\_\_\_

299-w19-95  
105-107.5'

ANIONS AND WET CHEMISTRY - SOLIDS				
ANALYSIS	METHOD	RESULT	UNITS	LIMIT
Chloride	300.0	5.8	mg/kg	1.0
Fluoride	300.0	0.9	mg/kg	0.5
Sulfate	300.0	10	mg/kg	5

FORM 1

Verified

*[Signature]* 3/07/94

9446225.1200

TMA Inc.

REPORT

Work Order # A3-09-045

Received: 09/17/93

Results by Sample

~~000014~~

SAMPLE ID 809341

FRACTION OSC

TEST CODE WCCLPS

NAME Anions in Solids

Date & Time Collected 09/15/93

Category \_\_\_\_\_

299-619-97  
101-103.3'

ANIONS AND WET CHEMISTRY - SOLIDS				
ANALYSIS	METHOD	RESULT	UNITS	LIMIT
Chloride	300.0	5.5	mg/kg	1.0
Fluoride	300.0	0.9	mg/kg	0.5
Sulfate	300.0	9	mg/kg	5

FORM I

Verified  
J. White 3/07/94

9413225.1201

TMA Inc.

REPORT

Work Order # A3-09-045

Received: 09/17/93

Results by Sample

~~000011~~

SAMPLE ID B09344

FRACTION 02E

TEST CODE UCCLPS

NAME Anions in Solids

299-w19-95  
120-122.5'

Date & Time Collected 09/15/93

Category \_\_\_\_\_

ANIONS AND WET CHEMISTRY - SOLIDS				
ANALYSIS	METHOD	RESULT	UNITS	LIMIT
Chloride	300.0	5.9	mg/kg	1.0
Fluoride	300.0	1.5	mg/kg	0.5
Sulfate	300.0	15	mg/kg	5

FORM 1

verified

*[Signature]* 3/07/94

9413225.1202

Received: 09/21/93

Results by Sample

Analyzed for Nitrate + Nitrite - N using Method: 353.2 (mod. Prod.)

SAMPLE ID B09337 SAMPLE # 01 FRACTIONS: A  
 Date & Time Collected 09/15/93 Category SOIL

NITR\_S 2.43 u  
 mg N/kg

SAMPLE ID B09339 SAMPLE # 02 FRACTIONS: A  
 Date & Time Collected 09/13/93 Category SOIL

NITR\_S 2.48 u  
 mg N/kg

SAMPLE ID B09340 SAMPLE # 03 FRACTIONS: A  
 Date & Time Collected 09/15/93 Category SOIL

NITR\_S 2.50 u  
 mg N/kg

SAMPLE ID B09341 SAMPLE # 04 FRACTIONS: A  
 Date & Time Collected 09/13/93 Category SOIL

NITR\_S 2.46 u  
 mg N/kg

SAMPLE ID B09344 SAMPLE # 05 FRACTIONS: A  
 Date & Time Collected 09/15/93 Category SOIL

NITR\_S 2.50 u  
 mg N/kg

SAMPLE ID B09344D SAMPLE # 05 FRACTIONS: B  
 Date & Time Collected 09/15/93 Category SOIL

NITR\_S 2.44 u  
 mg N/kg

SAMPLE ID B09344S SAMPLE # 05 FRACTIONS: C  
 Date & Time Collected 09/15/93 Category SOIL

NITR\_S 20.8  
 mg N/kg

rec'd  
3/07/94

014

9443225.1203



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

ATTACHMENT 4

LABORATORY NARRATIVE AND CHAIN-OF-CUSTODY DOCUMENTATION

9413225.1204

~~000007~~

GENERAL CHEMISTRY RESULTS

CASE NO. 09-045

Soil Sample #:

B09337	B09339
B09340	B09341
B09344	

CASE NARRATIVE

The holding time for the pH analysis was exceeded. In addition, the holding time was exceeded for the anion analysis on samples B09337 and B09339. In accordance with ROD-93-0238, the anions were analyzed for information purposes. Careful review of the QC analysis indicates that the data is reliable.

While an effort was made to obtain homogenous aliquots from soil sample B09344, the relative percent difference for Sulfate was 30.8%.

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

Maureen Parrish 12/9/93

Maureen Parrish

Received: 09/21/93

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)

9113225.1206

017



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) 890-7700  
1-800-414-7700 FAX (617) 890-7700

Custody Form Initiator L E ROGERS  
 Company Contact L E ROGERS Telephone 376-7690  
 Project Designation/Sampling Locations 200-UP-2 Collection Date 9-15-93  
 Ice Chest No. SML 319 Field Logbook No. EFL-1091  
 Bill of Lading/Airbill No. 253695 6191 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

9413225-1207

1) B09340  
 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 (B015H)  
 1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152,  
 Eu-154,Eu-155,K-40,Ru-106,Hn-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) B09344  
 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 (B015H)  
 1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152,  
 Eu-154,Eu-155,K-40,Ru-106,Hn-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) B09337  
~~1,250ml~~ 1,250ml P:CLP;TAL Metals,Hg,Ti  
 1,250ml Gs:VOA CLP \* 2,120ml  
 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 (B015H)  
 1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152,  
 Eu-154,Eu-155,K-40,Ru-106,Hn-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

Relinquished by:	Chain of Possession	Date/Time:
<u>1050</u> <u>L E ROGERS</u>	<u>17 TMA/NOORCAL</u>	<u>9-17-93 11:30</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:  
NOTE: TMA/NOORCAL received the 1,250 ml TAL METALS, Hg, Ti bottle also

0000000

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 9-13-93

Ice Chest No. SML 365

Field Logbook No. EFL-1091

Bill of Lading/Airbill No. 253 695 6191

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) B09339
- 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 (B015H)
  - 1,1000ml P/G:Gross alpha/beta (EP-10), 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) 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) B09341
- 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 (B015H)
  - 1,1000ml P/G:Gross alpha/beta (EP-10), 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) 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) PER 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 (B015H)
  - 1,1000ml P/G:Gross alpha/beta (EP-10), 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) 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

8021-5276116

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

Relinquished by: <u>1050</u> <u>L E Rogers 9-16-93</u>	Received by: <u>H. NARCISO</u> <u>Kimble TMA/NRC/CAL</u>	Date/Time: <u>9/17/93 11:30</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

9443225.1209

GENERAL CHEMISTRY DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	<u>E</u>
PROJECT:	200-UP-2		DATA PACKAGE: B09340-TMA-623		
VALIDATOR:	<i>[Signature]</i>	LAB: TMA	DATE: 03/07/94		
CASE:	SDG: B09340-TMA-623				
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>3</sub> /NO <sub>2</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 <i>Soils</i>					
<i>B09337</i>					
<i>B09339</i>					
<i>B09340</i>					
<i>B09341</i>					
<i>B09344</i>					

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: *There is a discrepancy for samples B09337 and B09341 between the collection date on the chain of custody and the sample analysis request forms. The collection dates recorded on the chain of custody forms were used for validation.*

9473225-1210

GENERAL CHEMISTRY DATA VALIDATION CHECKLIST

3. INSTRUMENT CALIBRATION

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

Comments: The initial calibration for the IC was performed on 08/28/93 and the samples were analyzed on 10/12/93. However, no qualification was required since a CCV was analyzed and within limits on the day of sample analysis

4. BLANKS

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

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

5. ACCURACY

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

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

6. PRECISION

- Were laboratory duplicate samples analyzed at the required frequency? . . . . .  Yes No N/A
- Are laboratory duplicate sample RPD values acceptable? . . . . .  Yes No N/A
- Are field duplicate RPD values acceptable? . . . . . Yes No  N/A
- Are field split RPD values acceptable? . . . . . Yes No  N/A

9413225.1211



HOLDING TIME SUMMARY

B09340-TMA-623

SDG:		VALIDATOR: <i>[Signature]</i>			DATE: 3/7/94		PAGE 1 OF 1	
COMMENTS: <i>General Chemistry</i>								
FIELD SAMPLE ID	ANALYSIS TYPE	DATE SAMPLED	DATE PREPARED	DATE ANALYZED	PREP. HOLDING TIME, DAYS	ANALYSIS HOLDING TIME, DAYS	QUALIFIER	
B09337	IC	<del>9/13/93</del> 9/15/93	10/12/93	10/12/93	29 27	0	None	
B09339		9/13/93			29			
B-9340		9/15/93			27			
B09341		<del>9/15/93</del> 9/18/93			27 29			
B09344	∇	9/15/93	∇	∇	27	∇	∇	
B09337	NO <sub>2</sub> /NO <sub>x</sub> -N	<del>9/13/93</del> 9/15/93	10/18/93	10/19/93	35 33	1	None	
B09339		9/13/93			35	1		
B09340		9/15/93			33	1		
B09341		<del>9/15/93</del> 9/18/93			33 35	1		
B09344	∇	9/15/93	∇	∇	33	1	∇	
		⊗ 3/2/94			⊗ 3/2/94			

B-1

024

94535490

~~94524750~~

ATTACHMENT 63

Page 1 of 26

METALS DATA VALIDATION SUMMARY FOR DATA PACKAGE:  
B09340-TMA-623 (923-E418, Filename B09340.MET)

9473225.1214

MEMORANDUM

MAR 1994  
RECEIVED  
TQO

TO: 200-UP-2 Project QA Record

March 21, 1994

FR: Susan Winter, Golder Associates Inc. *[Signature]*

RE: METALS DATA VALIDATION SUMMARY FOR DATA PACKAGE: B09340-TMA-623  
(923-E418, Filename B09340.MET)

INTRODUCTION

This memo presents the results of data validation on data package B09340-TMA-623 prepared by the Thermo Analytical (TMA) laboratory. A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

SAMPLE ID	SAMPLE DATE	MEDIA	ANALYSIS
B09337	09/15/93	SOIL	SEE NOTE 1
B09339	09/13/93	SOIL	
B09340	09/15/93	SOIL	
B09341	09/13/93	SOIL	
B09344	09/15/93	SOIL	
B09344	09/15/93	SOIL	

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

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

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

DATA QUALITY OBJECTIVES

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

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

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

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

**Completeness.** The data package was complete for all requested analyses. A total of five samples were validated in this data package with a total of 125 determinations reported, all of

9413225.1215

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

### MAJOR DEFICIENCIES

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

### MINOR DEFICIENCIES

The following minor deficiencies were identified during data validation which required qualification of data as estimated.

#### Holding Times

- The holding times for the mercury and cyanide analyses were exceeded. Attachments 2 and 5 provide a summary of the samples affected, data qualifications applied and supporting documentation.

#### Laboratory Blanks

- **Positive Blanks.** Antimony, beryllium, copper, and sodium were detected at positive concentrations in the calibration and/or preparation blanks. Attachments 2 and 5 provide a summary of the samples affected, data qualifications applied and supporting documentation.
- **Negative Blanks.** Thallium was detected at a negative concentration in the calibration blanks. Attachments 2 and 5 provide a summary of the samples affected, data qualification applied and supporting documentation.

#### Matrix Spike

- The matrix spike percent recovery (MS %R) for antimony was unacceptable. Attachments 2 and 5 provide a summary of the samples affected, data qualification applied and supporting documentation.

### REFERENCES

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

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

9413225.1216

ATTACHMENT 1

GLOSSARY OF DATA REPORTING QUALIFIERS

9443225.1217

## 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.

9M3225.1218

ATTACHMENT 2  
SUMMARY OF DATA QUALIFICATIONS

9413225.1219



ATTACHMENT 3

QUALIFIED DATA SUMMARY AND ANNOTATED LABORATORY REPORTS

9413225.1221

9443225.1222

## Validated Data Summary, Data Package: B09340-TMA-623

Parameter	Sampl#	B09337		B09339		B09340		B09341		B09344	
	Date	9-15-93		9-13-93		9-15-93		9-13-93		9-15-93	
	Location	299-W19-95		299-W19-97		299-W19-95		299-W19-97		299-W19-95	
	Depth	90.25 - 92.25		70.00 - 72.50		105.00 - 107.50		101.00 - 103.30		120.00 - 122.50	
	Type	---		---		---		---		---	
	Comments	---		---		---		---		---	
	Units	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
ALUMINUM	MG/KG	4680.000		5590.000		6210.000		5930.000		7450.000	
ANTIMONY	MG/KG	2.900	UJ	2.900	UJ	2.700	UJ	2.600	UJ	2.600	UJ
ARSENIC	MG/KG	1.500	B	2.100		4.500		3.900		6.200	
BARIUM	MG/KG	49.500		48.700		61.400		76.300		64.300	
BERYLLIUM	MG/KG	0.240	U	0.240	U	0.210	U	0.220	U	0.340	B
CADMIUM	MG/KG	0.260	U	0.270	U	0.270	U	0.260	U	0.260	U
CALCIUM	MG/KG	11200.000		9360.000		10900.000		8540.000		8820.000	
CHROMIUM	MG/KG	6.200		8.100		10.600		9.000		13.900	
COBALT	MG/KG	8.300	B	5.800	B	7.700	B	6.400	B	7.600	B
COPPER	MG/KG	17.100	U	11.300	U	13.400	U	12.000	U	13.200	U
IRON	MG/KG	17100.000		12100.000		14900.000		14200.000		13900.000	
LEAD	MG/KG	2.400		3.400		4.500		4.600		5.300	
MAGNESIUM	MG/KG	3930.000		4280.000		4790.000		4720.000		5410.000	
MANGANESE	MG/KG	208.000		245.000		292.000		345.000		288.000	
MERCURY	MG/KG	0.050	U	0.050	UJ	0.050	U	0.050	UJ	0.050	U
NICKEL	MG/KG	5.700	B	7.900	B	8.600		9.400		13.300	
POTASSIUM	MG/KG	732.000	B	1040.000		1290.000		1210.000		1720.000	
SELENIUM	MG/KG	0.560	U	0.570	U	0.580	U	0.720	B	0.560	U
SILVER	MG/KG	0.630	B	0.970	B	0.540	U	0.530	U	0.520	U
SODIUM	MG/KG	321.000	B	217.000	U	220.000	U	183.000	U	181.000	U
THALLIUM	MG/KG	0.320	UJ	0.330	UJ	0.330	UJ	0.330	UJ	0.320	UJ
VANADIUM	MG/KG	40.400		25.000		29.300		29.100		27.800	
ZINC	MG/KG	31.800		26.200		33.800		30.500		35.100	
CYANIDE	MG/KG	0.480	U	0.480	UJ	0.520	U	0.520	UJ	0.520	U
TITANIUM	MG/KG	1460.000		778.000		907.000		811.000		669.000	

Verified  
 White 3/21/94

WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER:

299-w19-95

B09337

90.25-92.25'

Lab Name: SKINNER & SHERMAN LABS.

Contract: 68-D0-0108

Lab Code: SKINER

Case No.: N3-09-074SAS No.:

SDG No.: B09337

Matrix (soil/water): SOIL

Lab Sample ID: 09153-01S

Level (low/med): LOW

Date Received: 09/21/93

% Solids:

95.5

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

9M3225.1223

CAS No.	Analyte	Concentration	C	Q	M	Q
7429-90-5	Aluminum	4680			P	
7440-36-0	Antimony	2.9	B	N	P	u
7440-38-2	Arsenic	1.5	B		P	
7440-39-3	Barium	49.5			P	
7440-41-7	Beryllium	0.24	B		P	u
7440-43-9	Cadmium	0.26	U		P	
7440-70-2	Calcium	11200			P	
7440-47-3	Chromium	6.2			P	
7440-48-4	Cobalt	8.3	B		P	
7440-50-8	Copper	17.1	I		P	u
7439-89-6	Iron	17100			P	
7439-92-1	Lead	2.4			P	
7439-95-4	Magnesium	3930			P	
7439-96-5	Manganese	208			P	
7439-97-6	Mercury	0.05	U		CV	
7440-02-0	Nickel	5.7	B		P	
7440-09-7	Potassium	732	B		P	
7782-49-2	Selenium	0.56	U		P	
7440-22-4	Silver	0.63	B		P	
7440-23-5	Sodium	321	B		P	
7440-28-0	Thallium	0.32	B		P	u
7440-62-2	Vanadium	40.4			P	
7440-66-6	Zinc	31.8			P	
	Cyanide	0.48	U		CA	
7440-32-6	Titanium	1460			P	

Color Before: BROWN

Clarity Before:

Texture: MEDIUM

Color After: BROWN

Clarity After:

Artifacts: YES

Comments:

STONES

*See field  
3/4/94*

009

WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER:  
299-~~W19~~-97

B09339

70-72.5'

Lab Name: SKINNER & SHERMAN LABS.

Contract: 68-D0-0108

Lab Code: SKINER

Case No.: N3-09-074SAS No.:

SDG No.: B09337

Matrix (soil/water): SOIL

Lab Sample ID: 09153-02S

Level (low/med): LOW

Date Received: 09/21/93

% Solids: 96.9

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	5590			P	u
7440-36-0	Antimony	2.9	B	N	P	u
7440-38-2	Arsenic	2.1			P	
7440-39-3	Barium	48.7			P	
7440-41-7	Beryllium	0.24	B		P	u
7440-43-9	Cadmium	0.27	U		P	
7440-70-2	Calcium	9360			P	
7440-47-3	Chromium	8.1			P	
7440-48-4	Cobalt	5.8	B		P	
7440-50-8	Copper	11.3			P	u
7439-89-6	Iron	12100			P	
7439-92-1	Lead	3.4			P	
7439-95-4	Magnesium	4280			P	
7439-96-5	Manganese	245			P	
7439-97-6	Mercury	0.05	B		CV	u
7440-02-0	Nickel	7.9	B		P	
7440-09-7	Potassium	1040			P	
7782-49-2	Selenium	0.57	U		P	
7440-22-4	Silver	0.97	B		P	
7440-23-5	Sodium	217	B		P	u
7440-28-0	Thallium	0.33	B		P	u
7440-62-2	Vanadium	25.0			P	
7440-66-6	Zinc	26.2			P	
	Cyanide	0.48	B		CA	u
7440-32-6	Titanium	778			P	

Color Before: BROWN

Clarity Before:

Texture: MEDIUM

Color After: BROWN

Clarity After: *Verified*

Artifacts: YES

Comments:  
STONES

*White 3/4/94*

010

9413225.1224

WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER:  
299-W19-95  
 B09340  
105-107.5'

Lab Name: SKINNER & SHERMAN LABS.

Contract: 68-D0-0108

Lab Code: SKINER

Case No.: N3-09-074SAS No.:

SDG No.: B09337

Matrix (soil/water): SOIL

Lab Sample ID: 09153-03S

Level (low/med): LOW

Date Received: 09/21/93

% Solids: 96.0

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

9M 3225.1225

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	6210			P	2
7440-36-0	Antimony	2.7	H	N	P	3
7440-38-2	Arsenic	4.5			P	
7440-39-3	Barium	61.4			P	
7440-41-7	Beryllium	0.21	B		P	3
7440-43-9	Cadmium	0.27	U		P	
7440-70-2	Calcium	10900			P	
7440-47-3	Chromium	10.6			P	
7440-48-4	Cobalt	7.7	B		P	
7440-50-8	Copper	13.4			P	3
7439-89-6	Iron	14900			P	
7439-92-1	Lead	4.5			P	
7439-95-4	Magnesium	4790			P	
7439-96-5	Manganese	292			P	
7439-97-6	Mercury	0.05	U		CV	
7440-02-0	Nickel	8.6			P	
7440-09-7	Potassium	1290			P	
7782-49-2	Selenium	0.58	U		P	
7440-22-4	Silver	0.54	U		P	
7440-23-5	Sodium	220	B		P	3
7440-28-0	Thallium	0.33	H		P	3
7440-62-2	Vanadium	29.3			P	
7440-66-6	Zinc	33.8			P	
	Cyanide	0.52	U		CA	
7440-32-6	Titanium	907			P	

Color Before: BROWN

Clarity Before:

Texture: FINE

Color After: BROWN

Clarity After: *Verified*

Artifacts: YES

Comments:  
 STONES

*3/4/94*

-011

WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER:  
299-219-97

B09341

101-103.3'

Lab Name: SKINNER & SHERMAN LABS.

Contract: 68-D0-0108

Lab Code: SKINER

Case No.: N3-09-074SAS No.:

SDG No.: B09337

Matrix (soil/water): SOIL

Lab Sample ID: 09153-04S

Level (low/med): LOW

Date Received: 09/21/93

% Solids: 93.7

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

9143225.1226

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	5930			P	21
7440-36-0	Antimony	2.6	U	N	P	13
7440-38-2	Arsenic	3.9			P	
7440-39-3	Barium	76.3			P	
7440-41-7	Beryllium	0.22	B		P	1
7440-43-9	Cadmium	0.26	U		P	
7440-70-2	Calcium	8540			P	
7440-47-3	Chromium	9.0			P	
7440-48-4	Cobalt	6.4	B		P	
7440-50-8	Copper	12.0	I		P	3
7439-89-6	Iron	14200			P	
7439-92-1	Lead	4.6			P	
7439-95-4	Magnesium	4720			P	
7439-96-5	Manganese	345			P	
7439-97-6	Mercury	0.05	U		CV	13
7440-02-0	Nickel	9.4			P	
7440-09-7	Potassium	1210			P	
7782-49-2	Selenium	0.72	B		P	
7440-22-4	Silver	0.53	U		P	
7440-23-5	Sodium	183	B		P	13
7440-28-0	Thallium	0.33	U		P	13
7440-62-2	Vanadium	29.1			P	
7440-66-6	Zinc	30.5			P	
	Cyanide	0.52	U		CA	13
7440-32-6	Titanium	811			P	

Color Before: BROWN

Clarity Before:

Texture: FINE

Color After: BROWN

Clarity After: *Verified*  
*3/4/94*

Artifacts: YES

Comments:  
STONES

012

WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER:  
299-W19-95

B09344

120-122.5'

Lab Name: SKINNER & SHERMAN LABS.

Contract: 68-D0-0108

Lab Code: SKINER

Case No.: N3-09-074SAS No.:

SDG No.: B09337

Matrix (soil/water): SOIL

Lab Sample ID: 09153-05S

Level (low/med): LOW

Date Received: 09/21/93

% Solids:

93.7

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

9113225.1227

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	7450			P
7440-36-0	Antimony	2.6	H	N	P
7440-38-2	Arsenic	6.2			P
7440-39-3	Barium	64.3			P
7440-41-7	Beryllium	0.34	B		P
7440-43-9	Cadmium	0.26	U		P
7440-70-2	Calcium	8820			P
7440-47-3	Chromium	13.9			P
7440-48-4	Cobalt	7.6	B		P
7440-50-8	Copper	13.2			P
7439-89-6	Iron	13900			P
7439-92-1	Lead	5.3			P
7439-95-4	Magnesium	5410			P
7439-96-5	Manganese	288			P
7439-97-6	Mercury	0.05	U		CV
7440-02-0	Nickel	13.3			P
7440-09-7	Potassium	1720			P
7782-49-2	Selenium	0.56	U		P
7440-22-4	Silver	0.52	U		P
7440-23-5	Sodium	181	H		P
7440-28-0	Thallium	0.32	H		P
7440-62-2	Vanadium	27.8			P
7440-66-6	Zinc	35.1			P
	Cyanide	0.52	U		CA
7440-32-6	Titanium	669			P

Color Before: BROWN

Clarity Before:

Texture: FINE

Color After: BROWN

Clarity After: *Very Slight*

Artifacts: YES

Comments:  
STONES

*3/4/94*

013

ATTACHMENT 4

LABORATORY NARRATIVE AND CHAIN-OF-CUSTODY DOCUMENTATION

9113225.1228

**TMA**

**Thermo Analytical Inc.**

Skinner & Sherman Labs., Inc.

300 Second Avenue

Post Office Box 521

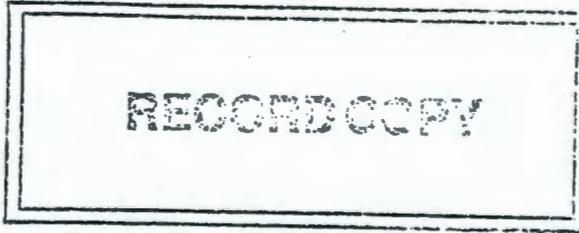
Waltham, MA 02254-0521

(617) 890-7200

FAX (617) 890-3883

October 29, 1993

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



Quality Control Narrative

Scope

Five (5) soil samples were submitted to TMA/Skinner & Sherman Laboratories, Inc. on September 21, 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 S309153.

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 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

6271-5273116  
9413225-1229

000002N

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 319  
 Bill of Lading/Airbill No. 253695 6191  
 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 9-15-93  
 Field Logbook No. EFL-1091  
 Offsite Property No. \_\_\_\_\_

### Sample Identification

9113225-1230

1) BO9340  
 -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 (B015M)  
 -1,1000ml P/G:Gross alpha/beta (EP-10), 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) 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

BO9344  
 -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 (B015M)  
 -1,1000ml P/G:Gross alpha/beta (EP-10), 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) 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) BO9337  
~~1,250ml~~ P:CLP;TAL Metals,Hg,Ti  
 -1,250ml Gs:VOA CLP \* 2,120ml  
 -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 (B015M)  
 -1,1000ml P/G:Gross alpha/beta (EP-10), 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) 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>1050</u> <u>L E ROGERS</u> 9-16-93	Received by: <u>17</u> <u>THORNTON</u>	Date/Time: <u>9-17-93 11:30</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:  
NOTE: TMA/NORCAL RECEIVED THE 1,250 ML TAL METALS, Hg, Ti BOTTLE ALSO

000002C

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 365  
 Bill of Lading/Airbill No. 253 695 6191  
 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 9-13-93  
 Field Logbook No. EFL-1091  
 Offsite Property No. \_\_\_\_\_

### Sample Identification

9113225-1231

1) B09339  
 -1,250ml P:CLP;TAL Metals,Hg,Ti  
 -1,250ml Gs:VOA CLP  
 -1,250ml nG:Semi-VOA CLP  
 -1,125ml G:Anions F,Cl,SO4 (EPA 300.0)  
 -1,125ml P/G:Anions NO2,NO3 (EPA 353.2)  
 -1,125ml G:Cyanide CLP  
 -1,125ml Gw:Kerosene (8015M)  
 -1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152,  
 Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) 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) B09341  
 -1,250ml P:CLP;TAL Metals,Hg,Ti  
 -1,250ml Gs:VOA CLP  
 -1,250ml nG:Semi-VOA CLP  
 -1,125ml G:Anions F,Cl,SO4 (EPA 300.0)  
 -1,125ml P/G:Anions NO2,NO3 (EPA 353.2)  
 -1,125ml G:Cyanide CLP  
 -1,125ml Gw:Kerosene (8015M)  
 -1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152,  
 Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) 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) OK 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 (8015M)  
 1,1000ml P/G:Gross alpha/beta (EP-10), 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) 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>1050</u> <u>L E Rogers 9-16-93</u>	Received by: <u>H. NARCISO</u> <u>Kilobe TMA/NRCAL</u>	Date/Time: <u>9/17/93</u> <u>11:30</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

9M3225.1232

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	<b>E</b>
PROJECT:	200-UP-2		DATA PACKAGE: B09340-TMA-623		
VALIDATOR:	<i>[Signature]</i>		LAB: TMA	DATE: 03/04/94	
CASE:			SDG: B09340-TMA-623		
ANALYSES PERFORMED					
<input checked="" type="checkbox"/> CLP/ICP	<input 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 <i>Soils</i>					
<i>B09337</i>					
<i>B09339</i>					
<i>B09340</i>					
<i>B09341</i>					
<i>B09344</i>					

9413225.1233

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: *There is a discrepancy for samples B-9337 and B-9341 between the collection date on the chain of custody and the sample analysis request forms. The collection dates recorded on the chain of custody forms were used for validation.*

*Manganese and CH analyses were performed out of holding time for samples B09339 and B09341. The associated results have been qualified "S estimated (C)".*

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

3. INSTRUMENT PERFORMANCE AND CALIBRATIONS

- Were initial calibrations performed on all instruments? . . . .  Yes No N/A
- Are initial calibrations acceptable? . . . . .  Yes No N/A
- Are ICP interference checks acceptable? . . . . .  Yes No N/A
- Were ICV and CCV checks performed on all instruments? . . . .  Yes No N/A
- Are ICV and CCV checks acceptable? . . . . .  Yes No N/A

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

4. BLANKS

- Were ICB and CCB checks performed for all applicable analyses?  Yes No N/A
- Are ICB and CCB results acceptable? . . . . . Yes  No N/A
- Were preparation blanks analyzed? . . . . .  Yes No N/A
- Are preparation blank results acceptable? . . . . . Yes  No N/A
- Were field/trip blanks analyzed? . . . . . Yes  No N/A
- Are field/trip blank results acceptable? . . . . . Yes No  N/A

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

5. ACCURACY

- Were spike samples analyzed? . . . . .  Yes No N/A
- Are spike sample recoveries acceptable? . . . . . Yes  No N/A
- Were laboratory control samples (LCS) analyzed? . . . . .  Yes No N/A
- Are LCS recoveries acceptable? . . . . .  Yes No N/A

Comments: The MS%R for antimony was less than  
75% but greater than 30%. Therefore all  
antimony results have been qualified  
as estimated (UE).

9113225.1234

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

6. PRECISION

- Were laboratory duplicates analyzed? . . . . .  Yes No N/A
- Are laboratory duplicate samples RPD values acceptable? . . . . .  Yes No N/A
- Were ICP serial dilution samples analyzed? . . . . .  Yes No N/A
- Are ICP serial dilution %D values acceptable? . . . . .  Yes No N/A
- Are field duplicate RPD values acceptable? . . . . . Yes No  N/A
- Are field split RPD values acceptable? . . . . . Yes No  N/A

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

7. FURNACE AA QUALITY CONTROL

- Were duplicate injections performed as required? . . . . . Yes No  N/A
- Are duplicate injection %RSD values acceptable? . . . . . Yes No  N/A
- Were analytical spikes performed as required? . . . . . Yes No  N/A
- Are analytical spike recoveries acceptable? . . . . . Yes No  N/A
- Was MSA performed as required? . . . . . Yes No  N/A
- Are MSA results acceptable? . . . . . Yes No  N/A

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

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

9413225.1235

HOLDING TIME SUMMARY

B09340-TMA-623

SDG:		VALIDATOR: <i>[Signature]</i>			DATE: 3/04/94		PAGE 1 OF 2	
COMMENTS: Metals								
FIELD SAMPLE ID	ANALYSIS TYPE	DATE SAMPLED	DATE PREPARED	DATE ANALYZED	PREP. HOLDING TIME, DAYS	ANALYSIS HOLDING TIME, DAYS	QUALIFIER	
B09337	ICP	09/15/93	10/20/93	10/22/93	35	2 37	None	
B09339		09/13/93			37	2 39		
B09340		09/15/93			35	2 37		
B09341		09/13/93			37	2 39		
B09344	∇	09/15/93	∇	∇	35	2 37	∇	
					⊗ 32/94	⊗ 32/94		
B09337	As, Se, Pb, Tl	09/15/93	10/20/93	10/22/93		44	None	
B09339		09/13/93				46		
B09340		09/15/93				44		
B09341		09/13/93				46		
B09344	∇	09/15/93	∇	∇		44	∇	
B09337	Hg	09/15/93	10/11/93	10/12/93		27	None	
B09339		09/13/93				29	US	
B09340		09/15/93				27	None	
B09341		09/13/93				29	US	
B09344	∇	09/15/93	∇	∇		27	None	

B-1

022



WESTINGHOUSE/HANFORD

3  
BLANKS

Lab Name: SKINNER & SHERMAN LABS.

Contract: 68-D0-0108

Lab Code: SKINER

Case No.: N3-09-074SAS No.:

SDG No.: B09337

Preparation Blank Matrix (soil/water): SOIL

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

911325 1238

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L)						Preparation Blank		
			1	C	2	C	3	C	C	M	
Aluminum	10.6	U	52.6	B	39.8	B	27.6	B	3.606	B	P
Antimony	12.9	U	17.5	B	12.9	U	13.9	B	2.580	U	P
Arsenic	2.1	U	2.1	U	2.1	U	2.1	U	0.420	U	P
Barium	1.2	U	2.9	B	3.4	B	2.6	B	0.240	U	P
Beryllium	0.2	U	0.3	B	0.5	B	0.5	B	0.040	U	P
Cadmium	1.3	U	3.7	B	3.7	B	3.2	B	0.260	U	P
Calcium	-71.2	B	59.0	U	-59.6	B	59.0	U	-24.730	B	P
Chromium	-3.6	B	2.1	U	2.1	U	2.1	U	0.420	U	P
Cobalt	2.6	U	2.6	U	2.7	B	3.2	B	0.520	U	P
Copper	7.5	B	9.6	B	3.6	B	4.2	B	3.446	B	P
Iron	7.8	B	28.9	B	39.2	B	28.0	B	5.928	B	P
Lead	2.9	U	2.9	U	2.9	U	2.9	U	0.580	U	P
Magnesium	22.9	U	60.2	B	35.6	B	29.8	B	7.834	B	P
Manganese	0.8	U	2.3	B	2.8	B	2.4	B	0.160	U	P
Mercury	0.1	U	0.1	U	0.1	U	0.1	U	0.050	U	CV
Nickel	3.4	U	3.4	U	3.4	U	3.4	U	0.680	U	P
Potassium	68.5	U	68.5	U	68.5	U	68.5	U	13.700	U	P
Selenium	2.8	U	2.8	U	2.8	U	2.8	U	0.560	U	P
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	51.942	B	P
Thallium	1.9	B	2.7	B	1.6	U	1.6	U	0.320	U	P
Vanadium	5.5	U	5.5	U	5.5	U	5.5	U	1.100	U	P
Zinc	4.9	B	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	1.3	B	3.0	B	3.8	B	3.4	B	0.384	B	P

*Handwritten signature*  
3/21/94

024

WESTINGHOUSE/HANFORD

5A

SAMPLE NUMBER:

SPIKE SAMPLE RECOVERY

B09344S

Lab Name: SKINNER & SHERMAN LABS.

Contract: 68-D0-0108

Lab Code: SKINER

Case No.: N3-09-074SAS No.:

SDG No.: B09337

Matrix (soil/water): SOIL

Level (low/med): LOW

% Solids for Sample: 93.7

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

9M3225-1239

Analyte	Control Limit %R	Spiked Sample Result (SSR) C	Sample Result (SR) C	Spike Added (SA)	%R	Q	M
Aluminum							NR
Antimony	75-125	59.7673	2.5733 U	104.63	57.1	N	P
Arsenic	75-125	423.2532	6.2221	418.52	99.6		P
Barium	75-125	472.4088	64.3074	418.52	97.5		P
Beryllium	75-125	10.0048	0.3371 B	10.46	92.4		P
Cadmium	75-125	9.1950	0.2593 U	10.46	87.9		P
Calcium							NR
Chromium	75-125	52.8345	13.8621	41.85	93.1		P
Cobalt	75-125	102.9883	7.5584 B	104.63	91.2		P
Copper	75-125	62.3705	13.1958	52.32	94.0		P
Iron							NR
Lead	75-125	103.3022	5.3292	104.63	93.6		P
Magnesium							NR
Manganese	75-125	395.7352	288.3332	104.63	102.6		P
Mercury	75-125	0.4931	0.0508 U	0.49	100.6		CV
Nickel	75-125	109.5319	13.2736	104.63	92.0		P
Potassium							NR
Selenium	75-125	398.0580	0.5586 U	418.52	95.1		P
Silver	75-125	10.4045	0.5187 U	10.46	99.5		P
Sodium							NR
Thallium	75-125	394.0821	0.3192 U	418.52	94.2		P
Vanadium	75-125	126.4737	27.7741	104.63	94.3		P
Zinc	75-125	131.6446	35.0712	104.63	92.3		P
Cyanide	75-125	24.7067	0.5181 U	24.48	100.9		CA
Titanium		890.5560	669.2467	104.63	211.5		P

Comments: No qualification is required for titanium since the ~~sample~~ sample result is greater than 4x amount of spike added.

*[Signature]*  
3/21/94

9453549D

~~9452475D~~

ATTACHMENT 62  
Page 1 of 42)

SEMIVOLATILE ORGANIC DATA VALIDATION SUMMARY FOR DATA PACKAGE:  
B09340-TMA-623 (923-E418, Filename B09340.BNA)

9453549D

MEMORANDUM

TO: 200-UP-2 Project QA Record

April 20, 1994

FR: Susan Winter, Golder Associates Inc. *S. Winter*

RE: SEMIVOLATILE ORGANIC DATA VALIDATION SUMMARY FOR DATA PACKAGE:  
B09340-TMA-623 (923-E418, Filename B09340.BNA)

INTRODUCTION

This memo presents the results of data validation on data package B09340-TMA-623 prepared by the Thermo Analytical (TMA) laboratory. A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

SAMPLE ID	SAMPLE DATE	MEDIA	ANALYSIS
B09337	09/15/93	SOIL	SEE NOTE 1
B09339	09/13/93	SOIL	
B09340	09/15/93	SOIL	
B09341	09/13/93	SOIL	
B09344	09/15/93	SOIL	

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

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

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

DATA QUALITY OBJECTIVES

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

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

**Accuracy.** Goals for accuracy were met.

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

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

9443225-1241

*Revised*  
*4/20/94* ... -001

**Completeness.** The data package was complete for all requested analyses. A total of five samples were validated in this data package with a total of 320 determinations reported, of which 310 were deemed valid. This results in a completeness of 97 percent, which meets normal work plan objectives of 90%.

### MAJOR DEFICIENCIES

The following major deficiencies were identified during data validation which required qualification of data as unusable.

- Two recoveries for two base/neutral surrogates for sample B09340 were unacceptable. The recovery for the surrogate 1,2-dichlorobenzene-d4 was less than 10% and therefore, the associated compounds have been qualified as unusable (UR). Attachments 2 and 5 provide a summary of the associated compounds and supporting documentation.

### MINOR DEFICIENCIES

The following minor deficiencies were identified during data validation which required qualification of data.

#### Laboratory Blanks

- Di-n-butylphthalate and bis(2-ethylhexyl)phthalate were detected in the laboratory blank. Attachments 2 and 5 provide a summary of the samples affected, data qualifications applied and supporting documentation.

#### Surrogate Recovery

- The recoveries for two base/neutral surrogates for sample B09340 were unacceptable. The recovery for the surrogate nitrobenzene-d5 was less than the lower control limit but greater than 10%. Attachments 2 and 5 provide a summary of the associated compounds, data qualifications applied and supporting documentation.

### TENTATIVELY IDENTIFIED COMPOUND EVALUATION

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

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

- TICs were detected in the blank and identified as common laboratory contaminants, resulting in qualification of the results as unusable (R) as shown in Attachment 5.
- TICs were detected in the samples and determined to be valid, resulting in qualification of the results as presumptive and valid (JN).

REFERENCES

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

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

9413225-243

Revised  
*[Signature]* 4/30/94

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ATTACHMENT 1  
GLOSSARY OF DATA REPORTING QUALIFIERS

Revised -- 6004  
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## GLOSSARY OF ORGANIC DATA REPORTING QUALIFIERS

- B - Indicates the constituent was analyzed for and detected in the associated laboratory blank. This qualifier is applied by the laboratory. During the process of data validation this qualifier may be replaced by other appropriate qualifiers as defined by the validation procedures. The associated data should be considered usable for decision making purposes.
- U - Indicates the constituent was analyzed for and not detected. The concentration reported is the sample quantitation limit corrected for aliquot size, dilution and percent solids (in the case of solid matrices) by the laboratory. The associated data should be considered usable for decision making purposes.
- UJ - Indicates the constituent was analyzed for and not detected. Due to a minor quality control deficiency identified during data validation the concentration reported may not accurately reflect the sample quantitation limit. The associated data should be considered usable for decision making purposes.
- J - Indicates the constituent was analyzed for and detected. This qualifier may be applied by the laboratory to indicate a concentration which is less than the contract required quantitation limit (CRQL) but greater than the instrument detection limit (IDL). During data validation this qualifier may be applied to indicate a minor quality control deficiency. However in either case, the associated data should be considered usable for decision making purposes.
- NJ - Indicates presumptive evidence of a constituent at an estimated value. This qualifier is normally applied to GC analysis data (such as organochlorine pesticide and PCB data). The associated data should be considered usable for decision making purposes.
- N - Indicates presumptive evidence of a constituent. This qualifier is normally applied to GC analysis data (such as organochlorine pesticide and PCB data). The associated data should be considered usable for decision making purposes.
- JN - Indicates a tentatively identified compound (TIC) whose concentration and identification have been determined to be valid as a result of data validation. The associated data should be considered usable for decision making purposes.
- UJN - Indicates a tentatively identified compound (TIC) that has been determined to be presumptive and valid (JN) in terms of identification and quantitation and has been qualified as undetected (U) due to associated blank contamination.
- UR - Indicates the constituent was analyzed for and not detected. The concentration reported has been qualified as unusable due to a major quality control deficiency identified during data validation. The associated data should be considered unusable for decision making purposes.
- R - Indicates the constituent was analyzed for and detected. The concentration reported has been qualified as unusable due to a major quality control deficiency identified during data validation. The associated data should be considered unusable for decision making purposes.

Revised  
4/20/94

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947325.1246

ATTACHMENT 2  
SUMMARY OF DATA QUALIFICATIONS

Revised  
④ 4/22/94 6006



ATTACHMENT 3  
QUALIFIED DATA SUMMARY AND ANNOTATED LABORATORY REPORTS

9113225.248

9413225.1249

Validated Data Summary, Data Package: B09340-TMA-623

Parameter	Sampl#	B09337		B09339		B09340		B09341		B09344	
	Date	9-15-93		9-13-93		9-15-93		9-13-93		9-15-93	
	Location	299-W19-95		299-W19-97		299-W19-95		299-W19-97		299-W19-95	
	Depth	90.25 - 92.25		70.00 - 72.50		105.00 - 107.50		101.00 - 103.30		120.00 - 122.50	
	Type	---		---		---		---		---	
	Comments	---		---		---		---		---	
Parameter	Units	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
PHENOL	UG/KG	350.000	U	360.000	U	340.000	U	350.000	U	350.000	U
BIS(2-CHLOROETHYL)ETHER	UG/KG	350.000	U	360.000	U	340.000	U	350.000	U	350.000	U
2-CHLOROPHENOL	UG/KG	350.000	U	360.000	U	340.000	U	350.000	U	350.000	U
1,3-DICHLOROBENZENE	UG/KG	350.000	U	360.000	U	340.000	UR	350.000	U	350.000	U
1,4-DICHLOROBENZENE	UG/KG	350.000	U	360.000	U	340.000	UR	350.000	U	350.000	U
1,2-DICHLOROBENZENE	UG/KG	350.000	U	360.000	U	340.000	UR	350.000	U	350.000	U
2-METHYLPHENOL	UG/KG	350.000	U	360.000	U	340.000	U	350.000	U	350.000	U
2,2'-OXYBIS(1-CHLOROPROPANE)	UG/KG	350.000	U	360.000	U	340.000	U	350.000	U	350.000	U
4-METHYLPHENOL	UG/KG	350.000	U	360.000	U	340.000	U	350.000	U	350.000	U
N-NITROSO-DI-N-PROPYLAMINE	UG/KG	350.000	U	360.000	U	340.000	UJ	350.000	U	350.000	U
HEXACHLOROETHANE	UG/KG	350.000	U	360.000	U	340.000	UR	350.000	U	350.000	U
NITROBENZENE	UG/KG	350.000	U	360.000	U	340.000	UJ	350.000	U	350.000	U
ISOPHORONE	UG/KG	350.000	U	360.000	U	340.000	U	350.000	U	350.000	U
2-NITROPHENOL	UG/KG	350.000	U	360.000	U	340.000	UJ	350.000	U	350.000	U
2,4-DIMETHYLPHENOL	UG/KG	350.000	U	360.000	U	340.000	U	350.000	U	350.000	U
BIS(2-CHLOROETHOXY)METHANE	UG/KG	350.000	U	360.000	U	340.000	U	350.000	U	350.000	U
2,4-DICHLOROPHENOL	UG/KG	350.000	U	360.000	U	340.000	U	350.000	U	350.000	U
1,2,4-TRICHLOROBENZENE	UG/KG	350.000	U	360.000	U	340.000	UR	350.000	U	350.000	U
NAPHTHALENE	UG/KG	350.000	U	360.000	U	340.000	U	350.000	U	350.000	U
4-CHLOROANILINE	UG/KG	350.000	U	360.000	U	340.000	UJ	350.000	U	350.000	U
HEXACHLOROBUTADIENE	UG/KG	350.000	U	360.000	U	340.000	UR	350.000	U	350.000	U
4-CHLORO-3-METHYLPHENOL	UG/KG	350.000	U	360.000	U	340.000	U	350.000	U	350.000	U
2-METHYLNAPHTHALENE	UG/KG	350.000	U	360.000	U	340.000	U	350.000	U	350.000	U
HEXACHLOROCYCLOPENTADIENE	UG/KG	350.000	U	360.000	U	340.000	UR	350.000	U	350.000	U
2,4,6-TRICHLOROPHENOL	UG/KG	350.000	U	360.000	U	340.000	U	350.000	U	350.000	U
2,4,5-TRICHLOROPHENOL	UG/KG	840.000	U	860.000	U	830.000	U	850.000	U	840.000	U
2-CHLORONAPHTHALENE	UG/KG	350.000	U	360.000	U	340.000	UR	350.000	U	350.000	U
2-NITROANILINE	UG/KG	840.000	U	860.000	U	830.000	UJ	850.000	U	840.000	U
DIMETHYLPHTHALATE	UG/KG	350.000	U	360.000	U	340.000	U	350.000	U	350.000	U
ACENAPHTHYLENE	UG/KG	350.000	U	360.000	U	340.000	U	350.000	U	350.000	U
3-NITROANILINE	UG/KG	840.000	U	860.000	U	830.000	UJ	850.000	U	840.000	U
ACENAPHTHENE	UG/KG	350.000	U	360.000	U	340.000	U	350.000	U	350.000	U

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3/21/94

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## Validated Data Summary, Data Package: B09340-TMA-623

Parameter	Samp#	809337		809339		809340		809341		809344	
	Date	9-15-93		9-13-93		9-15-93		9-13-93		9-15-93	
	Location	299-W19-95		299-W19-97		299-W19-95		299-W19-97		299-W19-95	
	Depth	90.25 - 92.25		70.00 - 72.50		105.00 - 107.50		101.00 - 103.30		120.00 - 122.50	
	Type	---		---		---		---		---	
	Comments	---		---		---		---		---	
Parameter	Units	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
2,4-DINITROPHENOL	UG/KG	840.000	U	860.000	U	830.000	UJ	850.000	U	840.000	U
4-NITROPHENOL	UG/KG	840.000	U	860.000	U	830.000	UJ	850.000	U	840.000	U
DIBENZOFURAN	UG/KG	350.000	U	360.000	U	340.000	U	350.000	U	350.000	U
2,4-DINITROTOLUENE	UG/KG	350.000	U	360.000	U	340.000	UJ	350.000	U	350.000	U
2,6-DINITROTOLUENE	UG/KG	350.000	U	360.000	U	340.000	UJ	350.000	U	350.000	U
DIETHYLPHTHALATE	UG/KG	350.000	U	360.000	U	340.000	U	350.000	U	350.000	U
4-CHLOROPHENYL-PHENYLETHER	UG/KG	350.000	U	360.000	U	340.000	U	350.000	U	350.000	U
FLUORENE	UG/KG	350.000	U	360.000	U	340.000	U	350.000	U	350.000	U
4-NITROANILINE	UG/KG	840.000	U	860.000	U	830.000	UJ	850.000	U	840.000	U
4,6-DINITRO-2-METHYLPHENOL	UG/KG	840.000	U	860.000	U	830.000	U	850.000	U	840.000	U
N-NITROSODIPHENYLAMINE	UG/KG	350.000	U	360.000	U	340.000	U	350.000	U	350.000	U
4-BROMOPHENYL-PHENYLETHER	UG/KG	350.000	U	360.000	U	340.000	U	350.000	U	350.000	U
HEXACHLOROBENZENE	UG/KG	350.000	U	360.000	U	340.000	UR	350.000	U	350.000	U
PENTACHLOROPHENOL	UG/KG	840.000	U	860.000	U	830.000	U	850.000	U	840.000	U
PHENANTHRENE	UG/KG	350.000	U	360.000	U	340.000	U	350.000	U	350.000	U
ANTHRACENE	UG/KG	350.000	U	360.000	U	340.000	U	350.000	U	350.000	U
CARBAZOLE	UG/KG	350.000	U	360.000	U	340.000	U	350.000	U	350.000	U
DI-N-BUTYLPHTHALATE	UG/KG	350.000	U	360.000	U	340.000	U	350.000	U	350.000	U
FLUORANTHENE	UG/KG	350.000	U	360.000	U	340.000	U	350.000	U	350.000	U
PYRENE	UG/KG	350.000	U	360.000	U	340.000	U	350.000	U	350.000	U
BUTYLBENZYLPHTHALATE	UG/KG	350.000	U	360.000	U	340.000	U	350.000	U	350.000	U
3,3'-DICHLOROBENZIDINE	UG/KG	350.000	U	360.000	U	340.000	UR	350.000	U	350.000	U
BENZO(A)ANTHRACENE	UG/KG	350.000	U	360.000	U	340.000	U	350.000	U	350.000	U
BIS(2-ETHYLHEXYL)PHTHALATE	UG/KG	350.000	U	360.000	U	340.000	U	350.000	U	350.000	U
CHRYSENE	UG/KG	350.000	U	360.000	U	340.000	U	350.000	U	350.000	U
DI-N-OCTYLPHTHALATE	UG/KG	350.000	U	360.000	U	340.000	U	350.000	U	350.000	U
BENZO(B)FLUORANTHENE	UG/KG	350.000	U	360.000	U	340.000	U	350.000	U	350.000	U
BENZO(K)FLUORANTHENE	UG/KG	350.000	U	360.000	U	340.000	U	350.000	U	350.000	U
BENZO(A)PYRENE	UG/KG	350.000	U	360.000	U	340.000	U	350.000	U	350.000	U
INDENO(1,2,3-CD)PYRENE	UG/KG	350.000	U	360.000	U	340.000	U	350.000	U	350.000	U
DIBENZ(A,H)ANTHRACENE	UG/KG	350.000	U	360.000	U	340.000	U	350.000	U	350.000	U
BENZO(G,H,I)PERYLENE	UG/KG	350.000	U	360.000	U	340.000	U	350.000	U	350.000	U

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3/21/94

1B  
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.  
299-619-95  
B09337  
90.25-92.25

~~000226~~

Lab Name: TMA/ARLI Contract: WHC  
Lab Code: TMALA Case No.: 09045 SAS No.: NA SDG No.: NA  
Matrix: (soil/water) SOIL Lab Sample ID: A309045-03B  
Sample wt/vol: 30.5 (g/mL) G Lab File ID: 30928S13  
Level: (low/med) LOW Date Received: 09/17/93  
% Moisture: 6 decanted: (Y/N) N Date Extracted: 09/22/93  
Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 09/28/93  
Injection Volume: 2.0(uL) Dilution Factor: 1.0  
GPC Cleanup: (Y/N) Y pH: 9.7

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) <u>UG/KG</u>	Q
108-95-2	Phenol	350	U
111-44-4	bis(2-Chloroethyl) Ether	350	U
95-57-8	2-Chlorophenol	350	U
541-73-1	1,3-Dichlorobenzene	350	U
106-46-7	1,4-Dichlorobenzene	350	U
95-50-1	1,2-Dichlorobenzene	350	U
95-48-7	2-Methylphenol	350	U
108-60-1	2,2'-oxybis(1-Chloropropane)	350	U
106-44-5	4-Methylphenol	350	U
621-64-7	N-Nitroso-Di-n-Propylamine	350	U
67-72-1	Hexachloroethane	350	U
98-95-3	Nitrobenzene	350	U
78-59-1	Isophorone	350	U
88-75-5	2-Nitrophenol	350	U
105-67-9	2,4-Dimethylphenol	350	U
111-91-1	bis(2-Chloroethoxy)Methane	350	U
120-83-2	2,4-Dichlorophenol	350	U
120-82-1	1,2,4-Trichlorobenzene	350	U
91-20-3	Naphthalene	350	U
106-47-8	4-Chloroaniline	350	U
87-68-3	Hexachlorobutadiene	350	U
59-50-7	4-Chloro-3-Methylphenol	350	U
91-57-6	2-Methylnaphthalene	350	U
77-47-4	Hexachlorocyclopentadiene	350	U
88-06-2	2,4,6-Trichlorophenol	350	U
95-95-4	2,4,5-Trichlorophenol	840	U
91-58-7	2-Chloronaphthalene	350	U
88-74-4	2-Nitroaniline	840	U
131-11-3	Dimethylphthalate	350	U
208-96-8	Acenaphthylene	350	U
99-09-2	3-Nitroaniline	840	U
83-32-9	Acenaphthene	350	U
51-28-5	2,4-Dinitrophenol	840	U

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*verified*  
*[Signature]*  
3/07/94

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1C  
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.  
299-619-95

~~000227~~

B09337  
90.25-92.25

Lab Name: TMA/ARLI

Contract: WHC

Lab Code: TMALA

Case No.: 09045

SAS No.: NA

SDG No.: NA

Matrix: (soil/water) SOIL

Lab Sample ID: A309045-03B

Sample wt/vol: 30.5 (g/mL) G

Lab File ID: 30928S13

Level: (low/med) LOW

Date Received: 09/17/93

% Moisture: 6 decanted: (Y/N) N

Date Extracted: 09/22/93

Concentrated Extract Volume: 500.0 (uL)

Date Analyzed: 09/28/93

Injection Volume: 2.0 (uL)

Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 9.7

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	840	U
132-64-9	Dibenzofuran	350	U
121-14-2	2,4-Dinitrotoluene	350	U
606-20-2	2,6-Dinitrotoluene	350	U
84-66-2	Diethylphthalate	350	U
7005-72-3	4-Chlorophenyl-phenylether	350	U
86-73-7	Fluorene	350	U
100-01-6	4-Nitroaniline	840	U
534-52-1	4,6-Dinitro-2-methylphenol	840	U
86-30-6	N-Nitrosodiphenylamine (1)	350	U
101-55-3	4-Bromophenyl-phenylether	350	U
118-74-1	Hexachlorobenzene	350	U
87-86-5	Pentachlorophenol	840	U
85-01-8	Phenanthrene	350	U
120-12-7	Anthracene	350	U
86-74-8	Carbazole	350	U
84-74-2	Di-n-Butylphthalate	350	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

350-110-85

(1) - Cannot be separated from Diphenylamine *verified*

*White 3/27/94*

9413225.1252

1F  
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET  
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.  
299-W19-95

~~000228~~

B09337  
90.25-92.25

Lab Name: TMA/ARLI Contract: WHC  
 Lab Code: TMALA Case No.: 09045 SAS No.: NA SDG No.: NA  
 Matrix: (soil/water) SOIL Lab Sample ID: A309045-03B  
 Sample wt/vol: 30.5 (g/mL) G Lab File ID: 30928S13  
 Level: (low/med) LOW Date Received: 09/17/93  
 % Moisture: 6 decanted: (Y/N) N Date Extracted: 09/22/93  
 Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 09/28/93  
 Injection Volume: 2.0(uL) Dilution Factor: 1.0  
 GPC Cleanup: (Y/N) Y pH: 9.7

Number TICs found: 5 CONCENTRATION UNITS:  
(ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
<del>1. 123 42 2</del>	<del>2-PENTANONE, 4-HYDROXY 4-METH</del>	<del>6.17</del>	<del>55000</del>	<del>ABJ</del>
<del>2.</del>	<del>UNKNOWN HYDROCARBON</del>	<del>7.37</del>	<del>800</del>	<del>BJ</del>
3.	UNKNOWN HYDROCARBON	8.70	70	J
4.	UNKNOWN HYDROCARBON	23.57	70	J
5.	HEXANEDIOIC ACID ISOMER	26.22	4800	BJ

*Handwritten notes:*  
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4/21/94  
4/21/94  
4/21/94

4/22/94

Revised  
4/22/94

Verified  
3/07/94

FORM I SV-TIC

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1B  
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.  
299-W19-97  
B09339  
70-72.5'

~~000247~~

Lab Name: TMA/ARLI

Contract: WHC

Lab Code: TMALA

Case No.: 09045

SAS No.: NA

SDG No.: NA

Matrix: (soil/water) SOIL

Lab Sample ID: A309045-04B

Sample wt/vol: 30.3 (g/mL) G

Lab File ID: 30928S14

Level: (low/med) LOW

Date Received: 09/17/93

% Moisture: 8 decanted: (Y/N) N

Date Extracted: 09/22/93

Concentrated Extract Volume: 500.0 (uL)

Date Analyzed: 09/28/93

Injection Volume: 2.0 (uL)

Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 9.7

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

CAS NO. COMPOUND Q

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-95-2	Phenol	360	U
111-44-4	bis(2-Chloroethyl) Ether	360	U
95-57-8	2-Chlorophenol	360	U
541-73-1	1,3-Dichlorobenzene	360	U
106-46-7	1,4-Dichlorobenzene	360	U
95-50-1	1,2-Dichlorobenzene	360	U
95-48-7	2-Methylphenol	360	U
108-60-1	2,2'-oxybis(1-Chloropropane)	360	U
106-44-5	4-Methylphenol	360	U
621-64-7	N-Nitroso-Di-n-Propylamine	360	U
67-72-1	Hexachloroethane	360	U
98-95-3	Nitrobenzene	360	U
78-59-1	Isophorone	360	U
88-75-5	2-Nitrophenol	360	U
105-67-9	2,4-Dimethylphenol	360	U
111-91-1	bis(2-Chloroethoxy) Methane	360	U
120-83-2	2,4-Dichlorophenol	360	U
120-82-1	1,2,4-Trichlorobenzene	360	U
91-20-3	Naphthalene	360	U
106-47-8	4-Chloroaniline	360	U
87-68-3	Hexachlorobutadiene	360	U
59-50-7	4-Chloro-3-Methylphenol	360	U
91-57-6	2-Methylnaphthalene	360	U
77-47-4	Hexachlorocyclopentadiene	360	U
88-06-2	2,4,6-Trichlorophenol	360	U
95-95-4	2,4,5-Trichlorophenol	860	U
91-58-7	2-Chloronaphthalene	360	U
88-74-4	2-Nitroaniline	860	U
131-11-3	Dimethylphthalate	360	U
208-96-8	Acenaphthylene	360	U
99-09-2	3-Nitroaniline	860	U
83-32-9	Acenaphthene	360	U
51-28-5	2,4-Dinitrophenol	860	U

FORM I SV-1 *Verified*

3/90

*White*  
3/07/94

014

9443225.1254

1C  
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

~~000248~~

299-219-97

Lab Name: TMA/ARLI

Contract: WHC

B09339

70-72.5'

Lab Code: TMALA Case No.: 09045

SAS No.: NA

SDG No.: NA

Matrix: (soil/water) SOIL

Lab Sample ID: A309045-04B

Sample wt/vol: 30.3 (g/mL) G

Lab File ID: 30928S14

Level: (low/med) LOW

Date Received: 09/17/93

% Moisture: 8 decanted: (Y/N) N

Date Extracted: 09/22/93

Concentrated Extract Volume: 500.0 (uL)

Date Analyzed: 09/28/93

Injection Volume: 2.0 (uL)

Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 9.7

CONCENTRATION UNITS:

(ug/L or ug/Kg) UG/KG

Q

Q

CAS NO.

COMPOUND

CAS NO.	COMPOUND	UG/KG	Q
100-02-7	4-Nitrophenol	860	U
132-64-9	Dibenzofuran	360	U
121-14-2	2,4-Dinitrotoluene	360	U
606-20-2	2,6-Dinitrotoluene	360	U
84-66-2	Diethylphthalate	360	U
7005-72-3	4-Chlorophenyl-phenylether	360	U
86-73-7	Fluorene	360	U
100-01-6	4-Nitroaniline	860	U
534-52-1	4,6-Dinitro-2-methylphenol	860	U
86-30-6	N-Nitrosodiphenylamine (1)	360	U
101-55-3	4-Bromophenyl-phenylether	360	U
118-74-1	Hexachlorobenzene	360	U
87-86-5	Pentachlorophenol	860	U
85-01-8	Phenanthrene	360	U
120-12-7	Anthracene	360	U
86-74-8	Carbazole	360	U
84-74-2	Di-n-Butylphthalate	360	U
206-44-0	Fluoranthene	360	U
129-00-0	Pyrene	360	U
85-68-7	Butylbenzylphthalate	360	U
91-94-1	3,3'-Dichlorobenzidine	360	U
56-55-3	Benzo(a)Anthracene	360	U
117-81-7	bis(2-Ethylhexyl) Phthalate	360	U
218-01-9	Chrysene	360	U
117-84-0	Di-n-Octyl Phthalate	360	U
205-99-2	Benzo(b)Fluoranthene	360	U
207-08-9	Benzo(k)Fluoranthene	360	U
50-32-8	Benzo(a)Pyrene	360	U
193-39-5	Indeno(1,2,3-cd)Pyrene	360	U
53-70-3	Dibenz(a,h)Anthracene	360	U
191-24-2	Benzo(g,h,i)Perylene	360	U

(1) - Cannot be separated from Diphenylamine

*Verified*

FORM I SV-2

3/90

*Winters*  
3/27/94

015

9413225.1255

1F  
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET  
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.  
299-619-97

000249

Lab Name: TMA/ARLI Contract: WHC B09339  
70-72.5'  
Lab Code: TMALA Case No.: 09045 SAS No.: NA SDG No.: NA  
Matrix: (soil/water) SOIL Lab Sample ID: A309045-04B  
Sample wt/vol: 30.3 (g/mL) G Lab File ID: 30928S14  
Level: (low/med) LOW Date Received: 09/17/93  
% Moisture: 8 decanted: (Y/N) N Date Extracted: 09/22/93  
Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 09/28/93  
Injection Volume: 2.0 (uL) Dilution Factor: 1.0  
GPC Cleanup: (Y/N) Y pH: 9.7

Number TICs found: 7 CONCENTRATION UNITS:  
(ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
<del>1. 123-42-2</del>	<del>2-PENTANONE, 4-HYDROXY-4-METH</del>	<del>6.22</del>	<del>79000</del>	<del>ABJ</del>
2.	UNKNOWN HYDROCARBON	6.32	110	J
3.	UNKNOWN HYDROCARBON	6.80	72	BJ
4.	UNKNOWN HYDROCARBON	7.38	1200	BJ
5.	UNKNOWN HYDROCARBON	8.70	110	J
6.	PROPANOIC ACID ISOMER	18.08	360	BJ
7.	HEXANEDIOIC ACID ISOMER	26.20	390	BJ

Q  
R  
S  
T  
U  
V  
W  
X  
Y  
Z

4/22/94

Revised  
4/22/94

Verified  
3/27/94

9413225.1256



1C  
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.  
299-619-95

~~000273~~

Lab Name: TMA/ARLI

Contract: WHC

B09340  
105-107.5'

Lab Code: TMALA Case No.: 09045 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A309045-01B

Sample wt/vol: 30.2 (g/mL) G Lab File ID: 30928S09

Level: (low/med) LOW Date Received: 09/17/93

% Moisture: 4 decanted: (Y/N) N Date Extracted: 09/22/93

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 09/28/93

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 9.8

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

CAS NO. COMPOUND (ug/L or ug/Kg) UG/KG Q

CAS NO.	COMPOUND	(ug/L or ug/Kg)	UG/KG	Q
100-02-7	4-Nitrophenol	830	#	
132-64-9	Dibenzofuran	340	U	
121-14-2	2,4-Dinitrotoluene	340	#	
606-20-2	2,6-Dinitrotoluene	340	#	
84-66-2	Diethylphthalate	340	U	
7005-72-3	4-Chlorophenyl-phenylether	340	U	
86-73-7	Fluorene	340	U	
100-01-6	4-Nitroaniline	830	#	
534-52-1	4,6-Dinitro-2-methylphenol	830	U	
86-30-6	N-Nitrosodiphenylamine (1)	340	U	
101-55-3	4-Bromophenyl-phenylether	340	U	
118-74-1	Hexachlorobenzene	340	#	
87-86-5	Pentachlorophenol	830	U	
85-01-8	Phenanthrene	340	U	
120-12-7	Anthracene	340	U	
86-74-8	Carbazole	340	U	
84-74-2	Di-n-Butylphthalate	340	<del>180</del>	
206-44-0	Fluoranthene	340	U	
129-00-0	Pyrene	340	U	
85-68-7	Butylbenzylphthalate	340	U	
91-94-1	3,3'-Dichlorobenzidine	340	#	
56-55-3	Benzo(a)Anthracene	340	U	
117-81-7	bis(2-Ethylhexyl) Phthalate	340	<del>140</del>	
218-01-9	Chrysene	340	U	
117-84-0	Di-n-Octyl Phthalate	340	U	
205-99-2	Benzo(b) Fluoranthene	340	U	
207-08-9	Benzo(k) Fluoranthene	340	U	
50-32-8	Benzo(a) Pyrene	340	U	
193-39-5	Indeno(1,2,3-cd) Pyrene	340	U	
53-70-3	Dibenz(a,h)Anthracene	340	U	
191-24-2	Benzo(g,h,i)Perylene	340	U	

(1) - Cannot be separated from Diphenylamine

FORM I SV-2

3/90

*Verified*  
*White*  
*3/07/94*

-018

8521.572116

1F  
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET  
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.  
299-619-95

000274

B09340  
105-107.5

Lab Name: TMA/ARLI Contract: WHC  
 Lab Code: TMALA Case No.: 09045 SAS No.: NA SDG No.: NA  
 Matrix: (soil/water) SOIL Lab Sample ID: A309045-01B  
 Sample wt/vol: 30.2 (g/mL) G Lab File ID: 30928S09  
 Level: (low/med) LOW Date Received: 09/17/93  
 % Moisture: 4 decanted: (Y/N) N Date Extracted: 09/22/93  
 Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 09/28/93  
 Injection Volume: 2.0 (uL) Dilution Factor: 1.0  
 GPC Cleanup: (Y/N) Y pH: 9.8

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
<del>1. 123-42-2</del>	<del>2-PENTANONE, 4-HYDROXY-4-METH</del>	<del>6.02</del>	<del>6600</del>	<del>ABJ</del>
<del>2.</del>	<del>UNKNOWN HYDROCARBON</del>	<del>7.37</del>	<del>240</del>	<del>BJ</del>
<del>3.</del>	<del>PROPANOIC ACID ISOMER</del>	<del>18.12</del>	<del>170</del>	<del>BJ</del>
4.	HEXANEDIOIC ACID ISOMER	26.22	1600	BJ

Handwritten notes and initials on the right side of the table, including 'BJ' and other illegible marks.

4/22/94

9413225.1259

Revised  
4/22/94

Verified

*White*  
3/07/94

1B  
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.  
299-619-97  
B09341  
101-103.3'

~~000294~~

Lab Name: TMA/ARLI Contract: WHC  
 Lab Code: TMALA Case No.: 09045 SAS No.: NA SDG No.: NA  
 Matrix: (soil/water) SOIL Lab Sample ID: A309045-05B  
 Sample wt/vol: 30.1 (g/mL) G Lab File ID: 30929S03  
 Level: (low/med) LOW Date Received: 09/17/93  
 % Moisture: 6 decanted: (Y/N) N Date Extracted: 09/22/93  
 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: 9.4

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

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

Verified  
3/07/94

9413225.1260

1C  
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.  
299-119-97  
B09341  
101-103.3'

~~000295~~

Lab Name: TMA/ARLI Contract: WHC  
 Lab Code: TMALA Case No.: 09045 SAS No.: NA SDG No.: NA  
 Matrix: (soil/water) SOIL Lab Sample ID: A309045-05B  
 Sample wt/vol: 30.1 (g/mL) G Lab File ID: 30929S03  
 Level: (low/med) LOW Date Received: 09/17/93  
 % Moisture: 6 decanted: (Y/N) N Date Extracted: 09/22/93  
 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: 9.4

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	U
206-44-0	Fluoranthene	350	U
129-00-0	Pyrene	350	U
85-68-7	Butylbenzylphthalate	350	U
91-94-1	3,3'-Dichlorobenzidine	350	U
56-55-3	Benzo(a)Anthracene	350	U
117-81-7	bis(2-Ethylhexyl) Phthalate	350	U
218-01-9	Chrysene	350	U
117-84-0	Di-n-Octyl Phthalate	350	U
205-99-2	Benzo(b)Fluoranthene	350	U
207-08-9	Benzo(k)Fluoranthene	350	U
50-32-8	Benzo(a)Pyrene	350	U
193-39-5	Indeno(1,2,3-cd)Pyrene	350	U
53-70-3	Dibenz(a,h)Anthracene	350	U
191-24-2	Benzo(g,h,i)Perylene	350	U

(1) - Cannot be separated from Diphenylamine

FORM I SV-2

*Verified*  
*White 307/94*

3/90

021

9413225-1261



1B  
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

000319

299-619-95

B09344

120-122.5'

Lab Name: TMA/ARLI

Contract: WHC

Lab Code: TMALA

Case No.: 09045

SAS No.: NA

SDG No.: NA

Matrix: (soil/water) SOIL

Lab Sample ID: A309045-02D

Sample wt/vol: 30.4 (g/mL) G

Lab File ID: 30929S02

Level: (low/med) LOW

Date Received: 09/17/93

% Moisture: 6 decanted: (Y/N) N

Date Extracted: 09/22/93

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: 9.5

CONCENTRATION UNITS:

(ug/L or ug/Kg) UG/KG

Q

Q

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-95-2	Phenol	350	U
111-44-4	bis(2-Chloroethyl) Ether	350	U
95-57-8	2-Chlorophenol	350	U
541-73-1	1,3-Dichlorobenzene	350	U
106-46-7	1,4-Dichlorobenzene	350	U
95-50-1	1,2-Dichlorobenzene	350	U
95-48-7	2-Methylphenol	350	U
108-60-1	2,2'-oxybis(1-Chloropropane)	350	U
106-44-5	4-Methylphenol	350	U
621-64-7	N-Nitroso-Di-n-Propylamine	350	U
67-72-1	Hexachloroethane	350	U
98-95-3	Nitrobenzene	350	U
78-59-1	Isophorone	350	U
88-75-5	2-Nitrophenol	350	U
105-67-9	2,4-Dimethylphenol	350	U
111-91-1	bis(2-Chloroethoxy) Methane	350	U
120-83-2	2,4-Dichlorophenol	350	U
120-82-1	1,2,4-Trichlorobenzene	350	U
91-20-3	Naphthalene	350	U
106-47-8	4-Chloroaniline	350	U
87-68-3	Hexachlorobutadiene	350	U
59-50-7	4-Chloro-3-Methylphenol	350	U
91-57-6	2-Methylnaphthalene	350	U
77-47-4	Hexachlorocyclopentadiene	350	U
88-06-2	2,4,6-Trichlorophenol	350	U
95-95-4	2,4,5-Trichlorophenol	840	U
91-58-7	2-Chloronaphthalene	350	U
88-74-4	2-Nitroaniline	840	U
131-11-3	Dimethylphthalate	350	U
208-96-8	Acenaphthylene	350	U
99-09-2	3-Nitroaniline	840	U
83-32-9	Acenaphthene	350	U
51-28-5	2,4-Dinitrophenol	840	U

FORM I SV-1

Verified

3/90

*White 307/94*

023

9413225.1263

1C  
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.  
299-W19-95

000320

B09344

120-122.5'

Lab Name: TMA/ARLI

Contract: WHC

Lab Code: TMALA

Case No.: 09045

SAS No.: NA

SDG No.: NA

Matrix: (soil/water) SOIL

Lab Sample ID: A309045-02D

Sample wt/vol: 30.4 (g/mL) G

Lab File ID: 30929S02

Level: (low/med) LOW

Date Received: 09/17/93

% Moisture: 6 decanted: (Y/N) N

Date Extracted: 09/22/93

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: 9.5

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

CAS NO.

COMPOUND

Q

6

100-02-7	4-Nitrophenol	840	U
132-64-9	Dibenzofuran	350	U
121-14-2	2,4-Dinitrotoluene	350	U
606-20-2	2,6-Dinitrotoluene	350	U
84-66-2	Diethylphthalate	350	U
7005-72-3	4-Chlorophenyl-phenylether	350	U
86-73-7	Fluorene	350	U
100-01-6	4-Nitroaniline	840	U
534-52-1	4,6-Dinitro-2-methylphenol	840	U
86-30-6	N-Nitrosodiphenylamine (1)	350	U
101-55-3	4-Bromophenyl-phenylether	350	U
118-74-1	Hexachlorobenzene	350	U
87-86-5	Pentachlorophenol	840	U
85-01-8	Phenanthrene	350	U
120-12-7	Anthracene	350	U
86-74-8	Carbazole	350	U
84-74-2	Di-n-Butylphthalate	350	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

350-200-35

2

(1) - Cannot be separated from Diphenylamine

Verified

FORM I SV-2

3/90

*[Signature]* 3/27/94

024

9413225.1264

1F  
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET  
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.  
299-419-95  
B09344  
120-122.5'

~~000321~~

Lab Name: TMA/ARLI Contract: WHC  
 Lab Code: TMALA Case No.: 09045 SAS No.: NA SDG No.: NA  
 Matrix: (soil/water) SOIL Lab Sample ID: A309045-02D  
 Sample wt/vol: 30.4 (g/mL) G Lab File ID: 30929S02  
 Level: (low/med) LOW Date Received: 09/17/93  
 % Moisture: 6 decanted: (Y/N) N Date Extracted: 09/22/93  
 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: 9.5

Number TICs found: 8 CONCENTRATION UNITS:  
(ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
<del>1. 123-42-2</del>	<del>2-PENTANONE, 4-HYDROXY 4-METH</del>	<del>6.13</del>	<del>49000</del>	<del>ABJ</del>
2.	UNKNOWN HYDROCARBON	6.28	70	H
3.	UNKNOWN HYDROCARBON	7.37	880	BJ
4.	UNKNOWN HYDROCARBON	8.70	70	H
5.	HEXANEDIOIC ACID ISOMER	26.20	490	BJ
6.	UNKNOWN ALKANE	26.28	70	H
7.	UNKNOWN HYDROCARBON	30.33	70	H
8.	UNKNOWN ALKANE	31.78	100	H

10  
 5  
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4/26/94

Revised  
4/26/94

Verified

FORM I SV-TIC

*[Signature]* 3/07/94

3/90

025

9413225.1265

ATTACHMENT 4

LABORATORY NARRATIVE AND CHAIN-OF-CUSTODY DOCUMENTATION

9413225-1266

CASE NARRATIVE

LABORATORY : TMA/ARLI

CASE : 09-045

CONTRACT ID : WESTINGHOUSE HANFORD COMPANY

SDG RECEIPT DATE : September 17, 1993

1.0 DESCRIPTION OF CASE :

Six 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>
B09340	A3-09-045-01A	V	SOIL
B09340	A3-09-045-01B	SV	SOIL
B09340 MS	A3-09-045-01C	SV	SOIL
B09340 MSD	A3-09-045-01D	SV	SOIL
B09340	A3-09-045-01G	K	SOIL
B09344	A3-09-045-02A	V	SOIL
B09344 MS	A3-09-045-02B	V	SOIL
B09344 MSD	A3-09-045-02C	V	SOIL
B09344	A3-09-045-02D	SV	SOIL
B09344	A3-09-045-02G	K	SOIL
B09337	A3-09-045-03A	V	SOIL
B09337	A3-09-045-03B	SV	SOIL
B09337	A3-09-045-03D	K	SOIL
B09337 MS	A3-09-045-03E	K	SOIL
B09337 MSD	A3-09-045-03F	K	SOIL
B09339	A3-09-045-04A	V	SOIL
B09339	A3-09-045-04B	SV	SOIL
B09339	A3-09-045-04D	K	SOIL
B09341	A3-09-045-05A	V	SOIL
B09341	A3-09-045-05B	SV	SOIL
B09341	A3-09-045-05D	K	SOIL
B09347	A3-09-045-06A	V	SOIL

3.0 COMMENTS :

3.1 SHIPPING AND DOCUMENTATION :

All of the samples were received intact and properly documented.

9413225.1267

3.2 ANALYSIS

3.2.1 VOLATILE ANALYSIS COMMENTS :

LOW LEVEL SOIL :

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

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

TUNES :

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

3.2.2 SEMIVOLATILE ANALYSIS COMMENTS :

LOW LEVEL SOIL :

The samples were extracted and analyzed within the CLP SOW holding times.

Sample B09340 had low surrogate recoveries. However, the following surrogate recoveries were below the QC limits: Nitrobenzene-d5 and 2-Fluorophenol, as well as the advisory surrogate, 1,2-Dichlorobenzene-d4. In accordance with CLP protocol, no reanalysis was required if one base/neutral surrogate recovery and one acid surrogate recovery was outside of the QC limits. Sample B09340 was also spiked with the matrix spike compounds and analyzed accordingly. The MS and the MSD samples exhibited very good surrogate recoveries, and in accordance with the protocol, were treated as the reextract of sample B09340.

The matrix spike recoveries of 2,4-Dinitrotoluene for samples B09340MS and B09340MSD were slightly above the QC limits. Sample B09340MS also had a matrix spike recovery of Phenol that was slightly above the QC limit. Although the MS and MSD samples had 4-Nitrophenol spike recoveries within the QC limits, the actual concentration detected in the samples exceeded the calibration of the instrument. Hence, the results for 4-Nitrophenol have been "E" qualified. In accordance with CLP protocol, no further action was required for any of the aforementioned occurrences.

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

9413225.1268

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.

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 B09337 was spiked with Kerosene and the matrix spike recoveries were between 90% and 101%. The blank spike was prepared at the same time, and had a 92% recovery.

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

9113225.1269

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  
CLP Program Manager  
12/10/93

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

DDDDG2A

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 319  
 Bill of Lading/Airbill No. 253695 6191  
 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 9-15-93  
 Field Logbook No. EFL-1091  
 Offsite Property No. \_\_\_\_\_

#### Sample Identification

9413225-1270

- 1) BO9340
- 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,Hn-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
- BO9344
- 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,Hn-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) fil 4-10-93 BO9337
- 1,250ml P:CLP;TAL Metals,Hg,Ti
  - 1,250ml Gs:VOA CLP \* 2,120ml
  - 1,250ml aG:Semi-VOA 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,Hn-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>1050</u> <u>9-16-93</u>	Received by: <u>THOMAS TMA/NORCAL</u>	Date/Time: <u>9-17-93 11:30</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:
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#### Comments:

NOTE: TMA/NORCAL received the 1,250 ml TAL METALS, Hg, Ti bottle als

0000020

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 9-13-93  
 Ice Chest No. SML 365 Field Loghook No. EFL-1091  
 Bill of Lading/Airbill No. 253 695 6191 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

9113225-1271

1) B09339  
 -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

2) B09341  
 -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) PER 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>L E ROGERS</u> 1050 <u>L E ROGERS</u> 9-16-93	Received by: <u>H. NAFELI</u> <u>THOMAS TMA/NAFELI</u>	Date/Time: <u>9/17/93</u> <u>11:30</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

9113225.1272

GC/MS ORGANIC DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	<u>E</u>
PROJECT:	200-UP-2		DATA PACKAGE: B-9340-TMA-623		
VALIDATOR:	<i>[Signature]</i>		LAB: TMA	DATE: 03/04/94	
CASE:			SDG: B-9340-TMA-623		
ANALYSES PERFORMED					
<input type="checkbox"/> CLP Volatiles	<input type="checkbox"/> SW-846 8240 (cap column)	<input type="checkbox"/> SW-846 8260 (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 <u>Soils</u>					
<u>B09337</u>					
<u>B09339</u>					
<u>B09340</u>					
<u>B09341</u>					
<u>B09344</u>					

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

9413225.1273

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: Di-n-butyl phthalate and bis(2-ethylhexyl) phthalate  
and several TICs were present in the  
laboratory blank.

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/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? . . . . . 3/4/94  Yes  No N/A

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

The MS/MSD %R for 2,4-dinitrotoluene are  
101% and 97%, respectively. The MS%R for  
phenol is 94%. No qualification was required  
since these MS/MSD %R are close to 100%,  
which is ideal.

The base/neutral surrogates nitrobenzene-d5 and  
1,2-dichlorobenzene-d4 were not at or below limit for  
compounds. Also, 4-nitrobenzene-d5 gave a peak  
at estimated (est) and 1,1,1-trichlorobenzene-d4 at  
estimated (est) since the %R < 100.

Sample  
B-934c

9413225.1274

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: \_\_\_\_\_  
 \_\_\_\_\_  
 This data pkg did not contain any  
 field duplicate or field split samples.  
 \_\_\_\_\_  
 \_\_\_\_\_

7. SYSTEM PERFORMANCE

Were internal standards analyzed? . . . . .  Yes No N/A  
 Are internal standard areas acceptable? . . . . .  Yes No N/A  
 Are internal standard retention times acceptable? . . . . .  Yes No N/A

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

8. COMPOUND IDENTIFICATION AND QUANTITATION

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

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

9. REPORTED RESULTS AND QUANTITATION LIMITS

Are results reported for all requested analyses? . . . . .  Yes No N/A  
 Are all results supported in the raw data? . . . . .  Yes No N/A  
 Do results meet the CRQLs? . . . . .  Yes No N/A  
 Has the laboratory properly identified and coded all TIC? . . .  Yes No N/A

Comments: \_\_\_\_\_  
 \_\_\_\_\_  
 The TIC retention times for the  
 propanoic acid isomer and hexanedioic acid  
 isomers <sup>detected in the lab blank</sup> were incorrectly reported by the  
 laboratory on the Form 2. The retention  
 times have been corrected according to the raw data.  
 All other reported RT are supported in the raw data.

9413225.1275



1C  
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

~~000410~~

SBLK0922S

Lab Name: TMA/ARLI

Contract: WHC

Lab Code: TMALA

Case No.: 09045

SAS No.: NA

SDG No.: NA

Matrix: (soil/water) SOIL

Lab Sample ID: A309045-BLK

Sample wt/vol: 30.4 (g/mL) G

Lab File ID: 30928S08

Level: (low/med) LOW

Date Received: \_\_\_\_\_

% Moisture: \_\_\_\_\_ decanted: (Y/N) N

Date Extracted: 09/22/93

Concentrated Extract Volume: 500.0 (uL)

Date Analyzed: 09/28/93

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:	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	270	J
206-44-0	Fluoranthene	330	U
129-00-0	Pyrene	330	U
85-68-7	Butylbenzylphthalate	330	U
91-94-1	3,3'-Dichlorobenzidine	330	U
56-55-3	Benzo(a)Anthracene	330	U
117-81-7	bis(2-Ethylhexyl) Phthalate	180	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

3/90

*[Signature]*  
3/4/94

037

9/13/225-1277

1F  
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET  
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

~~000411~~

SBLK0922S

Lab Name: TMA/ARLI Contract: WHC  
 Lab Code: TMALA Case No.: 09045 SAS No.: NA SDG No.: NA  
 Matrix: (soil/water) SOIL Lab Sample ID: A309045-BLK  
 Sample wt/vol: 30.4 (g/mL) G Lab File ID: 30928S08  
 Level: (low/med) LOW Date Received: \_\_\_\_\_  
 % Moisture: \_\_\_\_\_ decanted: (Y/N) N Date Extracted: 09/22/93  
 Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 09/28/93  
 Injection Volume: 2.0 (uL) Dilution Factor: 1.0  
 GPC Cleanup: (Y/N) Y pH: \_\_\_\_\_

Number TICs found: 5

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
<del>1. 123 42 2</del>	<del>2 PENTANONE, 4-HYDROXY-4-METH</del>	<del>5.32</del>	<del>79000</del>	<del>AJ</del>
2.	UNKNOWN HYDROCARBON	6.87	66	J
3.	UNKNOWN HYDROCARBON	7.45	1200	J
4.	PROPANOIC ACID ISOMER	<del>23.92</del> 18.12	360	J
5.	HEXANEDIOIC ACID ISOMER	<del>34.62</del> 26.22	130	J

9413225.1278

R

*[Handwritten signature]*  
3/4/94

9413225.1279

SBLK09225  
Propionic Acid Isomer

MID LIBRARY SEARCH (LIBRARY#)  
09/28/93 16:25:00 (18.07)  
SAMPLE: CLP,09045,,SBLK09225,L,S,A309045-BLK,BNA,BLANK  
COND.S.: CAP/.25,30928501,30FT0928501  
ENHANCED (S 15B 2H 0T)

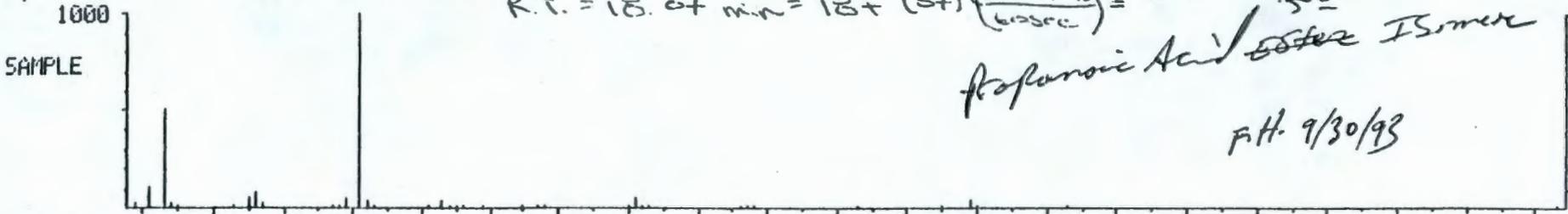
DATA: 30928508 #1435  
CALI: 30928508 # 3

BASE N/Z: 71  
RIC: 35584.

R.T. = 18.07 min = 18 + (07)  $\left(\frac{100 \text{ units}}{60 \text{ sec}}\right) = 18.12$  RT units

Propionic Acid Ester Isomer  
F.H. 9/30/93

000430



C16.H30.04  
1000  
M WT 286  
B FK 71  
RANK 1  
# 34387  
PUR 882

PROPANOIC ACID, 2-METHYL-, 1-(1,1-DIMETHYLETHYL)-2-METHYL-1,3-PROPANE!



C16.H30.04  
1000  
M WT 286  
B FK 71  
RANK 2  
# 34386  
PUR 773

PROPANOIC ACID, 2-METHYL-, 2-ETHYL-1-PROPYL-1,3-PROPANEDIYL ESTER



C12.H24.03  
1000  
M WT 216  
B FK 71  
RANK 3  
# 22646  
PUR 708

PROPANOIC ACID, 2-METHYL-, 2,2-DIMETHYL-1-(2-HYDROXY-1-METHYLETHYL)PR!



34194

039

N/Z

50

100

150

200

9413225.1280

000492

SBLK09225

Hexanoic Acid Isomer

MID LIBRARY SEARCH (LIBRARY#)

09/28/93 16:25:00 + 26:13

SAMPLE: CLP,09045,,SBLK09225,L,S,A309045-BLK,BNA,BLANK

COND.: CAP/.25,30928501,3DFT0928501

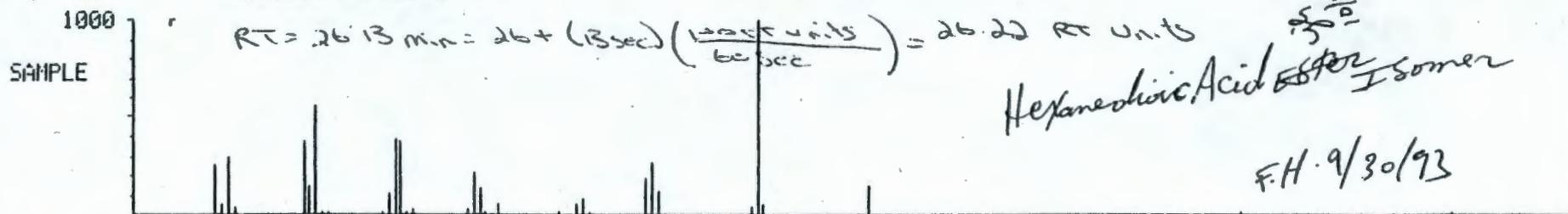
ENHANCED (S 15B 2N 0T)

DATA: 30928508 #2077

CALI: 30928508 # 3

BASE M/Z: 129

RIC: 8816.



C14.H26.04

HEXANOIC ACID, MONO(2-ETHYLHEXYL)ESTER

1000

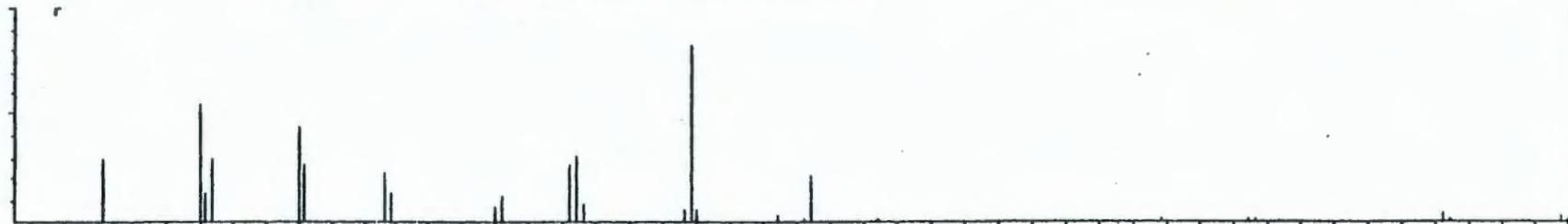
M WT 258

B PK 129

RANK 1

# 30124

PUR 828



C12.H24

1-DECENE, 3,4-DIMETHYL-

1000

M WT 168

B PK 57

RANK 2

# 12700

PUR 495



C16.H34.0

OCTANE, 1,1'-OXYBIS-

1000

M WT 242

B PK 57

RANK 3

# 27503

PUR 481



Blacks 3/1/94

-040

M/Z 50 100 150 200 250

2D  
SOIL SEMIVOLATILE SURROGATE RECOVERY

~~000216~~

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 09045 SAS No.: NA SDG No.: NA

Level: (low/med) LOW

Line #	EPA SAMPLE NO.	10 S1 (NBZ) #	11 S2 (FBP) #	12 S3 (TPH) #	8 S4 (PHL) #	7 S5 (2FP) #	9 S6 (TBP) #	13 S7 (2CP) #	14 S8 (DCB) #	TOT OUT
01	B09337	56	66	114	61	59	66	60	59	0
02	B09339	94	100	126	101	102	89	102	101	0
03	B09340	18*	49	117	37	23*	72	27	7*	3
04	B09341	76	79	103	77	85	80	74	74	0
05	B09344	97	98	129	98	108	103	94	91	0
06	B09340MS	89	92	118	96	93	85	95	94	0
07	B09340MSD	82	88	120	89	88	86	87	87	0
08	SBLK0922S	91	94	114	96	98	84	94	95	0

9443225.1281

- 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

*[Signature]*  
3/21/94