AR TARGET SHEET

The following document was too large to scan as one unit, therefore it has been broken down into sections.

DOCUMENT # B01CC9-TMA-082

EDMC # 45611

SECTION 1 OF 2

START 9613501.1941

B01CC9-TMA-082 TMA

0045611

1082

WESTINGHOUSE HANFORD COMPANY

Results of Analyses For:

ORGANICS
Case No. 12-066 & 12-067
(TMA/ARLI Work Order # A2-12-066 & A1-12-067)

METALS
Case No. N1-12-130
(TMA/Skinner Work Order # 9112178)

TMA Master Work Order N112130

March 9, 1992

OCT 1996
RECEIVED
EDMC

MAR 1992
RECEIVED
DMO
OSM

ms
7/15/96

RECORD OF DISPOSITION

ROD-91-00024

DATE: 12/23/91

LABORATORY: TMA 300-FF-1

PROJ 91-16

SAMPLE IDENTIFICATION NUMBERS

B01CC9
B01CD1
B01CD0

DISPOSITION OF SAMPLES

NCR B06119

☐ CANCELLED (REASON)

☐ DAMAGED SAMPLE CONTAINER. ANALYSIS CANCELLED

☐ BROKEN GLASS CONTAMINATING SAMPLE. ANALYSIS CANCELLED

☒ OTHER See attached DSI · Dan Edwards to Delores Sanchez

APPROVED Nancy Leavitt 12/23/91
PROJECT COORDINATOR DATE

TECHNICAL REPRESENTATIVE 1/28/92
DATE

9112301.1392

9613501.1943

DON'T SAY IT --- WRITE IT!

DATE: December 20, 1991

TO: Delores Sanchez, TMA FROM: Dan Edwards, WHC

cc: Karl Pool
George Henckel

SUBJECT: TMA Non-Conformance Notification Form #8, Samples B01CC9 and B01CD1

The chain of custody for samples B01CC9 and B01CD1 stated one 500ml glass bottle would be sent for anions and pH analysis. When the samples arrived at TMA, two 250ml glass bottles were sent for anions and pH analysis. The bottles listed on the chain of custody did not match the bottles in the delivery group. The project coordinator would like to have TMA run the anions and pH analysis on the two 250ml bottles, the volume of sample supplied to TMA is the same.

The chain of custody for sample B01CD0 requested only VOA analysis. The sample delivery group for sample B01CD0 contained 2 bottles; one 40ml vial for VOA analysis and one 500ml bottle for anions-pH analysis. The chain of custody for sample B01CD1 requested anions and pH analysis, but there was no 500ml bottle in the delivery group for the analysis. In talking with the project coordinator, the 500ml sample bottle sent (B01CD0) was incorrectly identified. WHC project coordinator is directing TMA to use the bottle labeled B01CD0 for analysis of pH and anions and report the results under sample number B01CD1.

The samples B01CC9 and B01CD1 are equipment blanks for the 300-FF-1 project. The sampled material is a soil matrix, the equipment blanks provided for this delivery group are a water matrix. The matrix spike and spike duplicate are not required on the blanks; therefore, the 1000ml volume should be adequate for the analysis.

When the shipping coolers were opened at TMA, the ice had melted. The bags that were around the samples contained water. Inspection of the containers showed no sign of the sample bottles being broken. The project coordinator has requested that the samples be run.

Westinghouse Hanford Company

Hanford Operations and Engineering Contractor for the U.S. Department of Energy P.O. Box 1970 Richland, WA 99352

9213501944

NONCONFORMANCE REPORT

Page 1 of ____

B 06119

1. MFR/ORG: WHC
ITEM/MATERIAL NAME: ENVIRON. SAMPLES
PART NO.: N/A
DRAWING/SPEC. NO.:
REV.: N/A
PROGRAM/PROJECT: 300-FF-1
P.O./W.O. NO.: 91-016
UNUSUAL OCCURRENCE REPORT REQUIRED ☐ YES ☐ NO
SYSTEM/END USE:
DATE: 12/23/91

2. DESCRIPTION OF NONCONFORMANCE

1. Bottles on COC did not match bottles received which were B01CC9/B01CD1.
2. Bottle requirement stated 1 bottle for VOA analysis. Two bottles showed up with sample # B01CD0
3. Upon receipt at the lab, the ice had melted and the bags around samples contained water.

3. REQUIREMENT VIOLATED

DOCUMENT	REV	ZONE/PA

Chain of custody on samples

Volume Requirement as designated

Integrity of samples shipped

Nancy O Sigmund — ORIGINATOR
28600 — ORGANIZATION
12/23/ — DATE

4. ASME CODE ITEM(s) ☐ NO ☐ YES. NOTIFY AUTHORIZED INSPECTOR.

WHC QAR

5. CAUSE OF NONCONFORMANCE
☐ PROCEDURES ☒ PERSONNEL ☐ MATERIALS
☐ EQUIPMENT ☐ OTHERS
REMARKS:

SW-01 / PR-08 / PN-006 / P/S = D3

6. CORRECTIVE ACTION TO ELIMINATE CAUSE
Retrain samplers - OSM to provide samplers with correct information. Verify lab quantity required from OSM to samplers.
INITIATION DATE: SERIAL NO.:
RESPONSIBLE ORG. REP. TITLE DATE

7. RECOMMENDED DISPOSITION ☒ ACCEPT ☐ REJECT ☐ REPAIR ☐ REWORK ☐ OTHER

8A. DISPOSITION JUSTIFICATION AND INSTRUCTIONS – SEE ATTACHED DSI
1. Two sample bottles arrived at lab instead of 1. Same volume - run the analysis.
2. 500ml bottle received by lab was incorrectly labeled. Proceed with analysis and put results as B01CD1 & Flag data
3. Although ice was melted in bags around samples, the containers showed no sign of being broken. Proceed with analysis. & Flag data.

8B. SUPPLIER ENG. SUPPLIER QA

9. ADDITIONAL REVIEWS REQUIRED (WHC ONLY) ☐ YES ☐ NO
IF YES, IDENTIFY:

10. DISPOSITION APPROVAL (WHC ONLY)
☐ APPROVED ☐ DISAPPROVED
☐ OTHER (SEE CONTINUATION SHEET)
COGNIZANT ENGINEER — DATE 2/7/92
JR McCALLUM — COGNIZANT QA ENGINEER — DATE 2/7/92
AUTHORIZED INSPECTOR REVIEW — DATE

11. ADDITIONAL APPROVALS

NAME	TITLE	DATE	NAME	TITLE	DATE

12. DISPOSITION ACTION COMPLETE
JR McCallum 2/10/92 — NAME DATE
QTY. ACCEPT QTY. REJ.
FOLLOW ON NC

QA LOG NO. EGA-91-047

The issuance and acceptance of this request in no way limits or affects the warranty provisions of the order. This request shall not establish a precedent or obligation to accept similar conditions in the future.

FOLLOW-UP LEVEL

A-7310-104 (6 87)

U.S. GPO 1990-79

TMA Inc. REPORT

Work Order # A1-12-067

Received: 12/14/91

Results by Sample

SAMPLE ID B00N93 FRACTION 01A TEST CODE WCCLPS NAME Anions in Solids - WM232

Date & Time Collected 12/10/91 Category

ANIONS AND WET CHEMISTRY - SOLIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT
Fluoride	300	6.0	mg/Kg	1.0
Nitrite	300	<1.0	mg/Kg	1.0
Nitrate	300	8.1	mg/Kg	2.0
Sulfate	300	43	mg/Kg	10.0
pH	150.1	8.7	pH	1.0
Ammonia	350.3	35	mg/Kg	0.5

FORM I

Received: 12/14/91

Results by Sample

SAMPLE ID B00N96 FRACTION 02A TEST CODE WCCLPS NAME Anions in Solids - WN232

Date & Time Collected 12/10/91 Category

ANIONS AND WET CHEMISTRY - SOLIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT
Fluoride	300	9.2	mg/Kg	1.0
Nitrite	300	<1.0	mg/Kg	1.0
Nitrate	300	42.8	mg/Kg	2.0
Sulfate	300	1625	mg/Kg	10.0
pH	150.1	8.6	pH	1.0
Ammonia	350.3	24	mg/Kg	0.5

FORM I

Received: 12/14/91

Results by Sample

SAMPLE ID B00H97 FRACTION 03A TEST CODE WCCLPS NAME Anions in Solids - WH232

Date & Time Collected 12/10/91 Category

ANIONS AND WET CHEMISTRY - SOLIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT
Fluoride	300	5.8	mg/Kg	1.0
Nitrite	300	<1.0	mg/Kg	1.0
Nitrate	300	9.8	mg/Kg	2.0
Sulfate	300	49	mg/Kg	10.0
pH	150.1	8.1	pH	1.0
Ammonia	350.3	1.9	mg/Kg	0.5

FORM I

Received: 12/14/91 Results by Sample

SAMPLE ID B00N99 FRACTION 04A TEST CODE VCCLPS NAME Anions in Solids - VN232
Date & Time Collected 12/10/91 Category

ANIONS AND WET CHEMISTRY - SOLIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT
Fluoride	300	4.8	mg/Kg	1.0
Nitrite	300	<1.0	mg/Kg	1.0
Nitrate	300	48.4	mg/Kg	2.0
Sulfate	300	1660	mg/Kg	10.0
pH	150.1	8.0	pH	1.0
Ammonia	350.3	21	mg/Kg	0.5

FORM I

Received: 12/14/91

Results by Sample

SAMPLE ID B00HB7 FRACTION 05A TEST CODE WCCLPS NAME Anions in Solids - WR232

Date & Time Collected 12/10/91 Category

ANIONS AND WET CHEMISTRY - SOLIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT
Fluoride	300	35.4	mg/Kg	1.0
Nitrite	300	<1.0	mg/Kg	1.0
Nitrate	300	7.1	mg/Kg	2.0
Sulfate	300	33	mg/Kg	10.0
pH	150.1	7.6	pH	1.0
Ammonia	350.3	1.4	mg/Kg	0.5

FORM I

SAMPLE ID B00HB9 FRACTION 06A TEST CODE VCCLPS NAME Anions in Solids - VH232
Date & Time Collected 12/10/91 Category

ANIONS AND WET CHEMISTRY - SOLIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT
Fluoride	300	26.9	mg/Kg	1.0
Nitrite	300	<1.0	mg/Kg	1.0
Nitrate	300	6.4	mg/Kg	2.0
Sulfate	300	33	mg/Kg	10.0
pH	150.1	7.7	pH	1.0
Ammonia	350.3	1.5	mg/Kg	0.5

FORM I

SAMPLE ID B00HC1 FRACTION 07A TEST CODE WCCLPS NAME Anions in Solids - WM23
Date & Time Collected 12/10/91 Category

ANIONS AND WET CHEMISTRY - SOLIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT
Fluoride	300	23.4	mg/Kg	1.0
Nitrite	300	<1.0	mg/Kg	1.0
Nitrate	300	5.7	mg/Kg	2.0
Sulfate	300	43	mg/Kg	10.0
pH	150.1	8.4	pH	1.0
Ammonia	350.3	23.9	mg/Kg	0.5

FORM I

SAMPLE ID B00MC3 FRACTION 08A TEST CODE WCCLPS NAME Anions in Solids - WW232
Date & Time Collected 12/10/91 Category

ANIONS AND WET CHEMISTRY - SOLIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT
Fluoride	300	11.1	mg/Kg	1.0
Nitrite	300	<1.0	mg/Kg	1.0
Nitrate	300	4.7	mg/Kg	2.0
Sulfate	300	38	mg/Kg	10.0
pH	150.1	8.1	pH	1.0
Ammonia	350.3	1.9	mg/Kg	0.5

FORM I

Received: 12/14/91

Results by Sample

SAMPLE ID B00MB1 FRACTION 09A TEST CODE WCCLPS NAME Anions in Solids - WM232

Date & Time Collected 12/10/91 Category

ANIONS AND WET CHEMISTRY - SOLIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT
Fluoride	300	40.3	mg/Kg	1.0
Nitrite	300	<1.0	mg/Kg	1.0
Nitrate	300	124.6	mg/Kg	2.0
Sulfate	300	738	mg/Kg	10.0
pH	150.1	8.1	pH	1.0
Ammonia	350.3	44.0	mg/Kg	0.5

FORM I

Received: 12/14/91

Results by Sample

SAMPLE ID B00NB3 FRACTION 10A TEST CODE WCCLPS NAME Anions in Solids - WN232

Date & Time Collected 12/10/91 Category

ANIONS AND WET CHEMISTRY - SOLIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT
Fluoride	300	31.5	mg/Kg	0.5
Nitrite	300	<1.0	mg/Kg	0.5
Nitrate	300	25.4	mg/Kg	1.0
Sulfate	300	51	mg/Kg	3.0
pH	150.1	7.7	pH	1.0
Ammonia	350.3	7.5	mg/Kg	0.5

FORM I

SAMPLE ID B00RB5 FRACTION 11A TEST CODE VCCLPS NAME Anions in Solids - VM232
Date & Time Collected 12/10/91 Category

ANIONS AND WET CHEMISTRY - SOLIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT
Fluoride	300	33.2	mg/Kg	1.0
Nitrite	300	<1.0	mg/Kg	1.0
Nitrate	300	15.4	mg/Kg	2.0
Sulfate	300	80	mg/Kg	10.0
pH	150.1	8.5	pH	1.0
Ammonia	350.3	4.2	mg/Kg	0.5

FORM I

CASE NARRATIVE

LABORATORY : TMA/ARLI

CASE : 12-067

CONTRACT ID : WESTINGHOUSE HANFORD COMPANY

SDG RECEIPT DATE : December 14, 1991

1.0 DESCRIPTION OF CASE :

Eleven soil samples were analyzed for TCL Organics-Volatiles and Pesticide/PCBs according to the USEPA Contract Laboratory Program (CLP) Statement of Work for Organic Analysis, Revision 2/88.

2.0 SAMPLE LIST :

WESTINGHOUSE ID	LAB ID	ANALYSIS REQUESTED	MATRIX
B00H93	A1-12-067-01A	P	SOIL
B00H93 MS	A1-12-067-01D	P	SOIL
B00H93 MSD	A1-12-067-01E	P	SOIL
B00H93	A1-12-067-01F	V	SOIL
B00H93 MS	A1-12-067-01G	V	SOIL
B00H93 MSD	A1-12-067-01H	V	SOIL
B00H96	A1-12-067-02A	P	SOIL
B00H96	A1-12-067-02B	V	SOIL
B00H97	A1-12-067-03A	P	SOIL
B00H97	A1-12-067-03B	V	SOIL
B00H99	A1-12-067-04A	P	SOIL
B00H99	A1-12-067-04B	V	SOIL
B00HB7	A1-12-067-05A	P	SOIL
B00HB7	A1-12-067-05B	V	SOIL
B00HB9	A1-12-067-06A	P	SOIL
B00HB9	A1-12-067-06B	V	SOIL
B00HC1	A1-12-067-07A	P	SOIL
B00HC1	A1-12-067-07B	V	SOIL
B00HC3	A1-12-067-08A	P	SOIL
B00HC3	A1-12-067-08B	V	SOIL
B00HB1 DL (1:10)	A1-12-067-09A	P	SOIL
B00HB1	A1-12-067-09B	V	SOIL
B00HB3	A1-12-067-10A	P	SOIL
B00HB3	A1-12-067-10B	V	SOIL

WESTINGHOUSE ID	LAB ID	ANALYSIS REQUESTED	MATRIX
B00HB5	A1-12-067-11A	P	SOIL
B00HB5	A1-12-067-11B	V	SOIL
B00H93 DL	A1-12-067-01F	V	SOIL
B00H96 DL	A1-12-067-02B	V	SOIL
B00H97 DL	A1-12-067-03B	V	SOIL
B00H99 DL	A1-12-067-04B	V	SOIL
B00HB1 RE	A1-12-067-09B	V	SOIL
B00HB5 RE	A1-12-067-11B	V	SOIL
B00HB1 DL (1:100)	A1-12-067-09A	P	SOIL
B00HB3 DL	A1-12-067-10A	P	SOIL

3.0 COMMENTS :

3.1 SHIPPING AND DOCUMENTATION :

All samples were received unbroken and properly documented.

3.2 ANALYSIS :

3.2.1 VOLATILE ANALYSIS COMMENTS :

LOW LEVEL SOIL :

The samples were all analyzed by heated purge. The samples were originally analyzed within the CLP SOW holding times with the exception of samples B00HB1, B00HB3 and B00HB5. These sample analyses exceeded the holding time by no more than 3 hours. The method blank analyzed on 12/23/91, associated with the original analyses of all the samples, failed to meet the QC limit for Carbon Disulfide. Other TCL compounds were detected, but below the CRQL. The source of contamination may have been an unrinsed syringe or the position on the autosampler used for the blank analysis may have been used to analyze a high level standard for the ICAL.

Samples B00H93 and B00H96 were originally analyzed using 2.0 grams of soil due to the low density of the sample matrix. Normally five (5) grams of soil are used in the analysis, however, since the density of this matrix was much lower than a normal soil more volume per gram was occupied by the matrix. A smaller volume, hence, fewer grams of this sample matrix had to used, otherwise, the sample would not fit in the purge vessel.

The internal standard area counts for samples BOOH93,BOOH96,BOOH97 and BOOH99 were low causing the recovery of the Toluene-d8 surrogate to be quantitated too high. The samples were reanalyzed using only one (1) gram in order to minimize the matrix effect. The results,however, were still the same. The sample analyses have been reported using the suffix "DL".

We believe that the matrix is absorbing the internal standard compounds and preventing them from being purged preferentially to the Toluene-d8 surrogate. The analyst reported that the samples had a charcoal like appearance.

Analysis of samples BOOHB1 and BOOHB5 was similarly affected. Both samples were reanalyzed and the results reported with the suffix "RE".

All of the dilutions and reanalyses were run outside of holding times.

All of the QC results were within the limits specified in the EPA CLP SOW with the exceptions mentioned above.

TUNES :

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

3.2.2 PESTICIDE/PCB ANALYSIS COMMENTS :

SEQUENCE NOTES :

The sequence was started on 1/9/92 and was analyzed in accordance with the EPA CLP SOW. The following standards were used for quantitation:

IND A	04:29	1/10/92	(B10924)
IND B	14:32	1/10/92	(B10936)
IND A	22:40	1/10/92	(B10947)
IND B	23:25	1/10/92	(B10948)

Due to the limitations of the software used to report 2/88 CLP Protocol Pesticide/PCBs results, the instrument blanks cannot be reported. The instrument blanks were injected in the sequence to insure that the system was not contaminated by the high level Aroclors that were detected.
Instrument blanks were injected at:

06:42	1/10/92	(B10927 and A10927)
16:01	1/10/92	(B10938 and A10938)
16:45	1/10/92	(B10939 and A10939)
17:29	1/10/92	(B10940 and A10940)
18:13	1/10/92	(B10941 and A10941)
21:10	1/10/92	(B10945 and A10945)
21:55	1/10/92	(B10946 and A10946)

Several dilutions were performed in the sequence, in which the DBC surrogate was diluted out of the sample. Therefore, the DBC % difference could not be reported on the Form 8E.

SAMPLE NOTES :

LOW LEVEL SOIL:

The samples were extracted and analyzed within the CLP SOW holding time with the exception of samples B00HB1, B00HB3 and B00HB5. These samples were extracted one day outside of the CLP SOW holding time. Due to the high levels of Aroclors detected in samples B00HB1 and B00HB3, dilutions were performed and reported. Sample B00HB1 required two dilutions, a 1:100 and a 1:10. Both of the diluted samples are reported as B00HB1DL. Sample B00HB3DL and sample B00HB1DL, at a 1:100 dilution, did not have a surrogate recovery. It appears that the DBC was diluted out of the samples. Sample B00HB1DL, at a 1:10 dilution, has a DBC surrogate recovery above the advisory QC limit. The high quantitation appears to be due to the interference of the high level analytes detected.

The Aroclors detected in samples B00HB1, B00HB3 and B00HB5 could not be confirmed by GC/MS. The levels detected were below the GC/MS detection limit. The "X" qualifier denotes that the data was manually entered into the software program.

All of the QC results were within the limits specified in the EPA CLP SOW with those exceptions mentioned above.

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
CLP Program Manager

Dennis D. Wells
Technical Director

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B00H93

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12067 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A112067-01F

Sample wt/vol: 2.0 (g/mL) G Lab File ID: 1223K15

Level: (low/med) LOW Date Received: 12/14/91

% Moisture: not dec. 5 Date Analyzed: 12/23/91

Column: (pack/cap) PACK Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
74-87-3	Chloromethane	26	U
74-83-9	Bromomethane	26	U
75-01-4	Vinyl Chloride	26	U
75-00-3	Chloroethane	26	U
75-09-2	Methylene Chloride	110	B
67-64-1	Acetone	92	B
75-15-0	Carbon Disulfide	36	B
75-35-4	1,1-Dichloroethene	13	U
75-34-3	1,1-Dichloroethane	13	U
540-59-0	1,2-Dichloroethene (total)	13	U
67-66-3	Chloroform	7	BJ
107-06-2	1,2-Dichloroethane	13	U
78-93-3	2-Butanone	26	U
71-55-6	1,1,1-Trichloroethane	13	U
56-23-5	Carbon Tetrachloride	13	U
108-05-4	Vinyl Acetate	26	U
75-27-4	Bromodichloromethane	13	U
78-87-5	1,2-Dichloropropane	13	U
10061-01-5	cis-1,3-Dichloropropene	13	U
79-01-6	Trichloroethene	13	U
124-48-1	Dibromochloromethane	13	U
79-00-5	1,1,2-Trichloroethane	13	U
71-43-2	Benzene	13	U
10061-02-6	trans-1,3-Dichloropropene	13	U
75-25-2	Bromoform	13	U
108-10-1	4-Methyl-2-Pentanone	26	U
591-78-6	2-Hexanone	26	U
127-18-4	Tetrachloroethene	13	U
79-34-5	1,1,2,2-Tetrachloroethane	13	U
108-88-3	Toluene	29	B
108-90-7	Chlorobenzene	13	U
100-41-4	Ethylbenzene	13	U
100-42-5	Styrene	13	U
1330-20-7	Xylene (Total)	13	U

9613501.1962

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1E

EPA SAMPLE NO.

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

B00H93

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12067 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A112067-01F

Sample wt/vol: 2.0 (g/mL) G Lab File ID: 1223K15

Level: (low/med) LOW Date Received: 12/14/91

% Moisture: not dec. 5 Date Analyzed: 12/23/91

Column (pack/cap) PACK Dilution Factor: 1.0

Number TICs found: 0

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

9613501.1963

0011

EPA SAMPLE NO

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

B00H96

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12067 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A112067-02B

Sample wt/vol: 2.0 (g/mL) G Lab File ID: 1223K18

Level: (low/med) LOW Date Received: 12/14/91

% Moisture: not dec. 25 Date Analyzed: 12/23/91

Column: (pack/cap) PACK Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
74-87-3	Chloromethane	33	U
74-83-9	Bromomethane	33	U
75-01-4	Vinyl Chloride	33	U
75-00-3	Chloroethane	33	U
75-09-2	Methylene Chloride	130	B
67-64-1	Acetone	150	B
75-15-0	Carbon Disulfide	46	B
75-35-4	1,1-Dichloroethene	17	U
75-34-3	1,1-Dichloroethane	17	U
540-59-0	1,2-Dichloroethene (total)	17	U
67-66-3	Chloroform	6	BJ
107-06-2	1,2-Dichloroethane	17	U
78-93-3	2-Butanone	33	U
71-55-6	1,1,1-Trichloroethane	17	U
56-23-5	Carbon Tetrachloride	17	U
108-05-4	Vinyl Acetate	33	U
75-27-4	Bromodichloromethane	17	U
78-87-5	1,2-Dichloropropane	17	U
10061-01-5	cis-1,3-Dichloropropene	17	U
79-01-6	Trichloroethene	17	U
124-48-1	Dibromochloromethane	17	U
79-00-5	1,1,2-Trichloroethane	17	U
71-43-2	Benzene	17	U
10061-02-6	trans-1,3-Dichloropropene	17	U
75-25-2	Bromoform	17	U
108-10-1	4-Methyl-2-Pentanone	33	U
591-78-6	2-Hexanone	33	U
127-18-4	Tetrachloroethene	17	U
79-34-5	1,1,2,2-Tetrachloroethane	17	U
108-88-3	Toluene	27	B
108-90-7	Chlorobenzene	17	U
100-41-4	Ethylbenzene	17	U
100-42-5	Styrene	17	U
1330-20-7	Xylene (Total)	17	U

1E

EPA SAMPLE N

B00H96

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12067 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A112067-02B

Sample wt/vol: 2.0 (g/mL) G Lab File ID: 1223K18

Level: (low/med) LOW Date Received: 12/14/91

% Moisture: not dec. 25 Date Analyzed: 12/23/91

Column (pack/cap) PACK Dilution Factor: 1.0

Number TICs found: 0

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

9613501.1965

0015

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B00H97

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12067 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A112067-03B

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 1223K19

Level: (low/med) LOW Date Received: 12/14/91

% Moisture: not dec. 7 Date Analyzed: 12/23/91

Column: (pack/cap) PACK Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
74-87-3	Chloromethane	11	U
74-83-9	Bromomethane	11	U
75-01-4	Vinyl Chloride	11	U
75-00-3	Chloroethane	11	U
75-09-2	Methylene Chloride	37	B
67-64-1	Acetone	33	B
75-15-0	Carbon Disulfide	13	B
75-35-4	1,1-Dichloroethene	5	U
75-34-3	1,1-Dichloroethane	5	U
540-59-0	1,2-Dichloroethene (total)	5	U
67-66-3	Chloroform	2	BJ
107-06-2	1,2-Dichloroethane	5	U
78-93-3	2-Butanone	11	U
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
108-05-4	Vinyl Acetate	11	U
75-27-4	Bromodichloromethane	5	U
78-87-5	1,2-Dichloropropane	5	U
10061-01-5	cis-1,3-Dichloropropene	5	U
79-01-6	Trichloroethene	5	U
124-48-1	Dibromochloromethane	5	U
79-00-5	1,1,2-Trichloroethane	5	U
71-43-2	Benzene	5	U
10061-02-6	trans-1,3-Dichloropropene	5	U
75-25-2	Bromoform	5	U
108-10-1	4-Methyl-2-Pentanone	11	U
591-78-6	2-Hexanone	11	U
127-18-4	Tetrachloroethene	5	U
79-34-5	1,1,2,2-Tetrachloroethane	5	U
108-88-3	Toluene	5	U
108-90-7	Chlorobenzene	5	U
100-41-4	Ethylbenzene	5	U
100-42-5	Styrene	5	U
1330-20-7	Xylene (Total)	5	U

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO

B00H97

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12067 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A112067-03B

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 1223K19

Level: (low/med) LOW Date Received: 12/14/91

% Moisture: not dec. 7 Date Analyzed: 12/23/91

Column (pack/cap) PACK Dilution Factor: 1.0

Number TICs found: 0

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B00H99

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12067 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A112067-04B

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 1223K20

Level: (low/med) LOW Date Received: 12/14/91

% Moisture: not dec. 7 Date Analyzed: 12/23/91

Column: (pack/cap) PACK Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
74-87-3	Chloromethane	11	U
74-83-9	Bromomethane	11	U
75-01-4	Vinyl Chloride	11	U
75-00-3	Chloroethane	11	U
75-09-2	Methylene Chloride	44	B
67-64-1	Acetone	110	B
75-15-0	Carbon Disulfide	19	B
75-35-4	1,1-Dichloroethene	5	U
75-34-3	1,1-Dichloroethane	5	U
540-59-0	1,2-Dichloroethene (total)	5	U
67-66-3	Chloroform	3	BJ
107-06-2	1,2-Dichloroethane	5	U
78-93-3	2-Butanone	11	U
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
108-05-4	Vinyl Acetate	11	U
75-27-4	Bromodichloromethane	5	U
78-87-5	1,2-Dichloropropane	5	U
10061-01-5	cis-1,3-Dichloropropene	5	U
79-01-6	Trichloroethene	5	BJ
124-48-1	Dibromochloromethane	5	U
79-00-5	1,1,2-Trichloroethane	5	U
71-43-2	Benzene	5	U
10061-02-6	trans-1,3-Dichloropropene	5	U
75-25-2	Bromoform	5	U
108-10-1	4-Methyl-2-Pentanone	11	U
591-78-6	2-Hexanone	11	U
127-18-4	Tetrachloroethene	5	U
79-34-5	1,1,2,2-Tetrachloroethane	5	U
108-88-3	Toluene	5	BJ
108-90-7	Chlorobenzene	5	U
100-41-4	Ethylbenzene	5	U
100-42-5	Styrene	5	U
1330-20-7	Xylene (Total)	5	U

1E

EPA SAMPLE NO.

B00H99

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12067 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A112067-04B

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 1223K20

Level: (low/med) LOW Date Received: 12/14/91

% Moisture: not dec. 7 Date Analyzed: 12/23/91

Column (pack/cap) PACK Dilution Factor: 1.0

Number TICs found: 0

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

9613501.1969

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE N

B00HB1

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12067 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A112067-09B

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 1223K25

Level: (low/med) LOW Date Received: 12/13/91

% Moisture: not dec. 22 Date Analyzed: 12/24/91

Column: (pack/cap) PACK Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
74-87-3	Chloromethane	13	U
74-83-9	Bromomethane	13	U
75-01-4	Vinyl Chloride	13	U
75-00-3	Chloroethane	13	U
75-09-2	Methylene Chloride	77	B
67-64-1	Acetone	240	B
75-15-0	Carbon Disulfide	42	B
75-35-4	1,1-Dichloroethene	6	U
75-34-3	1,1-Dichloroethane	6	U
540-59-0	1,2-Dichloroethene (total)	6	U
67-66-3	Chloroform	3	BJ
107-06-2	1,2-Dichloroethane	6	U
78-93-3	2-Butanone	13	U
71-55-6	1,1,1-Trichloroethane	6	U
56-23-5	Carbon Tetrachloride	6	U
108-05-4	Vinyl Acetate	13	U
75-27-4	Bromodichloromethane	6	U
78-87-5	1,2-Dichloropropane	6	U
10061-01-5	cis-1,3-Dichloropropene	6	U
79-01-6	Trichloroethene	8	B
124-48-1	Dibromochloromethane	6	U
79-00-5	1,1,2-Trichloroethane	6	U
71-43-2	Benzene	6	U
10061-02-6	trans-1,3-Dichloropropene	6	U
75-25-2	Bromoform	6	U
108-10-1	4-Methyl-2-Pentanone	13	U
591-78-6	2-Hexanone	13	U
127-18-4	Tetrachloroethene	6	U
79-34-5	1,1,2,2-Tetrachloroethane	6	U
108-88-3	Toluene	18	B
108-90-7	Chlorobenzene	6	U
100-41-4	Ethylbenzene	6	U
100-42-5	Styrene	6	U
1330-20-7	Xylene (Total)	6	U

EPA SAMPLE NO

B00HB1

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12067 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A112067-09B

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 1223K25

Level: (low/med) LOW Date Received: 12/13/91

% Moisture: not dec. 22 Date Analyzed: 12/24/91

Column (pack/cap) PACK Dilution Factor: 1.0

Number TICs found: 1

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN ALCOHOL	13.92	15	J

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO

B00HB3

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12067 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A112067-10B

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 1223K26

Level: (low/med) LOW Date Received: 12/13/91

% Moisture: not dec. 7 Date Analyzed: 12/24/91

Column: (pack/cap) PACK Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
74-87-3	Chloromethane	11	U
74-83-9	Bromomethane	11	U
75-01-4	Vinyl Chloride	11	U
75-00-3	Chloroethane	11	U
75-09-2	Methylene Chloride	30	B
67-64-1	Acetone	140	B
75-15-0	Carbon Disulfide	13	B
75-35-4	1,1-Dichloroethene	5	U
75-34-3	1,1-Dichloroethane	5	U
540-59-0	1,2-Dichloroethene (total)	5	U
67-66-3	Chloroform	1	BJ
107-06-2	1,2-Dichloroethane	5	U
78-93-3	2-Butanone	11	U
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
108-05-4	Vinyl Acetate	11	U
75-27-4	Bromodichloromethane	5	U
78-87-5	1,2-Dichloropropane	5	U
10061-01-5	cis-1,3-Dichloropropene	5	U
79-01-6	Trichloroethene	5	U
124-48-1	Dibromochloromethane	5	U
79-00-5	1,1,2-Trichloroethane	5	U
71-43-2	Benzene	5	U
10061-02-6	trans-1,3-Dichloropropene	5	U
75-25-2	Bromoform	5	U
108-10-1	4-Methyl-2-Pentanone	11	U
591-78-6	2-Hexanone	11	U
127-18-4	Tetrachloroethene	5	U
79-34-5	1,1,2,2-Tetrachloroethane	5	U
108-88-3	Toluene	5	U
108-90-7	Chlorobenzene	5	U
100-41-4	Ethylbenzene	5	U
100-42-5	Styrene	5	U
1330-20-7	Xylene (Total)	5	U

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO

B00HB3

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12067 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A112067-10B

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 1223K26

Level: (low/med) LOW Date Received: 12/13/91

% Moisture: not dec. 7 Date Analyzed: 12/24/91

Column (pack/cap) PACK Dilution Factor: 1.0

Number TICs found: 0

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B00HB5

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12067 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A112067-11B

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 1223K27

Level: (low/med) LOW Date Received: 12/13/91

% Moisture: not dec. 6 Date Analyzed: 12/24/91

Column: (pack/cap) PACK Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
74-87-3	Chloromethane	11	U
74-83-9	Bromomethane	11	U
75-01-4	Vinyl Chloride	11	U
75-00-3	Chloroethane	11	U
75-09-2	Methylene Chloride	29	B
67-64-1	Acetone	110	B
75-15-0	Carbon Disulfide	14	B
75-35-4	1,1-Dichloroethene	5	U
75-34-3	1,1-Dichloroethane	5	U
540-59-0	1,2-Dichloroethene (total)	5	U
67-66-3	Chloroform	5	U
107-06-2	1,2-Dichloroethane	5	U
78-93-3	2-Butanone	11	U
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
108-05-4	Vinyl Acetate	11	U
75-27-4	Bromodichloromethane	5	U
78-87-5	1,2-Dichloropropane	5	U
10061-01-5	cis-1,3-Dichloropropene	5	U
79-01-6	Trichloroethene	5	U
124-48-1	Dibromochloromethane	5	U
79-00-5	1,1,2-Trichloroethane	5	U
71-43-2	Benzene	5	U
10061-02-6	trans-1,3-Dichloropropene	5	U
75-25-2	Bromoform	5	U
108-10-1	4-Methyl-2-Pentanone	3	BJ
591-78-6	2-Hexanone	11	U
127-18-4	Tetrachloroethene	5	U
79-34-5	1,1,2,2-Tetrachloroethane	5	U
108-88-3	Toluene	5	BJ
108-90-7	Chlorobenzene	5	U
100-41-4	Ethylbenzene	5	U
100-42-5	Styrene	5	U
1330-20-7	Xylene (Total)	5	U

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO

B00HB5

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12067 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A112067-11B

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 1223K27

Level: (low/med) LOW Date Received: 12/13/91

% Moisture: not dec. 6 Date Analyzed: 12/24/91

Column (pack/cap) PACK Dilution Factor: 1.0

Number TICs found: 0

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO

B00HB7

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12067 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A112067-05B

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 1223K21

Level: (low/med) LOW Date Received: 12/14/91

% Moisture: not dec. 7 Date Analyzed: 12/23/91

Column: (pack/cap) PACK Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
74-87-3	Chloromethane	11	U
74-83-9	Bromomethane	11	U
75-01-4	Vinyl Chloride	11	U
75-00-3	Chloroethane	11	U
75-09-2	Methylene Chloride	30	B
67-64-1	Acetone	72	B
75-15-0	Carbon Disulfide	13	B
75-35-4	1,1-Dichloroethene	5	U
75-34-3	1,1-Dichloroethane	5	U
540-59-0	1,2-Dichloroethene (total)	5	U
67-66-3	Chloroform	5	U
107-06-2	1,2-Dichloroethane	5	U
78-93-3	2-Butanone	11	U
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
108-05-4	Vinyl Acetate	11	U
75-27-4	Bromodichloromethane	5	U
78-87-5	1,2-Dichloropropane	5	U
10061-01-5	cis-1,3-Dichloropropene	5	U
79-01-6	Trichloroethene	5	U
124-48-1	Dibromochloromethane	5	U
79-00-5	1,1,2-Trichloroethane	5	U
71-43-2	Benzene	5	U
10061-02-6	trans-1,3-Dichloropropene	5	U
75-25-2	Bromoform	5	U
108-10-1	4-Methyl-2-Pentanone	11	U
591-78-6	2-Hexanone	11	U
127-18-4	Tetrachloroethene	5	U
79-34-5	1,1,2,2-Tetrachloroethane	5	U
108-88-3	Toluene	5	U
108-90-7	Chlorobenzene	5	U
100-41-4	Ethylbenzene	5	U
100-42-5	Styrene	5	U
1330-20-7	Xylene (Total)	5	U

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B00HB7

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12067 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A112067-05B

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 1223K21

Level: (low/med) LOW Date Received: 12/14/91

% Moisture: not dec. 7 Date Analyzed: 12/23/91

Column (pack/cap) PACK Dilution Factor: 1.0

Number TICs found: 0

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

9613501.1977

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE N

B00HB9

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12067 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A112067-06B

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 1223K22

Level: (low/med) LOW Date Received: 12/14/91

% Moisture: not dec. 10 Date Analyzed: 12/23/91

Column: (pack/cap) PACK Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
74-87-3	Chloromethane	11	U
74-83-9	Bromomethane	11	U
75-01-4	Vinyl Chloride	11	U
75-00-3	Chloroethane	11	U
75-09-2	Methylene Chloride	31	B
67-64-1	Acetone	130	B
75-15-0	Carbon Disulfide	13	B
75-35-4	1,1-Dichloroethene	6	U
75-34-3	1,1-Dichloroethane	6	U
540-59-0	1,2-Dichloroethene (total)	6	U
67-66-3	Chloroform	1	BJ
107-06-2	1,2-Dichloroethane	6	U
78-93-3	2-Butanone	11	U
71-55-6	1,1,1-Trichloroethane	6	U
56-23-5	Carbon Tetrachloride	6	U
108-05-4	Vinyl Acetate	11	U
75-27-4	Bromodichloromethane	6	U
78-87-5	1,2-Dichloropropane	6	U
10061-01-5	cis-1,3-Dichloropropene	6	U
79-01-6	Trichloroethene	6	U
124-48-1	Dibromochloromethane	6	U
79-00-5	1,1,2-Trichloroethane	6	U
71-43-2	Benzene	6	U
10061-02-6	trans-1,3-Dichloropropene	6	U
75-25-2	Bromoform	6	U
108-10-1	4-Methyl-2-Pentanone	11	U
591-78-6	2-Hexanone	11	U
127-18-4	Tetrachloroethene	6	U
79-34-5	1,1,2,2-Tetrachloroethane	6	U
108-88-3	Toluene	6	U
108-90-7	Chlorobenzene	6	U
100-41-4	Ethylbenzene	6	U
100-42-5	Styrene	6	U
1330-20-7	Xylene (Total)	6	U

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B00HB9

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12067 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A112067-06B

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 1223K22

Level: (low/med) LOW Date Received: 12/14/91

% Moisture: not dec. 10 Date Analyzed: 12/23/91

Column (pack/cap) PACK Dilution Factor: 1.0

Number TICs found: 2

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN ALCOHOL	7.00	8.9	J
2.	UNKNOWN ALCOHOL	13.87	6.7	J

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B00HC1

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12067 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A112067-07B

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 1223K23

Level: (low/med) LOW Date Received: 12/14/91

% Moisture: not dec. 14 Date Analyzed: 12/24/91

Column: (pack/cap) PACK Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
74-87-3	Chloromethane	12	U
74-83-9	Bromomethane	12	U
75-01-4	Vinyl Chloride	12	U
75-00-3	Chloroethane	12	U
75-09-2	Methylene Chloride	33	B
67-64-1	Acetone	160	B
75-15-0	Carbon Disulfide	15	B
75-35-4	1,1-Dichloroethene	6	U
75-34-3	1,1-Dichloroethane	6	U
540-59-0	1,2-Dichloroethene (total)	6	U
67-66-3	Chloroform	1	BJ
107-06-2	1,2-Dichloroethane	6	U
78-93-3	2-Butanone	12	U
71-55-6	1,1,1-Trichloroethane	6	U
56-23-5	Carbon Tetrachloride	6	U
108-05-4	Vinyl Acetate	12	U
75-27-4	Bromodichloromethane	6	U
78-87-5	1,2-Dichloropropane	6	U
10061-01-5	cis-1,3-Dichloropropene	6	U
79-01-6	Trichloroethene	6	U
124-48-1	Dibromochloromethane	6	U
79-00-5	1,1,2-Trichloroethane	6	U
71-43-2	Benzene	6	U
10061-02-6	trans-1,3-Dichloropropene	6	U
75-25-2	Bromoform	6	U
108-10-1	4-Methyl-2-Pentanone	5	BJ
591-78-6	2-Hexanone	12	U
127-18-4	Tetrachloroethene	2	BJ
79-34-5	1,1,2,2-Tetrachloroethane	6	U
108-88-3	Toluene	6	U
108-90-7	Chlorobenzene	6	U
100-41-4	Ethylbenzene	6	U
100-42-5	Styrene	6	U
1330-20-7	Xylene (Total)	6	U

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B00HC1

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12067 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A112067-07B

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 1223K23

Level: (low/med) LOW Date Received: 12/14/91

% Moisture: not dec. 14 Date Analyzed: 12/24/91

Column (pack/cap) PACK Dilution Factor: 1.0

Number TICs found: 2

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN ALCOHOL	6.97	15	J
2.	UNKNOWN ALCOHOL	13.84	43	J

9613501.1981

0039

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B00HC3

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12067 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A112067-08B

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 1223K24

Level: (low/med) LOW Date Received: 12/14/91

% Moisture: not dec. 29 Date Analyzed: 12/24/91

Column: (pack/cap) PACK Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
74-87-3	Chloromethane	14	U
74-83-9	Bromomethane	14	U
75-01-4	Vinyl Chloride	14	U
75-00-3	Chloroethane	14	U
75-09-2	Methylene Chloride	41	B
67-64-1	Acetone	180	B
75-15-0	Carbon Disulfide	18	B
75-35-4	1,1-Dichloroethene	7	U
75-34-3	1,1-Dichloroethane	7	U
540-59-0	1,2-Dichloroethene (total)	7	U
67-66-3	Chloroform	7	BJ
107-06-2	1,2-Dichloroethane	7	U
78-93-3	2-Butanone	14	U
71-55-6	1,1,1-Trichloroethane	7	U
56-23-5	Carbon Tetrachloride	7	U
108-05-4	Vinyl Acetate	14	U
75-27-4	Bromodichloromethane	7	U
78-87-5	1,2-Dichloropropane	7	U
10061-01-5	cis-1,3-Dichloropropene	7	U
79-01-6	Trichloroethene	7	U
124-48-1	Dibromochloromethane	7	U
79-00-5	1,1,2-Trichloroethane	7	U
71-43-2	Benzene	7	U
10061-02-6	trans-1,3-Dichloropropene	7	U
75-25-2	Bromoform	7	U
108-10-1	4-Methyl-2-Pentanone	5	BJ
591-78-6	2-Hexanone	14	U
127-18-4	Tetrachloroethene	3	BJ
79-34-5	1,1,2,2-Tetrachloroethane	7	U
108-88-3	Toluene	7	U
108-90-7	Chlorobenzene	7	U
100-41-4	Ethylbenzene	7	U
100-42-5	Styrene	7	U
1330-20-7	Xylene (Total)	7	U

9613501.1982

0040

EPA SAMPLE NO.

B00HC3

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12067 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A112067-08B

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 1223K24

Level: (low/med) LOW Date Received: 12/14/91

% Moisture: not dec. 29 Date Analyzed: 12/24/91

Column (pack/cap) PACK Dilution Factor: 1.0

Number TICs found: 2

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN ALCOHOL	6.97	9.9	J
2.	UNKNOWN ALCOHOL	13.87	15	J

9613501.1983

1D

0041

EPA SAMPLE NO.

PESTICIDE ORGANICS ANALYSIS DATA SHEET

B00H93

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12067 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A112067-01A

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

Level: (low/med) LOW Date Received: 12/14/91

% Moisture: not dec. 5 dec. __ Date Extracted: 12/24/92

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 01/09/92

GPC Cleanup: (Y/N) N pH: 8.7 Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
319-84-6	alpha-BHC	8.4	U
319-85-7	beta-BHC	8.4	U
319-86-8	delta-BHC	8.4	U
58-89-9	gamma-BHC (Lindane)	8.4	U
76-44-8	Heptachlor	8.4	U
309-00-2	Aldrin	8.4	U
1024-57-3	Heptachlor epoxide	8.4	U
959-98-8	Endosulfan I	8.4	U
60-57-1	Dieldrin	17	U
72-55-9	4,4'-DDE	17	U
72-20-8	Endrin	17	U
33213-65-9	Endosulfan II	17	U
72-54-8	4,4'-DDD	17	U
1031-07-8	Endosulfan sulfate	17	U
50-29-3	4,4'-DDT	17	U
72-43-5	Methoxychlor	84	U
53494-70-5	Endrin ketone	17	U
5103-71-9	alpha-Chlordane	84	U
5103-74-2	gamma-Chlordane	84	U
8001-35-2	Toxaphene	170	U
12674-11-2	Aroclor-1016	84	U
11104-28-2	Aroclor-1221	84	U
11141-16-5	Aroclor-1232	84	U
53469-21-9	Aroclor-1242	84	U
12672-29-6	Aroclor-1248	84	U
11097-69-1	Aroclor-1254	170	U
11096-82-5	Aroclor-1260	170	U

9613501.1984

1D

PESTICIDE ORGANICS ANALYSIS DATA SHEET

0042
EPA SAMPLE NO.

B00H96

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12067 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A112067-02A

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

Level: (low/med) LOW Date Received: 12/14/91

% Moisture: not dec. 25 dec. __ Date Extracted: 12/24/92

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 01/09/92

GPC Cleanup: (Y/N) N pH: 8.6 Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
319-84-6	alpha-BHC	11	U
319-85-7	beta-BHC	11	U
319-86-8	delta-BHC	11	U
58-89-9	gamma-BHC (Lindane)	11	U
76-44-8	Heptachlor	11	U
309-00-2	Aldrin	11	U
1024-57-3	Heptachlor epoxide	11	U
959-98-8	Endosulfan I	11	U
60-57-1	Dieldrin	21	U
72-55-9	4,4'-DDE	21	U
72-20-8	Endrin	21	U
33213-65-9	Endosulfan II	21	U
72-54-8	4,4'-DDD	21	U
1031-07-8	Endosulfan sulfate	21	U
50-29-3	4,4'-DDT	21	U
72-43-5	Methoxychlor	110	U
53494-70-5	Endrin ketone	21	U
5103-71-9	alpha-Chlordane	110	U
5103-74-2	gamma-Chlordane	110	U
8001-35-2	Toxaphene	210	U
12674-11-2	Aroclor-1016	110	U
11104-28-2	Aroclor-1221	110	U
11141-16-5	Aroclor-1232	110	U
53469-21-9	Aroclor-1242	110	U
12672-29-6	Aroclor-1248	110	U
11097-69-1	Aroclor-1254	210	U
11096-82-5	Aroclor-1260	210	U

9613501.1985

1D

PESTICIDE ORGANICS ANALYSIS DATA SHEET

0043

EPA SAMPLE NO.

B00H97

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12067 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A112067-03A

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

Level: (low/med) LOW Date Received: 12/14/91

% Moisture: not dec. 7 dec. __ Date Extracted: 12/24/92

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 01/10/92

GPC Cleanup: (Y/N) N pH: 8.1 Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
319-84-6	alpha-BHC	8.6	U
319-85-7	beta-BHC	8.6	U
319-86-8	delta-BHC	8.6	U
58-89-9	gamma-BHC (Lindane)	8.6	U
76-44-8	Heptachlor	8.6	U
309-00-2	Aldrin	8.6	U
1024-57-3	Heptachlor epoxide	8.6	U
959-98-8	Endosulfan I	8.6	U
60-57-1	Dieldrin	17	U
72-55-9	4,4'-DDE	17	U
72-20-8	Endrin	17	U
33213-65-9	Endosulfan II	17	U
72-54-8	4,4'-DDD	17	U
1031-07-8	Endosulfan sulfate	17	U
50-29-3	4,4'-DDT	17	U
72-43-5	Methoxychlor	86	U
53494-70-5	Endrin ketone	17	U
5103-71-9	alpha-Chlordane	86	U
5103-74-2	gamma-Chlordane	86	U
8001-35-2	Toxaphene	170	U
12674-11-2	Aroclor-1016	86	U
11104-28-2	Aroclor-1221	86	U
11141-16-5	Aroclor-1232	86	U
53469-21-9	Aroclor-1242	86	U
12672-29-6	Aroclor-1248	86	U
11097-69-1	Aroclor-1254	170	U
11096-82-5	Aroclor-1260	170	U

9613501.1986

1D

PESTICIDE ORGANICS ANALYSIS DATA SHEET

0044

EPA SAMPLE NO.

B00H99

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12067 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A112067-04A

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

Level: (low/med) LOW Date Received: 12/14/91

% Moisture: not dec. 7 dec. __ Date Extracted: 12/24/92

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 01/10/92

GPC Cleanup: (Y/N) N pH: 8.0 Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
319-84-6	alpha-BHC	8.6	U
319-85-7	beta-BHC	8.6	U
319-86-8	delta-BHC	8.6	U
58-89-9	gamma-BHC (Lindane)	8.6	U
76-44-8	Heptachlor	8.6	U
309-00-2	Aldrin	8.6	U
1024-57-3	Heptachlor epoxide	8.6	U
959-98-8	Endosulfan I	8.6	U
60-57-1	Dieldrin	17	U
72-55-9	4,4'-DDE	17	U
72-20-8	Endrin	17	U
33213-65-9	Endosulfan II	17	U
72-54-8	4,4'-DDD	17	U
1031-07-8	Endosulfan sulfate	17	U
50-29-3	4,4'-DDT	17	U
72-43-5	Methoxychlor	86	U
53494-70-5	Endrin ketone	17	U
5103-71-9	alpha-Chlordane	86	U
5103-74-2	gamma-Chlordane	86	U
8001-35-2	Toxaphene	170	U
12674-11-2	Aroclor-1016	86	U
11104-28-2	Aroclor-1221	86	U
11141-16-5	Aroclor-1232	86	U
53469-21-9	Aroclor-1242	86	U
12672-29-6	Aroclor-1248	86	U
11097-69-1	Aroclor-1254	170	U
11096-82-5	Aroclor-1260	170	U

9613501.1987

1D

0047

EPA SAMPLE NO.

PESTICIDE ORGANICS ANALYSIS DATA SHEET

B00HB3

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12067 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A112067-10A

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

Level: (low/med) LOW Date Received: 12/13/91

% Moisture: not dec. 7 dec. __ Date Extracted: 12/24/92

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 01/10/92

GPC Cleanup: (Y/N) N pH: 7.7 Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
319-84-6	alpha-BHC	8.6	U
319-85-7	beta-BHC	8.6	U
319-86-8	delta-BHC	8.6	U
58-89-9	gamma-BHC (Lindane)	8.6	U
76-44-8	Heptachlor	8.6	U
309-00-2	Aldrin	8.6	U
1024-57-3	Heptachlor epoxide	8.6	U
959-98-8	Endosulfan I	8.6	U
60-57-1	Dieldrin	17	U
72-55-9	4,4'-DDE	17	U
72-20-8	Endrin	17	U
33213-65-9	Endosulfan II	17	U
72-54-8	4,4'-DDD	17	U
1031-07-8	Endosulfan sulfate	17	U
50-29-3	4,4'-DDT	17	U
72-43-5	Methoxychlor	86	U
53494-70-5	Endrin ketone	17	U
5103-71-9	alpha-Chlordane	86	U
5103-74-2	gamma-Chlordane	86	U
8001-35-2	Toxaphene	170	U
12674-11-2	Aroclor-1016	86	U
11104-28-2	Aroclor-1221	86	U
11141-16-5	Aroclor-1232	86	U
53469-21-9	Aroclor-1242	86	U
12672-29-6	Aroclor-1248	320	X
11097-69-1	Aroclor-1254	240	X
11096-82-5	Aroclor-1260	170	U

9613501.1988

1D

PESTICIDE ORGANICS ANALYSIS DATA SHEET

0049
EPA SAMPLE NO.

B00HB5

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12067 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A112067-11A

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

Level: (low/med) LOW Date Received: 12/13/91

% Moisture: not dec. 6 dec. __ Date Extracted: 12/24/92

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 01/10/92

GPC Cleanup: (Y/N) N pH: 8.5 Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
319-84-6	alpha-BHC	8.4	U
319-85-7	beta-BHC	8.4	U
319-86-8	delta-BHC	8.4	U
58-89-9	gamma-BHC (Lindane)	8.4	U
76-44-8	Heptachlor	8.4	U
309-00-2	Aldrin	8.4	U
1024-57-3	Heptachlor epoxide	8.4	U
959-98-8	Endosulfan I	8.4	U
60-57-1	Dieldrin	17	U
72-55-9	4,4'-DDE	17	U
72-20-8	Endrin	17	U
33213-65-9	Endosulfan II	17	U
72-54-8	4,4'-DDD	17	U
1031-07-8	Endosulfan sulfate	17	U
50-29-3	4,4'-DDT	17	U
72-43-5	Methoxychlor	84	U
53494-70-5	Endrin ketone	17	U
5103-71-9	alpha-Chlordane	84	U
5103-74-2	gamma-Chlordane	84	U
8001-35-2	Toxaphene	170	U
12674-11-2	Aroclor-1016	84	U
11104-28-2	Aroclor-1221	84	U
11141-16-5	Aroclor-1232	84	U
53469-21-9	Aroclor-1242	84	U
12672-29-6	Aroclor-1248	140	X
11097-69-1	Aroclor-1254	170	U
11096-82-5	Aroclor-1260	170	U

9613501.1989

1D

0050

EPA SAMPLE NO.

PESTICIDE ORGANICS ANALYSIS DATA SHEET

B00HB7

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12067 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A112067-05A

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

Level: (low/med) LOW Date Received: 12/14/91

% Moisture: not dec. 7 dec. __ Date Extracted: 12/24/92

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 01/10/92

GPC Cleanup: (Y/N) N pH: 7.6 Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
319-84-6	alpha-BHC	8.5	U
319-85-7	beta-BHC	8.5	U
319-86-8	delta-BHC	8.5	U
58-89-9	gamma-BHC (Lindane)	8.5	U
76-44-8	Heptachlor	8.5	U
309-00-2	Aldrin	8.5	U
1024-57-3	Heptachlor epoxide	8.5	U
959-98-8	Endosulfan I	8.5	U
60-57-1	Dieldrin	17	U
72-55-9	4,4'-DDE	17	U
72-20-8	Endrin	17	U
33213-65-9	Endosulfan II	17	U
72-54-8	4,4'-DDD	17	U
1031-07-8	Endosulfan sulfate	17	U
50-29-3	4,4'-DDT	17	U
72-43-5	Methoxychlor	85	U
53494-70-5	Endrin ketone	17	U
5103-71-9	alpha-Chlordane	85	U
5103-74-2	gamma-Chlordane	85	U
8001-35-2	Toxaphene	170	U
12674-11-2	Aroclor-1016	85	U
11104-28-2	Aroclor-1221	85	U
11141-16-5	Aroclor-1232	85	U
53469-21-9	Aroclor-1242	85	U
12672-29-6	Aroclor-1248	85	U
11097-69-1	Aroclor-1254	170	U
11096-82-5	Aroclor-1260	170	U

9613501.1990

1D

0051

EPA SAMPLE NO.

PESTICIDE ORGANICS ANALYSIS DATA SHEET

B00HB9

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12067 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A112067-06A

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

Level: (low/med) LOW Date Received: 12/14/91

% Moisture: not dec. 10 dec. __ Date Extracted: 12/24/92

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 01/10/92

GPC Cleanup: (Y/N) N pH: 7.7 Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
319-84-6	alpha-BHC	8.9	U
319-85-7	beta-BHC	8.9	U
319-86-8	delta-BHC	8.9	U
58-89-9	gamma-BHC (Lindane)	8.9	U
76-44-8	Heptachlor	8.9	U
309-00-2	Aldrin	8.9	U
1024-57-3	Heptachlor epoxide	8.9	U
959-98-8	Endosulfan I	8.9	U
60-57-1	Dieldrin	18	U
72-55-9	4,4'-DDE	18	U
72-20-8	Endrin	18	U
33213-65-9	Endosulfan II	18	U
72-54-8	4,4'-DDD	18	U
1031-07-8	Endosulfan sulfate	18	U
50-29-3	4,4'-DDT	18	U
72-43-5	Methoxychlor	89	U
53494-70-5	Endrin ketone	18	U
5103-71-9	alpha-Chlordane	89	U
5103-74-2	gamma-Chlordane	89	U
8001-35-2	Toxaphene	180	U
12674-11-2	Aroclor-1016	89	U
11104-28-2	Aroclor-1221	89	U
11141-16-5	Aroclor-1232	89	U
53469-21-9	Aroclor-1242	89	U
12672-29-6	Aroclor-1248	89	U
11097-69-1	Aroclor-1254	180	U
11096-82-5	Aroclor-1260	180	U

9613501.1991

1D

0052

EPA SAMPLE NO.

PESTICIDE ORGANICS ANALYSIS DATA SHEET

B00HC1

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12067 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A112067-07A

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

Level: (low/med) LOW Date Received: 12/14/91

% Moisture: not dec. 14 dec. __ Date Extracted: 12/24/92

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 01/10/92

GPC Cleanup: (Y/N) N pH: 8.4 Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
319-84-6	alpha-BHC	9.2	U
319-85-7	beta-BHC	9.2	U
319-86-8	delta-BHC	9.2	U
58-89-9	gamma-BHC (Lindane)	9.2	U
76-44-8	Heptachlor	9.2	U
309-00-2	Aldrin	9.2	U
1024-57-3	Heptachlor epoxide	9.2	U
959-98-8	Endosulfan I	9.2	U
60-57-1	Dieldrin	18	U
72-55-9	4,4'-DDE	18	U
72-20-8	Endrin	18	U
33213-65-9	Endosulfan II	18	U
72-54-8	4,4'-DDD	18	U
1031-07-8	Endosulfan sulfate	18	U
50-29-3	4,4'-DDT	18	U
72-43-5	Methoxychlor	92	U
53494-70-5	Endrin ketone	18	U
5103-71-9	alpha-Chlordane	92	U
5103-74-2	gamma-Chlordane	92	U
8001-35-2	Toxaphene	180	U
12674-11-2	Aroclor-1016	92	U
11104-28-2	Aroclor-1221	92	U
11141-16-5	Aroclor-1232	92	U
53469-21-9	Aroclor-1242	92	U
12672-29-6	Aroclor-1248	92	U
11097-69-1	Aroclor-1254	180	U
11096-82-5	Aroclor-1260	180	U

9613501.1992
1D

EPA SAMPLE NO.

B00HC3

PESTICIDE ORGANICS ANALYSIS DATA SHEET

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12067 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A112067-08A

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

Level: (low/med) LOW Date Received: 12/14/91

% Moisture: not dec. 29 dec. __ Date Extracted: 12/24/92

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 01/10/92

GPC Cleanup: (Y/N) N pH: 8.0 Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
319-84-6	alpha-BHC	11	U
319-85-7	beta-BHC	11	U
319-86-8	delta-BHC	11	U
58-89-9	gamma-BHC (Lindane)	11	U
76-44-8	Heptachlor	11	U
309-00-2	Aldrin	11	U
1024-57-3	Heptachlor epoxide	11	U
959-98-8	Endosulfan I	11	U
60-57-1	Dieldrin	22	U
72-55-9	4,4'-DDE	22	U
72-20-8	Endrin	22	U
33213-65-9	Endosulfan II	22	U
72-54-8	4,4'-DDD	22	U
1031-07-8	Endosulfan sulfate	22	U
50-29-3	4,4'-DDT	22	U
72-43-5	Methoxychlor	110	U
53494-70-5	Endrin ketone	22	U
5103-71-9	alpha-Chlordane	110	U
5103-74-2	gamma-Chlordane	110	U
8001-35-2	Toxaphene	220	U
12674-11-2	Aroclor-1016	110	U
11104-28-2	Aroclor-1221	110	U
11141-16-5	Aroclor-1232	110	U
53469-21-9	Aroclor-1242	110	U
12672-29-6	Aroclor-1248	110	U
11097-69-1	Aroclor-1254	220	U
11096-82-5	Aroclor-1260	220	U

9613501.1993

TMA

WESTINGHOUSE HANFORD COMPANY

Results of Analyses For:

ORGANICS
Case No. 12-066 & 12-067
(TMA/ARLI Work Order # A2-12-066 & A1-12-067)

METALS
Case No. N1-12-130
(TMA/Skinner Work Order # 9112178)

TMA Master Work Order N112130

March 9, 1992

MAR 1992
RECEIVED
DMO
OSM

ms
7/15/96

9613501.1994

Federal Express 4009269902
January 21, 1992

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

Quality Control Narrative

Scope
Eleven (11) soil samples and two (2) water samples were submitted to TMA/Skinner & Sherman Laboratories, Inc. on December 18, 1991 from Westinghouse/ Hanford Company. The samples were analyzed for the USEPA CLP metals. The analysis was performed under Skinner and Sherman work order 9112178.

Methodology
The samples were prepared, analyzed and reported in accordance with the USEPA Contract Laboratory Program Statement of Work 7/88 (CLP SOW788).

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

Soils
The antimony and selenium matrix spike recoveries exceeded the control limit requirements.

The copper and iron duplicates exceeded the control limit requirements.

Waters
All quality control limits were met for the water samples.

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

Respectfully submitted,

TMA/SKINNER & SHERMAN LABORATORIES, INC.

David N. Peterson
Assistant Laboratory Manager

This report is rendered upon all of the following conditions: Skinner & Sherman Laboratories, Inc. retains ownership of this report until associated submitted invoice is satisfi
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. Cl
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 invo
amount. The results listed refer only to tested samples and applicable parameters. Product endorsement is neither inferred nor implied. Skinner & Sherman Laboratories, Inc.
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
thirty days following issuance of report. Samples will be stored at client's expense, if authorized in writing.

TMA
Thermo Analytical Inc.
Skinner & Sherman Laboratories Inc.
300 Second Avenue, P.O. Box 521, Waltham, Massachusetts 02254-0521 (617) 890-7200
1-800-4 LAB TEST FAX (617) 890-3883

9613501.1995

WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B00H93

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

Lab Code: SKINER Case No.: N112130 SAS No.: SDG No.: B00HB1

Matrix (soil/water): SOIL Lab Sample ID: 12178-04S

Level (low/med): LOW Date Received: 12/18/91

% Solids: 75.8

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	12600.00			P
7440-36-0	Antimony	7.90	U	N	P
7440-38-2	Arsenic	2.00	B		F
7440-39-3	Barium	315.00			P
7440-41-7	Beryllium	1.40			P
7440-43-9	Cadmium	0.26	U		P
7440-70-2	Calcium	28500.00			P
7440-47-3	Chromium	12.90			P
7440-48-4	Cobalt	5.40	B		P
7440-50-8	Copper	37.40		*	P
7439-89-6	Iron	11500.00		*	P
7439-92-1	Lead	11.10			F
7439-95-4	Magnesium	3530.00			P
7439-96-5	Manganese	98.60			P
7439-97-6	Mercury	0.14			CV
7440-02-0	Nickel	17.40			P
7440-09-7	Potassium	1220.00	B		P
7782-49-2	Selenium	1.00	U	WN	F
7440-22-4	Silver	1.30	U		P
7440-23-5	Sodium	2100.00			P
7440-28-0	Thallium	0.25	U		F
7440-62-2	Vanadium	40.40			P
7440-66-6	Zinc	46.20			P
	Cyanide				NR

Color Before: BLACK Clarity Before: Texture: FINE

Color After: BLACK Clarity After: Artifacts: YES

Comments:
STONES

000002

9613501.1996

WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B00H96

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

Lab Code: SKINER Case No.: N112130 SAS No.: SDG No.: B00HB1

Matrix (soil/water): SOIL Lab Sample ID: 12178-05S

Level (low/med): LOW Date Received: 12/18/91

% Solids: 79.0

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	11500.00			P
7440-36-0	Antimony	7.40	U	N	P
7440-38-2	Arsenic	2.70			F
7440-39-3	Barium	307.00			P
7440-41-7	Beryllium	1.30			P
7440-43-9	Cadmium	0.24	U		P
7440-70-2	Calcium	28500.00			P
7440-47-3	Chromium	11.30			P
7440-48-4	Cobalt	4.40	B		P
7440-50-8	Copper	29.40		*	P
7439-89-6	Iron	15800.00		*	P
7439-92-1	Lead	11.30			F
7439-95-4	Magnesium	3330.00			P
7439-96-5	Manganese	94.30			P
7439-97-6	Mercury	0.12	U		CV
7440-02-0	Nickel	17.30			P
7440-09-7	Potassium	1230.00			P
7782-49-2	Selenium	0.96	U	MN	F
7440-22-4	Silver	1.20	U		P
7440-23-5	Sodium	2160.00			P
7440-28-0	Thallium	0.24	U		F
7440-62-2	Vanadium	37.90			P
7440-66-6	Zinc	46.50			P
	Cyanide				NR

Color Before: BLACK Clarity Before: Texture: FINE

Color After: BLACK Clarity After: Artifacts: YES

Comments:
STONES

000003

9613501.1997

WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B00H97

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

Lab Code: SKINER Case No.: N112130 SAS No.: SDG No.: B00HB1

Matrix (soil/water): SOIL Lab Sample ID: 12178-06S

Level (low/med): LOW Date Received: 12/18/91

% Solids: 91.1

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	12100.00			P
7440-36-0	Antimony	6.50	U	N	P
7440-38-2	Arsenic	2.10	B		F
7440-39-3	Barium	238.00			P
7440-41-7	Beryllium	1.30			P
7440-43-9	Cadmium	0.21	U		P
7440-70-2	Calcium	28400.00			P
7440-47-3	Chromium	12.80			P
7440-48-4	Cobalt	4.20	B		P
7440-50-8	Copper	27.20		*	P
7439-89-6	Iron	11400.00		*	P
7439-92-1	Lead	9.70			F
7439-95-4	Magnesium	3720.00			P
7439-96-5	Manganese	104.00			P
7439-97-6	Mercury	0.11			CV
7440-02-0	Nickel	17.70			P
7440-09-7	Potassium	956.00	B		P
7782-49-2	Selenium	1.70		SN	F
7440-22-4	Silver	1.10	U		P
7440-23-5	Sodium	2140.00			P
7440-28-0	Thallium	0.22	U		F
7440-62-2	Vanadium	37.80			P
7440-66-6	Zinc	49.60			P
	Cyanide				NR

Color Before: BLACK Clarity Before: Texture: FINE

Color After: BLACK Clarity After: Artifacts: YES

Comments:
STONES

000004

9613501.1998

WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B00H99

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

Lab Code: SKINER Case No.: N112130 SAS No.: SDG No.: B00HB1

Matrix (soil/water): SOIL Lab Sample ID: 12178-07S

Level (low/med): LOW Date Received: 12/18/91

% Solids: 93.0

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	11900.00			P
7440-36-0	Antimony	6.40	U	N	P
7440-38-2	Arsenic	1.90	B		F
7440-39-3	Barium	214.00			P
7440-41-7	Beryllium	1.20			P
7440-43-9	Cadmium	0.21	U		P
7440-70-2	Calcium	28500.00			P
7440-47-3	Chromium	11.10			P
7440-48-4	Cobalt	3.90	B		P
7440-50-8	Copper	31.70		*	P
7439-89-6	Iron	9000.00		*	P
7439-92-1	Lead	7.70			F
7439-95-4	Magnesium	3460.00			P
7439-96-5	Manganese	118.00			P
7439-97-6	Mercury	0.10			CV
7440-02-0	Nickel	14.20			P
7440-09-7	Potassium	777.00	B		P
7782-49-2	Selenium	0.84	U	N	F
7440-22-4	Silver	1.00	U		P
7440-23-5	Sodium	1990.00			P
7440-28-0	Thallium	0.21	U		F
7440-62-2	Vanadium	31.70			P
7440-66-6	Zinc	49.50			P
	Cyanide				NR

Color Before: GREY Clarity Before: Texture: FINE

Color After: GREY Clarity After: Artifacts: YES

Comments:
STONES

9613501.1999

WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B00HB1

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

Lab Code: SKINER Case No.: N112130 SAS No.: SDG No.: B00HB1

Matrix (soil/water): SOIL Lab Sample ID: 12178-01S

Level (low/med): LOW Date Received: 12/18/91

% Solids: 79.6

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	31000.00			P
7440-36-0	Antimony	7.30	U	N	P
7440-38-2	Arsenic	8.30			F
7440-39-3	Barium	242.00			P
7440-41-7	Beryllium	3.30			P
7440-43-9	Cadmium	1.90			P
7440-70-2	Calcium	30400.00			P
7440-47-3	Chromium	553.00			P
7440-48-4	Cobalt	9.00	B		P
7440-50-8	Copper	41100.00		*	P
7439-89-6	Iron	13500.00		*	P
7439-92-1	Lead	111.00			F
7439-95-4	Magnesium	8350.00			P
7439-96-5	Manganese	402.00			P
7439-97-6	Mercury	6.00			CV
7440-02-0	Nickel	1020.00			P
7440-09-7	Potassium	579.00	B		P
7782-49-2	Selenium	4.70	U	WN	F
7440-22-4	Silver	168.00			P
7440-23-5	Sodium	1100.00	B		P
7440-28-0	Thallium	0.24	U		F
7440-62-2	Vanadium	161.00			P
7440-66-6	Zinc	241.00			P
	Cyanide				NR

Color Before: GREY Clarity Before: Texture: FINE

Color After: GREY Clarity After: Artifacts: YES

Comments:
STONES

9613501.2000

WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B00HB3

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

Lab Code: SKINER Case No.: N112130 SAS No.: SDG No.: B00HB1

Matrix (soil/water): SOIL Lab Sample ID: 12178-02S

Level (low/med): LOW Date Received: 12/18/91

% Solids: 92.6

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	14600.00			P
7440-36-0	Antimony	12.30	B	N	P
7440-38-2	Arsenic	2.50			F
7440-39-3	Barium	67.40			P
7440-41-7	Beryllium	0.59	B		P
7440-43-9	Cadmium	0.21	U		P
7440-70-2	Calcium	4390.00			P
7440-47-3	Chromium	164.00			P
7440-48-4	Cobalt	9.80	B		P
7440-50-8	Copper	3670.00		*	P
7439-89-6	Iron	20100.00		*	P
7439-92-1	Lead	13.10			F
7439-95-4	Magnesium	4170.00			P
7439-96-5	Manganese	242.00			P
7439-97-6	Mercury	0.42			CV
7440-02-0	Nickel	154.00			P
7440-09-7	Potassium	606.00	B		P
7782-49-2	Selenium	0.79	U	WN	F
7440-22-4	Silver	8.80			P
7440-23-5	Sodium	274.00	B		P
7440-28-0	Thallium	0.20	U		F
7440-62-2	Vanadium	38.20			P
7440-66-6	Zinc	53.50			P
	Cyanide				NR

Color Before: GREY Clarity Before: Texture: MEDIUM

Color After: GREY Clarity After: Artifacts: YES

Comments:
STONES

900007

9613501.2001

WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B00HB5

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

Lab Code: SKINER Case No.: N112130 SAS No.: SDG No.: B00HB1

Matrix (soil/water): SOIL Lab Sample ID: 12178-03S

Level (low/med): LOW Date Received: 12/18/91

% Solids: 94.3

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	7000.00			P
7440-36-0	Antimony	6.10	U	N	P
7440-38-2	Arsenic	1.40	B		F
7440-39-3	Barium	79.30			P
7440-41-7	Beryllium	0.37	B		P
7440-43-9	Cadmium	0.20	U		P
7440-70-2	Calcium	5710.00			P
7440-47-3	Chromium	12.10			P
7440-48-4	Cobalt	11.70			P
7440-50-8	Copper	1040.00		*	P
7439-89-6	Iron	21600.00		*	P
7439-92-1	Lead	3.90			F
7439-95-4	Magnesium	3610.00			P
7439-96-5	Manganese	276.00			P
7439-97-6	Mercury	0.35			CV
7440-02-0	Nickel	53.70			P
7440-09-7	Potassium	429.00	B		P
7782-49-2	Selenium	0.79	U	WN	F
7440-22-4	Silver	1.30	B		P
7440-23-5	Sodium	321.00	B		P
7440-28-0	Thallium	0.20	B		F
7440-62-2	Vanadium	46.40			P
7440-66-6	Zinc	53.30			P
	Cyanide				NR

Color Before: BLACK Clarity Before: Texture: MEDIUM

Color After: BLACK Clarity After: Artifacts: YES

Comments:
STONES

000008

9613501.2002

WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B00HB7

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

Lab Code: SKINER Case No.: N112130 SAS No.: SDG No.: B00HB1

Matrix (soil/water): SOIL Lab Sample ID: 12178-08S

Level (low/med): LOW Date Received: 12/18/91

% Solids: 92.2

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	7490.00			P
7440-36-0	Antimony	9.40	B	N	P
7440-38-2	Arsenic	1.60	B		F
7440-39-3	Barium	117.00			P
7440-41-7	Beryllium	0.37	B		P
7440-43-9	Cadmium	0.20	U		P
7440-70-2	Calcium	5390.00			P
7440-47-3	Chromium	5.10			P
7440-48-4	Cobalt	13.30			P
7440-50-8	Copper	107.00		*	P
7439-89-6	Iron	23500.00		*	P
7439-92-1	Lead	2.70			F
7439-95-4	Magnesium	3740.00			P
7439-96-5	Manganese	323.00			P
7439-97-6	Mercury	0.57			CV
7440-02-0	Nickel	31.80			P
7440-09-7	Potassium	457.00	B		P
7782-49-2	Selenium	0.80	U	WN	F
7440-22-4	Silver	1.00	U		P
7440-23-5	Sodium	309.00	B		P
7440-28-0	Thallium	0.20	U		F
7440-62-2	Vanadium	45.00			P
7440-66-6	Zinc	51.30			P
	Cyanide				NR

Color Before: GREY Clarity Before: Texture: MEDIUM

Color After: GREY Clarity After: Artifacts: YES

Comments:
STONES

000009

FORM I - IN Rev.6/89

9613501.2003

WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B00HB9

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

Lab Code: SKINER Case No.: N112130 SAS No.: SDG No.: B00HB1

Matrix (soil/water): SOIL Lab Sample ID: 12178-09S

Level (low/med): LOW Date Received: 12/18/91

% Solids: 89.3

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	7990.00			P
7440-36-0	Antimony	7.10	B	N	P
7440-38-2	Arsenic	1.50	B		F
7440-39-3	Barium	115.00			P
7440-41-7	Beryllium	0.38	B		P
7440-43-9	Cadmium	0.22	U		P
7440-70-2	Calcium	4910.00			P
7440-47-3	Chromium	13.10			P
7440-48-4	Cobalt	13.10			P
7440-50-8	Copper	427.00		*	P
7439-89-6	Iron	24500.00		*	P
7439-92-1	Lead	3.60			F
7439-95-4	Magnesium	3980.00			P
7439-96-5	Manganese	345.00			P
7439-97-6	Mercury	0.57			CV
7440-02-0	Nickel	21.80			P
7440-09-7	Potassium	577.00	B		P
7782-49-2	Selenium	0.84	U	WN	F
7440-22-4	Silver	1.10	U		P
7440-23-5	Sodium	243.00	B		P
7440-28-0	Thallium	0.21	U		F
7440-62-2	Vanadium	50.40			P
7440-66-6	Zinc	53.60			P
	Cyanide				NR

Color Before: GREY Clarity Before: Texture: COARSE

Color After: GREY Clarity After: Artifacts: YES

Comments:
STONES

900010

9613501.2004

WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B00HC1

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

Lab Code: SKINER Case No.: N112130 SAS No.: SDG No.: B00HB1

Matrix (soil/water): SOIL Lab Sample ID: 12178-10S

Level (low/med): LOW Date Received: 12/18/91

% Solids: 86.9

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	9340.00			P
7440-36-0	Antimony	6.80	B	N	P
7440-38-2	Arsenic	2.30			F
7440-39-3	Barium	114.00			P
7440-41-7	Beryllium	0.46	B		P
7440-43-9	Cadmium	0.21	U		P
7440-70-2	Calcium	5250.00			P
7440-47-3	Chromium	20.70			P
7440-48-4	Cobalt	12.90			P
7440-50-8	Copper	1060.00		*	P
7439-89-6	Iron	24400.00		*	P
7439-92-1	Lead	7.40			F
7439-95-4	Magnesium	4580.00			P
7439-96-5	Manganese	370.00			P
7439-97-6	Mercury	0.37			CV
7440-02-0	Nickel	21.90			P
7440-09-7	Potassium	663.00	B		P
7782-49-2	Selenium	0.91	U	WN	F
7440-22-4	Silver	3.00			P
7440-23-5	Sodium	272.00	B		P
7440-28-0	Thallium	0.23	U		F
7440-62-2	Vanadium	49.10			P
7440-66-6	Zinc	52.80			P
	Cyanide				NR

Color Before: GREY Clarity Before: Texture: COARSE

Color After: GREY Clarity After: Artifacts: YES

Comments:
STONES

000011

9613501.2005

WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B00HC3

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

Lab Code: SKINER Case No.: N112130 SAS No.: SDG No.: B00HB1

Matrix (soil/water): SOIL Lab Sample ID: 12178-11S

Level (low/med): LOW Date Received: 12/18/91

% Solids: 51.6

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	21400.00			P
7440-36-0	Antimony	11.10	U	N	P
7440-38-2	Arsenic	3.80			F
7440-39-3	Barium	169.00			P
7440-41-7	Beryllium	1.10	B		P
7440-43-9	Cadmium	0.36	U		P
7440-70-2	Calcium	6760.00			P
7440-47-3	Chromium	45.00			P
7440-48-4	Cobalt	13.50	B		P
7440-50-8	Copper	3350.00		*	P
7439-89-6	Iron	24200.00		*	P
7439-92-1	Lead	16.70			F
7439-95-4	Magnesium	6370.00			P
7439-96-5	Manganese	572.00			P
7439-97-6	Mercury	0.86			CV
7440-02-0	Nickel	37.40			P
7440-09-7	Potassium	1870.00			P
7782-49-2	Selenium	1.40	U	WN	F
7440-22-4	Silver	9.50			P
7440-23-5	Sodium	286.00	B		P
7440-28-0	Thallium	0.35	U		F
7440-62-2	Vanadium	48.40			P
7440-66-6	Zinc	73.30			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts: YES

Comments:
STONES

000012

9613501.2006

WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B00HC5

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

Lab Code: SKINER Case No.: N112130 SAS No.: SDG No.: B00HB1

Matrix (soil/water): WATER Lab Sample ID: 12178-12S

Level (low/med): LOW Date Received: 12/18/91

% Solids: 0.0

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	119.00	B		P
7440-36-0	Antimony	31.00	U		P
7440-38-2	Arsenic	2.00	U		F
7440-39-3	Barium	3.50	B		P
7440-41-7	Beryllium	1.00	U		P
7440-43-9	Cadmium	1.00	U		P
7440-70-2	Calcium	894.00	B		P
7440-47-3	Chromium	2.00	U		P
7440-48-4	Cobalt	3.00	U		P
7440-50-8	Copper	8.40	B		P
7439-89-6	Iron	88.80	B		P
7439-92-1	Lead	2.00	U		F
7439-95-4	Magnesium	69.00	U		P
7439-96-5	Manganese	2.60	B		P
7439-97-6	Mercury	0.20	U		CV
7440-02-0	Nickel	5.00	B		P
7440-09-7	Potassium	106.00	B		P
7782-49-2	Selenium	4.00	U		F
7440-22-4	Silver	5.00	U		P
7440-23-5	Sodium	1500.00	B		P
7440-28-0	Thallium	1.00	U		F
7440-62-2	Vanadium	3.00	U		P
7440-66-6	Zinc	16.80	B		P
	Cyanide				NR

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

000013

9613501.2007

WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B00HC6

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

Lab Code: SKINER Case No.: N112130 SAS No.: SDG No.: B00HB1

Matrix (soil/water): WATER Lab Sample ID: 12178-13S

Level (low/med): LOW Date Received: 12/18/91

% Solids: 0.0

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	66.00	U		P
7440-36-0	Antimony	31.00	U		P
7440-38-2	Arsenic	2.30	B		F
7440-39-3	Barium	1.70	B		P
7440-41-7	Beryllium	1.00	U		P
7440-43-9	Cadmium	1.00	U		P
7440-70-2	Calcium	450.00	B		P
7440-47-3	Chromium	2.00	U		P
7440-48-4	Cobalt	3.00	U		P
7440-50-8	Copper	3.80	B		P
7439-89-6	Iron	35.00	U		P
7439-92-1	Lead	2.00	U	W	F
7439-95-4	Magnesium	69.00	U		P
7439-96-5	Manganese	1.00	U		P
7439-97-6	Mercury	0.20	U		CV
7440-02-0	Nickel	4.00	U		P
7440-09-7	Potassium	76.00	U		P
7782-49-2	Selenium	4.00	U		F
7440-22-4	Silver	5.00	U		P
7440-23-5	Sodium	898.00	B		P
7440-28-0	Thallium	1.00	U	W	F
7440-62-2	Vanadium	3.00	U		P
7440-66-6	Zinc	11.00	U		P
	Cyanide				NR

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

000014

9615501.2008

TMA
Thermo Analytical Inc.

TMA/Norcal
2030 Wright Avenue
P. O. Box 4040
Richmond, CA 94804-0040
(510) 235-2633 Fax No. (510) 235-0438

MAY 1992
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May 21, 1992

SENT BY FEDERAL EXPRESS

Ref. TMA/Norcal N2-04-115-7031

Mr. John Bourgeault
Westinghouse Hanford Company
2355 Stevens Drive
Richland, WA 99352

Dear Mr. Bourgeault:

Enclosed on Attachment 1, are the gross alpha, gross beta, ^{90}Sr, isotopic uranium, and gamma scan results for the soil samples and gross alpha, gross beta, ^{3}H, ^{90}Sr, isotopic uranium, and gamma scan results for the water samples from 300-FF-1 North Process Pond, Pit 1 Location, we received 14 December 1991.

Please call if you have any questions concerning this data.

Sincerely,

D. P. Kharkar

Dinkar P. Kharkar, Ph.D.
Manager, Nuclear Programs

Enclosures: Sections 1 through 11
Appendices

MS
7/15/96

ATTACHMENT 1 DATA TABLE

Collection date: 12/09/91 - 12/10/91

Customer I.D.	TMA/Norcal Group No. 7031	Analysis	Results pCi/g ± 2 σ	
BOOH93 (soil)	1	Gross Alpha	12 ± 5	
		Gross Beta	12 ± 2	
		^{90}Sr	(9 ± 3)	E-01
		^{234}U	(3.0 ± 0.3)	E+00
		^{235}U	(2 ± 1)	E-01
		^{238}U	(2.6 ± 0.3)	E+00
		Gamma Scan:		
		^{40}K	(5.008 ± 2.147)	E+00
		^{51}Cr	<6.503	E+01
		^{60}Co	<2.209	E-01
		^{65}Zn	<8.287	E-01
		^{134}Cs	<2.766	E-01
		^{137}Cs	<1.994	E-01
		^{226}Ra	(1.609 ± 0.466)	E+00
		^{228}Th	(2.184 ± 0.489)	E+00
		^{232}Th	<1.172	E+00
BOOH96 (soil)	2	Gross Alpha	21 ± 7	
		Gross Beta	12 ± 2	
		^{90}Sr	(3 ± 5)	E-01
		^{234}U	(2.6 ± 0.2)	E+00
		^{235}U	(2 ± 1)	E-01
		^{238}U	(2.5 ± 0.2)	E+00
		Gamma Scan:		
		^{40}K	(4.723 ± 2.334)	E+00
		^{51}Cr	<4.354	E+01
		^{60}Co	<2.388	E-01
		^{65}Zn	<6.586	E-01
		^{134}Cs	<1.903	E-01
		^{137}Cs	<1.906	E-01
		^{226}Ra	(1.594 ± 0.365)	E+00
		^{228}Th	(1.790 ± 0.362)	E+00
		^{232}Th	(1.634 ± 0.587)	E+00

ATTACHMENT 1 DATA TABLE (cont'd, page two)

Collection date: 12/09/91 - 12/10/91

Customer I.D.	TMA/Norcal Group No. 7031	Analysis	Results pCi/g ± 2 σ	
BOOH97 (soil)	3	Gross Alpha	15 ± 6	
		Gross Beta	9 ± 2	
		^{90}Sr	(2 ± 3)	E-01
		^{234}U	(2.6 ± 0.2)	E+00
		^{235}U	<2.	E-01
		^{238}U	(2.5 ± 0.2)	E+00
		Gamma Scan:		
		^{40}K	(2.569 ± 1.605)	E+00
		^{51}Cr	<4.616	E+01
		^{60}Co	<1.587	E-01
		^{65}Zn	<5.182	E-01
		^{134}Cs	<1.862	E-01
		^{137}Cs	<1.322	E-01
		^{226}Ra	(1.890 ± 0.330)	E+00
		^{228}Th	(1.276 ± 0.175)	E+00
		^{232}Th	(1.079 ± 0.586)	E+00
BOOH99 (soil)	4	Gross Alpha	24 ± 7	
		Gross Beta	21 ± 3	
		^{90}Sr	(-2 ± 4)	E-01
		^{234}U	(9.8 ± 0.6)	E+00
		^{235}U	(9 ± 1)	E-01
		^{238}U	(7.5 ± 0.4)	E+00
		Gamma Scan:		
		^{40}K	(6.511 ± 1.857)	E+00
		^{51}Cr	<4.500	E+01
		^{60}Co	<1.498	E-01
		^{65}Zn	<5.221	E-01
		^{134}Cs	<1.890	E-01
		^{137}Cs	<1.478	E-01
		^{226}Ra	(2.057 ± 0.316)	E+00
		^{228}Th	(1.329 ± 0.247)	E+00
		^{232}Th	(1.320 ± 0.528)	E+00

ATTACHMENT 1 DATA TABLE (cont'd, page three)

Collection date: 12/09/91 - 12/10/91

Customer I.D.	TMA/Norcal Group No. 7031	Analysis	Results pCi/g ± 2 σ	
BOOHB7 (soil)	5	Gross Alpha	10 ± 5	
		Gross Beta	22 ± 3	
		^{90}Sr	(-2 ± 4)	E-01
		^{234}U	(1.47 ± 0.08)	E+01
		^{235}U	(1.5 ± 0.2)	E+00
		^{238}U	(1.24 ± 0.07)	E+01
		Gamma Scan:		
		^{40}K	(6.718 ± 1.244)	E+00
		^{51}Cr	<2.638	E+01
		^{60}Co	(2.795 ± 1.202)	E-01
		^{65}Zn	<3.441	E-01
		^{134}Cs	<1.133	E-01
		^{137}Cs	<8.649	E-02
		^{226}Ra	(4.471 ± 2.071)	E-01
		^{228}Th	(6.617 ± 1.850)	E-01
		^{232}Th	(6.021 ± 4.264)	E-01
		^{235}U	(5.850 ± 3.650)	E-01
BOOHB9 (soil)	6	Gross Alpha	20 ± 6	
		Gross Beta	21 ± 3	
		^{90}Sr	(-1 ± 5)	E-01
		^{234}U	(1.63 ± 0.08)	E+01
		^{235}U	(1.6 ± 0.2)	E+00
		^{238}U	(1.36 ± 0.07)	E+01
		Gamma Scan:		
		^{40}K	(6.952 ± 1.231)	E+00
		^{51}Cr	<2.217	E+01
		^{60}Co	(2.578 ± 0.952)	E-01
		^{65}Zn	<3.037	E-01
		^{134}Cs	<9.399	E-02
		^{137}Cs	<7.810	E-02
		^{226}Ra	(3.736 ± 1.142)	E-01
		^{228}Th	(5.878 ± 1.330)	E-01
		^{232}Th	(4.811 ± 2.838)	E-01
		^{235}U	(4.642 ± 3.021)	E-01
		^{238}U	(1.114 ± 0.990)	E+01

ATTACHMENT 1 DATA TABLE (cont'd, page four)

Collection date: 12/09/91 - 12/10/91

Customer I.D.	TMA/Norcal Group No. 7031	Analysis	Results pCi/g ± 2 σ	
BOOHC1 (soil)	7	Gross Alpha	23 ± 7	
		Gross Beta	42 ± 3	
		^{90}Sr	(1 ± 7)	E-01
		^{234}U	(2.45 ± 0.11)	E+01
		^{235}U	(2.4 ± 0.2)	E+00
		^{238}U	(2.04 ± 0.10)	E+01
		Gamma Scan:		
		^{40}K	(7.150 ± 1.380)	E+00
		^{51}Cr	<2.708	E+01
		^{60}Co	(1.745 ± 0.887)	E-01
		^{65}Zn	<2.848	E-01
		^{134}Cs	<1.148	E-01
		^{137}Cs	<9.035	E-02
		^{226}Ra	(4.288 ± 1.237)	E-01
		^{228}Th	(5.037 ± 1.025)	E-01
		^{232}Th	(4.321 ± 3.375)	E-01
		^{235}U	(5.943 ± 3.282)	E-01
		^{238}U	(1.113 ± 1.024)	E+01
BOOHC3 (soil)	8	Gross Alpha	22 ± 7	
		Gross Beta	25 ± 3	
		^{90}Sr	(2 ± 7)	E-01
		^{234}U	(1.05 ± 0.07)	E+01
		^{235}U	(1.0 ± 0.1)	E+00
		^{238}U	(9.4 ± 0.6)	E+00
		Gamma Scan:		
		^{40}K	(1.042 ± 0.152)	E+01
		^{51}Cr	<2.298	E+01
		^{60}Co	<1.372	E-01
		^{65}Zn	<3.030	E-01
		^{134}Cs	<1.097	E-01
		^{137}Cs	<7.974	E-02
		^{226}Ra	(3.028 ± 1.187)	E-01
		^{228}Th	(8.587 ± 1.615)	E-01
		^{232}Th	(9.963 ± 3.666)	E-01

ATTACHMENT 1 DATA TABLE (cont'd, page five)

Collection date: 12/09/91 - 12/10/91

Customer I.D.	TMA/Norcal Group No. 7031	Analysis	Results pCi/L ± 2 σ	
BOOHC5 (water)	9	Gross Alpha	0 ± 1	
		Gross Beta	0 ± 1	
		^{3}H	(2.4 ± 1.3)	E+02
		^{90}Sr	(-0.05 ± 2)	E-01
		^{234}U	(4 ± 5)	E-02
		^{235}U	(-0.7 ± 1)	E-02
		^{238}U	(-0.6 ± 1)	E-02
		Gamma Scan:		
		^{40}K	<2.193	E+02
		^{51}Cr	<3.795	E+03
		^{60}Co	<1.328	E+01
		^{65}Zn	<4.384	E+01
		^{134}Cs	<1.486	E+01
		^{137}Cs	<1.383	E+01
		^{226}Ra	<2.543	E+01
		^{228}Th	<2.081	E+01
		^{232}Th	<5.986	E+01
BOOHC6 (water)	10	Gross Alpha	0 ± 1	
		Gross Beta	0 ± 2	
		^{3}H	(0.4 ± 1.15)	E+02
		^{90}Sr	(0.7 ± 2)	E-01
		^{234}U	<2.	E-02
		^{235}U	<2.	E-02
		^{238}U	<4.	E-02
		Gamma Scan:		
		^{40}K	<1.323	E+02
		^{51}Cr	<3.579	E+03
		^{60}Co	<1.287	E+01
		^{65}Zn	<4.018	E+01
		^{134}Cs	<1.162	E+01
		^{137}Cs	<1.138	E+01
		^{226}Ra	<3.203	E+01
		^{228}Th	<2.172	E+01
		^{232}Th	<3.899	E+01

CASE NARRATIVE

1. Project Hanford 300-FF-1, North Process Pond, PIT Location, soil and water (TMA/Norcal Group No. 7031) were processed and the results of the analyses are reported. The sample ID's are:

Customer Sample ID	TMA/Norcal Group No.	Customer Sample ID	TMA/Norcal Group No.
BOOH93 (Soil)	7031-1	BOOHB9 (Soil)	7031-6
BOOH96 (Soil)	7031-2	BOOHC1 (Soil)	7031-7
BOOH97 (Soil)	7031-3	BOOHC3 (Soil)	7031-8
BOOH99 (Soil)	7031-4	BOOHC5 (Water)	7031-9
BOOHB7 (Soil)	7031-5	BOOHC6 (Water)	7031-10

2. The analyses reported are:

SOIL AND WATER	
Analyte	Group # & Sample #
Gross Alpha and Beta	7031-1 - 10
^{3}H	7031-9 - 10
^{90}Sr	7031-1 - 10
Isotopic U	7031-1 - 10
Gamma Scan	7031-1 - 10

3. Results are reported pCi/gram dry material for soil and pCi/L for water with 2 σ errors.

4. The QC samples consisting of a spike, a lab control sample, and a replicate were processed with the soil and separate QC's were processed with the water samples.

5. The QC samples consisting of a spike, a lab control sample, and a replicate were processed with this batch as shown on Table 1.

TABLE 1

Preparation Batch Samples Processed	Data Package
7031-1 through 10	- Vegetation

9613501.2015

TMA

Sample I.D.	Type	Analyses	Reported with Data Package
7031-11 (QC 7448)	Spike*	Isotopic Uranium	X
7031-12 (QC 7449)	LCS*	Isotopic Uranium	X
7031-13 (QC 7450)	Replicate*	Isotopic Uranium	X
7031-14 (QC 7451)	Spike*	^{90}Sr	X
7031-15 (QC 7452)	LCS*	^{90}Sr	X
7031-16 (QC 7453)	Replicate*	^{90}Sr	X
7031-17 (QC 7454)	Spike*	Gross α,β	X
7031-18 (QC 7455)	LCS*	Gross α,β	X
7031-19 (QC 7456)	Replicate*	Gross α,β	X
7031-20 (QC 7457)	Spike*	Gamma Scan	X
7031-21 (QC 7458)	LCS*	Gamma Scan	X
7031-22 (QC 7459)	Replicate*	Gamma Scan	X
7031-23 (QC 7460)	Spike**	Isotopic Uranium	X
7031-24 (QC 7461)	LCS**	Isotopic Uranium	X
7031-25 (QC 7470)	Replicate**	Isotopic Uranium	X
7031-23 (QC 7462)	Spike**	^{90}Sr	X
7031-24 (QC 7463)	LCS**	^{90}Sr	X
7031-25 (QC 7464)	Replicate**	^{90}Sr	X
7031-29 (QC 7464)	Spike**	Gross α,β	X
7031-30 (QC 7465)	LCS**	Gross α,β	X
7031-31 (QC 7472)	Replicate**	Gross α,β	X
7031-32 (QC 7466)	Spike**	Gamma Scan	X
7031-33 (QC 7467)	LCS**	Gamma Scan	X
7031-34 (QC 7473)	Replicate**	Gamma Scan	X
7031-35 (QC 7468)	Spike**	^{3}H	X
7031-36 (QC 7469)	LCS**	^{3}H	X
7031-37 (QC 7474)	Replicate**	^{3}H	X

* Denotes Soil Sample
** Denotes Water Sample

6. Analyses, reanalyses, and reworks, etc.

Strontium Analyses (Soil and Water): The average yield for 10 analyses was 64%. The lowest yield was 33% and the highest was 76%. No abnormalities were encountered. The results of the spikes, the laboratory control samples, and the replicates were satisfactory.

Isotopic Uranium Analysis (Soil and Water): The average yield for 10 analyses was 58%. The lowest yield was 22% and the highest was 74%. No abnormalities were encountered. The results of the spike, the laboratory control sample, and the replicate were satisfactory.

Gamma Scan Analyses (Soil and Water): The spike samples processed had ^{60}Co and ^{137}Cs activities and the found/added ratio of the spike look good. The results of the spike, the laboratory control sample, and the replicate were satisfactory.

Tritium Analyses (Water): The results of the spike, the laboratory control sample, and the replicate were satisfactory. No abnormalities were encountered.

9613501.2017

TMA
Thermo Analytical Inc.

TMA/Norcal
2030 Wright Avenue
P. O. Box 4040
Richmond, CA 94804-0040
(510) 235-2633 Fax No. (510) 235-0438

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FINAL REPORT
SENT BY FEDERAL EXPRESS

April 16, 1992

Ref. TMA/Norcal N1-12-165-9580

Mr. John Bourgeault
Westinghouse Hanford Company
2355 Stevens Drive
Richland, WA 99352

Dear Mr. Bourgeault:

Enclosed on Attachment 1, are the gross alpha, gross beta, ^{90}Sr, isotopic uranium, and gamma scan results for the soil samples and gross alpha, gross beta, ^{3}H, ^{90}Sr, isotopic uranium, and gamma scan results for the water samples from 300-FF-1 Area, we received 13 December 1991.

Please call if you have any questions concerning this data.

Sincerely,

D. P. Kharkar

Dinkar P. Kharkar, Ph.D.
Manager, Nuclear Programs

Attachment 1

MS
7/16/96

CASE NARRATIVE

1. Project Hanford 300-FF-1 Area Soils and Water (TMA/Norcal Group Nos. 9580, 7001, 7008, and 7013) were processed together and the results of the analyses are reported. The sample ID's are:

Customer Sample ID	TMA/Norcal Group No.	Customer Sample ID	TMA/Norcal Group No.
B01CC9 (Water)	9580-1	B01CH0 (Soil)	7008-1
B01CD1 (Water)	9580-2	B01CH2 (Soil)	7008-2
B00HB1 (Soil)	9580-3	B01RJ0 (Soil)	7008-3
B00HB3 (Soil)	9580-4	B01RJ1 (Soil)	7008-4
B00HB5 (Soil)	9580-5	B01RJ2 (Soil)	7008-5
B01CF4 (Soil)	9580-6	B01RJ3 (Soil)	7008-6
B01CF5 (Soil)	9580-7	B01GN0 (Water)	7008-7
B01CF6 (Soil)	9580-8	B01GN1 (Water)	7008-8
B01CF7 (Soil)	9580-9	B01GM8 (Soil)	7008-9
B01CF8 (Soil)	9580-10	B01GM9 (Soil)	7008-10
B01GF4 (Soil)	9580-11	B01RL2 (Soil)	7008-11
B01GF6 (Soil)	9580-12	B01RL4 (Water)	7008-12
B01GF7 (Soil)	9580-13	B01RJ4 (Soil)	7008-13
B01GG9 (Soil)	9580-14	B01RK1 (Soil)	7013-1
B01GH0 (Soil)	9580-15	B01RJ1 (Soil)	7013-2
B01GM0 (Soil)	7001-1	B01RJ7 (Soil)	7013-3
B01GM1 (Soil)	7002-2	B01RJ8 (Soil)	7013-4
B01GM3 (Soil)	7003-3	B01RK2 (Soil)	7013-5
B01GM4 (Soil)	7001-4	B01RK3 (Soil)	7013-6
B01GM5 (Water)	7001-5	B01RK4 (Soil)	7013-7
B01GM6 (Water)	7001-6	B01GK7 (Soil)	7013-8
B01CG4 (Soil)	7001-7	B01GK4 (Soil)	7013-9
B00CG5 (Soil)	7001-8	B01GK5 (Soil)	7013-10
B01CG6 (Soil)	7001-9	B01GK8 (Soil)	7013-11
B01CG7 (Soil)	7001-10	B01GN3 (Soil)	7013-12
B01CG8 (Soil)	7001-11	B01GN4 (Water)	7013-13
B01CG9 (Soil)	7001-12	B01GN6 (Water)	7013-14
B01CH0 (Soil)	7001-13	B01RK8 (Soil)	7013-15
B01CG2 (Soil)	7001-14	B01RK9 (Soil)	7013-16
B01CG3 (Soil)	7001-15	B01RL7 (Water)	7013-17
B01CF9 (Soil)	7001-16	B01RL8 (Water)	7013-18
B01CG0 (Soil)	7001-17	B01CD4 (Soil)	7013-34

2. The analyses reported are gross alpha, gross beta, ^{90}Sr, isotopic U, and gamma scan for the following soil samples:

   9580-3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, and 15
   7001-1, 2, 3, 4, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, and 17
   7008-1, 2, 3, 4, 5, 6, 9, 10, and 13
   7013-1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 15, 16, 17, 18, and 34

Also reported are gross alpha, gross beta, ^{3}H, ^{90}Sr, isotopic U, and gamma scan for the following water samples:

9579-17, 18, 19, 20, and 21
9580-1 and 2
7001-5 and 6
7008-7, 8, 11, and 12
7013-13, 14, 17, and 18

3. Results are reported pCi/gram dry material for soil and pCi/L for water with 2 σ errors.

4. The QC samples consisting of a spike, a lab control sample, and a replicate were processed with this batch as shown on Table 1.

TABLE 1

Preparation Batch Samples Processed	Data Package
9580-1 and 2	- WATER
9580-3,4,5,6,7,8,9,10,11,12,13,14, and 15	- SOIL
7001-5 and 6	- WATER
7001-1,2,3,4,7,8,9,10,11,12,13,14,15,16, and 17	- SOIL
7008-8,11, and 12	- WATER
7008-1,2,3,4,5,6,9,10, and 13	- SOIL
7013-13,14,17, and 18	- WATER
7013-1,2,3,4,5,6,7,8,9,10,11,12,15,16, and 34	- SOIL

ATTACHMENT 1 DATA TABLE

Collection date: 12/11/91 - 12/15/91

Customer I.D.	TMA/Norcal Group No. 9580	Analysis	Results pCi/L ± 2 σ	
B01CC9 (water)	1	Gross Alpha	0 ± 1	
		Gross Beta	0 ± 1	
		^{3}H	11 ± 120	
		^{90}Sr	(-0.4 ± 1)	E+00
		^{234}U	(0 ± 0.2)	E-01
		^{235}U	(0.009 ± 0.02)	E+00
		^{238}U	(0.004 ± 0.02)	E+00
		Gamma Scan:		
		^{40}K	<1.236	E+02
		^{51}Cr	<8.464	E+02
		^{60}Co	<1.622	E+01
		^{65}Zn	<2.886	E+01
		^{134}Cs	<1.275	E+01
		^{137}Cs	<1.069	E+01
		^{226}Ra	<2.094	E+01
		^{228}Th	<1.873	E+01
		^{232}Th	<4.824	E+01
B01CD1 (water)	2	Gross Alpha	0 ± 0.4	
		Gross Beta	1 ± 1	
		^{3}H	-32 ± 117	
		^{90}Sr	(0.09 ± 0.2)	E+00
		^{234}U	(0 ± 0.04)	E+00
		^{235}U	(0 ± 0.02)	E+00
		^{238}U	(0.02 ± 0.03)	E+00
		Gamma Scan:		
		^{40}K	<2.114	E+02
		^{51}Cr	<8.798	E+02
		^{60}Co	<1.457	E+01
		^{65}Zn	<3.549	E+01
		^{134}Cs	<1.507	E+01
		^{137}Cs	<1.348	E+01
		^{226}Ra	<2.238	E+01
		^{228}Th	<2.019	E+01
		^{232}Th	<5.577	E+01

ATTACHMENT 1 DATA TABLE (cont'd, page two)

Collection date: 12/11/91 - 12/15/91

Customer I.D.	TMA/Norcal Group No. 9580	Analysis	Results pCi/g ± 2 σ	
BOOHB1 (soil)	3	Gross Alpha	942 ± 38	
		Gross Beta	1,069 ± 14	
		^{90}Sr	(2.1 ± 0.7)	E+00
		^{234}U	(1.10 ± 0.08)	E+03
		^{235}U	(1.1 ± 0.2)	E+02
		^{238}U	(9.0 ± 0.7)	E+02
		Gamma Scan:		
		^{40}K	(6.553 ± 2.236)	E+00
		^{51}Cr	<2.051	E+01
		^{60}Co	(3.518 ± 0.452)	E+00
		^{65}Zn	<7.027	E-01
		^{134}Cs	<3.933	E-01
		^{137}Cs	(3.752 ± 2.343)	E-01
		^{226}Ra	(9.309 ± 4.263)	E-01
		^{228}Th	(3.193 ± 0.317)	E+00
		^{232}Th	(3.546 ± 1.083)	E+00
		^{235}U	(2.046 ± 0.196)	E+01
		^{238}U	(4.307 ± 0.485)	E+02
BOOHB3 (soil)	4	Gross Alpha	52 ± 9	
		Gross Beta	54 ± 4	
		^{90}Sr	(0.05 ± 0.5)	E+00
		^{234}U	(1.28 ± 0.07)	E+02
		^{235}U	(2.5 ± 0.9)	E+00
		^{238}U	(1.16 ± 0.06)	E+02
		Gamma Scan:		
		^{40}K	(9.326 ± 2.031)	E+00
		^{51}Cr	<9.290	E+00
		^{60}Co	(2.400 ± 1.293)	E-01
		^{65}Zn	<3.297	E-01
		^{134}Cs	<1.671	E-01
		^{137}Cs	<1.866	E-01
		^{226}Ra	(3.273 ± 1.781)	E-01
		^{228}Th	(8.106 ± 2.157)	E-01
		^{232}Th	(8.338 ± 4.104)	E-01
		^{235}U	(3.165 ± 0.643)	E+00
		^{238}U	(7.219 ± 1.930)	E+01

ATTACHMENT 1 DATA TABLE (cont'd, page three)

Collection date: 12/11/91 - 12/15/91

Customer I.D.	TMA/Norcal Group No. 9580	Analysis	Results pCi/g ± 2 σ	
B00HB5 (soil)	5	Gross Alpha	17 ± 6	
		Gross Beta	16 ± 2	
		^{90}Sr	(0.4 ± 0.2)	E+00
		^{234}U	(4.2 ± 0.2)	E+01
		^{235}U	(4.4 ± 0.3)	E+00
		^{238}U	(3.4 ± 0.2)	E+01
		Gamma Scan:		
		^{40}K	(7.424 ± 1.356)	E+00
		^{51}Cr	<7.623	E+00
		^{60}Co	(3.151 ± 1.122)	E-01
		^{65}Zn	<2.458	E-01
		^{134}Cs	<1.121	E-01
		^{137}Cs	(1.175 ± 0.845)	E-01
		^{226}Ra	(4.135 ± 1.133)	E-01
		^{228}Th	(5.713 ± 1.075)	E-01
		^{232}Th	(4.891 ± 3.045)	E-01
		^{235}U	(6.352 ± 3.215)	E-01
		^{238}U	(9.113 ± 8.964)	E+00
B01CF4 (soil)	6	Gross Alpha	8 ± 5	
		Gross Beta	15 ± 3	
		^{90}Sr	(2 ± 2)	E-01
		^{234}U	(1.3 ± 0.1)	E+00
		^{235}U	(1 ± 0.4)	E-01
		^{238}U	(1.0 ± 0.1)	E+00
		Gamma Scan:		
		^{40}K	(8.864 ± 1.765)	E+00
		^{51}Cr	<9.276	E+00
		^{60}Co	<1.356	E-01
		^{65}Zn	<3.370	E-01
		^{134}Cs	<1.490	E-01
		^{137}Cs	<1.124	E-01
		^{226}Ra	(3.640 ± 1.898)	E-01
		^{228}Th	(5.821 ± 1.651)	E-01
		^{232}Th	<6.423	E-01

ATTACHMENT 1 DATA TABLE (cont'd, page four)

Collection date: 12/11/91 - 12/15/91

Customer I.D.	TMA/Norcal Group No. 9580	Analysis	Results pCi/g ± 2 σ	
B01CF5 (soil)	7	Gross Alpha	2 ± 3	
		Gross Beta	7 ± 2	
		^{90}Sr	(0.8 ± 0.2)	E+00
		^{234}U	(9 ± 1)	E-01
		^{235}U	(6 ± 4)	E-02
		^{238}U	(7 ± 1)	E-01
		Gamma Scan:		
		^{40}K	(7.360 ± 1.508)	E+00
		^{51}Cr	<6.251	E+00
		^{60}Co	(1.087 ± 0.906)	E-01
		^{65}Zn	<3.129	E-01
		^{134}Cs	<1.126	E-01
		^{137}Cs	<8.713	E-02
		^{226}Ra	(3.870 ± 1.379)	E-01
		^{228}Th	(4.984 ± 1.029)	E-01
		^{232}Th	(3.722 ± 2.601)	E-01
B01CF6 (soil)	8	Gross Alpha	5 ± 4	
		Gross Beta	9 ± 3	
		^{90}Sr	(0.009 ± 0.2)	E+00
		^{234}U	(8 ± 1)	E-01
		^{235}U	(4 ± 3)	E-02
		^{238}U	(8 ± 1)	E-01
		Gamma Scan:		
		^{40}K	(7.969 ± 1.405)	E+00
		^{51}Cr	<5.515	E+00
		^{60}Co	<7.991	E-02
		^{65}Zn	<2.181	E-01
		^{134}Cs	<9.955	E-02
		^{137}Cs	<9.483	E-02
		^{226}Ra	(4.108 ± 1.454)	E-01
		^{228}Th	(6.097 ± 0.885)	E-01
		^{232}Th	(7.258 ± 2.808)	E-01

ATTACHMENT 1 DATA TABLE (cont'd, page five)

Collection date: 12/11/91 - 12/15/91

Customer I.D.	TMA/Norcal Group No. 9580	Analysis	Results pCi/g ± 2 σ	
B01CF7 (soil)	9	Gross Alpha	2 ± 3	
		Gross Beta	9 ± 2	
		^{90}Sr	(-0.6 ± 2)	E+00
		^{234}U	(7 ± 1)	E-01
		^{235}U	(4 ± 3)	E-02
		^{238}U	(6 ± 1)	E-01
		Gamma Scan:		
		^{40}K	(9.059 ± 1.559)	E+00
		^{51}Cr	<5.256	E+00
		^{60}Co	<9.839	E-02
		^{65}Zn	<2.170	E-01
		^{134}Cs	<9.523	E-02
		^{137}Cs	<7.519	E-02
		^{226}Ra	(2.805 ± 1.326)	E-01
		^{228}Th	(4.908 ± 0.938)	E-01
		^{232}Th	(4.818 ± 2.851)	E-01
B01CF8 (soil)	10	Gross Alpha	2 ± 4	
		Gross Beta	6 ± 2	
		^{90}Sr	(0.1 ± 2)	E-01
		^{234}U	(6 ± 1)	E-01
		^{235}U	(4 ± 4)	E-02
		^{238}U	(7 ± 1)	E-01
		Gamma Scan:		
		^{40}K	(8.283 ± 1.474)	E+00
		^{51}Cr	<6.911	E+00
		^{60}Co	<1.113	E-01
		^{65}Zn	<3.066	E-01
		^{134}Cs	<1.167	E-01
		^{137}Cs	<1.009	E-01
		^{226}Ra	(4.137 ± 2.010)	E-01
		^{228}Th	(7.294 ± 1.844)	E-01
		^{232}Th	(7.376 ± 4.071)	E-01

ATTACHMENT 1 DATA TABLE (cont'd, page six)

Collection date: 12/11/91 - 12/15/91

Customer I.D.	TMA/Norcal Group No. 9580	Analysis	Results pCi/g ± 2 σ	
B01GF4 (soil)	11	Gross Alpha	68 ± 11	
		Gross Beta	61 ± 4	
		^{90}Sr	(4 ± 8)	E-01
		^{234}U	(3.6 ± 0.2)	E+01
		^{235}U	(9 ± 5)	E-01
		^{238}U	(4.3 ± 0.3)	E+01
		Gamma Scan:		
		^{40}K	(7.829 ± 1.681)	E+00
		^{51}Cr	<7.875	E+00
		^{60}Co	(4.532 ± 1.548)	E-01
		^{65}Zn	<3.764	E-01
		^{134}Cs	<1.550	E-01
		^{137}Cs	(1.193 ± 1.129)	E-01
		^{226}Ra	(3.732 ± 1.857)	E-01
		^{228}Th	(5.655 ± 1.951)	E-01
		^{232}Th	(6.683 ± 3.800)	E-01
		^{235}U	(1.126 ± 0.350)	E+00
		^{238}U	(3.014 ± 1.465)	E+01
B01GF6 (soil)	12	Gross Alpha	60 ± 10	
		Gross Beta	65 ± 4	
		^{90}Sr	(0.5 ± 0.2)	E+00
		^{234}U	(2.9 ± 0.2)	E+01
		^{235}U	(1.9 ± 0.2)	E+00
		^{238}U	(3.5 ± 0.2)	E+01
		Gamma Scan:		
		^{40}K	(7.872 ± 1.661)	E+00
		^{51}Cr	<7.423	E+00
		^{60}Co	(1.668 ± 0.906)	E-01
		^{65}Zn	<2.917	E-01
		^{134}Cs	<1.301	E-01
		^{137}Cs	(2.261 ± 1.128)	E-01
		^{226}Ra	(3.667 ± 2.199)	E-01
		^{228}Th	(6.733 ± 1.710)	E-01
		^{232}Th	(5.252 ± 3.627)	E-01
		^{235}U	(9.500 ± 4.342)	E-01
		^{238}U	(2.527 ± 1.255)	E+01

TMA

ATTACHMENT 1 DATA TABLE (cont'd, page seven)

Collection date: 12/11/91 - 12/15/91

Customer I.D.	TMA/Norcal Group No. 9580	Analysis	Results pCi/g ± 2 σ	
B01GF7 (soil)	13	Gross Alpha	78 ± 11	
		Gross Beta	71 ± 4	
		^{90}Sr	(-0.03 ± 0.7)	E+00
		^{234}U	(5.5 ± 0.3)	E+01
		^{235}U	(2.1 ± 0.8)	E+00
		^{238}U	(4.9 ± 0.3)	E+01
		Gamma Scan:		
		^{40}K	(7.013 ± 1.529)	E+00
		^{51}Cr	<7.710	E+00
		^{60}Co	(1.211 ± 0.185)	E+00
		^{65}Zn	<3.423	E-01
		^{134}Cs	<1.626	E-01
		^{137}Cs	(6.889 ± 1.187)	E-01
		^{226}Ra	(6.896 ± 2.363)	E-01
		^{228}Th	(6.862 ± 1.331)	E-01
		^{232}Th	(8.029 ± 3.826)	E-01
		^{235}U	(2.285 ± 0.535)	E+00
		^{238}U	(5.416 ± 1.739)	E+01
B01GG9 (soil)	14	Gross Alpha	18 ± 6	
		Gross Beta	18 ± 3	
		^{90}Sr	(-0.8 ± 5)	E+00
		^{234}U	(8.6 ± 0.7)	E+00
		^{235}U	(7 ± 1)	E-01
		^{238}U	(7.4 ± 0.6)	E+00
		Gamma Scan:		
		^{40}K	(7.682 ± 1.825)	E+00
		^{51}Cr	<7.467	E+00
		^{60}Co	(1.328 ± 1.269)	E-01
		^{65}Zn	<3.677	E-01
		^{134}Cs	<1.199	E-01
		^{137}Cs	(4.430 ± 1.440)	E-01
		^{141}Ce	(7.766 ± 7.121)	E-01
		^{226}Ra	(4.990 ± 1.440)	E-01
		^{228}Th	(5.732 ± 2.280)	E-01
		^{232}Th	(8.670 ± 5.781)	E-01
		^{235}U	(3.510 ± 3.218)	E-01

ATTACHMENT 1 DATA TABLE (cont'd, page seven)

Collection date: 12/11/91 - 12/15/91

Customer I.D.	TMA/Norcal Group No. 9580	Analysis	Results pCi/g ± 2 σ	
B01GH0 (soil)	15	Gross Alpha	10 ± 5	
		Gross Beta	13 ± 2	
		^{90}Sr	(0.2 ± 0.2)	E+00
		^{234}U	(5.8 ± 0.4)	E+00
		^{235}U	(5 ± 1)	E-01
		^{238}U	(5.6 ± 0.4)	E+00
		Gamma Scan:		
		^{40}K	(7.859 ± 1.607)	E+00
		^{51}Cr	<7.077	E+00
		^{60}Co	<1.455	E-01
		^{65}Zn	<3.367	E-01
		^{134}Cs	<9.858	E-02
		^{137}Cs	(2.825 ± 0.789)	E-01
		^{226}Ra	(4.183 ± 1.564)	E-01
		^{228}Th	(6.657 ± 1.611)	E-01
		^{232}Th	(5.780 ± 3.983)	E-01

9613501.2028

STINGHOUSE HANFORD COMPANY

Results of Analyses For:

GENERAL CHEMISTRY
CASE NO. 12-066
MA/ARLI Work Order #A1-12-066)

ORGANICS
CASE NO. 12-066
MA/ARLI Work Order #A1-12-066)

eral Chemistry and Organics results are
for the following WHC WATER samples:

B00HC5
B00HC6
B00HD8

Norcal Work Order #N1-12-130

Thermo Analytical Inc.
160 Taylor Street
Monrovia, CA 91016
818-357-3247

Received: 12/14/91

Results by Sample

SAMPLE ID B00HC5 FRACTION 01E TEST CODE WCCLPL NAME Anions & Wet Chem. - WH043

Date & Time Collected 12/09/91 Category

ANIONS AND WET CHEMISTRY - LIQUIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT
Fluoride	300	<0.1	mg/L	0.1
Nitrite	300	<0.1	mg/L	0.1
Nitrate	300	<0.2	mg/L	0.2
Sulfate	300	<1	mg/L	1.0
pH	150.1	9.8	pH	NA

FORM I

TMA Inc. REPORT

Work Order # A1-12-066

Received: 12/14/91

Results by Sample

SAMPLE ID B00HC5 FRACTION 01G TEST CODE WCCLPL NAME Anions & Wet Chem. - WH043

Date & Time Collected 12/09/91 Category

ANIONS AND WET CHEMISTRY - LIQUIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT
Ammonia	350	0.06	mg/L	0.05

FORM I

SAMPLE ID B00HC6 FRACTION 02C TEST CODE WCCLPL NAME Anions & Wet Chem. - WH043
Date & Time Collected 12/09/91 Category

ANIONS AND WET CHEMISTRY - LIQUIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT
Fluoride	300	<0.1	mg/L	0.1
Nitrite	300	<0.1	mg/L	0.1
Nitrate	300	<0.2	mg/L	0.2
Sulfate	300	<1	mg/L	1.0
pH	150.1	9.9	pH	NA

FORM I

Received: 12/14/91

Results by Sample

SAMPLE ID B00HC6 FRACTION 02E TEST CODE WCCLPL NAME Anions & Wet Chem. - WH043

Date & Time Collected 12/09/91 Category

ANIONS AND WET CHEMISTRY - LIQUIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT
Ammonia	350	0.06	mg/L	0.05

FORM I

CASE NARRATIVE

LABORATORY: TMA/ARLI

CASE: 12-066

CONTRACT ID: WESTINGHOUSE HANFORD COMPANY

SDG RECEIPT DATE: December 14, 1991

1.0 DESCRIPTION OF CASE:

Three water samples were analyzed for TCL Organics-Volatiles and Pesticide/PCB's according to the USEPA Contract Laboratory Program (CLP) Statement of Work for Organic Analysis, Revision 2/88.

The water samples for Pesticide/PCB analyses had insufficient sample volume to perform MS and MSD analyses. As per Westinghouse Hanford Company, a QC case (01-030) has been created using laboratory water. The QC case will be sent as an addendum to be added to this case.

2.0 SAMPLE LIST:

WESTINGHOUSE ID	LAB ID	ANALYSIS REQUESTED	MATRIX
B00HC5	A1-12-066-01A	V	WATER
B00HC5 MS	A1-12-066-01B	V	WATER
B00HC5 MSD	A1-12-066-01C	V	WATER
B00HC5	A1-12-066-01D	P	WATER
B00HC6	A1-12-066-02A	V	WATER
B00HC6	A1-12-066-02B	P	WATER
B00HD8	A1-12-066-03A	V	WATER
B00HC5 RE	A1-12-066-01A	V	WATER
B00HD8 RE	A1-12-066-03A	V	WATER

COMMENTS:

3.1 SHIPPING AND DOCUMENTATION:

All samples were received unbroken and properly documented.

3.2 ANALYSIS:

3.2.1 VOLATILE ANALYSIS COMMENTS:

LOW LEVEL WATER :

The samples were originally analyzed within the holding times specified in the EPA CLP SOW. Samples B00HC5 and B00HD8 were re-analyzed out of holding time on a different instrument (4500) because the ICAL and the 50 ppb Continuing Calibration Standard (CC-B12232) failed for SPCC compound Chloromethane on the original instrument (Bull). The CC (B122313) analyzed on 12/23/91 also failed to meet the criteria for CCC compounds Toluene and Vinyl Chloride. The blank (B12214) and sample B00HD8 failed to meet the QC limits for surrogates Toluene-d8 and 1,2-Dichloroethane-d4.

The original analyses of the samples and blank detected a TIC identified as substituted siloxane. In the re-analyses of the samples the TIC was not detected.

The MS and MSD pair was originally analyzed within holding time, however, they were associated with the standard that failed, and therefore they are not reported. The MS, MSD pair were re-analyzed out of holding time and reported in this package. The percent recoveries were all within the QC limits, however, the % RPD for all compounds were above the limits.

All of the QC results were within the limits specified by the EPA CLP SOW with the exceptions mentioned above.

TUNES:

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

3.2.2 PESTICIDE/PCB ANALYSIS COMMENTS:

SEQUENCE NOTES:

The sequence was started on 1/6/92 and was analyzed in accordance with the EPA CLP SOW. IND A and IND B were run consecutively at several times in the sequence. The following standards were used for quantitation:

IND A	04:00	1/7/92	(B10624)
IND B	12:51	1/7/92	(B10636)
IND A	22:01	1/7/92	(B10648)
IND B	07:32	1/8/92	(B10661)
IND A	16:32	1/8/92	(B10673)
IND B	01:56	1/9/92	(B10686)
IND A	08:32	1/9/92	(B10695)
IND B	09:16	1/9/92	(B10696)

Due to the limitations of the software used to report 2/88 CLP Protocol results for Pesticide/PCB's, instrument blanks cannot be reported. An instrument blank (B10639 and A10639) was injected at 15:23 on 1/7/92. The analysis indicated that there was no contamination in the system.

SAMPLES:

LOW LEVEL WATER :

The samples were extracted and analyzed within the CLP SOW holding times. The samples were extracted and analyzed without an MS, MSD pair, since WHC did not submit enough sample for their analyses. All of the other QC results were within the limits specified in the EPA CLP SOW.

A QC case (01-030) has been created as per Westinghouse Hanford Company. The samples are laboratory water with and MS and MSD pair. The case will be available at a later time to be added as an addendum to this case.

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 diskette is authorized by the Laboratory Manager or his designee, as verified by the following signatures.

Nicole Roth
CLP Program Manager

Dennis D. Wells
Technical Director

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B00HC5

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMA Case No.: 12066 SAS No.: NA SDG No.: NA

Matrix: (soil/water) WATER Lab Sample ID: A112066-01A

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: B122315

Level: (low/med) LOW Date Received: 12/14/91

% Moisture: not dec. ____ Date Analyzed: 12/23/91

Column: (pack/cap) WIDE Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
74-87-3	Chloromethane	10	U
74-83-9	Bromomethane	10	U
75-01-4	Vinyl Chloride	10	U
75-00-3	Chloroethane	10	U
75-09-2	Methylene Chloride	13	B
67-64-1	Acetone	20	B
75-15-0	Carbon Disulfide	5	U
75-35-4	1,1-Dichloroethene	5	U
75-34-3	1,1-Dichloroethane	5	U
540-59-0	1,2-Dichloroethene (total)	5	U
67-66-3	Chloroform	5	U
107-06-2	1,2-Dichloroethane	5	U
78-93-3	2-Butanone	10	U
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
108-05-4	Vinyl Acetate	10	U
75-27-4	Bromodichloromethane	5	U
78-87-5	1,2-Dichloropropane	5	U
10061-01-5	cis-1,3-Dichloropropene	5	U
79-01-6	Trichloroethene	5	U
124-48-1	Dibromochloromethane	5	U
79-00-5	1,1,2-Trichloroethane	5	U
71-43-2	Benzene	5	U
10061-02-6	trans-1,3-Dichloropropene	5	U
75-25-2	Bromoform	5	U
108-10-1	4-Methyl-2-Pentanone	10	U
591-78-6	2-Hexanone	10	U
127-18-4	Tetrachloroethene	5	U
79-34-5	1,1,2,2-Tetrachloroethane	5	U
108-88-3	Toluene	5	U
108-90-7	Chlorobenzene	5	U
100-41-4	Ethylbenzene	5	U
100-42-5	Styrene	5	U
1330-20-7	Xylene (Total)	5	U

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B00HC5

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMA Case No.: 12066 SAS No.: NA SDG No.: NA

Matrix: (soil/water) WATER Lab Sample ID: A112066-01A

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: B122315

Level: (low/med) LOW Date Received: 12/14/91

% Moisture: not dec. ____ Date Analyzed: 12/23/91

Column (pack/cap) WIDE Dilution Factor: 1.0

Number TICs found: 2

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	Subst. Siloxane	11.30	23	BJ
2.	Subst. Siloxane	12.25	9.0	J

9615501.2039

0008

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B00HC5RE

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMA Case No.: 12066 SAS No.: NA SDG No.: NA

Matrix: (soil/water) WATER Lab Sample ID: A112066-01A

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 102K19

Level: (low/med) LOW Date Received: 12/14/91

% Moisture: not dec. ____ Date Analyzed: 01/02/92

Column: (pack/cap) PACK Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
74-87-3	Chloromethane	10	U
74-83-9	Bromomethane	10	U
75-01-4	Vinyl Chloride	10	U
75-00-3	Chloroethane	10	U
75-09-2	Methylene Chloride	2	BJ
67-64-1	Acetone	10	B
75-15-0	Carbon Disulfide	5	U
75-35-4	1,1-Dichloroethene	5	U
75-34-3	1,1-Dichloroethane	5	U
540-59-0	1,2-Dichloroethene (total)	5	U
67-66-3	Chloroform	5	U
107-06-2	1,2-Dichloroethane	5	U
78-93-3	2-Butanone	10	U
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
108-05-4	Vinyl Acetate	10	U
75-27-4	Bromodichloromethane	5	U
78-87-5	1,2-Dichloropropane	5	U
10061-01-5	cis-1,3-Dichloropropene	5	U
79-01-6	Trichloroethene	5	U
124-48-1	Dibromochloromethane	5	U
79-00-5	1,1,2-Trichloroethane	5	U
71-43-2	Benzene	5	U
10061-02-6	trans-1,3-Dichloropropene	5	U
75-25-2	Bromoform	5	U
108-10-1	4-Methyl-2-Pentanone	10	U
591-78-6	2-Hexanone	10	U
127-18-4	Tetrachloroethene	5	U
79-34-5	1,1,2,2-Tetrachloroethane	5	U
108-88-3	Toluene	5	U
108-90-7	Chlorobenzene	5	U
100-41-4	Ethylbenzene	5	U
100-42-5	Styrene	5	U
1330-20-7	Xylene (Total)	5	U

9613501.2040

0009

EPA SAMPLE NO.

B00HC5RE

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMA Case No.: 12066 SAS No.: NA SDG No.: NA

Matrix: (soil/water) WATER Lab Sample ID: A112066-01A

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 102K19

Level: (low/med) LOW Date Received: 12/14/91

% Moisture: not dec. ____ Date Analyzed: 01/02/92

Column (pack/cap) PACK Dilution Factor: 1.0

Number TICs found: 0

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

9613501.2041

0010

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B00HC6

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMA Case No.: 12066 SAS No.: NA SDG No.: NA

Matrix: (soil/water) WATER Lab Sample ID: A112066-02A

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 1224K09

Level: (low/med) LOW Date Received: 12/14/91

% Moisture: not dec. Date Analyzed: 12/24/91

Column: (pack/cap) PACK Dilution Factor: 1.0

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

CAS NO.	COMPOUND		Q
74-87-3	Chloromethane	10	U
74-83-9	Bromomethane	10	U
75-01-4	Vinyl Chloride	10	U
75-00-3	Chloroethane	10	U
75-09-2	Methylene Chloride	18	B
67-64-1	Acetone	17	B
75-15-0	Carbon Disulfide	5	U
75-35-4	1,1-Dichloroethene	5	U
75-34-3	1,1-Dichloroethane	5	U
540-59-0	1,2-Dichloroethene (total)	5	U
67-66-3	Chloroform	5	U
107-06-2	1,2-Dichloroethane	5	U
78-93-3	2-Butanone	10	U
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
108-05-4	Vinyl Acetate	10	U
75-27-4	Bromodichloromethane	5	U
78-87-5	1,2-Dichloropropane	5	U
10061-01-5	cis-1,3-Dichloropropene	5	U
79-01-6	Trichloroethene	5	U
124-48-1	Dibromochloromethane	5	U
79-00-5	1,1,2-Trichloroethane	5	U
71-43-2	Benzene	5	U
10061-02-6	trans-1,3-Dichloropropene	5	U
75-25-2	Bromoform	5	U
108-10-1	4-Methyl-2-Pentanone	10	U
591-78-6	2-Hexanone	10	U
127-18-4	Tetrachloroethene	5	U
79-34-5	1,1,2,2-Tetrachloroethane	5	U
108-88-3	Toluene	5	U
108-90-7	Chlorobenzene	5	U
100-41-4	Ethylbenzene	5	U
100-42-5	Styrene	5	U
1330-20-7	Xylene (Total)	5	U

9613501.2042

0011

EPA SAMPLE NO.

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

B00HC6

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMA Case No.: 12066 SAS No.: NA SDG No.: NA

Matrix: (soil/water) WATER Lab Sample ID: A112066-02A

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 1224K09

Level: (low/med) LOW Date Received: 12/14/91

% Moisture: not dec. ____ Date Analyzed: 12/24/91

Column (pack/cap) PACK Dilution Factor: 1.0

Number TICs found: 0

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

9613501.2043

0012

EPA SAMPLE NO.

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

B00HD8

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMA Case No.: 12066 SAS No.: NA SDG No.: NA

Matrix: (soil/water) WATER Lab Sample ID: A112066-03A

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: B122318

Level: (low/med) LOW Date Received: 12/14/91

% Moisture: not dec. ____ Date Analyzed: 12/23/91

Column: (pack/cap) WIDE Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
74-87-3	Chloromethane	10	U
74-83-9	Bromomethane	10	U
75-01-4	Vinyl Chloride	10	U
75-00-3	Chloroethane	10	U
75-09-2	Methylene Chloride	16	B
67-64-1	Acetone	14	B
75-15-0	Carbon Disulfide	5	U
75-35-4	1,1-Dichloroethene	5	U
75-34-3	1,1-Dichloroethane	5	U
540-59-0	1,2-Dichloroethene (total)	5	U
67-66-3	Chloroform	0.7	J
107-06-2	1,2-Dichloroethane	5	U
78-93-3	2-Butanone	10	U
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
108-05-4	Vinyl Acetate	10	U
75-27-4	Bromodichloromethane	5	U
78-87-5	1,2-Dichloropropane	5	U
10061-01-5	cis-1,3-Dichloropropene	5	U
79-01-6	Trichloroethene	5	U
124-48-1	Dibromochloromethane	5	U
79-00-5	1,1,2-Trichloroethane	5	U
71-43-2	Benzene	5	U
10061-02-6	trans-1,3-Dichloropropene	5	U
75-25-2	Bromoform	5	U
108-10-1	4-Methyl-2-Pentanone	10	U
591-78-6	2-Hexanone	10	U
127-18-4	Tetrachloroethene	5	U
79-34-5	1,1,2,2-Tetrachloroethane	5	U
108-88-3	Toluene	5	U
108-90-7	Chlorobenzene	5	U
100-41-4	Ethylbenzene	5	U
100-42-5	Styrene	5	U
1330-20-7	Xylene (Total)	5	U

9613501.2044

0013

EPA SAMPLE NO.

B00HD8

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMA Case No.: 12066 SAS No.: NA SDG No.: NA

Matrix: (soil/water) WATER Lab Sample ID: A112066-03A

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: B122318

Level: (low/med) LOW Date Received: 12/14/91

% Moisture: not dec. ____ Date Analyzed: 12/23/91

Column (pack/cap) WIDE Dilution Factor: 1.0

Number TICs found: 1

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	Subst. Siloxane	11.34	7.0	BJ

9613501.2045

0014

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B00HD8RE

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMA Case No.: 12066 SAS No.: NA SDG No.: NA

Matrix: (soil/water) WATER Lab Sample ID: A112066-03A

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 102K23

Level: (low/med) LOW Date Received: 12/14/91

% Moisture: not dec. ____ Date Analyzed: 01/03/92

Column: (pack/cap) PACK Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
74-87-3	Chloromethane	10	U
74-83-9	Bromomethane	10	U
75-01-4	Vinyl Chloride	10	U
75-00-3	Chloroethane	10	U
75-09-2	Methylene Chloride	5	B
67-64-1	Acetone	7	BJ
75-15-0	Carbon Disulfide	5	U
75-35-4	1,1-Dichloroethene	5	U
75-34-3	1,1-Dichloroethane	5	U
540-59-0	1,2-Dichloroethene (total)	5	U
67-66-3	Chloroform	5	U
107-06-2	1,2-Dichloroethane	5	U
78-93-3	2-Butanone	10	U
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
108-05-4	Vinyl Acetate	10	U
75-27-4	Bromodichloromethane	5	U
78-87-5	1,2-Dichloropropane	5	U
10061-01-5	cis-1,3-Dichloropropene	5	U
79-01-6	Trichloroethene	5	U
124-48-1	Dibromochloromethane	5	U
79-00-5	1,1,2-Trichloroethane	5	U
71-43-2	Benzene	5	U
10061-02-6	trans-1,3-Dichloropropene	5	U
75-25-2	Bromoform	5	U
108-10-1	4-Methyl-2-Pentanone	10	U
591-78-6	2-Hexanone	10	U
127-18-4	Tetrachloroethene	5	U
79-34-5	1,1,2,2-Tetrachloroethane	5	U
108-88-3	Toluene	5	U
108-90-7	Chlorobenzene	5	U
100-41-4	Ethylbenzene	5	U
100-42-5	Styrene	5	U
1330-20-7	Xylene (Total)	5	U

9613501.2046

0013

1E

EPA SAMPLE NO.

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

B00HD8RE

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMA Case No.: 12066 SAS No.: NA SDG No.: NA

Matrix: (soil/water) WATER Lab Sample ID: A112066-03A

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 102K23

Level: (low/med) LOW Date Received: 12/14/91

% Moisture: not dec. ____ Date Analyzed: 01/03/92

Column (pack/cap) PACK Dilution Factor: 1.0

Number TICs found: 0

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

9613501.2047

0010

1D

EPA SAMPLE NO.

PESTICIDE ORGANICS ANALYSIS DATA SHEET

B00HC5

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12066 SAS No.: NA SDG No.: NA

Matrix: (soil/water) WATER Lab Sample ID: A112066-01D

Sample wt/vol: 1000 (g/mL) ML Lab File ID: _____

Level: (low/med) LOW Date Received: 12/14/91

% Moisture: not dec. __ dec. __ Date Extracted: 12/19/91

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 01/07/92

GPC Cleanup: (Y/N) N pH: ____ Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
319-84-6	alpha-BHC	0.050	U
319-85-7	beta-BHC	0.050	U
319-86-8	delta-BHC	0.050	U
58-89-9	gamma-BHC (Lindane)	0.050	U
76-44-8	Heptachlor	0.050	U
309-00-2	Aldrin	0.050	U
1024-57-3	Heptachlor epoxide	0.050	U
959-98-8	Endosulfan I	0.050	U
60-57-1	Dieldrin	0.10	U
72-55-9	4,4'-DDE	0.10	U
72-20-8	Endrin	0.10	U
33213-65-9	Endosulfan II	0.10	U
72-54-8	4,4'-DDD	0.10	U
1031-07-8	Endosulfan sulfate	0.10	U
50-29-3	4,4'-DDT	0.10	U
72-43-5	Methoxychlor	0.50	U
53494-70-5	Endrin ketone	0.10	U
5103-71-9	alpha-Chlordane	0.50	U
5103-74-2	gamma-Chlordane	0.50	U
8001-35-2	Toxaphene	1.0	U
12674-11-2	Aroclor-1016	0.50	U
11104-28-2	Aroclor-1221	0.50	U
11141-16-5	Aroclor-1232	0.50	U
53469-21-9	Aroclor-1242	0.50	U
12672-29-6	Aroclor-1248	0.50	U
11097-69-1	Aroclor-1254	1.0	U
11096-82-5	Aroclor-1260	1.0	U

9613501.2048

1D

PESTICIDE ORGANICS ANALYSIS DATA SHEET

0017
EPA SAMPLE NO.

B00HC6

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12066 SAS No.: NA SDG No.: NA

Matrix: (soil/water) WATER Lab Sample ID: A112066-02B

Sample wt/vol: 1000 (g/mL) ML Lab File ID: _____

Level: (low/med) LOW Date Received: 12/14/91

% Moisture: not dec. __ dec. __ Date Extracted: 12/19/91

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 01/07/92

GPC Cleanup: (Y/N) N pH: ____ Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
319-84-6	alpha-BHC	0.050	U
319-85-7	beta-BHC	0.050	U
319-86-8	delta-BHC	0.050	U
58-89-9	gamma-BHC (Lindane)	0.050	U
76-44-8	Heptachlor	0.050	U
309-00-2	Aldrin	0.050	U
1024-57-3	Heptachlor epoxide	0.050	U
959-98-8	Endosulfan I	0.050	U
60-57-1	Dieldrin	0.10	U
72-55-9	4,4'-DDE	0.10	U
72-20-8	Endrin	0.10	U
33213-65-9	Endosulfan II	0.10	U
72-54-8	4,4'-DDD	0.10	U
1031-07-8	Endosulfan sulfate	0.10	U
50-29-3	4,4'-DDT	0.10	U
72-43-5	Methoxychlor	0.50	U
53494-70-5	Endrin ketone	0.10	U
5103-71-9	alpha-Chlordane	0.50	U
5103-74-2	gamma-Chlordane	0.50	U
8001-35-2	Toxaphene	1.0	U
12674-11-2	Aroclor-1016	0.50	U
11104-28-2	Aroclor-1221	0.50	U
11141-16-5	Aroclor-1232	0.50	U
53469-21-9	Aroclor-1242	0.50	U
12672-29-6	Aroclor-1248	0.50	U
11097-69-1	Aroclor-1254	1.0	U
11096-82-5	Aroclor-1260	1.0	U

9613501.2049

TMA/Norcal

FEB 1992
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WESTINGHOUSE HANFORD COMPANY

Results of Analyses For:

ORGANICS
Case No. 12-060
(TMA/ARLI Work Order # A1-12-060)

METALS
Case No. N112112
(TMA/Skinner & Sherman W.O. # 91-12-146)

TMA Master Work Order N1-12-112

February 18, 1992

MS
7/15/96

WESTINGHOUSE HANFORD COMPANY

Results of Analyses For:

GENERAL CHEMISTRY
CASE NO. 12-060
(TMA/ARLI Work Order # A1-12-060)

ORGANICS
CASE NO. 12-060
(TMA/ARLI Work Order # A1-12-060)

General Chemistry and Organics results are presented for the following WHC WATER samples(s):

B01CC9
B01CD1
B01CD0

Norcal Work Order # N1-12-112

Thermo Analytical Inc.
160 Taylor Street
Monrovia, Ca. 91016
818-357-3247

Page 2 TMA Inc. REPORT Work Order # A1-12-060

Received: 12/13/91 Results by Sample

SAMPLE ID B01CC9 FRACTION 01D TEST CODE WCCLPL NAME Anions & Wet Chem. - WM043

Date & Time Collected 12/11/91 Category

ANIONS AND WET CHEMISTRY - LIQUIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT
Fluoride	300	<0.1	mg/L	0.1
Nitrite	300	<0.1	mg/L	0.1
Nitrate	300	<0.2	mg/L	0.2
Sulfate	300	<1	mg/L	1.0
pH	150.1	9.9	pH	NA

FORM I

Received: 12/13/91

Results by Sample

SAMPLE ID B01CC9 FRACTION 01F TEST CODE WCCLPL NAME Anions & Wet Chem. - WN043

Date & Time Collected 12/11/91 Category

ANIONS AND WET CHEMISTRY - LIQUIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT
Ammonia	350	<0.05	mg/L	0.05

FORM I

Received: 12/13/91

Results by Sample

SAMPLE ID B01CD1 FRACTION 02B TEST CODE WCCLPL NAME Anions & Wet Chem. - WH043

Date & Time Collected 12/11/91 Category

ANIONS AND WET CHEMISTRY - LIQUIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT
Fluoride	300	<0.1	mg/L	0.1
Nitrite	300	<0.1	mg/L	0.1
Nitrate	300	<0.2	mg/L	0.2
Sulfate	300	<1	mg/L	1.0
pH	150.1	10.0	pH	NA

FORM I

TMA Inc. REPORT

Work Order # A1-12-060

Received: 12/13/91

Results by Sample

SAMPLE ID B01CD1 FRACTION 02C TEST CODE WCCLPL NAME Anions & Wet Chem. - WH043

Date & Time Collected 12/11/91 Category

ANIONS AND WET CHEMISTRY - LIQUIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT
Ammonia	350	<0.05	mg/L	0.05

FORM I

CASE NARRATIVE

LABORATORY: TMA/ARLI

CASE: 12-060

CONTRACT ID: WESTINGHOUSE HANFORD COMPANY

SDG RECEIPT DATE: December 13, 1991

1.0 DESCRIPTION OF CASE:

Three water samples were analyzed for TCL Organics-Volatiles and Pesticide/PCB's according to the USEPA Contract Laboratory Program (CLP) Statement of Work for Organic Analysis, Revision 2/88.

The water samples for Pesticide/PCB analyses had insufficient sample volume to perform MS and MSD analyses. As per Westinghouse Hanford Company, a QC case (01-030) has been created using laboratory water. The QC case will be sent as an addendum to be added to this case.

2.0 SAMPLE LIST:

WESTINGHOUSE ID	LAB ID	ANALYSIS REQUESTED	MATRIX
B01CC9	A1-12-060-01A	P	WATER
B01CC9	A1-12-060-01H	V	WATER
B01CD1	A1-12-060-02A	P	WATER
B01CD1	A1-12-060-02D	V	WATER
B01CD1 MS	A1-12-060-02E	V	WATER
B01CD1 MSD	A1-12-060-02F	V	WATER
B01CD0	A1-12-060-03A	V	WATER

COMMENTS:

3.1 SHIPPING AND DOCUMENTATION:

All samples were received unbroken and properly documented.

3.2 ANALYSIS:

3.2.1 VOLATILE ANALYSIS COMMENTS:

LOW LEVEL WATER :

The samples were originally analyzed within the holding times specified in the EPA CLP SOW. The samples were re-analyzed out of holding time on a different instrument (4500) because the ICAL and the 50 ppb Continuing Calibration Standard (CC) failed for SPCC compound Chloromethane on the original instrument (Bull).

The MS and MSD were originally analyzed within the holding time, however, not reported because they failed to meet the QC criteria. The reported MS and MSD were analyzed outside of holding time. The matrix spike recoveries for the MS and MSD pair were within the limits.

The original analyses of the samples and blank detected TICs identified as substituted siloxane. In the re-analyses of the samples these TICs were not detected.

In the original analyses of samples B01CD0 and B01CD1 there were trace amounts of matrix spike compounds detected. When the samples were re-analyzed (out of hold time) these compounds were not detected. The re-analysis of sample B01CD1 detected 8 ug/L of Vinyl Acetate, which was not detected in the original analysis. The possibility of contamination is being investigated.

All of the QC results were within the limits specified by the EPA CLP SOW with the exceptions mentioned above.

TUNES:

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

3.2.2 PESTICIDE/PCB ANALYSIS COMMENTS:

SEQUENCE NOTES:

The sequence was started on 1/6/92 and was analyzed in accordance with the EPA CLP SOW. IND A and IND B were run consecutively at several times in the sequence. The following standards were used for quantitation:

IND A	04:00	1/7/92	(B10624)
IND B	12:51	1/7/92	(B10636)
IND A	22:01	1/7/92	(B10648)
IND B	07:32	1/8/92	(B10661)
IND A	16:32	1/8/92	(B10673)
IND B	01:56	1/9/92	(B10686)
IND A	08:32	1/9/92	(B10695)
IND B	09:16	1/9/92	(B10696)

Due to the limitations of the software used to report 2/88 CLP Protocol results for Pesticide/PCB's, instrument blanks cannot be reported. An instrument blank (B10639 and A10639) was injected at 15:23 on 1/7/92. The analysis indicated that there was no contamination in the system.

SAMPLES:

LOW LEVEL WATER :

The samples were extracted andanalyzed within the CLP SOW holding times. The samples were extracted and analyzed without an MS, MSD pair, since WHC did not submit enough sample for their analyses. All of the other QC results were within the limits specified in the EPA CLP SOW.

A QC case (01-030) has been created as per Westinghouse Hanford Company. The samples are laboratory water with and MS and MSD pair. The case will be available at a later time to be added as an addendum to this case.

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 diskette is authorized by the Laboratory Manager or his designee, as verified by the following signatures.

Nicole Roth

Nicole Roth
CLP Program Manager

Dennis D. Wells
Technical Director

9613501.2059

0006

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B01CC9

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMA Case No.: 12060 SAS No.: NA SDG No.: NA

Matrix: (soil/water) WATER Lab Sample ID: A112060-01H

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: B12208

Level: (low/med) LOW Date Received: 12/13/91

% Moisture: not dec. ____ Date Analyzed: 12/20/91

Column: (pack/cap) WIDE Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
74-87-3	Chloromethane	10	U
74-83-9	Bromomethane	10	U
75-01-4	Vinyl Chloride	10	U
75-00-3	Chloroethane	10	U
75-09-2	Methylene Chloride	11	B
67-64-1	Acetone	28	B
75-15-0	Carbon Disulfide	5	U
75-35-4	1,1-Dichloroethene	5	U
75-34-3	1,1-Dichloroethane	5	U
540-59-0	1,2-Dichloroethene (total)	5	U
67-66-3	Chloroform	5	U
107-06-2	1,2-Dichloroethane	5	U
78-93-3	2-Butanone	10	U
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
108-05-4	Vinyl Acetate	10	U
75-27-4	Bromodichloromethane	5	U
78-87-5	1,2-Dichloropropane	5	U
10061-01-5	cis-1,3-Dichloropropene	5	U
79-01-6	Trichloroethene	5	U
124-48-1	Dibromochloromethane	5	U
79-00-5	1,1,2-Trichloroethane	5	U
71-43-2	Benzene	5	U
10061-02-6	trans-1,3-Dichloropropene	5	U
75-25-2	Bromoform	5	U
108-10-1	4-Methyl-2-Pentanone	10	U
591-78-6	2-Hexanone	10	U
127-18-4	Tetrachloroethene	5	U
79-34-5	1,1,2,2-Tetrachloroethane	5	U
108-88-3	Toluene	5	U
108-90-7	Chlorobenzene	5	U
100-41-4	Ethylbenzene	5	U
100-42-5	Styrene	5	U
1330-20-7	Xylene (Total)	5	U

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0007

EPA SAMPLE NO.

B01CC9

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMA Case No.: 12060 SAS No.: NA SDG No.: NA

Matrix: (soil/water) WATER Lab Sample ID: A112060-01H

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: B12208

Level: (low/med) LOW Date Received: 12/13/91

% Moisture: not dec. ____ Date Analyzed: 12/20/91

Column (pack/cap) WIDE Dilution Factor: 1.0

Number TICs found: 2

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	Subst. siloxane	11.30	14	BJ
2.	Subst. siloxane	12.25	11	BJ

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0008

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B01CC9RE

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMA Case No.: 12060 SAS No.: NA SDG No.: NA

Matrix: (soil/water) WATER Lab Sample ID: A112060-01H

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 106K03

Level: (low/med) LOW Date Received: 12/13/91

% Moisture: not dec. ____ Date Analyzed: 01/06/92

Column: (pack/cap) PACK Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
74-87-3	Chloromethane	10	U
74-83-9	Bromomethane	10	U
75-01-4	Vinyl Chloride	10	U
75-00-3	Chloroethane	10	U
75-09-2	Methylene Chloride	5	U
67-64-1	Acetone	8	BJ
75-15-0	Carbon Disulfide	5	U
75-35-4	1,1-Dichloroethene	5	U
75-34-3	1,1-Dichloroethane	5	U
540-59-0	1,2-Dichloroethene (total)	5	U
67-66-3	Chloroform	5	U
107-06-2	1,2-Dichloroethane	5	U
78-93-3	2-Butanone	10	U
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
108-05-4	Vinyl Acetate	10	U
75-27-4	Bromodichloromethane	5	U
78-87-5	1,2-Dichloropropane	5	U
10061-01-5	cis-1,3-Dichloropropene	5	U
79-01-6	Trichloroethene	5	U
124-48-1	Dibromochloromethane	5	U
79-00-5	1,1,2-Trichloroethane	5	U
71-43-2	Benzene	5	U
10061-02-6	trans-1,3-Dichloropropene	5	U
75-25-2	Bromoform	5	U
108-10-1	4-Methyl-2-Pentanone	10	U
591-78-6	2-Hexanone	10	U
127-18-4	Tetrachloroethene	5	U
79-34-5	1,1,2,2-Tetrachloroethane	5	U
108-88-3	Toluene	5	U
108-90-7	Chlorobenzene	5	U
100-41-4	Ethylbenzene	5	U
100-42-5	Styrene	5	U
1330-20-7	Xylene (Total)	5	U

EPA SAMPLE NO.

B01CC9RE

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMA Case No.: 12060 SAS No.: NA SDG No.: NA

Matrix: (soil/water) WATER Lab Sample ID: A112060-01H

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 106K03

Level: (low/med) LOW Date Received: 12/13/91

% Moisture: not dec. ____ Date Analyzed: 01/06/92

Column (pack/cap) PACK Dilution Factor: 1.0

Number TICs found: 0

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B01CD0

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMA Case No.: 12060 SAS No.: NA SDG No.: NA

Matrix: (soil/water) WATER Lab Sample ID: A112060-03A

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: B122010

Level: (low/med) LOW Date Received: 12/13/91

% Moisture: not dec. ____ Date Analyzed: 12/20/91

Column: (pack/cap) WIDE Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
74-87-3	Chloromethane	10	U
74-83-9	Bromomethane	10	U
75-01-4	Vinyl Chloride	10	U
75-00-3	Chloroethane	10	U
75-09-2	Methylene Chloride	13	B
67-64-1	Acetone	10	U
75-15-0	Carbon Disulfide	5	U
75-35-4	1,1-Dichloroethene	5	U
75-34-3	1,1-Dichloroethane	5	U
540-59-0	1,2-Dichloroethene (total)	5	U
67-66-3	Chloroform	0.7	J
107-06-2	1,2-Dichloroethane	5	U
78-93-3	2-Butanone	10	U
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
108-05-4	Vinyl Acetate	10	U
75-27-4	Bromodichloromethane	5	U
78-87-5	1,2-Dichloropropane	5	U
10061-01-5	cis-1,3-Dichloropropene	5	U
79-01-6	Trichloroethene	1	J
124-48-1	Dibromochloromethane	5	U
79-00-5	1,1,2-Trichloroethane	5	U
71-43-2	Benzene	2	J
10061-02-6	trans-1,3-Dichloropropene	5	U
75-25-2	Bromoform	5	U
108-10-1	4-Methyl-2-Pentanone	10	U
591-78-6	2-Hexanone	10	U
127-18-4	Tetrachloroethene	5	U
79-34-5	1,1,2,2-Tetrachloroethane	5	U
108-88-3	Toluene	2	J
108-90-7	Chlorobenzene	2	J
100-41-4	Ethylbenzene	5	U
100-42-5	Styrene	5	U
1330-20-7	Xylene (Total)	5	U

EPA SAMPLE NO.

B01CD0

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMA Case No.: 12060 SAS No.: NA SDG No.: NA

Matrix: (soil/water) WATER Lab Sample ID: A112060-03A

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: B122010

Level: (low/med) LOW Date Received: 12/13/91

% Moisture: not dec. ____ Date Analyzed: 12/20/91

Column (pack/cap) WIDE Dilution Factor: 1.0

Number TICs found: 1

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	Subst. siloxane	11.30	44	BJ

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B01CD0RE

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMA Case No.: 12060 SAS No.: NA SDG No.: NA

Matrix: (soil/water) WATER Lab Sample ID: A112060-03A

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 106K05

Level: (low/med) LOW Date Received: 12/13/91

% Moisture: not dec. ____ Date Analyzed: 01/06/92

Column: (pack/cap) PACK Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
74-87-3	Chloromethane	10	U
74-83-9	Bromomethane	10	U
75-01-4	Vinyl Chloride	10	U
75-00-3	Chloroethane	10	U
75-09-2	Methylene Chloride	5	U
67-64-1	Acetone	10	U
75-15-0	Carbon Disulfide	5	U
75-35-4	1,1-Dichloroethene	5	U
75-34-3	1,1-Dichloroethane	5	U
540-59-0	1,2-Dichloroethene (total)	5	U
67-66-3	Chloroform	5	U
107-06-2	1,2-Dichloroethane	5	U
78-93-3	2-Butanone	10	U
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
108-05-4	Vinyl Acetate	10	U
75-27-4	Bromodichloromethane	5	U
78-87-5	1,2-Dichloropropane	5	U
10061-01-5	cis-1,3-Dichloropropene	5	U
79-01-6	Trichloroethene	5	U
124-48-1	Dibromochloromethane	5	U
79-00-5	1,1,2-Trichloroethane	5	U
71-43-2	Benzene	5	U
10061-02-6	trans-1,3-Dichloropropene	5	U
75-25-2	Bromoform	5	U
108-10-1	4-Methyl-2-Pentanone	10	U
591-78-6	2-Hexanone	10	U
127-18-4	Tetrachloroethene	5	U
79-34-5	1,1,2,2-Tetrachloroethane	5	U
108-88-3	Toluene	5	U
108-90-7	Chlorobenzene	5	U
100-41-4	Ethylbenzene	5	U
100-42-5	Styrene	5	U
1330-20-7	Xylene (Total)	5	U

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EPA SAMPLE NO.

B01CD0RE

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMA Case No.: 12060 SAS No.: NA SDG No.: NA

Matrix: (soil/water) WATER Lab Sample ID: A112060-03A

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 106K05

Level: (low/med) LOW Date Received: 12/13/91

% Moisture: not dec. ____ Date Analyzed: 01/06/92

Column (pack/cap) PACK Dilution Factor: 1.0

Number TICs found: 0

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B01CD1

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMA Case No.: 12060 SAS No.: NA SDG No.: NA

Matrix: (soil/water) WATER Lab Sample ID: A112060-02D

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: B12209

Level: (low/med) LOW Date Received: 12/13/91

% Moisture: not dec. ____ Date Analyzed: 12/20/91

Column: (pack/cap) WIDE Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
74-87-3	Chloromethane	10	U
74-83-9	Bromomethane	10	U
75-01-4	Vinyl Chloride	10	U
75-00-3	Chloroethane	10	U
75-09-2	Methylene Chloride	13	B
67-64-1	Acetone	34	B
75-15-0	Carbon Disulfide	5	U
75-35-4	1,1-Dichloroethene	5	U
75-34-3	1,1-Dichloroethane	5	U
540-59-0	1,2-Dichloroethene (total)	5	U
67-66-3	Chloroform	0.7	J
107-06-2	1,2-Dichloroethane	5	U
78-93-3	2-Butanone	10	U
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
108-05-4	Vinyl Acetate	10	U
75-27-4	Bromodichloromethane	5	U
78-87-5	1,2-Dichloropropane	5	U
10061-01-5	cis-1,3-Dichloropropene	5	U
79-01-6	Trichloroethene	1	J
124-48-1	Dibromochloromethane	5	U
79-00-5	1,1,2-Trichloroethane	5	U
71-43-2	Benzene	2	J
10061-02-6	trans-1,3-Dichloropropene	5	U
75-25-2	Bromoform	5	U
108-10-1	4-Methyl-2-Pentanone	10	U
591-78-6	2-Hexanone	10	U
127-18-4	Tetrachloroethene	5	U
79-34-5	1,1,2,2-Tetrachloroethane	5	U
108-88-3	Toluene	2	J
108-90-7	Chlorobenzene	5	U
100-41-4	Ethylbenzene	5	U
100-42-5	Styrene	5	U
1330-20-7	Xylene (Total)	5	U

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0015

EPA SAMPLE NO.

B01CD1

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMA Case No.: 12060 SAS No.: NA SDG No.: NA

Matrix: (soil/water) WATER Lab Sample ID: A112060-02D

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: B12209

Level: (low/med) LOW Date Received: 12/13/91

% Moisture: not dec. ____ Date Analyzed: 12/20/91

Column (pack/cap) WIDE Dilution Factor: 1.0

Number TICs found: 2

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	Subst. siloxane	11.30	22	BJ
2.	Subst. siloxane	12.25	7.0	BJ

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B01CD1RE

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMA Case No.: 12060 SAS No.: NA SDG No.: NA

Matrix: (soil/water) WATER Lab Sample ID: A112060-02D

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 106K04

Level: (low/med) LOW Date Received: 12/13/91

% Moisture: not dec. ____ Date Analyzed: 01/06/92

Column: (pack/cap) PACK Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
74-87-3	Chloromethane	10	U
74-83-9	Bromomethane	10	U
75-01-4	Vinyl Chloride	10	U
75-00-3	Chloroethane	10	U
75-09-2	Methylene Chloride	5	U
67-64-1	Acetone	10	U
75-15-0	Carbon Disulfide	5	U
75-35-4	1,1-Dichloroethene	5	U
75-34-3	1,1-Dichloroethane	5	U
540-59-0	1,2-Dichloroethene (total)	5	U
67-66-3	Chloroform	5	U
107-06-2	1,2-Dichloroethane	5	U
78-93-3	2-Butanone	10	U
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
108-05-4	Vinyl Acetate	8	J
75-27-4	Bromodichloromethane	5	U
78-87-5	1,2-Dichloropropane	5	U
10061-01-5	cis-1,3-Dichloropropene	5	U
79-01-6	Trichloroethene	5	U
124-48-1	Dibromochloromethane	5	U
79-00-5	1,1,2-Trichloroethane	5	U
71-43-2	Benzene	5	U
10061-02-6	trans-1,3-Dichloropropene	5	U
75-25-2	Bromoform	5	U
108-10-1	4-Methyl-2-Pentanone	10	U
591-78-6	2-Hexanone	10	U
127-18-4	Tetrachloroethene	5	U
79-34-5	1,1,2,2-Tetrachloroethane	5	U
108-88-3	Toluene	5	U
108-90-7	Chlorobenzene	5	U
100-41-4	Ethylbenzene	5	U
100-42-5	Styrene	5	U
1330-20-7	Xylene (Total)	5	U

9613501.2070

0017

EPA SAMPLE NO.

B01CD1RE

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMA Case No.: 12060 SAS No.: NA SDG No.: NA

Matrix: (soil/water) WATER Lab Sample ID: A112060-02D

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 106K04

Level: (low/med) LOW Date Received: 12/13/91

% Moisture: not dec. ____ Date Analyzed: 01/06/92

Column (pack/cap) PACK Dilution Factor: 1.0

Number TICs found: 0

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

1D

PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B01CC9

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12060 SAS No.: NA SDG No.: NA

Matrix: (soil/water) WATER Lab Sample ID: A112060-01A

Sample wt/vol: 1000 (g/mL) ML Lab File ID: _____

Level: (low/med) LOW Date Received: 12/13/91

% Moisture: not dec. __ dec. __ Date Extracted: 12/18/91

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 01/06/92

GPC Cleanup: (Y/N) N pH: ____ Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
319-84-6	alpha-BHC	0.050	U
319-85-7	beta-BHC	0.050	U
319-86-8	delta-BHC	0.050	U
58-89-9	gamma-BHC (Lindane)	0.050	U
76-44-8	Heptachlor	0.050	U
309-00-2	Aldrin	0.050	U
1024-57-3	Heptachlor epoxide	0.050	U
959-98-8	Endosulfan I	0.050	U
60-57-1	Dieldrin	0.10	U
72-55-9	4,4'-DDE	0.10	U
72-20-8	Endrin	0.10	U
33213-65-9	Endosulfan II	0.10	U
72-54-8	4,4'-DDD	0.10	U
1031-07-8	Endosulfan sulfate	0.10	U
50-29-3	4,4'-DDT	0.10	U
72-43-5	Methoxychlor	0.50	U
53494-70-5	Endrin ketone	0.10	U
5103-71-9	alpha-Chlordane	0.50	U
5103-74-2	gamma-Chlordane	0.50	U
8001-35-2	Toxaphene	1.0	U
12674-11-2	Aroclor-1016	0.50	U
11104-28-2	Aroclor-1221	0.50	U
11141-16-5	Aroclor-1232	0.50	U
53469-21-9	Aroclor-1242	0.50	U
12672-29-6	Aroclor-1248	0.50	U
11097-69-1	Aroclor-1254	1.0	U
11096-82-5	Aroclor-1260	1.0	U

9613501.2072

ID

EPA SAMPLE NO.

B01CD1

PESTICIDE ORGANICS ANALYSIS DATA SHEET

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12060 SAS No.: NA SDG No.: NA

Matrix: (soil/water) WATER Lab Sample ID: A112060-02A

Sample wt/vol: 1000 (g/mL) ML Lab File ID: _____

Level: (low/med) LOW Date Received: 12/13/91

% Moisture: not dec. __ dec. __ Date Extracted: 12/18/91

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 01/06/92

GPC Cleanup: (Y/N) N pH: ____ Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
319-84-6	alpha-BHC	0.050	U
319-85-7	beta-BHC	0.050	U
319-86-8	delta-BHC	0.050	U
58-89-9	gamma-BHC (Lindane)	0.050	U
76-44-8	Heptachlor	0.050	U
309-00-2	Aldrin	0.050	U
1024-57-3	Heptachlor epoxide	0.050	U
959-98-8	Endosulfan I	0.050	U
60-57-1	Dieldrin	0.10	U
72-55-9	4,4'-DDE	0.10	U
72-20-8	Endrin	0.10	U
33213-65-9	Endosulfan II	0.10	U
72-54-8	4,4'-DDD	0.10	U
1031-07-8	Endosulfan sulfate	0.10	U
50-29-3	4,4'-DDT	0.10	U
72-43-5	Methoxychlor	0.50	U
53494-70-5	Endrin ketone	0.10	U
5103-71-9	alpha-Chlordane	0.50	U
5103-74-2	gamma-Chlordane	0.50	U
8001-35-2	Toxaphene	1.0	U
12674-11-2	Aroclor-1016	0.50	U
11104-28-2	Aroclor-1221	0.50	U
11141-16-5	Aroclor-1232	0.50	U
53469-21-9	Aroclor-1242	0.50	U
12672-29-6	Aroclor-1248	0.50	U
11097-69-1	Aroclor-1254	1.0	U
11096-82-5	Aroclor-1260	1.0	U

9613501.2073

TMA
Thermo Analytical Inc.

Skinner & Sherman Laboratories Inc.
300 Second Avenue
Post Office Box 521
Waltham, MA 02254-0521

(617) 890-7200

FEB 1992
RECEIVED
OSM DMO

Federal Express 4009269994
January 22, 1992

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

Quality Control Narrative

Scope
Two (2) water samples were submitted to TMA/Skinner & Sherman Laboratories, Inc. on December 17, 1991 from Westinghouse Hanford Company. The samples were analyzed for the USEPA CLP metals. The analysis was performed under Skinner and Sherman work order 9112146.

Methodology
The samples were prepared, analyzed and reported in accordance with the USEPA Contract Laboratory Program Statement of Work 7/88 (CLP SOW788).

Discussion
All quality control requirements were met for the samples with no exceptions.

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

Respectfully submitted,

TMA/SKINNER & SHERMAN LABORATORIES, INC.

David N. Peterson
Assistant Laboratory Manager

9613501.2074

WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B01CC9

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

Lab Code: SKINER Case No.: N112112 SAS No.: SDG No.: B01CC9

Matrix (soil/water): WATER Lab Sample ID: 12146-01S

Level (low/med): LOW Date Received: 12/17/91

% Solids: 0.0

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	159.00	B		P
7440-36-0	Antimony	31.00	U		P
7440-38-2	Arsenic	2.00	U		F
7440-39-3	Barium	3.30	B		P
7440-41-7	Beryllium	1.00	U		P
7440-43-9	Cadmium	1.00	U		P
7440-70-2	Calcium	841.00	B		P
7440-47-3	Chromium	2.00	U		P
7440-48-4	Cobalt	3.00	U		P
7440-50-8	Copper	3.00	U		P
7439-89-6	Iron	122.00			P
7439-92-1	Lead	2.00	U		F
7439-95-4	Magnesium	74.20	B		P
7439-96-5	Manganese	6.40	B		P
7439-97-6	Mercury	0.20	U		CV
7440-02-0	Nickel	4.00	U		P
7440-09-7	Potassium	181.00	B		P
7782-49-2	Selenium	4.00	U		F
7440-22-4	Silver	5.00	U		P
7440-23-5	Sodium	1670.00	B		P
7440-28-0	Thallium	3.00	U		F
7440-62-2	Vanadium	3.00	U		P
7440-66-6	Zinc	11.00	U		P
	Cyanide				NR

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

9613501.2075

WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B01CD1

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

Lab Code: SKINER Case No.: N112112 SAS No.: SDG No.: B01CC9

Matrix (soil/water): WATER Lab Sample ID: 12146-02S

Level (low/med): LOW Date Received: 12/17/91

% Solids: 0.0

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	86.00	B		P
7440-36-0	Antimony	31.00	U		P
7440-38-2	Arsenic	2.00	U		F
7440-39-3	Barium	1.50	B		P
7440-41-7	Beryllium	1.00	U		P
7440-43-9	Cadmium	1.00	U		P
7440-70-2	Calcium	792.00	B		P
7440-47-3	Chromium	2.00	U		P
7440-48-4	Cobalt	3.00	U		P
7440-50-8	Copper	3.00	U		P
7439-89-6	Iron	76.50	B		P
7439-92-1	Lead	2.00	U		F
7439-95-4	Magnesium	69.00	U		P
7439-96-5	Manganese	2.70	B		P
7439-97-6	Mercury	0.20	U		CV
7440-02-0	Nickel	4.00	U		P
7440-09-7	Potassium	76.00	U		P
7782-49-2	Selenium	4.00	U		F
7440-22-4	Silver	5.00	U		P
7440-23-5	Sodium	1510.00	B		P
7440-28-0	Thallium	3.00	U		F
7440-62-2	Vanadium	3.00	U		P
7440-66-6	Zinc	11.00	U		P
	Cyanide				NR

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

WESTINGHOUSE HANFORD COMPANY

Results of Analyses For:

GENERAL CHEMISTRY
CASE NO. 12-069
(TMA/ARLI Work Order # A1-12-069)

ORGANICS
CASE NO. 12-069
(TMA/ARLI Work Order # A1-12-069)

General Chemistry and Organics results are presented for the following WHC SOIL samples(s):

B01CF4
B01CF5
B01CF6
B01CF7
B01CF8

Norcal Work Order # N1-12-127

Thermo Analytical Inc.
160 Taylor Street
Monrovia, Ca. 91016
818-357-3247

GENERAL CHEMISTRY RESULTS

CASE NO. 12-069

Soil Sample #:

B01CF4
B01CF5
B01CF6
B01CF7
B01CF8

CASE NARRATIVE

The data system for the Ion Chromatograph misinterpreted the Fluoride peak for sample B01CF8. The chromatogram has been hand edited, signed and dated.

There were no other problems were encountered during sample analysis.

Dennis D. Wells, Project Manager

TMA Inc. REPORT

Work Order # A1-12-069

Received: 12/13/91

Results by Sample

SAMPLE ID B01CF4 FRACTION 01A TEST CODE WCCLPS NAME Anions in Solids - WH232

Date & Time Collected 12/10/91 Category

ANIONS AND WET CHEMISTRY - SOLIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT
Fluoride	300	4.5	mg/Kg	1.0
Nitrite	300	<1.0	mg/Kg	1.0
Nitrate	300	8.2	mg/Kg	2.0
Sulfate	300	77	mg/Kg	10.0
pH	150.1	9.4	pH	NA
Ammonia	350	2.1	mg/Kg	0.5

FORM I

Received: 12/13/91

Results by Sample

SAMPLE ID B01CF5 FRACTION 02A TEST CODE WCCLPS NAME Anions in Solids - WN232

Date & Time Collected 12/10/91 Category

ANIONS AND WET CHEMISTRY - SOLIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT
Fluoride	300	4.5	mg/Kg	1.0
Nitrite	300	<1.0	mg/Kg	1.0
Nitrate	300	6.5	mg/Kg	2.0
Sulfate	300	59	mg/Kg	10.0
pH	150.1	8.6	pH	NA
Ammonia	350	2.0	mg/Kg	0.5

FORM I

Received: 12/13/91

Results by Sample

SAMPLE ID B01CF5 MS FRACTION 02B TEST CODE WCQCS NAME Quality Control Summary

Date & Time Collected 12/10/91 Category

SPIKE QC SUMMARY

ANALYSIS	SAMPLE ID	SAMPLE RESULT	SPIKE RESULT	AMOUNT ADDED	% R
Fluoride	B01CF5	4.5	103.6	100.00	99.1
Nitrite	B01CF5	<1.0	104.3	100.00	104.3
Nitrate	B01CF5	6.5	101.3	100.00	94.8
Sulfate	B01CF5	59	327	300.00	89.3

FORM V

SAMPLE ID B01CF5 Duplicate FRACTION 02C TEST CODE WCQCD NAME Quality Control Summary
Date & Time Collected 12/10/91 Category

DUPLICATE QC SUMMARY

ANALYSIS	SAMPLE ID	SAMPLE RESULT	DUPL. RESULT	RPD
pH	B01CF5	8.6	8.5	1.2
Ammonia	B01CF5	2.0	2.1	4.9

FORM VI

Page 6 TMA Inc. REPORT Work Order # A1-12-069

Received: 12/13/91 Results by Sample

SAMPLE ID B01CF6 FRACTION 03A TEST CODE VCCLPS NAME Anions in Solids - VN232

Date & Time Collected 12/10/91 Category

ANIONS AND WET CHEMISTRY - SOLIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT
Fluoride	300	6.0	mg/Kg	1.0
Nitrite	300	<1.0	mg/Kg	1.0
Nitrate	300	5.2	mg/Kg	2.0
Sulfate	300	37	mg/Kg	10.0
pH	150.1	9.4	pH	NA
Ammonia	350	2.2	mg/Kg	0.5

FORM I

Received: 12/13/91

Results by Sample

SAMPLE ID B01CF7 FRACTION 04A TEST CODE WCCLPS NAME Anions in Solids - WM232

Date & Time Collected 12/10/91 Category

ANIONS AND WET CHEMISTRY - SOLIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT
Fluoride	300	4.6	mg/Kg	1.0
Nitrite	300	<1.0	mg/Kg	1.0
Nitrate	300	5.5	mg/Kg	2.0
Sulfate	300	37	mg/Kg	10.0
pH	150.1	8.8	pH	NA
Ammonia	350	1.8	mg/Kg	0.5

FORM I

9613501.2084

Received: 12/13/91

TMA Inc. REPORT

Results by Sample

Work Order # A1-12-069

0016

SAMPLE ID B01CF8 FRACTION 05A TEST CODE VCCLPS NAME Anions in Solids - VM232

Date & Time Collected 12/10/91 Category

ANIONS AND WET CHEMISTRY - SOLIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT
Fluoride	300	<1.0	mg/Kg	1.0
Nitrite	300	<1.0	mg/Kg	1.0
Nitrate	300	4.7	mg/Kg	2.0
Sulfate	300	32	mg/Kg	10.0
pH	150.1	8.9	pH	NA
Ammonia	350	2.4	mg/Kg	0.5

FORM I

9613501.2085

FEB 1992
RECEIVED
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WESTINGHOUSE HANFORD COMPANY

Results of Analyses For:

ORGANICS
Case No. 12-069
(TMA/ARLI Work Order # A1-12-069)

METALS
Case No. N112127
(TMA/Skinner & Sherman W.O. # 91-12-180)

TMA Master Work Order N1-12-127

February 21, 1992

MS
7/18/96

CASE NARRATIVE

LABORATORY: TMA/ARLI

CASE: 12-069

CONTRACT ID: WESTINGHOUSE HANFORD COMPANY

SDG RECEIPT DATE: December 13, 1991

1.0 DESCRIPTION OF CASE:

Five soil samples were analyzed for TCL Organics-Volatiles and Pesticide/PCB's according to the USEPA Contract Laboratory Program (CLP) Statement of Work for Organic Analysis, Revision 2/88.

2.0 SAMPLE LIST:

WESTINGHOUSE ID	LAB ID	ANALYSIS REQUESTED	MATRIX
B01CF4	A1-12-069-01A	P	SOIL
B01CF4	A1-12-069-01B	V	SOIL
B01CF4 MS	A1-12-069-01C	V	SOIL
B01CF4 MSD	A1-12-069-01D	V	SOIL
B01CF5	A1-12-069-02A	P	SOIL
B01CF5 MS	A1-12-069-02D	P	SOIL
B01CF5 MSD	A1-12-069-02E	P	SOIL
B01CF5	A1-12-069-02F	V	SOIL
B01CF6	A1-12-069-03A	P	SOIL
B01CF6	A1-12-069-03B	V	SOIL
B01CF7	A1-12-069-04A	P	SOIL
B01CF7	A1-12-069-04B	V	SOIL
B01CF8	A1-12-069-05A	P	SOIL
B01CF8	A1-12-069-05B	V	SOIL

COMMENTS:

3.1 SHIPPING AND DOCUMENTATION:

All samples were received unbroken and properly documented.

3.2 ANALYSIS:

3.2.1 VOLATILE ANALYSIS COMMENTS:

LOW LEVEL SOIL :

The samples were analyzed by heated purge within the CLP SOW holding times. The method blank associated with these samples exceeded the criteria for Carbon Disulfide by 1 ug/Kg. However, the samples were not re-analyzed. The MS and MSD samples detected Vinyl Acetate in their analyses at approximately 70-80 ug/Kg. It has been confirmed that the matrix spiking solution was contaminated with Vinyl Acetate. A new MS solution was made and the samples were re-analyzed out of holding time. The re-analyzed MS and MSD samples did not contain Vinyl Acetate and are not reported. The MS and MSD originally analyzed are reported in this package. All of the other QC results were within the limits specified by the EPA CLP SOW.

TUNES:

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

3.2.2 PESTICIDE/PCB ANALYSIS COMMENTS:

SEQUENCE NOTES:

The sequence was started on 1/6/92 and was analyzed in accordance with the EPA CLP SOW. IND A and IND B were run consecutively at several times in the sequence. The following standards were used for quantitation:

IND A	04:00	1/7/92	(B10624)
IND B	12:51	1/7/92	(B10636)
IND A	22:01	1/7/92	(B10648)
IND B	07:32	1/8/92	(B10661)
IND A	16:32	1/8/92	(B10673)
IND B	01:56	1/9/92	(B10686)
IND A	08:32	1/9/92	(B10695)
IND B	09:16	1/9/92	(B10696)

Due to the limitations of the software used to report 2/88 CLP Protocol results for Pesticide/PCB's, instrument blanks cannot be reported. An instrument blank (B10639 and A10639) was injected at 15:23 on 1/7/92. The analysis indicated that there was no contamination in the system.

SAMPLES:

LOW LEVEL SOIL :

The samples were extracted and analyzed within the CLP SOW holding times. All of the QC results were within the limits specified in the EPA CLP SOW.

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 diskette is authorized by the Laboratory Manager or his designee, as verified by the following signatures.

Nicole Roth
CLP Program Manager

Dennis D. Wells
Technical Director

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B01CF4

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMA Case No.: 12069 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A112069-01B

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 1221K21

Level: (low/med) LOW Date Received: 12/13/91

% Moisture: not dec. 6 Date Analyzed: 12/21/91

Column: (pack/cap) PACK Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
74-87-3	Chloromethane	11	U
74-83-9	Bromomethane	11	U
75-01-4	Vinyl Chloride	11	U
75-00-3	Chloroethane	11	U
75-09-2	Methylene Chloride	19	B
67-64-1	Acetone	18	B
75-15-0	Carbon Disulfide	7	B
75-35-4	1,1-Dichloroethene	5	U
75-34-3	1,1-Dichloroethane	5	U
540-59-0	1,2-Dichloroethene (total)	5	U
67-66-3	Chloroform	5	U
107-06-2	1,2-Dichloroethane	5	U
78-93-3	2-Butanone	11	U
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
108-05-4	Vinyl Acetate	11	U
75-27-4	Bromodichloromethane	5	U
78-87-5	1,2-Dichloropropane	5	U
10061-01-5	cis-1,3-Dichloropropene	5	U
79-01-6	Trichloroethene	5	U
124-48-1	Dibromochloromethane	5	U
79-00-5	1,1,2-Trichloroethane	5	U
71-43-2	Benzene	5	U
10061-02-6	trans-1,3-Dichloropropene	5	U
75-25-2	Bromoform	5	U
108-10-1	4-Methyl-2-Pentanone	11	U
591-78-6	2-Hexanone	11	U
127-18-4	Tetrachloroethene	5	U
79-34-5	1,1,2,2-Tetrachloroethane	5	U
108-88-3	Toluene	2	J
108-90-7	Chlorobenzene	5	U
100-41-4	Ethylbenzene	5	U
100-42-5	Styrene	5	U
1330-20-7	Xylene (Total)	5	U

9613501.2090

0006

EPA SAMPLE NO.

B01CF4

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMA Case No.: 12069 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A112069-01B

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 1221K21

Level: (low/med) LOW Date Received: 12/13/91

% Moisture: not dec. 6 Date Analyzed: 12/21/91

Column (pack/cap) PACK Dilution Factor: 1.0

Number TICs found: 1

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	Unknown hydrocarbon	30.42	13	J

9613501.2091

0007

EPA SAMPLE NO.

B01CF5

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMA Case No.: 12069 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A112069-02F

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 1221K24

Level: (low/med) LOW Date Received: 12/13/91

% Moisture: not dec. 7 Date Analyzed: 12/22/91

Column: (pack/cap) PACK Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
74-87-3	Chloromethane	11	U
74-83-9	Bromomethane	11	U
75-01-4	Vinyl Chloride	11	U
75-00-3	Chloroethane	11	U
75-09-2	Methylene Chloride	17	B
67-64-1	Acetone	13	B
75-15-0	Carbon Disulfide	6	B
75-35-4	1,1-Dichloroethene	5	U
75-34-3	1,1-Dichloroethane	5	U
540-59-0	1,2-Dichloroethene (total)	5	U
67-66-3	Chloroform	5	U
107-06-2	1,2-Dichloroethane	5	U
78-93-3	2-Butanone	11	U
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
108-05-4	Vinyl Acetate	11	U
75-27-4	Bromodichloromethane	5	U
78-87-5	1,2-Dichloropropane	5	U
10061-01-5	cis-1,3-Dichloropropene	5	U
79-01-6	Trichloroethene	5	U
124-48-1	Dibromochloromethane	5	U
79-00-5	1,1,2-Trichloroethane	5	U
71-43-2	Benzene	5	U
10061-02-6	trans-1,3-Dichloropropene	5	U
75-25-2	Bromoform	5	U
108-10-1	4-Methyl-2-Pentanone	11	U
591-78-6	2-Hexanone	11	U
127-18-4	Tetrachloroethene	5	U
79-34-5	1,1,2,2-Tetrachloroethane	5	U
108-88-3	Toluene	1	J
108-90-7	Chlorobenzene	5	U
100-41-4	Ethylbenzene	5	U
100-42-5	Styrene	5	U
1330-20-7	Xylene (Total)	5	U

9613501.2092

0008
EPA SAMPLE NO.

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

B01CF5

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMA Case No.: 12069 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A112069-02F

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 1221K24

Level: (low/med) LOW Date Received: 12/13/91

% Moisture: not dec. 7 Date Analyzed: 12/22/91

Column (pack/cap) PACK Dilution Factor: 1.0

Number TICs found: 1

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	Unknown hydrocarbon	30.54	13	J

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B01CF6

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMA Case No.: 12069 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A112069-03B

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 1221K25

Level: (low/med) LOW Date Received: 12/13/91

% Moisture: not dec. 7 Date Analyzed: 12/22/91

Column: (pack/cap) PACK Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
74-87-3	Chloromethane	11	U
74-83-9	Bromomethane	11	U
75-01-4	Vinyl Chloride	11	U
75-00-3	Chloroethane	11	U
75-09-2	Methylene Chloride	17	B
67-64-1	Acetone	14	B
75-15-0	Carbon Disulfide	7	B
75-35-4	1,1-Dichloroethene	5	U
75-34-3	1,1-Dichloroethane	5	U
540-59-0	1,2-Dichloroethene (total)	5	U
67-66-3	Chloroform	5	U
107-06-2	1,2-Dichloroethane	5	U
78-93-3	2-Butanone	11	U
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
108-05-4	Vinyl Acetate	11	U
75-27-4	Bromodichloromethane	5	U
78-87-5	1,2-Dichloropropane	5	U
10061-01-5	cis-1,3-Dichloropropene	5	U
79-01-6	Trichloroethene	5	U
124-48-1	Dibromochloromethane	5	U
79-00-5	1,1,2-Trichloroethane	5	U
71-43-2	Benzene	5	U
10061-02-6	trans-1,3-Dichloropropene	5	U
75-25-2	Bromoform	5	U
108-10-1	4-Methyl-2-Pentanone	11	U
591-78-6	2-Hexanone	11	U
127-18-4	Tetrachloroethene	5	U
79-34-5	1,1,2,2-Tetrachloroethane	5	U
108-88-3	Toluene	2	J
108-90-7	Chlorobenzene	5	U
100-41-4	Ethylbenzene	5	U
100-42-5	Styrene	5	U
1330-20-7	Xylene (Total)	5	U

9613501.2094

0010
EPA SAMPLE NO.

B01CF6

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMA Case No.: 12069 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A112069-03B

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 1221K25

Level: (low/med) LOW Date Received: 12/13/91

% Moisture: not dec. 7 Date Analyzed: 12/22/91

Column (pack/cap) PACK Dilution Factor: 1.0

Number TICs found: 1

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	Unknown hydrocarbon	30.42	68	J

EPA SAMPLE NO.

B01CF7

VOLATILE ORGANICS ANALYSIS DATA SHEET

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMA Case No.: 12069 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A112069-04B

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 1221K26

Level: (low/med) LOW Date Received: 12/13/91

% Moisture: not dec. 9 Date Analyzed: 12/22/91

Column: (pack/cap) PACK Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
74-87-3	Chloromethane	11	U
74-83-9	Bromomethane	11	U
75-01-4	Vinyl Chloride	11	U
75-00-3	Chloroethane	11	U
75-09-2	Methylene Chloride	19	B
67-64-1	Acetone	22	B
75-15-0	Carbon Disulfide	7	B
75-35-4	1,1-Dichloroethene	5	U
75-34-3	1,1-Dichloroethane	5	U
540-59-0	1,2-Dichloroethene (total)	5	U
67-66-3	Chloroform	5	U
107-06-2	1,2-Dichloroethane	5	U
78-93-3	2-Butanone	11	U
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
108-05-4	Vinyl Acetate	11	U
75-27-4	Bromodichloromethane	5	U
78-87-5	1,2-Dichloropropane	5	U
10061-01-5	cis-1,3-Dichloropropene	5	U
79-01-6	Trichloroethene	5	U
124-48-1	Dibromochloromethane	5	U
79-00-5	1,1,2-Trichloroethane	5	U
71-43-2	Benzene	5	U
10061-02-6	trans-1,3-Dichloropropene	5	U
75-25-2	Bromoform	5	U
108-10-1	4-Methyl-2-Pentanone	11	U
591-78-6	2-Hexanone	11	U
127-18-4	Tetrachloroethene	5	U
79-34-5	1,1,2,2-Tetrachloroethane	5	U
108-88-3	Toluene	1	J
108-90-7	Chlorobenzene	5	U
100-41-4	Ethylbenzene	5	U
100-42-5	Styrene	5	U
1330-20-7	Xylene (Total)	5	U

EPA SAMPLE NO.

B01CF7

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMA Case No.: 12069 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A112069-04B

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 1221K26

Level: (low/med) LOW Date Received: 12/13/91

% Moisture: not dec. 9 Date Analyzed: 12/22/91

Column (pack/cap) PACK Dilution Factor: 1.0

Number TICs found: 2

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	Unknown alcohol	13.87	8.8	J
2.	Unknown hydrocarbon	30.47	20	J

9615501.2097

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

0013
EPA SAMPLE NO.

B01CF8

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMA Case No.: 12069 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A112069-05B

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 1221K27

Level: (low/med) LOW Date Received: 12/13/91

% Moisture: not dec. 10 Date Analyzed: 12/22/91

Column: (pack/cap) PACK Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
74-87-3	Chloromethane	11	U
74-83-9	Bromomethane	11	U
75-01-4	Vinyl Chloride	11	U
75-00-3	Chloroethane	11	U
75-09-2	Methylene Chloride	19	B
67-64-1	Acetone	46	B
75-15-0	Carbon Disulfide	7	B
75-35-4	1,1-Dichloroethene	6	U
75-34-3	1,1-Dichloroethane	6	U
540-59-0	1,2-Dichloroethene (total)	6	U
67-66-3	Chloroform	6	U
107-06-2	1,2-Dichloroethane	6	U
78-93-3	2-Butanone	11	U
71-55-6	1,1,1-Trichloroethane	6	U
56-23-5	Carbon Tetrachloride	6	U
108-05-4	Vinyl Acetate	11	U
75-27-4	Bromodichloromethane	6	U
78-87-5	1,2-Dichloropropane	6	U
10061-01-5	cis-1,3-Dichloropropene	6	U
79-01-6	Trichloroethene	6	U
124-48-1	Dibromochloromethane	6	U
79-00-5	1,1,2-Trichloroethane	6	U
71-43-2	Benzene	6	U
10061-02-6	trans-1,3-Dichloropropene	6	U
75-25-2	Bromoform	6	U
108-10-1	4-Methyl-2-Pentanone	11	U
591-78-6	2-Hexanone	11	U
127-18-4	Tetrachloroethene	6	U
79-34-5	1,1,2,2-Tetrachloroethane	6	U
108-88-3	Toluene	2	J
108-90-7	Chlorobenzene	6	U
100-41-4	Ethylbenzene	6	U
100-42-5	Styrene	6	U
1330-20-7	Xylene (Total)	6	U

9613501.2098

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.
0014

B01CF8

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMA Case No.: 12069 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A112069-05B

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 1221K27

Level: (low/med) LOW Date Received: 12/13/91

% Moisture: not dec. 10 Date Analyzed: 12/22/91

Column (pack/cap) PACK Dilution Factor: 1.0

Number TICs found: 2

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	Unknown alcohol	13.87	5.6	J
2.	Unknown hydrocarbon	30.42	270	J

9613501.2099

0015

1D
PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B01CF4

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12069 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A112069-01A

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

Level: (low/med) LOW Date Received: 12/13/91

% Moisture: not dec. 6 dec. __ Date Extracted: 12/23/91

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 01/08/92

GPC Cleanup: (Y/N) N pH: 9.4 Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
319-84-6	alpha-BHC	8.5	U
319-85-7	beta-BHC	8.5	U
319-86-8	delta-BHC	8.5	U
58-89-9	gamma-BHC (Lindane)	8.5	U
76-44-8	Heptachlor	8.5	U
309-00-2	Aldrin	8.5	U
1024-57-3	Heptachlor epoxide	8.5	U
959-98-8	Endosulfan I	8.5	U
60-57-1	Dieldrin	17	U
72-55-9	4,4'-DDE	17	U
72-20-8	Endrin	17	U
33213-65-9	Endosulfan II	17	U
72-54-8	4,4'-DDD	17	U
1031-07-8	Endosulfan sulfate	17	U
50-29-3	4,4'-DDT	17	U
72-43-5	Methoxychlor	85	U
53494-70-5	Endrin ketone	17	U
5103-71-9	alpha-Chlordane	85	U
5103-74-2	gamma-Chlordane	85	U
8001-35-2	Toxaphene	170	U
12674-11-2	Aroclor-1016	85	U
11104-28-2	Aroclor-1221	85	U
11141-16-5	Aroclor-1232	85	U
53469-21-9	Aroclor-1242	85	U
12672-29-6	Aroclor-1248	85	U
11097-69-1	Aroclor-1254	170	U
11096-82-5	Aroclor-1260	170	U

9613501.2100

0016

EPA SAMPLE NO.

B01CF5

1D

PESTICIDE ORGANICS ANALYSIS DATA SHEET

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12069 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A112069-02A

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

Level: (low/med) LOW Date Received: 12/13/91

% Moisture: not dec. 7 dec. __ Date Extracted: 12/23/91

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 01/08/92

GPC Cleanup: (Y/N) N pH: 8.6 Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
319-84-6	alpha-BHC	8.6	U
319-85-7	beta-BHC	8.6	U
319-86-8	delta-BHC	8.6	U
58-89-9	gamma-BHC (Lindane)	8.6	U
76-44-8	Heptachlor	8.6	U
309-00-2	Aldrin	8.6	U
1024-57-3	Heptachlor epoxide	8.6	U
959-98-8	Endosulfan I	8.6	U
60-57-1	Dieldrin	17	U
72-55-9	4,4'-DDE	17	U
72-20-8	Endrin	17	U
33213-65-9	Endosulfan II	17	U
72-54-8	4,4'-DDD	17	U
1031-07-8	Endosulfan sulfate	17	U
50-29-3	4,4'-DDT	17	U
72-43-5	Methoxychlor	86	U
53494-70-5	Endrin ketone	17	U
5103-71-9	alpha-Chlordane	86	U
5103-74-2	gamma-Chlordane	86	U
8001-35-2	Toxaphene	170	U
12674-11-2	Aroclor-1016	86	U
11104-28-2	Aroclor-1221	86	U
11141-16-5	Aroclor-1232	86	U
53469-21-9	Aroclor-1242	86	U
12672-29-6	Aroclor-1248	86	U
11097-69-1	Aroclor-1254	170	U
11096-82-5	Aroclor-1260	170	U

9613501.2101

0017

EPA SAMPLE NO.

B01CF6

1D

PESTICIDE ORGANICS ANALYSIS DATA SHEET

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12069 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A112069-03A

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

Level: (low/med) LOW Date Received: 12/13/91

% Moisture: not dec. 7 dec. __ Date Extracted: 12/23/91

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 01/08/92

GPC Cleanup: (Y/N) N pH: 9.4 Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
319-84-6	alpha-BHC	8.6	U
319-85-7	beta-BHC	8.6	U
319-86-8	delta-BHC	8.6	U
58-89-9	gamma-BHC (Lindane)	8.6	U
76-44-8	Heptachlor	8.6	U
309-00-2	Aldrin	8.6	U
1024-57-3	Heptachlor epoxide	8.6	U
959-98-8	Endosulfan I	8.6	U
60-57-1	Dieldrin	17	U
72-55-9	4,4'-DDE	17	U
72-20-8	Endrin	17	U
33213-65-9	Endosulfan II	17	U
72-54-8	4,4'-DDD	17	U
1031-07-8	Endosulfan sulfate	17	U
50-29-3	4,4'-DDT	17	U
72-43-5	Methoxychlor	86	U
53494-70-5	Endrin ketone	17	U
5103-71-9	alpha-Chlordane	86	U
5103-74-2	gamma-Chlordane	86	U
8001-35-2	Toxaphene	170	U
12674-11-2	Aroclor-1016	86	U
11104-28-2	Aroclor-1221	86	U
11141-16-5	Aroclor-1232	86	U
53469-21-9	Aroclor-1242	86	U
12672-29-6	Aroclor-1248	86	U
11097-69-1	Aroclor-1254	170	U
11096-82-5	Aroclor-1260	170	U

9615501.2102

0018

EPA SAMPLE NO.

1D

PESTICIDE ORGANICS ANALYSIS DATA SHEET

B01CF7

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12069 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A112069-04A

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

Level: (low/med) LOW Date Received: 12/13/91

% Moisture: not dec. 9 dec. __ Date Extracted: 12/23/91

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 01/08/92

GPC Cleanup: (Y/N) N pH: 8.8 Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
319-84-6	alpha-BHC	8.6	U
319-85-7	beta-BHC	8.6	U
319-86-8	delta-BHC	8.6	U
58-89-9	gamma-BHC (Lindane)	8.6	U
76-44-8	Heptachlor	8.6	U
309-00-2	Aldrin	8.6	U
1024-57-3	Heptachlor epoxide	8.6	U
959-98-8	Endosulfan I	8.6	U
60-57-1	Dieldrin	17	U
72-55-9	4,4'-DDE	17	U
72-20-8	Endrin	17	U
33213-65-9	Endosulfan II	17	U
72-54-8	4,4'-DDD	17	U
1031-07-8	Endosulfan sulfate	17	U
50-29-3	4,4'-DDT	17	U
72-43-5	Methoxychlor	86	U
53494-70-5	Endrin ketone	17	U
5103-71-9	alpha-Chlordane	86	U
5103-74-2	gamma-Chlordane	86	U
8001-35-2	Toxaphene	170	U
12674-11-2	Aroclor-1016	86	U
11104-28-2	Aroclor-1221	86	U
11141-16-5	Aroclor-1232	86	U
53469-21-9	Aroclor-1242	86	U
12672-29-6	Aroclor-1248	86	U
11097-69-1	Aroclor-1254	170	U
11096-82-5	Aroclor-1260	170	U

9613501.2103

0019

EPA SAMPLE NO.

1D

PESTICIDE ORGANICS ANALYSIS DATA SHEET

B01CF8

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12069 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A112069-05A

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

Level: (low/med) LOW Date Received: 12/13/91

% Moisture: not dec. 10 dec. __ Date Extracted: 12/23/91

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 01/08/92

GPC Cleanup: (Y/N) N pH: 8.9 Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
319-84-6	alpha-BHC	8.9	U
319-85-7	beta-BHC	8.9	U
319-86-8	delta-BHC	8.9	U
58-89-9	gamma-BHC (Lindane)	8.9	U
76-44-8	Heptachlor	8.9	U
309-00-2	Aldrin	8.9	U
1024-57-3	Heptachlor epoxide	8.9	U
959-98-8	Endosulfan I	8.9	U
60-57-1	Dieldrin	18	U
72-55-9	4,4'-DDE	18	U
72-20-8	Endrin	18	U
33213-65-9	Endosulfan II	18	U
72-54-8	4,4'-DDD	18	U
1031-07-8	Endosulfan sulfate	18	U
50-29-3	4,4'-DDT	18	U
72-43-5	Methoxychlor	89	U
53494-70-5	Endrin ketone	18	U
5103-71-9	alpha-Chlordane	89	U
5103-74-2	gamma-Chlordane	89	U
8001-35-2	Toxaphene	180	U
12674-11-2	Aroclor-1016	89	U
11104-28-2	Aroclor-1221	89	U
11141-16-5	Aroclor-1232	89	U
53469-21-9	Aroclor-1242	89	U
12672-29-6	Aroclor-1248	89	U
11097-69-1	Aroclor-1254	180	U
11096-82-5	Aroclor-1260	180	U

9613501.2104

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January 21, 1992

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

Quality Control Narrative

Scope

Five (5) soil samples were submitted to TMA/Skinner & Sherman Laboratories, Inc. on December 18, 1991 from Westinghouse/Hanford Company. The sample was analyzed for the USEPA CLP metals. The analysis was performed under Skinner and Sherman work order 9112080.

Methodology

The samples were prepared, analyzed and reported in accordance with the USEPA Contract Laboratory Program Statement of Work 7/88 (CLP SOW788).

Discussion

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

The antimony, manganese, silver and vanadium digestion spike recoveries exceeded the control limit requirements.

The chromium and vanadium duplicates 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.

David N. Peterson
Assistant Laboratory Manager

TMA
Thermo Analytical Inc.
Skinner & Sherman Laboratories Inc.
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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. Cl
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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
thirty days following issuance of report. Samples will be stored at client's expense, if authorized in writing.
500 Second Avenue, P.O. Box 521, Waltham, Massachusetts 02254-0521 (617) 890-7200
1-800-4 LAB TEST FAX (617) 890-3883

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B01CF4

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

Lab Code: SKINER Case No.: N112127 SAS No.: SDG No.: B01CF4

Matrix (soil/water): SOIL Lab Sample ID: 12180-01S

Level (low/med): LOW Date Received: 12/18/91

% Solids: 94.6

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	5910.00			P
7440-36-0	Antimony	1.50	U	N	P
7440-38-2	Arsenic	1.40	B		F
7440-39-3	Barium	89.70			P
7440-41-7	Beryllium	0.78	B		P
7440-43-9	Cadmium	1.20			P
7440-70-2	Calcium	8640.00			P
7440-47-3	Chromium	12.90		*	P
7440-48-4	Cobalt	13.50			P
7440-50-8	Copper	22.10			P
7439-89-6	Iron	27800.00			P
7439-92-1	Lead	3.00			F
7439-95-4	Magnesium	4020.00			P
7439-96-5	Manganese	330.00		N	P
7439-97-6	Mercury	0.09	U		CV
7440-02-0	Nickel	10.20			P
7440-09-7	Potassium	793.00	B		P
7782-49-2	Selenium	0.76	U	W	F
7440-22-4	Silver	0.37	U	N	P
7440-23-5	Sodium	507.00	B		P
7440-28-0	Thallium	0.76	U		F
7440-62-2	Vanadium	68.40		*N	P
7440-66-6	Zinc	50.40			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: BROWN Clarity After: Artifacts: YES

Comments:
STONES

FORM I - IN Rev.6/89

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INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B01CF5

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

Lab Code: SKINER Case No.: N112127 SAS No.: SDG No.: B01CF4

Matrix (soil/water): SOIL Lab Sample ID: 12180-02S

Level (low/med): LOW Date Received: 12/18/91

% Solids: 90.5

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	6110.00			P
7440-36-0	Antimony	1.60	U	N	P
7440-38-2	Arsenic	1.30	B		F
7440-39-3	Barium	99.90			P
7440-41-7	Beryllium	1.10			P
7440-43-9	Cadmium	0.20	U		P
7440-70-2	Calcium	4380.00			P
7440-47-3	Chromium	5.70		*	P
7440-48-4	Cobalt	12.40			P
7440-50-8	Copper	17.10			P
7439-89-6	Iron	22700.00			P
7439-92-1	Lead	3.50			F
7439-95-4	Magnesium	3460.00			P
7439-96-5	Manganese	269.00		N	P
7439-97-6	Mercury	0.11	U		CV
7440-02-0	Nickel	6.00	B		P
7440-09-7	Potassium	686.00	B		P
7782-49-2	Selenium	0.88	U		F
7440-22-4	Silver	0.41	U	N	P
7440-23-5	Sodium	298.00	B		P
7440-28-0	Thallium	0.88	U		F
7440-62-2	Vanadium	55.30		N*	P
7440-66-6	Zinc	43.00			P
	Cyanide				NR

Color Before: GREY Clarity Before: Texture: COARSE

Color After: GREY Clarity After: Artifacts: YES

Comments:
STONES

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B01CF6

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

Lab Code: SKINER Case No.: N112127 SAS No.: SDG No.: B01CF4

Matrix (soil/water): SOIL Lab Sample ID: 12180-03S

Level (low/med): LOW Date Received: 12/18/91

% Solids: 92.5

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	5620.00			P
7440-36-0	Antimony	1.60	U	N	P
7440-38-2	Arsenic	1.20	B		F
7440-39-3	Barium	85.60			P
7440-41-7	Beryllium	1.20			P
7440-43-9	Cadmium	0.20	U		P
7440-70-2	Calcium	4220.00			P
7440-47-3	Chromium	7.80		*	P
7440-48-4	Cobalt	10.60			P
7440-50-8	Copper	16.10			P
7439-89-6	Iron	19800.00			P
7439-92-1	Lead	3.00			F
7439-95-4	Magnesium	3070.00			P
7439-96-5	Manganese	255.00		N	P
7439-97-6	Mercury	0.10	U		CV
7440-02-0	Nickel	7.60	B		P
7440-09-7	Potassium	585.00	B		P
7782-49-2	Selenium	0.75	U	W	F
7440-22-4	Silver	0.40	U	N	P
7440-23-5	Sodium	313.00	B		P
7440-28-0	Thallium	0.75	U		F
7440-62-2	Vanadium	51.10		N*	P
7440-66-6	Zinc	39.10			P
	Cyanide				NR

Color Before: GREY Clarity Before: Texture: COARSE

Color After: GREY Clarity After: Artifacts: YES

Comments:
STONES

FORM I - IN Rev.6/89

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INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B01CF7

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

Lab Code: SKINER Case No.: N112127 SAS No.: SDG No.: B01CF4

Matrix (soil/water): SOIL Lab Sample ID: 12180-04S

Level (low/med): LOW Date Received: 12/18/91

% Solids: 91.5

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	4360.00			P
7440-36-0	Antimony	1.50	U	N	P
7440-38-2	Arsenic	1.10	B		F
7440-39-3	Barium	83.00			P
7440-41-7	Beryllium	0.89	B		P
7440-43-9	Cadmium	0.41	B		P
7440-70-2	Calcium	4660.00			P
7440-47-3	Chromium	4.40		*	P
7440-48-4	Cobalt	9.60			P
7440-50-8	Copper	13.70			P
7439-89-6	Iron	20000.00			P
7439-92-1	Lead	2.30			F
7439-95-4	Magnesium	2930.00			P
7439-96-5	Manganese	237.00		N	P
7439-97-6	Mercury	0.09	U		CV
7440-02-0	Nickel	4.80	B		P
7440-09-7	Potassium	601.00	B		P
7782-49-2	Selenium	0.77	U	W	F
7440-22-4	Silver	0.37	U	N	P
7440-23-5	Sodium	299.00	B		P
7440-28-0	Thallium	0.77	U		F
7440-62-2	Vanadium	43.90		N*	P
7440-66-6	Zinc	36.10			P
	Cyanide				NR

Color Before: GRYE Clarity Before: Texture: COARSE

Color After: GREY Clarity After: Artifacts: YES

Comments:
STONES

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B01CF8

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

Lab Code: SKINER Case No.: N112127 SAS No.: SDG No.: B01CF4

Matrix (soil/water): SOIL Lab Sample ID: 12180-05S

Level (low/med): LOW Date Received: 12/18/91

% Solids: 91.7

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	4520.00			P
7440-36-0	Antimony	1.60	U	N	P
7440-38-2	Arsenic	1.70	B		F
7440-39-3	Barium	77.50			P
7440-41-7	Beryllium	0.21	U		P
7440-43-9	Cadmium	0.21	U		P
7440-70-2	Calcium	4640.00			P
7440-47-3	Chromium	5.60		*	P
7440-48-4	Cobalt	11.00			P
7440-50-8	Copper	20.10			P
7439-89-6	Iron	21500.00			P
7439-92-1	Lead	2.30			F
7439-95-4	Magnesium	3290.00			P
7439-96-5	Manganese	232.00		N	P
7439-97-6	Mercury	0.10	U		CV
7440-02-0	Nickel	6.30	B		P
7440-09-7	Potassium	447.00	B		P
7782-49-2	Selenium	0.83	U	W	F
7440-22-4	Silver	0.41	U	N	P
7440-23-5	Sodium	393.00	B		P
7440-28-0	Thallium	0.83	U		F
7440-62-2	Vanadium	56.70		N*	P
7440-66-6	Zinc	39.30			P
	Cyanide				NR

Color Before: GREY Clarity Before: Texture: COARSE

Color After: GREY Clarity After: Artifacts: YES

Comments:
STONES

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WESTINGHOUSE HANFORD COMPANY

Results of Analyses For:

GENERAL CHEMISTRY
CASE NO. 12-077
(TMA/ARLI Work Order # A1-12-077)

ORGANICS
CASE NO. 12-077
(TMA/ARLI Work Order # A1-12-077)

General Chemistry and Organics results are presented for the following WHC SOIL samples(s):

B01GF4
B01GF6
B01GF7
B01GG9
B01GH0

Norcal Work Order # N1-12-154

Thermo Analytical Inc.
160 Taylor Street
Monrovia, Ca. 91016
818-357-3247

MS
7/15/96

GENERAL CHEMISTRY RESULTS

CASE NO. 12-077

Soil Sample #:

B01GF4
B01GF6
B01GF7
B01GG9
B01GH0

CASE NARRATIVE

No problems were encountered during sample analysis.

Dennis D. Wells, Project Manager

TMA Inc. REPORT

Work Order # A1-12-077

Received: 12/18/91

Results by Sample

SAMPLE ID B01GF4 FRACTION 01A TEST CODE WCCLPS NAME Anions in Solids - WN232

Date & Time Collected 12/14/91 Category

ANIONS AND WET CHEMISTRY - SOLIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT
Fluoride	300	6.8	mg/Kg	1.0
Nitrite	300	<1.0	mg/Kg	1.0
Nitrate	300	4.8	mg/Kg	2.0
Sulfate	300	34	mg/Kg	10.0
pH	150.1	8.9	pH	1.0
Ammonia	350.3	23.0	mg/Kg	0.5

FORM I

Received: 12/18/91

Results by Sample

SAMPLE ID B01GF6 FRACTION 02A TEST CODE VCCLPS NAME Anions in Solids - VW232

Date & Time Collected 12/14/91 Category

ANIONS AND WET CHEMISTRY - SOLIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT
Fluoride	300	8.2	mg/Kg	1.0
Nitrite	300	<1.0	mg/Kg	1.0
Nitrate	300	5.0	mg/Kg	2.0
Sulfate	300	34	mg/Kg	10.0
pH	150.1	8.9	pH	1.0
Ammonia	350.3	23.4	mg/Kg	0.5

FORM I

SAMPLE ID B01GF7 FRACTION 03A TEST CODE WCCLPS NAME Anions in Solids - WW232
Date & Time Collected 12/14/91 Category

ANIONS AND WET CHEMISTRY - SOLIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT
Fluoride	300	9.7	mg/Kg	1.0
Nitrite	300	<1.0	mg/Kg	1.0
Nitrate	300	7.8	mg/Kg	2.0
Sulfate	300	56	mg/Kg	10.0
pH	150.1	7.4	pH	1.0
Ammonia	350.3	17.0	mg/Kg	0.5

FORM I

Received: 12/18/91

Results by Sample

SAMPLE ID B01GG9 FRACTION 04A TEST CODE VCCLPS NAME Anions in Solids - VM232

Date & Time Collected 12/16/91 Category

ANIONS AND WET CHEMISTRY - SOLIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT
Fluoride	300	8.8	mg/Kg	1.0
Nitrite	300	<1.0	mg/Kg	1.0
Nitrate	300	6.2	mg/Kg	2.0
Sulfate	300	42	mg/Kg	10.0
pH	150.1	8.6	pH	1.0
Ammonia	350.3	8.0	mg/Kg	0.5

FORM I

Received: 12/18/91

Results by Sample

SAMPLE ID B01GH0 FRACTION 05A TEST CODE VCCLPS NAME Anions in Solids - VN232

Date & Time Collected 12/16/91 Category

ANIONS AND WET CHEMISTRY - SOLIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT
Fluoride	300	8.7	mg/Kg	1.0
Nitrite	300	<1.0	mg/Kg	1.0
Nitrate	300	6.2	mg/Kg	2.0
Sulfate	300	41	mg/Kg	10.0
pH	150.1	8.7	pH	1.0
Ammonia	350.3	12.0	mg/Kg	0.5

FORM I

CASE NARRATIVE

LABORATORY: TMA/ARLI

CASE: 12-077

CONTRACT ID: WESTINGHOUSE HANFORD COMPANY

SDG RECEIPT DATE: December 18, 1991

1.0 DESCRIPTION OF CASE:

Five soil samples were analyzed for TCL Organics-Volatiles and Pesticide/PCBs according to the USEPA Contract Laboratory Program (CLP) Statement of Work for Organic Analysis, Revision 2/88.

2.0 SAMPLE LIST:

WESTINGHOUSE ID	LAB ID	ANALYSIS REQUESTED	MATRIX
B01GF4	A1-12-077-01A	P	SOIL
B01GF4 MS	A1-12-077-01B	P	SOIL
B01GF4 MSD	A1-12-077-01C	P	SOIL
B01GF4	A1-12-077-01F	V	SOIL
B01GF4 MS	A1-12-077-01G	V	SOIL
B01GF4 MSD	A1-12-077-01H	V	SOIL
B01GF6	A1-12-077-02A	P	SOIL
B01GF6	A1-12-077-02C	V	SOIL
B01GF7 DL	A1-12-077-03A	P	SOIL
B01GF7	A1-12-077-03B	V	SOIL
B01GG9	A1-12-077-04A	P	SOIL
B01GG9	A1-12-077-04B	V	SOIL
B01GH0	A1-12-077-05A	P	SOIL
B01GH0	A1-12-077-05B	V	SOIL
B01GF6 RE	A1-12-077-02C	V	SOIL

COMMENTS:

3.1 SHIPPING AND DOCUMENTATION:

All samples were received unbroken and properly documented.

3.2 ANALYSIS:

3.2.1 VOLATILE ANALYSIS COMMENTS:

LOW LEVEL SOIL :

The samples were analyzed by heated purge within the CLP SOW holding times. The surrogate recovery of Toluene-d8 for sample B01GF6 was above the QC limit and all three internal standard areas were below the QC limit. The sample was re-analyzed out of holding time with the same results and is reported as B01GF6RE. All of the results were within the limits specified in the EPA CLP SOW.

TUNES:

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

3.2.2 PESTICIDE/PCB ANALYSIS COMMENTS:

SEQUENCE NOTES:

The sequence was started on 1/13/92 and was analyzed in accordance with the EPA CLP SOW. IND A and IND B were run consecutively at several times in the sequence. The following standards were used for quantitation:

IND A	04:57	1/14/92	(B11324)
IND B	13:47	1/14/92	(B11336)
IND A	22:35	1/14/92	(B11348)
IND B	07:23	1/15/92	(B11360)
IND A	16:58	1/15/92	(B11373)
IND B	02:32	1/16/92	(B11386)
IND A	06:56	1/16/92	(B11392)
IND B	07:46	1/16/92	(B11393)

Due to the limitations of the software used to report the results for 2/88 CLP Protocol Pesticide/PCBs, instrument blanks cannot be reported. An instrument blank (GC files B11366 and A11366) was injected at 11:47 on 1/15/92. The analysis indicated that there was no contamination in the system.

SAMPLES:

LOW LEVEL SOIL :

The samples were extracted and analyzed within the CLP SOW holding times. Sample B01GF7 contained Aroclor-1248 and Aroclor-1254. The sample was diluted 1 to 2 and reported as B01GF7DL. Several samples contained Aroclor analytes, however, they could not be confirmed by GC/MS since they were detected at levels below the GC/MS detection limit. The "X" qualifier denotes that the data was manually input into the software program.

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

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 diskette is authorized by the Laboratory Manager or his designee, as verified by the following signatures.

Nicole Roth
CLP Program Manager

Dennis D. Wells
Technical Director

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1A

0005

EPA SAMPLE NO.

B01GF4

VOLATILE ORGANICS ANALYSIS DATA SHEET

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12077 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A112077-01F

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 1227K03

Level: (low/med) LOW Date Received: 12/18/91

% Moisture: not dec. 12 Date Analyzed: 12/27/91

Column: (pack/cap) PACK Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
74-87-3	Chloromethane	11	U
74-83-9	Bromomethane	11	U
75-01-4	Vinyl Chloride	11	U
75-00-3	Chloroethane	11	U
75-09-2	Methylene Chloride	47	B
67-64-1	Acetone	44	B
75-15-0	Carbon Disulfide	6	U
75-35-4	1,1-Dichloroethene	6	U
75-34-3	1,1-Dichloroethane	6	U
540-59-0	1,2-Dichloroethene (total)	6	U
67-66-3	Chloroform	6	
107-06-2	1,2-Dichloroethane	6	U
78-93-3	2-Butanone	11	U
71-55-6	1,1,1-Trichloroethane	6	U
56-23-5	Carbon Tetrachloride	6	U
108-05-4	Vinyl Acetate	11	U
75-27-4	Bromodichloromethane	6	U
78-87-5	1,2-Dichloropropane	6	U
10061-01-5	cis-1,3-Dichloropropene	6	U
79-01-6	Trichloroethene	6	U
124-48-1	Dibromochloromethane	6	U
79-00-5	1,1,2-Trichloroethane	6	U
71-43-2	Benzene	6	U
10061-02-6	trans-1,3-Dichloropropene	6	U
75-25-2	Bromoform	6	U
108-10-1	4-Methyl-2-Pentanone	11	U
591-78-6	2-Hexanone	11	U
127-18-4	Tetrachloroethene	6	U
79-34-5	1,1,2,2-Tetrachloroethane	6	U
108-88-3	Toluene	6	U
108-90-7	Chlorobenzene	6	U
100-41-4	Ethylbenzene	6	U
100-42-5	Styrene	6	U
1330-20-7	Xylene (Total)	6	U

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0006

EPA SAMPLE NO.

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

B01GF4

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12077 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A112077-01F

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 1227K03

Level: (low/med) LOW Date Received: 12/18/91

% Moisture: not dec. 12 Date Analyzed: 12/27/91

Column (pack/cap) PACK Dilution Factor: 1.0

Number TICs found: 0

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

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1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

0007
EPA SAMPLE NO.

B01GF6

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12077 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A112077-02C

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 1226K12

Level: (low/med) LOW Date Received: 12/18/91

% Moisture: not dec. 16 Date Analyzed: 12/26/91

Column: (pack/cap) PACK Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
74-87-3	Chloromethane	12	U
74-83-9	Bromomethane	12	U
75-01-4	Vinyl Chloride	12	U
75-00-3	Chloroethane	12	U
75-09-2	Methylene Chloride	90	B
67-64-1	Acetone	12	B
75-15-0	Carbon Disulfide	6	U
75-35-4	1,1-Dichloroethene	6	U
75-34-3	1,1-Dichloroethane	6	U
540-59-0	1,2-Dichloroethene (total)	6	U
67-66-3	Chloroform	6	U
107-06-2	1,2-Dichloroethane	6	U
78-93-3	2-Butanone	12	U
71-55-6	1,1,1-Trichloroethane	6	U
56-23-5	Carbon Tetrachloride	6	U
108-05-4	Vinyl Acetate	12	U
75-27-4	Bromodichloromethane	6	U
78-87-5	1,2-Dichloropropane	6	U
10061-01-5	cis-1,3-Dichloropropene	6	U
79-01-6	Trichloroethene	6	U
124-48-1	Dibromochloromethane	6	U
79-00-5	1,1,2-Trichloroethane	6	U
71-43-2	Benzene	6	U
10061-02-6	trans-1,3-Dichloropropene	6	U
75-25-2	Bromoform	6	U
108-10-1	4-Methyl-2-Pentanone	12	U
591-78-6	2-Hexanone	12	U
127-18-4	Tetrachloroethene	6	U
79-34-5	1,1,2,2-Tetrachloroethane	6	U
108-88-3	Toluene	10	
108-90-7	Chlorobenzene	6	U
100-41-4	Ethylbenzene	6	U
100-42-5	Styrene	6	U
1330-20-7	Xylene (Total)	6	U

9613501.2123

1E

0008

EPA SAMPLE NO.

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

B01GF6

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12077 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A112077-02C

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 1226K12

Level: (low/med) LOW Date Received: 12/18/91

% Moisture: not dec. 16 Date Analyzed: 12/26/91

Column (pack/cap) PACK Dilution Factor: 1.0

Number TICs found: 0

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

9613501.2124

0009

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B01GF6RE

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12077 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A112077-02C

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 20109R10

Level: (low/med) LOW Date Received: 12/18/91

% Moisture: not dec. 16 Date Analyzed: 01/09/92

Column: (pack/cap) PACK Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
74-87-3	Chloromethane	12	U
74-83-9	Bromomethane	12	U
75-01-4	Vinyl Chloride	12	U
75-00-3	Chloroethane	12	U
75-09-2	Methylene Chloride	10	B
67-64-1	Acetone	52	B
75-15-0	Carbon Disulfide	8	
75-35-4	1,1-Dichloroethene	6	U
75-34-3	1,1-Dichloroethane	6	U
540-59-0	1,2-Dichloroethene (total)	6	U
67-66-3	Chloroform	3	J
107-06-2	1,2-Dichloroethane	6	U
78-93-3	2-Butanone	12	U
71-55-6	1,1,1-Trichloroethane	6	U
56-23-5	Carbon Tetrachloride	6	U
108-05-4	Vinyl Acetate	12	U
75-27-4	Bromodichloromethane	6	U
78-87-5	1,2-Dichloropropane	6	U
10061-01-5	cis-1,3-Dichloropropene	6	U
79-01-6	Trichloroethene	6	U
124-48-1	Dibromochloromethane	6	U
79-00-5	1,1,2-Trichloroethane	6	U
71-43-2	Benzene	6	U
10061-02-6	trans-1,3-Dichloropropene	6	U
75-25-2	Bromoform	6	U
108-10-1	4-Methyl-2-Pentanone	12	U
591-78-6	2-Hexanone	12	U
127-18-4	Tetrachloroethene	6	U
79-34-5	1,1,2,2-Tetrachloroethane	6	U
108-88-3	Toluene	6	U
108-90-7	Chlorobenzene	6	U
100-41-4	Ethylbenzene	6	U
100-42-5	Styrene	6	U
1330-20-7	Xylene (Total)	6	U

9613501.2125

1E

0010

EPA SAMPLE NO.

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

B01GF6RE

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12077 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A112077-02C

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 20109R10

Level: (low/med) LOW Date Received: 12/18/91

% Moisture: not dec. 16 Date Analyzed: 01/09/92

Column (pack/cap) PACK Dilution Factor: 1.0

Number TICs found: 0

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

9613501.2126

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

0011

B01GF7

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12077 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A112077-03B

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 1226K13

Level: (low/med) LOW Date Received: 12/18/91

% Moisture: not dec. 6 Date Analyzed: 12/26/91

Column: (pack/cap) PACK Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
74-87-3	Chloromethane	11	U
74-83-9	Bromomethane	11	U
75-01-4	Vinyl Chloride	11	U
75-00-3	Chloroethane	11	U
75-09-2	Methylene Chloride	22	B
67-64-1	Acetone	50	B
75-15-0	Carbon Disulfide	1	J
75-35-4	1,1-Dichloroethene	5	U
75-34-3	1,1-Dichloroethane	5	U
540-59-0	1,2-Dichloroethene (total)	5	U
67-66-3	Chloroform	5	U
107-06-2	1,2-Dichloroethane	5	U
78-93-3	2-Butanone	11	U
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
108-05-4	Vinyl Acetate	11	U
75-27-4	Bromodichloromethane	5	U
78-87-5	1,2-Dichloropropane	5	U
10061-01-5	cis-1,3-Dichloropropene	5	U
79-01-6	Trichloroethene	5	U
124-48-1	Dibromochloromethane	5	U
79-00-5	1,1,2-Trichloroethane	5	U
71-43-2	Benzene	5	U
10061-02-6	trans-1,3-Dichloropropene	5	U
75-25-2	Bromoform	5	U
108-10-1	4-Methyl-2-Pentanone	11	U
591-78-6	2-Hexanone	11	U
127-18-4	Tetrachloroethene	5	U
79-34-5	1,1,2,2-Tetrachloroethane	5	U
108-88-3	Toluene	1	J
108-90-7	Chlorobenzene	5	U
100-41-4	Ethylbenzene	5	U
100-42-5	Styrene	5	U
1330-20-7	Xylene (Total)	5	U

9613501.2127

0012

1E

EPA SAMPLE NO.

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

B01GF7

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12077 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A112077-03B

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 1226K13

Level: (low/med) LOW Date Received: 12/18/91

% Moisture: not dec. 6 Date Analyzed: 12/26/91

Column (pack/cap) PACK Dilution Factor: 1.0

Number TICs found: 0

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

9613501.2128

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

0013

EPA SAMPLE NO.

B01GG9

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12077 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A112077-04B

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 1226K14

Level: (low/med) LOW Date Received: 12/18/91

% Moisture: not dec. 6 Date Analyzed: 12/26/91

Column: (pack/cap) PACK Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
74-87-3	Chloromethane	11	U
74-83-9	Bromomethane	11	U
75-01-4	Vinyl Chloride	11	U
75-00-3	Chloroethane	11	U
75-09-2	Methylene Chloride	24	B
67-64-1	Acetone	29	B
75-15-0	Carbon Disulfide	5	U
75-35-4	1,1-Dichloroethene	5	U
75-34-3	1,1-Dichloroethane	5	U
540-59-0	1,2-Dichloroethene (total)	5	U
67-66-3	Chloroform	5	U
107-06-2	1,2-Dichloroethane	5	U
78-93-3	2-Butanone	11	U
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
108-05-4	Vinyl Acetate	11	U
75-27-4	Bromodichloromethane	5	U
78-87-5	1,2-Dichloropropane	5	U
10061-01-5	cis-1,3-Dichloropropene	5	U
79-01-6	Trichloroethene	5	U
124-48-1	Dibromochloromethane	5	U
79-00-5	1,1,2-Trichloroethane	5	U
71-43-2	Benzene	5	U
10061-02-6	trans-1,3-Dichloropropene	5	U
75-25-2	Bromoform	5	U
108-10-1	4-Methyl-2-Pentanone	11	U
591-78-6	2-Hexanone	11	U
127-18-4	Tetrachloroethene	5	U
79-34-5	1,1,2,2-Tetrachloroethane	5	U
108-88-3	Toluene	5	U
108-90-7	Chlorobenzene	5	U
100-41-4	Ethylbenzene	5	U
100-42-5	Styrene	5	U
1330-20-7	Xylene (Total)	5	U

9613501.2129
1E

EPA SAMPLE NO.

B01GG9

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12077 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A112077-04B

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 1226K14

Level: (low/med) LOW Date Received: 12/18/91

% Moisture: not dec. 6 Date Analyzed: 12/26/91

Column (pack/cap) PACK Dilution Factor: 1.0

Number TICs found: 0

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

EPA SAMPLE NO.

B01GH0

VOLATILE ORGANICS ANALYSIS DATA SHEET

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12077 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A112077-05B

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 1226K15

Level: (low/med) LOW Date Received: 12/18/91

% Moisture: not dec. 8 Date Analyzed: 12/26/91

Column: (pack/cap) PACK Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
74-87-3	Chloromethane	11	U
74-83-9	Bromomethane	11	U
75-01-4	Vinyl Chloride	11	U
75-00-3	Chloroethane	11	U
75-09-2	Methylene Chloride	31	B
67-64-1	Acetone	30	B
75-15-0	Carbon Disulfide	5	U
75-35-4	1,1-Dichloroethene	5	U
75-34-3	1,1-Dichloroethane	5	U
540-59-0	1,2-Dichloroethene (total)	5	U
67-66-3	Chloroform	5	U
107-06-2	1,2-Dichloroethane	5	U
78-93-3	2-Butanone	11	U
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
108-05-4	Vinyl Acetate	11	U
75-27-4	Bromodichloromethane	5	U
78-87-5	1,2-Dichloropropane	5	U
10061-01-5	cis-1,3-Dichloropropene	5	U
79-01-6	Trichloroethene	5	U
124-48-1	Dibromochloromethane	5	U
79-00-5	1,1,2-Trichloroethane	5	U
71-43-2	Benzene	5	U
10061-02-6	trans-1,3-Dichloropropene	5	U
75-25-2	Bromoform	5	U
108-10-1	4-Methyl-2-Pentanone	11	U
591-78-6	2-Hexanone	11	U
127-18-4	Tetrachloroethene	5	U
79-34-5	1,1,2,2-Tetrachloroethane	5	U
108-88-3	Toluene	5	U
108-90-7	Chlorobenzene	5	U
100-41-4	Ethylbenzene	5	U
100-42-5	Styrene	5	U
1330-20-7	Xylene (Total)	5	U

EPA SAMPLE NO.

B01GH0

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12077 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A112077-05B

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 1226K15

Level: (low/med) LOW Date Received: 12/18/91

% Moisture: not dec. 8 Date Analyzed: 12/26/91

Column (pack/cap) PACK Dilution Factor: 1.0

Number TICs found: 0

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

9613501.2132

ID

EPA SAMPLE NO.

B01GF4

PESTICIDE ORGANICS ANALYSIS DATA SHEET

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12077 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A112077-01A

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

Level: (low/med) LOW Date Received: 12/18/91

% Moisture: not dec. 12 dec. __ Date Extracted: 12/26/91

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 01/15/92

GPC Cleanup: (Y/N) N pH: 8.9 Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
319-84-6	alpha-BHC	8.9	U
319-85-7	beta-BHC	8.9	U
319-86-8	delta-BHC	8.9	U
58-89-9	gamma-BHC (Lindane)	8.9	U
76-44-8	Heptachlor	8.9	U
309-00-2	Aldrin	8.9	U
1024-57-3	Heptachlor epoxide	8.9	U
959-98-8	Endosulfan I	8.9	U
60-57-1	Dieldrin	18	U
72-55-9	4,4'-DDE	18	U
72-20-8	Endrin	18	U
33213-65-9	Endosulfan II	18	U
72-54-8	4,4'-DDD	18	U
1031-07-8	Endosulfan sulfate	18	U
50-29-3	4,4'-DDT	18	U
72-43-5	Methoxychlor	89	U
53494-70-5	Endrin ketone	18	U
5103-71-9	alpha-Chlordane	89	U
5103-74-2	gamma-Chlordane	89	U
8001-35-2	Toxaphene	180	U
12674-11-2	Aroclor-1016	89	U
11104-28-2	Aroclor-1221	89	U
11141-16-5	Aroclor-1232	89	U
53469-21-9	Aroclor-1242	89	U
12672-29-6	Aroclor-1248	89	U
11097-69-1	Aroclor-1254	210	
11096-82-5	Aroclor-1260	180	U

9613501.2133

0018

EPA SAMPLE NO.

PESTICIDE ORGANICS ANALYSIS DATA SHEET

B01GF6

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12077 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A112077-02A

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

Level: (low/med) LOW Date Received: 12/18/91

% Moisture: not dec. 16 dec. __ Date Extracted: 12/26/91

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 01/15/92

GPC Cleanup: (Y/N) N pH: 8.9 Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
319-84-6	alpha-BHC	9.3	U
319-85-7	beta-BHC	9.3	U
319-86-8	delta-BHC	9.3	U
58-89-9	gamma-BHC (Lindane)	9.3	U
76-44-8	Heptachlor	9.3	U
309-00-2	Aldrin	9.3	U
1024-57-3	Heptachlor epoxide	9.3	U
959-98-8	Endosulfan I	9.3	U
60-57-1	Dieldrin	19	U
72-55-9	4,4'-DDE	19	U
72-20-8	Endrin	19	U
33213-65-9	Endosulfan II	19	U
72-54-8	4,4'-DDD	19	U
1031-07-8	Endosulfan sulfate	19	U
50-29-3	4,4'-DDT	19	U
72-43-5	Methoxychlor	93	U
53494-70-5	Endrin ketone	19	U
5103-71-9	alpha-Chlordane	93	U
5103-74-2	gamma-Chlordane	93	U
8001-35-2	Toxaphene	190	U
12674-11-2	Aroclor-1016	93	U
11104-28-2	Aroclor-1221	93	U
11141-16-5	Aroclor-1232	93	U
53469-21-9	Aroclor-1242	93	U
12672-29-6	Aroclor-1248	93	U
11097-69-1	Aroclor-1254	230	
11096-82-5	Aroclor-1260	190	U

9613501.2154 7/18/96 - See Case Narrative, B01GF7 reported as B01GF7DL for the pesticides. 0019

1D

PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B01GF7DL

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12077 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A112077-03AD

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

Level: (low/med) LOW Date Received: 12/18/91

% Moisture: not dec. 6 dec. __ Date Extracted: 12/26/91

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 01/15/92

GPC Cleanup: (Y/N) N pH: 7.4 Dilution Factor: 2.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
319-84-6	alpha-BHC	17	U
319-85-7	beta-BHC	17	U
319-86-8	delta-BHC	17	U
58-89-9	gamma-BHC (Lindane)	17	U
76-44-8	Heptachlor	17	U
309-00-2	Aldrin	17	U
1024-57-3	Heptachlor epoxide	17	U
959-98-8	Endosulfan I	17	U
60-57-1	Dieldrin	34	U
72-55-9	4,4'-DDE	34	U
72-20-8	Endrin	34	U
33213-65-9	Endosulfan II	34	U
72-54-8	4,4'-DDD	34	U
1031-07-8	Endosulfan sulfate	34	U
50-29-3	4,4'-DDT	34	U
72-43-5	Methoxychlor	170	U
53494-70-5	Endrin ketone	34	U
5103-71-9	alpha-Chlordane	170	U
5103-74-2	gamma-Chlordane	170	U
8001-35-2	Toxaphene	340	U
12674-11-2	Aroclor-1016	170	U
11104-28-2	Aroclor-1221	170	U
11141-16-5	Aroclor-1232	170	U
53469-21-9	Aroclor-1242	170	U
12672-29-6	Aroclor-1248	630	DX
11097-69-1	Aroclor-1254	460	DX
11096-82-5	Aroclor-1260	340	U

9613501.2135 1D

0020

PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.: B01GG9

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12077 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A112077-04A

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

Level: (low/med) LOW Date Received: 12/18/91

% Moisture: not dec. 6 dec. __ Date Extracted: 12/26/91

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 01/15/92

GPC Cleanup: (Y/N) N pH: 8.6 Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
319-84-6	alpha-BHC	8.4	U
319-85-7	beta-BHC	8.4	U
319-86-8	delta-BHC	8.4	U
58-89-9	gamma-BHC (Lindane)	8.4	U
76-44-8	Heptachlor	8.4	U
309-00-2	Aldrin	8.4	U
1024-57-3	Heptachlor epoxide	8.4	U
959-98-8	Endosulfan I	8.4	U
60-57-1	Dieldrin	17	U
72-55-9	4,4'-DDE	17	U
72-20-8	Endrin	17	U
33213-65-9	Endosulfan II	17	U
72-54-8	4,4'-DDD	17	U
1031-07-8	Endosulfan sulfate	17	U
50-29-3	4,4'-DDT	17	U
72-43-5	Methoxychlor	84	U
53494-70-5	Endrin ketone	17	U
5103-71-9	alpha-Chlordane	84	U
5103-74-2	gamma-Chlordane	84	U
8001-35-2	Toxaphene	170	U
12674-11-2	Aroclor-1016	84	U
11104-28-2	Aroclor-1221	84	U
11141-16-5	Aroclor-1232	84	U
53469-21-9	Aroclor-1242	84	U
12672-29-6	Aroclor-1248	84	U
11097-69-1	Aroclor-1254	170	U
11096-82-5	Aroclor-1260	170	U

9613501.2136

0021

PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B01GH0

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12077 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A112077-05A

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

Level: (low/med) LOW Date Received: 12/18/91

% Moisture: not dec. 8 dec. __ Date Extracted: 12/26/91

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 01/15/92

GPC Cleanup: (Y/N) N pH: 8.7 Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
319-84-6	alpha-BHC	8.6	U
319-85-7	beta-BHC	8.6	U
319-86-8	delta-BHC	8.6	U
58-89-9	gamma-BHC (Lindane)	8.6	U
76-44-8	Heptachlor	8.6	U
309-00-2	Aldrin	8.6	U
1024-57-3	Heptachlor epoxide	8.6	U
959-98-8	Endosulfan I	8.6	U
60-57-1	Dieldrin	17	U
72-55-9	4,4'-DDE	17	U
72-20-8	Endrin	17	U
33213-65-9	Endosulfan II	17	U
72-54-8	4,4'-DDD	17	U
1031-07-8	Endosulfan sulfate	17	U
50-29-3	4,4'-DDT	17	U
72-43-5	Methoxychlor	86	U
53494-70-5	Endrin ketone	17	U
5103-71-9	alpha-Chlordane	86	U
5103-74-2	gamma-Chlordane	86	U
8001-35-2	Toxaphene	170	U
12674-11-2	Aroclor-1016	86	U
11104-28-2	Aroclor-1221	86	U
11141-16-5	Aroclor-1232	86	U
53469-21-9	Aroclor-1242	86	U
12672-29-6	Aroclor-1248	86	U
11097-69-1	Aroclor-1254	170	U
11096-82-5	Aroclor-1260	170	U

1D

PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO. 0020

B01GG9

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12077 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A112077-04A

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

Level: (low/med) LOW Date Received: 12/18/91

% Moisture: not dec. 6 dec. __ Date Extracted: 12/26/91

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 01/15/92

GPC Cleanup: (Y/N) N pH: 8.6 Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
319-84-6	alpha-BHC	8.4	U
319-85-7	beta-BHC	8.4	U
319-86-8	delta-BHC	8.4	U
58-89-9	gamma-BHC (Lindane)	8.4	U
76-44-8	Heptachlor	8.4	U
309-00-2	Aldrin	8.4	U
1024-57-3	Heptachlor epoxide	8.4	U
959-98-8	Endosulfan I	8.4	U
60-57-1	Dieldrin	17	U
72-55-9	4,4'-DDE	17	U
72-20-8	Endrin	17	U
33213-65-9	Endosulfan II	17	U
72-54-8	4,4'-DDD	17	U
1031-07-8	Endosulfan sulfate	17	U
50-29-3	4,4'-DDT	17	U
72-43-5	Methoxychlor	84	U
53494-70-5	Endrin ketone	17	U
5103-71-9	alpha-Chlordane	84	U
5103-74-2	gamma-Chlordane	84	U
8001-35-2	Toxaphene	170	U
12674-11-2	Aroclor-1016	84	U
11104-28-2	Aroclor-1221	84	U
11141-16-5	Aroclor-1232	84	U
53469-21-9	Aroclor-1242	84	U
12672-29-6	Aroclor-1248	84	U
11097-69-1	Aroclor-1254	170	U
11096-82-5	Aroclor-1260	170	U

9613501.2158

0021

EPA SAMPLE NO.

B01GH0

PESTICIDE ORGANICS ANALYSIS DATA SHEET

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12077 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A112077-05A

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

Level: (low/med) LOW Date Received: 12/18/91

% Moisture: not dec. 8 dec. __ Date Extracted: 12/26/91

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 01/15/92

GPC Cleanup: (Y/N) N pH: 8.7 Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
319-84-6	alpha-BHC	8.6	U
319-85-7	beta-BHC	8.6	U
319-86-8	delta-BHC	8.6	U
58-89-9	gamma-BHC (Lindane)	8.6	U
76-44-8	Heptachlor	8.6	U
309-00-2	Aldrin	8.6	U
1024-57-3	Heptachlor epoxide	8.6	U
959-98-8	Endosulfan I	8.6	U
60-57-1	Dieldrin	17	U
72-55-9	4,4'-DDE	17	U
72-20-8	Endrin	17	U
33213-65-9	Endosulfan II	17	U
72-54-8	4,4'-DDD	17	U
1031-07-8	Endosulfan sulfate	17	U
50-29-3	4,4'-DDT	17	U
72-43-5	Methoxychlor	86	U
53494-70-5	Endrin ketone	17	U
5103-71-9	alpha-Chlordane	86	U
5103-74-2	gamma-Chlordane	86	U
8001-35-2	Toxaphene	170	U
12674-11-2	Aroclor-1016	86	U
11104-28-2	Aroclor-1221	86	U
11141-16-5	Aroclor-1232	86	U
53469-21-9	Aroclor-1242	86	U
12672-29-6	Aroclor-1248	86	U
11097-69-1	Aroclor-1254	170	U
11096-82-5	Aroclor-1260	170	U

9613501.2139

MAR 1992
RECEIVED
OSM DMO

WESTINGHOUSE HANFORD COMPANY

Results of Analyses For:

ORGANICS
Case No. 12-077
(TMA/ARLI Work Order # A1-12-077)

METALS
Case No. N112154
(TMA/Skinner & Sherman W.O. # 91-12-185)

TMA Master Work Order N1-12-154

March 6, 1992

MS 7/18/96

TMA
Thermo Analytical Inc.

9613501.2140

Skinner & Sherman Laboratories Inc.
300 Second Avenue
Post Office Box 521
Waltham, MA 02254-0521

(617) 890-7200

Federal Express 4009269994
January 22, 1992

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

Quality Control Narrative

Scope
Five (5) soil samples were submitted to TMA/Skinner & Sherman Laboratories, Inc. on December 19, 1991 from Westinghouse/Hanford Company. The sample was analyzed for the USEPA CLP metals. The analysis was performed under Skinner and Sherman work order 9112085.

Methodology
The samples were prepared, analyzed and reported in accordance with the USEPA Contract Laboratory Program Statement of Work 7/88 (CLP SOW788).

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

The antimony, lead, and selenium digestion spike recoveries exceeded the control limit requirements.

The vanadium duplicates 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.

David N. Peterson
Assistant Laboratory Manager

NS 1/18/96

TMA
Thermo Analytical Inc.

9613501.2141

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

Federal Express 4009269994
January 22, 1992

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

Quality Control Narrative

Scope
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Methodology
The samples were prepared, analyzed and reported in accordance with the USEPA Contract Laboratory Program Statement of Work 7/88 (CLP SOW788).

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

The antimony, lead, and selenium digestion spike recoveries exceeded the control limit requirements.

The vanadium duplicates 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.

David N. Peterson
Assistant Laboratory Manager

9613501.2142 WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B01GF4

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

Lab Code: SKINER Case No.: N1-12-154SAS No.: SDG No.: B01GF4

Matrix (soil/water): SOIL Lab Sample ID: 12185-01S

Level (low/med): LOW Date Received: 12/19/91

% Solids: 83.6

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	16700.00			P
7440-36-0	Antimony	1.80	U	N	P
7440-38-2	Arsenic	1.80	B	S	F
7440-39-3	Barium	189.00			P
7440-41-7	Beryllium	0.23	U		P
7440-43-9	Cadmium	0.56	B		P
7440-70-2	Calcium	20000.00			P
7440-47-3	Chromium	116.00			P
7440-48-4	Cobalt	11.10	B		P
7440-50-8	Copper	277.00			P
7439-89-6	Iron	21300.00			P
7439-92-1	Lead	16.90		N	F
7439-95-4	Magnesium	7930.00			P
7439-96-5	Manganese	284.00			P
7439-97-6	Mercury	2.00			CV
7440-02-0	Nickel	48.40			P
7440-09-7	Potassium	792.00	B		P
7782-49-2	Selenium	4.30	U	MWN	F
7440-22-4	Silver	33.60			P
7440-23-5	Sodium	300.00	B		P
7440-28-0	Thallium	0.44	U		F
7440-62-2	Vanadium	46.40		*	P
7440-66-6	Zinc	64.60			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: BROWN Clarity After: Artifacts: YES

Comments:
STONES

9613501.2145

WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B01GF6

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

Lab Code: SKINER Case No.: N1-12-154SAS No.: SDG No.: B01GF4

Matrix (soil/water): SOIL Lab Sample ID: 12185-02S

Level (low/med): LOW Date Received: 12/19/91

% Solids: 84.8

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	13100.00			P
7440-36-0	Antimony	1.70	U	N	P
7440-38-2	Arsenic	2.30			F
7440-39-3	Barium	173.00			P
7440-41-7	Beryllium	0.22	U		P
7440-43-9	Cadmium	0.31	B		P
7440-70-2	Calcium	14700.00			P
7440-47-3	Chromium	83.90			P
7440-48-4	Cobalt	11.10			P
7440-50-8	Copper	259.00			P
7439-89-6	Iron	21900.00			P
7439-92-1	Lead	15.50		N	F
7439-95-4	Magnesium	6630.00			P
7439-96-5	Manganese	331.00			P
7439-97-6	Mercury	1.60			CV
7440-02-0	Nickel	39.00			P
7440-09-7	Potassium	773.00	B		P
7782-49-2	Selenium	4.50	U	WN	F
7440-22-4	Silver	23.40			P
7440-23-5	Sodium	305.00	B		P
7440-28-0	Thallium	0.45	U		F
7440-62-2	Vanadium	48.10		*	P
7440-66-6	Zinc	57.30			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: BROWN Clarity After: Artifacts: YES

Comments:
STONES

9613501.2144

WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B01GF7

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

Lab Code: SKINER Case No.: N1-12-154SAS No.: SDG No.: B01GF4

Matrix (soil/water): SOIL Lab Sample ID: 12185-03S

Level (low/med): LOW Date Received: 12/19/91

% Solids: 95.9

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	9980.00			P
7440-36-0	Antimony	1.60	U	N	P
7440-38-2	Arsenic	2.70			F
7440-39-3	Barium	79.60			P
7440-41-7	Beryllium	0.59	B		P
7440-43-9	Cadmium	0.62	B		P
7440-70-2	Calcium	5360.00			P
7440-47-3	Chromium	171.00			P
7440-48-4	Cobalt	14.00			P
7440-50-8	Copper	2600.00			P
7439-89-6	Iron	27400.00			P
7439-92-1	Lead	15.20		N	F
7439-95-4	Magnesium	4920.00			P
7439-96-5	Manganese	302.00			P
7439-97-6	Mercury	1.80			CV
7440-02-0	Nickel	322.00			P
7440-09-7	Potassium	585.00	B		P
7782-49-2	Selenium	3.70	U	WN	F
7440-22-4	Silver	23.70			P
7440-23-5	Sodium	278.00	B		P
7440-28-0	Thallium	0.37	U		F
7440-62-2	Vanadium	68.40		*	P
7440-66-6	Zinc	102.00			P
	Cyanide				NR

Color Before: GREY Clarity Before: Texture: MEDIUM

Color After: GREY Clarity After: Artifacts: YES

Comments:
STONES

9613501.2145 WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B01GG9

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

Lab Code: SKINER Case No.: N1-12-154SAS No.: SDG No.: B01GF4

Matrix (soil/water): SOIL Lab Sample ID: 12185-04S

Level (low/med): LOW Date Received: 12/19/91

% Solids: 90.9

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	13000.00			P
7440-36-0	Antimony	1.70	U	N	P
7440-38-2	Arsenic	3.70			F
7440-39-3	Barium	134.00			P
7440-41-7	Beryllium	0.64	B		P
7440-43-9	Cadmium	0.21	B		P
7440-70-2	Calcium	6380.00			P
7440-47-3	Chromium	64.60			P
7440-48-4	Cobalt	15.20			P
7440-50-8	Copper	1590.00			P
7439-89-6	Iron	30600.00			P
7439-92-1	Lead	10.20		N	F
7439-95-4	Magnesium	6960.00			P
7439-96-5	Manganese	440.00			P
7439-97-6	Mercury	0.63			CV
7440-02-0	Nickel	94.60			P
7440-09-7	Potassium	1130.00			P
7782-49-2	Selenium	4.20	U	N	F
7440-22-4	Silver	6.60			P
7440-23-5	Sodium	285.00	B		P
7440-28-0	Thallium	0.42	U		F
7440-62-2	Vanadium	65.20		*	P
7440-66-6	Zinc	78.90			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: BROWN Clarity After: Artifacts: YES

Comments:
STONES

9613501.2146 WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B01GH0

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

Lab Code: SKINER Case No.: N1-12-154SAS No.: SDG No.: B01GF4

Matrix (soil/water): SOIL Lab Sample ID: 12185-05S

Level (low/med): LOW Date Received: 12/19/91

% Solids: 89.5

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	12900.00			P
7440-36-0	Antimony	1.60	U	N	P
7440-38-2	Arsenic	4.30			F
7440-39-3	Barium	128.00			P
7440-41-7	Beryllium	0.62	B		P
7440-43-9	Cadmium	0.20	U		P
7440-70-2	Calcium	6680.00			P
7440-47-3	Chromium	71.10			P
7440-48-4	Cobalt	14.30			P
7440-50-8	Copper	1520.00			P
7439-89-6	Iron	27600.00			P
7439-92-1	Lead	10.10		N	F
7439-95-4	Magnesium	6750.00			P
7439-96-5	Manganese	385.00			P
7439-97-6	Mercury	0.66			CV
7440-02-0	Nickel	92.10			P
7440-09-7	Potassium	1210.00			P
7782-49-2	Selenium	4.30	U	WN	F
7440-22-4	Silver	6.90			P
7440-23-5	Sodium	248.00	B		P
7440-28-0	Thallium	0.43	U		F
7440-62-2	Vanadium	61.10		*	P
7440-66-6	Zinc	73.20			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: BROWN Clarity After: Artifacts: YES

Comments:
STONES

Westinghouse Hanford Company 9613501.2147

CHAIN OF CUSTODY

20

Custody Form Initiator: Jonathan G. Lucas

Company Contact: Jonathan G. Lucas — Telephone: (509) 376-2789

Project Designation/Sampling Locations: 300-FF-1 Test Pit Investigation - North Process Pond Pit #1 — Collection Date: 12-10-91

Ice Chest No.: RM# 39 — Field Logbook No.: EFL-1002

Bill of Lading/Airbill No.: 2509864665 — Offsite Property No.: W92-0-0123 #12

Method of Shipment: Emery

Shipped to: TMA/NORCAL Richmond, CA

Possible Sample Hazards/Remarks: —

Sample Identification

B00HB7
B00HB9
B00HC1 } (1-120ml aG, 1-250ml aG, 1-500ml aG, 1-500ml aP)
B00HC3

☐ Field Transfer of Custody

CHAIN OF POSSESSION (Sign and Print Names)

Relinquished by:	Received by:	Date/Time:
Jonathan G. Lucas / Jonathan G. Lucas	Kermit Blum	12-14-91 1130
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

A-6000-407 (12/90)

Westinghouse Hanford Company

9163501.2148

CHAIN OF CUSTODY

21

Custody Form Initiator: Jonathan G. Lucas

Company Contact: Jonathan G. Lucas

Telephone: (509) 376-2789

Project Designation/Sampling Locations: 300-FF-1 Test Pit Invest - North Pond Pit #1

Collection Date: 12-9, 12-10-91

Ice Chest No.: A-2

Field Logbook No.: EFL-1002

Bill of Lading/Airbill No.: 2509864665

Offsite Property No.: W92-0-0123 #12

Method of Shipment: Emery

Shipped to: TMA/NORCAL Richmond, CA

Possible Sample Hazards/Remarks: —

Sample Identification

B00HC5 (3-40ml Gs, 1-1000ml aG, 1-500ml plastic, 1-250ml P, 1-1000ml P,
B00HC6 1-400ml P, 1-250ml Gs)

B00HD8 (1-40ml Gs)

☐ Field Transfer of Custody

CHAIN OF POSSESSION (Sign and Print Names)

Relinquished by:	Received by:	Date/Time:
Jonathan G. Lucas (signature)	Kermit Blum	12-14-91 1130
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

A-6000-407 (12/90)

9615501.2149

Westinghouse Hanford Company

SAMPLE ANALYSIS REQUEST

PART I: FIELD SECTION

Collector S. Guzek / V. Luces / R. Steffler Date Sampled 12-9-91 12-10-91 Time 1740 1510, 2130 hours

Company Contact -- Telephone (509) 376-2789

Sample Number	Number and Type of Sample Containers	Type of Sample*	Analysis Requested
	3, 40ml glass septum	water	CLP VOA
	1,1000ml amber glass	water	PCB's
	~~2, 250~~ 1, 500ml plastic 12-12-91	water	Anions (F, SO4, NO2, NO3), pH
B00HC5	1, 250ml plastic	water(&H2SO4)	Ammonium
	1, 1000ml plastic	water(&HNO3)	CLP Metals
	1, 4000ml plastic	water(&HNO3)	Gross Alpha/Beta,Co-60,Sr-90,Cs-137,U-235,U-238
	1, 250ml glass septum	water	Tritium
	3, 40ml glass septum	water	CLP VOA
	1, 1000ml amber glass	water	PCB's
	~~2, 250~~ 1, 500ml plastic 12-12-91	water	Anions (F, SO4, NO2, NO3), pH
B00HC6	1, 250ml plastic	water(&H2SO4)	Ammonium
	1, 1000ml plastic	water(&HNO3)	CLP Metals
	1, 4000ml plastic	water(&HNO3)	Gross Alpha/Beta,Co-60,Sr-90,Cs-137,U-235,U-238
	1, 250ml glass septum	water	Tritium
B00HD8	1, 40ml glass septum	water	CLP VOA

Field Information** QA/QC samples for soil samples taken from 300-FF-1 operable unit.

Special Handling and/or Storage Samples must be maintained at 4°Celsius at all times.

Possible Sample Hazards None indicated.

PART II: LABORATORY SECTION

Received by Kermit Blum Title Sample Control Supervisor Date 12-14-91

Analysis Required

*Indicate whether sample is soil, sludge, water, etc.

9613501.2150

Westinghouse Hanford Company

SAMPLE ANALYSIS REQUEST

PART I: FIELD SECTION

Collector R. Roos Date Sampled 12-10-91 Time 0918-1225 hours

Company Contact Jonathan G. Lucas Telephone (509) 376-2789

Sample Number	Number and Type of Sample Containers	Type of Sample*	Analysis Requested
B00H93		Soil	125ml aG - VOA CLP
B00H96			250 ml aG - ICP/AA metals and Hg CLP
B00H77			500ml aG - PCBs, Ammonium,
B00H99	(1-120ml aG, 1-250ml aG,		Anions (IC) - EPA 300.0
B00HBT	1-500 ml aG, 1-500ml aP)		
B00HB9			500ml a Plastic - Gross alpha/beta,
B00HC1			Co-60, Sr-90, Cs-137, U-235,
B00HC3			U-238
			Note: Disregard label analysis
			on 250ml aG and 500ml aG.
			Go by above indicated
			analysis.

Field Information** —

Special Handling and/or Storage —

Possible Sample Hazards —

PART II: LABORATORY SECTION

Received by Kermit Blum Title Sample Control Supervisor Date 12-14-91

Analysis Required

*Indicate whether sample is soil, sludge, water, etc.

**Use back of page for additional information relative to sample location.

A-6000-406 (05/9

TMA
Thermo Analytical Inc.

Skinner And Sherman Laboratories
300 Second Avenue
Post Office Box 521
Waltham, MA 02254-0521
(617) 890-7200

Chain of Custody Record

N2-04-115

DATE April 29 PAGE 1 OF 1

CLIENT TMA/NorCal
ADDRESS
PROJECT NO. 91-12-178
PROJECT NAME Westinghouse
SAMPLERS (SIGNATURE) [signature]

SAMPLE NO.	DATE	TIME	COMP.	GRAB	LOCATION	Parameters: transfer	Other: Iced	Filtered	Preservative	Sample Type	NUMBER OF CONTAINERS	Observations/ Comments
B00HC5	4-29			X	waltham	X						
B00HC6	4-29			X	↓	X						

RELINQUISHED BY	DATE	RECEIVED BY	DATE	RELINQUISHED BY	DATE	RECEIVED BY	DATE
Signature: [signature]	4/29/92	Signature		Signature		Signature	
Printed Name: Antonia Benney	TIME 16:10	Printed Name	TIME	Printed Name	TIME	Printed Name	TIME
Company: TMA/Skinner		Company		Company		Company	
RELINQUISHED BY	DATE	RECEIVED BY	DATE	RELINQUISHED BY	DATE	RECEIVED BY (Laboratory): Kermit Blum	DATE 4-30-92
Signature		Signature		Signature		Signature: Kermit Blum	
Printed Name	TIME	Printed Name	TIME	Printed Name	TIME	Printed Name: Skinner & Sherman Labs	TIME 1030
Company		Company		Company			

TOTAL NUMBER OF CONTAINERS

METHOD OF SHIPMENT

SPECIAL SHIPMENT/HANDLING OR STORAGE REQUIREMENTS

Westinghouse Hanford Company 9613501.2152

CHAIN OF CUSTODY

25

Custody Form Initiator: Jonathan G. Lucas

Company Contact: Jonathan G. Lucas — Telephone: (509) 376-2789

Project Designation/Sampling Locations: 300-FF-1 Test Pit Investigation – North Process Pond Pit #1 — Collection Date: 12-10-91

Ice Chest No.: RM #44 — Field Logbook No.: EFL-1002

Bill of Lading/Airbill No.: 2509864665 — Offsite Property No.: W92-0-0123 #12

Method of Shipment: Emery

Shipped to: TMA/NORCAL Richmond, CA

Possible Sample Hazards/Remarks: —

Sample Identification

B00H93
B00H96
B00H97 (1-120 ml aG, 1-250 ml aG, 1-500 aP, 1-500 ml aG)
B00H99

☐ Field Transfer of Custody

CHAIN OF POSSESSION

(Sign and Print Names)

Relinquished by:	Received by:	Date/Time:
Jonathan G. Lucas	Kermit Blum	12-14-91 1130
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

A-6000-407 (12/90)

9613501.2153

3C

Westinghouse Hanford Company	CHAIN OF CUSTODY

Custody Form Initiator: W. Setzer/B.E. Innis

Company Contact: B.E. Innis

Telephone: 509-376-7690

Project Designation/Sampling Locations: 300-ff-1/TZ

Collection Date: 12-11-91

Ice Chest No.: SML 44

Field Logbook No.: WHC-N-557

Bill of Lading/Airbill No.: 250986449T

Offsite Property No.: W92-D-0104 #6

Method of Shipment: OVERNIGHT AIR SERVICE

Shipped to: TMA/NORCAL

Possible Sample Hazards/Remarks: None detected with field instruments

Sample Identification

1) B01CC9
- 3, 40ml glass septum: VOA
- 1, 1000ml amber glass: PCB'S
- * 3, 250ml plastic: Anions (F,SO4,NO2,NO3),pH,Ammonium
- 1, 4000ml plastic: Gross Alpha/Beta,Co-60,Sr-90,Cs-137,U-235,U-238
- 1, 1000ml plastic: CLP Metals
- 1, 250ml glass septum: Tritium

2) B01CD1
- 3, 40ml glass septum: VOA
- 1, 1000ml amber glass: PCB'S
- * 3, 250ml plastic: Anions (F,SO4,NO2,NO3),pH,Ammonium
- 1, 4000ml plastic: Gross Alpha/Beta,Co-60,Sr-90,Cs-137,U-235,U-238
- 1, 1000ml plastic: CLP Metals
- 1, 250ml glass septum: Tritium

B01CD0 1 40ml glass SEPTUM: VOA

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

Relinquished by:	Received by:	Date/Time:
W.V. SETZER W.V. Setzer	Kermit Blum	12-13-91 1130
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments: * 1 x 500 ml P for ANIONS & pH; 1 x 250 ml for AMMONIUM
Samples arrived immersed in water

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

9613501.2154

33

Westinghouse Hanford Company

SAMPLE ANALYSIS REQUEST

PART I: FIELD SECTION

Collector W. Setzer/B.E. Innis Date Sampled 12-11-91 Time _____ hours

Company Contact B.E. Innis Telephone (509) 376-7690

Sample Number	Number and Type of Sample Containers	Type of Sample*	Analysis Requested
	3, 40ml glass septum	water	CLP VOA
	1,1000ml amber glass	water	PCB's
	2, 250ml plastic	water	Anions (F, SO4, NO2, NO3), pH
B01CC9	1, 250ml plastic	water(&H2SO4)	Ammonium
	1, 1000ml plastic	water(&HNO3)	CLP Metals
	1, 4000ml plastic	water(&HNO3)	Gross Alpha/Beta,Co-60,Sr-90,Cs-137,U-235,U-238
	1, 250ml glass septum	water	Tritium
	3, 40ml glass septum	water	CLP VOA
	1, 1000ml amber glass	water	PCB's
	2, 250ml plastic	water	Anions (F, SO4, NO2, NO3), pH
B01CD1	1, 250ml plastic	water(&H2SO4)	Ammonium
	1, 1000ml plastic	water(&HNO3)	CLP Metals
	1, 4000ml plastic	water(&HNO3)	Gross Alpha/Beta,Co-60,Sr-90,Cs-137,U-235,U-238
	1, 250ml glass septum	water	Tritium
B01CD0	1, 40ml glass septum	water	CLP VOA

Field Information** QA/QC samples for soil samples taken from 300-FF-1 operable unit.

Special Handling and/or Storage Samples must be maintained at 4°Celsius at all times.

Possible Sample Hazards None indicated.

PART II: LABORATORY SECTION

Received by Kermit Blum Title Sample Control Supervisor Date 12-13-91

Analysis Required _____

*Indicate whether sample is soil, sludge, water, etc.

**Use back of page for additional information relative to sample location

A-6000-406 (05/9

Westinghouse Hanford Company 9613501.2155

CHAIN OF CUSTODY

Custody Form Initiator: Jonathan G. Lucas

Company Contact: Jonathan G. Lucas Telephone: (509) 376-2789

Project Designation/Sampling Locations: 300-FF-1 Test Pit Investigation - North Process Pond Pit #1 Collection Date: 12-10-91

Ice Chest No.: RM #87 Field Logbook No.: EFL-2000

Bill of Lading/Airbill No.: 1 ~~Offsite Property~~ RSR No.: 13680

Method of Shipment: ~~Emery~~ Fed. Ex

Shipped to: TMA/NORCAL Richmond, CA

Possible Sample Hazards/Remarks:

Sample Identification

B00HB1
B00HB3 } Soil (1-250ml G, 1-120ml G, 1-500ml G, 1-500ml P)
B00HB5

☐ Field Transfer of Custody

CHAIN OF POSSESSION (Sign and Print Names)		
Relinquished by: Jonathan G. Lucas Jonathan G. Lucas	Received by: Kermit Blum	Date/Time: 12-13-91 1130
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition		
Disposal Method:	Disposed by:	Date/Time:

Comments:

A-6000-407 (12/90)

9613501.2156

35

Westinghouse Hanford Company

SAMPLE ANALYSIS REQUEST

PART I: FIELD SECTION

Collector B. Ross Date Sampled 12-10-91 Time 1053 1110 hours

Company Contact Jonathon G. Lucas Telephone (509) 376-2789

Sample Number	Number and Type of Sample Containers	Type of Sample*	Analysis Requested
B00HB1	1-500ml P, 1-500ml A,	Soil	120ml aG - VOA CLP
B00HB3	1-120ml G, 1-250ml G	↓	250ml aG - ICP/AA Metals and Hg CLP
B00HB5			500ml aG - PCBs, Ammonium CLP, and
			Anions (IC) EPA 300.0
			500ml aP - Gross alpha, beta
			Co-60, Sr-90, Cs-137, U-235,
			U-238

Field Information** —

Special Handling and/or Storage —

Possible Sample Hazards —

PART II: LABORATORY SECTION

Received by Kermit Blum Title Sample Control Supervisor Date 12-13-91

Analysis Required

*Indicate whether sample is soil, sludge, water, etc.

**Use back of page for additional information relative to sample location.

A-6000-406 (05/90)

9613501.2157

36

Westinghouse Hanford Company	CHAIN OF CUSTODY

Custody Form Initiator: W. Setzer/B.E. Innis

Company Contact: B.E. Innis

Telephone: 509-376-7690

Project Designation/Sampling Locations: 300-ff-1 /T2

Collection Date: 12-9-91

Ice Chest No.: SML-81

Field Logbook No.: WHC-N-557

Bill of Lading/Airbill No.: 2509864491

Offsite Property No.: W92-0-0104 #6

Method of Shipment: OVERNIGHT AIR SERVICE

Shipped to: TMA/NORCAL

Possible Sample Hazards/Remarks: None detected with field instruments

Sample Identification

1) B01CF4
1, 500ml Amber Glass: PCB's,CLP Metals,Anions by IC (F,SO4,NO2,NO3),pH
1, 500ml Clear Glass: Gross Alpha/Beta, Co-60,Sr-90,Cs-137,U-235,U-238
1, 125ml Clear Glass: CLP VOA

2)
1, 500ml Amber Glass: PCB's,CLP Metals,Anions by IC (F,SO4,NO2,NO3),pH
1, 500ml Clear Glass: Gross Alpha/Beta, Co-60,Sr-90,Cs-137,U-235,U-238
1, 125ml Clear Glass: CLP VOA

3)
1, 500ml Amber Glass: PCB's,CLP Metals,Anions by IC (F,SO4,NO2,NO3),pH
1, 500ml Clear Glass: Gross Alpha/Beta, Co-60,Sr-90,Cs-137,U-235,U-238
1,.125ml Clear Glass: CLP VOA

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

Relinquished by:	Received by:	Date/Time:
W.V. SETZER W.V. Setzer	Kermit Blum	12-13-91 1130

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

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

9613501.2158

37

Westinghouse Hanford Company	CHAIN OF CUSTODY

Custody Form Initiator: W. Setzer/B.E. Innis

Company Contact: B.E. Innis

Telephone: 509-376-7690

Project Designation/Sampling Locations: 300-ff-1 / T2

Collection Date: 12/10/91

Ice Chest No.: 9ML-8)

Field Logbook No.: WHC-N-557

Bill of Lading/Airbill No.: 250986449T

Offsite Property No.: WA2-0-0104 #6

Method of Shipment: OVERNIGHT AIR SERVICE

Shipped to: TMA/NORCAL

Possible Sample Hazards/Remarks: None detected with field instruments

Sample Identification

1) B01CF5
1, 500ml Amber Glass: PCB's,CLP Metals,Anions by IC (F,SO4,NO2,NO3),pH
1, 500ml Clear Glass: Gross Alpha/Beta, Co-60,Sr-90,Cs-137,U-235,U-238
1, 125ml Clear Glass: CLP VOA

2) B01CF6
1, 500ml Amber Glass: PCB's,CLP Metals,Anions by IC (F,SO4,NO2,NO3),pH
1, 500ml Clear Glass: Gross Alpha/Beta, Co-60,Sr-90,Cs-137,U-235,U-238
1, 125ml Clear Glass: CLP VOA

3)
1, ~~500ml Amber Glass:~~ PCB's,CLP Metals,Anions by IC (F,SO4,NO2,NO3),pH
1, 500ml Clear Glass: Gross ~~Alpha/Beta~~, Co-60,Sr-90,Cs-137,U-235,U-238
1,.125ml Clear Glass: CLP VOA

WVS 12/10/91

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

Relinquished by:	Received by:	Date/Time:
W.V. SETZER W.V. Setzer	Kermit Blum	12-13-91 1130
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

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

9613501.2159

34

Westinghouse Hanford Company	CHAIN OF CUSTODY

Custody Form Initiator: W. Setzer/B.E. Innis

Company Contact: B.E. Innis

Telephone: 509-376-7690

Project Designation/Sampling Locations: 300-ff-1/T2

Collection Date: 12/11/91

Ice Chest No.: SML-81

Field Logbook No.: WHC-N-557

Bill of Lading/Airbill No.: 250986449T

Offsite Property No.: UA2-0-0104 #6

Method of Shipment: OVERNIGHT AIR SERVICE

Shipped to: TMA/NORCAL

Possible Sample Hazards/Remarks: None detected with field instruments

Sample Identification

1) B01CF7
1, 500ml Amber Glass: PCB's,CLP Metals,Anions by IC (F,SO4,NO2,NO3),pH
1, 500ml Clear Glass: Gross Alpha/Beta, Co-60,Sr-90,Cs-137,U-235,U-238
1, 125ml Clear Glass: CLP VOA

2) B01CF8
1, 500ml Amber Glass: PCB's,CLP Metals,Anions by IC (F,SO4,NO2,NO3),pH
1, 500ml Clear Glass: Gross Alpha/Beta, Co-60,Sr-90,Cs-137,U-235,U-238
1, 125ml Clear Glass: CLP VOA

3)
1, 500ml ~~Amber Glass~~: PCB's,CLP Metals,Anions by IC (F,SO4,NO2,NO3),pH
1, 500ml Clear Glass: ~~Gross Alpha/Beta~~, Co-60,Sr-90,Cs-137,U-235,U-238
1, 125ml Clear Glass: CLP VOA

WWS 12/11/91

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

Relinquished by:	Received by:	Date/Time:
W.V. SETZER W.V. Setzer	Kermit Blum	12-13-91 1130
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

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

9613501.2160

39

Westinghouse Hanford Company

SAMPLE ANALYSIS REQUEST

PART I: FIELD SECTION

Collector W. Setzer/B.E. Innis Date Sampled 12-9-91 12-10-91 Time _____ hours

Company Contact B.E. Innis Telephone (509) 376 7690

Sample Number	Number and Type of Sample Containers	Type of Sample*	Analysis Requested
	1, Amber Glass, 500ml	soil	PCB's, CLP Metals, Anions (F,SO4,NO2,NO3)
			pH, Ammonium
B01CF4	1, Clear Glass, 500ml	soil	Gross Alpha/Beta, Co-60,Sr-90,Cs-137,U-23
			U-238
	1, Amber Glass, 125ml	soil	CLP VOA
	1, Amber Glass, 500ml	soil	PCB's, CLP Metals, Anions (F, SO4, NO2, N
			pH, Ammonium
B01CF5	1, Clear Glass, 500ml	soil	Gross Alpha/Beta, Co-60, Sr-90, Cs-137,
			U-235, U-238
	1, Amber Glass, 125ml	soil	CLP VOA
	1, Amber Glass, 500ml	soil	PCB's, CLP Metals, Anions (F, SO4, NO2, N
			pH, Ammonium
B01CF6	1, Clear Glass, 500ml	soil	Gross Alpha/Beta, Co-60, Sr-90, Cs-137,
			U-235, U-238
	1, Amber Glass, 125ml	soil	CLP VOA

Field Information** Samples taken from 300-FF-1 borehole/Pit #

Special Handling and/or Storage Samples must be maintained at 4°Celsius

Possible Sample Hazards NONE INDICATED

PART II: LABORATORY SECTION

Received by Kermit Blum Title Sample Control Supervisor Date 12-13-91

Analysis Required

*Indicate whether sample is soil, sludge, water, etc.

**Use back of page for additional information relative to sample location

A-6000-406 (0

9613501.2161

4C

Westinghouse Hanford Company

SAMPLE ANALYSIS REQUEST

PART I: FIELD SECTION

Collector W. Setzer/B.E. Innis Date Sampled 12-11-91 Time _____ hour

Company Contact B.E. Innis Telephone (509) 376-7690

Sample Number	Number and Type of Sample Containers	Type of Sample*	Analysis Requested
	1, Amber Glass, 500ml	soil	PCB's, CLP Metals, Anions (F,SO4,NO2,NO3)
			pH, Ammonium
B01CF7	1, Clear Glass, 500ml	soil	Gross Alpha/Beta, Co-60,Sr-90,Cs-137,U-23
			U-238
	1, Amber Glass, 125ml	soil	CLP VOA
	1, Amber Glass, 500ml	soil	PCB's, CLP Metals, Anions (F, SO4, NO2, N
			pH, Ammonium
B01CF8	1, Clear Glass, 500ml	soil	Gross Alpha/Beta, Co-60, Sr-90, Cs-137,
			U-235, U-238
	1, Amber Glass, 125ml	soil	CLP VOA
	1, Amber Glass, 500ml	soil	PCB's, CLP Metals, Anions (F, SO4, NO2, N
			pH, Ammonium
	1, Clear Glass, 500ml	soil	Gross Alpha/Beta, Co-60, Sr-90, Cs-137,
			U-235, U-238
	1, Amber Glass, 125ml	soil	CLP VOA

WVS 12/11/91

Field Information** Samples taken from 300-FF-1 borehole/Pit #

Special Handling and/or Storage Samples must be maintained at 4°Celsius

Possible Sample Hazards NONE INDICATED

PART II: LABORATORY SECTION

Received by Kermit Blum Title Sample Control Supervisor Date 12-13-91

Analysis Required

*Indicate whether sample is soil, sludge, water, etc.

**Use back of page for additional information relative to sample location

A-6000-406 (0

4

Westinghouse Hanford Company 9613501.2162

CHAIN OF CUSTODY

Custody Form Initiator: Jonathan G. Lucas

Company Contact: Jonathan G. Lucas Telephone: 509-376-2789

Project Designation/Sampling Locations: 300-FF-1 Test Pit Investigation - North Process Pond Pits #2 & #3 Collection Date: 12-14, 12-16-91

Ice Chest No.: RM #24 Field Logbook No.: EFL-1002

Bill of Lading/Airbill No.: ~~Offsite Property No.~~ RSR: 14359

Method of Shipment: Fed. Express

Shipped to: TMA/NORCAL Richmond, CA

Possible Sample Hazards/Remarks: Low Level Radioactivity

Sample Identification

B01GF4
B01GF6
B01GF7 } Soil (1-120mlaG, 1-250mlaG, 1-500P, 1-500mlaG)
B01GG9
B01GH0

☐ Field Transfer of Custody

CHAIN OF POSSESSION (Sign and Print Names)		
Relinquished by: Jonathan G. Lucas	Received by: Kermit Blum	Date/Time: 12-18-91 1130
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

A-6000-407 (12/90)

9613501.2163

4C

Westinghouse Hanford Company

SAMPLE ANALYSIS REQUEST

PART I: FIELD SECTION

Collector R. Ross

Date Sampled 12-14-91, 12-16-91 Time 0902-0918 hours 1109-1112

Company Contact Jonathan G. Lucas

Telephone ( )

Sample Number	Number and Type of Sample Containers	Type of Sample*	Analysis Requested
B01GF4	Soil	Soil	120ml aG - VOA CLP
B01GF6	1-120ml aG, 1-250ml aG,		250ml aG - ICP/AA Metals and Hg CLP
B01GF7	1-500ml aG, 1-500ml P		500ml aG - PCBs, Ammonium CLP, and
B01GG9			Anions (IC) EPA 300.0
B01GH0			500ml aP - Gross alpha/beta, Co-60,
			Sr-90, Cs-137, U-235/238

Field Information** —

Special Handling and/or Storage —

Possible Sample Hazards Low Level Rad.

PART II: LABORATORY SECTION

Received by Kermit Blum Title Sample Control Supervisor Date 12-18-91

Analysis Required

*Indicate whether sample is soil, sludge, water, etc.

**Use back of page for additional information relative to sample location.

A-6000-406 (05/90)

Overnight Delivery 9613501 2164

4

Contractor	OFF-SITE PROPERTY CONTROL	CONTROL NUMBER (To be obtained from PROPERTY MANAGEMENT)
Westinghouse Hanford Company		W92-0-0104 #6

PART I – TO BE COMPLETED BY ORIGINATOR

Department: Env. Eng. & Geotech. | Section: EFSG | Unit: Env. Charac. & Sampling

The following items are to be shipped from: [X] Contractor [ ] Vendor

Routing: Air [X] Contractor [ ] Vendor

Shipped to: TMA/NORCAL
2030 WRIGHT AVE
RICHMOND CA 94804

Off-site Custodian: Robert Fox

Full Title: Project Coordinator

Quantity	Description (Include Serial and any Government Tag Numbers)	Original Cost
1 89lb.	SML 81 poly cooler. Contains soil samples that are double-bagged and packed in wet ice and vermiculite. Samples are nonhazardous. SAMPLE #: B01CF4, B01CF5, B01CF6, B01CF7, B01CF8	N/A
1 100lb.	poly cooler. CONTAINS WATER SAMPLES THAT ARE DOUBLE-BAGGED AND PACKED IN WET ICE AND VERMICULITE. SAMPLES ARE NON-HAZARDOUS. Sample #: B01CC9, B01CD0, B01CD1	N/A

[ ] Classified [X] Unclassified [ ] Shipped Under DOE Contract [ ] Shipped Under Contractor's Use Permit Contract

Necessity for the Off-Site Use of this Property
To support drilling and sampling in 300-FF-1

Bill of Lading # 250 986 449 T

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

RM Clearance for Public Release	RM Survey No	Date
MAC	113024	12/12/91

Location of Property (Area & Bldg.)	Contact	Phone
300 Area	B. E. Innis	375-7690

Date Ready for Shipment	Cost Code to be Charged	Approximate Date This Property will be Returned
12-12-91	PC3BE 81241	N/A

Originated By	Date	Authorized By	Date
RELINQUISHED BY W.V. Setzer W.V. SETZER	12-12-91	B. E. Innis B. E. Innis	12-12-91
Signature and Name of Property Control	Custodian Date	Property Management Approval	Date
			12/12/91

PART II – TO BE COMPLETED BY SHIPPING

Signature of Recipient	Return Order No.	Date Issued	Purchase Order No.	Date Issued
Date 12-12-91				

DISTRIBUTION

By Originator	Shipping Operation – Sign all Copies and Forward to:
White, Green, Yellow, Pink – Property Management Goldenrod – Retain	White – Property Management Yellow – Retain Green – Property Control Custodian (Issuing Office) Pink – Originator

54-3000-479 (09/89)

FEDERAL EXPRESS

[redacted] of 2

QUESTIONS? CALL 800-238-5355 TOLL FREE.

3101510005

AIRBILL PACKAGE TRACKING NUMBER 3101510005

[redacted]

Date 12-12-91

RECIPIENT'S COPY

From (Your Name) Please Print: G.O. BONESS

Your Phone Number (Very Important): (509) 376-7627

Company: U.S. DEPT. OF ENERGY c/o WESTINGHOUSE HANFORD

Department/Floor No.

(EMERGENCY CONTACT PHONE NUMBER 509-373-3800)

Street Address: 1100 AREA 1100 BLDG

City: RICHLAND State: WA ZIP Required

2 To (Recipient's Name) Please Print: ROBERT FOX

Recipient's Phone Number (Very Important): ( )

Company: THA/NORCAL

Department/Floor No.

Exact Street Address (We Cannot Deliver to P.O. Boxes or P.O. Zip Codes.): 2030 WRIGHT AVE.

City: RICHMOND State: CA ZIP Required: 94804

YOUR INTERNAL BILLING REFERENCE INFORMATION (First 24 characters will appear on invoice.) [redacted]-7617 81332 PC3M4

RADIOACTIVE MATERIAL, EXCEPTED PACKAGE - LIMITED QUANTITY OF MATERIAL

DOT EMERGENCY RESPONSE GUIDE NUMBER 61 ATTACHED

IF HOLD FOR PICK-UP, Print FEDEX Address Here (Not available at all locations)

Street Address

City State ZIP Required

3 PAYMENT 1 [X] Bill Sender 2 [ ] Bill Recipient's FedEx Acct. No. 3 [ ] Bill 3rd Party FedEx Acct. No. 4 [ ] Bill Credit Card 5 [ ] Cash/Check

[redacted]

4 SERVICES (Check only one box)

Priority Overnight (Delivery by next business morning †) 11 [ ]

Standard Overnight (Delivery by next business afternoon) 51 [ ]

Economy Two-Day (Delivery by second business day †) 30 [ ]

Government Overnight (Restricted to authorized users only) 41 [ ]

Freight Service (for Extra Large or any package over 150 lbs.)

70 [ ] OVERNIGHT FREIGHT ** (Confirmed reservation required)

80 [ ] TWO-DAY FREIGHT **

† Delivery commitment may be later in some areas.

*Declared Value Limit $100.

**Call for delivery schedule.

INSTRUCTIONS (Mark appropriate boxes)

- Dangerous Goods as per attached Shipper's Declaration [ ]
- Dangerous Goods Shipper's Declaration not required [X]
- Cargo Aircraft only [ ]

DELIVERY AND SPECIAL HANDLING (Check services required)

1 [ ] HOLD FOR PICK-UP (Use Box H)

2 [X] DELIVER WEEKDAY

3 DELIVER SATURDAY (Extra charge) (Not available to all locations) [ ]

4 [X] DANGEROUS GOODS (Extra charge)

6 [ ] DRY ICE Lbs.

- Dangerous Goods Shipper's Declaration not required
- Dry Ice, 9, UN 1845, kg. 8

7 [ ] OTHER SPECIAL SERVICE

11 [ ]

12 [ ] HOLIDAY DELIVERY (If offered) (Extra charge)

PACKAGES	WEIGHT in Pounds Only
1	34
Total 1	Total 34

DIM SHIPMENT (Dimensional Weight) [ ] lbs

Received At: 1 [X] Regular Stop 3 [ ] Drop Box 4 [ ] B.S.C. 2 [ ] On Call Stop 5 [ ] Station

FedEx Emp. No.

Date/Time

Emp. No. Date

[ ] Cash Received

[ ] Return Shipment

[ ] Third Party [ ] Chg. To Del. [ ] Chg. To Hold

Street Address

City State Zip

Received By: X

Date/Time Received FedEx Employee Number

SIGNATURE RELEASE UNAVAILABLE

Federal Express Use

Base Charges

Declared Value Charge

Other 1

Other 2

Total Charges

REVISION DATE 2/90

PART #13/211 FORMAT #069 MBFAN 5/91

069

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9150 1765

ERG-90 #61 ATTACHED

9613501.2166

OFFSITE RADIOACTIVE SHIPMENT RECORD
- EXTERIOR INSPECTION PERMITTED -

13

SHIPPING INST.

SHIP TO:
Company: TMA/NORCAL
Address: 2030 WRIGHT Ave
City, State, Zip: Richmond, CA 94804
Attention: Robert Fox

Contractor: ☐ PNL ☐ KEH ☒ WHC
Site Carrier: J. LUCAS
PR No. 55152 Veh. No. 102751

Ship: ☒ Prepaid ☐ Collect
☐ Motor-Rail ☒ Air Psgr.
☐ Excl. Use ☒ Air Cargo
☐ DOE Veh. ☐ Mail
☐ UPS Sur. ☒ FED X

SHIPMENT DESCRIPTION AND CERTIFICATION

Proper Shipping Name — UN Number
Radioactive Material,

1. Empty Packages ☐ UN 2908
2. Low Specific Activity, n.o.s ☐ UN 2912
3. Limited quantity, n.o.s. ☒ UN 2910
4. N.O.S. ☐ UN 2982
5. Fissile n.o.s. ☐ UN 2918
6. Special Form, n.o.s. ☐ UN 2974
7. Instruments & Articles ☐ UN 2911
8. ☐

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

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

Material Category: ☐ Empty ☐ Low Specific Act. (LSA) ☒ Limited Quantity ☐ Type A Quantity ☐ Type B Quantity ☐ Highway Route Controlled Quantity

For Normal Form Identify:
Physical Form: ☒ Solid ☐ Liquid ☐
Chemical Form: ☐ Metal ☐ Oxide ☒ Elemental ☐ Nitrate
Other

TYPE PACKAGE: ☒ Strong Tight ☐ Type A ☐ Type B ☐ Type B (U) ☐ Type B (M)

CONSTRUCTION: ☐ Box, FB ☐ Wood ☐ Steel ☐ Drum ☐ Cask ☒ Other POLY COOLER

FISSILE CLASS: ☒ Non Fissile ☐ Fissile Exempt ☐ Fissile I ☐ Fissile II ☐ Fissile III
Grams Fissile

SNM: ☒ No ☐ Yes ☐ <1 gr ☐ Category I ☐ Category II ☐ Category III

ACCOUNTABILITY/SECURITY CONTROL
☐ Classified ☒ Unclassified
Consignee authorized to receive this qty
Sig. Security Svc. Req. ☐ NA
~~Pu,EU>1g~~ ☐ NA ~~NU,DU>1kg~~
Security Escorts Req. ☐ Not. Req.
External Cask Temperature N/A
(Max. 122° F LTL, 180° F Ex. Use)

Packaging conforms to appropriate packaging procedure ☐ N/A ☒ Yes
Complies with D. O. T. packaging marking and labeling requirements ☐ N/A ☒ Yes
Container acceptability documented (incl. 7A cert.) ☒ N/A ☐ Yes

Container examined: No evidence of deterioration or damage ☒
QA Inspection Current ☐ Yes ☒ N/A Seals required ☒ No
Shipping Doc 49 CFR 173.421 Authorization No. NA

No. Pkgs.	Model Package	COC/Spec. No.	Serial No.	Seal No.	Isotopes	Curies/Pkg	T. I.	Gr.
1	STRONG TIGHT	NA	RM-87	PAPER	MEP	1.26 u	NA	34
(SOIL SAMPLE #'S B-00H-B1, B-00H-B3, & B-00H-B5 IN JARS WRAPPED IN PLAST WITH WET ICE IN PLASTIC BAGS WITH ABSORBANT IN COOLER. LTD QTY STATEMENT INSIDE POLY COOLER)							
(Shipper may describe package in detail on one of unused lines above)					TOTAL	1.26 u	NA	34

This is to certify that the above named materials are properly classified, described, packaged, marked and labeled, and are in proper condition for transportation, according to the applicable federal, state, local and international regulations for the transportation of hazardous materials.

Certifier's Signature: Eli R. Smith | Date: 12-12-91 | Organization: T&PX SES | Complete Cost Code (inc. end functi): PC3B4 81222

AREA MONITOR

Surface Dose Rate of Package: ☒ ≤0.5 or ___ mrem/hr (N + βγ)
Dose Rate at 1 Meter from Surface of Package: ☒ ≤0.5 or ___ mrem/hr (N + βγ)
Smears of Outer Container: ☒ ≤22 dpm βγ/cm² ☒ ≤2.2 dpm α/cm²
TRUCK LOAD OR EXCLUSIVE USE
Surface: ☒ ≤ 200 mrem/hr (N + βγ)
@ 6 feet: ☒ ≤ 10 mrem/hr (N + βγ)
@ Cab or Sleeper ☒ ≤ 2.0 mrem/hr (N + βγ)

Additional Data and Instructions (inc. Readings on Internal Packaging): N/A

Signature - Radiation Monitoring: M Hoxlenpyle | Bldg. 3706 | Survey No. RU-113075 | Date 12-12-91

AUTHORIZATION FOR SHIPMENT

APPROVAL

AIR TRANSPORT CERTIFICATION ▸ Cargo Only: ☐ Danger Labels Applied
Passenger: ☒ 1. Ltd. Qty. ☐ 2. ≤3 T.I ☐ 3. Research or Medical Diagnosis ☐ 4. Human Medical Research
Pkg. Dimensions: 21 X 14 X 16

Traffic has inspected and verified preshipment compliance to DOT regulations.

Authorized Signature ▸ Eli R. Smith | Printed Name ▸ Eli R. Smith | Date ▸ 12-12-9

APPROVED FOR OFFSITE SHIPMENT

TRAFFIC

B. L. No. RITIN-7017 | Date Shipped 12/12/91 | E. T. A. 12/13/91 | Routing FED X | ☐ N/A | Placards ☐ Yes ☒ No
Surveyed By | Date 12-12-91 | Approved for Shipment Westinghouse Hanford Company | Date 12/12/91 | Route Plan ☐ Yes ☒ N

ERGR. CONTACT #(509)-373-3800

Emery Worldwide

Overnight Delivery

9613501.2167

Contractor	OFF-SITE PROPERTY CONTROL	CONTROL NUMBER (To be obtained from PROPERTY MANAGEMENT)
Westinghouse Hanford Company		W92-0-0104

PART I – TO BE COMPLETED BY ORIGINATOR

Department	Section	Unit
Env. Eng. & Geotech.	EFSG	Env. Charac. & Sampling

The following items are to be shipped from [X] Contractor [ ] Vendor

Routing Air [X] Contractor [ ] Vendor

Shipped to THA/NORCAL
2030 WRIGHT AVE
RICHMOND CA 94804

Off-site Custodian: Robert Fox

Full Title: Project Coordinator

Quantity	Description (Include Serial and any Government Tag Numbers)	Original Cost
1 ~7 lb.	SML 21 poly cooler. Contains soil samples that are double-bagged and packed in wet ice and vermiculite. Samples are nonhazardous. Sample #: [illegible]	N/A
1 ~6 lb.	Poly cooler. Contains water samples that are double-bagged and packed in wet ice and vermiculite. Samples are non-hazardous. Sample #: [illegible]	N/A

[ ] Classified [X] Unclassified [ ] Shipped Under DOE Contract [ ] Shipped Under Contractor's Use Permit Contract

Necessity for the Off-Site Use of this Property
To support drilling and sampling in 300-FF-1

Bill of Lading # [illegible]

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

RM Clearance for Public Release	RM Survey No	Date
[illegible] (N/A)	130211	12/12/91

Location of Property (Area & Bldg.)	Contact	Phone
300 Area	B. E. Innis	376-7690

Date Ready for Shipment	Cost Code to be Charged	Approximate Date This Property will be Returned
12-12-91	PC3BE 81241	N/A

Originated By	Date	Authorized By	Date
RELINQUISHED BY W.V. SETZER	12-12-91	B.E. Innis	12-12-91
Signature and Name of Property Control	Custodian Date	Property Management Approval	Date
		[illegible]	12/12/91

PART II – TO BE COMPLETED BY SHIPPING

Signature of Recipient	Return Order No.	Date Issued	Purchase Order No.	Date Issued
[illegible]				
Date 12-12-91				

DISTRIBUTION

By Originator	Shipping Operation – Sign all Copies and Forward to:
White, Green, Yellow, Pink – Property Management Goldenrod – Retain	White – Property Management Yellow – Retain Green – Property Control Custodian (Issuing Office) Pink – Originator

54-3000-479 (09/8

FEDERAL EXPRESS [redacted] of 2

QUESTIONS? CALL 800-238-5355 TOLL FREE.

3101510020

AIRBILL PACKAGE TRACKING NUMBER 3101510020

RECIPIENT'S COPY

Date 12-17-91

From (Your Name) Please Print: G.O. BONESS

Your Phone Number (Very Important): (509) 376-7627

Company: U.S. DEPT. OF ENERGY c/o WESTINGHOUSE HANFORD

Department/Floor No.

(EMERGENCY CONTACT PHONE NUMBER 509-373-3800)

Street Address: 110[illegible] [illegible] BLDG

City: RICHLAND State: WA ZIP Required

To (Recipient's Name) Please Print: ROBERT FOX

Recipient's Phone Number (Very Important): ( )

Company: THA / NORCAL

Department/Floor No.

Exact Street Address (We Cannot Deliver to P.O. Boxes or P.O. Zip Codes.): 2030 WRIGHT AVE.

City: RICHMOND State: CA ZIP Required: 94804

YOUR INTERNAL BILLING REFERENCE INFORMATION (First 24 characters will appear on invoice.) RMM-7621 81332 PC304

RADIOACTIVE MATERIAL, EXCEPTED PACKAGE - LIMITED QUANTITY OF MATERIAL
DOT EMERGENCY RESPONSE GUIDE NUMBER 61 ATTACHED

IF HOLD FOR PICK-UP, Print FEDEX Address Here (Not available at all locations)
Street Address
City State ZIP Required

PAYMENT 1 [X] Bill Sender 2 [ ] Bill Recipient's FedEx Acct. No. 3 [ ] Bill 3rd Party FedEx Acct. No. 4 [ ] Bill Credit Card
5 [ ] Cash/Check

SERVICES (Check only one box)

Priority Overnight (Delivery by next business morning†) 11 [X]
Standard Overnight (Delivery by next business afternoon†) 51 [ ]
Economy Two-Day (Delivery by second business day†) 30 [ ]
Government Overnight (Restricted to authorized users only) 41 [ ]

Freight Service (for Extra Large or any package over 150 lbs.)
70 [ ] OVERNIGHT FREIGHT ** (Confirmed reservation required)
80 [ ] TWO-DAY FREIGHT **
†Delivery commitment may be later in some areas. **Call for delivery schedule. *Declared Value Limit $100.

INSTRUCTIONS (Mark appropriate boxes)
- Dangerous Goods as per attached Shipper's Declaration [ ]
- Dangerous Goods Shipper's Declaration not required [X]
- Cargo Aircraft only [ ]

DELIVERY AND SPECIAL HANDLING (Check services required)
1 [ ] HOLD FOR PICK-UP (Fill in Box H)
2 [X] DELIVER WEEKDAY
3 DELIVER SATURDAY (Extra charge) (Not available to all locations) [ ]
4 [X] DANGEROUS GOODS (Extra charge)
6 [ ] DRY ICE Lbs
- Dangerous Goods Shipper's Declaration not required
- Dry Ice, 9, UN 1845.

kg. B
7 [ ] OTHER SPECIAL SERVICE
11 [ ]
12 [ ] HOLIDAY DELIVERY (If offered) (Extra charge)

PACKAGES	WEIGHT in Pounds Only
1	50
Total 1	Total 50

DIM SHIPMENT (Chargeable Weight) [ ] lbs.

Received At: 1 [ ] Regular Stop 3 [ ] Drop Box 4 [ ] B.S.C.

FedEx Emp. No. Date/Time

Emp. No. Date
[ ] Cash Received
[ ] Return Shipment
[ ] Third Party [ ] Chg. To Del [ ] Chg. To Hold
Street Address
City State Zip
Received By: X
Date/Time Received FedEx Employee Number

SIGNATURE RELEASE UNAVAILABLE

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

REVISION DATE 2/91
PART #137211 FORMAT #069 MBFAN 5/91
069
© 1991 FEDEX PRINTED IN U.S.A.

5A

EMERGENCY CONTACT #(509) 373-3800

46

OFFSITE RADIOACTIVE SHIPMENT RECORD

– EXTERIOR INSPECTION PERMITTED –

14359

SHIPPING INST.

SHIP TO:

Company: TMA / NORCAL

Address: 2030 WRIGHT Ave

City, State, Zip: Richmond, CA 94804

Attention: Robert Fox

Contractor: ☐ PNL ☐ KEH ☒ WHC

Site Carrier: J. LUCAS

PR No. 55152 Veh. No. 102751

Ship: ☒ Prepaid ☐ Collect Via: ☐ Motor-Rail ☐ Excl. Use ☐ DOE Veh. ☐ UPS Sur. ☒ Air Psgr. ☐ Air Cargo ☐ Mail ☒ Fed X

SHIPMENT DESCRIPTION AND CERTIFICATION

Proper Shipping Name — UN Number

Radioactive Material,

1. Empty Packages ☐ UN 2908
2. Low Specific Activity, n.o.s ☐ UN 2912
3. Limited quantity, n.o.s. ☒ UN 2910
4. N.O.S. ☐ UN 2982
5. Fissile n.o.s. ☐ UN 2918
6. Special Form, n.o.s. ☐ UN 2974
7. Instruments & Articles ☐ UN 2911
8. ☐

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

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

Material Category: ☐ Empty ☐ Low Specific Act. (LSA) ☒ Limited Quantity ☐ Type A Quantity ☐ Type B Quantity ☐ Highway Route Controlled Quantity

For Normal Form Identify:

Physical Form: ☒ Solid ☐ Liquid ☐ Gas

Chemical Form: ☐ Metal ☐ Oxide ☒ Elemental ☐ Nitrate

Other

TYPE PACKAGE: ☒ Strong Tight ☐ Type A ☐ Type B ☐ Type B (U) ☐ Type B (M)

CONSTRUCTION: ☐ Box, FB ☐ Wood ☐ Steel ☐ Drum ☐ Cask ☒ Other Poly Cooler

FISSILE CLASS: ☒ Non Fissile ☐ Fissile Exempt ☐ Fissile I ☐ Fissile II ☐ Fissile III

Grams Fissile

SNM: ☒ No ☐ Yes ☐ <1 gr ☐ Category I ☐ Category II ☐ Category III

ACCOUNTABILITY/SECURITY CONTROL: ☐ Classified ☒ Unclassified

Consignee authorized to receive this qty ☒

Sig. Security Svc. Req. ☐ NA ☒

~~Pu, EU > 1 g~~ ☐ NA ~~NU, DU > 1 Kg~~ ☐ NA

Security Escorts Req. ☐ Not. Req ☒

External Cask Temperature (Max. 122° F LTL, 180° F Ex. Use) N/A ☒ °F

Packaging conforms to appropriate packaging procedure ☐ N/A ☒ Yes

Complies with D. O. T. packaging marking and labeling requirements ☐ N/A ☒ Yes

Container acceptability documented (incl. 7A cert.) ☒ N/A ☐ Yes

Container examined: No evidence of deterioration or damage ☒ Yes

QA Inspection Current ☐ Yes ☒ N/A Seals required ☒ No ☐ Yes

Shipping Doc. 49 CFR 173.421 Authorization No. NA

No. Pkgs.	Model Package	COC/Spec. No.	Serial No.	Seal No.	Isotopes	Curies/Pkg	T.I.	Gr. Wt.
1	STRONG TIGHT	NA	RM-24	PAPER	MFP	.55 μCi	NA	50 lb
DOT	ERG-90 #	61 ATTACHED						
(SOIL	SAMPLES	5 ea 20 in JARS	DOUBLE WRAPPED	IN PLASTIC	WITH WET ICE			
AND	ABSORBANT	IN POLY COOLER.	ATTO QTY	STATEMENT	IN COOLER)			
(Shipper may describe package in detail on one of unused lines above)					TOTAL	.55 μCi	NA	50 lbs

This is to certify that the above named materials are properly classified, described, packaged, marked and labeled, and are in proper condition for transportation, according to the applicable federal, state, local and international regulations for the transportation of hazardous materials.

Certifier's Signature: El R. Smith Date: 12-17-91 Organization: T&P / SFS Complete Cost Code (inc. end function): RC3B4

AREA MONITOR

Surface Dose Rate of Package: ☒ ≤0.5 or ___ mrem/hr (N + βγ)

Dose Rate at 1 Meter from Surface of Package: ☒ ≤0.5 or ___ mrem/hr (N + βγ)

Smears of Outer Container: ☒ ≤22 dpm βγ/cm² ☒ ≤2.2 dpm α/cm²

TRUCK LOAD OR EXCLUSIVE USE: Surface: ☒ ≤200 mrem/hr (N + βγ) @6 feet: ☐ ≤10 mrem/hr (N + βγ) @Cab or Sleeper ☐ ≤2.0 mrem/hr (N + βγ)

Additional Data and Instructions (inc. Readings on Internal Packaging)

ID on envelope JARS

Signature – Radiation Monitoring: [signature] Bldg. N/A Survey No. RD-113081 Date 12/17/91

AUTHORIZATION FOR SHIPMENT

APPROVAL

AIR TRANSPORT CERTIFICATION ▶ Cargo Only: ☐ Danger Labels Applied

Passenger: ☒ 1. Ltd. Qty. ☐ 2. ≤3 T.I ☐ 3. Research or Medical Diagnosis ☐ 4. Human Medical Research

Pkg. Dimensions: 21" x 14" x 16"

Traffic has inspected and verified preshipment compliance to DOT regulations.

Authorized Signature ▶ El R Smith Printed Name ▶ El R Smith Date ▶ 12-17-91

APPROVED FOR OFFSITE SHIPMENT

TRAFFIC

B. L. No. RMW-7621 Date Shipped 12/17/91 E. T. A. 12/18/91 Routing FED X ☐ N/A

Placards ☐ Yes ☒ No

Surveyed By [signature] Date 12/17/91 Approved for Shipment Westinghouse Hanford Company [signature] Date 12/17/91

Route Plan ☐ Yes ☒ No

9613501.2170

VALIDATION SUMMARY

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST - FORM A-6

PROJECT: 300-FF-1 RI/FS	REVIEWER: SS	DATE: 5-22-92
LABORATORY: TMA/~~[illegible]~~ SKINNER	CASE: V112112	SDG:
SAMPLES/MATRIX: B01CC9 (water)		
B01CD1 (water)		

1. COMPLETENESS AND CONTRACT COMPLIANCE

Review the data package for completeness and check off the items below. If any data review elements are missing contact the laboratory for submittal of the omitted data.

Data Package Item	Present?: Yes	No	N/A
Case Narrative	✓		
Cover Page	✓		
Traffic Reports	✓		
Sample Data			
Inorganic Analysis Data Sheets	✓		
Standards Data			
Initial and Continuing Calibration Verification	✓		
CRDL Standard for AA and ICP	✓		
QC Summary			
Blanks	✓		
ICP Interference Check Summary	✓		
Spike Sample Recovery	✓		
Post-Digestion Spike Sample Recovery	~~✓~~ SS	✓	
Duplicate	✓		
Laboratory Control Sample	✓		
Standard Addition Results		✓	
ICP Serial Dilutions	✓		
Instrument Detection Limits	✓		
ICP Interelement Correction Factors	✓		
ICP Linear Ranges	✓		
Preparation Log	✓		
Analysis Run Log	✓		
Raw Data			
ICP Raw Data	✓		
Furnace AA Raw Data	✓		
Mercury Raw Data	✓		
Cyanide Raw Data		✓	
Additional Data			
Internal laboratory chain-of-custody	✓		
Laboratory Sample Preparation Records	✓		

Data Package Item	Present?: Yes	No	N/A
Percent Solids Analysis Records		✓	
Reduction Formulae		✓	
Instrument Run Logs		✓	
Chemist Notebook Pages		✓	

2. HOLDING TIMES

Have all samples been analyzed within holding times? Yes No N/A

ACTION: If any holding times have been exceeded qualify all affected results as estimated (J for detects and UJ for nondetects).

3. INITIAL CALIBRATIONS

Were all instruments calibrated daily, each set-up time and were the proper number of standards used? Yes No N/A

Are the correlation coefficients ≥0.995? Yes No N/A

Was a midrange cyanide standard distilled? Yes No N/A

ACTION: Qualify all data as unusable if reported from an analysis in which an instrument was not calibrated or was calibrated with less than the minimum number of standards. Qualify associated sample results >IDL as estimated (J) and results <IDL as estimated (UJ), if the correlation coefficient is <0.995 or the laboratory did not distill the midrange cyanide standard.

4. INITIAL AND CONTINUING CALIBRATION VERIFICATION

Are ICV and CCV percent recoveries within control? Yes No N/A

Are there calculation errors? Yes No N/A

ACTION: Qualify all affected data in accordance with Section 8.3 of the validation requirements. If calculation errors are noted, contact the laboratory for clarification.

5. ICP INTERFERENCE CHECK SAMPLE

Has an ICS sample been analyzed at the proper frequency? Yes No N/A

Are the AB solution %R values within control? Yes No N/A

Are there calculation errors? Yes No N/A

ACTION: Qualify all affected data in accordance with Section 8.3 of the validation requirements. If calculation errors are noted, contact the laboratory for clarification.

6. LABORATORY BLANKS

Are target analytes present in the laboratory blanks? Yes No N/A

ACTION: Qualify all associated sample results for any analyte <5 times the amount in any laboratory blank as nondetected (U). If analyte concentrations in the blank are >CRDL or below the negative CRDL, verify the laboratory has redigested and reanalyzed associated samples with analyte concentrations <10 times the blank concentration. If the laboratory has not redigested and reanalyzed the samples, note in the validation narrative.

7. FIELD BLANKS

Are target analytes present in the field blanks? Yes No N/A

ACTION: Qualify all sample results for any analyte <5 times the amount in any valid field blank as nondetected (U).

8. MATRIX SPIKE SAMPLE ANALYSIS

Are spike recoveries within the control limits? Yes No N/A

ACTION: Qualify the affected sample data according to the following requirements:

If spike recovery is >125% and sample results are <IDL no qualification is required. If spike recovery is >125% or <75% qualify all positive results as estimated (J). If spike recovery is 30% to 74% qualify all nondetects as estimated (UJ). If spike recovery is <30%, reject all nondetects (R). If the field blank has been used for spike analysis, note in the validation narrative.

9. LABORATORY CONTROL SAMPLE

Are percent recoveries within the acceptance limits? Yes No N/A

Are there calculation errors? Yes No N/A

ACTION: Qualify the sample data according to the following requirements:

AQUEOUS LCS - Qualify as estimated (J), all sample results >IDL, for which the LCS %R falls within the range 50-79% or >120%. Qualify as estimated (UJ), all sample results <IDL, for which the LCS falls within the range of 50-79%. Qualify as unusable (R) all sample results, for which the LCS %R <50%.

SOLID LCS - Qualify as estimated (J), all sample results >IDL for which the LCS result is outside the established control limits. Qualify as estimated (UJ), all sample results <IDL for which the LCS %R are lower than the established control limits.

10. PERFORMANCE AUDIT ANALYSES

Are the performance audit sample results within the acceptance limits? Yes No N/A

ACTION: Note the results of the performance audit sample analyses in the data validation narrative.

11. DUPLICATE SAMPLE ANALYSIS

Are RPD values acceptable? Yes No N/A

ACTION: Qualify the results for all associated samples of the same matrix as estimated (J) if the RPD results fall outside the appropriate control limits. If field blanks were used for laboratory duplicates, note in the validation narrative.

12. ICP SERIAL DILUTION

Are the serial dilution results acceptable? Yes No N/A

Is there evidence of negative interference? Yes No N/A

ACTION: Qualify the associated data as estimated (J) for those analytes in which the %D is outside the control limits. If evidence of negative interference is found, use professional judgment to qualify the data.

13. FIELD DUPLICATE SAMPLES

Do the RPD values exceed the control limits? Yes No N/A

ACTION: Note the results of the field duplicate samples in the validation narrative.

14. FIELD SPLIT SAMPLES

Do the RPD values exceed the control limits? Yes No N/A

ACTION: Note the results of the field split samples in the validation narrative.

1516. FURNACE ATOMIC ABSORPTION QUALITY CONTROL

Do all applicable analyses have duplicate injections? Yes No N/A

Are applicable duplicate injection RSD values within control? Yes No N/A

If no, were samples rerun once as required? Yes No N/A

Does the RSD for the rerun fall within the control limits? Yes No N/A

Were analytical spike recoveries within the control limits? Yes No N/A

If no, were MSA analyses performed when required?	Yes	No	N/A
Are MSA correlation coefficients $\geq$0.995?	Yes	No	N/A
If no, was a second MSA analysis performed?	Yes	No	N/A

ACTION: If duplicate injections are outside the acceptance limits and the sample has not been reanalyzed or the reanalysis is outside the acceptance limits, qualify the associated data as estimated (J for detects and UJ for nondetects). If the analytical spike recovery is <40% qualify detects as estimated (J). If the analytical spike recovery is $\geq$10% but <40%, qualify all nondetects as estimated (UJ) and if the analytical spike recovery is <10%, reject all nondetects (R). If the sample absorbance is <50% of the analytical spike absorbance and the analytical spike recovery is <85% or >115%, qualify all results as estimated (J for detects and UJ for nondetects). If method of standard additions (MSA) was required but was not performed, the MSA samples were spiked incorrectly, or the MSA correllation coefficient was <0.995, qualify the associated detected results as estimated (J).

17. ANALYTE QUANTITATION AND DETECTION LIMITS

Have results been reported and calculated correctly?	Yes	No	N/A
Are results within the calibrated range of the instruments and within the linear range of the ICP?	Yes	No	N/A
Are all detection limits below the CRQL?	Yes	No	N/A

Action: If analyte quantitation is in error, contact the laboratory for explanation. If errors or deficiencies can not be resolved with the laboratory, qualify associated data as unusable (R).

18. OVERALL ASSESSMENT AND SUMMARY

Has the laboratory conducted the analysis in accordance with the analytical SOW?	Yes	No	N/A
Were project specific data quality objectives met for this analysis?	Yes	No	N/A

ACTION: Summarize all the data qualifications and complete the data validation narrative as specified in Section 10.0 of the data validation requirements.

COMMENTS (attach additional sheets as necessary):

WET CHEMISTRY DATA VALIDATION CHECKLIST - FORM A-7

PROJECT: 300-FF-1 RIFS	REVIEWER: SS	DATE: 5-22-92
LABORATORY: TMA / ARL	CASE: 12-060	SDG:
SAMPLES/MATRIX: B01CC9 (water)		
B01CD1 (water)		
B01CD0 (water)		

1. DATA PACKAGE COMPLETENESS

Review the data package for completeness and check off the items below. If any data review elements are missing contact the laboratory for submittal of the omitted data.

Data Package Item	Present?: Yes	No	N/A
Case Narrative	✓		
Cover Page		✓	
Traffic Reports/Chain-of-Custody	✓		
Sample Analysis Data Report Forms	✓		
Standards Data		✓	
QC Summary			
Blanks Summary Report Forms		✓	
Spike Sample Recovery Report Forms	✓		
Duplicate Sample Analysis Report Forms	✓		
Laboratory Control Sample Report Forms		✓	
Raw Data			
Ion Chromatograph Chromatograms	✓		
TOC and TOX Instrument Printouts	✓		
Laboratory Bench Sheets		✓	
Additional Data			
Laboratory Sample Preparation Logs		✓	
Instrument Run Logs		✓	
Internal Laboratory Chain-of-Custory		✓	
Percent Solids Analysis Records		✓	
Reduction Formulae		✓	
Chemist Notebook Pages	✓		

2. HOLDING TIMES

Were all samples analyzed within holding times?	Yes	No	N/A

Action: If any holding times were exceeded qualify all affected results as estimated (J for detects and UJ for nondetects).

3. INITIAL CALIBRATIONS

Were all instruments calibrated daily, each set-up time and were the proper number of standards used?	Yes	No	N/A
Are the correlation coefficients ≥0.995?	Yes	No	N/A
Was a balance check conducted prior to the TDS analysis?	Yes	No	N/A
Was the titrant normality checked?	Yes	No	N/A

ACTION: Qualify all data as unusable (R) if reported from an analysis in which the above criteria were not met.

4. INITIAL AND CONTINUING CALIBRATION VERIFICATION

Have ICV and CCV been analyzed at the proper frequency?	Yes	No	N/A
Are ICV and CCV percent recoveries within control?	Yes	No	N/A
Are there calculation errors?	Yes	No	N/A

ACTION: Qualify all affected data in accordance with the validation requirements.

5. LABORATORY BLANKS

Are target analytes present in the laboratory blanks?	Yes	No	N/A

ACTION: Qualify all associated sample results for any analyte <5 times the amount in any laboratory blank as nondetected (U) and list the affected samples and analytes below.

6. FIELD BLANKS

Are target analytes present in the field blanks?	Yes	No	N/A

ACTION: Qualify all sample results for any analyte <5 times the amount in any valid field blank as nondetected (U).

7. MATRIX SPIKE SAMPLE ANALYSIS

Are spike recoveries within the acceptance limits?	Yes	No	N/A

ACTION: If the sample concentration exceeds the spike concentration by a factor of 4 or more, and spike recoveries are outside the acceptance limits, no qualification is necessary. If spike recovery is outside the control limits and the sample results are >CRQL, qualify the data as estimated (J). If the spike recovery is <30% and the sample results are less then the IDL qualify the data as unusable (R).

8. LABORATORY CONTROL SAMPLE

Are percent recoveries within the acceptance limits? Yes No N/A

Are there calculation errors? Yes No N/A

ACTION: Qualify the affected results according to the following requirements:

AQUEOUS LCS - Qualify as estimated (J), all sample results > IDL, for which the LCS %R falls within the range 50-79% or > 120%. Qualify as estimated (UJ), all sample results < IDL, for which the LCS falls within the range of 50-79%. Qualify as unusable (R) all sample results, for which the LCS %R < 50%.

SOLID LCS - Qualify as estimated (J), all sample results > IDL for which the LCS %R is outside the established control limits. Qualify as estimated (UJ), all sample results < IDL for which the LCS %R are lower than the established control limits.

9. PERFORMANCE AUDIT ANALYSES

Are the performance audit sample results within the acceptance limits? Yes No N/A

ACTION: Note the results of the performance audit samples in the validation narrative.

10. DUPLICATE SAMPLE ANALYSIS

Are RPD values within the acceptance limits? Yes No N/A

Action: Qualify the results for all associated samples of the same matrix as estimated (J) if the RPD falls outside the acceptance limits.

11. FIELD DUPLICATE SAMPLES

Do RPD values exceed the acceptance limits? Yes No N/A

ACTION: Note the results of the field duplicate samples in the validation narrative.

12. FIELD SPLIT SAMPLES

Do RPD values exceed the acceptance limits? Yes No N/A

ACTION: Note the results of the field split samples in the validation narrative.

13. ANALYTE QUANTITATION AND DETECTION LIMITS

Have results been reported and calculated correctly?	Yes	No	N/A
Are instrument detection limits below the CRDL?	Yes	No	N/A

Action: If analyte quantitation is in error, contact the laboratory for explanation. If errors or deficiencies can not be resolved with the laboratory, qualify associated data as unusable (R).

14. OVERALL ASSESSMENT AND SUMMARY

Has the laboratory conducted the analysis in accordance with the analytical SOW?	Yes	No	N/A
Were project specific data quality objectives met for this analysis?	Yes	No	N/A

ACTION: Summarize all the data qualifications and complete the data validation narrative as specified in Section 10.0 of the data validation requirements.

COMMENTS (attach additional sheets as necessary):

VOLATILE ORGANIC DATA VALIDATION CHECKLIST - FORM A-1

PROJECT: 300-FF-1 RIFS	REVIEWER: SS	DATE: 5-22-92
LABORATORY: TMA / ARLI	CASE: 12-060	SDG:
SAMPLES/MATRIX: B01CC9 (water)		
B01CD1 (")		
B01CD0 (")		

1. DATA PACKAGE COMPLETENESS

Review the data package for completeness and check off the items below. If any data review elements are missing contact the laboratory for submittal.

Data Package Item	Present?: Yes	No	N/A
Case Narrative	✓		
Data Summary	✓		
Chain-of-Custody	✓		
QC Summary			
Surrogate report	✓		
MS/MSD report	✓		
Blank summary report (1-16-92) (1-20-92)	✓		
GC/MS tuning report (12-30-91) (1-6-92) (12-19-91) (12-20-91)	✓		
Internal standard summary report	✓		
Sample Data			
Sample reports	✓		
TIC reports for each sample	✓		
RIC reports for all samples	✓		
Raw and corrected spectra for all detected results	✓		
Raw and corrected library search data for all reported TIC	✓		
Quantitation and calculation data for all TIC	✓		
Standards Data			
Initial calibration report (12-30-91) (12-14-92) (1-16-92)	✓		
RIC and quantitation reports for initial calibration	✓		
Continuing calibration reports (1-6-92) (12-20-91) (1-20-91)	✓		
RIC and quantitation reports for cont. calibrations	✓		
Internal standard summary report	✓		
Raw QC Data			
Tuning report, spectra and mass lists	✓		
Blank analysis reports	✓		
TIC reports for all blanks	✓		
RIC and quantitation reports for blanks	✓		
Raw and corrected spectra for all detected results in blanks	✓		
Raw and corrected library search data for all reported TIC	✓		

Data Package Item	Present?: Yes	No	N/A
Quantitation and calculation data for all TIC	✓		
MS/MSD report forms	✓		
RIC and quantitation reports for MS/MSD	✓		
Additional Data			
Moisture/% solids data sheets		✓	
Reduction formulae		✓	
Instrument time logs		✓	
Chemist notebook pages		✓	
Sample preparation sheets		✓	

2. HOLDING TIMES

Complete the holding time summary form listing all samples and dates of collection and analysis.

Were all samples analyzed within holding time? Yes No N/A

ACTION: If any holding times were exceeded, but not by greater than a factor of two, qualify associated samples as estimated (J for detects or UJ for nondetects), otherwise reject all nondetects (R) and qualify all associated detects as estimated (J).

3. INSTRUMENT CALIBRATION, TUNING AND PERFORMANCE CHECKS

3.1 GC/MS TUNING AND PERFORMANCE CHECKS

Is a bromofluorobenzene tune report present for each applicable 12-h period? Yes No N/A

Do all tunes on all instruments meet the tuning criteria? Yes No N/A

Do all tunes on all instruments meet the expanded criteria? Yes No N/A

Has the laboratory made any calculation or transciption errors? Yes No N/A

Have the proper significant figures been reported? Yes No N/A

ACTION: If the mass calibration is out of specification but within the expanded criteria, qualify associated data as estimated (J for detects or UJ for nondetects). If all tuning criteria are missed, qualify all associated data as unusable (R).

3.2 INITIAL CALIBRATION

Is an initial calibration report provided for all instruments? Yes No N/A

Are all RSD values $\leq 30\%$ (2/88 SOW)? Yes No N/A

Are all RRF values ≥ 0.05 (2/88 SOW)? Yes No N/A

Are all applicable RSD values ≤20.5% (3/90 SOW)?	Yes	No	N/A
Are all applicable RSD values ≤40% (3/90 SOW)?	Yes	No	N/A
Are all applicable RRF values within SOW limits (3/90 SOW)?	Yes	No	N/A
Are all erratic performance compound RRF values ≥0.01 (3/90 SOW)?	Yes	No	N/A

ACTION: With the exception of compounds that exhibit erratic performance and making allowances for up to two TCL compounds, if any RRF value is out of specification qualify all detected results for the particular compound as estimated (J) and all nondetects as unusable (R). Making allowances for up to two TCL compounds, if any RSD value is out of specification qualify all associated data as estimated (J for detects or UJ for nondetects).

3.3. CONTINUING CALIBRATION

Is a continuing calibration report present for all 12-h periods in which associated samples were analyzed?	Yes	No	N/A
Are all RRF values ≥0.05 (2/88 SOW)?	Yes	No	N/A
Are all %D values ≤25% (2/88 or 3/90 SOW)?	Yes	No	N/A
Are all %D values ≤40% (3/90 SOW)?	Yes	No	N/A
Are all RRF values within SOW limits (3/90 SOW)?	Yes	No	N/A
Are all erratic performance compound RRF values ≥0.01 (3/90 SOW)?	Yes	No	N/A

ACTION: With the exception of compounds that exhibit erratic performance and making allowances for up to two TCL compounds, if any RRF value is out of specification qualify all associated detected results as estimated and all nondetects as unusable (R). Making allowances for up to two TCL compounds, if any %D is out of specification, qualify all associated results as estimated (J for detects or UJ for nondetects).

4. BLANKS

4.1 LABORATORY BLANKS

Has the laboratory conducted a method blank analysis per matrix for every 12-h period in which samples were analyzed?	Yes	No	N/A
Are TCL compounds present in the laboratory blanks?	Yes	No	N/A

ACTION: Qualify all sample results ≤10 time the highest blank concentration for the common laboratory contaminants, as nondetects (U) or at the SQL if the result is <CRQL. Qualify all remaining sample results ≤5 times the blank concentration in similar fashion.

4.2. FIELD BLANKS

Are TCL compounds present in the field blanks? Yes No N/A

ACTION: Qualify all detected sample results ≤ 5 times the amount in any valid field blank as nondetects (U) and note the field blank results in the validation narrative.

5. ACCURACY

5.1 SURROGATE/SYSTEM MONITORING COMPOUND RECOVERY

Are any surrogate recoveries out of specification? Yes No N/A

Are any surrogate recoveries $< 10\%$? Yes No N/A

Are any method blank surrogate recoveries out of specification? Yes No N/A

ACTION: Qualify all associated sample results as estimated (J for detects or UJ for nondetects) for surrogates out of specification but $> 10\%$. Qualify all associated positive sample results as estimated (J) and all nondetect results as unusable (R) for all surrogates below 10%. If method blank surrogates are out of specification and the associated sample surrogates are acceptable no qualification is necessary, however, the laboratory should be contacted for an explanation.

5.2 MATRIX SPIKE RECOVERY

Has an MS/MSD analysis been conducted per matrix in the sample group? Yes No N/A

Are MS/MSD recoveries within specification? Yes No N/A

Are there any calculation errors? Yes No N/A

ACTION: If an MS/MSD analysis has not been conducted contact the laboratory for an explanation. Review the MS/MSD recoveries in conjunction with other QC data such as surrogate recoveries and note the results in the validation narrative. If MS/MSD recoveries are out of specification and sample concentration is > 5 times the spike concentration, no qualification is required, otherwise qualify results as follows: Qualify positive results for the specific class of compound (aromatics and non-aromatics) as estimated (J) in all samples if associated surrogates are also out of specification. The qualification shall only be done on samples of similar matrix as the MS/MSD samples. If it is determined from the review that only the spiked samples are affected by low recoveries, qualify only the results for the spiked sample as described above. If it is determined from the review that out of specification MS/MSD recoveries are indicative of systematic problems in the laboratory such as sample preparation or sample-specific matrix interferences this must be noted in the validation narrative along with the potential affect on the sample results.

5.3 PERFORMANCE AUDIT SAMPLES

Are the performance audit sample results within the acceptance limits? Yes No N/A

ACTION: Note the results of the performance audit sample in the validation narrative.

6. PRECISION

6.1 MATRIX SPIKE/MATRIX SPIKE DUPLICATES

Are RPD values within specification? Yes No N/A

Are there any calculation errors? Yes No N/A

ACTION: Review the MS/MSD results in conjunction with other QC data such as field duplicates and note the results in the validation narrative. If MS/MSD RPDs are out of specification and sample results are >5xCRQL qualify positive results for the specific class of compound (aromatics and non-aromatics) as estimated (J). If it is determined from the review that out of specification MS/MSD results are indicative of systematic problems in the laboratory such as sample preparation or sample-specific matrix interferences this must be noted in the validation narrative along with the potential affect on the sample results.

6.2 FIELD DUPLICATE SAMPLES

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

ACTION: Note the results of the field duplicate samples in the validation narrative.

6.3 FIELD SPLIT SAMPLES

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

ACTION: Note the results of the field split samples in the validation narrative.

7. SYSTEM PERFORMANCE

7.1 INTERNAL STANDARDS PERFORMANCE

Are any internal standard area counts outside the acceptance limits? Yes No N/A

Are retention times for any internal standard outside the ±30 second windows established by the most recent calibration check? Yes No N/A

ACTION: If the area counts are outside the acceptance limits qualify all associated results as estimated (J for detects or UJ for nondetects). If it is determined from the review that out of specification area counts and relative retention times are indicative of systematic problems within the laboratory the reviewer may consider rejection of all affected sample data (R).

8. COMPOUND IDENTIFICATION AND QUANTITATION

8.1 COMPOUND IDENTIFICATION

Are detected compounds within ±0.06 relative retention time units of the associated calibration standard?	Yes	No	N/A
Are all ions at a relative intensity of ≥10% in the standard spectra present in the sample spectra?	Yes	No	N/A
Do the relative intensities between the standard and sample spectra agree within 20%?	Yes	No	N/A
Have all ions >10% in the sample spectra that are not present in the standard spectra been reviewed for possible background contamination?	Yes	No	N/A
Are molecular ions present in the reference specrum present in the sample spectrum?	Yes	No	N/A

ACTION: If compound identification is in error and retention time and mass spectral criteria are exceeded qualify all affected positive results as unusable (R). If cross-contamination between analyses is suspected, qualify affected data as unusable (R). Note the results in the validation narrative.

8.2 REPORTED RESULTS AND QUANTITATION LIMITS

Has the laboratory used the correct RRF values and internal standard(s) for quantitation?	Yes	No	N/A
Are results and quantitation limits calculated properly?	Yes	No	N/A
Has the laboratory reported the sample quantitation limits within 5xCRQL values?	Yes	No	N/A

ACTION: If the results and quantitation limits are in error contact the laboratory for clarification and note in the validation narrative.

8.3 TENTATIVELY IDENTIFIED COMPOUNDS (TIC)

Has the laboratory conducted a spectral library search on all candidate TIC peaks in accordance with the analytical SOW?	Yes	No	N/A
Has the laboratory properly identified and coded all TIC?	Yes	No	N/A

ACTION: If the laboratory has failed to search the minimum number of TIC peaks in the chromatogram contact the laboratory for submittal of the required data. Qualify as nondetects (U) all TIC compounds present in samples and blanks using the review criteria specified in the validation requirements. If TIC identification is in error sample results should be qualified as nondetects (U) or unusable (R). If TIC identifications are judged valid, qualify the results as presumptive and estimated (JN).

9. OVERALL ASSESSMENT AND SUMMARY

Has the laboratory conducted the analysis in accordance with the analytical SOW?	Yes	No	N/A
Were project specific data quality objectives met for this analysis?	Yes	No	N/A

ACTION: Summarize all the data qualifications recommended in the foregoing sections, and complete the data validation narrative according to the requirements of Section 10.0 of the data validation requirements.

COMMENTS (attach additional sheets as necessary):

9613501.2191

PESTICIDE/PCB DATA VALIDATION CHECKLIST - FORM A-3

PROJECT: 300-FF-1 RI-FS	REVIEWER: SS	DATE: 5-22-92
LABORATORY: TMA/ARL	CASE: 12-060	SDG:
SAMPLES/MATRIX: B01CC9 (water)		
B01CD1 (water)		

1. DATA PACKAGE COMPLETENESS

Review the data package for completeness and check off the items below. If any data review elements are missing contact the laboratory for resubmittal.

Data Package Item	Present?: Yes	No	N/A
Case Narrative	✓		
Data Summary	✓		
Chain-of-Custody	✓		
QC Summary			
Surrogate report	✓		
MS/MSD report	✓	✓	
Blank summary report	✓		
Sample Data			
Sample reports	✓		
Chromatograms	✓		
GC integration reports	✓		
Worksheets		✓	
UV traces from GPC		✓	
GC/MS confirmation spectra		✓	
Standards Data			
Pesticides Evaluation Standards Summary	✓		
Pesticides/PCB Standards Summary	✓		
Pesticides/PCB identification		✓	
Pesticides standard chromatograms	✓		
Raw QC Data			
Blank analysis report forms and chromatograms	✓		
MS/MSD report forms and chromatograms		✓	

9613501.2192

Data Package Item	Present?: Yes	No	N/A
Additional Data			
Moisture/% solids data sheets	___	✓	___
Reduction formulae	___	✓	___
Instrument time logs	___	✓	___
Chemist notebook pages	___	✓	___
Sample preparation sheets	___	✓	___

2. HOLDING TIMES

Were all samples extracted within holding time? Yes No N/A

Were all samples analyzed within holding time? Yes No N/A

ACTION: If any holding times were exceeded, but not by greater than a factor of two, qualify associated samples as estimated (J for detects or UJ for nondetects), otherwise reject all nondetects (R) and qualify all associated detects as estimated (J).

3. INSTRUMENT PERFORMANCE AND CALIBRATIONS

3.1 INSTRUMENT PERFORMANCE (2/88 SOW)

Are DDT retention times greater than 12 minutes? Yes No N/A

ACTION: If DDT retention time is $\leq$12 minutes and resolution is <25% qualify associated data as unusable (R).

Is resolution between DDT peaks acceptable? Yes No N/A

ACTION: If resolution between DDT peaks is unacceptable qualify associated data as unusable (R).

Do all pesticide standards elute within the established retention time windows? Yes No N/A

ACTION: If the standards do not meet the retention time criteria and peaks are not present near or within the retention time windows no sample qualification is necessary. If peaks are near or within the retention time windows and the standards and matrix spikes do not fall within the expanded retention time windows calculated according to the validation requirements, qualify all associated sample results from the last in-control point as unusable (R).

Are DDT breakdowns $\leq$20%? Yes No N/A

ACTION: If the DDT percent breakdown exceeds 20%, qualify all detected results for DDT as estimated (J) and all nondetects as unusable (R) if DDD and DDE are detected. In addition qualify all results for DDD or DDE as presumptive and estimated (NJ).

Are endrin breakdowns $\leq$20%? Yes No N/A

9613501.2193

ACTION: If the endrin breakdown exceeds 20%, qualify all detected results for endrin as estimated (J) and all nondetects as unusable (R) if endrin aldehyde or endrin ketone are detected. In addition, qualify all results for endrin ketone as presumptive and estimated (NJ).

Are DBC retention time differences within specification?	Yes	No	N/A

ACTION: If DBC %D values are outside the limits and the shift is ocurring repeatedly in samples and standards, qualify affected sample results as unusable (R).

3.2 CALIBRATIONS (2/88 SOW)

Are RSD values for aldrin, endrin, DDT and DBC ≤10%?	Yes	No	N/A
Have all standards been analyzed within 72 h of any sample?	Yes	No	N/A
Has a 3-point calibration been conducted for DDT or toxaphene?	Yes	No	N/A
Have all standards been analyzed at the start of each 72-h sequence?	Yes	No	N/A
Have evaluation standards A, B, and C been analyzed within 72 h of any sample?	Yes	No	N/A
Has the confirmation standard mix been analyzed after every five samples?	Yes	No	N/A
Has evaluation standard B analyzed every 10 samples?	Yes	No	N/A
Are %D values for initial and subsequent standards ≤15% for quantitation standards and ≤20% for confirmation standards?	Yes	No	N/A

ACTION: If the RSD criteria were exceeded or three point calibrations not conducted qualify associated detects as estimated (J). If all standards were not analyzed at the beginning of each 72-h sequence qualify associated data as unusable (R). If the confirmation standards were not analyzed properly qualify associated detects as estimated (J). If the continuing calibration criteria were not met qualify associated quantitation data as estimated (J).

9613501.2194

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

Is peak resolution acceptable? Yes No N/A

ACTION: If the resolution criteria are not met, reject positive sample results generated after initial calibration (R).

Are DDT and endrin breakdowns ≤20.0% Yes No N/A

ACTION: If the breakdown criteria are not met qualify sample results as described in Section 5.3.1 of the validation requirements.

Are single component target compounds in the PEMs, INDA, INDB and the calibration standards within the retention time windows? Yes No N/A

ACTION: If the retention time criteria are not met and no peaks are present in the samples within two times the retention time windows (±0.04, ±0.05 for methoxychlor), no qualification is necessary. If peaks are present in samples within the retention time window a review is made of the raw data to determine expanded retention time windows (see Section 5.3.1 of the validation requirements). If all standards and matrix spikes fall within the expanded windows then no qualification of sample results is necessary. If all standards and matrix spikes do not fall within the expanded windows then all affected sample results are qualified as unusable (R).

Are the RPDs acceptable for the PEMs? Yes No N/A

ACTION: If the RPD criteria are not met qualify associated positive sample results as estimated (J).

Are the RSDs for the calibration factors <10.0% (<15.0% for the BHC series, DDT, endrin, and methoxychlor)? Yes No N/A

ACTION: If the RSD criteria are not met qualify associated positive sample results as estimated (J).

3.4 CALIBRATION VERIFICATION (3/90 SOW)

Have the analytical sequence requirements been met for the analysis of instrument blanks, PEMs, INDA and INDB mixes? Yes No N/A

ACTION: If the analytical sequence requirements are not followed and any of the resolution or retention time criteria listed below are exceeded, reject associated positive results (R).

Is peak resolution acceptable for PEMs, INDA and INDB mixes? Yes No N/A

ACTION: If the resolution criteria are not met reject positive sample results generated after a noncompliant standard analysis (R).

Are single component target compounds in the PEMs, INDA and INDB mixes within the retention time windows? Yes No N/A

9613501L2195

ACTION: If the retention time criteria are not met and no peaks are present in the samples analyzed after the noncompliant standard within two times the retention time windows (±0.04, ±0.05 for methoxychlor), no qualification is necessary. If peaks are present in samples within the expanded windows rejected associated positive and nondetect results (R).

Are RPDs between the calculated and true amounts in the PEMs, INDA and INDB mixes ≤25.0%? Yes No N/A

ACTION: If the RPD criteria are not met qualify associated positive sample results as estimated (J).

Are DDT and endrin breakdowns in the PEMs ≤20.0% (≤30.0% total combined)? Yes No N/A

ACTION: If the breakdown criteria are not met qualify associated positive sample results in accordance with the criteria specified in Section 5.3.1.

4. BLANKS

4.1 LABORATORY BLANKS

Has the laboratory analyzed the method blanks at the required frequency? Yes No N/A

Has the laboratory analyzed a sulfur clean-up blank if required? Yes No N/A

Has the laboratory analyzed instrument blanks at the required frequency? Yes No N/A

Are target compounds present in the blanks? Yes No N/A

ACTION: Qualify all associated positive results as nondetects (U) that are <5 times the highest concentration in any acceptable blank.

4.2 FIELD BLANKS

Are target compounds present in the field blanks? Yes No N/A

ACTION: If target compounds are present in the field blanks qualify all positive sample results <5 times the highest valid field blank concentrations as nondetects (U) and note the results in the validation narrative.

9613501.2196

5. ACCURACY

5.1 SURROGATE RECOVERY

Are any surrogate recoveries out of specification?	Yes	No	N/A
Do any samples show nondetects for surrogates?	Yes	No	N/A
Are any method blank surrogates out of specification?	Yes	No	N/A

ACTION: Qualify all associated sample results as estimated (J for detects and UJ for nondetects) for surrogates out of specification. If the surrogate was not detected (0% recovery) in the sample qualify associated nondetects as unusable (R). If method blank surrogates are out of specification and sample surrogates are acceptable, no qualification is required however, the laboratory should be contacted for an explanation.

5.2 MATRIX SPIKE RECOVERY

Has the laboratory analyzed a MS/MSD per matrix for the the sample group?	Yes	No	N/A
Are MS/MSD recoveries within specification?	Yes	No	N/A
Are there any calculation or transcription errors?	Yes	No	N/A

ACTION: If MS/MSD analyses have not been conducted contact the laboratory for clarification. Review the MS/MSD recoveries in conjunction with other QC data such as surrogate recoveries and note the results in the validation narrative. If MS/MSD recoveries are out of specification and sample concentration is >5 times the spike concentration, no qualification is required, otherwise qualify results as follows: Qualify positive results as estimated (J) in all samples if associated surrogates are also out of specification. The qualification shall only be done on samples of similar matrix as the MS/MSD samples. If it is determined from the review that only the spiked samples are affected by the low recoveries, qualify only the results for the spiked sample as described above. If it is determined from the review that out of specification MS/MSD recoveries are indicative of systematic problems in the laboratory such as sample preparation or sample-specific matrix interferences this must be noted in the validation narrative along with the potential affect on the sample results.

5.3 PERFORMANCE AUDIT SAMPLES

Are performance audit sample results within the acceptance limits?	Yes	No	N/A

ACTION: Note the results of the performance audit samples in the validation narrative.

9613501.2197

6. PRECISION

6.1 MATRIX SPIKE/MATRIX SPIKE DUPLICATE SAMPLES

Are the RPD values within specification? Yes No N/A

ACTION: Review the MS/MSD results in conjunction with other QC data such as field duplicates and note the results in the validation narrative. If MS/MSD RPD values are out of specification and sample results are >5xCRQL qualify positive results as estimated (J). If it is determined from the review that out of specification MS/MSD results are indicative of systematic problems in the laboratory such as sample preparation or sample-specific matrix interferences this must be noted in the validation narrative along with the potential affect on the sample results.

6.2 FIELD DUPLICATE SAMPLES

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

ACTION: Note the results of the field duplicate samples in the validation narrative.

6.3 FIELD SPLIT SAMPLES

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

ACTION: Note the results of the field split samples in the validation narrative.

7. COMPOUND IDENTIFICATION AND QUANTITATION

7.1 COMPOUND IDENTIFICATION

Do positive results meet the retention time window criteria? Yes No N/A

Were positive results analyzed on disimilar columns? Yes No N/A

If dieldrin and DDE were reported was a 3% OV-1 column used for confirmation (2/88 SOW data only)? Yes No N/A

Do retention times and relative peak height ratios match the expected patterns for multipeak compounds (PCB, toxaphene or chlordane)? Yes No N/A

Has GC/MS confirmation been conducted on sample extract concentrations >10 ppm? Yes No N/A

9613501.2198

ACTION: If positive results do not meet the retention time criteria qualify all detected results as nondetects as follows: If the misidentified peak is outside the retention time windows and no interferences are noted report the CRQL and if the misidentified peak interferes with a target peak then the report value is qualified as estimated and nondetected (UJ). If positive results were not confirmed on disimilar columns, reject affected results (R). If a 3% OV-1 was used to confirm dieldrin and DDE, reject the affected data (R). If PCB, chlordane or toxaphene identification is questionable qualify the results as presumptive and estimated (NJ). If GC/MS confirmation was not conducted contact the laboratory for explanation and note in the validation narrative.

7.2 REPORTED RESULTS AND QUANTITATION LIMITS

Are results and quantitation limits calculated properly?	Yes	No	N/A
Has the laboratory reported the sample quantitation limits within 5xCRQL values?	Yes	No	N/A

ACTION: If results and quantitation limits are in error contact the laboratory for clarification and note in the validation narrative.

8. OVERALL ASSESSMENT AND SUMMARY

Has the laboratory conducted the analysis in accordance with the analytical SOW?	Yes	No	N/A
Were project specific data quality objectives met for this analysis?	Yes	No	N/A

ACTION: Summarize all the data qualifications and complete the data validation narrative as specified in Section 10.0 of the data validation requirements.

9615501.2199

COMMENTS (attach additional sheets as necessary):

9613501.2200

9613501.2201

HARTCROWSER

Earth and Environmental Technologies

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509 946 43[illegible]

2978-40

March 9, 1993

Mr. Ron Belden
Westinghouse Hanford Company
P.O. Box 1970 / MSIN H6-03
Richland, Washington 99352

Subject: WHC Order No. MLW-SVV-037106
Task Order No. E-92-15, Rev. E
Preliminary Quality Assurance Record - 300-FF-1 RI/FS
TMA Case Number 12-067 - Volatile Organics

Dear Mr. Belden:

Ebasco and Hart Crowser are pleased to provide you with the attached results of our review and validation of the subject data from the 300-FF-1 Operable Unit Remedial Investigation/Feasibility Study (RI/FS). The attached results are provided to you in fulfillment of Subtask 08 as outlined in our letter to you dated February 4, 1993. The subject data package consisted of 11 low level soil samples submitted for analysis for volatile organics. The samples were analyzed by TMA using the U.S. Environmental Protection Agency (EPA) Contract Laboratory Program (CLP) statement of work. Analytical results for two of these samples for which validation was requested, together with the data qualifiers which we have tentatively assigned as a result of our review, are provided in Attachment 4.

DATA QUALITY OBJECTIVES SUMMARY

Data quality objectives (e.g. holding times, GC/MS tuning, initial and continuing calibrations, contract required quantitation limits, and compound identification) were met for this case with the exception of the following: there was minor blank contamination, surrogate and matrix spike/matrix spike duplicate recoveries exceeded the required control limits, and the internal standard area recoveries were below the minimum limit for two samples.

9613501.2202

MAJOR DEFICIENCIES (REJECTED DATA)

No data were rejected.

MINOR DEFICIENCIES (OTHER QUALIFIED DATA)

The following general trends resulted in the qualification of data from multiple samples. All qualified data are discussed in Attachments 3 and 5.

Several compounds were qualified as undetected (UJ) at the quantitation limit or at the reported value (U) due to blank contamination. Low internal standard area counts were reported for sample B00HB1. The laboratory reanalyzed the sample (B00HB1RE), and the internal standard area counts were still low. This suggests a possible matrix interference in the sample. Therefore, all compounds associated with the exceeded standards were qualified as estimates (J or UJ) for samples B00HB1 and B00HB1RE. High surrogate and matrix spike recoveries were also reported. Due to the low internal standard area counts qualifiers were not assigned for the surrogate and matrix spike recoveries. Sample numbers that were assigned qualifiers are summarized in Attachment 3.

No other data qualifiers were assigned.

We trust that these preliminary results meet your needs. Our qualifier assignments will be finalized at the time the summary report for this sampling round is published. The final qualifiers may vary from those presented here, reflecting any trends in data quality or laboratory performance observed over the course of the 300-FF-1 RI/FS. Please contact me if you have any questions with regard to our activities.

Sincerely,

HART CROWSER, INC.

D. MARK GERBOTH, P.E.
Project Manager
HC#133:RL1678.DOC

Attachments

cc: Mark Gerboth (w/o attachments Westinghouse EDMC)
Jeff Grover (w/o attachments) Project File (E-92-15/T2-012)

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THIS APPENDIX CONSISTS OF FIVE ATTACHMENTS

Attachment 1 - Glossary of Data Qualifiers

This attachment provides a glossary explaining all data qualifiers applied as a result of the validation.

Attachment 2 - As Received Laboratory Sample Concentration Reports

This attachment provides copies of the as-received sample concentration reports.

Attachment 3 - Summary of Data Qualifications

This attachment provides a complete summary of all qualifications applied as a result of the validation.

Attachment 4 - As Qualified Data Summary

This attachment provides a tabular data summary or copies of the annotated sample concentration reports as qualified from the validation.

Attachment 5 - Data Review Supporting Documentation

This attachment provides copies of the data validation checklists, data summary forms, telephone contact memoranda and other documentation completed as a result of the data validation.

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ATTACHMENT 1

Glossary of Data Qualifiers

U - Indicates the compound or analyte was analyzed for and not detected. The value reported is the sample quantitation limit corrected for sample dilution and moisture content by the laboratory.

UJ - Indicates the compound or analyte was analyzed for and not detected. Due to quality control deficiencies identified during data validation the value reported may not accurately reflect the sample quantitation limit.

J - Indicates the compound or analyte was analyzed for and detected. The associated value is estimated but the data are useable for decision making processes.

R - Indicates the compound or analyte was analyzed for and due to an identified quality control deficiency the data are unusable.

NJ - Indicates presumptive evidence of a compound at an estimated value.

N - Indicates presumptive evidence of a compound.

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ATTACHMENT 2

As Received Laboratory Sample Concentration Reports

9613501.2206

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B00HB1

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12067 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A112067-008

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 1223K25

Level: (low/med) LOW Date Received: 12/13/91

% Moisture: not dec. 22 Date Analyzed: 12/24/91

Column: (pack/cap) PACK Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
74-87-3	Chloromethane	13	U
74-83-9	Bromomethane	13	U
75-01-4	Vinyl Chloride	13	U
75-00-3	Chloroethane	13	U
75-09-2	Methylene Chloride	77	B
67-64-1	Acetone	240	B
75-15-0	Carbon Disulfide	42	B
75-35-4	1,1-Dichloroethene	6	U
75-34-3	1,1-Dichloroethane	6	U
540-59-0	1,2-Dichloroethene (total)	6	U
67-66-3	Chloroform	3	BJ
107-06-2	1,2-Dichloroethane	6	U
78-93-3	2-Butanone	13	U
71-55-6	1,1,1-Trichloroethane	6	U
56-23-5	Carbon Tetrachloride	6	U
108-05-4	Vinyl Acetate	13	U
75-27-4	Bromodichloromethane	6	U
78-87-5	1,2-Dichloropropane	6	U
10061-01-5	cis-1,3-Dichloropropene	6	U
79-01-6	Trichloroethene	8	B
124-48-1	Dibromochloromethane	6	U
79-00-5	1,1,2-Trichloroethane	6	U
71-43-2	Benzene	6	U
10061-02-6	trans-1,3-Dichloropropene	6	U
75-25-2	Bromoform	6	U
108-10-1	4-Methyl-2-Pentanone	13	U
591-78-6	2-Hexanone	13	U
127-18-4	Tetrachloroethene	6	U
79-34-5	1,1,2,2-Tetrachloroethane	6	U
108-88-3	Toluene	18	B
108-90-7	Chlorobenzene	6	U
100-41-4	Ethylbenzene	6	U
100-42-5	Styrene	6	U
1330-20-7	Xylene (Total)	6	U

9613501.2207

0024

EPA SAMPLE NO.

B00HB1

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12067 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A112067-093

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 1223K25

Level: (low/med) LOW Date Received: 12/13/91

% Moisture: not dec. 22 Date Analyzed: 12/24/91

Column (pack/cap) PACK Dilution Factor: 1.0

Number TICs found: 1

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN ALCOHOL	13.92	15	J

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B00HB3

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12067 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A112067-10B

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 1223K26

Level: (low/med) LOW Date Received: 12/13/91

% Moisture: not dec. 7 Date Analyzed: 12/24/91

Column: (pack/cap) PACK Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
74-87-3	Chloromethane	11	U
74-83-9	Bromomethane	11	U
75-01-4	Vinyl Chloride	11	U
75-00-3	Chloroethane	11	U
75-09-2	Methylene Chloride	30	B
67-64-1	Acetone	140	B
75-15-0	Carbon Disulfide	13	B
75-35-4	1,1-Dichloroethene	5	U
75-34-3	1,1-Dichloroethane	5	U
540-59-0	1,2-Dichloroethene (total)	5	U
67-66-3	Chloroform	1	BJ
107-06-2	1,2-Dichloroethane	5	U
78-93-3	2-Butanone	11	U
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
108-05-4	Vinyl Acetate	11	U
75-27-4	Bromodichloromethane	5	U
78-87-5	1,2-Dichloropropane	5	U
10061-01-5	cis-1,3-Dichloropropene	5	U
79-01-6	Trichloroethene	5	U
124-48-1	Dibromochloromethane	5	U
79-00-5	1,1,2-Trichloroethane	5	U
71-43-2	Benzene	5	U
10061-02-6	trans-1,3-Dichloropropene	5	U
75-25-2	Bromoform	5	U
108-10-1	4-Methyl-2-Pentanone	11	U
591-78-6	2-Hexanone	11	U
127-18-4	Tetrachloroethene	5	U
79-34-5	1,1,2,2-Tetrachloroethane	5	U
108-88-3	Toluene	5	U
108-90-7	Chlorobenzene	5	U
100-41-4	Ethylbenzene	5	U
100-42-5	Styrene	5	U
1330-20-7	Xylene (Total)	5	U

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B00HB3

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12067 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A112067-10B

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 1223K26

Level: (low/med) LOW Date Received: 12/13/91

% Moisture: not dec. 7 Date Analyzed: 12/24/91

Column (pack/cap) PACK Dilution Factor: 1.0

Number TICs found: 0

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

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0266

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B00HB1RE

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12067 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A112067-09B

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 20206R03

Level: (low/med) LOW Date Received: 12/13/91

% Moisture: not dec. 22 Date Analyzed: 02/06/92

Column: (pack/cap) PACK Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
74-87-3	Chloromethane	13	U
74-83-9	Bromomethane	13	U
75-01-4	Vinyl Chloride	13	U
75-00-3	Chloroethane	13	U
75-09-2	Methylene Chloride	34	B
67-64-1	Acetone	62	B
75-15-0	Carbon Disulfide	6	U
75-35-4	1,1-Dichloroethene	6	U
75-34-3	1,1-Dichloroethane	6	U
540-59-0	1,2-Dichloroethene (total)	6	U
67-66-3	Chloroform	6	U
107-06-2	1,2-Dichloroethane	6	U
78-93-3	2-Butanone	13	U
71-55-6	1,1,1-Trichloroethane	6	U
56-23-5	Carbon Tetrachloride	6	U
108-05-4	Vinyl Acetate	13	U
75-27-4	Bromodichloromethane	6	U
78-87-5	1,2-Dichloropropane	6	U
10061-01-5	cis-1,3-Dichloropropene	6	U
79-01-6	Trichloroethene	6	U
124-48-1	Dibromochloromethane	6	U
79-00-5	1,1,2-Trichloroethane	6	U
71-43-2	Benzene	6	U
10061-02-6	trans-1,3-Dichloropropene	6	U
75-25-2	Bromoform	6	U
108-10-1	4-Methyl-2-Pentanone	13	U
591-78-6	2-Hexanone	13	U
127-18-4	Tetrachloroethene	6	U
79-34-5	1,1,2,2-Tetrachloroethane	6	U
108-88-3	Toluene	6	U
108-90-7	Chlorobenzene	6	U
100-41-4	Ethylbenzene	6	U
100-42-5	Styrene	6	U
1330-20-7	Xylene (Total)	6	U

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0267

EPA SAMPLE NO.

B00HB1RE

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12067 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A112067-09B

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 20206R03

Level: (low/med) LOW Date Received: 12/13/91

% Moisture: not dec. 22 Date Analyzed: 02/06/92

Column (pack/cap) PACK Dilution Factor: 1.0

Number TICs found: 0

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

9613501.2212

ATTACHMENT 3

Summary of Data Qualifications

DATA QUALIFICATION SUMMARY - FORM B-7

12067

SDG:	REVIEWER: CM	DATE: 2/25	PAGE 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
All compounds samples BOOHB1 and BOOHB1RE, qualified "J", "UJ". Due to internal standard low recovery and surrogate high recovery. In addition several compounds were detected in the blank, qualified "U".			
~~All volatile compounds~~	~~)(+)/U)(-)~~	BOOHB1, ~~BOOHB1RE~~	Low I.S. Area cont
1,1,1-trichloroethane	)(+)/U)(-)		
carbon tetrachloride			
vinyl acetate			
bromodichloromethane			
1,2-dichloroethane			
1-4,3-dichloropropene			
trichloroethene			
dibromochloromethane			
1,1,2-trichloroethane			
benzene			
cis-1,3-dichloropropene			
bromoform			
2-hexanone			
4-methyl-2-pentanone			
tetrachloroethene			
1,1,2,2-tetrachloroethane			
toluene			
chlorobenzene			
ethylbenzene			
styrene			
xylene (total)			
~~[illegible]~~			
All VOA compounds	)(+)/U)(-)	BOOHB1RE	Low I.S. Area Cont.

HS 3/7/93

DATA QUALIFICATION SUMMARY - FORM B-7

SDG:	REVIEWER:	DATE:	PAGE___OF___
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Methylene chloride	U at value	B00HB1, B00HB1ZE, B00HB7	
Acetone	"	B00HB1, B00HB1ZE, B00HB7	
Carbon disulfide	"	B00HB1 B00HB2	
dichloroethane	U at value	B00HB3	
chloroform	U at CRQL	B00HB3 B00HB1	
trichloroethane	U at ~~&~~ value	B00HB1	
toluene	U at value	B00HB1	

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ATTACHMENT 4

As Qualified Data Summary

9613501.2216

002

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE N

B00HB1

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12067 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A112067-09B

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 1223K25

Level: (low/med) LOW Date Received: 12/13/91

% Moisture: not dec. 22 Date Analyzed: 12/24/91

Column: (pack/cap) PACK Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
74-87-3	Chloromethane	13	U
74-83-9	Bromomethane	13	U
75-01-4	Vinyl Chloride	13	U
75-00-3	Chloroethane	13	U
75-09-2	Methylene Chloride	77	B
67-64-1	Acetone	240	B
75-15-0	Carbon Disulfide	42	B
75-35-4	1,1-Dichloroethene	6	U
75-34-3	1,1-Dichloroethane	6	U
540-59-0	1,2-Dichloroethene (total)	6	U
67-66-3	Chloroform	~~3~~ 6	~~B~~ U
107-06-2	1,2-Dichloroethane	6	U
78-93-3	2-Butanone	13	U
71-55-6	1,1,1-Trichloroethane	6	U
56-23-5	Carbon Tetrachloride	6	U
108-05-4	Vinyl Acetate	13	U
75-27-4	Bromodichloromethane	6	U
78-87-5	1,2-Dichloropropane	6	U
10061-01-5	cis-1,3-Dichloropropene	6	U
79-01-6	Trichloroethene	8	B
124-48-1	Dibromochloromethane	6	U
79-00-5	1,1,2-Trichloroethane	6	U
71-43-2	Benzene	6	U
10061-02-6	trans-1,3-Dichloropropene	6	U
75-25-2	Bromoform	6	U
108-10-1	4-Methyl-2-Pentanone	13	U
591-78-6	2-Hexanone	13	U
127-18-4	Tetrachloroethene	6	U
79-34-5	1,1,2,2-Tetrachloroethane	6	U
108-88-3	Toluene	18	B
108-90-7	Chlorobenzene	6	U
100-41-4	Ethylbenzene	6	U
100-42-5	Styrene	6	U
1330-20-7	Xylene (Total)	6	U

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0024

EPA SAMPLE NO

B00HB1

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12067 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A112067-09B

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 1223K25

Level: (low/med) LOW Date Received: 12/13/91

% Moisture: not dec. 22 Date Analyzed: 12/24/91

Column (pack/cap) PACK Dilution Factor: 1.0

Number TICs found: 1

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN ALCOHOL	13.92	15	~~J~~ JN

9615501.2218

0266

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B00HB1RE

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12067 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A112067-09B

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 20206R03

Level: (low/med) LOW Date Received: 12/13/91

% Moisture: not dec. 22 Date Analyzed: 02/06/92

Column: (pack/cap) PACK Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
74-87-3	Chloromethane	13	U
74-83-9	Bromomethane	13	U
75-01-4	Vinyl Chloride	13	U
75-00-3	Chloroethane	13	U
75-09-2	Methylene Chloride	34	B
67-64-1	Acetone	62	B
75-15-0	Carbon Disulfide	6	U
75-35-4	1,1-Dichloroethene	6	U
75-34-3	1,1-Dichloroethane	6	U
540-59-0	1,2-Dichloroethene (total)	6	U
67-66-3	Chloroform	6	U
107-06-2	1,2-Dichloroethane	6	U
78-93-3	2-Butanone	13	U
71-55-6	1,1,1-Trichloroethane	6	U
56-23-5	Carbon Tetrachloride	6	U
108-05-4	Vinyl Acetate	13	U
75-27-4	Bromodichloromethane	6	U
78-87-5	1,2-Dichloropropane	6	U
10061-01-5	cis-1,3-Dichloropropene	6	U
79-01-6	Trichloroethene	6	U
124-48-1	Dibromochloromethane	6	U
79-00-5	1,1,2-Trichloroethane	6	U
71-43-2	Benzene	6	U
10061-02-6	trans-1,3-Dichloropropene	6	U
75-25-2	Bromoform	6	U
108-10-1	4-Methyl-2-Pentanone	13	U
591-78-6	2-Hexanone	13	U
127-18-4	Tetrachloroethene	6	U
79-34-5	1,1,2,2-Tetrachloroethane	6	U
108-88-3	Toluene	6	U
108-90-7	Chlorobenzene	6	U
100-41-4	Ethylbenzene	6	U
100-42-5	Styrene	6	U
1330-20-7	Xylene (Total)	6	U

AS 3/3/93

9613501.2219

0267

EPA SAMPLE NO.

B00HB1RE

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12067 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A112067-09B

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 20206R03

Level: (low/med) LOW Date Received: 12/13/91

% Moisture: not dec. 22 Date Analyzed: 02/06/92

Column (pack/cap) PACK Dilution Factor: 1.0

Number TICs found: 0

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

9613501.2220

0027

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B00HB3

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12067 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A112067-10B

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 1223K26

Level: (low/med) LOW Date Received: 12/13/91

% Moisture: not dec. 7 Date Analyzed: 12/24/91

Column: (pack/cap) PACK Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
74-87-3	Chloromethane	11	U
74-83-9	Bromomethane	11	U
75-01-4	Vinyl Chloride	11	U
75-00-3	Chloroethane	11	U
75-09-2	Methylene Chloride	30	B
67-64-1	Acetone	140	B
75-15-0	Carbon Disulfide	13	B
75-35-4	1,1-Dichloroethene	5	U
75-34-3	1,1-Dichloroethane	5	U
540-59-0	1,2-Dichloroethene (total)	5	U
67-66-3	Chloroform	~~5~~ 1	~~BJ~~ U
107-06-2	1,2-Dichloroethane	5	U
78-93-3	2-Butanone	11	U
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
108-05-4	Vinyl Acetate	11	U
75-27-4	Bromodichloromethane	5	U
78-87-5	1,2-Dichloropropane	5	U
10061-01-5	cis-1,3-Dichloropropene	5	U
79-01-6	Trichloroethene	5	U
124-48-1	Dibromochloromethane	5	U
79-00-5	1,1,2-Trichloroethane	5	U
71-43-2	Benzene	5	U
10061-02-6	trans-1,3-Dichloropropene	5	U
75-25-2	Bromoform	5	U
108-10-1	4-Methyl-2-Pentanone	11	U
591-78-6	2-Hexanone	11	U
127-18-4	Tetrachloroethene	5	U
79-34-5	1,1,2,2-Tetrachloroethane	5	U
108-88-3	Toluene	5	U
108-90-7	Chlorobenzene	5	U
100-41-4	Ethylbenzene	5	U
100-42-5	Styrene	5	U
1330-20-7	Xylene (Total)	5	U

9613501.2221

0028

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B00HB3

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12067 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A112067-10B

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 1223K26

Level: (low/med) LOW Date Received: 12/13/91

% Moisture: not dec. 7 Date Analyzed: 12/24/91

Column (pack/cap) PACK Dilution Factor: 1.0

Number TICs found: 0

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

9613501.2222

ATTACHMENT 5

Data Review Supporting Documentation

VOLATILE ORGANIC DATA VALIDATION CHECKLIST - FORM A-1

PROJECT: 300 FF-1 2125	REVIEWER: SS	DATE: 5-26-92
LABORATORY: TMA/ARL	CASE: 12-67	SDG:
SAMPLES/MATRIX: B00H93 (soil) · B00HB9 (soil) · B00HB5 (soil)		
· B00H96 (soil) · B00HC1 (")		
· B00H97 (") B00HC3 (")		
· B00H99 (") · B00HB1 (")		
· B00HB7 (") B00HB3 (")		

1. DATA PACKAGE COMPLETENESS

Review the data package for completeness and check off the items below. If any data review elements are missing contact the laboratory for submittal.

Data Package Item	Present?: Yes	No	N/A
Case Narrative	✓		
Data Summary	✓		
Chain-of-Custody	✓		
QC Summary			
Surrogate report	✓		
MS/MSD report	✓		
Blank summary report	✓		
GC/MS tuning report (12-2 (1) 1-31-92) (1-31-92) (2-6-92) (2-10-92)	✓		
Internal standard summary report	✓		
Sample Data			
Sample reports	✓		
TIC reports for each sample	✓		
RIC reports for all samples	✓		
Raw and corrected spectra for all detected results	✓		
Raw and corrected library search data for all reported TIC	✓		
Quantitation and calculation data for all TIC	✓		
Standards Data			
Initial calibration report (12-23-91 (1) (1-31-92)	✓		
RIC and quantitation reports for initial calibration	✓		
Continuing calibration reports (12-28-91) (1-31-92) (2-6-92) (2-10-92)	✓		
RIC and quantitation reports for cont. calibrations	✓		
Internal standard summary report	✓		
Raw QC Data			
Tuning report, spectra and mass lists	✓		
Blank analysis reports	✓		
TIC reports for all blanks	✓		
RIC and quantitation reports for blanks	✓		
Raw and corrected spectra for all detected results in blanks	✓		
Raw and corrected library search data for all reported TIC			✓

Data Package Item	Present?: Yes	No	N/A
Quantitation and calculation data for all TIC			✓
MS/MSD report forms	✓		
RIC and quantitation reports for MS/MSD	✓		
Additional Data			
Moisture/% solids data sheets		✓	
Reduction formulae		✓	
Instrument time logs		✓	
Chemist notebook pages		✓	
Sample preparation sheets		✓	

2. HOLDING TIMES

Complete the holding time summary form listing all samples and dates of collection and analysis.

Were all samples analyzed within holding time? Yes No N/A

ACTION: If any holding times were exceeded, but not by greater than a factor of two, qualify associated samples as estimated (J for detects or UJ for nondetects), otherwise reject all nondetects (R) and qualify all associated detects as estimated (J).

3. INSTRUMENT CALIBRATION, TUNING AND PERFORMANCE CHECKS

3.1 GC/MS TUNING AND PERFORMANCE CHECKS

Is a bromofluorobenzene tune report present for each applicable 12-h period? Yes No N/A

Do all tunes on all instruments meet the tuning criteria? Yes No N/A

Do all tunes on all instruments meet the expanded criteria? Yes No N/A

Has the laboratory made any calculation or transciption errors? Yes No N/A

Have the proper significant figures been reported? Yes No N/A

ACTION: If the mass calibration is out of specification but within the expanded criteria, qualify associated data as estimated (J for detects or UJ for nondetects). If all tuning criteria are missed, qualify all associated data as unusable (R).

3.2 INITIAL CALIBRATION

Is an initial calibration report provided for all instruments? Yes No N/A

Are all RSD values ≤30% (2/88 SOW)? Yes No N/A AS

Are all RRF values ≥0.05 (2/88 SOW)? Yes No N/A AS

Are all applicable RSD values ≤20.5% (3/90 SOW)?	Yes	No	N/A
Are all applicable RSD values ≤40% (3/90 SOW)?	Yes	No	N/A
Are all applicable RRF values within SOW limits (3/90 SOW)?	Yes	No	N/A
Are all erratic performance compound RRF values ≥0.01 (3/90 SOW)?	Yes	No	N/A

ACTION: With the exception of compounds that exhibit erratic performance and making allowances for up to two TCL compounds, if any RRF value is out of specification qualify all detected results for the particular compound as estimated (J) and all nondetects as unusable (R). Making allowances for up to two TCL compounds, if any RSD value is out of specification qualify all associated data as estimated (J for detects or UJ for nondetects).

3.3. CONTINUING CALIBRATION

Is a continuing calibration report present for all 12-h periods in which associated samples were analyzed?	Yes	No	N/A
Are all RRF values ≥0.05 (2/88 SOW)?	Yes	No	N/A
Are all %D values ≤25% (2/88 or 3/90 SOW)?	Yes	No	N/A
Are all %D values ≤40% (3/90 SOW)?	Yes	No	N/A
Are all RRF values within SOW limits (3/90 SOW)?	Yes	No	N/A
Are all erratic performance compound RRF values ≥0.01 (3/90 SOW)?	Yes	No	N/A

ACTION: With the exception of compounds that exhibit erratic performance and making allowances for up to two TCL compounds, if any RRF value is out of specification qualify all associated detected results as estimated and all nondetects as unusable (R). Making allowances for up to two TCL compounds, if any %D is out of specification, qualify all associated results as estimated (J for detects or UJ for nondetects).

4. BLANKS

4.1 LABORATORY BLANKS

Has the laboratory conducted a method blank analysis per matrix for every 12-h period in which samples were analyzed?	Yes	No	N/A
Are TCL compounds present in the laboratory blanks?	Yes	No	N/A

ACTION: Qualify all sample results ≤10 time the highest blank concentration for the common laboratory contaminants, as nondetects (U) or at the SQL if the result is <CRQL. Qualify all remaining sample results ≤5 times the blank concentration in similar fashion.

4.2. FIELD BLANKS

Are TCL compounds present in the field blanks? Yes No N/A

ACTION: Qualify all detected sample results ≤ 5 times the amount in any valid field blank as nondetects (U) and note the field blank results in the validation narrative.

5. ACCURACY

5.1 SURROGATE/SYSTEM MONITORING COMPOUND RECOVERY

Are any surrogate recoveries out of specification? Yes No N/A

Are any surrogate recoveries < 10%? Yes No N/A

Are any method blank surrogate recoveries out of specification? Yes No N/A

ACTION: Qualify all associated sample results as estimated (J for detects or UJ for nondetects) for surrogates out of specification but > 10%. Qualify all associated positive sample results as estimated (J) and all nondetect results as unusable (R) for all surrogates below 10%. If method blank surrogates are out of specification and the associated sample surrogates are acceptable no qualification is necessary, however, the laboratory should be contacted for an explanation.

5.2 MATRIX SPIKE RECOVERY

Has an MS/MSD analysis been conducted per matrix in the sample group? Yes No N/A

Are MS/MSD recoveries within specification? Yes No N/A

Are there any calculation errors? Yes No N/A

ACTION: If an MS/MSD analysis has not been conducted contact the laboratory for an explanation. Review the MS/MSD recoveries in conjunction with other QC data such as surrogate recoveries and note the results in the validation narrative. If MS/MSD recoveries are out of specification and sample concentration is > 5 times the spike concentration, no qualification is required, otherwise qualify results as follows: Qualify positive results for the specific class of compound (aromatics and non-aromatics) as estimated (J) in all samples if associated surrogates are also out of specification. The qualification shall only be done on samples of similar matrix as the MS/MSD samples. If it is determined from the review that only the spiked samples are affected by low recoveries, qualify only the results for the spiked sample as described above. If it is determined from the review that out of specification MS/MSD recoveries are indicative of systematic problems in the laboratory such as sample preparation or sample-specific matrix interferences this must be noted in the validation narrative along with the potential affect on the sample results.

5.3 PERFORMANCE AUDIT SAMPLES

Are the performance audit sample results within the acceptance limits? Yes No N/A

ACTION: Note the results of the performance audit sample in the validation narrative.

6. PRECISION

6.1 MATRIX SPIKE/MATRIX SPIKE DUPLICATES

Are RPD values within specification? Yes No N/A

Are there any calculation errors? Yes No N/A

ACTION: Review the MS/MSD results in conjunction with other QC data such as field duplicates and note the results in the validation narrative. If MS/MSD RPDs are out of specification and sample results are > 5xCRQL qualify positive results for the specific class of compound (aromatics and non-aromatics) as estimated (J). If it is determined from the review that out of specification MS/MSD results are indicative of systematic problems in the laboratory such as sample preparation or sample-specific matrix interferences this must be noted in the validation narrative along with the potential affect on the sample results.

6.2 FIELD DUPLICATE SAMPLES

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

ACTION: Note the results of the field duplicate samples in the validation narrative.

6.3 FIELD SPLIT SAMPLES

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

ACTION: Note the results of the field split samples in the validation narrative.

7. SYSTEM PERFORMANCE

7.1 INTERNAL STANDARDS PERFORMANCE

Are any internal standard area counts outside the acceptance limits? Yes No N/A

Are retention times for any internal standard outside the ±30 second windows established by the most recent calibration check? Yes No N/A

ACTION: If the area counts are outside the acceptance limits qualify all associated results as estimated (J for detects or UJ for nondetects). If it is determined from the review that out of specification area counts and relative retention times are indicative of systematic problems within the laboratory the reviewer may consider rejection of all affected sample data (R).

8. COMPOUND IDENTIFICATION AND QUANTITATION

8.1 COMPOUND IDENTIFICATION

Are detected compounds within ±0.06 relative retention time units of the associated calibration standard?	Yes	No	N/A
Are all ions at a relative intensity of ≥10% in the standard spectra present in the sample spectra?	Yes	No	N/A
Do the relative intensities between the standard and sample spectra agree within 20%?	Yes	No	N/A
Have all ions >10% in the sample spectra that are not present in the standard spectra been reviewed for possible background contamination?	Yes	No	N/A
Are molecular ions present in the reference spectrum present in the sample spectrum?	Yes	No	N/A

ACTION: If compound identification is in error and retention time and mass spectral criteria are exceeded qualify all affected positive results as unusable (R). If cross-contamination between analyses is suspected, qualify affected data as unusable (R). Note the results in the validation narrative.

8.2 REPORTED RESULTS AND QUANTITATION LIMITS

Has the laboratory used the correct RRF values and internal standard(s) for quantitation?	Yes	No	N/A
Are results and quantitation limits calculated properly?	Yes	No	N/A
Has the laboratory reported the sample quantitation limits within 5xCRQL values?	Yes	No	N/A

ACTION: If the results and quantitation limits are in error contact the laboratory for clarification and note in the validation narrative.

8.3 TENTATIVELY IDENTIFIED COMPOUNDS (TIC)

Has the laboratory conducted a spectral library search on all candidate TIC peaks in accordance with the analytical SOW?	Yes	No	N/A
Has the laboratory properly identified and coded all TIC?	Yes	No	N/A

ACTION: If the laboratory has failed to search the minimum number of TIC peaks in the chromatogram contact the laboratory for submittal of the required data. Qualify as nondetects (U) all TIC compounds present in samples and blanks using the review criteria specified in the validation requirements. If TIC identification is in error sample results should be qualified as nondetects (U) or unusable (R). If TIC identifications are judged valid, qualify the results as presumptive and estimated (JN).

9. OVERALL ASSESSMENT AND SUMMARY

Has the laboratory conducted the analysis in accordance with the analytical SOW? Yes No N/A

Were project specific data quality objectives met for this analysis? Yes No N/A

ACTION: Summarize all the data qualifications recommended in the foregoing sections, and complete the data validation narrative according to the requirements of Section 10.0 of the data validation requirements.

COMMENTS (attach additional sheets as necessary):

2CC HB3	71 moist	RRP	1		300MB1RE	22
methylene chloride	30	✓	~~1.405~~	2.283	met. chloride	34 ✓
acetone	140	✓	~~0.991~~	1.369	acetone	62 ✓ .803
carbon disulfide	13	✓	~~3.029~~	5.361	(← cu)	
chloroform	1 J	✓	~~2.379~~	2.830	(← cu)	

3 CCHB1	22% moist			
methylene chloride	77	✓	~~1.405~~	2.283
acetone	240	✓	~~0.991~~	1.369
carbon disulfide	42	✓	~~3.029~~	5.361
chloroform	3	✓	~~2.379~~	2.830
trichloroethene	8	✓	~~0.391~~	.552
toluene	18	✓	~~0.662~~	.786

Blank UBL 1223A			
methylene chloride	21	✓	1.405
acetone	17	✓	0.991
carbon disulfide	13	✓	3.029
chlorobenzene	2 J	✓	0.972
chloroform	1 J	✓	2.379
trichloroethene	3 J	✓	0.391
benzene	2 J	✓	0.893
4-methyl-2-pentanone	4	✓	0.829
hexanone	7	✓	0.644
tetrachloroethane	2	✓	0.839
toluene	3	✓	0.662

12067

HOLDING TIME SUMMARY - FORM B-1

SDG:	REVIEWER: CJM	DATE: 2/25/93	PAGE 1 OF 1
COMMENTS:			

FIELD SAMPLE ID	ANALYSIS TYPE	DATE SAMPLED	DATE PREPARED	DATE ANALYZED	PREP. HOLDING TIME, DAYS	ANALYSIS HOLDING TIME, DAYS	QUALIFIER
B00HB1	VOA	12/10	N/A	12/24	NA	14	—
B00HB2	↓	12/10	↓	↓	↓	↓	—
B00HB1RE		12/10					—
—							
					1/5		
					3/3/93		

96150.2281 HC-SD-EN-SPP-002, Rev. 1

12067

CALIBRATION DATA SUMMARY - FORM B-2

SDG:	REVIEWER: CoP/M	DATE: 2/25/93	PAGE 1 OF 1		
COMMENTS:					
CALIB. TYPE:	INITIAL CONTINUING	INSTRUMENT:			
CALIB. DATE	COMPOUND	RF	RSD/%D/%R	SAMPLES AFFECTED	QUALIFIER
12/23/92	1,4 Difluoro benzene	(internal std)		BOOHB1	J
	Chlorobenzene-d5	too low.			
2/6/93	bromochloromethane	IS too low.		BOOHB1RE	J
	1,4-Difluorobenzene				
	Chlorobenzene-d5				
All	calibration %RSDs, %Ds and RRFs acceptable				

✓ JS 3/3/93

9613501.2232

12067

BLANK AND SAMPLE DATA SUMMARY - FORM B-3

SDG:	REVIEWER: Colin	DATE: 2/25/93	PAGE 1 OF 1

COMMENTS:

SAMPLE ID	COMPOUND	RESULT	Q	RT	UNITS	5X RESULT	10X RESULT	SAMPLES AFFECTED	QUALIFIER B3
VBL1223A	methylene chloride	21					210	B00HB1,	~~CRE~~ J - ~~CRL~~ U at value
	acetone	17					170	B00HB3,	B1, B1RE, U at value
	carbondisulfide	13				65		B00HB1B3,	3 U at value
	dichloroethene	2	J			10		B00HB3	U at value
	chloroform	1	J				10	B00HB3 B00HB1	U at CRQL
	trichloroethene	3	J			15		B00HB1	U at value
	benzene	2	J			10		ND	
	4-methyl-2-pentanone	4				20		ND	
	hexanone	7				35		ND	
	tetrachloroethane	2				10		ND	
	toluene	3				15		B00HB1	U at value
	chloroform								

U at value

WHC-SD-EN-SPP-002, Rev. 1

12067

ACCURACY DATA SUMMARY - FORM B-4

SDG:	REVIEWER: CdM	DATE: 2/25	PAGE 1 OF 1	
COMMENTS: (Surrogate + MS/MSD)				
SAMPLE ID	COMPOUND	MS / MSD % RECOVERY	SAMPLE(S) AFFECTED	QUALIFIER REQUIRED
B00H93	trichloroethene	157 / 144	B00HB1	NO
	benzene	181 / 170	B00HB1RC	
	toluene	169 / 167	B00HB3	
	~~chlorobenzene~~			
		— o —		
		Surrogate		
B00HB1	Toluene d8	161	B00HB1	J(+)
B00HB1RC		149	B00HB1RC	J(+)
		✓ MS 3/3/93		

9615012234

PRECISION DATA SUMMARY - FORM B-5

170671

SDG:	REVIEWER CLM	DATE: 2/25	PAGE 1 OF 1

COMMENTS: MB/MSD + replicate

COMPOUND RPD	SAMPLE ID:	SAMPLE ID:	RPD	SAMPLES AFFECTED	QUALIFIER
all precision parameters met specified criteria —					

AS
3/3/93

CALCULATION SUMMARY - FORM B-6

12067

SDG:	REVIEWER: Cal M.	DATE: 2/25	PAGE 1 OF 1

COMMENTS:

BOOHB3	7% moist		RRF50	
	[Conc]			
methylene chloride	30	✓	2.283	$= \frac{Ac \times Cis}{Ais \times RRF \times .}$
acetone	140	✓	1.369	
carbon disulfide	13	✓	5.361	
chloroform	15	✓	2.830	
BOOHB1	22% moist			
	[ ]		RRF50	
methylene chloride	77	✓	2.283	
acetone	240	✓	1.369	$= \frac{Ac \times Cis}{Ais \times RRF \times .78}$
carbon disulfide	42	✓	5.361	
chloroform	3	✓	2.830	
trichloroethene	8	✓	.552	
toluene	18	✓	.756	
BOOHB1RE	22%			
	[~~34~~]		RRF50	
methylene chloride	34	✓	2.283	$= \frac{Ac \times Cis}{Ais \times RRF \times .78}$
acetone	62	✓	1.369	

9613501.2237

HARTCROWSER

Earth and Environmental Technologies

Hart Crowser, Inc.
1201 Jadwin Avenue, Suite 204
Richland, WA 99352
FAX 509 946 4203
509 946 4344

2978-40

March 9, 1993

Mr. Ron Belden
Westinghouse Hanford Company
P.O. Box 1970 / MSIN H6-03
Richland, Washington 99352

Subject: WHC Order No. MLW-SVV-037106
Task Order No. E-92-15, Rev. E
Preliminary Quality Assurance Record - 300-FF-1 RI/FS
TMA Case Number N1-12-130 (SDG: B00HB1) - Metals

Dear Mr. Belden:

Ebasco and Hart Crowser are pleased to provide you with the attached results of our review and validation of the subject data from the 300-FF-1 Operable Unit Remedial Investigation/Feasibility Study (RI/FS). The attached results are provided to you in fulfillment of Subtask 08 as outlined in our letter to you dated February 4, 1993. The subject data package consisted of two low level soil samples submitted for analysis for metals. The samples were analyzed by TMA using the U.S. Environmental Protection Agency (EPA) Contract Laboratory Program (CLP) statement of work. All analytical results, together with the data qualifiers which we have tentatively assigned as a result of our review, are provided in Attachment 4.

DATA QUALITY OBJECTIVES SUMMARY

Data quality objectives (e.g. holding times, blanks, matrix spikes, duplicates, initial and continuing calibrations, contract required detection limits, and instrument-specific quality control measures) were met for this case with the exception of the following: minor blank contamination (cadmium, chromium, silver, and sodium,); negative blank results (arsenic and lead); analytical spike percent recoveries were outside the control limits (selenium); and LCS percent recoveries outside of limits (calcium, potassium, selenium, and silver).

9613501.2238

MAJOR DEFICIENCIES (REJECTED DATA)

No data were rejected.

MINOR DEFICIENCIES (OTHER QUALIFIED DATA)

The following discrepancies resulted in the qualification of data. All qualified data are discussed in Attachments 3 and 5.

Minor blank contamination resulted in the qualification of some data (cadmium, chromium, silver, and sodium) as undetected (U). Negative blank results resulted in estimated quantitation limits (UJ) for arsenic and lead. The following resulted in some data being qualified as estimates (J or UJ): analytical spike percent recoveries outside the control limits (selenium), and LCS percent recoveries outside of limits (calcium, potassium, selenium, and sodium).

No other qualifications were made.

We trust that these preliminary results meet your needs. Our qualifier assignments will be finalized at the time the summary report for this sampling round is published. The final qualifiers may vary from those presented here, reflecting any trends in data quality or laboratory performance observed over the course of the 300-FF-1 RI/FS. Please contact me if you have any questions with regard to our activities.

Sincerely,

HART CROWSER, INC.

D. MARK GERBOTH, P.E.
Project Manager
HC#133:RL1676.DOC

Attachments

cc: Mark Gerboth (w/o attachments)
Jeff Grover (w/o attachments)
Westinghouse EDMC
Project File (E-92-15/T2-010)

9613501.2239

THIS APPENDIX CONSISTS OF FIVE ATTACHMENTS

Attachment 1 - Glossary of Data Qualifiers

This attachment provides a glossary explaining all data qualifiers applied as a result of the validation.

Attachment 2 - As Received Laboratory Sample Concentration Reports

This attachment provides copies of the as-received sample concentration reports.

Attachment 3 - Summary of Data Qualifications

This attachment provides a complete summary of all qualifications applied as a result of the validation.

Attachment 4 - As Qualified Data Summary

This attachment provides a tabular data summary or copies of the annotated sample concentration reports as qualified from the validation.

Attachment 5 - Data Review Supporting Documentation

This attachment provides copies of the data validation checklists, data summary forms, telephone contact memoranda and other documentation completed as a result of the data validation.

9613501.2240

ATTACHMENT 1

Glossary of Data Qualifiers

U - Indicates the compound or analyte was analyzed for and not detected. The value reported is the sample quantitation limit corrected for sample dilution and moisture content by the laboratory.

UJ - Indicates the compound or analyte was analyzed for and not detected. Due to quality control deficiencies identified during data validation the value reported may not accurately reflect the sample quantitation limit.

J - Indicates the compound or analyte was analyzed for and detected. The associated value is estimated but the data are useable for decision making processes.

R - Indicates the compound or analyte was analyzed for and due to an identified quality control deficiency the data are unusable.

NJ - Indicates presumptive evidence of a compound at an estimated value.

N - Indicates presumptive evidence of a compound.

9613501.2241

ATTACHMENT 2

As Received Laboratory Sample Concentration Reports

9613501.2242

WESTINGHOUSE/HANFORD

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B00HB1

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

Lab Code: SKINER Case No.: N112130 SAS No.: SDG No.: B00HB1

Matrix (soil/water): SOIL Lab Sample ID: 12178-01S

Level (low/med): LOW Date Received: 12/18/91

% Solids: 79.6

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	31000.00			P
7440-36-0	Antimony	7.30	U	N	P
7440-38-2	Arsenic	8.30			F
7440-39-3	Barium	242.00			P
7440-41-7	Beryllium	3.30			P
7440-43-9	Cadmium	1.90			P
7440-70-2	Calcium	30400.00			P
7440-47-3	Chromium	553.00			P
7440-48-4	Cobalt	9.00	B		P
7440-50-8	Copper	41100.00		*	P
7439-89-6	Iron	13500.00		*	P
7439-92-1	Lead	111.00			F
7439-95-4	Magnesium	8350.00			P
7439-96-5	Manganese	402.00			P
7439-97-6	Mercury	6.00			CV
7440-02-0	Nickel	1020.00			P
7440-09-7	Potassium	579.00	B		P
7782-49-2	Selenium	4.70	U	WN	F
7440-22-4	Silver	168.00			P
7440-23-5	Sodium	1100.00	B		P
7440-28-0	Thallium	0.24	U		F
7440-62-2	Vanadium	161.00			P
7440-66-6	Zinc	241.00			P
	Cyanide				NR

Color Before: GREY Clarity Before: Texture: FINE

Color After: GREY Clarity After: Artifacts: YES

Comments:
STONES

9613501.2243

WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER:

B00HB3

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

Lab Code: SKINER Case No.: N112130 SAS No.: SDG No.: B00HB1

Matrix (soil/water): SOIL Lab Sample ID: 12178-02S

Level (low/med): LOW Date Received: 12/18/91

% Solids: 92.6

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	14600.00			P
7440-36-0	Antimony	12.30	B	N	P
7440-38-2	Arsenic	2.50			F
7440-39-3	Barium	67.40			P
7440-41-7	Beryllium	0.59	B		P
7440-43-9	Cadmium	0.21	U		P
7440-70-2	Calcium	4390.00			P
7440-47-3	Chromium	164.00			P
7440-48-4	Cobalt	9.80	B		P
7440-50-8	Copper	3670.00		*	P
7439-89-6	Iron	20100.00		*	P
7439-92-1	Lead	13.10			F
7439-95-4	Magnesium	4170.00			P
7439-96-5	Manganese	242.00			P
7439-97-6	Mercury	0.42			CV
7440-02-0	Nickel	154.00			P
7440-09-7	Potassium	606.00	B		P
7782-49-2	Selenium	0.79	U	WN	F
7440-22-4	Silver	8.80			P
7440-23-5	Sodium	274.00	B		P
7440-28-0	Thallium	0.20	U		F
7440-62-2	Vanadium	38.20			P
7440-66-6	Zinc	53.50			P
	Cyanide				NR

Color Before: GREY Clarity Before: Texture: MEDIUM

Color After: GREY Clarity After: Artifacts: YES

Comments:
STONES

000007

FORM I - IN Rev.6/89

9613501.2244

ATTACHMENT 3

Summary of Data Qualifications

DATA QUALIFICATION SUMMARY - FORM B-7

SDG: B00HB1	REVIEWER: KR	DATE: 2/26/93	PAGE 1 OF 2
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
As	UJ	~~B00H93 B00H96~~	Blank contamination ~~UJ~~ (negative)
↓	↓	~~B00H97 B00H99~~	↓
		B00HB1 B00H33	
		~~B00HB5 B00HB7~~	
		~~B00HB9 B00HC1~~	
		~~B00HC3 B00HC6~~	
Ba	U	~~B00HC5 B00HC6~~	Blank Cont.
Cd	U	B00HB1	↓
Cr	U	~~B00HB5~~, B00HB1	
↓	↓	~~B00H99~~, ~~B00H97~~	
		~~B00H93~~, ~~B00H96~~	
		~~B00HB7~~, ~~B00HB9~~	
Cu	U	~~B00H93~~, ~~B00H96~~	
↓	↓	~~B00H97~~, ~~B00H99~~	
		~~B00HC5~~, ~~B00HC6~~	
Pb	UJ	~~B00H93~~ ~~B00H96~~	Neg. blank Contamination
↓	↓	~~B00H97~~ ~~B00H99~~	↓
		~~B00HB3~~ ~~B00HB5~~	
		~~B00HB7~~ ~~B00HB9~~	
		~~B00HC1~~	
Mn	U	~~B00HC5~~	Blank Cont.
Ni	U	~~B00H93~~ ~~B00H96~~	↓
↓	↓	~~B00H97~~ ~~B00H99~~	
		~~B00HB9~~ ~~B00HC1~~	
		~~B00HC5~~	

DATA QUALIFICATION SUMMARY - FORM B-7

SDG: B00HB1	REVIEWER: KK	DATE: 2/26/93	PAGE 2 OF 2
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
K	U	~~B00HC5~~ ~~B00HB7~~	Blank Contamination
↓	↓	~~B00HB5~~	
Ag	U	B00HB3 ~~B00HB5~~	
↓		~~B00HC3~~ ~~B00HC1~~	
Na	U	B00HB3 ~~B00HB5~~	
		~~B00HB7~~ ~~B00HB9~~	
		~~B00HC1~~ ~~B00HC3~~	
		~~B00HC6~~	
Ca K Se Ag	J J UJ ⊖	~~B00H93~~	Laboratory
	UJ	~~B00H96~~	Control Sample
	J	~~B00H97~~	V. R out of
	UJ	~~B00H99~~	control.
	J	B00HB1	
	⊖	B00HB3	
	⊖	~~B00HB5~~	
	⊖	~~B00HB7~~	
	J	~~B00HB9~~	
		~~B00HC1~~	
		B00HC3	
Selenium	UJ	B00HB3 ~~B00H93~~	AS &/or V. CV
		B00HB1 ~~B00HB9~~	
		B00HC3 ~~B00HB5~~	
		~~B00HC1~~ B00HB1	
		~~B00HB1~~ B	

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ATTACHMENT 4

As Qualified Data Summary

9613501.2248

WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B00HB1

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

Lab Code: SKINER Case No.: N112130 SAS No.: SDG No.: B00HB1

Matrix (soil/water): SOIL Lab Sample ID: 12178-01S

Level (low/med): LOW Date Received: 12/18/91

% Solids: 79.6

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	31000.00			P	
7440-36-0	Antimony	7.30	U	N	P	
7440-38-2	Arsenic	8.30		WJ	F	-B
7440-39-3	Barium	242.00			P	
7440-41-7	Beryllium	3.30			P	
7440-43-9	Cadmium	1.90		U	P	B
7440-70-2	Calcium	30400.00		J	P	ICS
7440-47-3	Chromium	553.00			P	
7440-48-4	Cobalt	9.00	B		P	
7440-50-8	Copper	41100.00		*	P	
7439-89-6	Iron	13500.00		*	P	
7439-92-1	Lead	111.00			F	
7439-95-4	Magnesium	8350.00			P	
7439-96-5	Manganese	402.00			P	
7439-97-6	Mercury	6.00			CV	
7440-02-0	Nickel	1020.00			P	
7440-09-7	Potassium	579.00	B	J	P	ICS
7782-49-2	Selenium	4.70	U	JWN	F	ICS, W
7440-22-4	Silver	168.00		J	P	ICS
7440-23-5	Sodium	1100.00	B		P	
7440-28-0	Thallium	0.24	U		F	
7440-62-2	Vanadium	161.00			P	
7440-66-6	Zinc	241.00			P	
	Cyanide				NR	

Color Before: GREY Clarity Before: Texture: FINE

Color After: GREY Clarity After: Artifacts: YES

Comments:
STONES

9613501.2249

WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B00HB3

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

Lab Code: SKINER Case No.: N112130 SAS No.: SDG No.: B00HB1

Matrix (soil/water): SOIL Lab Sample ID: 12178-02S

Level (low/med): LOW Date Received: 12/18/91

% Solids: 92.6

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	14600.00			P	
7440-36-0	Antimony	12.30	B	N	P	
7440-38-2	Arsenic	2.50		WJ	F	-3
7440-39-3	Barium	67.40			P	
7440-41-7	Beryllium	0.59	B		P	
7440-43-9	Cadmium	0.21	U		P	
7440-70-2	Calcium	4390.00		J	P	ICS
7440-47-3	Chromium	164.00			P	
7440-48-4	Cobalt	9.80	B		P	
7440-50-8	Copper	3670.00		*	P	
7439-89-6	Iron	20100.00		*	P	
7439-92-1	Lead	13.10		WJ	F	+B
7439-95-4	Magnesium	4170.00			P	
7439-96-5	Manganese	242.00			P	
7439-97-6	Mercury	0.42			CV	
7440-02-0	Nickel	154.00			P	
7440-09-7	Potassium	606.00	B	J	P	ICS
7782-49-2	Selenium	0.79	U	J WN	F	ICS, AS, CV
7440-22-4	Silver	8.80		U	P	B
7440-23-5	Sodium	274.00	B	U	P	B
7440-28-0	Thallium	0.20	U		F	
7440-62-2	Vanadium	38.20			P	
7440-66-6	Zinc	53.50			P	
	Cyanide				NR	

Color Before: GREY Clarity Before: Texture: MEDIUM

Color After: GREY Clarity After: Artifacts: YES

Comments:
STONES

000007

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ATTACHMENT 5

Data Review Supporting Documentation

9613501.2251

WHC-SD-EN-SPP-002, Rev. 1

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST - FORM A-6

PROJECT: 300-FF-1 2ES	REVIEWER: SS	DATE: 5-26-92
LABORATORY: TMA/Skinner	CASE: UL-12-130	SDG:
SAMPLES/MATRIX: B00H93 (soil)	B00HB3 (soil)	B00HC3 (soil)
B00H96 (")	B00HB5 (")	B00HC5 (water)
B00H97 (")	B00HB7 (")	B00HC6 (water)
B00H99 (")	B00HB9 (")	
B00HB1 (")	B00HC1 (")	

1. COMPLETENESS AND CONTRACT COMPLIANCE

Review the data package for completeness and check off the items below. If any data review elements are missing contact the laboratory for submittal of the omitted data.

Data Package Item	Present?: Yes	No	N/A
Case Narrative	✓		
Cover Page	✓		
Traffic Reports	✓		
Sample Data			
Inorganic Analysis Data Sheets	✓		
Standards Data			
Initial and Continuing Calibration Verification	✓		
CRDL Standard for AA and ICP	✓		
QC Summary			
Blanks	✓		
ICP Interference Check Summary	✓		
Spike Sample Recovery	✓		
Post-Digestion Spike Sample Recovery	✓		
Duplicate	✓		
Laboratory Control Sample	✓		
Standard Addition Results	✓		
ICP Serial Dilutions	✓		
Instrument Detection Limits	✓		
ICP Interelement Correction Factors	✓		
ICP Linear Ranges	✓		
Preparation Log	✓		
Analysis Run Log	✓		
Raw Data			
ICP Raw Data	✓		
Furnace AA Raw Data	✓		
Mercury Raw Data	✓		
Cyanide Raw Data		✓	
Additional Data			
Internal laboratory chain-of-custody	✓		
Laboratory Sample Preparation Records	✓		

Data Package Item	Present?: Yes	No	N/A
Percent Solids Analysis Records	___	✓	___
Reduction Formulae	___	✓	___
Instrument Run Logs	___	✓	___
Chemist Notebook Pages	___	✓	___

2. HOLDING TIMES

Have all samples been analyzed within holding times? (Yes) No N/A

ACTION: If any holding times have been exceeded qualify all affected results as estimated (J for detects and UJ for nondetects).

3. INITIAL CALIBRATIONS

Were all instruments calibrated daily, each set-up time and were the proper number of standards used? (Yes) No N/A

Are the correlation coefficients ≥0.995? (Yes) No N/A

Was a midrange cyanide standard distilled? Yes No (N/A)

ACTION: Qualify all data as unusable if reported from an analysis in which an instrument was not calibrated or was calibrated with less than the minimum number of standards. Qualify associated sample results >IDL as estimated (J) and results <IDL as estimated (UJ), if the correlation coefficient is <0.995 or the laboratory did not distill the midrange cyanide standard.

4. INITIAL AND CONTINUING CALIBRATION VERIFICATION

Are ICV and CCV percent recoveries within control? (Yes) No N/A

Are there calculation errors? Yes (No) N/A Level 2

ACTION: Qualify all affected data in accordance with Section 8.3 of the validation requirements. If calculation errors are noted, contact the laboratory for clarification.

5. ICP INTERFERENCE CHECK SAMPLE

Has an ICS sample been analyzed at the proper frequency? (Yes) No N/A

Are the AB solution %R values within control? (Yes) No N/A

Are there calculation errors? Yes (No) N/A Lev 2

ACTION: Qualify all affected data in accordance with Section 8.3 of the validation requirements. If calculation errors are noted, contact the laboratory for clarification.

6. LABORATORY BLANKS

Are target analytes present in the laboratory blanks? Yes No N/A

ACTION: Qualify all associated sample results for any analyte <5 times the amount in any laboratory blank as nondetected (U). If analyte concentrations in the blank are >CRDL or below the negative CRDL, verify the laboratory has redigested and reanalyzed associated samples with analyte concentrations <10 times the blank concentration. If the laboratory has not redigested and reanalyzed the samples, note in the validation narrative.

7. FIELD BLANKS

Are target analytes present in the field blanks? Yes No N/A

ACTION: Qualify all sample results for any analyte <5 times the amount in any valid field blank as nondetected (U).

8. MATRIX SPIKE SAMPLE ANALYSIS

Are spike recoveries within the control limits? Yes No N/A

ACTION: Qualify the affected sample data according to the following requirements:

If spike recovery is >125% and sample results are <IDL no qualification is required. If spike recovery is >125% or <75% qualify all positive results as estimated (J). If spike recovery is 30% to 74% qualify all nondetects as estimated (UJ). If spike recovery is <30%, reject all nondetects (R). If the field blank has been used for spike analysis, note in the validation narrative.

9. LABORATORY CONTROL SAMPLE

Are percent recoveries within the acceptance limits? Yes No N/A

Are there calculation errors? Yes No N/A level 2

ACTION: Qualify the sample data according to the following requirements:

AQUEOUS LCS - Qualify as estimated (J), all sample results >IDL, for which the LCS %R falls within the range 50-79% or >120%. Qualify as estimated (UJ), all sample results <IDL, for which the LCS falls within the range of 50-79%. Qualify as unusable (R) all sample results, for which the LCS %R <50%.

SOLID LCS - Qualify as estimated (J), all sample results >IDL for which the LCS result is outside the established control limits. Qualify as estimated (UJ), all sample results <IDL for which the LCS %R are lower than the established control limits.

10. PERFORMANCE AUDIT ANALYSES

Are the performance audit sample results within the acceptance limits? Yes No N/A

ACTION: Note the results of the performance audit sample analyses in the data validation narrative.

11. DUPLICATE SAMPLE ANALYSIS

Are RPD values acceptable? Yes No N/A

ACTION: Qualify the results for all associated samples of the same matrix as estimated (J) if the RPD results fall outside the appropriate control limits. If field blanks were used for laboratory duplicates, note in the validation narrative.

12. ICP SERIAL DILUTION

Are the serial dilution results acceptable? Yes No N/A

Is there evidence of negative interference? Yes No N/A

ACTION: Qualify the associated data as estimated (J) for those analytes in which the %D is outside the control limits. If evidence of negative interference is found, use professional judgment to qualify the data.

13. FIELD DUPLICATE SAMPLES

Do the RPD values exceed the control limits? Yes No N/A

ACTION: Note the results of the field duplicate samples in the validation narrative.

14. FIELD SPLIT SAMPLES

Do the RPD values exceed the control limits? Yes No N/A

ACTION: Note the results of the field split samples in the validation narrative.

1516. FURNACE ATOMIC ABSORPTION QUALITY CONTROL

Do all applicable analyses have duplicate injections? Yes No N/A

Are applicable duplicate injection RSD values within control? Yes No N/A

If no, were samples rerun once as required? Yes No N/A

Does the RSD for the rerun fall within the control limits? Yes No N/A

Were analytical spike recoveries within the control limits? Yes No N/A

If no, were MSA analyses performed when required?	Yes	No	N/A
Are MSA correlation coefficients $\geq$0.995?	Yes	No	N/A
If no, was a second MSA analysis performed?	Yes	No	N/A

ACTION: If duplicate injections are outside the acceptance limits and the sample has not been reanalyzed or the reanalysis is outside the acceptance limits, qualify the associated data as estimated (J for detects and UJ for nondetects). If the analytical spike recovery is <40% qualify detects as estimated (J). If the analytical spike recovery is $\geq$10% but <40%, qualify all nondetects as estimated (UJ) and if the analytical spike recovery is <10%, reject all nondetects (R). If the sample absorbance is <50% of the analytical spike absorbance and the analytical spike recovery is <85% or >115%, qualify all results as estimated (J for detects and UJ for nondetects). If method of standard additions (MSA) was required but was not performed, the MSA samples were spiked incorrectly, or the MSA correllation coefficient was <0.995, qualify the associated detected results as estimated (J).

17. ANALYTE QUANTITATION AND DETECTION LIMITS

Have results been reported and calculated correctly?	Yes	No	N/A
Are results within the calibrated range of the instruments and within the linear range of the ICP?	Yes	No	N/A
Are all detection limits below the CRQL?	Yes	No	N/A

Action: If analyte quantitation is in error, contact the laboratory for explanation. If errors or deficiencies can not be resolved with the laboratory, qualify associated data as unusable (R).

18. OVERALL ASSESSMENT AND SUMMARY

Has the laboratory conducted the analysis in accordance with the analytical SOW?	Yes	No	N/A
Were project specific data quality objectives met for this analysis?	Yes	No	N/A

ACTION: Summarize all the data qualifications and complete the data validation narrative as specified in Section 10.0 of the data validation requirements.

COMMENTS (attach additional sheets as necessary):

HOLDING TIME SUMMARY - FORM B-1

B001B1

SDG: B00H93	REVIEWER: KR	DATE: FEB 26 1993	PAGE 1 OF ___

COMMENTS: All samples were analyzed within required holding times

FIELD SAMPLE ID	ANALYSIS TYPE	DATE SAMPLED	DATE PREPARED (CV ICP GFAA)	DATE ANALYZED	PREP. HOLDING TIME, DAYS	ANALYSIS HOLDING TIME, DAYS	QUALIFIER
B00H93	CV ICP GFAA	12/10/91	1/2 1/9 1/9	1/3 1/19 1/13-1/15	22 ~~20~~ 29 29	23 38 34	NONE
B00H96	↓	↓	↓	↓	↓	↓	↓
B00H97							
B00H99		↓	↓		↓ ↓	↓	
B00HB1		12/10/91	1/3		23 ~~29~~	24	
B00HB3		↓	↓		22 ↓	23	
B00HB5		↓			↓	↓	
B00HB7							
B00HB9							
B00HC1		12/10/91					
B00HC3		↓	↓		↓ ↓	↓	
B00HC5		12/9/91	1/3		23 ~~29~~	24	
B00HC6	↓	12/10/91	↓ ↓ ↓	↓ ↓ ↓	↓ ↓ ↓	↓ ↓ ↓	↓

CALIBRATION DATA SUMMARY - FORM B-2

SDG: B00HB1	REVIEWER: KR	DATE: 2/26/93		PAGE 1 OF	
COMMENTS: all calibration and ICP interference percent recoveries are acceptable					
CALIB. TYPE:	INITIAL CONTINUING	INSTRUMENT:			
CALIB. DATE	COMPOUND	RF	RSD/%D/%R	SAMPLES AFFECTED	QUALIFIER
All Correlation coefficients are acceptable					NONE
ALL ICV and CCV percent recoveries are within control					NONE
CRDL Standard.	lead		-18.3 %	(no QC criteria	None
	Selenium		133.4 %	based on	
	Lead		40 %	CRDL Std.)	
	Selenium		217 %		
ICP interference check sample; all percent recoveries are acceptable					NONE

BLANK AND SAMPLE DATA SUMMARY - FORM B-3

SDG: B00HB1 | REVIEWER: KR | DATE: 2/26/93 | PAGE 1 OF 2

COMMENTS:

SAMPLE ID	COMPOUND	RESULT	Q	RT	UNITS	5X RESULT	10X RESULT	SAMPLES AFFECTED	QUALIFIER
CCB8	Arsenic	-2.2	B		ug/L ~~mg/kg~~	-11 As	B00HB9 B00HC1	B00H93 B00H96	UJ
CCB1	Barium	1.9	B				B00HC3 B00HC6	B00H97 B00H99	
CCB2		1.4	B					B00HB1 B00HB3	
CCB3		2.3	B			11.5		B00HB5 B00HB7	
CCB4		2.1	B				Ba	B00HC5 B00HC6	U
CCB5		2.3	B						
CCB2	Cadmium	1.2	B				Cd	B00HB1	U
CCB3		2.0	B			10			
CCB4		1.3	B					B00HB5 B00HB1	
CCB5		1.6	B				Cr	B00H99 B00H97	
CCB5	Chromium	4.0	B			20	B00HB7 B00HB9	B00H93 B00H96	U
CCB2	Copper	6.5	B						
CCB3		4.6	B					B00H99 B00H93	U U
CCB4		3.8	B				Cu	B00H96 B00H97	
CCB5		8.8	B			44		B00HC5 B00HC6	
ICB	Lead	-3.0	B			-15			
CCB1		-2.7	B						

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BLANK AND SAMPLE DATA SUMMARY - FORM B-3

SDG: B00HB1 | REVIEWER: KR | DATE: 2/26/93 | PAGE 2 OF 2

COMMENTS:

SAMPLE ID	COMPOUND	RESULT	Q	RT	UNITS	5X RESULT	10X RESULT	SAMPLES AFFECTED	QUALIFIER
CCB2	Lead	-2.8	B		~~mg/kg~~ ug/L			B00H93	UJ
CCB3		-2.7	B					B00H96 B00H97	
PB		-0.504	B		mg/kg		Pb	B00H99 B00HB3	
CCB4		-3.0	B		ug/L	-15		B00HB5 B00HB7	
CCB5		-2.7	B					B00HB9 B00HC1	
CCB6		-2.6	B						
CCB1	Manganese	1.2	B				Mn	B00HC5	U
CCB2		1.3	B						
CCB3		1.3	B						
CCB4		1.3	B						Ni
CCB5		1.9	B			9.5	B00HC5	B00H99 B00H97	U
CCB5	Nickel	6.3	B			31.5	B00HB9 B00HC1	B00H93 B00H96	K
CCB4	Potassium	103.6	B			518	B00HC6	B00HB7 B00HB5	U Ag
CCB5	Silver	6.3	B			31.5	B00HC1 B00HC3	B00HB5 B00HB3	U
PB	Sodium	11.342	B		mg/kg		B00HC6	B00HC3 B00HB3	U
CCB5		212.7	B		ug/L	1063.5	B00HB9 B00HC1	B00HB5 B00HB7	Na
CCB5	Vanadium	5.1	B			25.5			

ACCURACY DATA SUMMARY - FORM B-4

SDG: B00H B1	REVIEWER: KR	DATE: 2/26/93	PAGE 1 OF ___	
COMMENTS:				
SAMPLE ID	COMPOUND	% RECOVERY	SAMPLE(S) AFFECTED	QUALIFIER REQUIRED
B00H93 Spike)	Antimony	50.8 %		
Post digestion Spike ↓		111.6 %		
B00HC5 Spike)	(water matrix – acceptable)			
				Ca K Se Hg
LCS for Soil	Calcium	53.5 %	B00H93	J J UJ ~~UJ~~ KR
	Potassium	123.2 %	B00H96	J J UJ ~~UJ~~
	Selenium	55.6 %	B00H97	J J J ~~UJ~~
	Silver	124.8 %	B00H99	J J UJ
			B00HB1	J J UJ J
LCS for Water was acceptable)			B00HB3	J J UJ
% R			B00HB5	J UJ
			B00HB7	J UJ
			B00HB9	J J UJ
			B00HC1	J J UJ
			B00HC3	J J UJ

PRECISION DATA SUMMARY - FORM B-5

SDG: B00HB1	REVIEWER KR	DATE: 2/26/93	PAGE 1 OF __		
COMMENTS:					
COMPOUND	SAMPLE ID:	SAMPLE ID:	RPD	SAMPLES AFFECTED	QUALIFIER
all duplicate RPDs that were acceptable					None
TCP Serial dilution: %D was acceptable.					None
GFAA QUALITY CONTROL				Selenium	
				↓	
Arsenic	all arsenic analytical spike		spike	* B00HB3 46.7%	UJ
	recoveries are acceptable.			○ B00HB3 76.2%	
				* B00HB7 76.2%	
Selenium	The analytical spike recoveries			* B00HB9 47.9%	
	were out of control for the			○ B00HB5 [illegible]	
				○ B00HB5 74.6%	
				○ B00HC1 77.8%	
	RSD (9.6%) was out on (Re-Run Fdy)			B00HB1	
				B00HB5	
				B00HB3	
				B00HB9	↓

All RSD (9.6%) and analytical spike recoveries for Thallium and Lead were acceptable.

CALCULATION SUMMARY - FORM B-6

SDG: BCOHB1	REVIEWER: KR	DATE: 2/26/93	PAGE 1 OF __

COMMENTS: correlation coefficients:

1/4 As	1/4 Se	1/5 Se
0 0	0 0	0 0
10 0.0355	5 0.0175	5 0.0125
50 0.1605	50 ~~0.0~~ 0.1455	50 ~~0.122~~ 0.1195
100 0.3005	100 0.2560	100 0.2265
r=0.999	r=0.998	r=0.999

1/3 Pb	1/3 TL	1/4 Pb	1/4 TL
0 0	0 0	0 0	0 0
3 0.0140	10 0.0275	3 0.008	10 0.02265
50 0.2195	50 0.1385	50 0.2320	50 0.1400
100 0.4230	100 0.2540	100 0.4230	100 0.2545
r=0.999	r=0.998	r=0.999	r=0.999

1/2 Hg	1/3 Hg
0 0	0 0
.5 12	.5 5
1 22	1 11
2 43	2 22
4 81	5 59
r=0.999	r=0.999

See attached for analyte quantitation

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B00HB1

Analyte	Result	% Solids	g Sample	VOL ML	RESULT
Al	131.97	79.6	1.07	200	30989.05
Sb	0	79.6	1.07	200	0
As	34.99	79.6	1.06	200	8.293827
Ba	1.0306	79.6	1.07	200	242.0044
Be	0.01415	79.6	1.07	200	3.322688
Cd	0.00829	79.6	1.07	200	1.946649
Ca	129.43	79.6	1.07	200	30392.61
Cr	2.3561	79.6	1.07	200	553.2569
Co	0.03841	79.6	1.07	200	9.019396
Cu	175.22	79.6	1.07	200	41144.97
Fe	57.649	79.6	1.07	200	13537.07
Mg	35.576	79.6	1.07	200	8353.919
Mn	1.7139	79.6	1.07	200	402.4562
Hg	10.08	79.6	0.21	100	6.030150
Ni	4.3225	79.6	1.07	200	1015.004
Pb	469.84	79.6	1.06	200	111.3681
K	2.4661	79.6	1.07	200	579.0870
Se	ND	79.6	1.06	200	0
Ag	0.71429	79.6	1.07	200	167.7288
Na	4.7035	79.6	1.07	200	1104.470
Tl	ND	79.6	1.06	200	0
V	0.68706	79.6	1.07	200	161.3347
Zn	1.0274	79.6	1.07	200	241.2529

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::

Analyte	Result	% Solids	g Sample	VOL ML	RESULT
Al	70.426	92.6	1.04	200	14625.76
Sb	0.05922	92.6	1.04	200	12.29855
As	12.86	92.6	1.1	200	2.525034
Ba	0.32432	92.6	1.04	200	67.35338
Be	0.00285	92.6	1.04	200	0.591875
Cd	0	92.6	1.04	200	0
Ca	21.136	92.6	1.04	200	4389.433
Cr	0.78969	92.6	1.04	200	163.9994
Co	0.04741	92.6	1.04	200	9.845904
Cu	17.65	92.6	1.04	200	3665.475
Fe	96.619	92.6	1.04	200	20065.41
Mg	20.097	92.6	1.04	200	4173.658
Mn	1.1659	92.6	1.04	200	242.1290
Hg	0.97	92.6	0.25	100	0.419006
Ni	0.74012	92.6	1.04	200	153.7049
Pb	66.75	92.6	1.1	200	13.10622
K	2.9196	92.6	1.04	200	606.3299
Se	ND	92.6	1.1	200	0
Ag	0.04248	92.6	1.04	200	8.822063
Na	1.3214	92.6	1.04	200	274.4226
Tl	ND	92.6	1.1	200	0
V	0.18406	92.6	1.04	200	38.22478
Zn	0.25783	92.6	1.04	200	53.54502

BOOH B3

KR

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HARTCROWSER

Hart Crowser, Inc.
1201 Jadwin Avenue, Suite 204
Richland, WA 99352
FAX 509 946.4203
509 946.4344

Earth and Environmental Technologies

2978-40

February 25, 1993

Mr. Ron Belden
Westinghouse Hanford Company
P.O. Box 1970 / MSIN H6-03
Richland, Washington 99352

Subject: WHC Order No. MLW-SVV-037106
Task Order No. E-92-15, Rev. E
Preliminary Quality Assurance Record - 300-FF-1 RI/FS
TMA Case Number N1-12-165-9580

Dear Mr. Belden:

Ebasco and Hart Crowser are pleased to provide you with the attached results of our review and validation of the subject data from the 300-FF-1 Operable Unit Remedial Investigation/Feasibility Study (RI/FS). The attached results are provided to you in partial fulfillment of Subtask 08 as outlined in our letter to you dated February 4, 1993. The subject data package consisted of thirteen soil samples and two water samples submitted for gross alpha, gross beta, strontium 90, isotopic uranium, and gamma scan radiochemical analyses. The samples were analyzed by Thermo Analytical, Inc. according to requirements specified in the Analytical Laboratory Statement of Work issued by Westinghouse Hanford. Seven soil sample results for isotopic uranium and gamma scan was selected for validation. The specific gamma scan radionuclides selected for validation were cobalt 60, cesium 137, radium 226 and thorium 228. In addition, all applicable QA/QC samples were validated. These results, together with the data qualifiers assigned as a result of our review, are provided in Attachment 4.

DATA QUALITY OBJECTIVES SUMMARY

Data quality objectives with the exception of precision requirements were generally met. Lack of data resulted in rejecting one cesium 137 sample result. Differences in reporting and raw data resulted in qualifying one cesium 137 and one thorium 288 sample result.

MAJOR DEFICIENCIES (REJECTED DATA)

Lack of necessary raw data resulted in rejecting one cesium 137 sample result.

MINOR DEFICIENCIES (OTHER QUALIFIED DATA)

The following general trends resulting in the qualification of data from multiple samples have been noted. All qualified data are discussed in Attachments 3 and 5.

One cesium 137 sample result and one thorium 288 sample result were qualified as estimated (J or UJ) due to differences between the raw data results and the reported results. The cesium 137 sample result was reported as a non-detect in the summary report. The raw data indicates that this sample is a detect. The thorium sample was reported as a detect in the summary table. The raw data indicates that this sample is a non-detect.

The isotopic uranium results were acceptable. QA/QC sample results were also acceptable.

We trust that these preliminary results meet your needs. Our qualifier assignments will be finalized at the time the summary report for this task revision is published. The final qualifiers may vary from those presented here, reflecting any trends in data quality or laboratory performance observed over the course of the 300-FF-1 RI/FS. Please contact me if you have any questions with regard to our activities.

Sincerely,

HART CROWSER, INC.

D. MARK GERBOTH, P.E.
Project Manager
HC#133:RL1666.DOC

Attachments

cc: Mark Gerboth (w/o attachments)
Westinghouse EDMC
Jeff Grover (w/o attachments)
Project File (E-92-15/T2-002)

THIS APPENDIX CONSISTS OF FIVE ATTACHMENTS

Attachment 1 - Glossary of Data Qualifiers

This attachment provides a glossary explaining all data qualifiers applied as a result of the validation.

Attachment 2 - As Received Laboratory Sample Concentration Reports

This attachment provides a copy of the as-received sample concentration reports. This may be a tabular summary similar to that provided in Attachment 4, or may be a copy of the laboratory reports.

Attachment 3 - Summary of Data Qualifications

This attachment provides a complete summary of all qualifications applied as a result of the validation.

Attachment 4 - As Qualified Data Summary

This attachment provides a tabular data summary of all data qualified from the validation.

Attachment 5 - Data Review Supporting Documentation

This attachment provides copies of the data validation checklists, data summary forms, telephone contact memoranda and other documentation completed as a result of the data validation.

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ATTACHMENT 1

Glossary of Data Qualifiers

9613501.2270

ATTACHMENT 1

Glossary of Data Qualifiers

U - Indicates the compound or analyte was analyzed for and not detected. The value reported is the sample quantitation limit corrected for sample dilution and moisture content by the laboratory.

UJ - Indicates the compound or analyte was analyzed for and not detected. Due to quality control deficiencies identified during data validation the value reported may not accurately reflect the sample quantitation limit.

J - Indicates the compound or analyte was analyzed for and detected. The associated value is estimated but the data are useable for decision making processes.

R - Indicates the compound or analyte was analyzed for and due to an identified quality control deficiency the data are unusable.

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ATTACHMENT 2

As Received Laboratory Sample Concentration Reports

TMA 9613501.2272
Thermo Analytical Inc.

TMA/Norcal
2030 Wright Avenue
P. O. Box 4040
Richmond, CA 94804-0040
(510) 235-2633 Fax No. (510) 235-0438

APR 1992
RECEIVED
OSM DMO

FINAL REPORT
SENT BY FEDERAL EXPRESS

April 16, 1992

Ref. TMA/Norcal N1-12-165-9580

Mr. John Bourgeault
Westinghouse Hanford Company
2355 Stevens Drive
Richland, WA 99352

Dear Mr. Bourgeault:

Enclosed on Attachment 1, are the gross alpha, gross beta, ^{90}Sr, isotopic uranium, and gamma scan results for the soil samples and gross alpha, gross beta, ^{3}H, ^{90}Sr, isotopic uranium, and gamma scan results for the water samples from 300-FF-1 Area, we received 13 December 1991.

Please call if you have any questions concerning this data.

Sincerely,

D.P. Kharkar

Dinkar P. Kharkar, Ph.D.
Manager, Nuclear Programs

Attachment 1

SECTION 1 Data Report

ATTACHMENT 1 DATA TABLE

Collection date: 12/11/91 - 12/15/91

Customer I.D.	TMA/Norcal Group No. 9580	Analysis	Results pCi/L ± 2 σ	
B01CC9 (water)	1	Gross Alpha	0 ± 1	
		Gross Beta	0 ± 1	
		^{3}H	11 ± 120	
		^{90}Sr	(-0.4 ± 1)	E+00
		^{234}U	(0 ± 0.2)	E-01
		^{235}U	(0.009 ± 0.02)	E+00
		^{238}U	(0.004 ± 0.02)	E+00
		Gamma Scan:		
		^{40}K	<1.236	E+02
		^{51}Cr	<8.464	E+02
		^{60}Co	<1.622	E+01
		^{65}Zn	<2.886	E+01
		^{134}Cs	<1.275	E+01
		^{137}Cs	<1.069	E+01
		^{226}Ra	<2.094	E+01
		^{228}Th	<1.873	E+01
		^{232}Th	<4.824	E+01
B01CD1 (water)	2	Gross Alpha	0 ± 0.4	
		Gross Beta	1 ± 1	
		^{3}H	-32 ± 117	
		^{90}Sr	(0.09 ± 0.2)	E+00
		^{234}U	(0 ± 0.04)	E+00
		^{235}U	(0 ± 0.02)	E+00
		^{238}U	(0.02 ± 0.03)	E+00
		Gamma Scan:		
		^{40}K	<2.114	E+02
		^{51}Cr	<8.798	E+02
		^{60}Co	<1.457	E+01
		^{65}Zn	<3.549	E+01
		^{134}Cs	<1.507	E+01
		^{137}Cs	<1.348	E+01
		^{226}Ra	<2.238	E+01
		^{228}Th	<2.019	E+01
		^{232}Th	<5.577	E+01

ATTACHMENT 1 DATA TABLE (cont'd, page two)

Collection date: 12/11/91 - 12/15/91

Customer I.D.	TMA/Norcal Group No. 9580	Analysis	Results pCi/g ± 2 σ	
BOOHB1 (soil)	3	Gross Alpha	942 ± 38	
		Gross Beta	1,069 ± 14	
		^{90}Sr	(2.1 ± 0.7)	E+00
		^{234}U	(1.10 ± 0.08)	E+03
		^{235}U	(1.1 ± 0.2)	E+02
		^{238}U	(9.0 ± 0.7)	E+02
		Gamma Scan:		
		^{40}K	(6.553 ± 2.236)	E+00
		^{51}Cr	<2.051	E+01
		^{60}Co	(3.518 ± 0.452)	E+00
		^{65}Zn	<7.027	E-01
		^{134}Cs	<3.933	E-01
		^{137}Cs	(3.752 ± 2.343)	E-01
		^{226}Ra	(9.309 ± 4.263)	E-01
		^{228}Th	(3.193 ± 0.317)	E+00
		^{232}Th	(3.546 ± 1.083)	E+00
		^{235}U	(2.046 ± 0.196)	E+01
		^{238}U	(4.307 ± 0.485)	E+02
BOOHB3 (soil)	4	Gross Alpha	52 ± 9	
		Gross Beta	54 ± 4	
		^{90}Sr	(0.05 ± 0.5)	E+00
		^{234}U	(1.28 ± 0.07)	E+02
		^{235}U	(2.5 ± 0.9)	E+00
		^{238}U	(1.16 ± 0.06)	E+02
		Gamma Scan:		
		^{40}K	(9.326 ± 2.031)	E+00
		^{51}Cr	<9.290	E+00
		^{60}Co	(2.400 ± 1.293)	E-01
		^{65}Zn	<3.297	E-01
		^{134}Cs	<1.671	E-01
		^{137}Cs	<1.866	E-01
		^{226}Ra	(3.273 ± 1.781)	E-01
		^{228}Th	(8.106 ± 2.157)	E-01
		^{232}Th	(8.338 ± 4.104)	E-01
		^{235}U	(3.165 ± 0.643)	E+00
		^{238}U	(7.219 ± 1.930)	E+01

ATTACHMENT 1 DATA TABLE (cont'd, page three)

Collection date: 12/11/91 - 12/15/91

Customer I.D.	TMA/Norcal Group No. 9580	Analysis	Results pCi/g ± 2 σ	
B00HB5 (soil)	5	Gross Alpha	17 ± 6	
		Gross Beta	16 ± 2	
		^{90}Sr	(0.4 ± 0.2)	E+00
		^{234}U	(4.2 ± 0.2)	E+01
		^{235}U	(4.4 ± 0.3)	E+00
		^{238}U	(3.4 ± 0.2)	E+01
		Gamma Scan:		
		^{40}K	(7.424 ± 1.356)	E+00
		^{51}Cr	<7.623	E+00
		^{60}Co	(3.151 ± 1.122)	E-01
		^{65}Zn	<2.458	E-01
		^{134}Cs	<1.121	E-01
		^{137}Cs	(1.175 ± 0.845)	E-01
		^{226}Ra	(4.135 ± 1.133)	E-01
		^{228}Th	(5.713 ± 1.075)	E-01
		^{232}Th	(4.891 ± 3.045)	E-01
		^{235}U	(6.352 ± 3.215)	E-01
		^{238}U	(9.113 ± 8.964)	E+00
B01CF4 (soil)	6	Gross Alpha	8 ± 5	
		Gross Beta	15 ± 3	
		^{90}Sr	(2 ± 2)	E-01
		^{234}U	(1.3 ± 0.1)	E+00
		^{235}U	(1 ± 0.4)	E-01
		^{238}U	(1.0 ± 0.1)	E+00
		Gamma Scan:		
		^{40}K	(8.864 ± 1.765)	E+00
		^{51}Cr	<9.276	E+00
		^{60}Co	<1.356	E-01
		^{65}Zn	<3.370	E-01
		^{134}Cs	<1.490	E-01
		^{137}Cs	<1.124	E-01
		^{226}Ra	(3.640 ± 1.898)	E-01
		^{228}Th	(5.821 ± 1.651)	E-01
		^{232}Th	<6.423	E-01

ATTACHMENT 1 DATA TABLE (cont'd, page four)

Collection date: 12/11/91 - 12/15/91

Customer I.D.	TMA/Norcal Group No. 9580	Analysis	Results pCi/g ± 2 σ	
B01CF5 (soil)	7	Gross Alpha	2 ± 3	
		Gross Beta	7 ± 2	
		^{90}Sr	(0.8 ± 0.2)	E+00
		^{234}U	(9 ± 1)	E-01
		^{235}U	(6 ± 4)	E-02
		^{238}U	(7 ± 1)	E-01
		Gamma Scan:		
		^{40}K	(7.360 ± 1.508)	E+00
		^{51}Cr	<6.251	E+00
		^{60}Co	(1.087 ± 0.906)	E-01
		^{65}Zn	<3.129	E-01
		^{134}Cs	<1.126	E-01
		^{137}Cs	<8.713	E-02
		^{226}Ra	(3.870 ± 1.379)	E-01
		^{228}Th	(4.984 ± 1.029)	E-01
		^{232}Th	(3.722 ± 2.601)	E-01
B01CF6 (soil)	8	Gross Alpha	5 ± 4	
		Gross Beta	9 ± 3	
		^{90}Sr	(0.009 ± 0.2)	E+00
		^{234}U	(8 ± 1)	E-01
		^{235}U	(4 ± 3)	E-02
		^{238}U	(8 ± 1)	E-01
		Gamma Scan:		
		^{40}K	(7.969 ± 1.405)	E+00
		^{51}Cr	<5.515	E+00
		^{60}Co	<7.991	E-02
		^{65}Zn	<2.181	E-01
		^{134}Cs	<9.955	E-02
		^{137}Cs	<9.483	E-02
		^{226}Ra	(4.108 ± 1.454)	E-01
		^{228}Th	(6.097 ± 0.885)	E-01
		^{232}Th	(7.258 ± 2.808)	E-01

ATTACHMENT 1 DATA TABLE (cont'd, page five)

Collection date: 12/11/91 - 12/15/91

Customer I.D.	TMA/Norcal Group No. 9580	Analysis	Results pCi/g ± 2 σ	
B01CF7 (soil)	9	Gross Alpha	2 ± 3	
		Gross Beta	9 ± 2	
		^{90}Sr	(-0.6 ± 2)	E+00
		^{234}U	(7 ± 1)	E-01
		^{235}U	(4 ± 3)	E-02
		^{238}U	(6 ± 1)	E-01
		Gamma Scan:		
		^{40}K	(9.059 ± 1.559)	E+00
		^{51}Cr	<5.256	E+00
		^{60}Co	<9.839	E-02
		^{65}Zn	<2.170	E-01
		^{134}Cs	<9.523	E-02
		^{137}Cs	<7.519	E-02
		^{226}Ra	(2.805 ± 1.326)	E-01
		^{228}Th	(4.908 ± 0.938)	E-01
		^{232}Th	(4.818 ± 2.851)	E-01
B01CF8 (soil)	10	Gross Alpha	2 ± 4	
		Gross Beta	6 ± 2	
		^{90}Sr	(0.1 ± 2)	E-01
		^{234}U	(6 ± 1)	E-01
		^{235}U	(4 ± 4)	E-02
		^{238}U	(7 ± 1)	E-01
		Gamma Scan:		
		^{40}K	(8.283 ± 1.474)	E+00
		^{51}Cr	<6.911	E+00
		^{60}Co	<1.113	E-01
		^{65}Zn	<3.066	E-01
		^{134}Cs	<1.167	E-01
		^{137}Cs	<1.009	E-01
		^{226}Ra	(4.137 ± 2.010)	E-01
		^{228}Th	(7.294 ± 1.844)	E-01
		^{232}Th	(7.376 ± 4.071)	E-01

ATTACHMENT 1 DATA TABLE (cont'd, page six)

Collection date: 12/11/91 - 12/15/91

Customer I.D.	TMA/Norcal Group No. 9580	Analysis	Results pCi/g ± 2 σ	
B01GF4 (soil)	11	Gross Alpha	68 ± 11	
		Gross Beta	61 ± 4	
		^{90}Sr	(4 ± 8)	E-01
		^{234}U	(3.6 ± 0.2)	E+01
		^{235}U	(9 ± 5)	E-01
		^{238}U	(4.3 ± 0.3)	E+01
		Gamma Scan:		
		^{40}K	(7.829 ± 1.681)	E+00
		^{51}Cr	<7.875	E+00
		^{60}Co	(4.532 ± 1.548)	E-01
		^{65}Zn	<3.764	E-01
		^{134}Cs	<1.550	E-01
		^{137}Cs	(1.193 ± 1.129)	E-01
		^{226}Ra	(3.732 ± 1.857)	E-01
		^{228}Th	(5.655 ± 1.951)	E-01
		^{232}Th	(6.683 ± 3.800)	E-01
		^{235}U	(1.126 ± 0.350)	E+00
		^{238}U	(3.014 ± 1.465)	E+01
B01GF6 (soil)	12	Gross Alpha	60 ± 10	
		Gross Beta	65 ± 4	
		^{90}Sr	(0.5 ± 0.2)	E+00
		^{234}U	(2.9 ± 0.2)	E+01
		^{235}U	(1.9 ± 0.2)	E+00
		^{238}U	(3.5 ± 0.2)	E+01
		Gamma Scan:		
		^{40}K	(7.872 ± 1.661)	E+00
		^{51}Cr	<7.423	E+00
		^{60}Co	(1.668 ± 0.906)	E-01
		^{65}Zn	<2.917	E-01
		^{134}Cs	<1.301	E-01
		^{137}Cs	(2.261 ± 1.128)	E-01
		^{226}Ra	(3.667 ± 2.199)	E-01
		^{228}Th	(6.733 ± 1.710)	E-01
		^{232}Th	(5.252 ± 3.627)	E-01
		^{235}U	(9.500 ± 4.342)	E-01
		^{238}U	(2.527 ± 1.255)	E+01

ATTACHMENT 1 DATA TABLE (cont'd, page seven)

Collection date: 12/11/91 - 12/15/91

Customer I.D.	TMA/Norcal Group No. 9580	Analysis	Results pCi/g ± 2 σ	
B01GF7 (soil)	13	Gross Alpha	78 ± 11	
		Gross Beta	71 ± 4	
		^{90}Sr	(-0.03 ± 0.7)	E+00
		^{234}U	(5.5 ± 0.3)	E+01
		^{235}U	(2.1 ± 0.8)	E+00
		^{238}U	(4.9 ± 0.3)	E+01
		Gamma Scan:		
		^{40}K	(7.013 ± 1.529)	E+00
		^{51}Cr	<7.710	E+00
		^{60}Co	(1.211 ± 0.185)	E+00
		^{65}Zn	<3.423	E-01
		^{134}Cs	<1.626	E-01
		^{137}Cs	(6.889 ± 1.187)	E-01
		^{226}Ra	(6.896 ± 2.363)	E-01
		^{228}Th	(6.862 ± 1.331)	E-01
		^{232}Th	(8.029 ± 3.826)	E-01
		^{235}U	(2.285 ± 0.535)	E+00
		^{238}U	(5.416 ± 1.739)	E+01
B01GG9 (soil)	14	Gross Alpha	18 ± 6	
		Gross Beta	18 ± 3	
		^{90}Sr	(-0.8 ± 5)	E+00
		^{234}U	(8.6 ± 0.7)	E+00
		^{235}U	(7 ± 1)	E-01
		^{238}U	(7.4 ± 0.6)	E+00
		Gamma Scan:		
		^{40}K	(7.682 ± 1.825)	E+00
		^{51}Cr	<7.467	E+00
		^{60}Co	(1.328 ± 1.269)	E-01
		^{65}Zn	<3.677	E-01
		^{134}Cs	<1.199	E-01
		^{137}Cs	(4.430 ± 1.440)	E-01
		^{141}Ce	(7.766 ± 7.121)	E-01
		^{226}Ra	(4.990 ± 1.440)	E-01
		^{228}Th	(5.732 ± 2.280)	E-01
		^{232}Th	(8.670 ± 5.781)	E-01
		^{235}U	(3.510 ± 3.218)	E-01

ATTACHMENT 1 DATA TABLE (cont'd, page seven)

Collection date: 12/11/91 - 12/15/91

Customer I.D.	TMA/Norcal Group No. 9580	Analysis	Results pCi/g ± 2 σ	
B01GH0 (soil)	15	Gross Alpha	10 ± 5	
		Gross Beta	13 ± 2	
		^{90}Sr	(0.2 ± 0.2)	E+00
		^{234}U	(5.8 ± 0.4)	E+00
		^{235}U	(5 ± 1)	E-01
		^{238}U	(5.6 ± 0.4)	E+00
		Gamma Scan:		
		^{40}K	(7.859 ± 1.607)	E+00
		^{51}Cr	<7.077	E+00
		^{60}Co	<1.455	E-01
		^{65}Zn	<3.367	E-01
		^{134}Cs	<9.858	E-02
		^{137}Cs	(2.825 ± 0.789)	E-01
		^{226}Ra	(4.183 ± 1.564)	E-01
		^{228}Th	(6.657 ± 1.611)	E-01
		^{232}Th	(5.780 ± 3.983)	E-01

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ATTACHMENT 3

Summary of Data Qualifications

TMA/Norcal N1-12-165-9580 Additional 300-FF-1 Samples

Isotopic Uranium

U234 (CRDL = 1 pCi/g)

Customer I.D. #	Calculated Results	Raw Data Results	Reported Results	Q
B00HB1	1095.25967	1095	1100	
B00HB3	128.32712	128.3	128	
B00HB5	41.92383	41.92	42	
B01GF4	35.76434	35.75	36	
B01GF7	55.12328	55.14	55	
B01GG9	8.61738	8.62	8.6	
B01GH0	5.83980	5.837	5.8	

U235 (CRDL = 1 pCi/g)

Customer I.D. #	Calculated Results	Raw Data Results	Reported Results	Q
B00HB1	114.44269	114.3	110	
B00HB3	2.52726	2.528	2.5	
B00HB5	4.36441	4.365	4.4	
B01GF4	0.86654	0.8645	0.9	
B01GF7	2.13364	2.134	2.1	
B01GG9	0.73935	0.7323	0.7	
B01GH0	0.51131	0.5124	0.5	

U238 (CRDL = 1 pCi/g)

Customer I.D. #	Calculated Results	Raw Data Results	Reported Results	Q
B00HB1	899.99566	900.3	900	
B00HB3	115.48555	115.5	116	
B00HB5	33.78454	33.78	34	
B01GF4	43.35255	43.34	43	
B01GF7	49.12191	49.13	49	
B01GG9	7.38007	7.38	7.4	
B01GH0	5.56679	5.564	5.6	

Gamma Spec

Cobalt 60 (CRDL = 0.05 pCi/g)

Customer I.D. #	Calculated Results	Raw Data Results	Reported Results	Q
B00HB1	3.38893	3.518	3.518	
B00HB3	0.23099	0.24	0.24	
B00HB5	0.30350	0.3151	0.3151	
B01GF4	0.43752	0.4532	0.4532	
B01GF7	1.16816	1.211	1.211	
B01GG9	0.12801	0.1328	0.1328	
B01GH0	0.15380	0.1596	0.1455	

Cesium 137 (CRDL = 0.1 pCi/g)

Customer I.D. #	Calculated Results	Raw Data Results	Reported Results	Q
B00HB1	0.37274	0.3752	0.3752	
B00HB3	0.09218	0.09286	**0.1866***	UJ
B00HB5	ERR	***	0.1175	R
B01GF4	0.11864	0.1193	0.1193	
B01GF7	0.68488	0.6889	0.6889	
B01GG9	0.44039	0.443	0.443	
B01GH0	0.28090	0.2825	0.2825	

Thorium 228 (CRDL = Not reported)

Customer I.D. #	Calculated Results	Raw Data Results	Reported Results	Q
B00HB1	2.88457	3.193	3.193	
B00HB3	0.73217	0.8106	0.8106	
B00HB5	0.51623	0.5713	0.5713	
B01GF4	0.22859	0.2517	**0.5655****	J
B01GF7	0.62299	0.6862	0.6862	
B01GG9	0.52068	0.5736	0.5732	
B01GH0	0.60423	0.6657	0.6657	

Radium 226 (CRDL = 0.1 pCi/g)

Customer I.D. #	Calculated Results	Raw Data Results	Reported Results	Q
B00HB1	0.93055	0.9309	0.9309	
B00HB3	0.32764	0.3273	0.3273	
B00HB5	0.41348	0.4134	0.4135	
B01GF4	0.37340	0.3732	0.3732	
B01GF7	0.68970	0.6896	0.6896	
B01GG9	0.49886	0.499	0.499	
B01GH0	0.41831	0.4184	0.4183	

* Reported as non-detect in results table, but reported in raw data as a detect.

** Reported as a detect in results table, but reported in raw data as a non-detect.

*** missing data

9613501.2284

ATTACHMENT 4

As Qualified Data Summary

9613501.2285

Applicable QC's
9580-16 through 30
AND 36,

TMA

ATTACHMENT 1 DATA TABLE

Collection date: 12/11/91 - 12/15/91

7 soil samples collected
2 Water total
13 soil total

Customer I.D.	TMA/Norcal Group No. 9580	Analysis	Results pCi/L ± 2 σ	
B01CC9 (water)	1	Gross Alpha	0 ± 1	
		Gross Beta	0 ± 1	
		^{3}H	11 ± 120	
		^{90}Sr	(-0.4 ± 1)	E+00
		^{234}U	(0 ± 0.2)	E-01
		^{235}U	(0.009 ± 0.02)	E+00
		^{238}U	(0.004 ± 0.02)	E+00
		Gamma Scan:		
		^{40}K	<1.236	E+02
		^{51}Cr	<8.464	E+02
		^{60}Co	<1.622	E+01
		^{65}Zn	<2.886	E+01
		^{134}Cs	<1.275	E+01
		^{137}Cs	<1.069	E+01
		^{226}Ra	<2.094	E+01
		^{228}Th	<1.873	E+01
		^{232}Th	<4.824	E+01
B01CD1 (water)	2	Gross Alpha	0 ± 0.4	
		Gross Beta	1 ± 1	
		^{3}H	-32 ± 117	
		^{90}Sr	(0.09 ± 0.2)	E+00
		^{234}U	(0 ± 0.04)	E+00
		^{235}U	(0 ± 0.02)	E+00
		^{238}U	(0.02 ± 0.03)	E+00
		Gamma Scan:		
		^{40}K	<2.114	E+02
		^{51}Cr	<8.798	E+02
		^{60}Co	<1.457	E+01
		^{65}Zn	<3.549	E+01
		^{134}Cs	<1.507	E+01
		^{137}Cs	<1.348	E+01
		^{226}Ra	<2.238	E+01
		^{228}Th	<2.019	E+01
		^{232}Th	<5.577	E+01

Level II QC - OK

ISO U 235
Prec.* OK
Acc.* OK
U 238
Prec.* OK
Acc.* OK
U234
Prec.* OK
Acc.* OK

ISO U
Holding Time OK
Calibration OK
BLANKS OK

B01GF4 U235 MDA Reported 1.03, calculated 0.39
Result 0.86 <CRDL consider U

B01GF7 U235 MDA >CRDL Result > MDA - OK

B00HB1 U238 " " " "

*Review of Quantitation - OK
Initially had problems with QC samples due to internal contamination. Redid samples - results OK
Redid QCs - OK
RPDs - OK
w/original results

ATTACHMENT 1 DATA TABLE (cont'd, page two)

Collection date: 12/11/91 - 12/15/91

Customer I.D.	TMA/Norcal Group No. 9580	Analysis	Results pCi/g ± 2 σ	
B00HB1 (soil)	3	Gross Alpha	942 ± 38	
		Gross Beta	1,069 ± 14	
		^{90}Sr	(2.1 ± 0.7)	E+00
		^{234}U	(1.10 ± 0.08)	E+03
		^{235}U	(1.1 ± 0.2)	E+02
		^{238}U	(9.0 ± 0.7)	E+02
		Gamma Scan:		
		^{40}K	(6.553 ± 2.236)	E+00
		^{51}Cr	<2.051	E+01
		^{60}Co	(3.518 ± 0.452)	E+00
		^{65}Zn	<7.027	E-01
		^{134}Cs	<3.933	E-01
		^{137}Cs	(3.752 ± 2.343)	E-01
		^{226}Ra	(9.309 ± 4.263)	E-01
		^{228}Th	(3.193 ± 0.317)	E+00
		^{232}Th	(3.546 ± 1.083)	E+00
		^{235}U	(2.046 ± 0.196)	E+01
		^{238}U	(4.307 ± 0.485)	E+02
B00HB3 (soil)	4	Gross Alpha	52 ± 9	
		Gross Beta	54 ± 4	
		^{90}Sr	(0.05 ± 0.5)	E+00
		^{234}U	(1.28 ± 0.07)	E+02
		^{235}U	(2.5 ± 0.9)	E+00
		^{238}U	(1.16 ± 0.06)	E+02
		Gamma Scan:		
		^{40}K	(9.326 ± 2.031)	E+00
		^{51}Cr	<9.290	E+00
		^{60}Co	(2.400 ± 1.293)	E-01
		^{65}Zn	<3.297	E-01
		^{134}Cs	<1.671	E-01
		^{137}Cs	<1.866	E-01
		^{226}Ra	(3.273 ± 1.781)	E-01
		^{228}Th	(8.106 ± 2.157)	E-01
		^{232}Th	(8.338 ± 4.104)	E-01
		^{235}U	(3.165 ± 0.643)	E+00
		^{238}U	(7.219 ± 1.930)	E+01

UJ See bol and spre sher

GAMMA SPEC

H.T. OK

ACC. OK Based on Cs 137 spike

PREC. ~~OK Based on Cs 137 spike~~ OK

BLANKS. OK

Calibration. OK

Co60 missing Bkg data for QC Dup. (9580-30) used summary info based upon TMA performance

Cs 137 sample B00HB5 missing data

Review of Quantification - OK except B00HB3 Cs 137 and B01GF4 Th 228

B00HB3 Calc MDA .14 Reported MDA not avail result .09 ⇒ UJ

Several samples w ~~result MDA~~ > CRDL but results > MDA — ⇒ accept.

ATTACHMENT 1 DATA TABLE (cont'd, page three)

Collection date: 12/11/91 - 12/15/91

Customer I.D.	TMA/Norcal Group No. 9580	Analysis	Results pCi/g ± 2 σ	
B00HB5 (soil)	5	Gross Alpha	17 ± 6	
		Gross Beta	16 ± 2	
		^{90}Sr	(0.4 ± 0.2)	E+00
		^{234}U	(4.2 ± 0.2)	E+01
		^{235}U	(4.4 ± 0.3)	E+00
		^{238}U	(3.4 ± 0.2)	E+01
		Gamma Scan:		
		^{40}K	(7.424 ± 1.356)	E+00
		^{51}Cr	<7.623	E+00
		^{60}Co	(3.151 ± 1.122)	E-01
		^{65}Zn	<2.458	E-01
		^{134}Cs	<1.121	E-01
		^{137}Cs	(1.175 ± 0.845)	E-01 ← no det
		^{226}Ra	(4.135 ± 1.133)	E-01
		^{228}Th	(5.713 ± 1.075)	E-01
		^{232}Th	(4.891 ± 3.045)	E-01
		^{235}U	(6.352 ± 3.215)	E-01
		^{238}U	(9.113 ± 8.964)	E+00
B01CF4 (soil)	6	Gross Alpha	8 ± 5	
		Gross Beta	15 ± 3	
		^{90}Sr	(2 ± 2)	E-01
		^{234}U	(1.3 ± 0.1)	E+00
		^{235}U	(1 ± 0.4)	E-01
		^{238}U	(1.0 ± 0.1)	E+00
		Gamma Scan:		
		^{40}K	(8.864 ± 1.765)	E+00
		^{51}Cr	<9.276	E+00
		^{60}Co	<1.356	E-01
		^{65}Zn	<3.370	E-01
		^{134}Cs	<1.490	E-01
		^{137}Cs	<1.124	E-01
		^{226}Ra	(3.640 ± 1.898)	E-01
		^{228}Th	(5.821 ± 1.651)	E-01
		^{232}Th	<6.423	E-01

ATTACHMENT 1 DATA TABLE (cont'd, page four)

Collection date: 12/11/91 - 12/15/91

Customer I.D.	TMA/Norcal Group No. 9580	Analysis	Results pCi/g ± 2 σ	
B01CF5 (soil)	7	Gross Alpha	2 ± 3	
		Gross Beta	7 ± 2	
		^{90}Sr	(0.8 ± 0.2)	E+00
		^{234}U	(9 ± 1)	E-01
		^{235}U	(6 ± 4)	E-02
		^{238}U	(7 ± 1)	E-01
		Gamma Scan:		
		^{40}K	(7.360 ± 1.508)	E+00
		^{51}Cr	<6.251	E+00
		^{60}Co	(1.087 ± 0.906)	E-01
		^{65}Zn	<3.129	E-01
		^{134}Cs	<1.126	E-01
		^{137}Cs	<8.713	E-02
		^{226}Ra	(3.870 ± 1.379)	E-01
		^{228}Th	(4.984 ± 1.029)	E-01
		^{232}Th	(3.722 ± 2.601)	E-01
B01CF6 (soil)	8	Gross Alpha	5 ± 4	
		Gross Beta	9 ± 3	
		^{90}Sr	(0.009 ± 0.2)	E+00
		^{234}U	(8 ± 1)	E-01
		^{235}U	(4 ± 3)	E-02
		^{238}U	(8 ± 1)	E-01
		Gamma Scan:		
		^{40}K	(7.969 ± 1.405)	E+00
		^{51}Cr	<5.515	E+00
		^{60}Co	<7.991	E-02
		^{65}Zn	<2.181	E-01
		^{134}Cs	<9.955	E-02
		^{137}Cs	<9.483	E-02
		^{226}Ra	(4.108 ± 1.454)	E-01
		^{228}Th	(6.097 ± 0.885)	E-01
		^{232}Th	(7.258 ± 2.808)	E-01

ATTACHMENT 1 DATA TABLE (cont'd, page five)

Collection date: 12/11/91 - 12/15/91

Customer I.D.	TMA/Norcal Group No. 9580	Analysis	Results pCi/g ± 2 σ	
B01CF7 (soil)	9	Gross Alpha	2 ± 3	
		Gross Beta	9 ± 2	
		^{90}Sr	(-0.6 ± 2)	E+00
		^{234}U	(7 ± 1)	E-01
		^{235}U	(4 ± 3)	E-02
		^{238}U	(6 ± 1)	E-01
		Gamma Scan:		
		^{40}K	(9.059 ± 1.559)	E+00
		^{51}Cr	<5.256	E+00
		^{60}Co	<9.839	E-02
		^{65}Zn	<2.170	E-01
		^{134}Cs	<9.523	E-02
		^{137}Cs	<7.519	E-02
		^{226}Ra	(2.805 ± 1.326)	E-01
		^{228}Th	(4.908 ± 0.938)	E-01
		^{232}Th	(4.818 ± 2.851)	E-01
B01CF8 (soil)	10	Gross Alpha	2 ± 4	
		Gross Beta	6 ± 2	
		^{90}Sr	(0.1 ± 2)	E-01
		^{234}U	(6 ± 1)	E-01
		^{235}U	(4 ± 4)	E-02
		^{238}U	(7 ± 1)	E-01
		Gamma Scan:		
		^{40}K	(8.283 ± 1.474)	E+00
		^{51}Cr	<6.911	E+00
		^{60}Co	<1.113	E-01
		^{65}Zn	<3.066	E-01
		^{134}Cs	<1.167	E-01
		^{137}Cs	<1.009	E-01
		^{226}Ra	(4.137 ± 2.010)	E-01
		^{228}Th	(7.294 ± 1.844)	E-01
		^{232}Th	(7.376 ± 4.071)	E-01

ATTACHMENT 1 DATA TABLE (cont'd, page six)

Collection date: 12/11/91 - 12/15/91

Customer I.D.	TMA/Norcal Group No. 9580	Analysis	Results pCi/g ± 2 σ	
B01GF4 (soil)	11	Gross Alpha	68 ± 11	
		Gross Beta	61 ± 4	
		^{90}Sr	(4 ± 8)	E-01
		^{234}U	(3.6 ± 0.2)	E+01
		^{235}U	(9 ± 5)	E-01 U
		^{238}U	(4.3 ± 0.3)	E+01
		Gamma Scan:		
		^{40}K	(7.829 ± 1.681)	E+00
		^{51}Cr	<7.875	E+00
		^{60}Co	(4.532 ± 1.548)	E-01
		^{65}Zn	<3.764	E-01
		^{134}Cs	<1.550	E-01
		^{137}Cs	(1.193 ± 1.129)	E-01
		^{226}Ra	(3.732 ± 1.857)	E-01
		^{228}Th	(5.655 ± 1.951)	E-01 J
		^{232}Th	(6.683 ± 3.800)	E-01
		^{235}U	(1.126 ± 0.350)	E+00
		^{238}U	(3.014 ± 1.465)	E+01
B01GF6 (soil)	12	Gross Alpha	60 ± 10	
		Gross Beta	65 ± 4	
		^{90}Sr	(0.5 ± 0.2)	E+00
		^{234}U	(2.9 ± 0.2)	E+01
		^{235}U	(1.9 ± 0.2)	E+00
		^{238}U	(3.5 ± 0.2)	E+01
		Gamma Scan:		
		^{40}K	(7.872 ± 1.661)	E+00
		^{51}Cr	<7.423	E+00
		^{60}Co	(1.668 ± 0.906)	E-01
		^{65}Zn	<2.917	E-01
		^{134}Cs	<1.301	E-01
		^{137}Cs	(2.261 ± 1.128)	E-01
		^{226}Ra	(3.667 ± 2.199)	E-01
		^{228}Th	(6.733 ± 1.710)	E-01
		^{232}Th	(5.252 ± 3.627)	E-01
		^{235}U	(9.500 ± 4.342)	E-01
		^{238}U	(2.527 ± 1.255)	E+01

ATTACHMENT 1 DATA TABLE (cont'd, page seven)

Collection date: 12/11/91 - 12/15/91

Customer I.D.	TMA/Norcal Group No. 9580	Analysis	Results pCi/g ± 2 σ	
B01GF7 (soil)	13	Gross Alpha	78 ± 11	
		Gross Beta	71 ± 4	
		^{90}Sr	(-0.03 ± 0.7)	E+00
		^{234}U	(5.5 ± 0.3)	E+01
		^{235}U	(2.1 ± 0.8)	E+00
		^{238}U	(4.9 ± 0.3)	E+01
		Gamma Scan:		
		^{40}K	(7.013 ± 1.529)	E+00
		^{51}Cr	<7.710	E+00
		^{60}Co	(1.211 ± 0.185)	E+00
		^{65}Zn	<3.423	E-01
		^{134}Cs	<1.626	E-01
		^{137}Cs	(6.889 ± 1.187)	E-01
		^{226}Ra	(6.896 ± 2.363)	E-01
		^{228}Th	(6.862 ± 1.331)	E-01
		^{232}Th	(8.029 ± 3.826)	E-01
		^{235}U	(2.285 ± 0.535)	E+00
		^{238}U	(5.416 ± 1.739)	E+01
B01GG9 (soil)	14	Gross Alpha	18 ± 6	
		Gross Beta	18 ± 3	
		^{90}Sr	(-0.8 ± 5)	E+00
		^{234}U	(8.6 ± 0.7)	E+00
		^{235}U	(7 ± 1)	E-01
		^{238}U	(7.4 ± 0.6)	E+00
		Gamma Scan:		
		^{40}K	(7.682 ± 1.825)	E+00
		^{51}Cr	<7.467	E+00
		^{60}Co	(1.328 ± 1.269)	E-01
		^{65}Zn	<3.677	E-01
		^{134}Cs	<1.199	E-01
		^{137}Cs	(4.430 ± 1.440)	E-01
		^{141}Ce	(7.766 ± 7.121)	E-01
		^{226}Ra	(4.990 ± 1.440)	E-01
		^{228}Th	(5.732 ± 2.280)	E-01
		^{232}Th	(8.670 ± 5.781)	E-01
		^{235}U	(3.510 ± 3.218)	E-01

ATTACHMENT 1 DATA TABLE (cont'd, page seven)

Collection date: 12/11/91 - 12/15/91

Customer I.D.	TMA/Norcal Group No. 9580	Analysis	Results pCi/g ± 2 σ	
B01GH0 (soil)	15	Gross Alpha	10 ± 5	
		Gross Beta	13 ± 2	
		^{90}Sr	(0.2 ± 0.2)	E+00
		^{234}U	(5.8 ± 0.4)	E+00
		^{235}U	(5 ± 1)	E-01
		^{238}U	(5.6 ± 0.4)	E+00
		Gamma Scan:		
		^{40}K	(7.859 ± 1.607)	E+00
		^{51}Cr	<7.077	E+00
		^{60}Co	<1.455	E-01
		^{65}Zn	<3.367	E-01
		^{134}Cs	<9.858	E-02
		^{137}Cs	(2.825 ± 0.789)	E-01
		^{226}Ra	(4.183 ± 1.564)	E-01
		^{228}Th	(6.657 ± 1.611)	E-01
		^{232}Th	(5.780 ± 3.983)	E-01

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ATTACHMENT 5

Data Review Supporting Documentation

9613501.2294

Data Package Completeness Checklists

ISO-U

Supplemental Requirements for Analyses Using
Alpha Spectroscopy

B.0 Completeness Checklist

Analysis Results

- ✓ Results Report for Sample Analyses and Reanalyses
- ✓ Raw Data (Spectra, Printouts, Notebook Pages)
- ✓ Calculation Sheets
- ✓ Sample Identifications
- ✓ Detector Identification
- ✓ Analysis Date and Initials of Analyst
- ✓ Amounts of Samples Counted (Precipitated or Deposited)

Initial and Continuing Calibration

- ✓ Detector Identification
- ✓ Calibration Date(s) and Initials of Analyst
- ✓ Identification of Calibration and Check Standards including Radionuclide, Certification, Expiration Date, and Activity
- NA ✓ Amount of (Check) Standard Used
- ✓ Raw Data including Spectra or Counts per Channel
- NA ✓ Kev/channel
- NA ✓ Count Duration for Standards
- ✓ Efficiencies
- NA ✓ Raw Data of Background Counts, Dates Counted, and Duration of Counts

Blanks

- ✓ Detector Identification
- ✓ Date of Analysis
- ✓ MDA of Method
- ✓ Amounts of Reagents Used in Blank

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Supplemental Requirements for Analyses Using Alpha Spectroscopy (Cont.)

Duplicates

- ✓ Detector Identification
- ✓ Date of Analysis
- ✓ Amounts of Samples Counted
- ✓ Count Durations
- ✓ Sample Identifications
- ✓ Calculated Precision

Radiometric and Gravimetric Yields

- ✓ Amounts (Volumes, Concentrations, Activity) of Spikes, Tracers, or Carriers Used
- ✓ Weights of Precipitates or Solids Counted
- ✓ Calculated Recoveries

Laboratory Control Samples

- ✓ Detector Identification
- ✓ Date of Analysis
- ✓ Calculation of Recoveries
- ✓ Results of Analyses

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Supplemental Requirements for Analyses Using Gamma Spectroscopy

C.0 Completeness Checklist

Analysis Results

- ✓ Results Report for Sample Analyses and Reanalyses
- ✓ Raw Data (Spectra, Printouts of Counts per Channel, Notebook Pages)
- ✓ Calculation Sheets
- ✓ Sample Identifications
- ✓ Detector Identification and Counting Position
- ✓ Analysis Date and Initials of Analyst
- ✓ Amounts of Samples Counted

Initial and Continuing Calibration

- ✓ Detector Identification
- ✓ Calibration Date(s) and Initials of Analyst
- ✓ Identification of Calibration and Check Standards including Radionuclides, Certification, Expiration Date, and Activity
- NA Amount of (Check) Standard Used
- ✓ Raw Data including Counts and Count Duration for Standards
- ✓ Efficiencies and/or Geometry and Matrix Factors
- ✓ Raw Data of Background Counts, Count Dates, and Duration of Counts
- ✓ Kev/Channel
- ✓ FWHM

Blanks

- ✓ Detector Identification
- ✓ Date of Analysis
- ✓ MDA of Method
- ✓ Amounts of Reagents Used in Blank
- ✓ Raw Data

Supplemental Requirements for Analyses Using Gamma Spectroscopy (Cont.)

Duplicates

- ✓ Detector Identification
- ✓ Date of Analysis
- ✓ Amounts of Samples
- ✓ Count Durations
- ✓ Sample Identifications
- ✓ Results of Analyses and Calculated Precision
- ✓ Raw Data

Radiometric and Gravimetric Yields

NA

- NA Amounts (Volumes, Concentrations, Activity) of Spikes, Tracers, or Carriers Used
- NA Weights of Precipitates or Solids Counted
- NA Calculated Recoveries

Laboratory Control Samples

- ✓ Detector Identification
- ✓ Date of Analysis
- ✓ Calculation of Recoveries
- ✓ Results of Analyses

SECTION 2 Case Narrative

CASE NARRATIVE

1. Project Hanford 300-FF-1 Area Soils and Water (TMA/Norcal Group Nos. 9580, 7001, 7008, and 7013) were processed together and the results of the analyses are reported. The sample ID's are:

Customer Sample ID	TMA/Norcal Group No.	Customer Sample ID	TMA/Norcal Group No.
B01CC9 (Water)	9580-1	B01CH0 (Soil)	7008-1
B01CD1 (Water)	9580-2	B01CH2 (Soil)	7008-2
B00HB1 (Soil)	9580-3	B01RJ0 (Soil)	7008-3
B00HB3 (Soil)	9580-4	B01RJ1 (Soil)	7008-4
B00HB5 (Soil)	9580-5	B01RJ2 (Soil)	7008-5
B01CF4 (Soil)	9580-6	B01RJ3 (Soil)	7008-6
B01CF5 (Soil)	9580-7	B01GN0 (Water)	7008-7
B01CF6 (Soil)	9580-8	B01GN1 (Water)	7008-8
B01CF7 (Soil)	9580-9	B01GM8 (Soil)	7008-9
B01CF8 (Soil)	9580-10	B01GM9 (Soil)	7008-10
B01GF4 (Soil)	9580-11	B01RL2 (Soil)	7008-11
B01GF6 (Soil)	9580-12	B01RL4 (Water)	7008-12
B01GF7 (Soil)	9580-13	B01RJ4 (Soil)	7008-13
B01GG9 (Soil)	9580-14	B01RK1 (Soil)	7013-1
B01GH0 (Soil)	9580-15	B01RJ1 (Soil)	7013-2
B01GM0 (Soil)	7001-1	B01RJ7 (Soil)	7013-3
B01GM1 (Soil)	7002-2	B01RJ8 (Soil)	7013-4
B01GM3 (Soil)	7003-3	B01RK2 (Soil)	7013-5
B01GM4 (Soil)	7001-4	B01RK3 (Soil)	7013-6
B01GM5 (Water)	7001-5	B01RK4 (Soil)	7013-7
B01GM6 (Water)	7001-6	B01GK7 (Soil)	7013-8
B01CG4 (Soil)	7001-7	B01GK4 (Soil)	7013-9
B00CG5 (Soil)	7001-8	B01GK5 (Soil)	7013-10
B01CG6 (Soil)	7001-9	B01GK8 (Soil)	7013-11
B01CG7 (Soil)	7001-10	B01GN3 (Soil)	7013-12
B01CG8 (Soil)	7001-11	B01GN4 (Water)	7013-13
B01CG9 (Soil)	7001-12	B01GN6 (Water)	7013-14
B01CH0 (Soil)	7001-13	B01RK8 (Soil)	7013-15
B01CG2 (Soil)	7001-14	B01RK9 (Soil)	7013-16
B01CG3 (Soil)	7001-15	B01RL7 (Water)	7013-17
B01CF9 (Soil)	7001-16	B01RL8 (Water)	7013-18
B01CG0 (Soil)	7001-17	B01CD4 (Soil)	7013-34

2. The analyses reported are gross alpha, gross beta, ^{90}Sr, isotopic U, and gamma scan for the following soil samples:

   9580-3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, and 15
   7001-1, 2, 3, 4, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, and 17
   7008-1, 2, 3, 4, 5, 6, 9, 10, and 13
   7013-1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 15, 16, 17, 18, and 34

Also reported are gross alpha, gross beta, ^{3}H, ^{90}Sr, isotopic U, and gamma scan for the following water samples:

9579-17, 18, 19, 20, and 21
9580-1 and 2
7001-5 and 6
7008-7, 8, 11, and 12
7013-13, 14, 17, and 18

3. Results are reported pCi/gram dry material for soil and pCi/L for water with 2 σ errors.

4. The QC samples consisting of a spike, a lab control sample, and a replicate were processed with this batch as shown on Table 1.

TABLE 1

Preparation Batch Samples Processed	Data Package
9580-1 and 2	- WATER
9580-3,4,5,6,7,8,9,10,11,12,13,14, and 15	- SOIL
7001-5 and 6	- WATER
7001-1,2,3,4,7,8,9,10,11,12,13,14,15,16, and 17	- SOIL
7008-8,11, and 12	- WATER
7008-1,2,3,4,5,6,9,10, and 13	- SOIL
7013-13,14,17, and 18	- WATER
7013-1,2,3,4,5,6,7,8,9,10,11,12,15,16, and 34	- SOIL

QC SAMPLES PROCESSED:

Sample I.D.	Type	Analyses	Reported with Data Package
9579-40 (QC 6715)	Spike**	Gross α,β	X
9579-46 (QC 6721)	LCS**	Gross α,β	X
9579-42 (QC 6717)	Spike**	^{3}H	X
9579-48 (QC 6723)	LCS**	^{3}H	X
9579-54 (QC 6729)	Replicate**	^{3}H	X
9579-38 (QC 6713)	Spike**	^{90}Sr	X
9759-39 (QC 6714)	Spike**	^{90}Sr	X
9579-44 (QC 6719)	LCS**	^{90}Sr	X
9579-45 (QC 6720)	LCS**	^{90}Sr	X
9579-37 (QC 6712)	Spike**	Isotopic Uranium	X
9579-43 (QC 6718)	LCS**	Isotopic Uranium	X
9579-49 (QC 6724)	Replicate**	Isotopic Uranium	X
9579-41 (QC 6716)	Spike**	Gamma Scan	X
9579-47 (QC 6722)	LCS**	Gamma Scan	X
9579-53 (QC 6728)	Replicate**	Gamma Scan	X
9580-19 (QC 6723)	Spike*	Gross α,β	X
9580-24 (QC 6738)	LCS*	Gross α,β	X
9580-29 (QC 6743)	Replicate*	Gross α,β	X
9580-17 (QC 6731)	Spike*	^{90}Sr	X
9580-18 (QC 6732)	Spike*	^{90}Sr	X
9580-22 (QC 6736)	LCS*	^{90}Sr	X
9580-23 (QC 6737)	LCS*	^{90}Sr	X
9580-27 (QC 6741)	Replicate*	^{90}Sr	X
9580-28 (QC 6742)	Replicate*	^{90}Sr	X
9580-16 (QC 6730)	Spike*	Isotopic Uranium	X
9580-21 (QC 6735)	LCS*	Isotopic Uranium	X
9580-26 (QC 6740)	Replicate*	Isotopic Uranium	X
9580-31 (QC 6978)	Spike*	Isotopic Uranium	X
9580-32 (QC 6979)	LCS*	Isotopic Uranium	X
9580-5A1	Replicate*	Isotopic Uranium	X
9580-6A1	Replicate*	Isotopic Uranium	X
9580-20 (QC 6734)	Spike*	Gamma Scan	X
9580-25 (QC 6739)	LCS*	Gamma Scan	X
9580-30 (QC 6745)	Replicate*	Gamma Scan	X
7001-21 (QC 6749)	Spike*	Gross α,β	NR
7001-26 (QC 6754)	LCS*	Gross α,β	NR
7001-31 (QC 6759)	Replicate*	Gross α,β	X
7001-19 (QC 6747)	Spike*	^{90}Sr	X
7001-20 (QC 6748)	Spike*	^{90}Sr	X
7001-24 (QC 6752)	LSC*	^{90}Sr	X

QC SAMPLES PROCESSED: (cont'd)

Sample I.D.	Type	Analyses	Reported with Data Package
7001-25 (QC 6753)	LSC*	^{90}Sr	X
7001-29 (QC 6757)	Replicate*	^{90}Sr	X
7001-30 (QC 6758)	Replicate*	^{90}Sr	X
7001-18 (QC 6746)	Spike*	Isotopic Uranium	X
7001-23 (QC 6751)	LCS*	Isotopic Uranium	X
7001-28 (QC 6756)	Replicate*	Isotopic Uranium	X
7001-22 (QC 6750)	Spike*	Gamma Scan	X
7001-27 (QC 6755)	LCS*	Gamma Scan	X
7001-32 (QC 6760)	Replicate*	Gamma Scan	X
7013-22 (QC 6764)	Spike*	Gross α,β	X
7013-27 (QC 6769)	LCS*	Gross α,β	X
7013-32 (QC 6774)	Replicate*	Gross α,β	X
7013-20 (QC 6762)	Spike*	^{90}Sr	X
7013-21 (QC 6763)	Spike*	^{90}Sr	X
7013-25 (QC 6767)	LCS*	^{90}Sr	X
7013-26 (QC 6768)	LCS*	^{90}Sr	X
7013-30 (QC 6772)	Replicate*	^{90}Sr	X
7013-31 (QC 6773)	Replicate*	^{90}Sr	X
7013-19 QC 6761)	Spike*	Isotopic Uranium	X
7013-24 QC 6766)	LCS*	Isotopic Uranium	X
7013-29 QC 6771)	Replicate*	Isotopic Uranium	X
7013-23 (QC 6765)	Spike*	Gamma Scan	X
7013-28 (QC 6770)	LCS*	Gamma Scan	X
7013-33 (QC 6775)	Replicate*	Gamma Scan	X

* Denotes Soil Sample
** Denotes Water Sample
NR Not Reported

5. Sample Batch and QCs: The following sample batch and QCs were processed:

(a) Soil samples 9580-3 through 14 and 7008-1 through 4 were processed with QCs 9580-16, 17, 18, 19, and 20 (spike), 9580-21, 22, 23, 24, and 25 (LCS), and 9580-26, 27, 28, 29, and 30 (replicate). Strontium-90 analyses were processed in two batches with ^{90}Sr QCs with each batch.

See 2 page earlier also

(b) Soil samples 7001-1 through 3 and 7 through 17, 7008-5 and 6 were processed with QCs 7001-18, 19, 20, 21, and 22 (spike), 7001-23, 24, 25, 26, and 27 (LCS), and 7001-28, 29, 30, 31, and 32 (replicate). Again, ^{90}Sr analyses were processed in two batches with ^{90}Sr QCs with each batch.

(c) Soil samples 7013-1 through 12 and 15 and 16 and 7008-9,10, and 13 were processed with QCs 7013-19, 20, 21, 22, and 23 (spike), 7013-24, 25, 26, 27, and 28 (LCS), and 7013-29, 30, 31, 32, and 33 (replicate). Strontium-90 analyses were processed in two batches with ^{90}Sr QCs with each batch.

(d) Soil Samples 9579-17 through 20 and 9580-1 through 2, 7008-7, 8, 11, and 12, 7001-5 and 6, and 7013-13, 14, 17, and 18 were processed with QCs 9579-37, 38, 39, 40, 41, and 42 (spike), 9579-43, 44, 45, 46, 47, and 48 (LCS), and 9579-49, 50, 51, 52, 53, and 54 (replicate). Again, ^{90}Sr analyses were processed in two batches with ^{90}Sr QCs with each batch.

6. Analyses, reanalyses, and reworks, etc.

Gross Alpha and Gross Beta Analyses (Soil and Water):

The found/added ratio for the gross alpha spike processed with soil and water were found to be low. We believe the low recovery ratio is due to the fact that no salts have been added to these samples; since the spikes were prepared from D.I. water only to approximate actual water samples. Two possible problems could result:

1. Potentially a significant amount of activity may remain in the beaker during transfer to the planchet.

2. The deposition on to the planchet is likely to be less uniform and, therefore, the efficiency is less well known.

We are in the process of testing our assumptions by processing spike samples both with and without added salts. These results should be available soon. If this is the cause, there is no effect on the validity of sample analyses, given that the typical residue weight ranged from 50 - 200 mg.

The results of the laboratory control sample and the replicate for gross alpha and beta were satisfactory.

Strontium Analyses (Soil): The average yield for 54 analyses was 63%. The lowest yield was 25% and the highest was 88%. No abnormalities were encountered. The results of the spikes, the Laboratory Control Samples, and the replicates were satisfactory.

Strontium Analyses (Water): The average yield for 16 analyses was 72%. The lowest yield was 57% and the highest was 88%. No abnormalities were encountered. The results of the spike, the Laboratory Control Sample, and the replicate were satisfactory.

Uranium Analyses (Soil): The average yield for 54 analyses was 60%. The lowest yield was 5% and the highest was 91%. The initial processing batch of isotopic uranium analysis consisted of soil samples 9580-3 through 14 and 7008-1 through 4. The associated quality control samples were 9580-16 through 20 (spike), 9580-21 through 25 (LCS), and 9580-26 through 30 (replicate). Aliquot 9580-3 had approximately 1500 dpm uranium. This level of activity did contaminate spike numbers QC 6730 and 6978 and LCS numbers (QC 6735 and 6979). There was also the possibility that other samples may have been contaminated. Therefore, sample numbers 9580-3, 5 through 10, and 14 were reanalyzed as another batch with QC sample numbers 9580-31 (spike), 9580-32 (LCS), and 9580-33 (replicate) The results from sample numbers 9580-1,3,4,11,12, and 13 were evaluated and determined to be valid either because the indicated contamination level was very low compared to the sample activity, or the sample results were at the MDA level.

The second processing batch showed a contaminated spike (9580-31) and LCS again despite low specific activity of all the aliquots. This indicated generalized lab contamination. This event occurred at approximately the same time as a contamination problem was discovered in our total uranium processing batch (sample numbers B01579 and B01591). See correspondence to Mr. Karl Pool, dated 20 March 1992.

We believe that the Corrective Action taken for that problem also corrected this. The time lag is due to different rates at which the radiometrics component of our analysis is completed

We examined all blanks run for that process during this time frame. Many of these are in process and have not yet been finalized. The following table summarizes these results.

TABLE 1: BLANKS

Sample I.D.	Date Processed	Activity ^{238}U dvm/aliquot
9579-27	2/15/92	0.006 ± 200%
9579-43	2/15/92	0.067 ± 40%
9580-21	2/20/92	3.5 ± 5%
7001-23	2/22/92	0.096 ± 43%
7013-24	2/29/92	0.073 ± 30%
9579-55	3/09/92	0.27 ± 27%
7015-7	3/13/92	0.076 ± 50%
9580-32	3/16/92	1.8 ± 8%
9540-10	3/17/92	0 ± 200%
7016-15	3/31/92	0.14 ± 33%

Based on these blank results, we believe that the contamination problem is under control. Sample numbers 9580-7, 9, 10, 14, and 15 were reanalyzed a second time with a new set of QCs (7196 and 7197) and the results are given in Table 2. Also given in Table 2 are the original sample results. All the uranium results are valid and comparable to each other. We will continue to monitor both the glassware and cleaning procedures and, also, our internal QC program to verify this.

TABLE 2: COMPARISON OF THE ISOTOPIC URANIUM RESULTS

	No. 9580-7A1 Reanalysis		No. 9580-7 Original	
^{234}U	(9 ± 1)	E-01	(9 ± 1)	E-01
^{235}U	(6 ± 4)	E-02	(5 ± 3)	E-02
^{238}U	(4 ± 1)	E-01	(9 ± 1)	E-01
	No. 9580-8A1 Reanalysis		**No. 9580-8 Original**	
^{234}U	(9 ± 1)	E-01	(8 ± 1)	E-01
^{235}U	(7 ± 4)	E-02	(4 ± 3)	E-02
^{238}U	(1.1 ± 0.1)	E+00	(8 ± 1)	E-01
	No. 9580-9A3 Reanalysis		**No. 9580-9 Original**	
^{234}U	(7 ± 1)	E-01	(5 ± 1)	E-01
^{235}U	(4 ± 3)	E-02	(5 ± 3)	E-02
^{238}U	(6 ± 1)	E-01	(5 ± 1)	E-01
	No. 9580-10A2 Reanalysis		**No. 9580-10 Original**	
^{234}U	(6 ± 1)	E-01	(7 ± 1)	E-01
^{235}U	(4 ± 4)	E-02	(4 ± 3)	E-02
^{238}U	(7 ± 1)	E-01	(8 ± 1)	E-01
	No. 9580-14A3 Reanalysis		**No. 9580-14A1 Original**	
^{234}U	(10.3 ± 0.9)	E+01	(8.6 ± 0.7)	E+00
^{235}U	(9 ± 2)	E-01	(7 ± 1)	E-01
^{238}U	(8.4 ± 0.7)	E+00	(7.4 ± 0.5)	E+00
	No. 9580-15A2 Reanalysis		**No. 9580-15 Original**	
^{234}U	(6.5 ± 0.6)	E+01	(5.8 ± 0.4)	E+00
^{235}U	(6 ± 1)	E-01	(5 ± 1)	E-01
^{238}U	(5.7 ± 0.5)	E+00	(5.6 ± 0.4)	E+00

Uranium Analyses (Water): The average yield for 16 analyses was 62%. The lowest yield was 40% and the highest was 75%. No abnormalities were encountered. The results of the spike, the Laboratory Control Sample, and the replicate were satisfactory.

Gamma Scan Analyses (Soil and Water): The spike sample processed with soil and water samples had only ^{137}Cs activity and the found/added ratio of the spike look good. The results of the spike, the laboratory control sample, and the replicate were satisfactory. One LCS sample showed a small positive activity of ^{228}Th which is small on a per gram basis and should not affect the sample results.

Tritium Analyses: The results of the spike, the laboratory control sample, and the replicate were satisfactory. No abnormalities were encountered.

SECTION 3: QC SUMMARY

QUALITY CONTROL SUMMARY

Attachment 2, 3, and 4 gives the results of the QC samples. The recovery ratios were determined by the QC Officer based upon the final data obtained for each. The laboratory control samples were calculated with an aliquot of 1.00 and, therefore, the presented data cannot be compared directly with the sample data. To compare them directly, the laboratory control sample data would need to be divided by sample aliquots.

The found/added ratio for the gross alpha and gross beta spikes processed with soil and water were low. We believe the low recovery ratios were due to the fact that no salts have been added to these samples. We are in the process of testing our assumptions. We believe that low found/added ratios for gross alpha and gross beta for spikes have no effect on the validity of sample analyses given that the typical residue weight ranged from 50 - 200 mg.

The results of the laboratory control sample and the replicate for gross alpha and gross beta were satisfactory. The high uranium concentration of one of the samples in the processing batch, did contaminate the QC samples, therefore the samples in the batch were reanalyzed as another batch with separate QC's. The results from the samples were evaluated and determined to be valid either because the indicated contamination level was very low compared to the sample activity, or the sample results were at the MDA level. based on the blank results processed during the time frame, we believe that the contamination problem is under control. We will continue to monitor both the glassware cleaning procedures and our internal QC program.

The results of the spike, the laboratory control sample, and the replicate for ^{90}Sr, isotopic U, and gamma scan were satisfactory both for soil and water. The tritium results were also satisfactory.

D. P. Kharkar

Dinkar P. Kharkar, Ph.D.
TMA/Norcal Program Manager

TMA/Norcal Group No.	Nuclide	pCi/Sample ± Error 2 σ Found	Added	Recovery Ratio Found/Added ± 2 σ
Spikes for Soil:				
9580-19				
QC-6733	Gross Alpha	7.6 ± 0.7	19.8 ± 0.8	0.38 ± 0.04
	Gross Beta	13.5 ± 0.9	16.4 ± 0.7	0.83 ± 0.06
9580-17				
QC-6731	^{90}Sr	4.5 ± 0.3	4.3 ± 0.2	1.03 ± 0.09
9580-18				
QC-6732	^{90}Sr	4.1 ± 0.7	4.3 ± 0.2	0.96 ± 0.16
9580-16				
QC-6730	^{234}U	7.00 ± 0.50	4.34 ± 0.17	1.61 ± 0.13
	^{235}U	0.54 ± 0.10	0.19 ± 0.02	2.73 ± 0.55
	^{238}U	6.14 ± 0.45	4.34 ± 0.17	1.41 ± 0.11
9580-31				
QC-6978	^{234}U	6.12 ± 0.51	4.78 ± 0.19	1.28 ± 0.12
	^{235}U	0.34 ± 0.09	0.22 ± 0.02	1.54 ± 0.42
	^{238}U	6.08 ± 0.50	4.78 ± 0.19	1.27 ± 0.12
9580-36				
QC-7196	^{234}U	5.02 ± 0.51	5.21 ± 0.21	0.96 ± 0.11
	^{235}U	0.23 ± 0.10	0.24 ± 0.02	0.95 ± 0.39
	^{238}U	5.27 ± 0.53	5.21 ± 0.21	1.01 ± 0.11
9580-20				
QC-6734	Gamma Scan:			
	^{137}Cs	87 ± 9	84 ± 3	1.04 ± 0.11
7001-21				
QC-6749	Gross Alpha	NR	NR	NR
	Gross Beta	NR	NR	NR
7001-19				
QC-6747	^{90}Sr	4.6 ± 0.5	4.3 ± 0.2	1.07 ± 0.12
7001-20				
QC-6748	^{90}Sr	4.1 ± 0.3	4.3 ± 0.2	0.95 ± 0.09
7001-18				
QC-6746	^{234}U	4.47 ± 0.35	4.34 ± 0.17	1.03 ± 0.09
	^{235}U	0.23 ± 0.07	0.20 ± 0.02	1.17 ± 0.36
	^{238}U	4.53 ± 0.36	4.34 ± 0.17	1.04 ± 0.09
7001-22				
QC-6750	Gamma Scan:			
	^{137}Cs	64 ± 8	63 ± 3	1.01 ± 0.12

OK

OK

NR = Not Reported

ATTACHMENT 2 QUALITY CONTROL SAMPLE RESULTS, SPIKES AND BLANKS (cont'd)

TMA/Norcal Group No.	Nuclide	pCi/Sample ± Error 2 σ Found	Added	Recovery Ratio Found/Added ± 2 σ
Spikes for Soil:				
7013-22				
QC-6764	Gross Alpha	13.5 ± 1.0	19.8 ± 0.8	0.68 ± 0.05
	Gross Beta	11.3 ± 0.8	16.4 ± 0.7	0.69 ± 0.06
7013-20				
QC-6762	^{90}Sr	4.5 ± 0.5	4.3 ± 0.2	1.04 ± 0.14
7013-21				
QC-6763	^{90}Sr	4.1 ± 0.2	4.3 ± 0.2	0.96 ± 0.07
7013-19				
QC-6761	^{234}U	4.2 ± 0.3	4.3 ± 0.2	0.97 ± 0.08
	^{235}U	0.20 ± 0.05	0.20 ± 0.02	1.00 ± 0.26
	^{238}U	4.1 ± 0.3	4.3 ± 0.2	0.95 ± 0.08
7013-23				
QC-6765	Gamma Scan:			
	^{137}Cs	83 ± 8	84 ± 3	0.98 ± 0.11
Spikes for Water:				
9579-40				
QC-6715	Gross Alpha	4.7 ± 0.6	19.8 ± 0.8	0.24 ± 0.03
	Gross Beta	11.1 ± 0.8	16.4 ± 0.7	0.68 ± 0.05
9579-38				
QC-6713	^{90}Sr	4.3 ± 0.3	4.3 ± 0.2	1.01 ± 0.08
9579-39				
QC-6714	^{90}Sr	3.8 ± 0.8	4.3 ± 0.2	0.88 ± 0.18
9579-42				
QC-6717	^{3}H	76 ± 5	82 ± 3	0.93 ± 0.07
9579-37				
QC-6712	^{234}U	4.14 ± 0.36	4.34 ± 0.17	0.95 ± 0.09 OK
	^{235}U	0.24 ± 0.07	0.20 ± 0.02	1.21 ± 0.36
	^{238}U	4.11 ± 0.36	4.34 ± 0.17	0.95 ± 0.09 N/A
9579-41				
QC-6716	Gamma Scan:			
	^{137}Cs	89 ± 9	84 ± 3	1.06 ± 0.12

ATTACHMENT 3 QUALITY CONTROL SAMPLE RESULTS, LABORATORY CONTROL SAMPLES

TMA/Norcal Group No.	Nuclide	pCi/Sample ± Error 2 σ Found	Added	Recovery Ratio Found/Added ± 2 σ
Laboratory Control Samples (Soil)				
9580-24				
QC-6738	Gross Alpha	-0.03 ± 0.01	0	Satisfactory
	Gross Beta	0.7 ± 0.4	0	Satisfactory
9580-22				
QC-6736	^{90}Sr	0.09 ± 0.8	0	Satisfactory
9580-23				
QC-6737	^{99}Sr	-0.2 ± 1	0	Satisfactory
9580-21				
QC-6735	^{234}U	1.99 ± 0.2	0	Positive Value (1)
	^{235}U	0.24 ± 0.07	0	Positive Value (1)
	^{238}U	1.56 ± 0.2	0	Positive Value (1)
9580-32				
QC-6979	^{234}U	0.56 ± 0.11	0	Positive Value (1)
	^{235}U	0.045 ± 0.03	0	Positive Value (1)
	^{238}U	0.80 ± 0.13	0	Positive Value (1)
9580-37				
QC-7197	^{234}U	0.04 ± 0.05	0	Satisfactory
	^{235}U	0.007 ± 0.1	0	Satisfactory
	^{238}U	0.04 ± 0.03	0	Satisfactory
9580-25				
QC-6739	Gamma Scan:			
	^{40}K	<5.439 E+01	0	Satisfactory
	^{51}Cr	<3.378 E+01	0	Satisfactory
	^{60}Co	<7.663 E+00	0	Satisfactory
	^{65}Zn	<1.264 E+01	0	Satisfactory
	^{134}Cs	<6.303 E+00	0	Satisfactory
	^{137}Cs	<6.245 E+00	0	Satisfactory
	^{226}Ra	<1.206 E+01	0	Satisfactory
	^{228}Th	<1.007 E+01	0	Satisfactory
	^{232}Th	<2.229 E+01	0	Satisfactory
7001-26				
QC-6754	Gross Alpha	NR	NR	NR
	Gross Beta	NR	NR	NR
7001-24				
QC-6752	^{90}Sr	-0.1 ± 0.3	0	Satisfactory
7001-25				
QC-6753	^{90}Sr	0 ± 0.4	0	Satisfactory
7001-23				
QC-6751	^{234}U	0.1 ± 0.1	0	Satisfactory
	^{235}U	-0.007 ± 0.02	0	Satisfactory
	^{238}U	0.04 ± 0.04	0	Satisfactory

ok

ok

ATTACHMENT 3 QUALITY CONTROL SAMPLE RESULTS, LABORATORY CONTROL SAMPLES (cont'd)

TMA/Norcal Group No.	Nuclide	pCi/Sample ± Error 2 σ Found		Added	Recovery Ratio Found/Added ± 2 σ
Laboratory Control Samples (Soil)					
7001-27					
QC-6755	Gamma Scan:				
	^{40}K	<7.420	E+01	0	Satisfactory
	^{51}Cr	<3.774	E+01	0	Satisfactory
	^{60}Co	<5.332	E+00	0	Satisfactory
	^{65}Zn	<8.914	E+00	0	Satisfactory
	^{134}Cs	<5.290	E+00	0	Satisfactory
	^{137}Cs	<5.799	E+00	0	Satisfactory
	^{226}Ra	<1.032	E+01	0	Satisfactory
	^{228}Th	<1.824	E+01	0	Satisfactory
	^{232}Th	<2.027	E+01	0	Satisfactory
7013-27					
QC-6769	Gross Alpha	0.12 ± 0.18		0	Satisfactory
	Gross Beta	0.08 ± 0.3		0	Satisfactory
7013-25					
QC-6767	^{90}Sr	0.08 ± 0.2		0	Satisfactory
7013-26					
QC-6768	^{90}Sr	-0.02 ± 0.5		0	Satisfactory
7013-24					
QC-6766	^{234}U	0.03 ± 0.03		0	Satisfactory
	^{235}U	0 ± 0.008		0	Satisfactory
	^{238}U	0.03 ± 0.02		0	Satisfactory
7013-28					
QC-6770	Gamma Scan:				
	^{40}K	<6.065	E+01	0	Satisfactory
	^{51}Cr	<4.299	E+01	0	Satisfactory
	^{60}Co	<9.421	E+00	0	Satisfactory
	^{65}Zn	<1.402	E+01	0	Satisfactory
	^{134}Cs	<6.358	E+00	0	Satisfactory
	^{137}Cs	<6.376	E+00	0	Satisfactory
	^{226}Ra	<1.099	E+01	0	Satisfactory
	^{228}Th	(8.018 ± 7.184)	E+00	0	Positive Value (1)
	^{232}Th	<2.565	E+01	0	Satisfactory
Laboratory Control Samples (Water)					
9579-46					
QC-6721	Gross Alpha	0.06 ± 0.2		0	Satisfactory
	Gross Beta	0.4 ± 0.4		0	Satisfactory
9579-48					
QC-6723	3H	0.2 ± 2.4		0	Satisfactory
9579-44					
QC-6719	^{90}Sr	0.07 ± 0.2		0	Satisfactory
9579-45					
QC-6720	^{90}Sr	0 ± 2		0	Satisfactory

ATTACHMENT 3 QUALITY CONTROL SAMPLE RESULTS, LABORATORY CONTROL SAMPLES (cont'd)

TMA/Norcal Group No.	Nuclide	pCi/Sample ± Error 2 σ Found		Added	Recovery Ratio Found/Added ± 2 σ
7579-43					
QC-6718	^{234}U	0.04 ± 0.03		0	Satisfactory
	^{235}U	0 ± 0.007		0	Satisfactory
	^{238}U	0.03 ± 0.02		0	Satisfactory
9579-47					
QC-6722	Gamma Scan:				
	^{40}K	<7.473	E+01	0	Satisfactory
	^{51}Cr	<3.859	E+01	0	Satisfactory
	^{60}Co	<7.918	E+00	0	Satisfactory
	^{65}Zn	<1.147	E+01	0	Satisfactory
	^{134}Cs	<6.221	E+00	0	Satisfactory
	^{137}Cs	<6.118	E+00	0	Satisfactory
	^{226}Ra	<1.070	E+01	0	Satisfactory
	^{228}Th	<9.906	E+00	0	Satisfactory
	^{232}Th	<2.476	E+01	0	Satisfactory

(1) Contamination suspected.

ATTACHMENT 4 QUALITY CONTROL RESULTS, REPLICATES

TMA

Nuclide	Results				
	pCi/g soil ± error 2 σ				
	No. 9580-29 Replicate		No. 9580-3 Original		
QC 6743					
Gross Alpha	1001 ± 42		942 ± 38		
Gross Beta	1311 ± 18		1069 ± 14		
	No. 9580-27 Replicate		No. 9580-3 Original		
QC 6741					
^{90}Sr	1.27 ± 0.42		2.1 ± 0.7		
	No. 9580-28 Replicate		No. 9580-4 Original		
QC 6742					
^{90}Sr	0.5 ± 0.6		0.05 ± 0.5		
	No. 9580-5A1 Replicate		No. 9580-5 Original		RPD
QC XXXX					
^{234}U	(3.9 ± 0.6)	E+01	(4.2 ± 0.2)	E+01	7.41
^{235}U	(4.8 ± 1.0)	E+00	(4.4 ± 0.3)	E+00	8.70
^{238}U	(3.4 ± 0.5)	E+01	(3.4 ± 0.2)	E+01	0
	No. 9580-6A1 Replicate		No. 9580-6 Original		RPD
QC XXXX					
^{234}U	(1.7 ± 0.2)	E+00	(1.3 ± 0.1)	E+00	26.67
^{235}U	(1 ± 0.5)	E-01	(1 ± 0.4)	E-01	0
^{238}U	(2.1 ± 0.2)	E+00	(1.0 ± 0.1)	E+00	70.97
	No. 9580-30 Replicate		No. 9580-3 Original		RPD
QC-6745					
Gamma Scan:					
^{40}K	(5.626 ± 2.154)	E+00	(6.553 ± 2.236)	E+00	
^{51}Cr	<2.056	E+01	<2.051	E+01	
^{60}Co	(4.156 ± 0.469)	E+00	(3.518 ± 0.452)	E+00	16.63
^{65}Zn	<8.239	E-01	<7.027	E-01	
^{134}Cs	<3.844	E-01	<3.933	E-01	
^{137}Cs	(3.204 ± 2.345)	E-01	(3.752 ± 2.343)	E-01	15.76
^{226}Ra	(1.065 ± 0.459)	E+00	(9.309 ± 4.263)	E-01	13.44
^{228}Th	(3.106 ± 0.424)	E+00	(3.193 ± 0.317)	E+00	2.76
^{232}Th	(3.160 ± 1.397)	E+00	(3.546 ± 1.083)	E+00	
^{235}U	(2.315 ± 0.190)	E+01	(2.046 ± 0.196)	E+01	
^{238}U	(4.630 ± 0.581)	E+02	(4.307 ± 0.485)	E+02	

OK

OK

ATTACHMENT 4 QUALITY CONTROL RESULTS, REPLICATES (cont'd)

Nuclide	Results				
	pCi/g soil ± error 2 σ				
	No. 7001-31 Replicate		No. 7001-1 Original		
QC 6759					
Gross Alpha	4 ± 3		4 ± 4		
Gross Beta	21 ± 2		21 ± 3		
	No. 7001-29 Replicate		No. 7001-1 Original		
QC 6757					
^{90}Sr	0.02 ± 0.2		0.4 ± 0.1		
	No. 7001-30 Replicate		No. 7001-2 Original		
QC 6758					
^{90}Sr	-0.0005 ± 0.5		0.2 ± 0.5		
	No. 7001-28 Replicate		No. 7001-1 Original		RPD
QC 6756					
^{234}U	2.6 ± 0.3		3.1 ± 0.3		17.54
^{235}U	0.2 ± 0.1		0.1 ± 0.1		66.67
^{238}U	2.4 ± 0.3		2.9 ± 0.3		18.87
	No. 7001-32 Replicate		No. 7001-1 Original		
QC 6760					
Gamma Scan:					RPD
^{40}K	(1.187 ± 0.182)	E+01	(1.309 ± 0.196)	E+01	
^{51}Cr	<3.493	E+00	<3.244	E+00	
^{60}Co	<9.235	E-02	<7.700	E-02	NA
^{65}Zn	<2.977	E-01	<2.897	E-01	
^{134}Cs	<8.523	E-02	<1.016	E-01	
^{137}Cs	<1.206	E-01	<1.130	E-01	NA
^{226}Ra	(4.246 ± 1.973)	E-01	(2.858 ± 1.803)	E-01	39.1
^{228}Th	(5.558 ± 1.085)	E-01	(5.138 ± 1.138)	E-01	7.85
^{232}Th	(8.343 ± 4.034)	E-01	(7.108 ± 4.033)	E-01	

ATTACHMENT 4 QUALITY CONTROL RESULTS, REPLICATES (cont'd.)

Nuclide	Results				
	pCi/g soil ± error 2 σ				
	No. 7013-32 Replicate		No. 7013-1 Original		
QC 6774					
Gross Alpha	22 ± 7		17 ± 6		
Gross Beta	37 ± 3		44 ± 3		
	No. 7013-30 Replicate		No. 7013-1 Original		
QC 6772					
^{90}Sr	-0.004 ± 0.5		-0.1 ± 0.6		
	No. 7013-31 Replicate		No. 7013-2 Original		
QC 6773					
^{90}Sr	0.02 ± 0.3		0.4 ± 0.2		
	No. 7013-29 Replicate		No. 7013-1 Original		RPD
QC 6771					
^{234}U	(1.9 ± 0.1)	E+01	(2.1 ± 0.2)	E+01	10
^{235}U	(9 ± 1)	E-01	(1.1 ± 0.2)	E+00	20
^{238}U	(1.9 ± 0.1)	E+01	(2.1 ± 0.2)	E+01	10
	No. 7013-33 Replicate		No. 7013-1 Original		
QC 6775					
Gamma Scan:					RPD
^{40}K	(1.303 ± 0.210)	E+01	(1.151 ± 0.207)	E+01	
^{51}Cr	<3.189	E+00	<3.225	E+00	
^{60}Co	<1.361	E-01	<1.312	E-01	<
^{65}Zn	<3.002	E-01	<3.456	E-01	
^{134}Cs	<1.400	E-01	<1.460	E-01	
^{137}Cs	<1.204	E-01	<1.045	E-01	<
^{226}Ra	(5.544 ± 2.013)	E-01	(5.073 ± 1.744)	E-01	8.87
^{228}Th	(7.186 ± 1.988)	E-01	(6.631 ± 1.297)	E-01	8.03
^{232}Th	(6.573 ± 3.780)	E-01	(5.457 ± 1.297)	E-01	
^{235}U	(8.917 ± 4.251)	E-01			
^{238}U	(2.260 ± 1.191)	E+01			

ATTACHMENT 4 QUALITY CONTROL RESULTS, REPLICATES (cont'd)

Nuclide	Results				
	pCi/L water ± error 2 σ				
	No. 9579-54 Replicate		No. 9579-17 Original		
QC 6729					
^{3}H	-20 ± 121		244 ± 133		
	No. 9579-49 Replicate		No. 9579-17 Original		RPD
QC 6724					
^{234}U	0.07 ± 0.04		-0.01 ± 0.02		266.67
^{235}U	0 ± 0.02		0.004 ± 0.001		200
^{238}U	0.02 ± 0.02		0.006 ± 0.01		107.69
	No. 9579-53 Replicate		No. 9579-18 Original		
QC 6728					
Gamma Scan:					RPD
^{40}K	<2.457	E+02	<1.428	E+02	
^{51}Cr	<1.083	E+03	<9.335	E+02	
^{60}Co	<1.659	E+01	<1.505	E+01	<
^{65}Zn	<4.163	E+01	<2.508	E+01	
^{134}Cs	<1.415	E+01	<1.060	E+01	
^{137}Cs	<1.542	E+01	<9.542	E+00	<
^{226}Ra	<2.517	E+01	<2.091	E+01	<
^{228}Th	<3.054	E+01	<2.442	E+01	<
^{232}Th	<6.619	E+01	<6.014	E+01	

SECTION 4 Chains-of-Custody Copies

Westinghouse Hanford Company 9613501.2319

CHAIN OF CUSTODY

Custody Form Initiator: Jonathan G. Lucas

Company Contact: Jonathan G. Lucas — Telephone: (509) 376-2789

Project Designation/Sampling Locations: 300-FF-1 Test Pit Investigation - North Process Pond Pit #1 — Collection Date: 12-18-91

Ice Chest No.: RM #87 — Field Logbook No.: EFL-2000

Bill of Lading/Airbill No.: 1 — ~~Offsite Property~~ RSR No.: 13680

Method of Shipment: ~~Emery~~ Fed. Ex

Shipped to: TMA/NORCAL Richmond, CA

Possible Sample Hazards/Remarks:

Sample Identification

B00HB1
B00HB3 } Soil (1-250ml G, 1-120ml G, 1-500ml G, 1-500ml P)
B00HB5

☐ Field Transfer of Custody

CHAIN OF POSSESSION (Sign and Print Names)		
Relinquished by: Jonathan G. Lucas Jonathan G. Lucas	Received by: Kermit Blum	Date/Time: 12-13-91 1130
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

A-6000-407 (12/90)

9613501.2320

Westinghouse Hanford Company

SAMPLE ANALYSIS REQUEST

PART I: FIELD SECTION

Collector R. Ross Date Sampled 12-10-91 Time 1053 1110 hours

Company Contact Jonathan G. Lucas Telephone (509) 376-2789

Sample Number	Number and Type of Sample Containers	Type of Sample*	Analysis Requested
B00HB1	1-500ml P, 1-500ml A,	Soil	120ml aG - VOA CLP
B00HB3	1-120ml G, 1-250ml G	↓	250ml aG - ICP/AA Metals and Hg CLP
B00HB5			500ml aG - PCBs, Ammonium CLP, and
			Anions (IC) EPA 300.0
			500ml aP - Gross alpha, beta
			Co-60, Sr-90, Cs-137, U-235,
			U-238

Field Information** —

Special Handling and/or Storage —

Possible Sample Hazards —

PART II: LABORATORY SECTION

Received by Kesinit Blum Title Sample Control Supervisor Date 12-13-91

Analysis Required

*Indicate whether sample is soil, sludge, water, etc.

**Use back of page for additional information relative to sample location.

A-6000-406 (05/90)

Westinghouse Hanford Company 9613301.2321

CHAIN OF CUSTODY

Custody Form Initiator: Jonathan G. Lucas

Company Contact: Jonathan G. Lucas — Telephone: 509-376-2789

Project Designation/Sampling Locations: 300-FF-1 Test Pit Investigation - North Process Pond Pits #2 & #3 — Collection Date: 12-14, 12-16-91

Ice Chest No.: RM #24 — Field Logbook No.: EFL-1002

Bill of Lading/Airbill No.: — ~~Offsite Property No.~~ RSR: 14359

Method of Shipment: Fed. Express

Shipped to: TMA/NORCAL Richmond, CA

Possible Sample Hazards/Remarks: Low Level Radioactivity

Sample Identification

B01GF4
B01GF6
B01GF7 } Soil (1-120mlaG, 1-250mlaG, 1-500P, 1-500mlaG)
B01GG9
B01GH0

Field Transfer of Custody	CHAIN OF POSSESSION	(Sign and Print Names)
Relinquished by: Jonathan G. Lucas	Received by: Kermit Blum	Date/Time: 12-18-91 1130
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

A-6000-407 (12/90)

9613501.2322

Westinghouse Hanford Company

SAMPLE ANALYSIS REQUEST

PART I: FIELD SECTION

Collector R. Ross

Date Sampled 12-14-91, 12-16-91 Time 0902-0918 hours 1109-1112

Company Contact Jonathan G. Lucas

Telephone ( )

Sample Number	Number and Type of Sample Containers	Type of Sample*	Analysis Requested
B01GF4	Soil	Soil	120ml aG - VOA CLP
B01GF6	1-120ml aG, 1-250ml aG,		250ml aG - ICP/AA Metals and Hg CLP
B01GF7	1-500ml aG, 1-500ml P		500ml aG - PCBs, Ammonium, CLP, and
B01GG9			Anions (IC) EPA 300.0
B01GH0			500ml aP - Gross alpha/beta, Co-60,
			Sr-90, Cs-137, U-235/238

Field Information** —

Special Handling and/or Storage —

Possible Sample Hazards Low Level Rad.

PART II: LABORATORY SECTION

Received by Kermit Blum Title Sample Control Supervisor Date 12-18-91

Analysis Required

*Indicate whether sample is soil, sludge, water, etc.

**Use back of page for additional information relative to sample location.

A-6000-406 (05/90)

TMA/Norcal N1-12-165-9580 Additional 300-FF-1 Samples

Isotopic Uranium

Sample #	9580-16		9580-21		9580-26		9580-31	
Cust. I.D. #	QC 6730		QC 6735		QC 6740		QC 6978	
Type	Spike		Blank		Duplicate of 9580-3		Spike	
U232 Tracer Added (DPM)	10.27000		10.27000		10.27000		10.26000	
Sample Size (g or l)	1.00000		1.00000		1.00000		1.00000	
Tracer BKG (CPM)	0.00787		0.00414		0.01408		0.00707	
Tracer Counts	1326.00000		1179.00000		1037.00000		1053.00000	
Counting Time (min)	729.72000		729.72000		720.37000		761.87000	
Detector Efficiency	0.31790		0.25720		0.33510		0.29900	
Reported Yield	0.55410		0.61030		0.41440		0.44820	
Calculated Yield	0.55417	OK	0.61010	OK	0.41420	OK	0.44823	OK
[U234]								
BKG (CPM)	0.00621		0.00580		0.01077		0.00499	
Gross Counts	2020.00000		518.00000		156410.00000		1401.00000	
U235 Counts	14.00000		6.00000		13310.00000		7.00000	
Branch Ratio	1.00000		1.00000		1.00000		1.00000	
Tracer Counts	2.00000		2.00000		2.00000		2.00000	
Reported Results (pCi/g or pCi/l)	7.00400		1.99000		644.40000		6.12300	
Calculated Results (pCi/g or pCi/l)	7.00605	OK	1.98961	OK	644.64028	OK	6.12414	OK
MDA Reported	0.07120		0.05800		2.42000		0.06820	
MDA Calculated	0.07400	OK	0.06409	OK	2.42176	OK	0.07356	OK
Results > MDA?	YES		YES		YES		YES	
[U235]								
BKG (CPM)	0.00166		0.00207		0.00455		0.00166	
Gross Counts	130.00000		54.00000		121007.00000		65.00000	
U235 Counts	0.00000		0.00000		0.00000		0.00000	
Branch Ratio	0.82600		0.82600		0.82600		0.82600	
Tracer Counts	1.00000		1.00000		1.00000		1.00000	
Table Counts	0.00000		0.00000		0.00000		0.00000	
Reported Results (pCi/g or pCi/l)	0.54300		0.24280		659.70000		0.33650	
Calculated Results (pCi/g or pCi/l)	0.54209	OK	0.24522	OK	659.96745	OK	0.33506	OK
MDA Reported	0.01980	OK	0.03140	OK	0.04400	OK	0.02490	OK
MDA Calculated	0.02940		0.03515		0.05254		0.03746	
Results > MDA?	YES		YES		YES		YES	
[U238]								
BKG (CPM)	0.00041		0.00000		0.00248		0.00000	
Gross Counts	1766.00000		402.00000		155150.00000		1385.00000	
U235 Counts	13.00000		5.00000		12100.00000		6.00000	
Branch Ratio	1.00000		1.00000		1.00000		1.00000	
Tracer Counts	1.00000		1.00000		1.00000		1.00000	
Reported Results (pCi/g or pCi/l)	6.13900		1.55700		644.20000		6.07900	
Calculated Results (pCi/g or pCi/l)	6.13789	OK	1.55781	OK	644.44643	OK	6.07914	OK
MDA Reported	0.05890		0.04100		2.31000		0.05040	
MDA Calculated	0.06175	OK	0.04489	OK	2.30848	OK	0.05439	OK
Results > MDA?	YES		YES		YES		YES	

TMA/Norcal N1-12-165-9580 Additional 300-FF-1 Samples

Isotopic Uranium

Sample #	9580-32		9580-36		9580-37	
Cust. I.D. #	QC 6979		QC 7196		QC 7197	
Type	Blank		?		?	
U232 Tracer Added (CPM)	10.26000		10.26000		10.26000	
Sample Size (g or l)	1.00000		1.00000		1.00000	
Tracer BKG (CPM)	0.00707		0.01069		0.01411	
Tracer Counts	1053.00000		749.00000		806.00000	
Counting Time (min)	974.87000		535.55000		535.55000	
Detector Efficiency	0.29780		0.26890		0.36070	
Reported Yield	0.35110		0.50300		0.40270	
Calculated Yield	0.35120	OK	0.50305	OK	0.40286	OK
[U234]						
BKG (CPM)	0.00499		0.00128		0.00684	
Gross Counts	134.00000		812.00000		12.00000	
U235 Counts	1.00000		3.00000		0.00000	
Branch Ratio	1.00000		1.00000		1.00000	
Tracer Counts	2.00000		1.00000		1.00000	
Reported Results (pCi/g or pCi/l)	0.55680		5.01900		0.04053	
Calculated Results (pCi/g or pCi/l)	0.55726	OK	5.01981	OK	0.04247	OK
MDA Reported	0.05040		0.05800		0.05400	
MDA Calculated	0.05775		0.06273	OK	0.05827	OK
Results > MDA?	YES		YES		NO	
[U235]						
BKG (CPM)	0.00166		0.00128		0.00086	
Gross Counts	10.00000		32.00000		2.00000	
U235 Counts	0.00000		0.00000		0.00000	
Branch Ratio	0.82600		0.82600		0.82600	
Tracer Counts	1.00000		1.00000		1.00000	
Table Counts	0.00000		0.00000		0.00000	
Reported Results (pCi/g or pCi/l)	0.03745		0.22590		0.00701	
Calculated Results (pCi/g or pCi/l)	0.03948	OK	0.22820	OK	0.00378	
MDA Reported	0.03530		0.03510		0.03270	OK
MDA Calculated	0.04034	OK	0.04555	OK	0.03948	
Results > MDA?	YES		YES		NO	
[U238]						
BKG (CPM)	0.00000		0.00000		0.00171	
Gross Counts	182.00000		852.00000		9.00000	
U235 Counts	1.00000		3.00000		0.00000	
Branch Ratio	1.00000		1.00000		1.00000	
Tracer Counts	1.00000		1.00000		1.00000	
Reported Results (pCi/g or pCi/l)	0.79550		5.27400		0.04053	
Calculated Results (pCi/g or pCi/l)	0.79523	OK	5.27279	OK	0.04101	OK
MDA Reported	0.02060		0.05020		0.02700	
MDA Calculated	0.02912	OK	0.05796	OK	0.03735	OK
Results > MDA?	YES		YES		YES	

9615501.2325

TMA/Norcal N1-12-165-9580 Additional 300-FF-1 Samples

Gamma Spectroscopy

Sample #	9580-20		9850-25		9580-30	
Cust. I.D. #	QC 6734		QC 6739		QC 6745	
Type	Spike		Blank		Duplicate of 9580-3	
Detector	G-5 MB		G-2 MB		G-3 JR	
Aliquot (g or l)	1.00000		1.00000		113.84000	
Counting Time (min)	475.98000		403.55000		100.67000	
[Cobalt 60; C0-60]						
Background CTS	0.00000		14.00000		***	
Background CPM	0.01700		0.07490		0.02380	
Net CPM	0.04800		0.05800		4.12400	
Branch Fraction	1.00000		1.00000		1.00000	
Efficiency	0.00403		0.00343		0.00408	
Reported Results (pCi/g or pCi/l)	<	*	<	*	4.15600	OK
Calculated Results (pCi/g or pCi/l)	5.36517		7.61695		3.99955	
Reported MDA	5.31700	OK	7.66300	OK	NA	*
Calculated MDA	3.11285		10.08509		0.06949	
Detect/Non Detect	Non Detect	YES	Non Detect	NO	Detect	YES
Results > MDA?	YES	YES	YES	YES	YES	NO
[Cesium 137; Cs-137]						
Background CTS	95.00000		0.00000		130.00000	
Background CPM	0.00000		0.02700		0.03440	
Net CPM	1.20800		0.07900		0.56900	
Branch Fraction	0.85100		0.85100		0.85100	
Efficiency	0.00732		0.00673		0.00831	
Reported Results (pCi/g or pCi/l)	87.32000	OK	<	*	0.32040	OK
Calculated Results (pCi/g or pCi/l)	87.35209		6.21340		0.31837	
Reported MDA	NA	*	6.24500	OK	NA	*
Calculated MDA	6.90026		2.99793		0.29922	
Detect/Non Detect	Detect	YES	Non Detect	YES	Detect	YES
Results > MDA?	YES	NO	YES	YES	YES	NO
[Thorium 228; Th-228]						
Background CTS	337.00000		197.00000		602.00000	
Background CPM	0.23520		0.12710		0.18520	
Net CPM	0.18600		0.17300		7.47500	
Branch Fraction	0.44800		0.44800		0.44800	
Efficiency	0.01866		0.01731		0.02354	
Reported Results (pCi/g or pCi/l)	<	*	<	*	3.10600	*
Calculated Results (pCi/g or pCi/l)	10.02237		10.04889		2.80465	
Reported MDA	10.02000	OK	10.07000	OK	NA	*
Calculated MDA	11.17774		10.56918		0.43269	
Detect/Non Detect	Non Detect	NO	Non Detect	NO	Detect	YES
Results > MDA?	YES	YES	YES	YES	YES	NO
[Radium 226; Ra-226]						
Background CTS	0.00000		0.00000		140.00000	
Background CPM	0.05230		0.04500		0.04900	
Net CPM	0.08100		0.09400		1.18000	
Branch Fraction	0.48400		0.48400		0.48400	
Efficiency	0.00789		0.00729		0.00905	
Reported Results (pCi/g or pCi/l)	<	*	<	*	1.06500	OK
Calculated Results (pCi/g or pCi/l)	9.55454		12.00057		1.06596	
Reported MDA	9.55800	OK	12.06000	OK	NA	*
Calculated MDA	5.76192		6.28228		0.50342	
Detect/Non Detect	Non Detect	YES	Non Detect	YES	Detect	YES
Results > MDA?	YES	YES	YES	YES	YES	NO

*** NOTE: Data cut off in photocopy

ok

9615501.2526

TMA/Norcal N1-12-165-9580 Additional 300-FF-1 Samples

Isotopic Uranium

Sample #	9580-3		9580-4		9580-5		9580-11		9580-13		9580-14		9580-15	
Cust. I.D. #	B00HB1		B00HB3		B00HB5		B01GF4		B01GF7		B01GG9		B01GH0	
Type	Soil		Soil		Soil		Soil		Soil		Soil		Soil	
U232 Tracer Added (DPM)	10.26000		10.27000		10.27000		10.27000		10.26000		10.26000		10.27000	
Sample Size (g or l)	0.01000		1.00000		1.00000		1.00000		1.00000		1.00000		1.00000	
Tracer BKG (CPM)	0.00415		0.00548		0.00414		0.00745		0.00540		0.00416		0.01408	
Tracer Counts	1105.00000		1537.00000		1600.00000		1320.00000		1360.00000		1073.00000		1365.00000	
Counting Time (min)	761.17000		720.87000		720.37000		721.00000		761.17000		761.87000		729.72000	
Detector Efficiency	0.28010		0.27790		0.25890		0.31920		0.27060		0.26160		0.33510	
Reported Yield	0.50360		0.74500		0.84050		0.55650		0.64150		0.52310		0.53980	
Calculated Yield	0.50371	OK	0.74514	OK	0.84027	OK	0.55620	OK	0.64160	OK	0.52318	OK	0.53945	OK
[U234]														
BKG (CPM)	0.00498		0.00380		0.00580		0.00787		0.00125		0.00291		0.01077	
Gross Counts	2642.00000		42608.00000		14617.00000		10193.00000		16232.00000		2014.00000		1734.00000	
U235 Counts	25.00000		76.00000		137.00000		22.00000		57.00000		15.00000		14.00000	
Branch Ratio	1.00000		1.00000		1.00000		1.00000		1.00000		1.00000		1.00000	
Tracer Counts	2.00000		3.00000		3.00000		2.00000		2.00000		2.00000		2.00000	
Reported Results (pCi/g or pCi/l)	1095.00000		128.30000		41.92000		35.75000		55.14000		8.62000		5.83700	
Calculated Results (pCi/g or pCi/l)	1095.25967	OK	128.32712	OK	41.92383	OK	35.76434	OK	55.12328	OK	8.61738	OK	5.83980	OK
MDA Reported	10.50000		0.12500		0.16000		0.08670		0.12100		0.08300		0.07460	
MDA Calculated	10.84830	OK	0.12716	OK	0.16204	OK	0.08928	OK	0.12301	OK	0.08826	OK	0.07768	OK
Results > MDA?	YES		YES		YES		YES		YES		YES		YES	
[U235]														
BKG (CPM)	0.00083		0.00169		0.00207		0.00083		0.00125		0.00083		0.00455	
Gross Counts	227.00000		2209.00000		1247.00000		590.00000		1369.00000		142.00000		128.00000	
U235 Counts	0.00000		0.00000		0.00000		0.00000		0.00000		0.00000		0.00000	
Branch Ratio	0.82600		0.82600		0.82600		0.82600		0.82600		0.82600		0.82600	
Tracer Counts	1.00000		1.00000		1.00000		1.00000		1.00000		0.00000		1.00000	
Table Counts	0.00000		1515.00000		0.00000		385.00000		850.00000		0.00000		0.00000	
Reported Results (pCi/g or pCi/l)	114.30000		2.52600		4.36500		0.86450		2.13400		0.73230		0.51240	
Calculated Results (pCi/g or pCi/l)	114.44269	OK	2.52726	OK	4.36441	OK	0.86654	OK	2.13364	OK	0.73935	OK	0.51131	OK
MDA Reported	2.37000		1.82000		0.01630		1.03000		1.77000		0.02440		0.03340	
MDA Calculated	3.02344	*	0.66325	*	0.02579	*	0.39014	*	0.56138	*	0.01938	*	0.04002	*
Results > MDA?	YES		YES		YES		NO		YES		YES		YES	
[U238]														
BKG (CPM)	0.00042		0.00042		0.00000		0.00041		0.00083		0.00083		0.00248	
Gross Counts	2170.00000		38341.00000		11789.00000		12341.00000		14485.00000		1724.00000		1645.00000	
U235 Counts	23.00000		69.00000		125.00000		20.00000		52.00000		14.00000		12.00000	
Branch Ratio	1.00000		1.00000		1.00000		1.00000		1.00000		1.00000		1.00000	
Tracer Counts	1.00000		1.00000		1.00000		1.00000		1.00000		1.00000		1.00000	
Reported Results (pCi/g or pCi/l)	900.30000		115.50000		33.78000		43.34000		49.13000		7.38000		5.56400	
Calculated Results (pCi/g or pCi/l)	899.90566	OK	115.48555	OK	33.78454	OK	43.35255	OK	49.12191	OK	7.38007	OK	5.56679	OK
MDA Reported	9.38000		0.11700		0.15100		0.07330		0.11600		0.07800		0.05950	
MDA Calculated	9.64121	OK	0.11793	OK	0.15148	OK	0.07563	OK	0.11634	OK	0.07961	OK	0.06120	OK
Results > MDA?	YES		YES		YES		YES		YES		YES		YES	

CRDL 1 pCi/g

considered OK - U

OK

TMA/Norcal N1-12-165-9580 Additional 300-FF-1 Samples

Gamma Spectroscopy

Sample #	9580-3		9580-4		9580-5		9580-11	
Cust. I.D. #	B00HB1		B00HB3		B00HB5		B01GF4	
Type	Soil		Soil		Soil		Soil	
Detector	G-2 JR		G-3 JR		G-5 JR		G-2 JR	
Aliquot (g or l)	129.39000		178.28000		210.33000		176.03999	
Counting Time (min)	102.88000		102.95000		103.00000		100.78000	
[Cobalt 60: Co-60]								
Background CTS	12.00000		21.00000		8.00000		0.00000	
Background CPM	0.07120		0.02380		0.01700		0.07120	
Net CPM	3.15400		0.37300		0.51300		0.55400	
Branch Fraction	1.00000		1.00000		1.00000		1.00000	
Efficiency	0.00324		0.00408		0.00362		0.00324	
Reported Results (pCi/g or pCi/l)	3.51800	OK	0.24000	OK	0.31510	OK	0.45320	OK
Calculated Results (pCi/g or pCi/l)	3.38893		0.23099		0.30350		0.43752	
Reported MDA	NA	*	NA	*	NA	*	NA	*
Calculated MDA	0.21395		0.13574		0.08358		0.09782	
Detect/Non Detect	Detect	YES	Detect	YES	Detect	YES	Detect	YES
Results > MDA?	YES	NO	YES	NO	YES	NO	YES	NO
[Cesium 137: Cs-137]								
Background CTS	114.00000		78.00000		27.00000		41.00000	
Background CPM	0.02700		0.03440		0.00000		0.02700	
Net CPM	0.60500		0.25800		***		0.26200	
Branch Fraction	0.85100		0.85100		0.85100		0.85100	
Efficiency	0.00664		0.00831		***		0.00664	
Reported Results (pCi/g or pCi/l)	0.37520	OK	0.09286	OK	***	ERR	0.11930	OK
Calculated Results (pCi/g or pCi/l)	0.37274		0.09216		ERR		0.11864	
Reported MDA	NA	*	NA	*	NA	ERR	NA	*
Calculated MDA	0.30157		0.14604		ERR		0.13845	
Detect/Non Detect	Detect	YES	Detect	NO	Detect	ERR	Detect	NO
Results > MDA?	YES	NO	NO	YES	ERR	ERR	NO	YES
[Thorium 228: Th-228]								
Background CTS	248.00000		369.00000		60.00000		177.00000	
Background CPM	0.12680		0.18520		0.23520		0.12680	
Net CPM	6.84500		3.05600		2.08200		0.73800	
Branch Fraction	0.44800		0.44800		0.44800		0.44800	
Efficiency	0.01844		0.02354		0.01928		0.01844	
Reported Results (pCi/g or pCi/l)	3.19300	*	0.81060	*	0.57130	*	<	*
Calculated Results (pCi/g or pCi/l)	2.88457		0.73217		0.51623		0.22859	
Reported MDA	NA	*	NA	*	NA	*	0.25170	*
Calculated MDA	0.30722		0.21364		0.10295		0.19730	
Detect/Non Detect	Detect	YES	Detect	YES	Detect	YES	Non Detect	YES
Results > MDA?	YES	NO	YES	NO	YES	NO	YES	YES
[Radium 226: Ra-226]								
Background CTS	110.00000		56.00000		17.00000		29.00000	
Background CPM	0.04850		0.04900		0.05230		0.04650	
Net CPM	0.94700		0.56800		0.72700		0.51700	
Branch Fraction	0.48400		0.48400		0.48400		0.48400	
Efficiency	0.00732		0.00905		0.00778		0.00732	
Reported Results (pCi/g or pCi/l)	0.93090	OK	0.32730	OK	0.41340	OK	0.37320	OK
Calculated Results (pCi/g or pCi/l)	0.93055		0.32764		0.41348		0.37340	
Reported MDA	NA	*	NA	*	NA	*	NA	*
Calculated MDA	0.47685		0.20400		0.12175		0.19383	
Detect/Non Detect	Detect	YES	Detect	YES	Detect	YES	Detect	YES
Results > MDA?	YES	NO	YES	NO	YES	NO	YES	NO

*** NOTE: Data cut off in photocopy

TMA/Norcal N1-12-165-9580 Additional 300-FF-1 Samples

Gamma Spectroscopy

Sample #	9580-13		9580-14		9580-15	
Cust. I.D. #	B01GF7		B01GG9		B01GH0	
Type	Soil		Soil		Soil	
Detector	G-5 JR		G-1 JR		G-2 JR	
Aliquot (g or l)	204.84000		203.14999		209.72000	
Counting Time (min)	100.83000		100.53000		100.70000	
[Cobalt 60; C0-60]						
Background CTS	16.00000		9.00000		11.00000	
Background CPM	0.01700		0.03610		0.07120	
Net CPM	1.92300		0.22400		0.23200	
Branch Fraction	1.00000		1.00000		1.00000	
Efficiency	0.00362		0.00388		0.00324	
Reported Results (pCi/g or pCi/l)	1.21100	OK	0.13280	OK	<	*
Calculated Results (pCi/g or pCi/l)	1.16816		0.12801		0.15360	
Reported MDA	NA	*	NA	*	0.15960	OK
Calculated MDA	0.11816		0.09414		0.13077	
Detect/Non Detect	Detect	YES	Detect	YES	Non Detect	YES
Results > MDA?	YES	NO	YES	NO	YES	YES
[Cesium 137; Cs-137]						
Background CTS	28.00000		59.00000		11.00000	
Background CPM	0.00000		0.02830		0.02700	
Net CPM	1.90300		1.34200		0.73900	
Branch Fraction	0.85100		0.85100		0.85100	
Efficiency	0.00718		0.00794		0.00664	
Reported Results (pCi/g or pCi/l)	0.68890	OK	0.44300	OK	0.28250	OK
Calculated Results (pCi/g or pCi/l)	0.68488		0.44039		0.28090	
Reported MDA	NA	*	NA	*	NA	*
Calculated MDA	0.08801		0.11963		0.06515	
Detect/Non Detect	Detect	YES	Detect	YES	Detect	YES
Results > MDA?	YES	NO	YES	NO	YES	NO
[Thorium 228; Th-228]						
Background CTS	137.00000		224.00000		170.00000	
Background CPM	0.23520		0.17090		0.12680	
Net CPM	2.44700		2.38700		2.32400	
Branch Fraction	0.44800		0.44800		0.44800	
Efficiency	0.01928		0.02269		0.01844	
Reported Results (pCi/g or pCi/l)	0.88620	*	0.57360	*	0.86570	*
Calculated Results (pCi/g or pCi/l)	0.82299		0.52068		0.80423	
Reported MDA	NA	*	NA	*	NA	*
Calculated MDA	0.14917		0.15703		0.16296	
Detect/Non Detect	Detect	YES	Detect	YES	Detect	YES
Results > MDA?	YES	NO	YES	NO	YES	NO
[Radium 226; Ra-226]						
Background CTS	53.00000		60.00000		29.00000	
Background CPM	0.05230		0.07710		0.04850	
Net CPM	1.18100		0.94300		0.89000	
Branch Fraction	0.48400		0.48400		0.48400	
Efficiency	0.00778		0.00866		0.00732	
Reported Results (pCi/g or pCi/l)	0.68960	OK	0.49900	OK	0.41840	OK
Calculated Results (pCi/g or pCi/l)	0.68970		0.49886		0.41831	
Reported MDA	NA	*	NA	*	NA	*
Calculated MDA	0.20603		0.20184		0.16282	
Detect/Non Detect	Detect	YES	Detect	YES	Detect	YES
Results > MDA?	YES	NO	YES	NO	YES	NO

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST - FORM A-6

PROJECT: 300-FF-1 215	REVIEWER: SS	DATE: 5-26-92
LABORATORY: TMA/Skinner	CASE: 92-12-130	SDG:
SAMPLES/MATRIX: B00H93 (soil)	B00HB3 (soil)	B00HC3 (soil)
B00H96 (")	B00HB5 (")	B00HC5 (water)
B00H97 (")	B00HB7 (")	B00HC6 (water)
B00H99 (")	B00HB9 (")	
B00HB1 (")	B00HC1 (")	

1. COMPLETENESS AND CONTRACT COMPLIANCE

Review the data package for completeness and check off the items below. If any data review elements are missing contact the laboratory for submittal of the omitted data.

Data Package Item	Present?: Yes	No	N/A
Case Narrative	✓		
Cover Page	✓		
Traffic Reports	✓		
Sample Data			
Inorganic Analysis Data Sheets	✓		
Standards Data			
Initial and Continuing Calibration Verification	✓		
CRDL Standard for AA and ICP	✓		
QC Summary			
Blanks	✓		
ICP Interference Check Summary	✓		
Spike Sample Recovery	✓		
Post-Digestion Spike Sample Recovery	✓		
Duplicate	✓		
Laboratory Control Sample	✓		
Standard Addition Results	✓		
ICP Serial Dilutions	✓		
Instrument Detection Limits	✓		
ICP Interelement Correction Factors	✓		
ICP Linear Ranges	✓		
Preparation Log	✓		
Analysis Run Log	✓		
Raw Data			
ICP Raw Data	✓		
Furnace AA Raw Data	✓		
Mercury Raw Data	✓		
Cyanide Raw Data		✓	
Additional Data			
Internal laboratory chain-of-custody	✓		
Laboratory Sample Preparation Records	✓		

Data Package Item	Present?: Yes	No	N/A
Percent Solids Analysis Records	___	✓	___
Reduction Formulae	___	✓	___
Instrument Run Logs	___	✓	___
Chemist Notebook Pages	___	✓	___

2. HOLDING TIMES

Have all samples been analyzed within holding times?	Yes	No	N/A

ACTION: If any holding times have been exceeded qualify all affected results as estimated (J for detects and UJ for nondetects).

3. INITIAL CALIBRATIONS

Were all instruments calibrated daily, each set-up time and were the proper number of standards used?	Yes	No	N/A
Are the correlation coefficients ≥0.995?	Yes	No	N/A
Was a midrange cyanide standard distilled?	Yes	No	N/A

ACTION: Qualify all data as unusable if reported from an analysis in which an instrument was not calibrated or was calibrated with less than the minimum number of standards. Qualify associated sample results >IDL as estimated (J) and results <IDL as estimated (UJ), if the correlation coefficient is <0.995 or the laboratory did not distill the midrange cyanide standard.

4. INITIAL AND CONTINUING CALIBRATION VERIFICATION

Are ICV and CCV percent recoveries within control?	Yes	No	N/A
Are there calculation errors?	Yes	No	N/A

ACTION: Qualify all affected data in accordance with Section 8.3 of the validation requirements. If calculation errors are noted, contact the laboratory for clarification.

5. ICP INTERFERENCE CHECK SAMPLE

Has an ICS sample been analyzed at the proper frequency?	Yes	No	N/A
Are the AB solution %R values within control?	Yes	No	N/A
Are there calculation errors?	Yes	No	N/A

ACTION: Qualify all affected data in accordance with Section 8.3 of the validation requirements. If calculation errors are noted, contact the laboratory for clarification.

6. LABORATORY BLANKS

Are target analytes present in the laboratory blanks? Yes No N/A

ACTION: Qualify all associated sample results for any analyte <5 times the amount in any laboratory blank as nondetected (U). If analyte concentrations in the blank are >CRDL or below the negative CRDL, verify the laboratory has redigested and reanalyzed associated samples with analyte concentrations <10 times the blank concentration. If the laboratory has not redigested and reanalyzed the samples, note in the validation narrative.

7. FIELD BLANKS

Are target analytes present in the field blanks? Yes No N/A

ACTION: Qualify all sample results for any analyte <5 times the amount in any valid field blank as nondetected (U).

8. MATRIX SPIKE SAMPLE ANALYSIS

Are spike recoveries within the control limits? Yes No N/A

ACTION: Qualify the affected sample data according to the following requirements:

If spike recovery is >125% and sample results are <IDL no qualification is required. If spike recovery is >125% or <75% qualify all positive results as estimated (J). If spike recovery is 30% to 74% qualify all nondetects as estimated (UJ). If spike recovery is <30%, reject all nondetects (R). If the field blank has been used for spike analysis, note in the validation narrative.

9. LABORATORY CONTROL SAMPLE

Are percent recoveries within the acceptance limits? Yes No N/A

Are there calculation errors? Yes No N/A

ACTION: Qualify the sample data according to the following requirements:

AQUEOUS LCS - Qualify as estimated (J), all sample results >IDL, for which the LCS %R falls within the range 50-79% or >120%. Qualify as estimated (UJ), all sample results <IDL, for which the LCS falls within the range of 50-79%. Qualify as unusable (R) all sample results, for which the LCS %R <50%.

SOLID LCS - Qualify as estimated (J), all sample results >IDL for which the LCS result is outside the established control limits. Qualify as estimated (UJ), all sample results <IDL for which the LCS %R are lower than the established control limits.

10. PERFORMANCE AUDIT ANALYSES

Are the performance audit sample results within the acceptance limits? Yes No N/A

ACTION: Note the results of the performance audit sample analyses in the data validation narrative.

11. DUPLICATE SAMPLE ANALYSIS

Are RPD values acceptable? Yes No N/A

ACTION: Qualify the results for all associated samples of the same matrix as estimated (J) if the RPD results fall outside the appropriate control limits. If field blanks were used for laboratory duplicates, note in the validation narrative.

12. ICP SERIAL DILUTION

Are the serial dilution results acceptable? Yes No N/A

Is there evidence of negative interference? Yes No N/A

ACTION: Qualify the associated data as estimated (J) for those analytes in which the %D is outside the control limits. If evidence of negative interference is found, use professional judgment to qualify the data.

13. FIELD DUPLICATE SAMPLES

Do the RPD values exceed the control limits? Yes No N/A

ACTION: Note the results of the field duplicate samples in the validation narrative.

14. FIELD SPLIT SAMPLES

Do the RPD values exceed the control limits? Yes No N/A

ACTION: Note the results of the field split samples in the validation narrative.

1516. FURNACE ATOMIC ABSORPTION QUALITY CONTROL

Do all applicable analyses have duplicate injections? Yes No N/A

Are applicable duplicate injection RSD values within control? Yes No N/A

If no, were samples rerun once as required? Yes No N/A

Does the RSD for the rerun fall within the control limits? Yes No N/A

Were analytical spike recoveries within the control limits? Yes No N/A

If no, were MSA analyses performed when required?	Yes	No	N/A
Are MSA correlation coefficients $\geq$0.995?	Yes	No	N/A
If no, was a second MSA analysis performed?	Yes	No	N/A

ACTION: If duplicate injections are outside the acceptance limits and the sample has not been reanalyzed or the reanalysis is outside the acceptance limits, qualify the associated data as estimated (J for detects and UJ for nondetects). If the analytical spike recovery is <40% qualify detects as estimated (J). If the analytical spike recovery is $\geq$10% but <40%, qualify all nondetects as estimated (UJ) and if the analytical spike recovery is <10%, reject all nondetects (R). If the sample absorbance is <50% of the analytical spike absorbance and the analytical spike recovery is <85% or >115%, qualify all results as estimated (J for detects and UJ for nondetects). If method of standard additions (MSA) was required but was not performed, the MSA samples were spiked incorrectly, or the MSA correllation coefficient was <0.995, qualify the associated detected results as estimated (J).

17. ANALYTE QUANTITATION AND DETECTION LIMITS

Have results been reported and calculated correctly?	Yes	No	N/A
Are results within the calibrated range of the instruments and within the linear range of the ICP?	Yes	No	N/A
Are all detection limits below the CRQL?	Yes	No	N/A

Action: If analyte quantitation is in error, contact the laboratory for explanation. If errors or deficiencies can not be resolved with the laboratory, qualify associated data as unusable (R).

18. OVERALL ASSESSMENT AND SUMMARY

Has the laboratory conducted the analysis in accordance with the analytical SOW?	Yes	No	N/A
Were project specific data quality objectives met for this analysis?	Yes	No	N/A

ACTION: Summarize all the data qualifications and complete the data validation narrative as specified in Section 10.0 of the data validation requirements.

COMMENTS (attach additional sheets as necessary):

WET CHEMISTRY DATA VALIDATION CHECKLIST - FORM A-7

PROJECT: 300-FF-1 215	REVIEWER: SS	DATE: 5-26-92
LABORATORY: TMA / ARL	CASE: 12-066	SDG:
SAMPLES/MATRIX: B00HC5 (water)		
B00HC6 (")		
B00HD8 (")		

1. DATA PACKAGE COMPLETENESS

Review the data package for completeness and check off the items below. If any data review elements are missing contact the laboratory for submittal of the omitted data.

Data Package Item	Present?:	Yes	No	N/A
Case Narrative		✓		
Cover Page			✓	
Traffic Reports/Chain-of-Custody		✓		
Sample Analysis Data Report Forms		✓		
Standards Data			✓	
QC Summary				
Blanks Summary Report Forms			✓	
Spike Sample Recovery Report Forms		✓		
Duplicate Sample Analysis Report Forms		✓		
Laboratory Control Sample Report Forms			✓	
Raw Data				
Ion Chromatograph Chromatograms		✓		
TOC and TOX Instrument Printouts		✓		
Laboratory Bench Sheets			✓	
Additional Data				
Laboratory Sample Preparation Logs			✓	
Instrument Run Logs			✓	
Internal Laboratory Chain-of-Custory			✓	
Percent Solids Analysis Records			✓	
Reduction Formulae			✓	
Chemist Notebook Pages		✓		

2. HOLDING TIMES

	Yes	No	N/A
Were all samples analyzed within holding times?			

Action: If any holding times were exceeded qualify all affected results as estimated (J for detects and UJ for nondetects).

3. INITIAL CALIBRATIONS

Were all instruments calibrated daily, each set-up time and were the proper number of standards used?	Yes	No	N/A
Are the correlation coefficients ≥0.995?	Yes	No	N/A
Was a balance check conducted prior to the TDS analysis?	Yes	No	N/A
Was the titrant normality checked?	Yes	No	N/A

ACTION: Qualify all data as unusable (R) if reported from an analysis in which the above criteria were not met.

4. INITIAL AND CONTINUING CALIBRATION VERIFICATION

Have ICV and CCV been analyzed at the proper frequency?	Yes	No	N/A
Are ICV and CCV percent recoveries within control?	Yes	No	N/A
Are there calculation errors?	Yes	No	N/A

ACTION: Qualify all affected data in accordance with the validation requirements.

5. LABORATORY BLANKS

Are target analytes present in the laboratory blanks?	Yes	No	N/A

ACTION: Qualify all associated sample results for any analyte <5 times the amount in any laboratory blank as nondetected (U) and list the affected samples and analytes below.

6. FIELD BLANKS

Are target analytes present in the field blanks?	Yes	No	N/A

ACTION: Qualify all sample results for any analyte <5 times the amount in any valid field blank as nondetected (U).

7. MATRIX SPIKE SAMPLE ANALYSIS

Are spike recoveries within the acceptance limits?	Yes	No	N/A

ACTION: If the sample concentration exceeds the spike concentration by a factor of 4 or more, and spike recoveries are outside the acceptance limits, no qualification is necessary. If spike recovery is outside the control limits and the sample results are >CRQL, qualify the data as estimated (J). If the spike recovery is <30% and the sample results are less then the IDL qualify the data as unusable (R).

8. LABORATORY CONTROL SAMPLE

Are percent recoveries within the acceptance limits? Yes No N/A

Are there calculation errors? Yes No N/A

ACTION: Qualify the affected results according to the following requirements:

AQUEOUS LCS - Qualify as estimated (J), all sample results >IDL, for which the LCS %R falls within the range 50-79% or >120%. Qualify as estimated (UJ), all sample results <IDL, for which the LCS falls within the range of 50-79%. Qualify as unusable (R) all sample results, for which the LCS %R <50%.

SOLID LCS - Qualify as estimated (J), all sample results >IDL for which the LCS %R is outside the established control limits. Qualify as estimated (UJ), all sample results <IDL for which the LCS %R are lower than the established control limits.

9. PERFORMANCE AUDIT ANALYSES

Are the performance audit sample results within the acceptance limits? Yes No N/A

ACTION: Note the results of the performance audit samples in the validation narrative.

10. DUPLICATE SAMPLE ANALYSIS

Are RPD values within the acceptance limits? Yes No N/A

Action: Qualify the results for all associated samples of the same matrix as estimated (J) if the RPD falls outside the acceptance limits.

11. FIELD DUPLICATE SAMPLES

Do RPD values exceed the acceptance limits? Yes No N/A

ACTION: Note the results of the field duplicate samples in the validation narrative.

12. FIELD SPLIT SAMPLES

Do RPD values exceed the acceptance limits? Yes No N/A

ACTION: Note the results of the field split samples in the validation narrative.

13. ANALYTE QUANTITATION AND DETECTION LIMITS

Have results been reported and calculated correctly?	Yes	No	N/A
Are instrument detection limits below the CRDL?	Yes	No	N/A

Action: If analyte quantitation is in error, contact the laboratory for explanation. If errors or deficiencies can not be resolved with the laboratory, qualify associated data as unusable (R).

14. OVERALL ASSESSMENT AND SUMMARY

Has the laboratory conducted the analysis in accordance with the analytical SOW?	Yes	No	N/A
Were project specific data quality objectives met for this analysis?	Yes	No	N/A

ACTION: Summarize all the data qualifications and complete the data validation narrative as specified in Section 10.0 of the data validation requirements.

COMMENTS (attach additional sheets as necessary):

WET CHEMISTRY DATA VALIDATION CHECKLIST - FORM A-7

PROJECT: 300-FF-1 RI/FS	REVIEWER: SS	DATE: 5-26-92
LABORATORY: TMA/ARLI	CASE: 12-067	SDG:
SAMPLES/MATRIX: B00H93 (soil)	B00HB9 (soil)	B00HB5 (soil)
B00H96 (")	B00HC1 (")	
B00H97 (")	B00HC3 (")	
B00H99 (")	B00HB1 (")	
B00HB7 (")	B00HB3 (")	

1. DATA PACKAGE COMPLETENESS

Review the data package for completeness and check off the items below. If any data review elements are missing contact the laboratory for submittal of the omitted data.

Data Package Item	Present?: Yes	No	N/A
Case Narrative	✓		
Cover Page		✓	
Traffic Reports/Chain-of-Custody	✓		
Sample Analysis Data Report Forms	✓		
Standards Data			
QC Summary			
Blanks Summary Report Forms		✓	
Spike Sample Recovery Report Forms	✓		
Duplicate Sample Analysis Report Forms	✓		
Laboratory Control Sample Report Forms		✓	
Raw Data			
Ion Chromatograph Chromatograms	✓		
TOC and TOX Instrument Printouts	✓		
Laboratory Bench Sheets		✓	
Additional Data			
Laboratory Sample Preparation Logs		✓	
Instrument Run Logs		✓	
Internal Laboratory Chain-of-Custory		✓	
Percent Solids Analysis Records		✓	
Reduction Formulae		✓	
Chemist Notebook Pages	✓		

2. HOLDING TIMES

Were all samples analyzed within holding times?	Yes	No	N/A

Action: If any holding times were exceeded qualify all affected results as estimated (J for detects and UJ for nondetects).

3. INITIAL CALIBRATIONS

Were all instruments calibrated daily, each set-up time and were the proper number of standards used?	Yes	No	N/A
Are the correlation coefficients ≥0.995?	Yes	No	N/A
Was a balance check conducted prior to the TDS analysis?	Yes	No	N/A
Was the titrant normality checked?	Yes	No	N/A

ACTION: Qualify all data as unusable (R) if reported from an analysis in which the above criteria were not met.

4. INITIAL AND CONTINUING CALIBRATION VERIFICATION

Have ICV and CCV been analyzed at the proper frequency?	Yes	No	N/A
Are ICV and CCV percent recoveries within control?	Yes	No	N/A
Are there calculation errors?	Yes	No	N/A

ACTION: Qualify all affected data in accordance with the validation requirements.

5. LABORATORY BLANKS

Are target analytes present in the laboratory blanks?	Yes	No	N/A

ACTION: Qualify all associated sample results for any analyte <5 times the amount in any laboratory blank as nondetected (U) and list the affected samples and analytes below.

6. FIELD BLANKS

Are target analytes present in the field blanks?	Yes	No	N/A

ACTION: Qualify all sample results for any analyte <5 times the amount in any valid field blank as nondetected (U).

7. MATRIX SPIKE SAMPLE ANALYSIS

Are spike recoveries within the acceptance limits?	Yes	No	N/A

ACTION: If the sample concentration exceeds the spike concentration by a factor of 4 or more, and spike recoveries are outside the acceptance limits, no qualification is necessary. If spike recovery is outside the control limits and the sample results are >CRQL, qualify the data as estimated (J). If the spike recovery is <30% and the sample results are less then the IDL qualify the data as unusable (R).

8. LABORATORY CONTROL SAMPLE

Are percent recoveries within the acceptance limits? Yes No N/A

Are there calculation errors? Yes No N/A

ACTION: Qualify the affected results according to the following requirements:

AQUEOUS LCS - Qualify as estimated (J), all sample results > IDL, for which the LCS %R falls within the range 50-79% or > 120%. Qualify as estimated (UJ), all sample results < IDL, for which the LCS falls within the range of 50-79%. Qualify as unusable (R) all sample results, for which the LCS %R < 50%.

SOLID LCS - Qualify as estimated (J), all sample results > IDL for which the LCS %R is outside the established control limits. Qualify as estimated (UJ), all sample results < IDL for which the LCS %R are lower than the established control limits.

9. PERFORMANCE AUDIT ANALYSES

Are the performance audit sample results within the acceptance limits? Yes No N/A

ACTION: Note the results of the performance audit samples in the validation narrative.

10. DUPLICATE SAMPLE ANALYSIS

Are RPD values within the acceptance limits? Yes No N/A

Action: Qualify the results for all associated samples of the same matrix as estimated (J) if the RPD falls outside the acceptance limits.

11. FIELD DUPLICATE SAMPLES

Do RPD values exceed the acceptance limits? Yes No N/A

ACTION: Note the results of the field duplicate samples in the validation narrative.

12. FIELD SPLIT SAMPLES

Do RPD values exceed the acceptance limits? Yes No N/A

ACTION: Note the results of the field split samples in the validation narrative.

13. ANALYTE QUANTITATION AND DETECTION LIMITS

Have results been reported and calculated correctly?	Yes	No	N/A
Are instrument detection limits below the CRDL?	Yes	No	N/A

Action: If analyte quantitation is in error, contact the laboratory for explanation. If errors or deficiencies can not be resolved with the laboratory, qualify associated data as unusable (R).

14. OVERALL ASSESSMENT AND SUMMARY

Has the laboratory conducted the analysis in accordance with the analytical SOW?	Yes	No	N/A
Were project specific data quality objectives met for this analysis?	Yes	No	N/A

ACTION: Summarize all the data qualifications and complete the data validation narrative as specified in Section 10.0 of the data validation requirements.

COMMENTS (attach additional sheets as necessary):

VOLATILE ORGANIC DATA VALIDATION CHECKLIST - FORM A-1

PROJECT: 300 FF-1 2 IFS	REVIEWER: SS	DATE: 5-26-92
LABORATORY: TMA/ARL1	CASE: 12-67	SDG:
SAMPLES/MATRIX: B00H93 (soil) · B00HB9 (soil) · B00HB5 (soil)		
· B00H96 (soil) · B00HC1 (")		
· B00H97 (") B00HC3 (")		
· B00H99 (") · B00HB1 (")		
· B00HB7 (") B00HB3 (")		

1. DATA PACKAGE COMPLETENESS

Review the data package for completeness and check off the items below. If any data review elements are missing contact the laboratory for submittal.

Data Package Item	Present?: Yes	No	N/A
Case Narrative	✓		
Data Summary	✓		
Chain-of-Custody	✓		
QC Summary			
Surrogate report	✓		
MS/MSD report	✓		
Blank summary report	✓		
GC/MS tuning report (12-2 (1) (1-31-92) (1-31-92) (2-6-92) (2-10-92)	✓		
Internal standard summary report	✓		
Sample Data			
Sample reports	✓		
TIC reports for each sample	✓		
RIC reports for all samples	✓		
Raw and corrected spectra for all detected results	✓		
Raw and corrected library search data for all reported TIC	✓		
Quantitation and calculation data for all TIC	✓		
Standards Data			
Initial calibration report (12-23-91) (1-31-92)	✓		
RIC and quantitation reports for initial calibration	✓		
Continuing calibration reports (12-23-91) (1-31-92) (2-6-92) (2-10-92)	✓		
RIC and quantitation reports for cont. calibrations	✓		
Internal standard summary report	✓		
Raw QC Data			
Tuning report, spectra and mass lists	✓		
Blank analysis reports	✓		
TIC reports for all blanks	✓		
RIC and quantitation reports for blanks	✓		
Raw and corrected spectra for all detected results in blanks	✓		
Raw and corrected library search data for all reported TIC			✓

Data Package Item	Present?: Yes	No	N/A
Quantitation and calculation data for all TIC			✓
MS/MSD report forms	✓		
RIC and quantitation reports for MS/MSD	✓		
Additional Data			
Moisture/% solids data sheets		✓	
Reduction formulae		✓	
Instrument time logs		✓	
Chemist notebook pages		✓	
Sample preparation sheets		✓	

2. HOLDING TIMES

Complete the holding time summary form listing all samples and dates of collection and analysis.

Were all samples analyzed within holding time? Yes No N/A

ACTION: If any holding times were exceeded, but not by greater than a factor of two, qualify associated samples as estimated (J for detects or UJ for nondetects), otherwise reject all nondetects (R) and qualify all associated detects as estimated (J).

3. INSTRUMENT CALIBRATION, TUNING AND PERFORMANCE CHECKS

3.1 GC/MS TUNING AND PERFORMANCE CHECKS

Is a bromofluorobenzene tune report present for each applicable 12-h period? Yes No N/A

Do all tunes on all instruments meet the tuning criteria? Yes No N/A

Do all tunes on all instruments meet the expanded criteria? Yes No N/A

Has the laboratory made any calculation or transciption errors? Yes No N/A

Have the proper significant figures been reported? Yes No N/A

ACTION: If the mass calibration is out of specification but within the expanded criteria, qualify associated data as estimated (J for detects or UJ for nondetects). If all tuning criteria are missed, qualify all associated data as unusable (R).

3.2 INITIAL CALIBRATION

Is an initial calibration report provided for all instruments? Yes No N/A

Are all RSD values ≤30% (2/88 SOW)? Yes No N/A

Are all RRF values ≥0.05 (2/88 SOW)? Yes No N/A

Are all applicable RSD values ≤20.5% (3/90 SOW)?	Yes	No	N/A
Are all applicable RSD values ≤40% (3/90 SOW)?	Yes	No	N/A
Are all applicable RRF values within SOW limits (3/90 SOW)?	Yes	No	N/A
Are all erratic performance compound RRF values ≥0.01 (3/90 SOW)?	Yes	No	N/A

ACTION: With the exception of compounds that exhibit erratic performance and making allowances for up to two TCL compounds, if any RRF value is out of specification qualify all detected results for the particular compound as estimated (J) and all nondetects as unusable (R). Making allowances for up to two TCL compounds, if any RSD value is out of specification qualify all associated data as estimated (J for detects or UJ for nondetects).

3.3. CONTINUING CALIBRATION

Is a continuing calibration report present for all 12-h periods in which associated samples were analyzed?	Yes	No	N/A
Are all RRF values ≥0.05 (2/88 SOW)?	Yes	No	N/A
Are all %D values ≤25% (2/88 or 3/90 SOW)?	Yes	No	N/A
Are all %D values ≤40% (3/90 SOW)?	Yes	No	N/A
Are all RRF values within SOW limits (3/90 SOW)?	Yes	No	N/A
Are all erratic performance compound RRF values ≥0.01 (3/90 SOW)?	Yes	No	N/A

ACTION: With the exception of compounds that exhibit erratic performance and making allowances for up to two TCL compounds, if any RRF value is out of specification qualify all associated detected results as estimated and all nondetects as unusable (R). Making allowances for up to two TCL compounds, if any %D is out of specification, qualify all associated results as estimated (J for detects or UJ for nondetects).

4. BLANKS

4.1 LABORATORY BLANKS

Has the laboratory conducted a method blank analysis per matrix for every 12-h period in which samples were analyzed?	Yes	No	N/A
Are TCL compounds present in the laboratory blanks?	Yes	No	N/A

ACTION: Qualify all sample results ≤10 time the highest blank concentration for the common laboratory contaminants, as nondetects (U) or at the SQL if the result is <CRQL. Qualify all remaining sample results ≤5 times the blank concentration in similar fashion.

4.2. FIELD BLANKS

Are TCL compounds present in the field blanks? Yes No N/A

ACTION: Qualify all detected sample results ≤ 5 times the amount in any valid field blank as nondetects (U) and note the field blank results in the validation narrative.

5. ACCURACY

5.1 SURROGATE/SYSTEM MONITORING COMPOUND RECOVERY

Are any surrogate recoveries out of specification? Yes No N/A

Are any surrogate recoveries < 10%? Yes No N/A

Are any method blank surrogate recoveries out of specification? Yes No N/A

ACTION: Qualify all associated sample results as estimated (J for detects or UJ for nondetects) for surrogates out of specification but > 10%. Qualify all associated positive sample results as estimated (J) and all nondetect results as unusable (R) for all surrogates below 10%. If method blank surrogates are out of specification and the associated sample surrogates are acceptable no qualification is necessary, however, the laboratory should be contacted for an explanation.

5.2 MATRIX SPIKE RECOVERY

Has an MS/MSD analysis been conducted per matrix in the sample group? Yes No N/A

Are MS/MSD recoveries within specification? Yes No N/A

Are there any calculation errors? Yes No N/A

ACTION: If an MS/MSD analysis has not been conducted contact the laboratory for an explanation. Review the MS/MSD recoveries in conjunction with other QC data such as surrogate recoveries and note the results in the validation narrative. If MS/MSD recoveries are out of specification and sample concentration is > 5 times the spike concentration, no qualification is required, otherwise qualify results as follows: Qualify positive results for the specific class of compound (aromatics and non-aromatics) as estimated (J) in all samples if associated surrogates are also out of specification. The qualification shall only be done on samples of similar matrix as the MS/MSD samples. If it is determined from the review that only the spiked samples are affected by low recoveries, qualify only the results for the spiked sample as described above. If it is determined from the review that out of specification MS/MSD recoveries are indicative of systematic problems in the laboratory such as sample preparation or sample-specific matrix interferences this must be noted in the validation narrative along with the potential affect on the sample results.

5.3 PERFORMANCE AUDIT SAMPLES

Are the performance audit sample results within the acceptance limits? Yes No N/A

ACTION: Note the results of the performance audit sample in the validation narrative.

6. PRECISION

6.1 MATRIX SPIKE/MATRIX SPIKE DUPLICATES

Are RPD values within specification? Yes No N/A

Are there any calculation errors? Yes No N/A

ACTION: Review the MS/MSD results in conjunction with other QC data such as field duplicates and note the results in the validation narrative. If MS/MSD RPDs are out of specification and sample results are >5xCRQL qualify positive results for the specific class of compound (aromatics and non-aromatics) as estimated (J). If it is determined from the review that out of specification MS/MSD results are indicative of systematic problems in the laboratory such as sample preparation or sample-specific matrix interferences this must be noted in the validation narrative along with the potential affect on the sample results.

6.2 FIELD DUPLICATE SAMPLES

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

ACTION: Note the results of the field duplicate samples in the validation narrative.

6.3 FIELD SPLIT SAMPLES

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

ACTION: Note the results of the field split samples in the validation narrative.

7. SYSTEM PERFORMANCE

7.1 INTERNAL STANDARDS PERFORMANCE

Are any internal standard area counts outside the acceptance limits? Yes No N/A

Are retention times for any internal standard outside the ±30 second windows established by the most recent calibration check? Yes No N/A

ACTION: If the area counts are outside the acceptance limits qualify all associated results as estimated (J for detects or UJ for nondetects). If it is determined from the review that out of specification area counts and relative retention times are indicative of systematic problems within the laboratory the reviewer may consider rejection of all affected sample data (R).

8. COMPOUND IDENTIFICATION AND QUANTITATION

8.1 COMPOUND IDENTIFICATION

Are detected compounds within ±0.06 relative retention time units of the associated calibration standard?	Yes	No	N/A
Are all ions at a relative intensity of ≥ 10% in the standard spectra present in the sample spectra?	Yes	No	N/A
Do the relative intensities between the standard and sample spectra agree within 20%?	Yes	No	N/A
Have all ions > 10% in the sample spectra that are not present in the standard spectra been reviewed for possible background contamination?	Yes	No	N/A
Are molecular ions present in the reference specrum present in the sample spectrum?	Yes	No	N/A

ACTION: If compound identification is in error and retention time and mass spectral criteria are exceeded qualify all affected positive results as unusable (R). If cross-contamination between analyses is suspected, qualify affected data as unusable (R). Note the results in the validation narrative.

8.2 REPORTED RESULTS AND QUANTITATION LIMITS

Has the laboratory used the correct RRF values and internal standard(s) for quantitation?	Yes	No	N/A
Are results and quantitation limits calculated properly?	Yes	No	N/A
Has the laboratory reported the sample quantitation limits within 5xCRQL values?	Yes	No	N/A

ACTION: If the results and quantitation limits are in error contact the laboratory for clarification and note in the validation narrative.

8.3 TENTATIVELY IDENTIFIED COMPOUNDS (TIC)

Has the laboratory conducted a spectral library search on all candidate TIC peaks in accordance with the analytical SOW?	Yes	No	N/A
Has the laboratory properly identified and coded all TIC?	Yes	No	N/A

ACTION: If the laboratory has failed to search the minimum number of TIC peaks in the chromatogram contact the laboratory for submittal of the required data. Qualify as nondetects (U) all TIC compounds present in samples and blanks using the review criteria specified in the validation requirements. If TIC identification is in error sample results should be qualified as nondetects (U) or unusable (R). If TIC identifications are judged valid, qualify the results as presumptive and estimated (JN).

9. OVERALL ASSESSMENT AND SUMMARY

Has the laboratory conducted the analysis in accordance with the analytical SOW?	Yes	No	N/A
Were project specific data quality objectives met for this analysis?	Yes	No	N/A

ACTION: Summarize all the data qualifications recommended in the foregoing sections, and complete the data validation narrative according to the requirements of Section 10.0 of the data validation requirements.

COMMENTS (attach additional sheets as necessary):

PESTICIDE/PCB DATA VALIDATION CHECKLIST - FORM A-3

PROJECT: 300-FF-1 RI/FS	REVIEWER: SS	DATE: 5-26-92
LABORATORY: TMA / ARL	CASE: 12-C67	SDG:
SAMPLES/MATRIX: B00H93 (soil) B00H94 (soil) B00H95 (soil)		
B00H96 (") B00HC1 (")		
B00H97 (") B00HC3 (")		
B00H99 (") B00HB1 (")		
B00HB7 (") B00HB3 (")		

1. DATA PACKAGE COMPLETENESS

Review the data package for completeness and check off the items below. If any data review elements are missing contact the laboratory for resubmittal.

Data Package Item	Present?:	Yes	No	N/A
Case Narrative		✓		
Data Summary		✓		
Chain-of-Custody		✓		
QC Summary				
Surrogate report		✓		
MS/MSD report		✓		
Blank summary report		✓		
Sample Data				
Sample reports	~~No report for B00H91~~	✓	✓	
Chromatograms		✓		
GC integration reports		✓		
Worksheets			✓	
UV traces from GPC			✓	
GC/MS confirmation spectra			✓	
Standards Data				
Pesticides Evaluation Standards Summary		✓		
Pesticides/PCB Standards Summary		✓		
Pesticides/PCB identification		✓		
Pesticides standard chromatograms		✓		
Raw QC Data				
Blank analysis report forms and chromatograms		✓		
MS/MSD report forms and chromatograms		✓		

Data Package Item	Present?: Yes	No	N/A
Additional Data			
Moisture/% solids data sheets		✓	
Reduction formulae		✓	
Instrument time logs		✓	
Chemist notebook pages		✓	
Sample preparation sheets		✓	

2. HOLDING TIMES

Were all samples extracted within holding time? Yes No N/A

Were all samples analyzed within holding time? Yes No N/A

ACTION: If any holding times were exceeded, but not by greater than a factor of two, qualify associated samples as estimated (J for detects or UJ for nondetects), otherwise reject all nondetects (R) and qualify all associated detects as estimated (J).

3. INSTRUMENT PERFORMANCE AND CALIBRATIONS

3.1 INSTRUMENT PERFORMANCE (2/88 SOW)

Are DDT retention times greater than 12 minutes? Yes No N/A

ACTION: If DDT retention time is $\leq$12 minutes and resolution is <25% qualify associated data as unusable (R).

Is resolution between DDT peaks acceptable? Yes No N/A

ACTION: If resolution between DDT peaks is unacceptable qualify associated data as unusable (R).

Do all pesticide standards elute within the established retention time windows? Yes No N/A

ACTION: If the standards do not meet the retention time criteria and peaks are not present near or within the retention time windows no sample qualification is necessary. If peaks are near or within the retention time windows and the standards and matrix spikes do not fall within the expanded retention time windows calculated according to the validation requirements, qualify all associated sample results from the last in-control point as unusable (R).

Are DDT breakdowns $\leq$20%? Yes No N/A

ACTION: If the DDT percent breakdown exceeds 20%, qualify all detected results for DDT as estimated (J) and all nondetects as unusable (R) if DDD and DDE are detected. In addition qualify all results for DDD or DDE as presumptive and estimated (NJ).

Are endrin breakdowns $\leq$20%? Yes No N/A

ACTION: If the endrin breakdown exceeds 20%, qualify all detected results for endrin as estimated (J) and all nondetects as unusable (R) if endrin aldehyde or endrin ketone are detected. In addition, qualify all results for endrin ketone as presumptive and estimated (NJ).

Are DBC retention time differences within specification?	Yes	No	N/A

ACTION: If DBC %D values are outside the limits and the shift is ocurring repeatedly in samples and standards, qualify affected sample results as unusable (R).

3.2 CALIBRATIONS (2/88 SOW)

Are RSD values for aldrin, endrin, DDT and DBC ≤10%?	Yes	No	N/A
Have all standards been analyzed within 72 h of any sample?	Yes	No	N/A
Has a 3-point calibration been conducted for DDT or toxaphene?	Yes	No	N/A
Have all standards been analyzed at the start of each 72-h sequence?	Yes	No	N/A
Have evaluation standards A, B, and C been analyzed within 72 h of any sample?	Yes	No	N/A
Has the confirmation standard mix been analyzed after every five samples?	Yes	No	N/A
Has evaluation standard B analyzed every 10 samples?	Yes	No	N/A
Are %D values for initial and subsequent standards ≤15% for quantitation standards and ≤20% for confirmation standards?	Yes	No	N/A

ACTION: If the RSD criteria were exceeded or three point calibrations not conducted qualify associated detects as estimated (J). If all standards were not analyzed at the beginning of each 72-h sequence qualify associated data as unusable (R). If the confirmation standards were not analyzed properly qualify associated detects as estimated (J). If the continuing calibration criteria were not met qualify associated quantitation data as estimated (J).

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

Is peak resolution acceptable? Yes No N/A

ACTION: If the resolution criteria are not met, reject positive sample results generated after initial calibration (R).

Are DDT and endrin breakdowns ≤20.0% Yes No N/A

ACTION: If the breakdown criteria are not met qualify sample results as described in Section 5.3.1 of the validation requirements.

Are single component target compounds in the PEMs, INDA, INDB and the calibration standards within the retention time windows? Yes No N/A

ACTION: If the retention time criteria are not met and no peaks are present in the samples within two times the retention time windows (±0.04, ±0.05 for methoxychlor), no qualification is necessary. If peaks are present in samples within the retention time window a review is made of the raw data to determine expanded retention time windows (see Section 5.3.1 of the validation requirements). If all standards and matrix spikes fall within the expanded windows then no qualification of sample results is necessary. If all standards and matrix spikes do not fall within the expanded windows then all affected sample results are qualified as unusable (R).

Are the RPDs acceptable for the PEMs? Yes No N/A

ACTION: If the RPD criteria are not met qualify associated positive sample results as estimated (J).

Are the RSDs for the calibration factors < 10.0% (< 15.0% for the BHC series, DDT, endrin, and methoxychlor)? Yes No N/A

ACTION: If the RSD criteria are not met qualify associated positive sample results as estimated (J).

3.4 CALIBRATION VERIFICATION (3/90 SOW)

Have the analytical sequence requirements been met for the analysis of instrument blanks, PEMs, INDA and INDB mixes? Yes No N/A

ACTION: If the analytical sequence requirements are not followed and any of the resolution or retention time criteria listed below are exceeded, reject associated positive results (R).

Is peak resolution acceptable for PEMs, INDA and INDB mixes? Yes No N/A

ACTION: If the resolution criteria are not met reject positive sample results generated after a noncompliant standard analysis (R).

Are single component target compounds in the PEMs, INDA and INDB mixes within the retention time windows? Yes No N/A

ACTION: If the retention time criteria are not met and no peaks are present in the samples analyzed after the noncompliant standard within two times the retention time windows (±0.04, ±0.05 for methoxychlor), no qualification is necessary. If peaks are present in samples within the expanded windows rejected associated positive and nondetect results (R).

Are RPDs between the calculated and true amounts in the PEMs, INDA and INDB mixes ≤25.0%? Yes No N/A

ACTION: If the RPD criteria are not met qualify associated positive sample results as estimated (J).

Are DDT and endrin breakdowns in the PEMs ≤20.0% (≤30.0% total combined)? Yes No N/A

ACTION: If the breakdown criteria are not met qualify associated positive sample results in accordance with the criteria specified in Section 5.3.1.

4. BLANKS

4.1 LABORATORY BLANKS

Has the laboratory analyzed the method blanks at the required frequency? Yes No N/A

Has the laboratory analyzed a sulfur clean-up blank if required? Yes No N/A

Has the laboratory analyzed instrument blanks at the required frequency? Yes No N/A

Are target compounds present in the blanks? Yes No N/A

ACTION: Qualify all associated positive results as nondetects (U) that are <5 times the highest concentration in any acceptable blank.

4.2 FIELD BLANKS

Are target compounds present in the field blanks? Yes No N/A

ACTION: If target compounds are present in the field blanks qualify all positive sample results <5 times the highest valid field blank concentrations as nondetects (U) and note the results in the validation narrative.

5. ACCURACY

5.1 SURROGATE RECOVERY

Are any surrogate recoveries out of specification?	Yes	No	N/A
Do any samples show nondetects for surrogates?	Yes	No	N/A
Are any method blank surrogates out of specification?	Yes	No	N/A

ACTION: Qualify all associated sample results as estimated (J for detects and UJ for nondetects) for surrogates out of specification. If the surrogate was not detected (0% recovery) in the sample qualify associated nondetects as unusable (R). If method blank surrogates are out of specification and sample surrogates are acceptable, no qualification is required however, the laboratory should be contacted for an explanation.

5.2 MATRIX SPIKE RECOVERY

Has the laboratory analyzed a MS/MSD per matrix for the the sample group?	Yes	No	N/A
Are MS/MSD recoveries within specification?	Yes	No	N/A
Are there any calculation or transcription errors?	Yes	No	N/A

ACTION: If MS/MSD analyses have not been conducted contact the laboratory for clarification. Review the MS/MSD recoveries in conjunction with other QC data such as surrogate recoveries and note the results in the validation narrative. If MS/MSD recoveries are out of specification and sample concentration is >5 times the spike concentration, no qualification is required, otherwise qualify results as follows: Qualify positive results as estimated (J) in all samples if associated surrogates are also out of specification. The qualification shall only be done on samples of similar matrix as the MS/MSD samples. If it is determined from the review that only the spiked samples are affected by the low recoveries, qualify only the results for the spiked sample as described above. If it is determined from the review that out of specification MS/MSD recoveries are indicative of systematic problems in the laboratory such as sample preparation or sample-specific matrix interferences this must be noted in the validation narrative along with the potential affect on the sample results.

5.3 PERFORMANCE AUDIT SAMPLES

Are performance audit sample results within the acceptance limits?	Yes	No	N/A

ACTION: Note the results of the performance audit samples in the validation narrative.

6. PRECISION

6.1 MATRIX SPIKE/MATRIX SPIKE DUPLICATE SAMPLES

Are the RPD values within specification? Yes No N/A

ACTION: Review the MS/MSD results in conjunction with other QC data such as field duplicates and note the results in the validation narrative. If MS/MSD RPD values are out of specification and sample results are >5xCRQL qualify positive results as estimated (J). If it is determined from the review that out of specification MS/MSD results are indicative of systematic problems in the laboratory such as sample preparation or sample-specific matrix interferences this must be noted in the validation narrative along with the potential affect on the sample results.

6.2 FIELD DUPLICATE SAMPLES

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

ACTION: Note the results of the field duplicate samples in the validation narrative.

6.3 FIELD SPLIT SAMPLES

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

ACTION: Note the results of the field split samples in the validation narrative.

7. COMPOUND IDENTIFICATION AND QUANTITATION

7.1 COMPOUND IDENTIFICATION

Do positive results meet the retention time window criteria? Yes No N/A

Were positive results analyzed on disimilar columns? Yes No N/A

If dieldrin and DDE were reported was a 3% OV-1 column used for confirmation (2/88 SOW data only)? Yes No N/A

Do retention times and relative peak height ratios match the expected patterns for multipeak compounds (PCB, toxaphene or chlordane)? Yes No N/A

Has GC/MS confirmation been conducted on sample extract concentrations > 10 ppm? Yes No N/A

ACTION: If positive results do not meet the retention time criteria qualify all detected results as nondetects as follows: If the misidentified peak is outside the retention time windows and no interferences are noted report the CRQL and if the misidentified peak interferes with a target peak then the report value is qualified as estimated and nondetected (UJ). If positive results were not confirmed on disimilar columns, reject affected results (R). If a 3% OV-1 was used to confirm dieldrin and DDE, reject the affected data (R). If PCB, chlordane or toxaphene identification is questionable qualify the results as presumptive and estimated (NJ). If GC/MS confirmation was not conducted contact the laboratory for explanation and note in the validation narrative.

7.2 REPORTED RESULTS AND QUANTITATION LIMITS

Are results and quantitation limits calculated properly?	Yes	No	N/A
Has the laboratory reported the sample quantitation limits within 5xCRQL values?	Yes	No	N/A

ACTION: If results and quantitation limits are in error contact the laboratory for clarification and note in the validation narrative.

8. OVERALL ASSESSMENT AND SUMMARY

Has the laboratory conducted the analysis in accordance with the analytical SOW?	Yes	No	N/A
Were project specific data quality objectives met for this analysis?	Yes	No	N/A

ACTION: Summarize all the data qualifications and complete the data validation narrative as specified in Section 10.0 of the data validation requirements.

COMMENTS (attach additional sheets as necessary):

VOLATILE ORGANIC DATA VALIDATION CHECKLIST - FORM A-1

PROJECT:	REVIEWER:	DATE:
LABORATORY:	CASE:	SDG:
SAMPLES/MATRIX: B00HC5 (water)		
B00H C6 (")		
B00HD8 (")		

1. DATA PACKAGE COMPLETENESS

Review the data package for completeness and check off the items below. If any data review elements are missing contact the laboratory for submittal.

Data Package Item	Present?: Yes	No	N/A
Case Narrative	✓		
Data Summary	✓		
Chain-of-Custody	✓		
QC Summary			
Surrogate report	✓		
MS/MSD report	✓	✓	
Blank summary report	✓		
GC/MS tuning report (12-24-91)(12-30-91)(1-2-92)(12-14-91)(12-23-91)	✓		
Internal standard summary report	✓		
Sample Data			
Sample reports	✓		
TIC reports for each sample	✓		
RIC reports for all samples	✓		
Raw and corrected spectra for all detected results	✓		
Raw and corrected library search data for all reported TIC	✓		
Quantitation and calculation data for all TIC		✓	
Standards Data			
Initial calibration report (12-24-91)(12-30-91)(12-14-91)	✓		
RIC and quantitation reports for initial calibration	✓		
Continuing calibration reports (12-24-91)(1-2-92)(12-23-91)	✓		
RIC and quantitation reports for cont. calibrations	✓		
Internal standard summary report	✓		
Raw QC Data			
Tuning report, spectra and mass lists	✓		
Blank analysis reports	✓		
TIC reports for all blanks	✓		
RIC and quantitation reports for blanks	✓		
Raw and corrected spectra for all detected results in blanks	✓		
Raw and corrected library search data for all reported TIC	✓		

Data Package Item	Present?: Yes	No	N/A
Quantitation and calculation data for all TIC	✓		
MS/MSD report forms	✓		
RIC and quantitation reports for MS/MSD	✓		
Additional Data			
Moisture/% solids data sheets		✓	
Reduction formulae		✓	
Instrument time logs		✓	
Chemist notebook pages		✓	
Sample preparation sheets		✓	

2. HOLDING TIMES

Complete the holding time summary form listing all samples and dates of collection and analysis.

Were all samples analyzed within holding time? Yes No N/A

ACTION: If any holding times were exceeded, but not by greater than a factor of two, qualify associated samples as estimated (J for detects or UJ for nondetects), otherwise reject all nondetects (R) and qualify all associated detects as estimated (J).

3. INSTRUMENT CALIBRATION, TUNING AND PERFORMANCE CHECKS

3.1 GC/MS TUNING AND PERFORMANCE CHECKS

Is a bromofluorobenzene tune report present for each applicable 12-h period? Yes No N/A

Do all tunes on all instruments meet the tuning criteria? Yes No N/A

Do all tunes on all instruments meet the expanded criteria? Yes No N/A

Has the laboratory made any calculation or transciption errors? Yes No N/A

Have the proper significant figures been reported? Yes No N/A

ACTION: If the mass calibration is out of specification but within the expanded criteria, qualify associated data as estimated (J for detects or UJ for nondetects). If all tuning criteria are missed, qualify all associated data as unusable (R).

3.2 INITIAL CALIBRATION

Is an initial calibration report provided for all instruments? Yes No N/A

Are all RSD values $\leq 30\%$ (2/88 SOW)? Yes No N/A

Are all RRF values ≥ 0.05 (2/88 SOW)? Yes No N/A

Are all applicable RSD values ≤20.5% (3/90 SOW)?	Yes	No	N/A
Are all applicable RSD values ≤40% (3/90 SOW)?	Yes	No	N/A
Are all applicable RRF values within SOW limits (3/90 SOW)?	Yes	No	N/A
Are all erratic performance compound RRF values ≥0.01 (3/90 SOW)?	Yes	No	N/A

ACTION: With the exception of compounds that exhibit erratic performance and making allowances for up to two TCL compounds, if any RRF value is out of specification qualify all detected results for the particular compound as estimated (J) and all nondetects as unusable (R). Making allowances for up to two TCL compounds, if any RSD value is out of specification qualify all associated data as estimated (J for detects or UJ for nondetects).

3.3. CONTINUING CALIBRATION

Is a continuing calibration report present for all 12-h periods in which associated samples were analyzed?	Yes	No	N/A
Are all RRF values ≥0.05 (2/88 SOW)?	Yes	No	N/A
Are all %D values ≤25% (2/88 or 3/90 SOW)?	Yes	No	N/A
Are all %D values ≤40% (3/90 SOW)?	Yes	No	N/A
Are all RRF values within SOW limits (3/90 SOW)?	Yes	No	N/A
Are all erratic performance compound RRF values ≥0.01 (3/90 SOW)?	Yes	No	N/A

ACTION: With the exception of compounds that exhibit erratic performance and making allowances for up to two TCL compounds, if any RRF value is out of specification qualify all associated detected results as estimated and all nondetects as unusable (R). Making allowances for up to two TCL compounds, if any %D is out of specification, qualify all associated results as estimated (J for detects or UJ for nondetects).

4. BLANKS

4.1 LABORATORY BLANKS

Has the laboratory conducted a method blank analysis per matrix for every 12-h period in which samples were analyzed?	Yes	No	N/A
Are TCL compounds present in the laboratory blanks?	Yes	No	N/A

ACTION: Qualify all sample results ≤10 time the highest blank concentration for the common laboratory contaminants, as nondetects (U) or at the SQL if the result is <CRQL. Qualify all remaining sample results ≤5 times the blank concentration in similar fashion.

4.2. FIELD BLANKS

Are TCL compounds present in the field blanks? Yes No N/A

ACTION: Qualify all detected sample results ≤ 5 times the amount in any valid field blank as nondetects (U) and note the field blank results in the validation narrative.

5. ACCURACY

5.1 SURROGATE/SYSTEM MONITORING COMPOUND RECOVERY

Are any surrogate recoveries out of specification? Yes No N/A

Are any surrogate recoveries < 10%? Yes No N/A

Are any method blank surrogate recoveries out of specification? Yes No N/A

ACTION: Qualify all associated sample results as estimated (J for detects or UJ for nondetects) for surrogates out of specification but > 10%. Qualify all associated positive sample results as estimated (J) and all nondetect results as unusable (R) for all surrogates below 10%. If method blank surrogates are out of specification and the associated sample surrogates are acceptable no qualification is necessary, however, the laboratory should be contacted for an explanation.

5.2 MATRIX SPIKE RECOVERY

Has an MS/MSD analysis been conducted per matrix in the sample group? Yes No N/A

Are MS/MSD recoveries within specification? Yes No N/A

Are there any calculation errors? Yes No N/A

ACTION: If an MS/MSD analysis has not been conducted contact the laboratory for an explanation. Review the MS/MSD recoveries in conjunction with other QC data such as surrogate recoveries and note the results in the validation narrative. If MS/MSD recoveries are out of specification and sample concentration is > 5 times the spike concentration, no qualification is required, otherwise qualify results as follows: Qualify positive results for the specific class of compound (aromatics and non-aromatics) as estimated (J) in all samples if associated surrogates are also out of specification. The qualification shall only be done on samples of similar matrix as the MS/MSD samples. If it is determined from the review that only the spiked samples are affected by low recoveries, qualify only the results for the spiked sample as described above. If it is determined from the review that out of specification MS/MSD recoveries are indicative of systematic problems in the laboratory such as sample preparation or sample-specific matrix interferences this must be noted in the validation narrative along with the potential affect on the sample results.

5.3 PERFORMANCE AUDIT SAMPLES

Are the performance audit sample results within the acceptance limits? Yes No N/A

ACTION: Note the results of the performance audit sample in the validation narrative.

6. PRECISION

6.1 MATRIX SPIKE/MATRIX SPIKE DUPLICATES

Are RPD values within specification? Yes No N/A

Are there any calculation errors? Yes No N/A

ACTION: Review the MS/MSD results in conjunction with other QC data such as field duplicates and note the results in the validation narrative. If MS/MSD RPDs are out of specification and sample results are >5xCRQL qualify positive results for the specific class of compound (aromatics and non-aromatics) as estimated (J). If it is determined from the review that out of specification MS/MSD results are indicative of systematic problems in the laboratory such as sample preparation or sample-specific matrix interferences this must be noted in the validation narrative along with the potential affect on the sample results.

6.2 FIELD DUPLICATE SAMPLES

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

ACTION: Note the results of the field duplicate samples in the validation narrative.

6.3 FIELD SPLIT SAMPLES

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

ACTION: Note the results of the field split samples in the validation narrative.

7. SYSTEM PERFORMANCE

7.1 INTERNAL STANDARDS PERFORMANCE

Are any internal standard area counts outside the acceptance limits? Yes No N/A

Are retention times for any internal standard outside the ±30 second windows established by the most recent calibration check? Yes No N/A

ACTION: If the area counts are outside the acceptance limits qualify all associated results as estimated (J for detects or UJ for nondetects). If it is determined from the review that out of specification area counts and relative retention times are indicative of systematic problems within the laboratory the reviewer may consider rejection of all affected sample data (R).

8. COMPOUND IDENTIFICATION AND QUANTITATION

8.1 COMPOUND IDENTIFICATION

Are detected compounds within ±0.06 relative retention time units of the associated calibration standard?	Yes	No	N/A
Are all ions at a relative intensity of ≥10% in the standard spectra present in the sample spectra?	Yes	No	N/A
Do the relative intensities between the standard and sample spectra agree within 20%?	Yes	No	N/A
Have all ions > 10% in the sample spectra that are not present in the standard spectra been reviewed for possible background contamination?	Yes	No	N/A
Are molecular ions present in the reference specrum present in the sample spectrum?	Yes	No	N/A

ACTION: If compound identification is in error and retention time and mass spectral criteria are exceeded qualify all affected positive results as unusable (R). If cross-contamination between analyses is suspected, qualify affected data as unusable (R). Note the results in the validation narrative.

8.2 REPORTED RESULTS AND QUANTITATION LIMITS

Has the laboratory used the correct RRF values and internal standard(s) for quantitation?	Yes	No	N/A
Are results and quantitation limits calculated properly?	Yes	No	N/A
Has the laboratory reported the sample quantitation limits within 5xCRQL values?	Yes	No	N/A

ACTION: If the results and quantitation limits are in error contact the laboratory for clarification and note in the validation narrative.

8.3 TENTATIVELY IDENTIFIED COMPOUNDS (TIC)

Has the laboratory conducted a spectral library search on all candidate TIC peaks in accordance with the analytical SOW?	Yes	No	N/A
Has the laboratory properly identified and coded all TIC?	Yes	No	N/A

ACTION: If the laboratory has failed to search the minimum number of TIC peaks in the chromatogram contact the laboratory for submittal of the required data. Qualify as nondetects (U) all TIC compounds present in samples and blanks using the review criteria specified in the validation requirements. If TIC identification is in error sample results should be qualified as nondetects (U) or unusable (R). If TIC identifications are judged valid, qualify the results as presumptive and estimated (JN).

9. OVERALL ASSESSMENT AND SUMMARY

Has the laboratory conducted the analysis in accordance with the analytical SOW?	Yes	No	N/A
Were project specific data quality objectives met for this analysis?	Yes	No	N/A

ACTION: Summarize all the data qualifications recommended in the foregoing sections, and complete the data validation narrative according to the requirements of Section 10.0 of the data validation requirements.

COMMENTS (attach additional sheets as necessary):

PESTICIDE/PCB DATA VALIDATION CHECKLIST - FORM A-3

PROJECT: 300-FF-1 2175	REVIEWER: SS	DATE: 5-26-92
LABORATORY: TMA / 1241	CASE: 12-066	SDG:
SAMPLES/MATRIX: BGS 4C5 (water)		
BGS 4C6 (water)		

1. DATA PACKAGE COMPLETENESS

Review the data package for completeness and check off the items below. If any data review elements are missing contact the laboratory for resubmittal.

Data Package Item	Present?: Yes	No	N/A
Case Narrative	✓		
Data Summary	✓		
Chain-of-Custody	✓		
QC Summary			
Surrogate report	✓		
MS/MSD report	✓	✓	
Blank summary report	✓		
Sample Data			
Sample reports	✓		
Chromatograms	✓		
GC integration reports	✓		
Worksheets		✓	
UV traces from GPC		✓	
GC/MS confirmation spectra		✓	
Standards Data			
Pesticides Evaluation Standards Summary	✓		
Pesticides/PCB Standards Summary	✓		
Pesticides/PCB identification		✓	
Pesticides standard chromatograms	✓		
Raw QC Data			
Blank analysis report forms and chromatograms	✓		
MS/MSD report forms and chromatograms		✓	

Data Package Item	Present?: Yes	No	N/A
Additional Data			
Moisture/% solids data sheets	___	✓	___
Reduction formulae	___	✓	___
Instrument time logs	___	✓	___
Chemist notebook pages	___	✓	___
Sample preparation sheets	___	✓	___

2. HOLDING TIMES

Were all samples extracted within holding time? Yes No N/A

Were all samples analyzed within holding time? Yes No N/A

ACTION: If any holding times were exceeded, but not by greater than a factor of two, qualify associated samples as estimated (J for detects or UJ for nondetects), otherwise reject all nondetects (R) and qualify all associated detects as estimated (J).

3. INSTRUMENT PERFORMANCE AND CALIBRATIONS

3.1 INSTRUMENT PERFORMANCE (2/88 SOW)

Are DDT retention times greater than 12 minutes? Yes No N/A

ACTION: If DDT retention time is $\leq$12 minutes and resolution is <25% qualify associated data as unusable (R).

Is resolution between DDT peaks acceptable? Yes No N/A

ACTION: If resolution between DDT peaks is unacceptable qualify associated data as unusable (R).

Do all pesticide standards elute within the established retention time windows? Yes No N/A

ACTION: If the standards do not meet the retention time criteria and peaks are not present near or within the retention time windows no sample qualification is necessary. If peaks are near or within the retention time windows and the standards and matrix spikes do not fall within the expanded retention time windows calculated according to the validation requirements, qualify all associated sample results from the last in-control point as unusable (R).

Are DDT breakdowns $\leq$20%? Yes No N/A

ACTION: If the DDT percent breakdown exceeds 20%, qualify all detected results for DDT as estimated (J) and all nondetects as unusable (R) if DDD and DDE are detected. In addition qualify all results for DDD or DDE as presumptive and estimated (NJ).

Are endrin breakdowns $\leq$20%? Yes No N/A

ACTION: If the endrin breakdown exceeds 20%, qualify all detected results for endrin as estimated (J) and all nondetects as unusable (R) if endrin aldehyde or endrin ketone are detected. In addition, qualify all results for endrin ketone as presumptive and estimated (NJ).

Are DBC retention time differences within specification?	Yes	No	N/A

ACTION: If DBC %D values are outside the limits and the shift is ocurring repeatedly in samples and standards, qualify affected sample results as unusable (R).

3.2 CALIBRATIONS (2/88 SOW)

Are RSD values for aldrin, endrin, DDT and DBC ≤10%?	Yes	No	N/A
Have all standards been analyzed within 72 h of any sample?	Yes	No	N/A
Has a 3-point calibration been conducted for DDT or toxaphene?	Yes	No	N/A
Have all standards been analyzed at the start of each 72-h sequence?	Yes	No	N/A
Have evaluation standards A, B, and C been analyzed within 72 h of any sample?	Yes	No	N/A
Has the confirmation standard mix been analyzed after every five samples?	Yes	No	N/A
Has evaluation standard B analyzed every 10 samples?	Yes	No	N/A
Are %D values for initial and subsequent standards ≤15% for quantitation standards and ≤20% for confirmation standards?	Yes	No	N/A

ACTION: If the RSD criteria were exceeded or three point calibrations not conducted qualify associated detects as estimated (J). If all standards were not analyzed at the beginning of each 72-h sequence qualify associated data as unusable (R). If the confirmation standards were not analyzed properly qualify associated detects as estimated (J). If the continuing calibration criteria were not met qualify associated quantitation data as estimated (J).

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

Is peak resolution acceptable? Yes No N/A

ACTION: If the resolution criteria are not met, reject positive sample results generated after initial calibration (R).

Are DDT and endrin breakdowns ≤20.0% Yes No N/A

ACTION: If the breakdown criteria are not met qualify sample results as described in Section 5.3.1 of the validation requirements.

Are single component target compounds in the PEMs, INDA, INDB and the calibration standards within the retention time windows? Yes No N/A

ACTION: If the retention time criteria are not met and no peaks are present in the samples within two times the retention time windows (±0.04, ±0.05 for methoxychlor), no qualification is necessary. If peaks are present in samples within the retention time window a review is made of the raw data to determine expanded retention time windows (see Section 5.3.1 of the validation requirements). If all standards and matrix spikes fall within the expanded windows then no qualification of sample results is necessary. If all standards and matrix spikes do not fall within the expanded windows then all affected sample results are qualified as unusable (R).

Are the RPDs acceptable for the PEMs? Yes No N/A

ACTION: If the RPD criteria are not met qualify associated positive sample results as estimated (J).

Are the RSDs for the calibration factors < 10.0% (< 15.0% for the BHC series, DDT, endrin, and methoxychlor)? Yes No N/A

ACTION: If the RSD criteria are not met qualify associated positive sample results as estimated (J).

3.4 CALIBRATION VERIFICATION (3/90 SOW)

Have the analytical sequence requirements been met for the analysis of instrument blanks, PEMs, INDA and INDB mixes? Yes No N/A

ACTION: If the analytical sequence requirements are not followed and any of the resolution or retention time criteria listed below are exceeded, reject associated positive results (R).

Is peak resolution acceptable for PEMs, INDA and INDB mixes? Yes No N/A

ACTION: If the resolution criteria are not met reject positive sample results generated after a noncompliant standard analysis (R).

Are single component target compounds in the PEMs, INDA and INDB mixes within the retention time windows? Yes No N/A

ACTION: If the retention time criteria are not met and no peaks are present in the samples analyzed after the noncompliant standard within two times the retention time windows (±0.04, ±0.05 for methoxychlor), no qualification is necessary. If peaks are present in samples within the expanded windows rejected associated positive and nondetect results (R).

Are RPDs between the calculated and true amounts in the PEMs, INDA and INDB mixes ≤25.0%? Yes No N/A

ACTION: If the RPD criteria are not met qualify associated positive sample results as estimated (J).

Are DDT and endrin breakdowns in the PEMs ≤20.0% (≤30.0% total combined)? Yes No N/A

ACTION: If the breakdown criteria are not met qualify associated positive sample results in accordance with the criteria specified in Section 5.3.1.

4. BLANKS

4.1 LABORATORY BLANKS

Has the laboratory analyzed the method blanks at the required frequency? Yes No N/A

Has the laboratory analyzed a sulfur clean-up blank if required? Yes No N/A

Has the laboratory analyzed instrument blanks at the required frequency? Yes No N/A

Are target compounds present in the blanks? Yes No N/A

ACTION: Qualify all associated positive results as nondetects (U) that are <5 times the highest concentration in any acceptable blank.

4.2 FIELD BLANKS

Are target compounds present in the field blanks? Yes No N/A

ACTION: If target compounds are present in the field blanks qualify all positive sample results <5 times the highest valid field blank concentrations as nondetects (U) and note the results in the validation narrative.

5. ACCURACY

5.1 SURROGATE RECOVERY

Are any surrogate recoveries out of specification?	Yes	No	N/A
Do any samples show nondetects for surrogates?	Yes	No	N/A
Are any method blank surrogates out of specification?	Yes	No	N/A

ACTION: Qualify all associated sample results as estimated (J for detects and UJ for nondetects) for surrogates out of specification. If the surrogate was not detected (0% recovery) in the sample qualify associated nondetects as unusable (R). If method blank surrogates are out of specification and sample surrogates are acceptable, no qualification is required however, the laboratory should be contacted for an explanation.

5.2 MATRIX SPIKE RECOVERY

Has the laboratory analyzed a MS/MSD per matrix for the the sample group?	Yes	No	N/A
Are MS/MSD recoveries within specification?	Yes	No	N/A
Are there any calculation or transcription errors?	Yes	No	N/A

ACTION: If MS/MSD analyses have not been conducted contact the laboratory for clarification. Review the MS/MSD recoveries in conjunction with other QC data such as surrogate recoveries and note the results in the validation narrative. If MS/MSD recoveries are out of specification and sample concentration is >5 times the spike concentration, no qualification is required, otherwise qualify results as follows: Qualify positive results as estimated (J) in all samples if associated surrogates are also out of specification. The qualification shall only be done on samples of similar matrix as the MS/MSD samples. If it is determined from the review that only the spiked samples are affected by the low recoveries, qualify only the results for the spiked sample as described above. If it is determined from the review that out of specification MS/MSD recoveries are indicative of systematic problems in the laboratory such as sample preparation or sample-specific matrix interferences this must be noted in the validation narrative along with the potential affect on the sample results.

5.3 PERFORMANCE AUDIT SAMPLES

Are performance audit sample results within the acceptance limits?	Yes	No	N/A

ACTION: Note the results of the performance audit samples in the validation narrative.

6. PRECISION

6.1 MATRIX SPIKE/MATRIX SPIKE DUPLICATE SAMPLES

Are the RPD values within specification? Yes No N/A

ACTION: Review the MS/MSD results in conjunction with other QC data such as field duplicates and note the results in the validation narrative. If MS/MSD RPD values are out of specification and sample results are >5xCRQL qualify positive results as estimated (J). If it is determined from the review that out of specification MS/MSD results are indicative of systematic problems in the laboratory such as sample preparation or sample-specific matrix interferences this must be noted in the validation narrative along with the potential affect on the sample results.

6.2 FIELD DUPLICATE SAMPLES

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

ACTION: Note the results of the field duplicate samples in the validation narrative.

6.3 FIELD SPLIT SAMPLES

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

ACTION: Note the results of the field split samples in the validation narrative.

7. COMPOUND IDENTIFICATION AND QUANTITATION

7.1 COMPOUND IDENTIFICATION

Do positive results meet the retention time window criteria? Yes No N/A

Were positive results analyzed on disimilar columns? Yes No N/A

If dieldrin and DDE were reported was a 3% OV-1 column used for confirmation (2/88 SOW data only)? Yes No N/A

Do retention times and relative peak height ratios match the expected patterns for multipeak compounds (PCB, toxaphene or chlordane)? Yes No N/A

Has GC/MS confirmation been conducted on sample extract concentrations >10 ppm? Yes No N/A

ACTION: If positive results do not meet the retention time criteria qualify all detected results as nondetects as follows: If the misidentified peak is outside the retention time windows and no interferences are noted report the CRQL and if the misidentified peak interferes with a target peak then the report value is qualified as estimated and nondetected (UJ). If positive results were not confirmed on disimilar columns, reject affected results (R). If a 3% OV-1 was used to confirm dieldrin and DDE, reject the affected data (R). If PCB, chlordane or toxaphene identification is questionable qualify the results as presumptive and estimated (NJ). If GC/MS confirmation was not conducted contact the laboratory for explanation and note in the validation narrative.

7.2 REPORTED RESULTS AND QUANTITATION LIMITS

Are results and quantitation limits calculated properly?	Yes	No	N/A
Has the laboratory reported the sample quantitation limits within 5xCRQL values?	Yes	No	N/A

ACTION: If results and quantitation limits are in error contact the laboratory for clarification and note in the validation narrative.

8. OVERALL ASSESSMENT AND SUMMARY

Has the laboratory conducted the analysis in accordance with the analytical SOW?	Yes	No	N/A
Were project specific data quality objectives met for this analysis?	Yes	No	N/A

ACTION: Summarize all the data qualifications and complete the data validation narrative as specified in Section 10.0 of the data validation requirements.

COMMENTS (attach additional sheets as necessary):

9613501.2383

0009

TMA Inc. REPORT Work Order # A1-12-069

Received: 12/13/91

Results by Sample

SAMPLE ID B01CF4 FRACTION 01A TEST CODE WCCLPS NAME Anions in Solids - WH232

Date & Time Collected 12/10/91 Category

ANIONS AND WET CHEMISTRY - SOLIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT
Fluoride	300	4.5	mg/Kg	1.0
Nitrite	300	<1.0	mg/Kg	1.0
Nitrate	300	8.2	mg/Kg	2.0
Sulfate	300	77	mg/Kg	10.0
pH	150.1	9.4	pH	NA
Ammonia	350	2.1	mg/Kg	0.5

FORM I

CJ Whitely
7/6

SAMPLE ID B01CF5 FRACTION 02A TEST CODE WCCLPS NAME Anions in Solids - WH232
Date & Time Collected 12/10/91 Category

ANIONS AND WET CHEMISTRY - SOLIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT
Fluoride	300	4.5 ✓	mg/Kg	1.0
Nitrite	300	<1.0	mg/Kg	1.0
Nitrate	300	6.5 ✓	mg/Kg	2.0
Sulfate	300	59 ✓	mg/Kg	10.0
pH	150.1	8.6 ✓	pH	NA
Ammonia	350	2.0 ✓	mg/Kg	0.5

FORM I

Page 4 TMA Inc. REPORT Work Order # A1-12-069
Received: 12/13/91 Results by Sample

SAMPLE ID B01CF5 MS FRACTION 02B TEST CODE WCQCS NAME Quality Control Summary
Date & Time Collected 12/10/91 Category

SPIKE QC SUMMARY

ANALYSIS	SAMPLE ID	SAMPLE RESULT	SPIKE RESULT	AMOUNT ADDED	% R
Fluoride	B01CF5	4.5	103.6 ✓	100.00	99.1 ✓
Nitrite	B01CF5	<1.0	104.3 ✓	100.00	104.3 ✓
Nitrate	B01CF5	6.5	101.3 ✓	100.00	94.8 ✓
Sulfate	B01CF5	59	327 ✓	300.00	89.3 ✓

FORM V

7/6 [illegible]

Page 6 TMA Inc. REPORT Work Order # A1-12-069
Received: 12/13/91 Results by Sample

SAMPLE ID B01CF6 FRACTION 03A TEST CODE WCCLPS NAME Anions in Solids - WM232
Date & Time Collected 12/10/91 Category

ANIONS AND WET CHEMISTRY - SOLIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT
Fluoride	300	6.0 ✓	mg/Kg	1.0
Nitrite	300	<1.0	mg/Kg	1.0
Nitrate	300	5.2 ✓	mg/Kg	2.0
Sulfate	300	37 ✓	mg/Kg	10.0
pH	150.1	9.4 ✓	pH	NA
Ammonia	350	2.2 ✓	mg/Kg	0.5

FORM I

7/6
CRitz

Received: 12/13/91

Results by Sample

SAMPLE ID B01CF7 FRACTION 04A TEST CODE WCCLPS NAME Anions in Solids - WH232

Date & Time Collected 12/10/91 Category

ANIONS AND WET CHEMISTRY - SOLIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT
Fluoride	300	4.6 ✓	mg/Kg	1.0
Nitrite	300	<1.0	mg/Kg	1.0
Nitrate	300	5.5 ✓	mg/Kg	2.0
Sulfate	300	37 ✓	mg/Kg	10.0
pH	150.1	8.8 ✓	pH	NA
Ammonia	350	1.8 ✓	mg/Kg	0.5

FORM I

7/6
C Banks

9613501.2388

0015

 TMA Inc. REPORT Work Order # A1-12-069

Received: 12/13/91 Results by Sample

SAMPLE ID B01CF7 Duplicate FRACTION 04C TEST CODE WCQCD NAME Quality Control Summary

Date & Time Collected 12/10/91 Category

DUPLICATE QC SUMMARY

ANALYSIS	SAMPLE ID	SAMPLE RESULT	DUPL. RESULT	RPD
Fluoride	B01CF7	4.6	4.0 ✓	14.0 ✓
Nitrite	B01CF7	<1.0	<1.0	
Nitrate	B01CF7	5.5	5.4 ✓	1.8 ✓
Sulfate	B01CF7	37	37 ✓	0.0 ✓

FORM VI

7/6
C. Dahlts

9613501.2389

Received: 12/13/91 Results by Sample

SAMPLE ID B01CF5 Duplicate FRACTION 02C TEST CODE WCQCD NAME Quality Control Summary
Date & Time Collected 12/10/91 Category

DUPLICATE QC SUMMARY

ANALYSIS	SAMPLE ID	SAMPLE RESULT	DUPL. RESULT	RPD
pH	B01CF5	8.6	8.5 ✓	1.2 ✓
Ammonia	B01CF5	2.0 ✓	2.1 ✓	4.9 ✓

FORM VI

7/6

9615501.2390

Received: 12/13/91

TMA Inc. REPORT
Results by Sample

Work Order # A1-12-069
0016

SAMPLE ID B01CF8 FRACTION 05A TEST CODE VCCLPS NAME Anions in Solids - VM232
Date & Time Collected 12/10/91 Category

ANIONS AND WET CHEMISTRY - SOLIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT
Fluoride	300	<1.0 ✓	mg/Kg	1.0
Nitrite	300	<1.0 ✓	mg/Kg	1.0
Nitrate	300	4.7 ✓	mg/Kg	2.0
Sulfate	300	32 ✓	mg/Kg	10.0
pH	150.1	8.9 ✓	pH	NA
Ammonia	350	2.4 ✓	mg/Kg	0.5

FORM I

7/6 Chris

ION CHROMATOGRAPHIC 5 POINT CALIBRATION
12/27/91
CONCENTRATION IN 100 MLS INJECTION SOLN *
100 uMHOs, full scale

	F CONC, * mg/L	AREA	CALC AREA	RT	mg/L	mg/L DIFF
1	0	0	76537		-0.17	0.17
2	0.1	224352	121270	0.89	0.33	-0.23
3	0.5	243915	300205	0.89	0.38	0.12
4	2.0	959832	971209	0.89	1.98	0.02
5	5.0	2387342	2313217	0.89	5.16	-0.16
6	10.0	4516894	4549897	0.89	9.91	0.09

Avg Rt = 0.89 Sd = 0.148

Area = a x (mg/L) + b

Regression Output:

Constant	b = 76536.
Std Err of Y Est	81187.
R Squared	0.9983
No. of Observations	6
Degrees of Freedom	4
X Coefficient(s)	447336 = a
Std Err of Coef.	9214

mg/L = a x (AREA) + b

Regression Output:

Constant	b = -0.165 mg/L
Std Err of Y Est	0.1813
R Squared	0.9983 0.9992 = R
No. of Observations	6
Degrees of Freedom	4
X Coefficient(s)	0.000002 = a
Std Err of Coef.	0.000000

ION CHROMATOGRAPHIC 5 POINT CALIBRATION
12/27/91
CONCENTRATION IN 100 MLS INJECTION SOLN *
100 uMHOs, full scale

	N(NO2) CONC, * mg/L	AREA	CALC AREA	RT	mg/L	mg/L DIFF
1	0	0	-32751		0.1	-0.05
2	0.1	46183	29298	1.55	0.1	-0.03
3	1.0	541436	587740	1.54	0.9	0.07
4	5.0	3031981	3069704	1.55	4.9	0.06
5	10.0	6228685	6172160	1.55	10.1	-0.09
6	15.0	9252480	9274615	1.56	15.0	0.04

Avg Rt = 1.55 Sd = 0.061

Area = a x (mg/L) + b

Regression Output:

Constant	-32751
Std Err of Y Est	46394.
R Squared	0.9998
No. of Observations	6
Degrees of Freedom	4
X Coefficient(s)	620491.0
Std Err of Coef.	3367.532

mg/L = a x (AREA) + b

Regression Output:

Constant	b = 0.0533 mg/L
Std Err of Y Est	0.0747
R Squared	0.9998 0.9999 = R
No. of Observations	6
Degrees of Freedom	4
X Coefficient(s)	0.000001 = a
Std Err of Coef.	0.000000

ION CHROMATOGRAPHIC 5 POINT CALIBRATION
12/27/91
CONCENTRATION IN 100 MLS INJECTION SOLN *
100 uMHOs, full scale

	N(NO3) CONC, * mg/L	AREA	CALC AREA	RT	mg/L	mg/L DIFF
1	0	0	-298212		0.4	-0.37
2	0.2	111429	-131198	2.59	0.5	-0.30
3	2.0	1273372	1371931	2.55	1.9	0.11
4	5.0	3534473	3877147	2.53	4.6	0.41
5	10.0	7667097	8052505	2.48	9.5	0.47
6	20.0	16689025	16403223	2.43	20.3	-0.31

Avg Rt = 2.516 Sd = 0.347

Area = a x (mg/L) + b

Regression Output:

Constant	-3E+05
Std Err of Y Est	355372
R Squared	0.9975
No. of Observations	6
Degrees of Freedom	4

X Coefficient(s) 835071.7
Std Err of Coef. 20572.40

mg/L = a x (AREA) + b

Regression Output:

Constant	b = ~~0.3712~~ mg/L
Std Err of Y Est	0.4250
R Squared	0.9975 0.9988 = R
No. of Observations	6
Degrees of Freedom	4

X Coefficient(s) 0.000001 =a
Std Err of Coef. 0.000000

ION CHROMATOGRAPHIC 5 POINT CALIBRATION
12/27/91
CONCENTRATION IN 100 MLS INJECTION SOLN *
100 uMHOs, full scale

	SO4 CONC, * mg/L	AREA	CALC AREA	RT	mg/L	mg/L DIFF
1	0	0	-441350		1.9	-1.90
2	1.0	167247	-200426	4.57	2.6	-1.60
3	10.0	1831414	1967897	4.56	9.5	0.51
4	20.0	3907173	4377144	9.17	18.1	1.92
5	50.0	10991815	11604885	4.5	47.4	2.59
6	100.0	24061622	23651121	4.45	101.5	-1.52
			Avg Rt =	5.45	Sd =	1.79

Area = a x (mg/L) + b

Regression Output:

Constant	-4E+05
Std Err of Y Est	527693
R Squared	0.9974
No. of Observations	6
Degrees of Freedom	4

X Coefficient(s)	240924.7
Std Err of Coef.	6076.754

mg/L = a x (AREA) + b

Regression Output:

Constant	b = 1.9038	mg/L
Std Err of Y Est	2.1875	
R Squared	0.9974	0.9987 = R
No. of Observations	6	
Degrees of Freedom	4	

X Coefficient(s)	0.000004 = a
Std Err of Coef.	0.000000

9613501.2395

0029

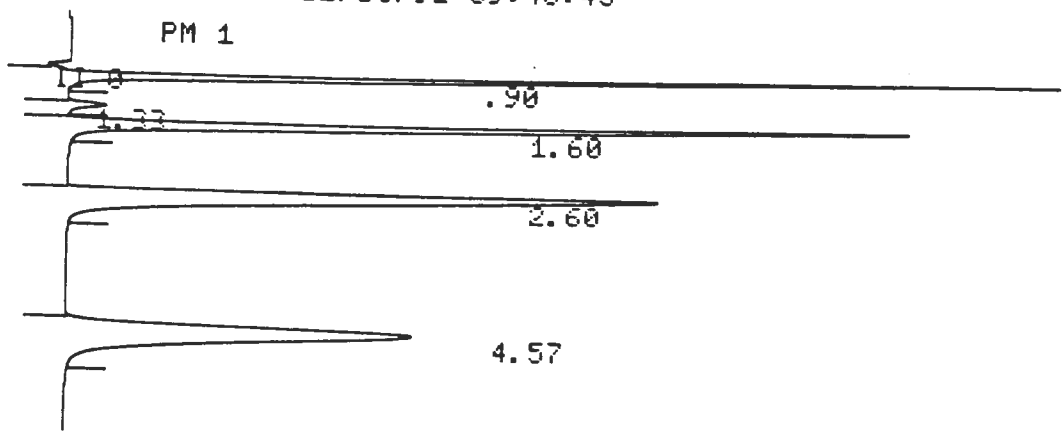
SAMPLE TABLE...
ANALYST:AN=" RL
INJECTIONS/SAMPLE:RA=
SAMPLES BETWEEN CALIB:CI=
CONC UNITS:CU=" MG/KG

SAM IDX	NAME	SAM AMT	SCALE FACTOR
SI= 1	SN=" 1206902BMS	SA= 10	XF= 100
SI=			

END OF DIALOG

CHANNEL A INJECT 12/30/91 09:40:45

PM 1



12/30/91 09:40:45 CH= "A" PS= 1.

FILE 1. METHOD 5. RUN 39 INDEX 1

ANALYST: RL

SAMPLE 1 1206902BMS

SA	IS	XF
10.	0.	100.

NAME	MG/KG	RT	AREA	BC	RF
F	103.621	0.9	4704694	01	45402.901
CL	11.032	1.33	266777	01	24182.107
NNO2	104.292 ✓	1.6	6438459	01	61734.927
NNO3	101.276 ✓	2.6	8159097	01	80562.986
SO4	327.061 ✓	4.57	7438357	01	22743.027
TOTALS	647.282		27007384		

Spike level
F 100 mg/kg
N-NO2 100 mg/kg
N-NO3 100 mg/kg
SO4 300 mg/kg

9613501.2396

12-069

Hart Crowser
J-2978-40

APPENDIX Q
DATA VALIDATION DOCUMENTATION

Thermo Analytical Laboratories

Data Package A112069

Conventional Wet Chemistry Analyses

9613501.2397

THIS APPENDIX CONSISTS OF FIVE ATTACHMENTS

Attachment 1 - Glossary of Data Qualifiers

This attachment provides a glossary explaining all data qualifiers applied as a result of the validation.

Attachment 2 - As Received Laboratory Sample Concentration Reports

This attachment provides a copy of the as-received sample concentration reports. This may be a tabular summary similar to that provided in Attachment 4, or may be a copy of the laboratory reports (e.g., Form I).

Attachment 3 - Summary of Data Qualifications (Form B-7)

This attachment provides a complete summary of all qualifications applied as a result of the validation.

Attachment 4 - As Qualified Data Summary

This attachment provides a tabular data summary of all data qualified from the validation.

Attachment 5 - Data Review Supporting Documentation

This attachment provides copies of the data validation checklists, data summary forms, telephone contact memoranda and other documentation completed as a result of the data validation.

9613501.2398

ATTACHMENT 1

Glossary of Data Qualifiers

U - Indicates the compound or analyte was analyzed for and not detected. The value reported is the sample quantitation limit corrected for sample dilution and moisture content by the laboratory.

UJ - Indicates the compound or analyte was analyzed for and not detected. Due to quality control deficiencies identified during data validation the value reported may not accurately reflect the sample quantitation limit.

J - Indicates the compound or analyte was analyzed for and detected. The associated value is estimated but the data are useable for decision making processes.

R - Indicates the compound or analyte was analyzed for and due to an identified quality control deficiency the data are unusable.

NJ - Indicates the presumptive evidence of a compound at an estimated value.

N - Indicates presumptive evidence of a compound.

9613501.2399

ATTACHMENT 2

As Received Laboratory Sample Concentration Reports

9615501_2400

0009

 TMA Inc. REPORT Work Order # A1-12-069

Received: 12/13/91 Results by Sample

SAMPLE ID B01CF4 FRACTION 01A TEST CODE WCCLPS NAME Anions in Solids - WH232

Date & Time Collected 12/10/91 Category

ANIONS AND WET CHEMISTRY - SOLIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT
Fluoride	300	4.5	mg/Kg	1.0
Nitrite	300	<1.0	mg/Kg	1.0
Nitrate	300	8.2	mg/Kg	2.0
Sulfate	300	77	mg/Kg	10.0
pH	150.1	9.4	pH	NA
Ammonia	350	2.1	mg/Kg	0.5

FORM I

Page 3 TMA Inc. REPORT Work Order # A1-12-069

Received: 12/13/91 Results by Sample

SAMPLE ID B01CF5 FRACTION 02A TEST CODE WCCLPS NAME Anions in Solids - WM232

Date & Time Collected 12/10/91 Category

ANIONS AND WET CHEMISTRY - SOLIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT
Fluoride	300	4.5	mg/Kg	1.0
Nitrite	300	<1.0	mg/Kg	1.0
Nitrate	300	6.5	mg/Kg	2.0
Sulfate	300	59	mg/Kg	10.0
pH	150.1	8.6	pH	NA
Ammonia	350	2.0	mg/Kg	0.5

FORM I

SAMPLE ID B01CF6 FRACTION 03A TEST CODE VCCLPS NAME Anions in Solids - WW232
Date & Time Collected 12/10/91 Category

ANIONS AND WET CHEMISTRY - SOLIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT
Fluoride	300	6.0	mg/Kg	1.0
Nitrite	300	<1.0	mg/Kg	1.0
Nitrate	300	5.2	mg/Kg	2.0
Sulfate	300	37	mg/Kg	10.0
pH	150.1	9.4	pH	NA
Ammonia	350	2.2	mg/Kg	0.5

FORM I

Received: 12/13/91

Results by Sample

SAMPLE ID B01CF7 FRACTION 04A TEST CODE WCCLPS NAME Anions in Solids - WM232

Date & Time Collected 12/10/91 Category

ANIONS AND WET CHEMISTRY - SOLIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT
Fluoride	300	4.6	mg/Kg	1.0
Nitrite	300	<1.0	mg/Kg	1.0
Nitrate	300	5.5	mg/Kg	2.0
Sulfate	300	37	mg/Kg	10.0
pH	150.1	8.8	pH	NA
Ammonia	350	1.8	mg/Kg	0.5

FORM I

9613501.2404

Received: 12/13/91

TMA Inc. REPORT
Results by Sample

Work Order # A1-12-069
0016

SAMPLE ID B01CF8 FRACTION 05A TEST CODE WCCLPS NAME Anions in Solids - WN232
Date & Time Collected 12/10/91 Category

ANIONS AND WET CHEMISTRY - SOLIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT
Fluoride	300	<1.0	mg/Kg	1.0
Nitrite	300	<1.0	mg/Kg	1.0
Nitrate	300	4.7	mg/Kg	2.0
Sulfate	300	32	mg/Kg	10.0
pH	150.1	8.9	pH	NA
Ammonia	350	2.4	mg/Kg	0.5

FORM I

9613501.2405

ATTACHMENT 3

Summary of Data Qualifications

DATA QUALIFICATION SUMMARY - FORM B-7

SDG:	REVIEWER: C Roberts	DATE: 7-6-92	PAGE 1 OF 1
COMMENTS: CASE 12-064 WET CHEMISTRY			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
AMMONIA AS N	R	B01CF4	NO CALIBRATION
		F5	DATA
		F6	
		F7	
		F8	
pH	J R	All	exceeded holding time
			No calibration curve
Anions	J (+) / UJ (-)	All	No ical run on
			sample day
Ammonia as N	J (+) / UJ (-)	All (B01CF4)	No MS spike
		(B01CF5)	submitted
		B01CF6	
		B01CF7	
		B01CF8	
Anions	J (+) / UJ (-)	All	No LCS submitted

9613501.2407

ATTACHMENT 4

As Qualified Data Summary

9613501.2408

0009

 TMA Inc. REPORT Work Order # A1-12-069

Received: 12/13/91 Results by Sample

SAMPLE ID B01CF4 FRACTION 01A TEST CODE WCCLPS NAME Anions in Solids - WH232

Date & Time Collected 12/10/91 Category

ANIONS AND WET CHEMISTRY - SOLIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT	
Fluoride	300	4.5	mg/Kg	1.0	J
Nitrite	300	<1.0	mg/Kg	1.0	UJ
Nitrate	300	8.2	mg/Kg	2.0	J
Sulfate	300	77	mg/Kg	10.0	J
pH	150.1	9.4	pH	NA	JK
Ammonia	350	2.1	mg/Kg	0.5	R

FORM I

Page 3 TMA Inc. REPORT Work Order # A1-12-069
Received: 12/13/91 Results by Sample

SAMPLE ID B01CF5 FRACTION 02A TEST CODE WCCLPS NAME Anions in Solids - WM232
Date & Time Collected 12/10/91 Category

ANIONS AND WET CHEMISTRY - SOLIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT	
Fluoride	300	4.5	mg/Kg	1.0	J
Nitrite	300	<1.0	mg/Kg	1.0	UJ
Nitrate	300	6.5	mg/Kg	2.0	J
Sulfate	300	59	mg/Kg	10.0	J
pH	150.1	8.6	pH	NA	J R
Ammonia	350	2.0	mg/Kg	0.5	R

FORM I

Page 6 TMA Inc. REPORT Work Order # A1-12-069
Received: 12/13/91 Results by Sample

SAMPLE ID B01CF6 FRACTION 03A TEST CODE WCCLPS NAME Anions in Solids - WM232
Date & Time Collected 12/10/91 Category

ANIONS AND WET CHEMISTRY - SOLIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT	
Fluoride	300	6.0	mg/Kg	1.0	J
Nitrite	300	<1.0	mg/Kg	1.0	UJ
Nitrate	300	5.2	mg/Kg	2.0	J
Sulfate	300	37	mg/Kg	10.0	J
pH	150.1	9.4	pH	NA	JR
Ammonia	350	2.2	mg/Kg	0.5	R

FORM I

SAMPLE ID B01CF7 FRACTION 04A TEST CODE WCCLPS NAME Anions in Solids - WH232
Date & Time Collected 12/10/91 Category

ANIONS AND WET CHEMISTRY - SOLIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT	
Fluoride	300	4.6	mg/Kg	1.0	J
Nitrite	300	<1.0	mg/Kg	1.0	UJ
Nitrate	300	5.5	mg/Kg	2.0	J
Sulfate	300	37	mg/Kg	10.0	J
pH	150.1	8.8	pH	NA	~~J~~ R
Ammonia	350	1.8	mg/Kg	0.5	R

FORM I

9613501.2412

Received: 12/13/91

TNA Inc. REPORT
Results by Sample

Work Order # A1-12-069
0016

SAMPLE ID B01CF8 FRACTION 05A TEST CODE UCCLPS NAME Anions in Solids - UM232
Date & Time Collected 12/10/91 Category

ANIONS AND WET CHEMISTRY - SOLIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT	
Fluoride	300	<1.0	mg/Kg	1.0	UJ
Nitrite	300	<1.0	mg/Kg	1.0	UJ
Nitrate	300	4.7	mg/Kg	2.0	J
Sulfate	300	32	mg/Kg	10.0	J
pH	150.1	8.9	pH	NA	JR
Ammonia	350	2.4	mg/Kg	0.5	R

FORM I

9613501.2413

ATTACHMENT 5

Data Review Supporting Documentation

WET CHEMISTRY DATA VALIDATION CHECKLIST - FORM A-7

PROJECT:	REVIEWER: SS	DATE: 5-19-92
LABORATORY: TMA/ARLI	CASE: 12-069	SDG:
SAMPLES/MATRIX: B01CF4 (soil)		
B01CF5 (")		
B01CF6 (")		
B01CF7 (")		
B01CF8 (")		

1. DATA PACKAGE COMPLETENESS

Review the data package for completeness and check off the items below. If any data review elements are missing contact the laboratory for submittal of the omitted data.

Data Package Item	Present?: Yes	No	N/A
Case Narrative	✓		
Cover Page	✓	✓	
Traffic Reports/Chain-of-Custody	✓		
Sample Analysis Data Report Forms	✓		
Standards Data	✓	✓	
QC Summary			
Blanks Summary Report Forms		✓	
Spike Sample Recovery Report Forms	✓		
Duplicate Sample Analysis Report Forms	✓		
Laboratory Control Sample Report Forms		✓	
Raw Data			
Ion Chromatograph Chromatograms	✓		
TOC and TOX Instrument Printouts	✓		
Laboratory Bench Sheets		✓	
Additional Data			
Laboratory Sample Preparation Logs	✓		
Instrument Run Logs	✓	✓	
Internal Laboratory Chain-of-Custory		✓	
Percent Solids Analysis Records		✓	
Reduction Formulae		✓	
Chemist Notebook Pages		✓	

2. HOLDING TIMES

Were all samples analyzed within holding times? Yes (NS) No N/A

pH past 14 days

Action: If any holding times were exceeded qualify all affected results as estimated (J for detects and UJ for nondetects).

3. INITIAL CALIBRATIONS

Were all instruments calibrated daily, each set-up time and were the proper number of standards used? Yes **No** N/A

Are the correlation coefficients ≥0.995? IC — **Yes** No **N/A** NO N-NH_3 CALIBRATION

Was a balance check conducted prior to the TDS analysis? Yes No **N/A**

Was the titrant normality checked? Yes No **N/A**

ACTION: Qualify all data as unusable (R) if reported from an analysis in which the above criteria were not met.

4. INITIAL AND CONTINUING CALIBRATION VERIFICATION

Have ICV and CCV been analyzed at the proper frequency? ~~Yes~~ AS **No** N/A

Are ICV and CCV percent recoveries within control? **Yes** No N/A

Are there calculation errors? Yes **No** N/A

ACTION: Qualify all affected data in accordance with the validation requirements.

5. LABORATORY BLANKS

Are target analytes present in the laboratory blanks? ~~Yes~~ AS No **N/A** - Ammonia as N

ACTION: Qualify all associated sample results for any analyte <5 times the amount in any laboratory blank as nondetected (U) and list the affected samples and analytes below.

6. FIELD BLANKS

Are target analytes present in the field blanks? Yes No **N/A** None submitted

ACTION: Qualify all sample results for any analyte <5 times the amount in any valid field blank as nondetected (U).

7. MATRIX SPIKE SAMPLE ANALYSIS

Are spike recoveries within the acceptance limits? **Yes** No N/A None submitted for ammonia

ACTION: If the sample concentration exceeds the spike concentration by a factor of 4 or more, and spike recoveries are outside the acceptance limits, no qualification is necessary. If spike recovery is outside the control limits and the sample results are >CRQL, qualify the data as estimated (J). If the spike recovery is <30% and the sample results are less then the IDL qualify the data as unusable (R).

8. LABORATORY CONTROL SAMPLE

Are percent recoveries within the acceptance limits? Yes No N/A

Are there calculation errors? Yes No N/A

None submitted

ACTION: Qualify the affected results according to the following requirements:

AQUEOUS LCS - Qualify as estimated (J), all sample results > IDL, for which the LCS %R falls within the range 50-79% or > 120%. Qualify as estimated (UJ), all sample results < IDL, for which the LCS falls within the range of 50-79%. Qualify as unusable (R) all sample results, for which the LCS %R < 50%.

SOLID LCS - Qualify as estimated (J), all sample results > IDL for which the LCS %R is outside the established control limits. Qualify as estimated (UJ), all sample results < IDL for which the LCS %R are lower than the established control limits.

9. PERFORMANCE AUDIT ANALYSES

Are the performance audit sample results within the acceptance limits? Yes No N/A

ACTION: Note the results of the performance audit samples in the validation narrative.

10. DUPLICATE SAMPLE ANALYSIS

Are RPD values within the acceptance limits? Yes No N/A

Action: Qualify the results for all associated samples of the same matrix as estimated (J) if the RPD falls outside the acceptance limits.

11. FIELD DUPLICATE SAMPLES

Do RPD values exceed the acceptance limits? Yes No N/A

ACTION: Note the results of the field duplicate samples in the validation narrative.

12. FIELD SPLIT SAMPLES

Do RPD values exceed the acceptance limits? Yes No N/A

ACTION: Note the results of the field split samples in the validation narrative.

13. ANALYTE QUANTITATION AND DETECTION LIMITS

Have results been reported and calculated correctly?	Yes	No	N/A
Are instrument detection limits below the CRDL?	Yes	No	N/A

Action: If analyte quantitation is in error, contact the laboratory for explanation. If errors or deficiencies can not be resolved with the laboratory, qualify associated data as unusable (R).

14. OVERALL ASSESSMENT AND SUMMARY

Has the laboratory conducted the analysis in accordance with the analytical SOW?	Yes	No	N/A
Were project specific data quality objectives met for this analysis?	Yes	No	N/A

ACTION: Summarize all the data qualifications and complete the data validation narrative as specified in Section 10.0 of the data validation requirements.

CAST 12-004 9613501.2418 WET CHEMISTRY

WHC-SD-EN-SPP-002, Rev. 1

COMMENTS (attach additional sheets as necessary): IC was calibrated on 12/27, Samples Run on 12/30. - But continuing calibration check looks Good

Validation split Between Julie Campbell (0.5 Hrs) & Russ Roberts (1.5 Hrs)

9613501.2419

HOLDING TIME SUMMARY - FORM B-1

SDG: 12-069 | REVIEWER: Julie Campbell | DATE: 7/2/92 | PAGE 1 OF 1

COMMENTS:

FIELD SAMPLE ID	ANALYSIS TYPE	DATE SAMPLED	DATE PREPARED	DATE ANALYZED (Ions / NH_3 / pH / % solids)	PREP. HOLDING TIME, DAYS	ANALYSIS HOLDING TIME, DAYS (Ions / pH / % solids)	QUALIFIER
B01CF4	~~Ions~~, Cl, F, NO_2, NO_3, NH_3, pH, % solids	12-9-91		12-30 / 1-2 / 12-27 / 12-27		21 / 24 / 18 / 18	none
B01CF5		12-10-91		12-30 / 1-2 / 12-27 / 12-27		20 / 23 / 17 / 17	
B01CF6		12-10-91		12-30 / 1-2 / 12-27 / 12-27		20 / 23 / 17 / 17	
B01CF7		12-11-91		12-30 / 1-2 / 12-27 / 12-27		19 / 22 / 16 / 16	
B01CF8		12-11-91		12-30 / 1-2 / 12-27 / 12-27		19 / 22 / 16 / 16	

VAS 7/9/92

pH (14 days) J J J J J

CALIBRATION DATA SUMMARY - FORM B-2

SDG:	REVIEWER: C Roberts	DATE: 7-6-92	PAGE 1 OF 1		
COMMENTS: CASE 12-069 INITIAL CALIBRATION OF AMMONIA AS N - WET CHEMISTRY					
CALIB. TYPE:	INITIAL CONTINUING	INSTRUMENT:			
CALIB. DATE	COMPOUND	RF	RSD/%D/%R	SAMPLES AFFECTED	QUALIFIER
????	AMMONIA AS N	(NO DATA)		ALL	R
		→ no calibration submitted			
12/27/92	Anions (Fl, NO_2, NO_3, SO_4)				
	= ical was not run on day of analysis			All	J(+)/UJ(-)
	ICAL (12/27/91), analysis (12/30/91)				
	pH = no calibration submitted			All	J
	% solid = NA	—	—	—	—
	AS 7/8/92				

BLANK AND SAMPLE DATA SUMMARY - FORM B-3

SDG:	REVIEWER: C Roberts			DATE: 7/6/92				PAGE 1 OF 1	
COMMENTS: CASE 12-069 WET CHEMISTRY - NO DATA FOR "AMMONIA AS N" BLANK									
SAMPLE ID	COMPOUND	RESULT	Q	RT	UNITS	5X RESULT	10X RESULT	SAMPLES AFFECTED	QUALIFIER
B10CF4	Anions = None detected	—				—		—	NONE
F5									
F6									
F7									
F8									
	No ammonia blank submitted								
	pH & % solid = NA	—							
	AS 7/8/92								

9615012.2122 WHC-SD-EN-SPP-002, Rev. 1

ACCURACY DATA SUMMARY - FORM B-4

SDG:	REVIEWER: C Roberts	DATE: 7/6/92	PAGE 1 OF 1	
COMMENTS: CALC 12-069 WET CHEM.				
SAMPLE ID	COMPOUND	% RECOVERY	SAMPLE(S) AFFECTED	QUALIFIER REQUIRED
ALL SAMPLES	Various = 89% — 104%.			NONE
B01CF4				
B01CF5				
B01CF6				
B01CF7				
B01CF8				
No ammonia	spike submitted	—	All	J(+)/UJ(-)

MS
7/8/92

PRECISION DATA SUMMARY - FORM B-5

SDG:	REVIEWER C Roberts	DATE: 7/6/92	PAGE 1 OF 1

COMMENTS: CASE 12-069 Wet Chemistry ALL RESULTS ACCEPTABLE

COMPOUND	SAMPLE ID:	SAMPLE ID:	RPD	SAMPLES AFFECTED	QUALIFIER
	B0ICF4	Anions = 0-14%			NONE
	F5	pH, ammonia			
	F6				
	F7				
	F8				
	Nitrite =	non detected			
		AS 7/4/92			

CALCULATION SUMMARY - FORM B-6

SDG:	REVIEWER: C Roberts	DATE: 7/6/92	PAGE 1 OF 1

COMMENTS: CASE 12-069 WET CHEMISTRY
NO RECALCULATIONS NECESSARY

HS
7/9/92

9613501.2426

0038

5A
VOLATILE ORGANIC GC/MS TUNING AND MASS
CALIBRATION - BROMOFLUOROBENZENE (BFB)

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMA Case No.: 12069 SAS No.: NA SDG No.: NA

Lab File ID: BFB1212 BFB Injection Date: 12/12/91

Instrument ID: 4500 BFB Injection Time: 0822

Matrix:(soil/water) _____ Level:(low/med) _____ Column:(pack/cap) PACK

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
50	15.0 - 40.0% of mass 95	23.4
75	30.0 - 60.0% of mass 95	45.0
95	Base peak, 100% relative abundance	100.0
96	5.0 - 9.0% of mass 95	6.6
173	Less than 2.0% of mass 174	0.0 (0.0)1
174	Greater than 50.0% of mass 95	77.4
175	5.0 - 9.0% of mass 174	5.0 (6.4)1
176	Greater than 95.0%, but less than 101.0% of mass 174	76.9 (99.4)1
177	5.0 - 9.0% of mass 176	5.8 (7.6)2

1-Value is % mass 174 2-Value is % mass 176

THIS TUNE APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	IC-050_CC	50PPB-V1122B	1212K01	12/12/91	853
02	IC-020	20PPB-V1122B	1212K02	12/12/91	945
03	IC-100	100PPB-V1122B	1212K03	12/12/91	1024
04	IC-150	150PPB-V1122B	1212K04	12/12/91	1103
05	IC-200	200PPB-V1122B	1212K05	12/12/91	1142

<12hr.

FORM V VOA 1/87 Rev.

5A
VOLATILE ORGANIC GC/MS TUNING AND MASS CALIBRATION - BROMOFLUOROBENZENE (BFB)

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMA Case No.: 12069 SAS No.: NA SDG No.: NA

Lab File ID: BFB1221C BFB Injection Date: 12/21/91

Instrument ID: 4500 BFB Injection Time: 1446

Matrix:(soil/water) _____ Level:(low/med) _____ Column:(pack/cap) PACK

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
50	15.0 - 40.0% of mass 95	27.0
75	30.0 - 60.0% of mass 95	43.2
95	Base peak, 100% relative abundance	100.0
96	5.0 - 9.0% of mass 95	7.6
173	Less than 2.0% of mass 174	0.0 (0.0)1
174	Greater than 50.0% of mass 95	64.9
175	5.0 - 9.0% of mass 174	5.1 (7.8)1
176	Greater than 95.0%, but less than 101.0% of mass 174	65.0 (100.1)1
177	5.0 - 9.0% of mass 176	5.1 (7.9)2

1-Value is % mass 174 2-Value is % mass 176

THIS TUNE APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	50PPB-CC	50PPB-V1122C	1221K11	12/21/91	1517
02	VBL1221A	WB122191	1221K12	12/21/91	1608
03	B01CF4	A112069-01B	1221K21	12/21/91	2204
04	B01CF4MS	A112069-01C	1221K22	12/21/91	2243
05	B01CF4MSD	A112069-01D	1221K23	12/21/91	2321
06	B01CF5	A112069-02F	1221K24	12/22/91	0000
07	B01CF6	A112069-03B	1221K25	12/22/91	0038
08	B01CF7	A112069-04B	1221K26	12/22/91	0117
09	B01CF8	A112069-05B	1221K27	12/22/91	0155

Mass List
12/21/91 14:46:00 + 10 30
Sample: 50NG OF BFB
Conds.: 2UL DI
#252 to #253 summed - #240

Data: BFB1221C # 252
Cali: 1125K04 # 3

Base m/z: 95
RIC: 19328.

37		0.00	0.	Minima	Min Inten:	0.
177				Maxima	# 0	
Mass		% RA	Inten.			
37?		8.71	382.			
38?		7.53	330.			
40?	S	1.46	64.			
44?	S	0.82	36.			
49?		5.73	251.			
50?		26.96	1182.			
51?		8.60	377.			
55?		2.12	93.			
56?		1.21	53.			
57?	S	4.77	209.			
58?		3.03	133.			
61?		4.40	193.			
62?		1.67	73.			
63?		3.79	166.			
68?		12.82	562.			
69	S	9.26	406.			
73		6.48	284.			
74		15.01	658.			
75		43.25	1896.			
76		2.87	126.			
87		5.57	244.			
88		8.96	393.			
92		1.98	87.			
93		3.17	139.			
94		1.37	60.			
95		100.00	4384.			
96		7.64	335.			
149		1.16	51.			
174		64.87	2844.			
175		5.09	223.			
176		64.96	2848.			
177		5.16	226.			

9613501.2429

0154

6A

VOLATILE ORGANICS INITIAL CALIBRATION DATA

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMA Case No.: 12069 SAS No.: NA SDG No.: NA

Instrument ID: 4500 Calibration Date(s): 12/12/91 12/12/91

Matrix:(soil/water) SOIL Level:(low/med) LOW Column:(pack/cap) PACK

Min $\overline{RRF}$ for SPCC(#) = 0.300 (0.250 for Bromoform) Max %RSD for CCC(*) = 30.0%

LAB FILE ID: RRF20 = 1212K02 RRF50 = 1212K01
RRF100= 1212K03 RRF150= 1212K04 RRF200= 1212K05

COMPOUND		RRF20	RRF50	RRF100	RRF150	RRF200	$\overline{RRF}$	% RSD
Chloromethane	#	2.167	1.941	1.354	0.908	1.301	1.534	33.3#
Bromomethane		1.813	1.457	1.444	1.482	1.406	1.520	10.9
Vinyl Chloride	*	1.846	1.466	1.214	0.996	1.403	1.385	22.8*
Chloroethane		1.541	1.259	1.269	0.950	0.843	1.172	23.8
Methylene Chloride		3.087	2.158	2.308	2.278	2.155	2.397	16.3
Acetone		1.853	1.467	0.920	1.183	1.046	1.294	28.8
Carbon Disulfide		4.479	4.071	3.943	3.994	3.809	4.059	6.2
1,1-Dichloroethene	*	2.125	1.846	1.836	1.876	1.813	1.899	6.8*
1,1-Dichloroethane	#	2.944	3.006	2.827	2.957	2.785	2.904	3.2#
1,2-Dichloroethene (total)		2.376	2.058	2.050	2.133	2.016	2.127	6.9
Chloroform	*	2.928	2.911	2.844	2.991	2.763	2.887	3.0*
1,2-Dichloroethane		1.828	1.760	1.697	1.901	1.774	1.792	4.3
2-Butanone		0.419	0.335	0.235	0.324	0.291	0.321	21.0
1,1,1-Trichloroethane		0.634	0.620	0.579	0.514	0.496	0.569	10.9
Carbon Tetrachloride		0.548	0.535	0.525	0.476	0.452	0.507	8.1
Vinyl Acetate		1.212	1.015	1.008	1.058	0.993	1.057	8.5
Bromodichloromethane		1.211	0.996	1.011	0.962	0.978	1.032	9.9
1,2-Dichloropropane	*	0.448	0.439	0.425	0.425	0.411	0.430	3.3*
cis-1,3-Dichloropropene	*	0.643	0.632	0.615	0.641	0.621	0.630	1.9*
Trichloroethene		0.470	0.467	0.452	0.436	0.425	0.450	4.3
Dibromochloromethane		1.113	0.943	0.938	0.934	0.938	0.973	8.0
1,1,2-Trichloroethane		0.380	0.365	0.335	0.357	0.340	0.355	5.2
Benzene		1.369	1.364	1.331	1.260	1.244	1.314	4.4
trans-1,3-Dichloropropene		0.571	0.578	0.571	0.581	0.573	0.575	0.8
Bromoform	#	0.627	0.608	0.580	0.582	0.565	0.592	4.2#
4-Methyl-2-Pentanone		1.040	0.811	0.697	0.790	0.757	0.819	16.0
2-Hexanone		0.897	0.573	0.451	0.576	0.544	0.608	27.8
Tetrachloroethene		0.404	0.395	0.381	0.391	0.373	0.389	3.1
1,1,2,2-Tetrachloroethane	#	1.101	1.016	0.955	0.937	0.900	0.982	8.0#
Toluene	*	0.803	0.803	0.767	0.804	0.779	0.791	2.2*
Chlorobenzene	#	1.008	1.016	0.969	1.008	0.956	0.991	2.7#
Ethylbenzene	*	0.507	0.479	0.446	0.457	0.431	0.464	6.4*
Styrene		1.100	1.031	0.945	0.947	0.933	0.991	7.3
Xylene (Total)		0.647	0.591	0.564	0.556	0.518	0.575	8.3
Toluene-d8		1.129	0.997	1.008	0.958	1.031	1.025	6.2
BFB		0.868	0.727	0.709	0.662	0.690	0.731	11.0
1,2-Dichloroethane-d4		1.520	1.353	1.390	1.432	1.454	1.430	4.5

Quantitation Report File: 1212K02

Data: 1212K02.TI
12/12/91 9:45:00
Sample: CLP,,,IC-020,L,S,20PPB-V1122B,VOA,IC-020
Conds.: PACK,,BFB1212,,
Formula: 5ML Instrument: 4500 Weight: 0.000
Submitted by: Analyst: KC Acct. No.:

AMOUNT=AREA * REF AMNT/(REF AREA * RESP FACT)
Resp. fac. from Library Entry

No	Name	
1	CI01	BROMOCHLOROMETHANE(I.S)
2	CI10	1,4-DIFLUORBENZENE(I.S)
3	CI20	CHLOROBENZENE D-5(I.S)
4	CS15	D4-1,2-DICHLOROETHANE(SURR)
5	CS05	D8-TOLUENE(SURR)
6	CS10	BROMOFLUOROBENZENE(SURR)
7	C010	CHLOROMETHANE
8	C015	BROMOMETHANE
9	C020	VINYL CHORIDE
10	C025	CHLOROETHANE
11	C030	METHYLENE CHLORIDE
12	C035	ACETONE
13	C036	ACROLEIN
14	C037	ACRYLONITRILE
15	C040	CARBON DISULFIDE
16	C045	1,1-DICHLOROETHENE
17	C050	1,1-DICHLOROETHANE
18	C053	1,2-DICHLOROETHENE(TOTAL)
19	C060	CHLOROFORM
20	C110	2-BUTANONE
21	C065	1,2-DICHLOROETHANE
22	C115	1,1,1-TRICHLOROETHANE
23	C120	CARBON TETRACHLORIDE
24	C125	VINYL ACETATE
25	C130	BROMODICHLOROMETHANE
26	C140	1,2-DICHLOROPROPANE
27	C143	CIS-1,3-DICHLOROPROPENE
28	C150	TRICHLOROETHENE
29	C155	DIBROMOCHLOROMETHANE
30	C165	BENZENE
31	C160	1,1,2-TRICHLOROETHANE
32	C172	TRANS-1,3-DICHLOROPROPENE
33	C175	2-CHLOROETHOXY ETHENE
34	C180	BROMOFORM
35	C205	4-METHYL-2-PENTANONE
36	C210	2-HEXANONE
37	C225	1,1,2,2-TETRACHLOROETHANE
38	C220	TETRACHLOROETHENE
39	C230	TOLUENE
40	C235	CHLOROBENZENE
41	C240	ETHYL BENZENE
42	C245	STYRENE
43	C250	OP-XYLENE
44	C255	M-XYLENE

No	m/z	Scan	Time	Ref	RRT	Meth	Area(Hght)	Amount	%Tot
1	128	202	8:25	1	1.000	A BB	20165.	50.000 PPB	5.16
2	114	400	16:40	2	1.000	A BB	63856.	50.000 PPB	5.16
3	117	497	20:42	3	1.000	A BB	61439.	50.000 PPB	5.16
4	65	256	10:40	1	1.267	A BB	12264.	20.000 PPB	2.07
5	98	473	19:42	3	0.952	A BB	27746.	20.000 PPB	2.07
6	95	609	25:22	3	1.225	A BB	21328.	20.000 PPB	2.07
7	50	28	1:10	1	0.139	A BB	17481.	20.000 PPB	2.07
8	94	49	2:02	1	0.243	A BB	14625.	20.000 PPB	2.07
9	62	65	2:42	1	0.322	A BB	14889.	20.000 PPB	2.07
10	64	89	3:42	1	0.441	A BB	12432.	20.000 PPB	2.07
11	84	135	5:37	1	0.668	A BB	24896.	20.000 PPB	2.07
12	43	148	6:10	1	0.733	A BB	14945.	20.000 PPB	2.07
13	NOT FOUND								
14	NOT FOUND								
15	76	167	6:57	1	0.827	A BB	36124.	20.000 PPB	2.07
16	96	193	8:02	1	0.955	A BB	17142.	20.000 PPB	2.07
17	63	218	9:05	1	1.079	A BB	23749.	20.000 PPB	2.07
18	96	232	9:40	1	1.149	A BB	38337.	40.000 PPB	4.13
19	83	244	10:10	1	1.208	A BB	23617.	20.000 PPB	2.07
20	72	256	10:40	1	1.267	A BB	3381.	20.000 PPB	2.07
21	62	258	10:45	1	1.277	A BB	14744.	20.000 PPB	2.07
22	97	283	11:47	2	0.707	A BB	16202.	20.000 PPB	2.07
23	117	290	12:05	2	0.725	A VB	13992.	20.000 PPB	2.07
24	43	293	12:12	2	0.732	A BB	30956.	20.000 PPB	2.07
25	83	301	12:32	2	0.752	A BB	30922.	20.000 PPB	2.07
26	63	326	13:35	2	0.815	A BB	11436.	20.000 PPB	2.07
27	75	331	13:47	2	0.828	A BB	26283.	32.000 PPB	3.31
28	130	342	14:15	2	0.855	A BB	12010.	20.000 PPB	2.07
29	129	354	14:45	2	0.885	A BB	28430.	20.000 PPB	2.07
30	78	351	14:37	2	0.878	A BB	34970.	20 000 PPB	2.07
31	97	356	14:50	2	0.890	A BB	9713.	20.000 PPB	2.07
32	75	356	14:50	2	0.890	A BB	5835.	8.000 PPB	0.83
33	63	326	13:35	2	0.815	A BB	11436.	20.000 PPB	2.07
34	173	406	16:55	2	1.015	A BB	16011.	20.000 PPB	2.07
35	43	415	17:17	3	0.835	A BB	25569.	20.000 PPB	2.07
36	43	445	18:32	3	0.895	A BB	22041.	20.000 PPB	2.07
37	83	451	18:47	3	0.907	A BB	27058.	20.000 PPB	2.07
38	164	451	18:47	3	0.907	A BB	9923.	20.000 PPB	2.07
39	92	477	19:52	3	0.960	A BB	19722.	20.000 PPB	2.07
40	112	500	20:50	3	1.006	A BB	24782.	20.000 PPB	2.07
41	106	546	22:45	3	1.099	A BB	12455.	20.000 PPB	2.07
42	104	647	26:57	3	1.302	A BB	27042.	20.000 PPB	2.07
43	106	681	28:22	3	1.370	A BB	31791.	40.000 PPB	4.13
44	106	654	27:15	3	1.316	A BB	15723.	20.000 PPB	2.07

No	Ret(L)	Ratio	RRT(L)	Ratio	Amnt	Amnt(L)	R.Fac	R.Fac(L)	Ratio
1	8:05	1.04	1.000	1.00	50.00	50.00	1.000	1.000	1.00
2	16:30	1.01	1.000	1.00	50.00	50.00	1.000	1.000	1.00
3	20:30	1.01	1.000	1.00	50.00	50.00	1.000	1.000	1.00
4	10:25	1.02	1.289	0.98	20.00	20.00	1.520	1.520	1.00
5	19:27	1.01	0.949	1.00	20.00	20.00	1.129	1.129	1.00
6	24:52	1.02	1.213	1.01	20.00	20.00	0.868	0.868	1.00
7	1:12	0.97	0.149	0.93	20.00	20.00	2.167	2.167	1.00
8	2:00	1.02	0.247	0.98	20.00	20.00	1.813	1.813	1.00
9	2:27	1.10	0.304	1.06	20.00	20.00	1.846	1.846	1.00
10	3:17	1.13	0.407	1.08	20.00	20.00	1.541	1.541	1.00

Quantitation Report File: 1212K01

Data: 1212K01.TI
12/12/91 8:53:00
Sample: CLP,,,IC-050/CC,L,S,50PPB-V1122B,VOA,IC-050/CC
Conds.: PACK,1202SAVE,BFB1212,,
Formula 5ML Instrument: 4500 Weight: 0.000
Submitted by: Analyst: KC Acct. No.:

AMOUNT=AREA * REF AMNT/(REF AREA * RESP FACT)
Resp. fac. from Library Entry

No	Name	
1	CI01	BROMOCHLOROMETHANE(I.S)
2	CI10	1,4-DIFLUORBENZENE(I.S)
3	CI20	CHLOROBENZENE D-5(I.S)
4	CS15	D4-1,2-DICHLOROETHANE(SURR)
5	CS05	D8-TOLUENE(SURR)
6	CS10	BROMOFLUOROBENZENE(SURR)
7	C010	CHLOROMETHANE
8	C015	BROMOMETHANE
9	C020	VINYL CHORIDE
10	C025	CHLOROETHANE
11	C030	METHYLENE CHLORIDE
12	C035	ACETONE
13	C036	ACROLEIN
14	C037	ACRYLONITRILE
15	C040	CARBON DISULFIDE
16	C045	1,1-DICHLOROETHENE
17	C050	1,1-DICHLOROETHANE
18	C053	1,2-DICHLOROETHENE(TOTAL)
19	C060	CHLOROFORM
20	C110	2-BUTANONE
21	C065	1,2-DICHLOROETHANE
22	C115	1,1,1-TRICHLOROETHANE
23	C120	CARBON TETRACHLORIDE
24	C125	VINYL ACETATE
25	C130	BROMODICHLOROMETHANE
26	C140	1,2-DICHLOROPROPANE
27	C143	CIS-1,3-DICHLOROPROPENE
28	C150	TRICHLOROETHENE
29	C155	DIBROMOCHLOROMETHANE
30	C165	BENZENE
31	C160	1,1,2-TRICHLOROETHANE
32	C172	TRANS-1,3-DICHLOROPROPENE
33	C175	2-CHLOROETHOXY ETHENE
34	C180	BROMOFORM
35	C205	4-METHYL-2-PENTANONE
36	C210	2-HEXANONE
37	C225	1,1,2,2-TETRACHLOROETHANE
38	C220	TETRACHLOROETHENE
39	C230	TOLUENE
40	C235	CHLOROBENZENE
41	C240	ETHYL BENZENE
42	C245	STYRENE
43	C250	OP-XYLENE
44	C255	M-XYLENE

No	m/z	Scan	Time	Ref	RRT	Meth	Area(Hght)	Amount	%Tot
1	128	201	8:22	1	1.000	A BB	22244.	50.000 PPB	2.27
2	114	401	16:42	2	1.000	A BV	72232.	50.000 PPB	2.27
3	117	497	20:42	3	1.000	A BB	69610.	50.000 PPB	2.27
4	65	256	10.40	1	1.274	A BB	30101.	50.000 PPB	2.27
5	98	473	19:42	3	0.952	A BB	69409.	50.000 PPB	2.27
6	95	608	25:20	3	1.223	A BB	50579.	50.000 PPB	2.27
7	50	27	1:07	1	0.134	A BB	43181.	50.000 PPB	2.27
8	94	49	2:02	1	0.244	A BB	32419.	50.000 PPB	2.27
9	62	64	2:40	1	0.318	A BB	32604.	50.000 PPB	2.27
10	64	88	3:40	1	0.438	A BB	28002.	50.000 PPB	2.27
11	84	134	5:35	1	0.667	A BB	47997.	50.000 PPB	2.27
12	43	150	6:15	1	0.746	A BB	32643.	50.000 PPB	2.27
13	NOT	FOUND							
14	NOT	FOUND							
15	76	166	6:55	1	0.826	A BB	90557.	50.000 PPB	2.27
16	96	192	8:00	1	0.955	A BB	41061.	50.000 PPB	2.27
17	63	218	9:05	1	1.085	A BB	66862.	50.000 PPB	2.27
18	96	232	9:40	1	1.154	A BB	91545.	100.000 PPB	4.55
19	83	244	10:10	1	1.214	A BB	64746.	50.000 PPB	2.27
20	72	255	10:37	1	1.269	A BB	7458.	50.000 PPB	2.27
21	62	258	10:45	1	1.284	A BB	39144.	50.000 PPB	2.27
22	97	283	11:47	2	0.706	A BB	44758.	50.000 PPB	2.27
23	117	290	12:05	2	0.723	A VB	38663.	50.000 PPB	2.27
24	43	293	12:12	2	0.731	A BB	73282.	50.000 PPB	2.27
25	83	301	12:32	2	0.751	A BB	71977.	50.000 PPB	2.27
26	63	326	13:35	2	0.813	A BB	31726.	50.000 PPB	2.27
27	75	331	13.47	2	0.825	A BB	74012.	81.000 PPB	3.68
28	130	342	14:15	2	0.853	A BB	33703.	50.000 PPB	2.27
29	129	354	14:45	2	0.883	A BB	68113.	50.000 PPB	2.27
30	78	351	14:37	2	0.875	A BB	98559.	50.000 PPB	2.27
31	97	356	14:50	2	0.888	A BB	26397.	50.000 PPB	2.27
32	75	356	14:50	2	0.888	A BB	15860.	19.000 PPB	0.86
33	63	326	13:35	2	0.813	A BB	31726.	50.000 PPB	2.27
34	173	406	16:55	2	1.012	A BB	43939.	50.000 PPB	2.27
35	43	415	17.17	3	0.835	A BB	56452.	50.000 PPB	2.27
36	43	445	18.32	3	0.895	A BB	39855.	50.000 PPB	2.27
37	83	451	18:47	3	0.907	A BB	70713.	50.000 PPB	2.27
38	164	451	18.47	3	0.907	A BB	27510.	50.000 PPB	2.27
39	92	477	19:52	3	0.960	A BB	55885.	50.000 PPB	2.27
40	112	500	20:50	3	1.006	A BB	70740.	50.000 PPB	2.27
41	106	546	22:45	3	1.099	A BB	33337.	50.000 PPB	2.27
42	104	646	26:55	3	1.300	A BB	71794.	50.000 PPB	2.27
43	106	680	28:20	3	1.368	A BB	82260.	100.000 PPB	4.55
44	106	654	27:15	3	1.316	A BB	42650.	50.000 PPB	2.27

No	Ret(L)	Ratio	RRT(L)	Ratio	Amnt	Amnt(L)	R.Fac	R.Fac(L)	Ratio
1	8:05	1.04	1.000	1.00	50.00	50.00	1.000	1.000	1.00
2	16:30	1.01	1.000	1.00	50.00	50.00	1.000	1.000	1.00
3	20:30	1.01	1.000	1.00	50.00	50.00	1.000	1.000	1.00
4	10:25	1.02	1.289	0.99	50.00	50.00	1.353	1.353	1.00
5	19:27	1.01	0.949	1.00	50.00	50.00	0.997	0.997	1.00
6	24:52	1.02	1.213	1.01	50.00	50.00	0.727	0.727	1.00
7	1:12	0.93	0.149	0.90	50.00	50.00	1.941	1.941	1.00
8	2:00	1.02	0.247	0.99	50.00	50.00	1.457	1.457	1.00
9	2:27	1.08	0.304	1.05	50.00	50.00	1.466	1.466	1.00
10	3:17	1.11	0.407	1.08	50.00	50.00	1.259	1.259	1.00

Quantitation Report File: 1212K03

Data. 1212K03.TI
12/12/91 10:24:00
Sample: CLP,,,IC-100,L,S,100PPB-V1212B,VOA,IC-100
Conds.: PACK,,BFB1212,,
Formula: 5ML Instrument: 4500 Weight: 0.000
Submitted by: Analyst: KC Acct. No.:

AMOUNT-AREA * REF AMNT/(REF AREA * RESP FACT)
Resp. fac. from Library Entry

No	Name	
1	CI01	BROMOCHLOROMETHANE(I.S)
2	CI10	1,4-DIFLUORBENZENE(I.S)
3	CI20	CHLOROBENZENE D-5(I.S)
4	CS15	D4-1,2-DICHLOROETHANE(SURR)
5	CS05	D8-TOLUENE(SURR)
6	CS10	BROMOFLUOROBENZENE(SURR)
7	C010	CHLOROMETHANE
8	C015	BROMOMETHANE
9	C020	VINYL CHORIDE
10	C025	CHLOROETHANE
11	C030	METHYLENE CHLORIDE
12	C035	ACETONE
13	C036	ACROLEIN
14	C037	ACRYLONITRILE
15	C040	CARBON DISULFIDE
16	C045	1,1-DICHLOROETHENE
17	C050	1,1-DICHLOROETHANE
18	C053	1,2-DICHLOROETHENE(TOTAL)
19	C060	CHLOROFORM
20	C110	2-BUTANONE
21	C065	1,2-DICHLOROETHANE
22	C115	1,1,1-TRICHLOROETHANE
23	C120	CARBON TETRACHLORIDE
24	C125	VINYL ACETATE
25	C130	BROMODICHLOROMETHANE
26	C140	1,2-DICHLOROPROPANE
27	C143	CIS-1,3-DICHLOROPROPENE
28	C150	TRICHLOROETHENE
29	C155	DIBROMOCHLOROMETHANE
30	C165	BENZENE
31	C160	1,1,2-TRICHLOROETHANE
32	C172	TRANS-1,3-DICHLOROPROPENE
33	C175	2-CHLOROETHOXY ETHENE
34	C180	BROMOFORM
35	C205	4-METHYL-2-PENTANONE
36	C210	2-HEXANONE
37	C225	1,1,2,2-TETRACHLOROETHANE
38	C220	TETRACHLOROETHENE
39	C230	TOLUENE
40	C235	CHLOROBENZENE
41	C240	ETHYL BENZENE
42	C245	STYRENE
43	C250	OP-XYLENE
44	C255	M-XYLENE

No	m/z	Scan	Time	Ref	RRT	Meth	Area(Hght)	Amount	%Tot
1	128	198	8:15	1	1.000	A BB	23581.	50.000 PPB	1.18
2	114	401	16:42	2	1.000	A BB	75533.	50.000 PPB	1.18
3	117	498	20:45	3	1.000	A BB	72763.	50.000 PPB	1.18
4	65	254	10:35	1	1.283	A BB	65549.	100.000 PPB	2.35
5	98	473	19:42	3	0.950	A BB	146696.	100.000 PPB	2.35
6	95	609	25:22	3	1.223	A BB	103146.	100.000 PPB	2.35
7	50	27	1:07	1	0.136	A BB	63844.	100.000 PPB	2.35
8	94	47	1:57	1	0.237	A BB	68120.	100.000 PPB	2.35
9	62	59	2:27	1	0.298	A BB	57232.	100.000 PPB	2.35
10	64	80	3:20	1	0.404	A BB	59828.	100.000 PPB	2.35
11	84	126	5:15	1	0.636	A BB	108864.	100.000 PPB	2.35
12	43	143	5:57	1	0.722	A BV	43398.	100.000 PPB	2.35
13	NOT FOUND								
14	NOT FOUND								
15	76	159	6:37	1	0.803	A BB	185974.	100.000 PPB	2.35
16	96	187	7:47	1	0.944	A BB	86593.	100.000 PPB	2.35
17	63	214	8:55	1	1.081	A BB	133313.	100.000 PPB	2.35
18	96	229	9:32	1	1.157	A BB	193369.	200.000 PPB	4.71
19	83	241	10:02	1	1.217	A BB	134129.	100.000 PPB	2.35
20	72	254	10:35	1	1.283	A BB	11068.	100.000 PPB	2.35
21	62	256	10:40	1	1.293	A BB	80045.	100.000 PPB	2.35
22	97	281	11:42	2	0.701	A BB	87437.	100.000 PPB	2.35
23	117	289	12:02	2	0.721	A VB	79338.	100.000 PPB	2.35
24	43	292	12:10	2	0.728	A BV	152314.	100.000 PPB	2.35
25	83	299	12:27	2	0.746	A BB	152735.	100.000 PPB	2.35
26	63	326	13:35	2	0.813	A BB	64169.	100.000 PPB	2.35
27	75	331	13:47	2	0.825	A BB	150437.	162.000 PPB	3.81
28	130	341	14:12	2	0.850	A BB	68249.	100.000 PPB	2.35
29	129	354	14:45	2	0.883	A BB	141766.	100.000 PPB	2.35
30	78	351	14:37	2	0.875	A BB	201139.	100.000 PPB	2.35
31	97	356	14:50	2	0.888	A VB	50598.	100.000 PPB	2.35
32	75	356	14:50	2	0.888	A BB	32791.	38.000 PPB	0.89
33	63	326	13:35	2	0.813	A BB	64169.	100.000 PPB	2.35
34	173	406	16:55	2	1.012	A BB	87598.	100.000 PPB	2.35
35	43	415	17:17	3	0.833	A BV	101421.	100.000 PPB	2.35
36	43	445	18:32	3	0.894	A BB	65656.	100.000 PPB	2.35
37	83	451	18:47	3	0.906	A BV	138943.	100.000 PPB	2.35
38	164	452	18:50	3	0.908	A BB	55444.	100.000 PPB	2.35
39	92	477	19:52	3	0.958	A BB	111678.	100.000 PPB	2.35
40	112	500	20:50	3	1.004	A BB	140983.	100.000 PPB	2.35
41	106	546	22:45	3	1.096	A BB	64965.	100.000 PPB	2.35
42	104	647	26:57	3	1.299	A BB	137512.	100.000 PPB	2.35
43	106	681	28:22	3	1.367	A BB	164034.	200.000 PPB	4.71
44	106	655	27:17	3	1.315	A BB	79052.	100.000 PPB	2.35

No	Ret(L)	Ratio	RRT(L)	Ratio	Amnt	Amnt(L)	R.Fac	R.Fac(L)	Ratio
1	8:05	1.02	1.000	1.00	50.00	50.00	1.000	1.000	1.00
2	16:30	1.01	1.000	1.00	50.00	50.00	1.000	1.000	1.00
3	20:30	1.01	1.000	1.00	50.00	50.00	1.000	1.000	1.00
4	10:25	1.02	1.289	1.00	100.00	100.00	1.390	1.390	1.00
5	19:27	1.01	0.949	1.00	100.00	100.00	1.008	1.008	1.00
6	24:52	1.02	1.213	1.01	100.00	100.00	0.709	0.709	1.00
7	1:12	0.93	0.149	0.91	100.00	100.00	1.354	1.354	1.00
8	2:00	0.98	0.247	0.96	100.00	100.00	1.444	1.444	1.00
9	2:27	1.00	0.304	0.98	100.00	100.00	1.214	1.214	1.00
10	3:17	1.01	0.407	0.99	100.00	100.00	1.269	1.269	1.00

Quantitation Report File: 1212K04

Data: 1212K04.TI
12/12/91 11:03:00
Sample: CLP,,,IC-150,L,S,150PPB-V1212B,VOA,IC-150
Conds.: PACK,,BFB1212,,
Formula 5ML Instrument: 4500 Weight: 0.000
Submitted by: Analyst: KC Acct. No.:

AMOUNT-AREA * REF AMNT/(REF AREA * RESP FACT)
Resp. fac. from Library Entry

No	Name	
1	CI01	BROMOCHLOROMETHANE(I.S)
2	CI10	1,4-DIFLUORBENZENE(I.S)
3	CI20	CHLOROBENZENE D-5(I.S)
4	CS15	D4-1,2-DICHLOROETHANE(SURR)
5	CS05	D8-TOLUENE(SURR)
6	CS10	BROMOFLUOROBENZENE(SURR)
7	C010	CHLOROMETHANE
8	C015	BROMOMETHANE
9	C020	VINYL CHORIDE
10	C025	CHLOROETHANE
11	C030	METHYLENE CHLORIDE
12	C035	ACETONE
13	C036	ACROLEIN
14	C037	ACRYLONITRILE
15	C040	CARBON DISULFIDE
16	C045	1,1-DICHLOROETHENE
17	C050	1,1-DICHLOROETHANE
18	C053	1,2-DICHLOROETHENE(TOTAL)
19	C060	CHLOROFORM
20	C110	2-BUTANONE
21	C065	1,2-DICHLOROETHANE
22	C115	1,1,1-TRICHLOROETHANE
23	C120	CARBON TETRACHLORIDE
24	C125	VINYL ACETATE
25	C130	BROMODICHLOROMETHANE
26	C140	1,2-DICHLOROPROPANE
27	C143	CIS-1,3-DICHLOROPROPENE
28	C150	TRICHLOROETHENE
29	C155	DIBROMOCHLOROMETHANE
30	C165	BENZENE
31	C160	1,1,2-TRICHLOROETHANE
32	C172	TRANS-1,3-DICHLOROPROPENE
33	C175	2-CHLOROETHOXY ETHENE
34	C180	BROMOFORM
35	C205	4-METHYL-2-PENTANONE
36	C210	2-HEXANONE
37	C225	1,1,2,2-TETRACHLOROETHANE
38	C220	TETRACHLOROETHENE
39	C230	TOLUENE
40	C235	CHLOROBENZENE
41	C240	ETHYL BENZENE
42	C245	STYRENE
43	C250	OP-XYLENE
44	C255	M-XYLENE

No	m/z	Scan	Time	Ref	RRT	Meth	Area(Hght)	Amount	%Tot
1	128	199	8:17	1	1.000	A BB	22223.	50.000 PPB	0.79
2	114	401	16:42	2	1.000	A BB	81837.	50.000 PPB	0.79
3	117	498	20:45	3	1.000	A BB	76800.	50.000 PPB	0.79
4	65	254	10:35	1	1.276	A BB	95447.	150.000 PPB	2.38
5	98	473	19:42	3	0.950	A BV	220750.	150.000 PPB	2.38
6	95	609	25:22	3	1.223	A BB	152494.	150.000 PPB	2.38
7	50	27	1:07	1	0.136	A BB	60531.	150.000 PPB	2.38
8	94	47	1:57	1	0.236	A BB	98804.	150.000 PPB	2.38
9	62	59	2:27	1	0.296	A BB	66377.	150.000 PPB	2.38
10	64	82	3:25	1	0.412	A BB	63325.	150.000 PPB	2.38
11	84	130	5:25	1	0.653	A BB	151903.	150.000 PPB	2.38
12	43	149	6:12	1	0.749	A BB	78837.	150.000 PPB	2.38
13	NOT FOUND								
14	NOT FOUND								
15	76	160	6:40	1	0.804	A BB	266255.	150.000 PPB	2.38
16	96	188	7:50	1	0.945	A BB	125066.	150.000 PPB	2.38
17	63	215	8:57	1	1.080	A BB	197152.	150.000 PPB	2.38
18	96	230	9:35	1	1.156	A BB	284355.	300.000 PPB	4.76
19	83	242	10:05	1	1.216	A BV	199429.	150.000 PPB	2.38
20	72	255	10:37	1	1.281	A BB	21627.	150.000 PPB	2.38
21	62	257	10:42	1	1.291	A BB	126762.	150.000 PPB	2.38
22	97	282	11:45	2	0.703	A BB	126312.	150.000 PPB	2.38
23	117	289	12:02	2	0.721	A VB	116797.	150.000 PPB	2.38
24	43	292	12:10	2	0.728	A BB	259865.	150.000 PPB	2.38
25	83	300	12:30	2	0.748	A BB	236235.	150.000 PPB	2.38
26	63	326	13:35	2	0.813	A BB	104453.	150.000 PPB	2.38
27	75	331	13:47	2	0.825	A BB	255018.	243.000 PPB	3.86
28	130	342	14:15	2	0.853	A BB	107163.	150.000 PPB	2.38
29	129	354	14:45	2	0.883	A BB	229256.	150.000 PPB	2.38
30	78	351	14:37	2	0.875	A BB	309432.	150.000 PPB	2.38
31	97	356	14:50	2	0.888	A BB	87765.	150.000 PPB	2.38
32	75	356	14:50	2	0.888	A BB	54236.	57.000 PPB	0.91
33	63	326	13:35	2	0.813	A BB	104453.	150.000 PPB	2.38
34	173	406	16:55	2	1.012	A BB	142887.	150.000 PPB	2.38
35	43	415	17:17	3	0.833	A BB	181913.	150.000 PPB	2.38
36	43	445	18:32	3	0.894	A BB	132694.	150.000 PPB	2.38
37	83	451	18:47	3	0.906	A BB	215862.	150.000 PPB	2.38
38	164	452	18:50	3	0.908	A BB	90065.	150.000 PPB	2.38
39	92	477	19:52	3	0.958	A BB	185303.	150.000 PPB	2.38
40	112	500	20:50	3	1.004	A BB	232128.	150.000 PPB	2.38
41	106	546	22:45	3	1.096	A BB	105284.	150.000 PPB	2.38
42	104	647	26:57	3	1.299	A BB	218112.	150.000 PPB	2.38
43	106	680	28:20	3	1.365	A BB	256403.	300.000 PPB	4.76
44	106	655	27:17	3	1.315	A BB	126742.	150.000 PPB	2.38

No	Ret(L)	Ratio	RRT(L)	Ratio	Amnt	Amnt(L)	R.Fac	R.Fac(L)	Ratio
1	8:05	1.03	1.000	1.00	50.00	50.00	1.000	1.000	1.00
2	16:30	1.01	1.000	1.00	50.00	50.00	1.000	1.000	1.00
3	20:30	1.01	1.000	1.00	50.00	50.00	1.000	1.000	1.00
4	10:25	1.02	1.289	0.99	150.00	150.00	1.432	1.432	1.00
5	19:27	1.01	0.949	1.00	150.00	150.00	0.958	0.958	1.00
6	24:52	1.02	1.213	1.01	150.00	150.00	0.662	0.662	1.00
7	1:12	0.93	0.149	0.91	150.00	150.00	0.908	0.908	1.00
8	2:00	0.98	0.247	0.95	150.00	150.00	1.482	1.482	1.00
9	2:27	1.00	0.304	0.97	150.00	150.00	0.996	0.996	1.00
10	3:17	1.04	0.407	1.01	150.00	150.00	0.950	0.950	1.00

Quantitation Report File: 1212K05

Data: 1212K05.TI
12/12/91 11:42:00
Sample: CLP,,,IC-200,L,S,200PPB-V1212B,VOA,IC-200
Conds.: PACK,,BFB1212,,
Formula: 5ML Instrument: 4500 Weight: 0.000
Submitted by: Analyst: KC Acct. No.:

AMOUNT=AREA * REF AMNT/(REF AREA * RESP FACT)
Resp. fac. from Library Entry

No	Name	
1	CI01	BROMOCHLOROMETHANE(I.S)
2	CI10	1,4-DIFLUORBENZENE(I.S)
3	CI20	CHLOROBENZENE D-5(I.S)
4	CS15	D4-1,2-DICHLOROETHANE(SURR)
5	CS05	D8-TOLUENE(SURR)
6	CS10	BROMOFLUOROBENZENE(SURR)
7	C010	CHLOROMETHANE
8	C015	BROMOMETHANE
9	C020	VINYL CHORIDE
10	C025	CHLOROETHANE
11	C030	METHYLENE CHLORIDE
12	C035	ACETONE
13	C036	ACROLEIN
14	C037	ACRYLONITRILE
15	C040	CARBON DISULFIDE
16	C045	1,1-DICHLOROETHENE
17	C050	1,1-DICHLOROETHANE
18	C053	1,2-DICHLOROETHENE(TOTAL)
19	C060	CHLOROFORM
20	C110	2-BUTANONE
21	C065	1,2-DICHLOROETHANE
22	C115	1,1,1-TRICHLOROETHANE
23	C120	CARBON TETRACHLORIDE
24	C125	VINYL ACETATE
25	C130	BROMODICHLOROMETHANE
26	C140	1,2-DICHLOROPROPANE
27	C143	CIS-1,3-DICHLOROPROPENE
28	C150	TRICHLOROETHENE
29	C155	DIBROMOCHLOROMETHANE
30	C165	BENZENE
31	C160	1,1,2-TRICHLOROETHANE
32	C172	TRANS-1,3-DICHLOROPROPENE
33	C175	2-CHLOROETHOXY ETHENE
34	C180	BROMOFORM
35	C205	4-METHYL-2-PENTANONE
36	C210	2-HEXANONE
37	C225	1,1,2,2-TETRACHLOROETHANE
38	C220	TETRACHLOROETHENE
39	C230	TOLUENE
40	C235	CHLOROBENZENE
41	C240	ETHYL BENZENE
42	C245	STYRENE
43	C250	OP-XYLENE
44	C255	M-XYLENE

No	m/z	Scan	Time	Ref	RRT	Meth	Area(Hght)	Amount	%Tot
1	128	199	8:17	1	1.000	A BB	20555.	50.000 PPB	0.60
2	114	400	16:40	2	1.000	A BV	74492.	50.000 PPB	0.60
3	117	497	20:42	3	1.000	A BB	70994.	50.000 PPB	0.60
4	65	254	10:35	1	1.276	A BB	119543.	200.000 PPB	2.40
5	98	472	19:40	3	0.950	A BB	292743.	200.000 PPB	2.40
6	95	609	25:22	3	1.225	A BB	195849.	200.000 PPB	2.40
7	50	27	1:07	1	0.136	A BB	106988.	200.000 PPB	2.40
8	94	47	1:57	1	0.236	A BB	115582.	200.000 PPB	2.40
9	62	58	2:25	1	0.291	A BB	115389.	200.000 PPB	2.40
10	64	80	3:20	1	0.402	A BB	69326.	200.000 PPB	2.40
11	84	128	5:20	1	0.643	A BB	177206.	200.000 PPB	2.40
12	43	149	6:12	1	0.749	A BB	85974.	200.000 PPB	2.40
13	NOT	FOUND							
14	NOT	FOUND							
15	76	158	6:35	1	0.794	A BB	313167.	200.000 PPB	2.40
16	96	187	7:47	1	0.940	A BB	149081.	200.000 PPB	2.40
17	63	215	8:57	1	1.080	A BB	229013.	200.000 PPB	2.40
18	96	229	9:32	1	1.151	A BB	331484.	400.000 PPB	4.79
19	83	241	10:02	1	1.211	A BV	227200.	200.000 PPB	2.40
20	72	254	10:35	1	1.276	A BB	23919.	200.000 PPB	2.40
21	62	256	10:40	1	1.286	A BB	145818.	200.000 PPB	2.40
22	97	281	11:42	2	0.702	A BB	147660.	200.000 PPB	2.40
23	117	289	12:02	2	0.722	A VB	134543.	200.000 PPB	2.40
24	43	292	12:10	2	0.730	A BB	295964.	200.000 PPB	2.40
25	83	299	12:27	2	0.747	A BB	291290.	200.000 PPB	2.40
26	63	325	13:32	2	0.813	A BB	122538.	200.000 PPB	2.40
27	75	330	13:45	2	0.825	A BB	299935.	324.000 PPB	3.88
28	130	341	14:12	2	0.853	A BV	126517.	200.000 PPB	2.40
29	129	354	14:45	2	0.885	A BB	279524.	200.000 PPB	2.40
30	78	351	14:37	2	0.878	A BB	370587.	200.000 PPB	2.40
31	97	356	14:50	2	0.890	A BB	101307.	200.000 PPB	2.40
32	75	355	14:47	2	0.888	A BB	64839.	76.000 PPB	0.91
33	63	325	13:32	2	0.813	A BB	122013.	200.000 PPB	2.40
34	173	406	16:55	2	1.015	A BB	168253.	200.000 PPB	2.40
35	43	414	17:15	3	0.833	A BB	214991.	200.000 PPB	2.40
36	43	444	18:30	3	0.893	A BV	154408.	200.000 PPB	2.40
37	83	451	18:47	3	0.907	A BB	255644.	200.000 PPB	2.40
38	164	451	18:47	3	0.907	A BB	106001.	200.000 PPB	2.40
39	92	476	19:50	3	0.958	A BB	221262.	200.000 PPB	2.40
40	112	500	20:50	3	1.006	A BB	271468.	200.000 PPB	2.40
41	106	545	22:42	3	1.097	A BB	122532.	200.000 PPB	2.40
42	104	645	26:52	3	1.298	A BB	265089.	200.000 PPB	2.40
43	106	680	28:20	3	1.368	A BB	294016.	400.000 PPB	4.79
44	106	654	27:15	3	1.316	A BB	150268.	200.000 PPB	2.40

No	Ret(L)	Ratio	RRT(L)	Ratio	Amnt	Amnt(L)	R.Fac	R.Fac(L)	Ratio
1	8:05	1.03	1.000	1.00	50.00	50.00	1.000	1.000	1.00
2	16:30	1.01	1.000	1.00	50.00	50.00	1.000	1.000	1.00
3	20:30	1.01	1.000	1.00	50.00	50.00	1.000	1.000	1.00
4	10:25	1.02	1.289	0.99	200.00	200.00	1.454	1.454	1.00
5	19:27	1.01	0.949	1.00	200.00	200.00	1.031	1.031	1.00
6	24:52	1.02	1.213	1.01	200.00	200.00	0.690	0.690	1.00
7	1:12	0.93	0.149	0.91	200.00	200.00	1.301	1.301	1.00
8	2:00	0.98	0.247	0.95	200.00	200.00	1.406	1.406	1.00
9	2:27	0.98	0.304	0.96	200.00	200.00	1.403	1.403	1.00
10	3:17	1.01	0.407	0.99	200.00	200.00	0.843	0.843	1.00

7A
VOLATILE CONTINUING CALIBRATION CHECK

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMA Case No.: 12069 SAS No.: NA SDG No.: NA

Instrument ID: 4500 Calibration date: 12/21/91 Time: 1517

Lab File ID: 1221K11 Init. Calib. Date(s): 12/12/91 12/12/91

Matrix:(soil/water) SOIL Level:(low/med) LOW Column:(pack/cap) PACK

Min RRF50 for SPCC(#) = 0.300 (0.250 for Bromoform) Max %D for CCC(*) = 25.0%

COMPOUND		$\overline{RRF}$	RRF50	%D	
Chloromethane	#	1.534	1.584	-3.3	#
Bromomethane		1.520	1.532	-0.8	
Vinyl Chloride	*	1.385	1.349	2.6	*
Chloroethane		1.172	1.611	-37.5	
Methylene Chloride		2.397	3.731	-55.6	
Acetone		1.294	1.111	14.1	
Carbon Disulfide		4.059	5.067	-24.8	
1,1-Dichloroethene	*	1.899	2.031	-7.0	*
1,1-Dichloroethane	#	2.904	3.239	-11.5	#
1,2-Dichloroethene (total)		2.127	2.429	-14.2	
Chloroform	*	2.887	3.128	-8.3	*
1,2-Dichloroethane		1.792	1.982	-10.6	
2-Butanone		0.321	0.298	7.2	
1,1,1-Trichloroethane		0.569	0.593	-4.2	
Carbon Tetrachloride		0.507	0.519	-2.4	
Vinyl Acetate		1.057	1.186	-12.2	
Bromodichloromethane		1.032	1.153	-11.7	
1,2-Dichloropropane	*	0.430	0.498	-15.8	*
cis-1,3-Dichloropropene	*	0.630	0.723	-14.8	*
Trichloroethene		0.450	0.480	-6.7	
Dibromochloromethane		0.973	1.033	-6.2	
1,1,2-Trichloroethane		0.355	0.406	-14.4	
Benzene		1.314	1.448	-10.2	
trans-1,3-Dichloropropene		0.575	0.712	-23.8	
Bromoform	#	0.592	0.569	3.9	#
4-Methyl-2-Pentanone		0.819	0.899	-9.8	
2-Hexanone		0.608	0.603	0.8	
Tetrachloroethene		0.389	0.414	-6.4	
1,1,2,2-Tetrachloroethane	#	0.982	1.107	-12.7	#
Toluene	*	0.791	0.896	-13.3	*
Chlorobenzene	#	0.991	1.094	-10.4	#
Ethylbenzene	*	0.464	0.541	-16.6	*
Styrene		0.991	1.090	-10.0	
Xylene (Total)		0.575	0.618	-7.5	
Toluene-d8		1.025	1.054	-2.8	
BFB		0.731	0.713	2.5	
1,2-Dichloroethane-d4		1.430	1.523	-6.5	

Quantitation Report File: 1221K11

Data: 1221K11.TI
12/21/91 15:17:00
Sample: CLP,,,50PPB-CC,L,S,50PPB-V1122C,VOA,CC
Conds.: PACK,1212SAVE,BFB1221C,,
Formula: 5ML Instrument: 4500 Weight: 0.000
Submitted by: Analyst: KC Acct. No.:

AMOUNT=AREA * REF AMNT/(REF AREA * RESP FACT)
Resp. fac. from Library Entry

No	Name	
1	CI01	BROMOCHLOROMETHANE(I.S)
2	CI10	1,4-DIFLUORBENZENE(I.S)
3	CI20	CHLOROBENZENE D-5(I.S)
4	CS15	D4-1,2-DICHLOROETHANE(SURR)
5	CS05	D8-TOLUENE(SURR)
6	CS10	BROMOFLUOROBENZENE(SURR)
7	C010	CHLOROMETHANE
8	C015	BROMOMETHANE
9	C020	VINYL CHORIDE
10	C025	CHLOROETHANE
11	C030	METHYLENE CHLORIDE
12	C035	ACETONE
13	C036	ACROLEIN
14	C037	ACRYLONITRILE
15	C040	CARBON DISULFIDE
16	C045	1,1-DICHLOROETHENE
17	C050	1,1-DICHLOROETHANE
18	C053	1,2-DICHLOROETHENE(TOTAL)
19	C060	CHLOROFORM
20	C110	2-BUTANONE
21	C065	1,2-DICHLOROETHANE
22	C115	1,1,1-TRICHLOROETHANE
23	C120	CARBON TETRACHLORIDE
24	C125	VINYL ACETATE
25	C130	BROMODICHLOROMETHANE
26	C140	1,2-DICHLOROPROPANE
27	C143	CIS-1,3-DICHLOROPROPENE
28	C150	TRICHLOROETHENE
29	C155	DIBROMOCHLOROMETHANE
30	C165	BENZENE
31	C160	1,1,2-TRICHLOROETHANE
32	C173	TRANS-1,3-DICHLOROPROPENE
33	C175	2-CHLOROETHOXY ETHENE
34	C180	BROMOFORM
35	C205	4-METHYL-2-PENTANONE
36	C210	2-HEXANONE
37	C225	1,1,2,2-TETRACHLOROETHANE
38	C220	TETRACHLOROETHENE
39	C230	TOLUENE
40	C235	CHLOROBENZENE
41	C240	ETHYL BENZENE
42	C245	STYRENE
43	C250	OP-XYLENE
44	C255	M-XYLENE

No	m/z	Scan	Time	Ref	RRT	Meth	Area(Hght)	Amount	%Tot
1	128	197	8:12	1	1.000	A BB	18331.	50.000 PPB	2.27
2	114	401	16:42	2	1.000	A BB	62137.	50.000 PPB	2.27
3	117	498	20:45	3	1.000	A BV	57401.	50.000 PPB	2.27
4	65	254	10:35	1	1.289	A BB	27927.	50.000 PPB	2.27
5	98	474	19:45	3	0.952	A BB	60496.	50.000 PPB	2.27
6	95	610	25:25	3	1.225	A BB	40909.	50.000 PPB	2.27
7	90	26	1:05	1	0.132	A BB	29033.	50.000 PPB	2.27
8	94	46	1:55	1	0.234	A BB	28087.	50.000 PPB	2.27
9	62	58	2:25	1	0.294	A BB	24720.	50.000 PPB	2.27
10	64	79	3:17	1	0.401	A BB	29528.	50.000 PPB	2.27
11	84	124	5:10	1	0.629	A BB	68399.	50.000 PPB	2.27
12	43	140	5:50	1	0.711	A BV	20370.	50.000 PPB	2.27
13	NOT FOUND								
14	NOT FOUND								
15	76	159	6:37	1	0.807	A BB	92890.	50.000 PPB	2.27
16	96	187	7:47	1	0.949	A BV	37238.	50.000 PPB	2.27
17	63	214	8:55	1	1.086	A BB	59382.	50.000 PPB	2.27
18	96	229	9:32	1	1.162	A BB	89042.	100.000 PPB	4.55
19	83	241	10:02	1	1.223	A BV	57337.	50.000 PPB	2.27
20	72	254	10:35	1	1.289	A BB	5462.	50.000 PPB	2.27
21	62	256	10:40	1	1.299	A BB	36341.	50.000 PPB	2.27
22	97	281	11:42	2	0.701	A BB	36826.	50.000 PPB	2.27
23	117	289	12:02	2	0.721	A VB	32280.	50.000 PPB	2.27
24	43	292	12:10	2	0.728	A BB	73695.	50.000 PPB	2.27
25	83	300	12:30	2	0.748	A BB	71653.	50.000 PPB	2.27
26	63	326	13:35	2	0.813	A BB	30974.	50.000 PPB	2.27
27	75	331	13:47	2	0.825	A BB	72758.	81.000 PPB	3.68
28	130	342	14:15	2	0.853	A BB	29820.	50.000 PPB	2.27
29	129	354	14:45	2	0.883	A BB	64176.	50.000 PPB	2.27
30	78	351	14:37	2	0.875	A BB	89948.	50.000 PPB	2.27
31	97	356	14:50	2	0.888	A BV	25218.	50.000 PPB	2.27
32	75	356	14:50	2	0.888	A VB	16812.	19.000 PPB	0.86
33	63	326	13:35	2	0.813	A BB	30974.	50.000 PPB	2.27
34	173	407	16:57	2	1.015	A BB	35382.	50.000 PPB	2.27
35	43	415	17:17	3	0.833	A BB	51583.	50.000 PPB	2.27
36	43	446	18:35	3	0.896	A BB	34598.	50.000 PPB	2.27
37	83	452	18:50	3	0.908	A BB	63521.	50.000 PPB	2.27
38	164	452	18:50	3	0.908	A BB	23765.	50.000 PPB	2.27
39	92	478	19:55	3	0.960	A BB	51417.	50.000 PPB	2.27
40	112	501	20:52	3	1.006	A BB	62793.	50.000 PPB	2.27
41	106	547	22:47	3	1.098	A BB	31033.	50.000 PPB	2.27
42	104	647	26:57	3	1.299	A BB	62588.	50.000 PPB	2.27
43	106	681	28:22	3	1.367	A BB	70901.	100.000 PPB	4.55
44	106	655	27:17	3	1.315	A BB	35431.	50.000 PPB	2.27

No	Ret(L)	Ratio	RRT(L)	Ratio	Amnt	Amnt(L)	R.Fac	R.Fac(L)	Ratio
1	8:05	1.02	1.000	1.00	50.00	50.00	1.000	1.000	1.00
2	16:30	1.01	1.000	1.00	50.00	50.00	1.000	1.000	1.00
3	20:30	1.01	1.000	1.00	50.00	50.00	1.000	1.000	1.00
4	10:25	1.02	1.289	1.00	50.00	50.00	1.523	1.523	1.00
5	19:07	1.01	0.949	1.00	50.00	50.00	1.054	1.054	1.00
6	24:52	1.02	1.213	1.01	50.00	50.00	0.713	0.713	1.00
7	1:12	0.90	0.149	0.88	50.00	50.00	1.584	1.584	1.00
8	2:30	0.96	0.247	0.94	50.00	50.00	1.532	1.532	1.00
9	3:27	0.98	0.304	0.97	50.00	50.00	1.349	1.349	1.00
10	3:17	1.00	0.407	0.98	50.00	50.00	1.611	1.611	1.00

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

VBL1221A

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMA Case No.: 12069 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: WB122191

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 1221K12

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

% Moisture: not dec. ____ Date Analyzed: 12/21/91

Column: (pack/cap) PACK Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
74-87-3	Chloromethane	10	U
74-83-9	Bromomethane	10	U
75-01-4	Vinyl Chloride	10	U
75-00-3	Chloroethane	10	U
75-09-2	Methylene Chloride	18	
67-64-1	Acetone	4	J
75-15-0	Carbon Disulfide	6	
75-35-4	1,1-Dichloroethene	5	U
75-34-3	1,1-Dichloroethane	5	U
540-59-0	1,2-Dichloroethene (total)	5	U
67-66-3	Chloroform	5	U
107-06-2	1,2-Dichloroethane	5	U
78-93-3	2-Butanone	10	U
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
108-05-4	Vinyl Acetate	10	U
75-27-4	Bromodichloromethane	5	U
78-87-5	1,2-Dichloropropane	5	U
10061-01-5	cis-1,3-Dichloropropene	5	U
79-01-6	Trichloroethene	5	U
124-48-1	Dibromochloromethane	5	U
79-00-5	1,1,2-Trichloroethane	5	U
71-43-2	Benzene	5	U
10061-02-6	trans-1,3-Dichloropropene	5	U
75-25-2	Bromoform	5	U
108-10-1	4-Methyl-2-Pentanone	10	U
591-78-6	2-Hexanone	3	J
127-18-4	Tetrachloroethene	5	U
79-34-5	1,1,2,2-Tetrachloroethane	5	U
108-88-3	Toluene	5	U
108-90-7	Chlorobenzene	5	U
100-41-4	Ethylbenzene	5	U
100-42-5	Styrene	5	U
1330-20-7	Xylene (Total)	5	U

9613531.2444

0041

EPA SAMPLE NO.

B01CF4

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMA Case No.: 12069 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A112069-01B

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 1221K21

Level: (low/med) LOW Date Received: 12/13/91

% Moisture: not dec. 6 Date Analyzed: 12/21/91

Column: (pack/cap) PACK Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q	
74-87-3	Chloromethane	11	UJ	ICAL
74-83-9	Bromomethane	11	U	
75-01-4	Vinyl Chloride	11	U	
75-00-3	Chloroethane	11	UJ	CCV
75-09-2	Methylene Chloride	19	~~B~~ U J	<10YBL;
67-64-1	Acetone	18	~~B~~ U	
75-15-0	Carbon Disulfide	7	~~B~~ U	
75-35-4	1,1-Dichloroethene	5	U	
75-34-3	1,1-Dichloroethane	5	U	
540-59-0	1,2-Dichloroethene (total)	5	U	
67-66-3	Chloroform	5	U	
107-06-2	1,2-Dichloroethane	5	U	
78-93-3	2-Butanone	11	U	
71-55-6	1,1,1-Trichloroethane	5	U	
56-23-5	Carbon Tetrachloride	5	U	
108-05-4	Vinyl Acetate	11	U	
75-27-4	Bromodichloromethane	5	U	
78-87-5	1,2-Dichloropropane	5	U	
10061-01-5	cis-1,3-Dichloropropene	5	U	
79-01-6	Trichloroethene	5	U	
124-48-1	Dibromochloromethane	5	U	
79-00-5	1,1,2-Trichloroethane	5	U	
71-43-2	Benzene	5	U	
10061-02-6	trans-1,3-Dichloropropene	5	U	
75-25-2	Bromoform	5	U	
108-10-1	4-Methyl-2-Pentanone	11	U	
591-78-6	2-Hexanone	11	U	
127-18-4	Tetrachloroethene	5	U	
79-34-5	1,1,2,2-Tetrachloroethane	5	U	
108-88-3	Toluene	5 ~~2~~	~~J~~ U	
108-90-7	Chlorobenzene	5	U	
100-41-4	Ethylbenzene	5	U	
100-42-5	Styrene	5	U	
1330-20-7	Xylene (Total)	5	U	

9613561.2445

0042

EPA SAMPLE NO.

B01CF4

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMA Case No.: 12069 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A112069-01B

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 1221K21

Level: (low/med) LOW Date Received: 12/13/91

% Moisture: not dec. 6 Date Analyzed: 12/21/91

Column (pack/cap) PACK Dilution Factor: 1.0

Number TICs found: 1

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	Unknown hydrocarbon	30.42	13	~~J~~ NJ

Quantitation Report File: 1221K21

Data: 1221K21.TI
12/21/91 22:04:00
Sample: CLP,12069,,B01CF4,L,S,A112069-01B,VOA,EPA
Conds.: PACK,1221K11,BFB1221C,1221K12,
Formula: Instrument: 4500 Weight: 5.001
Submitted by: Analyst: KC Acct. No.:

AMOUNT=AREA * REF AMNT/(REF AREA * RESP FACT)
Resp. fac. from Library Entry

No	Name	
1	CI01	BROMOCHLOROMETHANE(I.S)
2	CI10	1,4-DIFLUORBENZENE(I.S)
3	CI20	CHLOROBENZENE D-5(I.S)
4	CS15	D4-1,2-DICHLOROETHANE(SURR)
5	CS05	D8-TOLUENE(SURR)
6	CS10	BROMOFLUOROBENZENE(SURR)
7	C030	METHYLENE CHLORIDE
8	C035	ACETONE
9	C040	CARBON DISULFIDE
10	C230	TOLUENE

No	m/z	Scan	Time	Ref	RRT	Meth	Area(Hght)	Amount	%Tot
1	128	197	8:12	1	1.000	A BB	14588.	50.000 PPB	14.77
2	114	401	16:42	2	1.000	A BB	43640.	50.000 PPB	14.77
3	117	498	20:45	3	1.000	A BB	42098.	50.000 PPB	14.77
4	65	254	10:35	1	1.289	A BB	20935.	47.099 PPB	13.91
5	98	474	19:45	3	0.952	A BB	43499.	49.021 PPB	14.48
6	95	610	25:25	3	1.225	A BB	29823.	49.700 PPB	14.68
7	84	125	5:12	1	0.635	A BB	19460	17.875 PPB	5.28
8	43	138	5:45	1	0.701	A BB	5571.	17.183 PPB	5.08
9	76	160	6:40	1	0.812	A BB	9135.	6.179 PPB	1.83
10	92	478	19:55	3	0.960	A BB	1095.	1.452 PPB	0.43

No	Ret(L)	Ratio	RRT(L)	Ratio	Amnt	Amnt(L)	R.Fac	R.Fac(L)	Ratio
1	8:05	1.02	1.000	1.00	50.00	50.00	1.000	1.000	1.00
2	16:30	1.01	1.000	1.00	50.00	50.00	1.000	1.000	1.00
3	20:30	1.01	1.000	1.00	50.00	50.00	1.000	1.000	1.00
4	10:25	1.02	1.289	1.00	47.10	50.00	1.435	1.523	0.94
5	19:27	1.01	0.949	1.00	49.02	50.00	1.033	1.054	0.98
6	24:52	1.02	1.213	1.01	49.70	50.00	0.708	0.713	0.99
7	5:02	1.03	0.624	1.02	17.88	50.00	1.334	3.731	0.36
8	5:35	1.03	0.691	1.01	17.18	50.00	0.382	1.111	0.34
9	6:27	1.03	0.799	1.02	6.18	50.00	0.626	5.067	0.12
10	19:37	1.01	0.957	1.00	1.45	50.00	0.026	0.896	0.03

9615501.2447

0062

EPA SAMPLE NO.

B01CF5

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMA Case No.: 12069 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A112069-02F

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 1221K24

Level: (low/med) LOW Date Received: 12/13/91

% Moisture: not dec. 7 Date Analyzed: 12/22/91

Column: (pack/cap) PACK Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
74-87-3	Chloromethane	11	UJ
74-83-9	Bromomethane	11	U
75-01-4	Vinyl Chloride	11	U
75-00-3	Chloroethane	11	UJ
75-09-2	Methylene Chloride	17	~~B~~ UJ
67-64-1	Acetone	13	~~B~~ U
75-15-0	Carbon Disulfide	6	~~B~~ U
75-35-4	1,1-Dichloroethene	5	U
75-34-3	1,1-Dichloroethane	5	U
540-59-0	1,2-Dichloroethene (total)	5	U
67-66-3	Chloroform	5	U
107-06-2	1,2-Dichloroethane	5	U
78-93-3	2-Butanone	11	U
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
108-05-4	Vinyl Acetate	11	U
75-27-4	Bromodichloromethane	5	U
78-87-5	1,2-Dichloropropane	5	U
10061-01-5	cis-1,3-Dichloropropene	5	U
79-01-6	Trichloroethene	5	U
124-48-1	Dibromochloromethane	5	U
79-00-5	1,1,2-Trichloroethane	5	U
71-43-2	Benzene	5	U
10061-02-6	trans-1,3-Dichloropropene	5	U
75-25-2	Bromoform	5	U
108-10-1	4-Methyl-2-Pentanone	11	U
591-78-6	2-Hexanone	11	U
127-18-4	Tetrachloroethene	5	U
79-34-5	1,1,2,2-Tetrachloroethane	5	U
108-88-3	Toluene	5 ~~1~~	~~J~~ U
108-90-7	Chlorobenzene	5	U
100-41-4	Ethylbenzene	5	U
100-42-5	Styrene	5	U
1330-20-7	Xylene (Total)	5	U

ICAL

CCV

10xBL

FORM I VOA 1/87 Rev.

9613501.2448

0063

EPA SAMPLE NO.

B01CF5

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMA Case No.: 12069 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A112069-02F

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 1221K24

Level: (low/med) LOW Date Received: 12/13/91

% Moisture: not dec. 7 Date Analyzed: 12/22/91

Column (pack/cap) PACK Dilution Factor: 1.0

Number TICs found: 1

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	Unknown hydrocarbon	30.54	13	~~J~~ NJ

Quantitation Report File: 1221K24

Data: 1221K24.TI
12/22/91 0:00:00
Sample: CLP,12069,,B01CF5,L,S,A112069-02F,VOA,EPA
Conds.: PACK,1221K11,BFB1221C,1221K12,
Formula: Instrument: 4500 Weight: 5.001
Submitted by: Analyst: KC Acct. No.:

AMOUNT=AREA * REF AMNT/(REF AREA * RESP FACT)
Resp. fac. from Library Entry

No	Name	
1	CI01	BROMOCHLOROMETHANE(I.S)
2	CI10	1,4-DIFLUORBENZENE(I.S)
3	CI20	CHLOROBENZENE D-5(I.S)
4	CS15	D4-1,2-DICHLOROETHANE(SURR)
5	CS05	D8-TOLUENE(SURR)
6	CS10	BROMOFLUOROBENZENE(SURR)
7	C030	METHYLENE CHLORIDE
8	C035	ACETONE
9	C040	CARBON DISULFIDE
10	C230	TOLUENE

No	m/z	Scan	Time	Ref	RRT	Meth	Area(Hght)	Amount	%Tot
1	128	197	8:12	1	1.000	A BB	18619.	50.000 PPB	15.10
2	114	401	16:42	2	1.000	A BB	62748.	50.000 PPB	15.10
3	117	498	20:45	3	1.000	A BB	58685.	50.000 PPB	15 10
4	65	254	10:35	1	1.289	A BB	28090.	49.514 PPB	14.96
5	98	474	19:45	3	0.952	A BB	61604.	49.802 PPB	15.04
6	95	611	25:27	3	1.227	A BB	39262.	46.937 PPB	14.18
7	84	125	5:12	1	0.635	A BB	22430.	16.143 PPB	4.88
8	43	139	5:47	1	0.706	A BB	4832.	11.677 PPB	3.53
9	76	160	6:40	1	0.812	A BB	11178.	5.923 PPB	1.79
10	92	477	19:52	3	0.958	A BB	1080.	1.027 PPB	0.31

No	Ret(L)	Ratio	RRT(L)	Ratio	Amnt	Amnt(L)	R.Fac	R.Fac(L)	Ratio
1	8:05	1.02	1.000	1.00	50.00	50.00	1.000	1.000	1.00
2	16:30	1.01	1.000	1.00	50.00	50.00	1.000	1.000	1.00
3	20:30	1.01	1.000	1.00	50.00	50.00	1.000	1.000	1.00
4	10:25	1.02	1.289	1.00	49.51	50.00	1.509	1.523	0.99
5	19:27	1.01	0.949	1.00	49.80	50.00	1.050	1.054	1.00
6	24:52	1.02	1.213	1.01	46.94	50.00	0.669	0.713	0.94
7	5:02	1.03	0.624	1.02	16.14	50.00	1.205	3.731	0.32
8	5:35	1.04	0.691	1.02	11.68	50.00	0.260	1.111	0.23
9	6:27	1.03	0.799	1.02	5.92	50.00	0.600	5.067	0.12
10	19:37	1.01	0.957	1.00	1.03	50.00	0.018	0.896	0.02

9613501.2450

0084

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B01CF6

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMA Case No.: 12069 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A112069-03B

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 1221K25

Level: (low/med) LOW Date Received: 12/13/91

% Moisture: not dec. 7 Date Analyzed: 12/22/91

Column: (pack/cap) PACK Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
74-87-3	Chloromethane	11	UJ
74-83-9	Bromomethane	11	U
75-01-4	Vinyl Chloride	11	U
75-00-3	Chloroethane	11	UJ
75-09-2	Methylene Chloride	17	~~B~~ U
67-64-1	Acetone	14	~~B~~ U
75-15-0	Carbon Disulfide	7	~~B~~ U
75-35-4	1,1-Dichloroethene	5	U
75-34-3	1,1-Dichloroethane	5	U
540-59-0	1,2-Dichloroethene (total)	5	U
67-66-3	Chloroform	5	U
107-06-2	1,2-Dichloroethane	5	U
78-93-3	2-Butanone	11	U
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
108-05-4	Vinyl Acetate	11	U
75-27-4	Bromodichloromethane	5	U
78-87-5	1,2-Dichloropropane	5	U
10061-01-5	cis-1,3-Dichloropropene	5	U
79-01-6	Trichloroethene	5	U
124-48-1	Dibromochloromethane	5	U
79-00-5	1,1,2-Trichloroethane	5	U
71-43-2	Benzene	5	U
10061-02-6	trans-1,3-Dichloropropene	5	U
75-25-2	Bromoform	5	U
108-10-1	4-Methyl-2-Pentanone	11	U
591-78-6	2-Hexanone	11	U
127-18-4	Tetrachloroethene	5	U
79-34-5	1,1,2,2-Tetrachloroethane	5	U
108-88-3	Toluene	5 ~~2~~	~~J~~ U
108-90-7	Chlorobenzene	5	U
100-41-4	Ethylbenzene	5	U
100-42-5	Styrene	5	U
1330-20-7	Xylene (Total)	5	U

ICAL

CCV

10xBLK

FORM I VOA 1/87 Rev.

9613501.2451

0085

EPA SAMPLE NO.

B01CF6

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMA Case No.: 12069 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A112069-03B

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 1221K25

Level: (low/med) LOW Date Received: 12/13/91

% Moisture: not dec. 7 Date Analyzed: 12/22/91

Column (pack/cap) PACK Dilution Factor: 1.0

Number TICs found: 1

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	Unknown hydrocarbon	30.42	68	~~J~~ NJ

Quantitation Report File: 1221K25

Data: 1221K25.TI
12/22/91 0:38:00
Sample: CLP,12069,,B01CF6,L,S,A112069-03B,VOA,EPA
Conds.: PACK,1221K11,BFB1221C,1221K12,
Formula: Instrument: 4500 Weight: 5.001
Submitted by: Analyst: KC Acct. No.:

AMOUNT=AREA * REF AMNT/(REF AREA * RESP FACT)
Resp. fac. from Library Entry

No	Name	
1	CI01	BROMOCHLOROMETHANE(I.S)
2	CI10	1,4-DIFLUORBENZENE(I.S)
3	CI20	CHLOROBENZENE D-5(I.S)
4	CS15	D4-1,2-DICHLOROETHANE(SURR)
5	CS05	D8-TOLUENE(SURR)
6	CS10	BROMOFLUOROBENZENE(SURR)
7	C030	METHYLENE CHLORIDE
8	C035	ACETONE
9	C040	CARBON DISULFIDE
10	C230	TOLUENE

No	m/z	Scan	Time	Ref	RRT	Meth	Area(Hght)	Amount	%Tot
1	128	196	8:10	1	1.000	A BB	18517.	50.000 PPB	14.97
2	114	401	16:42	2	1.000	A BB	59993.	50.000 PPB	14.97
3	117	498	20:45	3	1.000	A BB	55813.	50.000 PPB	14.97
4	65	253	10:32	1	1.291	A BB	27855.	49.370 PPB	14.79
5	98	473	19:42	3	0.950	A BB	58413.	49.652 PPB	14.87
6	95	611	25:27	3	1.227	A BB	37898.	47.637 PPB	14.27
7	84	124	5:10	1	0.633	A BB	21894.	15.844 PPB	4.74
8	43	137	5:42	1	0.699	A BB	5471.	13.294 PPB	3.98
9	76	159	6:37	1	0.811	A BB	12420.	6.618 PPB	1.98
10	92	478	19:55	3	0.960	A BB	1491.	1.491 PPB	0.45

No	Ret(L)	Ratio	RRT(L)	Ratio	Amnt	Amnt(L)	R.Fac	R.Fac(L)	Ratio
1	8:05	1.01	1.000	1.00	50.00	50.00	1.000	1.000	1.00
2	16:30	1.01	1.000	1.00	50.00	50.00	1.000	1.000	1.00
3	20:30	1.01	1.000	1.00	50.00	50.00	1.000	1.000	1.00
4	10:25	1.01	1.289	1.00	49.37	50.00	1.504	1.523	0.99
5	19:27	1.01	0.949	1.00	49.65	50.00	1.047	1.054	0.99
6	24:52	1.02	1.213	1.01	47.64	50.00	0.679	0.713	0.95
7	5:02	1.02	0.624	1.01	15.84	50.00	1.182	3.731	0.32
8	5:35	1.02	0.691	1.01	13.29	50.00	0.295	1.111	0.27
9	6:27	1.03	0.799	1.02	6.62	50.00	0.671	5.067	0.13
10	19:37	1.01	0.957	1.00	1.49	50.00	0.027	0.896	0.03

9613501.2453

0106

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B01CF7

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMA Case No.: 12069 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A112069-04B

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 1221K26

Level: (low/med) LOW Date Received: 12/13/91

% Moisture: not dec. 9 Date Analyzed: 12/22/91

Column: (pack/cap) PACK Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
74-87-3	Chloromethane	11	UJ
74-83-9	Bromomethane	11	U
75-01-4	Vinyl Chloride	11	U
75-00-3	Chloroethane	11	UJ
75-09-2	Methylene Chloride	19	~~B~~ UJ
67-64-1	Acetone	22	~~B~~ U
75-15-0	Carbon Disulfide	7	~~B~~ U
75-35-4	1,1-Dichloroethene	5	U
75-34-3	1,1-Dichloroethane	5	U
540-59-0	1,2-Dichloroethene (total)	5	U
67-66-3	Chloroform	5	U
107-06-2	1,2-Dichloroethane	5	U
78-93-3	2-Butanone	11	U
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
108-05-4	Vinyl Acetate	11	U
75-27-4	Bromodichloromethane	5	U
78-87-5	1,2-Dichloropropane	5	U
10061-01-5	cis-1,3-Dichloropropene	5	U
79-01-6	Trichloroethene	5	U
124-48-1	Dibromochloromethane	5	U
79-00-5	1,1,2-Trichloroethane	5	U
71-43-2	Benzene	5	U
10061-02-6	trans-1,3-Dichloropropene	5	U
75-25-2	Bromoform	5	U
108-10-1	4-Methyl-2-Pentanone	11	U
591-78-6	2-Hexanone	11	U
127-18-4	Tetrachloroethene	5	U
79-34-5	1,1,2,2-Tetrachloroethane	5	U
108-88-3	Toluene	5 ~~1~~	~~B~~ U
108-90-7	Chlorobenzene	5	U
100-41-4	Ethylbenzene	5	U
100-42-5	Styrene	5	U
1330-20-7	Xylene (Total)	5	U

ICAL

CCV <10xBL

FORM I VOA 1/87 Rev.

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B01CF7

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMA Case No.: 12069 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A112069-04B

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 1221K26

Level: (low/med) LOW Date Received: 12/13/91

% Moisture: not dec. 9 Date Analyzed: 12/22/91

Column (pack/cap) PACK Dilution Factor: 1.0

Number TICs found: 2

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	Unknown alcohol	13.87	8.8	~~J~~ NJ
2.	Unknown hydrocarbon	30.47	20	~~J~~ NJ

Quantitation Report File: 1221K26

Data: 1221K26.TI
12/22/91 1:17:00
Sample: CLP,12069,,B01CF7,L,S,A112069-04F,VOA,EPA 6 2-10-92 gc
Conds.: PACK,1221K11,BFB1221C,1221K12,
Formula: Instrument: 4500 Weight: 5.001
Submitted by: Analyst: KC Acct. No.:

AMOUNT=AREA * REF AMNT/(REF AREA * RESP FACT)
Resp. fac. from Library Entry

No	Name	
1	CI01	BROMOCHLOROMETHANE(I.S)
2	CI10	1,4-DIFLUORBENZENE(I.S)
3	CI20	CHLOROBENZENE D-5(I.S)
4	CS15	D4-1,2-DICHLOROETHANE(SURR)
5	CS05	D8-TOLUENE(SURR)
6	CS10	BROMOFLUOROBENZENE(SURR)
7	C030	METHYLENE CHLORIDE
8	C035	ACETONE
9	C040	CARBON DISULFIDE
10	C230	TOLUENE

No	m/z	Scan	Time	Ref	RRT	Meth	Area(Hght)	Amount	%Tot
1	128	197	8:12	1	1.000	A BB	17704.	50.000 PPB	14.64
2	114	401	16:42	2	1.000	A BB	61109.	50.000 PPB	14.64
3	117	498	20:45	3	1.000	A BB	57177.	50.000 PPB	14.64
4	65	254	10:35	1	1.289	A BB	26717.	49.528 PPB	14.50
5	98	473	19:42	3	0.950	A BB	59633.	49.480 PPB	14.49
6	95	610	25:25	3	1.225	A BB	38509.	47.251 PPB	13.84
7	84	124	5:10	1	0.629	A BB	23107.	17.490 PPB	5.12
8	43	138	5:45	1	0.701	A BB	7809.	19.847 PPB	5.81
9	76	160	6:40	1	0.812	A BB	11805.	6.579 PPB	1.93
10	92	477	19:52	3	0.958	A BB	1377.	1.344 PPB	0.39

No	Ret(L)	Ratio	RRT(L)	Ratio	Amnt	Amnt(L)	R.Fac	R.Fac(L)	Ratio
1	8:05	1.02	1.000	1.00	50.00	50.00	1.000	1.000	1.00
2	16:30	1.01	1.000	1.00	50.00	50.00	1.000	1.000	1.00
3	20:30	1.01	1.000	1.00	50.00	50.00	1.000	1.000	1.00
4	10:25	1.02	1.289	1.00	49.53	50.00	1.509	1.523	0.99
5	19:27	1.01	0.949	1.00	49.48	50.00	1.043	1.054	0.99
6	24:52	1.02	1.213	1.01	47.25	50.00	0.674	0.713	0.95
7	5:02	1.02	0.624	1.01	17.49	50.00	1.305	3.731	0.35
8	5:35	1.03	0.691	1.01	19.85	50.00	0.441	1.111	0.40
9	6:27	1.03	0.799	1.02	6.58	50.00	0.667	5.067	0.13
10	19:37	1.01	0.957	1.00	1.34	50.00	0.024	0.896	0.03

9613501.2456

0130

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B01CF8

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMA Case No.: 12069 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A112069-05B

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 1221K27

Level: (low/med) LOW Date Received: 12/13/91

% Moisture: not dec. 10 Date Analyzed: 12/22/91

Column: (pack/cap) PACK Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q	
74-87-3	Chloromethane	11	UJ	ICAL
74-83-9	Bromomethane	11	U	
75-01-4	Vinyl Chloride	11	U	
75-00-3	Chloroethane	11	UJ	
75-09-2	Methylene Chloride	19	~~B~~ U	CCV <10xBL
67-64-1	Acetone	46	~~B~~ U	
75-15-0	Carbon Disulfide	7	~~B~~ U	
75-35-4	1,1-Dichloroethene	6	U	
75-34-3	1,1-Dichloroethane	6	U	
540-59-0	1,2-Dichloroethene (total)	6	U	
67-66-3	Chloroform	6	U	
107-06-2	1,2-Dichloroethane	6	U	
78-93-3	2-Butanone	11	U	
71-55-6	1,1,1-Trichloroethane	6	U	
56-23-5	Carbon Tetrachloride	6	U	
108-05-4	Vinyl Acetate	11	U	
75-27-4	Bromodichloromethane	6	U	
78-87-5	1,2-Dichloropropane	6	U	
10061-01-5	cis-1,3-Dichloropropene	6	U	
79-01-6	Trichloroethene	6	U	
124-48-1	Dibromochloromethane	6	U	
79-00-5	1,1,2-Trichloroethane	6	U	
71-43-2	Benzene	6	U	
10061-02-6	trans-1,3-Dichloropropene	6	U	
75-25-2	Bromoform	6	U	
108-10-1	4-Methyl-2-Pentanone	11	U	
591-78-6	2-Hexanone	11	U	
127-18-4	Tetrachloroethene	6	U	
79-34-5	1,1,2,2-Tetrachloroethane	6	U	
108-88-3	Toluene	6 ~~2~~	~~J~~ U	
108-90-7	Chlorobenzene	6	U	
100-41-4	Ethylbenzene	6	U	
100-42-5	Styrene	6	U	
1330-20-7	Xylene (Total)	6	U	

9615501.2457

0131

EPA SAMPLE NO.

B01CF8

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMA Case No.: 12069 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A112069-05B

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 1221K27

Level: (low/med) LOW Date Received: 12/13/91

% Moisture: not dec. 10 Date Analyzed: 12/22/91

Column (pack/cap) PACK Dilution Factor: 1.0

Number TICs found: 2

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	Unknown alcohol	13.87	5.6	~~J~~ NJ
2.	Unknown hydrocarbon	30.42	270	~~J~~ NJ

9613901.2458

Quantitation Report File: 1221K27

Data: 1221K27.TI
12/22/91 1:55:00
Sample: CLP,12069,,B01CF8,L,S,A112069-05B,VOA,EPA
Conds.: PACK,1221K11,BFB1221C,1221K12,
Formula: Instrument: 4500 Weight: 5.001
Submitted by: Analyst: KC Acct. No.:

AMOUNT=AREA * REF AMNT/(REF AREA * RESP FACT)
Resp. fac. from Library Entry

No	Name	
1	CI01	BROMOCHLOROMETHANE(I.S)
2	CI10	1,4-DIFLUORBENZENE(I.S)
3	CI20	CHLOROBENZENE D-5(I.S)
4	CS15	D4-1,2-DICHLOROETHANE(SURR)
5	CS05	D8-TOLUENE(SURR)
6	CS10	BROMOFLUOROBENZENE(SURR)
7	C030	METHYLENE CHLORIDE
8	C035	ACETONE
9	C040	CARBON DISULFIDE
10	C230	TOLUENE

No	m/z	Scan	Time	Ref	RRT	Meth	Area(Hght)	Amount	%Tot
1	128	197	8:12	1	1.000	A BB	16349.	50.000 PPB	13.81
2	114	401	16:42	2	1.000	A BB	54044.	50.000 PPB	13.81
3	117	498	20:45	3	1.000	A BB	48674.	50.000 PPB	13.81
4	65	253	10:32	1	1.284	A BB	25025.	50.236 PPB	13.88
5	98	473	19:42	3	0.950	A BB	50824.	49.538 PPB	13.68
6	95	610	25:25	3	1.225	A BB	31130.	44.870 PPB	12.40
7	84	124	5:10	1	0.629	A BB	20446.	16.758 PPB	4.63
8	43	137	5:42	1	0.695	A BB	15182.	41.783 PPB	11.54
9	76	160	6:40	1	0.812	A BB	10959.	6.614 PPB	1.83
10	92	476	19:50	3	0.956	A BB	1912.	2.193 PPB	0.61

No	Ret(L)	Ratio	RRT(L)	Ratio	Amnt	Amnt(L)	R.Fac	R.Fac(L)	Ratio
1	8:05	1.02	1.000	1.00	50.00	50.00	1.000	1.000	1.00
2	16:30	1.01	1.000	1.00	50.00	50.00	1.000	1.000	1.00
3	20:30	1.01	1.000	1.00	50.00	50.00	1.000	1.000	1.00
4	10:25	1.01	1.289	1.00	50.24	50.00	1.531	1.523	1.00
5	19:27	1.01	0.949	1.00	49.54	50.00	1.044	1.054	0.99
6	24:52	1.02	1.213	1.01	44.87	50.00	0.640	0.713	0.90
7	5:02	1.02	0.624	1.01	16.76	50.00	1.251	3.731	0.34
8	5:35	1.02	0.691	1.01	41.78	50.00	0.929	1.111	0.84
9	6:27	1.03	0.799	1.02	6.61	50.00	0.670	5.067	0.13
10	19:37	1.01	0.957	1.00	2.19	50.00	0.039	0.896	0.04

9613301.2459

Case 12069

ARL1 000

Westinghouse Hanford Company	CHAIN OF CUSTODY

Custody Form Initiator: W. Setzer/B.E. Innis

Company Contact: B.E. Innis

Telephone: 509-376-7690

Project Designation/Sampling Locations: 300-ff-1 /T2

Collection Date: 12-9-91

Ice Chest No.: SML-81

Field Logbook No.: WHC-N-557

Bill of Lading/Airbill No.: 2509864491

Offsite Property No.: WA2-0-0104 #6

Method of Shipment: OVERNIGHT AIR SERVICE

Shipped to: TMA/NORCAL

Possible Sample Hazards/Remarks: None detected with field instruments

Sample Identification

1) B01CF4
1, 500ml Amber Glass: PCB's, ~~CLP Metals~~, Anions by IC (F,SO4,NO2,NO3),pH
~~1, 500ml Clear Glass: Gross Alpha/Beta, Co-60,Sr-90,Cs-137,U-235,U-238~~
1, 125ml Clear Glass: CLP VOA

2)
1, 500ml Amber Glass: PCB's,CLP Metals,Anions by IC (F,SO4,NO2,NO3),pH
1, 500ml Clear Glass: Gross Alpha/Beta, Co-60,Sr-90,Cs-137,U-235,U-238
1, 125ml Clear Glass: CLP VOA

3)
1, 500ml Amber Glass: PCB's,CLP Metals,Anions by IC (F,SO4,NO2,NO3),pH
1, 500ml Clear Glass: Gross Alpha/Beta, Co-60,Sr-90,Cs-137,U-235,U-238
1, 125ml Clear Glass: CLP VOA

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

Relinquished by:	Received by:	Date/Time:
W.V. SETZER W.V. Setzer	Kermit Blum	12-13-91 1130
12-17-91 Kermit Blum	T Bernard	12-18-91 1000

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

A-6000-407 (12/90) (EF) WEF061

9613501.2460

000

Westinghouse Hanford Company	CHAIN OF CUSTODY

Custody Form Initiator: W. Setzer/B.E. Innis

Company Contact: B.E. Innis

Telephone: 509-376-7690

Project Designation/Sampling Locations: 300-ff-1 / T2

Collection Date: 12/10/91

Ice Chest No.: 9ML-8)

Field Logbook No.: WHC-N-557

Bill of Lading/Airbill No.: 2509864495

Offsite Property No.: WA2-0-0104 #6

Method of Shipment: OVERNIGHT AIR SERVICE

Shipped to: TMA/NORCAL

Possible Sample Hazards/Remarks: None detected with field instruments

Sample Identification

1) B01CF5
1, 500ml Amber Glass: PCB's, ~~CLP Metals~~, Anions by IC (F, SO4, NO2, NO3), pH
~~1, 500ml Clear Glass: Gross Alpha/Beta, Co-60, Sr-90, Cs-137, U-235, U-238~~
1, 125ml Clear Glass: CLP VOA

2) B01CF6
1, 500ml Amber Glass: PCB's, ~~CLP Metals~~, Anions by IC (F, SO4, NO2, NO3), pH
~~1, 500ml Clear Glass: Gross Alpha/Beta, Co-60, Sr-90, Cs-137, U-235, U-238~~
1, 125ml Clear Glass: CLP VOA

3)
~~1, 500ml Amber Glass: PCB's, CLP Metals, Anions by IC (F, SO4, NO2, NO3), pH~~
~~1, 500ml Clear Glass: Gross Alpha/Beta, Co-60, Sr-90, Cs-137, U-235, U-238~~
1, 125ml Clear Glass: CLP VOA
WVS 12/10/91

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

Relinquished by:	Received by:	Date/Time:
W.V. SETZER W.V. Setzer	Kermit Blum	12-13-91 1130
Kermit Blum 12-17-91	T Bennett	12-18-91 1000

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

A-6000-407 (12/90) (EF) WEF061

9615501.2461

0004

Westinghouse Hanford Company	CHAIN OF CUSTODY

Custody Form Initiator: W. Setzer/B.E. Innis

Company Contact: B.E. Innis

Telephone: 509-376-7690

Project Designation/Sampling Locations: 300-ff-1/T2

Collection Date: 12/11/91

Ice Chest No.: SML-81

Field Logbook No.: WHC-N-557

Bill of Lading/Airbill No.: 2509 86 449T

Offsite Property No.: WA2-0-0104 #6

Method of Shipment: OVERNIGHT AIR SERVICE

Shipped to: TMA/NORCAL

Possible Sample Hazards/Remarks: None detected with field instruments

Sample Identification

1) B01CF7
1, 500ml Amber Glass: PCB's, ~~CLP Metals~~, Anions by IC (F,SO4,NO2,NO3),pH
~~1, 500ml Clear Glass: Gross Alpha/Beta, Co-60,Sr-90,Cs-137,U-235,U-238~~
1, 125ml Clear Glass: CLP VOA

2) B01CF8
1, 500ml Amber Glass: PCB's, ~~CLP Metals~~, Anions by IC (F,SO4,NO2,NO3),pH
~~1, 500ml Clear Glass: Gross Alpha/Beta, Co-60,Sr-90,Cs-137,U-235,U-238~~
1, 125ml Clear Glass: CLP VOA

3)
1, 500ml ~~Amber Glass~~: PCB's,CLP Metals,Anions by IC (F,SO4,NO2,NO3),pH
1, 500ml Clear Glass: Gross ~~Alpha/Beta~~, Co-60,Sr-90,Cs-137,U-235,U-238
1, 125ml Clear Glass: CLP VOA
WWS 12/11/91

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

Relinquished by:	Received by:	Date/Time:
W.V. SETZER W.V. Setzer	Kermit Blum	12-13-91 1130
Relinquished by: 12-17-91 Kermit Blum	Received by: T Bernard	Date/Time: 12-18-91 1000
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

A-6000-407 (12/90) (EF) WEF061

9615501.2462

12-069

Hart Crowser
J-2978-40

APPENDIX C
DATA VALIDATION DOCUMENTATION

Thermo Analytical Laboratories

Data Package A112069

Volatile Organics Analyses

96153012465

THIS APPENDIX CONSISTS OF FIVE ATTACHMENTS

Attachment 1 - Glossary of Data Qualifiers

This attachment provides a glossary explaining all data qualifiers applied as a result of the validation.

Attachment 2 - As Received Laboratory Sample Concentration Reports

This attachment provides a copy of the as-received sample concentration reports. This may be a tabular summary similar to that provided in Attachment 4, or may be a copy of the laboratory reports (e.g., Form I).

Attachment 3 - Summary of Data Qualifications (Form B-7)

This attachment provides a complete summary of all qualifications applied as a result of the validation.

Attachment 4 - As Qualified Data Summary

This attachment provides a tabular data summary of all data qualified from the validation.

Attachment 5 - Data Review Supporting Documentation

This attachment provides copies of the data validation checklists, data summary forms, telephone contact memoranda and other documentation completed as a result of the data validation.

96135011.2464

ATTACHMENT 1

Glossary of Data Qualifiers

U - Indicates the compound or analyte was analyzed for and not detected. The value reported is the sample quantitation limit corrected for sample dilution and moisture content by the laboratory.

UJ - Indicates the compound or analyte was analyzed for and not detected. Due to quality control deficiencies identified during data validation the value reported may not accurately reflect the sample quantitation limit.

J - Indicates the compound or analyte was analyzed for and detected. The associated value is estimated but the data are useable for decision making processes.

R - Indicates the compound or analyte was analyzed for and due to an identified quality control deficiency the data are unusable.

NJ - Indicates the presumptive evidence of a compound at an estimated value.

N - Indicates presumptive evidence of a compound.

9613501.2465

ATTACHMENT 2

As Received Laboratory Sample Concentration Reports

9613501.2466

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B01CF4

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMA Case No.: 12069 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A112069-01B

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 1221K21

Level: (low/med) LOW Date Received: 12/13/91

% Moisture: not dec. 6 Date Analyzed: 12/21/91

Column: (pack/cap) PACK Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
74-87-3	Chloromethane	11	U
74-83-9	Bromomethane	11	U
75-01-4	Vinyl Chloride	11	U
75-00-3	Chloroethane	11	U
75-09-2	Methylene Chloride	19	B
67-64-1	Acetone	18	B
75-15-0	Carbon Disulfide	7	B
75-35-4	1,1-Dichloroethene	5	U
75-34-3	1,1-Dichloroethane	5	U
540-59-0	1,2-Dichloroethene (total)	5	U
67-66-3	Chloroform	5	U
107-06-2	1,2-Dichloroethane	5	U
78-93-3	2-Butanone	11	U
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
108-05-4	Vinyl Acetate	11	U
75-27-4	Bromodichloromethane	5	U
78-87-5	1,2-Dichloropropane	5	U
10061-01-5	cis-1,3-Dichloropropene	5	U
79-01-6	Trichloroethene	5	U
124-48-1	Dibromochloromethane	5	U
79-00-5	1,1,2-Trichloroethane	5	U
71-43-2	Benzene	5	U
10061-02-6	trans-1,3-Dichloropropene	5	U
75-25-2	Bromoform	5	U
108-10-1	4-Methyl-2-Pentanone	11	U
591-78-6	2-Hexanone	11	U
127-18-4	Tetrachloroethene	5	U
79-34-5	1,1,2,2-Tetrachloroethane	5	U
108-88-3	Toluene	2	J
108-90-7	Chlorobenzene	5	U
100-41-4	Ethylbenzene	5	U
100-42-5	Styrene	5	U
1330-20-7	Xylene (Total)	5	U

9613501.2467

0006

EPA SAMPLE NO.

B01CF4

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMA Case No.: 12069 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A112069-01B

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 1221K21

Level: (low/med) LOW Date Received: 12/13/91

% Moisture: not dec. 6 Date Analyzed: 12/21/91

Column (pack/cap) PACK Dilution Factor: 1.0

Number TICs found: 1

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	Unknown hydrocarbon	30.42	13	J

9615501.2468

0007

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B01CF5

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMA Case No.: 12069 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A112069-02F

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 1221K24

Level: (low/med) LOW Date Received: 12/13/91

% Moisture: not dec. 7 Date Analyzed: 12/22/91

Column: (pack/cap) PACK Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
74-87-3	Chloromethane	11	U
74-83-9	Bromomethane	11	U
75-01-4	Vinyl Chloride	11	U
75-00-3	Chloroethane	11	U
75-09-2	Methylene Chloride	17	B
67-64-1	Acetone	13	B
75-15-0	Carbon Disulfide	6	B
75-35-4	1,1-Dichloroethene	5	U
75-34-3	1,1-Dichloroethane	5	U
540-59-0	1,2-Dichloroethene (total)	5	U
67-66-3	Chloroform	5	U
107-06-2	1,2-Dichloroethane	5	U
78-93-3	2-Butanone	11	U
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
108-05-4	Vinyl Acetate	11	U
75-27-4	Bromodichloromethane	5	U
78-87-5	1,2-Dichloropropane	5	U
10061-01-5	cis-1,3-Dichloropropene	5	U
79-01-6	Trichloroethene	5	U
124-48-1	Dibromochloromethane	5	U
79-00-5	1,1,2-Trichloroethane	5	U
71-43-2	Benzene	5	U
10061-02-6	trans-1,3-Dichloropropene	5	U
75-25-2	Bromoform	5	U
108-10-1	4-Methyl-2-Pentanone	11	U
591-78-6	2-Hexanone	11	U
127-18-4	Tetrachloroethene	5	U
79-34-5	1,1,2,2-Tetrachloroethane	5	U
108-88-3	Toluene	1	J
108-90-7	Chlorobenzene	5	U
100-41-4	Ethylbenzene	5	U
100-42-5	Styrene	5	U
1330-20-7	Xylene (Total)	5	U

0008
EPA SAMPLE NO.

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

B01CF5

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMA Case No.: 12069 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A112069-02F

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 1221K24

Level: (low/med) LOW Date Received: 12/13/91

% Moisture: not dec. 7 Date Analyzed: 12/22/91

Column (pack/cap) PACK Dilution Factor: 1.0

Number TICs found: 1

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	Unknown hydrocarbon	30.54	13	J

9613501.2470

0009

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B01CF6

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMA Case No.: 12069 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A112069-03B

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 1221K25

Level: (low/med) LOW Date Received: 12/13/91

% Moisture: not dec. 7 Date Analyzed: 12/22/91

Column: (pack/cap) PACK Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
74-87-3	Chloromethane	11	U
74-83-9	Bromomethane	11	U
75-01-4	Vinyl Chloride	11	U
75-00-3	Chloroethane	11	U
75-09-2	Methylene Chloride	17	B
67-64-1	Acetone	14	B
75-15-0	Carbon Disulfide	7	B
75-35-4	1,1-Dichloroethene	5	U
75-34-3	1,1-Dichloroethane	5	U
540-59-0	1,2-Dichloroethene (total)	5	U
67-66-3	Chloroform	5	U
107-06-2	1,2-Dichloroethane	5	U
78-93-3	2-Butanone	11	U
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
108-05-4	Vinyl Acetate	11	U
75-27-4	Bromodichloromethane	5	U
78-87-5	1,2-Dichloropropane	5	U
10061-01-5	cis-1,3-Dichloropropene	5	U
79-01-6	Trichloroethene	5	U
124-48-1	Dibromochloromethane	5	U
79-00-5	1,1,2-Trichloroethane	5	U
71-43-2	Benzene	5	U
10061-02-6	trans-1,3-Dichloropropene	5	U
75-25-2	Bromoform	5	U
108-10-1	4-Methyl-2-Pentanone	11	U
591-78-6	2-Hexanone	11	U
127-18-4	Tetrachloroethene	5	U
79-34-5	1,1,2,2-Tetrachloroethane	5	U
108-88-3	Toluene	2	J
108-90-7	Chlorobenzene	5	U
100-41-4	Ethylbenzene	5	U
100-42-5	Styrene	5	U
1330-20-7	Xylene (Total)	5	U

9613501.2471

0010
EPA SAMPLE NO.

B01CF6

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMA Case No.: 12069 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A112069-03B

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 1221K25

Level: (low/med) LOW Date Received: 12/13/91

% Moisture: not dec. 7 Date Analyzed: 12/22/91

Column (pack/cap) PACK Dilution Factor: 1.0

Number TICs found: 1

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	Unknown hydrocarbon	30.42	68	J

9613501.2472

0011

EPA SAMPLE NO.

B01CF7

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMA Case No.: 12069 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A112069-04B

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 1221K26

Level: (low/med) LOW Date Received: 12/13/91

% Moisture: not dec. 9 Date Analyzed: 12/22/91

Column: (pack/cap) PACK Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
74-87-3	Chloromethane	11	U
74-83-9	Bromomethane	11	U
75-01-4	Vinyl Chloride	11	U
75-00-3	Chloroethane	11	U
75-09-2	Methylene Chloride	19	B
67-64-1	Acetone	22	B
75-15-0	Carbon Disulfide	7	B
75-35-4	1,1-Dichloroethene	5	U
75-34-3	1,1-Dichloroethane	5	U
540-59-0	1,2-Dichloroethene (total)	5	U
67-66-3	Chloroform	5	U
107-06-2	1,2-Dichloroethane	5	U
78-93-3	2-Butanone	11	U
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
108-05-4	Vinyl Acetate	11	U
75-27-4	Bromodichloromethane	5	U
78-87-5	1,2-Dichloropropane	5	U
10061-01-5	cis-1,3-Dichloropropene	5	U
79-01-6	Trichloroethene	5	U
124-48-1	Dibromochloromethane	5	U
79-00-5	1,1,2-Trichloroethane	5	U
71-43-2	Benzene	5	U
10061-02-6	trans-1,3-Dichloropropene	5	U
75-25-2	Bromoform	5	U
108-10-1	4-Methyl-2-Pentanone	11	U
591-78-6	2-Hexanone	11	U
127-18-4	Tetrachloroethene	5	U
79-34-5	1,1,2,2-Tetrachloroethane	5	U
108-88-3	Toluene	1	J
108-90-7	Chlorobenzene	5	U
100-41-4	Ethylbenzene	5	U
100-42-5	Styrene	5	U
1330-20-7	Xylene (Total)	5	U

9615901.2473

0012

EPA SAMPLE NO.

B01CF7

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMA Case No.: 12069 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A112069-04B

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 1221K26

Level: (low/med) LOW Date Received: 12/13/91

% Moisture: not dec. 9 Date Analyzed: 12/22/91

Column (pack/cap) PACK Dilution Factor: 1.0

Number TICs found: 2

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	Unknown alcohol	13.87	8.8	J
2.	Unknown hydrocarbon	30.47	20	J

0013
EPA SAMPLE NO.

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

B01CF8

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMA Case No.: 12069 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A112069-05B

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 1221K27

Level: (low/med) LOW Date Received: 12/13/91

% Moisture: not dec. 10 Date Analyzed: 12/22/91

Column: (pack/cap) PACK Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
74-87-3	Chloromethane	11	U
74-83-9	Bromomethane	11	U
75-01-4	Vinyl Chloride	11	U
75-00-3	Chloroethane	11	U
75-09-2	Methylene Chloride	19	B
67-64-1	Acetone	46	B
75-15-0	Carbon Disulfide	7	B
75-35-4	1,1-Dichloroethene	6	U
75-34-3	1,1-Dichloroethane	6	U
540-59-0	1,2-Dichloroethene (total)	6	U
67-66-3	Chloroform	6	U
107-06-2	1,2-Dichloroethane	6	U
78-93-3	2-Butanone	11	U
71-55-6	1,1,1-Trichloroethane	6	U
56-23-5	Carbon Tetrachloride	6	U
108-05-4	Vinyl Acetate	11	U
75-27-4	Bromodichloromethane	6	U
78-87-5	1,2-Dichloropropane	6	U
10061-01-5	cis-1,3-Dichloropropene	6	U
79-01-6	Trichloroethene	6	U
124-48-1	Dibromochloromethane	6	U
79-00-5	1,1,2-Trichloroethane	6	U
71-43-2	Benzene	6	U
10061-02-6	trans-1,3-Dichloropropene	6	U
75-25-2	Bromoform	6	U
108-10-1	4-Methyl-2-Pentanone	11	U
591-78-6	2-Hexanone	11	U
127-18-4	Tetrachloroethene	6	U
79-34-5	1,1,2,2-Tetrachloroethane	6	U
108-88-3	Toluene	2	J
108-90-7	Chlorobenzene	6	U
100-41-4	Ethylbenzene	6	U
100-42-5	Styrene	6	U
1330-20-7	Xylene (Total)	6	U

9613501.2475

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.
0014

B01CF8

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMA Case No.: 12069 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A112069-05B

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 1221K27

Level: (low/med) LOW Date Received: 12/13/91

% Moisture: not dec. 10 Date Analyzed: 12/22/91

Column (pack/cap) PACK Dilution Factor: 1.0

Number TICs found: 2

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	Unknown alcohol	13.87	5.6	J
2.	Unknown hydrocarbon	30.42	270	J

9613501.2476

ATTACHMENT 3

Summary of Data Qualifications

Report #6
Appendix (C)

DATA QUALIFICATION SUMMARY - FORM B-7

SDG: A1.12.069	REVIEWER: CMKumel	DATE: 7/2/92	PAGE 1 OF 1
COMMENTS: Level 2			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
chloromethane	UJ	B01CF4, B01CF5, B01CF6, B01CF7, B01CF8	ICAL %RSD
chloroethane	UJ	↓	CCV%D
methylene chloride	UJ	↓	CCV%D; <10xBL
acetone	↓	↓	<10xBL
carbon disulfide	↓	↓	<10xBL
toluene	U at CRQL	↓	common contam. <CRQL
unknown TIC (RT 3.04)	NJ	↓	presumptive evidence
unknown TIC (RT 13.9)	NJ	B01CF7, B01CF8	presump. evidence

9613501.2478

ATTACHMENT 4

As Qualified Data Summary

9613501.2479

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B01CF4

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMA Case No.: 12069 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A112069-01B

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 1221K21

Level: (low/med) LOW Date Received: 12/13/91

% Moisture: not dec. 6 Date Analyzed: 12/21/91

Column: (pack/cap) PACK Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q	
74-87-3	Chloromethane	11	UJ	ICAL
74-83-9	Bromomethane	11	U	
75-01-4	Vinyl Chloride	11	U	
75-00-3	Chloroethane	11	UJ	CCV
75-09-2	Methylene Chloride	19	~~B~~ UJ	CCV; BL
67-64-1	Acetone	18	~~B~~ U	BL
75-15-0	Carbon Disulfide	7	~~B~~ U	BL
75-35-4	1,1-Dichloroethene	5	U	
75-34-3	1,1-Dichloroethane	5	U	
540-59-0	1,2-Dichloroethene (total)	5	U	
67-66-3	Chloroform	5	U	
107-06-2	1,2-Dichloroethane	5	U	
78-93-3	2-Butanone	11	U	
71-55-6	1,1,1-Trichloroethane	5	U	
56-23-5	Carbon Tetrachloride	5	U	
108-05-4	Vinyl Acetate	11	U	
75-27-4	Bromodichloromethane	5	U	
78-87-5	1,2-Dichloropropane	5	U	
10061-01-5	cis-1,3-Dichloropropene	5	U	
79-01-6	Trichloroethene	5	U	
124-48-1	Dibromochloromethane	5	U	
79-00-5	1,1,2-Trichloroethane	5	U	
71-43-2	Benzene	5	U	
10061-02-6	trans-1,3-Dichloropropene	5	U	
75-25-2	Bromoform	5	U	
108-10-1	4-Methyl-2-Pentanone	11	U	
591-78-6	2-Hexanone	11	U	
127-18-4	Tetrachloroethene	5	U	
79-34-5	1,1,2,2-Tetrachloroethane	5	U	
108-88-3	Toluene	5 ~~2~~	~~J~~ U	
108-90-7	Chlorobenzene	5	U	
100-41-4	Ethylbenzene	5	U	
100-42-5	Styrene	5	U	
1330-20-7	Xylene (Total)	5	U	

9613501.2480

0006

EPA SAMPLE NO.

B01CF4

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMA Case No.: 12069 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A112069-01B

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 1221K21

Level: (low/med) LOW Date Received: 12/13/91

% Moisture: not dec. 6 Date Analyzed: 12/21/91

Column (pack/cap) PACK Dilution Factor: 1.0

Number TICs found: 1

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	Unknown hydrocarbon	30.42	13	~~J~~ NJ

9615501.2481

0007

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B01CF5

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMA Case No.: 12069 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A112069-02F

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 1221K24

Level: (low/med) LOW Date Received: 12/13/91

% Moisture: not dec. 7 Date Analyzed: 12/22/91

Column: (pack/cap) PACK Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q	
74-87-3	Chloromethane	11	~~U~~ UJ	ICAL
74-83-9	Bromomethane	11	U	
75-01-4	Vinyl Chloride	11	U	
75-00-3	Chloroethane	11	UJ	CCV
75-09-2	Methylene Chloride	17	~~B~~ UJ	CCV; BL
67-64-1	Acetone	13	~~B~~ U	BL
75-15-0	Carbon Disulfide	6	~~B~~ U	BL
75-35-4	1,1-Dichloroethene	5	U	
75-34-3	1,1-Dichloroethane	5	U	
540-59-0	1,2-Dichloroethene (total)	5	U	
67-66-3	Chloroform	5	U	
107-06-2	1,2-Dichloroethane	5	U	
78-93-3	2-Butanone	11	U	
71-55-6	1,1,1-Trichloroethane	5	U	
56-23-5	Carbon Tetrachloride	5	U	
108-05-4	Vinyl Acetate	11	U	
75-27-4	Bromodichloromethane	5	U	
78-87-5	1,2-Dichloropropane	5	U	
10061-01-5	cis-1,3-Dichloropropene	5	U	
79-01-6	Trichloroethene	5	U	
124-48-1	Dibromochloromethane	5	U	
79-00-5	1,1,2-Trichloroethane	5	U	
71-43-2	Benzene	5	U	
10061-02-6	trans-1,3-Dichloropropene	5	U	
75-25-2	Bromoform	5	U	
108-10-1	4-Methyl-2-Pentanone	11	U	
591-78-6	2-Hexanone	11	U	
127-18-4	Tetrachloroethene	5	U	
79-34-5	1,1,2,2-Tetrachloroethane	5	U	
108-88-3	Toluene	5 ~~2~~	~~B~~ U	
108-90-7	Chlorobenzene	5	U	
100-41-4	Ethylbenzene	5	U	
100-42-5	Styrene	5	U	
1330-20-7	Xylene (Total)	5	U	

9615501.2482

0008
EPA SAMPLE NO.

B01CF5

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMA Case No.: 12069 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A112069-02F

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 1221K24

Level: (low/med) LOW Date Received: 12/13/91

% Moisture: not dec. 7 Date Analyzed: 12/22/91

Column (pack/cap) PACK Dilution Factor: 1.0

Number TICs found: 1

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	Unknown hydrocarbon	30.54	13	~~J~~ NJ

9613501.2483

0009

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B01CF6

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMA Case No.: 12069 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A112069-03B

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 1221K25

Level: (low/med) LOW Date Received: 12/13/91

% Moisture: not dec. 7 Date Analyzed: 12/22/91

Column: (pack/cap) PACK Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q	
74-87-3	Chloromethane	11	UJ	ICAL
74-83-9	Bromomethane	11	U	
75-01-4	Vinyl Chloride	11	U	
75-00-3	Chloroethane	11	UJ	CCV
75-09-2	Methylene Chloride	17	~~B~~ UJ	CCV; BL
67-64-1	Acetone	14	~~B~~ U	BL
75-15-0	Carbon Disulfide	7	~~B~~ U	BL
75-35-4	1,1-Dichloroethene	5	U	
75-34-3	1,1-Dichloroethane	5	U	
540-59-0	1,2-Dichloroethene (total)	5	U	
67-66-3	Chloroform	5	U	
107-06-2	1,2-Dichloroethane	5	U	
78-93-3	2-Butanone	11	U	
71-55-6	1,1,1-Trichloroethane	5	U	
56-23-5	Carbon Tetrachloride	5	U	
108-05-4	Vinyl Acetate	11	U	
75-27-4	Bromodichloromethane	5	U	
78-87-5	1,2-Dichloropropane	5	U	
10061-01-5	cis-1,3-Dichloropropene	5	U	
79-01-6	Trichloroethene	5	U	
124-48-1	Dibromochloromethane	5	U	
79-00-5	1,1,2-Trichloroethane	5	U	
71-43-2	Benzene	5	U	
10061-02-6	trans-1,3-Dichloropropene	5	U	
75-25-2	Bromoform	5	U	
108-10-1	4-Methyl-2-Pentanone	11	U	
591-78-6	2-Hexanone	11	U	
127-18-4	Tetrachloroethene	5	U	
79-34-5	1,1,2,2-Tetrachloroethane	5	U	
108-88-3	Toluene	52	~~J~~ U	
108-90-7	Chlorobenzene	5	U	
100-41-4	Ethylbenzene	5	U	
100-42-5	Styrene	5	U	
1330-20-7	Xylene (Total)	5	U	

9613501.2484

0010
EPA SAMPLE NO.

B01CF6

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMA Case No.: 12069 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A112069-03B

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 1221K25

Level: (low/med) LOW Date Received: 12/13/91

% Moisture: not dec. 7 Date Analyzed: 12/22/91

Column (pack/cap) PACK Dilution Factor: 1.0

Number TICs found: 1

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	Unknown hydrocarbon	30.42	68	NJ

9613501.2485

0011

EPA SAMPLE NO.

B01CF7

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMA Case No.: 12069 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A112069-04B

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 1221K26

Level: (low/med) LOW Date Received: 12/13/91

% Moisture: not dec. 9 Date Analyzed: 12/22/91

Column: (pack/cap) PACK Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q	
74-87-3	Chloromethane	11	UJ	ICAL
74-83-9	Bromomethane	11	U	
75-01-4	Vinyl Chloride	11	U	
75-00-3	Chloroethane	11	UJ	CCV
75-09-2	Methylene Chloride	19	~~B~~ UJ	CCV; BL
67-64-1	Acetone	22	~~B~~ U	BL
75-15-0	Carbon Disulfide	7	~~B~~ U	BL
75-35-4	1,1-Dichloroethene	5	U	
75-34-3	1,1-Dichloroethane	5	U	
540-59-0	1,2-Dichloroethene (total)	5	U	
67-66-3	Chloroform	5	U	
107-06-2	1,2-Dichloroethane	5	U	
78-93-3	2-Butanone	11	U	
71-55-6	1,1,1-Trichloroethane	5	U	
56-23-5	Carbon Tetrachloride	5	U	
108-05-4	Vinyl Acetate	11	U	
75-27-4	Bromodichloromethane	5	U	
78-87-5	1,2-Dichloropropane	5	U	
10061-01-5	cis-1,3-Dichloropropene	5	U	
79-01-6	Trichloroethene	5	U	
124-48-1	Dibromochloromethane	5	U	
79-00-5	1,1,2-Trichloroethane	5	U	
71-43-2	Benzene	5	U	
10061-02-6	trans-1,3-Dichloropropene	5	U	
75-25-2	Bromoform	5	U	
108-10-1	4-Methyl-2-Pentanone	11	U	
591-78-6	2-Hexanone	11	U	
127-18-4	Tetrachloroethene	5	U	
79-34-5	1,1,2,2-Tetrachloroethane	5	U	
108-88-3	Toluene	5 ~~1~~	~~J~~ U	
108-90-7	Chlorobenzene	5	U	
100-41-4	Ethylbenzene	5	U	
100-42-5	Styrene	5	U	
1330-20-7	Xylene (Total)	5	U	

9615501.2486

0012

EPA SAMPLE NO.

B01CF7

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMA Case No.: 12069 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A112069-04B

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 1221K26

Level: (low/med) LOW Date Received: 12/13/91

% Moisture: not dec. 9 Date Analyzed: 12/22/91

Column (pack/cap) PACK Dilution Factor: 1.0

Number TICs found: 2

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	Unknown alcohol	13.87	8.8	~~J~~ NJ
2.	Unknown hydrocarbon	30.47	20	~~J~~ NJ

9615501.2487

0013
EPA SAMPLE NO.

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

B01CF8

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMA Case No.: 12069 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A112069-05B

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 1221K27

Level: (low/med) LOW Date Received: 12/13/91

% Moisture: not dec. 10 Date Analyzed: 12/22/91

Column: (pack/cap) PACK Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q	
74-87-3	Chloromethane	11	UJ	ICAL
74-83-9	Bromomethane	11	U	
75-01-4	Vinyl Chloride	11	U	
75-00-3	Chloroethane	11	UJ	CCV
75-09-2	Methylene Chloride	19	~~B~~ UJ	CCV;
67-64-1	Acetone	46	~~B~~ U	BL
75-15-0	Carbon Disulfide	7	~~B~~ U	BL
75-35-4	1,1-Dichloroethene	6	U	
75-34-3	1,1-Dichloroethane	6	U	
540-59-0	1,2-Dichloroethene (total)	6	U	
67-66-3	Chloroform	6	U	
107-06-2	1,2-Dichloroethane	6	U	
78-93-3	2-Butanone	11	U	
71-55-6	1,1,1-Trichloroethane	6	U	
56-23-5	Carbon Tetrachloride	6	U	
108-05-4	Vinyl Acetate	11	U	
75-27-4	Bromodichloromethane	6	U	
78-87-5	1,2-Dichloropropane	6	U	
10061-01-5	cis-1,3-Dichloropropene	6	U	
79-01-6	Trichloroethene	6	U	
124-48-1	Dibromochloromethane	6	U	
79-00-5	1,1,2-Trichloroethane	6	U	
71-43-2	Benzene	6	U	
10061-02-6	trans-1,3-Dichloropropene	6	U	
75-25-2	Bromoform	6	U	
108-10-1	4-Methyl-2-Pentanone	11	U	
591-78-6	2-Hexanone	11	U	
127-18-4	Tetrachloroethene	6	U	
79-34-5	1,1,2,2-Tetrachloroethane	6	U	
108-88-3	Toluene	6 ~~2~~	~~J~~ U	
108-90-7	Chlorobenzene	6	U	
100-41-4	Ethylbenzene	6	U	
100-42-5	Styrene	6	U	
1330-20-7	Xylene (Total)	6	U	

9613501.2488

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.
0014

B01CF8

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMA Case No.: 12069 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A112069-05B

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 1221K27

Level: (low/med) LOW Date Received: 12/13/91

% Moisture: not dec. 10 Date Analyzed: 12/22/91

Column (pack/cap) PACK Dilution Factor: 1.0

Number TICs found: 2

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	Unknown alcohol	13.87	5.6	J NJ
2.	Unknown hydrocarbon	30.42	270	J NJ

9613501.2489

ATTACHMENT 5

Data Review Supporting Documentation

9615501.2490

VOLATILE ORGANIC DATA VALIDATION CHECKLIST - FORM A-1

PROJECT: Westinghouse Hanford 300FF1	REVIEWER: SS	DATE: 5-19-92
LABORATORY: TMA/ARL1	CASE: 12-069	SDG:
SAMPLES/MATRIX: B01CF4 (Soil)		
B01CF5 (")		
B01CF6 (")		
B01CF7 (")		
B01CF8 (")		

1. DATA PACKAGE COMPLETENESS

Review the data package for completeness and check off the items below. If any data review elements are missing contact the laboratory for submittal.

Data Package Item	Present?: Yes	No	N/A
Case Narrative	✓		
Data Summary	✓		
Chain-of-Custody	✓		
QC Summary			
Surrogate report	✓		
MS/MSD report	✓		
Blank summary report	✓		
GC/MS tuning report (12-12-91) (12-21-91)	✓		
Internal standard summary report	✓		
Sample Data			
Sample reports	✓		
TIC reports for each sample	✓		
RIC reports for all samples	✓		
Raw and corrected spectra for all detected results	✓		
Raw and corrected library search data for all reported TIC	✓		
Quantitation and calculation data for all TIC	✓		
Standards Data			
Initial calibration report (12-12-91)	✓		
RIC and quantitation reports for initial calibration	✓		
Continuing calibration reports (12-21-91)	✓		
RIC and quantitation reports for cont. calibrations	✓		
Internal standard summary report	✓		
Raw QC Data			
Tuning report, spectra and mass lists	✓		
Blank analysis reports	✓		
TIC reports for all blanks	✓		
RIC and quantitation reports for blanks	✓		
Raw and corrected spectra for all detected results in blanks	✓		
Raw and corrected library search data for all reported TIC	✓		

Data Package Item	Present?: Yes	No	N/A
Quantitation and calculation data for all TIC	✓		
MS/MSD report forms	✓		
RIC and quantitation reports for MS/MSD	✓		
Additional Data			
Moisture/% solids data sheets		✓	
Reduction formulae		✓	
Instrument time logs		✓	
Chemist notebook pages		✓	
Sample preparation sheets	✓		

2. HOLDING TIMES

Complete the holding time summary form listing all samples and dates of collection and analysis.

Were all samples analyzed within holding time? (Yes) No N/A

ACTION: If any holding times were exceeded, but not by greater than a factor of two, qualify associated samples as estimated (J for detects or UJ for nondetects), otherwise reject all nondetects (R) and qualify all associated detects as estimated (J).

3. INSTRUMENT CALIBRATION, TUNING AND PERFORMANCE CHECKS

3.1 GC/MS TUNING AND PERFORMANCE CHECKS

Is a bromofluorobenzene tune report present for each applicable 12-h period? (Yes) No N/A

Do all tunes on all instruments meet the tuning criteria? (Yes) No N/A

Do all tunes on all instruments meet the expanded criteria? (Yes) No N/A

Has the laboratory made any calculation or transciption errors? Yes (No) N/A Level 2

Have the proper significant figures been reported? (Yes) No N/A

ACTION: If the mass calibration is out of specification but within the expanded criteria, qualify associated data as estimated (J for detects or UJ for nondetects). If all tuning criteria are missed, qualify all associated data as unusable (R).

3.2 INITIAL CALIBRATION

Is an initial calibration report provided for all instruments? (Yes) No N/A

Are all RSD values ≤30% (2/88 SOW)? Yes (No) N/A

Are all RRF values ≥0.05 (2/88 SOW)? (Yes) No N/A

Are all applicable RSD values ≤20.5% (3/90 SOW)?	Yes	No	N/A
Are all applicable RSD values ≤40% (3/90 SOW)?	Yes	No	N/A
Are all applicable RRF values within SOW limits (3/90 SOW)?	Yes	No	N/A
Are all erratic performance compound RRF values ≥0.01 (3/90 SOW)?	Yes	No	N/A

ACTION: With the exception of compounds that exhibit erratic performance and making allowances for up to two TCL compounds, if any RRF value is out of specification qualify all detected results for the particular compound as estimated (J) and all nondetects as unusable (R). Making allowances for up to two TCL compounds, if any RSD value is out of specification qualify all associated data as estimated (J for detects or UJ for nondetects).

3.3. CONTINUING CALIBRATION

Is a continuing calibration report present for all 12-h periods in which associated samples were analyzed?	Yes	No	N/A
Are all RRF values ≥0.05 (2/88 SOW)?	Yes	No	N/A
Are all %D values ≤25% (2/88 or 3/90 SOW)?	Yes	No	N/A
Are all %D values ≤40% (3/90 SOW)?	Yes	No	N/A
Are all RRF values within SOW limits (3/90 SOW)?	Yes	No	N/A
Are all erratic performance compound RRF values ≥0.01 (3/90 SOW)?	Yes	No	N/A

ACTION: With the exception of compounds that exhibit erratic performance and making allowances for up to two TCL compounds, if any RRF value is out of specification qualify all associated detected results as estimated and all nondetects as unusable (R). Making allowances for up to two TCL compounds, if any %D is out of specification, qualify all associated results as estimated (J for detects or UJ for nondetects).

4. BLANKS

4.1 LABORATORY BLANKS

Has the laboratory conducted a method blank analysis per matrix for every 12-h period in which samples were analyzed?	Yes	No	N/A
Are TCL compounds present in the laboratory blanks?	Yes	No	N/A

ACTION: Qualify all sample results ≤10 time the highest blank concentration for the common laboratory contaminants, as nondetects (U) or at the SQL if the result is <CRQL. Qualify all remaining sample results ≤5 times the blank concentration in similar fashion.

4.2. FIELD BLANKS

Are TCL compounds present in the field blanks? Yes No N/A

ACTION: Qualify all detected sample results ≤ 5 times the amount in any valid field blank as nondetects (U) and note the field blank results in the validation narrative.

5. ACCURACY

5.1 SURROGATE/SYSTEM MONITORING COMPOUND RECOVERY

Are any surrogate recoveries out of specification? Yes No N/A

Are any surrogate recoveries < 10%? Yes No N/A

Are any method blank surrogate recoveries out of specification? Yes No N/A

ACTION: Qualify all associated sample results as estimated (J for detects or UJ for nondetects) for surrogates out of specification but > 10%. Qualify all associated positive sample results as estimated (J) and all nondetect results as unusable (R) for all surrogates below 10%. If method blank surrogates are out of specification and the associated sample surrogates are acceptable no qualification is necessary, however, the laboratory should be contacted for an explanation.

5.2 MATRIX SPIKE RECOVERY

Has an MS/MSD analysis been conducted per matrix in the sample group? Yes No N/A

Are MS/MSD recoveries within specification? Yes No N/A

Are there any calculation errors? Yes No N/A Level 2

ACTION: If an MS/MSD analysis has not been conducted contact the laboratory for an explanation. Review the MS/MSD recoveries in conjunction with other QC data such as surrogate recoveries and note the results in the validation narrative. If MS/MSD recoveries are out of specification and sample concentration is > 5 times the spike concentration, no qualification is required, otherwise qualify results as follows: Qualify positive results for the specific class of compound (aromatics and non-aromatics) as estimated (J) in all samples if associated surrogates are also out of specification. The qualification shall only be done on samples of similar matrix as the MS/MSD samples. If it is determined from the review that only the spiked samples are affected by low recoveries, qualify only the results for the spiked sample as described above. If it is determined from the review that out of specification MS/MSD recoveries are indicative of systematic problems in the laboratory such as sample preparation or sample-specific matrix interferences this must be noted in the validation narrative along with the potential affect on the sample results.

5.3 PERFORMANCE AUDIT SAMPLES

Are the performance audit sample results within the acceptance limits? Yes No (N/A)

ACTION: Note the results of the performance audit sample in the validation narrative.

6. PRECISION

6.1 MATRIX SPIKE/MATRIX SPIKE DUPLICATES

Are RPD values within specification? (Yes) No N/A

Are there any calculation errors? Yes (No) N/A Level 2

ACTION: Review the MS/MSD results in conjunction with other QC data such as field duplicates and note the results in the validation narrative. If MS/MSD RPDs are out of specification and sample results are >5xCRQL qualify positive results for the specific class of compound (aromatics and non-aromatics) as estimated (J). If it is determined from the review that out of specification MS/MSD results are indicative of systematic problems in the laboratory such as sample preparation or sample-specific matrix interferences this must be noted in the validation narrative along with the potential affect on the sample results.

6.2 FIELD DUPLICATE SAMPLES

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

ACTION: Note the results of the field duplicate samples in the validation narrative.

6.3 FIELD SPLIT SAMPLES

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

ACTION: Note the results of the field split samples in the validation narrative.

7. SYSTEM PERFORMANCE

7.1 INTERNAL STANDARDS PERFORMANCE

Are any internal standard area counts outside the acceptance limits? Yes (No) N/A

Are retention times for any internal standard outside the ±30 second windows established by the most recent calibration check? Yes (No) N/A

ACTION: If the area counts are outside the acceptance limits qualify all associated results as estimated (J for detects or UJ for nondetects). If it is determined from the review that out of specification area counts and relative retention times are indicative of systematic problems within the laboratory the reviewer may consider rejection of all affected sample data (R).

8. COMPOUND IDENTIFICATION AND QUANTITATION

8.1 COMPOUND IDENTIFICATION

Are detected compounds within ±0.06 relative retention time units of the associated calibration standard?	Yes	No	N/A
Are all ions at a relative intensity of ≥10% in the standard spectra present in the sample spectra?	Yes	No	N/A
Do the relative intensities between the standard and sample spectra agree within 20%?	Yes	No	N/A
Have all ions > 10% in the sample spectra that are not present in the standard spectra been reviewed for possible background contamination?	Yes	No	N/A
Are molecular ions present in the reference spectrum present in the sample spectrum?	Yes	No	N/A

ACTION: If compound identification is in error and retention time and mass spectral criteria are exceeded qualify all affected positive results as unusable (R). If cross-contamination between analyses is suspected, qualify affected data as unusable (R). Note the results in the validation narrative.

8.2 REPORTED RESULTS AND QUANTITATION LIMITS

Has the laboratory used the correct RRF values and internal standard(s) for quantitation?	Yes	No	N/A
Are results and quantitation limits calculated properly?	Yes	No	N/A
Has the laboratory reported the sample quantitation limits within 5xCRQL values?	Yes	No	N/A

ACTION: If the results and quantitation limits are in error contact the laboratory for clarification and note in the validation narrative.

8.3 TENTATIVELY IDENTIFIED COMPOUNDS (TIC)

Has the laboratory conducted a spectral library search on all candidate TIC peaks in accordance with the analytical SOW?	Yes	No	N/A
Has the laboratory properly identified and coded all TIC?	Yes	No	N/A

ACTION: If the laboratory has failed to search the minimum number of TIC peaks in the chromatogram contact the laboratory for submittal of the required data. Qualify as nondetects (U) all TIC compounds present in samples and blanks using the review criteria specified in the validation requirements. If TIC identification is in error sample results should be qualified as nondetects (U) or unusable (R). If TIC identifications are judged valid, qualify the results as presumptive and estimated (JN).

9. OVERALL ASSESSMENT AND SUMMARY

Has the laboratory conducted the analysis in accordance with the analytical SOW? Yes No N/A

Were project specific data quality objectives met for this analysis? Yes No N/A

ACTION: Summarize all the data qualifications recommended in the foregoing sections, and complete the data validation narrative according to the requirements of Section 10.0 of the data validation requirements.

COMMENTS (attach additional sheets as necessary):

From Narrative

① CLP SOW 2/88

② The MS and MSD samples detected vinyl acetate; the lab confirmed that the matrix spiking solution was contaminated.

∴ (U) the vinyl acetate for MS/MSD results.

Report #6
Appendix C

HOLDING TIME SUMMARY - FORM B-1

SDG: A1.12.069	REVIEWER: CMRussell	DATE: 7/2/92	PAGE 1 OF 1
COMMENTS: Level 2			

FIELD SAMPLE ID	ANALYSIS TYPE	DATE SAMPLED	DATE PREPARED	DATE ANALYZED	PREP. HOLDING TIME, DAYS	ANALYSIS HOLDING TIME, DAYS	QUALIFIER
B01CF4	VOA	12/9/91	NA	12/21/91	NA	12	none
B01CF5		12/10/91		12/22/91		13	
B01CF6		12/10/91		12/22/91		13	
B01CF7		12/11/91		12/22/91		13	
B01CF8		12/11/91		12/22/91		13	

Soil

Report #6
Appendix (C)

CALIBRATION DATA SUMMARY - FORM B-2

SDG: A1.12.069	REVIEWER: CMRussell	DATE: 7/2/92	PAGE 1 OF 1
COMMENTS: Level 2			
CALIB. TYPE: INITIAL CONTINUING		INSTRUMENT:	

	CALIB. DATE	COMPOUND	RF	RSD/%D/%R	SAMPLES AFFECTED	QUALIFIER
(1)	Tune 12/12/91	→ ICAL			all acceptable	none
	12/21/91	→ CCV, VBLK, B01CF4, B01CF4MS, B01CF4MSD, B01CF5, B01CF6, B01CF7, B01CF8				↓
(2)	ICAL 12/12/91	chloromethane	33.3 %RSD →		B01CF4, B01CF5, B01CF6, B01CF7, B01CF8	UJ
	↓ ↓					↓
(3)	CCV 12/21/91	chloroethane		-37.5 %D	B01CF4, B01CF5, ~~B01CF6, B01CF7~~ B01CF8	UJ
	↓ ↓	methylene chloride		-55.6 %D		UJ

WHC-SD-EN-SPP-002, Rev. 1

Report #6
Appendix C

BLANK AND SAMPLE DATA SUMMARY - FORM B-3

SDG: 41.12.069 REVIEWER: CM Russell DATE: 7/2/92 PAGE 1 OF 1

COMMENTS: Level 2

SAMPLE ID	COMPOUND	RESULT	Q	RT	UNITS	5X RESULT	10X RESULT	SAMPLES AFFECTED	QUALIFIER
VBL1221A	methylene chloride	18			ug/kg	~~180~~	180	B01CF4, B01CF5, B01CF6, B01CF7, B01CF8	U at value
	acetone	4	J		ug/kg		40		
	carbondisulfide	6			ug/kg		60		
	2-hexanone	3	J		ug/kg	15		all above	none
common contam <CRQL	toluene	—						all above	U at CRQL

Report #6
Appendix (C)

ACCURACY DATA SUMMARY - FORM B-4

SDG: A1·12·069	REVIEWER: CMRussell	DATE: 7/2/92	PAGE 1 OF 1	
COMMENTS: Level 2				
SAMPLE ID	COMPOUND	% RECOVERY	SAMPLE(S) AFFECTED	QUALIFIER REQUIRED
(1) surrogates → all are acceptable, and range from 90-103% CMR			B01CF4, B01CF5, B01CF6, B01CF7, B01CF8	none ↓
(2) B01CF4 matrix spike and msdup → all are acceptable, and range from 67-109% CMR			B01CF4, B01CF5, B01CF6, B01CF7, B01CF8	none ↓
(3) all internal standard areas are acceptable. CMR			B01CF4, B01CF5, B01CF6, B01CF7, B01CF8	none ↓

Report #6
Appendix (C)

PRECISION DATA SUMMARY - FORM B-5

SDG: A1.12.069	REVIEWER CMRussell	DATE: 7/2/92	PAGE 1 OF 1
COMMENTS: Level 2			

	COMPOUND	SAMPLE ID:	SAMPLE ID:	RPD	SAMPLES AFFECTED	QUALIFIER
(1)	all matrix spike dup precision is acceptable, ranges from 0 – 3% RPD	B01CF4 MS	B01CF4 MSD		B01CF4, B0CF5, B01CF6, B01CF7, B01CF8	none ↓
(2)	field dups → there are no field dups in this package. CMR				all above	none
(3)	field split samples → there are no field splits addressed in this package (all are addressed in Weston pkgs, if present)				all	none

Report #6
Appendix (C)

CALCULATION SUMMARY - FORM B-6

SDG: A1.12.06	REVIEWER: CMRussell	DATE: 7/2/92	PAGE 1 OF 1

COMMENTS:

Please refer to the attached pages.
CMR

9613501.2504

Report #6
Appendix C Calculations

HARTCROWSER

Page 1 of 3

Job No. 2978-40

Date 6/30/92

Project

Calculations for Vertex [illegible] Analysis Data [illegible]

Made by [illegible]

0041

Methylene Chloride $\frac{19460 \times 50}{14588 (3.731) (.94)}$ 19.01

Acetone $\frac{5571 \times 50}{14588\ 1.111\ (.94)} = \frac{278550}{15234.831} = 18.28$

Carbon Disulfide $\frac{9135}{14588} \times \frac{50}{5.067} \times \frac{1}{.94} = 6.57$

Toluene $\frac{1095}{42098} \times \frac{50}{.896} \times \frac{1}{.94} = 1.54$

0062

Methylene Chloride $\frac{22430}{18619} \times \frac{50}{3.731} \times \frac{1}{.93} = 17.35$

Acetone $\frac{1832}{18619} \times \frac{50}{1.111} \times \frac{}{.93} = 12.55$

Carbon Disulfide $\frac{1176}{18619} \times \frac{50}{5.067} \times .93 = 5.8$

Toluene $\frac{1080}{58685} \times \frac{50}{.896} \times \frac{}{.93} = 1.1$

0024

Methylene Chloride $\frac{21894}{18517} \times \frac{50}{3.731} \times \frac{}{.93} = 17.33$

Acetone $\frac{5471}{18517} \times \frac{50}{1.111} \times \frac{}{.93} = 14.2$

Carbon Disulfide $\frac{12420}{18517} \times \frac{50}{5.067} \times \frac{}{.93} = 7.11$

Toluene $\frac{1491}{55813} \times \frac{50}{.896} \times \frac{}{.93} = 1.60$

Recycled Paper

9613501.2505

Report #6
Appendix C
Calculations

HARTCROWSER

Page 2 of 3
Job No. 2978-40
Date 4/30/92
Made by [illegible]

Project
Calculations for

TICs

Meth Chloride $\frac{23107}{17704} \times \frac{50}{3.73} \times \frac{}{.91} = 19.22$

Acetone $\frac{7809}{17704} \times \frac{50}{1.11} \times \frac{}{.91} = 31.81$

Carbon Disulfide $\frac{11805}{17704} \times \frac{50}{5.067} \times \frac{}{.91} = 7.23$

Toluene $\frac{1377}{57177} \times \frac{50}{.896} \times \frac{}{.91} = 1.47$

0130

meth Chloride $\frac{20446}{16349} \times \frac{50}{3.731} \times \frac{}{.90} = 18.62$

acetone $\frac{15182}{16349} \times \frac{50}{1.11} \times \frac{}{.90} = 46.43$

Carbon Disulfide $\frac{10959}{16349} \times \frac{50}{5.067} \times \frac{}{.90} = 7.34$

Toluene $\frac{1912}{48677} \times \frac{50}{.896} \times \frac{}{.90} = 2.43$

0154 Calibrations

Bromomethane $\frac{17481}{20165} \times \frac{50}{20} = 2.167$

Acetone $\frac{14945}{20165} \times \frac{50}{20} = 1.8528$

Chloroform $\frac{23617}{20165} \times \frac{50}{20} = 2.9279$

Tetrachloroethene $\frac{57232}{23581} \times \frac{50}{100} = 1.2135$

Toluene $\frac{221262}{70994} \times \frac{50}{200} = .7791$

0175

Bromomethane $\frac{28087}{18331} \times \frac{50}{50} = 1.5322$

Recycled Paper

9613501.2506

Report #6
Appendix (C)

Calculations

HARTCROWSER

Page 3 of 3

Job No. 2978-40

Project

Date 6/30/92

Calculations for

Made by C. Gaasland
CMK

Turning

0038

$\frac{.60}{95} = \frac{259}{2844}$ .2344

0039

$\frac{17\frac{1}{2}}{95} = \frac{2844}{4384}$ .6487

Recycled Paper

9613550H.2507 Case 12069

ARL1 000

Westinghouse Hanford Company	CHAIN OF CUSTODY

Custody Form Initiator: W. Setzer/B.E. Innis

Company Contact: B.E. Innis — Telephone: 509-376-7690

Project Designation/Sampling Locations: 300-ff-1 /T2 — Collection Date: 12-9-91

Ice Chest No.: SML-81 — Field Logbook No.: WHC-N-557

Bill of Lading/Airbill No.: 250986449T — Offsite Property No.: W92-0-0104 #6

Method of Shipment: OVERNIGHT AIR SERVICE

Shipped to: TMA/NORCAL

Possible Sample Hazards/Remarks: None detected with field instruments

Sample Identification

1) B01CF4 1, 500ml Amber Glass: PCB's, ~~CLP Metals~~, Anions by IC (F,SO4,NO2,NO3),pH
~~1, 500ml Clear Glass: Gross Alpha/Beta, Co-60,Sr-90,Cs-137,U-235,U-238~~
1, 125ml Clear Glass: CLP VOA

2) 1, 500ml Amber Glass: PCB's,CLP Metals,Anions by IC (F,SO4,NO2,NO3),pH
1, 500ml Clear Glass: Gross Alpha/Beta, Co-60,Sr-90,Cs-137,U-235,U-238
1, 125ml Clear Glass: CLP VOA

3) 1, 500ml Amber Glass: PCB's,CLP Metals,Anions by IC (F,SO4,NO2,NO3),pH
1, 500ml Clear Glass: Gross Alpha/Beta, Co-60,Sr-90,Cs-137,U-235,U-238
1, 125ml Clear Glass: CLP VOA

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

Relinquished by:	Received by:	Date/Time:
W.V. SETZER W.V. Setzer	Kermit Blum	12-13-91 1130
12-17-91 Kermit Blum	T Bernard	12-18-91 1000

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

A-6000-407 (12/90) (EF) WEF061

2F
SOIL PESTICIDE SURROGATE RECOVERY

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12069 SAS No.: NA SDG No.: NA

Level:(low/med) LOW

	EPA SAMPLE NO.	S1 (DBC) #	OTHER
01	PBLK1223S	82	0
02	B01CF4	79	0
03	B01CF5	75	0
04	B01CF6	82	0
05	B01CF7	88	0
06	B01CF8	84	0
07	B01CF5MS	79	0
08	B01CF5MSD	89	0

ADVISORY QC LIMITS

S1 (DBC) = Dibutylchlorendate (20-150)

Column to be used to flag recovery values

* Values outside of contract required QC limits

D Surrogates diluted out

3F

SOIL PESTICIDE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12069 SAS No.: NA SDG No.: NA

Matrix Spike - EPA Sample No.: B01CF5 Level:(low/med) LOW

COMPOUND	SPIKE ADDED (ug/Kg)	SAMPLE CONCENTRATION (ug/Kg)	MS CONCENTRATION (ug/Kg)	MS % REC #	QC LIMITS REC.
gamma-BHC (Lindane)	28.1	0	25.7	91	46-127
Heptachlor	28.1	0	28.2	100	35-130
Aldrin	28.1	0	24.1	86	34-132
Dieldrin	70.3	0	71.4	102	31-134
Endrin	70.3	0	62.3	89	42-139
4,4'-DDT	70.3	0	59.5	85	23-134

COMPOUND	SPIKE ADDED (ug/Kg)	MSD CONCENTRATION (ug/Kg)	MSD % REC #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
gamma-BHC (Lindane)	28.1	29.5	105	-14	50	46-127
Heptachlor	28.1	31.9	114	-13	31	35-130
Aldrin	28.1	29.4	105	-20	43	34-132
Dieldrin	70.3	84.6	120	-16	38	31-134
Endrin	70.3	73.5	105	-16	45	42-139
4,4'-DDT	70.3	69.9	99	-15	50	23-134

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

RPD: 0 out of 6 outside limits
Spike Recovery: 0 out of 12 outside limits

COMMENTS:

9613501.2510

0382

EPA SAMPLE NO.

B01CF5MS

1D
PESTICIDE ORGANICS ANALYSIS DATA SHEET

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12069 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A112069-02D

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

Level: (low/med) LOW Date Received: 12/13/91

% Moisture: not dec. 7 dec. Date Extracted: 12/23/91

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 01/08/92

GPC Cleanup: (Y/N) N pH: 8.6 Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
319-84-6	alpha-BHC	8.4	U
319-85-7	beta-BHC	8.4	U
319-86-8	delta-BHC	8.4	U
58-89-9	gamma-BHC (Lindane)	8.4	U
76-44-8	Heptachlor	8.4	U
309-00-2	Aldrin	8.4	U
1024-57-3	Heptachlor epoxide	8.4	U
959-98-8	Endosulfan I	8.4	U
60-57-1	Dieldrin	17	U
72-55-9	4,4'-DDE	17	U
72-20-8	Endrin	17	U
33213-65-9	Endosulfan II	17	U
72-54-8	4,4'-DDD	17	U
1031-07-8	Endosulfan sulfate	17	U
50-29-3	4,4'-DDT	17	U
72-43-5	Methoxychlor	84	U
53494-70-5	Endrin ketone	17	U
5103-71-9	alpha-Chlordane	84	U
5103-74-2	gamma-Chlordane	84	U
8001-35-2	Toxaphene	170	U
12674-11-2	Aroclor-1016	84	U
11104-28-2	Aroclor-1221	84	U
11141-16-5	Aroclor-1232	84	U
53469-21-9	Aroclor-1242	84	U
12672-29-6	Aroclor-1248	84	U
11097-69-1	Aroclor-1254	170	U
11096-82-5	Aroclor-1260	170	U

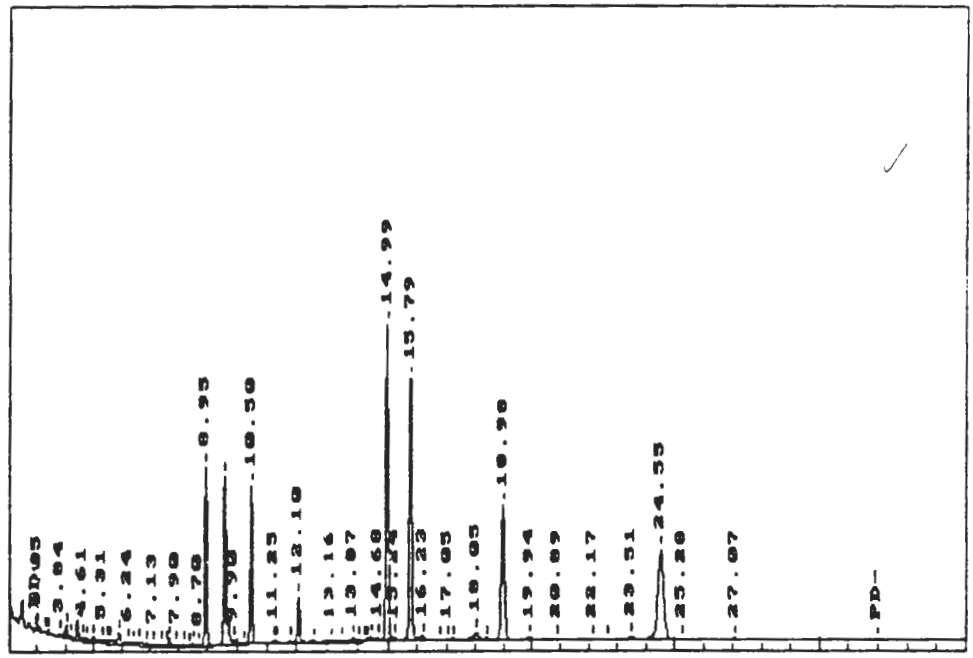
48	14.21		1.0039	0.7062%	10039	1461	6.9	2			1.0000E-04
49	14.31		0.8724	0.6154%	8724	1569	5.6	2			1.0000E-04
50	14.44	~~4,4'-DDE~~	0.0014	0.0010%	35292	5073	7.0	2	0	.2185	4.0611E-08
51	14.68		1.9489	1.3749%	19489	2485	7.8	2			1.0000E-04
52	14.99	Dieldrin	0.1001	0.0706%	2355495	432526	5.4	3	0	.2179	4.2476E-08
53	15.24		0.7056	0.4978%	7056	1135	6.2	4			1.0000E-04
54	15.79	Endrin	0.0886	0.0625%	2152487	354089	6.1	2	0	.2170	4.1158E-08
55	16.23		2.6246	1.8516%	26246	3737	7.0	2			1.0000E-04
56	16.80		0.6374	0.4496%	6374	610	10.4	2			1.0000E-04
57	17.05		0.6987	0.4929%	6987	674	10.4	2			1.0000E-04
58	17.23		1.4978	1.0567%	14978	1020	14.7	2			1.0000E-04
59	18.05	~~4,4'-DDD~~	0.0086	0.0060%	131499	9397	14.0	2	0	.2705	6.5143E-08
60	18.42		1.4037	0.9902%	14037	1379	10.2	1			1.0000E-04
61	18.98	4,4'-DDT	0.0846	0.0597%	1535419	181239	8.5	1	0	.1788	5.5092E-08
63	19.94		1.6794	1.1847%	16794	1449	11.6	1			1.0000E-04
64	20.89	~~Endrin Aldehyde~~	0.0005	0.0004%	12101	865	14.0	1	0	.3251	4.4275E-08
66	22.17		1.9158	1.3515%	19158	1432	13.4	2			1.0000E-04
67	22.67		0.5527	0.3899%	5527	377	14.7	2			1.0000E-04
68	23.51	~~Endo. sulfate~~	0.0023	0.0016%	62924	3630	17.3	2	0	.4683	3.6514E-08
69	24.55	DBC	0.0787	0.0555%	1778131	121498	14.6	3	0	.1836	4.4265E-08
70	25.28		2.0674	1.4584%	20674	912	22.7	4			1.0000E-04
71	27.07	~~Endrin ketone~~	0.0014	0.0010%	37746	2704	14.0	1	0	.3213	3.7997E-08

TOTAL AMOUNT = 141.7525

all cross out by cy ~~LB~~ 1-17-92

Data File = A:B10670.PTS Printed on 01-13-1992 at 15:54:06
Start time: 2.00 min. Stop time: 35.02 min. Offset: 0 mv.
Low Value: 51565 uv High Value: 494255 uv Scale factor: 0.5

2 of 2



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0386

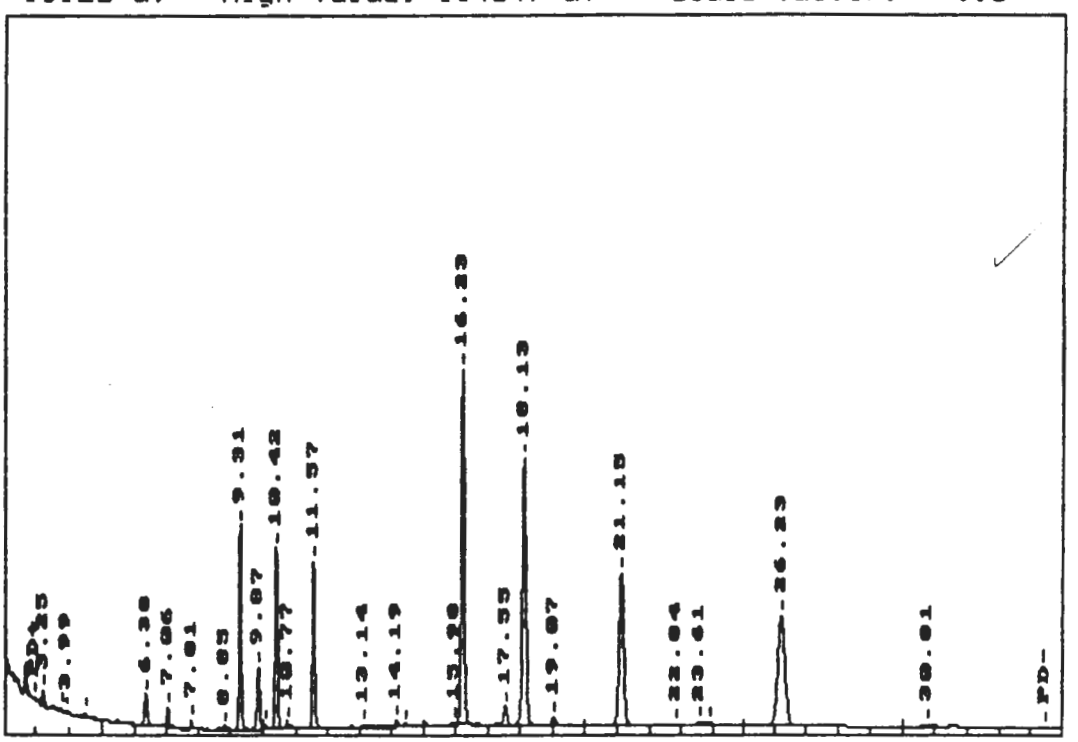
39	17.55		3.6399	11.4733%	36399	4937	7.4	2			1.0000E-04
40	18.13	Endrin	0.0947	0.2986%	547799	70496	7.8	1	0	.2887	1.7290E-07
41	19.07	~~4,4' DDD~~	0.0051	0.0159%	16943	1909	8.9	1	0	.3547	2.9848E-07
45	21.15	4,4'-DDT	0.0909	0.2864%	408258	40444	10.1	2	0	.2126	2.2259E-07
47	22.84	~~Endo. sulfate~~	0.0010	0.0030%	6122	458	13.4	1	0	.8904	1.5630E-07
48	23.61		0.9534	3.0053%	9534	697	13.7	2			1.0000E-04
49	23.91		1.2182	3.8398%	12182	838	14.5	2			1.0000E-04
50	26.23	DBC	0.0798	0.2514%	465753	29014	16.1	1	0	.2740	1.7127E-07
51	30.81	~~Endrin ketone~~	0.0014	0.0045%	9819	593	16.5	1	0	.3828	1.4413E-07

TOTAL AMOUNT = 31.7250

all cross out by cy 1-17-92

Data File = A:A10670.PTS Printed on 01-13-1992 at 14:30:50
Start time: 2.00 min. Stop time: 35.02 min. Offset: 0 mv.
Low Value: 19125 uv High Value: 114647 uv Scale factor: 0.5

2 of 2



9613501.2513

0389

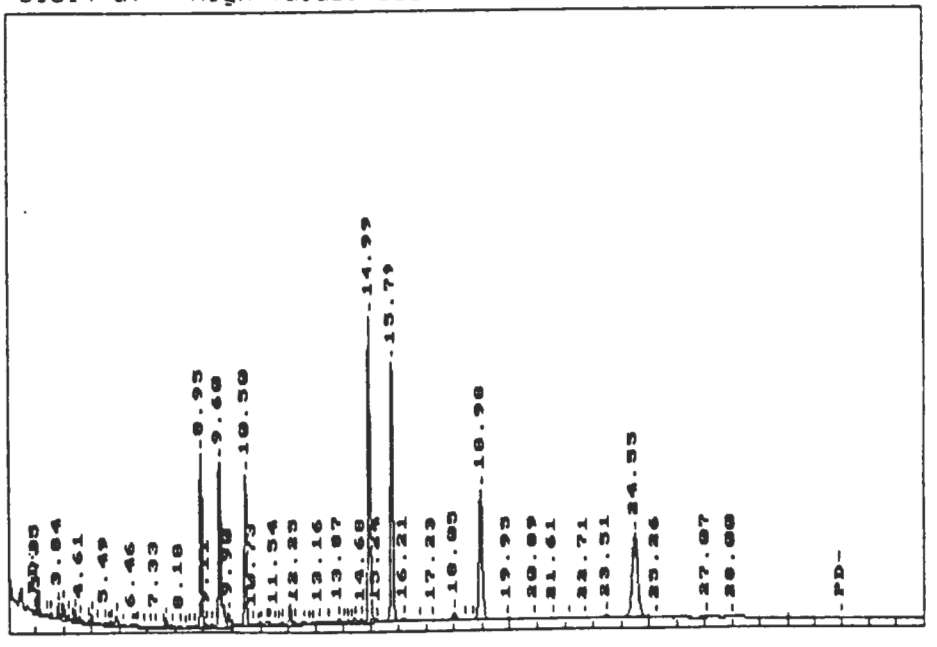
42	11.35	~~beta BHC~~	0.0041	0.0015%	56846	8094	7.0	2	0	-.5954	7.1599E-08
43	11.54		2.3939	0.8657%	23999	3134	7.7	2			1.0000E-04
44	11.67		1.8218	0.6572%	18218	2906	6.3	2			1.0000E-04
45	11.82		5.1589	1.8610%	51589	5545	9.3	2			1.0000E-04
46	12.10		21.5990	7.7914%	215990	34753	6.2	3			1.0000E-04
47	12.25	~~delta BHC~~	0.0014	0.0005%	33280	4759	7.0	4	0	.2765	4.3374E-08
48	12.60		5.9511	2.1467%	59511	3651	16.3	4			1.0000E-04
49	12.79	~~Heptachlorepoxide~~	0.0007	0.0002%	18101	2316	7.8	2	0	.3783	3.6272E-08
50	12.92		2.4798	0.8945%	24798	2774	8.9	2			1.0000E-04
51	13.16		6.7033	2.4181%	67033	4890	13.7	2			1.0000E-04
52	13.49		6.2914	2.2695%	62914	4150	15.2	2			1.0000E-04
53	13.87	~~g-chlordane~~	0.0030	0.0011%	82078	8231	10.0	2	0	.2434	3.6498E-08
54	14.04	~~a-chlordane~~	0.0015	0.0005%	40266	4077	9.9	2	0	.1476	3.7524E-08
55	14.19		3.3290	1.2009%	33290	4351	7.7	2			1.0000E-04
56	14.31		2.1498	0.7755%	21498	3746	5.7	2			1.0000E-04
57	14.44	~~4,4'-DDE~~	0.0027	0.0010%	66859	7741	8.6	2	0	.2185	4.0611E-08
58	14.68		4.9848	1.7982%	49848	4763	10.5	2			1.0000E-04
59	14.99	Dieldrin	0.1185	0.0428%	2790551	492965	5.7	3	0	.2179	4.2476E-08
60	15.24		4.3073	1.5538%	43073	2742	15.7	4			1.0000E-04
61	15.79	Endrin	0.1045	0.0377%	2538015	417125	6.1	2	0	.2170	4.1158E-08
62	16.21		3.4862	1.2576%	34862	4448	7.8	2			1.0000E-04
63	16.78		0.6027	0.2174%	6027	600	10.1	2			1.0000E-04
65	17.23		0.9552	0.3446%	9552	964	9.9	2			1.0000E-04
66	18.05	~~4,4'-DDD~~	0.0080	0.0029%	122932	10556	11.6	2	0	.2705	6.5143E-08
67	18.40		1.3342	0.4813%	13342	1198	11.1	2			1.0000E-04
68	18.67		1.0903	0.3933%	10903	1006	10.8	2			1.0000E-04
69	18.98	4,4'-DDT	0.0995	0.0359%	1805810	211251	8.5	2	0	.1788	5.5092E-08
71	19.95		1.0765	0.3883%	10765	924	11.6	1			1.0000E-04
72	20.89	~~Endrin Aldehyde~~	0.0015	0.0005%	33641	1404	24.0	2	0	.3251	4.4275E-08
73	21.61		0.8557	0.3087%	8557	564	15.2	2			1.0000E-04
74	22.17		2.0477	0.7387%	20477	1436	14.3	2			1.0000E-04
75	22.71		0.7935	0.2862%	7935	484	16.4	2			1.0000E-04
76	23.51	~~Endo-sulfate~~	0.0028	0.0010%	75618	4250	17.8	2	0	.4683	3.6514E-08
77	24.55	DBC	0.0887	0.0320%	2004181	136942	14.6	3	0	.1836	4.4265E-08
78	25.26		1.5246	0.5500%	15246	818	18.6	4			1.0000E-04
80	27.07	~~Endrin ketone~~	0.0021	0.0008%	55216	3674	15.0	1	0	.3213	3.7997E-08
81	28.00		0.5794	0.2090%	5794	410	14.1	1			1.0000E-04

TOTAL AMOUNT = 277.2156

all cross out by cy 1-17-92

Data File = A:B10671.PTS Printed on 01-13-1992 at 15:55:10
Start time: 2.00 min. Stop time: 35.02 min. Offset: 0 mv.
Low Value: 51614 uv High Value: 553627 uv Scale factor: 0.5

2 of 2



9613501.2514

0390

***** EXTERNAL STANDARD TABLE *****

********** 01-13-1992 14:31:27 Version 4.1 **********

* Sample Name: CLP,B01CF5MSD/A112069-02E;S Data File: A:A10671 *

* Date: 01-08-1992 14:54:55 Method: A:ACLP088 01-06-1992 14:27:20 # 280*

* Interface: 2 Cycle#: 71 Operator CP Channel#: 0 Vial#: N.A. *

* Starting Peak Width: 10 Threshold: 1 Area Threshold: 100 *

****

* Instrument Type: HP5890A,B Column Type: DB-608,DB-1701 *

* Solvent Description: *

* Conditions: 160D,5D/M,230D,15M(35M RUN) *

* Detector 0: ECD Detector 1: ECD *

* Misc. Information: 1-06-1992, P, Col 0.53mm 4UL *

****

Starting Delay: 2.00 Ending retention time: 35.00

Area reject: 5000 One sample per 1.002 sec.

Amount injected: ~~1.00~~ 4.00 Dilution factor: 1.00

Sample Weight: 1.000000

PEAK NUM	RET TIME	PEAK NAME	CONCENTRATION in ug/ml	NORMALIZED CONC	AREA	HEIGHT	AREA/ HEIGHT	BL	REF PEAK	% DELTA RET TIME	CONC/AREA
1	3.10		3.2226	6.1543%	32226	8187	3.9	2			1.0000E-04
2	3.25		3.4545	6.5973%	34545	6622	5.2	2			1.0000E-04
4	3.64		1.8518	3.5365%	18518	4903	3.8	2			1.0000E-04
5	3.80		1.8804	3.5910%	18804	4865	3.9	2			1.0000E-04
6	3.94		2.4540	4.6865%	24540	2819	8.7	2			1.0000E-04
7	4.52		1.9617	3.7463%	19617	4339	4.5	1			1.0000E-04
10	5.49		0.7116	1.3590%	7116	915	7.8	1			1.0000E-04
12	5.99		0.6666	1.2731%	6666	1507	4.4	2			1.0000E-04
1 of 2 13	6.12		0.5230	0.9988%	5230	868	6.0	2			1.0000E-04
14	6.38		6.3391	12.1062%	63391	8619	7.4	3			1.0000E-04
16	7.06		2.3617	4.5103%	23617	3710	6.4	2			1.0000E-04
17	7.39		0.5252	1.0031%	5252	586	9.0	2			1.0000E-04
19	7.81		1.7003	3.2472%	17003	4042	4.2	2			1.0000E-04
21	8.48		0.5210	0.9951%	5210	491	10.6	1			1.0000E-04
23	8.85		2.6714	5.1016%	26714	3345	8.0	2			1.0000E-04
24	9.30	gamma-BHC	0.0524	0.1001%	293577	65697	4.5	3	0	0	1.7852E-07
25	9.52	~~beta-BHC~~	0.0015	0.0029%	5553	1092	5.1	4	0	-.3664	2.7673E-07
26	9.87		12.2991	23.4882%	122991	18342	6.7	3			1.0000E-04
27	10.08		0.6128	1.1703%	6128	1250	4.9	4			1.0000E-04
28	10.42	Heptachlor	0.0416	0.0794%	295671	59258	5.0	2	0	.1615	1.4055E-07
29	10.83	~~delta-BHC~~	0.0030	0.0057%	14649	1805	8.1	2	0	0	2.0290E-07
30	10.92		1.3043	2.4909%	13043	2213	5.9	2			1.0000E-04
33	11.57	Aldrin	0.0452	0.0862%	291985	53595	5.4	1	0	.1653	1.5467E-07
38	13.14		0.7929	1.5142%	7929	902	8.8	2			1.0000E-04
41	13.91		0.5555	1.0609%	5555	617	9.0	2			1.0000E-04
42	14.17	~~g. chlordane~~	0.0017	0.0033%	11493	1588	7.2	2	0	.1009	1.4860E-07
43	14.44		0.5942	1.1348%	5942	534	11.1	2			1.0000E-04
44	14.71	~~a. chlordane~~	0.0009	0.0018%	6111	717	8.5	2	0	-.3475	1.5247E-07
47	15.98	~~4,4'-DDE~~	0.0013	0.0025%	7893	1014	7.8	2	0	.1749	1.6680E-07
48	16.23	Dieldrin	0.1310	0.2501%	746197	116086	6.4	2	0	.1135	1.7550E-07
49	16.70		0.5210	0.9951%	5210	647	8.1	2			1.0000E-04
52	17.55		2.1000	4.0104%	21000	2701	7.8	2			1.0000E-04
53	18.13	Endrin	0.1129	0.2157%	653128	83019	7.9	1	0	.2887	1.7290E-07
54	19.05	~~4,4'-DDD~~	0.0061	0.0116%	20332	2340	8.7	1	0	.2668	2.9848E-07
58	21.14	4,4'-DDT	0.1083	0.2068%	486501	48071	10.1	2	0	.1335	2.2259E-07
59	21.71	~~Endrin Aldehyde~~	0.0011	0.0021%	5349	385	13.9	2	0	.3049	2.0733E-07
61	23.59		0.7312	1.3964%	7312	543	13.5	2			1.0000E-04
62	23.91		1.4063	2.6858%	14063	962	14.6	2			1.0000E-04
63	26.23	DBC	0.0915	0.1747%	534031	33628	15.9	1	0	.2740	1.7127E-07

4C

PESTICIDE METHOD BLANK SUMMARY

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12069 SAS No.: NA SDG No.: NA

Lab Sample ID: A112069-BLK Lab File ID: _____

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

Date Extracted: 12/23/91 Extraction:(SepF/Cont/Sonc) SONC

Date Analyzed (1): 01/08/92 Date Analyzed (2): 01/08/92

Time Analyzed (1): 1115 Time Analyzed (2): 1115

Instrument ID (1): HP5890A Instrument ID (2): HP5890B

GC Column ID (1): DB1701 GC Column ID (2): DB608

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS AND MSD:

	EPA SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED 1	DATE ANALYZED 2
01	B01CF4	A112069-01A	01/08/92	01/08/92
02	B01CF5	A112069-02A	01/08/92	01/08/92
03	B01CF6	A112069-03A	01/08/92	01/08/92
04	B01CF7	A112069-04A	01/08/92	01/08/92
05	B01CF8	A112069-05A	01/08/92	01/08/92
06	B01CF5MS	A112069-02D	01/08/92	01/08/92
07	B01CF5MSD	A112069-02E	01/08/92	01/08/92

COMMENTS: THIS BLANK EXTRACTED WITH CASES 12-069 AND 12-068

9613501.2516

0378

EPA SAMPLE NO.

PBLK1223S

1D
PESTICIDE ORGANICS ANALYSIS DATA SHEET

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12069 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A112069-BLK

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

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

% Moisture: not dec. __ dec. __ Date Extracted: 12/23/91

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 01/08/92

GPC Cleanup: (Y/N) N pH: ____ Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
319-84-6	alpha-BHC	8.0	U
319-85-7	beta-BHC	8.0	U
319-86-8	delta-BHC	8.0	U
58-89-9	gamma-BHC (Lindane)	8.0	U
76-44-8	Heptachlor	8.0	U
309-00-2	Aldrin	8.0	U
1024-57-3	Heptachlor epoxide	8.0	U
959-98-8	Endosulfan I	8.0	U
60-57-1	Dieldrin	16	U
72-55-9	4,4'-DDE	16	U
72-20-8	Endrin	16	U
33213-65-9	Endosulfan II	16	U
72-54-8	4,4'-DDD	16	U
1031-07-8	Endosulfan sulfate	16	U
50-29-3	4,4'-DDT	16	U
72-43-5	Methoxychlor	80	U
53494-70-5	Endrin ketone	16	U
5103-71-9	alpha-Chlordane	80	U
5103-74-2	gamma-Chlordane	80	U
8001-35-2	Toxaphene	160	U
12674-11-2	Aroclor-1016	80	U
11104-28-2	Aroclor-1221	80	U
11141-16-5	Aroclor-1232	80	U
53469-21-9	Aroclor-1242	80	U
12672-29-6	Aroclor-1248	80	U
11097-69-1	Aroclor-1254	160	U
11096-82-5	Aroclor-1260	160	U

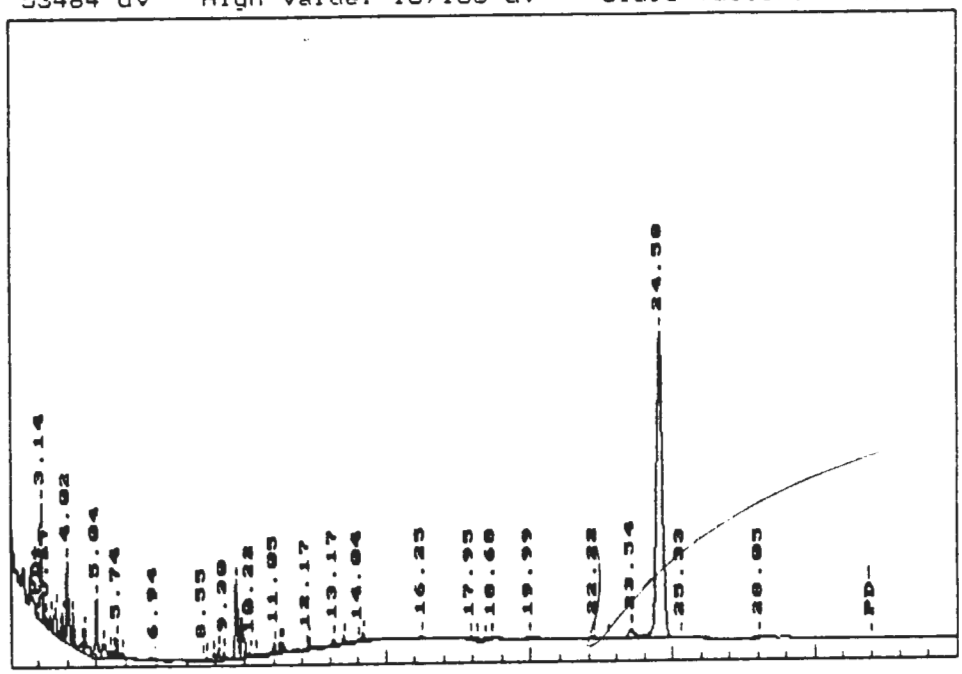
70	22.22		1.5391	0.9264%	15391	1182	13.0	2			1.0000E-04
71	22.72		0.5703	0.3432%	5703	366	15.6	2			1.0000E-04
72	23.54	~~Endo. sulfate~~	0.0024	0.0015%	66442	3852	17.2	2	0	.6111	3.6514E-08
73	24.58	DBC	0.0823	0.0495%	1859064	126541	14.7	3	0	.3199	4.4265E-08
74	25.33		0.9924	0.5973%	9924	601	16.5	4			1.0000E-04
75	28.05		0.9929	0.5976%	9929	613	16.2	1			1.0000E-04

TOTAL AMOUNT = 166.1348

all cuts out by cy 1-15-92

Data File = A:B10666.FTS Printed on 01-13-1992 at 15:50:12
Start time: 2.00 min. Stop time: 35.02 min. Offset: 0 mv.
Low Value: 53484 uv High Value: 187168 uv Scale factor: 0.5

2 of 2



9613501.2518

0381

****** EXTERNAL STANDARD TABLE ******

********** 01-13-1992 14:27:20 Version 4.1 **********

* Sample Name: CLP,PBLK1223S/A112069-BLK;S Data File: A:A10666

* Date: 01-08-1992 11:15:31 Method: A:ACLP088 01-06-1992 14:27:20 # 280

* Interface: 2 Cycle#: 66 Operator CP Channel#: 0 Vial#: N.A.

* Starting Peak Width: 10 Threshold: 1 Area Threshold: 100

****

* Instrument Type: HP5890A/B Column Type: DB-608,DB-1701

* Solvent Description:

* Conditions: 160D,5D/M,230D,15M(35M RUN)

* Detector 0: ECD Detector 1: ECD

* Misc. Information: 1-06-1992, B/, Col 0.53mm 4UL

****

Starting Delay: 2.00 Ending retention time: 35.00

Area reject: 5000 One sample per 1.002 sec.

Amount injected: ~~1.00~~ 4.00 Dilution factor: 1.00

Sample Weight: 1.000000

PEAK NUM	RET TIME	PEAK NAME	CONCENTRATION in ug/ml	NORMALIZED CONC	AREA	HEIGHT	AREA/ HEIGHT	BL	REF PEAK	% DELTA RET TIME	CONC/AREA
1	3.12		3.4930	9.5751%	34930	9393	3.7	2			1.0000E-04
2	3.25		3.4835	9.5489%	34835	6720	5.2	2			1.0000E-04
3	3.47		0.8337	2.2853%	8337	915	9.1	2			1.0000E-04
4	3.65		0.6300	1.7269%	6300	1580	4.0	2			1.0000E-04
5	3.80		2.4267	6.6521%	24267	5910	4.1	2			1.0000E-04
6	3.95		2.8909	7.9245%	28909	3503	8.3	2			1.0000E-04
8	4.54		2.7886	7.6440%	27886	6116	4.6	2			1.0000E-04
10	5.51		0.5414	1.4840%	5414	822	6.6	1			1.0000E-04
12	6.01		1.0203	2.7968%	10203	2103	4.9	2			1.0000E-04
21	8.86		1.6737	4.5881%	16737	3045	5.5	1			1.0000E-04
23	9.45		0.5042	1.3821%	5042	961	5.2	2			1.0000E-04
24	9.53	~~beta-BHC~~	0.0016	0.0044%	5863	1085	5.4	2	0	-.1916	2.7673E-07
25	9.88		10.9557	30.0317%	109557	16075	6.8	3			1.0000E-04
26	10.10		0.8535	2.3397%	8535	1527	5.6	4			1.0000E-04
29	10.78	~~delta-BHC~~	0.0013	0.0035%	6366	885	7.2	2	0	-.4228	2.0298E-07
30	10.95		0.7900	2.1655%	7900	1148	6.9	2			1.0000E-04
33	11.67		1.1840	3.2456%	11840	2138	5.5	2			1.0000E-04
34	11.79		0.5107	1.3999%	5107	885	5.8	2			1.0000E-04
52	23.64		0.5709	1.5650%	5709	426	13.4	2			1.0000E-04
53	23.96		1.2424	3.4056%	12424	858	14.5	2			1.0000E-04
54	26.28	BBC	0.0844	0.2314%	492800	30811	16.0	1	0	.4635	1.7127E-07
		TOTAL AMOUNT =	36.4804								

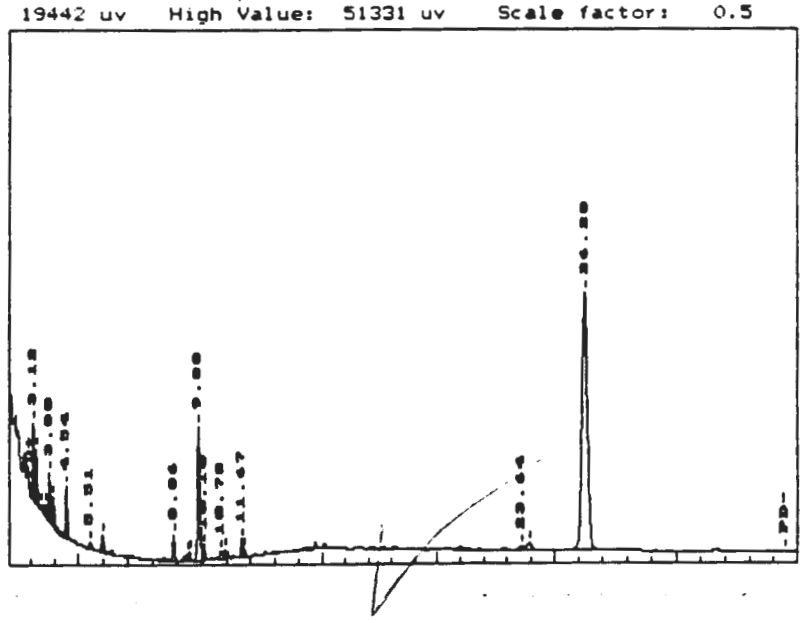
all cross out by CY 1-15-92

Data File = A:A10666.PTS Printed on 01-13-1992 at 14:27:32

Start time: 2.00 min. Stop time: 35.02 min. Offset: 0 mv.

Low Value: 19442 uv High Value: 51331 uv Scale factor: 0.5

1 of 1



8D
PESTICIDE EVALUATION STANDARDS SUMMARY

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12069 SAS No.: NA SDG No.: NA

Instrument ID: HP5890A GC Column ID: DB1701

Dates of Analyses: 01/06/92 to 01/09/92

Evaluation Check for Linearity

PESTICIDE	CALIBRATION FACTOR EVAL MIX A	CALIBRATION FACTOR EVAL MIX B	CALIBRATION FACTOR EVAL MIX C	%RSD (</= 10.0%)	
Aldrin	7050000	7230000	6360000	6.7	
Endrin	6020000	6030000	5720000	3.0	
4,4'-DDT	4250000	4370000	4300000	1.4	(1)
DBC	5750000	5500000	5580000	2.3	

(1) If > 10.0% RSD, plot a standard curve and determine the ng for each sample in that set from the curve.

Evaluation Check for 4,4'-DDT/Endrin Breakdown
(percent breakdown expressed as total degradation)

		DATE ANALYZED	TIME ANALYZED	ENDRIN	4,4'-DDT	COMBINED (2)
	INITIAL					
01	EVAL MIX B	01/06/92	1147	2.5	6.0	
02	EVAL MIX B	01/06/92	2336	2.9	5.7	
03	EVAL MIX B	01/07/92	0824	2.9	5.8	
04	EVAL MIX B	01/07/92	1736	0.0	6.3	
05	EVAL MIX B	01/08/92	0308	0.0	8.7	
06	EVAL MIX B	01/08/92	1158	2.8	10.7	
07	EVAL MIX B	01/08/92	2048	2.5	9.0	
08	EVAL MIX B	01/09/92	0620	3.3	2.1	

(2) See Form instructions.

8E
PESTICIDE EVALUATION STANDARDS SUMMARY
Evaluation of Retention Time Shift for Dibutylchlorendate

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12069 SAS No.: NA SDG No.: NA

Instrument ID: HP5890A GC Column ID: DB1701

Dates of Analyses: 01/06/92 to 01/09/92

	EPA SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED	TIME ANALYZED	% D	*
01	EVALA	B1061	01/06/92	1103	0.0	
02	EVALB	B1062	01/06/92	1147	0.1	
03	EVALC	B1063	01/06/92	1232	0.1	
04	INDA	B1064	01/06/92	1318	0.1	
05	INDB	B1065	01/06/92	1402	0.1	
06	TOXAPH	B1066	01/06/92	1446	0.1	
07	AR1660	B1067	01/06/92	1531	0.1	
08	AR1221	B1068	01/06/92	1615	0.1	
09	AR1232	B1069	01/06/92	1659	0.1	
10	AR1242	B10610	01/06/92	1743	0.1	
11	AR1248	B10611	01/06/92	1826	0.1	
12	AR1254	B10612	01/06/92	1911	0.0	
13	ZZZZZ	A112060-BLK	01/06/92	1955	0.1	
14	ZZZZZ	A112060-01A	01/06/92	2040	0.0	
15	ZZZZZ	A112060-02A	01/06/92	2124	0.0	
16	ZZZZZ	A112061-01A	01/06/92	2208	0.0	
17	ZZZZZ	A112061-02A	01/06/92	2252	-0.1	
18	EVALB	B10618	01/06/92	2336	-0.1	
19	ZZZZZ	A112061-03A	01/07/92	0020	-0.1	
20	ZZZZZ	A112061-04A	01/07/92	0104	-0.1	
21	ZZZZZ	A112061-06A	01/07/92	0148	-0.1	
22	ZZZZZ	A112064-BLK	01/07/92	0232	-0.1	
23	ZZZZZ	A112064-01D	01/07/92	0316	-0.1	
24	INDA	B10624	01/07/92	0400	-0.2	
25	ZZZZZ	A112064-02B	01/07/92	0444	-0.2	
26	ZZZZZ	A112064-03B	01/07/92	0528	-0.2	
27	ZZZZZ	A112064-04B	01/07/92	0612	-0.2	
28	ZZZZZ	A112066-01D	01/07/92	0656	-0.2	
29	ZZZZZ	A112066-02B	01/07/92	0740	-0.2	
30	EVALB	B10630	01/07/92	0824	-0.2	
31	ZZZZZ	A112049-BLK	01/07/92	0909	-0.2	
32	ZZZZZ	A112049-04A	01/07/92	0954	-0.3	
33	ZZZZZ	A112049-04AR	01/07/92	1040	-0.2	
34	ZZZZZ	A112066-02BR	01/07/92	1123	-0.2	
35	ZZZZZ	A112049-04B	01/07/92	1206	-0.2	
36	INDB	B10636	01/07/92	1251	-0.2	
37	ZZZZZ	A112049-04C	01/07/92	1356	-0.2	
38	ZZZZZ	A112049-09B	01/07/92	1440	0.0	

* Values outside of QC limits (2.0% for packed columns, 0.3% for capillary columns)

8E

PESTICIDE EVALUATION STANDARDS SUMMARY

Evaluation of Retention Time Shift for Dibutylchlorendate

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12069 SAS No.: NA SDG No.: NA

Instrument ID: HP5890A GC Column ID: DB1701

Dates of Analyses: 01/06/92 to 01/09/92

	EPA SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED	TIME ANALYZED	% D	*
01	ZZZZZ	A112049-06B	01/07/92	1608	0.0	
02	ZZZZZ	A112049-07B	01/07/92	1652	-0.1	
03	EVALB	B10642	01/07/92	1736	-0.1	
04	ZZZZZ	A112049-08B	01/07/92	1820	-0.2	
05	ZZZZZ	A112049-05H	01/07/92	1904	-0.1	
06	ZZZZZ	A112049-10A	01/07/92	1949	-0.1	
07	ZZZZZ	A112049-11A	01/07/92	2033	-0.1	
08	ZZZZZ	A112049-12A	01/07/92	2117	-0.1	
09	INDA	B10648	01/07/92	2201	-0.2	
10	INDB	B10649	01/07/92	2245	-0.2	
11	ZZZZZ	A112050-BLK	01/07/92	2329	-0.2	
12	ZZZZZ	A112050-01B	01/08/92	0013	-0.2	
13	ZZZZZ	A112050-02C	01/08/92	0057	-0.3	
14	ZZZZZ	A112050-02D	01/08/92	0140	-0.3	
15	ZZZZZ	A112050-02E	01/08/92	0224	-0.3	
16	EVALB	B10655	01/08/92	0308	-0.4	
17	ZZZZZ	A112050-03B	01/08/92	0352	-0.3	
18	ZZZZZ	A112050-04B	01/08/92	0436	-0.4	
19	ZZZZZ	A112050-05B	01/08/92	0520	-0.4	
20	ZZZZZ	A112050-06B	01/08/92	0604	-0.4	
21	ZZZZZ	A112050-07B	01/08/92	0648	-0.4	
22	INDB	B10661	01/08/92	0732	-0.6	
23	ZZZZZ	A112050-08B	01/08/92	0816	-0.5	
24	ZZZZZ	A112050-09B	01/08/92	0902	-0.5	
25	ZZZZZ	A112050-10B	01/08/92	0945	-0.4	
26	ZZZZZ	A112050-11B	01/08/92	1030	-0.4	
27	PBLK1223S	A112069-BLK	01/08/92	1115	-0.3	
28	EVALB	B10667	01/08/92	1158	-0.2	
29	B01CF4	A112069-01A	01/08/92	1245	-0.2	
30	B01CF5	A112069-02A	01/08/92	1329	-0.2	
31	B01CF5MS	A112069-02D	01/08/92	1410	-0.2	
32	B01CF5MSD	A112069-02E	01/08/92	1454	-0.2	
33	B01CF6	A112069-03A	01/08/92	1538	-0.2	
34	INDA	B10673	01/08/92	1623	-0.2	
35	B01CF7	A112069-04A	01/08/92	1707	-0.2	
36	B01CF8	A112069-05A	01/08/92	1754	-0.2	
37	ZZZZZ	A112068-01B	01/08/92	1835	-0.2	
38	ZZZZZ	A112068-01C	01/08/92	1919	-0.2	

* Values outside of QC limits (2.0% for packed columns, 0.3% for capillary columns)

8E
PESTICIDE EVALUATION STANDARDS SUMMARY
Evaluation of Retention Time Shift for Dibutylchlorendate

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12069 SAS No.: NA SDG No.: NA

Instrument ID: HP5890A GC Column ID: DB1701

Dates of Analyses: 01/06/92 to 01/09/92

	EPA SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED	TIME ANALYZED	% D	*
01	ZZZZZ	A112068-01D	01/08/92	2005	-0.2	
02	EVALB	B10679	01/08/92	2048	-0.2	
03	ZZZZZ	A112068-02D	01/08/92	2132	-0.2	
04	ZZZZZ	A112068-03C	01/08/92	2216	-0.2	
05	ZZZZZ	A112068-04B	01/08/92	t 2300	-0.3	
06	ZZZZZ	A112068-05B	01/08/92	2344	-0.3	
07	ZZZZZ	A112068-06B	01/09/92	0029	-0.4	
08	INDA	B10685	01/09/92	0112	-0.4	
09	INDB	B10686	01/09/92	0156	-0.4	
10	ZZZZZ	A112076-BLK	01/09/92	0240	-0.4	
11	ZZZZZ	A112076-01D	01/09/92	0324	-0.4	
12	ZZZZZ	A112076-03B	01/09/92	0408	-0.5	
13	ZZZZZ	A112076-04B	01/09/92	0452	-0.5	
14	ZZZZZ	A112076-05B	01/09/92	0536	-0.5	
15	EVALB	B10692	01/09/92	0620	-0.6	
16	ZZZZZ	A112076-06B	01/09/92	0704	-0.6	
17	ZZZZZ	A112076-07B	01/09/92	0748	-0.6	
18	INDA	B10695	01/09/92	0832	-0.6	
19	INDB	B10696	01/09/92	0916	-0.6	

* Values outside of QC limits (2.0% for packed columns, 0.3% for capillary columns)

PESTICIDE/PCB STANDARDS SUMMARY

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12069 SAS No.: NA SDG No.: NA

Instrument ID: HP5890A GC Column ID: DB1701

DATE(S) OF ANALYSIS FROM: 01/06/92 TO: 01/06/92
TIME(S) OF ANALYSIS FROM: 1318 TO: 1911

DATE OF ANALYSIS 01/07/92
TIME OF ANALYSIS 0400
EPA SAMPLE NO. (STANDARD) INDA

COMPOUND	RT	RT WINDOW FROM	RT WINDOW TO	CALIBRATION FACTOR	RT	CALIBRATION FACTOR	QNT Y/N	%D
alpha-BHC	7.66	7.54	7.78	6770000				
beta-BHC	11.42	11.26	11.58	3490000				
delta-BHC	12.22	12.05	12.39	5760000				
gamma-BHC	8.93	8.74	9.12	7310000	8.95	7520000	Y	-2.9
Heptachlor	9.58	9.40	9.76	8050000	9.60	8340000	Y	-3.6
Aldrin	10.47	10.30	10.64	7270000	10.48	7600000	Y	-4.5
Hept. epoxide	12.74	12.55	12.93	6890000	12.77	7250000	Y	-5.2
Endosulfan I	13.66	13.47	13.85	3440000	13.67	3490000	Y	-1.5
Dieldrin	14.96	14.75	15.17	5800000	14.98	6330000	Y	-9.1
4,4'-DDE	14.41	14.23	14.59	6170000				
Endrin	15.76	15.52	16.00	6070000				
Endosulfan II	18.20	17.87	18.53	2040000	18.23	2100000	Y	-2.9
4,4'-DDD	18.00	17.73	18.27	3840000				
Endo. sulfate	23.31	22.90	23.72	6850000				
4,4'-DDT	18.95	18.60	19.30	4540000	18.98	4630000	Y	-2.0
Methoxychlor	23.86	23.34	24.38	3070000	23.91	3090000	Y	-0.7
Endrin ketone	26.98	26.39	27.57	6580000				
a. Chlordane	14.02	13.83	14.21	6600000				
g. Chlordane	13.84	13.67	14.01	6750000				
Toxaphene	17.76	17.52	18.00	1220000				
Aroclor-1016	9.31	9.17	9.45	1550000				
Aroclor-1221	6.73	6.61	6.85	328000				
Aroclor-1232	9.73	9.56	9.90	557000				
Aroclor-1242	10.07	9.93	10.21	1190000				
Aroclor-1248	11.22	11.08	11.36	1060000				
Aroclor-1254	14.66	14.48	14.84	1590000				
Aroclor-1260	15.21	14.95	15.47	1880000				

Under QNT Y/N: enter Y if quantitation was performed, N if not performed. %D must be less than or equal to 15.0% for quantitiation, and less than or equal to 20.0% for confirmation.

Note: Determining that no compounds were found above the CRDL is a form of quantitation, and therefore at least one column must meet the 15.0% criteria.

For multicomponent analytes, the single largest peak that is characteristic of the component should be used to establish retention time and %D. Identification of such analytes is based primarily on pattern recognition.

9

PESTICIDE/PCB STANDARDS SUMMARY

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12069 SAS No.: NA SDG No.: NA

Instrument ID: HP5890A GC Column ID: DB1701

DATE(S) OF ANALYSIS FROM: 01/06/92 TO: 01/06/92
TIME(S) OF ANALYSIS FROM: 1318 TO: 1911

DATE OF ANALYSIS 01/07/92
TIME OF ANALYSIS 1251
EPA SAMPLE NO. (STANDARD) INDB

COMPOUND	RT	RT WINDOW FROM	RT WINDOW TO	CALIBRATION FACTOR	RT	CALIBRATION FACTOR	QNT Y/N	%D
alpha-BHC	7.66	7.54	7.78	6770000	7.69	7110000	Y	-5.0
beta-BHC	11.42	11.26	11.58	3490000	11.45	3580000	Y	-2.6
delta-BHC	12.22	12.05	12.39	5760000	12.25	6170000	Y	-7.1
gamma-BHC	8.93	8.74	9.12	7310000				
Heptachlor	9.58	9.40	9.76	8050000				
Aldrin	10.47	10.30	10.64	7270000	10.50	7460000	Y	-2.6
Hept. epoxide	12.74	12.55	12.93	6890000				
Endosulfan I	13.66	13.47	13.85	3440000				
Dieldrin	14.96	14.75	15.17	5800000				
4,4'-DDE	14.41	14.23	14.59	6170000	14.44	6430000	Y	-4.2
Endrin	15.76	15.52	16.00	6070000	15.79	6370000	Y	-4.9
Endosulfan II	18.20	17.87	18.53	2040000				
4,4'-DDD	18.00	17.73	18.27	3840000	18.03	4080000	Y	-6.2
Endo. sulfate	23.31	22.90	23.72	6850000	23.39	7000000	Y	-2.2
4,4'-DDT	18.95	18.60	19.30	4540000				
Methoxychlor	23.86	23.34	24.38	3070000				
Endrin ketone	26.98	26.39	27.57	6580000	27.07	6720000	Y	-2.1
a. Chlordane	14.02	13.83	14.21	6600000	14.06	6910000	Y	-4.7
g. Chlordane	13.84	13.67	14.01	6750000	13.87	7090000	Y	-5.0
Toxaphene	17.76	17.52	18.00	1220000				
Aroclor-1016	9.31	9.17	9.45	1550000				
Aroclor-1221	6.73	6.61	6.85	328000				
Aroclor-1232	9.73	9.56	9.90	557000				
Aroclor-1242	10.07	9.93	10.21	1190000				
Aroclor-1248	11.22	11.08	11.36	1060000				
Aroclor-1254	14.66	14.48	14.84	1590000				
Aroclor-1260	15.21	14.95	15.47	1880000				

Under QNT Y/N: enter Y if quantitation was performed, N if not performed. %D must be less than or equal to 15.0% for quantitiation, and less than or equal to 20.0% for confirmation.

Note: Determining that no compounds were found above the CRDL is a form of quantitation, and therefore at least one column must meet the 15.0% criteria.

For multicomponent analytes, the single largest peak that is characteristic of the component should be used to establish retention time and %D. Identification of such analytes is based primarily on pattern recognition.

PESTICIDE/PCB STANDARDS SUMMARY

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12069 SAS No.: NA SDG No.: NA

Instrument ID: HP5890A GC Column ID: DB1701

DATE(S) OF ANALYSIS FROM: 01/06/92 TO: 01/06/92
TIME(S) OF ANALYSIS FROM: 1318 TO: 1911

DATE OF ANALYSIS 01/07/92
TIME OF ANALYSIS 2201
EPA SAMPLE NO. (STANDARD) INDA

COMPOUND	RT	RT WINDOW FROM	RT WINDOW TO	CALIBRATION FACTOR	RT	CALIBRATION FACTOR	QNT Y/N	%D
alpha-BHC	7.66	7.54	7.78	6770000				
beta-BHC	11.42	11.26	11.58	3490000				
delta-BHC	12.22	12.05	12.39	5760000				
gamma-BHC	8.93	8.74	9.12	7310000	8.95	7560000	Y	-3.4
Heptachlor	9.58	9.40	9.76	8050000	9.60	8260000	Y	-2.6
Aldrin	10.47	10.30	10.64	7270000	10.50	8130000	Y	-11.8
Hept. epoxide	12.74	12.55	12.93	6890000	12.77	6750000	Y	2.0
Endosulfan I	13.66	13.47	13.85	3440000	13.67	3640000	Y	-5.8
Dieldrin	14.96	14.75	15.17	5800000	14.99	6340000	Y	-9.3
4,4'-DDE	14.41	14.23	14.59	6170000				
Endrin	15.76	15.52	16.00	6070000				
Endosulfan II	18.20	17.87	18.53	2040000	18.23	1860000	Y	8.8
4,4'-DDD	18.00	17.73	18.27	3840000				
Endo. sulfate	23.31	22.90	23.72	6850000				
4,4'-DDT	18.95	18.60	19.30	4540000	18.98	4530000	Y	0.2
Methoxychlor	23.86	23.34	24.38	3070000	23.91	3120000	Y	-1.6
Endrin ketone	26.98	26.39	27.57	6580000				
a. Chlordane	14.02	13.83	14.21	6600000				
g. Chlordane	13.84	13.67	14.01	6750000				
Toxaphene	17.76	17.52	18.00	1220000				
Aroclor-1016	9.31	9.17	9.45	1550000				
Aroclor-1221	6.73	6.61	6.85	328000				
Aroclor-1232	9.73	9.56	9.90	557000				
Aroclor-1242	10.07	9.93	10.21	1190000				
Aroclor-1248	11.22	11.08	11.36	1060000				
Aroclor-1254	14.66	14.48	14.84	1590000				
Aroclor-1260	15.21	14.95	15.47	1880000				

Under QNT Y/N: enter Y if quantitation was performed, N if not performed. %D must be less than or equal to 15.0% for quantitiation, and less than or equal to 20.0% for confirmation.

Note: Determining that no compounds were found above the CRDL is a form of quantitation, and therefore at least one column must meet the 15.0% criteria.

For multicomponent analytes, the single largest peak that is characteristic of the component should be used to establish retention time and %D. Identification of such analytes is based primarily on pattern recognition.

PESTICIDE/PCB STANDARDS SUMMARY

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12069 SAS No.: NA SDG No.: NA

Instrument ID: HP5890A GC Column ID: DB1701

DATE(S) OF ANALYSIS FROM: 01/06/92 TO: 01/06/92
TIME(S) OF ANALYSIS FROM: 1318 TO: 1911

DATE OF ANALYSIS 01/07/92
TIME OF ANALYSIS 2245
EPA SAMPLE NO. (STANDARD) INDB

COMPOUND	RT	RT WINDOW FROM	RT WINDOW TO	CALIBRATION FACTOR	RT	CALIBRATION FACTOR	QNT Y/N	%D
alpha-BHC	7.66	7.54	7.78	6770000	7.69	6720000	N	0.7
beta-BHC	11.42	11.26	11.58	3490000	11.45	3350000	N	4.0
delta-BHC	12.22	12.05	12.39	5760000	12.25	5860000	N	-1.7
gamma-BHC	8.93	8.74	9.12	7310000				
Heptachlor	9.58	9.40	9.76	8050000				
Aldrin	10.47	10.30	10.64	7270000	10.48	7640000	N	-5.1
Hept. epoxide	12.74	12.55	12.93	6890000				
Endosulfan I	13.66	13.47	13.85	3440000				
Dieldrin	14.96	14.75	15.17	5800000				
4,4'-DDE	14.41	14.23	14.59	6170000	14.42	6230000	N	-1.0
Endrin	15.76	15.52	16.00	6070000	15.79	6130000	N	-1.0
Endosulfan II	18.20	17.87	18.53	2040000				
4,4'-DDD	18.00	17.73	18.27	3840000	18.03	3900000	N	-1.6
Endo. sulfate	23.31	22.90	23.72	6850000	23.38	6740000	N	1.6
4,4'-DDT	18.95	18.60	19.30	4540000				
Methoxychlor	23.86	23.34	24.38	3070000				
Endrin ketone	26.98	26.39	27.57	6580000	27.07	6710000	N	-2.0
a. Chlordane	14.02	13.83	14.21	6600000	14.06	6580000	N	0.3
g. Chlordane	13.84	13.67	14.01	6750000	13.87	6670000	N	1.2
Toxaphene	17.76	17.52	18.00	1220000				
Aroclor-1016	9.31	9.17	9.45	1550000				
Aroclor-1221	6.73	6.61	6.85	328000				
Aroclor-1232	9.73	9.56	9.90	557000				
Aroclor-1242	10.07	9.93	10.21	1190000				
Aroclor-1248	11.22	11.08	11.36	1060000				
Aroclor-1254	14.66	14.48	14.84	1590000				
Aroclor-1260	15.21	14.95	15.47	1880000				

Under QNT Y/N: enter Y if quantitation was performed, N if not performed. %D must be less than or equal to 15.0% for quantitiation, and less than or equal to 20.0% for confirmation.

Note: Determining that no compounds were found above the CRDL is a form of quantitation, and therefore at least one column must meet the 15.0% criteria.

For multicomponent analytes, the single largest peak that is characteristic of the component should be used to establish retention time and %D. Identification of such analytes is based primarily on pattern recognition.

PESTICIDE/PCB STANDARDS SUMMARY

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12069 SAS No.: NA SDG No.: NA

Instrument ID: HP5890A GC Column ID: DB1701

DATE(S) OF ANALYSIS FROM: 01/06/92 TO: 01/06/92
TIME(S) OF ANALYSIS FROM: 1318 TO: 1911

DATE OF ANALYSIS 01/08/92
TIME OF ANALYSIS 0732
EPA SAMPLE NO. (STANDARD) INDB

COMPOUND	RT	RT WINDOW FROM	RT WINDOW TO	CALIBRATION FACTOR	RT	CALIBRATION FACTOR	QNT Y/N	%D
alpha-BHC	7.66	7.54	7.78	6770000	7.71	7070000	Y	-4.4
beta-BHC	11.42	11.26	11.58	3490000	11.49	3730000	Y	-6.9
delta-BHC	12.22	12.05	12.39	5760000	12.29	5710000	Y	0.9
gamma-BHC	8.93	8.74	9.12	7310000				
Heptachlor	9.58	9.40	9.76	8050000				
Aldrin	10.47	10.30	10.64	7270000	10.53	7750000	Y	-6.6
Hept. epoxide	12.74	12.55	12.93	6890000				
Endosulfan I	13.66	13.47	13.85	3440000				
Dieldrin	14.96	14.75	15.17	5800000				
4,4'-DDE	14.41	14.23	14.59	6170000	14.47	6480000	Y	-5.0
Endrin	15.76	15.52	16.00	6070000	15.84	6320000	Y	-4.1
Endosulfan II	18.20	17.87	18.53	2040000				
4,4'-DDD	18.00	17.73	18.27	3840000	18.10	4020000	Y	-4.7
Endo. sulfate	23.31	22.90	23.72	6850000	23.48	6670000	Y	2.6
4,4'-DDT	18.95	18.60	19.30	4540000				
Methoxychlor	23.86	23.34	24.38	3070000				
Endrin ketone	26.98	26.39	27.57	6580000	27.18	6610000	Y	-0.5
a. Chlordane	14.02	13.83	14.21	6600000	14.09	6850000	Y	-3.8
g. Chlordane	13.84	13.67	14.01	6750000	13.91	7160000	Y	-6.1
Toxaphene	17.76	17.52	18.00	1220000				
Aroclor-1016	9.31	9.17	9.45	1550000				
Aroclor-1221	6.73	6.61	6.85	328000				
Aroclor-1232	9.73	9.56	9.90	557000				
Aroclor-1242	10.07	9.93	10.21	1190000				
Aroclor-1248	11.22	11.08	11.36	1060000				
Aroclor-1254	14.66	14.48	14.84	1590000				
Aroclor-1260	15.21	14.95	15.47	1880000				

Under QNT Y/N: enter Y if quantitation was performed, N if not performed. %D must be less than or equal to 15.0% for quantitiation, and less than or equal to 20.0% for confirmation.

Note: Determining that no compounds were found above the CRDL is a form of quantitation, and therefore at least one column must meet the 15.0% criteria.

For multicomponent analytes, the single largest peak that is characteristic of the component should be used to establish retention time and %D. Identification of such analytes is based primarily on pattern recognition.

PESTICIDE/PCB STANDARDS SUMMARY

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12069 SAS No.: NA SDG No.: NA

Instrument ID: HP5890A GC Column ID: DB1701

DATE(S) OF ANALYSIS FROM: 01/06/92 TO: 01/06/92
TIME(S) OF ANALYSIS FROM: 1318 TO: 1911

DATE OF ANALYSIS 01/08/92
TIME OF ANALYSIS 1623
EPA SAMPLE NO. (STANDARD) INDA

COMPOUND	RT	RT WINDOW FROM	RT WINDOW TO	CALIBRATION FACTOR	RT	CALIBRATION FACTOR	QNT Y/N	%D
alpha-BHC	7.66	7.54	7.78	6770000				
beta-BHC	11.42	11.26	11.58	3490000				
delta-BHC	12.22	12.05	12.39	5760000				
gamma-BHC	8.93	8.74	9.12	7310000	8.96	7440000	Y	-1.8
Heptachlor	9.58	9.40	9.76	8050000	9.60	8140000	Y	-1.1
Aldrin	10.47	10.30	10.64	7270000	10.50	7410000	Y	-1.9
Hept. epoxide	12.74	12.55	12.93	6890000	12.77	7030000	Y	-2.0
Endosulfan I	13.66	13.47	13.85	3440000	13.67	3450000	Y	-0.3
Dieldrin	14.96	14.75	15.17	5800000	14.99	6050000	Y	-4.3
4,4'-DDE	14.41	14.23	14.59	6170000				
Endrin	15.76	15.52	16.00	6070000				
Endosulfan II	18.20	17.87	18.53	2040000	18.23	1940000	Y	4.9
4,4'-DDD	18.00	17.73	18.27	3840000				
Endo. sulfate	23.31	22.90	23.72	6850000				
4,4'-DDT	18.95	18.60	19.30	4540000	18.98	4310000	Y	5.1
Methoxychlor	23.86	23.34	24.38	3070000	23.91	3030000	Y	1.3
Endrin ketone	26.98	26.39	27.57	6580000				
a. Chlordane	14.02	13.83	14.21	6600000				
g. Chlordane	13.84	13.67	14.01	6750000				
Toxaphene	17.76	17.52	18.00	1220000				
Aroclor-1016	9.31	9.17	9.45	1550000				
Aroclor-1221	6.73	6.61	6.85	328000				
Aroclor-1232	9.73	9.56	9.90	557000				
Aroclor-1242	10.07	9.93	10.21	1190000				
Aroclor-1248	11.22	11.08	11.36	1060000				
Aroclor-1254	14.66	14.48	14.84	1590000				
Aroclor-1260	15.21	14.95	15.47	1880000				

Under QNT Y/N: enter Y if quantitation was performed, N if not performed. %D must be less than or equal to 15.0% for quantitiation, and less than or equal to 20.0% for confirmation.

Note: Determining that no compounds were found above the CRDL is a form of quantitation, and therefore at least one column must meet the 15.0% criteria.

For multicomponent analytes, the single largest peak that is characteristic of the component should be used to establish retention time and %D. Identification of such analytes is based primarily on pattern recognition.

PESTICIDE/PCB STANDARDS SUMMARY

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12069 SAS No.: NA SDG No.: NA

Instrument ID: HP5890A GC Column ID: DB1701

DATE(S) OF ANALYSIS FROM: 01/06/92 TO: 01/06/92
TIME(S) OF ANALYSIS FROM: 1318 TO: 1911

DATE OF ANALYSIS 01/09/92
TIME OF ANALYSIS 0112
EPA SAMPLE NO. (STANDARD) INDA

COMPOUND	RT	RT WINDOW FROM	RT WINDOW TO	CALIBRATION FACTOR	RT	CALIBRATION FACTOR	QNT Y/N	%D
alpha-BHC	7.66	7.54	7.78	6770000				
beta-BHC	11.42	11.26	11.58	3490000				
delta-BHC	12.22	12.05	12.39	5760000				
gamma-BHC	8.93	8.74	9.12	7310000	8.96	7670000	N	-4.9
Heptachlor	9.58	9.40	9.76	8050000	9.62	8530000	N	-6.0
Aldrin	10.47	10.30	10.64	7270000	10.52	7720000	N	-6.2
Hept. epoxide	12.74	12.55	12.93	6890000	12.79	7160000	N	-3.9
Endosulfan I	13.66	13.47	13.85	3440000	13.69	3580000	N	-4.1
Dieldrin	14.96	14.75	15.17	5800000	15.01	6250000	N	-7.8
4,4'-DDE	14.41	14.23	14.59	6170000				
Endrin	15.76	15.52	16.00	6070000				
Endosulfan II	18.20	17.87	18.53	2040000	18.27	1970000	N	3.4
4,4'-DDD	18.00	17.73	18.27	3840000				
Endo. sulfate	23.31	22.90	23.72	6850000				
4,4'-DDT	18.95	18.60	19.30	4540000	19.02	4460000	N	1.8
Methoxychlor	23.86	23.34	24.38	3070000	23.94	3080000	N	-0.3
Endrin ketone	26.98	26.39	27.57	6580000				
a. Chlordane	14.02	13.83	14.21	6600000				
g. Chlordane	13.84	13.67	14.01	6750000				
Toxaphene	17.76	17.52	18.00	1220000				
Aroclor-1016	9.31	9.17	9.45	1550000				
Aroclor-1221	6.73	6.61	6.85	328000				
Aroclor-1232	9.73	9.56	9.90	557000				
Aroclor-1242	10.07	9.93	10.21	1190000				
Aroclor-1248	11.22	11.08	11.36	1060000				
Aroclor-1254	14.66	14.48	14.84	1590000				
Aroclor-1260	15.21	14.95	15.47	1880000				

Under QNT Y/N: enter Y if quantitation was performed, N if not performed. %D must be less than or equal to 15.0% for quantitiation, and less than or equal to 20.0% for confirmation.

Note: Determining that no compounds were found above the CRDL is a form of quantitation, and therefore at least one column must meet the 15.0% criteria.

For multicomponent analytes, the single largest peak that is characteristic of the component should be used to establish retention time and %D. Identification of such analytes is based primarily on pattern recognition.

9

PESTICIDE/PCB STANDARDS SUMMARY

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12069 SAS No.: NA SDG No.: NA

Instrument ID: HP5890A GC Column ID: DB1701

DATE(S) OF ANALYSIS FROM: 01/06/92 TO: 01/06/92
TIME(S) OF ANALYSIS FROM: 1318 TO: 1911

DATE OF ANALYSIS 01/09/92
TIME OF ANALYSIS 0156
EPA SAMPLE NO. (STANDARD) INDB

COMPOUND	RT	RT WINDOW FROM	RT WINDOW TO	CALIBRATION FACTOR	RT	CALIBRATION FACTOR	QNT Y/N	%D
alpha-BHC	7.66	7.54	7.78	6770000	7.71	7170000	Y	-5.9
beta-BHC	11.42	11.26	11.58	3490000	11.47	3650000	Y	-4.6
delta-BHC	12.22	12.05	12.39	5760000	12.27	5740000	Y	0.3
gamma-BHC	8.93	8.74	9.12	7310000				
Heptachlor	9.58	9.40	9.76	8050000				
Aldrin	10.47	10.30	10.64	7270000	10.52	7630000	Y	-5.0
Hept. epoxide	12.74	12.55	12.93	6890000				
Endosulfan I	13.66	13.47	13.85	3440000				
Dieldrin	14.96	14.75	15.17	5800000				
4,4'-DDE	14.41	14.23	14.59	6170000	14.46	6790000	Y	-10.0
Endrin	15.76	15.52	16.00	6070000	15.83	6380000	Y	-5.1
Endosulfan II	18.20	17.87	18.53	2040000				
4,4'-DDD	18.00	17.73	18.27	3840000	18.07	4030000	Y	-4.9
Endo. sulfate	23.31	22.90	23.72	6850000	23.44	6810000	Y	0.6
4,4'-DDT	18.95	18.60	19.30	4540000				
Methoxychlor	23.86	23.34	24.38	3070000				
Endrin ketone	26.98	26.39	27.57	6580000	27.13	6840000	Y	-4.0
a. Chlordane	14.02	13.83	14.21	6600000	14.07	7140000	Y	-8.2
g. Chlordane	13.84	13.67	14.01	6750000	13.89	7470000	Y	-10.7
Toxaphene	17.76	17.52	18.00	1220000				
Aroclor-1016	9.31	9.17	9.45	1550000				
Aroclor-1221	6.73	6.61	6.85	328000				
Aroclor-1232	9.73	9.56	9.90	557000				
Aroclor-1242	10.07	9.93	10.21	1190000				
Aroclor-1248	11.22	11.08	11.36	1060000				
Aroclor-1254	14.66	14.48	14.84	1590000				
Aroclor-1260	15.21	14.95	15.47	1880000				

Under QNT Y/N: enter Y if quantitation was performed, N if not performed. %D must be less than or equal to 15.0% for quantitiation, and less than or equal to 20.0% for confirmation.

Note: Determining that no compounds were found above the CRDL is a form of quantitation, and therefore at least one column must meet the 15.0% criteria.

For multicomponent analytes, the single largest peak that is characteristic of the component should be used to establish retention time and %D. Identification of such analytes is based primarily on pattern recognition.

9613501.2531

PESTICIDE/PCB STANDARDS SUMMARY

0258

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12069 SAS No.: NA SDG No.: NA

Instrument ID: HP5890A GC Column ID: DB1701

DATE(S) OF ANALYSIS FROM: 01/06/92 TO: 01/06/92
TIME(S) OF ANALYSIS FROM: 1318 TO: 1911

DATE OF ANALYSIS 01/09/92
TIME OF ANALYSIS 0832
EPA SAMPLE NO. (STANDARD) INDA

COMPOUND	RT	RT WINDOW FROM	RT WINDOW TO	CALIBRATION FACTOR	RT	CALIBRATION FACTOR	QNT Y/N	%D
alpha-BHC	7.66	7.54	7.78	6770000				
beta-BHC	11.42	11.26	11.58	3490000				
delta-BHC	12.22	12.05	12.39	5760000				
gamma-BHC	8.93	8.74	9.12	7310000	9.00	7790000	Y	-6.6
Heptachlor	9.58	9.40	9.76	8050000	9.63	8400000	Y	-4.3
Aldrin	10.47	10.30	10.64	7270000	10.53	7790000	Y	-7.2
Hept. epoxide	12.74	12.55	12.93	6890000	12.80	7240000	Y	-5.1
Endosulfan I	13.66	13.47	13.85	3440000	13.72	3600000	Y	-4.7
Dieldrin	14.96	14.75	15.17	5800000	15.04	6290000	Y	-8.4
4,4'-DDE	14.41	14.23	14.59	6170000				
Endrin	15.76	15.52	16.00	6070000				
Endosulfan II	18.20	17.87	18.53	2040000	18.30	2080000	Y	-2.0
4,4'-DDD	18.00	17.73	18.27	3840000				
Endo. sulfate	23.31	22.90	23.72	6850000				
4,4'-DDT	18.95	18.60	19.30	4540000	19.05	4540000	Y	0.0
Methoxychlor	23.86	23.34	24.38	3070000	24.03	3050000	Y	0.7
Endrin ketone	26.98	26.39	27.57	6580000				
a. Chlordane	14.02	13.83	14.21	6600000				
g. Chlordane	13.84	13.67	14.01	6750000				
Toxaphene	17.76	17.52	18.00	1220000				
Aroclor-1016	9.31	9.17	9.45	1550000				
Aroclor-1221	6.73	6.61	6.85	328000				
Aroclor-1232	9.73	9.56	9.90	557000				
Aroclor-1242	10.07	9.93	10.21	1190000				
Aroclor-1248	11.22	11.08	11.36	1060000				
Aroclor-1254	14.66	14.48	14.84	1590000				
Aroclor-1260	15.21	14.95	15.47	1880000				

Under QNT Y/N: enter Y if quantitation was performed, N if not performed. %D must be less than or equal to 15.0% for quantitiation, and less than or equal to 20.0% for confirmation.

Note: Determining that no compounds were found above the CRDL is a form of quantitation, and therefore at least one column must meet the 15.0% criteria.

For multicomponent analytes, the single largest peak that is characteristic of the component should be used to establish retention time and %D. Identification of such analytes is based primarily on pattern recognition.

PESTICIDE/PCB STANDARDS SUMMARY

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12069 SAS No.: NA SDG No.: NA

Instrument ID: HP5890A GC Column ID: DB1701

DATE(S) OF ANALYSIS FROM: 01/06/92 TO: 01/06/92
TIME(S) OF ANALYSIS FROM: 1318 TO: 1911

DATE OF ANALYSIS 01/09/92
TIME OF ANALYSIS 0916
EPA SAMPLE NO. (STANDARD) INDB

COMPOUND	RT	RT WINDOW FROM	RT WINDOW TO	CALIBRATION FACTOR	RT	CALIBRATION FACTOR	QNT Y/N	%D
alpha-BHC	7.66	7.54	7.78	6770000	7.73	7280000	Y	-7.5
beta-BHC	11.42	11.26	11.58	3490000	11.49	3580000	Y	-2.6
delta-BHC	12.22	12.05	12.39	5760000	12.29	5970000	Y	-3.6
gamma-BHC	8.93	8.74	9.12	7310000				
Heptachlor	9.58	9.40	9.76	8050000				
Aldrin	10.47	10.30	10.64	7270000	10.53	7690000	Y	-5.8
Hept. epoxide	12.74	12.55	12.93	6890000				
Endosulfan I	13.66	13.47	13.85	3440000				
Dieldrin	14.96	14.75	15.17	5800000				
4,4'-DDE	14.41	14.23	14.59	6170000	14.47	6550000	Y	-6.2
Endrin	15.76	15.52	16.00	6070000	15.84	6400000	Y	-5.4
Endosulfan II	18.20	17.87	18.53	2040000				
4,4'-DDD	18.00	17.73	18.27	3840000	18.10	3890000	Y	-1.3
Endo. sulfate	23.31	22.90	23.72	6850000	23.48	6710000	Y	2.0
4,4'-DDT	18.95	18.60	19.30	4540000				
Methoxychlor	23.86	23.34	24.38	3070000				
Endrin ketone	26.98	26.39	27.57	6580000	27.20	6840000	Y	-4.0
a. Chlordane	14.02	13.83	14.21	6600000	14.09	7050000	Y	-6.8
g. Chlordane	13.84	13.67	14.01	6750000	13.91	7060000	Y	-4.6
Toxaphene	17.76	17.52	18.00	1220000				
Aroclor-1016	9.31	9.17	9.45	1550000				
Aroclor-1221	6.73	6.61	6.85	328000				
Aroclor-1232	9.73	9.56	9.90	557000				
Aroclor-1242	10.07	9.93	10.21	1190000				
Aroclor-1248	11.22	11.08	11.36	1060000				
Aroclor-1254	14.66	14.48	14.84	1590000				
Aroclor-1260	15.21	14.95	15.47	1880000				

Under QNT Y/N: enter Y if quantitation was performed, N if not performed. %D must be less than or equal to 15.0% for quantitiation, and less than or equal to 20.0% for confirmation.

Note: Determining that no compounds were found above the CRDL is a form of quantitation, and therefore at least one column must meet the 15.0% criteria.

For multicomponent analytes, the single largest peak that is characteristic of the component should be used to establish retention time and %D. Identification of such analytes is based primarily on pattern recognition.

8D
PESTICIDE EVALUATION STANDARDS SUMMARY

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12069 SAS No.: NA SDG No.: NA

Instrument ID: HP5890B GC Column ID: DB608

Dates of Analyses: 01/06/92 to 01/09/92

Evaluation Check for Linearity

PESTICIDE	CALIBRATION FACTOR EVAL MIX A	CALIBRATION FACTOR EVAL MIX B	CALIBRATION FACTOR EVAL MIX C	%RSD (</= 10.0%)	
Aldrin	1610000	1600000	1660000	2.0	
Endrin	1420000	1420000	1440000	0.8	
4,4'-DDT	1090000	1090000	1130000	2.1	(1)
DBC	1530000	1460000	1520000	2.5	

(1) If > 10.0% RSD, plot a standard curve and determine the ng for each sample in that set from the curve.

Evaluation Check for 4,4'-DDT/Endrin Breakdown
(percent breakdown expressed as total degradation)

		DATE ANALYZED	TIME ANALYZED	ENDRIN	4,4'-DDT	COMBINED (2)
	INITIAL					
01	EVAL MIX B	01/06/92	1147	0.0	0.0	
02	EVAL MIX B	01/06/92	2336	0.0	1.4	
03	EVAL MIX B	01/07/92	0824	0.0	0.0	
04	EVAL MIX B	01/07/92	1736	0.0	0.0	
05	EVAL MIX B	01/08/92	0308	0.0	7.2	
06	EVAL MIX B	01/08/92	1158	0.0	8.8	
07	EVAL MIX B	01/08/92	2048	0.0	6.9	
08	EVAL MIX B	01/09/92	0620	0.0	8.0	

(2) See Form instructions.

8E
PESTICIDE EVALUATION STANDARDS SUMMARY
Evaluation of Retention Time Shift for Dibutylchlorendate

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12069 SAS No.: NA SDG No.: NA

Instrument ID: HP5890B GC Column ID: DB608

Dates of Analyses: 01/06/92 to 01/09/92

	EPA SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED	TIME ANALYZED	% D	*
01	EVALA	A1061	01/06/92	1103	0.0	
02	EVALB	A1062	01/06/92	1147	0.2	
03	EVALC	A1063	01/06/92	1232	0.2	
04	INDA	A1064	01/06/92	1318	0.2	
05	INDB	A1065	01/06/92	1402	0.2	
06	TOXAPH	A1066	01/06/92	1446	0.2	
07	AR1660	A1067	01/06/92	1531	0.2	
08	AR1221	A1068	01/06/92	1615	0.1	
09	AR1232	A1069	01/06/92	1659	0.1	
10	AR1242	A10610	01/06/92	1743	0.1	
11	AR1248	A10611	01/06/92	1826	0.1	
12	AR1254	A10612	01/06/92	1911	0.1	
13	ZZZZZ	A112060-BLK	01/06/92	1955	0.0	
14	ZZZZZ	A112060-01A	01/06/92	2040	0.0	
15	ZZZZZ	A112060-02A	01/06/92	2124	0.0	
16	ZZZZZ	A112061-01A	01/06/92	2208	-0.1	
17	ZZZZZ	A112061-02A	01/06/92	2252	-0.1	
18	EVALB	A10618	01/06/92	2336	-0.1	
19	ZZZZZ	A112061-03A	01/07/92	0020	-0.1	
20	ZZZZZ	A112061-04A	01/07/92	0104	-0.1	
21	ZZZZZ	A112061-06A	01/07/92	0148	-0.1	
22	ZZZZZ	A112064-BLK	01/07/92	0232	-0.1	
23	ZZZZZ	A112064-01D	01/07/92	0316	-0.1	
24	INDA	A10624	01/07/92	0400	-0.1	
25	ZZZZZ	A112064-02B	01/07/92	0444	-0.1	
26	ZZZZZ	A112064-03B	01/07/92	0528	-0.1	
27	ZZZZZ	A112064-04B	01/07/92	0612	-0.1	
28	ZZZZZ	A112066-01D	01/07/92	0656	-0.2	
29	ZZZZZ	A112066-02B	01/07/92	0740	-0.2	
30	EVALB	A10630	01/07/92	0824	-0.2	
31	ZZZZZ	A112049-BLK	01/07/92	0909	-0.2	
32	ZZZZZ	A112049-04A	01/07/92	0954	-0.2	
33	ZZZZZ	A112049-04AR	01/07/92	1040	-0.2	
34	ZZZZZ	A112066-02BR	01/07/92	1123	-0.2	
35	ZZZZZ	A112049-04B	01/07/92	1206	-0.2	
36	INDB	A10636	01/07/92	1251	-0.1	
37	ZZZZZ	A112049-04C	01/07/92	1356	-0.2	
38	ZZZZZ	A112049-09B	01/07/92	1440	0.0	

* Values outside of QC limits (2.0% for packed columns, 0.3% for capillary columns)

FORM VIII PEST-2 1/87 Rev.

8E
PESTICIDE EVALUATION STANDARDS SUMMARY
Evaluation of Retention Time Shift for Dibutylchlorendate

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12069 SAS No.: NA SDG No.: NA

Instrument ID: HP5890B GC Column ID: DB608

Dates of Analyses: 01/06/92 to 01/09/92

	EPA SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED	TIME ANALYZED	% D	*
01	ZZZZZ	A112049-06B	01/07/92	1608	0.0	
02	ZZZZZ	A112049-07B	01/07/92	1652	-0.1	
03	EVALB	A10642	01/07/92	1736	-0.1	
04	ZZZZZ	A112049-08B	01/07/92	1820	-0.1	
05	ZZZZZ	A112049-05H	01/07/92	1904	-0.1	
06	ZZZZZ	A112049-10A	01/07/92	1949	-0.1	
07	ZZZZZ	A112049-11A	01/07/92	2033	-0.1	
08	ZZZZZ	A112049-12A	01/07/92	2117	-0.1	
09	INDA	A10648	01/07/92	2201	-0.1	
10	INDB	A10649	01/07/92	2245	-0.1	
11	ZZZZZ	A112050-BLK	01/07/92	2329	-0.2	
12	ZZZZZ	A112050-01B	01/08/92	0013	-0.2	
13	ZZZZZ	A112050-02C	01/08/92	0057	-0.2	
14	ZZZZZ	A112050-02D	01/08/92	0140	-0.3	
15	ZZZZZ	A112050-02E	01/08/92	0224	-0.3	
16	EVALB	A10655	01/08/92	0308	-0.3	
17	ZZZZZ	A112050-03B	01/08/92	0352	-0.4	
18	ZZZZZ	A112050-04B	01/08/92	0436	-0.4	
19	ZZZZZ	A112050-05B	01/08/92	0520	-0.4	
20	ZZZZZ	A112050-06B	01/08/92	0604	-0.5	
21	ZZZZZ	A112050-07B	01/08/92	0648	-0.5	
22	INDB	A10661	01/08/92	0732	-0.6	
23	ZZZZZ	A112050-08B	01/08/92	0816	-0.6	
24	ZZZZZ	A112050-09B	01/08/92	0902	-0.6	
25	ZZZZZ	A112050-10B	01/08/92	0945	-0.5	
26	ZZZZZ	A112050-11B	01/08/92	1030	-0.5	
27	PBLK1223S	A112069-BLK	01/08/92	1115	-0.3	
28	EVALB	A10667	01/08/92	1158	-0.2	
29	B01CF4	A112069-01A	01/08/92	1245	-0.2	
30	B01CF5	A112069-02A	01/08/92	1329	-0.2	
31	B01CF5MS	A112069-02D	01/08/92	1410	-0.1	
32	B01CF5MSD	A112069-02E	01/08/92	1454	-0.1	
33	B01CF6	A112069-03A	01/08/92	1538	-0.2	
34	INDA	A10673	01/08/92	1623	-0.2	
35	B01CF7	A112069-04A	01/08/92	1707	-0.2	
36	B01CF8	A112069-05A	01/08/92	1754	-0.2	
37	ZZZZZ	A112068-01B	01/08/92	1835	-0.2	
38	ZZZZZ	A112068-01C	01/08/92	1919	-0.2	

* Values outside of QC limits (2.0% for packed columns, 0.3% for capillary columns)

8E

PESTICIDE EVALUATION STANDARDS SUMMARY

Evaluation of Retention Time Shift for Dibutylchlorendate

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12069 SAS No.: NA SDG No.: NA

Instrument ID: HP5890B GC Column ID: DB608

Dates of Analyses: 01/06/92 to 01/09/92

	EPA SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED	TIME ANALYZED	% D	*
01	ZZZZZ	A112068-01D	01/08/92	2005	-0.2	
02	EVALB	A10679	01/08/92	2048	-0.2	
03	ZZZZZ	A112068-02D	01/08/92	2132	-0.2	
04	ZZZZZ	A112068-03C	01/08/92	2216	-0.2	
05	ZZZZZ	A112068-04B	01/08/92	2300	-0.3	
06	ZZZZZ	A112068-05B	01/08/92	2344	-0.3	
07	ZZZZZ	A112068-06B	01/09/92	0029	-0.3	
08	INDA	A10685	01/09/92	0112	-0.4	
09	INDB	A10686	01/09/92	0156	-0.5	
10	ZZZZZ	A112076-BLK	01/09/92	0240	-0.5	
11	ZZZZZ	A112076-01D	01/09/92	0324	-0.5	
12	ZZZZZ	A112076-03B	01/09/92	0408	-0.5	
13	ZZZZZ	A112076-04B	01/09/92	0452	-0.6	
14	ZZZZZ	A112076-05B	01/09/92	0536	-0.6	
15	EVALB	A10692	01/09/92	0620	-0.6	
16	ZZZZZ	A112076-06B	01/09/92	0704	-0.6	
17	ZZZZZ	A112076-07B	01/09/92	0748	-0.6	
18	INDA	A10695	01/09/92	0832	-0.6	
19	INDB	A10696	01/09/92	0916	-0.6	

* Values outside of QC limits (2.0% for packed columns, 0.3% for capillary columns)

PESTICIDE/PCB STANDARDS SUMMARY

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12069 SAS No.: NA SDG Ng.: NA

Instrument ID: HP5890B GC Column ID: DB608

DATE(S) OF ANALYSIS FROM: 01/06/92 TO: 01/06/92
TIME(S) OF ANALYSIS FROM: 1318 TO: 1911

DATE OF ANALYSIS 01/07/92
TIME OF ANALYSIS 0400
EPA SAMPLE NO. (STANDARD) INDA

COMPOUND	RT	RT WINDOW FROM	RT WINDOW TO	CALIBRATION FACTOR	RT	CALIBRATION FACTOR	QNT Y/N	%D
alpha-BHC	7.94	7.78	8.10	1360000				
beta-BHC	9.55	9.42	9.68	903000				
delta-BHC	10.83	10.64	11.02	1230000				
gamma-BHC	9.30	9.11	9.49	1400000	9.30	1390000	N	0.7
Heptachlor	10.40	10.23	10.57	1780000	10.42	1760000	N	1.1
Aldrin	11.55	11.35	11.75	1620000	11.57	1600000	N	1.2
Hept. epoxide	13.57	13.37	13.77	1670000	13.59	1680000	N	-0.6
Endosulfan I	14.88	14.64	15.12	851000	14.89	857000	N	-0.7
Dieldrin	16.21	15.91	16.51	1420000	16.23	1420000	N	0.0
4,4'-DDE	15.94	15.70	16.18	1500000				
Endrin	18.08	17.76	18.40	1450000				
Endosulfan II	19.23	18.87	19.59	516000	19.27	523000	N	-1.4
4,4'-DDD	19.00	18.64	19.36	838000				
Endo. sulfate	22.64	22.19	23.09	1600000				
4,4'-DDT	21.10	20.65	21.55	1120000	21.14	1120000	N	0.0
Methoxychlor	30.96	30.14	31.78	780000	31.04	773000	N	0.9
Endrin ketone	30.69	29.96	31.42	1730000				
a. Chlordane	14.78	14.58	14.98	1640000				
g. Chlordane	14.16	13.97	14.35	1810000				
Toxaphene	21.02	20.74	21.30	255000				
Aroclor-1016	9.23	9.06	9.40	405000				
Aroclor-1221	7.83	7.69	7.97	99800				
Aroclor-1232	10.48	10.30	10.66	175000				
Aroclor-1242	11.60	11.43	11.77	341000				
Aroclor-1248	13.67	13.48	13.86	403000				
Aroclor-1254	14.42	14.19	14.65	385000				
Aroclor-1260	18.08	17.75	18.41	525000				

Under QNT Y/N: enter Y if quantitation was performed, N if not performed. %D must be less than or equal to 15.0% for quantitiation, and less than or equal to 20.0% for confirmation.

Note: Determining that no compounds were found above the CRDL is a form of quantitation, and therefore at least one column must meet the 15.0% criteria.

For multicomponent analytes, the single largest peak that is characteristic of the component should be used to establish retention time and %D. Identification of such analytes is based primarily on pattern recognition.

PESTICIDE/PCB STANDARDS SUMMARY

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12069 SAS No.: NA SDG No.: NA

Instrument ID: HP5890B GC Column ID: DB608

DATE(S) OF ANALYSIS FROM: 01/06/92 TO: 01/06/92
TIME(S) OF ANALYSIS FROM: 1318 TO: 1911

DATE OF ANALYSIS 01/07/92
TIME OF ANALYSIS 1251
EPA SAMPLE NO. (STANDARD) INDB

COMPOUND	RT	RT WINDOW FROM	RT WINDOW TO	CALIBRATION FACTOR	RT	CALIBRATION FACTOR	QNT Y/N	%D
alpha-BHC	7.94	7.78	8.10	1360000	7.98	1410000	N	-3.7
beta-BHC	9.55	9.42	9.68	903000	9.56	932000	N	-3.2
delta-BHC	10.83	10.64	11.02	1230000	10.85	1330000	N	-8.1
gamma-BHC	9.30	9.11	9.49	1400000				
Heptachlor	10.40	10.23	10.57	1780000				
Aldrin	11.55	11.35	11.75	1620000	11.57	1640000	N	-1.2
Hept. epoxide	13.57	13.37	13.77	1670000				
Endosulfan I	14.88	14.64	15.12	851000				
Dieldrin	16.21	15.91	16.51	1420000				
4,4'-DDE	15.94	15.70	16.18	1500000	15.98	1550000	N	-3.3
Endrin	18.08	17.76	18.40	1450000	18.13	1500000	N	-3.4
Endosulfan II	19.23	18.87	19.59	516000				
4,4'-DDD	19.00	18.64	19.36	838000	19.05	884000	N	-5.5
Endo. sulfate	22.64	22.19	23.09	1600000	22.71	1640000	N	2.5
4,4'-DDT	21.10	20.65	21.55	1120000				
Methoxychlor	30.96	30.14	31.78	780000				
Endrin ketone	30.69	29.96	31.42	1730000	30.81	1740000	N	-0.6
a. Chlordane	14.78	14.58	14.98	1640000	14.81	1680000	N	-2.4
g. Chlordane	14.16	13.97	14.35	1810000	14.17	1760000	N	2.8
Toxaphene	21.02	20.74	21.30	255000				
Aroclor-1016	9.23	9.06	9.40	405000				
Aroclor-1221	7.83	7.69	7.97	99800				
Aroclor-1232	10.48	10.30	10.66	175000				
Aroclor-1242	11.60	11.43	11.77	341000				
Aroclor-1248	13.67	13.48	13.86	403000				
Aroclor-1254	14.42	14.19	14.65	385000				
Aroclor-1260	18.08	17.75	18.41	525000				

Under QNT Y/N: enter Y if quantitation was performed, N if not performed.
%D must be less than or equal to 15.0% for quantitiation, and less than or equal to 20.0% for confirmation.

Note: Determining that no compounds were found above the CRDL is a form of quantitation, and therefore at least one column must meet the 15.0% criteria.

For multicomponent analytes, the single largest peak that is characteristic of the component should be used to establish retention time and %D. Identification of such analytes is based primarily on pattern recognition.

PESTICIDE/PCB STANDARDS SUMMARY

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12069 SAS No.: NA SDG No.: NA

Instrument ID: HP5890B GC Column ID: DB608

DATE(S) OF ANALYSIS FROM: 01/06/92 TO: 01/06/92
TIME(S) OF ANALYSIS FROM: 1318 TO: 1911

DATE OF ANALYSIS 01/07/92
TIME OF ANALYSIS 2201
EPA SAMPLE NO. (STANDARD) INDA

COMPOUND	RT	RT WINDOW FROM	RT WINDOW TO	CALIBRATION FACTOR	RT	CALIBRATION FACTOR	QNT Y/N	%D
alpha-BHC	7.94	7.78	8.10	1360000				
beta-BHC	9.55	9.42	9.68	903000				
delta-BHC	10.83	10.64	11.02	1230000				
gamma-BHC	9.30	9.11	9.49	1400000	9.32	1430000	N	-2.1
Heptachlor	10.40	10.23	10.57	1780000	10.42	1780000	N	0.0
Aldrin	11.55	11.35	11.75	1620000	11.57	1620000	N	0.0
Hept. epoxide	13.57	13.37	13.77	1670000	13.59	1620000	N	3.0
Endosulfan I	14.88	14.64	15.12	851000	14.89	857000	N	-0.7
Dieldrin	16.21	15.91	16.51	1420000	16.23	1450000	N	-2.1
4,4'-DDE	15.94	15.70	16.18	1500000				
Endrin	18.08	17.76	18.40	1450000				
Endosulfan II	19.23	18.87	19.59	516000	19.27	473000	N	8.3
4,4'-DDD	19.00	18.64	19.36	838000				
Endo. sulfate	22.64	22.19	23.09	1600000				
4,4'-DDT	21.10	20.65	21.55	1120000	21.16	1180000	N	-5.4
Methoxychlor	30.96	30.14	31.78	780000	31.04	841000	N	-7.8
Endrin ketone	30.69	29.96	31.42	1730000				
a. Chlordane	14.78	14.58	14.98	1640000				
g. Chlordane	14.16	13.97	14.35	1810000				
Toxaphene	21.02	20.74	21.30	255000				
Aroclor-1016	9.23	9.06	9.40	405000				
Aroclor-1221	7.83	7.69	7.97	99800				
Aroclor-1232	10.48	10.30	10.66	175000				
Aroclor-1242	11.60	11.43	11.77	341000				
Aroclor-1248	13.67	13.48	13.86	403000				
Aroclor-1254	14.42	14.19	14.65	385000				
Aroclor-1260	18.08	17.75	18.41	525000				

Under QNT Y/N: enter Y if quantitation was performed, N if not performed. %D must be less than or equal to 15.0% for quantitiation, and less than or equal to 20.0% for confirmation.

Note: Determining that no compounds were found above the CRDL is a form of quantitation, and therefore at least one column must meet the 15.0% criteria.

For multicomponent analytes, the single largest peak that is characteristic of the component should be used to establish retention time and %D. Identification of such analytes is based primarily on pattern recognition.

PESTICIDE/PCB STANDARDS SUMMARY

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12069 SAS No.: NA SDG No.: NA

Instrument ID: HP5890B GC Column ID: DB608

DATE(S) OF ANALYSIS FROM: 01/06/92 TO: 01/06/92
TIME(S) OF ANALYSIS FROM: 1318 TO: 1911

DATE OF ANALYSIS 01/07/92
TIME OF ANALYSIS 2245
EPA SAMPLE NO. (STANDARD) INDB

COMPOUND	RT	RT WINDOW FROM	RT WINDOW TO	CALIBRATION FACTOR	RT	CALIBRATION FACTOR	QNT Y/N	%D
alpha-BHC	7.94	7.78	8.10	1360000	7.96	1440000	N	-5.9
beta-BHC	9.55	9.42	9.68	903000	9.56	900000	N	0.3
delta-BHC	10.83	10.64	11.02	1230000	10.85	1290000	N	-4.9
gamma-BHC	9.30	9.11	9.49	1400000				
Heptachlor	10.40	10.23	10.57	1780000				
Aldrin	11.55	11.35	11.75	1620000	11.57	1640000	N	-1.2
Hept. epoxide	13.57	13.37	13.77	1670000				
Endosulfan I	14.88	14.64	15.12	851000				
Dieldrin	16.21	15.91	16.51	1420000				
4,4'-DDE	15.94	15.70	16.18	1500000	15.98	1580000	N	-5.3
Endrin	18.08	17.76	18.40	1450000	18.13	1500000	N	-3.4
Endosulfan II	19.23	18.87	19.59	516000				
4,4'-DDD	19.00	18.64	19.36	838000	19.05	889000	N	-6.1
Endo. sulfate	22.64	22.19	23.09	1600000	22.71	1590000	N	0.6
4,4'-DDT	21.10	20.65	21.55	1120000				
Methoxychlor	30.96	30.14	31.78	780000				
Endrin ketone	30.69	29.96	31.42	1730000	30.79	1750000	N	-1.2
a. Chlordane	14.78	14.58	14.98	1640000	14.81	1630000	N	0.6
g. Chlordane	14.16	13.97	14.35	1810000	14.17	1720000	N	5.0
Toxaphene	21.02	20.74	21.30	255000				
Aroclor-1016	9.23	9.06	9.40	405000				
Aroclor-1221	7.83	7.69	7.97	99800				
Aroclor-1232	10.48	10.30	10.66	175000				
Aroclor-1242	11.60	11.43	11.77	341000				
Aroclor-1248	13.67	13.48	13.86	403000				
Aroclor-1254	14.42	14.19	14.65	385000				
Aroclor-1260	18.08	17.75	18.41	525000				

Under QNT Y/N: enter Y if quantitation was performed, N if not performed. %D must be less than or equal to 15.0% for quantitiation, and less than or equal to 20.0% for confirmation.

Note: Determining that no compounds were found above the CRDL is a form of quantitation, and therefore at least one column must meet the 15.0% criteria.

For multicomponent analytes, the single largest peak that is characteristic of the component should be used to establish retention time and %D. Identification of such analytes is based primarily on pattern recognition.

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PESTICIDE/PCB STANDARDS SUMMARY

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12069 SAS No.: NA SDG No.: NA

Instrument ID: HP5890B GC Column ID: DB608

DATE(S) OF ANALYSIS FROM: 01/06/92 TO: 01/06/92
TIME(S) OF ANALYSIS FROM: 1318 TO: 1911

DATE OF ANALYSIS 01/08/92
TIME OF ANALYSIS 0732
EPA SAMPLE NO. (STANDARD) INDB

COMPOUND	RT	RT WINDOW FROM	RT WINDOW TO	CALIBRATION FACTOR	RT	CALIBRATION FACTOR	QNT Y/N	%D
alpha-BHC	7.94	7.78	8.10	1360000	8.00	1430000	N	-5.1
beta-BHC	9.55	9.42	9.68	903000	9.60	919000	N	-1.8
delta-BHC	10.83	10.64	11.02	1230000	10.88	1250000	N	-1.6
gamma-BHC	9.30	9.11	9.49	1400000				
Heptachlor	10.40	10.23	10.57	1780000				
Aldrin	11.55	11.35	11.75	1620000	11.60	1650000	N	-1.9
Hept. epoxide	13.57	13.37	13.77	1670000				
Endosulfan I	14.88	14.64	15.12	851000				
Dieldrin	16.21	15.91	16.51	1420000				
4,4'-DDE	15.94	15.70	16.18	1500000	16.03	1570000	N	-4.7
Endrin	18.08	17.76	18.40	1450000	18.20	1490000	N	-2.8
Endosulfan II	19.23	18.87	19.59	516000				
4,4'-DDD	19.00	18.64	19.36	838000	19.12	922000	N	-10.0
Endo. sulfate	22.64	22.19	23.09	1600000	22.81	1530000	N	4.4
4,4'-DDT	21.10	20.65	21.55	1120000				
Methoxychlor	30.96	30.14	31.78	780000				
Endrin ketone	30.69	29.96	31.42	1730000	30.96	1740000	N	-0.6
a. Chlordane	14.78	14.58	14.98	1640000	14.84	1680000	N	-2.4
g. Chlordane	14.16	13.97	14.35	1810000	14.22	1710000	N	5.5
Toxaphene	21.02	20.74	21.30	255000				
Aroclor-1016	9.23	9.06	9.40	405000				
Aroclor-1221	7.83	7.69	7.97	99800				
Aroclor-1232	10.48	10.30	10.66	175000				
Aroclor-1242	11.60	11.43	11.77	341000				
Aroclor-1248	13.67	13.48	13.86	403000				
Aroclor-1254	14.42	14.19	14.65	385000				
Aroclor-1260	18.08	17.75	18.41	525000				

Under QNT Y/N: enter Y if quantitation was performed, N if not performed. %D must be less than or equal to 15.0% for quantitiation, and less than or equal to 20.0% for confirmation.

Note: Determining that no compounds were found above the CRDL is a form of quantitation, and therefore at least one column must meet the 15.0% criteria.

For multicomponent analytes, the single largest peak that is characteristic of the component should be used to establish retention time and %D. Identification of such analytes is based primarily on pattern recognition.

PESTICIDE/PCB STANDARDS SUMMARY

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12069 SAS No.: NA SDG No.: NA

Instrument ID: HP5890B GC Column ID: DB608

DATE(S) OF ANALYSIS FROM: 01/06/92 TO: 01/06/92
TIME(S) OF ANALYSIS FROM: 1318 TO: 1911

DATE OF ANALYSIS 01/08/92
TIME OF ANALYSIS 1623
EPA SAMPLE NO. (STANDARD) INDA

COMPOUND	RT	RT WINDOW FROM	RT WINDOW TO	CALIBRATION FACTOR	RT	CALIBRATION FACTOR	QNT Y/N	%D
alpha-BHC	7.94	7.78	8.10	1360000				
beta-BHC	9.55	9.42	9.68	903000				
delta-BHC	10.83	10.64	11.02	1230000				
gamma-BHC	9.30	9.11	9.49	1400000	9.32	1420000	N	-1.4
Heptachlor	10.40	10.23	10.57	1780000	10.42	1810000	N	-1.7
Aldrin	11.55	11.35	11.75	1620000	11.57	1650000	N	-1.9
Hept. epoxide	13.57	13.37	13.77	1670000	13.61	1710000	N	-2.4
Endosulfan I	14.88	14.64	15.12	851000	14.89	872000	N	-2.5
Dieldrin	16.21	15.91	16.51	1420000	16.24	1450000	N	-2.1
4,4'-DDE	15.94	15.70	16.18	1500000				
Endrin	18.08	17.76	18.40	1450000				
Endosulfan II	19.23	18.87	19.59	516000	19.28	490000	N	5.0
4,4'-DDD	19.00	18.64	19.36	838000				
Endo. sulfate	22.64	22.19	23.09	1600000				
4,4'-DDT	21.10	20.65	21.55	1120000	21.16	1100000	N	1.8
Methoxychlor	30.96	30.14	31.78	780000	31.06	813000	N	-4.2
Endrin ketone	30.69	29.96	31.42	1730000				
a. Chlordane	14.78	14.58	14.98	1640000				
g. Chlordane	14.16	13.97	14.35	1810000				
Toxaphene	21.02	20.74	21.30	255000				
Aroclor-1016	9.23	9.06	9.40	405000				
Aroclor-1221	7.83	7.69	7.97	99800				
Aroclor-1232	10.48	10.30	10.66	175000				
Aroclor-1242	11.60	11.43	11.77	341000				
Aroclor-1248	13.67	13.48	13.86	403000				
Aroclor-1254	14.42	14.19	14.65	385000				
Aroclor-1260	18.08	17.75	18.41	525000				

Under QNT Y/N: enter Y if quantitation was performed, N if not performed. %D must be less than or equal to 15.0% for quantitiation, and less than or equal to 20.0% for confirmation.

Note: Determining that no compounds were found above the CRDL is a form of quantitation, and therefore at least one column must meet the 15.0% criteria.

For multicomponent analytes, the single largest peak that is characteristic of the component should be used to establish retention time and %D. Identification of such analytes is based primarily on pattern recognition.

PESTICIDE/PCB STANDARDS SUMMARY

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12069 SAS No.: NA SDG No.: NA

Instrument ID: HP5890B GC Column ID: DB608

DATE(S) OF ANALYSIS FROM: 01/06/92 TO: 01/06/92
TIME(S) OF ANALYSIS FROM: 1318 TO: 1911

DATE OF ANALYSIS 01/09/92
TIME OF ANALYSIS 0112
EPA SAMPLE NO. (STANDARD) INDA

COMPOUND	RT	RT WINDOW FROM	RT WINDOW TO	CALIBRATION FACTOR	RT	CALIBRATION FACTOR	QNT Y/N	%D
alpha-BHC	7.94	7.78	8.10	1360000				
beta-BHC	9.55	9.42	9.68	903000				
delta-BHC	10.83	10.64	11.02	1230000				
gamma-BHC	9.30	9.11	9.49	1400000	9.33	1420000	N	-1.4
Heptachlor	10.40	10.23	10.57	1780000	10.43	1770000	N	0.6
Aldrin	11.55	11.35	11.75	1620000	11.59	1640000	N	-1.2
Hept. epoxide	13.57	13.37	13.77	1670000	13.62	1710000	N	-2.4
Endosulfan I	14.88	14.64	15.12	851000	14.91	863000	N	-1.4
Dieldrin	16.21	15.91	16.51	1420000	16.26	1440000	N	-1.4
4,4'-DDE	15.94	15.70	16.18	1500000				
Endrin	18.08	17.76	18.40	1450000				
Endosulfan II	19.23	18.87	19.59	516000	19.32	490000	N	5.0
4,4'-DDD	19.00	18.64	19.36	838000				
Endo. sulfate	22.64	22.19	23.09	1600000				
4,4'-DDT	21.10	20.65	21.55	1120000	21.19	1090000	N	2.7
Methoxychlor	30.96	30.14	31.78	780000	31.12	808000	N	-3.6
Endrin ketone	30.69	29.96	31.42	1730000				
a. Chlordane	14.78	14.58	14.98	1640000				
g. Chlordane	14.16	13.97	14.35	1810000				
Toxaphene	21.02	20.74	21.30	255000				
Aroclor-1016	9.23	9.06	9.40	405000				
Aroclor-1221	7.83	7.69	7.97	99800				
Aroclor-1232	10.48	10.30	10.66	175000				
Aroclor-1242	11.60	11.43	11.77	341000				
Aroclor-1248	13.67	13.48	13.86	403000				
Aroclor-1254	14.42	14.19	14.65	385000				
Aroclor-1260	18.08	17.75	18.41	525000				

Under QNT Y/N: enter Y if quantitation was performed, N if not performed. %D must be less than or equal to 15.0% for quantitiation, and less than or equal to 20.0% for confirmation.

Note: Determining that no compounds were found above the CRDL is a form of quantitation, and therefore at least one column must meet the 15.0% criteria.

For multicomponent analytes, the single largest peak that is characteristic of the component should be used to establish retention time and %D. Identification of such analytes is based primarily on pattern recognition.

PESTICIDE/PCB STANDARDS SUMMARY

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12069 SAS No.: NA SDG No.: NA

Instrument ID: HP5890B GC Column ID: DB608

DATE(S) OF ANALYSIS FROM: 01/06/92 TO: 01/06/92
TIME(S) OF ANALYSIS FROM: 1318 TO: 1911

DATE OF ANALYSIS 01/09/92
TIME OF ANALYSIS 0156
EPA SAMPLE NO. (STANDARD) INDB

COMPOUND	RT	RT WINDOW FROM	RT WINDOW TO	CALIBRATION FACTOR	RT	CALIBRATION FACTOR	QNT Y/N	%D
alpha-BHC	7.94	7.78	8.10	1360000	8.00	1370000	N	-0.7
beta-BHC	9.55	9.42	9.68	903000	9.60	909000	N	-0.7
delta-BHC	10.83	10.64	11.02	1230000	10.87	1230000	N	0.0
gamma-BHC	9.30	9.11	9.49	1400000				
Heptachlor	10.40	10.23	10.57	1780000				
Aldrin	11.55	11.35	11.75	1620000	11.60	1640000	N	-1.2
Hept. epoxide	13.57	13.37	13.77	1670000				
Endosulfan I	14.88	14.64	15.12	851000				
Dieldrin	16.21	15.91	16.51	1420000				
4,4'-DDE	15.94	15.70	16.18	1500000	16.01	1540000	N	-2.7
Endrin	18.08	17.76	18.40	1450000	18.17	1470000	N	-1.4
Endosulfan II	19.23	18.87	19.59	516000				
4,4'-DDD	19.00	18.64	19.36	838000	19.10	860000	N	-2.6
Endo. sulfate	22.64	22.19	23.09	1600000	22.76	1520000	N	5.0
4,4'-DDT	21.10	20.65	21.55	1120000				
Methoxychlor	30.96	30.14	31.78	780000				
Endrin ketone	30.69	29.96	31.42	1730000	30.91	1740000	N	-0.6
a. Chlordane	14.78	14.58	14.98	1640000	14.83	1670000	N	-1.8
g. Chlordane	14.16	13.97	14.35	1810000	14.21	1820000	N	-0.6
Toxaphene	21.02	20.74	21.30	255000				
Aroclor-1016	9.23	9.06	9.40	405000				
Aroclor-1221	7.83	7.69	7.97	99800				
Aroclor-1232	10.48	10.30	10.66	175000				
Aroclor-1242	11.60	11.43	11.77	341000				
Aroclor-1248	13.67	13.48	13.86	403000				
Aroclor-1254	14.42	14.19	14.65	385000				
Aroclor-1260	18.08	17.75	18.41	525000				

Under QNT Y/N: enter Y if quantitation was performed, N if not performed. %D must be less than or equal to 15.0% for quantitiation, and less than or equal to 20.0% for confirmation.

Note: Determining that no compounds were found above the CRDL is a form of quantitation, and therefore at least one column must meet the 15.0% criteria.

For multicomponent analytes, the single largest peak that is characteristic of the component should be used to establish retention time and %D. Identification of such analytes is based primarily on pattern recognition.

PESTICIDE/PCB STANDARDS SUMMARY

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12069 SAS No.: NA SDG No.: NA

Instrument ID: HP5890B GC Column ID: DB608

DATE(S) OF ANALYSIS FROM: 01/06/92 TO: 01/06/92
TIME(S) OF ANALYSIS FROM: 1318 TO: 1911

DATE OF ANALYSIS 01/09/92
TIME OF ANALYSIS 0832
EPA SAMPLE NO. (STANDARD) INDA

COMPOUND	RT	RT WINDOW FROM	RT WINDOW TO	CALIBRATION FACTOR	RT	CALIBRATION FACTOR	QNT Y/N	%D
alpha-BHC	7.94	7.78	8.10	1360000				
beta-BHC	9.55	9.42	9.68	903000				
delta-BHC	10.83	10.64	11.02	1230000				
gamma-BHC	9.30	9.11	9.49	1400000	9.35	1410000	N	-0.7
Heptachlor	10.40	10.23	10.57	1780000	10.47	1790000	N	-0.6
Aldrin	11.55	11.35	11.75	1620000	11.62	1600000	N	1.2
Hept. epoxide	13.57	13.37	13.77	1670000	13.64	1720000	N	-3.0
Endosulfan I	14.88	14.64	15.12	851000	14.94	867000	N	-1.9
Dieldrin	16.21	15.91	16.51	1420000	16.30	1440000	N	-1.4
4,4'-DDE	15.94	15.70	16.18	1500000				
Endrin	18.08	17.76	18.40	1450000				
Endosulfan II	19.23	18.87	19.59	516000	19.35	492000	N	4.7
4,4'-DDD	19.00	18.64	19.36	838000				
Endo. sulfate	22.64	22.19	23.09	1600000				
4,4'-DDT	21.10	20.65	21.55	1120000	21.24	1070000	N	4.5
Methoxychlor	30.96	30.14	31.78	780000	31.22	781000	N	-0.1
Endrin ketone	30.69	29.96	31.42	1730000				
a. Chlordane	14.78	14.58	14.98	1640000				
g. Chlordane	14.16	13.97	14.35	1810000				
Toxaphene	21.02	20.74	21.30	255000				
Aroclor-1016	9.23	9.06	9.40	405000				
Aroclor-1221	7.83	7.69	7.97	99800				
Aroclor-1232	10.48	10.30	10.66	175000				
Aroclor-1242	11.60	11.43	11.77	341000				
Aroclor-1248	13.67	13.48	13.86	403000				
Aroclor-1254	14.42	14.19	14.65	385000				
Aroclor-1260	18.08	17.75	18.41	525000				

Under QNT Y/N: enter Y if quantitation was performed, N if not performed. %D must be less than or equal to 15.0% for quantitiation, and less than or equal to 20.0% for confirmation.

Note: Determining that no compounds were found above the CRDL is a form of quantitation, and therefore at least one column must meet the 15.0% criteria.

For multicomponent analytes, the single largest peak that is characteristic of the component should be used to establish retention time and %D. Identification of such analytes is based primarily on pattern recognition.

PESTICIDE/PCB STANDARDS SUMMARY

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12069 SAS No.: NA SDG No.: NA

Instrument ID: HP5890B GC Column ID: DB608

DATE(S) OF ANALYSIS FROM: 01/06/92 TO: 01/06/92
TIME(S) OF ANALYSIS FROM: 1318 TO: 1911

DATE OF ANALYSIS 01/09/92
TIME OF ANALYSIS 0916
EPA SAMPLE NO. (STANDARD) INDB

COMPOUND	RT	RT WINDOW FROM	RT WINDOW TO	CALIBRATION FACTOR	RT	CALIBRATION FACTOR	QNT Y/N	%D
alpha-BHC	7.94	7.78	8.10	1360000	8.01	1370000	N	-0.7
beta-BHC	9.55	9.42	9.68	903000	9.62	902000	N	0.1
delta-BHC	10.83	10.64	11.02	1230000	10.88	1230000	N	0.0
gamma-BHC	9.30	9.11	9.49	1400000				
Heptachlor	10.40	10.23	10.57	1780000				
Aldrin	11.55	11.35	11.75	1620000	11.62	1650000	N	-1.9
Hept. epoxide	13.57	13.37	13.77	1670000				
Endosulfan I	14.88	14.64	15.12	851000				
Dieldrin	16.21	15.91	16.51	1420000				
4,4'-DDE	15.94	15.70	16.18	1500000	16.03	1540000	N	-2.7
Endrin	18.08	17.76	18.40	1450000	18.20	1460000	N	-0.7
Endosulfan II	19.23	18.87	19.59	516000				
4,4'-DDD	19.00	18.64	19.36	838000	19.13	848000	N	-1.2
Endo. sulfate	22.64	22.19	23.09	1600000	22.81	1520000	N	5.0
4,4'-DDT	21.10	20.65	21.55	1120000				
Methoxychlor	30.96	30.14	31.78	780000				
Endrin ketone	30.69	29.96	31.42	1730000	30.96	1750000	N	-1.2
a. Chlordane	14.78	14.58	14.98	1640000	14.84	1630000	N	0.6
g. Chlordane	14.16	13.97	14.35	1810000	14.22	1690000	N	6.6
Toxaphene	21.02	20.74	21.30	255000				
Aroclor-1016	9.23	9.06	9.40	405000				
Aroclor-1221	7.83	7.69	7.97	99800				
Aroclor-1232	10.48	10.30	10.66	175000				
Aroclor-1242	11.60	11.43	11.77	341000				
Aroclor-1248	13.67	13.48	13.86	403000				
Aroclor-1254	14.42	14.19	14.65	385000				
Aroclor-1260	18.08	17.75	18.41	525000				

Under QNT Y/N: enter Y if quantitation was performed, N if not performed. %D must be less than or equal to 15.0% for quantitiation, and less than or equal to 20.0% for confirmation.

Note: Determining that no compounds were found above the CRDL is a form of quantitation, and therefore at least one column must meet the 15.0% criteria.

For multicomponent analytes, the single largest peak that is characteristic of the component should be used to establish retention time and %D. Identification of such analytes is based primarily on pattern recognition.

***** EXTERNAL STANDARD TABLE *****

********** 01-13-1992 12:23:10 Version 4.1 **********

* Sample Name: CLP/INDA Data File: A:A10624 *
* Date: 01-07-1992 04:00:35 Method: A:ACLP088 01-06-1992 14:27:20 # 28 *
* Interface: 2 Cycle#: 24 Operator CP Channel#: 0 Vial#: N.A. *
* Starting Peak Width: 10 Threshold: 1 Area Threshold: 100 *

* Instrument Type: HP5890/B Column Type: DB-608,DB-1701 *
* Solvent Description: *
* Conditions: 160D,5D/M,230D,15M(35M RUN) *
* Detector 0: ECD Detector 1: ECD *
* Misc. Information: 1-06-1992, P, Col 0.53mm 4UL *

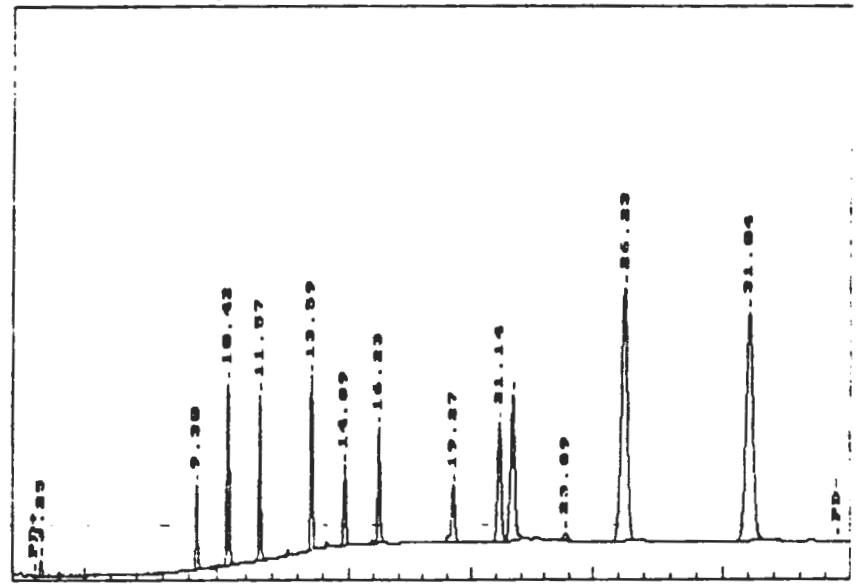
Starting Delay: 2.00 Ending retention time: 35.02
Area reject: 5000 One sample per 1.002 sec.
Amount injected: ~~1.00~~ 4.00 Dilution factor: 1.00
Sample Weight: 1.000000

PEAK NUM	RET TIME	PEAK NAME	CONCENTRATION in ug/ml (total ng)	NORMALIZED CONC	AREA	HEIGHT	AREA/ HEIGHT	BL	REF PEAK	% DELTA RET TIME	CONC/AREA
1	3.25		0.5615	34.2664%	5615	1176	4.8	1			1.00[illegible]E-04
5	9.30	gamma-BHC 0.02	0.0050	0.3034%	27848	5957	4.7	1	0	0	1.78[illegible]E-07
8	10.42	Heptachlor 0.04	0.0099	0.6050%	70535	13099	5.4	1	0	.1615	1.40[illegible]E-07
9	11.57	Aldrin 0.04	0.0099	0.6045%	64039	11911	5.4	2	0	.1653	1.54[illegible]E-07
13	13.59	Hept. epoxide 0.04	0.0101	0.6142%	67254	12562	5.4	1	0	.1459	1.49[illegible]E-07
15	14.89	Endosulfan I 0.04	0.0101	0.6150%	34290	5671	6.0	1	0	0	2.93[illegible]E-07
17	16.23	Dieldrin 0.04	0.0100	0.6097%	56931	8308	6.9	2	0	.1135	1.75[illegible]E-07
18	19.27	Endosulfan II 0.08	0.0203	1.2378%	41836	4065	10.3	1	0	.1965	4.84[illegible]E-07
19	21.14	4,4'-DDT 0.08	0.0199	1.2123%	89249	8612	10.4	1	0	.1335	2.22[illegible]E-07
20	21.69	Endrin Aldehyde 0.1	0.0252	1.5324%	121353	10509	11.5	1	0	.2278	2.07[illegible]E-07
21	23.89		0.8077	49.2900%	8077	567	14.2	1			1.00[illegible]E-04
22	26.23	DBC 0.2	0.0501	3.0543%	232228	18204	16.1	1	0	.2740	1.71[illegible]E-07
23	31.04	Methoxychlor 0.4	0.0992	6.0521%	309287	16500	18.7	1	0	.2625	3.20[illegible]E-07
		TOTAL AMOUNT =	1.6387								

all cross out by 1-15-92

Data File = A:A10624.PTS Printed on 01-13-1992 at 12:23:20
Start time: 2.00 min. Stop time: 35.02 min. Offset: 0 mv.
Low Value: 16298 uv High Value: 37055 uv Scale factor: 0.5

1 of 1



***** EXTERNAL STANDARD TABLE *****

********** 01-13-1992 12:35:56 Version 4.1 **********

* Sample Name: CLP/INDB Data File: A:A10636 *
* Date: 01-07-1992 12:51:00 Method: A:ACLP088 01-06-1992 14:27:20 # 280*
* Interface: 2 Cycle#: 36 Operator CP Channel#: 0 Vial#: N.A. *
* Starting Peak Width: 10 Threshold: 1 Area Threshold: 100 *

* Instrument Type: HP5890 AB Column Type: DB-608,DB-1701 *
* Solvent Description: *
* Conditions: 160D,5D/M,200D,15M(35M RUN) *
* Detector 0: ECD Detector 1: ECD *
* Misc. Information: 1-06-1992, P, Col 0.53mm 4UL *

Starting Delay: 2.00 Ending retention time: 35.00
Area reject: 5000 One sample per 1.002 sec.
Amount injected: ~~1.00~~ 4.00 Dilution factor: 1.00
Sample Weight: 1.000000

PEAK NUM	RET TIME	PEAK NAME	CONCENTRATION in ug/ml	NORMALIZED CONC	AREA	HEIGHT	AREA/ HEIGHT	BL	REF PEAK	% DELTA RET TIME	CONC/AREA
1	3.25		0.9074	48.4905%	9074	1906	4.8	1			1.0000E-04
5	7.98	alpha-BHC ~~0.04~~ 0.02	0.0052	0.2774%	28181	6269	4.5	1	0	.4861	1.8420E-07
6	9.57	beta-BHC 0.04	0.0103	0.5513%	37280	7883	4.7	2	0	.1581	2.7673E-07
10	10.85	delta-BHC 0.04	0.0108	0.5758%	53108	12054	4.4	1	0	.1939	2.0296E-07
11	11.57	Aldrin 0.04	0.0101	0.5423%	65609	12140	5.4	1	0	.1653	1.5467E-07
15	14.17	g. chlordane 0.04	0.0104	0.5579%	70256	12632	5.6	1	0	.1009	1.4860E-07
16	14.81	a. chlordane 0.04	0.0102	0.5461%	67026	11363	5.3	1	0	.3313	1.5247E-07
17	15.98	4,4'-DDE 0.04	0.0104	0.5543%	62181	9701	6.4	1	0	.1749	1.6680E-07
18	18.13	Endrin 0.04	0.0104	0.5556%	60137	7439	8.1	1	0	.2887	1.7290E-07
19	19.05	4,4'-DDD 0.08	0.0211	1.1286%	70760	8234	8.6	1	0	.2668	2.9848E-07
20	22.71	Endo. sulfate 0.08	0.0205	1.0991%	131583	11203	11.7	1	0	.3003	1.5630E-07
22	22.91		0.7727	41.2941%	7727	534	14.5	2			1.0000E-04
23	26.23	DBC 0.2	0.0515	2.7525%	300736	18698	16.1	1	0	.2740	1.7127E-07
24	30.81	Endrin ketone 0.08	0.0201	1.0744%	139499	8062	17.3	1	0	.3828	1.4413E-07
		TOTAL AMOUNT =	1.8713								

all cross out by cy 1-15-92

Data File = A:A10636.FTS Printed on 01-13-1992 at 12:36:07
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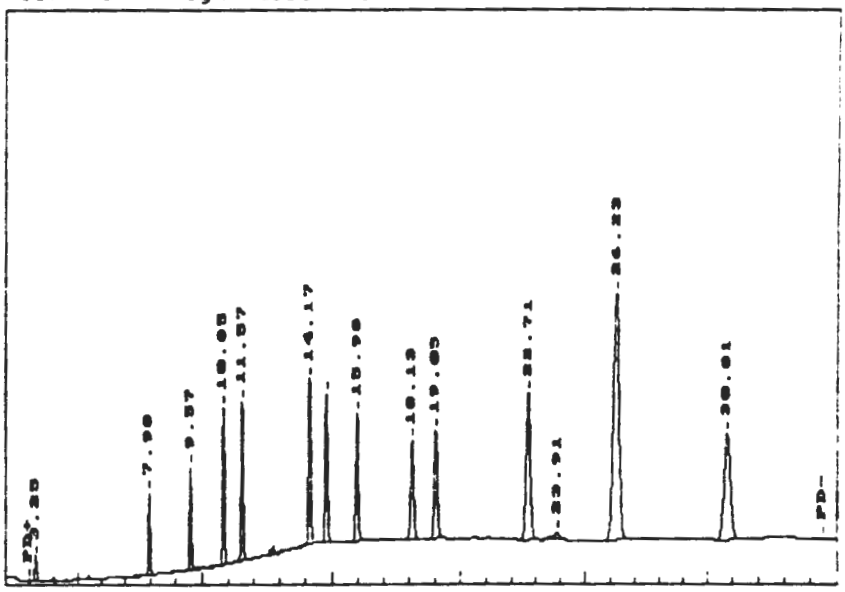
Low Value: 16777 uv High Value: 38614 uv Scale factor: 0.5

1 of 1