

0038848
8 of 27

9453549D

~~9452475D~~

ATTACHMENT 80

Page 1 of (21)

GENERAL CHEMISTRY DATA VALIDATION SUMMARY FOR DATA PACKAGE:
B098Y7-TMA-628 (923-E418 628GEN.UP2)

9473225.082

MEMORANDUM



TO: 200 UP-2 Project QA Record

March 18, 1994

FR: Thomas Stapp, Golder Associates Inc. *TS*

RE: GENERAL CHEMISTRY DATA VALIDATION SUMMARY FOR DATA PACKAGE B098Y7-TMA-628 (923-E418 628GEN.UP2)

INTRODUCTION

This memo presents the results of data validation on data package B098Y7-TMA-628 prepared by TMA laboratory. A list of samples validated along with the analyses reported and the methods of analysis is provided in the following table.

SAMPLE ID	SAMPLE DATE	MEDIA	ANALYSES
B098Y7	10/07/93	SOIL	SEE NOTE 1
B098Y8	10/07/93	SOIL	SEE NOTE 2
Notes:			
1. Indicates the sample was analyzed for Nitrate/Nitrite as N (by colorimetry), and fluoride, chloride, and sulfate anions (by ion chromatography).			
2. Indicates the sample was analyzed for Nitrate/Nitrite as N (by colorimetry).			

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.

Completeness. The data package was complete for all requested analyses. A total of two (2) samples were validated in this data package with a total of five (5) determinations reported, all of which were deemed valid. This results in a completeness of 100 percent which meets the work plan completeness objective of 90 percent.

9473225-0822

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.

9113225-0823

ATTACHMENT 1

GLOSSARY OF DATA REPORTING QUALIFIERS

9413225.0824

GLOSSARY OF INORGANIC DATA REPORTING QUALIFIERS

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

ATTACHMENT 2
SUMMARY OF DATA QUALIFICATIONS

9113225-0826

ATTACHMENT 3

QUALIFIED DATA SUMMARY and ANNOTATED LABORATORY REPORTS

9/11/3225.0828

94/3225.0829

Validated Data Summary, Data Package: B098Y7-TMA-628

Parameter	Units	Result	Q	Result	Q
	CHLORIDE	MG/KG	6.000		---
FLUORIDE	MG/KG	3.200		---	
SULFATE	MG/KG	8.000		---	
NITRATE+NITRITE-N	MG-N/K	2.450	U	2.480	U

Verified *FS* 3-14-94

3-18-94

Page 2

Skinner&Sherman

REPORT

Work Order # S3-10-098

Received: 10/12/93

Results by Sample

Q

SAMPLE ID B098Y7 SAMPLE # 01 FRACTIONS: A
 Date & Time Collected 10/07/93 Category SOIL

NITR_S <2.45
 mg N/kg

u

SAMPLE ID B098Y8 SAMPLE # 02 FRACTIONS: A
 Date & Time Collected 10/07/93 Category SOIL

NITR_S <2.48
 mg N/kg

u

SAMPLE ID B098Y8 DUPL SAMPLE # 02 FRACTIONS: B
 Date & Time Collected 10/07/93 Category SOIL

NITR_S <2.48
 mg N/kg

SAMPLE ID B098Y8 SPIKE SAMPLE # 02 FRACTIONS: C
 Date & Time Collected 10/07/93 Category SOIL

NITR_S 22.1
 mg N/kg

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

NITR_S 1.97
 mg N/L

9443225.0830

Verified 3-7-94

009



Thermo Analytical Inc.

Skinner & Sherman Laboratories Inc.

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

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

~~3-18-94~~ ~~000009~~

TMA Inc.

REPORT

Work Order # A3-10-014

Received: 10/11/93

Results by Sample

SAMPLE ID B098Y7

FRACTION 01E

TEST CODE UCCLPS

NAME Anions in Solids

Date & Time Collected 10/07/93

Category _____

ANIONS AND WET CHEMISTRY - SOLIDS				
<u>ANALYSIS</u>	<u>METHOD</u>	<u>RESULT</u>	<u>UNITS</u>	<u>LIMIT</u>
Chloride	300.0	6.0	mg/kg	1.0
Fluoride	300.0	3.2	mg/kg	0.5
Sulfate	300.0	8	mg/kg	5

FORM 1

Verified

~~3-7-94~~

9413275.003

ATTACHMENT 4

LABORATORY NARRATIVE and CHAIN-OF-CUSTODY DOCUMENTATION

9/11/3225.0832

~~000006~~

~~3-18-94~~

GENERAL CHEMISTRY RESULTS

CASE NO. 10-014

Soil Sample #:

B098Y7

B098Y9

CASE NARRATIVE

Sample B098Y7 did not exhibit homogeneity. Therefore, the percent RPD for Fluoride was 24.6%.

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

Maureen Parrish 12/9/93

Maureen Parrish

9473225.0833

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 10-7-93

Ice Chest No. SML-54B

Field Logbook No. EFL-1091

Bill of Lading/Airbill No. _____

Offsite Property No. _____

Method of Shipment OVERNIGHT AIR SERVICE

Shipped to TMA

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

Sample Identification

- 1) SER 10-7-93 BO88Y7
- 1,250ml ag P:CLP;TAL Metals,Hg,Ti
 - +1,250ml ag Gs:VOA CLP
 - +1,250ml ag Semi-VOA CLP
 - 1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
 - 1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
 - +1,125ml G:Cyanide CLP
 - +1,125ml Gw:Kerosene (8015M)
 - 1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154, Eu-155, K-40, Ru-106, Na-22 (RC-30), Total Uranium (EA-01C) U-235, U-234, U-238 (EP-70, EP-71, EP-5) Np-237, (RC-101A, RC-622, EP-5) Pu-238, Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241, Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79
- 2) 1,250ml ags PCB/Rest
- 1,250ml P:CLP;TAL Metals,Hg,Ti
 - 1,250ml Gs:VOA CLP
 - 1,250ml ag: Semi-VOA CLP
 - 1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
 - 1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
 - 1,125ml G:Cyanide CLP
 - 1,125ml Gw:Kerosene (8015M)
 - 1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154, Eu-155, K-40, Ru-106, Na-22 (RC-30), Total Uranium (EA-01C) U-235, U-234, U-238 (EP-70, EP-71, EP-5) Np-237, (RC-101A, RC-622, EP-5) Pu-238, Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241, Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79
- 3) SER 10-7-93
- 1,250ml P:CLP;TAL Metals,Hg,Ti
 - 1,250ml Gs:VOA CLP
 - 1,250ml ag: Semi-VOA CLP
 - 1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
 - 1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
 - 1,125ml G:Cyanide CLP
 - 1,125ml Gw:Kerosene (8015M)
 - 1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154, Eu-155, K-40, Ru-106, Na-22 (RC-30), Total Uranium (EA-01C) U-235, U-234, U-238 (EP-70, EP-71, EP-5) Np-237, (RC-101A, RC-622, EP-5) Pu-238, Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241, Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

9413225.0834

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

Relinquished by: <u>10-8-93</u> <u>Corene E. Pappas 1122</u>	Received by: <u>JG HOGAN</u> <u>JG HOGAN</u>	Date/Time: <u>10-8-93</u> / <u>1122</u>
Relinquished by: <u>JG HOGAN</u> <u>JG HOGAN 10-9-93 1135</u>	Received by: <u>H. NARCISSO</u> <u>H. NARCISSO TMA/NORCAL</u>	Date/Time: <u>10-11-93</u> 8:00
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

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

Rec'd SATURDAY
10-9-92

OPENED 10/11/93

HANFORD ANALYTICAL SERVICES MANAGEMENT

RECORD OF DISPOSITION

ROD-93-0241
Record of Disposition No.

DATE: November 4, 1993

LABORATORY: TMA

PROJECT TITLE/NO.: 200-UP-2 / 93-263

NCR NO.: N/A

SAMPLE IDENTIFICATION NUMBERS: B098Y7, B098Y9

DESCRIPTION OF EVENT:

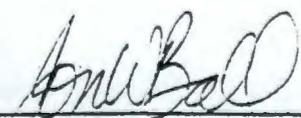
On October 25th, HASM received direction regarding samples B098Y7 and B098Y9 taken 4-6' from the surface. The entire suite of analyses listed on SAF 93-263 were requested for sample B098Y7 and VOA's were requested for the trip blank (sample B098Y9). HASM was informed that samples taken from the 4-6' depth should only have radiochemistry analyses requested since they are apart of a sitewide background study. TMA was subsequently informed to cancel all non-radchem analyses for sample B098Y7 and cancel the VOA analysis for B098Y9. On November 3rd, HASM was informed that all of the requested analyses on the Chain of Custody should be performed for samples B098Y7 and B098Y9. Due to the delay, two analyses (CN and Hg) exceeded holding time limits.

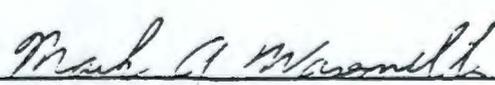
9/13/25 0835

DISPOSITION OF SAMPLES:

With the customer's consent, TMA was instructed to proceed with all the analyses listed on the Chain of Custody, including CN and Hg which exceeded holding times. The customer understands that data obtained for CN and Hg may be for information only.

APPROVAL SIGNATURES:

Jon W. Ball  11-4-93
HASM Project Coordinator (Print/Sign Name) Date

Mark Wasemiller  11/12/93
Technical Representative (Print/Sign Name) Date

N/A
Quality Assurance (Print/Sign Name) Date

Westinghouse
Hanford Company

CHAIN OF CUSTODY

3-18-91

Custody Form Initiator L E ROGERS

Company Contact L E ROGERS

Telephone 376-7690

Project Designation/Sampling Locations 200-UP-2

Collection Date 10-7-93

Ice Chest No. SMB-54B

Field Logbook No. EFL-1091

Bill of Lading/Airbill No. _____

Offsite Property No. _____

Method of Shipment OVERNIGHT AIR SERVICE

Shipped to TMA

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

Sample Identification

- 1) BO9848
 1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
 1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)
- 2) ~~1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
 1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)~~
- 3) ~~1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
 1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)~~

9113225-0836

PER 10-8-93

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

Relinquished by: <u>10-8-93</u> <u>Lois E. Rogers 1120</u>	Received by: <u>JG HOGAN</u> <u>JG HOGAN</u>	Date/Time: <u>10-8-93 / 1120</u>
Relinquished by: <u>JG HOGAN</u> <u>JG HOGAN 10-8-93 / 1135</u>	Received by: <u>H. NARCISO</u> <u>H. NARCISO TMA/NORCAL</u>	Date/Time: <u>10-11-93 / 8:00</u>
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

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

Rec'd SATURDAY 10-9-93 OPENED 10-11-93

ATTACHMENT 5

DATA VALIDATION SUPPORTING DOCUMENTATION

9113225.0837

GENERAL CHEMISTRY DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT:	200 UP-2		DATA PACKAGE: BC98Y7-TMA-628		
VALIDATOR:	T. Stapp	LAB: TMA / Skinner & Sh.	DATE: 3-4-94		
CASE:	N3-10-030		SDG:		
ANALYSES PERFORMED					
<input 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 checked="" type="checkbox"/> Chloride (2)	<input type="checkbox"/> Chromium-VI	<input type="checkbox"/> pH	<input checked="" type="checkbox"/> NO ₂ /NO ₃ (1, 2)
<input checked="" type="checkbox"/> Sulfate (2)	<input type="checkbox"/> TDS	<input type="checkbox"/> TKN	<input type="checkbox"/> Phosphate	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/> Fluoride (2)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
SAMPLES/MATRIX (1) BC98Y8, BC98Y7 / SOIL					
(2) BC98Y7 / SOIL					

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: Performed by WHC.

2. HOLDING TIMES

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

Comments: See HOLDING TIME SUMMARY page 7-26 in

checklist form B-1 (attached).

9413225.0838

3-7-94

GENERAL CHEMISTRY DATA VALIDATION CHECKLIST

3. INSTRUMENT CALIBRATION

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

Comments: _____

4. BLANKS

- Were laboratory blanks analyzed? Yes No N/A
- Are laboratory blank results acceptable? Yes No N/A
- Were field/trip blanks analyzed? NOTE ① Yes No N/A
- Are field/trip blank results acceptable? Yes No N/A

Comments: ① Field QC including field/trip blanks were not identified in this sample set, but it has been requested. Field QC will be evaluated in the final data summary.

5. ACCURACY

- Were spike samples analyzed at the required frequency? Yes No N/A
- Are spike recoveries acceptable? NOTE ① Yes No N/A
- Were LCS analyses performed at the required frequency? NOTE ② Yes No N/A
- Are LCS recoveries acceptable? Yes No N/A

Comments: ① QC sheet indicates MS recovery of 95% for NO₂/NO₃ but calculated result is 11% - No qualifier applied.
② NO₂/NO₃ LCS raw data not provided, but it has been requested. Reported results acceptable & within limits

6. PRECISION

- Were laboratory duplicate samples analyzed at the required frequency? Yes No N/A
- Are laboratory duplicate sample RPD values acceptable? Yes No N/A
- Are field duplicate RPD values acceptable? SEE NOTE ① Yes No N/A
- Are field split RPD values acceptable? Yes No N/A

9113225.0839

94535490

~~94524758~~

ATTACHMENT 81

Page 1 of 21

GENERAL GC DATA VALIDATION SUMMARY FOR DATA PACKAGE:
B098Y7-TMA-628 (923-E418 628EXTR.UP2)

945325.0842

MEMORANDUM

REC'D
RECEIVED
TQC

TO: 200 UP-2 Project QA Record

March 18, 1994

FR: Thomas Stapp, Golder Associates Inc. *TS*

RE: GENERAL GC DATA VALIDATION SUMMARY FOR DATA PACKAGE
B098Y7-TMA-628 (923-E418 628EXTR.UP2)

INTRODUCTION

This memo presents the results of data validation on data package B098Y7-TMA-628 prepared by TMA laboratory. A list of samples validated along with the analyses reported and the methods of analysis is provided in the following table.

SAMPLE ID	SAMPLE DATE	MEDIA	ANALYSES
B098Y7	10/07/93	SOIL	SEE NOTE 1
Notes:			
1. Indicates the sample was analyzed for extractable fuel hydrocarbons (kerosene range) by SW-846 method 8015M.			

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

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

DATA QUALITY OBJECTIVES

Precision. Goals for precision were met.

Accuracy. Goals for accuracy were met.

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

Detection Limits. Detection limit goals were met.

Completeness. The data package was complete for all requested analyses. A total of one (1) sample was validated in this data package with a total of one (1) determination reported, which was deemed valid. This results in a completeness of 100 percent which meets the work plan completeness objective of 90 percent.

9113225.0843

ATTACHMENT 1

GLOSSARY OF DATA REPORTING QUALIFIERS

9113225-0845

GLOSSARY OF ORGANIC DATA REPORTING QUALIFIERS

- 9/11/3225-0846
- B - Indicates the constituent was analyzed for and detected in the associated laboratory blank. This qualifier is applied by the laboratory. During the process of data validation this qualifier may be replaced by other appropriate qualifiers as defined by the validation procedures. The associated data should be considered usable for decision making purposes.
 - U - Indicates the constituent was analyzed for and not detected. The concentration reported is the sample quantitation limit corrected for aliquot size, dilution and percent solids (in the case of solid matrices) by the laboratory. The associated data should be considered usable for decision making purposes.
 - UJ - Indicates the constituent was analyzed for and not detected. Due to a minor quality control deficiency identified during data validation the concentration reported may not accurately reflect the sample quantitation limit. The associated data should be considered usable for decision making purposes.
 - J - Indicates the constituent was analyzed for and detected. This qualifier may be applied by the laboratory to indicate a concentration which is less than the contract required quantitation limit (CRQL) but greater than the instrument detection limit (IDL). During data validation this qualifier may be applied to indicate a minor quality control deficiency. However in either case, the associated data should be considered usable for decision making purposes.
 - NJ - Indicates presumptive evidence of a constituent at an estimated value. This qualifier is normally applied to GC analysis data (such as organochlorine pesticide and PCB data). The associated data should be considered usable for decision making purposes.
 - N - Indicates presumptive evidence of a constituent. This qualifier is normally applied to GC analysis data (such as organochlorine pesticide and PCB data). The associated data should be considered usable for decision making purposes.
 - JN - Indicates a tentatively identified compound (TIC) whose concentration and identification have been determined to be valid as a result of data validation. The associated data should be considered usable for decision making purposes.
 - UR - Indicates the constituent was analyzed for and not detected. The concentration reported has been qualified as unusable due to a major quality control deficiency identified during data validation. The associated data should be considered unusable for decision making purposes.
 - R - Indicates the constituent was analyzed for and detected. The concentration reported has been qualified as unusable due to a major quality control deficiency identified during data validation. The associated data should be considered unusable for decision making purposes.

ATTACHMENT 2
SUMMARY OF DATA QUALIFICATIONS

9473225-0847

ATTACHMENT 3

QUALIFIED DATA SUMMARY and ANNOTATED LABORATORY REPORTS

9/11/3225.0849

94/3225.0850

Validated Data Summary, Data Package: B098Y7-TMA-628

Parameter	Samp#	B098Y7	
	Date	10-7-93	
	Location	---	
	Depth	---	
	Type	---	
	Comments	---	
	Units	Result	Q
KEROSENE	MG/KG	5.000	UJ

Verified *[Signature]* 3-15-94

Received: 10/11/93

TMA Inc.

REPORT

Work Order # A3-10-014

Results by Sample

000141
3-18-94

SAMPLE ID B098Y7

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

Date & Time Collected 10/07/93

Category _____

MODIFIED 8015 - EXTRACTABLE FUEL HYDROCARBONS

Matrix: SOIL

Date Analyzed: 12/01/93

Dilution factor: 1.00

Concentration Units: mg/Kg

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

G
UJ

ND = Not detected at the specified limits

Form 1

Verified 3-18-94

943225.085

ATTACHMENT 4

LABORATORY NARRATIVE and CHAIN-OF-CUSTODY DOCUMENTATION

9113225.0852

000002A
 3-18-94

Westinghouse
 Hanford Company

CHAIN OF CUSTODY

Custody Form Initiator L E ROGERS
 Company Contact L E ROGERS Telephone 376-7690
 Project Designation/Sampling Locations 200-UP-2 Collection Date 10-7-93
 Ice Chest No. SML-54B Field Logbook No. EFL-1091
 Bill of Lading/Airbill No. _____ Offsite Property No. _____
 Method of Shipment OVERNIGHT AIR SERVICE
 Shipped to TMA
 Possible Sample Hazards/Remarks Keep samples at 4C (SOIL) NONE NOTED

Sample Identification

- 1) GER 10-7-93 3098Y7
 -1,250ml as P:CLP; TAL Metals, Hg, Ti
 -1,250ml aGs:VOA CLP
 -1,250ml aG:Semi-VOA CLP
 -1,125ml G:Anions F, Cl, SO₄ (EPA 300.0)
 -1,125ml P/G:Anions NO₂, NO₃ (EPA 353.2)
 -1,125ml G:Cyanide CLP
 -1,125ml Gw:Kerosene (8015M)
 -1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include, Cs-134, Cs-137, Co-60, Eu-152, Eu-154, Eu-155, K-40, Ru-106, Na-22 (RC-30), Total Uranium (EA-01C) U-235, U-234, U-238 (EP-70, EP-71, EP-5) Np-237, (RC-101A, RC-622, EP-5) Pu-238, Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241, Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79
 -1,250ml as PCB/Pest
 1,250ml P:CLP; TAL Metals, Hg, Ti
 1,250ml Gs:VOA CLP
 1,250ml aG:Semi-VOA CLP
 1,125ml G:Anions F, Cl, SO₄ (EPA 300.0)
 1,125ml P/G:Anions NO₂, NO₃ (EPA 353.2)
 1,125ml G:Cyanide CLP
 1,125ml Gw:Kerosene (8015M)
 1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include, Cs-134, Cs-137, Co-60, Eu-152, Eu-154, Eu-155, K-40, Ru-106, Na-22 (RC-30), Total Uranium (EA-01C) U-235, U-234, U-238 (EP-70, EP-71, EP-5) Np-237, (RC-101A, RC-622, EP-5) Pu-238, Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241, Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79
- 2) GER 10-7-93
 1,250ml P:CLP; TAL Metals, Hg, Ti
 1,250ml Gs:VOA CLP
 1,250ml aG:Semi-VOA CLP
 1,125ml G:Anions F, Cl, SO₄ (EPA 300.0)
 1,125ml P/G:Anions NO₂, NO₃ (EPA 353.2)
 1,125ml G:Cyanide CLP
 1,125ml Gw:Kerosene (8015M)
 1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include, Cs-134, Cs-137, Co-60, Eu-152, Eu-154, Eu-155, K-40, Ru-106, Na-22 (RC-30), Total Uranium (EA-01C) U-235, U-234, U-238 (EP-70, EP-71, EP-5) Np-237, (RC-101A, RC-622, EP-5) Pu-238, Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241, Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79
- 3) GER 10-7-93
 1,250ml P:CLP; TAL Metals, Hg, Ti
 1,250ml Gs:VOA CLP
 1,250ml aG:Semi-VOA CLP
 1,125ml G:Anions F, Cl, SO₄ (EPA 300.0)
 1,125ml P/G:Anions NO₂, NO₃ (EPA 353.2)
 1,125ml G:Cyanide CLP
 1,125ml Gw:Kerosene (8015M)
 1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include, Cs-134, Cs-137, Co-60, Eu-152, Eu-154, Eu-155, K-40, Ru-106, Na-22 (RC-30), Total Uranium (EA-01C) U-235, U-234, U-238 (EP-70, EP-71, EP-5) Np-237, (RC-101A, RC-622, EP-5) Pu-238, Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241, Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

9413225-0853
 9413225-0853

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

Relinquished by: <u>10-8-93</u> <u>Sharon E. Pappas 1122</u>	Received by: <u>JG HOGAN</u> <u>JG HOGAN</u>	Date/Time: <u>10-8-93</u> / <u>1122</u>
Relinquished by: <u>JG HOGAN</u> <u>JG HOGAN 10-8-93 1135</u>	Received by: <u>H. NORCIS</u> <u>JG HOGAN TMA/NORCIS</u>	Date/Time: <u>10-11-93</u> 8:00
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

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

Rec'd SATURDAY 10-9-92
 OPENED 10/11/93

3-18-94
~~000072~~

CASE NARRATIVE

LABORATORY : TMA/ARLI

CASE : 10-014

CONTRACT ID : WESTINGHOUSE HANFORD COMPANY

SDG RECEIPT DATE : October 11, 1993

1.0 DESCRIPTION OF CASE :

Two soil samples were analyzed for TCL Organics - Volatiles, Semivolatiles, and Pesticide/PCBs according to the USEPA Contract Laboratory Program (CLP) Statement of Work for Organic Analysis, Revision OLM01.8. The Total Petroleum Hydrocarbons in the Kerosene range (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>
B098Y7	A3-10-014-01A	V	SOIL
B098Y7	A3-10-014-01B	SV	SOIL
B098Y7 MS	A3-10-014-01C	SV	SOIL
B098Y7 MSD	A3-10-014-01D	SV	SOIL
B098Y7	A3-10-014-01H	K	SOIL
B098Y7 MS	A3-10-014-01I	K	SOIL
B098Y7 MSD	A3-10-014-01J	K	SOIL
B098Y7	A3-10-014-01K	P	SOIL
B098Y7 MS	A3-10-014-01L	P	SOIL
B098Y7 MSD	A3-10-014-01M	P	SOIL
B098Y9	A3-10-014-02A	V	SOIL
B098Y9 MS	A3-10-014-02B	V	SOIL
B098Y9 MSD	A3-10-014-02C	V	SOIL

3.0 COMMENTS :

3.1 SHIPPING AND DOCUMENTATION :

All of the samples were received intact and properly documented.

On October 23, 1993, the Westinghouse Hanford Company cancelled the analysis of samples B098Y7 and B098Y9, despite the fact that the Volatile samples had already been analyzed, and the samples were extracted for Semivolatiles, Pesticides, and Extractable Hydrocarbons. On November 3, 1993, TMA/ARLI, in accordance with ROD-93-0241, reinitiated the analyses and reporting of the aforementioned samples.

1580-2728-116

3-18-94
~~000073~~

3.2 ANALYSIS

3.2.1 VOLATILE ANALYSIS COMMENTS :

LOW LEVEL SOIL :

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

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

TUNES :

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

3.2.2 SEMIVOLATILE ANALYSIS COMMENTS :

LOW LEVEL SOIL :

The samples were extracted and analyzed within the contract required holding times. No TCL analytes were detected in the samples.

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

3.2.3 PESTICIDE/PCB ANALYSIS COMMENTS :

SEQUENCE NOTES :

The sequence was started on 11/02/93 and was analyzed according to the USEPA CLP SOW. The sequence was analyzed by a single injection into a dual column system.

During the analysis sequence, the Autosampler malfunctioned, and after the injection of the PIBLKs and the PEMs, the sequence was continued. The %RSD for all of the analytes were within the QC limits on both of the GC columns, with the exception of alpha- and delta-BHC on the DB-608 column, which were slightly above 20% but less than the 30% limit.

Several Aroclor standards were injected throughout the sequence in order to confirm the presence of Aroclors in the samples. Although the retention times for some peaks exceeded their retention time window, the identification of each Aroclor was based primarily on the pattern recognition for each peak in the chromatogram.

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

9413225-0855

3-18-94
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The chromatograms are presented in the manner consistent with the capabilities of the Nelson 2700 Turbochrome Data System which normalizes the largest peak to scale.

LOW LEVEL SOIL :

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

The TCX surrogate recoveries on the DB-608 column for samples B098Y7MS and B098Y7MSD were slightly below the advisory QC limits. However, the TCX recoveries on the DB-1701 column were higher for all of the samples in comparison to the DB-608 column, due to the interference peaks that coeluted with TCX on the DB-1701 column, therefore yielding higher recoveries. The %D between the two GC columns, for TCX in the spiked and unspiked samples, were greater than the 25% limit. The DCB recoveries on the two GC columns were comparable for all of the samples.

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

3.2.4 TOTAL PETROLEUM HYDROCARBONS "KEROSENE RANGE" COMMENTS :

SEQUENCE NOTES :

The sequence was started on 12/01/93, with the injection of a continuing calibration, and was analyzed according to the SW-846 Method 8015M. The instrument calibration was performed on 11/18/93 with the injection of 5 different levels of the Kerosene standard. The %RSD for the initial calibration, and the %D for the continuing calibration were all within their respective QC limits as specified by the SW-846 Method 8015M. respectively.

SAMPLE NOTES :

LOW LEVEL SOIL :

The samples were extracted within the SW-846 holding time. However, the sample extracts were analyzed 10 days outside of the holding time due to laboratory miscommunication. The laboratory has taken the appropriate steps to ensure that this will not happen again. No Kerosene was detected in the samples.

Sample B098Y7 was spiked with Kerosene. The matrix spike recovery in B098Y7MS was 61%, and 59% in sample B098Y7MSD. A blank spike, KLCS1014S, was prepared and analyzed at the same time, and had a 70% recovery.

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

9413225.0856

FS 3-18-94
~~000075~~

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

Nicole Roth
Nicole Roth 12/14/93
CLP Program Manager

Maureen Parrish
Maureen Parrish 12/14/93
Program Manager

4900-9728-116

ATTACHMENT 5

DATA VALIDATION SUPPORTING DOCUMENTATION

9113225-0858

GENERAL GC DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	<u>E</u>
PROJECT:	200 WP-2		DATA PACKAGE: BC9847-TMA-628		
VALIDATOR:	T. Stapp	LAB:	TMA	DATE: 3-14-94	
CASE:			SDG:		
* ANALYSES PERFORMED					
<input type="checkbox"/> 8010	<input checked="" type="checkbox"/> 8015 <i>WPH-HCID</i>	<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: BC9847 - SOIL					

9113225.0859

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Is technical verification documentation present? *Note (1)* . Yes No N/A

Is a case narrative present? Yes No N/A

Comments: (1) Performed by WHC.

2. HOLDING TIMES

Are sample holding times acceptable? Yes No N/A

Comments: See HOLDING TIME Summary page B-1.

GENERAL GC DATA VALIDATION CHECKLIST

3. INSTRUMENT CALIBRATION

3.1 INITIAL CALIBRATION

Was an initial calibration performed? Yes No N/A

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

Comments: _____

3.2 CONTINUING CALIBRATION

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

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

Comments: _____

4. BLANKS

Were laboratory blanks analyzed? Yes No N/A

Are laboratory blank results acceptable? Yes No N/A

Were field/trip blanks analyzed? Note ① Yes No N/A

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

Comments: ① Field GC samples were not identified in this sample set, but have been requested. Field GC will be evaluated in the final data Summary.

5. ACCURACY

Were surrogates analyzed? Yes No N/A

Are surrogate recoveries acceptable? Note ① Yes No N/A

Were MS/MSD samples analyzed? Yes No N/A

Are MS/MSD recoveries acceptable? Note ② Yes No N/A

Were LCS samples analyzed? Yes No N/A 3-15-94

Are LCS recoveries acceptable? Note ③ Yes No N/A

0980-572C116

GENERAL GC DATA VALIDATION CHECKLIST

Comments: ① Surrogate Compounds were not added to samples, blanks, or calib. Stnds. No qualification applied, see note ②.

② MS/MSD recoveries are 61% and 59% respectively and will be acceptable for data package accuracy requirements.

③ LCS recovery @ 70% which is similar to MS/MSD recoveries and 6. PRECISION qualification will not be applied. Control limits not provided, by Lab.

Are MS/MSD sample RPD values acceptable? . . . NOTE ② . . . Yes No N/A

Are field duplicate RPD values acceptable? . . . NOTE ① . . . Yes No N/A

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

Comments: ① Field QC including Field duplicate and/or splits are not identified in this sample set, but it has been requested. Field QC will be evaluated in the final data Summary.

② Lab precision control limits not provided, however good agreement obtained @ 3% RSD - RPD and no qualification will be applied.

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? NOTE ① Yes No N/A

Comments: CRQL values have not been provided for SW-846 analyses.

9413225.0861

9453549D

~~9452475D~~

ATTACHMENT 82

Page 1 of 22

INORGANIC DATA VALIDATION SUMMARY FOR DATA PACKAGE:
B098Y7-TMA-628 (923-E418 628MET.UP2)

9453225-0863

MEMORANDUM

MAR 1994
RECEIVED
TOD

TO: -200 UP-2 Project QA Record

March 18, 1994

FR: Thomas Stapp, Golder Associates Inc. 

RE: INORGANIC DATA VALIDATION SUMMARY FOR DATA PACKAGE
B098Y7-TMA-628 (923-E418 628MET.UP2)

INTRODUCTION

This memo presents the results of data validation on data package B098Y7-TMA-628 prepared by TMA laboratory. A list of samples validated along with the analyses reported and the methods of analysis is provided in the following table. .

SAMPLE ID	SAMPLE DATE	MEDIA	ANALYSES
B098Y7	10/07/93	SOIL	SEE NOTE 1

Notes:

1. Indicates the samples were analyzed for CLP TAL metals, titanium, and cyanide.

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

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

DATA QUALITY OBJECTIVES

Precision. Goals for precision were met, with the exception of the ICP serial dilution results as indicated under "Minor Deficiencies" below.

Accuracy. Goals for accuracy were met, with the exception of the matrix spike recoveries as indicated under "Minor Deficiencies" below.

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

Detection Limits. Detection limit goals were met for all sample results.

Completeness. The data package was complete for all requested analyses. A total of one sample was validated in this data package with a total of 25 determinations reported, all of which were deemed valid. This results in a completeness of 100 percent which meets the work plan completeness objective of 90 percent.

9413225.0864

MAJOR DEFICIENCIES

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

MINOR DEFICIENCIES

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

Holding Times

- The mercury analysis holding time exceeded the 28 day limit, therefore the mercury result for sample B098Y7 has been qualified as estimated (J).

Blanks

- Silver was detected in the continuing calibration blank, therefore the associated sample result less than five times the blank value has been qualified as undetected (U) as shown in Attachment 2.

Matrix Spike Recoveries

- Matrix spike recoveries for antimony, and manganese were unacceptable. Attachments 2 and 5 provide a summary of the samples affected, data qualification applied, and supporting documentation.

ICP Serial Dilution

- The zinc serial dilution percent difference exceeded the 10% limit for sample results greater than 50 times the IDL, therefore the result for sample B098Y7 has been qualified as estimated (J).

REFERENCES

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

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

9413225.0865

ATTACHMENT 1

GLOSSARY OF DATA REPORTING QUALIFIERS

9113225-0866

GLOSSARY OF INORGANIC DATA REPORTING QUALIFIERS

- 9/11 3225-0867
- 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

9980-5225-0868

DATA QUALIFICATION SUMMARY - FORM B-7

SDG: B098Y7-TMA-628	REVIEWER: T. STAPP	DATE: 3-07-94	PAGE <u>1</u> OF <u>1</u>
COMMENTS: INORGANIC ANALYSIS			
COMPOUND/ANALYTE	QUALIFIER	SAMPLES AFFECTED	REASON
MERCURY	BJ	B098Y7	HOLDING TIME EXPIRED
ANTIMONY, MANGANESE	J	B098Y7	MATRIX SPIKE RECOVERY IS BELOW THE 75% LIMIT
ZINC	J	B098Y7	ICP SERIAL DILUTION PERCENT DIFFERENCE EXCEEDS 10%
SILVER	U	B098Y7	CONTAMINANT FOUND IN BLANK

9113225.0869

ATTACHMENT 3

QUALIFIED DATA SUMMARY and ANNOTATED LABORATORY REPORTS

9/11/3225.0870

94/3225.0871

Validated Data Summary, Data Package: B098Y7-TMA-628

Parameter	Samp# Date Location Depth Type Comments		B098Y7 10-7-93 --- --- --- ---	
	Units	Result	Q	
ALUMINUM	MG/KG	7350.000		
ANTIMONY	MG/KG	2.800	BJ	
ARSENIC	MG/KG	8.600		
BARIUM	MG/KG	104.000		
BERYLLIUM	MG/KG	0.400	B	
CADMIUM	MG/KG	0.260	U	
CALCIUM	MG/KG	20400.000		
CHROMIUM	MG/KG	8.400		
COBALT	MG/KG	11.800		
COPPER	MG/KG	15.800		
IRON	MG/KG	22400.000		
LEAD	MG/KG	7.500		
MAGNESIUM	MG/KG	6990.000		
MANGANESE	MG/KG	415.000	J	
MERCURY	MG/KG	0.060	BJ	
NICKEL	MG/KG	8.400		
POTASSIUM	MG/KG	1200.000		
SELENIUM	MG/KG	0.560	U	
SILVER	MG/KG	0.960	U	
SODIUM	MG/KG	223.000	B	
THALLIUM	MG/KG	0.320	U	
VANADIUM	MG/KG	55.200		
ZINC	MG/KG	46.600	J	
CYANIDE	MG/KG	0.530	U	
TITANIUM	MG/KG	1780.000		

Verified *[Signature]* 3-18-94

800

WESTINGHOUSE/HANFORD

1

SAMPLE NUMBER:

INORGANIC ANALYSIS DATA SHEET

8098Y7

Lab Name SKINNER & SHERMAN LABS

Contract: 68-D2-0039

Lab Code SKINNER

Case No. NS-10-0305AS No.

SDG No. B098Y7

Matrix (soil/water) SOIL

Lab Sample ID: 8310097-01

Level (low/med) LOW

Date Received 10/12/93

% Solids 93.2

Concentration Units (ug/L or ug/g dry weight) MG/KG

CAS No	Analyte	Concentration	C	D	M
7429-90-5	Aluminum	7350			P
7440-36-0	Antimony	2.8	X	N	P BJ
7440-38-0	Arsenic	2.6			P
7440-39-3	Barium	104			P
7440-41-7	Beryllium	0.40	B		P
7440-43-9	Cadmium	0.26	U		P
7440-70-2	Calcium	20400			P
7440-47-3	Chromium	8.4			P
7440-48-4	Cobalt	11.8			P
7440-50-8	Copper	15.8			P
7439-89-6	Iron	22400			P
7439-92-1	Lead	7.5			P
7439-95-4	Magnesium	6490			P
7439-96-5	Manganese	413		N	P BJ
7439-97-6	Mercury	0.05	X		P CV BJ
7440-02-0	Nickel	8.4			P
7440-09-7	Potassium	1200			P
7782-49-2	Selenium	0.56	U		P
7440-22-4	Silver	0.96	X		P U
7440-23-5	Sodium	223	B		P
7440-28-0	Thallium	0.32	U		P
7440-62-2	Vanadium	55.2			P
7440-66-6	Zinc	46.6		E	P J
	Cyanide	0.53	U		CA
7440-32-6	Titanium	1780			P

9473225.0872

G

BJ

BJ

CV BJ

U

J

CA

P

3-18-94
Verified

3-8-94

Color Before: BROWN

Clarity Before:

Texture FINE

Color After: BROWN

Clarity After:

Artifacts:

Comments:

009

3-18-94

ATTACHMENT 4

LABORATORY NARRATIVE and CHAIN-OF-CUSTODY DOCUMENTATION

9443225.0873

TMA

Thermo Analytical Inc.

Skinner & Sherman Labs., Inc.

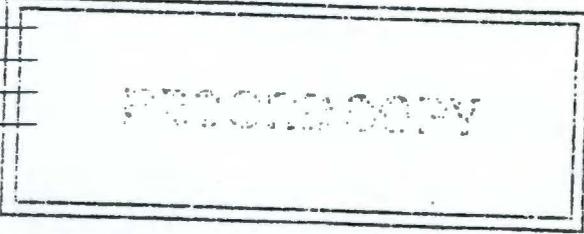
300 Second Avenue

Post Office Box 521

Waltham, MA 02254-0521

(617) 890-7200

FAX (617) 890-3883



November 23, 1993

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

Quality Control Narrative

Scope

One (1) soil sample was submitted to TMA/Skinner & Sherman Laboratories, Inc. on October 12, 1993 from TMA/Norcal. The sample was analyzed for the USEPA CLP Target Analyte List metals, titanium and cyanide. The analysis were performed under TMA/Skinner and Sherman work order S310097.

Methodology

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

Discussion

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

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

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

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

Respectfully submitted,

TMA/SKINNER & SHERMAN LABORATORIES, INC.

Steven R. Provencal

Steven R. Provencal
Lead Chemist

4780-5723-116

HANFORD ANALYTICAL SERVICES MANAGEMENT

RECORD OF DISPOSITION

ROD-93-0241
Record of Disposition No.

DATE: November 4, 1993

LABORATORY: TMA

PROJECT TITLE/NO.: 200-UP-2 / 93-263

NCR NO.: N/A

SAMPLE IDENTIFICATION NUMBERS: B098Y7, B098Y9

DESCRIPTION OF EVENT:

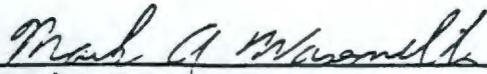
On October 25th, HASM received direction regarding samples B098Y7 and B098Y9 taken 4-6' from the surface. The entire suite of analyses listed on SAF 93-263 were requested for sample B098Y7 and VOA's were requested for the trip blank (sample B098Y9). HASM was informed that samples taken from the 4-6' depth should only have radiochemistry analyses requested since they are apart of a sitewide background study. TMA was subsequently informed to cancel all non-radchem analyses for sample B098Y7 and cancel the VOA analysis for B098Y9. On November 3rd, HASM was informed that all of the requested analyses on the Chain of Custody should be performed for samples B098Y7 and B098Y9. Due to the delay, two analyses (CN and Hg) exceeded holding time limits.

DISPOSITION OF SAMPLES:

With the customer's consent, TMA was instructed to proceed with all the analyses listed on the Chain of Custody, including CN and Hg which exceeded holding times. The customer understands that data obtained for CN and Hg may be for information only.

APPROVAL SIGNATURES:

Jon W. Ball  11-4-93
HASM Project Coordinator (Print/Sign Name) Date

Mark Wasemiller  11/12/93
Technical Representative (Print/Sign Name) Date

N/A
Quality Assurance (Print/Sign Name) Date

Westinghouse
Hanford Company

CHAIN OF CUSTODY

0000027
-853/18/94

Custody Form Initiator L E ROGERS
Company Contact L E ROGERS
Project Designation/Sampling Locations 200-UP-2
Ice Chest No. SM6-54B
Bill of Lading/Airbill No. _____
Method of Shipment OVERNIGHT AIR SERVICE
Shipped to TMA
Possible Sample Hazards/Remarks Keep samples at 4C (SOIL) NONE NOTED

Telephone 376-7690
Collection Date 10-7-93
Field Logbook No. EFL-1091
Offsite Property No. _____

Sample Identification

- 1) GER 10-7-93 3098Y7
- 1,250ml ag P:CLP;TAL Metals,Hg,Ti
 - 1,250ml ag Gs:VOA CLP
 - 1,250ml ag Semi-VOA CLP
 - 1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
 - 1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
 - 1,125ml G:Cyanide CLP
 - 1,125ml Gw:Kerosene (8015M)
 - 1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237, (RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79
 - 1,250ml ag PCB/Pest
 - 1,250ml P:CLP;TAL Metals,Hg,Ti
 - 1,250ml Gs:VOA CLP
 - 1,250ml ag:Semi-VOA CLP
 - 1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
 - 1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
 - 1,125ml G:Cyanide CLP
 - 1,125ml Gw:Kerosene (8015M)
 - 1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237, (RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79
- 2) GER 10-7-93
- 1,250ml P:CLP;TAL Metals,Hg,Ti
 - 1,250ml Gs:VOA CLP
 - 1,250ml ag:Semi-VOA CLP
 - 1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
 - 1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
 - 1,125ml G:Cyanide CLP
 - 1,125ml Gw:Kerosene (8015M)
 - 1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237, (RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79
- 3) GER 10-7-93
- 1,250ml P:CLP;TAL Metals,Hg,Ti
 - 1,250ml Gs:VOA CLP
 - 1,250ml ag:Semi-VOA CLP
 - 1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
 - 1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
 - 1,125ml G:Cyanide CLP
 - 1,125ml Gw:Kerosene (8015M)
 - 1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237, (RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

9180 5289 H16

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

Relinquished by: <u>10-8-93</u> <u>Robert E. Fogart 1122</u>	Received by: <u>JG HOGAN</u> <u>JG HOGAN</u>	Date/Time: <u>10-8-93 / 1122</u>
Relinquished by: <u>JG HOGAN</u> <u>JG HOGAN 10-8-93 1135</u>	Received by: <u>H. NORCAL</u> <u>H. NORCAL TMA</u>	Date/Time: <u>10-11-93 8:00</u>
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

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

Rec'd SATURDAY 10-9-93
OPENED 10/11/93

ATTACHMENT 5

DATA VALIDATION SUPPORTING DOCUMENTATION

9113225.0877

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT:	200 UP-2		DATA PACKAGE: B098Y7-TMA-628		
VALIDATOR:	T. Stapp		LAB: TMA	DATE: 3-7-94	
CASE:	N3-10-030		SDG:		
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	B098Y7 / SOIL				

9413225.0878

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: Performed by WHC

2. HOLDING TIMES

Are sample holding times acceptable? Yes No N/A

Comments: Hg analysis exceeds holding time @ 31 days. Associated sample results qualified J/UJ.

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

3. INSTRUMENT PERFORMANCE AND CALIBRATIONS

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

Comments: _____

4. BLANKS

- Were ICB and CCB checks performed for all applicable analyses? Yes No N/A
- Are ICB and CCB results acceptable? . . . See note ② . . . 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? . See note ① Yes No N/A
- Are field/trip blank results acceptable? Yes No N/A

Comments: ① Field QC, including Field/Trip Blanks are not identified with this sample set, but have been requested. Field QC will be evaluated in the final data summary.
② See blank summary page B-3.

5. ACCURACY

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

Comments: _____

9413225.0879

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

6. PRECISION

- Were laboratory duplicates analyzed? Yes No N/A
- Are laboratory duplicate samples RPD values acceptable? Yes No N/A
- Were ICP serial dilution samples analyzed? Yes No N/A
- Are ICP serial dilution %D values acceptable? *See Precision Summary* Yes No N/A
- Are field duplicate RPD values acceptable? Yes No N/A
- Are field split RPD values acceptable? *See note ①* Yes No N/A

Comments: ① Field QC including duplicates and/or splits were not identified with this sample set, but have been requested. Field QC will be evaluated in the final data summary.

7. FURNACE AA QUALITY CONTROL

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

Comments: Furnace analyses not performed.

8. REPORTED RESULTS AND DETECTION LIMITS

- Are results reported for all requested analyses? Yes No N/A
- Are all results supported in the raw data? Yes No N/A
- Are results calculated properly? Yes No N/A
- Do results meet the CRDLs? Yes No N/A

Comments: _____

0880 5725 416

BLANK AND SAMPLE DATA SUMMARY

SDG: B098Y7-TMA-628		VALIDATOR: T. Stapp			DATE: 3-18-94		PAGE 1 OF 1		
COMMENTS: INORGANIC ANALYSES									
SAMPLE ID	COMPOUND	RESULT	Q	RT	UNITS	5X RESULT	10X RESULT	SAMPLES AFFECTED	QUALIFIER
CCBZ	Ag	4.8			ug/L	24		B098Y7	U

B-3

019

94535490

~~94524750~~

ATTACHMENT 83

Page 1 of 23

PESTICIDE/PCB DATA VALIDATION SUMMARY FOR DATA PACKAGE:
B098Y7-TMA-628 (923-E418 628PES.UP2)

94535490

MEMORANDUM

RECEIVED
TQO

TO: 200 UP-2 Project QA Record

March 14, 1994

FR: Thomas Stapp, Golder Associates Inc. *TS*

RE: PESTICIDE/PCB DATA VALIDATION SUMMARY FOR DATA PACKAGE B098Y7-TMA-628 (923-E418 628PES.UP2)

INTRODUCTION

This memo presents the results of data validation on data package B098Y7-TMA-628 prepared by TMA laboratory. A list of samples validated along with the analyses reported and the methods of analysis is provided in the following table.

SAMPLE ID	SAMPLE DATE	MEDIA	ANALYSES
B098Y7	10/07/93	SOIL	SEE NOTE 1
Notes:			
1. Indicates the samples were analyzed for target compound list (TCL) pesticides and arochlor PCB's.			

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.

Completeness. The data package was complete for all requested analyses. A total of one (1) sample was validated in this data package with a total of twenty-eight (28) determinations reported, all of which were deemed valid. This results in a completeness of 100 percent which meets the work plan completeness objective of 90 percent.

9113225.0886

23 1994

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.

1890-572-16

ATTACHMENT 1
GLOSSARY OF DATA REPORTING QUALIFIERS

9413225.0888

GLOSSARY OF ORGANIC DATA REPORTING QUALIFIERS

- 9113225.0889
- B - Indicates the constituent was analyzed for and detected in the associated laboratory blank. This qualifier is applied by the laboratory. During the process of data validation this qualifier may be replaced by other appropriate qualifiers as defined by the validation procedures. The associated data should be considered usable for decision making purposes.
 - U - Indicates the constituent was analyzed for and not detected. The concentration reported is the sample quantitation limit corrected for aliquot size, dilution and percent solids (in the case of solid matrices) by the laboratory. The associated data should be considered usable for decision making purposes.
 - UJ - Indicates the constituent was analyzed for and not detected. Due to a minor quality control deficiency identified during data validation the concentration reported may not accurately reflect the sample quantitation limit. The associated data should be considered usable for decision making purposes.
 - J - Indicates the constituent was analyzed for and detected. This qualifier may be applied by the laboratory to indicate a concentration which is less than the contract required quantitation limit (CRQL) but greater than the instrument detection limit (IDL). During data validation this qualifier may be applied to indicate a minor quality control deficiency. However in either case, the associated data should be considered usable for decision making purposes.
 - NJ - Indicates presumptive evidence of a constituent at an estimated value. This qualifier is normally applied to GC analysis data (such as organochlorine pesticide and PCB data). The associated data should be considered usable for decision making purposes.
 - N - Indicates presumptive evidence of a constituent. This qualifier is normally applied to GC analysis data (such as organochlorine pesticide and PCB data). The associated data should be considered usable for decision making purposes.
 - JN - Indicates a tentatively identified compound (TIC) whose concentration and identification have been determined to be valid as a result of data validation. The associated data should be considered usable for decision making purposes.
 - UR - Indicates the constituent was analyzed for and not detected. The concentration reported has been qualified as unusable due to a major quality control deficiency identified during data validation. The associated data should be considered unusable for decision making purposes.
 - R - Indicates the constituent was analyzed for and detected. The concentration reported has been qualified as unusable due to a major quality control deficiency identified during data validation. The associated data should be considered unusable for decision making purposes.

ATTACHMENT 2
AS QUALIFIED DATA SUMMARY

9113225.0890

ATTACHMENT 3

QUALIFIED DATA SUMMARY and ANNOTATED LABORATORY REPORTS

2680-5276-116
9/1/2025-0892

9413225.0893

Validated Data Summary, Data Package: B098Y7-TMA-628

Parameter	Sampl Date	B098Y7		
	Location	Depth	Type	Comments
Parameter	Units	Result	Q	
ALPHA-BHC	UG/KG	1.800	U	
BETA-BHC	UG/KG	1.800	U	
DELTA-BHC	UG/KG	1.800	U	
GAMMA-BHC (LINDANE)	UG/KG	1.800	U	
HEPTACHLOR	UG/KG	1.800	U	
ALDRIN	UG/KG	1.800	U	
HEPTACHLOR EPOXIDE	UG/KG	1.800	U	
ENDOSULFAN I	UG/KG	1.800	U	
DIELDRIN	UG/KG	3.500	U	
4,4'-DDE	UG/KG	3.500	U	
ENDRIN	UG/KG	3.500	U	
ENDOSULFAN II	UG/KG	3.500	U	
4,4'-DDD	UG/KG	3.500	U	
ENDOSULFAN SULFATE	UG/KG	3.500	U	
4,4'-DDT	UG/KG	3.500	U	
METHOXYCHLOR	UG/KG	18.000	U	
ENDRIN KETONE	UG/KG	3.500	U	
ENDRIN ALDEHYDE	UG/KG	3.500	U	
ALPHA-CHLORDANE	UG/KG	1.800	U	
GAMMA-CHLORDANE	UG/KG	1.800	U	
TOXAPHENE	UG/KG	180.000	U	
AROCLOR-1016	UG/KG	35.000	U	
AROCLOR-1221	UG/KG	72.000	U	
AROCLOR-1232	UG/KG	35.000	U	
AROCLOR-1242	UG/KG	35.000	U	
AROCLOR-1248	UG/KG	35.000	U	
AROCLOR-1254	UG/KG	35.000	U	
AROCLOR-1260	UG/KG	35.000	U	

Verified 9/3-14-94

3-11-94 000083

1D
PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B098Y7

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 10014 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A310014-01K

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

% Moisture: 8 decanted: (Y/N) N Date Received: 10/11/93

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 10/13/93

Concentrated Extract Volume: 5000 (uL) Date Analyzed: 11/03/93

Injection Volume: 1.00 (uL) Dilution Factor: 1.00

GPC Cleanup: (Y/N) Y pH: 9.6 Sulfur Cleanup: (Y/N) N

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) <u>UG/KG</u>	Q
319-84-6	alpha-BHC	1.8	U
319-85-7	beta-BHC	1.8	U
319-86-8	delta-BHC	1.8	U
58-89-9	gamma-BHC (Lindane)	1.8	U
76-44-8	Heptachlor	1.8	U
309-00-2	Aldrin	1.8	U
1024-57-3	Heptachlor epoxide	1.8	U
959-98-8	Endosulfan I	1.8	U
60-57-1	Dieldrin	3.5	U
72-55-9	4,4'-DDE	3.5	U
72-20-8	Endrin	3.5	U
33213-65-9	Endosulfan II	3.5	U
72-54-8	4,4'-DDD	3.5	U
1031-07-8	Endosulfan sulfate	3.5	U
50-29-3	4,4'-DDT	3.5	U
72-43-5	Methoxychlor	18	U
53494-70-5	Endrin ketone	3.5	U
7421-36-3	Endrin aldehyde	3.5	U
5103-71-9	alpha-Chlordane	1.8	U
5103-74-2	gamma-Chlordane	1.8	U
8001-35-2	Toxaphene	180	U
12674-11-2	Aroclor-1016	35	U
11104-28-2	Aroclor-1221	72	U
11141-16-5	Aroclor-1232	35	U
53469-21-9	Aroclor-1242	35	U
12672-29-6	Aroclor-1248	35	U
11097-69-1	Aroclor-1254	35	U
11096-82-5	Aroclor-1260	35	U

Verified 3-11-94

9113225.0894

ATTACHMENT 4

LABORATORY NARRATIVE and CHAIN-OF-CUSTODY DOCUMENTATION

9113225.0895

Westinghouse
Hanford Company

CHAIN OF CUSTODY

0000000000

3-18-94

Custody Form Initiator L E ROGERS
 Company Contact L E ROGERS
 Project Designation/Sampling Locations 200-UP-2
 Ice Chest No. SML-54B
 Bill of Lading/Airbill No. _____
 Method of Shipment OVERNIGHT AIR SERVICE
 Shipped to TMA
 Possible Sample Hazards/Remarks Keep samples at 4C (SOIL) NONE NOTED

Telephone 376-7690
 Collection Date 10-7-93
 Field Logbook No. EFL-1091
 Offsite Property No. _____

Sample Identification

- 1) *SEP 10-7-93* **BO98Y7**
- 1,250ml P:CLP;TAL Metals,Hg,Ti
 - 1,250ml aGs:VOA CLP
 - 1,250ml aG:Semi-VOA CLP
 - 1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
 - 1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
 - 1,125ml G:Cyanide CLP
 - 1,125ml Gw:Kerosene (8015M)
 - 1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79
- 1,250ml aGs PCB/Rest
- 1,250ml P:CLP;TAL Metals,Hg,Ti
 - 1,250ml Gs:VOA CLP
 - 1,250ml aG:Semi-VOA CLP
 - 1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
 - 1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
 - 1,125ml G:Cyanide CLP
 - 1,125ml Gw:Kerosene (8015M)
 - 1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

9680-527416

- 3) *SEP 10-7-93*
- 1,250ml P:CLP;TAL Metals,Hg,Ti
 - 1,250ml Gs:VOA CLP
 - 1,250ml aG:Semi-VOA CLP
 - 1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
 - 1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
 - 1,125ml G:Cyanide CLP
 - 1,125ml Gw:Kerosene (8015M)
 - 1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

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

Relinquished by: <i>10-8-93</i> <i>Choren E. Pappas 1122</i>	Received by: <i>JG HOGAN</i> <i>JG HOGAN</i>	Date/Time: <i>10-8-93 / 1122</i>
Relinquished by: <i>JG HOGAN</i> <i>JG HOGAN 10-8-93 1135</i>	Received by: <i>H. Narziso</i> <i>JG HOGAN TMA/NORCAL</i>	Date/Time: <i>10-11-93 8:00</i>
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

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

Comments:

Rec'd SATURDAY
10-9-93

OPENED 10/11/93

011

HANFORD ANALYTICAL SERVICES MANAGEMENT

RECORD OF DISPOSITION

ROD-93-0241

Record of Disposition No.

DATE: November 4, 1993

LABORATORY: TMA

PROJECT TITLE/NO.: 200-UP-2 / 93-263

NCR NO.: N/A

SAMPLE IDENTIFICATION NUMBERS: B098Y7, B098Y9

DESCRIPTION OF EVENT:

On October 25th, HASM received direction regarding samples B098Y7 and B098Y9 taken 4-6' from the surface. The entire suite of analyses listed on SAF 93-263 were requested for sample B098Y7 and VOA's were requested for the trip blank (sample B098Y9). HASM was informed that samples taken from the 4-6' depth should only have radiochemistry analyses requested since they are apart of a sitewide background study. TMA was subsequently informed to cancel all non-radchem analyses for sample B098Y7 and cancel the VOA analysis for B098Y9. On November 3rd, HASM was informed that all of the requested analyses on the Chain of Custody should be performed for samples B098Y7 and B098Y9. Due to the delay, two analyses (CN and Hg) exceeded holding time limits.

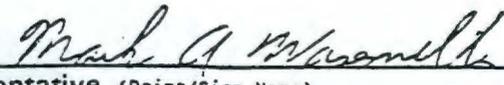
DISPOSITION OF SAMPLES:

With the customer's consent, TMA was instructed to proceed with all the analyses listed on the Chain of Custody, including CN and Hg which exceeded holding times. The customer understands that data obtained for CN and Hg may be for information only.

APPROVAL SIGNATURES:

Jon W. Ball 
 HASM Project Coordinator (Print/Sign Name)

11-4-93
 Date

Mark Wasemiller 
 Technical Representative (Print/Sign Name)

11/12/93
 Date

N/A
 Quality Assurance (Print/Sign Name)

Date

3-18-94
000072

CASE NARRATIVE

LABORATORY : TMA/ARLI

CASE : 10-014

CONTRACT ID : WESTINGHOUSE HANFORD COMPANY

SDG RECEIPT DATE : October 11, 1993

1.0 DESCRIPTION OF CASE :

Two soil samples were analyzed for TCL Organics - Volatiles, Semivolatiles, and Pesticide/PCBs according to the USEPA Contract Laboratory Program (CLP) Statement of Work for Organic Analysis, Revision OLM01.8. The Total Petroleum Hydrocarbons in the Kerosene range (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>
B098Y7	A3-10-014-01A	V	SOIL
B098Y7	A3-10-014-01B	SV	SOIL
B098Y7 MS	A3-10-014-01C	SV	SOIL
B098Y7 MSD	A3-10-014-01D	SV	SOIL
B098Y7	A3-10-014-01H	K	SOIL
B098Y7 MS	A3-10-014-01I	K	SOIL
B098Y7 MSD	A3-10-014-01J	K	SOIL
B098Y7	A3-10-014-01K	P	SOIL
B098Y7 MS	A3-10-014-01L	P	SOIL
B098Y7 MSD	A3-10-014-01M	P	SOIL
B098Y9	A3-10-014-02A	V	SOIL
B098Y9 MS	A3-10-014-02B	V	SOIL
B098Y9 MSD	A3-10-014-02C	V	SOIL

3.0 COMMENTS :

3.1 SHIPPING AND DOCUMENTATION :

All of the samples were received intact and properly documented.

On October 23, 1993, the Westinghouse Hanford Company cancelled the analysis of samples B098Y7 and B098Y9, despite the fact that the Volatile samples had already been analyzed, and the samples were extracted for Semivolatiles, Pesticides, and Extractable Hydrocarbons. On November 3, 1993, TMA/ARLI, in accordance with ROD-93-0241, reinitiated the analyses and reporting of the aforementioned samples.

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3.2 ANALYSIS

3.2.1 VOLATILE ANALYSIS COMMENTS :

LOW LEVEL SOIL :

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

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

TUNES :

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

3.2.2 SEMIVOLATILE ANALYSIS COMMENTS :

LOW LEVEL SOIL :

The samples were extracted and analyzed within the contract required holding times. No TCL analytes were detected in the samples.

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

3.2.3 PESTICIDE/PCB ANALYSIS COMMENTS :

SEQUENCE NOTES :

The sequence was started on 11/02/93 and was analyzed according to the USEPA CLP SOW. The sequence was analyzed by a single injection into a dual column system.

During the analysis sequence, the Autosampler malfunctioned, and after the injection of the PIBLKs and the PEMs, the sequence was continued. The %RSD for all of the analytes were within the QC limits on both of the GC columns, with the exception of alpha- and delta-BHC on the DB-608 column, which were slightly above 20% but less than the 30% limit.

Several Aroclor standards were injected throughout the sequence in order to confirm the presence of Aroclors in the samples. Although the retention times for some peaks exceeded their retention time window, the identification of each Aroclor was based primarily on the pattern recognition for each peak in the chromatogram.

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

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The chromatograms are presented in the manner consistent with the capabilities of the Nelson 2700 Turbochrome Data System which normalizes the largest peak to scale.

LOW LEVEL SOIL :

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

The TCX surrogate recoveries on the DB-608 column for samples B098Y7MS and B098Y7MSD were slightly below the advisory QC limits. However, the TCX recoveries on the DB-1701 column were higher for all of the samples in comparison to the DB-608 column, due to the interference peaks that coeluted with TCX on the DB-1701 column, therefore yielding higher recoveries. The %D between the two GC columns, for TCX in the spiked and unspiked samples, were greater than the 25% limit. The DCB recoveries on the two GC columns were comparable for all of the samples.

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

3.2.4 TOTAL PETROLEUM HYDROCARBONS "KEROSENE RANGE" COMMENTS :

SEQUENCE NOTES :

The sequence was started on 12/01/93, with the injection of a continuing calibration, and was analyzed according to the SW-846 Method 8015M. The instrument calibration was performed on 11/18/93 with the injection of 5 different levels of the Kerosene standard. The %RSD for the initial calibration, and the %D for the continuing calibration were all within their respective QC limits as specified by the SW-846 Method 8015M. respectively.

SAMPLE NOTES :

LOW LEVEL SOIL :

The samples were extracted within the SW-846 holding time. However, the sample extracts were analyzed 10 days outside of the holding time due to laboratory miscommunication. The laboratory has taken the appropriate steps to ensure that this will not happen again. No Kerosene was detected in the samples.

Sample B098Y7 was spiked with Kerosene. The matrix spike recovery in B098Y7MS was 61%, and 59% in sample B098Y7MSD. A blank spike, KLCS1014S, was prepared and analyzed at the same time, and had a 70% recovery.

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

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

Nicole Roth
Nicole Roth 12/14/93
CLF Program Manager

Maureen Parrish
Maureen Parrish 12/14/93
Program Manager

060522646
947325090

ATTACHMENT 5

DATA VALIDATION SUPPORTING DOCUMENTATION

9443225.0902

PESTICIDE/PCB DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT:	200 UP-2		DATA PACKAGE: B09847-TMA-628		
VALIDATOR:	LAB: TMA		DATE: 3-9-94		
CASE:	10-014		SDG:		
ANALYSES PERFORMED					
<input checked="" type="checkbox"/> CLP3/90	<input type="checkbox"/> SW-846 8080	<input type="checkbox"/> SW-846 8081	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
SAMPLES/MATRIX	B09847 / SOIL				

9113225-0903

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Is technical verification documentation present? *Note ①* . . . **Yes** No N/A
 Is a case narrative present? Yes No N/A
 Comments: ① Performed by WHC

2. HOLDING TIMES

Are sample holding times acceptable? **Yes** No N/A
 Comments: See Form B-1.

3. INSTRUMENT PERFORMANCE AND CALIBRATIONS

3.1 INSTRUMENT PERFORMANCE (METHOD 8080 AND 8081)

Are DDT retention times acceptable Yes No **N/A**
 Are calibration standard retention times acceptable? Yes No **N/A**
 Are DDT and endrin breakdowns acceptable? Yes No **N/A**

PESTICIDE/PCB DATA VALIDATION CHECKLIST

Are DBC retention times acceptable? Yes No (N/A)
Is the GC/MS tuning/performance check acceptable? Yes No (N/A)

Comments: _____

3.2 CALIBRATIONS (METHOD 8080 AND 8081)

Are EVAL standard calibration factors and %RSD values acceptable? Yes No (N/A)
Are quantitation column calibration factor %RSD values acceptable? Yes No (N/A)
Were the analytical sequence requirements met? Yes No (N/A)
Are continuing calibration %D values acceptable? Yes No (N/A)

Comments: _____

3.3 INSTRUMENT PERFORMANCE AND INITIAL CALIBRATION (3/90 SOW)

Was the initial calibration sequence performed? (Yes) No N/A
Was the resolution acceptable in the resolution check mix? (Yes) No N/A
Is resolution acceptable in the PEM, INDA and INDB? (Yes) No N/A
Are DDT and Endrin breakdowns acceptable? (Yes) No N/A
Are retention times in PEMs and calibration mixes acceptable? (Yes) No N/A
Are RPD values in the PEMs acceptable? (Yes) No N/A
Are %RSD values acceptable? (Yes) No N/A

Comments: _____

3.4 CALIBRATION VERIFICATION (3/90 SOW)

Were the analytical sequence requirements met? (Yes) No N/A
Is resolution acceptable in the PEMs? (Yes) No N/A
Are initial calibrations acceptable? (Yes) No N/A

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PESTICIDE/PCB DATA VALIDATION CHECKLIST

- Are retention times acceptable in the PEMS, INDA and INDB mixes? Yes No N/A
- Are RPD values in the PEMS acceptable? Yes No N/A
- Are the DDT and endrin breakdowns acceptable? Yes No N/A
- Was GPC cleanup performed? Yes No N/A
- Is the GPC calibration check acceptable? Yes No N/A
- Was Florisil cleanup performed? Yes No N/A
- Is the Florisil performance check acceptable? Yes No N/A

Comments: _____

9/13/25.0905

4. BLANKS

- Were laboratory blanks analyzed? Yes No N/A
- Are laboratory blank results acceptable? *See note ①* Yes No N/A
- Were field/trip blanks analyzed? *See note ②* Yes No N/A
- Are field/trip blank results acceptable? Yes No N/A

Comments: ① Methoxychlor in method blank, No qualification since sample results are non-detect. See MRB Summary sheet.
② GC field samples not identified with this sample set but have been requested. Field GC data will be evaluated in the final data Summary.

ft
3-18-9

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 results acceptable? Yes No N/A
- Were LCS samples analyzed? *See note ①* Yes No N/A
- Are LCS results acceptable? Yes No N/A

Comments: ① LCS analysis not required when MS/MSD results are present.

PESTICIDE/PCB DATA VALIDATION CHECKLIST

6. PRECISION

- Are MS/MSD RPD values acceptable? Yes No N/A
- Are laboratory duplicate results acceptable? See Note ① . . . Yes No N/A
- Are field duplicate RPD values acceptable? See note ② . . . Yes No N/A
- Are field split RPD values acceptable? Yes No N/A

Comments: ① Laboratory duplicate analysis not required since MS/MSD analysis is present.
② Field QC samples not identified with this sample set, but have been requested. Field QC will be evaluated in the final data summary.

7. SYSTEM PERFORMANCE

- Is chromatographic performance acceptable? Yes No N/A
- Are positive results resolved acceptably? Note ① Yes No N/A

Comments: ① All sample results are non-detect.

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

Comments: _____

9060 5225 0906

9453549D

9452475D

ATTACHMENT 79

Page 1 of 55

SEMIVOLATILE ORGANIC DATA VALIDATION SUMMARY FOR DATA PACKAGE:
B098Y7-TMA-628 (923-E418 628SEMI.UP2)

9453549D

MEMORANDUM

TO: 200 UP-2 Project QA Record

April 21, 1994

FR: Thomas Stapp, Golder Associates Inc. *TS*

RE: SEMIVOLATILE DATA VALIDATION SUMMARY FOR DATA PACKAGE B098Y7-TMA-628 (923-E418 628SEMI.UP2)

INTRODUCTION

This memo presents the results of data validation on data package B098Y7-TMA-628 prepared by TMA laboratory. A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

SAMPLE ID	SAMPLE DATE	MEDIA	ANALYSES
B098Y7	10/07/93	SOIL	SEE NOTE 1
Notes:			
1. Indicates the samples were analyzed for target compound list (TCL) semivolatile organics.			

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

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

DATA QUALITY OBJECTIVES

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

Precision. Goals for precision were met.

Accuracy. Goals for accuracy were met.

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

Detection Limits. Detection limit goals were met.

Completeness. The data package was complete for all requested analyses. A total of one (1) sample was validated in this data package with a total of sixty-four (64) determinations reported, all of which were deemed valid. This results in a completeness of 100 percent which meets normal work plan objectives of 90 percent.

*4-20-94 Revised
TS -001*

9113225-0909

MAJOR DEFICIENCIES

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

MINOR DEFICIENCIES

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

Laboratory Blanks

- Di-n-butylphthalate was detected in the laboratory blank. Attachments 2 and 5 provide a summary of the sample affected, data qualification applied and supporting documentation.

TENTATIVELY IDENTIFIED COMPOUNDS

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

- An unknown alkane detected in the sample has been qualified as presumptive and valid (JN).
- TICs were detected in the sample and associated laboratory blank and have been qualified due to associated blank contamination and determined to be presumptive and valid (UJN). Attachments 3 and 5 provide a summary of the sample affected, data qualification applied and supporting documentation.

REFERENCES

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

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

Revised *fs*
4-21-94 002

9413225.0910

ATTACHMENT 1

GLOSSARY OF DATA REPORTING QUALIFIERS

1160-522616

GLOSSARY OF ORGANIC DATA REPORTING QUALIFIERS

- 9/13/25 0912
- 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
Feb 7 40 19
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ATTACHMENT 2
SUMMARY OF DATA QUALIFICATIONS

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ATTACHMENT 3

QUALIFIED DATA SUMMARY and ANNOTATED LABORATORY REPORTS

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9413225.0916

Validated Data Summary, Data Package: B098Y7-TMA-628

Parameter	B098Y7	
	Units	Result
PHENOL	UG/KG	350.000 U
BIS(2-CHLOROETHYL)ETHER	UG/KG	350.000 U
2-CHLOROPHENOL	UG/KG	350.000 U
1,3-DICHLOROBENZENE	UG/KG	350.000 U
1,4-DICHLOROBENZENE	UG/KG	350.000 U
1,2-DICHLOROBENZENE	UG/KG	350.000 U
2-METHYL PHENOL	UG/KG	350.000 U
2,2'-OXYBIS(1-CHLOROPROPANE)	UG/KG	350.000 U
4-METHYL PHENOL	UG/KG	350.000 U
N-NITROSO-DI-N-PROPYLAMINE	UG/KG	350.000 U
HEXACHLOROETHANE	UG/KG	350.000 U
NITROBENZENE	UG/KG	350.000 U
ISOPHORONE	UG/KG	350.000 U
2-NITROPHENOL	UG/KG	350.000 U
2,4-DIMETHYL PHENOL	UG/KG	350.000 U
BIS(2-CHLOROETHOXY)METHANE	UG/KG	350.000 U
2,4-DICHLOROPHENOL	UG/KG	350.000 U
1,2,4-TRICHLOROBENZENE	UG/KG	350.000 U
NAPHTHALENE	UG/KG	350.000 U
4-CHLOROANILINE	UG/KG	350.000 U
HEXACHLOROBUTADIENE	UG/KG	350.000 U
4-CHLORO-3-METHYLPHENOL	UG/KG	350.000 U
2-METHYLNAPHTHALENE	UG/KG	350.000 U
HEXACHLOROCYCLOPENTADIENE	UG/KG	350.000 U
2,4,6-TRICHLOROPHENOL	UG/KG	350.000 U
2,4,5-TRICHLOROPHENOL	UG/KG	860.000 U
2-CHLORONAPHTHALENE	UG/KG	350.000 U
2-NITROANILINE	UG/KG	860.000 U
DIMETHYLPHTHALATE	UG/KG	350.000 U
ACENAPHTHYLENE	UG/KG	350.000 U
3-NITROANILINE	UG/KG	860.000 U
ACENAPHTHENE	UG/KG	350.000 U

Verified ~~by~~ 3-15-94

3-18-94 000080

1B SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B098Y7

Lab Name: TMA/ARLI Contract: WHC
Lab Code: TMALA Case No.: 10014 SAS No.: NA SDG No.: NA
Matrix: (soil/water) SOIL Lab Sample ID: A310014-01B
Sample wt/vol: 30.4 (g/mL) G Lab File ID: 31021I03
Level: (low/med) LOW Date Received: 10/11/93
% Moisture: 8 decanted: (Y/N) N Date Extracted: 10/13/93
Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 10/21/93
Injection Volume: 2.0(uL) Dilution Factor: 1.0
GPC Cleanup: (Y/N) Y pH: 9.6

9413225-0918

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

Table with 4 columns: CAS NO., COMPOUND, CONCENTRATION UNITS, and Q. Lists various organic compounds like Phenol, bis(2-Chloroethyl) Ether, etc., with their respective CAS numbers and detection results.

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Verified 3-15-94

* 3-18-94

000081
EPA SAMPLE NO.

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

B098Y7

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 10014 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A310014-01B

Sample wt/vol: 30.4 (g/mL) G Lab File ID: 31021I03

Level: (low/med) LOW Date Received: 10/11/93

% Moisture: 8 decanted: (Y/N) N Date Extracted: 10/13/93

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 10/21/93

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 9.6

9/13/25.0919

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	860	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	860	U
534-52-1	4,6-Dinitro-2-methylphenol	860	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	860	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

~~230~~ BJ

U
10/5/93

011

(1) - Cannot be separated from Diphenylamine

3-18-94 000082
EPA SAMPLE NO.

1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

B098Y7

Lab Name: TMA/ARLI Contract: WHC
 Lab Code: TMALA Case No.: 10014 SAS No.: NA SDG No.: NA
 Matrix: (soil/water) SOIL Lab Sample ID: A310014-01B
 Sample wt/vol: 30.4 (g/mL) G Lab File ID: 31021I03
 Level: (low/med) LOW Date Received: 10/11/93
 % Moisture: 8 decanted: (Y/N) N Date Extracted: 10/13/93
 Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 10/21/93
 Injection Volume: 2.0(uL) Dilution Factor: 1.0
 GPC Cleanup: (Y/N) Y pH: 9.6

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

9413225.0920

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q	
1.	UNKNOWN HYDROCARBON	5.33	140	BJ	UJ
2.	UNKNOWN HYDROCARBON	5.87	1800	BJ	UJ
3.	PROPANOIC ACID ESTER	16.25	320	J	UJ
4.	HEXANEDIOIC ACID ESTER	24.57	180	J	UJ
5.	UNKNOWN ALKANE	28.85	110	J	UJ

Verified
3-15-94
IN
3-18

Revised
4-20-94
-012
3/90

ATTACHMENT 4

LABORATORY NARRATIVE and CHAIN-OF-CUSTODY DOCUMENTATION

9443225.0921

Westinghouse
Hanford Company

CHAIN OF CUSTODY

~~000002A~~
~~3-18-94~~

Custody Form Initiator L E ROGERS

Company Contact L E ROGERS

Telephone 376-7690

Project Designation/Sampling Locations 200-UP-2

Collection Date 10-7-93

Ice Chest No. SMH-54B

Field Logbook No. EFL-1091

Bill of Lading/Airbill No. _____

Offsite Property No. _____

Method of Shipment OVERNIGHT AIR SERVICE

Shipped to TMA

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

Sample Identification

- 1) GER 10-7-93 BOB8Y7
- 1,250ml ~~P:CLP; TAL Metals, Hg, Ti~~
 - 1,250ml ~~aGs: VOA CLP~~
 - 1,250ml ~~aG: Semi-VOA CLP~~
 - 1,125ml ~~G: Anions F, Cl, SO4 (EPA 300.0)~~
 - 1,125ml ~~P/G: Anions NO2, NO3 (EPA 353.2)~~
 - 1,125ml ~~G: Cyanide CLP~~
 - 1,125ml ~~Gw: Kerosene (8015M)~~
 - 1,1000ml ~~P/G: Gross alpha/beta (EP-10), Gamma Spec to include, Cs-134, Cs-137, Co-60, Eu-152, Eu-154, Eu-155, K-40, Ru-106, Na-22 (RC-30), Total Uranium (EA-01C) U-235, U-234, U-238 (EP-70, EP-71, EP-5) Np-237, (RC-101A, RC-622, EP-5) Pu-238, Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241, Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79~~
- 2) 1,250ml aGs PCB/Rest
- 1,250ml ~~P:CLP; TAL Metals, Hg, Ti~~
 - 1,250ml ~~Gs: VOA CLP~~
 - 1,250ml ~~aG: Semi-VOA CLP~~
 - 1,125ml ~~G: Anions F, Cl, SO4 (EPA 300.0)~~
 - 1,125ml ~~P/G: Anions NO2, NO3 (EPA 353.2)~~
 - 1,125ml ~~G: Cyanide CLP~~
 - 1,125ml ~~Gw: Kerosene (8015M)~~
 - 1,1000ml ~~P/G: Gross alpha/beta (EP-10), Gamma Spec to include, Cs-134, Cs-137, Co-60, Eu-152, Eu-154, Eu-155, K-40, Ru-106, Na-22 (RC-30), Total Uranium (EA-01C) U-235, U-234, U-238 (EP-70, EP-71, EP-5) Np-237, (RC-101A, RC-622, EP-5) Pu-238, Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241, Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79~~
- 3) GER 10-7-93
- 1,250ml ~~P:CLP; TAL Metals, Hg, Ti~~
 - 1,250ml ~~Gs: VOA CLP~~
 - 1,250ml ~~aG: Semi-VOA CLP~~
 - 1,125ml ~~G: Anions F, Cl, SO4 (EPA 300.0)~~
 - 1,125ml ~~P/G: Anions NO2, NO3 (EPA 353.2)~~
 - 1,125ml ~~G: Cyanide CLP~~
 - 1,125ml ~~Gw: Kerosene (8015M)~~
 - 1,1000ml ~~P/G: Gross alpha/beta (EP-10), Gamma Spec to include, Cs-134, Cs-137, Co-60, Eu-152, Eu-154, Eu-155, K-40, Ru-106, Na-22 (RC-30), Total Uranium (EA-01C) U-235, U-234, U-238 (EP-70, EP-71, EP-5) Np-237, (RC-101A, RC-622, EP-5) Pu-238, Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241, Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79~~

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

Relinquished by: <u>10-8-93</u> <u>Steven E. Pappas 1122</u>	Received by: <u>JG HOGAN</u> <u>JG HOGAN</u>	Date/Time: <u>10-8-93 / 11:22</u>
Relinquished by: <u>JG HOGAN</u> <u>JG HOGAN 10-8-93 1135</u>	Received by: <u>H. NATZUSO</u> <u>JG HOGAN TMA/NORCAL</u>	Date/Time: <u>10-11-93 8:00</u>
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:

Rec'd SATURDAY
10-9-93 OPENED 10/11/93

3-18-94
~~000072~~

CASE NARRATIVE

LABORATORY : TMA/ARLI

CASE : 10-014

CONTRACT ID : WESTINGHOUSE HANFORD COMPANY

SDG RECEIPT DATE : October 11, 1993

1.0 DESCRIPTION OF CASE :

Two soil samples were analyzed for TCL Organics - Volatiles, Semivolatiles, and Pesticide/PCBs according to the USEPA Contract Laboratory Program (CLP) Statement of Work for Organic Analysis, Revision- OLM01.8. The Total Petroleum Hydrocarbons in the Kerosene range (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>
B098Y7	A3-10-014-01A	V	SOIL
B098Y7	A3-10-014-01B	SV	SOIL
B098Y7 MS	A3-10-014-01C	SV	SOIL
B098Y7 MSD	A3-10-014-01D	SV	SOIL
B098Y7	A3-10-014-01H	K	SOIL
B098Y7 MS	A3-10-014-01I	K	SOIL
B098Y7 MSD	A3-10-014-01J	K	SOIL
B098Y7	A3-10-014-01K	P	SOIL
B098Y7 MS	A3-10-014-01L	P	SOIL
B098Y7 MSD	A3-10-014-01M	P	SOIL
B098Y9	A3-10-014-02A	V	SOIL
B098Y9 MS	A3-10-014-02B	V	SOIL
B098Y9 MSD	A3-10-014-02C	V	SOIL

3.0 COMMENTS :

3.1 SHIPPING AND DOCUMENTATION :

All of the samples were received intact and properly documented.

On October 23, 1993, the Westinghouse Hanford Company cancelled the analysis of samples B098Y7 and B098Y9, despite the fact that the Volatile samples had already been analyzed, and the samples were extracted for Semivolatiles, Pesticides, and Extractable Hydrocarbons. On November 3, 1993, TMA/ARLI, in accordance with ROD-93-0241, reinitiated the analyses and reporting of the aforementioned samples.

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3.2 ANALYSIS

3.2.1 VOLATILE ANALYSIS COMMENTS :

LOW LEVEL SOIL :

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

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

TUNES :

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

3.2.2 SEMIVOLATILE ANALYSIS COMMENTS :

LOW LEVEL SOIL :

The samples were extracted and analyzed within the contract required holding times. No TCL analytes were detected in the samples.

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

3.2.3 PESTICIDE/PCB ANALYSIS COMMENTS :

SEQUENCE NOTES :

The sequence was started on 11/02/93 and was analyzed according to the USEPA CLP SOW. The sequence was analyzed by a single injection into a dual column system.

During the analysis sequence, the Autosampler malfunctioned, and after the injection of the PIBLKs and the PEMs, the sequence was continued. The %RSD for all of the analytes were within the QC limits on both of the GC columns, with the exception of alpha- and delta-BHC on the DB-608 column, which were slightly above 20% but less than the 30% limit.

Several Aroclor standards were injected throughout the sequence in order to confirm the presence of Aroclors in the samples. Although the retention times for some peaks exceeded their retention time window, the identification of each Aroclor was based primarily on the pattern recognition for each peak in the chromatogram.

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

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The chromatograms are presented in the manner consistent with the capabilities of the Nelson 2700 Turbochrome Data System which normalizes the largest peak to scale.

LOW LEVEL SOIL :

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

The TCX surrogate recoveries on the DB-608 column for samples B098Y7MS and B098Y7MSD were slightly below the advisory QC limits. However, the TCX recoveries on the DB-1701 column were higher for all of the samples in comparison to the DB-608 column, due to the interference peaks that coeluted with TCX on the DB-1701 column, therefore yielding higher recoveries. The %D between the two GC columns, for TCX in the spiked and unspiked samples, were greater than the 25% limit. The DCB recoveries on the two GC columns were comparable for all of the samples.

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

3.2.4 TOTAL PETROLEUM HYDROCARBONS "KEROSENE RANGE" COMMENTS :

SEQUENCE NOTES :

The sequence was started on 12/01/93, with the injection of a continuing calibration, and was analyzed according to the SW-846 Method 8015M. The instrument calibration was performed on 11/18/93 with the injection of 5 different levels of the Kerosene standard. The %RSD for the initial calibration, and the %D for the continuing calibration were all within their respective QC limits as specified by the SW-846 Method 8015M. respectively.

SAMPLE NOTES :

LOW LEVEL SOIL :

The samples were extracted within the SW-846 holding time. However, the sample extracts were analyzed 10 days outside of the holding time due to laboratory miscommunication. The laboratory has taken the appropriate steps to ensure that this will not happen again. No Kerosene was detected in the samples.

Sample B098Y7 was spiked with Kerosene. The matrix spike recovery in B098Y7MS was 61%, and 59% in sample B098Y7MSD. A blank spike, KLCS1014S, was prepared and analyzed at the same time, and had a 70% recovery.

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

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

Nicole Roth

Nicole Roth 12/14/93
CLP Program Manager

Maureen Parrish

Maureen Parrish 12/14/93
Program Manager

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ATTACHMENT 5
DATA VALIDATION SUPPORTING DOCUMENTATION

9473225-0927

GC/MS ORGANIC DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT:	200 UP-2		DATA PACKAGE: B098Y7-TMA-628		
VALIDATOR:	T. Stapp	LAB:	TMA	DATE:	3-14-94
CASE:	10-014		SDG:		
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	B098Y7, Soil				

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1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Is technical verification documentation present? . Note ① . . . Yes No N/A

Is a case narrative present? Yes No N/A

Comments: ① Performed by WHC.

2. HOLDING TIMES

Are sample holding times acceptable? Yes No N/A

Comments: See Holding Time Summary page B-1.

GC/MS ORGANIC DATA VALIDATION CHECKLIST

3. INSTRUMENT TUNING AND CALIBRATION

Is the GC/MS tuning/performance check acceptable? Yes No N/A

Are initial calibrations acceptable? Yes No N/A

Are continuing calibrations acceptable? Yes No N/A

Comments: _____

4. BLANKS

Were laboratory blanks analyzed? Yes No N/A

Are laboratory blank results acceptable? Note ① and ③ Yes No N/A

Were field/trip blanks analyzed? Note ② Yes No N/A

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

Comments: ① Lab blank TIC's are present. See Method blank Summary page for results affecting sample TIC's.

② Field blank GC samples have not been identified in this sample set, but have been requested. Field GC will be evaluated in the final data Summary.

5. ACCURACY ③ Distributor/manufacturer raised to CRGL and qualified U₁ since blank is less than CRGL-5

Were surrogates/System Monitoring Compounds analyzed? Yes No N/A

Are surrogate/System Monitoring Compound recoveries acceptable? Yes No N/A

Were MS/MSD samples analyzed? Yes No N/A

Are MS/MSD results acceptable? Yes No N/A

Comments: _____

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Handwritten notes and signatures on the right side of the page, including a date "3/24/11" and a signature.

GC/MS ORGANIC DATA VALIDATION CHECKLIST

6. PRECISION

Are MS/MSD RPD values acceptable? Yes No N/A
 Are field duplicate RPD values acceptable? . Note ① Yes No N/A
 Are field split RPD values acceptable? Yes No N/A

Comments: ① Field QC duplicates and splits are not identified in this sample set, but it has been requested. Field QC will be evaluated in the final data Summary.

7. SYSTEM PERFORMANCE

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

Comments: _____

8. COMPOUND IDENTIFICATION AND QUANTITATION

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

Comments: _____

9. REPORTED RESULTS AND QUANTITATION LIMITS

Are results reported for all requested analyses? Yes No N/A
 Are all results supported in the raw data? Yes No N/A
 Do results meet the CRQLs? Yes No N/A
 Has the laboratory properly identified and coded all TIC? Yes No N/A Note ①

Comments: ① The ~~unknown alkane~~ TICs have been qualified as presumptive and estimated according to WHC validation procedure.

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METHOD BLANK SUMMARY

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1F SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

SBLK1013S1

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 10014 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A310014-BLK

Sample wt/vol: 30.3 (g/mL) G Lab File ID: 31021I02

Level: (low/med) LOW Date Received: _____

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

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 10/21/93

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

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

Number TICs found: 4

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN HYDROCARBON	5.28	130	J
2.	UNKNOWN HYDROCARBON	5.83	1500	J
3.	HEXANEDIOIC ACID ESTER	24.53	99	J
4.	PROPANOIC ACID ESTER	16.22	260	J

All TIC's found ^{will} qualify associated sample B09847 TIC's as ~~non detected (u) when less than 5x the method blank amount.~~ as undetected, presumptive and valid. (U/N).

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4-20-94

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