142891

CATIONS DATA PACKAGE

000001

Engineers
Planners
CH2M HILL Economists
Scientists

CASE NARRATIVE
Cations

Batch Number: 21232

Client/Project: BARR ENGINEERING COMPANY

I. Holding Time:
All holding times were met.

II. Analysis:

A. Blanks:
All acceptance criteria were met.

B. Calibration:
All acceptance criteria were met.

C. ICP Interference Check Sample:
All acceptance criteria were met.

D. Spike Sample Analysis:
Prespike recoveries outside criteria are flagged accordingly.

E. Duplicate Sample Analysis:
Duplicate precision outside criteria are flagged accordingly.

F. Laboratory Control Sample Analysis:
All acceptance criteria were met.

G. ICP Serial Dilution:
ICP serial dilutions outside criteria are flagged accordingly.

H. Other:
The QC data for the serial dilution is included in the 21184 data package.

III. I certify that this data package is in compliance with the terms and conditions agreed to by the client and CH2M HILL, both technically and for completeness, for other than the conditions detailed above.

SIGNED: _____ DATE: 4 MAY 92
Kevin A. Sanders
Inorganic Division Manager

CH2M HILL Quality Analytical Laboratories 2567 Fairlane Drive, P.O. Box 230548, Montgomery, Alabama 36116 205 271 1444

Engineers
Planners
CH2M HILL
Economists
Scientists

CASE NARRATIVE
General Chemistry

Batch Number: 21232

Client/Project: BARR ENGINEERING COMPANY

I. Holding Time: All criteria were met.

II. Analysis:

A.	Calibration:	Acceptance criteria met.
B.	Blanks:	Acceptance criteria met.
C.	Matrix Spike:	The cyanide prespike recovery was outside criteria. The postspike was within criteria.
D.	Duplicate Analysis:	The relative percent difference of 23.3 for cyanide is attributed to poor sample homogeneity. The sample was re-analyzed and a similar relative percent difference was obtained.
E.	Lab Control Sample:	Acceptance criteria met.
F.	Other:	None.

III. I certify that this data package is in compliance with the terms and conditions agreed to by the client and CH2M HILL, both technically and for completeness, for other than the conditions detailed above.

SIGNED: _____ DATE: 4 MAY 92
Kevin A. Sanders
Inorganic Division Manager

CH2M HILL
Quality Analytical Laboratories
2567 Fairlane Drive, P.O. Box 230548
Montgomery, Alabama 36116
205 271 1444

U.S. EPA - CLP

COVER PAGE - INORGANIC ANALYSES DATA PACKAGE

Lab Name: CH2M_HILL_MGM_____ Contract: 21232_____

Lab Code: NA____ Case No.: 21232 SAS No.: 21232_ SDG No.:21232_

SOW No.: 3/90_

EPA Sample No.	Lab Sample ID
_T-14-02_____	__S21232002___
_-14-02D_____	__S21232002D__
_-14-02S_____	__S21232002S__

Were ICP interelement corrections applied ? Yes/No YES

Were ICP background corrections applied ? Yes/No YES
If yes - were raw data generated before application of background corrections ? Yes/No NO_

Comments:
____QC_DATA_FOR_THE_SERIAL_DILUTION_IS_IN_DATA_PACKAGE_21184._____

I 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 contained in this hardcopy data package and in the computer-readable data submitted on floppy diskette has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature.

Signature: _____ Name: Kevin A. Sanders_____

Date: 20 APR 92 Title: Inorganic Division Mgr__

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

TT-14-02

Lab Name: CH2M_HILL_MGM Contract: 21232

Lab Code: NA Case No.: 21232 SAS No.: 21232 SDG No.: 21232

Matrix (soil/water): SOIL Lab Sample ID: S21232002

Level (low/med): LOW Date Received: 03/19/92

% 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	7860		*	P
7440-36-0	Antimony	2.7	U	N	P
7440-38-2	Arsenic	39.0		*	F
7440-39-3	Barium	57.4		E	P
7440-41-7	Beryllium	0.38	B		P
7440-43-9	Cadmium	4.4		N*	P
7440-70-2	Calcium	23700			P
7440-47-3	Chromium	15.6			P
7440-48-4	Cobalt	7.9	B		P
7440-50-8	Copper	20.8		*	P
7439-89-6	Iron	16300			P
7439-92-1	Lead	15.3		*	F
7439-95-4	Magnesium	14700			P
7439-96-5	Manganese	384		N*	P
7439-97-6	Mercury	0.24		*	CV
7440-02-0	Nickel	16.2			P
7440-09-7	Potassium	777	B		P
7782-49-2	Selenium	4.2		N	F
7440-22-4	Silver	0.43	U		P
7440-23-5	Sodium	319	B		P
7440-28-0	Thallium	0.46	B		F
7440-62-2	Vanadium	20.1			P
7440-66-6	Zinc	75.6			P
	Cyanide	28.5		N*	CA

Color Before: BLACK Clarity Before: N/A Texture: MUD

Color After: CLEAR Clarity After: CLEAR Artifacts:

Comments:
THE "N" QUALIFIER INDICATES POOR PRESPIKE RECOVERY. THE "*" REFLECTS POOR DUPLICATE PRECISION. THE "E" QUALIFIER INDICATES A GREATER THAN 10% DIFFERENCE BETWEEN THE NATIVE CONCENTRATION AND SERIAL DILUTION RESULTS.

7803 GLENROY ROAD
MINNEAPOLIS, MN 55439

PROJECT NUMBER Nº 01268
13/49-003JSL31
NO: Waukegan Coke Plant RI

Jim Langseth
PROJECT CONTACT: Mary Mackey
LABORATORY: CH2M Hill
REMARKS/ ANALYSIS REQUIRED:

SAMPLE IDENTIFICATION	COLLECTION DATE	COLLECTION TIME	GRAB	COMP.	BLANK	VOLATILE ORGANIC - CLP	SEMIVOLATILE ORGANIC	METALS - CLP T	UNFILTERED METALS	GENERAL	CYANIDE	NUTRIENTS	OIL AND GREASE	TOC	SULFIDE	DIOXIN	EXTRACTABLES - CLP T	PESTICIDES/PCB CLP	PAHs	Phenols PAH/Phenols						TOTAL NO. OF CONTAINERS
TT-12-01	3/18/92	PM	X	X		X														X				CO1		3
TT-14-02	3/18/92	AM	X	X		X		X			X						X	X						CO2		5
MW-3D	3/18/92	PM				X														X				CO3		3
TT-14-02 MS MSD	3/18/92	AM	X	X		X		X			X						X	X						CO2		5
Method Blank	3/19/92							✓																ZS1		
TT14-02 MS	3/18/92					✓		✓			✓						✓	✓						MO2		
MSD						✓											✓	✓						DO2		
DUP								✓			✓													PO2		

FOR LAB USE ONLY
LAB # 21232
PROJ # LM633486.XX
ACK [illegible] 3/20 VERIFIED [illegible] 3/19
HAZWRAP/HEESA Y (N)
QC LEVEL 1 2 (3)
COC yes ICE yes
ANA REQ [illegible] TEMP 2°C
CUST SEAL yes [illegible]
SAMPLE COND Sail

SAMPLED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY LAB:	DATE	TIME
(JMF) [signature] (TWW) [signature]	(TWW) [signature]	3/18/92	PM			
RECEIVED BY: (JMF) [signature]	RELINQUISHED BY: [signature] (JMF)	3/18/92	PM	RECEIVED BY LAB: [signature]	3/19/92	0902
RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY LAB:	DATE	TIME

REMARKS:

SAMPLES SHIPPED VIA
☐ AIR FREIGHT ☒ FED. EXP. ☐ SAMPLER
☐ OTHER

AIR BILL NUMBER: 3161694826

DISTRIBUTION: WHITE-ORIGINAL ACCOMPANIES SHIPMENT TO LAB, RETURNS TO BARR WITH RESULTS: YELLOW-LAB COPY; PINK-LAB COORDINATOR; GOLD-FIELD COPY

000348

CH2M HILL
Engineers
Planners
Economists
Scientists

RECEIVED

MAY 0 5 92

May 4, 1992

LMG33486.XY

Ms. Marti Harding-Smith
Barr Engineering Company
8300 Norman Center Drive
Suite 300
Minneapolis, Minnesota 55437-1026

RE: Analytical Data for LMG Laboratory No. 21232

Dear Ms. Harding-Smith:

On March 19, 1992, the CH2M HILL Montgomery Laboratory received three samples with a request for analysis of selected organic parameters.

The analytical results and associated quality control data are enclosed. Any unusual difficulties encountered during the analyses of these samples are discussed in the case narratives.

If you should have any questions concerning the data, please inquire.

The CH2M HILL policy is to store samples for up to 30 days after reporting. If you desire, our laboratory will maintain your samples for a longer period at a cost of $5.00 per sample per month. Samples determined to be hazardous can either be returned to you or disposed of at a cost of $25.00 per sample.

Sincerely,

Wanda L. Hall

Wanda L. Hall
Data Package Supervisor

Enclosures

cc: Mr. Jim Langseth

Engineers
Planners
Economists
Scientists

TABLE OF CONTENTS

CH2M HILL Laboratory No. 21232

	Page No.
List of Organic EPA-defined Qualifiers	i
List of Sample ID Qualifiers	ii
Sample Cross-Reference	iii
List of Internal Standards and Surrogates (Volatiles)	iv
List of Internal Standards and Surrogates (Semivolatiles)	v
SAMPLE DATA SUMMARY PACKAGE	1-68
SAMPLE DATA PACKAGE	69
Case Narratives	70-70I
Shipping Receipts	71-72
Volatile Data	73
QC Summary	74-89
Sample Data (Analytical Results of Field Samples)	90
TT-12-01 (LMG #21232001)	91-133
TT-12-01_DL (LMG #21232001DL)	134-162
TT-14-02 (LMG #21232002)	163-201
TT-14-02_DL (LMG #21232002DL)	202-224
MW-3D (LMG #21232001)	225-241
Standards Data	242
Initial Calibration Data	243-295
Continuing Calibration Data	296-315
Raw QC Data	316
BFB Data	317-341
Blank Data	342-370
MS/MSD Data	371-381
Semivolatile Data	382
QC Summary	383-390
Sample Data (Analytical Results of Field Samples)	391
TT-14-02 (LMG #21232002)	392-476
TT-14-02_DL (LMG #21232002DL)	477-552
Standards Data	553
Initial Calibration Data	554-596
Continuing Calibration Data	597-607
GPC Calibration Data	608-609
Raw QC Data	610
DFTPP Data	611-619
Blank Data	620-650
MS/MSD Data	651-667

CH2M HILL Quality Analytical Laboratories 2567 Fairlane Drive, P.O. Box 230548, Montgomery, Alabama 36116 205 271 1444

Engineers
Planners
Economists
Scientists

TABLE OF CONTENTS (cont.)

CH2M HILL Laboratory No. 21232

	Page No.
PNA/Phenol Data	668
QC Summary	669-678
Sample Data (Analytical Results of Field Samples)	679
TT-12-01 (LMG #21232001)	680-711
MW-3D (LMG #21232003)	712-739
Standards Data	740
Initial Calibration Data	741-773
Continuing Calibration Data	774-790
GPC Calibration Data	791-792
Raw QC Data	793
DFTPP Data	794-806
Blank Data	807-813
Pesticide/PCB Data	814
QC Summary	815-818
Sample Data (Analytical Results of Field Samples)	819
TT-14-02 (LMG #21232002)	820-824
Standards Data	825
Summary Forms	826-858
Raw Data (Primary Column)	859-904
Raw Data (Confirmation Column)	905-952
GPC Calibration Data	953-954
Raw QC Data	955
Blank Data	956-991
MS/MSD Data	992-1002

CH2M HILL Quality Analytical Laboratories 2567 Fairlane Drive, P.O. Box 230548, Montgomery, Alabama 36116 205 271 1444

EPA - DEFINED QUALIFIERS

ORGANICS

Definitions for the EPA-defined qualifiers:

U -- Indicates the compound was analyzed for but not detected. The number adjacent to the "U" qualifier indicates the quantitation limit for that compound. The detection limit can vary from sample to sample depending on dilution factors or percent moisture adjustment when indicated.

J -- Indicates an estimated value. This flag is used when the mass spectral data indicates the presence of a compound below the stated quantitation limit. The "J" qualifier is not used with pesticide results.

C -- This flag applies to pesticide results only. The "C" flag indicates the presence of this compound has been confirmed by GC/MS analysis.

B -- This flag is used when the analyte is found in the associated blank as well as the sample. This notation indicates possible blank contamination and suggests the data user evaluate these compounds and their amounts carefully.

E -- This flag applies to GC/MS only. The "E" qualifier indicates a compound may be above or below the linear range of the instrument. If the particular compound level is deemed above the linear calibration range, then the sample should be reanalyzed at an appropriate dilution. Therefore, the "E" qualified amount is an estimated concentration. The results for the dilution will be reported on a separate Form I and will be flagged with a "D" if the dilution brings the concentration within proper calibration.

D -- This flag identifies compounds which have been run at a dilution to bring the concentration of that compound within the linear range of the instrument. "D" qualifiers are only used for samples that have been run initially with results above acceptable ranges. For secondary dilutions the "DL" suffix is appended to the sample number on the Form I.

A -- Indicates the Tentatively Identified Compound (TIC) is a suspected aldol-condensation product.

X -- Indicates the compound concentration has been manually modified or the EPA qualifier has been manually modified or added.

JX -- The compound was detected and quantitated below the Contract Required Quantitation Limit.

CH2M HILL Quality Analytical Laboratories 2567 Fairlane Drive, P.O. Box 230548, Montgomery, Alabama 36116 205 271 1444

CLIENT SAMPLE ID QUALIFIERS

LEVEL 3

The qualifiers that GC/MS and GC use with the client sample ID are defined below:

DL -- Dilution Run

R -- Rerun (may be followed by a digit to indicate multiple reruns)

RD -- Diluted Rerun

RX -- Re-extraction Analysis

MS -- Matrix Spike (may be followed by a digit to indicate multiple matrix spikes within a sample set)

MSD -- Matrix Spike Duplicate (may be followed by a digit to indicate multiple matrix spike duplicates within a sample set)

VBLK -- Volatile Blank (will be followed by a "W" for waters, "S" for soils run at a low level, or "SM" for soils run at a medium level -- these letters may be followed by a digit to indicate multiple blanks of that type).

SBLK -- Semivolatile Blank (will be followed by a "W" for waters, "S" for soils run at a low level, or "SM" for soils run at a medium level -- these letters may be followed by a digit to indicate multiple blanks of that type).

PBLK -- Pesticide/PCB Blank (may be followed by digits to indicate multiple blanks)

These qualifiers allow GC/MS and GC to have unique client sample ID's so that the client can get more accurate information from the data reported.

CH2M HILL Quality Analytical Laboratories 2567 Fairlane Drive, P O Box 230548 Montgomery, Alabama 36116 205 271 1444

Engineers
Planners
CH2M HILL
Economists
Scientists

TABLE 1

SAMPLE CROSS-REFERENCE SUMMARY

CH2M HILL Laboratory No. 21232

CH2M HILL Sample No.	Sample Description				
21232001	TT-12-01	03/18/92	GRAB	13/49-003JSL31	PO#01268
21232002	TT-14-02	03/18/92	GRAB	13/49-003JSL31	PO#01268
21232003	MW-3D	03/18/92		13/49-003JSL31	PO#01268

CH2M HILL
Quality Analytical Laboratories
2567 Fairlane Drive, P.O. Box 230548, Montgomery, Alabama 36116
205.271 1444

INTERNAL STANDARD AND SURROGATE COMPOUNDS

VOLATILE ANALYSIS

The internal standards on the GC/MS volatile chromatograms are designated as IS1, IS2, and IS3. The surrogate standards are labelled as SS1, SS2, and SS3. The compounds corresponding to these labels are listed below.

LABEL	INTERNAL STANDARD COMPOUND
IS1	BROMOCHLOROMETHANE
IS2	1,4-DIFLUOROBENZENE
IS3	D5-CHLOROBENZENE

LABEL	SURROGATE STANDARD COMPOUND
SS1	D4-1,2-DICHLOROETHANE
SS2	D8-TOLUENE
SS3	1,4-BROMOFLUOROBENZENE

CH2M HILL
Quality
Analytical Laboratories
2567 Fairlane Drive. P.O. Box 230548.
Montgomery, Alabama 36116
205 271 1444

Engineers
Planners
CH2M HILL Economists
Scientists

INTERNAL STANDARD AND SURROGATE COMPOUNDS

SEMIVOLATILE ANALYSIS

The internal standards on the GC/MS semivolatile chromatograms are designated as IS1, IS2, IS3, IS4, IS5, and IS6. The surrogate standards are labelled as SS1, SS2, SS3, SS4, SS5, and SS6. The compounds corresponding to these labels are listed below.

LABEL	INTERNAL STANDARD COMPOUND
IS1	D4-1,4-DICHLOROBENZENE
IS2	D8-NAPHTHALENE
IS3	D10-ACENAPHTHENE
IS4	D10-PHENANTHRENE
IS5	D12-CHRYSENE
IS6	D12-PERYLENE

LABEL	SURROGATE STANDARD COMPOUND
SS1	2-FLUOROPHENOL
SS2	D5-PHENOL
SS3	D5-NITROBENZENE
SS4	2-FLUOROBIPHENYL
SS5	2,4,6-TRIBROMOPHENOL
SS6	D14-TERPHENYL

CH2M HILL Quality Analytical Laboratories 2567 Fairlane Drive, P.O. Box 230548, Montgomery, Alabama 36116 205 271 1444

SAMPLE DATA SUMMARY PACKAGE

Engineers
Planners
CH2M HILL
Economists
Scientists

CASE NARRATIVE FOR VOLATILE MASS SPECTROMETRY SAMPLES

LABORATORY: CH2M HILL LABORATORIES CLIENT: BARR ENGINEERING

CASE NO. : N/A CONTRACT NO.: N/A

LAB NO. : 21232 SDG NO.: N/A

I. RECEIPT

A. DATE: March 19, 1992

B. SAMPLE INFORMATION

LAB ID	CLIENT ID	SAMPLE MATRIX	DATE SAMPLED	EXTRACTION DATE	ANALYSIS DATE
21232001	TT-12-01	SOIL	03/18/92	NA	03/31/92
21232001DL	TT-12-01_DL	SOIL	03/18/92	04/01/92	04/01/92
21232002	TT-14-02	SOIL	03/18/92	NA	03/31/92
21232002DL	TT-14-02_DL	SOIL	03/18/92	04/01/92	04/01/92
21232003	MW-3D	SOIL	03/18/92	NA	04/02/92
21232M02	TT-14-02MS	SOIL	03/18/92	NA	04/01/92
21232D02	TT-14-02MSD	SOIL	03/18/92	NA	04/01/92
Y03302B3	VBLKS	SOIL	NA	NA	03/30/92
L03312B3	VBLKSM	SOIL	NA	04/01/92	04/01/92
Y04022B1	VBLKS_2	SOIL	NA	NA	04/02/92

C. Documentation
Exceptions : No exceptions were encountered.

II. EXTRACTION

A. Holding Times: All holding times were met.

B. Extraction
Exceptions : No exceptions were encountered.

CH2M HILL Quality Analytical Laboratories 2567 Fairlane Drive. P O Box 230548. Montgomery. Alabama 36116 205 271 1444

III. ANALYSIS

A. Holding times: All holding times were met.

B. Analytical Exceptions : Please see attached table for information concerning methylene chloride and acetone.

Please note that the original analysis of samples 21232001 (TT-12-01) and 21232002 (TT-14-02) showed target compounds above the calibration range. The samples were diluted and reanalyzed using medium level protocol. The results of both analyses have been reported.

IV. QUALITY CONTROL

A. Method Blank : All associated method blanks met acceptable QC criteria.

B. Surrogate Recoveries : Please note that sample 21232M02 (TT-14-02MS) showed two surrogates below QC limits. According to CLP protocol, the matrix spike and matrix spike duplicate samples need not be reanalyzed when surrogate recoveries are outside QC limits if the surrogate recoveries in the native sample are within QC limits. Since the native sample showed all surrogates within QC limits, the laboratory took no further action. All other samples met acceptable QC limits.

C. Matrix Spike Results : Please note that the percent recovery of Benzene is below acceptable QC limits in sample 21232M02. The relative percent differences for Benzene and Toluene are above acceptable QC limits. Since these limits are advisory limits only, the laboratory took no further action. All other spike recoveries were within acceptable QC limits.

Please note that Forms II, IV, V, and VIII have numbers to the immediate left of each table. These numbers are sequential only and have no relation to CH2M HILL identification numbers.

I 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 contained in this hardcopy data package and in the computer-readable data submitted on floppy diskette has been authorized by the Laboratory Manager or his designee, as verified by the following signature.

Herb Kelly 5/14/92
Herb Kelly Date
Manager, Organic Division

CH2M HILL Quality Analytical Laboratories 2567 Fairlane Drive P.O. Box 230548 Montgomery, Alabama 36116 205 271 [illegible]

Engineers
Planners
CH2M HILL Economists
Scientists

METHYLENE CHLORIDE/ACETONE SUMMARY

Due to the level of target compounds, the following samples required large dilutions for analysis. As required by the Statement of Work, these dilution factors have been applied, without background subtraction, to all detected compounds, particularly methylene chloride and acetone. As methylene chloride and acetone are common laboratory contaminants, the following table is being provided to present a more accurate perspective of these compounds. Included in the table is 1) the amount of methylene chloride and acetone, detected at the instrument, prior to multiplication by the dilution factor; and 2) the amount of methylene chloride and acetone for that particular sample's laboratory method blank.

SAMPLE	METHYLENE CHLORIDE	ACETONE	METHOD BLANK	METHYLENE CHLORIDE	ACETONE
21232001DL	4 ug/Kg	10 U	L03312B3	4 ug/Kg	10 U
21232002	9 ug/Kg	8 ug/Kg	Y03302B3	7 ug/Kg	6 ug/Kg
21232002DL	4 ug/Kg	10 U	L03312B3	4 ug/Kg	10 U

CH2M HILL
Quality Analytical Laboratories
2567 Fairlane Drive, P.O. Box 230548, Montgomery, Alabama 36116
205 271 1443

Engineers
Planners
CH2M HILL Economists
Scientists

CASE NARRATIVE FOR SEMIVOLATILE MASS SPECTROMETRY SAMPLES

LABORATORY: CH2M HILL LABORATORIES CLIENT: BARR ENGINEERING

CASE NO. : N/A CONTRACT NO.: N/A

LAB NO. : 21232 SDG NO.: N/A

I. RECEIPT

A. DATE: March 19, 1992

B. SAMPLE INFORMATION

LAB ID	CLIENT ID	SAMPLE MATRIX	DATE SAMPLED	EXTRACTION DATE	ANALYSIS DATE
21232002	TT-14-02	SOIL	03/18/92	03/23/92	04/02/92
21232002DL	TT-14-02_DL	SOIL	03/18/92	03/23/92	04/02/92
21232M02	TT14-02MS	SOIL	03/18/92	03/23/92	04/02/92
21232D02	TT14-02MSD	SOIL	03/18/92	03/23/92	04/02/92
S03232B1	SBLKS	SOIL	NA	03/23/92	04/02/92

C. Documentation Exceptions : Please note that the amount listed on the quantitation report reflects the mass detected at the instrument. According to the CLP Statement of Work, 2-uL injections must be made. Therefore, the amount on the quantitation report must be divided by a factor of two in order to determine the concentration of the extract injected.

No other exceptions were encountered.

CH2M HILL Quality Analytical Laboratories 2567 Fairlane Drive, P.O. Box 230548, Montgomery, Alabama 36116 205 271 1444

II. EXTRACTION

A. Holding Times: All holding times were met.

B. Extraction Exceptions : No exceptions were encountered.

III. ANALYSIS

A. Holding times: All holding times were met.

B. Analytical Exceptions : The original analysis of samples 21232002 (TT-14-02) showed target compounds above the calibration range. The sample was diluted and reanalyzed. The results of both analyses have been reported.

No other exceptions were encountered.

IV. QUALITY CONTROL

A. Method Blank : All associated method blanks met acceptable QC criteria.

B. Surrogate Recoveries : All samples met acceptable QC limits.

C. Matrix Spike Results : Please note that the relative percent difference of several compounds failed to meet acceptable QC limits. Since the percent recoveries were within acceptable QC criteria, the laboratory took no further action.

All other spike recoveries were within CLP advisory limits.

Please note that Forms II, IV, V, and VIII have numbers to the immediate left of each table. These numbers are sequential only and have no relation to CH2M HILL identification numbers.

I 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 contained in this hardcopy data package and in the computer-readable data submitted on floppy diskette has been authorized by the Laboratory Manager or his designee, as verified by the following signature.

Herb Kelly 5/14/92

Herb Kelly Date
Manager, Organic Division

CH2M HILL Quality Analytical Laboratories 2567 Fairlane Drive, P.O. Box 230548, Montgomery, Alabama 36116 205 271 1444

Engineers
Planners
CH2M HILL Economists
Scientists

CASE NARRATIVE FOR PNA/PHENOL MASS SPECTROMETRY SAMPLES

LABORATORY: CH2M HILL LABORATORIES CLIENT: BARR ENGINEERING

CASE NO. : N/A CONTRACT NO.: N/A

LAB NO. : 21232 SDG NO.: N/A

I. RECEIPT

A. DATE: March 19, 1992

B. SAMPLE INFORMATION

LAB ID	CLIENT ID	SAMPLE MATRIX	DATE SAMPLED	EXTRACTION DATE	ANALYSIS DATE
21232001	TT-12-01	SOIL	03/18/92	03/23/92	04/03/92
21232003	MW-3D	SOIL	03/18/92	03/23/92	04/02/92
21232003DL	MW-3D_DL	SOIL	03/18/92	03/23/92	04/03/92
S03232B1	SBLKS	SOIL	NA	03/23/92	04/02/9

C. Documentation Exceptions : Tentatively Identified Compounds (TIC) were not requested as part of this analysis. Therefore, the TIC forms and raw data will not be included in this package.

As you have requested, Benzo(b)fluoranthene and Benzo(k)fluoranthene will be reported separately. Due to the low concentrations analyzed for, there may be instances where the native matrix offers chromatographic interferences in this region of the chromatogram, making it difficult to correctly quantitate these isomers as separate compounds. In that case, Benzo(b)fluoranthene and Benzo(k)fluoranthene will be reported as total Benzo(b&k)fluoranthene. An "NR" (not reported) qualifier will then be used for the compounds for which are not reported.

Please note that the amount listed on the quantitation report reflects the mass detected at the instrument. According to the CLP Statement of Work, 2-uL injections must be made. Therefore, the amount on the quantitation report must be divided by a factor of two in order to determine the concentration of the extract injected.

No other exceptions were encountered.

CH2M HILL Quality Analytical Laboratories 2567 Fairlane Drive, P.O. Box 230548, Montgomery, Alabama 36116 205 271 1444

II. EXTRACTION

A. Holding Times: All holding times were met.

B. Extraction Exceptions : No exceptions were encountered.

III. ANALYSIS

A. Holding times: All holding times were met.

B. Analytical Exceptions : Please note that the analysis of sample 21232003 (MW-3D) showed Phenol above the calibration range. The sample was diluted and reanalyzed. The results of both analyses have been reported.

No other exceptions were encountered.

IV. QUALITY CONTROL

A. Method Blank : All associated method blanks met acceptable QC criteria.

B. Surrogate Recoveries : Sample 21249003 required a large dilution for analysis. Therefore, surrogate recoveries could not be determined for the diluted sample.

All other samples met acceptable QC limits.

C. Matrix Spike Results : The native sample, matrix spike, and matrix spike duplicate results are contained within another batch of samples. The results will be reported with the results of our laboratory contract number 21128.

Please note that Forms II, IV, V, and VIII have numbers to the immediate left of each table. These numbers are sequential only and have no relation to CH2M HILL identification numbers.

I 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 contained in this hardcopy data package and in the computer-readable data submitted on floppy diskette has been authorized by the Laboratory Manager or his designee, as verified by the following signature.

Herb Kelly 5/4/92

Herb Kelly Date
Manager, Organic Division

CH2M HILL Quality Analytical Laboratories 2567 Fairlane Drive, P.O. Box 230548, Montgomery, Alabama 36116 205 271 1444

Engineers
Planners
Economists
Scientists

CASE NARRATIVE FOR PESTICIDE/PCB GAS CHROMATOGRAPHY SAMPLES

LABORATORY: CH2M HILL LABORATORIES CLIENT: BARR ENGINEERING

CASE NO. : N/A CONTRACT NO.: N/A

LAB NO. : 21232 SDG NO.: N/A

I. RECEIPT

A. DATE: March 19, 1992

B. SAMPLE INFORMATION

LAB ID	CLIENT ID	SAMPLE MATRIX	DATE SAMPLED	EXTRACTION DATE	ANALYSIS DATE
21232002	TT-14-02	SOIL	03/18/92	03/23/92	04/09/92
21232M02	TT-14-02MS	SOIL	03/18/92	03/23/92	04/09/92
21232D02	TT-14-02MSD	SOIL	03/18/92	03/23/92	04/09/92
S03231B1	PBLK23	SOIL	NA	03/23/92	04/09/92

C. Documentation
Exceptions : No exceptions were encountered.

II. EXTRACTION

A. Holding times: All holding times were met.

B. Extraction
Exceptions : No exceptions were encountered.

CH2M HILL Quality Analytical Laboratories 2567 Fairlane Drive, P O Box 230548, Montgomery, Alabama 36116 205 271 1444

III. ANALYSIS

A. Holding times: All holding times were met.

B. Analytical Exceptions : Sample 21232002 (TT-14-02) and its matrix spikes were diluted for analysis because of chemical interferences which were not removed by our cleanup procedures. Report limits for this sample have been adjusted to reflect both the dilution factor and the residual chemical interferences still observed in the chromatogram.

No additional exceptions were encountered.

IV. QUALITY CONTROL

A. Method Blank : All associated method blanks met acceptable QC criteria.

B. Surrogate Recoveries : All samples met acceptable QC limits.

C. Matrix Spike Results : Please note that the percent recovery for Aldrin in 21232D02 and relati[illegible] percent difference for Aldrin were outside QC lim[illegible] these limits are advisory only, the laboratory took no further action.

D. Special Conditions : Primary and confirmation data was acquired by a single injection into a dual column/ECD system.

Please note that Forms II, IV, V, and VIII have numbers to the immediate left of each table. These numbers are sequential only and have no relation to CH2M HILL identification numbers.

I 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 contained in this hardcopy data package and in the computer-readable data submitted on floppy diskette has been authorized by the Laboratory Manager or his designee, as verified by the following signature.

Herb Kelly 5/4/92

Herb Kelly Date
Manager, Organic Division

CH2M HILL Quality Analytical Laboratories 2567 Fairlane Drive, P.O. Box 230548, Montgomery, Alabama 36116 205 271 1444

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

TT-12-01

Lab Name: CH2M HILL/MGM Contract: _____

Code: _____ Case No.: 21232 SAS No.: _____ SDG No.: _____

Matrix: (soil/water) SOIL Lab Sample ID: 21232001

Sample wt/vol: 1.0 (g/mL) G Lab File ID: C1VO021254

Level: (low/med) LOW Date Received: 03/19/92

% Moisture: not dec. 17 Date Analyzed: 03/31/92

GC Column: CAP ID: 0.530 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
74-87-3	Chloromethane	60	U
74-83-9	Bromomethane	60	U
75-01-4	Vinyl Chloride	60	U
75-00-3	Chloroethane	60	U
75-09-2	Methylene Chloride	93	B
67-64-1	Acetone	150	B
75-15-0	Carbon Disulfide	13	J
75-35-4	1,1-Dichloroethene	60	U
75-34-3	1,1-Dichloroethane	60	U
540-59-0	1,2-Dichloroethene (total)	60	U
67-66-3	Chloroform	60	U
107-06-2	1,2-Dichloroethane	60	U
78-93-3	2-Butanone	64	
71-55-6	1,1,1-Trichloroethane	60	U
56-23-5	Carbon Tetrachloride	60	U
75-27-4	Bromodichloromethane	60	U
78-87-5	1,2-Dichloropropane	60	U
10061-01-5	cis-1,3-Dichloropropene	60	U
79-01-6	Trichloroethene	60	U
124-48-1	Dibromochloromethane	60	U
79-00-5	1,1,2-Trichloroethane	60	U
71-43-2	Benzene	600	
10061-02-6	trans-1,3-Dichloropropene	60	U
75-25-2	Bromoform	60	U
591-78-6	2-Hexanone	60	U
108-10-1	4-Methyl-2-Pentanone	60	U
127-18-4	Tetrachloroethene	60	U
79-34-5	1,1,2,2-Tetrachloroethane	60	U
108-88-3	Toluene	280	
108-90-7	Chlorobenzene	60	U
100-41-4	Ethylbenzene	3000	E
100-42-5	Styrene	60	U
1330-20-7	Xylene (total)	6500	E

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

TT-12-01

Lab Name: CH2M HILL/MGM Contract: _____

Lab Code: _____ Case No.: 21232 SAS No.: _____ SDG No.: _____

Matrix: (soil/water) SOIL Lab Sample ID: 21232001

Sample wt/vol: 1.0 (g/mL) G Lab File ID: C1VO021254

Level: (low/med) LOW Date Received: 03/19/92

% Moisture: not dec. 17 Date Analyzed: 03/31/92

GC Column: CAP ID: 0.530 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____(uL)

Number TICs found: 10

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 61142-07-2	CYCLOPENTENE, 1-ETHENYL-3-ME	18.45	6500	J
2.	BENZENE, (METHYLETHYL)- ISOM	19.07	1100	J
3. 124-18-5	DECANE	19.64	470	J
4.	HEPTADIENYNE, DIMETHYL- ISOM	19.97	5200	J
5.	BENZENE, TRIMETHYL- ISOMER	20.09	6100	J
6.	BENZENE, ETHYL-, METHYL- ISO	20.52	1200	J
7.	HEPTADIENYNE, DIMETHYL- ISOM	20.79	7800	J
8.	BENZENE, METHYL-, (METHYLETH	21.25	500	J
9.	BENZENE, TRIMETHYL- ISOMER	21.62	2500	J
10.	NOT IDENTIFIED	22.24	600	J

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

TT-12-01_DL

Lab Name: CH2M HILL/MGM Contract: _____

Code: _____ Case No.: 21232 SAS No.: _____ SDG No.: _____

Matrix: (soil/water) SOIL Lab Sample ID: 21232001DL

Sample wt/vol: 4.0 (g/mL) G Lab File ID: B3VM014767

Level: (low/med) MED Date Received: 03/19/92

% Moisture: not dec. 17 Date Analyzed: 04/01/92

GC Column: CAP ID: 0.530 (mm) Dilution Factor: 1.0

Soil Extract Volume: 10000 (uL) Soil Aliquot Volume: 30.0(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
74-87-3	Chloromethane	4800	U
74-83-9	Bromomethane	4800	U
75-01-4	Vinyl Chloride	4800	U
75-00-3	Chloroethane	4800	U
75-09-2	Methylene Chloride	2200	BDJ
67-64-1	Acetone	4800	U
75-15-0	Carbon Disulfide	4800	U
75-35-4	1,1-Dichloroethene	4800	U
75-34-3	1,1-Dichloroethane	4800	U
540-59-0	1,2-Dichloroethene (total)	4800	U
67-66-3	Chloroform	4800	U
107-06-2	1,2-Dichloroethane	4800	U
78-93-3	2-Butanone	4800	U
71-55-6	1,1,1-Trichloroethane	4800	U
56-23-5	Carbon Tetrachloride	4800	U
75-27-4	Bromodichloromethane	4800	U
78-87-5	1,2-Dichloropropane	4800	U
10061-01-5	cis-1,3-Dichloropropene	4800	U
79-01-6	Trichloroethene	4800	U
124-48-1	Dibromochloromethane	4800	U
79-00-5	1,1,2-Trichloroethane	4800	U
71-43-2	Benzene	2500	DJ
10061-02-6	trans-1,3-Dichloropropene	4800	U
75-25-2	Bromoform	4800	U
591-78-6	2-Hexanone	4800	U
108-10-1	4-Methyl-2-Pentanone	4800	U
127-18-4	Tetrachloroethene	4800	U
79-34-5	1,1,2,2-Tetrachloroethane	4800	U
108-88-3	Toluene	970	DJ
108-90-7	Chlorobenzene	4800	U
100-41-4	Ethylbenzene	8800	D
100-42-5	Styrene	4800	U
1330-20-7	Xylene (total)	89000	D

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

TT-12-01_DL

Lab Name: CH2M HILL/MGM Contract: _____

Lab Code: _____ Case No.: 21232 SAS No.: _____ SDG No.: _____

Matrix: (soil/water) SOIL Lab Sample ID: 21232001DL

Sample wt/vol: 4.0 (g/mL) G Lab File ID: B3VM014767

Level: (low/med) MED Date Received: 03/19/92

% Moisture: not dec. 17 Date Analyzed: 04/01/92

GC Column: CAP ID: 0.530 (mm) Dilution Factor: 1.0

Soil Extract Volume: 10000 (uL) Soil Aliquot Volume: 30.0(uL)

Number TICs found: 6

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 611-14-3	BENZENE, 1-ETHYL-2-METHYL-	18.52	23000	J
2.	BENZENE, TRIMETHYL- ISOMER	18.62	39000	J
3.	BENZENE, TRIMETHYL- ISOMER	19.32	56000	J
4.	BENZENE, ETHENYL, METHYL- IS	20.74	340000	J
5. 95-93-2	BENZENE, 1,2,4,5-TETRAMETHYL	22.22	3200	J
6. 824-22-6	1H-INDENE, 2,3-DIHYDRO-4-MET	22.90	3300	J

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

TT-14-02

Lab Name: CH2M HILL/MGM Contract: _____

Code: _____ Case No.: 21232 SAS No.: _____ SDG No.: _____

Matrix: (soil/water) SOIL Lab Sample ID: 21232002

Sample wt/vol: 1.0 (g/mL) G Lab File ID: C1VO021255

Level: (low/med) LOW Date Received: 03/19/92

% Moisture: not dec. 21 Date Analyzed: 03/31/92

GC Column: CAP ID: 0.530 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
74-87-3	Chloromethane	63	U
74-83-9	Bromomethane	63	U
75-01-4	Vinyl Chloride	63	U
75-00-3	Chloroethane	63	U
75-09-2	Methylene Chloride	57	BJ
67-64-1	Acetone	52	BJ
75-15-0	Carbon Disulfide	63	U
75-35-4	1,1-Dichloroethene	63	U
75-34-3	1,1-Dichloroethane	63	U
540-59-0	1,2-Dichloroethene (total)	63	U
67-66-3	Chloroform	63	U
107-06-2	1,2-Dichloroethane	63	U
78-93-3	2-Butanone	63	U
71-55-6	1,1,1-Trichloroethane	63	U
56-23-5	Carbon Tetrachloride	63	U
75-27-4	Bromodichloromethane	63	U
78-87-5	1,2-Dichloropropane	63	U
10061-01-5	cis-1,3-Dichloropropene	63	U
79-01-6	Trichloroethene	63	U
124-48-1	Dibromochloromethane	63	U
79-00-5	1,1,2-Trichloroethane	63	U
71-43-2	Benzene	1900	E
10061-02-6	trans-1,3-Dichloropropene	63	U
75-25-2	Bromoform	63	U
591-78-6	2-Hexanone	63	U
108-10-1	4-Methyl-2-Pentanone	63	U
127-18-4	Tetrachloroethene	63	U
79-34-5	1,1,2,2-Tetrachloroethane	63	U
108-88-3	Toluene	35	J
108-90-7	Chlorobenzene	63	U
100-41-4	Ethylbenzene	2200	E
100-42-5	Styrene	63	U
1330-20-7	Xylene (total)	1600	E

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

TT-14-02

Lab Name: CH2M HILL/MGM Contract: _____

Lab Code: _____ Case No.: 21232 SAS No.: _____ SDG No.: _____

Matrix: (soil/water) SOIL Lab Sample ID: 21232002

Sample wt/vol: 1.0 (g/mL) G Lab File ID: C1VO021255

Level: (low/med) LOW Date Received: 03/19/92

% Moisture: not dec. 21 Date Analyzed: 03/31/92

GC Column: CAP ID: 0.530 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____(uL)

Number TICs found: 10

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	BENZENE, ETHYL-, METHYL- ISO	20.00	1200	J
2.	BENZENE, TRIMETHYL- ISOMER	20.10	2100	J
3.	BENZENE, TRIMETHYL- ISOMER	20.80	4100	J
4. 271-89-6	BENZOFURAN	21.47	1600	J
5.	BENZENE, TRIMETHYL- ISOMER	21.65	1400	J
6.	NOT IDENTIFIED	22.27	9400	J
7. 95-13-6	1H-INDENE	22.60	940	J
8.	NOT IDENTIFIED	[illegible]	520	J
9. 104-55-2	2-PROPENAL, 3-PHENYL-	[illegible]	1000	J
10.	BENZENE, ETHYL-, METHYL- ISO	20.55	370	J

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

TT-14-02_DL

Lab Name: CH2M HILL/MGM Contract: _____

Code: _____ Case No.: 21232 SAS No.: _____ SDG No.: _____

Matrix: (soil/water) SOIL Lab Sample ID: 21232002DL

Sample wt/vol: 4.0 (g/mL) G Lab File ID: B2VM014762

Level: (low/med) MED Date Received: 03/19/92

% Moisture: not dec. 21 Date Analyzed: 04/01/92

GC Column: CAP ID: 0.530 (mm) Dilution Factor: 1.0

Soil Extract Volume: 10000 (uL) Soil Aliquot Volume: 100 (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
74-87-3	Chloromethane	1500	U
74-83-9	Bromomethane	1500	U
75-01-4	Vinyl Chloride	1500	U
75-00-3	Chloroethane	1500	U
75-09-2	Methylene Chloride	580	BDJ
67-64-1	Acetone	1500	U
75-15-0	Carbon Disulfide	1500	U
75-35-4	1,1-Dichloroethene	1500	U
75-34-3	1,1-Dichloroethane	1500	U
540-59-0	1,2-Dichloroethene (total)	1500	U
67-66-3	Chloroform	1500	U
107-06-2	1,2-Dichloroethane	1500	U
78-93-3	2-Butanone	1500	U
71-55-6	1,1,1-Trichloroethane	1500	U
56-23-5	Carbon Tetrachloride	1500	U
75-27-4	Bromodichloromethane	1500	U
78-87-5	1,2-Dichloropropane	1500	U
10061-01-5	cis-1,3-Dichloropropene	1500	U
79-01-6	Trichloroethene	1500	U
124-48-1	Dibromochloromethane	1500	U
79-00-5	1,1,2-Trichloroethane	1500	U
71-43-2	Benzene	1000	DJ
10061-02-6	trans-1,3-Dichloropropene	1500	U
75-25-2	Bromoform	1500	U
591-78-6	2-Hexanone	1500	U
108-10-1	4-Methyl-2-Pentanone	1500	U
127-18-4	Tetrachloroethene	1500	U
79-34-5	1,1,2,2-Tetrachloroethane	1500	U
108-88-3	Toluene	1500	U
108-90-7	Chlorobenzene	1500	U
100-41-4	Ethylbenzene	3100	D
100-42-5	Styrene	1500	U
1330-20-7	Xylene (total)	8000	D

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

TT-14-02_DL

Lab Name: CH2M HILL/MGM Contract: _____

Lab Code: _____ Case No.: 21232 SAS No.: _____ SDG No.: _____

Matrix: (soil/water) SOIL Lab Sample ID: 21232002DL

Sample wt/vol: 4.0 (g/mL) G Lab File ID: B2VM014762

Level: (low/med) MED Date Received: 03/19/92

% Moisture: not dec. 21 Date Analyzed: 04/01/92

GC Column: CAP ID: 0.530 (mm) Dilution Factor: 1.0

Soil Extract Volume: 10000 (uL) Soil Aliquot Volume: 100 (uL)

Number TICs found: 4

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	BENZENE, TRIMETHYL- ISOMER	18.65	8000	J
2.	BENZENE, TRIMETHYL- ISOMER	19.34	18000	J
3. 271-89-6	BENZOFURAN	19.99	1100	J
4. 611-15-4	BENZENE, 1-ETHENYL-2-METHYL-	20.75	99000	J

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

MW-3D

Lab Name: CH2M HILL/MGM Contract: _____

Code: _____ Case No.: 21232 SAS No.: _____ SDG No.: _____

Matrix: (soil/water) SOIL Lab Sample ID: 21232003

Sample wt/vol: 5.0 (g/mL) G Lab File ID: C4VO021298

Level: (low/med) LOW Date Received: 03/19/92

% Moisture: not dec. 19 Date Analyzed: 04/02/92

GC Column: CAP ID: 0.530 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
74-87-3	Chloromethane	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	19	B
67-64-1	Acetone	25	B
75-15-0	Carbon Disulfide	12	U
75-35-4	1,1-Dichloroethene	12	U
75-34-3	1,1-Dichloroethane	12	U
540-59-0	1,2-Dichloroethene (total)	12	U
67-66-3	Chloroform	12	U
107-06-2	1,2-Dichloroethane	12	U
78-93-3	2-Butanone	12	U
71-55-6	1,1,1-Trichloroethane	12	U
56-23-5	Carbon Tetrachloride	12	U
75-27-4	Bromodichloromethane	12	U
78-87-5	1,2-Dichloropropane	12	U
10061-01-5	cis-1,3-Dichloropropene	12	U
79-01-6	Trichloroethene	12	U
124-48-1	Dibromochloromethane	12	U
79-00-5	1,1,2-Trichloroethane	12	U
71-43-2	Benzene	12	U
10061-02-6	trans-1,3-Dichloropropene	12	U
75-25-2	Bromoform	12	U
591-78-6	2-Hexanone	12	U
108-10-1	4-Methyl-2-Pentanone	12	U
127-18-4	Tetrachloroethene	12	U
79-34-5	1,1,2,2-Tetrachloroethane	12	U
108-88-3	Toluene	12	U
108-90-7	Chlorobenzene	12	U
100-41-4	Ethylbenzene	12	U
100-42-5	Styrene	12	U
1330-20-7	Xylene (total)	4	J

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

MW-3D

Lab Name: CH2M HILL/MGM Contract: _____

Lab Code: _____ Case No.: 21232 SAS No.: _____ SDG No.: _____

Matrix: (soil/water) SOIL Lab Sample ID: 21232003

Sample wt/vol: 5.0 (g/mL) G Lab File ID: C4VO021298

Level: (low/med) LOW Date Received: 03/19/92

% Moisture: not dec. 19 Date Analyzed: 04/02/92

GC Column: CAP ID: 0.530 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____(uL)

Number TICs found: 2

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 556-67-2	CYCLOTETRASILOXANE, OCTAMETH	19.55	21	J
2.	BENZENE, ETHYNYL-, METHYL- I	23.55	42	J

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

TT-14-02

Lab Name: CH2M HILL/MGM Contract: _____

Code: _____ Case No.: 21232 SAS No.: _____ SDG No.: _____

Matrix: (soil/water) SOIL Lab Sample ID: 21232002

Sample wt/vol: 30.0 (g/mL) G Lab File ID: A1BA013528

Level: (low/med) LOW Date Received: 03/19/92

% Moisture: 19 decanted: (Y/N) N Date Extracted: 03/23/92

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 04/02/92

Injection Volume: 2.0(uL) Dilution Factor: 4.0

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-95-2	Phenol	1600	U
111-44-4	bis(2-Chloroethyl)Ether	1600	U
95-57-8	2-Chlorophenol	1600	U
541-73-1	1,3-Dichlorobenzene	1600	U
106-46-7	1,4-Dichlorobenzene	1600	U
95-50-1	1,2-Dichlorobenzene	1600	U
95-48-7	2-Methylphenol	1600	U
108-60-1	2,2'-oxybis(1-Chloropropane)	1600	U
106-44-5	4-Methylphenol	1600	U
621-64-7	N-Nitroso-Di-n-Propylamine	1600	U
67-72-1	Hexachloroethane	1600	U
98-95-3	Nitrobenzene	1600	U
78-59-1	Isophorone	1600	U
88-75-5	2-Nitrophenol	1600	U
105-67-9	2,4-Dimethylphenol	1600	U
111-91-1	bis(2-Chloroethoxy)Methane	1600	U
120-83-2	2,4-Dichlorophenol	1600	U
120-82-1	1,2,4-Trichlorobenzene	1600	U
91-20-3	Naphthalene	27000	E
106-47-8	4-Chloroaniline	1600	U
87-68-3	Hexachlorobutadiene	1600	U
59-50-7	4-Chloro-3-Methylphenol	1600	U
91-57-6	2-Methylnaphthalene	5300	
77-47-4	Hexachlorocyclopentadiene	1600	U
88-06-2	2,4,6-Trichlorophenol	1600	U
95-95-4	2,4,5-Trichlorophenol	4000	U
91-58-7	2-Chloronaphthalene	1600	U
88-74-4	2-Nitroaniline	4000	U
131-11-3	Dimethylphthalate	1600	U
208-96-8	Acenaphthylene	560	J
606-20-2	2,6-Dinitrotoluene	1600	U
99-09-2	3-Nitroaniline	4000	U
83-32-9	Acenaphthene	3500	

1C

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

TT-14-02

Lab Name: CH2M HILL/MGM Contract: _____

Lab Code: _____ Case No.: 21232 SAS No.: _____ SDG No.: _____

Matrix: (soil/water) SOIL Lab Sample ID: 21232002

Sample wt/vol: 30.0 (g/mL) G Lab File ID: A1BA013528

Level: (low/med) LOW Date Received: 03/19/92

% Moisture: 19 decanted: (Y/N) N Date Extracted: 03/23/92

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 04/02/92

Injection Volume: 2.0(uL) Dilution Factor: 4.0

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	4000	U
100-02-7	4-Nitrophenol	4000	U
132-64-9	Dibenzofuran	2900	
121-14-2	2,4-Dinitrotoluene	1600	U
84-66-2	Diethylphthalate	1600	U
7005-72-3	4-Chlorophenyl-phenylether	1600	U
86-73-7	Fluorene	3700	
100-10-6	4-Nitroaniline	4000	U
534-52-1	4,6-Dinitro-2-methylphenol	4000	U
86-30-6	N-Nitrosodiphenylamine (1)	1600	U
101-55-3	4-Bromophenyl-phenylether	1600	U
118-74-1	Hexachlorobenzene	1600	U
87-86-5	Pentachlorophenol	4000	U
85-01-8	Phenanthrene	5400	
120-12-7	Anthracene	1700	
86-74-8	Carbazole	850	J
84-74-2	Di-n-Butylphthalate	1600	U
206-44-0	Fluoranthene	4400	
129-00-0	Pyrene	3200	
85-68-7	Butylbenzylphthalate	1600	U
91-94-1	3,3'-Dichlorobenzidine	1600	U
56-55-3	Benzo(a)Anthracene	1200	J
218-01-9	Chrysene	1200	J
117-81-7	bis(2-Ethylhexyl)Phthalate	1600	U
117-84-0	Di-n-Octyl Phthalate	1600	U
205-99-2	Benzo(b)Fluoranthene	830	J
207-08-9	Benzo(k)Fluoranthene	940	J
50-32-8	Benzo(a)Pyrene	870	J
193-39-5	Indeno(1,2,3-cd)Pyrene	510	J
53-70-3	Dibenz(a,h)Anthracene	1600	U
191-24-2	Benzo(g,h,i)Perylene	1600	U

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

TT-14-02

Lab Name: CH2M HILL/MGM Contract: _____

Code: _____ Case No.: 21232 SAS No.: _____ SDG No.: _____

Matrix: (soil/water) SOIL Lab Sample ID: 21232002

Sample wt/vol: 30.0 (g/mL) G Lab File ID: A1BA013528

Level: (low/med) LOW Date Received: 03/19/92

% Moisture: 19 decanted: (Y/N) N Date Extracted: 03/23/92

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 04/02/92

Injection Volume: 2.0(uL) Dilution Factor: 4.0

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

Number TICs found: 20

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

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		BENZENE, ETHYL METHYL- ISOME	7.65	3100	J
2.		BENZENE, TRIMETHYL- ISOMER	7.80	3200	J
3.	271-89-6	BENZOFURAN	8.47	2200	J
4.		BENZENE, TRIMETHYL- ISOMER	9.02	2400	J
5.	496-11-7	1H-INDENE, 2,3-DIHYDRO-	9.35	35000	J
6.	95-13-6	1H-INDENE	9.50	1800	J
7.		PROPENAL, PHENYL- ISOMER	10.70	3000	J
8.		BENZENE, (METHYL CYCLOPROPEN	11.55	2500	J
9.		BENZENE, (METHYL CYCLOPROPEN	11.67	2600	J
10.	95-15-8	BENZO[B]THIOPHENE	12.39	2700	J
11.	62016-34-6	OCTANE, 2,3,7-TRIMETHYL-	13.70	1800	J
12.	90-12-0	NAPHTHALENE, 1-METHYL-	14.40	7700	J
13.		NAPHTHALENE, DIMETHYL- ISOME	16.12	3700	J
14.	103-44-6	HEPTANE, 3-[(ETHENYLOXY)METH	16.69	4200	J
15.	1921-70-6	PENTADECANE, 2,6,10,14-TETRA	20.10	12000	J
16.	74645-98-0	DODECANE, 2,7,10-TRIMETHYL-	21.42	10000	J
17.		UNKNOWN HYDROCARBON	26.26	3500	J
18.		UNKNOWN HYDROCARBON	29.86	2900	J
19.		UNKNOWN HYDROCARBON	30.27	2800	J
20.		NOT IDENTIFIED	4.50	24000	J

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

TT-14-02_DL

Lab Name: CH2M HILL/MGM Contract: _____

Lab Code: _____ Case No.: 21232 SAS No.: _____ SDG No.: _____

Matrix: (soil/water) SOIL Lab Sample ID: 21232002DL

Sample wt/vol: 30.0 (g/mL) G Lab File ID: A2BA013529

Level: (low/med) LOW Date Received: 03/19/92

% Moisture: 19 decanted: (Y/N) N Date Extracted: 03/23/92

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 04/02/92

Injection Volume: 2.0(uL) Dilution Factor: 12.0

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-95-2	Phenol	4900	U
111-44-4	bis(2-Chloroethyl)Ether	4900	U
95-57-8	2-Chlorophenol	4900	U
541-73-1	1,3-Dichlorobenzene	4900	U
106-46-7	1,4-Dichlorobenzene	4900	U
95-50-1	1,2-Dichlorobenzene	4900	U
95-48-7	2-Methylphenol	4900	U
108-60-1	2,2'-oxybis(1-Chloropropane)	4900	U
106-44-5	4-Methylphenol	4900	U
621-64-7	N-Nitroso-Di-n-Propylamine	4900	U
67-72-1	Hexachloroethane	4900	U
98-95-3	Nitrobenzene	4900	U
78-59-1	Isophorone	4900	U
88-75-5	2-Nitrophenol	4900	U
105-67-9	2,4-Dimethylphenol	4900	U
111-91-1	bis(2-Chloroethoxy)Methane	4900	U
120-83-2	2,4-Dichlorophenol	4900	U
120-82-1	1,2,4-Trichlorobenzene	4900	U
91-20-3	Naphthalene	34000	D
106-47-8	4-Chloroaniline	4900	U
87-68-3	Hexachlorobutadiene	4900	U
59-50-7	4-Chloro-3-Methylphenol	4900	U
91-57-6	2-Methylnaphthalene	5500	D
77-47-4	Hexachlorocyclopentadiene	4900	U
88-06-2	2,4,6-Trichlorophenol	4900	U
95-95-4	2,4,5-Trichlorophenol	12000	U
91-58-7	2-Chloronaphthalene	4900	U
88-74-4	2-Nitroaniline	12000	U
131-11-3	Dimethylphthalate	4900	U
208-96-8	Acenaphthylene	510	DJ
606-20-2	2,6-Dinitrotoluene	4900	U
99-09-2	3-Nitroaniline	12000	U
83-32-9	Acenaphthene	3700	DJ

MS

1C

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

TT-14-02_DL

Lab Name: CH2M HILL/MGM Contract: _____

Code: _____ Case No.: 21232 SAS No.: _____ SDG No.: _____

Matrix: (soil/water) SOIL Lab Sample ID: 21232002DL

Sample wt/vol: 30.0 (g/mL) G Lab File ID: A2BA013529

Level: (low/med) LOW Date Received: 03/19/92

% Moisture: 19 decanted: (Y/N) N Date Extracted: 03/23/92

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 04/02/92

Injection Volume: 2.0(uL) Dilution Factor: 12.0

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	12000	U
100-02-7	4-Nitrophenol	12000	U
132-64-9	Dibenzofuran	3100	DJ
121-14-2	2,4-Dinitrotoluene	4900	U
84-66-2	Diethylphthalate	4900	U
7005-72-3	4-Chlorophenyl-phenylether	4900	U
86-73-7	Fluorene	4200	DJ
100-10-6	4-Nitroaniline	12000	U
534-52-1	4,6-Dinitro-2-methylphenol	12000	U
86-30-6	N-Nitrosodiphenylamine (1)	4900	U
101-55-3	4-Bromophenyl-phenylether	4900	U
118-74-1	Hexachlorobenzene	4900	U
87-86-5	Pentachlorophenol	12000	U
85-01-8	Phenanthrene	6000	D
120-12-7	Anthracene	1700	DJ
86-74-8	Carbazole	750	DJ
84-74-2	Di-n-Butylphthalate	4900	U
206-44-0	Fluoranthene	4300	DJ
129-00-0	Pyrene	3200	DJ
85-68-7	Butylbenzylphthalate	4900	U
91-94-1	3,3'-Dichlorobenzidine	4900	U
56-55-3	Benzo(a)Anthracene	1100	DJ
218-01-9	Chrysene	1200	DJ
117-81-7	bis(2-Ethylhexyl)Phthalate	4900	U
117-84-0	Di-n-Octyl Phthalate	4900	U
205-99-2	Benzo(b)Fluoranthene	830	DJ
207-08-9	Benzo(k)Fluoranthene	910	DJ
50-32-8	Benzo(a)Pyrene	860	DJ
193-39-5	Indeno(1,2,3-cd)Pyrene	580	DJ
53-70-3	Dibenz(a,h)Anthracene	4900	U
191-24-2	Benzo(g,h,i)Perylene	4900	U

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

TT-14-02_DL

Lab Name: CH2M HILL/MGM Contract: _____

Lab Code: _____ Case No.: 21232 SAS No.: _____ SDG No.: _____

Matrix: (soil/water) SOIL Lab Sample ID: 21232002DL

Sample wt/vol: 30.0 (g/mL) G Lab File ID: A2BA013529

Level: (low/med) LOW Date Received: 03/19/92

% Moisture: 19 decanted: (Y/N) N Date Extracted: 03/23/92

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 04/02/92

Injection Volume: 2.0(uL) Dilution Factor: 12.0

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

Number TICs found: 16

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 620-14-4	BENZENE, 1-ETHYL-3-METHYL-	7.67	3100	J
2.	BENZENE, TRIMETHYL- ISOMER	7.82	3000	J
3.	BENZENE, TRIMETHYL- ISOMER	8.40	9800	J
4. 271-89-6	BENZOFURAN	8.49	2900	J
5.	BENZENE, TRIMETHYL- ISOMER	9.04	2300	J
6. 496-11-7	1H-INDENE, 2,3-DIHYDRO-	9.[illegible]	41000	J
7. 104-55-2	2-PROPENAL, 3-PHENYL-	10[illegible]	2700	J
8.	BENZENE, (METHYL CYCLOPROPEN	11.55	2300	J
9.	BENZENE, (METHYL CYCLOPROPEN	11.70	2900	J
10. 95-15-8	BENZO[B]THIOPHENE	12.39	2600	J
11. 2471-83-2	1H-INDENE, 1-ETHYLIDENE-	14.42	6600	J
12. 571-61-9	NAPHTHALENE, 1,5-DIMETHYL-	15.90	2800	J
13. 62238-13-5	DECANE, 2,3,7-TRIMETHYL-	16.69	4300	J
14.	DODECANE, TRIMETHYL- ISOMER	20.07	8700	J
15.	DODECANE, TRIMETHYL- ISOMER	21.39	7200	J
16.	NOT IDENTIFIED	4.58	23000	J

ORGANICS ANALYSIS DATA SHEET

Laboratory Name:	CH2M HILL/MGM	Concentration:	LOW	Date Extracted:	03/23/92
Lab Sample ID:	21232001	Sample Matrix:	SOIL	Date Analyzed:	04/03/92
Client Sample ID:	TT-12-01	Percent Moisture:	16.0	Dilution Factor:	320

POLYNUCLEAR AROMATIC COMPOUNDS

CAS Number		ug/Kg		CAS Number		ug/Kg	
271-89-6	2,3-Benzofuran	130000	U	260-94-6	Acridine	130000	U
496-11-7	2,3-Dihydro-1h-Indene	110000	J	229-87-8	Phenanthridine	130000	U
95-13-6	1H-Indene	130000	U	86-74-8	Carbazole	130000	U
91-20-3	Naphthalene	640000		206-44-0	Fluoranthene	22000	J
95-15-8	Benzo(b)thiophene	17000	J	129-00-0	Pyrene	14000	J
91-22-5	Quinoline	130000	U	56-55-3	Benzo(a)anthracene	130000	U
119-65-3	Isoquinoline	130000	U	218-01-9	Chrysene/Triphenylene	130000	U
91-57-6	2-Methylnaphthalene	120000	J	NA	Benzo(b&k)fluoranthene	NR	
120-72-9	Indole	130000	U	57-97-6	7,12-Dimethylbenz(a)anthrac	130000	U
90-12-0	1-Methylnaphthalene	88000	J	192-97-2	Benzo(e)pyrene	130000	U
[illegible]-52-4	Biphenyl	22000	J	50-32-8	Benzo(a)pyrene	130000	U
208-96-8	Acenaphthylene	130000	U	198-55-0	Perylene	130000	U
83-32-9	Acenaphthene	53000	J	56-49-5	3-Methylcholanthrene	130000	U
132-64-9	Dibenzofuran	28000	J	193-39-5	Indeno(1,2,3-cd)pyrene	130000	U
86-73-7	Fluorene	52000	J	53-70-3	Dibenz(a,h)anthracene	130000	U
132-65-0	Dibenzothiophene	130000	U	191-24-2	Benzo(g,h,i,)perylene	130000	U
85-01-8	Phenanthrene	50000	J	205-99-2	Benzo(b)fluoranthene	130000	U
[illegible]-12-7	Anthracene	13000	J	207-08-9	Benzo(k)fluoranthene	130000	U

U - Compound analyzed for but not detected.
B - Compound was detected in QC blank.
J - Reported value less than quantitation limit.

Form I

ORGANICS ANALYSIS DATA SHEET

Laboratory Name:	CH2M HILL/MGM	Concentration:	LOW	Date Extracted:	03/23/92
Lab Sample ID:	21232001	Sample Matrix:	SOIL	Date Analyzed:	04/03/92
Client Sample ID:	TT-12-01	Percent Moisture:	16.0	Dilution Factor:	320

PHENOL COMPOUNDS

CAS Number		ug/Kg	CAS Number	ug/Kg
108-95-2	Phenol	130000 U		
95-57-8	2-Chlorophenol	130000 U		
95-48-7	2-Methylphenol	130000 U		
106-44-5	4-Methylphenol	130000 U		
88-75-5	2-Nitrophenol	130000 U		
105-67-9	2,4-Dimethylphenol	130000 U		
120-83-2	2,4-Dichlorophenol	130000 U		
65-85-0	Benzoic acid	300000 U		
59-50-7	4-Chloro-3-Methylphenol	130000 U		
88-06-2	2,4,6-Trichlorophenol	130000 U		
95-95-4	2,4,5-Trichlorophenol	300000 U		
51-28-5	2,4-Dinitrophenol	300000 U		
100-02-7	4-Nitrophenol	300000 U		
534-52-1	4,6-Dinitro-2-Methylphenol	300000 U		
87-86-5	Pentachlorophenol	300000 U		

U - Compound analyzed for but not detected.
B - Compound was detected in QC blank.
J - Reported value less than quantitation limit.

Form I

ORGANICS ANALYSIS DATA SHEET

Laboratory Name:	CH2M HILL/MGM	Concentration:	LOW	Date Extracted:	03/23/92
Lab Sample ID:	21232003	Sample Matrix:	SOIL	Date Analyzed:	04/02/92
Client Sample ID:	MW-3D	Percent Moisture:	18.0	Dilution Factor:	16

POLYNUCLEAR AROMATIC COMPOUNDS

CAS Number		ug/Kg		CAS Number		ug/Kg	
271-89-6	2,3-Benzofuran	6400	U	260-94-6	Acridine	6400	U
496-11-7	2,3-Dihydro-1h-Indene	6400	U	229-87-8	Phenanthridine	6400	U
95-13-6	1H-Indene	6400	U	86-74-8	Carbazole	6400	U
91-20-3	Naphthalene	6400	U	206-44-0	Fluoranthene	6400	U
95-15-8	Benzo(b)thiophene	6400	U	129-00-0	Pyrene	6400	U
91-22-5	Quinoline	6400	U	56-55-3	Benzo(a)anthracene	6400	U
119-65-3	Isoquinoline	6400	U	218-01-9	Chrysene/Triphenylene	6400	U
91-57-6	2-Methylnaphthalene	6400	U	NA	Benzo(b&k)fluoranthene	NR	
120-72-9	Indole	6400	U	57-97-6	7,12-Dimethylbenz(a)anthrac	6400	U
[illegible]-12-0	1-Methylnaphthalene	6400	U	192-97-2	Benzo(e)pyrene	6400	U
[illegible]-52-4	Biphenyl	6400	U	50-32-8	Benzo(a)pyrene	6400	U
208-96-8	Acenaphthylene	6400	U	198-55-0	Perylene	6400	U
83-32-9	Acenaphthene	6400	U	56-49-5	3-Methylcholanthrene	6400	U
132-64-9	Dibenzofuran	6400	U	193-39-5	Indeno(1,2,3-cd)pyrene	6400	U
86-73-7	Fluorene	6400	U	53-70-3	Dibenz(a,h)anthracene	6400	U
132-65-0	Dibenzothiophene	6400	U	191-24-2	Benzo(g,h,i,)perylene	6400	U
85-01-8	Phenanthrene	6400	U	205-99-2	Benzo(b)fluoranthene	6400	U
[illegible]-12-7	Anthracene	6400	U	207-08-9	Benzo(k)fluoranthene	6400	U

U - Compound analyzed for but not detected.
B - Compound was detected in QC blank.
J - Reported value less than quantitation limit.

Form I

ORGANICS ANALYSIS DATA SHEET

Laboratory Name: CH2M HILL/MGM
Lab Sample ID: 21232003
Client Sample ID: MW-3D

Concentration: LOW
Sample Matrix: SOIL
Percent Moisture: 18.0

Date Extracted: 03/23/92
Date Analyzed: 04/02/92
Dilution Factor: 16

PHENOL COMPOUNDS

CAS Number		ug/Kg	
108-95-2	Phenol	58000	E
95-57-8	2-Chlorophenol	6400	U
95-48-7	2-Methylphenol	7000	
106-44-5	4-Methylphenol	25000	
88-75-5	2-Nitrophenol	6400	U
105-67-9	2,4-Dimethylphenol	2000	J
120-83-2	2,4-Dichlorophenol	6400	U
65-85-0	Benzoic acid	16000	U
59-50-7	4-Chloro-3-Methylphenol	6400	U
88-06-2	2,4,6-Trichlorophenol	6400	U
95-95-4	2,4,5-Trichlorophenol	16000	U
51-28-5	2,4-Dinitrophenol	16000	U
100-02-7	4-Nitrophenol	16000	U
534-52-1	4,6-Dinitro-2-Methylphenol	16000	U
87-86-5	Pentachlorophenol	16000	U

CAS Number	ug/Kg

U - Compound analyzed for but not detected.
B - Compound was detected in QC blank.
J - Reported value less than quantitation limit.
E - Compound concentration exceeded calibration range.

Form I

ORGANICS ANALYSIS DATA SHEET

Laboratory Name:	CH2M HILL/MGM	Concentration:	LOW	Date Extracted:	03/23/92
Lab Sample ID:	21232003 DL	Sample Matrix:	SOIL	Date Analyzed:	04/03/92
Client Sample ID:	MW-3D DL	Percent Moisture:	18.0	Dilution Factor:	32

POLYNUCLEAR AROMATIC COMPOUNDS

CAS Number		ug/Kg		CAS Number		ug/Kg	
271-89-6	2,3-Benzofuran	13000	U	260-94-6	Acridine	13000	U
496-11-7	2,3-Dihydro-1h-Indene	13000	U	229-87-8	Phenanthridine	13000	U
95-13-6	1H-Indene	13000	U	86-74-8	Carbazole	13000	U
91-20-3	Naphthalene	13000	U	206-44-0	Fluoranthene	13000	U
95-15-8	Benzo(b)thiophene	13000	U	129-00-0	Pyrene	13000	U
91-22-5	Quinoline	13000	U	56-55-3	Benzo(a)anthracene	13000	U
119-65-3	Isoquinoline	13000	U	218-01-9	Chrysene/Triphenylene	13000	U
91-57-6	2-Methylnaphthalene	13000	U	NA	Benzo(b&k)fluoranthene	NR	
120-72-9	Indole	13000	U	57-97-6	7,12-Dimethylbenz(a)anthrac	13000	U
90-12-0	1-Methylnaphthalene	13000	U	192-97-2	Benzo(e)pyrene	13000	U
92-52-4	Biphenyl	13000	U	50-32-8	Benzo(a)pyrene	13000	U
208-96-8	Acenaphthylene	13000	U	198-55-0	Perylene	13000	U
83-32-9	Acenaphthene	13000	U	56-49-5	3-Methylcholanthrene	13000	U
132-64-9	Dibenzofuran	13000	U	193-39-5	Indeno(1,2,3-cd)pyrene	13000	U
86-73-7	Fluorene	13000	U	53-70-3	Dibenz(a,h)anthracene	13000	U
132-65-0	Dibenzothiophene	13000	U	191-24-2	Benzo(g,h,i,)perylene	13000	U
85-01-8	Phenanthrene	13000	U	205-99-2	Benzo(b)fluoranthene	13000	U
120-12-7	Anthracene	13000	U	207-08-9	Benzo(k)fluoranthene	13000	U

U - Compound analyzed for but not detected.
B - Compound was detected in QC blank.
J - Reported value less than quantitation limit.

Form I

ORGANICS ANALYSIS DATA SHEET

Laboratory Name: CH2M HILL/MGM
Lab Sample ID: 21232003DL
Client Sample ID: MW-3D DL

Concentration: LOW
Sample Matrix: SOIL
Percent Moisture: 18.0

Date Extracted: 03/23/92
Date Analyzed: 04/03/92
Dilution Factor: 32

PHENOL COMPOUNDS

CAS Number		ug/Kg	
108-95-2	Phenol	71000	
95-57-8	2-Chlorophenol	13000	U
95-48-7	2-Methylphenol	8600	J
106-44-5	4-Methylphenol	31000	
88-75-5	2-Nitrophenol	13000	U
105-67-9	2,4-Dimethylphenol	2800	J
120-83-2	2,4-Dichlorophenol	13000	U
65-85-0	Benzoic acid	31000	U
59-50-7	4-Chloro-3-Methylphenol	13000	U
88-06-2	2,4,6-Trichlorophenol	13000	U
95-95-4	2,4,5-Trichlorophenol	31000	U
51-28-5	2,4-Dinitrophenol	31000	U
100-02-7	4-Nitrophenol	31000	U
534-52-1	4,6-Dinitro-2-Methylphenol	31000	U
87-86-5	Pentachlorophenol	31000	U

CAS Number	ug/Kg

U - Compound analyzed for but not detected.
B - Compound was detected in QC blank.
J - Reported value less than quantitation limit.

Form I

MSr

1D
PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

TT-14-02

Lab Name: CH2M HILL/MGM Contract: _____

1 Code: CH2M Case No.: 21232 SAS No.: _____ SDG No.: _____

Matrix: (soil/water) SOIL Lab Sample ID: 21232002

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

% Moisture: 19 decanted: (Y/N) N Date Received: 03/19/92

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 03/23/92

Concentrated Extract Volume: 5000 (uL) Date Analyzed: 04/09/92

Injection Volume: 2.00 (uL) Dilution Factor: 4.00

GPC Cleanup: (Y/N) Y pH: 8.2 Sulfur Cleanup: (Y/N) Y

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	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	84	U
53494-70-5	Endrin ketone	16	U
7421-36-3	Endrin aldehyde	16	U
5103-71-9	alpha-Chlordane	8.4	U
5103-74-2	gamma-Chlordane	8.4	U
8001-35-2	Toxaphene	4200	U
12674-11-2	Aroclor-1016	800	U
11104-28-2	Aroclor-1221	1600	U
11141-16-5	Aroclor-1232	800	U
53469-21-9	Aroclor-1242	800	U
12672-29-6	Aroclor-1248	800	U
11097-69-1	Aroclor-1254	800	U
11096-82-5	Aroclor-1260	800	U

2B

SOIL VOLATILE SYSTEM MONITORING COMPOUND RECOVERY

Lab Name: CH2M HILL/MGM Contract: _____

Lab Code: _____ Case No.: 21232 SAS No.: _____ SDG No.: _____

Level:(low/med) LOW

	EPA SAMPLE NO.	SMC1 (TOL)#	SMC2 (BFB)#	SMC3 (DCE)#	OTHER	TOT OUT
01	MW-3D	100	101	102	0	0
02	TT-12-01	106	87	100	0	0
03	TT-14-02	105	99	99	0	0
04	VBLKS	104	100	101	0	0
05	VBLKS_2	100	98	99	0	0

		QC LIMITS
SMC1 (TOL)	= Toluene-d8	(84-138)
SMC2 (BFB)	= Bromofluorobenzene	(59-113)
SMC3 (DCE)	= 1,2-Dichloroethane-d4	(70-121)

Column to be used to flag recovery values

* Values outside of contract required QC limits

D System Monitoring Compound diluted out

2B

SOIL VOLATILE SYSTEM MONITORING COMPOUND RECOVERY

Lab Name: CH2M HILL/MGM Contract: _____

Lab Code: _____ Case No.: 21232 SAS No.: _____ SDG No.: _____

Level:(low/med) MED

	EPA SAMPLE NO.	SMC1 (TOL)#	SMC2 (BFB)#	SMC3 (DCE)#	OTHER	TOT OUT
01	TT-12-01_DL	85 D	109 D	75 D	0	0
02	TT-14-02_DL	87	101	77	0	0
03	TT14-02DLMS	78 *	101	66 *	0	2
04	TT14-02DLMSD	84	102	73	0	0
05	VBLKSM	89	99	82	0	0

		QC LIMITS
SMC1 (TOL)	= Toluene-d8	(84-138)
SMC2 (BFB)	= Bromofluorobenzene	(59-113)
SMC3 (DCE)	= 1,2-Dichloroethane-d4	(70-121)

Column to be used to flag recovery values

* Values outside of contract required QC limits

D System Monitoring Compound diluted out

FORM II VOA-2

3/90 MTP

2D

SOIL SEMIVOLATILE SURROGATE RECOVERY

Lab Name: CH2M HILL/MGM Contract: _____

Lab Code: _____ Case No.: 21232 SAS No.: _____ SDG No.: _____

Level:(low/med) LOW

	EPA SAMPLE NO.	S1 (NBZ)#	S2 (FBP)#	S3 (TPH)#	S4 (PHL)#	S5 (2FP)#	S6 (TBP)#	S7 (2CP)#	S8 (DCB)#	TOT OUT
01	TT-14-02	92	78	82	33	54	87	86	73	0
02	TT-14-02_DL	76	82	85	91	82	112	96	85	0
03	TT14-02DLMS	72	72	78	49	70	88	83	76	0
04	TT14-02DLMSD	75	83	76	76	88	95	87	80	0
05	SBLKS	74	75	81	85	87	85	78	71	0

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

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

SOIL SURROGATE PERCENT RECOVERY SUMMARY
(Page 1)

Case No. S21232 Contract Laboratory CH2M HILL/MGM
XXX Medium

SMO TRAFFIC NO.	SEMI-VOLATILE 1-Fluoronaphthalene - SS 0-81	2-Fluorophenol - SS 25-121	Phenol-d5 - SS 24-113	2,4,6-Tribromophenol - SS 19-122	Nitrobenzene-d5 - SS 9-197	2-Fluorobiphenyl - SS 9-109	Terphenyl-d14 - SS 0-143	2-Chlorophenol-d4 - SS 20-130	1,2-Dichlorobenzene - d4 SS 20-130
TT-12-01	**	**	**	**	**	**	**	**	**
MW-3D	52	76	85	88	61	70	62	91	72
MW-3D_DL	**	**	**	**	**	**	**	**	**
SBLKS	57	92	106	79	76	75	66	92	78

Semi-Volatiles: 0 out of 36; outside of QC limits

Comments:

** - Surrogate Standard not determined due to required dilution.

FORM II

2F

SOIL PESTICIDE SURROGATE RECOVERY

Lab Name: CH2M HILL/MGM Contract: _____

Lab Code: CH2M Case No.: 21232 SAS No.: _____ SDG No.: _____

GC Column(1): SPB-5 ID: 0.53(mm) GC Column(2): SPB-608 ID: 0.53(mm)

	EPA SAMPLE NO.	TCX 1 %REC #	TCX 2 %REC #	DCB 1 %REC #	DCB 2 %REC #	OTHER (1)	OTHER (2)	TOT OUT
01	PBLK23	69	71	86	80			0
02	TT-14-02	65	134	104	106			0
03	TT-14-02MS	67	73	104	124			0
04	TT-14-02MSD	64	71	102	147			0

	ADVISORY QC LIMITS
TCX = Tetrachloro-m-xylene	(60-150)
DCB = Decachlorobiphenyl	(60-150)

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

3B

SOIL VOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: CH2M HILL/MGM Contract: _____

Lab Code: _____ Case No.: 21232 SAS No.: _____ SDG No.: _____

Matrix Spike - EPA Sample No.: TT-14-02 DL Level:(low/med) MED

COMPOUND	SPIKE ADDED (ug/Kg)	SAMPLE CONCENTRATION (ug/Kg)	MS CONCENTRATION (ug/Kg)	MS % REC #	QC LIMITS REC.
1,1-Dichloroethene	7910	0	5680	72	59-172
Trichloroethene	7910	0	6044	76	62-137
Benzene	7910	1047	5775	60 *	66-142
Toluene	7910	0	4668	59	59-139
Chlorobenzene	7910	0	5475	69	60-133

COMPOUND	SPIKE ADDED (ug/Kg)	MSD CONCENTRATION (ug/Kg)	MSD % REC #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
1,1-Dichloroethene	7910	6329	80	11	22	59-172
Trichloroethene	7910	7168	91	18	24	62-137
Benzene	7910	8038	88	38 *	21	66-142
Toluene	7910	5949	75	24 *	21	59-139
Chlorobenzene	7910	6535	83	18	21	60-133

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

RPD: 2 out of 5 outside limits
Spike Recovery: 1 out of 10 outside limits

COMMENTS: CLP,21232,,TT-14-02,M,S,21232002,V,EPA,
10DG TO 200DG @8DG/MIN IH=3MIN

SOIL SEMIVOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: CH2M HILL/MGM Contract: _____

Lab Code: _____ Case No.: 21232 SAS No.: _____ SDG No.: _____

Matrix Spike - EPA Sample No.: TT-14-02 DL Level:(low/med) LOW

COMPOUND	SPIKE ADDED (ug/Kg)	SAMPLE CONCENTRATION (ug/Kg)	MS CONCENTRATION (ug/Kg)	MS % REC #	QC LIMITS REC.
Phenol	6170	0	1985	32	26- 90
2-Chlorophenol	6170	0	4040	65	25-102
1,4-Dichlorobenzene	4120	0	2701	66	28-104
N-Nitroso-di-n-prop.(1)	4120	0	2904	70	41-126
1,2,4-Trichlorobenzene	4120	0	3210	78	38-107
4-Chloro-3-methylphenol	6170	0	4059	66	26-103
Acenaphthene	4120	7358	10020	65	31-137
4-Nitrophenol	6170	0	3753	61	11-114
2,4-Dinitrotoluene	4120	0	2049	50	28- 89
Pentachlorophenol	6170	0	2647	43	17-109
Pyrene	4120	6519	10320	92	35-142

COMPOUND	SPIKE ADDED (ug/Kg)	MSD CONCENTRATION (ug/Kg)	MSD % REC #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
Phenol	6170	4430	72	77 *	35	26- 90
2-Chlorophenol	6170	4395	71	9	50	25-102
1,4-Dichlorobenzene	4120	2805	68	3	27	28-104
N-Nitroso-di-n-prop.(1)	4120	3235	79	12	38	41-126
1,2,4-Trichlorobenzene	4120	3165	77	1	23	38-107
4-Chloro-3-methylphenol	6170	4158	67	2	33	26-103
Acenaphthene	4120	9284	47	32 *	19	31-137
4-Nitrophenol	6170	3482	56	9	50	11-114
2,4-Dinitrotoluene	4120	2143	52	4	47	28- 89
Pentachlorophenol	6170	2884	47	9	47	17-109
Pyrene	4120	8741	54	52 *	36	35-142

(1) N-Nitroso-di-n-propylamine

Column to be used to flag recovery and RPD values with an asterisk
* Values outside of QC limits

RPD: 3 out of 11 outside limits
Spike Recovery: 0 out of 22 outside limits

COMMENTS: CLP,21232,,TT-14-02,L,S,21232002,B,E,
20DG TO 310DG @4DG/MIN IH=10MIN

SOIL PESTICIDE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: CH2M HILL/MGM Contract: _____

Code: CH2M Case No.: 21232 SAS No.: _____ SDG No.: _____

Matrix Spike - EPA Sample No.: TT-14-02

COMPOUND	SPIKE ADDED (ug/Kg)	SAMPLE CONCENTRATION (ug/Kg)	MS CONCENTRATION (ug/Kg)	MS % REC #	QC LIMITS REC.
gamma-BHC (Lindane)	20.600	0	13.5	66	46-127
Heptachlor	20.600	0	13.1	64	35-130
Aldrin	20.600	0	11.6	56	34-132
Dieldrin	41.100	0	34.0	83	31-134
Endrin	41.100	0	37.6	91	42-139
4,4'-DDT	41.100	0	33.5	82	23-134

COMPOUND	SPIKE ADDED (ug/Kg)	MSD CONCENTRATION (ug/Kg)	MSD % REC #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
gamma-BHC (Lindane)	20.600	13.5	66	0	50	46-127
Heptachlor	20.600	13.0	63	2	31	35-130
Aldrin	20.600	5.97	29 *	64 *	43	34-132
Dieldrin	41.100	33.6	82	1	38	31-134
Endrin	41.100	37.1	90	1	45	42-139
4,4'-DDT	41.100	33.7	82	0	50	23-134

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

RPD: 1 out of 6 outside limits
Spike Recovery: 1 out of 12 outside limits

COMMENTS:

4A
VOLATILE METHOD BLANK SUMMARY

EPA SAMPLE NO.

VBLKS

Lab Name: CH2M HILL/MGM Contract: _____

Lab Code: _____ Case No.: 21232 SAS No.: _____ SDG No.: _____

Lab File ID: CBVO021252 Lab Sample ID: Y03302B3

Date Analyzed: 03/30/92 Time Analyzed: 2250

GC Column: CAP ID: 0.530(mm) Heated Purge: (Y/N) Y

Instrument ID: 4500

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS AND MSD:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	TIME ANALYZED
01	TT-12-01	21232001	C1VO021254	0007
02	TT-14-02	21232002	C1VO021255	0106

COMMENTS: CLP,12222,,VBLKS,L,S,Y03302B3,V,BLANK,
10DG TO 200DG @8DG/MIN IH=3MIN

FORM IV VOA

3/90 mmp

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

VBLKS

Lab Name: CH2M HILL/MGM Contract: _____

Code: _____ Case No.: 21232 SAS No.: _____ SDG No.: _____

Matrix: (soil/water) SOIL Lab Sample ID: Y03302B3

Sample wt/vol: 5.0 (g/mL) G Lab File ID: CBVO021252

Level: (low/med) LOW Date Received: 03/30/92

% Moisture: not dec. 0 Date Analyzed: 03/30/92

GC Column: CAP ID: 0.530 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____(uL)

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

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

VBLKS

Lab Name: CH2M HILL/MGM Contract: _____

Lab Code: _____ Case No.: 21232 SAS No.: _____ SDG No.: _____

Matrix: (soil/water) SOIL Lab Sample ID: Y03302B3

Sample wt/vol: 5.0 (g/mL) G Lab File ID: CBVO021252

Level: (low/med) LOW Date Received: 03/30/92

% Moisture: not dec. 0 Date Analyzed: 03/30/92

GC Column: CAP ID: 0.530 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____(uL)

Number TICs found: 0

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

4A
VOLATILE METHOD BLANK SUMMARY

EPA SAMPLE NO.

VBLKS_2

Lab Name: CH2M HILL/MGM Contract: _____

Code: _____ Case No.: 21232 SAS No.: _____ SDG No.: _____

Lab File ID: CBV0021293 Lab Sample ID: Y04022B1

Date Analyzed: 04/02/92 Time Analyzed: 1417

GC Column: CAP ID: 0.530(mm) Heated Purge: (Y/N) Y

Instrument ID: 4500

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS AND MSD:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	TIME ANALYZED
01	MW-3D	21232003	C4V0021298	1724

COMMENTS: CLP,21232,,VBLKS,L,S,Y04022B1,V,BLANK,
10DG TO 160DG @4DG/MIN IH=7MIN

FORM IV VOA

3/90 mm

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

VBLKS_2

Lab Name: CH2M HILL/MGM Contract: _____

Lab Code: _____ Case No.: 21232 SAS No.: _____ SDG No.: _____

Matrix: (soil/water) SOIL Lab Sample ID: Y04022B1

Sample wt/vol: 5.0 (g/mL) G Lab File ID: CBV0021293

Level: (low/med) LOW Date Received: 04/02/92

% Moisture: not dec. 0 Date Analyzed: 04/02/92

GC Column: CAP ID: 0.530 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____(uL)

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

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

VBLKS_2

Lab Name: CH2M HILL/MGM Contract: _____

Code: _____ Case No.: 21232 SAS No.: _____ SDG No.: _____

Matrix: (soil/water) SOIL Lab Sample ID: Y04022B1

Sample wt/vol: 5.0 (g/mL) G Lab File ID: CBVO021293

Level: (low/med) LOW Date Received: 04/02/92

% Moisture: not dec. 0 Date Analyzed: 04/02/92

GC Column: CAP ID: 0.530 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____(uL)

Number TICs found: 0

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

4A
VOLATILE METHOD BLANK SUMMARY

EPA SAMPLE NO.

VBLKSM

Lab Name: CH2M HILL/MGM Contract: _____

Lab Code: _____ Case No.: 21232 SAS No.: _____ SDG No.: _____

Lab File ID: BBVM014760 Lab Sample ID: L03312B3

Date Analyzed: 04/01/92 Time Analyzed: 1511

GC Column: CAP ID: 0.530(mm) Heated Purge: (Y/N) N

Instrument ID: 5100B

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS AND MSD:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	TIME ANALYZED
01	TT-12-01_DL	21232001DL	B3VM014767	1929
02	TT-14-02_DL	21232002DL	B2VM014762	1629
03	TT14-02DLMS	21232M02	BMVM014772	2219
04	TT14-02DLMSD	21232D02	BMVM014766	1854

COMMENTS: CLP,21222,,VBLKS,M,S,L03312B3,V,BLANK,
10DG TO 200DG @8DG/MIN IH=3MIN

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

VBLKSM

Lab Name: CH2M HILL/MGM Contract: _____

Code: _____ Case No.: 21232 SAS No.: _____ SDG No.: _____

Matrix: (soil/water) SOIL Lab Sample ID: L03312B3

Sample wt/vol: 4.0 (g/mL) G Lab File ID: BBVM014760

Level: (low/med) MED Date Received: 04/01/92

% Moisture: not dec. 0 Date Analyzed: 04/01/92

GC Column: CAP ID: 0.530 (mm) Dilution Factor: 1.0

Soil Extract Volume: 10000 (uL) Soil Aliquot Volume: 100 (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
74-87-3	Chloromethane	1200	U
74-83-9	Bromomethane	1200	U
75-01-4	Vinyl Chloride	1200	U
75-00-3	Chloroethane	1200	U
75-09-2	Methylene Chloride	450	J
67-64-1	Acetone	1200	U
75-15-0	Carbon Disulfide	1200	U
75-35-4	1,1-Dichloroethene	1200	U
75-34-3	1,1-Dichloroethane	1200	U
540-59-0	1,2-Dichloroethene (total)	1200	U
67-66-3	Chloroform	1200	U
107-06-2	1,2-Dichloroethane	1200	U
78-93-3	2-Butanone	1200	U
71-55-6	1,1,1-Trichloroethane	1200	U
56-23-5	Carbon Tetrachloride	1200	U
75-27-4	Bromodichloromethane	1200	U
78-87-5	1,2-Dichloropropane	1200	U
10061-01-5	cis-1,3-Dichloropropene	1200	U
79-01-6	Trichloroethene	1200	U
124-48-1	Dibromochloromethane	1200	U
79-00-5	1,1,2-Trichloroethane	1200	U
71-43-2	Benzene	1200	U
10061-02-6	trans-1,3-Dichloropropene	1200	U
75-25-2	Bromoform	1200	U
591-78-6	2-Hexanone	1200	U
108-10-1	4-Methyl-2-Pentanone	1200	U
127-18-4	Tetrachloroethene	1200	U
79-34-5	1,1,2,2-Tetrachloroethane	1200	U
108-88-3	Toluene	1200	U
108-90-7	Chlorobenzene	1200	U
100-41-4	Ethylbenzene	1200	U
100-42-5	Styrene	1200	U
1330-20-7	Xylene (total)	1200	U

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

VBLKSM

Lab Name: CH2M HILL/MGM Contract: _____

Lab Code: _____ Case No.: 21232 SAS No.: _____ SDG No.: _____

Matrix: (soil/water) SOIL Lab Sample ID: L03312B3

Sample wt/vol: 4.0 (g/mL) G Lab File ID: BBVM014760

Level: (low/med) MED Date Received: 04/01/92

% Moisture: not dec. 0 Date Analyzed: 04/01/92

GC Column: CAP ID: 0.530 (mm) Dilution Factor: 1.0

Soil Extract Volume: 10000 (uL) Soil Aliquot Volume: 100 (uL)

Number TICs found: 0

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

4B
SEMIVOLATILE METHOD BLANK SUMMARY

EPA SAMPLE NO.

SBLKS

Lab Name: CH2M HILL/MGM Contract: _____

Code: _____ Case No.: 21232 SAS No.: _____ SDG No.: _____

Lab File ID: ABBA013524 Lab Sample ID: S03232B1

Instrument ID: 4000 Date Extracted: 03/23/92

Matrix: (soil/water) SOIL Date Analyzed: 04/02/92

Level:(low/med) LOW Time Analyzed: 1500

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS AND MSD:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
01	TT-14-02	21232002	A1BA013528	04/02/92
02	TT-14-02_DL	21232002DL	A2BA013529	04/02/92
03	TT14-02DLMS	21232M02	AMBA013531	04/02/92
04	TT14-02DLMSD	21232D02	AMBA013532	04/02/92

COMMENTS: CLP,21232,,SBLKS,L,S,S03232B1,B,B,
20DG TO 310DG @4DG/MIN IH=10MIN

FORM IV SV

3/90

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SBLKS

Lab Name: CH2M HILL/MGM Contract: _____

Lab Code: _____ Case No.: 21232 SAS No.: _____ SDG No.: _____

Matrix: (soil/water) SOIL Lab Sample ID: S03232B1

Sample wt/vol: 30.0 (g/mL) G Lab File ID: ABBA013524

Level: (low/med) LOW Date Received: 03/23/92

% Moisture: 0 decanted: (Y/N) N Date Extracted: 03/23/92

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 04/02/92

Injection Volume: 2.0(uL) Dilution Factor: 1.0

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-95-2	Phenol	330	U
111-44-4	bis(2-Chloroethyl)Ether	330	U
95-57-8	2-Chlorophenol	330	U
541-73-1	1,3-Dichlorobenzene	330	U
106-46-7	1,4-Dichlorobenzene	330	U
95-50-1	1,2-Dichlorobenzene	330	U
95-48-7	2-Methylphenol	330	U
108-60-1	2,2'-oxybis(1-Chloropropane)	330	U
106-44-5	4-Methylphenol	330	U
621-64-7	N-Nitroso-Di-n-Propylamine	330	U
67-72-1	Hexachloroethane	330	U
98-95-3	Nitrobenzene	330	U
78-59-1	Isophorone	330	U
88-75-5	2-Nitrophenol	330	U
105-67-9	2,4-Dimethylphenol	330	U
111-91-1	bis(2-Chloroethoxy)Methane	330	U
120-83-2	2,4-Dichlorophenol	330	U
120-82-1	1,2,4-Trichlorobenzene	330	U
91-20-3	Naphthalene	330	U
106-47-8	4-Chloroaniline	330	U
87-68-3	Hexachlorobutadiene	330	U
59-50-7	4-Chloro-3-Methylphenol	330	U
91-57-6	2-Methylnaphthalene	330	U
77-47-4	Hexachlorocyclopentadiene	330	U
88-06-2	2,4,6-Trichlorophenol	330	U
95-95-4	2,4,5-Trichlorophenol	800	U
91-58-7	2-Chloronaphthalene	330	U
88-74-4	2-Nitroaniline	800	U
131-11-3	Dimethylphthalate	330	U
208-96-8	Acenaphthylene	330	U
606-20-2	2,6-Dinitrotoluene	330	U
99-09-2	3-Nitroaniline	800	U
83-32-9	Acenaphthene	330	U

1C

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SBLKS

Lab Name: CH2M HILL/MGM Contract: _____

Code: _____ Case No.: 21232 SAS No.: _____ SDG No.: _____

Matrix: (soil/water) SOIL Lab Sample ID: S03232B1

Sample wt/vol: 30.0 (g/mL) G Lab File ID: ABBA013524

Level: (low/med) LOW Date Received: 03/23/92

% Moisture: 0 decanted: (Y/N) N Date Extracted: 03/23/92

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 04/02/92

Injection Volume: 2.0(uL) Dilution Factor: 1.0

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	800	U
100-02-7	4-Nitrophenol	800	U
132-64-9	Dibenzofuran	330	U
121-14-2	2,4-Dinitrotoluene	330	U
84-66-2	Diethylphthalate	330	U
7005-72-3	4-Chlorophenyl-phenylether	330	U
86-73-7	Fluorene	330	U
100-10-6	4-Nitroaniline	800	U
534-52-1	4,6-Dinitro-2-methylphenol	800	U
86-30-6	N-Nitrosodiphenylamine (1)	330	U
101-55-3	4-Bromophenyl-phenylether	330	U
118-74-1	Hexachlorobenzene	330	U
87-86-5	Pentachlorophenol	800	U
85-01-8	Phenanthrene	330	U
120-12-7	Anthracene	330	U
86-74-8	Carbazole	330	U
84-74-2	Di-n-Butylphthalate	130	J
206-44-0	Fluoranthene	330	U
129-00-0	Pyrene	330	U
85-68-7	Butylbenzylphthalate	330	U
91-94-1	3,3'-Dichlorobenzidine	330	U
56-55-3	Benzo(a)Anthracene	330	U
218-01-9	Chrysene	330	U
117-81-7	bis(2-Ethylhexyl)Phthalate	330	U
117-84-0	Di-n-Octyl Phthalate	330	U
205-99-2	Benzo(b)Fluoranthene	330	U
207-08-9	Benzo(k)Fluoranthene	330	U
50-32-8	Benzo(a)Pyrene	330	U
193-39-5	Indeno(1,2,3-cd)Pyrene	330	U
53-70-3	Dibenz(a,h)Anthracene	330	U
191-24-2	Benzo(g,h,i)Perylene	330	U

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

SBLKS

Lab Name: CH2M HILL/MGM Contract: _____

Lab Code: _____ Case No.: 21232 SAS No.: _____ SDG No.: _____

Matrix: (soil/water) SOIL Lab Sample ID: S03232B1

Sample wt/vol: 30.0 (g/mL) G Lab File ID: ABBA013524

Level: (low/med) LOW Date Received: 03/23/92

% Moisture: 0 decanted: (Y/N) N Date Extracted: 03/23/92

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 04/02/92

Injection Volume: 2.0(uL) Dilution Factor: 1.0

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

Number TICs found: 9

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	ACETIC ACID, METHYLETHYL EST	3.85	130	J
2.	ACETIC ACID, METHYLETHYL EST	3.90	150	J
3.	NOT IDENTIFIED	6.77	140	J
4.	NOT IDENTIFIED	6.82	200	J
5. 20019-64-1	2(5H)-FURANONE, 5,5-DIMETHYL	7.77	190	J
6. 112-36-7	ETHANE, 1,1'-OXYBIS[2-ETHOXY	8.90	250	J
7. 541-02-6	CYCLOPENTASILOXANE, DECAMETH	11.70	83	J
8.	NOT IDENTIFIED	27.67	200	J
9.	NOT IDENTIFIED	4.82	15000	J

4B

SEMIVOLATILE METHOD BLANK SUMMARY

EPA SAMPLE NO.

SBLKS

Lab Name: CH2M HILL/MGM Contract: _____

Code: _____ Case No.: S21232 SAS No.: _____ SDG No.: _____

Lab File ID: DBPA010372 Lab Sample ID: S03232B1

Instrument ID: 5100D Date Extracted: 03/23/92

Matrix: (soil/water) SOIL Date Analyzed: 04/02/92

Level:(low/med) LOW Time Analyzed: 1527

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS AND MSD:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
01	MW-3D	21232003	D1PA010364	04/02/92
02	MW-3D_DL	21232003DL	D2PA010392	04/03/92
03	TT-1[illegible]-01	21232001	D2PA010391	04/03/92

COMMENTS: CLP,21222,,SBLKS,L,S,S03232B1,B,BLANK,
30DG TO 310DG @10DG/MIN IH=4MINS

FORM IV SV

3/90 MTP

ORGANICS ANALYSIS DATA SHEET

Laboratory Name:	CH2M HILL/MGM	Concentration:	LOW	Date Extracted:	03/23/92
Lab Sample ID:	S03232B1	Sample Matrix:	SOIL	Date Analyzed:	04/02/92
Client Sample ID:	SBLKS	Percent Moisture:	0.0	Dilution Factor:	1.0

POLYNUCLEAR AROMATIC COMPOUNDS

CAS Number		ug/Kg		CAS Number		ug/Kg	
271-89-6	2,3-Benzofuran	330	U	260-94-6	Acridine	330	U
496-11-7	2,3-Dihydro-1h-Indene	330	U	229-87-8	Phenanthridine	330	U
95-13-6	1H-Indene	330	U	86-74-8	Carbazole	330	U
91-20-3	Naphthalene	330	U	206-44-0	Fluoranthene	330	U
95-15-8	Benzo(b)thiophene	330	U	129-00-0	Pyrene	330	U
91-22-5	Quinoline	330	U	56-55-3	Benzo(a)anthracene	330	U
119-65-3	Isoquinoline	330	U	218-01-9	Chrysene/Triphenylene	330	U
91-57-6	2-Methylnaphthalene	330	U	NA	Benzo(b&k)fluoranthene	NR	
120-72-9	Indole	330	U	57-97-6	7,12-Dimethylbenz(a)anthrac	330	U
90-12-0	1-Methylnaphthalene	330	U	192-97-2	Benzo(e)pyrene	330	U
92-52-4	Biphenyl	330	U	50-32-8	Benzo(a)pyrene	330	U
208-96-8	Acenaphthylene	330	U	198-55-0	Perylene	330	U
83-32-9	Acenaphthene	330	U	56-49-5	3-Methylcholanthrene	330	U
132-64-9	Dibenzofuran	330	U	193-39-5	Indeno(1,2,3-cd)pyrene	330	U
86-73-7	Fluorene	330	U	53-70-3	Dibenz(a,h)anthracene	330	U
132-65-0	Dibenzothiophene	330	U	191-24-2	Benzo(g,h,i,)perylene	330	U
85-01-8	Phenanthrene	330	U	205-99-2	Benzo(b)fluoranthene	330	U
120-12-7	Anthracene	330	U	207-08-9	Benzo(k)fluoranthene	330	U

U - Compound analyzed for but not detected.
B - Compound was detected in QC blank.
J - Reported value less than quantitation limit.

Form I

MTP

ORGANICS ANALYSIS DATA SHEET

ratory Name:	CH2M HILL/MGM	Concentration:	LOW	Date Extracted:	03/23/92
Lab Sample ID:	S03232B1	Sample Matrix:	SOIL	Date Analyzed:	04/02/92
Client Sample ID:	SBLKS	Percent Moisture:	0.0	Dilution Factor:	1.0

PHENOL COMPOUNDS

CAS Number		ug/Kg		CAS Number	ug/Kg
108-95-2	Phenol	330	U		
95-57-8	2-Chlorophenol	330	U		
95-48-7	2-Methylphenol	330	U		
106-44-5	4-Methylphenol	330	U		
88-75-5	2-Nitrophenol	330	U		
105-67-9	2,4-Dimethylphenol	330	U		
120-83-2	2,4-Dichlorophenol	330	U		
65-85-0	Benzoic acid	800	U		
59-50-7	4-Chloro-3-Methylphenol .	330	U		
88-06-2	2,4,6-Trichlorophenol . .	330	U		
-95-4	2,4,5-Trichlorophenol . .	800	U		
51-28-5	2,4-Dinitrophenol	800	U		
100-02-7	4-Nitrophenol	800	U		
534-52-1	4,6-Dinitro-2-Methylphenol	800	U		
87-86-5	Pentachlorophenol	800	U		

U - Compound analyzed for but not detected.
- Compound was detected in QC blank.
J - Reported value less than quantitation limit.

Form I

4C
PESTICIDE METHOD BLANK SUMMARY

EPA SAMPLE NO.

PBLK23

Lab Name: CH2M HILL/MGM Contract: _____

Lab Code: CH2M Case No.: 21232 SAS No.: _____ SDG No.: _____

Lab Sample ID: S03232B1 Lab File ID: _____

Matrix:(soil/water) SOIL Extraction:(SepF/Cont/Sonc) SONC

Sulfur Cleanup: (Y/N) Y Date Extracted: 03/23/92

Date Analyzed (1): 04/09/92 Date Analyzed (2): 04/09/92

Time Analyzed (1): 1644 Time Analyzed (2): 1644

Instrument ID (1): V6000A Instrument ID (2): V6000B

GC Column (1): SPB-5 ID: 0.53 (mm) GC Column (2): SPB-608 ID: 0.53 (mm)

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS AND MSD:

	EPA SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED 1	DATE ANALYZED 2
01	TT-14-02	21232002	04/09/92	04/09/92
02	TT-14-02MS	21232M02	04/09/92	04/09/92
03	TT-14-02MSD	21232D02	04/09/92	04/09/92

COMMENTS:

1D

PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

PBLK23

Lab Name: CH2M HILL/MGM Contract: _____

Code: CH2M Case No.: 21232 SAS No.: _____ SDG No.: _____

Matrix: (soil/water) SOIL Lab Sample ID: S03232B1

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

% Moisture: _____ decanted: (Y/N) ___ Date Received: _____

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 03/23/92

Concentrated Extract Volume: 5000 (uL) Date Analyzed: 04/09/92

Injection Volume: 2.00 (uL) Dilution Factor: 1.00

GPC Cleanup: (Y/N) Y pH: 7.0 Sulfur Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
319-84-6	alpha-BHC	1.7	U
319-85-7	beta-BHC	1.7	U
319-86-8	delta-BHC	1.7	U
58-89-9	gamma-BHC (Lindane)	1.7	U
76-44-8	Heptachlor	1.7	U
309-00-2	Aldrin	1.7	U
1024-57-3	Heptachlor epoxide	1.7	U
959-98-8	Endosulfan I	1.7	U
60-57-1	Dieldrin	3.3	U
72-55-9	4,4'-DDE	3.3	U
72-20-8	Endrin	3.3	U
33213-65-9	Endosulfan II	3.3	U
72-54-8	4,4'-DDD	3.3	U
1031-07-8	Endosulfan sulfate	3.3	U
50-29-3	4,4'-DDT	3.3	U
72-43-5	Methoxychlor	17	U
53494-70-5	Endrin ketone	3.3	U
7421-36-3	Endrin aldehyde	3.3	U
5103-71-9	alpha-Chlordane	1.7	U
5103-74-2	gamma-Chlordane	1.7	U
8001-35-2	Toxaphene	170	U
12674-11-2	Aroclor-1016	33	U
11104-28-2	Aroclor-1221	67	U
11141-16-5	Aroclor-1232	33	U
53469-21-9	Aroclor-1242	33	U
12672-29-6	Aroclor-1248	33	U
11097-69-1	Aroclor-1254	33	U
11096-82-5	Aroclor-1260	33	U

8A

VOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: CH2M HILL/MGM Contract: _____

Lab Code: _____ Case No.: 21232 SAS No.: _____ SDG No.: _____

Lab File ID (Standard): CSVO021250 Date Analyzed: 03/30/92

Instrument ID: 4500 Time Analyzed: 2126

GC Column: CAP ID: 0.530(mm) Heated Purge: (Y/N) Y

		IS1(BCM) AREA #	RT #	IS2(DFB) AREA #	RT #	IS3(CBZ) AREA #	RT #
	12 HOUR STD	80035	11.04	320963	12.54	285694	17.44
	UPPER LIMIT	160070	11.54	641926	13.04	571388	17.94
	LOWER LIMIT	40018	10.54	160482	12.04	142847	16.94
	EPA SAMPLE NO.						
01	TT-12-01	61022	10.99	233160	12.50	173184	17.40
02	TT-14-02	73490	11.04	288561	12.55	249062	17.45
03	VBLKS	59713	11.00	238169	12.50	216967	17.42

IS1 (BCM) = Bromochloromethane
IS2 (DFB) = 1,4-Difluorobenzene
IS3 (CBZ) = Chlorobenzene-d5

AREA UPPER LIMIT = + 100% of internal standard area.
AREA LOWER LIMIT = - 50% of internal standard area.
RT UPPER LIMIT = +0.50 minutes of internal standard RT.
RT LOWER LIMIT = -0.50 minutes of internal standard RT.

Column used to flag values outside QC limits with an asterisk.
* Values outside of QC limits.

8A

VOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: CH2M HILL/MGM Contract: _____

Job Code: _____ Case No.: 21232 SAS No.: _____ SDG No.: _____

Lab File ID (Standard): CSV0021292 Date Analyzed: 04/02/92

Instrument ID: 4500 Time Analyzed: 1328

GC Column: CAP ID: 0.530(mm) Heated Purge: (Y/N) Y

		IS1(BCM) AREA #	RT #	IS2(DFB) AREA #	RT #	IS3(CBZ) AREA #	RT #
	12 HOUR STD	45788	12.14	181209	13.60	160921	18.47
	UPPER LIMIT	91576	12.64	362418	14.10	321842	18.97
	LOWER LIMIT	22894	11.64	90604	13.10	80460	17.97
	EPA SAMPLE NO.						
01	MW-3D	43504	12.12	162719	13.59	140969	18.45
02	VBLKS_2	42901	12.07	170417	13.54	150211	18.44

IS1 (BCM) = Bromochloromethane
IS2 (DFB) = 1,4-Difluorobenzene
IS3 (CBZ) = Chlorobenzene-d5

AREA UPPER LIMIT = + 100% of internal standard area.
AREA LOWER LIMIT = - 50% of internal standard area.
RT UPPER LIMIT = +0.50 minutes of internal standard RT.
RT LOWER LIMIT = -0.50 minutes of internal standard RT.

Column used to flag values outside QC limits with an asterisk.
* Values outside of QC limits.

FORM VIII VOA 3/90 MMP

8A .

VOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: CH2M HILL/MGM Contract: _____

Lab Code: _____ Case No.: 21232 SAS No.: _____ SDG No.: _____

Lab File ID (Standard): BSVM014759 Date Analyzed: 04/01/92

Instrument ID: 5100B Time Analyzed: 1406

GC Column: CAP ID: 0.530(mm) Heated Purge: (Y/N) N

		IS1(BCM) AREA #	RT #	IS2(DFB) AREA #	RT #	IS3(CBZ) AREA #	RT #
	12 HOUR STD	69713	9.57	259220	11.09	244025	15.95
	UPPER LIMIT	139426	10.07	518440	11.59	488050	16.45
	LOWER LIMIT	34856	9.07	129610	10.59	122012	15.45
	EPA SAMPLE NO.						
01	TT-12-01_DL	67990	9.54	247690	11.07	223626	15.94
02	TT-14-02_DL	73108	9.54	269852	11.07	248224	15.95
03	TT14-02DLMS	64478	9.57	237086	11.09	216403	15.94
04	TT14-02DLMSD	61755	9.54	226977	11.07	216043	15.94
05	VBLKSM	66911	9.59	258484	11.10	237757	15.95

IS1 (BCM) = Bromochloromethane
IS2 (DFB) = 1,4-Difluorobenzene
IS3 (CBZ) = Chlorobenzene-d5

AREA UPPER LIMIT = + 100% of internal standard area.
AREA LOWER LIMIT = - 50% of internal standard area.
RT UPPER LIMIT = +0.50 minutes of internal standard RT.
RT LOWER LIMIT = -0.50 minutes of internal standard RT.

Column used to flag values outside QC limits with an asterisk.
* Values outside of QC limits.

8B

SEMIVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: CH2M HILL/MGM Contract: _____

Code: _____ Case No.: 21232 SAS No.: _____ SDG No.: _____

Lab File ID (Standard): ASBA013523 Date Analyzed: 04/02/92

Instrument ID: 4000 Time Analyzed: 1410

		IS1(DCB) AREA #	RT #	IS2(NPT) AREA #	RT #	IS3(ANT) AREA #	RT #
	12 HOUR STD	16391	8.72	64426	12.15	30275	17.05
	UPPER LIMIT	32782	9.22	128852	12.65	60550	17.55
	LOWER LIMIT	8196	8.22	32213	11.65	15138	16.55
	EPA SAMPLE NO.						
01	TT-14-02	15514	8.75	55816	12.17	32587	17.05
02	TT-14-02_DL	15284	8.77	66728	12.19	34531	17.05
03	TT14-02DLMS	17640	8.65	72075	12.15	36467	17.07
04	TT14-02DLMSD	17354	8.70	75781	12.14	37909	17.04
05	SBLKS	17192	8.77	74628	12.14	36956	17.04

IS1 (DCB) = 1,4-Dichlorobenzene-d4
IS2 (NPT) = Naphthalene-d8
IS3 (ANT) = Acenaphthene-d10

AREA UPPER LIMIT = + 100% of internal standard area.
AREA LOWER LIMIT = - 50% of internal standard area.
RT UPPER LIMIT = +0.50 minutes of internal standard RT.
RT LOWER LIMIT = -0.50 minutes of internal standard RT.

Column used to flag internal standard area values with an asterisk.
* Values outside of QC limits.

8C

SEMIVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: CH2M HILL/MGM Contract: _____

Lab Code: _____ Case No.: 21232 SAS No.: _____ SDG No.: _____

Lab File ID (Standard): ASBA013523 Date Analyzed: 04/02/92

Instrument ID: 4000 Time Analyzed: 1410

		IS4(PHN) AREA #	RT #	IS5(CRY) AREA #	RT #	IS6(PRY) AREA #	RT #
	12 HOUR STD	40409	21.17	35554	28.77	38449	32.59
	UPPER LIMIT	80818	21.67	71108	29.27	76898	33.09
	LOWER LIMIT	20204	20.67	17777	28.27	19224	32.09
	EPA SAMPLE NO.						
01	TT-14-02	46315	21.15	42616	28.69	45920	32.49
02	TT-14-02_DL	50682	21.12	43836	28.71	47666	32.52
03	TT14-02DLMS	54555	21.19	46955	28.77	51613	32.61
04	TT14-02DLMSD	55048	21.15	48385	28.74	51605	32.57
05	SBLKS	52119	21.14	42317	28.74	43058	32.56

IS4 (PHN) = Phenanthrene-d10
IS5 (CRY) = Chrysene-d12
IS6 (PRY) = Perylene-d12

AREA UPPER LIMIT = + 100% of internal standard area.
AREA LOWER LIMIT = - 50% of internal standard area.
RT UPPER LIMIT = +0.50 minutes of internal standard RT.
RT LOWER LIMIT = -0.50 minutes of internal standard RT.

Column used to flag internal standard area values with an asterisk.
* Values outside of QC limits.

8B

SEMIVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: CH2M HILL/MGM Contract: _____

Lab Code: _____ Case No.: S21232 SAS No.: _____ SDG No.: _____

Lab File ID (Standard): DSPA010362 Date Analyzed: 04/02/92

Instrument ID: 5100D Time Analyzed: 0813

		IS1(DCB) AREA #	RT #	IS2(NPT) AREA #	RT #	IS3(ANT) AREA #	RT #
	12 HOUR STD	9234	9.82	35837	12.74	25187	17.05
	UPPER LIMIT	18468	10.32	71674	13.24	50374	17.55
	LOWER LIMIT	4617	9.32	17918	12.24	12594	16.55
	EPA SAMPLE NO.						
01	MW-3D	10276	9.79	45004	12.70	34069	17.02
02	SBLKS	8258	9.77	36479	12.64	25623	16.89

IS1 (DCB) = 1,4-Dichlorobenzene-d4
IS2 (NPT) = Naphthalene-d8
IS3 (ANT) = Acenaphthene-d10

AREA UPPER LIMIT = + 100% of internal standard area.
AREA LOWER LIMIT = - 50% of internal standard area.
RT UPPER LIMIT = +0.50 minutes of internal standard RT.
RT LOWER LIMIT = -0.50 minutes of internal standard RT.

Column used to flag internal standard area values with an asterisk.
* Values outside of QC limits.

FORM VIII SV-1 3/90 MTP

8C

SEMIVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: CH2M HILL/MGM Contract: _____

Lab Code: _____ Case No.: S21232 SAS No.: _____ SDG No.: _____

Lab File ID (Standard): DSPA010362 Date Analyzed: 04/02/92

Instrument ID: 5100D Time Analyzed: 0813

		IS4(PHN) AREA #	RT #	IS5(CRY) AREA #	RT #	IS6(PRY) AREA #	RT #
	12 HOUR STD	41092	20.70	41286	27.42	47700	30.81
	UPPER LIMIT	82184	21.20	82572	27.92	95400	31.31
	LOWER LIMIT	20546	20.20	20643	26.92	23850	30.31
	EPA SAMPLE NO.						
01	MW-3D	62357	20.65	71680	27.39	80118	30.77
02	SBLKS	45039	20.52	49668	27.26	56959	30.64

IS4 (PHN) = Phenanthrene-d10
IS5 (CRY) = Chrysene-d12
IS6 (PRY) = Perylene-d12

AREA UPPER LIMIT = + 100% of internal standard area.
AREA LOWER LIMIT = - 50% of internal standard area.
RT UPPER LIMIT = +0.50 minutes of internal standard RT.
RT LOWER LIMIT = -0.50 minutes of internal standard RT.

Column used to flag internal standard area values with an asterisk.
* Values outside of QC limits.

FORM VIII SV-2

3/90 MTP

8B

SEMIVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: CH2M HILL/MGM Contract: _____

Lab Code: _____ Case No.: S21232 SAS No.: _____ SDG No.: _____

Lab File ID (Standard): DSPA010381 Date Analyzed: 04/03/92

Instrument ID: 5100D Time Analyzed: 0740

		IS1(DCB) AREA #	RT #	IS2(NPT) AREA #	RT #	IS3(ANT) AREA #	RT #
	12 HOUR STD	10239	9.69	41966	12.52	31814	16.75
	UPPER LIMIT	20478	10.19	83932	13.02	63628	17.25
	LOWER LIMIT	5120	9.19	20983	12.02	15907	16.25
	EPA SAMPLE NO.						
01	MW-3D_DL	12888	9.65	53291	12.50	39719	16.74
02	TT-12-01	12525	9.65	49896	12.54	34517	16.77

IS1 (DCB) = 1,4-Dichlorobenzene-d4
IS2 (NPT) = Naphthalene-d8
IS3 (ANT) = Acenaphthene-d10

AREA UPPER LIMIT = + 100% of internal standard area.
AREA LOWER LIMIT = - 50% of internal standard area.
RT UPPER LIMIT = +0.50 minutes of internal standard RT.
RT LOWER LIMIT = -0.50 minutes of internal standard RT.

Column used to flag internal standard area values with an asterisk.
* Values outside of QC limits.

8C

SEMIVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: CH2M HILL/MGM Contract: _____

Lab Code: _____ Case No.: S21232 SAS No.: _____ SDG No.: _____

Lab File ID (Standard): DSPA010381 Date Analyzed: 04/03/92

Instrument ID: 5100D Time Analyzed: 0740

		IS4(PHN) AREA #	RT #	IS5(CRY) AREA #	RT #	IS6(PRY) AREA #	RT #
	12 HOUR STD	53575	20.37	57198	27.09	60045	30.49
	UPPER LIMIT	107150	20.87	114396	27.59	120090	30.99
	LOWER LIMIT	26788	19.87	28599	26.59	30022	29.99
	EPA SAMPLE NO.						
01	MW-3D_DL	71093	20.35	83094	27.07	90383	30.47
02	TT-12-01	63878	20.40	66457	27.11	73441	30.47

IS4 (PHN) = Phenanthrene-d10
IS5 (CRY) = Chrysene-d12
IS6 (PRY) = Perylene-d12

AREA UPPER LIMIT = + 100% of internal standard area.
AREA LOWER LIMIT = - 50% of internal standard area.
RT UPPER LIMIT = +0.50 minutes of internal standard RT.
RT LOWER LIMIT = -0.50 minutes of internal standard RT.

Column used to flag internal standard area values with an asterisk.
* Values outside of QC limits.

SAMPLE DATA PACKAGE

SAMPLE DATA PACKAGE

CASE NARRATIVE

Engineers
Planners
CH2M HILL Economists
Scientists

CASE NARRATIVE FOR VOLATILE MASS SPECTROMETRY SAMPLES

LABORATORY: CH2M HILL LABORATORIES CLIENT: BARR ENGINEERING

CASE NO. : N/A CONTRACT NO.: N/A

LAB NO. : 21232 SDG NO.: N/A

I. RECEIPT

A. DATE: March 19, 1992

B. SAMPLE INFORMATION

LAB ID	CLIENT ID	SAMPLE MATRIX	DATE SAMPLED	EXTRACTION DATE	ANALYSIS DATE
21232001	TT-12-01	SOIL	03/18/92	NA	03/31/92
21232001DL	TT-12-01_DL	SOIL	03/18/92	04/01/92	04/01/92
21232002	TT-14-02	SOIL	03/18/92	NA	03/31/92
21232002DL	TT-14-02_DL	SOIL	03/18/92	04/01/92	04/01/92
21232003	MW-3D	SOIL	03/18/92	NA	04/02/92
21232M02	TT-14-02MS	SOIL	03/18/92	NA	04/01/92
21232D02	TT-14-02MSD	SOIL	03/18/92	NA	04/01/92
Y03302B3	VBLKS	SOIL	NA	NA	03/30/92
L03312B3	VBLKSM	SOIL	NA	04/01/92	04/01/92
Y04022B1	VBLKS_2	SOIL	NA	NA	04/02/92

C. Documentation
Exceptions : No exceptions were encountered.

II. EXTRACTION

A. Holding Times: All holding times were met.

B. Extraction
Exceptions : No exceptions were encountered.

000070A

III. ANALYSIS

A. Holding times: All holding times were met.

B. Analytical Exceptions : Please see attached table for information concerning methylene chloride and acetone.

Please note that the original analysis of samples 21232001 (TT-12-01) and 21232002 (TT-14-02) showed target compounds above the calibration range. The samples were diluted and reanalyzed using medium level protocol. The results of both analyses have been reported.

IV. QUALITY CONTROL

A. Method Blank : All associated method blanks met acceptable QC criteria.

B. Surrogate Recoveries : Please note that sample 21232M02 (TT-14-02MS) showed two surrogates below QC limits. According to CLP protocol, the matrix spike and matrix spike duplicate samples need not be reanalyzed when surrogate recoveries are outside QC limits if the surrogate recoveries in the native sample are within QC limits. Since the native sample showed all surrogates within QC limits, the laboratory took no further action. All other samples met acceptable QC limits.

C. Matrix Spike Results : Please note that the percent recovery of Benzene is below acceptable QC limits in sample 21232M02. The relative percent differences for Benzene and Toluene are above acceptable QC limits. Since these limits are advisory limits only, the laboratory took no further action. All other spike recoveries were within acceptable QC limits.

Please note that Forms II, IV, V, and VIII have numbers to the immediate left of each table. These numbers are sequential only and have no relation to CH2M HILL identification numbers.

I 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 contained in this hardcopy data package and in the computer-readable data submitted on floppy diskette has been authorized by the Laboratory Manager or his designee, as verified by the following signature.

Herb Kelly 5/4/92

Herb Kelly
Manager, Organic Division

Date

0000708

Engineers
Planners
CH2M HILL
Economists
Scientists

METHYLENE CHLORIDE/ACETONE SUMMARY

Due to the level of target compounds, the following samples required large dilutions for analysis. As required by the Statement of Work, these dilution factors have been applied, without background subtraction, to all detected compounds, particularly methylene chloride and acetone. As methylene chloride and acetone are common laboratory contaminants, the following table is being provided to present a more accurate perspective of these compounds. Included in the table is 1) the amount of methylene chloride and acetone, detected at the instrument, prior to multiplication by the dilution factor; and 2) the amount of methylene chloride and acetone for that particular sample's laboratory method blank.

SAMPLE	METHYLENE CHLORIDE	ACETONE	METHOD BLANK	METHYLENE CHLORIDE	ACETONE
21232001DL	4 ug/Kg	10 U	L03312B3	4 ug/Kg	10 U
21232002	9 ug/Kg	8 ug/Kg	Y03302B3	7 ug/Kg	6 ug/Kg /
21232002DL	4 ug/Kg	10 U	L03312B3	4 ug/Kg	10 U

000070 C

Engineers
Planners
CH2M HILL
Economists
Scientists

CASE NARRATIVE FOR SEMIVOLATILE MASS SPECTROMETRY SAMPLES

LABORATORY: CH2M HILL LABORATORIES CLIENT: BARR ENGINEERING

CASE NO. : N/A CONTRACT NO.: N/A

LAB NO. : 21232 SDG NO.: N/A

I. RECEIPT

A. DATE: March 19, 1992

B. SAMPLE INFORMATION

LAB ID	CLIENT ID	SAMPLE MATRIX	DATE SAMPLED	EXTRACTION DATE	ANALYSIS DATE
21232002	TT-14-02	SOIL	03/18/92	03/23/92	04/02/92
21232002DL	TT-14-02_DL	SOIL	03/18/92	03/23/92	04/02/92
21232M02	TT14-02MS	SOIL	03/18/92	03/23/92	04/02/92
21232D02	TT14-02MSD	SOIL	03/18/92	03/23/92	04/02/92
S03232B1	SBLKS	SOIL	NA	03/23/92	04/02/92

C. Documentation Exceptions : Please note that the amount listed on the quantitation report reflects the mass detected at the instrument. According to the CLP Statement of Work, 2-uL injections must be made. Therefore, the amount on the quantitation report must be divided by a factor of two in order to determine the concentration of the extract injected.

No other exceptions were encountered.

000070D

II. EXTRACTION

A. Holding Times: All holding times were met.

B. Extraction Exceptions : No exceptions were encountered.

III. ANALYSIS

A. Holding times: All holding times were met.

B. Analytical Exceptions : The original analysis of samples 21232002 (TT-14-02) showed target compounds above the calibration range. The sample was diluted and reanalyzed. The results of both analyses have been reported.

No other exceptions were encountered.

IV. QUALITY CONTROL

A. Method Blank : All associated method blanks met acceptable QC criteria.

B. Surrogate Recoveries : All samples met acceptable QC limits.

C. Matrix Spike Results : Please note that the relative percent difference of several compounds failed to meet acceptable QC limits. Since the percent recoveries were within acceptable QC criteria, the laboratory took no further action.

All other spike recoveries were within CLP advisory limits.

Please note that Forms II, IV, V, and VIII have numbers to the immediate left of each table. These numbers are sequential only and have no relation to CH2M HILL identification numbers.

I 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 contained in this hardcopy data package and in the computer-readable data submitted on floppy diskette has been authorized by the Laboratory Manager or his designee, as verified by the following signature.

Herb Kelly 5/14/92

Herb Kelly Date
Manager, Organic Division

000070E

Engineers
Planners
Economists
Scientists

CASE NARRATIVE FOR PNA/PHENOL MASS SPECTROMETRY SAMPLES

LABORATORY: CH2M HILL LABORATORIES CLIENT: BARR ENGINEERING

CASE NO. : N/A CONTRACT NO.: N/A

LAB NO. : 21232 SDG NO.: N/A

I. RECEIPT

A. DATE: March 19, 1992

B. SAMPLE INFORMATION

LAB ID	CLIENT ID	SAMPLE MATRIX	DATE SAMPLED	EXTRACTION DATE	ANALYSIS DATE
21232001	TT-12-01	SOIL	03/18/92	03/23/92	04/03/92
21232003	MW-3D	SOIL	03/18/92	03/23/92	04/02/92
21232003DL	MW-3D_DL	SOIL	03/18/92	03/23/92	04/03/92
S03232B1	SBLKS	SOIL	NA	03/23/92	04/02/9

C. Documentation Exceptions : Tentatively Identified Compounds (TIC) were not requested as part of this analysis. Therefore, the TIC forms and raw data will not be included in this package.

As you have requested, Benzo(b)fluoranthene and Benzo(k)fluoranthene will be reported separately. Due to the low concentrations analyzed for, there may be instances where the native matrix offers chromatographic interferences in this region of the chromatogram, making it difficult to correctly quantitate these isomers as separate compounds. In that case, Benzo(b)fluoranthene and Benzo(k)fluoranthene will be reported as total Benzo(b&k)fluoranthene. An "NR" (not reported) qualifier will then be used for the compounds for which are not reported.

Please note that the amount listed on the quantitation report reflects the mass detected at the instrument. According to the CLP Statement of Work, 2-uL injections must be made. Therefore, the amount on the quantitation report must be divided by a factor of two in order to determine the concentration of the extract injected.

No other exceptions were encountered.

CH2M HILL Quality Analytical Laboratories 2567 Fairlane Drive, P.O. Box 230548, Montgomery, Alabama 36116 205 271 1444

II. EXTRACTION

A. Holding Times: All holding times were met.

B. Extraction Exceptions : No exceptions were encountered.

III. ANALYSIS

A. Holding times: All holding times were met.

B. Analytical Exceptions : Please note that the analysis of sample 21232003 (MW-3D) showed Phenol above the calibration range. The sample was diluted and reanalyzed. The results of both analyses have been reported.

No other exceptions were encountered.

IV. QUALITY CONTROL

A. Method Blank : All associated method blanks met acceptable QC criteria.

B. Surrogate Recoveries : Sample 21249003 required a large dilution for analysis. Therefore, surrogate recoveries could not be determined for the diluted sample.

All other samples met acceptable QC limits.

C. Matrix Spike Results : The native sample, matrix spike, and matrix spike duplicate results are contained within another batch of samples. The results will be reported with the results of our laboratory contract number 21128.

Please note that Forms II, IV, V, and VIII have numbers to the immediate left of each table. These numbers are sequential only and have no relation to CH2M HILL identification numbers.

I 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 contained in this hardcopy data package and in the computer-readable data submitted on floppy diskette has been authorized by the Laboratory Manager or his designee, as verified by the following signature.

Herb Kelly 5/4/92

Herb Kelly Date
Manager, Organic Division

000070 G

Engineers
Planners
CH2M HILL Economists
Scientists

CASE NARRATIVE FOR PESTICIDE/PCB GAS CHROMATOGRAPHY SAMPLES

LABORATORY: CH2M HILL LABORATORIES CLIENT: BARR ENGINEERING

CASE NO. : N/A CONTRACT NO.: N/A

LAB NO. : 21232 SDG NO.: N/A

I. RECEIPT

A. DATE: March 19, 1992

B. SAMPLE INFORMATION

LAB ID	CLIENT ID	SAMPLE MATRIX	DATE SAMPLED	EXTRACTION DATE	ANALYSIS DATE
21232002	TT-14-02	SOIL	03/18/92	03/23/92	04/09/92
21232M02	TT-14-02MS	SOIL	03/18/92	03/23/92	04/09/92
21232D02	TT-14-02MSD	SOIL	03/18/92	03/23/92	04/09/92
S03231B1	PBLK23	SOIL	NA	03/23/92	04/09/92

C. Documentation
Exceptions : No exceptions were encountered.

II. EXTRACTION

A. Holding times: All holding times were met.

B. Extraction
Exceptions : No exceptions were encountered.

CH2M HILL Quality Analytical Laboratories 2567 Fairlane Drive, P.O. Box 230548, Montgomery, Alabama 36116 205 271 1444

III. ANALYSIS

A. Holding times: All holding times were met.

B. Analytical Exceptions : Sample 21232002 (TT-14-02) and its matrix spikes were diluted for analysis because of chemical interferences which were not removed by our cleanup procedures. Report limits for this sample have been adjusted to reflect both the dilution factor and the residual chemical interferences still observed in the chromatogram.

No additional exceptions were encountered.

IV. QUALITY CONTROL

A. Method Blank : All associated method blanks met acceptable QC criteria.

B. Surrogate Recoveries : All samples met acceptable QC limits.

C. Matrix Spike Results : Please note that the percent recovery for Aldrin in 21232D02 and relative percent difference for Aldrin were outside QC limits. Since these limits are advisory only, the laboratory took no further action.

D. Special Conditions : Primary and confirmation data was acquired by a single injection into a dual column/ECD system.

Please note that Forms II, IV, V, and VIII have numbers to the immediate left of each table. These numbers are sequential only and have no relation to CH2M HILL identification numbers.

I 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 contained in this hardcopy data package and in the computer-readable data submitted on floppy diskette has been authorized by the Laboratory Manager or his designee, as verified by the following signature.

Herb Kelly 5/4/92

Herb Kelly Date
Manager, Organic Division

000070I

SAMPLE DATA PACKAGE

SHIPPING RECEIPTS

780[illegible] ENROY ROAD
MINNEAPOLIS, MN 55439

PROJECT NUMBER Nº 01268
13/49-003JSL31
NO: Waukegan Coke Plant

Jim Langseth
PROJECT CONTACT: Mary Mackey
LABORATORY: CH2M Hill
REMARKS/ ANALYSIS REQUIRED:

SAMPLE IDENTIFICATION	COLLECTION DATE	COLLECTION TIME	GRAB	COMP.	BLANK	VOLATILE ORGANIC - CLP	SEMIVOLATILE ORGANIC	METALS - CLP	UNFILTERED METALS	GENERAL	CYANIDE	NUTRIENTS	OIL AND GREASE	TOC	SULFIDE	DIOXIN	EXTRACTABLES - CLP	PESTICIDES/PCB CLP	PAHs	Phenols						TOTAL NO. OF CONTAINERS
TT-12-01	3/18/92	PM	X	X		X																		CO1		3
TT-14-02	3/18/92	AM	X	X		X		X			X						X	X						CO2		5
MW-3D	3/18/92	PM				X														X				CO3		3
TT-14-02 MS MSD	3/18/92	AM	X	X		X		X			X						X	X						CO2		5
Method Blank	3/19/92							✓																ZS1		
TT14-02 MS	3/18/92					✓		✓			✓						✓	✓						MO2		
MSD						✓											✓	✓						DO2		
DUP								✓			✓													PO2		

FOR LAB USE ONLY
LAB # 21232
PROJ # LM633486.XX
ACK [illegible] 3/20 VERIFIED [illegible] 3/19
HAZWRAP/NEESA Y N
QC LEVEL 1 2 3
COC yes ICE yes
ANA REQ yes TEMP 2°C
CUST SEAL yes RH N/A
SAMPLE COND Sail

SAMPLED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY LAB:	DATE	TIME
(JMF) [signature] (TWW) [signature]	(TWW) [signature]	3/18/92	PM			
RECEIVED BY: (JMF) [signature]	RELINQUISHED BY: [signature] (JMF)	3/18/92	PM	RECEIVED BY LAB: [signature]	3/19/92	0902
RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY LAB:	DATE	TIME

REMARKS:

SAMPLES SHIPPED VIA
☐ AIR FREIGHT ☒ FED. EXP. ☐ SAMPLER
☐ OTHER

AIR BILL NUMBER: 3161694826

DISTRIBUTION: WHITE-ORIGINAL ACCOMPANIES SHIPMENT TO LAB, RETURNS TO BARR WITH RESULTS; YELLOW-LAB COPY; PINK-LAB COORDINATOR; GOLD-FIELD COPY

000072

Laboratory No. 21249

-- Volatiles

-- PAH/Phenols

-- Metals

Three investigative soil samples (TT0701, TT0703 and TT2303) were collected March 18, 1992. Two samples were analyzed for volatiles, and one sample was analyzed for PAH/phenols and metals. The results of these analyses were reported in this case and qualified as described in the following sections.

Holding Times

Holding times were met on both samples and all analyses using the EPA holding time criteria for water samples.

Instrument Tuning

Volatiles

GC/MS Tuning met the established method performance criteria for compounds, concentrations, frequencies and relative ion abundances for the volatiles analyses.

PAH/PHENOL

GC/MS Tuning met the established method performance criteria for compounds, concentrations, frequencies and relative ion abundances for the semivolatiles analyses.

Metals

Instrument tuning does not apply to the metals analyses.

Instrument Calibration

Volatiles

Initial calibration percent relative standard deviation (%RSD) and continuing calibration percent difference (%D) values for several volatile compounds were outside the appropriate control limits.

The volatile analyses initial calibration parameters and associated %RSD values beyond control limits were chloromethane (-38.9 percent), acetone (42.9 percent), 2-butanone (34.1 percent) and bromodichloromethane (33.5 percent). Continuing calibration parameters with %D value outliers were chloromethane (-71.0 percent), chloroethane (-27.0 percent), methylene chloride (-35.4 percent), carbon disulfide (-30.6 percent), bromoform (35.1 percent), 4-methyl-2-pentanone (-27.4 percent), and the surrogate standard 1,2-dichloroethane-d4 (-27.2 percent). Carbon disulfide was detected, qualified as estimated, and flagged "J" in the affected sample.

PAH/PHENOL

Initial calibrations had acceptable average relative response factors and %RSD values. Continuing calibration relative response factors and %D values were acceptable for all compounds.

Metals

Instrument calibrations were completed the proper number of times using the appropriate number and type of standards and blanks. Initial and continuing calibration percent recovery values were acceptable for all metals analyses.

Blanks

Volatiles

Methylene chloride (450 J µg/kg) was detected in the volatiles blank. Sample results less than ten times the blank concentration of this compound were qualified as nondetects and flagged "U."

PAH/PHENOL

No compounds were detected in the PAH/phenols method blank.

Metals

Total metals analyses calibration and preparation blanks had concentrations of aluminum, arsenic, beryllium, calcium, chromium, copper, iron, lead, manganese, nickel, selenium, silver, sodium, thallium, and zinc. These concentrations were greater than the instrument detection limit (IDL) but less than the contract required detection limit (CRDL). Sample results for these compounds less than five times the blank concentration were qualified as nondetects and flagged "U."

Surrogate Recovery

Volatiles

The volatiles system monitoring compound bromofluorobenzene (185 percent) recoveries were outside the 59-113 percent quality control limits for sample TT2303DL. The outlier recovery is due to the large dilution required for analysis, so no data were qualified.

PAH/PHENOL

The PAH/phenol analyses surrogates could not be determined on sample TT0703 due to the large dilution required for analysis. No data were qualified.

Metals

Total metals analyses ICP interference check sample recoveries and the laboratory control sample results were within the established quality control limits.

Matrix Spike/Matrix Spike Duplicate

Volatiles

The matrix spike/matrix spike duplicate samples recovery value for benzene (60 percent) was beyond control limits (66-142 percent). The RPD values for benzene (38 percent) and toluene (24 percent) were also outside control limits (21 percent). Since benzene recoveries were low only on the matrix spike sample, no data were qualified. No action was taken on the toluene results due to acceptable recoveries on the matrix spike/matrix spike duplicate samples.

PAH/PHENOL

PAH/phenol analyses matrix spike/matrix spike duplicate samples had several compounds with recoveries and RPD values outside control limits. These results may be due to the high level of spike compounds in the native sample, so no data were qualified.

Metals

Metals analyses quality control samples included a duplicate sample, a spike sample, post digestion spike samples and an ICP serial dilution sample.

Duplicate samples RPD values for cadmium (124.4 percent), lead (103.1 percent), manganese (42.5 percent), mercury (59.0 percent), selenium (27.0 percent), thallium (144.8 percent) and cyanide (23.3 percent) were beyond the appropriate control limits. Results in the investigative samples for these compounds were qualified as estimated and flagged "J."

The spike sample had recoveries beyond control limits (75-125 percent) for antimony (21.0 percent), cadmium (73.8 percent), manganese (144.2 percent), selenium (71.2 percent) and cyanide (-3.1 percent). Sample results for these compounds were qualified as estimated and flagged "J."

The post digestion spike recoveries for Selenium (70.7 percent) and thallium (118.5 percent) were outside the 85-115 percent control limits on the laboratory control sample. All post digestion spike recoveries on investigative samples were within control limits. No data were qualified.

ICP serial dilution results were within the 10 percent difference control limits.

Field Duplicates

No field duplicate samples were collected.

Overall Assessment

The data are considered acceptable with the recommended qualifiers.

Engineers
Planners
CH2M HILL
Economists
Scientists

APR 20 92

April 17, 1992

LMG33486.XY

Ms. Marti Harding-Smith
Barr Engineering Company
8300 Norman Center Drive
Suite 300
Minneapolis, Minnesota 55437-1026

RE: Analytical Data for LMG Laboratory No. 21249

Dear Ms. Harding-Smith:

On March 20, 1992, the CH2M HILL Montgomery Laboratory received one sample with a request for analysis of selected inorganic parameters.

The analytical results and associated quality control data are enclosed. Any unusual difficulties encountered during the analyses of this sample are discussed in the case narratives.

If you should have any questions concerning the data, please inquire.

The CH2M HILL policy is to store samples for up to 30 days after reporting. If you desire, our laboratory will maintain your samples for a longer period at a cost of $5.00 per sample per month. Samples determined to be hazardous can either be returned to you or disposed of at a cost of $25.00 per sample.

Sincerely,

Wanda L. Hall

Wanda L. Hall
Data Package Supervisor

Enclosures

cc: Mr. Jim Langseth

Engineers
Planners
CH2M HILL Economists
Scientists

TABLE OF CONTENTS

CH2M HILL Laboratory No. 21249

	Page No.
List of Inorganic EPA-defined Qualifiers	i
Sample Cross-Reference	ii
CATIONS DATA PACKAGE	1
Case Narrative	2
Cover Page	3
Analytical Results of Field Samples	
TT-07-01 (LMG #21249001)	4
Quality Control Data	
Initial & Continuing Calibration Verification	5-10
CRDL Standard for AA	11-12
Blank Data	13-16
ICP Interference Check Sample	17-18
Post Digest Spike Sample Data	19-21
Laboratory Control Sample	22
Instrument Detection Limits	23-25
ICP Interelement Correction Factors	26-29
ICP Linear Ranges	30
Preparation Log	31-34
Analysis Run Log	35-56
Raw Data	
ICP Data	57-205
Arsenic Data (GFAA)	206-244
Lead Data (GFAA)	245-290
Selenium Data (GFAA)	291-315
Thallium Data (GFAA)	316-348
Mercury Data	349-351
Cyanide Data	352-363
Digestion/Distillation Logs	364-368
Percent Solids	369-370
X Copy of Chain-of-custody	371-372

EPA QUALIFIERS

INORGANIC ANALYSES

- C (Concentration) Qualifier -- Enter "B" if the reported value obtained was less than the CRDL but greater than or equal to the IDL. Enter "U" if the value was less than the IDL or was not detected.

- Q Qualifier -- Entries and their meanings are:

  E - The reported value is estimated because of interference. An explanatory comment must be included under "Comments" on the Cover Page if the problem applies to all samples in this data package or on the individual FORM I if it is an isolated problem.

  M - Duplicate injection precision was not met (two analyses of the same sample did not agree).

  N - Spiked sample recovery not within control limits.

  S - The reported value was determined by the Method of Standard Additions (MSA).

  W - Post-digestion spike for Furnace AA analysis is out of control limits (85-115%), while sample absorbance is less than 50% of spike absorbance.

  * - Duplicate analysis not within control limits.

  + - Correlation coefficient for the MSA is less than 0.995.

  Entering "S", "W", or "+" is mutually exclusive. No combination of these qualifiers can appear in the same field.

- M (Method) Qualifier -- Enter one of the following:

  P - ICP
  A - Flame AA
  F - Furnace AA
  CV - Manual Cold Vapor AA
  AV - Automated Cold Vapor AA
  AS - Semi-Automated Spectrophotometric
  C - Manual Spectrophotometric
  T - Titrimetric
  NR - Analyte was not required by your lab

CH2M HILL Quality Analytical Laboratories 2567 Fairlane Drive, P.O. Box 230548 Montgomery, Alabama 36116 205 271 1444

Engineers
Planners
Economists
Scientists

TABLE 1

SAMPLE CROSS-REFERENCE SUMMARY

CH2M HILL Laboratory No. 21249

CH2M HILL Sample No.	Sample Description				
21249001	TT-07-01	03/19/92	GRAB	13/49-003JSL31	PO#01263

CH2M HILL
Quality Analytical Laboratories
2567 Fairlane Drive, P.O. Box 230548, Montgomery, Alabama 36116
205 271 1444

CATIONS DATA PACKAGE

Engineers
Planners
CH2M HILL Economists
Scientists

CASE NARRATIVE
Cations

Batch Number: 21249

Client/Project: BARR ENGINEERING COMPANY

I. Holding Time:
All holding times were met.

II. Analysis:

A. Blanks:
All acceptance criteria were met.

B. Calibration:
All acceptance criteria were met.

C. ICP Interference Check Sample:
All acceptance criteria were met.

D. Spike Sample Analysis:
Prespike recoveries outside criteria are flagged accordingly.

E. Duplicate Sample Analysis:
Duplicate precision outside criteria are flagged accordingly.

F. Laboratory Control Sample Analysis:
All acceptance criteria were met.

G. ICP Serial Dilution:
ICP serial dilutions outside criteria are flagged accordingly.

H. Other:
The mercury and serial dilution QC data is found in data package 21184. The remaining QC data is found in data package 21232.

III. I certify that this data package is in compliance with the terms and conditions agreed to by the client and CH2M HILL, both technically and for completeness, for other than the conditions detailed above.

SIGNED: Kaye Walker for **DATE:** 4/17/92
Kevin A. Sanders
Inorganic Division Manager

CH2M HILL Quality Analytical Laboratories 2567 Fairlane Drive, P.O. Box 230548, Montgomery, Alabama 36116 205 271 1444

U.S. EPA - CLP

COVER PAGE - INORGANIC ANALYSES DATA PACKAGE

b Name: CH2M_HILL_MGM_____ Contract: 21249_____

Lab Code: NA____ Case No.: 21249 SAS No.: 21249_ SDG No.:21249_

SOW No.: 3/90_

EPA Sample No.	Lab Sample ID
_T-07-01_____	__S21249001___

Were ICP interelement corrections applied ? Yes/No YES

Were ICP background corrections applied ? Yes/No YES

If yes - were raw data generated before application of background corrections ? Yes/No NO_

Comments:

____THE_MERCURY_AND_SERIAL_DILUTION_QC_DATA_IS_FOUND_IN_DATA_PACKAGE_____
____21184._THE_REMAINING_QC_DATA_IS_FOUND_IN_DATA_PACKAGE_21232._____

I 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 contained in this hardcopy data package and in the computer-readable data submitted on floppy diskette has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature.

Signature: Kay Walker for Name: Kevin A. Sanders_____

Date: 4/17/92 Title: Inorganic Division Mgr._

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

TT-07-01

Lab Name: CH2M_HILL_MGM_____ Contract: 21249_____

Lab Code: NA____ Case No.: 21249 SAS No.: 21249_ SDG No.: 21249_

Matrix (soil/water): SOIL_ Lab Sample ID: S21249001_

Level (low/med): LOW__ Date Received: 03/20/92

% Solids: _82.2

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum_	637		*	P
7440-36-0	Antimony_	73.5		N	P
7440-38-2	Arsenic__	1820		*	F
7440-39-3	Barium___	2.0	B	E	P
7440-41-7	Beryllium	0.08	B		P
7440-43-9	Cadmium__	1.6		N*	P
7440-70-2	Calcium__	14400			P
7440-47-3	Chromium_	13.7			P
7440-48-4	Cobalt___	0.95	B		P
7440-50-8	Copper___	24.5		*	P
7439-89-6	Iron____	1960			P
7439-92-1	Lead____	19.0		*	F
7439-95-4	Magnesium	1650			P
7439-96-5	Manganese	27.6		N*	P
7439-97-6	Mercury__	5.6			CV
7440-02-0	Nickel___	3.5	B		P
7440-09-7	Potassium	173	U		P
7782-49-2	Selenium_	1.5		N	F
7440-22-4	Silver___	0.42	U		P
7440-23-5	Sodium___	246	B		P
7440-28-0	Thallium_	0.40	U		F
7440-62-2	Vanadium_	3.6	B		P
7440-66-6	Zinc____	21.0			P
	Cyanide__	13.7		N	CA

Color Before: TAN_____ Clarity Before: N/A___ Texture: SAND__

Color After: CLEAR____ Clarity After: CLEAR_ Artifacts: YES___

Comments:
THE_ARTIFACTS_CONSIST_OF_ROCKS._THE_"E"_QUALIFIER_INDICATES_A_GREATER_
THAN_10%_DIFFERENCE_BETWEEN_THE_NATIVE_CONCENTRATION_AND_THE_SERIAL___
DILUTION_RESULTS.THE_"N"_DENOTES_POOR_PRESPIKE_RECOVERY._THE_"*"_____
DENOTES_POOR_DUPLICATE_PRECISION._____

FORM I - IN

3/90

7803 ENROY ROAD
MINNEAPOLIS, MN 55439

PROJECT NUMBER N° 01263
13/19-003 JSL31
NO: WAUKEGAN COKE PLANT RI

JIM LAND FH
PROJECT CONTACT: MARY MACKEY
LABORATORY: CH2M HILL
REMARKS/ ANALYSIS REQUIRED:

SAMPLE IDENTIFICATION	COLLECTION DATE	COLLECTION TIME	GRAB	COMP.	BLANK	VOLATILE ORGANIC-CLP TCL	SEMIVOLATILE ORGANIC	METALS CLP TCL	UNFILTERED METALS	GENERAL	CYANIDE	NUTRIENTS	OIL AND GREASE	TOC	SULFIDE	DIOXIN	EXTRACTABLES CLP TCL	PESTICIDES/PCB CLP TCL	PAH'S	PAH/PHENOLS						TOTAL NO. OF CONTAINERS
TT-07-01	3.19.92	PM	X					X			X													001		1
TT-07-03	3.19.92	PM	X			X														X				002		3
TT-23-03	3.19.92	~~PM~~ AM	X			X																		003		2
Method Blank								✓			✓													251		

FOR LAB USE ONLY
LAB # 21249
PROJ 4M633486.X1
ACK 3/23 VERIFIED
HAZWOPNER/NEESA Y
QC LEVEL 1 2
COC yes ICE yes
ANALREQ yes TEMP 4°C
CUST SEAL yes PH n/a
SAMPLE COND
verified BS 3/20/92

SAMPLED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY LAB:	DATE	TIME
(TMF)	(TMF)	3.19.92	PM		3/20/92	0730
RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY LAB:	DATE	TIME
RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY LAB:	DATE	TIME

REMARKS:

SAMPLES SHIPPED VIA
☐ AIR FREIGHT ☒ FED. EXP. ☐ SAMPLER
☐ OTHER

AIR BILL NUMBER: 3161694815

DISTRIBUTION: WHITE-ORIGINAL ACCOMPANIES SHIPMENT TO LAB, RETURNS TO BARR WITH RESULTS; YELLOW-LAB COPY; PINK-LAB COORDINATOR; GOLD-FIELD COPY

000372

CH2M HILL
Engineers
Planners
Economists
Scientists

92

April 16, 1992

LMG33486.XY

Ms. Marti Harding-Smith
Barr Engineering Company
8300 Norman Center Drive
Suite 300
Minneapolis, Minnesota 55437-1026

RE: Analytical Data for LMG Laboratory No. 21249

Dear Ms. Harding-Smith:

On March 20, 1992, the CH2M HILL Montgomery Laboratory received two samples with a request for analysis of selected organic parameters.

The analytical results and associated quality control data are enclosed. Any unusual difficulties encountered during the analyses of these samples are discussed in the case narratives.

If you should have any questions concerning the data, please inquire.

The CH2M HILL policy is to store samples for up to 30 days after reporting. If you desire, our laboratory will maintain your samples for a longer period at a cost of $5.00 per sample per month. Samples determined to be hazardous can either be returned to you or disposed of at a cost of $25.00 per sample.

Sincerely,

Wanda L. Hall

Wanda L. Hall
Data Package Supervisor

Enclosures

cc: Mr. Jim Langseth

Engineers
Planners
CH2M HILL Economists
Scientists

TABLE OF CONTENTS

CH2M HILL Laboratory No. 21249

	Page No.
List of Organic EPA-defined Qualifiers	i
List of Sample ID Qualifiers	ii
Sample Cross-Reference	iii
List of Internal Standards and Surrogates (Volatiles)	iv
List of Internal Standards and Surrogates (Semivolatiles)	v
SAMPLE DATA SUMMARY PACKAGE	1-27
SAMPLE DATA PACKAGE	28
Case Narratives	29-34
Shipping Receipts	35-36
Volatile Data	37
QC Summary	38-43
Sample Data (Analytical Results of Field Samples)	44
TT-07-03 (LMG #21249002)	
Form I	45
Form I - TIC	46
Raw Data	47-73
TT-23-03 (LMG #21249003)	
Form I	74
Form I - TIC	75
Raw Data	76-114
TT-23-03_DL (LMG #21249003DL)	
Form I	115
Form I - TIC	116
Raw Data	117-147
Standards Data	148
Initial Calibration Data	149-175
Continuing Calibration Data	176-182
Raw QC Data	183
BFB Data	184-192
Blank Data	193-201

CH2M HILL Quality Analytical Laboratories 2567 Fairlane Drive, P.O. Box 230548, Montgomery, Alabama 36116 205.271.1444

Engineers
Planners
CH2M HILL Economists
Scientists

TABLE OF CONTENTS (cont.)

CH2M HILL Laboratory No. 21249

	Page No.
PNA/Phenol Data	202
QC Summary	203-212
Sample Data (Analytical Results of Field Samples)	213
TT-07-03 (LMG #21249002)	
Form I	214-215
Raw Data	216-259
Standards Data	260
Initial Calibration Data	261-293
Continuing Calibration Data	294-310
GPC Chromatogram	311-312
Raw QC Data	313
DFTPP Data	314-326
Blank Data	327-333

CH2M HILL Quality Analytical Laboratories 2567 Fairlane Drive, P.O. Box 230548 Montgomery, Alabama 36116 205 271 1444

CH2M HILL
Engineers
Planners
Economists
Scientists

EPA - DEFINED QUALIFIERS

ORGANICS

Definitions for the EPA-defined qualifiers:

U -- Indicates the compound was analyzed for but not detected. The number adjacent to the "U" qualifier indicates the quantitation limit for that compound. The detection limit can vary from sample to sample depending on dilution factors or percent moisture adjustment when indicated.

J -- Indicates an estimated value. This flag is used when the mass spectral data indicates the presence of a compound below the stated quantitation limit. The "J" qualifier is not used with pesticide results.

C -- This flag applies to pesticide results only. The "C" flag indicates the presence of this compound has been confirmed by GC/MS analysis.

B -- This flag is used when the analyte is found in the associated blank as well as the sample. This notation indicates possible blank contamination and suggests the data user evaluate these compounds and their amounts carefully.

E -- This flag applies to GC/MS only. The "E" qualifier indicates a compound may be above or below the linear range of the instrument. If the particular compound level is deemed above the linear calibration range, then the sample should be reanalyzed at an appropriate dilution. Therefore, the "E" qualified amount is an estimated concentration. The results for the dilution will be reported on a separate Form I and will be flagged with a "D" if the dilution brings the concentration within proper calibration.

D -- This flag identifies compounds which have been run at a dilution to bring the concentration of that compound within the linear range of the instrument. "D" qualifiers are only used for samples that have been run initially with results above acceptable ranges. For secondary dilutions the "DL" suffix is appended to the sample number on the Form I.

A -- Indicates the Tentatively Identified Compound (TIC) is a suspected aldol-condensation product.

X -- Indicates the compound concentration has been manually modified or the EPA qualifier has been manually modified or added.

JX -- The compound was detected and quantitated below the Contract Required Quantitation Limit.

CH2M HILL Quality Analytical Laboratories 2567 Fairlane Drive, P.O. Box 230548, Montgomery, Alabama 36116 205 271 1444

CLIENT SAMPLE ID QUALIFIERS

LEVEL 3

The qualifiers that GC/MS and GC use with the client sample ID are defined below:

DL -- Dilution Run

R -- Rerun (may be followed by a digit to indicate multiple reruns)

RD -- Diluted Rerun

RX -- Re-extraction Analysis

MS -- Matrix Spike (may be followed by a digit to indicate multiple matrix spikes within a sample set)

MSD -- Matrix Spike Duplicate (may be followed by a digit to indicate multiple matrix spike duplicates within a sample set)

VBLK -- Volatile Blank (will be followed by a "W" for waters, "S" for soils run at a low level, or "SM" for soils run at a medium level -- these letters may be followed by a digit to indicate multiple blanks of that type).

SBLK -- Semivolatile Blank (will be followed by a "W" for waters, "S" for soils run at a low level, or "SM" for soils run at a medium level -- these letters may be followed by a digit to indicate multiple blanks of that type).

PBLK -- Pesticide/PCB Blank (may be followed by digits to indicate multiple blanks)

These qualifiers allow GC/MS and GC to have unique client sample ID's so that the client can get more accurate information from the data reported.

CH2M HILL Quality Analytical Laboratories 2567 Fairlane Drive, P.O. Box 230548 Montgomery, Alabama 36116 205 271 1444

Engineers
Planners
CH2M HILL
Economists
Scientists

TABLE 1

SAMPLE CROSS-REFERENCE SUMMARY

CH2M HILL Laboratory No. 21249

CH2M HILL Sample No.	Sample Description				
21249002	TT-07-03	03/19/92	GRAB	13/49-003JSL31	PO#01263
21249003	TT-23-03	03/19/92	GRAB	13/49-003JSL31	PO#01263

CH2M HILL
Quality Analytical Laboratories
2567 Fairlane Drive, P.O. Box 230548, Montgomery, Alabama 36116
205 271 1444

INTERNAL STANDARD AND SURROGATE COMPOUNDS

VOLATILE ANALYSIS

The internal standards on the GC/MS volatile chromatograms are designated as IS1, IS2, and IS3. The surrogate standards are labelled as SS1, SS2, and SS3. The compounds corresponding to these labels are listed below.

LABEL	INTERNAL STANDARD COMPOUND
IS1	BROMOCHLOROMETHANE
IS2	1,4-DIFLUOROBENZENE
IS3	D5-CHLOROBENZENE

LABEL	SURROGATE STANDARD COMPOUND
SS1	D4-1,2-DICHLOROETHANE
SS2	D8-TOLUENE
SS3	1,4-BROMOFLUOROBENZENE

CH2M HILL Quality Analytical Laboratories 2567 Fairlane Drive, P O Box 230548, Montgomery, Alabama 36116 205 271 1444

INTERNAL STANDARD AND SURROGATE COMPOUNDS

SEMIVOLATILE ANALYSIS

The internal standards on the GC/MS semivolatile chromatograms are designated as IS1, IS2, IS3, IS4, IS5, and IS6. The surrogate standards are labelled as SS1, SS2, SS3, SS4, SS5, and SS6. The compounds corresponding to these labels are listed below.

LABEL	INTERNAL STANDARD COMPOUND
IS1	D4-1,4-DICHLOROBENZENE
IS2	D8-NAPHTHALENE
IS3	D10-ACENAPHTHENE
IS4	D10-PHENANTHRENE
IS5	D12-CHRYSENE
IS6	D12-PERYLENE

LABEL	SURROGATE STANDARD COMPOUND
SS1	2-FLUOROPHENOL
SS2	D5-PHENOL
SS3	D5-NITROBENZENE
SS4	2-FLUOROBIPHENYL
SS5	2,4,6-TRIBROMOPHENOL
SS6	D14-TERPHENYL

CH2M HILL Quality Analytical Laboratories 2567 Fairlane Drive, P.O. Box 230548, Montgomery, Alabama 36116 205 271 1444

SAMPLE DATA SUMMARY PACKAGE

Engineers
Planners
Economists
Scientists

CASE NARRATIVE FOR VOLATILE MASS SPECTROMETRY SAMPLES

LABORATORY: CH2M HILL LABORATORIES CLIENT: BARR ENGINEERING

CASE NO. : N/A CONTRACT NO.: N/A

LAB NO. : 21249 SDG NO.: N/A

I. RECEIPT

A. DATE: March 20, 1992

B. SAMPLE INFORMATION

LAB ID	CLIENT ID	SAMPLE MATRIX	DATE SAMPLED	EXTRACTION DATE	ANALYSIS DATE
21249002	TT-07-03	SOIL	03/20/92	03/31/92	04/01/92
21249003	TT-23-03	SOIL	03/19/92	03/31/92	04/01/92
21249003DL	TT-23-03_DL	SOIL	03/19/92	03/31/92	04/02/92
L03312B3	VBLKSM	SOIL	NA	03/31/92	04/01/92

C. Documentation
Exceptions : No exceptions were encountered.

II. EXTRACTION

A. Holding Times: All holding times were met. Samples 21249002 (TT-07-03), 21249003 (TT-23-03), 21249003DL (TT-23-3_DL) were analyzed using medium level soil protocols.

B. Extraction
Exceptions : No exceptions were encountered.

CH2M HILL Quality Analytical Laboratories 2567 Fairlane Drive, P.O. Box 230548, Montgomery, Alabama 36116 205 271 1444

CH2M HILL
Engineers
Planners
Economists
Scientists

III. ANALYSIS

A. Holding times: All holding times were met.

B. Analytical Exceptions : Please see attached table for information concerning methylene chloride and acetone.

The original analysis of sample 21249003 (TT-23-03) showed target compounds above the calibration range. The sample was diluted and reanalyzed. The results of both analyses have been reported.

Due to the saturation of the quantitation ion, the quantitated amount of Toluene and Total Xylene present in sample 21249003 was determined by using a secondary ion quantitation. A chromatogram demonstrating the interferences has been included with the sample as well as the calculation used to determine the amount of each target present in the sample.

No other exceptions were encountered.

IV. QUALITY CONTROL

A. Method Blank : All associated method blanks met acceptable QC criteria.

B. Surrogate Recoveries : All samples met acceptable QC limits.

C. Matrix Spike Results : The native sample, matrix spike, and matrix spike duplicate results are contained within another batch of samples. The results will be reported with the results of our laboratory contract number 21232.

Please note that Forms II, IV, V, and VIII have numbers to the immediate left of each table. These numbers are sequential only and have no relation to CH2M HILL identification numbers.

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

Herb Kelly 4/16/92
Herb Kelly Date
Manager, Organic Division

CH2M HILL Quality Analytical Laboratories 2567 Fairlane Drive, P.O. Box 230548, Montgomery, Alabama 36116 205 271 1444

Engineers
Planners
CH2M HILL
Economists
Scientists

METHYLENE CHLORIDE/ACETONE SUMMARY

Due to the level of target compounds, the following samples required large dilutions for analysis. As required by the Statement of Work, these dilution factors have been applied, without background subtraction, to all detected compounds, particularly methylene chloride and acetone. As methylene chloride and acetone are common laboratory contaminants, the following table is being provided to present a more accurate perspective of these compounds. Included in the table is 1) the amount of methylene chloride and acetone, detected at the instrument, prior to multiplication by the dilution factor; and 2) the amount of methylene chloride and acetone for that particular sample's laboratory method blank.

SAMPLE	METHYLENE CHLORIDE	ACETONE	METHOD BLANK	METHYLENE CHLORIDE	ACETONE
21249002	5 ug/Kg	10 U	L03312B3	4 ug/Kg	10 U
21249003	4 ug/Kg	10 U	L03312B3	4 ug/Kg	10 U
21249003DL	5 ug/Kg	10 U	L03312B3	4 ug/Kg	10 U

CH2M HILL
Quality Analytical Laboratories
2567 Fairlane Drive, P.O. Box 230548, Montgomery, Alabama 36116
205 271 [illegible]

Engineers
Planners
CH2M HILL Economists
Scientists

CASE NARRATIVE FOR PNA/PHENOL MASS SPECTROMETRY SAMPLES

LABORATORY: CH2M HILL LABORATORIES CLIENT: BARR ENGINEERING

CASE NO. : N/A CONTRACT NO.: N/A

LAB NO. : 21249 SDG NO.: N/A

I. RECEIPT

A. DATE: March 20, 1992

B. SAMPLE INFORMATION

LAB ID	CLIENT ID	SAMPLE MATRIX	DATE SAMPLED	EXTRACTION DATE	ANALYSIS DATE
21249002	TT-07-03	SOIL	03/20/92	03/23/92	04/03/92
S03232B1	SBLKS	SOIL	NA	03/23/92	04/02/92

C. Documentation Exceptions : Tentatively Identified Compounds (TIC) were not requested as part of this analysis. Therefore, the TIC forms and raw data will not be included in this package.

As you have requested, Benzo(b)fluoranthene and Benzo(k)fluoranthene will be reported separately. Due to the low concentrations analyzed for, there may be instances where the native matrix offers chromatographic interferences in this region of the chromatogram, making it difficult to correctly quantitate these isomers as separate compounds. In that case, Benzo(b)fluoranthene and Benzo(k)fluoranthene will be reported as total Benzo(b&k)fluoranthene. An "NR" (not reported) qualifier will then be used for the compounds for which are not reported.

Please note that the amount listed on the quantitation report reflects the mass detected at the instrument. According to the CLP Statement of Work, 2-uL injections must be made. Therefore, the amount on the quantitation report must be divided by a factor of two in order to determine the concentration of the extract injected.

No other exceptions were encountered.

CH2M HILL Quality Analytical Laboratories 2567 Fairlane Drive, P.O. Box 230548, Montgomery, Alabama 36116 205 271 1444

II. EXTRACTION

A. Holding Times: All holding times were met.

B. Extraction Exceptions : No exceptions were encountered.

III. ANALYSIS

A. Holding times: All holding times were met.

B. Analytical Exceptions : No exceptions were encountered.

IV. QUALITY CONTROL

A. Method Blank : All associated method blanks met acceptable QC criteria.

B. Surrogate Recoveries : Sample 21249002 (TT-07-03) required a large dilution for analysis. Therefore, surrogate recoveries could not be determined for this sample.

All other samples met acceptable QC limits.

C. Matrix Spike Results : The native sample, matrix spike, and matrix spike duplicate results are contained within another batch of samples. The results will be reported with the results of our laboratory contract number 21128.

Please note that Forms II, IV, V, and VIII have numbers to the immediate left of each table. These numbers are sequential only and have no relation to CH2M HILL identification numbers.

I 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 contained in this hardcopy data package and in the computer-readable data submitted on floppy diskette has been authorized by the Laboratory Manager or his designee, as verified by the following signature.

Herb Kelly 4/16/92

Herb Kelly Date
Manager, Organic Division

CH2M HILL Quality Analytical Laboratories 2567 Fairlane Drive, P.O. Box 230548, Montgomery, Alabama 36116 205 271 [illegible]

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

TT-07-03

Lab Name: CH2M HILL/MGM Contract: _____

Code: _____ Case No.: 21249 SAS No.: _____ SDG No.: _____

Matrix: (soil/water) SOIL Lab Sample ID: 21249002

Sample wt/vol: 4.0 (g/mL) G Lab File ID: B1VM014768

Level: (low/med) MED Date Received: 03/20/92

% Moisture: not dec. 15 Date Analyzed: 04/01/92

GC Column: CAP ID: 0.530 (mm) Dilution Factor: 1.0

Soil Extract Volume: 10000 (uL) Soil Aliquot Volume: 100 (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
74-87-3	Chloromethane	1400	U
74-83-9	Bromomethane	1400	U
75-01-4	Vinyl Chloride	1400	U
75-00-3	Chloroethane	1400	U
75-09-2	Methylene Chloride	690	BJ
67-64-1	Acetone	1400	U
75-15-0	Carbon Disulfide	1400	U
75-35-4	1,1-Dichloroethene	1400	U
75-34-3	1,1-Dichloroethane	1400	U
540-59-0	1,2-Dichloroethene (total)	1400	U
67-66-3	Chloroform	1400	U
107-06-2	1,2-Dichloroethane	1400	U
78-93-3	2-Butanone	1400	U
71-55-6	1,1,1-Trichloroethane	1400	U
56-23-5	Carbon Tetrachloride	1400	U
75-27-4	Bromodichloromethane	1400	U
78-87-5	1,2-Dichloropropane	1400	U
10061-01-5	cis-1,3-Dichloropropene	1400	U
79-01-6	Trichloroethene	1400	U
124-48-1	Dibromochloromethane	1400	U
79-00-5	1,1,2-Trichloroethane	1400	U
71-43-2	Benzene	1400	U
10061-02-6	trans-1,3-Dichloropropene	1400	U
75-25-2	Bromoform	1400	U
591-78-6	2-Hexanone	1400	U
108-10-1	4-Methyl-2-Pentanone	1400	U
127-18-4	Tetrachloroethene	1400	U
79-34-5	1,1,2,2-Tetrachloroethane	1400	U
108-88-3	Toluene	1300	J
108-90-7	Chlorobenzene	1400	U
100-41-4	Ethylbenzene	360	J
100-42-5	Styrene	990	J
1330-20-7	Xylene (total)	12000	

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

TT-07-03

Lab Name: CH2M HILL/MGM Contract: _____

Lab Code: _____ Case No.: 21249 SAS No.: _____ SDG No.: _____

Matrix: (soil/water) SOIL Lab Sample ID: 21249002

Sample wt/vol: 4.0 (g/mL) G Lab File ID: B1VM014768

Level: (low/med) MED Date Received: 03/20/92

% Moisture: not dec. 15 Date Analyzed: 04/01/92

GC Column: CAP ID: 0.530 (mm) Dilution Factor: 1.0

Soil Extract Volume: 10000 (uL) Soil Aliquot Volume: 100 (uL)

Number TICs found: 6

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	BENZENE, TRIMETHYL- ISOMER	18.64	7800	J
2.	BENZENE, TRIMETHYL- ISOMER	19.34	11000	J
3.	BENZENE, ETHENYL, METHYL- IS	19.50	1400	J
4.	BENZENE, ETHENYL, METHYL- IS	20.75	3100	J
5.	BENZENE, ETHYNYL, METHYL- IS	21.12	46000	J
6. 95-93-2	BENZENE, 1,2,4,5-TETRAMETHYL	22.24	750	J

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

TT-23-03

Lab Name: CH2M HILL/MGM Contract: _____

Code: _____ Case No.: 21249 SAS No.: _____ SDG No.: _____

Matrix: (soil/water) SOIL Lab Sample ID: 21249003

Sample wt/vol: 4.0 (g/mL) G Lab File ID: B1VM014769

Level: (low/med) MED Date Received: 03/20/92

% Moisture: not dec. 16 Date Analyzed: 04/01/92

GC Column: CAP ID: 0.530 (mm) Dilution Factor: 1.0

Soil Extract Volume: 10000 (uL) Soil Aliquot Volume: 50.0(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
74-87-3	Chloromethane	2900	U
74-83-9	Bromomethane	2900	U
75-01-4	Vinyl Chloride	2900	U
75-00-3	Chloroethane	2900	U
75-09-2	Methylene Chloride	1300	BJ
67-64-1	Acetone	2900	U
75-15-0	Carbon Disulfide	480	J
75-35-4	1,1-Dichloroethene	2900	U
75-34-3	1,1-Dichloroethane	2900	U
540-59-0	1,2-Dichloroethene (total)	2900	U
67-66-3	Chloroform	2900	U
107-06-2	1,2-Dichloroethane	2900	U
78-93-3	2-Butanone	2900	U
71-55-6	1,1,1-Trichloroethane	2900	U
56-23-5	Carbon Tetrachloride	2900	U
75-27-4	Bromodichloromethane	2900	U
78-87-5	1,2-Dichloropropane	2900	U
10061-01-5	cis-1,3-Dichloropropene	2900	U
79-01-6	Trichloroethene	2900	U
124-48-1	Dibromochloromethane	2900	U
79-00-5	1,1,2-Trichloroethane	2900	U
71-43-2	Benzene	22000	
10061-02-6	trans-1,3-Dichloropropene	2900	U
75-25-2	Bromoform	2900	U
591-78-6	2-Hexanone	2900	U
108-10-1	4-Methyl-2-Pentanone	2900	U
127-18-4	Tetrachloroethene	2900	U
79-34-5	1,1,2,2-Tetrachloroethane	2900	U
108-88-3	Toluene	160000	E
108-90-7	Chlorobenzene	2900	U
100-41-4	Ethylbenzene	61000	E
100-42-5	Styrene	2900	U
1330-20-7	Xylene (total)	360000	E

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

TT-23-03

Lab Name: CH2M HILL/MGM Contract: _____

Lab Code: _____ Case No.: 21249 SAS No.: _____ SDG No.: _____

Matrix: (soil/water) SOIL Lab Sample ID: 21249003

Sample wt/vol: 4.0 (g/mL) G Lab File ID: B1VM014769

Level: (low/med) MED Date Received: 03/20/92

% Moisture: not dec. 16 Date Analyzed: 04/01/92

GC Column: CAP ID: 0.530 (mm) Dilution Factor: 1.0

Soil Extract Volume: 10000 (uL) Soil Aliquot Volume: 50.0(uL)

Number TICs found: 9

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 611-14-3	BENZENE, 1-ETHYL-2-METHYL-	18.54	57000	J
2. 108-67-8	BENZENE, 1,3,5-TRIMETHYL-	18.64	95000	J
3. 41898-89-9	2,3-HEPTADIEN-5-YNE, 2,4-DIM	19.34	140000	J
4.	BENZENE, ETHENYL, METHYL- IS	19.47	41000	J
5. 271-89-6	BENZOFURAN	19.97	8500	J
6. 25340-17-4	BENZENE, DIETHYL-	20.54	3900	J
7.	BENZENE, ETHENYL, METHYL- IS	20.74	43000	J
8.	BENZENE, ETHYNYL, METHYL- IS	21.10	150000	J
9.	NOT IDENTIFIED	21.75	1600	J

Ms

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

TT-23-03_DL

Lab Name: CH2M HILL/MGM Contract: _____

Code: _____ Case No.: 21249 SAS No.: _____ SDG No.: _____

Matrix: (soil/water) SOIL Lab Sample ID: 21249003DL

Sample wt/vol: 4.0 (g/mL) G Lab File ID: B3VM014776

Level: (low/med) MED Date Received: 03/20/92

% Moisture: not dec. 16 Date Analyzed: 04/02/92

GC Column: CAP ID: 0.530 (mm) Dilution Factor: 17.0

Soil Extract Volume: 10000 (uL) Soil Aliquot Volume: 100 (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
74-87-3	Chloromethane	24000	U
74-83-9	Bromomethane	24000	U
75-01-4	Vinyl Chloride	24000	U
75-00-3	Chloroethane	24000	U
75-09-2	Methylene Chloride	12000	BDJ
67-64-1	Acetone	24000	U
75-15-0	Carbon Disulfide	24000	U
75-35-4	1,1-Dichloroethene	24000	U
75-34-3	1,1-Dichloroethane	24000	U
540-59-0	1,2-Dichloroethene (total)	24000	U
67-66-3	Chloroform	24000	U
107-06-2	1,2-Dichloroethane	24000	U
78-93-3	2-Butanone	24000	U
71-55-6	1,1,1-Trichloroethane	24000	U
56-23-5	Carbon Tetrachloride	24000	U
75-27-4	Bromodichloromethane	24000	U
78-87-5	1,2-Dichloropropane	24000	U
10061-01-5	cis-1,3-Dichloropropene	24000	U
79-01-6	Trichloroethene	24000	U
124-48-1	Dibromochloromethane	24000	U
79-00-5	1,1,2-Trichloroethane	24000	U
71-43-2	Benzene	24000	D
10061-02-6	trans-1,3-Dichloropropene	24000	U
75-25-2	Bromoform	24000	U
591-78-6	2-Hexanone	24000	U
108-10-1	4-Methyl-2-Pentanone	24000	U
127-18-4	Tetrachloroethene	24000	U
79-34-5	1,1,2,2-Tetrachloroethane	24000	U
108-88-3	Toluene	140000	D
108-90-7	Chlorobenzene	24000	U
100-41-4	Ethylbenzene	64000	D
100-42-5	Styrene	24000	U
1330-20-7	Xylene (total)	370000	D

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

TT-23-03_DL

Lab Name: CH2M HILL/MGM Contract: _____

Lab Code: _____ Case No.: 21249 SAS No.: _____ SDG No.: _____

Matrix: (soil/water) SOIL Lab Sample ID: 21249003DL

Sample wt/vol: 4.0 (g/mL) G Lab File ID: B3VM014776

Level: (low/med) MED Date Received: 03/20/92

% Moisture: not dec. 16 Date Analyzed: 04/02/92

GC Column: CAP ID: 0.530 (mm) Dilution Factor: 17.0

Soil Extract Volume: 10000 (uL) Soil Aliquot Volume: 100 (uL)

Number TICs found: 8

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 620-14-4	BENZENE, 1-ETHYL-3-METHYL-	18.52	59000	J
2.	BENZENE, TRIMETHYL- ISOMER	18.62	99000	J
3.	BENZENE, TRIMETHYL- ISOMER	19.32	170000	J
4.	BENZENE, ETHENYL, METHYL- IS	19.45	63000	J
5. 271-89-6	BENZOFURAN	19.95	20000	J
6.	BENZENE, ETHENYL, METHYL- IS	20.72	73000	J
7.	BENZENE, ETHYNYL, METHYL- IS	21.09	600000	J
8.	NOT IDENTIFIED	22.20	19000	J

ORGANICS ANALYSIS DATA SHEET

oratory Name:	CH2M HILL/MGM	Concentration:	LOW	Date Extracted:	03/23/92
Lab Sample ID:	21249002	Sample Matrix:	SOIL	Date Analyzed:	04/03/92
Client Sample ID:	TT-07-03	Percent Moisture:	6.0	Dilution Factor:	600

POLYNUCLEAR AROMATIC COMPOUNDS

CAS Number		ug/Kg	CAS Number		ug/Kg
271-89-6	2,3-Benzofuran	210000 U	260-94-6	Acridine	210000 U
496-11-7	2,3-Dihydro-1h-Indene	210000 U	229-87-8	Phenanthridine	210000 U
95-13-6	1H-Indene	160000 J	86-74-8	Carbazole	210000 U
91-20-3	Naphthalene	1600000	206-44-0	Fluoranthene	36000 J
95-15-8	Benzo(b)thiophene	36000 J	129-00-0	Pyrene	24000 J
91-22-5	Quinoline	210000 U	56-55-3	Benzo(a)anthracene	210000 U
119-65-3	Isoquinoline	210000 U	218-01-9	Chrysene/Triphenylene	22000 J
91-57-6	2-Methylnaphthalene	200000 J	NA	Benzo(b&k)fluoranthene	NR
120-72-9	Indole	210000 U	57-97-6	7,12-Dimethylbenz(a)anthrac	210000 U
90-12-0	1-Methylnaphthalene	94000 J	192-97-2	Benzo(e)pyrene	210000 U
92-52-4	Biphenyl	28000 J	50-32-8	Benzo(a)pyrene	210000 U
208-96-8	Acenaphthylene	68000 J	198-55-0	Perylene	210000 U
83-32-9	Acenaphthene	210000 U	56-49-5	3-Methylcholanthrene	210000 U
132-64-9	Dibenzofuran	210000 U	193-39-5	Indeno(1,2,3-cd)pyrene	210000 U
86-73-7	Fluorene	58000 J	53-70-3	Dibenz(a,h)anthracene	210000 U
132-65-0	Dibenzothiophene	210000 U	191-24-2	Benzo(g,h,i,)perylene	210000 U
85-01-8	Phenanthrene	83000 J	205-99-2	Benzo(b)fluoranthene	210000 U
120-12-7	Anthracene	24000 J	207-08-9	Benzo(k)fluoranthene	210000 U

U - Compound analyzed for but not detected.
B - Compound was detected in QC blank.
J - Reported value less than quantitation limit.

Form I

ORGANICS ANALYSIS DATA SHEET

Laboratory Name:	CH2M HILL/MGM	Concentration:	LOW	Date Extracted:	03/23/92
Lab Sample ID:	21249002	Sample Matrix:	SOIL	Date Analyzed:	04/03/92
Client Sample ID:	TT-07-03	Percent Moisture:	6.0	Dilution Factor:	600

PHENOL COMPOUNDS

CAS Number		ug/Kg	CAS Number	ug/Kg
108-95-2	Phenol	210000 U		
95-57-8	2-Chlorophenol	210000 U		
95-48-7	2-Methylphenol	210000 U		
106-44-5	4-Methylphenol	210000 U		
88-75-5	2-Nitrophenol	210000 U		
105-67-9	2,4-Dimethylphenol	210000 U		
120-83-2	2,4-Dichlorophenol	210000 U		
65-85-0	Benzoic acid	510000 U		
59-50-7	4-Chloro-3-Methylphenol .	210000 U		
88-06-2	2,4,6-Trichlorophenol . .	210000 U		
95-95-4	2,4,5-Trichlorophenol . .	510000 U		
51-28-5	2,4-Dinitrophenol	510000 U		
100-02-7	4-Nitrophenol	510000 U		
534-52-1	4,6-Dinitro-2-Methylphenol	510000 U		
87-86-5	Pentachlorophenol	510000 U		

U - Compound analyzed for but not detected.
B - Compound was detected in QC blank.
J - Reported value less than quantitation limit.

Form I

2B

SOIL VOLATILE SYSTEM MONITORING COMPOUND RECOVERY

Lab Name: CH2M HILL/MGM Contract: _____

Lab Code: _____ Case No.: 21249 SAS No.: _____ SDG No.: _____

Level:(low/med) MED

	EPA SAMPLE NO.	SMC1 (TOL)#	SMC2 (BFB)#	SMC3 (DCE)#	OTHER	TOT OUT
01	TT-07-03	94	110	78	0	0
02	TT-23-03	84 D	107 D	75 D	0	0
03	TT-23-03_DL	115 D	185 D	114 D	0	0
04	VBLKSM	89	99	82	0	0

		QC LIMITS
SMC1 (TOL)	= Toluene-d8	(84-138)
SMC2 (BFB)	= Bromofluorobenzene	(59-113)
SMC3 (DCE)	= 1,2-Dichloroethane-d4	(70-121)

Column to be used to flag recovery values

* Values outside of contract required QC limits

D System Monitoring Compound diluted out

FORM II VOA-2

3/90

SOIL SURROGATE PERCENT RECOVERY SUMMARY
(Page 1)

Case No. 21249 Contract Laboratory CH2M HILL/MGM
Low XXX Medium

SMO TRAFFIC NO.	SEMI-VOLATILE 1-Fluoronaphthalene - SS 0-81	2-Fluorophenol - SS 25-121	Phenol-d5 - SS 24-113	2,4,6-Tribromophenol - SS 19-122	Nitrobenzene-d5 - SS 9-197	2-Fluorobiphenyl - SS 9-109	Terphenyl-d14 - SS 0-143	2-Chlorophenol-d4 - SS 20-130	1,2-Dichlorobenzene - d4 SS 20-130
TT-07-03	**	**	**	**	**	**	**	**	**
SBLKS	57	92	106	79	76	75	66	101	78

Semi-Volatiles: 0 out of 18; outside of QC limits

Comments:

** - Surrogate Standard not determined due to required dilution.

FORM II

4A
VOLATILE METHOD BLANK SUMMARY

EPA SAMPLE NO.

VBLKSM

Lab Name: CH2M HILL/MGM Contract: _____

) Code: _____ Case No.: 21249 SAS No.: _____ SDG No.: _____

Lab File ID: BBVM014760 Lab Sample ID: L03312B3

Date Analyzed: 04/01/92 Time Analyzed: 1511

GC Column: CAP ID: 0.530(mm) Heated Purge: (Y/N) N

Instrument ID: 5100B

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS AND MSD:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	TIME ANALYZED
01	TT-07-03	21249002	B1VM014768	2003
02	TT-23-03	21249003	B1VM014769	2037
03	TT-23-03_DL	21249003DL	B3VM014776	0038

COMMENTS: CLP,21222,,VBLKS,M,S,L03312B3,V,BLANK,
10DG TO 200DG @8DG/MIN IH=3MIN

FORM IV VOA

3/90

000017

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

VBLKSM

Lab Name: CH2M HILL/MGM Contract: _____

Lab Code: _____ Case No.: 21249 SAS No.: _____ SDG No.: _____

Matrix: (soil/water) SOIL Lab Sample ID: L03312B3

Sample wt/vol: 4.0 (g/mL) G Lab File ID: BBVM014760

Level: (low/med) MED Date Received: 04/01/92

% Moisture: not dec. 0 Date Analyzed: 04/01/92

GC Column: CAP ID: 0.530 (mm) Dilution Factor: 1.0

Soil Extract Volume: 10000 (uL) Soil Aliquot Volume: 100 (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
74-87-3	Chloromethane	1200	U
74-83-9	Bromomethane	1200	U
75-01-4	Vinyl Chloride	1200	U
75-00-3	Chloroethane	1200	U
75-09-2	Methylene Chloride	450	J
67-64-1	Acetone	1200	U
75-15-0	Carbon Disulfide	1200	U
75-35-4	1,1-Dichloroethene	1200	U
75-34-3	1,1-Dichloroethane	1200	U
540-59-0	1,2-Dichloroethene (total)	1200	U
67-66-3	Chloroform	1200	U
107-06-2	1,2-Dichloroethane	1200	U
78-93-3	2-Butanone	1200	U
71-55-6	1,1,1-Trichloroethane	1200	U
56-23-5	Carbon Tetrachloride	1200	U
75-27-4	Bromodichloromethane	1200	U
78-87-5	1,2-Dichloropropane	1200	U
10061-01-5	cis-1,3-Dichloropropene	1200	U
79-01-6	Trichloroethene	1200	U
124-48-1	Dibromochloromethane	1200	U
79-00-5	1,1,2-Trichloroethane	1200	U
71-43-2	Benzene	1200	U
10061-02-6	trans-1,3-Dichloropropene	1200	U
75-25-2	Bromoform	1200	U
591-78-6	2-Hexanone	1200	U
108-10-1	4-Methyl-2-Pentanone	1200	U
127-18-4	Tetrachloroethene	1200	U
79-34-5	1,1,2,2-Tetrachloroethane	1200	U
108-88-3	Toluene	1200	U
108-90-7	Chlorobenzene	1200	U
100-41-4	Ethylbenzene	1200	U
100-42-5	Styrene	1200	U
1330-20-7	Xylene (total)	1200	U

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

VBLKSM

Lab Name: CH2M HILL/MGM Contract: _____

Code: _____ Case No.: 21249 SAS No.: _____ SDG No.: _____

Matrix: (soil/water) SOIL Lab Sample ID: L03312B3

Sample wt/vol: 4.0 (g/mL) G Lab File ID: BBVM014760

Level: (low/med) MED Date Received: 04/01/92

% Moisture: not dec. 0 Date Analyzed: 04/01/92

GC Column: CAP ID: 0.530 (mm) Dilution Factor: 1.0

Soil Extract Volume: 10000 (uL) Soil Aliquot Volume: 100 (uL)

Number TICs found: 0

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

4B

SEMIVOLATILE METHOD BLANK SUMMARY

EPA SAMPLE NO.

SBLKS

Lab Name: CH2M HILL/MGM Contract: _____

Lab Code: _____ Case No.: 21249 SAS No.: _____ SDG No.: _____

Lab File ID: DBPA010372 Lab Sample ID: S03232B1

Instrument ID: 5100D Date Extracted: 03/23/92

Matrix: (soil/water) SOIL Date Analyzed: 04/02/92

Level:(low/med) LOW Time Analyzed: 1527

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS AND MSD:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
01	TT-07-03	21249002	D1PA010382	04/03/92

COMMENTS: CLP,21222,,SBLKS,L,S,S03232B1,B,BLANK,
30DG TO 310DG @10DG/MIN IH=4MINS

FORM IV SV

3/90

µSv

ORGANICS ANALYSIS DATA SHEET

oratory Name:	CH2M HILL/MGM	Concentration:	LOW	Date Extracted:	03/23/92
Lab Sample ID:	S03232B1	Sample Matrix:	SOIL	Date Analyzed:	04/02/92
Client Sample ID:	SBLKS	Percent Moisture:	0.0	Dilution Factor:	1.0

POLYNUCLEAR AROMATIC COMPOUNDS

CAS Number		ug/Kg		CAS Number		ug/Kg	
271-89-6	2,3-Benzofuran	330	U	260-94-6	Acridine	330	U
496-11-7	2,3-Dihydro-1h-Indene	330	U	229-87-8	Phenanthridine	330	U
95-13-6	1H-Indene	330	U	86-74-8	Carbazole	330	U
91-20-3	Naphthalene	330	U	206-44-0	Fluoranthene	330	U
95-15-8	Benzo(b)thiophene	330	U	129-00-0	Pyrene	330	U
91-22-5	Quinoline	330	U	56-55-3	Benzo(a)anthracene	330	U
119-65-3	Isoquinoline	330	U	218-01-9	Chrysene/Triphenylene	330	U
91-57-6	2-Methylnaphthalene	330	U	NA	Benzo(b&k)fluoranthene	NR	
120-72-9	Indole	330	U	57-97-6	7,12-Dimethylbenz(a)anthrac	330	U
90-12-0	1-Methylnaphthalene	330	U	192-97-2	Benzo(e)pyrene	330	U
2-52-4	Biphenyl	330	U	50-32-8	Benzo(a)pyrene	330	U
208-96-8	Acenaphthylene	330	U	198-55-0	Perylene	330	U
83-32-9	Acenaphthene	330	U	56-49-5	3-Methylcholanthrene	330	U
132-64-9	Dibenzofuran	330	U	193-39-5	Indeno(1,2,3-cd)pyrene	330	U
86-73-7	Fluorene	330	U	53-70-3	Dibenz(a,h)anthracene	330	U
132-65-0	Dibenzothiophene	330	U	191-24-2	Benzo(g,h,i,)perylene	330	U
85-01-8	Phenanthrene	330	U	205-99-2	Benzo(b)fluoranthene	330	U
120-12-7	Anthracene	330	U	207-08-9	Benzo(k)fluoranthene	330	U

U - Compound analyzed for but not detected.
B - Compound was detected in QC blank.
J - Reported value less than quantitation limit.

Form I

ORGANICS ANALYSIS DATA SHEET

Laboratory Name:	CH2M HILL/MGM	Concentration:	LOW	Date Extracted:	03/23/92
Lab Sample ID:	S03232B1	Sample Matrix:	SOIL	Date Analyzed:	04/02/92
Client Sample ID:	SBLKS	Percent Moisture:	0.0	Dilution Factor:	1.0

PHENOL COMPOUNDS

CAS Number		ug/Kg		CAS Number	ug/Kg
108-95-2	Phenol	330	U		
95-57-8	2-Chlorophenol	330	U		
95-48-7	2-Methylphenol	330	U		
106-44-5	4-Methylphenol	330	U		
88-75-5	2-Nitrophenol	330	U		
105-67-9	2,4-Dimethylphenol	330	U		
120-83-2	2,4-Dichlorophenol	330	U		
65-85-0	Benzoic acid	800	U		
59-50-7	4-Chloro-3-Methylphenol .	330	U		
88-06-2	2,4,6-Trichlorophenol . .	330	U		
95-95-4	2,4,5-Trichlorophenol . .	800	U		
51-28-5	2,4-Dinitrophenol	800	U		
100-02-7	4-Nitrophenol	800	U		
534-52-1	4,6-Dinitro-2-Methylphenol	800	U		
87-86-5	Pentachlorophenol	800	U		

U - Compound analyzed for but not detected.
B - Compound was detected in QC blank.
J - Reported value less than quantitation limit.

Form I

8A

VOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: CH2M HILL/MGM Contract: _____

Lab Code: _____ Case No.: 21249 SAS No.: _____ SDG No.: _____

Lab File ID (Standard): BSVM014759 Date Analyzed: 04/01/92

Instrument ID: 5100B Time Analyzed: 1406

GC Column: CAP ID: 0.530(mm) Heated Purge: (Y/N) N

		IS1(BCM) AREA #	RT #	IS2(DFB) AREA #	RT #	IS3(CBZ) AREA #	RT #
	12 HOUR STD	69713	9.57	259220	11.09	244025	15.95
	UPPER LIMIT	139426	10.07	518440	11.59	488050	16.45
	LOWER LIMIT	34856	9.07	129610	10.59	122012	15.45
	EPA SAMPLE NO.						
01	TT-07-03	63974	9.49	237734	11.04	212506	15.94
02	TT-23-03	67675	9.54	251652	11.07	237495	15.94
03	TT-23-03_DL	64258	9.54	232272	11.04	207087	15.90
04	VBLKSM	66911	9.59	258484	11.10	237757	15.95

IS1 (BCM) = Bromochloromethane
IS2 (DFB) = 1,4-Difluorobenzene
IS3 (CBZ) = Chlorobenzene-d5

AREA UPPER LIMIT = + 100% of internal standard area.
AREA LOWER LIMIT = - 50% of internal standard area.
RT UPPER LIMIT = +0.50 minutes of internal standard RT.
RT LOWER LIMIT = -0.50 minutes of internal standard RT.

Column used to flag values outside QC limits with an asterisk.
* Values outside of QC limits.

8B

SEMIVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: CH2M HILL/MGM Contract: _____

Lab Code: _____ Case No.: 21249 SAS No.: _____ SDG No.: _____

Lab File ID (Standard): DSPA010362 Date Analyzed: 04/02/92

Instrument ID: 5100D Time Analyzed: 0813

		IS1(DCB) AREA #	RT #	IS2(NPT) AREA #	RT #	IS3(ANT) AREA #	RT #
	12 HOUR STD	9234	9.82	35837	12.74	25187	17.05
	UPPER LIMIT	18468	10.32	71674	13.24	50374	17.55
	LOWER LIMIT	4617	9.32	17918	12.24	12594	16.55
	EPA SAMPLE NO.						
01	SBLKS	8258	9.77	36479	12.64	25623	16.89

IS1 (DCB) = 1,4-Dichlorobenzene-d4
IS2 (NPT) = Naphthalene-d8
IS3 (ANT) = Acenaphthene-d10

AREA UPPER LIMIT = + 100% of internal standard area.
AREA LOWER LIMIT = - 50% of internal standard area.
RT UPPER LIMIT = +0.50 minutes of internal standard RT.
RT LOWER LIMIT = -0.50 minutes of internal standard RT.

Column used to flag internal standard area values with an asterisk.
* Values outside of QC limits.

8C

SEMIVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: CH2M HILL/MGM Contract: _____

Lab Code: _____ Case No.: 21249 SAS No.: _____ SDG No.: _____

Lab File ID (Standard): DSPA010362 Date Analyzed: 04/02/92

Instrument ID: 5100D Time Analyzed: 0813

		IS4(PHN) AREA #	RT #	IS5(CRY) AREA #	RT #	IS6(PRY) AREA #	RT #
	12 HOUR STD	41092	20.70	41286	27.42	47700	30.81
	UPPER LIMIT	82184	21.20	82572	27.92	95400	31.31
	LOWER LIMIT	20546	20.20	20643	26.92	23850	30.31
	EPA SAMPLE NO.						
01	SBLKS	45039	20.52	49668	27.26	56959	30.64

IS4 (PHN) = Phenanthrene-d10
IS5 (CRY) = Chrysene-d12
IS6 (PRY) = Perylene-d12

AREA UPPER LIMIT = + 100% of internal standard area.
AREA LOWER LIMIT = - 50% of internal standard area.
RT UPPER LIMIT = +0.50 minutes of internal standard RT.
RT LOWER LIMIT = -0.50 minutes of internal standard RT.

Column used to flag internal standard area values with an asterisk.
* Values outside of QC limits.

FORM VIII SV-2

3/90

000025

8B

SEMIVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: CH2M HILL/MGM Contract: _____

Lab Code: _____ Case No.: 21249 SAS No.: _____ SDG No.: _____

Lab File ID (Standard): DSPA010381 Date Analyzed: 04/03/92

Instrument ID: 5100D Time Analyzed: 0740

		IS1(DCB) AREA #	RT #	IS2(NPT) AREA #	RT #	IS3(ANT) AREA #	RT #
	12 HOUR STD	10239	9.69	41966	12.52	31814	16.75
	UPPER LIMIT	20478	10.19	83932	13.02	63628	17.25
	LOWER LIMIT	5120	9.19	20983	12.02	15907	16.25
	EPA SAMPLE NO.						
01	TT-07-03	9944	9.67	39948	12.50	27950	16.74

IS1 (DCB) = 1,4-Dichlorobenzene-d4
IS2 (NPT) = Naphthalene-d8
IS3 (ANT) = Acenaphthene-d10

AREA UPPER LIMIT = + 100% of internal standard area.
AREA LOWER LIMIT = - 50% of internal standard area.
RT UPPER LIMIT = +0.50 minutes of internal standard RT.
RT LOWER LIMIT = -0.50 minutes of internal standard RT.

Column used to flag internal standard area values with an asterisk.
* Values outside of QC limits.

8C

SEMIVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: CH2M HILL/MGM Contract: _____

Lab Code: _____ Case No.: 21249 SAS No.: _____ SDG No.: _____

Lab File ID (Standard): DSPA010381 Date Analyzed: 04/03/92

Instrument ID: 5100D Time Analyzed: 0740

		IS4(PHN) AREA #	RT #	IS5(CRY) AREA #	RT #	IS6(PRY) AREA #	RT #
	12 HOUR STD	53575	20.37	57198	27.09	60045	30.49
	UPPER LIMIT	107150	20.87	114396	27.59	120090	30.99
	LOWER LIMIT	26788	19.87	28599	26.59	30022	29.99
	EPA SAMPLE NO.						
01	TT-07-03	50695	20.37	57303	27.07	66256	30.46

IS4 (PHN) = Phenanthrene-d10
IS5 (CRY) = Chrysene-d12
IS6 (PRY) = Perylene-d12

AREA UPPER LIMIT = + 100% of internal standard area.
AREA LOWER LIMIT = - 50% of internal standard area.
RT UPPER LIMIT = +0.50 minutes of internal standard RT.
RT LOWER LIMIT = -0.50 minutes of internal standard RT.

Column used to flag internal standard area values with an asterisk.
* Values outside of QC limits.

SAMPLE DATA PACKAGE

SAMPLE DATA PACKAGE

CASE NARRATIVE

Engineers
Planners
Economists
Scientists

CASE NARRATIVE FOR VOLATILE MASS SPECTROMETRY SAMPLES

LABORATORY: CH2M HILL LABORATORIES CLIENT: BARR ENGINEERING

CASE NO. : N/A CONTRACT NO.: N/A

LAB NO. : 21249 SDG NO.: N/A

I. RECEIPT

A. DATE: March 20, 1992

B. SAMPLE INFORMATION

LAB ID	CLIENT ID	SAMPLE MATRIX	DATE SAMPLED	EXTRACTION DATE	ANALYSIS DATE
21249002	TT-07-03	SOIL	03/20/92	03/31/92	04/01/92
21249003	TT-23-03	SOIL	03/19/92	03/31/92	04/01/92
21249003DL	TT-23-03_DL	SOIL	03/19/92	03/31/92	04/02/92
L03312B3	VBLKSM	SOIL	NA	03/31/92	04/01/92

C. Documentation
Exceptions : No exceptions were encountered.

II. EXTRACTION

A. Holding Times: All holding times were met. Samples 21249002 (TT-07-03), 21249003 (TT-23-03), 21249003DL (TT-23-3_DL) were analyzed using medium level soil protocols.

B. Extraction
Exceptions : No exceptions were encountered.

CH2M HILL Quality Analytical Laboratories 2567 Fairlane Drive. P.O. Box 230548. Montgomery, Alabama 36116 205 271 1444

III. ANALYSIS

A. Holding times: All holding times were met.

B. Analytical Exceptions : Please see attached table for information concerning methylene chloride and acetone.

The original analysis of sample 21249003 (TT-23-03) showed target compounds above the calibration range. The sample was diluted and reanalyzed. The results of both analyses have been reported.

Due to the saturation of the quantitation ion, the quantitated amount of Toluene and Total Xylene present in sample 21249003 was determined by using a secondary ion quantitation. A chromatogram demonstrating the interferences has been included with the sample as well as the calculation used to determine the amount of each target present in the sample.

No other exceptions were encountered.

IV. QUALITY CONTROL

A. Method Blank : All associated method blanks met acceptable QC criteria.

B. Surrogate Recoveries : All samples met acceptable QC limits.

C. Matrix Spike Results : The native sample, matrix spike, and matrix spike duplicate results are contained within another batch of samples. The results will be reported with the results of our laboratory contract number 21232.

Please note that Forms II, IV, V, and VIII have numbers to the immediate left of each table. These numbers are sequential only and have no relation to CH2M HILL identification numbers.

I 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 contained in this hardcopy data package and in the computer-readable data submitted on floppy diskette has been authorized by the Laboratory Manager or his designee, as verified by the following signature.

Herb Kelly 4/16/92
Herb Kelly Date
Manager, Organic Division

CH2M HILL Quality Analytical Laboratories 2567 Fairlane Drive, P.O. Box 230548, Montgomery, Alabama 36116 205 271 1444

Engineers
Planners
CH2M HILL
Economists
Scientists

METHYLENE CHLORIDE/ACETONE SUMMARY

Due to the level of target compounds, the following samples required large dilutions for analysis. As required by the Statement of Work, these dilution factors have been applied, without background subtraction, to all detected compounds, particularly methylene chloride and acetone. As methylene chloride and acetone are common laboratory contaminants, the following table is being provided to present a more accurate perspective of these compounds. Included in the table is 1) the amount of methylene chloride and acetone, detected at the instrument, prior to multiplication by the dilution factor; and 2) the amount of methylene chloride and acetone for that particular sample's laboratory method blank.

SAMPLE	METHYLENE CHLORIDE	ACETONE	METHOD BLANK	METHYLENE CHLORIDE	ACETONE
21249002	5 ug/Kg	10 U	L03312B3	4 ug/Kg	10 U
21249003	4 ug/Kg	10 U	L03312B3	4 ug/Kg	10 U
21249003DL	5 ug/Kg	10 U	L03312B3	4 ug/Kg	10 U

CH2M HILL
Quality Analytical Laboratories
2567 Fairlane Drive, P.O. Box 230548, Montgomery, Alabama 36116
205 271 1444

SAMPLE DATA PACKAGE

SHIPPING RECEIPTS

7803 GLENROY ROAD
MINNEAPOLIS, MN 55439

PROJECT NUMBER Nº 01263
13/49-003JSL31
NO: WAUKEGAN COKE PLANT RI

JIM LANGSETH
PROJECT CONTACT: MARY MACKEY
LABORATORY: CH_2M HILL
REMARKS/ ANALYSIS REQUIRED:

SAMPLE IDENTIFICATION	COLLECTION DATE	COLLECTION TIME	GRAB	COMP.	BLANK	VOLATILE ORGANIC-CLP TCL	SEMIVOLATILE ORGANIC	~~FILTERED~~ METALS CLP TAL	UNFILTERED METALS	GENERAL	CYANIDE	NUTRIENTS	OIL AND GREASE	TOC	SULFIDE	DIOXIN	EXTRACTABLES CLP TCL	PESTICIDES/PCB CLP TCL	PAH'S	PAH/PHENOLS						TOTAL NO. OF CONTAINERS
TT-07-01	3.19.92	PM	X					X			X													001		1
TT-07-03	3.19.92	PM	X			X														X				002		3
TT-23-03	3.19.92	~~PM~~ AM	X			X																		003		2
Method Blank								✓			✓													ZS1		

FOR LAB USE ONLY
LAB # 21249
PROJ # LMG33486.XV
ACK JH 3/23 VERIFIED BS 3/20/92
HAZWRAP/HEESA Y 3/20
QC LEVEL 1 2 3
COC yes | ICE yes
ANA REQ yes | TEMP 4°C
CUST SEAL yes | PH n/a
SAMPLE COND Sat
verified BS 3/20/92

SAMPLED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY LAB:	DATE	TIME
(TMF) [signature]	(TMF) [signature]	3.19.92	PM	[signature]	3/20/92	0730
RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY LAB:	DATE	TIME
RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY LAB:	DATE	TIME

REMARKS:

SAMPLES SHIPPED VIA
☐ AIR FREIGHT ☒ FED. EXP. ☐ SAMPLER
☐ OTHER

AIR BILL NUMBER: 3161694815

DISTRIBUTION: WHITE-ORIGINAL ACCOMPANIES SHIPMENT TO LAB, RETURNS TO BARR WITH RESULTS; YELLOW-LAB COPY; PINK-LAB COORDINATOR; GOLD-FIELD COPY

000036

Engineers
Planners
Economists
Scientists

CASE NARRATIVE FOR PNA/PHENOL MASS SPECTROMETRY SAMPLES

LABORATORY: CH2M HILL LABORATORIES CLIENT: BARR ENGINEERING

CASE NO. : N/A CONTRACT NO.: N/A

LAB NO. : 21249 SDG NO.: N/A

I. RECEIPT

A. DATE: March 20, 1992

B. SAMPLE INFORMATION

LAB ID	CLIENT ID	SAMPLE MATRIX	DATE SAMPLED	EXTRACTION DATE	ANALYSIS DATE
21249002	TT-07-03	SOIL	03/20/92	03/23/92	04/03/92
S03232B1	SBLKS	SOIL	NA	03/23/92	04/02/92

C. Documentation Exceptions : Tentatively Identified Compounds (TIC) were not requested as part of this analysis. Therefore, the TIC forms and raw data will not be included in this package.

As you have requested, Benzo(b)fluoranthene and Benzo(k)fluoranthene will be reported separately. Due to the low concentrations analyzed for, there may be instances where the native matrix offers chromatographic interferences in this region of the chromatogram, making it difficult to correctly quantitate these isomers as separate compounds. In that case, Benzo(b)fluoranthene and Benzo(k)fluoranthene will be reported as total Benzo(b&k)fluoranthene. An "NR" (not reported) qualifier will then be used for the compounds for which are not reported.

Please note that the amount listed on the quantitation report reflects the mass detected at the instrument. According to the CLP Statement of Work, 2-uL injections must be made. Therefore, the amount on the quantitation report must be divided by a factor of two in order to determine the concentration of the extract injected.

No other exceptions were encountered.

CH2M HILL Quality Analytical Laboratories 2567 Fairlane Drive, P O Box 230548, Montgomery, Alabama 36116 205 271 1444

II. EXTRACTION

A. Holding Times: All holding times were met.

B. Extraction Exceptions : No exceptions were encountered.

III. ANALYSIS

A. Holding times: All holding times were met.

B. Analytical Exceptions : No exceptions were encountered.

IV. QUALITY CONTROL

A. Method Blank : All associated method blanks met acceptable QC criteria.

B. Surrogate Recoveries : Sample 21249002 (TT-07-03) required a large dilution for analysis. Therefore, surrogate recoveries could not be determined for this sample.

All other samples met acceptable QC limits.

C. Matrix Spike Results : The native sample, matrix spike, and matrix spike duplicate results are contained within another batch of samples. The results will be reported with the results of our laboratory contract number 21128.

Please note that Forms II, IV, V, and VIII have numbers to the immediate left of each table. These numbers are sequential only and have no relation to CH2M HILL identification numbers.

I 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 contained in this hardcopy data package and in the computer-readable data submitted on floppy diskette has been authorized by the Laboratory Manager or his designee, as verified by the following signature.

Herb Kelly 4/16/92
Herb Kelly Date
Manager, Organic Division

CH2M HILL Quality Analytical Laboratories 2567 Fairlane Drive, P.O. Box 230548, Montgomery, Alabama 36116 205 271 1444

Laboratory No. 21263

-- Volatiles

-- PAH/Phenols

-- Metals

Five investigative soil samples (TT1001, TT1001 two duplicates, TT0802, T08A01 and SB0403) were collected March 20 and 21, 1992. Four samples were analyzed for volatiles and PAH/phenols, and three samples were analyzed for metals. The results of these analyses were reported in this case and qualified as described in the following sections.

Holding Times

Holding times were met on all samples and analyses using the EPA holding time criteria for water samples.

Instrument Tuning

Volatiles

GC/MS Tuning met the established method performance criteria for compounds, concentrations, frequencies and relative ion abundances for the volatiles analyses.

PAH/PHENOL

GC/MS Tuning met the established method performance criteria for compounds, concentrations, frequencies and relative ion abundances for the semivolatiles analyses.

Metals

Instrument tuning does not apply to the metals analyses.

Instrument Calibration

Volatiles

Initial calibration percent relative standard deviation (%RSD) and continuing calibration percent difference (%D) values for several compounds were outside the appropriate control limits.

The volatile analyses initial calibration parameters and associated %RSD values beyond control limits were chloroethane (32.4 percent), chloromethane (-38.9 percent), acetone (42.9 percent), 2-butanone (34.1 percent) and bromodichloromethane (33.5 percent). The continuing calibration parameters with %D value outliers were chloromethane (49.0 percent and -71.0 percent), chloroethane (-27.0 percent), methylene chloride (-35.4 percent), carbon disulfide (-30.6 percent and 26.8 percent), bromoform (35.1 percent), 4-methyl-2-pentanone (-27.4 percent), vinyl chloride (27.2 percent) and the surrogate standard 1,2-dichloroethane-d4 (-27.2 percent). Carbon disulfide was detected, qualified as estimated, and flagged "J" in the associated samples.

PAH/PHENOL

Initial calibrations had acceptable average relative response factors and %RSD values. Continuing calibration relative response factors and %D values were acceptable for all compounds.

Metals

Instrument calibrations were completed the proper number of times using the appropriate number and type of standards and blanks. Initial and continuing calibration percent recovery values were acceptable for all metals analyses.

Blanks

Volatiles

Methylene chloride (12 and 450 J µg/kg), acetone (10 µg/kg) and chloroform (2 J µg/kg) were detected in the volatiles blank. Sample results less than five times the associated blank concentration of Chloroform or less than ten times the associated blank concentration of either remaining compound were qualified as nondetects and flagged "U."

PAH/Phenols

No compounds were detected in the PAH/phenols method blank.

Metals

Total metals analyses calibration and preparation blanks had concentrations of arsenic less than the contract required detection limit (CRDL) but greater than the instrument detection limit (IDL). Sample results were greater than five times the blank concentration, so no data were qualified.

Surrogate Recovery

Volatiles

The volatiles system monitoring compound bromofluorobenzene had recoveries outside the 59-113 percent quality control limits for sample TT0802DL (116 percent). Since the recovery for this surrogate on the native sample TT0802 was within quality control limits, no data were qualified. High recoveries on samples TT1001 (118 percent), and TT1001DL (118 percent), were due to the large dilutions required for analysis. No action was taken.

PAH/PHENOL

The PAH/phenol analyses surrogates could not be determined on samples TT1001, TT1001 duplicate and TT0802 due to the large dilutions required for analysis. No data were qualified.

Metals

A total metals analyses ICP interference check sample was not required since only furnace analyses were completed. Recoveries and results for the laboratory control sample were within the established control limits.

Matrix Spike/Matrix Spike Duplicate

Volatiles

The matrix spike/matrix spike duplicate samples recovery values were acceptable for all samples except sample TT1001. Matrix spike/matrix spike duplicate results for this sample were included in report 21262. Report 21262 was not part of this project and was not received. The data were accepted without a matrix spike/matrix spike duplicate sample review.

PAH/PHENOL

PAH/Phenol analyses matrix spike/matrix spike duplicate samples recoveries and RPD values were within the control limits.

Metals

Metals analyses quality control samples included a duplicate sample, a spike sample, post digestion spike samples and an ICP serial dilution sample.

Duplicate samples RPD values for cyanide (23.3 percent) were beyond the appropriate control limits. Results in the investigative samples for cyanide were qualified as estimated and flagged as "J."

The spike sample had recoveries beyond control limits (75-125 percent) for cyanide (-3.1 percent). Sample results for cyanide were qualified as estimated and flagged "J."

The post digestion spike recoveries for arsenic were within the 85-115 percent control limits on all samples. Post digestion spike analysis was not required for cyanide.

ICP serial dilution was not required.

Field Duplicates

Field duplicate samples are summarized in Tables 2.3-6 through 2.3-11.

Overall Assessment

The data are considered acceptable with the recommended qualifiers.

Engineers
Planners
CH2M HILL Economists
Scientists

RECEIVED
MAY 05 92

April 23, 1992

LMG33486.XY

Ms. Marti Harding-Smith
Barr Engineering Company
8300 Norman Center Drive
Suite 300
Minneapolis, Minnesota 55437-1026

RE: Analytical Data for LMG Laboratory No. 21263

Dear Ms. Harding-Smith:

On March 23, 1992, the CH2M HILL Montgomery Laboratory received three samples with a request for analysis of selected inorganic parameters.

The analytical results and associated quality control data are enclosed. Any unusual difficulties encountered during the analyses of these samples are discussed in the case narratives.

If you should have any questions concerning the data, please inquire.

The CH2M HILL policy is to store samples for up to 30 days after reporting. If you desire, our laboratory will maintain your samples for a longer period at a cost of $5.00 per sample per month. Samples determined to be hazardous can either be returned to you or disposed of at a cost of $25.00 per sample.

Sincerely,

Wanda L. Hall

Wanda L. Hall
Data Package Supervisor

Enclosures

cc: Mr. Jim Langseth

Engineers
Planners
Economists
Scientists

TABLE OF CONTENTS

CH2M HILL Laboratory No. 21263

	Page No.
List of Inorganic EPA-defined Qualifiers	i
Sample Cross-Reference	ii
CATIONS DATA PACKAGE	1
Case Narrative	2-3
Cover Page	4
Analytical Results of Field Samples	
TT-10-01 (LMG #21263001)	5
TT-08A-01 (LMG #21263003)	6
M-06 (LMG #21263004)	7
Quality Control Data	
Initial & Continuing Calibration Verification	8-11
CRDL Standard for AA	12-13
Blank Data	14-16
Post Digest Spike Sample Data	17-21
Laboratory Control Sample	22
Instrument Detection Limits	23
Preparation Log	24-25
Analysis Run Log	26-34
Raw Data	
Arsenic Data (GFAA)	35-114
Cyanide Data	115-126
Digestion/Distillation Logs	127-129
Percent Solids	130-131
Copy of Chain-of-custody	132-133

EPA QUALIFIERS

INORGANIC ANALYSES

- C (Concentration) Qualifier -- Enter "B" if the reported value obtained was less than the CRDL but greater than or equal to the IDL. Enter "U" if the value was less than the IDL or was not detected.

- Q Qualifier -- Entries and their meanings are:

  E - The reported value is estimated because of interference. An explanatory comment must be included under "Comments" on the Cover Page if the problem applies to all samples in this data package or on the individual FORM I if it is an isolated problem.

  M - Duplicate injection precision was not met (two analyses of the same sample did not agree).

  N - Spiked sample recovery not within control limits.

  S - The reported value was determined by the Method of Standard Additions (MSA).

  W - Post-digestion spike for Furnace AA analysis is out of control limits (85-115%), while sample absorbance is less than 50% of spike absorbance.

  * - Duplicate analysis not within control limits.

  + - Correlation coefficient for the MSA is less than 0.995.

  Entering "S", "W", or "+" is mutually exclusive. No combination of these qualifiers can appear in the same field.

- M (Method) Qualifier -- Enter one of the following:

  P - ICP
  A - Flame AA
  F - Furnace AA
  CV - Manual Cold Vapor AA
  AV - Automated Cold Vapor AA
  AS - Semi-Automated Spectrophotometric
  C - Manual Spectrophotometric
  T - Titrimetric
  NR - Analyte was not required by your lab

CH2M HILL Quality Analytical Laboratories 2567 Fairlane Drive, P.O. Box 230548, Montgomery, Alabama 36116 205 271 1444

Engineers
Planners
CH2M HILL
Economists
Scientists

TABLE 1

SAMPLE CROSS-REFERENCE SUMMARY

CH2M HILL Laboratory No. 21263

CH2M HILL Sample No.	Sample Description				
21263001	TT-10-01	03/21/92	GRAB	13/49-003JSL31	PO#01262
21263003	TT-08A-01	03/21/92	GRAB	13/49-003JSL31	PO#01262
21263004	M-06	03/21/92	GRAB	13/49-003JSL31	PO#01262

CH2M HILL
Quality
Analytical Laboratories
2567 Fairlane Drive, P.O. Box 230548,
Montgomery, Alabama 36116
205 271 1444

CATIONS DATA PACKAGE

Engineers
Planners
CH2M HILL Economists
Scientists

CASE NARRATIVE
Cations

Batch Number: 21263

Client/Project: BARR ENGINEERING COMPANY

I. Holding Time:
All holding times were met.

II. Analysis:

A. Blanks:
All acceptance criteria were met.

B. Calibration:
All acceptance criteria were met.

C. ICP Interference Check Sample:
Not applicable for this analysis.

D. Spike Sample Analysis:
Prespike recoveries outside criteria are flagged accordingly.

E. Duplicate Sample Analysis:
Duplicate precision outside criteria are flagged accordingly.

F. Laboratory Control Sample Analysis:
All acceptance criteria were met.

G. ICP Serial Dilution:
Not applicable for this analysis.

H. Other:
The QC associated with 21263 is included in the 21232 data package.

III. I certify that this data package is in compliance with the terms and conditions agreed to by the client and CH2M HILL, both technically and for completeness, for other than the conditions detailed above.

SIGNED: _____ DATE: 23APR92
Kevin A. Sanders
Inorganic Division Manager

CH2M HILL Quality Analytical Laboratories 2567 Fairlane Drive, P.O. Box 230548, Montgomery, Alabama 36116 205 271 1444

Engineers
Planners
CH2M HILL Economists
Scientists

CASE NARRATIVE
General Chemistry

Batch Number: 21263

Client/Project: BARR ENGINEERING COMPANY

I. Holding Time: All criteria were met.

II. Analysis:

A.	Calibration:	Acceptance criteria met.
B.	Blanks:	Acceptance criteria met.
C.	Matrix Spike:	The cyanide prespike recovery was outside criteria and is flagged accordingly.
D.	Duplicate Analysis:	The cyanide duplicate precision was outside criteria and is flagged accordingly.
E.	Lab Control Sample:	Acceptance criteria met.
F.	Other:	None.

III. I certify that this data package is in compliance with the terms and conditions agreed to by the client and CH2M HILL, both technically and for completeness, for other than the conditions detailed above.

SIGNED: _____ DATE: 23APR92

Kevin A. Sanders
Inorganic Division Manager

CH2M HILL Quality Analytical Laboratories 2567 Fairlane Drive, P.O. Box 230548, Montgomery, Alabama 36116 205 271 1444

U.S. EPA - CLP

COVER PAGE - INORGANIC ANALYSES DATA PACKAGE

Lab Name: CH2M_HILL_MGM_____ Contract: 21263_____

Lab Code: NA____ Case No.: 21263 SAS No.: 21263_ SDG No.:21263_

SOW No.: 3/90_

EPA Sample No.	Lab Sample ID
_M-06_____	__S21263004___
_-08A-01_____	__S21263003___
_T-10-01_____	__S21263001___

Were ICP interelement corrections applied ? Yes/No YES

Were ICP background corrections applied ? Yes/No YES
If yes - were raw data generated before application of background corrections ? Yes/No NO_

Comments:
____QC_IS_INCLUDED_IN_DATA_PACKAGE_21232._____

I 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 contained in this hardcopy data package and in the computer-readable data submitted on floppy diskette has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature.

Signature: [signature] Name: Kevin A. Sanders_____

Date: 20APR92 Title: Inorganic Division Mgr__

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

TT-10-01

Lab Name: CH2M_HILL_MGM_____ Contract: 21263_____

Lab Code: NA____ Case No.: 21263 SAS No.: 21263_ SDG No.: 21263_

Matrix (soil/water): SOIL_ Lab Sample ID: S21263001_

Level (low/med): LOW__ Date Received: 03/23/92

% Solids: _81.6

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum_				NR
7440-36-0	Antimony_				NR
7440-38-2	Arsenic__	191		*	F_
7440-39-3	Barium___				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium__				NR
7440-70-2	Calcium__				NR
7440-47-3	Chromium_				NR
7440-48-4	Cobalt___				NR
7440-50-8	Copper___				NR
7439-89-6	Iron_____				NR
7439-92-1	Lead_____				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury__				NR
7440-02-0	Nickel___				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium_				NR
7440-22-4	Silver___				NR
7440-23-5	Sodium___				NR
7440-28-0	Thallium_				NR
7440-62-2	Vanadium_				NR
7440-66-6	Zinc_____				NR
_____	Cyanide__	1.3	B	N*	CA

Color Before: BLACK____ Clarity Before: N/A___ Texture: MUD___

Color After: CLEAR____ Clarity After: CLEAR_ Artifacts: _____

Comments:
THE_"*"_QUALIFIER_REFLECTS_POOR_DUPLICATE_PRECISION.__THE_"N"_____
QUALIFIER_INDICATES_POOR_PRESPIKE_RECOVERY._____

FORM I - IN

3/90

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

TT-08A-01

Lab Name: CH2M_HILL_MGM_____ Contract: 21263_____

Lab Code: NA____ Case No.: 21263 SAS No.: 21263_ SDG No.: 21263_

Matrix (soil/water): SOIL_ Lab Sample ID: S21263003_

Level (low/med): LOW__ Date Received: 03/23/92

% Solids: _80.9

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum_				NR
7440-36-0	Antimony_				NR
7440-38-2	Arsenic__	304		*	F_
7440-39-3	Barium___				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium__				NR
7440-70-2	Calcium__				NR
7440-47-3	Chromium_				NR
7440-48-4	Cobalt___				NR
7440-50-8	Copper___				NR
7439-89-6	Iron____				NR
7439-92-1	Lead____				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury__				NR
7440-02-0	Nickel___				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium_				NR
7440-22-4	Silver___				NR
7440-23-5	Sodium___				NR
7440-28-0	Thallium_				NR
7440-62-2	Vanadium_				NR
7440-66-6	Zinc____				NR
	Cyanide__	52.4		N*	CA

Color Before: BROWN____ Clarity Before: N/A___ Texture: SAND__

Color After: CLEAR____ Clarity After: CLEAR_ Artifacts: _____

Comments:

FORM I - IN

3/90

U.S. EPA - CLP

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

M-06

Lab Name: CH2M_HILL_MGM Contract: 21263

Lab Code: NA Case No.: 21263 SAS No.: 21263 SDG No.: 21263

Matrix (soil/water): SOIL Lab Sample ID: S21263004

Level (low/med): LOW Date Received: 03/23/92

% 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				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic	318		*	F
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury				NR
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide	2.5	B	N*	CA

Color Before: BLACK Clarity Before: N/A Texture: MUD

Color After: CLEAR Clarity After: CLEAR Artifacts:

Comments:

FORM I - IN

3/90

BARR ENGINEERING CO.
7803 GLENROY ROAD
MINNEAPOLIS, MN 55439

PROJECT NUMBER № 01262
13/49-003JSL31

NO: WAUKEGAN COKE PLANT RI

JIM LANGSETH
PROJECT CONTACT: MARY MACKEY
LABORATORY: CH_2M HILL
REMARKS/ ANALYSIS REQUIRED:

SAMPLE IDENTIFICATION	COLLECTION DATE	COLLECTION TIME	GRAB	COMP.	BLANK	VOLATILE ORGANIC - CLP TCL	SEMIVOLATILE ORGANIC	[redacted] METALS CLP TAL	UNFILTERED METALS	GENERAL	CYANIDE	NUTRIENTS	OIL AND GREASE	TOC	SULFIDE	DIOXIN	EXTRACTABLES - CLP TCL	PESTICIDES/PCB CLP TCL	PAH's	PAH/PHENOLS	ARSENIC					TOTAL NO. OF CONTAINERS
TT-10-01	3/21/92	AM	X			X					X								[redacted]	X	X			001		4 CONTAINERS
TT-08-02	3/21/92	AM	X			X													[redacted]	X				002		3
TT-08A-01	3/21/92	AM	X			X					X										X			003		3
M-06	3/21/92	AM	X								X										X			004		1
SB-04	3/20/92	AM	X			X														X				005		3
M-07	3/21/92	AM	X																	X				006		1
Method Blank																								ZS1		

FOR LAB USE ONLY
LAB # 21263
PROJ # LMG 33486, XY
ACK 3/24 VERIFIED
HAZWRAP/NEESA Y (N)
QC LEVEL 1 2 3 D
COC yes ICE yes
ANALREQ yes TEMP 4°C
CUST SEAL yes PH N/A
SAMPLE COND. Soil

SAMPLED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY LAB:	DATE	TIME
(SEM) [signature]	(SEM) [signature]	3/20/92 3/21/92	PM Am	[signature]	3/23/92	0845
RECEIVED BY: (SEM) [signature]	RELINQUISHED BY: (SEM) [signature]	DATE 3/21/92	TIME Am	RECEIVED BY LAB:	DATE	TIME
RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY LAB:	DATE	TIME

REMARKS:

SAMPLES SHIPPED VIA
☐ AIR FREIGHT ☒ FED. EXP. ☐ SAMPLER
☐ OTHER

AIR BILL NUMBER: 3161694804

DISTRIBUTION: WHITE-ORIGINAL ACCOMPANIES SHIPMENT TO LAB, RETURNS TO BARR WITH RESULTS; YELLOW-LAB COPY; PINK-LAB COORDINATOR; GOLD-FIELD COPY

000133

CH2M HILL
Engineers
Planners
Economists
Scientists

May 4, 1992

LMG33486.XY

Ms. Marti Harding-Smith
Barr Engineering Company
8300 Norman Center Drive
Suite 300
Minneapolis, Minnesota 55437-1026

RE: Analytical Data for LMG Laboratory No. 21263

Dear Ms. Harding-Smith:

On March 23, 1992, the CH2M HILL Montgomery Laboratory received five samples with a request for analysis of selected organic parameters.

The analytical results and associated quality control data are enclosed. Any unusual difficulties encountered during the analyses of these samples are discussed in the case narratives.

If you should have any questions concerning the data, please inquire.

The CH2M HILL policy is to store samples for up to 30 days after reporting. If you desire, our laboratory will maintain your samples for a longer period at a cost of $5.00 per sample per month. Samples determined to be hazardous can either be returned to you or disposed of at a cost of $25.00 per sample.

Sincerely,

Wanda L. Hall

Wanda L. Hall
Data Package Supervisor

Enclosures

cc: Mr. Jim Langseth

Engineers
Planners
CH2M HILL Economists
Scientists

TABLE OF CONTENTS

CH2M HILL Laboratory No. 21263

	Page No.
List of Organic EPA-defined Qualifiers	i
List of Sample ID Qualifiers	ii
Sample Cross-Reference	iii
List of Internal Standards and Surrogates (Volatiles)	iv
List of Internal Standards and Surrogates (Semivolatiles)	v
SAMPLE DATA SUMMARY PACKAGE	1-43
SAMPLE DATA PACKAGE	44
Case Narratives	45-49
Shipping Receipts	50-51
Volatile Data	52
QC Summary	53-63
Sample Data (Analytical Results of Field Samples)	64
TT-10-01 (LMG #21263001)	65-99
TT-10-0_DL (LMG #21263001DL)	100-130
TT-08-02 (LMG #21263002)	131-169
TT-08-02_DL (LMG #21263001DL)	170-190
TT-08A-01 (LMG #21263003)	191-231
SB-04-03 (LMG #21263005)	232-260
Standards Data	261
Initial Calibration Data	262-314
Continuing Calibration Data	315-327
Raw QC Data	328
BFB Data	329-345
Blank Data	346-366
PNA/Phenol Data	367
QC Summary	368-377
Sample Data (Analytical Results of Field Samples)	378
TT-10-01 (LMG #21263001)	379-404
TT-08-02 (LMG #21263002)	405-440
SB-04-03 (LMG #21263005)	441-454
M-07 (LMG #21263006)	455-480
Standards Data	481
Initial Calibration Data	482-514
Continuing Calibration Data	515-531
GPC Calibration Data	532-533
Raw QC Data	534
DFTPP Data	535-547
Blank Data	548-554

CH2M HILL
Engineers
Planners
Economists
Scientists

EPA - DEFINED QUALIFIERS

ORGANICS

Definitions for the EPA-defined qualifiers:

U -- Indicates the compound was analyzed for but not detected. The number adjacent to the "U" qualifier indicates the quantitation limit for that compound. The detection limit can vary from sample to sample depending on dilution factors or percent moisture adjustment when indicated.

J -- Indicates an estimated value. This flag is used when the mass spectral data indicates the presence of a compound below the stated quantitation limit. The "J" qualifier is not used with pesticide results.

C -- This flag applies to pesticide results only. The "C" flag indicates the presence of this compound has been confirmed by GC/MS analysis.

B -- This flag is used when the analyte is found in the associated blank as well as the sample. This notation indicates possible blank contamination and suggests the data user evaluate these compounds and their amounts carefully.

E -- This flag applies to GC/MS only. The "E" qualifier indicates a compound may be above or below the linear range of the instrument. If the particular compound level is deemed above the linear calibration range, then the sample should be reanalyzed at an appropriate dilution. Therefore, the "E" qualified amount is an estimated concentration. The results for the dilution will be reported on a separate Form I and will be flagged with a "D" if the dilution brings the concentration within proper calibration.

D -- This flag identifies compounds which have been run at a dilution to bring the concentration of that compound within the linear range of the instrument. "D" qualifiers are only used for samples that have been run initially with results above acceptable ranges. For secondary dilutions the "DL" suffix is appended to the sample number on the Form I.

A -- Indicates the Tentatively Identified Compound (TIC) is a suspected aldol-condensation product.

X -- Indicates the compound concentration has been manually modified or the EPA qualifier has been manually modified or added.

JX -- The compound was detected and quantitated below the Contract Required Quantitation Limit.

CH2M HILL Quality Analytical Laboratories 2567 Fairlane Drive P.O. Box 230548 Montgomery, Alabama 36116 205 271 1444

CLIENT SAMPLE ID QUALIFIERS

LEVEL 3

The qualifiers that GC/MS and GC use with the client sample ID are defined below:

DL -- Dilution Run

R -- Rerun (may be followed by a digit to indicate multiple reruns)

RD -- Diluted Rerun

RX -- Re-extraction Analysis

MS -- Matrix Spike (may be followed by a digit to indicate multiple matrix spikes within a sample set)

MSD -- Matrix Spike Duplicate (may be followed by a digit to indicate multiple matrix spike duplicates within a sample set)

VBLK -- Volatile Blank (will be followed by a "W" for waters, "S" for soils run at a low level, or "SM" for soils run at a medium level -- these letters may be followed by a digit to indicate multiple blanks of that type).

SBLK -- Semivolatile Blank (will be followed by a "W" for waters, "S" for soils run at a low level, or "SM" for soils run at a medium level -- these letters may be followed by a digit to indicate multiple blanks of that type).

PBLK -- Pesticide/PCB Blank (may be followed by digits to indicate multiple blanks)

These qualifiers allow GC/MS and GC to have unique client sample ID's so that the client can get more accurate information from the data reported.

CH2M HILL Quality Analytical Laboratories 2567 Fairlane Drive, P.O. Box 230548 Montgomery, Alabama 36116 205 271 1444

Engineers
Planners
Economists
Scientists

TABLE 1

SAMPLE CROSS-REFERENCE SUMMARY

CH2M HILL Laboratory No. 21263

CH2M HILL Sample No.	Sample Description				
21263001	TT-10-01	03/21/92	GRAB	13/49-003JSL31	PO#01262
21263002	TT-08-02	03/21/92	GRAB	13/49-003JSL31	PO#01262
21263003	TT-08A-01	03/21/92	GRAB	13/49-003JSL31	PO#01262
21263005	SB-04-03	03/20/92	GRAB	13/49-003JSL31	PO#01262
21263006	M-07	03/21/92	GRAB	13/49-003JSL31	PO#01262

CH2M HILL
Quality Analytical Laboratories
2567 Fairlane Drive, P.O. Box 230548, Montgomery, Alabama 36116
205 271 1444

INTERNAL STANDARD AND SURROGATE COMPOUNDS

VOLATILE ANALYSIS

The internal standards on the GC/MS volatile chromatograms are designated as IS1, IS2, and IS3. The surrogate standards are labelled as SS1, SS2, and SS3. The compounds corresponding to these labels are listed below.

LABEL	INTERNAL STANDARD COMPOUND
IS1	BROMOCHLOROMETHANE
IS2	1,4-DIFLUOROBENZENE
IS3	D5-CHLOROBENZENE

LABEL	SURROGATE STANDARD COMPOUND
SS1	D4-1,2-DICHLOROETHANE
SS2	D8-TOLUENE
SS3	1,4-BROMOFLUOROBENZENE

CH2M HILL Quality Analytical Laboratories 2567 Fairlane Drive, P.O. Box 230548, Montgomery, Alabama 36116 205 271 1444

INTERNAL STANDARD AND SURROGATE COMPOUNDS

SEMIVOLATILE ANALYSIS

The internal standards on the GC/MS semivolatile chromatograms are designated as IS1, IS2, IS3, IS4, IS5, and IS6. The surrogate standards are labelled as SS1, SS2, SS3, SS4, SS5, and SS6. The compounds corresponding to these labels are listed below.

LABEL	INTERNAL STANDARD COMPOUND
IS1	D4-1,4-DICHLOROBENZENE
IS2	D8-NAPHTHALENE
IS3	D10-ACENAPHTHENE
IS4	D10-PHENANTHRENE
IS5	D12-CHRYSENE
IS6	D12-PERYLENE

LABEL	SURROGATE STANDARD COMPOUND
SS1	2-FLUOROPHENOL
SS2	D5-PHENOL
SS3	D5-NITROBENZENE
SS4	2-FLUOROBIPHENYL
SS5	2,4,6-TRIBROMOPHENOL
SS6	D14-TERPHENYL

CH2M HILL
Quality Analytical Laboratories
2567 Fairlane Drive, P.O. Box 230548, Montgomery, Alabama 36116
205 271 1444

SAMPLE DATA SUMMARY PACKAGE

Engineers
Planners
Economists
Scientists

CASE NARRATIVE FOR VOLATILE MASS SPECTROMETRY SAMPLES

LABORATORY: CH2M HILL LABORATORIES CLIENT: BARR ENGINEERING

CASE NO. : N/A CONTRACT NO.: N/A

LAB NO. : 21263 SDG NO.: N/A

I. RECEIPT

A. DATE: March 23, 1992

B. SAMPLE INFORMATION

LAB ID	CLIENT ID	SAMPLE MATRIX	DATE SAMPLED	EXTRACTION DATE	ANALYSIS DATE
21263001	TT-10-01	SOIL	03/21/92	04/01/92	04/01/92
21263001DL	TT-10-01 DL	SOIL	03/21/92	04/01/92	04/01/92
21263002	TT-08-01	SOIL	03/21/92	NA	03/26/92
21263002DL	TT-08-01 DL	SOIL	03/21/92	04/01/92	04/01/92
21263003	TT-08A-01	SOIL	03/21/92	NA	03/26/92
21263005	SB-04-03	SOIL	03/20/92	NA	03/26/92
Y03262B2	VBLKS	SOIL	NA	NA	03/26/92
L03312B3	VBLKSM	SOIL	NA	04/01/92	04/01/92

C. Documentation
Exceptions : No exceptions were encountered.

II. EXTRACTION

A. Holding Times: All holding times were met.

B. Extraction
Exceptions : No exceptions were encountered.

CH2M HILL Quality Analytical Laboratories 2567 Fairlane Drive, P.O. Box 230548, Montgomery, Alabama 36116 205 271 1444

III. ANALYSIS

A. Holding times: All holding times were met.

B. Analytical Exceptions : No exceptions were encountered.

IV. QUALITY CONTROL

A. Method Blank : All associated method blanks met acceptable QC criteria.

B. Surrogate Recoveries : Please note that the recovery of Bromofluorobenzene in the medium soil analysis of sample 21263002 (TT-08-02) was above the acceptable QC limit. Since the recovery was acceptable in the original analysis, the laboratory took no further action.

All other samples met acceptable QC limits.

C. Matrix Spike Results : The native sample, matrix spike, and matrix spike duplicate results are contained within other batches of samples. The results for sample 21263001 will be reported with the results of our laboratory contract number 21262. The results for samples 21263002, 21263003, and 21263005 will be reported with the results of our laboratory contract number 21136.

Please note that Forms II, IV, V, and VIII have numbers to the immediate left of each table. These numbers are sequential only and have no relation to CH2M HILL identification numbers.

I 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 contained in this hardcopy data package and in the computer-readable data submitted on floppy diskette has been authorized by the Laboratory Manager or his designee, as verified by the following signature.

Herb Kelly 5/4/92

Herb Kelly Date
Manager, Organic Division

CH2M HILL Quality Analytical Laboratories 2567 Fairlane Drive, P.O. Box 230548, Montgomery, Alabama 36116 205 271 1444

Engineers
Planners
CH2M HILL
Economists
Scientists

CASE NARRATIVE FOR PNA/PHENOL MASS SPECTROMETRY SAMPLES

LABORATORY: CH2M HILL LABORATORIES
CASE NO. : N/A
LAB NO. : 21263

CLIENT: BARR ENGINEERING
CONTRACT NO.: N/A
SDG NO.: N/A

I. RECEIPT

A. DATE: March 23, 1992

B. SAMPLE INFORMATION

LAB ID	CLIENT ID	SAMPLE MATRIX	DATE SAMPLED	EXTRACTION DATE	ANALYSIS DATE
21263001	TT-10-01	SOIL	03/21/92	03/23/92	04/03/92
21263002	TT-08-01	SOIL	03/21/92	03/23/92	04/03/92
21263005	SB-04-03	SOIL	03/20/92	03/23/92	04/03/92
21263006	M-07	SOIL	03/21/92	03/23/92	04/03/92
S03232B1	SBLKS	SOIL	NA	03/23/92	04/02/92

C. Documentation Exceptions : Tentatively Identified Compounds (TIC) were not requested as part of this analysis. Therefore, the TIC forms and raw data will not be included in this package.

As you have requested, Benzo(b)fluoranthene and Benzo(k)fluoranthene will be reported separately. Due to the low concentrations analyzed for, there may be instances where the native matrix offers chromatographic interferences in this region of the chromatogram, making it difficult to correctly quantitate these isomers as separate compounds. In that case, Benzo(b)fluoranthene and Benzo(k)fluoranthene will be reported as total Benzo(b&k)fluoranthene. An "NR" (not reported) qualifier will then be used for the compounds for which are not reported.

Please note that the amount listed on the quantitation report reflects the mass detected at the instrument. According to the CLP Statement of Work, 2-uL injections must be made. Therefore, the amount on the quantitation report must be divided by a factor of two in order to determine the concentration of the extract injected.

No other exceptions were encountered.

CH2M HILL
Quality Analytical Laboratories
2567 Fairlane Drive, P.O. Box 230548, Montgomery, Alabama 36116
205 271 1444

II. EXTRACTION

A. Holding Times: All holding times were met.

B. Extraction Exceptions : No exceptions were encountered.

III. ANALYSIS

A. Holding times: All holding times were met.

B. Analytical Exceptions : No exceptions were encountered.

IV. QUALITY CONTROL

A. Method Blank : All associated method blanks met acceptable QC criteria.

B. Surrogate Recoveries : All samples met acceptable QC limits.

C. Matrix Spike Results : The native sample, matrix spike, and matrix spike duplicate results are contained within another batch of samples. The results will be reported with the results of our laboratory contract number 21281.

Please note that Forms II, IV, V, and VIII have numbers to the immediate left of each table. These numbers are sequential only and have no relation to CH2M HILL identification numbers.

I 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 contained in this hardcopy data package and in the computer-readable data submitted on floppy diskette has been authorized by the Laboratory Manager or his designee, as verified by the following signature.

Herb Kelly 5/4/92
Herb Kelly Date
Manager, Organic Division

CH2M HILL Quality Analytical Laboratories 2567 Fairlane Drive, P.O. Box 230548, Montgomery, Alabama 36116 205 271 1444

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

TT-10-01

Lab Name: CH2M HILL/MGM Contract: _____

Lab Code: _____ Case No.: 21263 SAS No.: _____ SDG No.: _____

Matrix: (soil/water) SOIL Lab Sample ID: 21263001

Sample wt/vol: 4.0 (g/mL) G Lab File ID: B1VM014770

Level: (low/med) MED Date Received: 03/23/92

% Moisture: not dec. 16 Date Analyzed: 04/01/92

GC Column: CAP ID: 0.530 (mm) Dilution Factor: 2.0

Soil Extract Volume: 10000 (uL) Soil Aliquot Volume: 100 (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
74-87-3	Chloromethane	2900	U
74-83-9	Bromomethane	2900	U
75-01-4	Vinyl Chloride	2900	U
75-00-3	Chloroethane	2900	U
75-09-2	Methylene Chloride	1300	BJ
67-64-1	Acetone	2900	U
75-15-0	Carbon Disulfide	2900	U
75-35-4	1,1-Dichloroethene	2900	U
75-34-3	1,1-Dichloroethane	2900	U
540-59-0	1,2-Dichloroethene (total)	2900	U
67-66-3	Chloroform	2900	U
107-06-2	1,2-Dichloroethane	2900	U
78-93-3	2-Butanone	2900	U
71-55-6	1,1,1-Trichloroethane	2900	U
56-23-5	Carbon Tetrachloride	2900	U
75-27-4	Bromodichloromethane	2900	U
78-87-5	1,2-Dichloropropane	2900	U
10061-01-5	cis-1,3-Dichloropropene	2900	U
79-01-6	Trichloroethene	2900	U
124-48-1	Dibromochloromethane	2900	U
79-00-5	1,1,2-Trichloroethane	2900	U
71-43-2	Benzene	31000	
10061-02-6	trans-1,3-Dichloropropene	2900	U
75-25-2	Bromoform	2900	U
591-78-6	2-Hexanone	2900	U
108-10-1	4-Methyl-2-Pentanone	2900	U
127-18-4	Tetrachloroethene	2900	U
79-34-5	1,1,2,2-Tetrachloroethane	2900	U
108-88-3	Toluene	71000	E
108-90-7	Chlorobenzene	2900	U
100-41-4	Ethylbenzene	4900	
100-42-5	Styrene	3700	
1330-20-7	Xylene (total)	110000	E

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

TT-10-01

Lab Name: CH2M HILL/MGM Contract: _____

Lab Code: _____ Case No.: 21263 SAS No.: _____ SDG No.: _____

Matrix: (soil/water) SOIL Lab Sample ID: 21263001

Sample wt/vol: 4.0 (g/mL) G Lab File ID: B1VM014770

Level: (low/med) MED Date Received: 03/23/92

% Moisture: not dec. 16 Date Analyzed: 04/01/92

GC Column: CAP ID: 0.530 (mm) Dilution Factor: 2.0

Soil Extract Volume: 10000 (uL) Soil Aliquot Volume: 100 (uL)

Number TICs found: 8

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	BENZENE, TRIMETHYL- ISOMER	18.64	46000	J
2.	BENZENE, TRIMETHYL- ISOMER	19.32	46000	J
3.	BENZENE, ETHENYL, METHYL- IS	19.47	5300	J
4. 25340-17-4	BENZENE, DIETHYL-	20.50	2100	J
5.	BENZENE, ETHENYL, METHYL- IS	20.74	14000	J
6. 99-87-6	BENZENE, 1-METHYL-4-(1-METHY	21.37	2100	J
7.	NOT IDENTIFIED	21.74	2500	J
8. 95-93-2	BENZENE, 1,2,4,5-TETRAMETHYL	22.22	2600	J

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

TT-10-01_DL

Lab Name: CH2M HILL/MGM Contract: _____

L Code: _____ Case No.: 21263 SAS No.: _____ SDG No.: _____

Matrix: (soil/water) SOIL Lab Sample ID: 21263001DL

Sample wt/vol: 4.0 (g/mL) G Lab File ID: B2VM014774

Level: (low/med) MED Date Received: 03/23/92

% Moisture: not dec. 16 Date Analyzed: 04/01/92

GC Column: CAP ID: 0.530 (mm) Dilution Factor: 4.0

Soil Extract Volume: 10000 (uL) Soil Aliquot Volume: 100 (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
74-87-3	Chloromethane	5700	U
74-83-9	Bromomethane	5700	U
75-01-4	Vinyl Chloride	5700	U
75-00-3	Chloroethane	5700	U
75-09-2	Methylene Chloride	3000	BDJ
67-64-1	Acetone	5700	U
75-15-0	Carbon Disulfide	5700	U
75-35-4	1,1-Dichloroethene	5700	U
75-34-3	1,1-Dichloroethane	5700	U
540-59-0	1,2-Dichloroethene (total)	5700	U
67-66-3	Chloroform	5700	U
107-06-2	1,2-Dichloroethane	5700	U
78-93-3	2-Butanone	5700	U
71-55-6	1,1,1-Trichloroethane	5700	U
56-23-5	Carbon Tetrachloride	5700	U
75-27-4	Bromodichloromethane	5700	U
78-87-5	1,2-Dichloropropane	5700	U
10061-01-5	cis-1,3-Dichloropropene	5700	U
79-01-6	Trichloroethene	5700	U
124-48-1	Dibromochloromethane	5700	U
79-00-5	1,1,2-Trichloroethane	5700	U
71-43-2	Benzene	25000	D
10061-02-6	trans-1,3-Dichloropropene	5700	U
75-25-2	Bromoform	5700	U
591-78-6	2-Hexanone	5700	U
108-10-1	4-Methyl-2-Pentanone	5700	U
127-18-4	Tetrachloroethene	5700	U
79-34-5	1,1,2,2-Tetrachloroethane	5700	U
108-88-3	Toluene	58000	D
108-90-7	Chlorobenzene	5700	U
100-41-4	Ethylbenzene	4200	DJ
100-42-5	Styrene	3200	DJ
1330-20-7	Xylene (total)	90000	D

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

TT-10-01_DL

Lab Name: CH2M HILL/MGM Contract: _____

Lab Code: _____ Case No.: 21263 SAS No.: _____ SDG No.: _____

Matrix: (soil/water) SOIL Lab Sample ID: 21263001DL

Sample wt/vol: 4.0 (g/mL) G Lab File ID: B2VM014774

Level: (low/med) MED Date Received: 03/23/92

% Moisture: not dec. 16 Date Analyzed: 04/01/92

GC Column: CAP ID: 0.530 (mm) Dilution Factor: 4.0

Soil Extract Volume: 10000 (uL) Soil Aliquot Volume: 100 (uL)

Number TICs found: 6

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	BENZENE, TRIMETHYL- ISOMER	18.64	40000	J
2.	BENZENE, TRIMETHYL- ISOMER	19.34	38000	J
3.	BENZENE, ETHENYL, METHYL- IS	19.47	5700	J
4.	BENZENE, ETHENYL, METHYL- IS	20.74	13000	J
5.	BENZENE, ETHYNYL, METHYL- IS	21.10	140000	J
6. 488-23-3	BENZENE, 1,2,3,4-TETRAMETHYL	22.22	4200	J

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

TT-08-02

Lab Name: CH2M HILL/MGM Contract: _____

I Code: _____ Case No.: 21263 SAS No.: _____ SDG No.: _____

Matrix: (soil/water) SOIL Lab Sample ID: 21263002

Sample wt/vol: 1.0 (g/mL) G Lab File ID: C1VO021171

Level: (low/med) LOW Date Received: 03/23/92

% Moisture: not dec. 21 Date Analyzed: 03/26/92

GC Column: CAP ID: 0.530 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
74-87-3	Chloromethane	63	U
74-83-9	Bromomethane	63	U
75-01-4	Vinyl Chloride	63	U
75-00-3	Chloroethane	63	U
75-09-2	Methylene Chloride	66	B
67-64-1	Acetone	61	BJ
75-15-0	Carbon Disulfide	10	J
75-35-4	1,1-Dichloroethene	63	U
75-34-3	1,1-Dichloroethane	63	U
540-59-0	1,2-Dichloroethene (total)	63	U
67-66-3	Chloroform	11	BJ
107-06-2	1,2-Dichloroethane	63	U
78-93-3	2-Butanone	63	U
71-55-6	1,1,1-Trichloroethane	63	U
56-23-5	Carbon Tetrachloride	63	U
75-27-4	Bromodichloromethane	63	U
78-87-5	1,2-Dichloropropane	63	U
10061-01-5	cis-1,3-Dichloropropene	63	U
79-01-6	Trichloroethene	63	U
124-48-1	Dibromochloromethane	63	U
79-00-5	1,1,2-Trichloroethane	63	U
71-43-2	Benzene	18	J
10061-02-6	trans-1,3-Dichloropropene	63	U
75-25-2	Bromoform	63	U
591-78-6	2-Hexanone	63	U
108-10-1	4-Methyl-2-Pentanone	63	U
127-18-4	Tetrachloroethene	63	U
79-34-5	1,1,2,2-Tetrachloroethane	63	U
108-88-3	Toluene	120	
108-90-7	Chlorobenzene	63	U
100-41-4	Ethylbenzene	72	
100-42-5	Styrene	63	U
1330-20-7	Xylene (total)	2100	E

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

TT-08-02

Lab Name: CH2M HILL/MGM Contract: _____

Lab Code: _____ Case No.: 21263 SAS No.: _____ SDG No.: _____

Matrix: (soil/water) SOIL Lab Sample ID: 21263002

Sample wt/vol: 1.0 (g/mL) G Lab File ID: C1VO021171

Level: (low/med) LOW Date Received: 03/23/92

% Moisture: not dec. 21 Date Analyzed: 03/26/92

GC Column: CAP ID: 0.530 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____(uL)

Number TICs found: 8

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

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		BENZENE, TRIMETHYL- ISOMER	20.09	1900	J
2.		BENZENE, TRIMETHYL- ISOMER	20.79	1900	J
3.		BENZENE, TRIMETHYL- ISOMER	21.64	650	J
4.	871-83-0	NONANE, 2-METHYL-	21.82	1200	J
5.	766-97-2	BENZENE, 1-ETHYNYL-4-METHYL-	22.59	3800	J
6.		NOT IDENTIFIED	23.65	740	J
7.	104-55-2	2-PROPENAL, 3-PHENYL-	23.74	730	J
8.		NOT IDENTIFIED	24.34	240	J

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

TT-08-02_DL

Lab Name: CH2M HILL/MGM Contract: _____

Code: _____ Case No.: 21263 SAS No.: _____ SDG No.: _____

Matrix: (soil/water) SOIL Lab Sample ID: 21263002DL

Sample wt/vol: 4.0 (g/mL) G Lab File ID: B1VM014771

Level: (low/med) MED Date Received: 03/23/92

% Moisture: not dec. 21 Date Analyzed: 04/01/92

GC Column: CAP ID: 0.530 (mm) Dilution Factor: 1.0

Soil Extract Volume: 10000 (uL) Soil Aliquot Volume: 100 (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
74-87-3	Chloromethane	1500	U
74-83-9	Bromomethane	1500	U
75-01-4	Vinyl Chloride	1500	U
75-00-3	Chloroethane	1500	U
75-09-2	Methylene Chloride	710	BDJ
67-64-1	Acetone	1500	U
75-15-0	Carbon Disulfide	1500	U
75-35-4	1,1-Dichloroethene	1500	U
75-34-3	1,1-Dichloroethane	1500	U
540-59-0	1,2-Dichloroethene (total)	1500	U
67-66-3	Chloroform	1500	U
107-06-2	1,2-Dichloroethane	1500	U
78-93-3	2-Butanone	1500	U
71-55-6	1,1,1-Trichloroethane	1500	U
56-23-5	Carbon Tetrachloride	1500	U
75-27-4	Bromodichloromethane	1500	U
78-87-5	1,2-Dichloropropane	1500	U
10061-01-5	cis-1,3-Dichloropropene	1500	U
79-01-6	Trichloroethene	1500	U
124-48-1	Dibromochloromethane	1500	U
79-00-5	1,1,2-Trichloroethane	1500	U
71-43-2	Benzene	1500	U
10061-02-6	trans-1,3-Dichloropropene	1500	U
75-25-2	Bromoform	1500	U
591-78-6	2-Hexanone	1500	U
108-10-1	4-Methyl-2-Pentanone	1500	U
127-18-4	Tetrachloroethene	1500	U
79-34-5	1,1,2,2-Tetrachloroethane	1500	U
108-88-3	Toluene	160	DJ
108-90-7	Chlorobenzene	1500	U
100-41-4	Ethylbenzene	1500	U
100-42-5	Styrene	1500	U
1330-20-7	Xylene (total)	1700	D

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

TT-08-02_DL

Lab Name: CH2M HILL/MGM Contract: _____

Lab Code: _____ Case No.: 21263 SAS No.: _____ SDG No.: _____

Matrix: (soil/water) SOIL Lab Sample ID: 21263002DL

Sample wt/vol: 4.0 (g/mL) G Lab File ID: B1VM014771

Level: (low/med) MED Date Received: 03/23/92

% Moisture: not dec. 21 Date Analyzed: 04/01/92

GC Column: CAP ID: 0.530 (mm) Dilution Factor: 1.0

Soil Extract Volume: 10000 (uL) Soil Aliquot Volume: 100 (uL)

Number TICs found: 4

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	BENZENE, TRIMETHYL- ISOMER	18.65	2100	J
2.	BENZENE, TRIMETHYL- ISOMER	19.34	2200	J
3. 99-87-6	BENZENE, 1-METHYL-4-(1-METHY	20.69	930	J
4. 766-97-2	BENZENE, 1-ETHYNYL-4-METHYL-	21.12	4000	J

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

TT-08A-01

Lab Name: CH2M HILL/MGM Contract: _____

Code: _____ Case No.: 21263 SAS No.: _____ SDG No.: _____

Matrix: (soil/water) SOIL Lab Sample ID: 21263003

Sample wt/vol: 5.0 (g/mL) G Lab File ID: C1VO021170

Level: (low/med) LOW Date Received: 03/23/92

% Moisture: not dec. 21 Date Analyzed: 03/26/92

GC Column: CAP ID: 0.530 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
74-87-3	Chloromethane	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	24	B
67-64-1	Acetone	28	B
75-15-0	Carbon Disulfide	3	J
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	2	BJ
107-06-2	1,2-Dichloroethane	13	U
78-93-3	2-Butanone	13	
71-55-6	1,1,1-Trichloroethane	13	U
56-23-5	Carbon Tetrachloride	13	U
75-27-4	Bromodichloromethane	13	U
78-87-5	1,2-Dichloropropane	13	U
10061-01-5	cis-1,3-Dichloropropene	13	U
79-01-6	Trichloroethene	13	U
124-48-1	Dibromochloromethane	13	U
79-00-5	1,1,2-Trichloroethane	13	U
71-43-2	Benzene	3	J
10061-02-6	trans-1,3-Dichloropropene	13	U
75-25-2	Bromoform	13	U
591-78-6	2-Hexanone	13	U
108-10-1	4-Methyl-2-Pentanone	13	U
127-18-4	Tetrachloroethene	13	U
79-34-5	1,1,2,2-Tetrachloroethane	13	U
108-88-3	Toluene	3	J
108-90-7	Chlorobenzene	13	U
100-41-4	Ethylbenzene	13	U
100-42-5	Styrene	13	U
1330-20-7	Xylene (total)	17	

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

TT-08A-01

Lab Name: CH2M HILL/MGM Contract: _____

Lab Code: _____ Case No.: 21263 SAS No.: _____ SDG No.: _____

Matrix: (soil/water) SOIL Lab Sample ID: 21263003

Sample wt/vol: 5.0 (g/mL) G Lab File ID: C1VO021170

Level: (low/med) LOW Date Received: 03/23/92

% Moisture: not dec. 21 Date Analyzed: 03/26/92

GC Column: CAP ID: 0.530 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____(uL)

Number TICs found: 9

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	BENZENE, TRIMETHYL- ISOMER	20.10	31	J
2.	BENZENE, TRIMETHYL- ISOMER	20.80	41	J
3.	BENZENE, TRIMETHYL- ISOMER	21.65	14	J
4.	BENZENE, ETHYL-, DIMETHYL- I	22.10	10	J
5.	BENZENE, ETHENYLMETHYL- ISOM	22.22	15	J
6.	BENZENE, ETHYNYLMETHYL- ISOM	22.59	33	J
7.	BENZENE, TETRAMETHYL- ISOMER	23.52	11	J
8.	BENZENE, TETRAMETHYL- ISOMER	23.67	20	J
9. 104-55-2	2-PROPENAL, 3-PHENYL-	23.75	8	J

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SB-04-03

Lab Name: CH2M HILL/MGM Contract: _____

1 Code: _____ Case No.: 21263 SAS No.: _____ SDG No.: _____

Matrix: (soil/water) SOIL Lab Sample ID: 21263005

Sample wt/vol: 5.0 (g/mL) G Lab File ID: C1VO021169

Level: (low/med) LOW Date Received: 03/23/92

% Moisture: not dec. 21 Date Analyzed: 03/26/92

GC Column: CAP ID: 0.530 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
74-87-3	Chloromethane	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	19	B
67-64-1	Acetone	170	B
75-15-0	Carbon Disulfide	3	J
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	2	BJ
107-06-2	1,2-Dichloroethane	13	U
78-93-3	2-Butanone	37	
71-55-6	1,1,1-Trichloroethane	13	U
56-23-5	Carbon Tetrachloride	13	U
75-27-4	Bromodichloromethane	13	U
78-87-5	1,2-Dichloropropane	13	U
10061-01-5	cis-1,3-Dichloropropene	13	U
79-01-6	Trichloroethene	13	U
124-48-1	Dibromochloromethane	13	U
79-00-5	1,1,2-Trichloroethane	13	U
71-43-2	Benzene	19	
10061-02-6	trans-1,3-Dichloropropene	13	U
75-25-2	Bromoform	13	U
591-78-6	2-Hexanone	13	U
108-10-1	4-Methyl-2-Pentanone	13	U
127-18-4	Tetrachloroethene	13	U
79-34-5	1,1,2,2-Tetrachloroethane	13	U
108-88-3	Toluene	13	U
108-90-7	Chlorobenzene	13	U
100-41-4	Ethylbenzene	13	U
100-42-5	Styrene	13	U
1330-20-7	Xylene (total)	3	J

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

SB-04-03

Lab Name: CH2M HILL/MGM Contract: _____

Lab Code: _____ Case No.: 21263 SAS No.: _____ SDG No.: _____

Matrix: (soil/water) SOIL Lab Sample ID: 21263005

Sample wt/vol: 5.0 (g/mL) G Lab File ID: C1VO021169

Level: (low/med) LOW Date Received: 03/23/92

% Moisture: not dec. 21 Date Analyzed: 03/26/92

GC Column: CAP ID: 0.530 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____(uL)

Number TICs found: 4

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 109-06-8	PYRIDINE, 2-METHYL-	16.77	16	J
2. 13435-09-1	SILANEDIAMINE, 1,1-DIMETHYL-	21.27	20	J
3. 526-75-0	PHENOL, 2,3-DIMETHYL-	23.77	9	J
4.	NOT IDENTIFIED	7.42	22	J

ORGANICS ANALYSIS DATA SHEET

Laboratory Name:	CH2M HILL/MGM	Concentration:	LOW	Date Extracted:	03/23/92
Lab Sample ID:	21263001	Sample Matrix:	SOIL	Date Analyzed:	04/03/92
Client Sample ID:	TT-10-01	Percent Moisture:	19.0	Dilution Factor:	300

POLYNUCLEAR AROMATIC COMPOUNDS

CAS Number		ug/Kg		CAS Number		ug/Kg	
271-89-6	2,3-Benzofuran	120000	U	260-94-6	Acridine	120000	U
496-11-7	2,3-Dihydro-1h-Indene	120000	U	229-87-8	Phenanthridine	120000	U
95-13-6	1H-Indene	94000	J	86-74-8	Carbazole	120000	U
91-20-3	Naphthalene	610000		206-44-0	Fluoranthene	120000	U
95-15-8	Benzo(b)thiophene	16000	J	129-00-0	Pyrene	120000	U
91-22-5	Quinoline	120000	U	56-55-3	Benzo(a)anthracene	120000	U
119-65-3	Isoquinoline	120000	U	218-01-9	Chrysene/Triphenylene	120000	U
91-57-6	2-Methylnaphthalene	120000	J	NA	Benzo(b&k)fluoranthene	NR	
120-72-9	Indole	120000	U	57-97-6	7,12-Dimethylbenz(a)anthrac	120000	U
[illegible]-12-0	1-Methylnaphthalene	62000	J	192-97-2	Benzo(e)pyrene	120000	U
92-52-4	Biphenyl	15000	J	50-32-8	Benzo(a)pyrene	120000	U
208-96-8	Acenaphthylene	65000	J	198-55-0	Perylene	120000	U
83-32-9	Acenaphthene	120000	U	56-49-5	3-Methylcholanthrene	120000	U
132-64-9	Dibenzofuran	17000	J	193-39-5	Indeno(1,2,3-cd)pyrene	120000	U
86-73-7	Fluorene	27000	J	53-70-3	Dibenz(a,h)anthracene	120000	U
132-65-0	Dibenzothiophene	120000	U	191-24-2	Benzo(g,h,i,)perylene	120000	U
85-01-8	Phenanthrene	23000	J	205-99-2	Benzo(b)fluoranthene	120000	U
12-7	Anthracene	120000	U	207-08-9	Benzo(k)fluoranthene	120000	U

U - Compound analyzed for but not detected.
B - Compound was detected in QC blank.
J - Reported value less than quantitation limit.

Form I

ORGANICS ANALYSIS DATA SHEET

Laboratory Name:	CH2M HILL/MGM	Concentration:	LOW	Date Extracted:	03/23/92
Lab Sample ID:	21263001	Sample Matrix:	SOIL	Date Analyzed:	04/03/92
Client Sample ID:	TT-10-01	Percent Moisture:	19.0	Dilution Factor:	300

PHENOL COMPOUNDS

CAS Number		ug/Kg	CAS Number	ug/Kg
108-95-2	Phenol	120000 U		
95-57-8	2-Chlorophenol	120000 U		
95-48-7	2-Methylphenol	120000 U		
106-44-5	4-Methylphenol	120000 U		
88-75-5	2-Nitrophenol	120000 U		
105-67-9	2,4-Dimethylphenol	120000 U		
120-83-2	2,4-Dichlorophenol	120000 U		
65-85-0	Benzoic acid	300000 U		
59-50-7	4-Chloro-3-Methylphenol .	120000 U		
88-06-2	2,4,6-Trichlorophenol . .	120000 U		
95-95-4	2,4,5-Trichlorophenol . .	300000 U		
51-28-5	2,4-Dinitrophenol	300000 U		
100-02-7	4-Nitrophenol	300000 U		
534-52-1	4,6-Dinitro-2-Methylphenol	300000 U		
87-86-5	Pentachlorophenol	300000 U		

U - Compound analyzed for but not detected.
B - Compound was detected in QC blank.
J - Reported value less than quantitation limit.

Form I

MTP

ORGANICS ANALYSIS DATA SHEET

ratory Name:	CH2M HILL/MGM	Concentration:	LOW	Date Extracted:	03/23/92
Lab Sample ID:	21263002	Sample Matrix:	SOIL	Date Analyzed:	04/03/92
Client Sample ID:	TT-08-02	Percent Moisture:	23.0	Dilution Factor:	140

POLYNUCLEAR AROMATIC COMPOUNDS

CAS Number		ug/Kg		CAS Number		ug/Kg	
271-89-6	2,3-Benzofuran	60000	U	260-94-6	Acridine	60000	U
496-11-7	2,3-Dihydro-1h-Indene	60000	U	229-87-8	Phenanthridine	60000	U
95-13-6	1H-Indene	11000	J	86-74-8	Carbazole	6100	J
91-20-3	Naphthalene	410000		206-44-0	Fluoranthene	14000	J
95-15-8	Benzo(b)thiophene	60000	U	129-00-0	Pyrene	9900	J
91-22-5	Quinoline	60000	U	56-55-3	Benzo(a)anthracene	6600	J
119-65-3	Isoquinoline	60000	U	218-01-9	Chrysene/Triphenylene	7100	J
91-57-6	2-Methylnaphthalene	61000		NA	Benzo(b&k)fluoranthene	NR	
120-72-9	Indole	60000	U	57-97-6	7,12-Dimethylbenz(a)anthrac	60000	U
[illegible]-12-0	1-Methylnaphthalene	30000	J	192-97-2	Benzo(e)pyrene	60000	U
[illegible]-52-4	Biphenyl	7000	J	50-32-8	Benzo(a)pyrene	60000	U
208-96-8	Acenaphthylene	16000	J	198-55-0	Perylene	60000	U
83-32-9	Acenaphthene	60000	U	56-49-5	3-Methylcholanthrene	60000	U
132-64-9	Dibenzofuran	14000	J	193-39-5	Indeno(1,2,3-cd)pyrene	60000	U
86-73-7	Fluorene	23000	J	53-70-3	Dibenz(a,h)anthracene	60000	U
132-65-0	Dibenzothiophene	60000	U	191-24-2	Benzo(g,h,i,)perylene	60000	U
85-01-8	Phenanthrene	29000	J	205-99-2	Benzo(b)fluoranthene	60000	U
1[illegible]-12-7	Anthracene	7000	J	207-08-9	Benzo(k)fluoranthene	60000	U

U - Compound analyzed for but not detected.
B - Compound was detected in QC blank.
J - Reported value less than quantitation limit.

Form I

ORGANICS ANALYSIS DATA SHEET

Laboratory Name:	CH2M HILL/MGM	Concentration:	LOW	Date Extracted:	03/23/92
Lab Sample ID:	21263002	Sample Matrix:	SOIL	Date Analyzed:	04/03/92
Client Sample ID:	TT-08-02	Percent Moisture:	23.0	Dilution Factor:	140

PHENOL COMPOUNDS

CAS Number		ug/Kg		CAS Number	ug/Kg
108-95-2	Phenol	60000	U		
95-57-8	2-Chlorophenol	60000	U		
95-48-7	2-Methylphenol	60000	U		
106-44-5	4-Methylphenol	60000	U		
88-75-5	2-Nitrophenol	60000	U		
105-67-9	2,4-Dimethylphenol	60000	U		
120-83-2	2,4-Dichlorophenol	60000	U		
65-85-0	Benzoic acid	150000	U		
59-50-7	4-Chloro-3-Methylphenol .	60000	U		
88-06-2	2,4,6-Trichlorophenol . .	60000	U		
95-95-4	2,4,5-Trichlorophenol . .	150000	U		
51-28-5	2,4-Dinitrophenol	150000	U		
100-02-7	4-Nitrophenol	150000	U		
534-52-1	4,6-Dinitro-2-Methylphenol	150000	U		
87-86-5	Pentachlorophenol	150000	U		

U - Compound analyzed for but not detected.
B - Compound was detected in QC blank.
J - Reported value less than quantitation limit.

Form I

ORGANICS ANALYSIS DATA SHEET

L[illegible]ratory Name:	CH2M HILL/MGM	Concentration:	LOW	Date Extracted:	03/23/92
Lab Sample ID:	21263005	Sample Matrix:	SOIL	Date Analyzed:	04/03/92
Client Sample ID:	SB-04-03	Percent Moisture:	14.0	Dilution Factor:	12

POLYNUCLEAR AROMATIC COMPOUNDS

CAS Number		ug/Kg		CAS Number		ug/Kg	
271-89-6	2,3-Benzofuran	4600	U	260-94-6	Acridine	4600	U
496-11-7	2,3-Dihydro-1h-Indene	4600	U	229-87-8	Phenanthridine	4600	U
95-13-6	1H-Indene	4600	U	86-74-8	Carbazole	4600	U
91-20-3	Naphthalene	4600	U	206-44-0	Fluoranthene	4600	U
95-15-8	Benzo(b)thiophene	4600	U	129-00-0	Pyrene	4600	U
91-22-5	Quinoline	4600	U	56-55-3	Benzo(a)anthracene	4600	U
119-65-3	Isoquinoline	4600	U	218-01-9	Chrysene/Triphenylene	4600	U
91-57-6	2-Methylnaphthalene	4600	U	NA	Benzo(b&k)fluoranthene	NR	
120-72-9	Indole	4600	U	57-97-6	7,12-Dimethylbenz(a)anthrac	4600	U
[illegible]-12-0	1-Methylnaphthalene	4600	U	192-97-2	Benzo(e)pyrene	4600	U
[illegible]-52-4	Biphenyl	4600	U	50-32-8	Benzo(a)pyrene	4600	U
208-96-8	Acenaphthylene	4600	U	198-55-0	Perylene	4600	U
83-32-9	Acenaphthene	4600	U	56-49-5	3-Methylcholanthrene	4600	U
132-64-9	Dibenzofuran	4600	U	193-39-5	Indeno(1,2,3-cd)pyrene	4600	U
86-73-7	Fluorene	4600	U	53-70-3	Dibenz(a,h)anthracene	4600	U
132-65-0	Dibenzothiophene	4600	U	191-24-2	Benzo(g,h,i,)perylene	4600	U
85-01-8	Phenanthrene	4600	U	205-99-2	Benzo(b)fluoranthene	4600	U
120-12-7	Anthracene	4600	U	207-08-9	Benzo(k)fluoranthene	4600	U

U - Compound analyzed for but not detected.
B - Compound was detected in QC blank.
J - Reported value less than quantitation limit.

Form I

ORGANICS ANALYSIS DATA SHEET

Laboratory Name:	CH2M HILL/MGM	Concentration:	LOW	Date Extracted:	03/23/92
Lab Sample ID:	21263005	Sample Matrix:	SOIL	Date Analyzed:	04/03/92
Client Sample ID:	SB-04-03	Percent Moisture:	14.0	Dilution Factor:	12

PHENOL COMPOUNDS

CAS Number		ug/Kg		CAS Number	ug/Kg
108-95-2	Phenol	35000			
95-57-8	2-Chlorophenol	4600	U		
95-48-7	2-Methylphenol	5300			
106-44-5	4-Methylphenol	37000			
88-75-5	2-Nitrophenol	4600	U		
105-67-9	2,4-Dimethylphenol	3600	J		
120-83-2	2,4-Dichlorophenol	4600	U		
65-85-0	Benzoic acid	11000	U		
59-50-7	4-Chloro-3-Methylphenol	4600	U		
88-06-2	2,4,6-Trichlorophenol	4600	U		
95-95-4	2,4,5-Trichlorophenol	11000	U		
51-28-5	2,4-Dinitrophenol	11000	U		
100-02-7	4-Nitrophenol	11000	U		
534-52-1	4,6-Dinitro-2-Methylphenol	11000	U		
87-86-5	Pentachlorophenol	11000	U		

U - Compound analyzed for but not detected.
B - Compound was detected in QC blank.
J - Reported value less than quantitation limit.

Form I

MTP
000023

ORGANICS ANALYSIS DATA SHEET

Laboratory Name:	CH2M HILL/MGM	Concentration:	LOW	Date Extracted:	03/23/92
Lab Sample ID:	21263006	Sample Matrix:	SOIL	Date Analyzed:	04/03/92
Client Sample ID:	M-07	Percent Moisture:	17.0	Dilution Factor:	350

POLYNUCLEAR AROMATIC COMPOUNDS

CAS Number		ug/Kg	CAS Number		ug/Kg
271-89-6	2,3-Benzofuran	140000 U	260-94-6	Acridine	140000 U
496-11-7	2,3-Dihydro-1h-Indene	140000 U	229-87-8	Phenanthridine	140000 U
95-13-6	1H-Indene	90000 J	86-74-8	Carbazole	140000 U
91-20-3	Naphthalene	720000	206-44-0	Fluoranthene	140000 U
95-15-8	Benzo(b)thiophene	17000 J	129-00-0	Pyrene	140000 U
91-22-5	Quinoline	140000 U	56-55-3	Benzo(a)anthracene	140000 U
119-65-3	Isoquinoline	140000 U	218-01-9	Chrysene/Triphenylene	140000 U
91-57-6	2-Methylnaphthalene	110000 J	NA	Benzo(b&k)fluoranthene	NR
120-72-9	Indole	140000 U	57-97-6	7,12-Dimethylbenz(a)anthrac	140000 U
90-12-0	1-Methylnaphthalene	53000 J	192-97-2	Benzo(e)pyrene	140000 U
[illegible]-52-4	Biphenyl	14000 J	50-32-8	Benzo(a)pyrene	140000 U
208-96-8	Acenaphthylene	31000 J	198-55-0	Perylene	140000 U
83-32-9	Acenaphthene	140000 U	56-49-5	3-Methylcholanthrene	140000 U
132-64-9	Dibenzofuran	16000 J	193-39-5	Indeno(1,2,3-cd)pyrene	140000 U
86-73-7	Fluorene	25000 J	53-70-3	Dibenz(a,h)anthracene	140000 U
132-65-0	Dibenzothiophene	140000 U	191-24-2	Benzo(g,h,i,)perylene	140000 U
85-01-8	Phenanthrene	16000 J	205-99-2	Benzo(b)fluoranthene	140000 U
120-12-7	Anthracene	140000 U	207-08-9	Benzo(k)fluoranthene	140000 U

U - Compound analyzed for but not detected.
B - Compound was detected in QC blank.
J - Reported value less than quantitation limit.

Form I

ORGANICS ANALYSIS DATA SHEET

Laboratory Name:	CH2M HILL/MGM	Concentration:	LOW	Date Extracted:	03/23/92
Lab Sample ID:	21263006	Sample Matrix:	SOIL	Date Analyzed:	04/03/92
Client Sample ID:	M-07	Percent Moisture:	17.0	Dilution Factor:	350

PHENOL COMPOUNDS

CAS Number		ug/Kg	CAS Number	ug/Kg
108-95-2	Phenol	140000 U		
95-57-8	2-Chlorophenol	140000 U		
95-48-7	2-Methylphenol	140000 U		
106-44-5	4-Methylphenol	140000 U		
88-75-5	2-Nitrophenol	140000 U		
105-67-9	2,4-Dimethylphenol	140000 U		
120-83-2	2,4-Dichlorophenol	140000 U		
65-85-0	Benzoic acid	340000 U		
59-50-7	4-Chloro-3-Methylphenol	140000 U		
88-06-2	2,4,6-Trichlorophenol	140000 U		
95-95-4	2,4,5-Trichlorophenol	340000 U		
51-28-5	2,4-Dinitrophenol	340000 U		
100-02-7	4-Nitrophenol	340000 U		
534-52-1	4,6-Dinitro-2-Methylphenol	340000 U		
87-86-5	Pentachlorophenol	340000 U		

U - Compound analyzed for but not detected.
B - Compound was detected in QC blank.
J - Reported value less than quantitation limit.

Form I

2B

SOIL VOLATILE SYSTEM MONITORING COMPOUND RECOVERY

Lab Name: CH2M HILL/MGM Contract: _____

Lab Code: _____ Case No.: 21263 SAS No.: _____ SDG No.: _____

Level:(low/med) LOW

	EPA SAMPLE NO.	SMC1 (TOL)#	SMC2 (BFB)#	SMC3 (DCE)#	OTHER	TOT OUT
01	SB-04-03	99	93	96	0	0
02	TT-08-02	101	93	96	0	0
03	TT-08A-01	101	100	99	0	0
04	VBLKS	107	102	102	0	0

		QC LIMITS
SMC1 (TOL)	= Toluene-d8	(84-138)
SMC2 (BFB)	= Bromofluorobenzene	(59-113)
SMC3 (DCE)	= 1,2-Dichloroethane-d4	(70-121)

Column to be used to flag recovery values

* Values outside of contract required QC limits

D System Monitoring Compound diluted out

FORM II VOA-2

3/90 MTF

2B

SOIL VOLATILE SYSTEM MONITORING COMPOUND RECOVERY

Lab Name: CH2M HILL/MGM Contract: _____

Lab Code: _____ Case No.: 21263 SAS No.: _____ SDG No.: _____

Level:(low/med) MED

	EPA SAMPLE NO.	SMC1 (TOL)#	SMC2 (BFB)#	SMC3 (DCE)#	OTHER	TOT OUT
01	TT-08-02_DL	91	116 *	76	0	1
02	TT-10-01	92 D	118 D	82 D	0	0
03	TT-10-01_DL	87 D	118 D	78 D	0	0
04	VBLKSM	89	99	82	0	0

		QC LIMITS
SMC1 (TOL)	= Toluene-d8	(84-138)
SMC2 (BFB)	= Bromofluorobenzene	(59-113)
SMC3 (DCE)	= 1,2-Dichloroethane-d4	(70-121)

Column to be used to flag recovery values

* Values outside of contract required QC limits

D System Monitoring Compound diluted out

SOIL SURROGATE PERCENT RECOVERY SUMMARY
(Page 1)

Case No. S21263 Contract Laboratory CH2M HILL/MGM
Low XXX Medium

	SEMI-VOLATILE								
SMO TRAFFIC NO.	1-Fluoronaphthalene - SS 0-81	2-Fluorophenol - SS 25-121	Phenol-d5 - SS 24-113	2,4,6-Tribromophenol - SS 19-122	Nitrobenzene-d5 - SS 9-197	2-Fluorobiphenyl - SS 9-109	Terphenyl-d14 - SS 0-143	2-Chlorophenol-d4 - SS 20-130	1,2-Dichlorobenzene -d4 SS 20-130
SB-04-03	64	93	99	122	76	95	80	97	90
TT-10-01	**	**	**	**	**	**	**	**	**
TT-08-02	**	**	**	**	**	**	**	**	**
M-07	**	**	**	**	**	**	**	**	**
SBLKS	57	92	106	79	76	75	66	101	78

Semi-Volatiles: 0 out of 45; outside of QC limits

Comments:

** - Surrogate Standard not determined due to required dilution.

FORM II

4A
VOLATILE METHOD BLANK SUMMARY

EPA SAMPLE NO.

VBLKS

Lab Name: CH2M HILL/MGM Contract: _____

Lab Code: _____ Case No.: 21263 SAS No.: _____ SDG No.: _____

Lab File ID: CBV0021165 Lab Sample ID: Y03262B2

Date Analyzed: 03/26/92 Time Analyzed: 1246

GC Column: CAP ID: 0.530(mm) Heated Purge: (Y/N) Y

Instrument ID: 4500

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS AND MSD:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	TIME ANALYZED
01	SB-04-03	21263005	C1V0021169	1510
02	TT-08-02	21263002	C1V0021171	1620
03	TT-08A-01	21263003	C1V0021170	1544

COMMENTS: CLP,21184,,VBLKS,L,S,Y03262B2,V,B,
10DG TO 200DG @8DG/MIN IH=3MIN

FORM IV VOA

3/90 MTP

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

VBLKS

Lab Name: CH2M HILL/MGM Contract: _____

Code: _____ Case No.: 21263 SAS No.: _____ SDG No.: _____

Matrix: (soil/water) SOIL Lab Sample ID: Y03262B2

Sample wt/vol: 5.0 (g/mL) G Lab File ID: CBVO021165

Level: (low/med) LOW Date Received: 03/26/92

% Moisture: not dec. 0 Date Analyzed: 03/26/92

GC Column: CAP ID: 0.530 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____(uL)

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

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

VBLKS

Lab Name: CH2M HILL/MGM Contract: _____

Lab Code: _____ Case No.: 21263 SAS No.: _____ SDG No.: _____

Matrix: (soil/water) SOIL Lab Sample ID: Y03262B2

Sample wt/vol: 5.0 (g/mL) G Lab File ID: CBV0021165

Level: (low/med) LOW Date Received: 03/26/92

% Moisture: not dec. 0 Date Analyzed: 03/26/92

GC Column: CAP ID: 0.530 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____(uL)

Number TICs found: 0

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

4A
VOLATILE METHOD BLANK SUMMARY

EPA SAMPLE NO.

VBLKSM

Lab Name: CH2M HILL/MGM Contract: _____

Code: _____ Case No.: 21263 SAS No.: _____ SDG No.: _____

Lab File ID: BBVM014760 Lab Sample ID: L03312B3

Date Analyzed: 04/01/92 Time Analyzed: 1511

GC Column: CAP ID: 0.530(mm) Heated Purge: (Y/N) N

Instrument ID: 5100B

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS AND MSD:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	TIME ANALYZED
01	TT-08-02_DL	21263002DL	B1VM014771	2145
02	TT-10-01	21263001	B1VM014770	2111
03	TT-10-01_DL	21263001DL	B2VM014774	2329

COMMENTS: CLP,21222,,VBLKS,M,S,L03312B3,V,BLANK,
10DG TO 200DG @8DG/MIN IH=3MIN

FORM IV VOA

3/90 MMP

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

VBLKSM

Lab Name: CH2M HILL/MGM Contract: _____

Lab Code: _____ Case No.: 21263 SAS No.: _____ SDG No.: _____

Matrix: (soil/water) SOIL Lab Sample ID: L03312B3

Sample wt/vol: 4.0 (g/mL) G Lab File ID: BBVM014760

Level: (low/med) MED Date Received: 04/01/92

% Moisture: not dec. 0 Date Analyzed: 04/01/92

GC Column: CAP ID: 0.530 (mm) Dilution Factor: 1.0

Soil Extract Volume: 10000 (uL) Soil Aliquot Volume: 100 (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
74-87-3	Chloromethane	1200	U
74-83-9	Bromomethane	1200	U
75-01-4	Vinyl Chloride	1200	U
75-00-3	Chloroethane	1200	U
75-09-2	Methylene Chloride	450	J
67-64-1	Acetone	1200	U
75-15-0	Carbon Disulfide	1200	U
75-35-4	1,1-Dichloroethene	1200	U
75-34-3	1,1-Dichloroethane	1200	U
540-59-0	1,2-Dichloroethene (total)	1200	U
67-66-3	Chloroform	1200	U
107-06-2	1,2-Dichloroethane	1200	U
78-93-3	2-Butanone	1200	U
71-55-6	1,1,1-Trichloroethane	1200	U
56-23-5	Carbon Tetrachloride	1200	U
75-27-4	Bromodichloromethane	1200	U
78-87-5	1,2-Dichloropropane	1200	U
10061-01-5	cis-1,3-Dichloropropene	1200	U
79-01-6	Trichloroethene	1200	U
124-48-1	Dibromochloromethane	1200	U
79-00-5	1,1,2-Trichloroethane	1200	U
71-43-2	Benzene	1200	U
10061-02-6	trans-1,3-Dichloropropene	1200	U
75-25-2	Bromoform	1200	U
591-78-6	2-Hexanone	1200	U
108-10-1	4-Methyl-2-Pentanone	1200	U
127-18-4	Tetrachloroethene	1200	U
79-34-5	1,1,2,2-Tetrachloroethane	1200	U
108-88-3	Toluene	1200	U
108-90-7	Chlorobenzene	1200	U
100-41-4	Ethylbenzene	1200	U
100-42-5	Styrene	1200	U
1330-20-7	Xylene (total)	1200	U

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

VBLKSM

Lab Name: CH2M HILL/MGM Contract: _____

Code: _____ Case No.: 21263 SAS No.: _____ SDG No.: _____

Matrix: (soil/water) SOIL Lab Sample ID: L03312B3

Sample wt/vol: 4.0 (g/mL) G Lab File ID: BBVM014760

Level: (low/med) MED Date Received: 04/01/92

% Moisture: not dec. 0 Date Analyzed: 04/01/92

GC Column: CAP ID: 0.530 (mm) Dilution Factor: 1.0

Soil Extract Volume: 10000 (uL) Soil Aliquot Volume: 100 (uL)

Number TICs found: 0

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

4B
SEMIVOLATILE METHOD BLANK SUMMARY

Lab Name: CH2M HILL/MGM Contract: _____

Lab Code: _____ Case No.: S21263 SAS No.: _____ SDG No.: _____

Lab File ID: DBPA010372 Lab Sample ID: S03232B1

Date Extracted: 03/23/92 Extraction:(SepF/Cont/Sonc) SONC

Date Analyzed: 04/02/92 Time Analyzed: 1527

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

Instrument ID: 5100D

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS AND MSD:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
01	M-07	21263006	D2PA010387	04/03/92
02	SB-04-03	21263005	D1PA010383	04/03/92
03	TT-08-02	21263002	D1PA010385	04/03/92
04	TT-10-01	21263001	D1PA010384	04/03/92

COMMENTS: CLP,21222,,SBLKS,L,S,S03232B1,B,BLANK,
30DG TO 310DG @10DG/MIN IH=4MINS

FORM IV SV 1/87 Rev. MTP

ORGANICS ANALYSIS DATA SHEET

Laboratory Name:	CH2M HILL/MGM	Concentration:	LOW	Date Extracted:	03/23/92
Lab Sample ID:	S03232B1	Sample Matrix:	SOIL	Date Analyzed:	04/02/92
Client Sample ID:	SBLKS	Percent Moisture:	0.0	Dilution Factor:	1.0

POLYNUCLEAR AROMATIC COMPOUNDS

CAS Number		ug/Kg		CAS Number		ug/Kg	
271-89-6	2,3-Benzofuran	330	U	260-94-6	Acridine	330	U
496-11-7	2,3-Dihydro-1h-Indene	330	U	229-87-8	Phenanthridine	330	U
95-13-6	1H-Indene	330	U	86-74-8	Carbazole	330	U
91-20-3	Naphthalene	330	U	206-44-0	Fluoranthene	330	U
95-15-8	Benzo(b)thiophene	330	U	129-00-0	Pyrene	330	U
91-22-5	Quinoline	330	U	56-55-3	Benzo(a)anthracene	330	U
119-65-3	Isoquinoline	330	U	218-01-9	Chrysene/Triphenylene	330	U
91-57-6	2-Methylnaphthalene	330	U	NA	Benzo(b&k)fluoranthene	NR	
120-72-9	Indole	330	U	57-97-6	7,12-Dimethylbenz(a)anthrac	330	U
[illegible]-12-0	1-Methylnaphthalene	330	U	192-97-2	Benzo(e)pyrene	330	U
[illegible]-52-4	Biphenyl	330	U	50-32-8	Benzo(a)pyrene	330	U
208-96-8	Acenaphthylene	330	U	198-55-0	Perylene	330	U
83-32-9	Acenaphthene	330	U	56-49-5	3-Methylcholanthrene	330	U
132-64-9	Dibenzofuran	330	U	193-39-5	Indeno(1,2,3-cd)pyrene	330	U
86-73-7	Fluorene	330	U	53-70-3	Dibenz(a,h)anthracene	330	U
132-65-0	Dibenzothiophene	330	U	191-24-2	Benzo(g,h,i,)perylene	330	U
85-01-8	Phenanthrene	330	U	205-99-2	Benzo(b)fluoranthene	330	U
120-12-7	Anthracene	330	U	207-08-9	Benzo(k)fluoranthene	330	U

U - Compound analyzed for but not detected.
B - Compound was detected in QC blank.
J - Reported value less than quantitation limit.

Form I

ORGANICS ANALYSIS DATA SHEET

Laboratory Name:	CH2M HILL/MGM	Concentration:	LOW	Date Extracted:	03/23/92
Lab Sample ID:	S03232B1	Sample Matrix:	SOIL	Date Analyzed:	04/02/92
Client Sample ID:	SBLKS	Percent Moisture:	0.0	Dilution Factor:	1.0

PHENOL COMPOUNDS

CAS Number		ug/Kg		CAS Number	ug/Kg
108-95-2	Phenol	330	U		
95-57-8	2-Chlorophenol	330	U		
95-48-7	2-Methylphenol	330	U		
106-44-5	4-Methylphenol	330	U		
88-75-5	2-Nitrophenol	330	U		
105-67-9	2,4-Dimethylphenol	330	U		
120-83-2	2,4-Dichlorophenol	330	U		
65-85-0	Benzoic acid	800	U		
59-50-7	4-Chloro-3-Methylphenol .	330	U		
88-06-2	2,4,6-Trichlorophenol . .	330	U		
95-95-4	2,4,5-Trichlorophenol . .	800	U		
51-28-5	2,4-Dinitrophenol	800	U		
100-02-7	4-Nitrophenol	800	U		
534-52-1	4,6-Dinitro-2-Methylphenol	800	U		
87-86-5	Pentachlorophenol	800	U		

U - Compound analyzed for but not detected.
B - Compound was detected in QC blank.
J - Reported value less than quantitation limit.

Form I

8A
VOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: CH2M HILL/MGM Contract: _____

Lab Code: _____ Case No.: 21263 SAS No.: _____ SDG No.: _____

Lab File ID (Standard): CSV0021163 Date Analyzed: 03/26/92

Instrument ID: 4500 Time Analyzed: 1104

GC Column: CAP ID: 0.530(mm) Heated Purge: (Y/N) Y

		IS1(BCM) AREA #	RT #	IS2(DFB) AREA #	RT #	IS3(CBZ) AREA #	RT #
	12 HOUR STD	71435	11.02	288453	12.54	257886	17.44
	UPPER LIMIT	142870	11.52	576906	13.04	515772	17.94
	LOWER LIMIT	35718	10.52	144226	12.04	128943	16.94
	EPA SAMPLE NO.						
01	SB-04-03	60136	10.99	227633	12.54	193554	17.45
02	TT-08-02	64714	10.94	248690	12.49	206264	17.44
03	TT-08A-01	60009	11.00	235079	12.54	201786	17.45
04	VBLKS	54456	11.04	225611	12.57	180545	17.47

IS1 (BCM) = Bromochloromethane
IS2 (DFB) = 1,4-Difluorobenzene
IS3 (CBZ) = Chlorobenzene-d5

AREA UPPER LIMIT = + 100% of internal standard area.
AREA LOWER LIMIT = - 50% of internal standard area.
RT UPPER LIMIT = +0.50 minutes of internal standard RT.
RT LOWER LIMIT = -0.50 minutes of internal standard RT.

Column used to flag values outside QC limits with an asterisk.
* Values outside of QC limits.

8A

VOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: CH2M HILL/MGM Contract: _____

Lab Code: _____ Case No.: 21263 SAS No.: _____ SDG No.: _____

Lab File ID (Standard): BSVM014759 Date Analyzed: 04/01/92

Instrument ID: 5100B Time Analyzed: 1406

GC Column: CAP ID: 0.530(mm) Heated Purge: (Y/N) N

		IS1(BCM) AREA #	RT #	IS2(DFB) AREA #	RT #	IS3(CBZ) AREA #	RT #
	12 HOUR STD	69713	9.57	259220	11.09	244025	15.95
	UPPER LIMIT	139426	10.07	518440	11.59	488050	16.45
	LOWER LIMIT	34856	9.07	129610	10.59	122012	15.45
	EPA SAMPLE NO.						
01	TT-08-02_DL	68011	9.55	236308	11.09	215603	15.95
02	TT-10-01	64541	9.57	240725	11.09	215035	15.94
03	TT-10-01_DL	65392	9.57	238298	11.09	212699	15.95
04	VBLKSM	66911	9.59	258484	11.10	237757	15.95

IS1 (BCM) = Bromochloromethane
IS2 (DFB) = 1,4-Difluorobenzene
IS3 (CBZ) = Chlorobenzene-d5

AREA UPPER LIMIT = + 100% of internal standard area.
AREA LOWER LIMIT = - 50% of internal standard area.
RT UPPER LIMIT = +0.50 minutes of internal standard RT.
RT LOWER LIMIT = -0.50 minutes of internal standard RT.

Column used to flag values outside QC limits with an asterisk.
* Values outside of QC limits.

8B

SEMIVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: CH2M HILL/MGM Contract: _____

Lab Code: _____ Case No.: S21263 SAS No.: _____ SDG No.: _____

Lab File ID (Standard): DSPA010362 Date Analyzed: 04/02/92

Instrument ID: 5100D Time Analyzed: 0813

	IS1(DCB) AREA #	RT #	IS2(NPT) AREA #	RT #	IS3(ANT) AREA #	RT #
12 HOUR STD	9234	9.82	35837	12.74	25187	17.05
UPPER LIMIT	18468	10.32	71674	13.24	50374	17.55
LOWER LIMIT	4617	9.32	17918	12.24	12594	16.55
EPA SAMPLE NO.						
01 SBLKS	8258	9.77	36479	12.64	25623	16.89

IS1 (DCB) = 1,4-Dichlorobenzene-d4
IS2 (NPT) = Naphthalene-d8
IS3 (ANT) = Acenaphthene-d10

AREA UPPER LIMIT = + 100% of internal standard area.
AREA LOWER LIMIT = - 50% of internal standard area.
RT UPPER LIMIT = +0.50 minutes of internal standard RT.
RT LOWER LIMIT = -0.50 minutes of internal standard RT.

Column used to flag internal standard area values with an asterisk.
* Values outside of QC limits.

8C

SEMIVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: CH2M HILL/MGM Contract: _____

Lab Code: _____ Case No.: S21263 SAS No.: _____ SDG No.: _____

Lab File ID (Standard): DSPA010362 Date Analyzed: 04/02/92

Instrument ID: 5100D Time Analyzed: 0813

		IS4(PHN) AREA #	RT #	IS5(CRY) AREA #	RT #	IS6(PRY) AREA #	RT #
	12 HOUR STD	41092	20.70	41286	27.42	47700	30.81
	UPPER LIMIT	82184	21.20	82572	27.92	95400	31.31
	LOWER LIMIT	20546	20.20	20643	26.92	23850	30.31
	EPA SAMPLE NO.						
01	SBLKS	45039	20.52	49668	27.26	56959	30.64

IS4 (PHN) = Phenanthrene-d10
IS5 (CRY) = Chrysene-d12
IS6 (PRY) = Perylene-d12

AREA UPPER LIMIT = + 100% of internal standard area.
AREA LOWER LIMIT = - 50% of internal standard area.
RT UPPER LIMIT = +0.50 minutes of internal standard RT.
RT LOWER LIMIT = -0.50 minutes of internal standard RT.

Column used to flag internal standard area values with an asterisk.
* Values outside of QC limits.

8B

SEMIVOLATILE INTERNAL STANDARD AREA SUMMARY

Lab Name: CH2M HILL/MGM Contract: _____

Code: _____ Case No.: S21263 SAS No.: _____ SDG No.: _____

Lab File ID (Standard): DSPA010381 Date Analyzed: 04/03/92

Instrument ID: 5100D Time Analyzed: 0740

		IS1(DCB) AREA #	RT	IS2(NPT) AREA #	RT	IS3(ANT) AREA #	RT
	12 HOUR STD	10239	9.69	41966	12.52	31814	16.75
	UPPER LIMIT	20478		83932		63628	
	LOWER LIMIT	5120		20983		15907	
	EPA SAMPLE NO.						
01	M-07	12149	9.65	50165	12.50	34350	16.75
02	SB-04-03	8458	9.59	34657	12.47	25561	16.72
03	TT-08-02	8910	9.65	36324	12.50	27818	16.74
04	TT-10-01	8536	9.67	35510	12.52	27980	16.75

IS1 (DCB) = 1,4-Dichlorobenzene-d4
IS2 (NPT) = Naphthalene-d8
IS3 (ANT) = Acenaphthene-d10

UPPER LIMIT = + 100% of internal standard area.
LOWER LIMIT = - 50% of internal standard area.

Column used to flag internal standard area values with an asterisk

FORM VIII SV-1 1/87 Rev. MTP

8C

SEMIVOLATILE INTERNAL STANDARD AREA SUMMARY

Lab Name: CH2M HILL/MGM Contract: _____

Lab Code: _____ Case No.: S21263 SAS No.: _____ SDG No.: _____

Lab File ID (Standard): DSPA010381 Date Analyzed: 04/03/92

Instrument ID: 5100D Time Analyzed: 0740

		IS4(PHN) AREA #	RT	IS5(CRY) AREA #	RT	IS6(PRY) AREA #	RT
	12 HOUR STD	53575	20.37	57198	27.09	60045	30.49
	UPPER LIMIT	107150		114396		120090	
	LOWER LIMIT	26788		28599		30022	
	EPA SAMPLE NO.						
01	M-07	61593	20.39	66247	27.12	71395	30.52
02	SB-04-03	48439	20.35	56771	27.07	62950	30.46
03	TT-08-02	51672	20.35	60437	27.07	70552	30.47
04	TT-10-01	52787	20.37	57896	27.09	68837	30.47

IS4 (PHN) = Phenanthrene-d10
IS5 (CRY) = Chrysene-d12
IS6 (PRY) = Perylene-d12

UPPER LIMIT = + 100% of internal standard area.
LOWER LIMIT = - 50% of internal standard area.

Column used to flag internal standard area values with an asterisk

FORM VIII SV-2 1/87 Rev. MTP

SAMPLE DATA PACKAGE

SAMPLE DATA PACKAGE

CASE NARRATIVE

Engineers
Planners
Economists
Scientists

CASE NARRATIVE FOR VOLATILE MASS SPECTROMETRY SAMPLES

LABORATORY: CH2M HILL LABORATORIES CLIENT: BARR ENGINEERING

CASE NO. : N/A CONTRACT NO.: N/A

LAB NO. : 21263 SDG NO.: N/A

I. RECEIPT

A. DATE: March 23, 1992

B. SAMPLE INFORMATION

LAB ID	CLIENT ID	SAMPLE MATRIX	DATE SAMPLED	EXTRACTION DATE	ANALYSIS DATE
21263001	TT-10-01	SOIL	03/21/92	04/01/92	04/01/92
21263001DL	TT-10-01 DL	SOIL	03/21/92	04/01/92	04/01/92
21263002	TT-08-01	SOIL	03/21/92	NA	03/26/92
21263002DL	TT-08-01 DL	SOIL	03/21/92	04/01/92	04/01/92
21263003	TT-08A-01	SOIL	03/21/92	NA	03/26/92
21263005	SB-04-03	SOIL	03/20/92	NA	03/26/92
Y03262B2	VBLKS	SOIL	NA	NA	03/26/92
L03312B3	VBLKSM	SOIL	NA	04/01/92	04/01/92

C. Documentation
Exceptions : No exceptions were encountered.

II. EXTRACTION

A. Holding Times: All holding times were met.

B. Extraction
Exceptions : No exceptions were encountered.

CH2M HILL Quality Analytical Laboratories 2567 Fairlane Drive, P.O. Box 230548, Montgomery, Alabama 36116 205.271 1444

Engineers
Planners
CH2M HILL Economists
Scientists

III. ANALYSIS

A. Holding times: All holding times were met.

B. Analytical Exceptions : No exceptions were encountered.

IV. QUALITY CONTROL

A. Method Blank : All associated method blanks met acceptable QC criteria.

B. Surrogate Recoveries : Please note that the recovery of Bromofluorobenzene in the medium soil analysis of sample 21263002 (TT-08-02) was above the acceptable QC limit. Since the recovery was acceptable in the original analysis, the laboratory took no further action.

All other samples met acceptable QC limits.

C. Matrix Spike Results : The native sample, matrix spike, and matrix spike duplicate results are contained within other batches of samples. The results for sample 21263001 will be reported with the results of our laboratory contract number 21262. The results for samples 21263002, 21263003, and 21263005 will be reported with the results of our laboratory contract number 21136.

Please note that Forms II, IV, V, and VIII have numbers to the immediate left of each table. These numbers are sequential only and have no relation to CH2M HILL identification numbers.

I 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 contained in this hardcopy data package and in the computer-readable data submitted on floppy diskette has been authorized by the Laboratory Manager or his designee, as verified by the following signature.

Herb Kelly 5/4/92
Herb Kelly Date
Manager, Organic Division

CH2M HILL Quality Analytical Laboratories 2567 Fairlane Drive, P.O. Box 230548, Montgomery, Alabama 36116 205 271 1444

Engineers
Planners
CH2M HILL
Economists
Scientists

CASE NARRATIVE FOR PNA/PHENOL MASS SPECTROMETRY SAMPLES

LABORATORY: CH2M HILL LABORATORIES
CASE NO. : N/A
LAB NO. : 21263

CLIENT: BARR ENGINEERING
CONTRACT NO.: N/A
SDG NO.: N/A

I. RECEIPT

A. DATE: March 23, 1992

B. SAMPLE INFORMATION

LAB ID	CLIENT ID	SAMPLE MATRIX	DATE SAMPLED	EXTRACTION DATE	ANALYSIS DATE
21263001	TT-10-01	SOIL	03/21/92	03/23/92	04/03/92
21263002	TT-08-01	SOIL	03/21/92	03/23/92	04/03/92
21263005	SB-04-03	SOIL	03/20/92	03/23/92	04/03/92
21263006	M-07	SOIL	03/21/92	03/23/92	04/03/92
S03232B1	SBLKS	SOIL	NA	03/23/92	04/02/92

C. Documentation Exceptions : Tentatively Identified Compounds (TIC) were not requested as part of this analysis. Therefore, the TIC forms and raw data will not be included in this package.

As you have requested, Benzo(b)fluoranthene and Benzo(k)fluoranthene will be reported separately. Due to the low concentrations analyzed for, there may be instances where the native matrix offers chromatographic interferences in this region of the chromatogram, making it difficult to correctly quantitate these isomers as separate compounds. In that case, Benzo(b)fluoranthene and Benzo(k)fluoranthene will be reported as total Benzo(b&k)fluoranthene. An "NR" (not reported) qualifier will then be used for the compounds for which are not reported.

Please note that the amount listed on the quantitation report reflects the mass detected at the instrument. According to the CLP Statement of Work, 2-uL injections must be made. Therefore, the amount on the quantitation report must be divided by a factor of two in order to determine the concentration of the extract injected.

No other exceptions were encountered.

CH2M HILL
Quality Analytical Laboratories
2567 Fairlane Drive, P.O. Box 230548, Montgomery, Alabama 36116
205 271 1444

II. EXTRACTION

A. Holding Times: All holding times were met.

B. Extraction Exceptions : No exceptions were encountered.

III. ANALYSIS

A. Holding times: All holding times were met.

B. Analytical Exceptions : No exceptions were encountered.

IV. QUALITY CONTROL

A. Method Blank : All associated method blanks met acceptable QC criteria.

B. Surrogate Recoveries : All samples met acceptable QC limits.

C. Matrix Spike Results : The native sample, matrix spike, and matrix spike duplicate results are contained within another batch of samples. The results will be reported with the results of our laboratory contract number 21281.

Please note that Forms II, IV, V, and VIII have numbers to the immediate left of each table. These numbers are sequential only and have no relation to CH2M HILL identification numbers.

I 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 contained in this hardcopy data package and in the computer-readable data submitted on floppy diskette has been authorized by the Laboratory Manager or his designee, as verified by the following signature.

Herb Kelly 5/4/92
Herb Kelly Date
Manager, Organic Division

CH2M HILL Quality Analytical Laboratories 2567 Fairlane Drive, P.O. Box 230548, Montgomery, Alabama 36116 205 271 1444

SAMPLE DATA PACKAGE

SHIPPING RECEIPTS

BARR ENGINEERING CO.
7803 GLENROY ROAD
MINNEAPOLIS, MN 55439

PROJECT NUMBER No 01262
13/49-003JSL

NO: WAUKEGAN COKE PLANT RI

JIM LANGSETH
PROJECT CONTACT: MARY MACKEY
LABORATORY: CH_2M HILL
REMARKS/ ANALYSIS REQUIRED:

SAMPLE IDENTIFICATION	COLLECTION DATE	COLLECTION TIME	GRAB	COMP.	BLANK	VOLATILE ORGANIC - CLP TCL	SEMIVOLATILE ORGANIC	[redacted] METALS CLP TAL	UNFILTERED METALS	GENERAL	CYANIDE	NUTRIENTS	OIL AND GREASE	TOC	SULFIDE	DIOXIN	EXTRACTABLE CLP TCL	PESTICIDES/ CLP TCL	PAH's	PAH/PHENOLS	ARSENIC					TOTAL NO. OF CONTAINERS
TT-10-01	3/21/92	AM	X			X					X								[redacted]	X	X			001		4 CONTAINERS
TT-08-02	3/21/92	AM	X			X													[redacted]	X				002		3
TT-08A-01	3/21/92	AM	X			X					X										X			003		3
M-06	3/21/92	AM	X								X										X			004		1
SB-04	3/20/92	AM	X			X														X				005		3
M-07	3/21/92	AM	X																	X				006		1
Method Blank																								ZS1		

FOR LAB USE ONLY
LAB # 21263
PROJ # LMG 33486, XY
ACK 3/24 VERIFIED
HAZWRAP/NEESA Y (N)
QC LEVEL 1 2 3 D
COC yes | ICE yes
ALL REC yes | TEMP 4°C
CUST SEAL yes | PH N/A
SAMPLE COND Soil

SAMPLED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY LAB:	DATE	TIME
(SEM) [signature]	(SEM) [signature]	2/20/92 3/21/92	PM AM	[signature]	3/23/92	0845
RECEIVED BY: (SEM) [signature]	RELINQUISHED BY: (SEM) [signature]	DATE 3/21/92	TIME AM	RECEIVED BY LAB:	DATE	TIME
RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY LAB:	DATE	TIME

REMARKS:

SAMPLES SHIPPED VIA
☐ AIR FREIGHT ☒ FED. EXP. ☐ SAMPLER
☐ OTHER

AIR BILL NUMBER: 3161694804

DISTRIBUTION: WHITE-ORIGINAL ACCOMPANIES SHIPMENT TO LAB, RETURNS TO BARR WITH RESULTS; YELLOW-LAB COPY; PINK-LAB COORDINATOR; GOLD-FIELD COPY

000051

Laboratory No. 21281

-- Volatiles

-- PAH/Phenols

One investigative sample (SB0601) was collected March 24, 1992 and analyzed for volatiles and PAH/phenols. The results of these analyses were reported in this case and qualified as described in the following sections.

Holding Times

Holding times were met on this sample for both analyses using the EPA holding time criteria for water samples.

Instrument Tuning

Volatiles

GC/MS Tuning met the established method performance criteria for compounds, concentrations, frequencies and relative ion abundances for the volatiles analyses.

PAH/PHENOL

GC/MS Tuning met the established method performance criteria for compounds, concentrations, frequencies and relative ion abundances for the PAH/phenols analyses.

Instrument Calibration

Volatiles

Initial calibration percent relative standard deviation (%RSD) and continuing calibration percent difference (%D) values for two compounds were outside the appropriate control limits.

The volatile analyses initial calibration parameter and associated %RSD value beyond control limits was chloroethane (32.4 percent). The continuing calibration parameter with the %D value outlier was 1,1,1-trichloroethane (26.8 percent). Neither of these compounds was detected or qualified in the associated sample.

PAH/PHENOL

Initial calibrations had acceptable average relative response factors and %RSD values. Continuing calibration relative response factors and %D values were acceptable for all compounds.

Blanks

Volatiles

Methylene chloride (8 J µg/kg) and acetone (9 J µg/kg) were detected in the volatiles blank. Sample results less than ten times the blank concentration of either compound were qualified as nondetects and flagged "U."

PAH/Phenol

No compounds were detected in the PAH/phenols method blank.

Surrogate Recovery

Volatiles

Volatiles system monitoring compounds had acceptable recoveries for the associated samples.

PAH/PHENOL

The PAH/Phenol analyses surrogates could not be determined on the associated samples due to the large dilutions required for analysis. The method

blank surrogate recoveries were within the quality control limits. No data were qualified.

Matrix Spike/Matrix Spike Duplicate

Volatiles

The matrix spike/matrix spike duplicate samples recovery value for benzene (161 percent) was beyond control limits. The spike compounds with RPD values outside control limits were benzene (73 percent) and toluene (46 percent). Since the benzene recovery was high, it was detected in the investigative sample, and all other spike compounds met the performance criteria, no action was taken. The toluene recoveries were within acceptable quality control limits, so no data were qualified.

PAH/PHENOL

PAH/Phenol analyses matrix spike/matrix spike duplicate samples recoveries for phenol (-35 percent and -111 percent) and RPD values for phenol (104 percent) and naphthalene (55 percent) were not within control limits. Sample SB0601 results for phenol were qualified as estimated and flagged "J." Since recoveries for naphthalene were acceptable, no action was taken.

Field Duplicates

No field duplicate samples were collected.

Overall Assessment

The data are considered acceptable with the recommended qualifiers.

CH2M HILL
Engineers
Planners
Economists
Scientists

April 20, 1992

LMG33486.XY

APR 3

Ms. Marti Harding-Smith
Barr Engineering Company
8300 Norman Center Drive
Suite 300
Minneapolis, Minnesota 55437-1026

RE: Analytical Data for LMG Laboratory No. 21281

Dear Ms. Harding-Smith:

On March 25, 1992, the CH2M HILL Montgomery Laboratory received one sample with a request for analysis of selected organic parameters.

The analytical results and associated quality control data are enclosed. Any unusual difficulties encountered during the analyses of this sample are discussed in the case narratives.

If you should have any questions concerning the data, please inquire.

The CH2M HILL policy is to store samples for up to 30 days after reporting. If you desire, our laboratory will maintain your samples for a longer period at a cost of $5.00 per sample per month. Samples determined to be hazardous can either be returned to you or disposed of at a cost of $25.00 per sample.

Sincerely,

Wanda L. Hall

Wanda L. Hall
Data Package Supervisor

Enclosures

cc: Mr. Jim Langseth

Engineers
Planners
Economists
Scientists

TABLE OF CONTENTS

CH2M HILL Laboratory No. 21281

	Page No.
List of Organic EPA-defined Qualifiers	i
List of Sample ID Qualifiers	ii
Sample Cross-Reference	iii
List of Internal Standards and Surrogates (Volatiles)	iv
List of Internal Standards and Surrogates (Semivolatiles)	v
SAMPLE DATA SUMMARY PACKAGE	1-23
SAMPLE DATA PACKAGE	24
Case Narratives	25-29
Shipping Receipts	30-31
Volatile Data	32
QC Summary	33-39
Sample Data (Analytical Results of Field Samples)	40
SB-06-01 (LMG #21281001)	41-71
Standards Data	72
Initial Calibration Data	73-99
Continuing Calibration Data	100-107
Raw QC Data	108
BFB Data	109-117
Blank Data	118-128
MS/MSD Summary	129-139
PNA/Phenol Data	140
QC Summary	141-149
Sample Data (Analytical Results of Field Samples)	150
SB-06-01 (LMG #21281001)	151-170
Standards Data	171
Initial Calibration Data	172-204
Continuing Calibration Data	205-213
GPC Chromatogram	214-215
Raw QC Data	216
DFTPP Data	217-225
Blank Data	226-232
MS/MSD Summary	233-245

CH2M HILL
Engineers
Planners
Economists
Scientists

EPA - DEFINED QUALIFIERS

ORGANICS

Definitions for the EPA-defined qualifiers:

U -- Indicates the compound was analyzed for but not detected. The number adjacent to the "U" qualifier indicates the quantitation limit for that compound. The detection limit can vary from sample to sample depending on dilution factors or percent moisture adjustment when indicated.

J -- Indicates an estimated value. This flag is used when the mass spectral data indicates the presence of a compound below the stated quantitation limit. The "J" qualifier is not used with pesticide results.

C -- This flag applies to pesticide results only. The "C" flag indicates the presence of this compound has been confirmed by GC/MS analysis.

B -- This flag is used when the analyte is found in the associated blank as well as the sample. This notation indicates possible blank contamination and suggests the data user evaluate these compounds and their amounts carefully.

E -- This flag applies to GC/MS only. The "E" qualifier indicates a compound may be above or below the linear range of the instrument. If the particular compound level is deemed above the linear calibration range, then the sample should be reanalyzed at an appropriate dilution. Therefore, the "E" qualified amount is an estimated concentration. The results for the dilution will be reported on a separate Form I and will be flagged with a "D" if the dilution brings the concentration within proper calibration.

D -- This flag identifies compounds which have been run at a dilution to bring the concentration of that compound within the linear range of the instrument. "D" qualifiers are only used for samples that have been run initially with results above acceptable ranges. For secondary dilutions the "DL" suffix is appended to the sample number on the Form I.

A -- Indicates the Tentatively Identified Compound (TIC) is a suspected aldol-condensation product.

X -- Indicates the compound concentration has been manually modified or the EPA qualifier has been manually modified or added.

JX -- The compound was detected and quantitated below the Contract Required Quantitation Limit.

CH2M HILL Quality Analytical Laboratories 2567 Fairlane Drive P.O. Box 230548 Montgomery, Alabama 36116 205 271 1444

CLIENT SAMPLE ID QUALIFIERS

LEVEL 3

The qualifiers that GC/MS and GC use with the client sample ID are defined below:

DL -- Dilution Run

R -- Rerun (may be followed by a digit to indicate multiple reruns)

RD -- Diluted Rerun

RX -- Re-extraction Analysis

MS -- Matrix Spike (may be followed by a digit to indicate multiple matrix spikes within a sample set)

MSD -- Matrix Spike Duplicate (may be followed by a digit to indicate multiple matrix spike duplicates within a sample set)

VBLK -- Volatile Blank (will be followed by a "W" for waters, "S" for soils run at a low level, or "SM" for soils run at a medium level -- these letters may be followed by a digit to indicate multiple blanks of that type).

SBLK -- Semivolatile Blank (will be followed by a "W" for waters, "S" for soils run at a low level, or "SM" for soils run at a medium level -- these letters may be followed by a digit to indicate multiple blanks of that type).

PBLK -- Pesticide/PCB Blank (may be followed by digits to indicate multiple blanks)

These qualifiers allow GC/MS and GC to have unique client sample ID's so that the client can get more accurate information from the data reported.

CH2M HILL Quality Analytical Laboratories 2567 Fairlane Drive, P.O. Box 230548, Montgomery, Alabama 36116 205 271 1444

Engineers
Planners
CH2M HILL Economists
Scientists

TABLE 1

SAMPLE CROSS-REFERENCE SUMMARY

CH2M HILL Laboratory No. 21281

CH2M HILL Sample No.	Sample Description				
21281001	SB-06-01	03/24/92	GRAB	13/49-003JSL31	PO#01261

CH2M HILL Quality Analytical Laboratories 2567 Fairlane Drive, P.O. Box 230548 Montgomery, Alabama 36116 205 271 1444

INTERNAL STANDARD AND SURROGATE COMPOUNDS

VOLATILE ANALYSIS

The internal standards on the GC/MS volatile chromatograms are designated as IS1, IS2, and IS3. The surrogate standards are labelled as SS1, SS2, and SS3. The compounds corresponding to these labels are listed below.

LABEL	INTERNAL STANDARD COMPOUND
IS1	BROMOCHLOROMETHANE
IS2	1,4-DIFLUOROBENZENE
IS3	D5-CHLOROBENZENE

LABEL	SURROGATE STANDARD COMPOUND
SS1	D4-1,2-DICHLOROETHANE
SS2	D8-TOLUENE
SS3	1,4-BROMOFLUOROBENZENE

CH2M HILL Quality Analytical Laboratories 2567 Fairlane Drive, P.O. Box 230548, Montgomery, Alabama 36116 205 271 1444

INTERNAL STANDARD AND SURROGATE COMPOUNDS

SEMIVOLATILE ANALYSIS

The internal standards on the GC/MS semivolatile chromatograms are designated as IS1, IS2, IS3, IS4, IS5, and IS6. The surrogate standards are labelled as SS1, SS2, SS3, SS4, SS5, and SS6. The compounds corresponding to these labels are listed below.

LABEL	INTERNAL STANDARD COMPOUND
IS1	D4-1,4-DICHLOROBENZENE
IS2	D8-NAPHTHALENE
IS3	D10-ACENAPHTHENE
IS4	D10-PHENANTHRENE
IS5	D12-CHRYSENE
IS6	D12-PERYLENE

LABEL	SURROGATE STANDARD COMPOUND
SS1	2-FLUOROPHENOL
SS2	D5-PHENOL
SS3	D5-NITROBENZENE
SS4	2-FLUOROBIPHENYL
SS5	2,4,6-TRIBROMOPHENOL
SS6	D14-TERPHENYL

CH2M HILL Quality Analytical Laboratories 2567 Fairlane Drive, P.O. Box 230548 Montgomery, Alabama 36116 205 271 1444

SAMPLE DATA SUMMARY PACKAGE

Engineers
Planners
Economists
Scientists

CASE NARRATIVE FOR VOLATILE MASS SPECTROMETRY SAMPLES

LABORATORY: CH2M HILL LABORATORIES CLIENT: BARR ENGINEERING

CASE NO. : N/A CONTRACT NO.: N/A

LAB NO. : 21281 SDG NO.: N/A

I. RECEIPT

A. DATE: March 25, 1992

B. SAMPLE INFORMATION

LAB ID	CLIENT ID	SAMPLE MATRIX	DATE SAMPLED	EXTRACTION DATE	ANALYSIS DATE
21281001	SB-06-01	SOIL	03/24/92	NA	04/02/92
21281M01	SB-06-01_MS	SOIL	03/24/92	NA	04/02/92
21281D01	SB-06-01_MSD	SOIL	03/24/92	NA	04/02/92
Y04022B1	VBLKS	SOIL	NA	NA	04/02/92

C. Documentation
Exceptions : No exceptions were encountered.

CH2M HILL Quality Analytical Laboratories 2567 Fairlane Drive P.O. Box 230548 Montgomery, Alabama 36116 205 271 [illegible]

II. EXTRACTION

A. Holding Times: Medium level protocol was not performed; therefore, extraction time is not applicable.

B. Extraction Exceptions : Not applicable.

III. ANALYSIS

A. Holding times: All holding times were met.

B. Analytical Exceptions : No exceptions were encountered.

IV. QUALITY CONTROL

A. Method Blank : All associated method blanks met acceptable QC criteria.

B. Surrogate Recoveries : All samples met acceptable QC limits.

C. Matrix Spike Results : Please note that the percent recoveries and relative percent differences for Toluene and Benzene in samples 21281M01 (SB-06-01_MS) and 21281D01 SB-06-01_MSD) were outside QC limits. This may possibly be due to the high level of Toluene and Benzene present in the native sample. Since these limits are advisory only, the laboratory took no further action.

All other spike recoveries were within CLP advisory limits.

Please note that Forms II, IV, V, and VIII have numbers to the immediate left of each table. These numbers are sequential only and have no relation to CH2M HILL identification numbers.

I 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 contained in this hardcopy data package and in the computer-readable data submitted on floppy diskette has been authorized by the Laboratory Manager or his designee, as verified by the following signature.

Herb Kelly 4/20/93
Herb Kelly Date
Manager, Organic Division

CH2M HILL Quality Analytical Laboratories 2567 Fairlane Drive P O Box 230548 Montgomery, Alabama 36116 205 271 1444

Engineers
Planners
CH2M HILL Economists
Scientists

CASE NARRATIVE FOR PNA/PHENOL MASS SPECTROMETRY SAMPLES

LABORATORY: CH2M HILL LABORATORIES CLIENT: BARR ENGINEERING

CASE NO. : N/A CONTRACT NO.: N/A

LAB NO. : 21281 SDG NO.: N/A

I. RECEIPT

A. DATE: March 25, 1992

B. SAMPLE INFORMATION

LAB ID	CLIENT ID	SAMPLE MATRIX	DATE SAMPLED	EXTRACTION DATE	ANALYSIS DATE
21281001	SB-06-01	SOIL	03/24/92	04/02/92	04/03/92
21281M01	SB-06-01_MS	SOIL	03/24/92	04/02/92	04/03/92
21281D01	SB-06-01_MSD	SOIL	03/24/92	04/02/92	04/03/92
S04022B2	SBLKS	SOIL	NA	04/02/92	04/03/92

C. Documentation Exceptions : Tentatively Identified Compounds (TIC) were not requested as part of this analysis. Therefore, the TIC forms and raw data will not be included in this package.

As you have requested, Benzo(b)fluoranthene and Benzo(k)fluoranthene will be reported separately. Due to the low concentrations analyzed for, there may be instances where the native matrix offers chromatographic interferences in this region of the chromatogram, making it difficult to correctly quantitate these isomers as separate compounds. In that case, Benzo(b)fluoranthene and Benzo(k)fluoranthene will be reported as total Benzo(b&k)fluoranthene. An "NR" (not reported) qualifier will then be used for the compounds for which are not reported.

Please note that the amount listed on the quantitation report reflects the mass detected at the instrument. According to the CLP Statement of Work, 2-uL injections must be made. Therefore, the amount on the quantitation report must be divided by a factor of two in order to determine the concentration of the extract injected.

No other exceptions were encountered.

CH2M HILL Quality Analytical Laboratories 2567 Fairlane Drive, P.O. Box 230548 Montgomery, Alabama 36116 205 271 1444

II. EXTRACTION

A. Holding Times: All holding times were met.

B. Extraction Exceptions : No exceptions were encountered.

III. ANALYSIS

A. Holding times: All holding times were met.

B. Analytical Exceptions : No exceptions were encountered.

IV. QUALITY CONTROL

A. Method Blank : All associated method blanks met acceptable QC criteria.

B. Surrogate Recoveries : Samples 21281001 (SB-06-01), 21281M01 (SB-06-01_MS), and 21281D01 (SB-06-01_MSD) required a large dilution for analysis. Therefore, surrogate recoveries could not be determined for these samples.

All other samples met acceptable QC limits. According to CLP protocol, one surrogate per fraction may be outside of QC limits as long as the recovery is ten percent or greater.

C. Matrix Spike Results : Please note that the percent recovery and relative percent difference for Phenol in samples 21281M01 and 21281D01 were outside QC limits. This may possibly be due to the high level of phenol present in the native sample. Also, the relative percent difference for Naphthalene in samples 21281M01 and 21281D01 was outside QC limits. This may possibly be due to the high level of Naphthalene present in the native sample. Since these limits are advisory only, the laboratory took no further action.

Please note that Forms II, IV, V, and VIII have numbers to the immediate left of each table. These numbers are sequential only and have no relation to CH2M HILL identification numbers.

I 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 contained in this hardcopy data package and in the computer-readable data submitted on floppy diskette has been authorized by the Laboratory Manager or his designee, as verified by the following signature.

Herb Kelly 4/20/92

Herb Kelly Date
Manager, Organic Division

CH2M HILL Quality Analytical Laboratories 2567 Fairlane Drive, P.O. Box 230548, Montgomery, Alabama 36116 205 271 1444

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SB-06-01

Lab Name: CH2M HILL/MGM Contract: _____

Code: _____ Case No.: 21281 SAS No.: _____ SDG No.: _____

Matrix: (soil/water) SOIL Lab Sample ID: 21281001

Sample wt/vol: 5.0 (g/mL) G Lab File ID: C3VO021294

Level: (low/med) LOW Date Received: 03/25/92

% Moisture: not dec. 23 Date Analyzed: 04/02/92

GC Column: CAP ID: 0.530 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
74-87-3	Chloromethane	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	62	B
67-64-1	Acetone	110	B
75-15-0	Carbon Disulfide	4	J
75-35-4	1,1-Dichloroethene	13	U
75-34-3	1,1-Dichloroethane	13	U
540-59-0	1,2-Dichloroethene (total)	13	U
67-66-3	Chloroform	13	U
107-06-2	1,2-Dichloroethane	13	U
78-93-3	2-Butanone	32	
71-55-6	1,1,1-Trichloroethane	13	U
56-23-5	Carbon Tetrachloride	13	U
75-27-4	Bromodichloromethane	13	U
78-87-5	1,2-Dichloropropane	13	U
10061-01-5	cis-1,3-Dichloropropene	13	U
79-01-6	Trichloroethene	13	U
124-48-1	Dibromochloromethane	13	U
79-00-5	1,1,2-Trichloroethane	13	U
71-43-2	Benzene	110	
10061-02-6	trans-1,3-Dichloropropene	13	U
75-25-2	Bromoform	13	U
591-78-6	2-Hexanone	3	J
108-10-1	4-Methyl-2-Pentanone	13	U
127-18-4	Tetrachloroethene	13	U
79-34-5	1,1,2,2-Tetrachloroethane	13	U
108-88-3	Toluene	61	
108-90-7	Chlorobenzene	13	U
100-41-4	Ethylbenzene	2	J
100-42-5	Styrene	13	U
1330-20-7	Xylene (total)	7	J

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

SB-06-01

Lab Name: CH2M HILL/MGM Contract: _____

Lab Code: _____ Case No.: 21281 SAS No.: _____ SDG No.: _____

Matrix: (soil/water) SOIL Lab Sample ID: 21281001

Sample wt/vol: 5.0 (g/mL) G Lab File ID: C3VO021294

Level: (low/med) LOW Date Received: 03/25/92

% Moisture: not dec. 23 Date Analyzed: 04/02/92

GC Column: CAP ID: 0.530 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____(uL)

Number TICs found: 3

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 593-75-9	METHANE, ISOCYANO-	8.55	15	J
2. 109-06-8	PYRIDINE, 2-METHYL-	17.75	20	J
3. 13435-09-1	SILANEDIAMINE, 1,1-DIMETHYL-	22.20	25	J

ORGANICS ANALYSIS DATA SHEET

Laboratory Name:	CH2M HILL/MGM	Concentration:	LOW	Date Extracted:	04/02/92
Lab Sample ID:	21281001	Sample Matrix:	SOIL	Date Analyzed:	04/03/92
Client Sample ID:	SB-06-01	Percent Moisture:	21.0	Dilution Factor:	20

POLYNUCLEAR AROMATIC COMPOUNDS

CAS Number		ug/Kg		CAS Number		ug/Kg	
271-89-6	2,3-Benzofuran	8400	U	260-94-6	Acridine	8400	U
496-11-7	2,3-Dihydro-1h-Indene	8400	U	229-87-8	Phenanthridine	8400	U
95-13-6	1H-Indene	8400	U	86-74-8	Carbazole	8400	U
91-20-3	Naphthalene	3450	J	206-44-0	Fluoranthene	8400	U
95-15-8	Benzo(b)thiophene	550	J	129-00-0	Pyrene	8400	U
91-22-5	Quinoline	8400	U	56-55-3	Benzo(a)anthracene	8400	U
119-65-3	Isoquinoline	8400	U	218-01-9	Chrysene/Triphenylene	8400	U
91-57-6	2-Methylnaphthalene	8400	U	NA	Benzo(b&k)fluoranthene	NR	
120-72-9	Indole	8400	U	57-97-6	7,12-Dimethylbenz(a)anthrac	8400	U
90-12-0	1-Methylnaphthalene	8400	U	192-97-2	Benzo(e)pyrene	8400	U
[illegible]-52-4	Biphenyl	8400	U	50-32-8	Benzo(a)pyrene	8400	U
208-96-8	Acenaphthylene	8400	U	198-55-0	Perylene	8400	U
83-32-9	Acenaphthene	8400	U	56-49-5	3-Methylcholanthrene	8400	U
132-64-9	Dibenzofuran	8400	U	193-39-5	Indeno(1,2,3-cd)pyrene	8400	U
86-73-7	Fluorene	8400	U	53-70-3	Dibenz(a,h)anthracene	8400	U
132-65-0	Dibenzothiophene	8400	U	191-24-2	Benzo(g,h,i,)perylene	8400	U
85-01-8	Phenanthrene	8400	U	205-99-2	Benzo(b)fluoranthene	8400	U
120-12-7	Anthracene	8400	U	207-08-9	Benzo(k)fluoranthene	8400	U

U - Compound analyzed for but not detected.
B - Compound was detected in QC blank.
J - Reported value less than quantitation limit.

Form I

MS

ORGANICS ANALYSIS DATA SHEET

Laboratory Name:	CH2M HILL/MGM	Concentration:	LOW	Date Extracted:	04/02/92
Lab Sample ID:	21281001	Sample Matrix:	SOIL	Date Analyzed:	04/03/92
Client Sample ID:	SB-06-01	Percent Moisture:	21.0	Dilution Factor:	20

PHENOL COMPOUNDS

CAS Number		ug/Kg		CAS Number	ug/Kg
108-95-2	Phenol	37000			
95-57-8	2-Chlorophenol	8400	U		
95-48-7	2-Methylphenol	5300	J		
106-44-5	4-Methylphenol	41000			
88-75-5	2-Nitrophenol	8400	U		
105-67-9	2,4-Dimethylphenol	3900	J		
120-83-2	2,4-Dichlorophenol	8400	U		
65-85-0	Benzoic acid	20000	U		
59-50-7	4-Chloro-3-Methylphenol .	8400	U		
88-06-2	2,4,6-Trichlorophenol . .	8400	U		
95-95-4	2,4,5-Trichlorophenol . .	20000	U		
51-28-5	2,4-Dinitrophenol	20000	U		
100-02-7	4-Nitrophenol	20000	U		
534-52-1	4,6-Dinitro-2-Methylphenol	20000	U		
87-86-5	Pentachlorophenol	1400	J		

U - Compound analyzed for but not detected.
B - Compound was detected in QC blank.
J - Reported value less than quantitation limit.

Form I

Mx

2B

SOIL VOLATILE SYSTEM MONITORING COMPOUND RECOVERY

Lab Name: CH2M HILL/MGM Contract: _____

I Code: _____ Case No.: 21281 SAS No.: _____ SDG No.: _____

Level:(low/med) LOW

	EPA SAMPLE NO.	SMC1 (TOL)#	SMC2 (BFB)#	SMC3 (DCE)#	OTHER	TOT OUT
01	SB-06-01	108	99	100	0	0
02	SB-06-01_MS	110	104	103	0	0
03	SB-06-01_MSD	106	99	101	0	0
04	VBLKS	100	98	99	0	0

		QC LIMITS
SMC1 (TOL)	= Toluene-d8	(84-138)
SMC2 (BFB)	= Bromofluorobenzene	(59-113)
SMC3 (DCE)	= 1,2-Dichloroethane-d4	(70-121)

Column to be used to flag recovery values

* Values outside of contract required QC limits

D System Monitoring Compound diluted out

FORM II VOA-2

3/90

SOIL SURROGATE PERCENT RECOVERY SUMMARY
(Page 1)

Case No. 21281 Contract Laboratory CH2M HILL/MGM
Low XXX Medium

SMO TRAFFIC NO.	SEMI-VOLATILE								
	1-Fluoronaphthalene - SS 0-81	2-Fluorophenol - SS 25-121	Phenol-d5 - SS 24-113	2,4,6-Tribromophenol - SS 19-122	Nitrobenzene-d5 - SS 9-197	2-Fluorobiphenyl - SS 9-109	Terphenyl-d14 - SS 0-143	2-Chlorophenol-d4 - SS 20-130	1,2-Dichlorobenzene - d4 - SS 20-130
SB-06-01	**	**	**	**	**	**	**	**	**
SB-06-01_MS	**	**	**	**	**	**	**	**	**
SB-06-01_MSD	**	**	**	**	**	**	**	**	**
SBLKS	71	86	95	42	82	84	79	92	80

Semi-Volatiles: 0 out of 36; outside of QC limits

Comments:

** - Surrogate Standard not reported due to required dilution.

FORM II

Use

3B

SOIL VOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: CH2M HILL/MGM Contract: _____

Code: _____ Case No.: 21281 SAS No.: _____ SDG No.: _____

Matrix Spike - EPA Sample No.: SB-06-01 Level:(low/med) LOW

COMPOUND	SPIKE ADDED (ug/Kg)	SAMPLE CONCENTRATION (ug/Kg)	MS CONCENTRATION (ug/Kg)	MS % REC #	QC LIMITS REC.
1,1-Dichloroethene	64.90	0	56.36	87	59-172
Trichloroethene	64.90	0	54.16	83	62-137
Benzene	64.90	109.6	158.4	75	66-142
Toluene	64.90	60.52	109.7	76	59-139
Chlorobenzene	64.90	0	56.49	87	60-133

COMPOUND	SPIKE ADDED (ug/Kg)	MSD CONCENTRATION (ug/Kg)	MSD % REC #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
1,1-Dichloroethene	64.90	61.04	94	8	22	59-172
Trichloroethene	64.90	56.10	86	4	24	62-137
Benzene	64.90	214.3	161 *	73 *	21	66-142
Toluene	64.90	139.0	121	46 *	21	59-139
Chlorobenzene	64.90	59.74	92	6	21	60-133

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

RPD: 2 out of 5 outside limits
Spike Recovery: 1 out of 10 outside limits

COMMENTS: CLP,21281,,SB-06-01,L,S,21281001,V,E,
10DG TO 160DG @4DG/MIN IH=7MIN

SOIL SEMIVOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: CH2M HILL

Matrix Spike - EPA Sample No.: MS/MSD

COMPOUND	SPIKE ADDED (UG/KG)	SAMPLE CONCENTRATION (UG/KG)	MS CONCENTRATION (UG/KG)	MS % REC #	QC LIMITS REC.
1H-Indene	8400		4851	58	10-130
Napththalene	8400	5418	9899	53	10-130
Quinoline	8400		3065	36	10-130
2-Methylnaphthalene	8400		4688	56	10-130
Acenaphthylene	8400		5455	65	10-130
Acenaphthene	8400		5872	70	10-130
Fluorene	8400		6062	72	10-130
Phenanthrene	8400		5882	70	10-130
Anthracene	8400		6188	73	10-130
Carbazole	8400		5944	70	10-130
Pyrene	8400		5578	66	10-130
Fluoranthene	8400		5490	65	10-130
Benzo(a)Anthracene	8400		5810	69	10-130
Chrysene/Triphenylene	8400		5487	65	10-130
Benzo(b)Fluoranthene	8400		5414	64	10-130
Benzo(e)pyrene	8400		4882	58	10-130
Benzo(a)pyrene	8400		5435	64	10-130
Indeno(1,2,3-cd)pyrene	8400		4535	54	10-130
Dibenzo(a,h)anthracene	8400		5108	61	10-130
Benzo(g,h,i)perylene	8400		2890	34	10-130
Benzo(k)Fluoranthene	8400		5140	61	10-130

COMPOUND	SPIKE ADDED (UG/KG)	MSD CONCENTRATION (UG/KG)	MSD % REC #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
1H-Indene	8400	4256	50	15	25	10-130
Napththalene	8400	7965	30	55*	25	10-130
Quinoline	8400	2489	30	18	25	10-130
2-Methylnaphtahlene	8400	4299	51	9	25	10-130
Acenaphthylene	8400	4859	58	11	25	10-130
Acenapthene	8400	5275	63	10	25	10-130
Fluorene	8400	5591	66	9	25	10-130
Phenanthrene	8400	5296	63	10	25	10-130
Anthracene	8400	5374	64	13	25	10-130
Carbazole	8400	5188	62	12	25	10-130
Pyrene	8400	4980	59	11	25	10-130
Fluoranthene	8400	5091	60	8	25	10-130
Benzo(a)Anthacene	8400	5595	66	4	25	10-130
Chyrsene/Triphenylene	8400	5356	64	2	25	10-130
Benzo(b)Fluoranthene	8400	4595	54	17	25	10-130
Benzo(e)pyrene	8400	4387	52	11	25	10-130
Benzo(a)pyrene	8400	5016	60	6	25	10-130
Indeno(1,2,3-cd)pyrene	8400	4108	49	10	25	10-130
Dibenzo(a,h)anthracene	8400	4517	54	12	25	10-130
Benzo(g,h,i)perylene	8400	3050	36	6	25	10-130
Benzo(k)Fluoranthene	8400	4610	55	10	25	10-130

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

RPD: 1 out of 42 outside limits

Spike Recovery: 0 out of 42 outside limits

3D

SOIL SEMIVOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: CH2M HILL/MGM Contract:

Lab Code: _____ Case No.: 21281 SAS No.: _____ SDG No.: _____

Matrix Spike - EPA Sample No.: SB-06-01 Level:(low/med) LOW

COMPOUND	SPIKE ADDED (ug/Kg)	SAMPLE CONCENTRATION (ug/Kg)	MS CONCENTRATION (ug/Kg)	MS % REC #	QC LIMITS REC.
Phenol	16900	74470	68560	-35 *	26- 90
2-Chlorophenol	16900	0	13000	77	25-102
4-Chloro-3-methylphenol	16900	0	12830	76	26-103
4-Nitrophenol	16900	0	13340	79	11-114
Pentachlorophenol	16900	2828	13850	65	17-109

COMPOUND	SPIKE ADDED (ug/Kg)	MSD CONCENTRATION (ug/Kg)	MSD % REC #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
Phenol	16900	55640	-111 *	104 *	35	26- 90
2-Chlorophenol	16900	12240	72	7	50	25-102
4-Chloro-3-methylphenol	16900	11140	66	14	33	26-103
4-Nitrophenol	16900	13680	81	2	50	11-114
Pentachlorophenol	16900	12070	55	17	47	17-109

(1) N-Nitroso-di-n-propylamine

Column to be used to flag recovery and RPD values with an asterisk
* Values outside of QC limits

RPD: 1 out of 10 outside limits
Spike Recovery: 2 out of 10 outside limits

COMMENTS:

4A

VOLATILE METHOD BLANK SUMMARY

EPA SAMPLE NO.

VBLKS

Lab Name: CH2M HILL/MGM Contract: _____

Lab Code: _____ Case No.: 21281 SAS No.: _____ SDG No.: _____

Lab File ID: CBVO021293 Lab Sample ID: Y04022B1

Date Analyzed: 04/02/92 Time Analyzed: 1417

GC Column: CAP ID: 0.530(mm) Heated Purge: (Y/N) Y

Instrument ID: 4500

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS AND MSD:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	TIME ANALYZED
01	SB-06-01	21281001	C3VO021294	1505
02	SB-06-01_MS	21281M01	CMVO021295	1540
03	SB-06-01_MSD	21281D01	CMVO021296	1616

COMMENTS: CLP,21232,,VBLKS,L,S,Y04022B1,V,BLANK,
10DG TO 160DG @4DG/MIN IH=7MIN

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

VBLKS

Lab Name: CH2M HILL/MGM Contract: _____

Lab Code: _____ Case No.: 21281 SAS No.: _____ SDG No.: _____

Matrix: (soil/water) SOIL Lab Sample ID: Y04022B1

Sample wt/vol: 5.0 (g/mL) G Lab File ID: CBVO021293

Level: (low/med) LOW Date Received: 04/02/92

% Moisture: not dec. 0 Date Analyzed: 04/02/92

GC Column: CAP ID: 0.530 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____(uL)

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

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

VBLKS

Lab Name: CH2M HILL/MGM Contract: _____

Lab Code: _____ Case No.: 21281 SAS No.: _____ SDG No.: _____

Matrix: (soil/water) SOIL Lab Sample ID: Y04022B1

Sample wt/vol: 5.0 (g/mL) G Lab File ID: CBV0021293

Level: (low/med) LOW Date Received: 04/02/92

% Moisture: not dec. 0 Date Analyzed: 04/02/92

GC Column: CAP ID: 0.530 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____(uL)

Number TICs found: 0

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

4B

SEMIVOLATILE METHOD BLANK SUMMARY

EPA SAMPLE NO.

SBLKS

Lab Name: CH2M HILL/MGM Contract: _____

Code: _____ Case No.: 21281 SAS No.: _____ SDG No.: _____

Lab File ID: DBPA010388 Lab Sample ID: S04022B2

Instrument ID: 5100D Date Extracted: 04/02/92

Matrix: (soil/water) SOIL Date Analyzed: 04/03/92

Level:(low/med) LOW Time Analyzed: 1244

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS AND MSD:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
01	SB-06-01	21281001	D1PA010389	04/03/92
02	SB-06-01_MS	21281M01	DMPA010393	04/03/92
03	SB-06-01_MSD	21281D01	DMPA010394	04/03/92

COMMENTS: CLP,21281,,SBLKS,L,S,S04022B2,B,BLANK,
30DG TO 310DG @10DG/MIN IH=4MINS

FORM IV SV

3/90

ORGANICS ANALYSIS DATA SHEET

Laboratory Name:	CH2M HILL/MGM	Concentration:	LOW	Date Extracted:	04/02/92
Lab Sample ID:	S04022B2	Sample Matrix:	SOIL	Date Analyzed:	04/03/92
Client Sample ID:	SBLKS	Percent Moisture:	0.0	Dilution Factor:	1.0

POLYNUCLEAR AROMATIC COMPOUNDS

CAS Number		ug/Kg		CAS Number		ug/Kg	
271-89-6	2,3-Benzofuran	330	U	260-94-6	Acridine	330	U
496-11-7	2,3-Dihydro-1h-Indene	330	U	229-87-8	Phenanthridine	330	U
95-13-6	1H-Indene	330	U	86-74-8	Carbazole	330	U
91-20-3	Naphthalene	330	U	206-44-0	Fluoranthene	330	U
95-15-8	Benzo(b)thiophene	330	U	129-00-0	Pyrene	330	U
91-22-5	Quinoline	330	U	56-55-3	Benzo(a)anthracene	330	U
119-65-3	Isoquinoline	330	U	218-01-9	Chrysene/Triphenylene	330	U
91-57-6	2-Methylnaphthalene	330	U	NA	Benzo(b&k)fluoranthene	NR	
120-72-9	Indole	330	U	57-97-6	7,12-Dimethylbenz(a)anthrac	330	U
90-12-0	1-Methylnaphthalene	330	U	192-97-2	Benzo(e)pyrene	330	U
92-52-4	Biphenyl	330	U	50-32-8	Benzo(a)pyrene	330	U
208-96-8	Acenaphthylene	330	U	198-55-0	Perylene	330	U
83-32-9	Acenaphthene	330	U	56-49-5	3-Methylcholanthrene	330	U
132-64-9	Dibenzofuran	330	U	193-39-5	Indeno(1,2,3-cd)pyrene	330	U
86-73-7	Fluorene	330	U	53-70-3	Dibenz(a,h)anthracene	330	U
132-65-0	Dibenzothiophene	330	U	191-24-2	Benzo(g,h,i,)perylene	330	U
85-01-8	Phenanthrene	330	U	205-99-2	Benzo(b)fluoranthene	330	U
120-12-7	Anthracene	330	U	207-08-9	Benzo(k)fluoranthene	330	U

U - Compound analyzed for but not detected.
B - Compound was detected in QC blank.
J - Reported value less than quantitation limit.

Form I

ORGANICS ANALYSIS DATA SHEET

Laboratory Name:	CH2M HILL/MGM	Concentration:	LOW	Date Extracted:	04/02/92
Lab Sample ID:	S04022B2	Sample Matrix:	SOIL	Date Analyzed:	04/03/92
Client Sample ID:	SBLKS	Percent Moisture:	0.0	Dilution Factor:	1.0

PHENOL COMPOUNDS

CAS Number		ug/Kg		CAS Number	ug/Kg
108-95-2	Phenol	330	U		
95-57-8	2-Chlorophenol	330	U		
95-48-7	2-Methylphenol	330	U		
106-44-5	4-Methylphenol	330	U		
88-75-5	2-Nitrophenol	330	U		
105-67-9	2,4-Dimethylphenol	330	U		
120-83-2	2,4-Dichlorophenol	330	U		
65-85-0	Benzoic acid	800	U		
59-50-7	4-Chloro-3-Methylphenol .	330	U		
-06-2	2,4,6-Trichlorophenol . .	330	U		
95-95-4	2,4,5-Trichlorophenol . .	800	U		
51-28-5	2,4-Dinitrophenol	800	U		
100-02-7	4-Nitrophenol	800	U		
534-52-1	4,6-Dinitro-2-Methylphenol	800	U		
87-86-5	Pentachlorophenol	800	U		

U - Compound analyzed for but not detected.
B - Compound was detected in QC blank.
J - Reported value less than quantitation limit.

Form I

Msc

8A

VOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: CH2M HILL/MGM Contract: _____

Lab Code: _____ Case No.: 21281 SAS No.: _____ SDG No.: _____

Lab File ID (Standard): CSVO021292 Date Analyzed: 04/02/92

Instrument ID: 4500 Time Analyzed: 1328

GC Column: CAP ID: 0.530(mm) Heated Purge: (Y/N) Y

		IS1(BCM) AREA #	RT #	IS2(DFB) AREA #	RT #	IS3(CBZ) AREA #	RT #
	12 HOUR STD	45788	12.14	181209	13.60	160921	18.47
	UPPER LIMIT	91576	12.64	362418	14.10	321842	18.97
	LOWER LIMIT	22894	11.64	90604	13.10	80460	17.97
	EPA SAMPLE NO.						
01	SB-06-01	36222	12.09	136531	13.57	117532	18.45
02	SB-06-01_MS	37805	12.02	139195	13.52	111483	18.44
03	SB-06-01_MSD	40558	12.02	146860	13.54	117383	18.44
04	VBLKS	42901	12.07	170417	13.54	150211	18.44

IS1 (BCM) = Bromochloromethane
IS2 (DFB) = 1,4-Difluorobenzene
IS3 (CBZ) = Chlorobenzene-d5

AREA UPPER LIMIT = + 100% of internal standard area.
AREA LOWER LIMIT = - 50% of internal standard area.
RT UPPER LIMIT = +0.50 minutes of internal standard RT.
RT LOWER LIMIT = -0.50 minutes of internal standard RT.

Column used to flag values outside QC limits with an asterisk.
* Values outside of QC limits.

8B

SEMIVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: CH2M HILL/MGM Contract: _____

L-' Code: _____ Case No.: 21281 SAS No.: _____ SDG No.: _____

Lab File ID (Standard): DSPA010381 Date Analyzed: 04/03/92

Instrument ID: 5100D Time Analyzed: 0740

		IS1(DCB) AREA #	RT #	IS2(NPT) AREA #	RT #	IS3(ANT) AREA #	RT #
	12 HOUR STD	10239	9.69	41966	12.52	31814	16.75
	UPPER LIMIT	20478	10.19	83932	13.02	63628	17.25
	LOWER LIMIT	5120	9.19	20983	12.02	15907	16.25
	EPA SAMPLE NO.						
01	SB-06-01	9796	9.67	40299	12.52	30106	16.75
02	SB-06-01_MS	11905	9.64	47434	12.50	34543	16.77
03	SB-06-01_MSD	11676	9.70	48562	12.52	35789	16.75
04	SBLKS	8316	9.60	33652	12.49	25894	16.75

IS1 (DCB) = 1,4-Dichlorobenzene-d4
IS2 (NPT) = Naphthalene-d8
S3 (ANT) = Acenaphthene-d10

AREA UPPER LIMIT = + 100% of internal standard area.
AREA LOWER LIMIT = - 50% of internal standard area.
RT UPPER LIMIT = +0.50 minutes of internal standard RT.
RT LOWER LIMIT = -0.50 minutes of internal standard RT.

Column used to flag internal standard area values with an asterisk.
* Values outside of QC limits.

8C

SEMIVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: CH2M HILL/MGM Contract: _____

Lab Code: _____ Case No.: 21281 SAS No.: _____ SDG No.: _____

Lab File ID (Standard): DSPA010381 Date Analyzed: 04/03/92

Instrument ID: 5100D Time Analyzed: 0740

		IS4(PHN) AREA #	RT #	IS5(CRY) AREA #	RT #	IS6(PRY) AREA #	RT #
	12 HOUR STD	53575	20.37	57198	27.09	60045	30.49
	UPPER LIMIT	107150	20.87	114396	27.59	120090	30.99
	LOWER LIMIT	26788	19.87	28599	26.59	30022	29.99
	EPA SAMPLE NO.						
01	SB-06-01	55680	20.39	66253	27.11	75221	30.49
02	SB-06-01_MS	62743	20.39	70146	27.12	78275	30.52
03	SB-06-01_MSD	65486	20.37	72561	27.11	83868	30.49
04	SBLKS	49660	20.39	52760	27.12	60930	30.51

IS4 (PHN) = Phenanthrene-d10
IS5 (CRY) = Chrysene-d12
IS6 (PRY) = Perylene-d12

AREA UPPER LIMIT = + 100% of internal standard area.
AREA LOWER LIMIT = - 50% of internal standard area.
RT UPPER LIMIT = +0.50 minutes of internal standard RT.
RT LOWER LIMIT = -0.50 minutes of internal standard RT.

Column used to flag internal standard area values with an asterisk.
* Values outside of QC limits.

SAMPLE DATA PACKAGE

SAMPLE DATA PACKAGE

CASE NARRATIVE

Engineers
Planners
Economists
Scientists

CASE NARRATIVE FOR VOLATILE MASS SPECTROMETRY SAMPLES

LABORATORY: CH2M HILL LABORATORIES CLIENT: BARR ENGINEERING

CASE NO. : N/A CONTRACT NO.: N/A

LAB NO. : 21281 SDG NO.: N/A

I. RECEIPT

A. DATE: March 25, 1992

B. SAMPLE INFORMATION

LAB ID	CLIENT ID	SAMPLE MATRIX	DATE SAMPLED	EXTRACTION DATE	ANALYSIS DATE
21281001	SB-06-01	SOIL	03/24/92	NA	04/02/92
21281M01	SB-06-01_MS	SOIL	03/24/92	NA	04/02/92
21281D01	SB-06-01_MSD	SOIL	03/24/92	NA	04/02/92
Y04022B1	VBLKS	SOIL	NA	NA	04/02/92

C. Documentation
Exceptions : No exceptions were encountered.

CH2M HILL Quality Analytical Laboratories 2567 Fairlane Drive, P O Box 230548, Montgomery, Alabama 36116 205 271 1444

II. EXTRACTION

A. Holding Times: Medium level protocol was not performed; therefore, extraction time is not applicable.

B. Extraction Exceptions : Not applicable.

III. ANALYSIS

A. Holding times: All holding times were met.

B. Analytical Exceptions : No exceptions were encountered.

IV. QUALITY CONTROL

A. Method Blank : All associated method blanks met acceptable QC criteria.

B. Surrogate Recoveries : All samples met acceptable QC limits.

C. Matrix Spike Results : Please note that the percent recoveries and relative percent differences for Toluene and Benzene in samples 21281M01 (SB-06-01_MS) and 21281D01 SB-06-01_MSD) were outside QC limits. This may possibly be due to the high level of Toluene and Benzene present in the native sample. Since these limits are advisory only, the laboratory took no further action.

All other spike recoveries were within CLP advisory limits.

Please note that Forms II, IV, V, and VIII have numbers to the immediate left of each table. These numbers are sequential only and have no relation to CH2M HILL identification numbers.

I 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 contained in this hardcopy data package and in the computer-readable data submitted on floppy diskette has been authorized by the Laboratory Manager or his designee, as verified by the following signature.

Herb Kelly 4/20/93
Herb Kelly Date
Manager, Organic Division

Engineers
Planners
Economists
Scientists

CASE NARRATIVE FOR PNA/PHENOL MASS SPECTROMETRY SAMPLES

LABORATORY: CH2M HILL LABORATORIES CLIENT: BARR ENGINEERING

CASE NO. : N/A CONTRACT NO.: N/A

LAB NO. : 21281 SDG NO.: N/A

I. RECEIPT

A. DATE: March 25, 1992

B. SAMPLE INFORMATION

LAB ID	CLIENT ID	SAMPLE MATRIX	DATE SAMPLED	EXTRACTION DATE	ANALYSIS DATE
21281001	SB-06-01	SOIL	03/24/92	04/02/92	04/03/92
21281M01	SB-06-01_MS	SOIL	03/24/92	04/02/92	04/03/92
21281D01	SB-06-01_MSD	SOIL	03/24/92	04/02/92	04/03/92
S04022B2	SBLKS	SOIL	NA	04/02/92	04/03/92

C. Documentation Exceptions : Tentatively Identified Compounds (TIC) were not requested as part of this analysis. Therefore, the TIC forms and raw data will not be included in this package.

As you have requested, Benzo(b)fluoranthene and Benzo(k)fluoranthene will be reported separately. Due to the low concentrations analyzed for, there may be instances where the native matrix offers chromatographic interferences in this region of the chromatogram, making it difficult to correctly quantitate these isomers as separate compounds. In that case, Benzo(b)fluoranthene and Benzo(k)fluoranthene will be reported as total Benzo(b&k)fluoranthene. An "NR" (not reported) qualifier will then be used for the compounds for which are not reported.

Please note that the amount listed on the quantitation report reflects the mass detected at the instrument. According to the CLP Statement of Work, 2-uL injections must be made. Therefore, the amount on the quantitation report must be divided by a factor of two in order to determine the concentration of the extract injected.

No other exceptions were encountered.

CH2M HILL Quality Analytical Laboratories 2567 Fairlane Drive P.O. Box 230548 Montgomery, Alabama 36116 205 271 1444

II. EXTRACTION

A. Holding Times: All holding times were met.

B. Extraction Exceptions : No exceptions were encountered.

III. ANALYSIS

A. Holding times: All holding times were met.

B. Analytical Exceptions : No exceptions were encountered.

IV. QUALITY CONTROL

A. Method Blank : All associated method blanks met acceptable QC criteria.

B. Surrogate Recoveries : Samples 21281001 (SB-06-01), 21281M01 (SB-06-01_MS), and 21281D01 (SB-06-01_MSD) required a large dilution for analysis. Therefore, surrogate recoveries could not be determined for these samples.

All other samples met acceptable QC limits. According to CLP protocol, one surrogate per fraction may be outside of QC limits as long as the recovery is ten percent or greater.

C. Matrix Spike Results : Please note that the percent recovery and relative percent difference for Phenol in samples 21281M01 and 21281D01 were outside QC limits. This may possibly be due to the high level of phenol present in the native sample. Also, the relative percent difference for Naphthalene in samples 21281M01 and 21281D01 was outside QC limits. This may possibly be due to the high level of Naphthalene present in the native sample. Since these limits are advisory only, the laboratory took no further action.

Please note that Forms II, IV, V, and VIII have numbers to the immediate left of each table. These numbers are sequential only and have no relation to CH2M HILL identification numbers.

I 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 contained in this hardcopy data package and in the computer-readable data submitted on floppy diskette has been authorized by the Laboratory Manager or his designee, as verified by the following signature.

Herb Kelly 4/20/92

Herb Kelly Date
Manager, Organic Division

SAMPLE DATA PACKAGE

SHIPPING RECEIPTS

BARR ENGINEERING CO.
7803 ENROY ROAD
MINNEAPOLIS, MN 55439

PROJECT NUMBER No. 01261
13/49-003JSL31
NO: WAUKEGAN COKE PLANT RI

JIM LANGS JH
PROJECT CONTACT: MARY MACKEY
LABORATORY: CH2M HILL
REMARKS/ ANALYSIS REQUIRED:

SAMPLE IDENTIFICATION	COLLECTION DATE	COLLECTION TIME	GRAB	COMP.	BLANK	VOLATILE ORGANIC CLP TCL	SEMIVOLATILE ORGANIC	~~FILTERED~~ METALS CLP TAL	UNFILTERED METALS	GENERAL	CYANIDE	NUTRIENTS	OIL AND GREASE	TOC	SULFIDE	DIOXIN	EXTRACTABLES CLP TCL	PESTICIDES/PCB CLP TCL	PAH'S	PAH/PHENOLS							TOTAL NO. OF CONTAINERS
SB-06-01	3.24.92	AM	X			X														X							3

21281
MG33486.XY
SH 3/27

SAMPLED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY LAB:	DATE	TIME
(Trow) Tally Wright Wells	(Trow) Tally Wright Wells	3/24	PM	[signature]	3/25/92	1000
RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY LAB:	DATE	TIME
RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY LAB:	DATE	TIME

REMARKS:

SAMPLES SHIPPED VIA
☐ AIR FREIGHT ☒ FED. EXP. ☐ SAMPLER
☐ OTHER

AIR BILL NUMBER: 0524326611

DISTRIBUTION: WHITE-ORIGINAL ACCOMPANIES SHIPMENT TO LAB, RETURNS TO BARR WITH RESULTS; YELLOW-LAB COPY; PINK-LAB COORDINATOR; GOLD-FIELD COPY

000031

Laboratory No. 21297

-- Volatiles

-- Semivolatiles

-- Pesticides/PCBS

-- Metals

Four investigative soil samples (BS06, BS06 duplicate, BS07 and BS08) were collected March 25, 1992 and analyzed for volatiles, semivolatiles, pesticides/PCBS and metals. The results of these analyses were reported in this case and qualified as described in the following sections.

Holding Times

Holding times were met on all samples and analyses using the EPA holding time criteria for water samples.

Instrument Tuning

Volatiles

GC/MS Tuning met the established method performance criteria for compounds, concentrations, frequencies and relative ion abundances for the volatiles analyses.

Semivolatiles

GC/MS Tuning met the established method performance criteria for compounds, concentrations, frequencies and relative ion abundances for the semivolatiles analyses.

Pesticides

Instrument performance was acceptable for retention times, retention time windows, and DDT and Endrin degradation for all samples.

Metals

Instrument tuning does not apply to the metals analyses.

Instrument Calibration

Volatiles

Initial calibration percent relative standard deviation (%RSD) values were within the appropriate control limits. Continuing calibration percent difference (%D) value for bromomethane (35.0 percent) was not within the appropriate control limits. This compound was not detected in the associated samples, so no action was taken.

Semivolatiles

Initial calibration %RSD value for 1,2-dichlorobenzene-d4 (36.4) was outside of control limits. The continuing calibration %D value for 4-nitrophenol (27.1 percent) was beyond acceptable quality control limits. Neither compound was detected in the associated samples, so no data were qualified.

Pesticides

Pesticide/PCB analyses instrument calibration %RSD and continuing calibration %D values were within the appropriate quality control limits. The resolution check mixture and performance evaluation mixture samples were analyzed at the proper frequency. All retention time and RPD values were within the appropriate quality control limits.

Metals

Instrument calibrations were completed the proper number of times using the appropriate number and type of standards and blanks. Initial and continuing calibration percent recovery values were acceptable for all metals analyses.

Blanks

Volatiles

Methylene chloride (7 J µg/kg) and Acetone (6 J µg/kg) were detected in the volatiles blank. Sample results less than ten times the blank concentration of either compound were qualified as nondetects and flagged "U."

Semivolatiles

The semivolatiles method blank had concentrations of di-n-butylphthalate (62 J µg/kg). Sample results less than ten times the blank concentration of this compound were qualified as nondetects and flagged "U."

Pesticides

No compounds were detected in the Pesticide/PCB method blank.

Metals

Total metals analyses calibration and preparation blanks had concentrations of antimony, barium, beryllium, calcium, copper, iron, lead, manganese, nickel, potassium, selenium, silver, sodium, thallium, vanadium, and zinc. These concentrations were greater than the instrument detection limit (IDL) but less than the contract required detection limit (CRDL). Sample results for these compounds less than five times the blank concentration were qualified as nondetects and flagged "U."

Surrogate Recovery

Volatiles

The volatiles system monitoring compounds recoveries were within the quality control limits for all samples.

Semivolatiles

Surrogate recoveries were within the control limits for all semivolatiles analyses samples.

Pesticides

Both Pesticide/PCB surrogates had recoveries outside the control limits for the method blank sample. Results for all compounds on the method blank sample were qualified as estimated and flagged "J."

Metals

Total metals analyses ICP interference check sample recoveries and laboratory control sample results were within the established quality control limits.

Matrix Spike/Matrix Spike Duplicate

Volatiles

The matrix spike/matrix spike duplicate samples recovery value for benzene (161 percent) was beyond control limits. The spike compounds with RPD values outside control limits were benzene (73 percent) and toluene (46 percent). Since the benzene recovery was high, it was not detected above the IDL in the associated samples, and all other spike compounds met the performance criteria, no data were qualified.

Semivolatiles

Semivolatile analyses matrix spike/matrix spike duplicate samples recoveries for phenol (-35 percent and -111 percent) were beyond quality control limits. The RPD value for phenol (104 percent) was also outside acceptable quality control limits. Results for phenol in the investigative samples were qualified as estimated and flagged "J."

Pesticides

Pesticide/PCB matrix spike/matrix spike duplicate samples had outlier recovery and RPD values for Aldrin (29%R, 64%RPD). Since all other recoveries and RPD values met performance criteria, and Aldrin recoveries on the Matrix Spike sample were acceptable, no action was taken.

Metals

Metals analyses quality control samples included a duplicate sample, a spike sample, post digestion spike samples and an ICP serial dilution sample.

Duplicate samples RPD values for antimony (200 percent), arsenic (123.8 percent), beryllium (43.6 percent), mercury (59.0 percent), lead (31.6 percent), sodium (58.3 percent), zinc (47.4 percent) and cyanide (23.3 percent) were beyond control limits. Sample results for these outlier compounds were qualified as estimated and flagged "J."

The spike sample had recoveries beyond control limits (75-125 percent) for arsenic (159.8 percent), copper (125.8 percent) and lead (423.7 percent). Recoveries for copper were out by less than 1 percent, so no sample results were flagged. Sample results less than the IDL for arsenic or lead are acceptable for use. Results for these two compounds greater than the IDL were qualified as estimated and flagged "J."

Spike sample recoveries for Cyanide (-3.1 percent) were also outside the quality control limits. Results for cyanide in samples BS07 and BS08 were less than the IDL, were qualified as unusable, and were flagged "R." Positive results for cyanide were qualified as estimated and flagged "J."

The post digestion spike recoveries for Lead in samples BS06 (3.6 percent) and BS08 (3.9 percent) were outside the 85-115 percent control limits. Lead results greater than the IDL in the two affected samples were qualified as estimated and flagged "J."

ICP serial dilution results for barium (40.1 percent) and zinc (23.9 percent) were not within the 10 percent difference control limit. Results for these two compounds in the associated samples were qualified as estimated and flagged "J."

Field Duplicates

Field duplicate samples are summarized in Tables 2.3-6 through 2.3-11.

Overall Assessment

All data is considered acceptable with the recommended qualifiers except the "R" qualified cyanide results in samples BS07 and BS08. These data are not usable.

Engineers
Planners
CH2M HILL Economists
Scientists

May 13, 1992

LMG33486.XY

MAY 18 92

Ms. Marti Harding-Smith
Barr Engineering Company
8300 Norman Center Drive
Suite 300
Minneapolis, Minnesota 55437-1026

RE: Analytical Data for 13/49-003JSL31, LMG Laboratory No. 21297

Dear Ms. Harding-Smith:

On March 26, 1992, the CH2M HILL Montgomery Laboratory received four samples with a request for analysis of selected inorganic parameters.

The analytical results and associated quality control data are enclosed. Any unusual difficulties encountered during the analysis of your samples are discussed in the case narratives.

Under CH2M HILL policy, your samples will be stored for up to 30 days after reporting. If you have not given us prior instructions for disposal, we will contact you if any samples require disposal as hazardous waste.

CH2M HILL Laboratories appreciate your business and look forward to serving your analytical needs again. If you should have any questions concerning the data, or if you need additional information, please call.

Sincerely,

Wanda L. Hall

Wanda L. Hall
Data Package Supervisor

Enclosures

cc: Mr. Jim Langseth

Engineers
Planners
CH2M HILL
Economists
Scientists

TABLE OF CONTENTS

CH2M HILL Laboratory No. 21297

	Page No.
List of Inorganic EPA-defined Qualifiers	i
Sample Cross-Reference	ii
CATIONS DATA PACKAGE	1
Case Narrative	2-3
Cover Page	4
Analytical Results of Field Samples	
BS-06 (LMG #21297001)	5
BS-07 (LMG #21297002)	6
BS-08 (LMG #21297003)	7
M-08 (LMG #21297004)	8
Quality Control Data	
Initial & Continuing Calibration Verification	9-16
CRDL Standard for AA	17-18
Blank Data	19-23
ICP Interference Check Sample	24
Spike Sample Recovery	25
Post Digest Spike Sample Data	26-32
Duplicate Sample Data	33
Laboratory Control Sample	34
ICP Serial Dilution	35
Instrument Detection Limits	36-38
ICP Interelement Correction Factors	39-42
ICP Linear Ranges	43
Preparation Log	44-47
Analysis Run Log	48-83
Raw Data	
ICP Data	94-156
Arsenic Data (GFAA)	157-268
Lead Data (GFAA)	269-359
Selenium Data (GFAA)	360-467
Thallium Data (GFAA)	468-504
Mercury Data	505-507
Cyanide Data	508-519
Digestion/Distillation Logs	520-525
Percent Solids	526-527
Copy of Chain-of-custody	528-529

EPA QUALIFIERS

INORGANIC ANALYSES

- C (Concentration) Qualifier -- Enter "B" if the reported value obtained was less than the CRDL but greater than or equal to the IDL. Enter "U" if the value was less than the IDL or was not detected.

- Q Qualifier -- Entries and their meanings are:

  E - The reported value is estimated because of interference. An explanatory comment must be included under "Comments" on the Cover Page if the problem applies to all samples in this data package or on the individual FORM I if it is an isolated problem.

  M - Duplicate injection precision was not met (two analyses of the same sample did not agree).

  N - Spiked sample recovery not within control limits.

  S - The reported value was determined by the Method of Standard Additions (MSA).

  W - Post-digestion spike for Furnace AA analysis is out of control limits (85-115%), while sample absorbance is less than 50% of spike absorbance.

  * - Duplicate analysis not within control limits.

  + - Correlation coefficient for the MSA is less than 0.995.

  Entering "S", "W", or "+" is mutually exclusive. No combination of these qualifiers can appear in the same field.

- M (Method) Qualifier -- Enter one of the following:

  P - ICP
  A - Flame AA
  F - Furnace AA
  CV - Manual Cold Vapor AA
  AV - Automated Cold Vapor AA
  AS - Semi-Automated Spectrophotometric
  C - Manual Spectrophotometric
  T - Titrimetric
  NR - Analyte was not required by your lab

CH2M HILL Quality Analytical Laboratories 2567 Fairlane Drive, P.O. Box 230548, Montgomery, Alabama 36116 205 271 1444

Engineers
Planners
CH2M HILL
Economists
Scientists

CLIENT SAMPLE CROSS-REFERENCE

CH2M HILL Laboratory No. 21297

LMG Sample No.	Client ID
21297001	BS-06
21297002	BS-07
21297003	BS-08
21297004	M-08

CH2M HILL
Quality Analytical Laboratories
2567 Fairlane Drive, P.O. Box 230548, Montgomery, Alabama 36116
205 271 1444

CATIONS DATA PACKAGE

Engineers
Planners
Economists
Scientists

CASE NARRATIVE
Cations

Batch Number: 21297

Client/Project: BARR ENGINEERING COMPANY

I. Holding Time:
All holding times were met.

II. Analysis:

A. Blanks:
All acceptance criteria were met.

B. Calibration:
All acceptance criteria were met.

C. ICP Interference Check Sample:
All acceptance criteria were met.

D. Spike Sample Analysis:
Prespike and postspike recoveries outside criteria are flagged accordingly.

E. Duplicate Sample Analysis:
Duplicate precision outside criteria are flagged accordingly.

F. Laboratory Control Sample Analysis:
All acceptance criteria were met.

G. ICP Serial Dilution:
ICP serial dilutions outside criteria are flagged accordingly.

H. Other:
The QC for mercury is included in the 21232 data package.

III. I certify that this data package is in compliance with the terms and conditions agreed to by the client and CH2M HILL, both technically and for completeness, for other than the conditions detailed above.

SIGNED: DATE: 13 MAY 92
Kevin A. Sanders
Inorganic Division Manager

CH2M HILL
Quality Analytical Laboratories
2567 Fairlane Drive, P.O. Box 230548, Montgomery, Alabama 36116
205 271 1444

Engineers
Planners
CH2M HILL Economists
Scientists

CASE NARRATIVE
General Chemistry

Batch Number: 21297

Client/Project: BARR ENGINEERING COMPANY

I. Holding Time: All criteria were met.

II. Analysis:

A.	Calibration:	Acceptance criteria met.
B.	Blanks:	Acceptance criteria met.
C.	Matrix Spike:	Prespike recoveries outside criteria are flagged accordingly.
D.	Duplicate Analysis:	Duplicate precision outside criteria are flagged accordingly.
E.	Lab Control Sample:	Acceptance criteria met.
F.	Other:	The QC for cyanide is included in the 21232 data package.

III. I certify that this data package is in compliance with the terms and conditions agreed to by the client and CH2M HILL, both technically and for completeness, for other than the conditions detailed above.

SIGNED: _____ DATE: 13 MAY 92
Kevin A. Sanders
Inorganic Division Manager

CH2M HILL
Quality Analytical Laboratories
2567 Fairlane Drive, P O Box 230548, Montgomery, Alabama 36116
205 271 1444

U.S. EPA - CLP

COVER PAGE - INORGANIC ANALYSES DATA PACKAGE

Lab Name: CH2M_HILL_MGM_____ Contract: 21297_____

Lab Code: NA____ Case No.: 21297 SAS No.: 21297_ SDG No.:21297_

SOW No.: 3/90_

EPA Sample No.	Lab Sample ID
_BS-06_____	__S21297001___
_BS-06D_____	__S21297001D__
_BS-06S_____	__S21297001S__
_BS-07_____	__S21297002___
_BS-08_____	__S21297003___
_M-08_____	__S21297004___

Were ICP interelement corrections applied ? Yes/No YES

Were ICP background corrections applied ? Yes/No YES
If yes - were raw data generated before application of background corrections ? Yes/No NO_

Comments:
____QC_FOR_MERCURY_AND_CYANIDE_IS_INCLUDED_IN_DATA_PACKAGE_21232._____

I 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 contained in this hardcopy data package and in the computer-readable data submitted on floppy diskette has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature.

Signature: _____ Name: Kevin A. Sanders_____

Date: 24 APR 92 Title: Inorganic Division Mgr__

U.S. EPA - CLP

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

BS-06

Lab Name: CH2M_HILL_MGM Contract: 21297

Lab Code: NA Case No.: 21297 SAS No.: 21297 SDG No.: 21297

Matrix (soil/water): SOIL Lab Sample ID: S21297001

Level (low/med): LOW Date Received: 03/26/92

% Solids: 93.9

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	1670			P
7440-36-0	Antimony	2.9	B		P
7440-38-2	Arsenic	1.7	B	N*	F
7440-39-3	Barium	8.8	B	E	P
7440-41-7	Beryllium	0.20	B		P
7440-43-9	Cadmium	0.62	U		P
7440-70-2	Calcium	27800			P
7440-47-3	Chromium	5.3			P
7440-48-4	Cobalt	2.9	B		P
7440-50-8	Copper	8.3		N	P
7439-89-6	Iron	5380			P
7439-92-1	Lead	3.5		N*	F
7439-95-4	Magnesium	14600			P
7439-96-5	Manganese	194			P
7439-97-6	Mercury	0.07	U		CV
7440-02-0	Nickel	5.3	B		P
7440-09-7	Potassium	151	U		P
7782-49-2	Selenium	0.27	U		F
7440-22-4	Silver	0.37	U		P
7440-23-5	Sodium	204	B		P
7440-28-0	Thallium	0.35	U		F
7440-62-2	Vanadium	14.9			P
7440-66-6	Zinc	21.2		E*	P
	Cyanide	0.79	B		CA

Color Before: BROWN Clarity Before: N/A Texture: N/A

Color After: CLEAR Clarity After: CLEAR Artifacts: YES

Comments:
ARTIFACTS CONSIST OF ROCKS.THE "N" QUALIFIER INDICATES POOR PRESPIKE RECOVERY. THE "*" QUALIFIER DENOTES POOR DUPLICATE PERCISION. THE "E" REFLECTS A GREATER THAN 10% DIFFERENCE BETWEEN THE NATIVE CONCENTRATION AND THE SERIAL DILUTION RESULTS.

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

BS-07

Lab Name: CH2M_HILL_MGM Contract: 21297

Lab Code: NA Case No.: 21297 SAS No.: 21297 SDG No.: 21297

Matrix (soil/water): SOIL Lab Sample ID: S21297002

Level (low/med): LOW Date Received: 03/26/92

% Solids: 84.1

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	881			P
7440-36-0	Antimony	3.4	B		P
7440-38-2	Arsenic	2.2	B	N*	F
7440-39-3	Barium	5.5	B	E	P
7440-41-7	Beryllium	0.23	B		P
7440-43-9	Cadmium	0.70	U		P
7440-70-2	Calcium	23100			P
7440-47-3	Chromium	14.6			P
7440-48-4	Cobalt	1.6	B		P
7440-50-8	Copper	7.5		N	P
7439-89-6	Iron	2560			P
7439-92-1	Lead	3.6		N	F
7439-95-4	Magnesium	11800			P
7439-96-5	Manganese	103			P
7439-97-6	Mercury	0.08	U		CV
7440-02-0	Nickel	3.9	B		P
7440-09-7	Potassium	169	U		P
7782-49-2	Selenium	0.31	U		F
7440-22-4	Silver	0.41	U		P
7440-23-5	Sodium	229	B		P
7440-28-0	Thallium	0.30	B		F
7440-62-2	Vanadium	4.4	B		P
7440-66-6	Zinc	28.8		E*	P
	Cyanide	0.22	U	N*	CA

Color Before: BROWN Clarity Before: N/A Texture: SAND

Color After: CLEAR Clarity After: CLEAR Artifacts:

Comments:

FORM I - IN

3/90

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

BS-08

Lab Name: CH2M_HILL_MGM Contract: 21297

Lab Code: NA Case No.: 21297 SAS No.: 21297 SDG No.: 21297

Matrix (soil/water): SOIL Lab Sample ID: S21297003

Level (low/med): LOW Date Received: 03/26/92

% Solids: 82.4

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	896			P
7440-36-0	Antimony	2.6	U		P
7440-38-2	Arsenic	2.8		N*	F
7440-39-3	Barium	6.6	B	E	P
7440-41-7	Beryllium	0.16	B		P
7440-43-9	Cadmium	0.71	U		P
7440-70-2	Calcium	24800			P
7440-47-3	Chromium	5.7			P
7440-48-4	Cobalt	2.2	B		P
7440-50-8	Copper	6.5		N	P
7439-89-6	Iron	2820			P
7439-92-1	Lead	4.8		N	F
7439-95-4	Magnesium	12900			P
7439-96-5	Manganese	133			P
7439-97-6	Mercury	0.08	U		CV
7440-02-0	Nickel	2.6	B		P
7440-09-7	Potassium	172	U		P
7782-49-2	Selenium	0.31	U	W	F
7440-22-4	Silver	0.42	U		P
7440-23-5	Sodium	288	B		P
7440-28-0	Thallium	0.40	U		F
7440-62-2	Vanadium	4.9	B		P
7440-66-6	Zinc	30.8		E*	P
	Cyanide	0.22	U	N*	CA

Color Before: BROWN Clarity Before: N/A Texture: SAND

Color After: CLEAR Clarity After: CLEAR Artifacts:

Comments:
THE "W" QUALIFIER INDICATES POOR POSTSPIKE RECOVERY.

FORM I - IN

3/90

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

M-08

Lab Name: CH2M_HILL_MGM Contract: 21297

Lab Code: NA Case No.: 21297 SAS No.: 21297 SDG No.: 21297

Matrix (soil/water): SOIL Lab Sample ID: S21297004

Level (low/med): LOW Date Received: 03/26/92

% Solids: 94.0

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	3550			P
7440-36-0	Antimony	2.3	U		P
7440-38-2	Arsenic	1.7	B	N*	F
7440-39-3	Barium	12.2	B	E	P
7440-41-7	Beryllium	0.29	B		P
7440-43-9	Cadmium	0.62	U		P
7440-70-2	Calcium	27300			P
7440-47-3	Chromium	8.5			P
7440-48-4	Cobalt	5.8	B		P
7440-50-8	Copper	24.3		N	P
7439-89-6	Iron	10100			P
7439-92-1	Lead	3.1		N*	F
7439-95-4	Magnesium	16000			P
7439-96-5	Manganese	249			P
7439-97-6	Mercury	0.08	U		CV
7440-02-0	Nickel	12.8			P
7440-09-7	Potassium	365	B		P
7782-49-2	Selenium	0.27	U		F
7440-22-4	Silver	0.37	U		P
7440-23-5	Sodium	326	B		P
7440-28-0	Thallium	0.35	U		F
7440-62-2	Vanadium	32.9			P
7440-66-6	Zinc	40.8		E*	P
	Cyanide	1.2	B		CA

Color Before: BROWN Clarity Before: N/A Texture: SAND

Color After: CLEAR Clarity After: CLEAR Artifacts:

Comments:

FORM I - IN

3/90

780 LENROY ROAD
MINNEAPOLIS, MN 55439

PROJECT NUMBER № 01876
13/49-003JSL31

NO: WAUKEGAN COKE PLANT RI

Jim LAN ETH

PROJECT CONTACT: MARY MACKEY

LABORATORY: CH2M HILL

SAMPLE IDENTIFICATION	COLLECTION DATE	COLLECTION TIME	GRAB	COMP.	BLANK	VOLATILE ORGANIC CLP TCL	SEMIVOLATILE ORGANIC	METALS CLP TAL	UNFILTERED METALS	GENERAL	CYANIDE	NUTRIENTS	OIL AND GREASE	TOC	SULFIDE	DIOXIN	EXTRACTABLES CLP TCL	PESTICIDES/PCB CLP TCL	PAH's	PAH/PHENOLS							TOTAL NO. OF CONTAINERS	REMARKS/ ANALYSIS REQUIRED:
BS-06	3/25/92	AM	X	X		X		X			X						X	X									4	001
BS-07	↓	↓	X	X		X		X			X						X	X									4	002
BS-08	↓	↓	X	X		X		X			X						X	X									4	003
M-08	↓	↓	X	X		X		X			X						X	X									4	004
Method Blank																												251

FOR LAB USE ONLY
LAB # 21297
PROJ # LMG33486 XII
ACK 3/30 VERIFIED
HAZARDOUS Y (N)
QC LEVEL (I)
COC Yes
ANA REQ Yes
CUST SEAL Yes
SAMPLE COND. Good
ICE Yes
TEMP 3°
PH NA

SAMPLED BY:	RELINQUISHED BY	DATE	TIME	RECEIVED BY LAB:	DATE	TIME
(JMF)	(JMF)	3/25/92	PM			
RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY LAB:	DATE	TIME
RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY LAB:	DATE	TIME
					3/26/92	090

REMARKS:

SAMPLES SHIPPED VIA
☐ AIR FREIGHT ☒ FED. EXP. ☐ SAMPLER
☐ OTHER

AIR BILL NUMBER: 052436600

DISTRIBUTION: WHITE-ORIGINAL ACCOMPANIES SHIPMENT TO LAB, RETURNS TO BARR WITH RESULTS; YELLOW-LAB COPY; PINK-LAB COORDINATOR; GOLD-FIELD COPY

000529

Engineers
Planners
CH2M HILL Economists
Scientists

RECEIVED

MAY 18 92

May 15, 1992

LMG33486.XY

Ms. Marti Harding-Smith
Barr Engineering Company
8300 Norman Center Drive
Suite 300
Minneapolis, Minnesota 55437-1026

RE: Analytical Data for 13/49-003JSL13, LMG Laboratory No. 21297

Dear Ms. Harding-Smith:

On March 26, 1992, the CH2M HILL Montgomery Laboratory received four samples with a request for analysis of selected organic parameters.

The analytical results and associated quality control data are enclosed. Any unusual difficulties encountered during the analysis of your samples are discussed in the case narratives.

Under CH2M HILL policy, your samples will be stored for up to 30 days after reporting. If you have not given us prior instructions for disposal, we will contact you if any samples require disposal as hazardous waste.

CH2M HILL Laboratories appreciate your business and look forward to serving your analytical needs again. If you should have any questions concerning the data, or if you need additional information, please call.

Sincerely,

Wanda L. Hall

Wanda L. Hall
Data Package Supervisor

Enclosures

cc: Mr. Jim Langseth

Engineers
Planners
Economists
Scientists

TABLE OF CONTENTS

CH2M HILL Laboratory No. 21297

	Page No.
List of Organic EPA-defined Qualifiers	i
List of Sample ID Qualifiers	ii
Sample Cross-Reference	iii
List of Internal Standards and Surrogates (Volatiles)	iv
List of Internal Standards and Surrogates (Semivolatiles)	v
SAMPLE DATA SUMMARY PACKAGE	1-52
SAMPLE DATA PACKAGE	53
Case Narratives	54-60
Shipping Receipts	61-62
Volatile Data	63
QC Summary	64-69
Sample Data (Analytical Results of Field Samples)	70
BS-06 (LMG #21297001)	71-86
BS-07 (LMG #21297002)	87-103
BS-08 (LMG #21297003)	104-117
M-08 (LMG #21297004)	118-129
Standards Data	130
Initial Calibration Data	131-157
Continuing Calibration Data	158-164
Raw QC Data	165
BFB Data	166-174
Blank Data	175-185
Semivolatile Data	186
QC Summary	187-196
Sample Data (Analytical Results of Field Samples)	197
BS-06 (LMG #21297001)	198-225
BS-07 (LMG #21297002)	226-259
BS-08 (LMG #21297003)	260-291
M-08 (LMG #21297004)	292-309
Standards Data	310
Initial Calibration Data	311-353
Continuing Calibration Data	354-374
GPC Calibration	375-376
Raw QC Data	377
DFTPP Data	378-390
Blank Data	391-411

CH2M HILL Quality Analytical Laboratories 2567 Fairlane Drive, P.O. Box 230548, Montgomery, Alabama 36116 205.271.1444

Engineers
Planners
CH2M HILL
Economists
Scientists

TABLE OF CONTENTS (cont.)

CH2M HILL Laboratory No. 21297

		Page No.
Pesticide/PCB Data		412
QC Summary		413-415
Sample Data (Analytical Results of Field Samples)		416
BS-06	(LMG #21297001)	417-421
BS-06DL	(LMG #21297001DL)	422-426
BS-07	(LMG #21297002)	427-433
BS-07DL	(LMG #21297002DL)	434-439
BS-08	(LMG #21297003)	440-446
BS-08DL	(LMG #21297003DL)	447-453
M-08	(LMG #21297004)	454-458
M-08DL	(LMG #21297004DL)	459-463
Standards Data		464
Standard Summary Forms		465-487
Pesticide/PCB Identification		488-495
Raw Data (Primary Column)		496-534
Raw Data (Confirmation Column)		535-575
GPC/Florisil Calibration		576-591
Raw QC Data		592
Blank Data		593-608

CH2M HILL
Quality Analytical Laboratories
2567 Fairlane Drive, P.O. Box 230548, Montgomery, Alabama 36116
205 271 1444

Engineers
Planners
CH2M HILL Economists
Scientists

EPA - DEFINED QUALIFIERS

ORGANICS

Definitions for the EPA-defined qualifiers:

U -- Indicates the compound was analyzed for but not detected. The number adjacent to the "U" qualifier indicates the quantitation limit for that compound. The detection limit can vary from sample to sample depending on dilution factors or percent moisture adjustment when indicated.

J -- Indicates an estimated value. This flag is used when the mass spectral data indicates the presence of a compound below the stated quantitation limit. The "J" qualifier is not used with pesticide results.

C -- This flag applies to pesticide results only. The "C" flag indicates the presence of this compound has been confirmed by GC/MS analysis.

B -- This flag is used when the analyte is found in the associated blank as well as the sample. This notation indicates possible blank contamination and suggests the data user evaluate these compounds and their amounts carefully.

E -- This flag applies to GC/MS only. The "E" qualifier indicates a compound may be above or below the linear range of the instrument. If the particular compound level is deemed above the linear calibration range, then the sample should be reanalyzed at an appropriate dilution. Therefore, the "E" qualified amount is an estimated concentration. The results for the dilution will be reported on a separate Form I and will be flagged with a "D" if the dilution brings the concentration within proper calibration.

D -- This flag identifies compounds which have been run at a dilution to bring the concentration of that compound within the linear range of the instrument. "D" qualifiers are only used for samples that have been run initially with results above acceptable ranges. For secondary dilutions the "DL" suffix is appended to the sample number on the Form I.

A -- Indicates the Tentatively Identified Compound (TIC) is a suspected aldol-condensation product.

X -- Indicates the compound concentration has been manually modified or the EPA qualifier has been manually modified or added.

JX -- The compound was detected and quantitated below the Contract Required Quantitation Limit.

CH2M HILL Quality Analytical Laboratories 2567 Fairlane Drive, P.O. Box 230548, Montgomery, Alabama 36116 205 271 1444

CLIENT SAMPLE ID QUALIFIERS

LEVEL 3

The qualifiers that GC/MS and GC use with the client sample ID are defined below:

DL -- Dilution Run

R -- Rerun (may be followed by a digit to indicate multiple reruns)

RD -- Diluted Rerun

RX -- Re-extraction Analysis

MS -- Matrix Spike (may be followed by a digit to indicate multiple matrix spikes within a sample set)

MSD -- Matrix Spike Duplicate (may be followed by a digit to indicate multiple matrix spike duplicates within a sample set)

VBLK -- Volatile Blank (will be followed by a "W" for waters, "S" for soils run at a low level, or "SM" for soils run at a medium level -- these letters may be followed by a digit to indicate multiple blanks of that type).

SBLK -- Semivolatile Blank (will be followed by a "W" for waters, "S" for soils run at a low level, or "SM" for soils run at a medium level -- these letters may be followed by a digit to indicate multiple blanks of that type).

PBLK -- Pesticide/PCB Blank (may be followed by digits to indicate multiple blanks)

These qualifiers allow GC/MS and GC to have unique client sample ID's so that the client can get more accurate information from the data reported.

CH2M HILL Quality Analytical Laboratories 2567 Fairlane Drive, P.O. Box 230548, Montgomery, Alabama 36116 205 271 1444

Engineers
Planners
CH2M HILL
Economists
Scientists

CLIENT SAMPLE CROSS-REFERENCE

CH2M HILL Laboratory No. 21297

LMG Sample No.	Client ID
21297001	BS-06
21297002	BS-07
21297003	BS-08
21297004	M-08

CH2M HILL
Quality Analytical Laboratories
2567 Fairlane Drive, P.O. Box 230548, Montgomery, Alabama 36116
205 271 1444

INTERNAL STANDARD AND SURROGATE COMPOUNDS

VOLATILE ANALYSIS

The internal standards on the GC/MS volatile chromatograms are designated as IS1, IS2, and IS3. The surrogate standards are labelled as SS1, SS2, and SS3. The compounds corresponding to these labels are listed below.

LABEL	INTERNAL STANDARD COMPOUND
IS1	BROMOCHLOROMETHANE
IS2	1,4-DIFLUOROBENZENE
IS3	D5-CHLOROBENZENE

LABEL	SURROGATE STANDARD COMPOUND
SS1	D4-1,2-DICHLOROETHANE
SS2	D8-TOLUENE
SS3	1,4-BROMOFLUOROBENZENE

CH2M HILL Quality Analytical Laboratories 2567 Fairlane Drive, P.O. Box 230548 Montgomery, Alabama 36116 205 271 1444

INTERNAL STANDARD AND SURROGATE COMPOUNDS

SEMIVOLATILE ANALYSIS

The internal standards on the GC/MS semivolatile chromatograms are designated as IS1, IS2, IS3, IS4, IS5, and IS6. The surrogate standards are labelled as SS1, SS2, SS3, SS4, SS5, and SS6. The compounds corresponding to these labels are listed below.

LABEL	INTERNAL STANDARD COMPOUND
IS1	D4-1,4-DICHLOROBENZENE
IS2	D8-NAPHTHALENE
IS3	D10-ACENAPHTHENE
IS4	D10-PHENANTHRENE
IS5	D12-CHRYSENE
IS6	D12-PERYLENE

LABEL	SURROGATE STANDARD COMPOUND
SS1	2-FLUOROPHENOL
SS2	D5-PHENOL
SS3	D5-NITROBENZENE
SS4	2-FLUOROBIPHENYL
SS5	2,4,6-TRIBROMOPHENOL
SS6	D14-TERPHENYL

CH2M HILL Quality Analytical Laboratories 2567 Fairlane Drive, P.O. Box 230548, Montgomery, Alabama 36116 205.271 1444

SAMPLE DATA SUMMARY PACKAGE

Engineers
Planners
CH2M HILL
Economists
Scientists

CASE NARRATIVE FOR VOLATILE MASS SPECTROMETRY SAMPLES

LABORATORY: CH2M HILL LABORATORIES CLIENT: BARR ENGINEERING

CASE NO. : N/A CONTRACT NO.: N/A

LAB NO. : 21297 SDG NO.: N/A

I. RECEIPT

A. DATE: March 26, 1992

B. SAMPLE INFORMATION

LAB ID	CLIENT ID	SAMPLE MATRIX	DATE SAMPLED	EXTRACTION DATE	ANALYSIS DATE
21297001	BS-06	SOIL	03/25/92	NA	03/31/92
21297002	BS-07	SOIL	03/25/92	NA	03/31/92
21297003	BS-08	SOIL	03/25/92	NA	03/31/92
21297004	M-08	SOIL	03/25/92	NA	03/31/92
Y03302B3	VBLKS	SOIL	NA	NA	03/30/92

C. Documentation
Exceptions : No exceptions were encountered.

CH2M HILL Quality Analytical Laboratories 2567 Fairlane Drive, P.O. Box 230548, Montgomery, Alabama 36116 205 271 1444

II. EXTRACTION

A. Holding Times: Medium level protocol was not performed; therefore, extraction time is not applicable.

B. Extraction Exceptions : Not applicable.

III. ANALYSIS

A. Holding times: All holding times were met.

B. Analytical Exceptions : No exceptions were encountered.

IV. QUALITY CONTROL

A. Method Blank : All associated method blanks met acceptable QC criteria.

B. Surrogate Recoveries : All samples met acceptable QC limits.

C. Matrix Spike Results : The native sample, matrix spike, and matrix spike duplicate results are contained within another batch of samples. The results will be reported with the results of our laboratory contract number 21281.

Please note that Forms II, IV, V, and VIII have numbers to the immediate left of each table. These numbers are sequential only and have no relation to CH2M HILL identification numbers.

I 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 contained in this hardcopy data package and in the computer-readable data submitted on floppy diskette has been authorized by the Laboratory Manager or his designee, as verified by the following signature.

Herb Kelly 5/15/92

Herb Kelly
Manager, Organic Division

Date

CH2M HILL Quality Analytical Laboratories 2567 Fairlane Drive, P.O. Box 230548, Montgomery, Alabama 36116 205 271 1444

Engineers
Planners
Economists
Scientists

CASE NARRATIVE FOR SEMIVOLATILE MASS SPECTROMETRY SAMPLES

LABORATORY: CH2M HILL LABORATORIES CLIENT: BARR ENGINEERING

CASE NO. : N/A CONTRACT NO.: N/A

LAB NO. : 21297 SDG NO.: N/A

I. RECEIPT

A. DATE: March 26, 1992

B. SAMPLE INFORMATION

LAB ID	CLIENT ID	SAMPLE MATRIX	DATE SAMPLED	EXTRACTION DATE	ANALYSIS DATE
21297001	BS-06	SOIL	03/25/92	04/02/92	04/06/92
21297002	BS-07	SOIL	03/25/92	04/02/92	04/06/92
21297003	BS-08	SOIL	03/25/92	04/02/92	04/07/92
21297004	M-08	SOIL	03/25/92	04/02/92	04/07/92
S04022B1	SBLKS	SOIL	NA	04/02/92	04/06/92

C. Documentation

Exceptions : Please note that the amount listed on the quantitation report reflects the mass detected at the instrument. According to the CLP Statement of Work, 2-uL injections must be made. Therefore, the amount on the quantitation report must be divided by a factor of two in order to determine the concentration of the extract injected.

No other exceptions were encountered.

CH2M HILL Quality Analytical Laboratories 2567 Fairlane Drive, P.O. Box 230548, Montgomery, Alabama 36116 205.271 1444

II. EXTRACTION

A. Holding Times: All holding times were met.

B. Extraction Exceptions : No exceptions were encountered.

III. ANALYSIS

A. Holding times: All holding times were met.

B. Analytical Exceptions : No exceptions were encountered.

IV. QUALITY CONTROL

A. Method Blank : All associated method blanks met acceptable QC criteria.

B. Surrogate Recoveries : All samples met acceptable QC limits.

C. Matrix Spike Results : The native sample, matrix spike, and matrix spike duplicate results are contained within another batch of samples. The results will be reported with the results of our laboratory contract number 21232.

Please note that Forms II, IV, V, and VIII have numbers to the immediate left of each table. These numbers are sequential only and have no relation to CH2M HILL identification numbers.

I 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 contained in this hardcopy data package and in the computer-readable data submitted on floppy diskette has been authorized by the Laboratory Manager or his designee, as verified by the following signature.

Herb Kelly 5/15/92

Herb Kelly Date
Manager, Organic Division

CH2M HILL Quality Analytical Laboratories 2567 Fairlane Drive, P.O. Box 230548, Montgomery, Alabama 36116 205 271 1444

Engineers
Planners
CH2M HILL Economists
Scientists

CASE NARRATIVE FOR PESTICIDE/PCB GAS CHROMATOGRAPHY SAMPLES

LABORATORY: CH2M HILL LABORATORIES CLIENT: BARR ENGINEERING

CASE NO. : N/A CONTRACT NO.: N/A

LAB NO. : 21297 SDG NO.: N/A

I. RECEIPT

A. DATE: March 26, 1992

B. SAMPLE INFORMATION

LAB ID	CLIENT ID	SAMPLE MATRIX	DATE SAMPLED	EXTRACTION DATE	ANALYSIS DATE
21297001	BS-06	SOIL	03/25/92	04/02/92	04/05/92
21297001DL	BS-06DL	SOIL	03/25/92	04/02/92	04/05/92
21297002	BS-07	SOIL	03/25/92	04/02/92	04/05/92
21297002DL	BS-07DL	SOIL	03/25/92	04/02/92	04/05/92
21297003	BS-08	SOIL	03/25/92	04/02/92	04/05/92
21297003DL	BS-08DL	SOIL	03/25/92	04/02/92	04/05/92
21297004	M-08	SOIL	03/25/92	04/02/92	04/05/92
21297004DL	M-08DL	SOIL	03/25/92	04/02/92	04/05/92
S04022B2	PBLK02	SOIL	NA	04/02/92	04/05/92

C. Documentation
Exceptions : No exceptions were encountered.

II. EXTRACTION

A. Holding times: All holding times were met.

B. Extraction
Exceptions : No exceptions were encountered.

CH2M HILL Quality Analytical Laboratories 2567 Fairlane Drive, P.O. Box 230548, Montgomery, Alabama 36116 205 271 1444

III. ANALYSIS

A. Holding times: All holding times were met.

B. Analytical Exceptions : Internal standards were added to the pesticide/PCB samples before injection for internal QC purposes only. According to CLP protocol, only external standard calculations were performed for this report.

No exceptions were encountered.

IV. QUALITY CONTROL

A. Method Blank : Except for the low surrogate recoveries, all associated method blanks met acceptable QC criteria.

B. Surrogate Recoveries : Both surrogate recoveries were somewhat low for the method blank. All other samples met acceptable QC limits.

C. Matrix Spike Results : The native sample, matrix spike, and matrix spike duplicate results are contained within another batch of samples. The results will be reported with the results of our laboratory contract number 21232.

D. Special Conditions : Primary and confirmation data was acquired by a single injection into a dual column/ECD system.

Please note that Forms II, IV, V, and VIII have numbers to the immediate left of each table. These numbers are sequential only and have no relation to CH2M HILL identification numbers.

I 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 contained in this hardcopy data package and in the computer-readable data submitted on floppy diskette has been authorized by the Laboratory Manager or his designee, as verified by the following signature.

Herb Kelly 5/15/92

Herb Kelly Date
Manager, Organic Division

CH2M HILL Quality Analytical Laboratories 2567 Fairlane Drive, P.O. Box 230548, Montgomery, Alabama 36116 205 271 1444

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BS-06

Lab Name: CH2M HILL/MGM Contract: _____

Lab Code: _____ Case No.: 21297 SAS No.: _____ SDG No.: _____

Matrix: (soil/water) SOIL Lab Sample ID: 21297001

Sample wt/vol: 5.0 (g/mL) G Lab File ID: C1VO021257

Level: (low/med) LOW Date Received: 03/26/92

% Moisture: not dec. 5 Date Analyzed: 03/31/92

GC Column: CAP ID: 0.530 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____(uL)

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

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

BS-06

Lab Name: CH2M HILL/MGM Contract: _____

Code: _____ Case No.: 21297 SAS No.: _____ SDG No.: _____

Matrix: (soil/water) SOIL Lab Sample ID: 21297001

Sample wt/vol: 5.0 (g/mL) G Lab File ID: C1VO021257

Level: (low/med) LOW Date Received: 03/26/92

% Moisture: not dec. 5 Date Analyzed: 03/31/92

GC Column: CAP ID: 0.530 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____(uL)

Number TICs found: 0

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BS-07

Lab Name: CH2M HILL/MGM Contract: _____

Lab Code: _____ Case No.: 21297 SAS No.: _____ SDG No.: _____

Matrix: (soil/water) SOIL Lab Sample ID: 21297002

Sample wt/vol: 5.0 (g/mL) G Lab File ID: C1VO021258

Level: (low/med) LOW Date Received: 03/26/92

% Moisture: not dec. 19 Date Analyzed: 03/31/92

GC Column: CAP ID: 0.530 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
74-87-3	Chloromethane	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	26	B
67-64-1	Acetone	51	B
75-15-0	Carbon Disulfide	12	U
75-35-4	1,1-Dichloroethene	12	U
75-34-3	1,1-Dichloroethane	12	U
540-59-0	1,2-Dichloroethene (total)	12	U
67-66-3	Chloroform	12	U
107-06-2	1,2-Dichloroethane	12	U
78-93-3	2-Butanone	20	
71-55-6	1,1,1-Trichloroethane	12	U
56-23-5	Carbon Tetrachloride	12	U
75-27-4	Bromodichloromethane	12	U
78-87-5	1,2-Dichloropropane	12	U
10061-01-5	cis-1,3-Dichloropropene	12	U
79-01-6	Trichloroethene	12	U
124-48-1	Dibromochloromethane	12	U
79-00-5	1,1,2-Trichloroethane	12	U
71-43-2	Benzene	12	U
10061-02-6	trans-1,3-Dichloropropene	12	U
75-25-2	Bromoform	12	U
591-78-6	2-Hexanone	12	U
108-10-1	4-Methyl-2-Pentanone	12	U
127-18-4	Tetrachloroethene	12	U
79-34-5	1,1,2,2-Tetrachloroethane	12	U
108-88-3	Toluene	12	U
108-90-7	Chlorobenzene	12	U
100-41-4	Ethylbenzene	12	U
100-42-5	Styrene	12	U
1330-20-7	Xylene (total)	2	J

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

BS-07

Lab Name: CH2M HILL/MGM Contract: _____

1 Code: _____ Case No.: 21297 SAS No.: _____ SDG No.: _____

Matrix: (soil/water) SOIL Lab Sample ID: 21297002

Sample wt/vol: 5.0 (g/mL) G Lab File ID: C1VO021258

Level: (low/med) LOW Date Received: 03/26/92

% Moisture: not dec. 19 Date Analyzed: 03/31/92

GC Column: CAP ID: 0.530 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____(uL)

Number TICs found: 1

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 2471-83-2	1H-INDENE, 1-ETHYLIDENE-	23.34	6	J

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BS-08

Lab Name: CH2M HILL/MGM Contract: _____

Lab Code: _____ Case No.: 21297 SAS No.: _____ SDG No.: _____

Matrix: (soil/water) SOIL Lab Sample ID: 21297003

Sample wt/vol: 5.0 (g/mL) G Lab File ID: C1VO021259

Level: (low/med) LOW Date Received: 03/26/92

% Moisture: not dec. 17 Date Analyzed: 03/31/92

GC Column: CAP ID: 0.530 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
74-87-3	Chloromethane	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	26	B
67-64-1	Acetone	25	B
75-15-0	Carbon Disulfide	12	U
75-35-4	1,1-Dichloroethene	12	U
75-34-3	1,1-Dichloroethane	12	U
540-59-0	1,2-Dichloroethene (total)	12	U
67-66-3	Chloroform	12	U
107-06-2	1,2-Dichloroethane	12	U
78-93-3	2-Butanone	12	
71-55-6	1,1,1-Trichloroethane	12	U
56-23-5	Carbon Tetrachloride	12	U
75-27-4	Bromodichloromethane	12	U
78-87-5	1,2-Dichloropropane	12	U
10061-01-5	cis-1,3-Dichloropropene	12	U
79-01-6	Trichloroethene	12	U
124-48-1	Dibromochloromethane	12	U
79-00-5	1,1,2-Trichloroethane	12	U
71-43-2	Benzene	12	U
10061-02-6	trans-1,3-Dichloropropene	12	U
75-25-2	Bromoform	12	U
591-78-6	2-Hexanone	12	U
108-10-1	4-Methyl-2-Pentanone	12	U
127-18-4	Tetrachloroethene	12	U
79-34-5	1,1,2,2-Tetrachloroethane	12	U
108-88-3	Toluene	12	U
108-90-7	Chlorobenzene	12	U
100-41-4	Ethylbenzene	12	U
100-42-5	Styrene	12	U
1330-20-7	Xylene (total)	1	J

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

BS-08

Lab Name: CH2M HILL/MGM Contract: _____

Code: _____ Case No.: 21297 SAS No.: _____ SDG No.: _____

Matrix: (soil/water) SOIL Lab Sample ID: 21297003

Sample wt/vol: 5.0 (g/mL) G Lab File ID: C1VO021259

Level: (low/med) LOW Date Received: 03/26/92

% Moisture: not dec. 17 Date Analyzed: 03/31/92

GC Column: CAP ID: 0.530 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____(uL)

Number TICs found: 0

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

M-08

Lab Name: CH2M HILL/MGM Contract: _____

Lab Code: _____ Case No.: 21297 SAS No.: _____ SDG No.: _____

Matrix: (soil/water) SOIL Lab Sample ID: 21297004

Sample wt/vol: 5.0 (g/mL) G Lab File ID: C1VO021260

Level: (low/med) LOW Date Received: 03/26/92

% Moisture: not dec. 6 Date Analyzed: 03/31/92

GC Column: CAP ID: 0.530 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
74-87-3	Chloromethane	11	U
74-83-9	Bromomethane	11	U
75-01-4	Vinyl Chloride	11	U
75-00-3	Chloroethane	11	U
75-09-2	Methylene Chloride	8	BJ
67-64-1	Acetone	5	BJ
75-15-0	Carbon Disulfide	11	U
75-35-4	1,1-Dichloroethene	11	U
75-34-3	1,1-Dichloroethane	11	U
540-59-0	1,2-Dichloroethene (total)	11	U
67-66-3	Chloroform	11	U
107-06-2	1,2-Dichloroethane	11	U
78-93-3	2-Butanone	11	U
71-55-6	1,1,1-Trichloroethane	11	U
56-23-5	Carbon Tetrachloride	11	U
75-27-4	Bromodichloromethane	11	U
78-87-5	1,2-Dichloropropane	11	U
10061-01-5	cis-1,3-Dichloropropene	11	U
79-01-6	Trichloroethene	11	U
124-48-1	Dibromochloromethane	11	U
79-00-5	1,1,2-Trichloroethane	11	U
71-43-2	Benzene	11	U
10061-02-6	trans-1,3-Dichloropropene	11	U
75-25-2	Bromoform	11	U
591-78-6	2-Hexanone	11	U
108-10-1	4-Methyl-2-Pentanone	11	U
127-18-4	Tetrachloroethene	11	U
79-34-5	1,1,2,2-Tetrachloroethane	11	U
108-88-3	Toluene	11	U
108-90-7	Chlorobenzene	11	U
100-41-4	Ethylbenzene	11	U
100-42-5	Styrene	11	U
1330-20-7	Xylene (total)	1	J

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

M-08

Lab Name: CH2M HILL/MGM Contract: _____

Code: _____ Case No.: 21297 SAS No.: _____ SDG No.: _____

Matrix: (soil/water) SOIL Lab Sample ID: 21297004

Sample wt/vol: 5.0 (g/mL) G Lab File ID: C1VO021260

Level: (low/med) LOW Date Received: 03/26/92

% Moisture: not dec. 6 Date Analyzed: 03/31/92

GC Column: CAP ID: 0.530 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

Number TICs found: 0

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BS-06

Lab Name: CH2M HILL/MGM Contract: _____

Lab Code: _____ Case No.: 21297 SAS No.: _____ SDG No.: _____

Matrix: (soil/water) SOIL Lab Sample ID: 21297001

Sample wt/vol: 30.0 (g/mL) G Lab File ID: A1BA013538

Level: (low/med) LOW Date Received: 03/26/92

% Moisture: 5 decanted: (Y/N) N Date Extracted: 04/02/92

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 04/06/92

Injection Volume: 2.0(uL) Dilution Factor: 1.0

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-95-2	Phenol	350	U
111-44-4	bis(2-Chloroethyl)Ether	350	U
95-57-8	2-Chlorophenol	350	U
541-73-1	1,3-Dichlorobenzene	350	U
106-46-7	1,4-Dichlorobenzene	350	U
95-50-1	1,2-Dichlorobenzene	350	U
95-48-7	2-Methylphenol	350	U
108-60-1	2,2'-oxybis(1-Chloropropane)	350	U
106-44-5	4-Methylphenol	350	U
621-64-7	N-Nitroso-Di-n-Propylamine	350	U
67-72-1	Hexachloroethane	350	U
98-95-3	Nitrobenzene	350	U
78-59-1	Isophorone	350	U
88-75-5	2-Nitrophenol	350	U
105-67-9	2,4-Dimethylphenol	350	U
111-91-1	bis(2-Chloroethoxy)Methane	350	U
120-83-2	2,4-Dichlorophenol	350	U
120-82-1	1,2,4-Trichlorobenzene	350	U
91-20-3	Naphthalene	350	U
106-47-8	4-Chloroaniline	350	U
87-68-3	Hexachlorobutadiene	350	U
59-50-7	4-Chloro-3-Methylphenol	350	U
91-57-6	2-Methylnaphthalene	350	U
77-47-4	Hexachlorocyclopentadiene	350	U
88-06-2	2,4,6-Trichlorophenol	350	U
95-95-4	2,4,5-Trichlorophenol	840	U
91-58-7	2-Chloronaphthalene	350	U
88-74-4	2-Nitroaniline	840	U
131-11-3	Dimethylphthalate	350	U
208-96-8	Acenaphthylene	350	U
606-20-2	2,6-Dinitrotoluene	350	U
99-09-2	3-Nitroaniline	840	U
83-32-9	Acenaphthene	350	U

1C

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BS-06

Lab Name: CH2M HILL/MGM Contract: _____

Code: _____ Case No.: 21297 SAS No.: _____ SDG No.: _____

Matrix: (soil/water) SOIL Lab Sample ID: 21297001

Sample wt/vol: 30.0 (g/mL) G Lab File ID: A1BA013538

Level: (low/med) LOW Date Received: 03/26/92

% Moisture: 5 decanted: (Y/N) N Date Extracted: 04/02/92

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 04/06/92

Injection Volume: 2.0(uL) Dilution Factor: 1.0

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	840	U
100-02-7	4-Nitrophenol	840	U
132-64-9	Dibenzofuran	350	U
121-14-2	2,4-Dinitrotoluene	350	U
84-66-2	Diethylphthalate	350	U
7005-72-3	4-Chlorophenyl-phenylether	350	U
86-73-7	Fluorene	350	U
100-10-6	4-Nitroaniline	840	U
534-52-1	4,6-Dinitro-2-methylphenol	840	U
86-30-6	N-Nitrosodiphenylamine (1)	350	U
101-55-3	4-Bromophenyl-phenylether	350	U
118-74-1	Hexachlorobenzene	350	U
87-86-5	Pentachlorophenol	840	U
85-01-8	Phenanthrene	350	U
120-12-7	Anthracene	350	U
86-74-8	Carbazole	350	U
84-74-2	Di-n-Butylphthalate	350	U
206-44-0	Fluoranthene	350	U
129-00-0	Pyrene	350	U
85-68-7	Butylbenzylphthalate	350	U
91-94-1	3,3'-Dichlorobenzidine	350	U
56-55-3	Benzo(a)Anthracene	350	U
218-01-9	Chrysene	350	U
117-81-7	bis(2-Ethylhexyl)Phthalate	350	U
117-84-0	Di-n-Octyl Phthalate	350	U
205-99-2	Benzo(b)Fluoranthene	350	U
207-08-9	Benzo(k)Fluoranthene	350	U
50-32-8	Benzo(a)Pyrene	350	U
193-39-5	Indeno(1,2,3-cd)Pyrene	350	U
53-70-3	Dibenz(a,h)Anthracene	350	U
191-24-2	Benzo(g,h,i)Perylene	89	J

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

BS-06

Lab Name: CH2M HILL/MGM Contract: _____

Lab Code: _____ Case No.: 21297 SAS No.: _____ SDG No.: _____

Matrix: (soil/water) SOIL Lab Sample ID: 21297001

Sample wt/vol: 30.0 (g/mL) G Lab File ID: A1BA013538

Level: (low/med) LOW Date Received: 03/26/92

% Moisture: 5 decanted: (Y/N) N Date Extracted: 04/02/92

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 04/06/92

Injection Volume: 2.0(uL) Dilution Factor: 1.0

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

Number TICs found: 8

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 100-52-7	BENZALDEHYDE (ACN)(DOT)	7.27	590	J
2. 6938-94-9	HEXANEDIOIC ACID, BIS(1-METH	16.29	95	BJ
3.	NOT IDENTIFIED	19.55	78	J
4.	UNKNOWN HYDROCARBON	27.47	87	J
5. 544-76-3	HEXADECANE	28.41	110	J
6.	UNKNOWN HYDROCARBON	29.34	80	J
7.	NOT IDENTIFIED	4.53	50000	J
8.	NOT IDENTIFIED	6.30	1200	J

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BS-07

Lab Name: CH2M HILL/MGM Contract: _____

Code: _____ Case No.: 21297 SAS No.: _____ SDG No.: _____

Matrix: (soil/water) SOIL Lab Sample ID: 21297002

Sample wt/vol: 30.0 (g/mL) G Lab File ID: A1BA013540

Level: (low/med) LOW Date Received: 03/26/92

% Moisture: 16 decanted: (Y/N) N Date Extracted: 04/02/92

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 04/06/92

Injection Volume: 2.0(uL) Dilution Factor: 1.0

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-95-2	Phenol	390	U
111-44-4	bis(2-Chloroethyl)Ether	390	U
95-57-8	2-Chlorophenol	390	U
541-73-1	1,3-Dichlorobenzene	390	U
106-46-7	1,4-Dichlorobenzene	390	U
95-50-1	1,2-Dichlorobenzene	390	U
95-48-7	2-Methylphenol	390	U
108-60-1	2,2'-oxybis(1-Chloropropane)	390	U
106-44-5	4-Methylphenol	390	U
621-64-7	N-Nitroso-Di-n-Propylamine	390	U
67-72-1	Hexachloroethane	390	U
98-95-3	Nitrobenzene	390	U
78-59-1	Isophorone	390	U
88-75-5	2-Nitrophenol	390	U
105-67-9	2,4-Dimethylphenol	390	U
111-91-1	bis(2-Chloroethoxy)Methane	390	U
120-83-2	2,4-Dichlorophenol	390	U
120-82-1	1,2,4-Trichlorobenzene	390	U
91-20-3	Naphthalene	390	U
106-47-8	4-Chloroaniline	390	U
87-68-3	Hexachlorobutadiene	390	U
59-50-7	4-Chloro-3-Methylphenol	390	U
91-57-6	2-Methylnaphthalene	390	U
77-47-4	Hexachlorocyclopentadiene	390	U
88-06-2	2,4,6-Trichlorophenol	390	U
95-95-4	2,4,5-Trichlorophenol	950	U
91-58-7	2-Chloronaphthalene	390	U
88-74-4	2-Nitroaniline	950	U
131-11-3	Dimethylphthalate	390	U
208-96-8	Acenaphthylene	390	U
606-20-2	2,6-Dinitrotoluene	390	U
99-09-2	3-Nitroaniline	950	U
83-32-9	Acenaphthene	390	U

1C

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BS-07

Lab Name: CH2M HILL/MGM Contract: _____

Lab Code: _____ Case No.: 21297 SAS No.: _____ SDG No.: _____

Matrix: (soil/water) SOIL Lab Sample ID: 21297002

Sample wt/vol: 30.0 (g/mL) G Lab File ID: A1BA013540

Level: (low/med) LOW Date Received: 03/26/92

% Moisture: 16 decanted: (Y/N) N Date Extracted: 04/02/92

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 04/06/92

Injection Volume: 2.0(uL) Dilution Factor: 1.0

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	950	U
100-02-7	4-Nitrophenol	950	U
132-64-9	Dibenzofuran	390	U
121-14-2	2,4-Dinitrotoluene	390	U
84-66-2	Diethylphthalate	390	U
7005-72-3	4-Chlorophenyl-phenylether	390	U
86-73-7	Fluorene	390	U
100-10-6	4-Nitroaniline	950	U
534-52-1	4,6-Dinitro-2-methylphenol	950	U
86-30-6	N-Nitrosodiphenylamine (1)	390	U
101-55-3	4-Bromophenyl-phenylether	390	U
118-74-1	Hexachlorobenzene	390	U
87-86-5	Pentachlorophenol	950	U
85-01-8	Phenanthrene	390	U
120-12-7	Anthracene	390	U
86-74-8	Carbazole	390	U
84-74-2	Di-n-Butylphthalate	42	J
206-44-0	Fluoranthene	390	U
129-00-0	Pyrene	390	U
85-68-7	Butylbenzylphthalate	390	U
91-94-1	3,3'-Dichlorobenzidine	390	U
56-55-3	Benzo(a)Anthracene	390	U
218-01-9	Chrysene	390	U
117-81-7	bis(2-Ethylhexyl)Phthalate	390	U
117-84-0	Di-n-Octyl Phthalate	390	U
205-99-2	Benzo(b)Fluoranthene	390	U
207-08-9	Benzo(k)Fluoranthene	390	U
50-32-8	Benzo(a)Pyrene	390	U
193-39-5	Indeno(1,2,3-cd)Pyrene	390	U
53-70-3	Dibenz(a,h)Anthracene	390	U
191-24-2	Benzo(g,h,i)Perylene	390	U

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

BS-07

Lab Name: CH2M HILL/MGM Contract: _____

Code: _____ Case No.: 21297 SAS No.: _____ SDG No.: _____

Matrix: (soil/water) SOIL Lab Sample ID: 21297002

Sample wt/vol: 30.0 (g/mL) G Lab File ID: A1BA013540

Level: (low/med) LOW Date Received: 03/26/92

% Moisture: 16 decanted: (Y/N) N Date Extracted: 04/02/92

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 04/06/92

Injection Volume: 2.0(uL) Dilution Factor: 1.0

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

mber TICs found: 11

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	NOT IDENTIFIED	6.43	1800	J
2.	NOT IDENTIFIED	7.58	440	J
3. 542-10-9	1,1-ETHANEDIOL, DIACETATE	8.67	490	J
4. 6938-94-9	HEXANEDIOIC ACID, BIS(1-METH	16.29	120	BJ
5. 57-10-3	HEXADECANOIC ACID	22.90	110	J
6. 41464-46-4	1,1'-BIPHENYL, 2,3',4',6-TET	24.22	91	J
7.	UNKNOWN HYDROCARBON	28.42	100	J
8.	NOT IDENTIFIED	3.40	1500	J
9.	NOT IDENTIFIED	4.80	71000	J
10.	UNKNOWN HYDROCARBON	29.34	77	J
11.	NOT IDENTIFIED	35.32	180	J

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BS-08

Lab Name: CH2M HILL/MGM Contract: _____

Lab Code: _____ Case No.: 21297 SAS No.: _____ SDG No.: _____

Matrix: (soil/water) SOIL Lab Sample ID: 21297003

Sample wt/vol: 30.0 (g/mL) G Lab File ID: A2BA013547

Level: (low/med) LOW Date Received: 03/26/92

% Moisture: 17 decanted: (Y/N) N Date Extracted: 04/02/92

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 04/07/92

Injection Volume: 2.0(uL) Dilution Factor: 1.0

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-95-2	Phenol	400	U
111-44-4	bis(2-Chloroethyl)Ether	400	U
95-57-8	2-Chlorophenol	400	U
541-73-1	1,3-Dichlorobenzene	400	U
106-46-7	1,4-Dichlorobenzene	400	U
95-50-1	1,2-Dichlorobenzene	400	U
95-48-7	2-Methylphenol	400	U
108-60-1	2,2'-oxybis(1-Chloropropane)	400	U
106-44-5	4-Methylphenol	400	U
621-64-7	N-Nitroso-Di-n-Propylamine	400	U
67-72-1	Hexachloroethane	400	U
98-95-3	Nitrobenzene	400	U
78-59-1	Isophorone	400	U
88-75-5	2-Nitrophenol	400	U
105-67-9	2,4-Dimethylphenol	400	U
111-91-1	bis(2-Chloroethoxy)Methane	400	U
120-83-2	2,4-Dichlorophenol	400	U
120-82-1	1,2,4-Trichlorobenzene	400	U
91-20-3	Naphthalene	400	U
106-47-8	4-Chloroaniline	400	U
87-68-3	Hexachlorobutadiene	400	U
59-50-7	4-Chloro-3-Methylphenol	400	U
91-57-6	2-Methylnaphthalene	400	U
77-47-4	Hexachlorocyclopentadiene	400	U
88-06-2	2,4,6-Trichlorophenol	400	U
95-95-4	2,4,5-Trichlorophenol	960	U
91-58-7	2-Chloronaphthalene	400	U
88-74-4	2-Nitroaniline	960	U
131-11-3	Dimethylphthalate	400	U
208-96-8	Acenaphthylene	400	U
606-20-2	2,6-Dinitrotoluene	400	U
99-09-2	3-Nitroaniline	960	U
83-32-9	Acenaphthene	400	U

MSc

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BS-08

Lab Name: CH2M HILL/MGM Contract: _____

I Code: _____ Case No.: 21297 SAS No.: _____ SDG No.: _____

Matrix: (soil/water) SOIL Lab Sample ID: 21297003

Sample wt/vol: 30.0 (g/mL) G Lab File ID: A2BA013547

Level: (low/med) LOW Date Received: 03/26/92

% Moisture: 17 decanted: (Y/N) N Date Extracted: 04/02/92

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 04/07/92

Injection Volume: 2.0(uL) Dilution Factor: 1.0

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	960	U
100-02-7	4-Nitrophenol	960	U
132-64-9	Dibenzofuran	400	U
121-14-2	2,4-Dinitrotoluene	400	U
84-66-2	Diethylphthalate	400	U
7005-72-3	4-Chlorophenyl-phenylether	400	U
86-73-7	Fluorene	400	U
100-10-6	4-Nitroaniline	960	U
534-52-1	4,6-Dinitro-2-methylphenol	960	U
86-30-6	N-Nitrosodiphenylamine (1)	400	U
101-55-3	4-Bromophenyl-phenylether	400	U
118-74-1	Hexachlorobenzene	400	U
87-86-5	Pentachlorophenol	960	U
85-01-8	Phenanthrene	400	U
120-12-7	Anthracene	400	U
86-74-8	Carbazole	400	U
84-74-2	Di-n-Butylphthalate	400	U
206-44-0	Fluoranthene	400	U
129-00-0	Pyrene	400	U
85-68-7	Butylbenzylphthalate	400	U
91-94-1	3,3'-Dichlorobenzidine	400	U
56-55-3	Benzo(a)Anthracene	400	U
218-01-9	Chrysene	400	U
117-81-7	bis(2-Ethylhexyl)Phthalate	400	U
117-84-0	Di-n-Octyl Phthalate	400	U
205-99-2	Benzo(b)Fluoranthene	400	U
207-08-9	Benzo(k)Fluoranthene	400	U
50-32-8	Benzo(a)Pyrene	400	U
193-39-5	Indeno(1,2,3-cd)Pyrene	400	U
53-70-3	Dibenz(a,h)Anthracene	400	U
191-24-2	Benzo(g,h,i)Perylene	400	U

EPA SAMPLE NO.

BS-08

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: CH2M HILL/MGM Contract: _____

Lab Code: _____ Case No.: 21297 SAS No.: _____ SDG No.: _____

Matrix: (soil/water) SOIL Lab Sample ID: 21297003

Sample wt/vol: 30.0 (g/mL) G Lab File ID: A2BA013547

Level: (low/med) LOW Date Received: 03/26/92

% Moisture: 17 decanted: (Y/N) N Date Extracted: 04/02/92

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 04/07/92

Injection Volume: 2.0(uL) Dilution Factor: 1.0

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

Number TICs found: 11

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	NOT IDENTIFIED	6.02	1500	J
2.	NOT IDENTIFIED	8.39	410	J
3.	UNKNOWN HYDROCARBON	27.16	170	J
4.	UNKNOWN HYDROCARBON	28.11	140	J
5.	NOT IDENTIFIED	2.70	2800	J
6.	NOT IDENTIFIED	4.27	75000	J
7.	NOT IDENTIFIED	9.17	250	J
8.	NOT IDENTIFIED	22.59	160	J
9.	UNKNOWN HYDROCARBON	26.17	100	J
10.	UNKNOWN HYDROCARBON	29.02	180	J
11.	UNKNOWN HYDROCARBON	29.91	85	J

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

M-08

Lab Name: CH2M HILL/MGM Contract: _____

Code: _____ Case No.: 21297 SAS No.: _____ SDG No.: _____

Matrix: (soil/water) SOIL Lab Sample ID: 21297004

Sample wt/vol: 30.0 (g/mL) G Lab File ID: A1BA013546

Level: (low/med) LOW Date Received: 03/26/92

% Moisture: 6 decanted: (Y/N) N Date Extracted: 04/02/92

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 04/07/92

Injection Volume: 2.0(uL) Dilution Factor: 1.0

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-95-2	Phenol	350	U
111-44-4	bis(2-Chloroethyl)Ether	350	U
95-57-8	2-Chlorophenol	350	U
541-73-1	1,3-Dichlorobenzene	350	U
106-46-7	1,4-Dichlorobenzene	350	U
95-50-1	1,2-Dichlorobenzene	350	U
95-48-7	2-Methylphenol	350	U
108-60-1	2,2'-oxybis(1-Chloropropane)	350	U
106-44-5	4-Methylphenol	350	U
621-64-7	N-Nitroso-Di-n-Propylamine	350	U
67-72-1	Hexachloroethane	350	U
98-95-3	Nitrobenzene	350	U
78-59-1	Isophorone	350	U
88-75-5	2-Nitrophenol	350	U
105-67-9	2,4-Dimethylphenol	350	U
111-91-1	bis(2-Chloroethoxy)Methane	350	U
120-83-2	2,4-Dichlorophenol	350	U
120-82-1	1,2,4-Trichlorobenzene	350	U
91-20-3	Naphthalene	350	U
106-47-8	4-Chloroaniline	350	U
87-68-3	Hexachlorobutadiene	350	U
59-50-7	4-Chloro-3-Methylphenol	350	U
91-57-6	2-Methylnaphthalene	350	U
77-47-4	Hexachlorocyclopentadiene	350	U
88-06-2	2,4,6-Trichlorophenol	350	U
95-95-4	2,4,5-Trichlorophenol	850	U
91-58-7	2-Chloronaphthalene	350	U
88-74-4	2-Nitroaniline	850	U
131-11-3	Dimethylphthalate	350	U
208-96-8	Acenaphthylene	350	U
606-20-2	2,6-Dinitrotoluene	350	U
99-09-2	3-Nitroaniline	850	U
83-32-9	Acenaphthene	350	U

1C

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

M-08

Lab Name: CH2M HILL/MGM Contract: _____

Lab Code: _____ Case No.: 21297 SAS No.: _____ SDG No.: _____

Matrix: (soil/water) SOIL Lab Sample ID: 21297004

Sample wt/vol: 30.0 (g/mL) G Lab File ID: A1BA013546

Level: (low/med) LOW Date Received: 03/26/92

% Moisture: 6 decanted: (Y/N) N Date Extracted: 04/02/92

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 04/07/92

Injection Volume: 2.0(uL) Dilution Factor: 1.0

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	850	U
100-02-7	4-Nitrophenol	850	U
132-64-9	Dibenzofuran	350	U
121-14-2	2,4-Dinitrotoluene	350	U
84-66-2	Diethylphthalate	350	U
7005-72-3	4-Chlorophenyl-phenylether	350	U
86-73-7	Fluorene	350	U
100-10-6	4-Nitroaniline	850	U
534-52-1	4,6-Dinitro-2-methylphenol	850	U
86-30-6	N-Nitrosodiphenylamine (1)	350	U
101-55-3	4-Bromophenyl-phenylether	350	U
118-74-1	Hexachlorobenzene	350	U
87-86-5	Pentachlorophenol	850	U
85-01-8	Phenanthrene	350	U
120-12-7	Anthracene	350	U
86-74-8	Carbazole	350	U
84-74-2	Di-n-Butylphthalate	350	U
206-44-0	Fluoranthene	350	U
129-00-0	Pyrene	350	U
85-68-7	Butylbenzylphthalate	350	U
91-94-1	3,3'-Dichlorobenzidine	350	U
56-55-3	Benzo(a)Anthracene	350	U
218-01-9	Chrysene	350	U
117-81-7	bis(2-Ethylhexyl)Phthalate	350	U
117-84-0	Di-n-Octyl Phthalate	350	U
205-99-2	Benzo(b)Fluoranthene	350	U
207-08-9	Benzo(k)Fluoranthene	350	U
50-32-8	Benzo(a)Pyrene	350	U
193-39-5	Indeno(1,2,3-cd)Pyrene	350	U
53-70-3	Dibenz(a,h)Anthracene	350	U
191-24-2	Benzo(g,h,i)Perylene	350	U

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

M-08

Lab Name: CH2M HILL/MGM Contract: _____

Code: _____ Case No.: 21297 SAS No.: _____ SDG No.: _____

Matrix: (soil/water) SOIL Lab Sample ID: 21297004

Sample wt/vol: 30.0 (g/mL) G Lab File ID: A1BA013546

Level: (low/med) LOW Date Received: 03/26/92

% Moisture: 6 decanted: (Y/N) N Date Extracted: 04/02/92

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 04/07/92

Injection Volume: 2.0(uL) Dilution Factor: 1.0

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

mber TICs found: 4

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	NOT IDENTIFIED	6.17	1300	J
2.	NOT IDENTIFIED	4.38	61000	J
3.	NOT IDENTIFIED	9.19	190	J
4. 17851-53-5	1,2-BENZENEDICARBOXYLIC ACID	22.70	140	J

1D

PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BS-06

Lab Name: CH2M HILL/MGM Contract: _____

Lab Code: CH2M Case No.: 21297 SAS No.: _____ SDG No.: _____

Matrix: (soil/water) SOIL Lab Sample ID: 21297001

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

% Moisture: 5 decanted: (Y/N) N Date Received: 03/26/92

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 04/02/92

Concentrated Extract Volume: 5000 (uL) Date Analyzed: 05/05/92

Injection Volume: 2.00 (uL) Dilution Factor: 1.00

GPC Cleanup: (Y/N) Y pH: 8.4 Sulfur Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
319-84-6	alpha-BHC	1.8	U
319-85-7	beta-BHC	1.8	U
319-86-8	delta-BHC	1.8	U
58-89-9	gamma-BHC (Lindane)	1.8	U
76-44-8	Heptachlor	2.5	
309-00-2	Aldrin	1.8	U
1024-57-3	Heptachlor epoxide	5.5	P
959-98-8	Endosulfan I	1.8	U
60-57-1	Dieldrin	3.5	U
72-55-9	4,4'-DDE	3.5	U
72-20-8	Endrin	3.5	U
33213-65-9	Endosulfan II	3.5	U
72-54-8	4,4'-DDD	3.5	U
1031-07-8	Endosulfan sulfate	3.5	U
50-29-3	4,4'-DDT	3.5	U
72-43-5	Methoxychlor	18	U
53494-70-5	Endrin ketone	3.5	U
7421-36-3	Endrin aldehyde	3.5	U
5103-71-9	alpha-Chlordane	28	
5103-74-2	gamma-Chlordane	16	
8001-35-2	Toxaphene	180	U
12674-11-2	Aroclor-1016	35	U
11104-28-2	Aroclor-1221	71	U
11141-16-5	Aroclor-1232	35	U
53469-21-9	Aroclor-1242	35	U
12672-29-6	Aroclor-1248	35	U
11097-69-1	Aroclor-1254	35	U
11096-82-5	Aroclor-1260	35	U

1D

PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BS-06DL

Lab Name: CH2M HILL/MGM Contract: _____

Code: CH2M Case No.: 21297 SAS No.: _____ SDG No.: _____

Matrix: (soil/water) SOIL Lab Sample ID: 21297001DL

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

% Moisture: 5 decanted: (Y/N) N Date Received: 03/26/92

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 04/02/92

Concentrated Extract Volume: 5000 (uL) Date Analyzed: 05/05/92

Injection Volume: 2.00 (uL) Dilution Factor: 5.00

GPC Cleanup: (Y/N) Y pH: 8.4 Sulfur Cleanup: (Y/N) Y

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	5.6	JP
959-98-8	Endosulfan I	8.9	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	89	U
53494-70-5	Endrin ketone	17	U
7421-36-3	Endrin aldehyde	17	U
5103-71-9	alpha-Chlordane	27	
5103-74-2	gamma-Chlordane	15	
8001-35-2	Toxaphene	890	U
12674-11-2	Aroclor-1016	170	U
11104-28-2	Aroclor-1221	350	U
11141-16-5	Aroclor-1232	170	U
53469-21-9	Aroclor-1242	170	U
12672-29-6	Aroclor-1248	170	U
11097-69-1	Aroclor-1254	170	U
11096-82-5	Aroclor-1260	170	U

1D

PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BS-07

Lab Name: CH2M HILL/MGM Contract: _____

Lab Code: CH2M Case No.: 21297 SAS No.: _____ SDG No.: _____

Matrix: (soil/water) SOIL Lab Sample ID: 21297002

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

% Moisture: 16 decanted: (Y/N) N Date Received: 03/26/92

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 04/02/92

Concentrated Extract Volume: 5000 (uL) Date Analyzed: 05/05/92

Injection Volume: 2.00 (uL) Dilution Factor: 1.00

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
319-84-6	alpha-BHC	2.0	U
319-85-7	beta-BHC	2.0	U
319-86-8	delta-BHC	2.0	U
58-89-9	gamma-BHC (Lindane)	2.0	U
76-44-8	Heptachlor	2.0	U
309-00-2	Aldrin	2.0	U
1024-57-3	Heptachlor epoxide	2.0	U
959-98-8	Endosulfan I	2.0	U
60-57-1	Dieldrin	3.9	U
72-55-9	4,4'-DDE	3.9	U
72-20-8	Endrin	3.9	U
33213-65-9	Endosulfan II	3.9	U
72-54-8	4,4'-DDD	3.9	U
1031-07-8	Endosulfan sulfate	3.9	U
50-29-3	4,4'-DDT	3.9	U
72-43-5	Methoxychlor	20	U
53494-70-5	Endrin ketone	3.9	U
7421-36-3	Endrin aldehyde	3.9	U
5103-71-9	alpha-Chlordane	2.0	U
5103-74-2	gamma-Chlordane	2.0	U
8001-35-2	Toxaphene	200	U
12674-11-2	Aroclor-1016	39	U
11104-28-2	Aroclor-1221	80	U
11141-16-5	Aroclor-1232	39	U
53469-21-9	Aroclor-1242	39	U
12672-29-6	Aroclor-1248	1200	
11097-69-1	Aroclor-1254	39	U
11096-82-5	Aroclor-1260	56	

1D
PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BS-07DL

Lab Name: CH2M HILL/MGM Contract: _____

Lab Code: CH2M Case No.: 21297 SAS No.: _____ SDG No.: _____

Matrix: (soil/water) SOIL Lab Sample ID: 21297002DL

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

% Moisture: 16 decanted: (Y/N) N Date Received: 03/26/92

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 04/02/92

Concentrated Extract Volume: 5000 (uL) Date Analyzed: 05/05/92

Injection Volume: 2.00 (uL) Dilution Factor: 20.0

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
319-84-6	alpha-BHC	40	U
319-85-7	beta-BHC	40	U
319-86-8	delta-BHC	40	U
58-89-9	gamma-BHC (Lindane)	40	U
76-44-8	Heptachlor	40	U
309-00-2	Aldrin	40	U
1024-57-3	Heptachlor epoxide	40	U
959-98-8	Endosulfan I	40	U
60-57-1	Dieldrin	79	U
72-55-9	4,4'-DDE	79	U
72-20-8	Endrin	79	U
33213-65-9	Endosulfan II	79	U
72-54-8	4,4'-DDD	79	U
1031-07-8	Endosulfan sulfate	79	U
50-29-3	4,4'-DDT	79	U
72-43-5	Methoxychlor	400	U
53494-70-5	Endrin ketone	79	U
7421-36-3	Endrin aldehyde	79	U
5103-71-9	alpha-Chlordane	40	U
5103-74-2	gamma-Chlordane	40	U
8001-35-2	Toxaphene	4000	U
12674-11-2	Aroclor-1016	790	U
11104-28-2	Aroclor-1221	1600	U
11141-16-5	Aroclor-1232	790	U
53469-21-9	Aroclor-1242	790	U
12672-29-6	Aroclor-1248	1300	P
11097-69-1	Aroclor-1254	790	U
11096-82-5	Aroclor-1260	790	U

1D

PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BS-08

Lab Name: CH2M HILL/MGM Contract: _____

Lab Code: CH2M Case No.: 21297 SAS No.: _____ SDG No.: _____

Matrix: (soil/water) SOIL Lab Sample ID: 21297003

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

% Moisture: 17 decanted: (Y/N) N Date Received: 03/26/92

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 04/02/92

Concentrated Extract Volume: 5000 (uL) Date Analyzed: 05/05/92

Injection Volume: 2.00 (uL) Dilution Factor: 1.00

GPC Cleanup: (Y/N) Y pH: 7.9 Sulfur Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
319-84-6	alpha-BHC	2.0	U
319-85-7	beta-BHC	2.0	U
319-86-8	delta-BHC	2.0	U
58-89-9	gamma-BHC (Lindane)	2.0	U
76-44-8	Heptachlor	2.0	U
309-00-2	Aldrin	2.0	U
1024-57-3	Heptachlor epoxide	2.0	U
959-98-8	Endosulfan I	2.0	U
60-57-1	Dieldrin	4.0	U
72-55-9	4,4'-DDE	4.0	U
72-20-8	Endrin	4.0	U
33213-65-9	Endosulfan II	4.0	U
72-54-8	4,4'-DDD	4.0	U
1031-07-8	Endosulfan sulfate	4.0	U
50-29-3	4,4'-DDT	4.0	U
72-43-5	Methoxychlor	20	U
53494-70-5	Endrin ketone	4.0	U
7421-36-3	Endrin aldehyde	4.0	U
5103-71-9	alpha-Chlordane	2.0	U
5103-74-2	gamma-Chlordane	2.0	U
8001-35-2	Toxaphene	200	U
12674-11-2	Aroclor-1016	40	U
11104-28-2	Aroclor-1221	81	U
11141-16-5	Aroclor-1232	40	U
53469-21-9	Aroclor-1242	40	U
12672-29-6	Aroclor-1248	700	
11097-69-1	Aroclor-1254	40	U
11096-82-5	Aroclor-1260	58	

1D

PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BS-08DL

Lab Name: CH2M HILL/MGM Contract: _____

I Code: CH2M Case No.: 21297 SAS No.: _____ SDG No.: _____

Matrix: (soil/water) SOIL Lab Sample ID: 21297003DL

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

% Moisture: 17 decanted: (Y/N) N Date Received: 03/26/92

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 04/02/92

Concentrated Extract Volume: 5000 (uL) Date Analyzed: 05/05/92

Injection Volume: 2.00 (uL) Dilution Factor: 10.0

GPC Cleanup: (Y/N) Y pH: 7.9 Sulfur Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
319-84-6	alpha-BHC	20	U
319-85-7	beta-BHC	20	U
319-86-8	delta-BHC	20	U
58-89-9	gamma-BHC (Lindane)	20	U
76-44-8	Heptachlor	20	U
309-00-2	Aldrin	20	U
1024-57-3	Heptachlor epoxide	20	U
959-98-8	Endosulfan I	20	U
60-57-1	Dieldrin	40	U
72-55-9	4,4'-DDE	40	U
72-20-8	Endrin	40	U
33213-65-9	Endosulfan II	40	U
72-54-8	4,4'-DDD	40	U
1031-07-8	Endosulfan sulfate	40	U
50-29-3	4,4'-DDT	40	U
72-43-5	Methoxychlor	200	U
53494-70-5	Endrin ketone	40	U
7421-36-3	Endrin aldehyde	40	U
5103-71-9	alpha-Chlordane	20	U
5103-74-2	gamma-Chlordane	20	U
8001-35-2	Toxaphene	2000	U
12674-11-2	Aroclor-1016	400	U
11104-28-2	Aroclor-1221	810	U
11141-16-5	Aroclor-1232	400	U
53469-21-9	Aroclor-1242	400	U
12672-29-6	Aroclor-1248	680	
11097-69-1	Aroclor-1254	400	U
11096-82-5	Aroclor-1260	46	JP

1D
PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

M-08

Lab Name: CH2M HILL/MGM Contract: _____

Lab Code: CH2M Case No.: 21297 SAS No.: _____ SDG No.: _____

Matrix: (soil/water) SOIL Lab Sample ID: 21297004

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

% Moisture: 6 decanted: (Y/N) N Date Received: 03/26/92

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 04/02/92

Concentrated Extract Volume: 5000 (uL) Date Analyzed: 05/05/92

Injection Volume: 2.00 (uL) Dilution Factor: 1.00

GPC Cleanup: (Y/N) Y pH: 8.4 Sulfur Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
319-84-6	alpha-BHC	1.8	U
319-85-7	beta-BHC	1.8	U
319-86-8	delta-BHC	1.8	U
58-89-9	gamma-BHC (Lindane)	1.8	U
76-44-8	Heptachlor	2.0	
309-00-2	Aldrin	1.8	U
1024-57-3	Heptachlor epoxide	6.9	P
959-98-8	Endosulfan I	1.8	U
60-57-1	Dieldrin	3.5	U
72-55-9	4,4'-DDE	3.5	U
72-20-8	Endrin	3.5	U
33213-65-9	Endosulfan II	3.5	U
72-54-8	4,4'-DDD	3.5	U
1031-07-8	Endosulfan sulfate	3.5	U
50-29-3	4,4'-DDT	3.5	U
72-43-5	Methoxychlor	18	U
53494-70-5	Endrin ketone	3.5	U
7421-36-3	Endrin aldehyde	3.5	U
5103-71-9	alpha-Chlordane	31	
5103-74-2	gamma-Chlordane	18	
8001-35-2	Toxaphene	180	U
12674-11-2	Aroclor-1016	35	U
11104-28-2	Aroclor-1221	71	U
11141-16-5	Aroclor-1232	35	U
53469-21-9	Aroclor-1242	35	U
12672-29-6	Aroclor-1248	35	U
11097-69-1	Aroclor-1254	35	U
11096-82-5	Aroclor-1260	35	U

1D

PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

M-08DL

Lab Name: CH2M HILL/MGM Contract: _____

Code: CH2M Case No.: 21297 SAS No.: _____ SDG No.: _____

Matrix: (soil/water) SOIL Lab Sample ID: 21297004DL

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

% Moisture: 6 decanted: (Y/N) N Date Received: 03/26/92

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 04/02/92

Concentrated Extract Volume: 5000 (uL) Date Analyzed: 05/05/92

Injection Volume: 2.00 (uL) Dilution Factor: 5.00

GPC Cleanup: (Y/N) Y pH: 8.4 Sulfur Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
319-84-6	alpha-BHC	9.0	U
319-85-7	beta-BHC	9.0	U
319-86-8	delta-BHC	9.0	U
58-89-9	gamma-BHC (Lindane)	9.0	U
76-44-8	Heptachlor	9.0	U
309-00-2	Aldrin	9.0	U
1024-57-3	Heptachlor epoxide	6.8	JP
959-98-8	Endosulfan I	9.0	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	90	U
53494-70-5	Endrin ketone	18	U
7421-36-3	Endrin aldehyde	18	U
5103-71-9	alpha-Chlordane	29	
5103-74-2	gamma-Chlordane	16	
8001-35-2	Toxaphene	900	U
12674-11-2	Aroclor-1016	180	U
11104-28-2	Aroclor-1221	360	U
11141-16-5	Aroclor-1232	180	U
53469-21-9	Aroclor-1242	180	U
12672-29-6	Aroclor-1248	180	U
11097-69-1	Aroclor-1254	180	U
11096-82-5	Aroclor-1260	180	U

2B

SOIL VOLATILE SYSTEM MONITORING COMPOUND RECOVERY

Lab Name: CH2M HILL/MGM Contract: _____

Lab Code: _____ Case No.: 21297 SAS No.: _____ SDG No.: _____

Level:(low/med) LOW

	EPA SAMPLE NO.	SMC1 (TOL)#	SMC2 (BFB)#	SMC3 (DCE)#	OTHER	TOT OUT
01	BS-06	99	98	102	0	0
02	BS-07	102	97	99	0	0
03	BS-08	101	94	100	0	0
04	M-08	115	98	99	0	0
05	VBLKS	104	100	101	0	0

		QC LIMITS
SMC1 (TOL)	= Toluene-d8	(84-138)
SMC2 (BFB)	= Bromofluorobenzene	(59-113)
SMC3 (DCE)	= 1,2-Dichloroethane-d4	(70-121)

Column to be used to flag recovery values

* Values outside of contract required QC limits

D System Monitoring Compound diluted out

FORM II VOA-2

3/90

000036

2D

SOIL SEMIVOLATILE SURROGATE RECOVERY

Lab Name: CH2M HILL/MGM Contract: _____

Lab Code: _____ Case No.: 21297 SAS No.: _____ SDG No.: _____

Level:(low/med) LOW

	EPA SAMPLE NO.	S1 (NBZ)#	S2 (FBP)#	S3 (TPH)#	S4 (PHL)#	S5 (2FP)#	S6 (TBP)#	S7 (2CP)#	S8 (DCB)#	TOT OUT
01	BS-06	57	58	53	75	76	70	71	60	0
02	BS-07	70	73	67	90	95	83	86	72	0
03	BS-08	79	63	63	104	100	71	94	82	0
04	M-08	81	65	62	99	102	77	92	80	0
05	SBLKS	66	64	62	90	88	49	81	70	0

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

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

2F

SOIL PESTICIDE SURROGATE RECOVERY

Lab Name: CH2M HILL/MGM Contract: _____

Lab Code: CH2M Case No.: 21297 SAS No.: _____ SDG No.: _____

GC Column(1): SPB-5 ID: 0.53(mm) GC Column(2): SPB-608 ID: 0.53(mm)

	EPA SAMPLE NO.	TCX 1 %REC #	TCX 2 %REC #	DCB 1 %REC #	DCB 2 %REC #	OTHER (1)	OTHER (2)	TOT OUT
01	PBLK02	48*	45*	48*	50*			4
02	BS-06	68	67	77	75			0
03	BS-06DL	83	69	83	79			0
04	BS-07	80	78	89	92			0
05	BS-07DL	0D	0D	0D	0D			0
06	BS-08	80	80	86	88			0
07	BS-08DL	82	86	87	87			0
08	M-08	74	73	82	81			0
09	M-08DL	74	81	85	80			0

	ADVISORY QC LIMITS
TCX = Tetrachloro-m-xylene	(60-150)
DCB = Decachlorobiphenyl	(60-150)

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

4A
VOLATILE METHOD BLANK SUMMARY

EPA SAMPLE NO.

VBLKS

Lab Name: CH2M HILL/MGM Contract: _____

Code: _____ Case No.: 21297 SAS No.: _____ SDG No.: _____

Lab File ID: CBVO021252 Lab Sample ID: Y03302B3

Date Analyzed: 03/30/92 Time Analyzed: 2250

GC Column: CAP ID: 0.530(mm) Heated Purge: (Y/N) Y

Instrument ID: 4500

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS AND MSD:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	TIME ANALYZED
01	BS-06	21297001	C1VO021257	0235
02	BS-07	21297002	C1VO021258	0309
03	BS-08	21297003	C1VO021259	0343
04	M-08	21297004	C1VO021260	0418

COMMENTS: CLP,12222,,VBLKS,L,S,Y03302B3,V,BLANK,
10DG TO 200DG @8DG/MIN IH=3MIN

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

VBLKS

Lab Name: CH2M HILL/MGM Contract: _____

Lab Code: _____ Case No.: 21297 SAS No.: _____ SDG No.: _____

Matrix: (soil/water) SOIL Lab Sample ID: Y03302B3

Sample wt/vol: 5.0 (g/mL) G Lab File ID: CBV0021252

Level: (low/med) LOW Date Received: 03/30/92

% Moisture: not dec. 0 Date Analyzed: 03/30/92

GC Column: CAP ID: 0.530 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____(uL)

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

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

VBLKS

Lab Name: CH2M HILL/MGM Contract: _____

Code: _____ Case No.: 21297 SAS No.: _____ SDG No.: _____

Matrix: (soil/water) SOIL Lab Sample ID: Y03302B3

Sample wt/vol: 5.0 (g/mL) G Lab File ID: CBVO021252

Level: (low/med) LOW Date Received: 03/30/92

% Moisture: not dec. 0 Date Analyzed: 03/30/92

GC Column: CAP ID: 0.530 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____(uL)

Number TICs found: 0

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

4B

SEMIVOLATILE METHOD BLANK SUMMARY

EPA SAMPLE NO.

SBLKS

Lab Name: CH2M HILL/MGM Contract: _____

Lab Code: _____ Case No.: 21297 SAS No.: _____ SDG No.: _____

Lab File ID: ABBA013537 Lab Sample ID: S04022B1

Instrument ID: 4000 Date Extracted: 04/02/92

Matrix: (soil/water) SOIL Date Analyzed: 04/06/92

Level:(low/med) LOW Time Analyzed: 1421

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS AND MSD:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
01	BS-06	21297001	A1BA013538	04/06/92
02	BS-07	21297002	A1BA013540	04/06/92
03	BS-08	21297003	A2BA013547	04/07/92
04	M-08	21297004	A1BA013546	04/07/92

COMMENTS: CLP,21297,,SBLKS,L,S,S04022B1,B,BLANK,
20DG TO 310DG @4DG/MIN IH=10MIN

FORM IV SV

3/90

000042

MSr

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SBLKS

Lab Name: CH2M HILL/MGM Contract: _____

Code: _____ Case No.: 21297 SAS No.: _____ SDG No.: _____

Matrix: (soil/water) SOIL Lab Sample ID: S04022B1

Sample wt/vol: 30.0 (g/mL) G Lab File ID: ABBA013537

Level: (low/med) LOW Date Received: 04/02/92

% Moisture: 0 decanted: (Y/N) N Date Extracted: 04/02/92

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 04/06/92

Injection Volume: 2.0(uL) Dilution Factor: 1.0

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-95-2	Phenol	330	U
111-44-4	bis(2-Chloroethyl)Ether	330	U
95-57-8	2-Chlorophenol	330	U
541-73-1	1,3-Dichlorobenzene	330	U
106-46-7	1,4-Dichlorobenzene	330	U
95-50-1	1,2-Dichlorobenzene	330	U
95-48-7	2-Methylphenol	330	U
108-60-1	2,2'-oxybis(1-Chloropropane)	330	U
106-44-5	4-Methylphenol	330	U
621-64-7	N-Nitroso-Di-n-Propylamine	330	U
67-72-1	Hexachloroethane	330	U
98-95-3	Nitrobenzene	330	U
78-59-1	Isophorone	330	U
88-75-5	2-Nitrophenol	330	U
105-67-9	2,4-Dimethylphenol	330	U
111-91-1	bis(2-Chloroethoxy)Methane	330	U
120-83-2	2,4-Dichlorophenol	330	U
120-82-1	1,2,4-Trichlorobenzene	330	U
91-20-3	Naphthalene	330	U
106-47-8	4-Chloroaniline	330	U
87-68-3	Hexachlorobutadiene	330	U
59-50-7	4-Chloro-3-Methylphenol	330	U
91-57-6	2-Methylnaphthalene	330	U
77-47-4	Hexachlorocyclopentadiene	330	U
88-06-2	2,4,6-Trichlorophenol	330	U
95-95-4	2,4,5-Trichlorophenol	800	U
91-58-7	2-Chloronaphthalene	330	U
88-74-4	2-Nitroaniline	800	U
131-11-3	Dimethylphthalate	330	U
208-96-8	Acenaphthylene	330	U
606-20-2	2,6-Dinitrotoluene	330	U
99-09-2	3-Nitroaniline	800	U
83-32-9	Acenaphthene	330	U

1C

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SBLKS

Lab Name: CH2M HILL/MGM Contract: _____

Lab Code: _____ Case No.: 21297 SAS No.: _____ SDG No.: _____

Matrix: (soil/water) SOIL Lab Sample ID: S04022B1

Sample wt/vol: 30.0 (g/mL) G Lab File ID: ABBA013537

Level: (low/med) LOW Date Received: 04/02/92

% Moisture: 0 decanted: (Y/N) N Date Extracted: 04/02/92

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 04/06/92

Injection Volume: 2.0(uL) Dilution Factor: 1.0

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	800	U
100-02-7	4-Nitrophenol	800	U
132-64-9	Dibenzofuran	330	U
121-14-2	2,4-Dinitrotoluene	330	U
84-66-2	Diethylphthalate	330	U
7005-72-3	4-Chlorophenyl-phenylether	330	U
86-73-7	Fluorene	330	U
100-10-6	4-Nitroaniline	800	U
534-52-1	4,6-Dinitro-2-methylphenol	800	U
86-30-6	N-Nitrosodiphenylamine (1)	330	U
101-55-3	4-Bromophenyl-phenylether	330	U
118-74-1	Hexachlorobenzene	330	U
87-86-5	Pentachlorophenol	800	U
85-01-8	Phenanthrene	330	U
120-12-7	Anthracene	330	U
86-74-8	Carbazole	330	U
84-74-2	Di-n-Butylphthalate	62	J
206-44-0	Fluoranthene	330	U
129-00-0	Pyrene	330	U
85-68-7	Butylbenzylphthalate	330	U
91-94-1	3,3'-Dichlorobenzidine	330	U
56-55-3	Benzo(a)Anthracene	330	U
218-01-9	Chrysene	330	U
117-81-7	bis(2-Ethylhexyl)Phthalate	330	U
117-84-0	Di-n-Octyl Phthalate	330	U
205-99-2	Benzo(b)Fluoranthene	330	U
207-08-9	Benzo(k)Fluoranthene	330	U
50-32-8	Benzo(a)Pyrene	330	U
193-39-5	Indeno(1,2,3-cd)Pyrene	330	U
53-70-3	Dibenz(a,h)Anthracene	330	U
191-24-2	Benzo(g,h,i)Perylene	330	U

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

SBLKS

Lab Name: CH2M HILL/MGM Contract: _____

Code: _____ Case No.: 21297 SAS No.: _____ SDG No.: _____

Matrix: (soil/water) SOIL Lab Sample ID: S04022B1

Sample wt/vol: 30.0 (g/mL) G Lab File ID: ABBA013537

Level: (low/med) LOW Date Received: 04/02/92

% Moisture: 0 decanted: (Y/N) N Date Extracted: 04/02/92

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 04/06/92

Injection Volume: 2.0(uL) Dilution Factor: 1.0

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

mber TICs found: 4

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 6938-94-9	HEXANEDIOIC ACID, BIS(1-METH	16.30	75	J
2.	NOT IDENTIFIED	3.52	3300	J
3.	NOT IDENTIFIED	4.42	40000	J
4.	NOT IDENTIFIED	6.18	940	J

ms

4C

PESTICIDE METHOD BLANK SUMMARY

EPA SAMPLE NO.

PBLK02

Lab Name: CH2M HILL/MGM Contract: _____

Lab Code: CH2M Case No.: 21297 SAS No.: _____ SDG No.: _____

Lab Sample ID: S04022B2 Lab File ID: _____

Matrix:(soil/water) SOIL Extraction:(SepF/Cont/Sonc) SONC

Sulfur Cleanup: (Y/N) Y Date Extracted: 04/02/92

Date Analyzed (1): 05/05/92 Date Analyzed (2): 05/05/92

Time Analyzed (1): 0129 Time Analyzed (2): 0129

Instrument ID (1): V6000A Instrument ID (2): V6000B

GC Column (1): SPB-5 ID: 0.53 (mm) GC Column (2): SPB-608 ID: 0.53 (mm)

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS AND MSD:

	EPA SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED 1	DATE ANALYZED 2
01	BS-06	21297001	05/05/92	05/05/92
02	BS-06DL	21297001DL	05/05/92	05/05/92
03	BS-07	21297002	05/05/92	05/05/92
04	BS-07DL	21297002DL	05/05/92	05/05/92
05	BS-08	21297003	05/05/92	05/05/92
06	BS-08DL	21297003DL	05/05/92	05/05/92
07	M-08	21297004	05/05/92	05/05/92
08	M-08DL	21297004DL	05/05/92	05/05/92

COMMENTS:

1D

PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

PBLK02

Lab Name: CH2M HILL/MGM Contract: _____

Code: CH2M Case No.: 21297 SAS No.: _____ SDG No.: _____

Matrix: (soil/water) SOIL Lab Sample ID: S04022B2

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

% Moisture: _____ decanted: (Y/N) ___ Date Received: _____

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 04/02/92

Concentrated Extract Volume: 5000 (uL) Date Analyzed: 05/05/92

Injection Volume: 2.00 (uL) Dilution Factor: 1.00

GPC Cleanup: (Y/N) Y pH: 7.0 Sulfur Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
319-84-6	alpha-BHC	1.7	U
319-85-7	beta-BHC	1.7	U
319-86-8	delta-BHC	1.7	U
58-89-9	gamma-BHC (Lindane)	1.7	U
76-44-8	Heptachlor	1.7	U
309-00-2	Aldrin	1.7	U
1024-57-3	Heptachlor epoxide	1.7	U
959-98-8	Endosulfan I	1.7	U
60-57-1	Dieldrin	3.3	U
72-55-9	4,4'-DDE	3.3	U
72-20-8	Endrin	3.3	U
33213-65-9	Endosulfan II	3.3	U
72-54-8	4,4'-DDD	3.3	U
1031-07-8	Endosulfan sulfate	3.3	U
50-29-3	4,4'-DDT	3.3	U
72-43-5	Methoxychlor	17	U
53494-70-5	Endrin ketone	3.3	U
7421-36-3	Endrin aldehyde	3.3	U
5103-71-9	alpha-Chlordane	1.7	U
5103-74-2	gamma-Chlordane	1.7	U
8001-35-2	Toxaphene	170	U
12674-11-2	Aroclor-1016	33	U
11104-28-2	Aroclor-1221	67	U
11141-16-5	Aroclor-1232	33	U
53469-21-9	Aroclor-1242	33	U
12672-29-6	Aroclor-1248	33	U
11097-69-1	Aroclor-1254	33	U
11096-82-5	Aroclor-1260	33	U

8A

VOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: CH2M HILL/MGM Contract: _____

Lab Code: _____ Case No.: 21297 SAS No.: _____ SDG No.: _____

Lab File ID (Standard): CSVO021250 Date Analyzed: 03/30/92

Instrument ID: 4500 Time Analyzed: 2126

GC Column: CAP ID: 0.530(mm) Heated Purge: (Y/N) Y

		IS1(BCM) AREA #	RT #	IS2(DFB) AREA #	RT #	IS3(CBZ) AREA #	RT #
	12 HOUR STD	80035	11.04	320963	12.54	285694	17.44
	UPPER LIMIT	160070	11.54	641926	13.04	571388	17.94
	LOWER LIMIT	40018	10.54	160482	12.04	142847	16.94
	EPA SAMPLE NO.						
01	BS-06	58182	10.99	235085	12.52	206613	17.44
02	BS-07	65076	10.99	249244	12.52	206800	17.42
03	BS-08	60575	10.97	235945	12.50	203850	17.42
04	M-08	66162	10.90	251839	12.45	186556	17.37
05	VBLKS	59713	11.00	238169	12.50	216967	17.42

IS1 (BCM) = Bromochloromethane
IS2 (DFB) = 1,4-Difluorobenzene
IS3 (CBZ) = Chlorobenzene-d5

AREA UPPER LIMIT = + 100% of internal standard area.
AREA LOWER LIMIT = - 50% of internal standard area.
RT UPPER LIMIT = +0.50 minutes of internal standard RT.
RT LOWER LIMIT = -0.50 minutes of internal standard RT.

Column used to flag values outside QC limits with an asterisk.
* Values outside of QC limits.

8B

SEMIVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: CH2M HILL/MGM Contract: _____

Job Code: _____ Case No.: 21297 SAS No.: _____ SDG No.: _____

Lab File ID (Standard): ASBA013534 Date Analyzed: 04/06/92

Instrument ID: 4000 Time Analyzed: 0631

		IS1(DCB) AREA #	RT #	IS2(NPT) AREA #	RT #	IS3(ANT) AREA #	RT #
	12 HOUR STD	10986	8.37	48503	11.74	31416	16.57
	UPPER LIMIT	21972	8.87	97006	12.24	62832	17.07
	LOWER LIMIT	5493	7.87	24252	11.24	15708	16.07
	EPA SAMPLE NO.						
01	BS-06	14352	8.35	69828	11.74	41806	16.60
02	BS-07	12269	8.42	57873	11.75	35147	16.60
03	SBLKS	12007	8.32	60265	11.74	38276	16.60

IS1 (DCB) = 1,4-Dichlorobenzene-d4
IS2 (NPT) = Naphthalene-d8
IS3 (ANT) = Acenaphthene-d10

AREA UPPER LIMIT = + 100% of internal standard area.
AREA LOWER LIMIT = - 50% of internal standard area.
RT UPPER LIMIT = +0.50 minutes of internal standard RT.
RT LOWER LIMIT = -0.50 minutes of internal standard RT.

Column used to flag internal standard area values with an asterisk.
* Values outside of QC limits.

8C

SEMIVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: CH2M HILL/MGM Contract: _____

Lab Code: _____ Case No.: 21297 SAS No.: _____ SDG No.: _____

Lab File ID (Standard): ASBA013534 Date Analyzed: 04/06/92

Instrument ID: 4000 Time Analyzed: 0631

		IS4(PHN) AREA #	RT #	IS5(CRY) AREA #	RT #	IS6(PRY) AREA #	RT #
	12 HOUR STD	46395	20.64	37894	28.17	36362	31.94
	UPPER LIMIT	92790	21.14	75788	28.67	72724	32.44
	LOWER LIMIT	23198	20.14	18947	27.67	18181	31.44
	EPA SAMPLE NO.						
01	BS-06	70669	20.65	57313	28.19	58401	31.99
02	BS-07	57308	20.67	46557	28.19	46327	31.99
03	SBLKS	60540	20.65	50339	28.19	46014	31.99

IS4 (PHN) = Phenanthrene-d10
IS5 (CRY) = Chrysene-d12
IS6 (PRY) = Perylene-d12

AREA UPPER LIMIT = + 100% of internal standard area.
AREA LOWER LIMIT = - 50% of internal standard area.
RT UPPER LIMIT = +0.50 minutes of internal standard RT.
RT LOWER LIMIT = -0.50 minutes of internal standard RT.

Column used to flag internal standard area values with an asterisk.
* Values outside of QC limits.

8B

SEMIVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: CH2M HILL/MGM Contract: _____

Lab Code: _____ Case No.: 21297 SAS No.: _____ SDG No.: _____

Lab File ID (Standard): ASBA013544 Date Analyzed: 04/07/92

Instrument ID: 4000 Time Analyzed: 1009

		IS1(DCB) AREA #	RT #	IS2(NPT) AREA #	RT #	IS3(ANT) AREA #	RT #
	12 HOUR STD	8867	8.15	40211	11.49	22538	16.32
	UPPER LIMIT	17734	8.65	80422	11.99	45076	16.82
	LOWER LIMIT	4434	7.65	20106	10.99	11269	15.82
	EPA SAMPLE NO.						
01	BS-08	8910	8.10	44568	11.47	29676	16.29
02	M-08	9075	8.15	44460	11.50	28519	16.35

IS1 (DCB) = 1,4-Dichlorobenzene-d4
IS2 (NPT) = Naphthalene-d8
IS3 (ANT) = Acenaphthene-d10

AREA UPPER LIMIT = + 100% of internal standard area.
AREA LOWER LIMIT = - 50% of internal standard area.
RT UPPER LIMIT = +0.50 minutes of internal standard RT.
RT LOWER LIMIT = -0.50 minutes of internal standard RT.

Column used to flag internal standard area values with an asterisk.
* Values outside of QC limits.

8C

SEMIVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: CH2M HILL/MGM Contract: _____

Lab Code: _____ Case No.: 21297 SAS No.: _____ SDG No.: _____

Lab File ID (Standard): ASBA013544 Date Analyzed: 04/07/92

Instrument ID: 4000 Time Analyzed: 1009

		IS4(PHN) AREA #	RT #	IS5(CRY) AREA #	RT #	IS6(PRY) AREA #	RT #
	12 HOUR STD	36176	20.35	36903	27.87	38320	31.67
	UPPER LIMIT	72352	20.85	73806	28.37	76640	32.17
	LOWER LIMIT	18088	19.85	18452	27.37	19160	31.17
	EPA SAMPLE NO.						
01	BS-08	52983	20.34	51624	27.82	49972	31.62
02	M-08	50832	20.37	48201	27.89	47644	31.66

IS4 (PHN) = Phenanthrene-d10
IS5 (CRY) = Chrysene-d12
IS6 (PRY) = Perylene-d12

AREA UPPER LIMIT = + 100% of internal standard area.
AREA LOWER LIMIT = - 50% of internal standard area.
RT UPPER LIMIT = +0.50 minutes of internal standard RT.
RT LOWER LIMIT = -0.50 minutes of internal standard RT.

Column used to flag internal standard area values with an asterisk.
* Values outside of QC limits.

SAMPLE DATA PACKAGE

SAMPLE DATA PACKAGE

CASE NARRATIVE

Engineers
Planners
Economists
Scientists

CASE NARRATIVE FOR VOLATILE MASS SPECTROMETRY SAMPLES

LABORATORY: CH2M HILL LABORATORIES CLIENT: BARR ENGINEERING

CASE NO. : N/A CONTRACT NO.: N/A

LAB NO. : 21297 SDG NO.: N/A

I. RECEIPT

A. DATE: March 26, 1992

B. SAMPLE INFORMATION

LAB ID	CLIENT ID	SAMPLE MATRIX	DATE SAMPLED	EXTRACTION DATE	ANALYSIS DATE
21297001	BS-06	SOIL	03/25/92	NA	03/31/92
21297002	BS-07	SOIL	03/25/92	NA	03/31/92
21297003	BS-08	SOIL	03/25/92	NA	03/31/92
21297004	M-08	SOIL	03/25/92	NA	03/31/92
Y03302B3	VBLKS	SOIL	NA	NA	03/30/92

C. Documentation
Exceptions : No exceptions were encountered.

CH2M HILL Quality Analytical Laboratories 2567 Fairlane Drive, P.O. Box 230548, Montgomery, Alabama 36116 205 271 1444

II. EXTRACTION

A. Holding Times: Medium level protocol was not performed; therefore, extraction time is not applicable.

B. Extraction Exceptions : Not applicable.

III. ANALYSIS

A. Holding times: All holding times were met.

B. Analytical Exceptions : No exceptions were encountered.

IV. QUALITY CONTROL

A. Method Blank : All associated method blanks met acceptable QC criteria.

B. Surrogate Recoveries : All samples met acceptable QC limits.

C. Matrix Spike Results : The native sample, matrix spike, and matrix spike duplicate results are contained within another batch of samples. The results will be reported with the results of our laboratory contract number 21281.

Please note that Forms II, IV, V, and VIII have numbers to the immediate left of each table. These numbers are sequential only and have no relation to CH2M HILL identification numbers.

I 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 contained in this hardcopy data package and in the computer-readable data submitted on floppy diskette has been authorized by the Laboratory Manager or his designee, as verified by the following signature.

Herb Kelly 5/15/92

Herb Kelly Date
Manager, Organic Division

CH2M HILL Quality Analytical Laboratories 2567 Fairlane Drive, P.O. Box 230548, Montgomery, Alabama 36116 205 271 1444

Engineers
Planners
Economists
Scientists

CASE NARRATIVE FOR SEMIVOLATILE MASS SPECTROMETRY SAMPLES

LABORATORY: CH2M HILL LABORATORIES CLIENT: BARR ENGINEERING

CASE NO. : N/A CONTRACT NO.: N/A

LAB NO. : 21297 SDG NO.: N/A

I. RECEIPT

A. DATE: March 26, 1992

B. SAMPLE INFORMATION

LAB ID	CLIENT ID	SAMPLE MATRIX	DATE SAMPLED	EXTRACTION DATE	ANALYSIS DATE
21297001	BS-06	SOIL	03/25/92	04/02/92	04/06/92
21297002	BS-07	SOIL	03/25/92	04/02/92	04/06/92
21297003	BS-08	SOIL	03/25/92	04/02/92	04/07/92
21297004	M-08	SOIL	03/25/92	04/02/92	04/07/92
S04022B1	SBLKS	SOIL	NA	04/02/92	04/06/92

C. Documentation Exceptions : Please note that the amount listed on the quantitation report reflects the mass detected at the instrument. According to the CLP Statement of Work, 2-uL injections must be made. Therefore, the amount on the quantitation report must be divided by a factor of two in order to determine the concentration of the extract injected.

No other exceptions were encountered.

CH2M HILL Quality Analytical Laboratories 2567 Fairlane Drive, P.O. Box 230548, Montgomery, Alabama 36116 205 271 1444

II. EXTRACTION

A. Holding Times: All holding times were met.

B. Extraction Exceptions : No exceptions were encountered.

III. ANALYSIS

A. Holding times: All holding times were met.

B. Analytical Exceptions : No exceptions were encountered.

IV. QUALITY CONTROL

A. Method Blank : All associated method blanks met acceptable QC criteria.

B. Surrogate Recoveries : All samples met acceptable QC limits.

C. Matrix Spike Results : The native sample, matrix spike, and matrix spike duplicate results are contained within another batch of samples. The results will be reported with the results of our laboratory contract number 21232.

Please note that Forms II, IV, V, and VIII have numbers to the immediate left of each table. These numbers are sequential only and have no relation to CH2M HILL identification numbers.

I 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 contained in this hardcopy data package and in the computer-readable data submitted on floppy diskette has been authorized by the Laboratory Manager or his designee, as verified by the following signature.

Herb Kelly 5/15/92

Herb Kelly Date
Manager, Organic Division

CH2M HILL Quality Analytical Laboratories 2567 Fairlane Drive, P.O. Box 230548, Montgomery, Alabama 36116 205 271 1444

Engineers
Planners
Economists
Scientists

CASE NARRATIVE FOR PESTICIDE/PCB GAS CHROMATOGRAPHY SAMPLES

LABORATORY: CH2M HILL LABORATORIES CLIENT: BARR ENGINEERING

CASE NO. : N/A CONTRACT NO.: N/A

LAB NO. : 21297 SDG NO.: N/A

I. RECEIPT

A. DATE: March 26, 1992

B. SAMPLE INFORMATION

LAB ID	CLIENT ID	SAMPLE MATRIX	DATE SAMPLED	EXTRACTION DATE	ANALYSIS DATE
21297001	BS-06	SOIL	03/25/92	04/02/92	04/05/92
21297001DL	BS-06DL	SOIL	03/25/92	04/02/92	04/05/92
21297002	BS-07	SOIL	03/25/92	04/02/92	04/05/92
21297002DL	BS-07DL	SOIL	03/25/92	04/02/92	04/05/92
21297003	BS-08	SOIL	03/25/92	04/02/92	04/05/92
21297003DL	BS-08DL	SOIL	03/25/92	04/02/92	04/05/92
21297004	M-08	SOIL	03/25/92	04/02/92	04/05/92
21297004DL	M-08DL	SOIL	03/25/92	04/02/92	04/05/92
S04022B2	PBLK02	SOIL	NA	04/02/92	04/05/92

C. Documentation
Exceptions : No exceptions were encountered.

II. EXTRACTION

A. Holding times: All holding times were met.

B. Extraction
Exceptions : No exceptions were encountered.

CH2M HILL Quality Analytical Laboratories 2567 Fairlane Drive, P.O. Box 230548, Montgomery, Alabama 36116 205 271 1444

III. ANALYSIS

A. Holding times: All holding times were met.

B. Analytical Exceptions : Internal standards were added to the pesticide/PCB samples before injection for internal QC purposes only. According to CLP protocol, only external standard calculations were performed for this report.

No exceptions were encountered.

IV. QUALITY CONTROL

A. Method Blank : Except for the low surrogate recoveries, all associated method blanks met acceptable QC criteria.

B. Surrogate Recoveries : Both surrogate recoveries were somewhat low for the method blank. All other samples met acceptable QC limits.

C. Matrix Spike Results : The native sample, matrix spike, and matrix spike duplicate results are contained within another batch of samples. The results will be reported with the results of our laboratory contract number 21232.

D. Special Conditions : Primary and confirmation data was acquired by a single injection into a dual column/ECD system.

Please note that Forms II, IV, V, and VIII have numbers to the immediate left of each table. These numbers are sequential only and have no relation to CH2M HILL identification numbers.

I 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 contained in this hardcopy data package and in the computer-readable data submitted on floppy diskette has been authorized by the Laboratory Manager or his designee, as verified by the following signature.

Herb Kelly 5/15/92
Herb Kelly Date
Manager, Organic Division

CH2M HILL Quality Analytical Laboratories 2567 Fairlane Drive, P.O. Box 230548, Montgomery, Alabama 36116 205.271 1444

SAMPLE DATA PACKAGE

SHIPPING RECEIPTS

7803 GLENROY ROAD
MINNEAPOLIS, MN 55439

PROJECT NUMBER № 01876
13/49-003JSL31

NO: WAUKEGAN COKE PLANT RI

JIM LANGSETH

PROJECT CONTACT: MARY MACKEY

LABORATORY: CH2M HILL

SAMPLE IDENTIFICATION	COLLECTION DATE	COLLECTION TIME	GRAB	COMP.	BLANK	VOLATILE ORGANIC CLP TCL	SEMIVOLATILE ORGANIC	~~FILTERED~~ METALS CLP TAL	UNFILTERED METALS	GENERAL	CYANIDE	NUTRIENTS	OIL AND GREASE	TOC	SULFIDE	DIOXIN	EXTRACTABLES CLP TCL	PESTICIDES/PCB CLP TCL	PAH's	PAH/PHENOLS	TOTAL NO. OF CONTAINERS	REMARKS/ ANALYSIS REQUIRED:
BS-06	3/25/92	AM	X	X		X		X			X						X	X			4	001
BS-07	↓	↓	X	X		X		X			X						X	X			4	002
BS-08	↓	↓	X	X		X		X			X						X	X			4	003
M-08	↓	↓	X	X		X		X			X						X	X			4	004
Method Blank																						251

FOR LAB USE ONLY

LAB # 21297
PROJ # LMG33486.XH
ACK SH 3/30 VERIFIED [illegible]
HAZ [illegible] Y (N)
QC LEVEL (J)
COC Yes ICE Yes
ANA REQ Yes TEMP [illegible]
CUST SEAL Yes PH NA
SAMPLE COND Seal

SAMPLED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY LAB:	DATE	TIME
(JMF) [signature]	(JMF) [signature]	3/25/92	PM			
RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY LAB:	DATE	TIME
RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY LAB: [signature]	DATE 3/26/92	TIME 0901

REMARKS:

SAMPLES SHIPPED VIA
☐ AIR FREIGHT ☒ FED. EXP. ☐ SAMPLER
☐ OTHER

AIR BILL NUMBER: 052436600

DISTRIBUTION: WHITE-ORIGINAL ACCOMPANIES SHIPMENT TO LAB, RETURNS TO BARR WITH RESULTS; YELLOW-LAB COPY; PINK-LAB COORDINATOR; GOLD-FIELD COPY

[illegible] 3/26/92 C3X 51458

000062

Laboratory No. 21396

-- Volatiles

-- Semivolatiles

-- Pesticides

-- Metals

Seven investigative water samples (MW3S1, MW3D1, MW4S1, MW4D1, MW4D1 duplicate, FB, and TB) were collected April 7, 1992. Seven samples were analyzed for volatiles; and six samples were analyzed for semivolatiles, pesticide/PCBS and metals.

Holding Times

Holding times were met on all samples and analyses.

Instrument Tuning

Volatiles

GC/MS Tuning met the established method performance criteria for compounds, concentrations, frequencies and relative ion abundances for the volatiles analyses.

Semivolatiles

GC/MS Tuning met the established method performance criteria for compounds, concentrations, frequencies and relative ion abundances for the semivolatiles analyses.

Pesticides

Instrument performance was acceptable for retention times, retention time windows, and DDT and Endrin degradation for all samples.

Metals

Instrument tuning does not apply to the metals analyses.

Instrument Calibration

Volatiles

Initial calibration percent relative standard deviation (%RSD) and continuing calibration percent difference (%D) values for two volatile parameters were outside the appropriate control limits. Control limits for %RSD and %D were ≤30 percent and ≤25 percent, respectively.

The volatiles analyses initial calibration parameter and associated %RSD value beyond control limits was chloroethane (32.4 percent). Parameters with %D outlier values were target compounds bromomethane (-37.5 percent) and chloroethane (-39.0 percent). These compounds were not detected in any of the associated samples, so no action was taken.

Semivolatiles

Initial calibration percent relative standard deviation (%RSD) and continuing calibration percent difference (%D) values for two semivolatile parameters were outside of the appropriate control limits. Control limits for %RSD and %D were ≤30 percent and ≤25 percent, respectively.

The semivolatiles analyses initial calibration parameter and associated %RSD value beyond control limits was 2,4-dinitrophenol (33.9 percent). Compounds with %D outlier values were 2,4-dinitrophenol (-36.3 percent and -60.7 percent) and the surrogate standard 2,4,6-tribromophenol (-77.4). The target compound was not detected in the associated samples, so no data were qualified.

Pesticides

Pesticide/PCB analyses instrument calibration %RSD and %D values were within the appropriate quality control limits. Resolution check mixture and performance evaluation mixture samples were analyzed at the proper frequency. All retention time and RPD values were within control limits.

Metals

Instrument calibrations were completed the proper number of times using the appropriate number and type of standards and blanks. Initial and continuing calibration percent recovery values were acceptable for all metals analyses.

Blanks

Volatiles

Methylene chloride (5 J and 4 J µg/L), Acetone (3 J and 4 J µg/L), and 2-butanone (5 J µg/L) were detected in the volatiles blanks. Sample results less than five times the associated blank concentration of 2-butanone or less than ten times the associated blank concentration of either remaining compound were qualified as nondetects and flagged "U."

Semivolatiles

The semivolatiles method blank had concentrations of di-n-butylphthalate (4 J µg/L). Sample results less than ten times the blank concentration of this compound were qualified as nondetects and flagged "U."

Pesticides

No compounds were detected in this blank.

Metals

Total metals analyses calibration and preparation blanks had concentrations of aluminum, antimony, arsenic, beryllium, calcium, copper, iron, magnesium, manganese, mercury, nickel, sodium, and zinc. These concentrations were greater than the instrument detection limit (IDL) but less than the contract required detection limit (CRDL). Sample results for these compounds less than five times the blank concentration were qualified as nondetects and flagged "U."

Surrogate Recovery

Volatiles

Recoveries for the volatiles system monitoring compounds were within the established quality control limits.

Semivolatiles

Semivolatiles surrogate recoveries were not determined for samples MW4D1, MW4D1 duplicate, MW3D1 and MW3D1DL due to the large dilutions required for analysis. No data were qualified.

Pesticides

Pesticide/PCB surrogate compound percent recoveries for Tetrachloro-m-xylene for sample MW4S1 and the method blank were outside control limits. All results for these two samples were qualified as estimated and flagged "J."

Metals

Total metals analyses ICP interference check sample recoveries and laboratory control sample results were within the established quality control limits.

Matrix Spike/Matrix Spike Duplicate

Volatiles

Volatiles analyses matrix spike/matrix spike duplicate samples percent recovery and RPD values were within the appropriate control limits for all spike compounds.

Semivolatiles

Semivolatiles analyses matrix spike/matrix spike duplicate samples recoveries for phenol (10 percent), 1,2,4-trichlorobenzene (34 percent) and acenaphthene (35 percent) were beyond control limits. RPD outliers were phenol (163 percent) and acenaphthene (33 percent). Since the matrix spike duplicate sample recoveries for all spike compounds met the established performance criteria, no action was taken.

Pesticides

Pesticide/PCB matrix spike/matrix spike duplicate samples had acceptable recovery and RPD values for all compounds.

Metals

Metals analyses quality control samples included a duplicate sample, a spike sample, post digestion spike samples, and an ICP serial dilution sample.

Duplicate samples RPD values for Antimony (200 percent), beryllium (24.0 percent), cadmium (200.0 percent), chromium (200.0 percent) and selenium (200.0 percent) were beyond the control limits. Investigative sample results for these compounds were qualified as estimated and flagged *"J."*

Recoveries for the spike sample were within control limits for all spike compounds.

Lead recoveries were beyond control limits for samples MW3D1 (83.6 percent), MW4D1 (68.4 percent) and MW4D1 duplicate (70.9 percent). Selenium recoveries were outside the control limits in samples MW3D1 (58.2 percent), MW3S1 (72.4 percent), MW4D1 (72.0 percent), MW4D1 duplicate (52.7 percent) and MW4S1 (76.5 percent). Also beyond control limits were thallium recoveries on samples MW3D1 (44.7 percent), MW4D1 (48.7 percent) and MW4D1 duplicate (48.0 percent). These compounds were qualified as estimated and flagged "J" in the affected samples.

ICP serial dilution results for zinc (34.5 percent) were outside the 10 percent difference control limit. This compound was qualified as estimated and flagged "J" in the associated samples.

Field Duplicates

Field duplicates are summarized in Tables 2.3-6 through 2.3-11.

Overall Assessment

The data are considered acceptable with the recommended qualifiers.

CH2M HILL
Engineers
Planners
Economists
Scientists

RECEIVED
JUN 0 5 92
BARR ENGINEERING

May 19, 1992

LMG33486.XY

Ms. Marti Harding-Smith
Barr Engineering Company
8300 Norman Center Drive
Suite 300
Minneapolis, Minnesota 55437-1026

RE: Analytical Data for 13/49-003JSL31, LMG Laboratory No. 21396

Dear Ms. Harding-Smith:

On April 8, 1992, the CH2M HILL Montgomery Laboratory received six samples with a request for analysis of selected inorganic parameters.

The analytical results and associated quality control data are enclosed. Any unusual difficulties encountered during the analysis of your samples are discussed in the case narratives.

Under CH2M HILL policy, your samples will be stored for up to 30 days after reporting. If you have not given us prior instructions for disposal, we will contact you if any samples require disposal as hazardous waste.

CH2M HILL Laboratories appreciate your business and look forward to serving your analytical needs again. If you should have any questions concerning the data, or if you need additional information, please call.

Sincerely,

Wanda L. Hall

Wanda L. Hall
Data Package Supervisor

Enclosures

cc: Mr. Jim Langseth

Engineers
Planners
CH2M HILL
Economists
Scientists

TABLE OF CONTENTS

CH2M HILL Laboratory No. 21396

	Page No.
List of Inorganic EPA-defined Qualifiers	i
Sample Cross-Reference	ii
CATIONS DATA PACKAGE	1
Case Narrative	2-3
Cover Page	4
Analytical Results of Field Samples	
MW3S-1 (LMG #21396001)	5
MW3D-1 (LMG #21396002)	6
FB-1 (LMG #21396003)	7
MW4S-1 (LMG #21396004)	8
MW4D-1 (LMG #21396005)	9
M-1 (LMG #21396006)	10
Quality Control Data	
Initial & Continuing Calibration Verification	11-16
CRDL Standard for AA	17-18
Blank Data	19-22
ICP Interference Check Sample	23
Spike Sample Recovery	24
Post Digest Spike Sample Data	25-32
Duplicate Sample Data	33
Laboratory Control Sample	34
ICP Serial Dilution	35
Instrument Detection Limits	36-38
ICP Interelement Correction Factors	39-42
ICP Linear Ranges	43
Preparation Log	44-47
Analysis Run Log	48-73
Raw Data	
ICP Data	74-130
Arsenic Data (GFAA)	131-225
Lead Data (GFAA)	226-264
Selenium Data (GFAA)	265-323
Thallium Data (GFAA)	324-374
Mercury Data	375-377
Cyanide Data	378-392
Digestion/Distillation Logs	393-398
Copy of Chain-of-custody	399-402

EPA QUALIFIERS

INORGANIC ANALYSES

- C (Concentration) Qualifier -- Enter "B" if the reported value obtained was less than the CRDL but greater than or equal to the IDL. Enter "U" if the value was less than the IDL or was not detected.

- Q Qualifier -- Entries and their meanings are:

  E - The reported value is estimated because of interference. An explanatory comment must be included under "Comments" on the Cover Page if the problem applies to all samples in this data package or on the individual FORM I if it is an isolated problem.

  M - Duplicate injection precision was not met (two analyses of the same sample did not agree).

  N - Spiked sample recovery not within control limits.

  S - The reported value was determined by the Method of Standard Additions (MSA).

  W - Post-digestion spike for Furnace AA analysis is out of control limits (85-115%), while sample absorbance is less than 50% of spike absorbance.

  * - Duplicate analysis not within control limits.

  + - Correlation coefficient for the MSA is less than 0.995.

  Entering "S", "W", or "+" is mutually exclusive. No combination of these qualifiers can appear in the same field.

- M (Method) Qualifier -- Enter one of the following:

  P - ICP
  A - Flame AA
  F - Furnace AA
  CV - Manual Cold Vapor AA
  AV - Automated Cold Vapor AA
  AS - Semi-Automated Spectrophotometric
  C - Manual Spectrophotometric
  T - Titrimetric
  NR - Analyte was not required by your lab

CH2M HILL Quality Analytical Laboratories 2567 Fairlane Drive, P.O. Box 230548, Montgomery, Alabama 36116 205 271 1444

Engineers
Planners
Economists
Scientists

CLIENT SAMPLE CROSS-REFERENCE

CH2M HILL Laboratory No. 21396

LMG Sample No.	Client ID
21396001	MW3S-1
21396002	MW3D-1
21396003	FB-1
21396004	MW4S-1
21396005	MW4D-1
21396006	M-1

CH2M HILL
Quality Analytical Laboratories
2567 Fairlane Drive, P.O. Box 230548, Montgomery, Alabama 36116
205 271 1444

CATIONS DATA PACKAGE

Engineers
Planners
CH2M HILL Economists
Scientists

CASE NARRATIVE
Cations

Batch Number: 21396

Client/Project: BARR ENGINEERING COMPANY

I. Holding Time:
All holding times were met.

II. Analysis:

A. Blanks:
All acceptance criteria were met.

B. Calibration:
All acceptance criteria were met.

C. ICP Interference Check Sample:
All acceptance criteria were met.

D. Spike Sample Analysis:
Postspike recoveries outside criteria are flagged accordingly.

E. Duplicate Sample Analysis:
All acceptance criteria were met.

F. Laboratory Control Sample Analysis:
All acceptance criteria were met.

G. ICP Serial Dilution:
ICP serial dilutions outside criteria are flagged accordingly.

H. Other:
Mercury QC data and serial dilution QC data are included in this data package. Remaining QC data is included in data package 21405.

III. I certify that this data package is in compliance with the terms and conditions agreed to by the client and CH2M HILL, both technically and for completeness, for other than the conditions detailed above.

SIGNED: _____ DATE: 19 MAY 92
Kevin A. Sanders
Inorganic Division Manager

CH2M HILL Quality Analytical Laboratories 2567 Fairlane Drive, P.O. Box 230548, Montgomery, Alabama 36116 205 271 1444

Engineers
Planners
CH2M HILL Economists
Scientists

CASE NARRATIVE
General Chemistry

Batch Number: 21396

Client/Project: BARR ENGINEERING COMPANY

I. Holding Time: All criteria were met.

II. Analysis:

A.	Calibration:	Acceptance criteria met.
B.	Blanks:	Acceptance criteria met.
C.	Matrix Spike:	Acceptance criteria met.
D.	Duplicate Analysis:	Acceptance criteria met.
E.	Lab Control Sample:	Acceptance criteria met.
F.	Other:	None.

III. I certify that this data package is in compliance with the terms and conditions agreed to by the client and CH2M HILL, both technically and for completeness, for other than the conditions detailed above.

SIGNED: _____ DATE: 19 MAY 92
Kevin A. Sanders
Inorganic Division Manager

CH2M HILL Quality Analytical Laboratories 2567 Fairlane Drive, P.O. Box 230548, Montgomery, Alabama 36116 205 271 1444

U.S. EPA - CLP

COVER PAGE - INORGANIC ANALYSES DATA PACKAGE

Lab Name: CH2M_HILL_MGM_____ Contract: 21396_____

Lab Code: NA____ Case No.: 21396 SAS No.: 21396_ SDG No.:21396_

SOW No.: 3/90_

EPA Sample No.	Lab Sample ID
_FB-1_____	__W21396003___
_M-1_____	__W21396006___
_MW3D-1_____	__W21396002___
_MW3S-1_____	__W21396001___
_MW3S-1D_____	__W21396001D__
_MW3S-1S_____	__W21396001S__
_MW4D-1_____	__W21396005___
_MW4S-1_____	__W21396004___

Were ICP interelement corrections applied ? Yes/No YES

Were ICP background corrections applied ? Yes/No YES
If yes - were raw data generated before application of background corrections ? Yes/No NO_

Comments:
____MERCURY_QC_DATA_AND_SERIAL_DILUTION_QC_DATA_ARE_INCLUDED_IN_THIS_DATA____
____PACKAGE._REMAINING_QC_DATA_IS_INCLUDED_IN_DATA_PACKAGE_21405._____

I 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 contained in this hardcopy data package and in the computer-readable data submitted on floppy diskette has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature.

Signature: _____ Name: Kevin A. Sanders_____

Date: 13MAY92 Title: Inorganic Division Mgr._

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

MW3S-1

Lab Name: CH2M_HILL_MGM_____ Contract: 21396_____

Lab Code: NA____ Case No.: 21396 SAS No.: 21396_ SDG No.: 21396_

Matrix (soil/water): WATER Lab Sample ID: W21396001_

Level (low/med): LOW__ Date Received: 04/08/92

% 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_	28.0	B		P_
7440-36-0	Antimony_	10.9	U		P_
7440-38-2	Arsenic__	134			F_
7440-39-3	Barium___	184	B		P_
7440-41-7	Beryllium	0.19	U		P_
7440-43-9	Cadmium__	3.2	B		P_
7440-70-2	Calcium__	117000			P_
7440-47-3	Chromium_	2.1	U		P_
7440-48-4	Cobalt___	3.6	U		P_
7440-50-8	Copper___	19.4	B		P_
7439-89-6	Iron____	1040			P_
7439-92-1	Lead____	1.8	B		F_
7439-95-4	Magnesium	25100			P_
7439-96-5	Manganese	885			P_
7439-97-6	Mercury__	0.00	U		CV
7440-02-0	Nickel___	3.8	U		P_
7440-09-7	Potassium	3460	B		P_
7782-49-2	Selenium_	2.6	B	W	F_
7440-22-4	Silver___	1.7	U		P_
7440-23-5	Sodium___	10900			P_
7440-28-0	Thallium_	1.7	U		F_
7440-62-2	Vanadium_	1.7	U		P_
7440-66-6	Zinc____	26.0		E	P_
	Cyanide__	115			CA

Color Before: CLEAR____ Clarity Before: CLEAR_ Texture: N/A___

Color After: CLEAR____ Clarity After: CLEAR_ Artifacts: _____

Comments:
THE_"E"_QUALIFIER_INDICATES_A_GREATER_THAN_10%_DIFFERENCE_BETWEEN_THE_ NATIVE_CONCENTRATION_AND_SERIAL_DILUTION_RESULTS._THE_"W"_QUALIFIER___ DENOTES_POOR_POSTSPIKE_RECOVERY.

U.S. EPA - CLP

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

MW3D-1

Lab Name: CH2M_HILL_MGM_____ Contract: 21396_____

Lab Code: NA____ Case No.: 21396 SAS No.: 21396_ SDG No.: 21396_

Matrix (soil/water): WATER Lab Sample ID: W21396002_

Level (low/med): LOW__ Date Received: 04/08/92

% 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_	58.9	B		P_
7440-36-0	Antimony_	10.9	U		P_
7440-38-2	Arsenic__	7110			F_
7440-39-3	Barium___	200	B		P_
7440-41-7	Beryllium	0.46	B		P_
7440-43-9	Cadmium__	12.4			P_
7440-70-2	Calcium__	17100			P_
7440-47-3	Chromium_	13.5			P_
7440-48-4	Cobalt___	8.0	B		P_
7440-50-8	Copper___	47.4			P_
7439-89-6	Iron_____	495			P_
7439-92-1	Lead_____	3.8		W	F_
7439-95-4	Magnesium	13200			P_
7439-96-5	Manganese	203			P_
7439-97-6	Mercury__	0.00	U		CV
7440-02-0	Nickel___	20.3	B		P_
7440-09-7	Potassium	13100			P_
7782-49-2	Selenium_	7.2	B	W	F_
7440-22-4	Silver___	1.7	U		P_
7440-23-5	Sodium___	55400			P_
7440-28-0	Thallium_	1.7	U	W	F_
7440-62-2	Vanadium_	103			P_
7440-66-6	Zinc_____	59.4		E	P_
	Cyanide__	200			CA

Color Before: ORANGE___ Clarity Before: CLOUDY Texture: N/A___

Color After: YELLOW___ Clarity After: CLOUDY Artifacts: _____

Comments:

FORM I - IN

3/90

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

FB-1

Lab Name: CH2M_HILL_MGM Contract: 21396

Lab Code: NA Case No.: 21396 SAS No.: 21396 SDG No.: 21396

Matrix (soil/water): WATER Lab Sample ID: W21396003

Level (low/med): LOW Date Received: 04/08/92

% 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	27.8	B		P
7440-36-0	Antimony	10.9	U		P
7440-38-2	Arsenic	0.94	U		F
7440-39-3	Barium	0.63	B		P
7440-41-7	Beryllium	0.19	U		P
7440-43-9	Cadmium	2.9	U		P
7440-70-2	Calcium	225	B		P
7440-47-3	Chromium	2.1	U		P
7440-48-4	Cobalt	3.6	U		P
7440-50-8	Copper	11.8	B		P
7439-89-6	Iron	35.0	B		P
7439-92-1	Lead	2.7	B		F
7439-95-4	Magnesium	21.3	U		P
7439-96-5	Manganese	0.92	B		P
7439-97-6	Mercury	0.00	U		CV
7440-02-0	Nickel	3.8	U		P
7440-09-7	Potassium	710	U		P
7782-49-2	Selenium	1.2	U		F
7440-22-4	Silver	1.7	U		P
7440-23-5	Sodium	757	B		P
7440-28-0	Thallium	1.7	U		F
7440-62-2	Vanadium	1.7	U		P
7440-66-6	Zinc	23.7		E	P
	Cyanide	1.8	U		CA

Color Before: CLEAR Clarity Before: CLEAR Texture: N/A

Color After: CLEAR Clarity After: CLEAR Artifacts:

Comments:

FORM I - IN

3/90

U.S. EPA - CLP

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

MW4S-1

Lab Name: CH2M_HILL_MGM Contract: 21396

Lab Code: NA Case No.: 21396 SAS No.: 21396 SDG No.: 21396

Matrix (soil/water): WATER Lab Sample ID: W21396004

Level (low/med): LOW Date Received: 04/08/92

% 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	82.2	B		P
7440-36-0	Antimony	10.9	U		P
7440-38-2	Arsenic	18.4			F
7440-39-3	Barium	204			P
7440-41-7	Beryllium	0.19	B		P
7440-43-9	Cadmium	2.9	U		P
7440-70-2	Calcium	114000			P
7440-47-3	Chromium	2.1	U		P
7440-48-4	Cobalt	3.6	U		P
7440-50-8	Copper	30.6			P
7439-89-6	Iron	224			P
7439-92-1	Lead	0.92	U		F
7439-95-4	Magnesium	27600			P
7439-96-5	Manganese	370			P
7439-97-6	Mercury	0.00	U		CV
7440-02-0	Nickel	3.8	U		P
7440-09-7	Potassium	2880	B		P
7782-49-2	Selenium	1.2	U	W	F
7440-22-4	Silver	1.7	U		P
7440-23-5	Sodium	35600			P
7440-28-0	Thallium	1.7	U		F
7440-62-2	Vanadium	1.7	U		P
7440-66-6	Zinc	30.0		E	P
	Cyanide	7.1	B		CA

Color Before: CLEAR Clarity Before: CLEAR Texture: N/A

Color After: CLEAR Clarity After: CLEAR Artifacts:

Comments:

FORM I - IN

3/90

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

MW4D-1

Lab Name: CH2M_HILL_MGM_____ Contract: 21396_____

Lab Code: NA____ Case No.: 21396 SAS No.: 21396_ SDG No.: 21396_

Matrix (soil/water): WATER Lab Sample ID: W21396005_

Level (low/med): LOW__ Date Received: 04/08/92

% 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_	135	B		P_
7440-36-0	Antimony_	10.9	U		P_
7440-38-2	Arsenic__	22400			F_
7440-39-3	Barium___	402			P_
7440-41-7	Beryllium	0.19	U		P_
7440-43-9	Cadmium__	50.7			P_
7440-70-2	Calcium__	37200			P_
7440-47-3	Chromium_	15.4			P_
7440-48-4	Cobalt___	15.2	B		P_
7440-50-8	Copper___	43.8			P_
7439-89-6	Iron____	807			P_
7439-92-1	Lead____	4.1		W	F_
7439-95-4	Magnesium	20000			P_
7439-96-5	Manganese	326			P_
7439-97-6	Mercury__	0.00	U		CV
7440-02-0	Nickel___	46.7			P_
7440-09-7	Potassium	30000			P_
7782-49-2	Selenium_	6.0	U	W	F_
7440-22-4	Silver___	1.7	U		P_
7440-23-5	Sodium___	170000			P_
7440-28-0	Thallium_	1.7	U	W	F_
7440-62-2	Vanadium_	33.1	B		P_
7440-66-6	Zinc____	72.0		E	P_
	Cyanide__	706			CA

Color Before: ORANGE___ Clarity Before: CLOUDY Texture: N/A___

Color After: BROWN____ Clarity After: CLOUDY Artifacts: _____

Comments:

FORM I - IN

3/90

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

M-1

Lab Name: CH2M_HILL_MGM Contract: 21396

Lab Code: NA Case No.: 21396 SAS No.: 21396 SDG No.: 21396

Matrix (soil/water): WATER Lab Sample ID: W21396006

Level (low/med): LOW Date Received: 04/08/92

% 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	128	B		P
7440-36-0	Antimony	10.9	U		P
7440-38-2	Arsenic	27100			F
7440-39-3	Barium	448			P
7440-41-7	Beryllium	0.19	U		P
7440-43-9	Cadmium	50.3			P
7440-70-2	Calcium	39300			P
7440-47-3	Chromium	17.1			P
7440-48-4	Cobalt	16.6	B		P
7440-50-8	Copper	91.0			P
7439-89-6	Iron	975			P
7439-92-1	Lead	2.2	B	W	F
7439-95-4	Magnesium	22400			P
7439-96-5	Manganese	387			P
7439-97-6	Mercury	0.00	U		CV
7440-02-0	Nickel	82.2			P
7440-09-7	Potassium	34900			P
7782-49-2	Selenium	6.8	B	W	F
7440-22-4	Silver	1.7	U		P
7440-23-5	Sodium	181000			P
7440-28-0	Thallium	1.7	U	W	F
7440-62-2	Vanadium	37.0	B		P
7440-66-6	Zinc	84.2		E	P
	Cyanide	662			CA

Color Before: ORANGE Clarity Before: CLOUDY Texture: N/A

Color After: BROWN Clarity After: CLOUDY Artifacts:

Comments:

FORM I - IN

3/90

CHAIN OF CUSTODY
BARR ENGINEERING CO.
7803 GLENROY ROAD
MINNEAPOLIS, MN 55439

PROJECT NUMBER: 13/49-003 JSL 31
NO:

PROJECT MANAGER: JSL
PROJECT CONTACT: SDI
LABORATORY: CH2M Hill
REMARKS/ ANALYSIS REQUIRED: Level 3 QA/QC

CONTAINER TYPE AND NUMBER

SAMPLE IDENTIFICATION	COLLECTION DATE	COLLECTION TIME	GRAB	COMP.	BLANK	VOLATILE ORGANIC	SEMIVOLATILE ORGANIC	FILTERED METALS	UNFILTERED METALS	GENERAL	CYANIDE	NUTRIENTS	OIL AND GREASE	TOC	SULFIDE	DIOXIN											TOTAL NO. OF CONTAINERS	
MW3S-1	4/7/92		X			3	2																	0	0	1	5	See List
MW3D-1			X			3	2																	0	0	2	5	
FB-1					X	3	2																	0	0	3	5	
MW4S-1			X			3																		0	0	4	3	
MW4D-1			X			3																		0	0	5	3	21396
M-1			X			3	NEUTRAL PH																	0	0	6	3	SH 4/10
TB-1					X	3																		0	0	7	3	
																								1	5	6	8	
	METHOD BLANK																							2	1	1		

Page 1 of 3

SAMPLED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY LAB:	DATE	TIME
Eric Gabrielson ESJ	[signature]	4/7/92		[signature]	4/8/92	1545
RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY LAB:	DATE	TIME
RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY LAB:	DATE	TIME

REMARKS:

SAMPLES SHIPPED VIA
☐ AIR FREIGHT ☐ FED. EXP. ☒ SAMPLER
☐ OTHER

AIR BILL NUMBER:

DISTRIBUTION: WHITE-ORIGINAL ACCOMPANIES SHIPMENT TO LAB, RETURNS TO BARR WITH RESULTS; YELLOW-LAB COPY; PINK-LAB COORDINATOR, GOLD-FIELD COP

RS 4/8/92 C4855653

000400

.GINEERING CO.
GLENROY ROAD
MINNEAPOLIS, MN 55439

PROJECT NUMBER N° 01511
13/49-003 JSL 31
NO:

PROJECT MANAGER: JSL
PROJECT CONTACT: SDI
LABORATORY: CH2M Hill
REMARKS/ ANALYSIS REQUIRED: Level 3 QA/QC

CONTAINER TYPE AND NUMBER

SAMPLE IDENTIFICATION	COLLECTION DATE	COLLECTION TIME	GRAB	COMP.	BLANK	VOLATILE ORGANIC	SEMIVOLATILE ORGANIC	FILTERED METALS Below 2	UNFILTERED METALS	GENERAL	CYANIDE 002, 005, 006 → 001, 003, 004 → 12	NUTRIENTS	OIL AND GREASE	TOC	SULFIDE	DIOXIN											TOTAL NO. OF CONTAINERS
MW3D-1	4/7/92		X					1			1														002	2	
MW3S-1			X					1			1														001	2	
MW4D-1			X					1			1														005	2	See List
MW4S-1			X					1			1														004	2	
FB-1					X			1			1														003	2	
M-1			X					1			1														006	2	

* CN All below 12, Added NaOH flakes but only 001, 003, & 004 were brought ~~above~~ 12 ~~below~~ above 2 - BS 4/8/92
* Metals 002, 005, 006 All had neutral pts added 1 2N HNO3 and brought them to A.D.H. of below 2 BS 4/8/92

2139 6
SH
4/9/92
yes yes
yes yes
yes SEE ABOVE
page 2 of 3

SAMPLED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY LAB:	DATE	TIME
Eric Cabrielson KSJ	[signature]	4/7/92		[signature]	4/8/92	1341
RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY LAB:	DATE	TIME
RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY LAB:	DATE	TIME

REMARKS:

SAMPLES SHIPPED VIA
☐ AIR FREIGHT ☐ FED. EXP. ☒ SAMPLER
☐ OTHER

AIR BILL NUMBER:

DISTRIBUTIO ITE-ORIGINAL ACCOMPANIES SHIPMENT TO B, RETURNS TO B ITH RESULTS; YEL V-LAB COPY; PINK-LAB COORDINATOR; GO ED COPY

000401

EERING CO.
GLENROY ROAD
MINNEAPOLIS, MN 55439

PROJECT NUMBER Nº 01542
13/49-003T
NO:

PROJECT MANAGER: JSL
PROJECT CONTACT: SDI
LABORATORY: CH2MHill
REMARKS/ ANALYSIS REQUIRED: Level 3 QA/QC

SAMPLE IDENTIFICATION	COLLECTION DATE	COLLECTION TIME	GRAB	COMP.	BLANK	VOLATILE ORGANIC	SEMIVOLATILE ORGANIC	FILTERED METALS	UNFILTERED METALS	GENERAL	CYANIDE	NUTRIENTS	OIL AND GREASE	TOC	SULFIDE	DIOXIN											TOTAL NO. OF CONTAINERS	
M-1	4/7/92		X				2																			0.6	2	See List
MW4D-1			X				2																			0.5	2	
MW4S-1			X				2																			0.4	2	

[illegible] 21396
LMG [illegible]
[illegible] 4/9/92
[illegible] Yes [illegible] Yes
[illegible] Yes [illegible] 4°C
[illegible] Yes [illegible]
SAMPLE COND.

PAGE 3 of 3

SAMPLED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY LAB:	DATE	TIME
Eric Gaomeisn KSJ	[illegible]	4/7/92		[illegible]	4/8	1345
RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY LAB:	DATE	TIME
RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY LAB:	DATE	TIME

REMARKS:

SAMPLES SHIPPED VIA
☐ AIR FREIGHT ☐ FED. EXP. ☒ SAMPLER
☐ OTHER

AIR BILL NUMBER:

DISTRIBUTION: WHITE-ORIGINAL ACCOMPANIES SHIPMENT TO LAB, RETURNS TO BARR WITH RESULTS; YELLOW-LAB COPY; PINK-LAB COORDINATOR; GOLD-FIELD COPY

000402

Engineers
Planners
CH2M HILL Economists
Scientists

RECEIVED

JUN 0 5 92

BARR ENGINEERING

June 4, 1992

LMG33486.XY

Ms. Marti Harding-Smith
Barr Engineering Company
8300 Norman Center Drive
Suite 300
Minneapolis, Minnesota 55437-1026

RE: Analytical Data for 13/49-003JSL31, LMG Laboratory No. 21396

Dear Ms. Harding-Smith:

On April 8, 1992, the CH2M HILL Montgomery Laboratory received seven samples with a request for analysis of selected organic parameters.

The analytical results and associated quality control data are enclosed. Any unusual difficulties encountered during the analysis of your samples are discussed in the case narratives.

Under CH2M HILL policy, your samples will be stored for up to 30 days after reporting. If you have not given us prior instructions for disposal, we will contact you if any samples require disposal as hazardous waste.

CH2M HILL Laboratories appreciate your business and look forward to serving your analytical needs again. If you should have any questions concerning the data, or if you need additional information, please call.

Sincerely,

Wanda L. Hall

Wanda L. Hall
Data Package Supervisor

Enclosures

cc: Mr. Jim Langseth

Engineers
Planners
CH2M HILL Economists
Scientists

TABLE OF CONTENTS

CH2M HILL Laboratory No. 21396

	Page No.
List of Organic EPA-defined Qualifiers	i
List of Sample ID Qualifiers	ii
Sample Cross-Reference	iii
List of Internal Standards and Surrogates (Volatiles)	iv
List of Internal Standards and Surrogates (Semivolatiles)	v
SAMPLE DATA SUMMARY PACKAGE	1-84
SAMPLE DATA PACKAGE	85
Case Narratives	86-92
Shipping Receipts	93-96
Volatile Data	97
QC Summary	98-109
Sample Data (Analytical Results of Field Samples)	110
MW3S-1 (LMG #21396001)	111-124
MW3D-1 (LMG #21396002)	125-151
MW3D-1 DL (LMG #21396002DL)	152-174
FB-1 (LMG #21396003)	175-191
MW4S-1 (LMG #21396004)	192-201
MW4D-1 (LMG #21396005)	202-226
MW4D-1 DL (LMG #21396005DL)	227-245
M-1 (LMG #21396006)	246-266
M-1 DL (LMG #21396006DL)	267-287
TB-1 (LMG #21396007)	288-299
Standards Data	300
Initial Calibration Data	301-327
Continuing Calibration Data	328-346
Raw QC Data	347
BFB Data	348-364
Blank Data	365-400

CH2M HILL Quality Analytical Laboratories 2567 Fairlane Drive, P.O. Box 230548, Montgomery, Alabama 36116 205 271 1444

Engineers
Planners
Economists
Scientists

TABLE OF CONTENTS (cont.)

CH2M HILL Laboratory No. 21396

		Page No.
Semivolatile Data		401
QC Summary		402-411
Sample Data (Analytical Results of Field Samples)		412
MW3S-1	(LMG #21396001)	413-429
MW3D-1	(LMG #21396002)	430-446
MW3D-1 DL	(LMG #21396002DL)	447-463
FB-1	(LMG #21396003)	464-485
MW4S-1	(LMG #21396004)	486-547
MW4S-1 DL	(LMG #21396004DL)	548-585
MW4D-1	(LMG #21396005)	586-602
M-1	(LMG #21396006)	603-619
Standards Data		620
Initial Calibration Data		621-663
Continuing Calibration Data		664-684
Raw QC Data		685
DFTPP Data		686-698
Blank Data		699-715
Pesticide/PCB Data		716
QC Summary		717-719
Sample Data (Analytical Results of Field Samples)		720
MW3S-1	(LMG #21396001)	721-725
MW3D-1	(LMG #21396002)	726-730
FB-1	(LMG #21396003)	731-735
MW4S-1	(LMG #21396004)	736-740
MW4D-1	(LMG #21396005)	741-745
MW4D-1 DL	(LMG #21396005DL)	746-750
M-1	(LMG #21396006)	751-755
M-1DL	(LMG #21396006DL)	756-760
Standards Data		761
Standard Summary Forms		762-781
Raw Data (Primary Column)		782-824
Raw Data (Confirmation Column)		825-869
Raw QC Data		870
Blank Data		871-891

CH2M HILL
Quality Analytical Laboratories
2567 Fairlane Drive, P.O. Box 230548, Montgomery, Alabama 36116
205 271 1444

EPA - DEFINED QUALIFIERS

ORGANICS

Definitions for the EPA-defined qualifiers:

U -- Indicates the compound was analyzed for but not detected. The number adjacent to the "U" qualifier indicates the quantitation limit for that compound. The detection limit can vary from sample to sample depending on dilution factors or percent moisture adjustment when indicated.

J -- Indicates an estimated value. This flag is used when the mass spectral data indicates the presence of a compound below the stated quantitation limit. The "J" qualifier is not used with pesticide results.

C -- This flag applies to pesticide results only. The "C" flag indicates the presence of this compound has been confirmed by GC/MS analysis.

B -- This flag is used when the analyte is found in the associated blank as well as the sample. This notation indicates possible blank contamination and suggests the data user evaluate these compounds and their amounts carefully.

E -- This flag applies to GC/MS only. The "E" qualifier indicates a compound may be above or below the linear range of the instrument. If the particular compound level is deemed above the linear calibration range, then the sample should be reanalyzed at an appropriate dilution. Therefore, the "E" qualified amount is an estimated concentration. The results for the dilution will be reported on a separate Form I and will be flagged with a "D" if the dilution brings the concentration within proper calibration.

D -- This flag identifies compounds which have been run at a dilution to bring the concentration of that compound within the linear range of the instrument. "D" qualifiers are only used for samples that have been run initially with results above acceptable ranges. For secondary dilutions the "DL" suffix is appended to the sample number on the Form I.

A -- Indicates the Tentatively Identified Compound (TIC) is a suspected aldol-condensation product.

X -- Indicates the compound concentration has been manually modified or the EPA qualifier has been manually modified or added.

JX -- The compound was detected and quantitated below the Contract Required Quantitation Limit.

CH2M HILL Quality Analytical Laboratories 2567 Fairlane Drive, P O Box 230548, Montgomery, Alabama 36116 205 271 1444

CLIENT SAMPLE ID QUALIFIERS

LEVEL 3

The qualifiers that GC/MS and GC use with the client sample ID are defined below:

DL -- Dilution Run

R -- Rerun (may be followed by a digit to indicate multiple reruns)

RD -- Diluted Rerun

RX -- Re-extraction Analysis

MS -- Matrix Spike (may be followed by a digit to indicate multiple matrix spikes within a sample set)

MSD -- Matrix Spike Duplicate (may be followed by a digit to indicate multiple matrix spike duplicates within a sample set)

VBLK -- Volatile Blank (will be followed by a "W" for waters, "S" for soils run at a low level, or "SM" for soils run at a medium level -- these letters may be followed by a digit to indicate multiple blanks of that type).

SBLK -- Semivolatile Blank (will be followed by a "W" for waters, "S" for soils run at a low level, or "SM" for soils run at a medium level -- these letters may be followed by a digit to indicate multiple blanks of that type).

PBLK -- Pesticide/PCB Blank (may be followed by digits to indicate multiple blanks)

These qualifiers allow GC/MS and GC to have unique client sample ID's so that the client can get more accurate information from the data reported.

CH2M HILL Quality Analytical Laboratories 2567 Fairlane Drive P.O. Box 230548 Montgomery, Alabama 36116 205 271 1444

Engineers
Planners
CH2M HILL Economists
Scientists

CLIENT SAMPLE CROSS-REFERENCE

CH2M HILL Laboratory No. 21396

LMG Sample No.	Client ID
21396001	MW3S-1
21396002	MW3D-1
21396003	FB-1
21396004	MW4S-1
21396005	MW4D-1
21396006	M-1
21396007	TB-1

CH2M HILL Quality Analytical Laboratories 2567 Fairlane Drive, P.O. Box 230548, Montgomery, Alabama 36116 205 271 1444

INTERNAL STANDARD AND SURROGATE COMPOUNDS

VOLATILE ANALYSIS

The internal standards on the GC/MS volatile chromatograms are designated as IS1, IS2, and IS3. The surrogate standards are labelled as SS1, SS2, and SS3. The compounds corresponding to these labels are listed below.

LABEL	INTERNAL STANDARD COMPOUND
IS1	BROMOCHLOROMETHANE
IS2	1,4-DIFLUOROBENZENE
IS3	D5-CHLOROBENZENE

LABEL	SURROGATE STANDARD COMPOUND
SS1	D4-1,2-DICHLOROETHANE
SS2	D8-TOLUENE
SS3	1,4-BROMOFLUOROBENZENE

CH2M HILL
Quality Analytical Laboratories
2567 Fairlane Drive, P.O. Box 230548, Montgomery, Alabama 36116
205.271.1444

INTERNAL STANDARD AND SURROGATE COMPOUNDS

SEMIVOLATILE ANALYSIS

The internal standards on the GC/MS semivolatile chromatograms are designated as IS1, IS2, IS3, IS4, IS5, and IS6. The surrogate standards are labelled as SS1, SS2, SS3, SS4, SS5, and SS6. The compounds corresponding to these labels are listed below.

LABEL	INTERNAL STANDARD COMPOUND
IS1	D4-1,4-DICHLOROBENZENE
IS2	D8-NAPHTHALENE
IS3	D10-ACENAPHTHENE
IS4	D10-PHENANTHRENE
IS5	D12-CHRYSENE
IS6	D12-PERYLENE

LABEL	SURROGATE STANDARD COMPOUND
SS1	2-FLUOROPHENOL
SS2	D5-PHENOL
SS3	D5-NITROBENZENE
SS4	2-FLUOROBIPHENYL
SS5	2,4,6-TRIBROMOPHENOL
SS6	D14-TERPHENYL

CH2M HILL
Quality Analytical Laboratories
2567 Fairlane Drive, P.O. Box 230548, Montgomery, Alabama 36116
205 271 1444