Enseco

ANALYTICAL DATA REPORT
FOR
THE NEW JERSEY DEPARTMENT
OF ENVIRONMENTAL PROTECTION
GEOENGINEERING, INC.

Project Name: LE Carpenter
Project No.: Not Available
Samples received on June 21, 1988

Enseco Incorporated
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Cambridge, Massachusetts 02138
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345989

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The New Jersey Department of Environmental Protection
Contractor: Enseco - Erco Laboratory
Project Name: LE Carpenter

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One

Project Inventory

GeoEngineering, Inc.
Project Name: LE Carpenter
Date Sampled: 06/20/88
Erco Booking Log No.: 0008
Date Samples Received: 06/21/88

Client ID	Erco ID	Description
0200-01	0008-01	Aqueous/Volatile Organic Compounds
0200-02	0008-02	Aqueous/Volatile Organic Compounds
0200-03	0008-03	Aqueous/Volatile Organic Compounds
0200-04	0008-04	Aqueous/Volatile Organic Compounds
0200-05	0008-05	Aqueous/Volatile Organic Compounds
0200-TB	0008-06	Aqueous/Volatile Organic Compounds

ENSECO - Erco Laboratory

Sample Analysis Instrumentation Key for Organics

ID	Manufacturer	Model	Data System
GC/MS #S-1	Finnigan	4530	INCOS
GC/MS #S-2	Finnigan	4615B	INCOS
GC/MS #S-3	Finnigan	4530	INCOS
GC/MS #V1*	Hewlett Packard	5996	RTE-6
GC/MS #V2*	Hewlett Packard	5996	RTE-6
GC/MS #V3*	Hewlett Packard	5996	RTE-6
GC/MS #V4*	Hewlett Packard	5985	RTE-6
GC/HECD #1	Perkin-Elmer/Tracor	3920/700	HP-1000
GC/HECD #2	Tracor/Tracor	560/700A	HP-1000
GC/HECD #3	Varian/Tracor	3700/700A	HP-1000
GC/PID #1	Perkin-Elmer/HNU	3920/52-02	HP-1000
GC/PID #3	Varian/HNU	3700/52-02	HP-1000
GC/ECD #2	Hewlett Packard	5840	Beckman/HP-1000
GC/ECD #7	Hewlett Packard	5880	Beckman/HP-1000
GC/ECC #9	Hewlett Packard	5880	Beckman/HP-1000
GC/FPD #10	Hewlett Packard	5890	--
GC/ECD #11	Hewlett Packard	5890	--
GC/ECD #12	Hewlett Packard	5890	--
GC/ECD #13	Hewlett Packard	5890	--

*Purge-and-trap units manufactured by Tekmar - Model #LSC2/ALS

Two

NONCONFORMANCE SUMMARY

The screening of Sample Numbers 0200-02, 0200-04, 0200-05, and 0200-TB in the volatile fraction gave a higher dilution factor than was necessary. Therefore, these samples were rerun at the correct dilution factor. The initial analyses were run within the holding time.

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VOLATILE ORGANICS

Surrogate Recovery Summary

Client Name: GeoEngineering, Inc.

Matrix: Aqueous

Authorized: 06/21/88 Received: 06/21/88

		Surrogate Compound (%)		
Erco ID	Client ID	d_4-1,2,-Dichloro-ethane	d_8-Toluene	p-Bromofluoro-benzene
0008-01	0200-1	103	100	87
0008-02	0200-2	99	100	104
0008-03	0200-3	101	103	87
0008-04	0200-4	98	102	104
0008-05	0200-5	98	103	103
0008-06	0200-TB	100	99	99
8826B	Erco Blank	97	101	100
8788B	Erco Blank	98	98	97
DD452B	Erco Blank	104	100	86
DD429B	Erco Blank	110	99	87
QC Advisory Limits:		76-114%	61-110%	74-115%

Reported by LA Approved by

METHOD BLANK SUMMARY

Case No. GeoEngineering Region — Contractor Enseco-Erco Lab Contract No. —

FILE ID	DATE OF ANALYSIS	FRACTION	MATRIX	CONC. LEVEL	INST. ID	CAS NUMBER	COMPOUND (MSL, TIC OR UNKNOWN)	CONC.	UNITS	CRDL
8788B	6/27/88	VOA	Aqueous	low	V2	75-09-2	Methylene Chloride	2.9	µg/L	5.0
8826B	6/29/88	VOA	Aqueous	low	V2	75-09-2	Methylene Chloride	2.9	µg/L	5.0
DD429B	6/26/88	VOA	Aqueous	low	V4	—	no volatile compounds found	—	—	—
DD452B	6/27/88	VOA	Aqueous	low	V4	—	no Volatile compounds found	—	—	—

Comments:

GC/MS TUNING AND MASS CALIBRATION

Bromofluorobenzene (BFB)

Case No. GEO ENGINEERING Contractor ENSECO INC / ERCO LAB Contract No. —

Instrument ID V2 Date 6/27/88 Time 21:03

Lab ID 8786 Data Release Authorized By: VOA / M

m/e	ION ABUNDANCE CRITERIA	%RELATIVE ABUNDANCE
50	15.0 - 40.0% of the base peak	22.6
75	30.0 - 60.0% of the base peak	47.9
95	Base peak, 100% relative abundance	100
96	5.0 - 9.0% of the base peak	8.06
173	Less than 1.0% of the base peak	0.00
174	Greater than 50.0% of the base peak	94.1
175	5.0 - 9.0% of mass 174	7.62 (8.10)[1]
176	Greater than 95.0%, but less than 101.0% of mass 174	93.4 (99.3)[1]
177	5.0 - 9.0% of mass 176	5.94 (6.36)[2]

THIS PERFORMANCE TUNE APPLIES TO THE FOLLOWING SAMPLES, BLANKS AND STANDARDS.

[1]Value in parenthesis is % mass 174.
[2]Value in parenthesis is % mass 176.

SAMPLE ID	LAB ID	DATE OF ANALYSIS	TIME OF ANALYSIS
	BFB 8786	6/27/88	21:03
	50PPB STD 8787	6/27/88	21:36
	ERCO BLANK 8788	6/27/88	22:50
B200-TB	0008-06 8791	6/28/88	01:48

FORM V

7/85

GC/MS TUNING AND MASS CALIBRATION

Bromofluorobenzene (BFB)

Case No. GEO ENGINEERING Contractor ENSECO INC / ERCO LAB Contract No. —

Instrument ID V2 Date 6/29/88 Time 8:40

Lab ID 8823 Data Release Authorized By: A

m/e	ION ABUNDANCE CRITERIA	%RELATIVE ABUNDANCE
50	15.0 - 40.0% of the base peak	22.3
75	30.0 - 60.0% of the base peak	46.1
95	Base peak, 100% relative abundance	100
96	5.0 - 9.0% of the base peak	5.91
173	Less than 1.0% of the base peak	0.00
174	Greater than 50.0% of the base peak	92.0
175	5.0 - 9.0% of mass 174	7.62 (8.28)[1]
176	Greater than 95.0%, but less than 101.0% of mass 174	92.5 (101)[1]
177	5.0 - 9.0% of mass 176	6.77 (7.31)[2]

[1] Value in parenthesis is % mass 174
[2] Value in parenthesis is % mass 176.

THIS PERFORMANCE TUNE APPLIES TO THE FOLLOWING SAMPLES, BLANKS AND STANDARDS.

SAMPLE ID	LAB ID		DATE OF ANALYSIS	TIME OF ANALYSIS
	BFB	8823	6/29/88	8:40
	50 PPB STD	8825	6/29/88	11:11
	ERCO BLANK	8826	6/29/88	12:06
0200-4	0008-04	8831	6/29/88	17:01
0200-5	0008-05	8832	6/29/88	17:56
0200-2	0008-02	8833	6/29/88	18:49

FORM V 7/85

GC/MS TUNING AND MASS CALIBRATION

Bromofluorobenzene (BFB)

Case No. GEO ENGINEERING Contractor ENSECO INC / ERCO LAB Contract No. —

Instrument ID V4 Date 6/26/88 Time 11:10

Lab ID DD 427 Data Release Authorized By: Am

m/e	ION ABUNDANCE CRITERIA	%RELATIVE ABUNDANCE
50	15.0 - 40.0% of the base peak	17.9
75	30.0 - 60.0% of the base peak	44.4
95	Base peak, 100% relative abundance	100
96	5.0 - 9.0% of the base peak	7.47
173	Less than 1.0% of the base peak	0.00
174	Greater than 50.0% of the base peak	76.9
175	5.0 - 9.0% of mass 174	5.90 (7.68)[1]
176	Greater than 95.0%, but less than 101.0% of mass 174	76.6 (99.6)[1]
177	5.0 - 9.0% of mass 176	4.97 (6.49)[2]

THIS PERFORMANCE TUNE APPLIES TO THE FOLLOWING SAMPLES, BLANKS AND STANDARDS.

[1] Value in parenthesis is % mass 174.
[2] Value in parenthesis is % mass 176.

SAMPLE ID	LAB ID	DATE OF ANALYSIS	TIME OF ANALYSIS
	BFB DD 427	6/26/88	11:10
	50 PPB STD DD 428	6/26/88	11:39
	ERCO BLANK DD 429	6/26/88	12:49
0200-3	0008-03 DD 432	6/26/88	16:18

FORM V 7/85

GC/MS TUNING AND MASS CALIBRATION

Bromofluorobenzene (BFB)

Case No. GEO ENGINEERING Contractor ENSECO INC / ERCO LAB Contract No. —

Instrument ID V4 Date 6/27/88 Time 9:37

Lab ID DD 450 Data Release Authorized By: [illegible]

m/e	ION ABUNDANCE CRITERIA	%RELATIVE ABUNDANCE
50	15.0 - 40.0% of the base peak	19.5
75	30.0 - 60.0% of the base peak	49.6
95	Base peak, 100% relative abundance	100
96	5.0 - 9.0% of the base peak	7.54
173	Less than 1.0% of the base peak	0.00
174	Greater than 50.0% of the base peak	79.8
175	5.0 - 9.0% of mass 174	5.62 (7.04)[1]
176	Greater than 95.0%, but less than 101.0% of mass 174	77.0 (96.5)[1]
177	5.0 - 9.0% of mass 176	5.32 (6.91)[2]

THIS PERFORMANCE TUNE APPLIES TO THE FOLLOWING SAMPLES, BLANKS AND STANDARDS.

[1] Value in parenthesis is % mass 174.
[2] Value in parenthesis is % mass 176.

SAMPLE ID	LAB ID		DATE OF ANALYSIS	TIME OF ANALYSIS
	BFB	DD450	6/27/88	9:37
	50 PPB STD	DD451	6/27/88	10:08
	ERCO BLANK	DD452	6/27/88	11:13
0200-1	0008-01	DD460	6/27/88	18:07

FORM V

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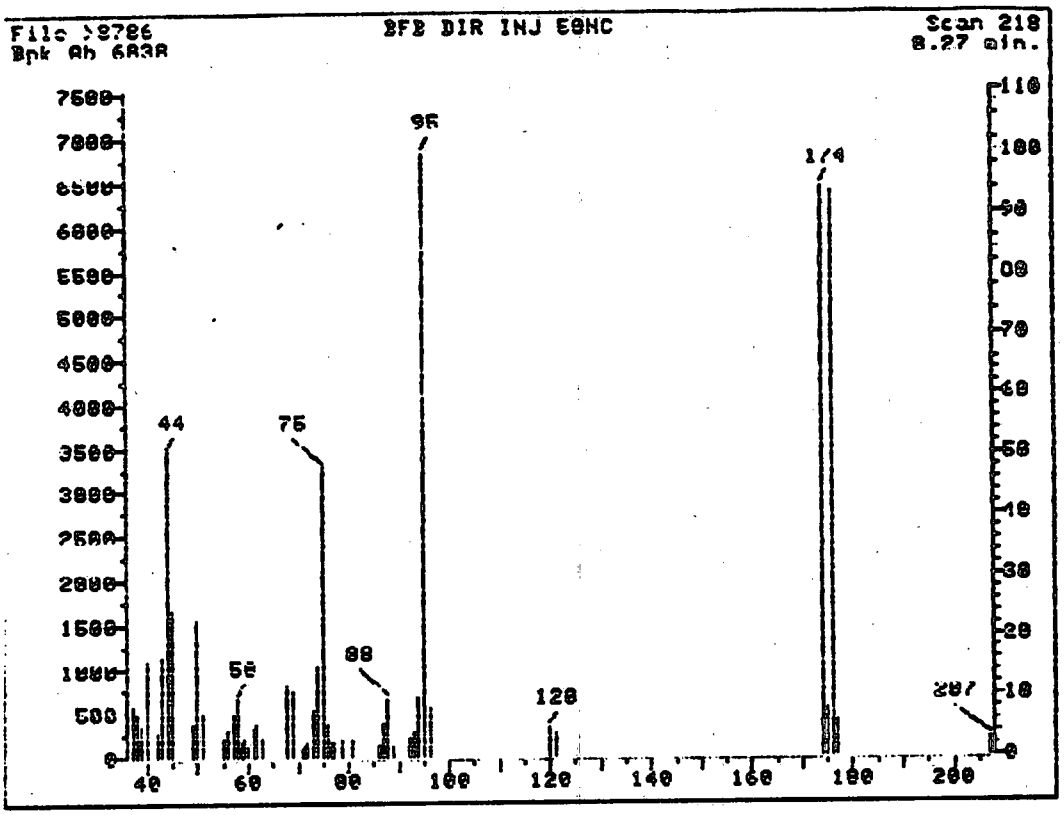


MS data file header from : >8786

Sample: BFB DIR INJ 50NG Operator: KERY MS 6/27/88 21:03
Misc :
Sys. #: 2 MS model: 96 SW/HW rev.: 1A AIS # : 0
Method file: BFB2 Tuning file: MT7402 No. of extra records: 2
Source temp.: 200 Analyzer temp.: 200 Transfer line temp. : 220

Chromatographic temperatures :	220.	220.	0.	0.	0.
Chromatographic times, min. :	1.0	9.0	0.0	0.0	0.0
Chromatographic rate, deg/min:	1.0	0.0	0.0	0.0	0.0

GC/MS PERFORMANCE STANDARD

Bromofluorobenzene (BFB)

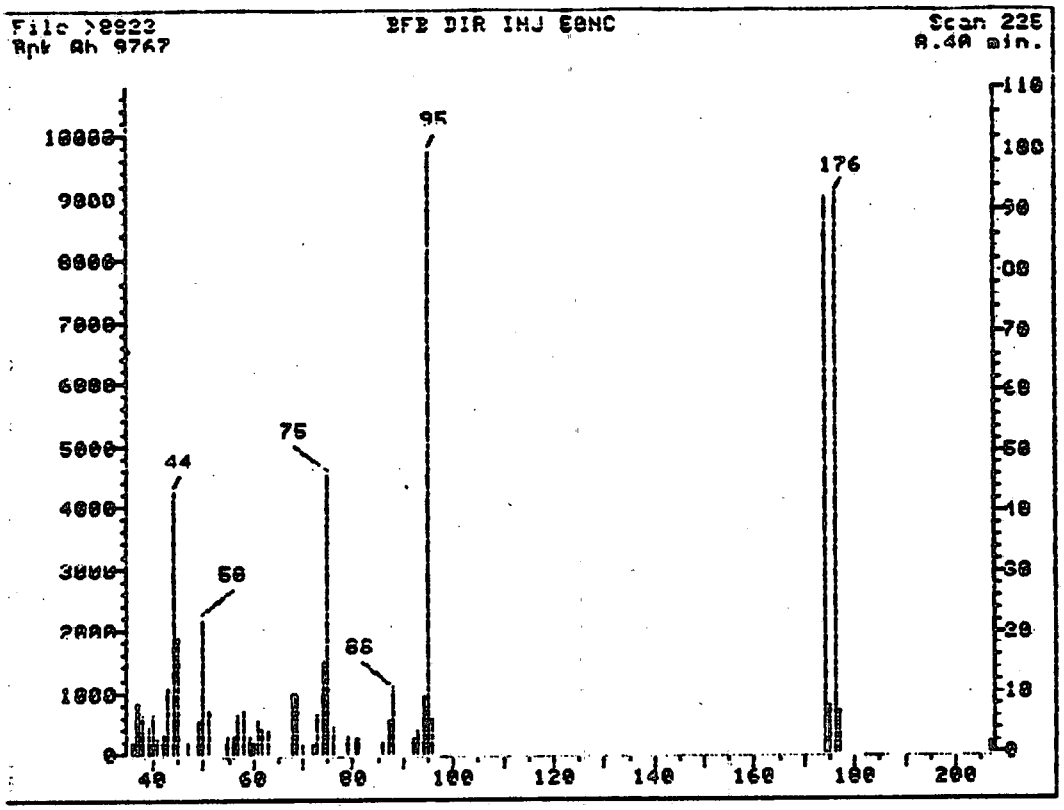
m/z	Ion Abundance Criteria	% Relative Abundance Base Peak	% Relative Abundance Appropriate Peak	Status
50	15-40% of mass 95	22.64	22.64	Ok
75	30-60% of mass 95	47.88	47.88	Ok
95	Base peak, 100% relative abundance	100.00	100.00	Ok
96	5-9% of mass 95	8.06	8.06	Ok
173	Less than 2% of mass 174	0.00	0.00	Ok
174	Greater than 50% of mass 95	94.06	94.06	Ok
175	5-9% of mass 174	7.67	8.10	Ok
176	95-101% of mass 174	93.39	99.28	Ok
177	5-9% of mass 176	5.94	6.36	Ok

Injection Date: 06/27/88
Injection Time: 21:03
Data File: >8786
Scan: 218

>8786 BFB DIR INJ 50NG
218 NRM

File: >8786 Scan #: 218 Retn. time: 8.27

m/z	Int.	m/z	Int.	m/z	Int.	m/z	Int.	m/z	Int.
37.00	8.482	50.90	7.385	63.00	3.510	76.90	2.413	93.90	9.754
38.00	7.049	55.00	3.188	67.90	11.816	77.10	2.354	95.00	100.000
39.00	4.914	56.00	4.270	69.00	10.720	78.70	2.793	96.10	8.058
40.00	15.809	57.00	7.444	71.00	1.521	80.80	2.603	120.05	4.753
42.00	3.978	57.90	9.754	71.50	1.930	85.90	2.208	121.15	3.875
43.00	16.438	58.70	2.457	71.80	2.296	86.90	5.499	174.05	94.063
44.00	50.717	59.10	2.954	72.90	7.839	87.90	9.564	175.05	7.619
45.00	24.218	60.10	1.828	74.00	14.931	88.80	1.843	175.95	93.390
49.00	5.250	61.10	4.738	74.90	47.880	92.00	3.013	176.95	5.937
49.90	22.638	61.80	5.528	75.90	5.323	92.90	4.036	207.15	2.749



MS data file header from : >8823

Sample: BFB DIR INJ 50NG Operator: KERY MS 6/29/88 R:411
Misc :
Sys. #: 2 MS model: 96 SW/HW rev.: 1A ALS # : 0
Method file: BFB2 Tuning file: MT7402 No. of extra records: 2
Source temp.: 200 Analyzer temp.: 200 Transfer line temp. : 220

Chromatographic temperatures :	220.	220.	0.	0.	0.
Chromatographic times, min. :	1.0	9.0	0.0	0.0	0.0
Chromatographic rate, deg/min:	1.0	0.0	0.0	0.0	0.0

GC/MS PERFORMANCE STANDARD

Bromofluorobenzene (BFB)

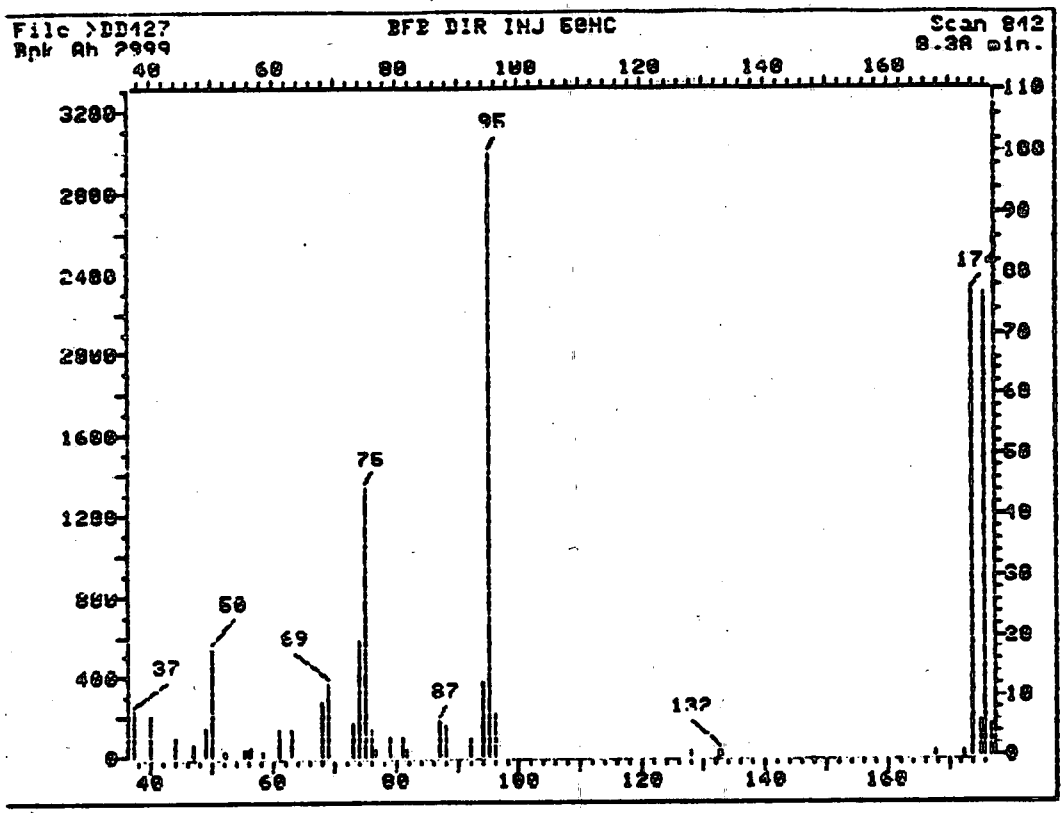
m/z	Ion Abundance Criteria	% Relative Abundance Base Peak	Appropriate Peak	Status
50	15-40% of mass 95	22.28	22.28	Ok
75	30-60% of mass 95	46.13	46.13	Ok
95	Base peak, 100% relative abundance	100.00	100.00	Ok
96	5-9% of mass 95	5.91	5.91	Ok
173	Less than 2% of mass 174	0.00	0.00	Ok
174	Greater than 50% of mass 95	91.97	91.97	Ok
175	5-9% of mass 174	7.62	8.28	Ok
176	95-101% of mass 174	92.54	100.61	Ok
177	5-9% of mass 176	6.77	7.31	Ok

Injection Date: 06/29/88
Injection Time: 08:40
Data File: >8823
Scan: 225

>8823 BFB DIR INJ 50NG
225 NRM

File: >8823 Scan #: 225 Retn. time: 8.40

m/z	Int.	m/z	Int.	m/z	Int.	m/z	Int.	m/z	Int.
35.70	2.027	45.00	19.105	59.70	1.505	74.00	15.143	93.10	3.583
36.80	8.549	47.00	2.007	59.90	1.597	74.90	46.135	94.00	9.379
37.00	8.549	49.00	5.375	61.00	5.242	76.00	4.362	95.00	100.000
38.00	6.338	50.00	22.279	61.90	3.952	78.90	2.775	96.00	5.908
39.10	4.351	51.00	7.259	62.90	3.594	80.70	2.263	174.05	91.973
40.00	6.409	54.90	2.642	67.90	10.228	81.00	2.345	174.95	7.617
40.90	2.396	55.90	2.744	68.90	10.044	86.10	1.628	176.05	92.536
42.00	3.358	57.00	6.266	69.80	1.229	87.00	5.457	176.95	6.768
43.00	10.925	57.90	7.269	72.00	1.546	88.00	10.413	207.05	1.833
44.00	43.586	59.10	2.652	73.00	6.573	92.00	2.293		



MS data file header from : >DD427

Sample: BFB DIR INJ 50NG Operator: KFRY MS 6/26/88 11:10
Misc :
Sys. #: 1 MS model: 87 SW/HW rev.: IA AIS # : 0
Method file: BFB4 Tuning file: MT7404 No. of extra records: 2
Source temp.: 220 Analyzer temp.: 0 Transfer line temp. : 0

Chromatographic temperatures :	0.	0.	0.	0.	0.
Chromatographic times, min. :	0.0	0.0	0.0	0.0	0.0
Chromatographic rate, deg/min:	0.0	0.0	0.0	0.0	0.0

GC/MS PERFORMANCE STANDARD

Bromofluorobenzene (BFB)

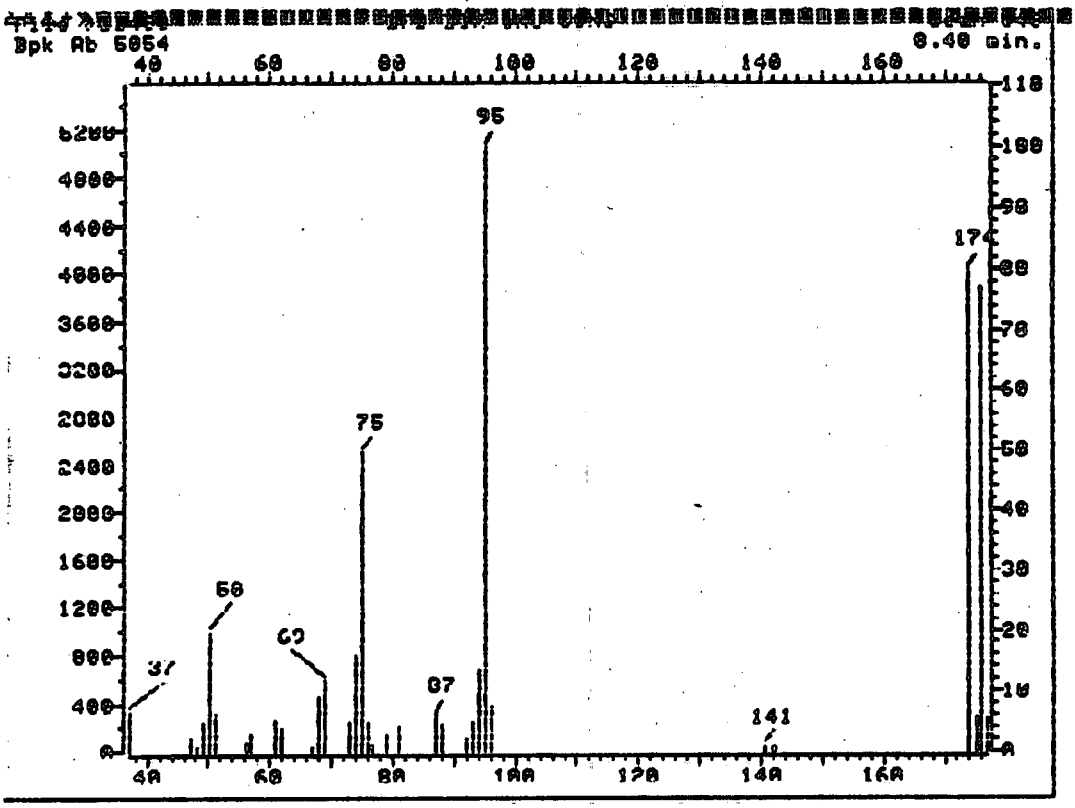
m/z	Ion Abundance Criteria	% Relative Abundance Base Peak	% Relative Abundance Appropriate Peak	Status
50	15-40% of mass 95	17.87	17.87	Ok
75	30-60% of mass 95	44.45	44.45	Ok
95	Base peak, 100% relative abundance	100.00	100.00	Ok
96	5-9% of mass 95	7.47	7.47	Ok
173	Less than 2% of mass 174	0.00	0.00	Ok
174	Greater than 50% of mass 95	76.89	76.89	Ok
175	5-9% of mass 174	5.90	7.68	Ok
176	95-101% of mass 174	76.56	99.57	Ok
177	5-9% of mass 176	4.97	6.49	Ok

Injection Date: 06/26/88
Injection Time: 11:10
Data File: >DD427
Scan: 842

>DD427 BFB DIR INJ 50NG
842 NRM

File: >DD427 Scan #: 842 Retn. time: 8.38

m/z	Int.	m/z	Int.	m/z	Int.	m/z	Int.	m/z	Int.
37.05	7.603	55.40	1.000	72.95	5.502	86.95	6.002	133.05	.734
39.95	6.602	55.90	1.200	73.95	19.040	88.05	5.102	167.95	.867
44.05	3.001	56.15	1.234	74.95	44.448	92.05	2.768	172.45	.800
47.05	2.167	58.15	.667	75.95	4.335	94.00	12.404	173.95	76.892
49.05	4.802	61.00	4.502	76.70	.967	95.00	100.000	175.05	5.902
50.05	17.873	63.00	4.368	78.95	3.501	96.00	7.469	175.90	76.559
51.90	.667	68.00	9.003	80.95	2.901	127.95	.834	176.90	4.968
52.40	.734	69.00	12.171	81.70	1.167	132.55	.867		



MS data file header from : >DD450

Sample: AFB DIR INJ 50NG Operator: KERY MS 6/27/88 9:37
Misc :
Sys. #: 1 MS model: 87 SW/HW rev.: 1A AIS # : 0
Method file: AFB4 Tuning file: MT7404 No. of extra records: 2
Source temp.: 220 Analyzer temp.: 0 Transfer line temp. : 0

Chromatographic temperatures :	0.	0.	0.	0.	0.
Chromatographic times, min. :	0.0	0.0	0.0	0.0	0.0
Chromatographic rate, deg/min:	0.0	0.0	0.0	0.0	0.0

GC/MS PERFORMANCE STANDARD

Bromofluorobenzene (BFB)

m/z	Ion Abundance Criteria	% Relative Abundance Base Peak	% Relative Abundance Appropriate Peak	Status
50	15-40% of mass 95	19.51	19.51	Ok
75	30-60% of mass 95	49.60	49.60	Ok
95	Base peak, 100% relative abundance	100.00	100.00	Ok
96	5-9% of mass 95	7.54	7.54	Ok
173	Less than 2% of mass 174	0.00	0.00	Ok
174	Greater than 50% of mass 95	79.82	79.82	Ok
175	5-9% of mass 174	5.62	7.04	Ok
176	95-101% of mass 174	77.03	96.50	Ok
177	5-9% of mass 176	5.32	6.91	Ok

Injection Date: 06/27/88
Injection Time: 09:37
Data File: >DD450
Scan: 846

>DD450 BFB DIR INJ 50NG
846 NRM

File: >DD450 Scan #: 846 Retn. time: 8.40

m/z	Int.	m/z	Int.	m/z	Int.	m/z	Int.	m/z	Int.
36.95	6.510	57.00	3.225	73.95	15.809	87.95	4.294	142.15	.594
47.05	2.196	61.00	4.966	75.05	49.604	92.05	1.979	147.50	.693
48.20	.851	62.00	3.839	75.95	4.670	93.05	4.848	173.95	79.818
49.05	4.670	67.00	.594	76.70	1.088	94.00	13.395	175.05	5.619
50.05	19.509	68.00	9.260	78.95	2.592	95.00	100.000	175.90	77.028
51.20	6.074	69.00	11.713	80.95	4.195	96.00	7.539	176.90	5.323
56.15	1.306	72.95	4.689	86.95	6.015	140.75	.871		

Three

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PRIORITY POLLUTANT VOLATILE ORGANICS

EPA Method 624 + 624/HSL List

QUALITY CONTROL

Client Name: GeoEngineering, Inc.
Client ID: Laboratory Control Spike
Laboratory ID: 8827LCS
Matrix: Aqueous Prepared: 06/29/88 Analyzed: 06/29/88

Parameter	% Recovery	QC Advisory Limits
1,1-Dichloroethene	104	61 - 145%
Trichloroethene	88	71 - 120%
Benzene	95	76 - 127%
Toluene	94	76 - 125%
Chlorobenzene	96	75 - 130%

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PRIORITY POLLUTANT VOLATILE ORGANICS

EPA Method 624 + 624/HSL List

QUALITY CONTROL

Client Name: GeoEngineering, Inc.

Client ID: Laboratory Control Spike Dup.

Laboratory ID: 8828LCSD

Matrix: Aqueous Prepared: 06/29/88 Analyzed: 06/29/88

Parameter	% Recovery	QC Advisory Limits
1,1-Dichloroethene	101	61 - 145%
Trichloroethene	83	71 - 120%
Benzene	91	76 - 127%
Toluene	90	76 - 125%
Chlorobenzene	92	75 - 130%

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HAZARDOUS SUBSTANCE LIST (HSL) VOLATILE ORGANICS

EPA Method 624/HSL List

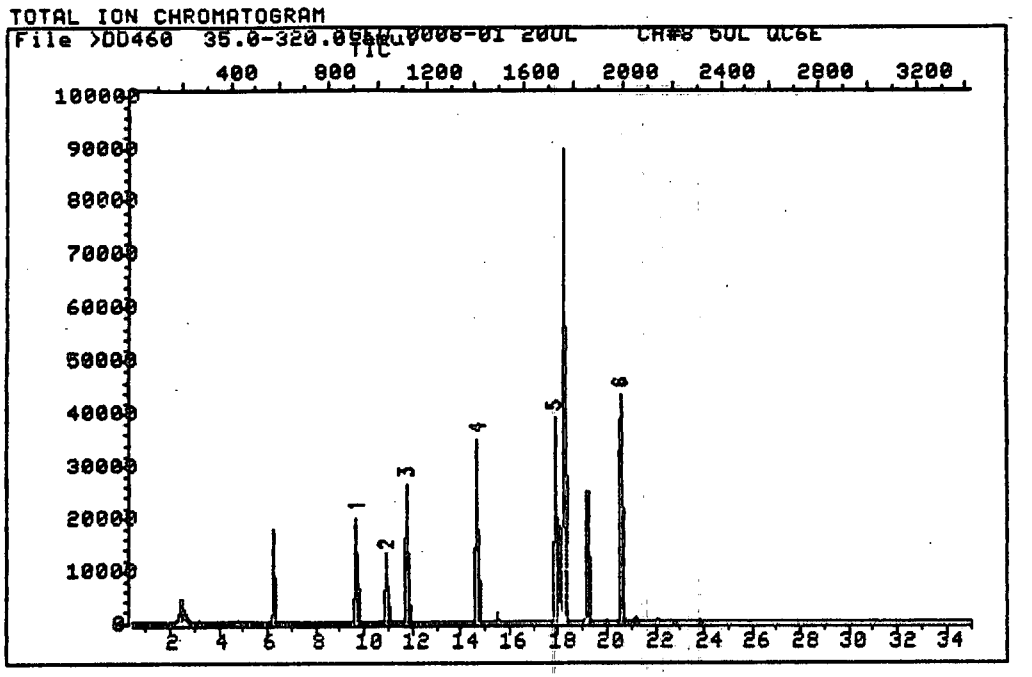
Client Name: GeoEngineering, Inc.
Client ID: 0200-1
Laboratory ID: 0008-01
Matrix: Aqueous Sampled: 06/20/88 Received: 06/21/88
Authorized: 06/21/88 Prepared: 06/27/88 Analyzed: 06/27/88

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	µg/L	1,300
Bromomethane	ND	µg/L	1,300
Vinyl chloride	ND	µg/L	1,300
Chloroethane	ND	µg/L	1,300
Methylene chloride	9,900	µg/L	1,300
Acetone	ND	µg/L	6,300
Carbon disulfide	ND	µg/L	500
1,1-Dichloroethene	ND	µg/L	500
1,1-Dichloroethane	ND	µg/L	500
trans-1,2-Dichloroethene	ND	µg/L	500
Chloroform	ND	µg/L	500
1,2-Dichloroethane	ND	µg/L	500
2-Butanone	ND	µg/L	2,500
1,1,1-Trichloroethane	ND	µg/L	500
Carbon tetrachloride	ND	µg/L	500
Vinyl acetate	ND	µg/L	2,500
Bromodichloromethane	ND	µg/L	500
1,2-Dichloropropane	ND	µg/L	500
trans-1,3-Dichloropropene	ND	µg/L	500
Trichloroethene	ND	µg/L	500
Dibromochloromethane	ND	µg/L	500
1,1,2-Trichloroethane	ND	µg/L	500
Benzene	ND	µg/L	500
cis-1,3-Dichloropropene	ND	µg/L	500
2-Chloroethyl vinyl ether	ND	µg/L	2,500
Bromoform	ND	µg/L	500
4-Methyl-2-pentanone	ND	µg/L	2,500
2-Hexanone	ND	µg/L	2,500
1,1,2,2-Tetrachloroethane	ND	µg/L	500
Tetrachloroethene	ND	µg/L	500
Toluene	ND	µg/L	500
Chlorobenzene	ND	µg/L	500
Ethyl benzene	4,300	µg/L	500
Styrene	ND	µg/L	500
Total xylenes	27,000	µg/L	500

ND = Not detected.

Reported by _____ Approved by _____

TOTAL ION CHROMATOGRAM



Data File: >DD460::D3
Name: GEO 0008-01 20UL
Misc: CH#8 5UL QC6E

Quant Output File: ^DD460::QT

Id File: VOC4::$$
Title: HSL VOLATILES: 60M VOCOL GCMS4 ERCO/ENSECO
Last Calibration: 880627 12:32

Operator ID: KERY
Quant Time: 880627 18:43
Injected at: 880627 18:07

FOR INTERNAL USE ONLY
Erco VOA GC/MS Lab

Previous sample FROM DD459 Erco ID 8213-7
Major contaminants _____
Previously in chamber FROM DD447 Erco ID 8161-7
Which contaminate _____
Carryover? Yes___ No X
Are our blanks clean _____

250
DD452
DD453
DD454

Initials: DH

0200-1

QUANT REPORT

Operator ID: KERY
Output File: ^DD460::QT
Data File: >DD460::D3
Name: GEO 0008-01 20UL
Misc: CH#8 5UL QC6E

Quant Rev: 6
Quant Time: 880627 18:43
Injected at: 880627 18:07
Dilution Factor: 1.00000

Df= 250

ID File: VOC4::$$
Title: HSL VOLATILES: 60M VOCOL GCMS4 ERCO/ENSECO
Last Calibration: 880627 12:32

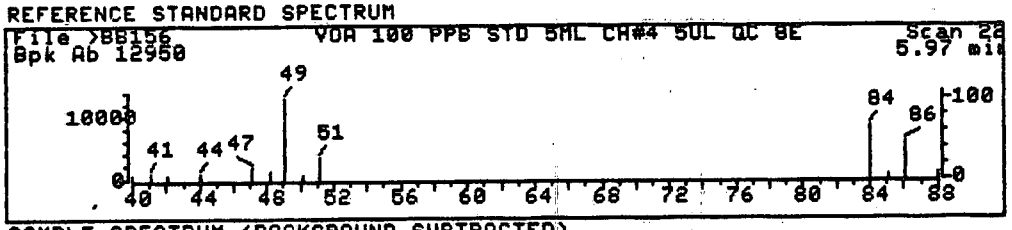
	Compound	R.T.	Q ion	Area	Conc	Units	q
1)	*Bromochloromethane	9.66	49.0	28978	50.00	UG/L	100
8)	Acetone	5.23	43.0	66	~~.73~~	~~UG/L~~ BMDL	100
9)	Methylene Chloride	6.21	84.0	20323	39.62	UG/L	94
14)	D4-1,2-Dichloroethane	10.87	65.0	26552	51.65	UG/L 103	91
15)	*1,4-Difluorobenzene	11.73	114.0	64488	50.00	UG/L	100
30)	*D5-Chlorobenzene	17.81	117.0	61518	50.00	UG/L	100
31)	D8-Toluene	14.66	100.0	44609	50.21	UG/L 100	91
33)	Toluene	14.83	92.0	115	~~.12~~	~~UG/L~~ BMDL	94
37)	Ethylbenzene	18.06	106.0	11822	17.41	UG/L	94
38)	Xylene (m,p)	18.23	106.0	74159	82.10	UG/L	86
39)	Xylenes (o)	19.14	106.0	20368	25.18	UG/L	94
40)	Styrene	19.14	104.0	815	~~.54~~	~~UG/L~~ BMDL	100
42)	Bromofluorobenzene (BFB)	20.53	95.0	39392	43.39	UG/L 87	85

* Compound is ISTD

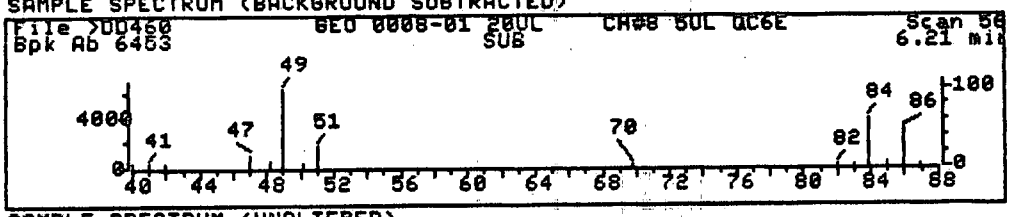
WA

0200-1

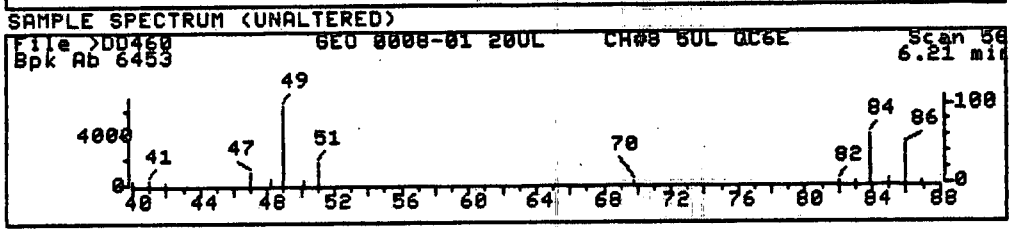
REFERENCE STANDARD SPECTRUM



SAMPLE SPECTRUM (BACKGROUND SUBTRACTED)



SAMPLE SPECTRUM (UNALTERED)



Data File: >DD460::D3
Name: GEO 0008-01 20UL
Misc: CH#8 5UL QC6E
Quant Time: 880627 18:43
Injected at: 880627 18:07

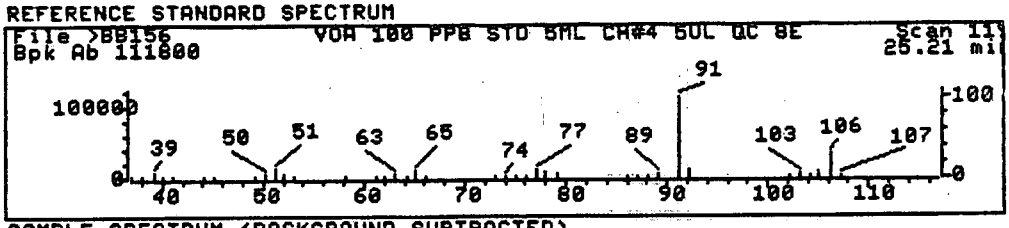
Quant Output File: ^DD460::QT

Quant ID File: VOC4::$$
Last Calibration: 880627 12:32

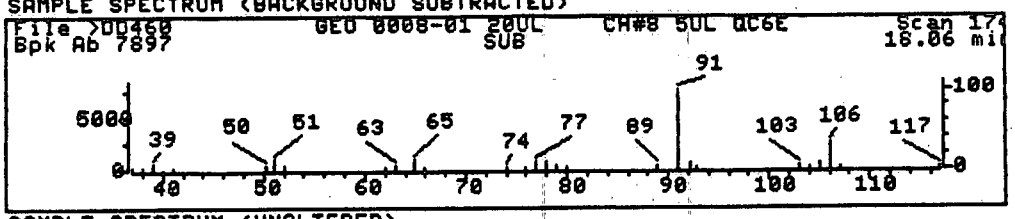
Compound No: 9
Compound Name: Methylene Chloride
Scan Number: 568
Retention Time: 6.21 min.
Quant Ion: 84.0
Area: 20323
Concentration: 39.62 UG/L
q-value: 94

0200-1

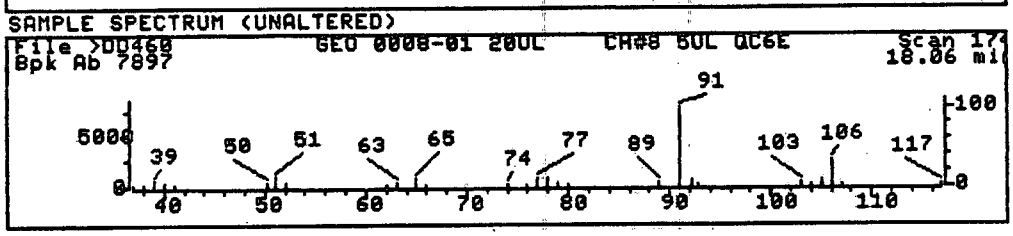
REFERENCE STANDARD SPECTRUM



SAMPLE SPECTRUM (BACKGROUND SUBTRACTED)



SAMPLE SPECTRUM (UNALTERED)



Data File: >DD460::D3
Name: GEO 0008-01 20UL
Misc: CH#8 5UL QC6E
Quant Time: 880627 18:43
Injected at: 880627 18:07

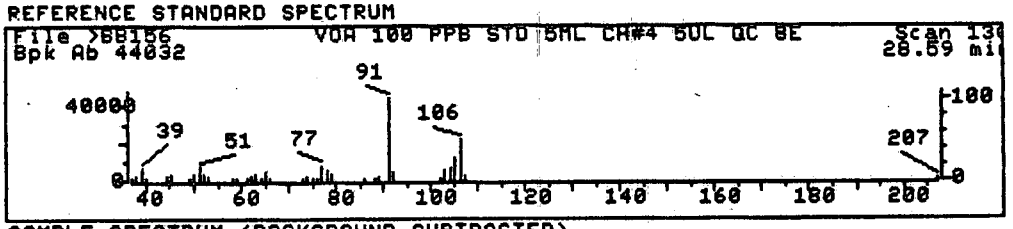
Quant Output File: ^DD460::QT

Quant ID File: VOC4::$$
Last Calibration: 880627 12:32

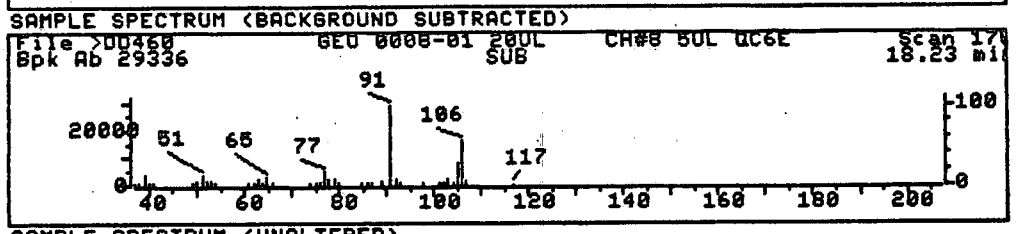
Compound No: 37
Compound Name: Ethylbenzene
Scan Number: 1741
Retention Time: 18.06 min.
Quant Ion: 106.0
Area: 11822
Concentration: 17.41 UG/L
q-value: 94

0200-1

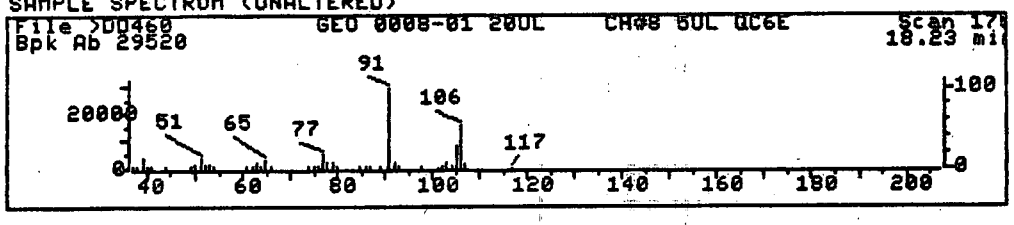
REFERENCE STANDARD SPECTRUM



SAMPLE SPECTRUM (BACKGROUND SUBTRACTED)



SAMPLE SPECTRUM (UNALTERED)



Data File: >DD460::D3
Name: GEO 0008-01 20UL
Misc: CH#8 5UL QC6E
Quant Time: 880627 18:43
Injected at: 880627 18:07

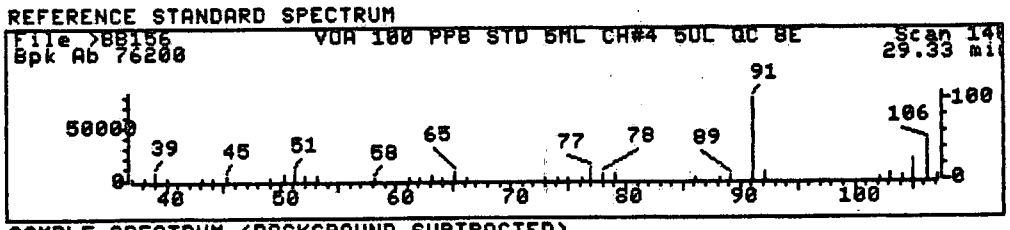
Quant Output File: ^DD460::QT

Quant ID File: VOC4::$$
Last Calibration: 880627 12:32

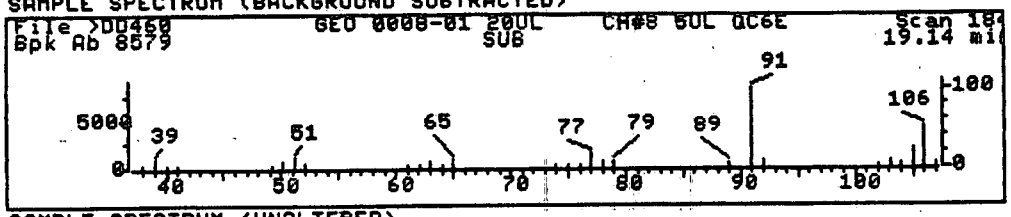
Compound No: 38
Compound Name: Xylene (m,p)
Scan Number: 1758
Retention Time: 18.23 min.
Quant Ion: 106.0
Area: 74159
Concentration: 82.10 UG/L
q-value: 86

0200-1

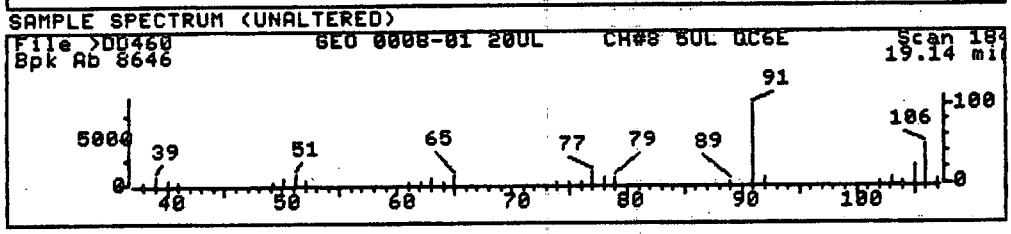
REFERENCE STANDARD SPECTRUM



SAMPLE SPECTRUM (BACKGROUND SUBTRACTED)



SAMPLE SPECTRUM (UNALTERED)



Data File: >DD460::D3
Name: GEO 0008-01 20UL
Misc: CH#8 5UL QC6E
Quant Time: 880627 18:43
Injected at: 880627 18:07

Quant Output File: ^DD460::QT

Quant ID File: VOC4::$$
Last Calibration: 880627 12:32

Compound No: 39
Compound Name: Xylenes (o)
Scan Number: 1848
Retention Time: 19.14 min.
Quant Ion: 106.0
Area: 20368
Concentration: 25.18 UG/L
q-value: 94

0200-1

Enseco

HAZARDOUS SUBSTANCE LIST (HSL) VOLATILE ORGANICS

EPA Method 624/HSL List

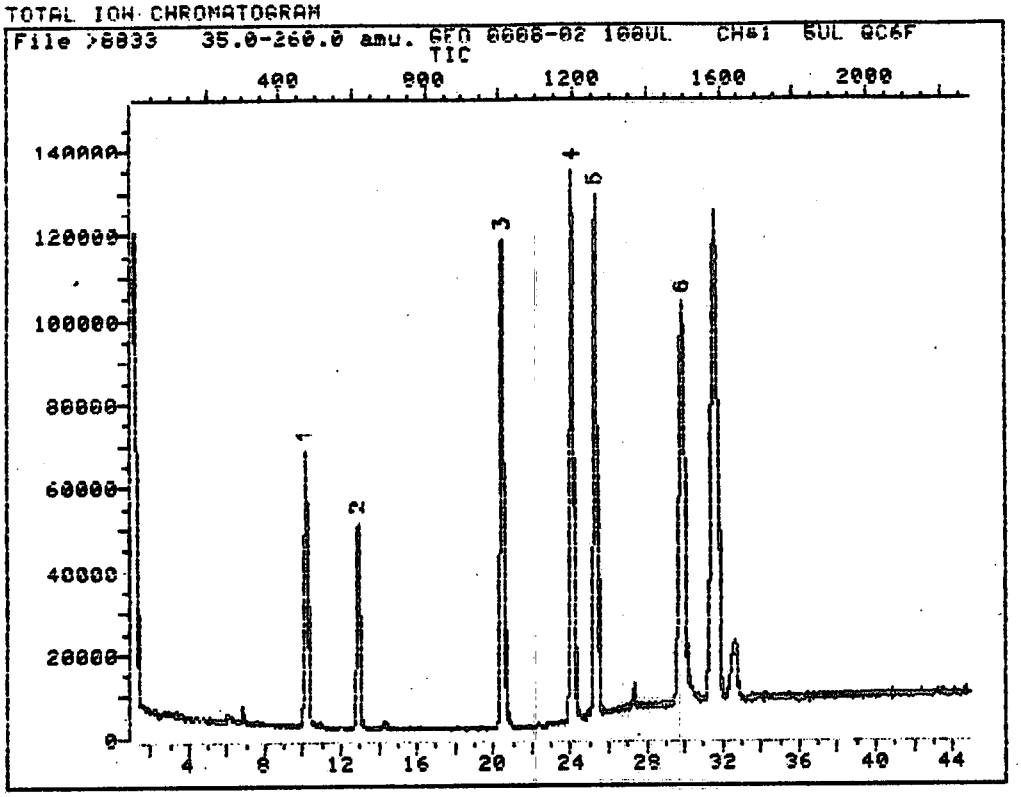
Client Name: GeoEngineering, Inc.
Client ID: 0200-2
Laboratory ID: 0008-02
Matrix: Aqueous Sampled: 06/20/88 Received: 06/21/88
Authorized: 06/21/88 Prepared: 06/29/88 Analyzed: 06/29/88

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	µg/L	250
Bromomethane	ND	µg/L	250
Vinyl chloride	ND	µg/L	250
Chloroethane	ND	µg/L	250
Methylene chloride	ND	µg/L	250
Acetone	ND	µg/L	1,300
Carbon disulfide	ND	µg/L	100
1,1-Dichloroethene	ND	µg/L	100
1,1-Dichloroethane	ND	µg/L	100
trans-1,2-Dichloroethene	ND	µg/L	100
Chloroform	ND	µg/L	100
1,2-Dichloroethane	ND	µg/L	100
2-Butanone	ND	µg/L	500
1,1,1-Trichloroethane	ND	µg/L	100
Carbon tetrachloride	ND	µg/L	100
Vinyl acetate	ND	µg/L	500
Bromodichloromethane	ND	µg/L	100
1,2-Dichloropropane	ND	µg/L	100
trans-1,3-Dichloropropene	ND	µg/L	100
Trichloroethene	ND	µg/L	100
Dibromochloromethane	ND	µg/L	100
1,1,2-Trichloroethane	ND	µg/L	100
Benzene	ND	µg/L	100
cis-1,3-Dichloropropene	ND	µg/L	100
2-Chloroethyl vinyl ether	ND	µg/L	500
Bromoform	ND	µg/L	100
4-Methyl-2-pentanone	ND	µg/L	500
2-Hexanone	ND	µg/L	500
1,1,2,2-Tetrachloroethane	ND	µg/L	100
Tetrachloroethene	ND	µg/L	100
Toluene	ND	µg/L	100
Chlorobenzene	ND	µg/L	100
Ethyl benzene	100	µg/L	100
Styrene	ND	µg/L	100
Total xylenes	3,600	µg/L	100

ND = Not detected.

Reported by LA/Ar Approved by Ar/Ar

TOTAL ION CHROMATOGRAM



Data File: >8833::D3
Name: GFD 0008-02 100UL
Misc: CH#1 5UL QC6F

Quant Output File: ^8833::ZZ

Id File: VOAID2::$$
Title: HSL VOLATILES:RFT1%SP1000:45-220@H/MIN:GCMS V2:ERCO/ENSECO
Last Calibration: 880629 12:05

Operator ID: KFRY
Quant Time: 880629 19:35
Injected at: 880629 18:49

FOR INTERNAL USE ONLY
Erco VOA GC/MS Lab

Previous sample FDN: 8832 Erco ID: 0008-05
Major contaminants: —
Previously in curve FDN: 8818 ID: 8305-2
Major contaminants: —
Carryover? Yes ___ No ✓
I.S. and surrogate recoveries acceptable
Integration checked
Spectra checked
All peaks verified
If not, explain:
Reinjection: 5
Blank FDN: 8826
LCS FDN: 8827 LCS2 FDN: 8828
Extraction Method:
% solid: Date:
Methanol blank FDN:
Initials: MM

0200-2

QUANT REPORT

Operator ID: KERY
Output File: ^8833::7Z
Data File: >8833::D3
Name: GFO 0008-02 100UL
Misc: CH#1 5UL QC6F

Quant Rev: 6 Quant Time: 880629 19:35
Injected at: 880629 18:49
Dilution Factor: 1.00000
DF=1.50

ID File: VOAID2::$$
Title: HSL VOLATILES:BFT1%SP1000:45-220@8/MIN:GCMS V2:ERCO/ENSECO
Last Calibration: 880629 12:05

	Compound	R.T.	Q ion	Area	Conc	Units	Q
1)	*Bromochloromethane	10.10	49.0	185588	50.00	UG/L	100
14)	D4-1,2-Dichloroethane	12.85	65.0	201520	49.34	UG/L 99	95
15)	*1,4-Difluorobenzene	20.44	114.0	517772	50.00	UG/L	100
30)	*D5-Chlorobenzene	25.25	117.0	425947	50.00	UG/L	73
36)	D8-Toluene	24.07	100.0	333114	49.86	UG/L 100	97
38)	Ethylbenzene	27.29	106.0	9203	1.99	UG/L	99
39)	Xylene (m)	31.54	106.0	374956	63.16	UG/L	92
41)	Xylenes (o , p)	32.60	106.0	48812	8.88	UG/L	89
42)	Bromofluorobenzene (BFB)	29.81	95.0	338191	52.00	UG/L 104	96

* Compound is ISTD

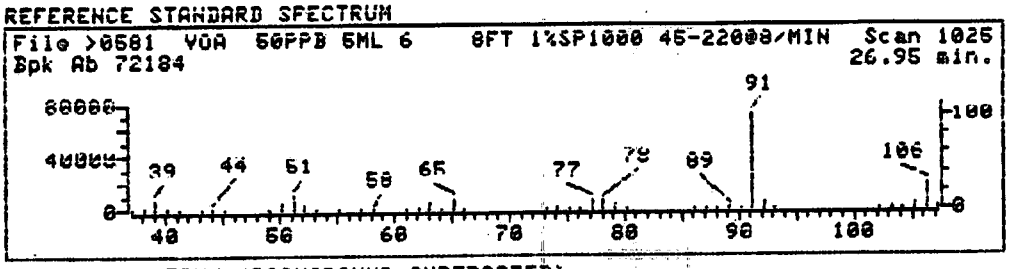
LA.

E-Benz = 100

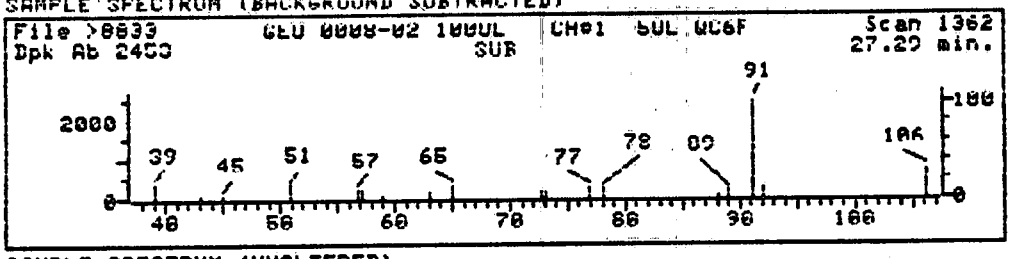
xylene = 3600

0200-2.

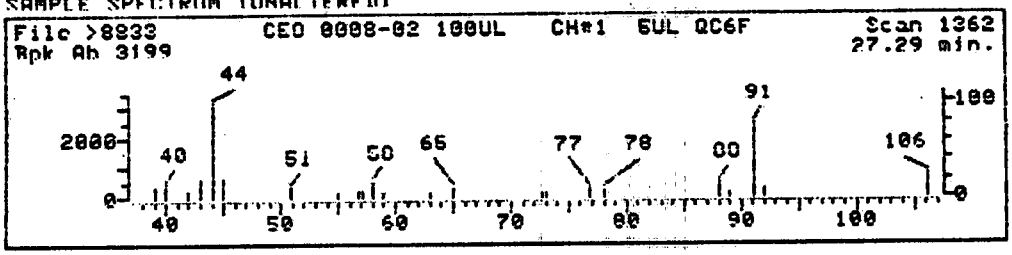
REFERENCE STANDARD SPECTRUM



SAMPLE SPECTRUM (BACKGROUND SUBTRACTED)



SAMPLE SPECTRUM (UNALTERED)



Data File: >8833::D3
Name: GEO 0008-02 100UL
Misc: CH#1 5UL QC6F
Quant Time: 880629 19:35
Injected at: 880629 18:49

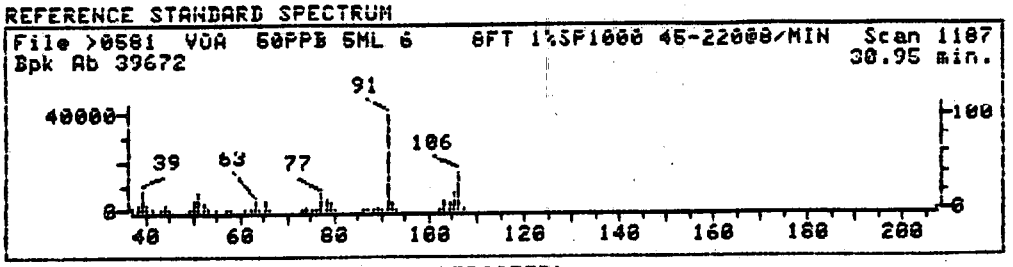
Quant Output File: ^8833::Z2

Quant ID File: VOAID2::$$
Last Calibration: 880629 12:05

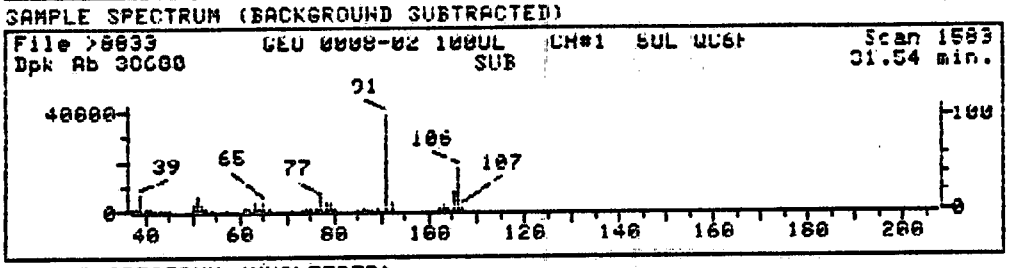
Compound No: 38
Compound Name: Ethylbenzene
Scan Number: 1362
Retention Time: 27.29 min.
Quant Ion: 106.0
Area: 9203
Concentration: 1.99 UG/L
q-value: 99

0200-2

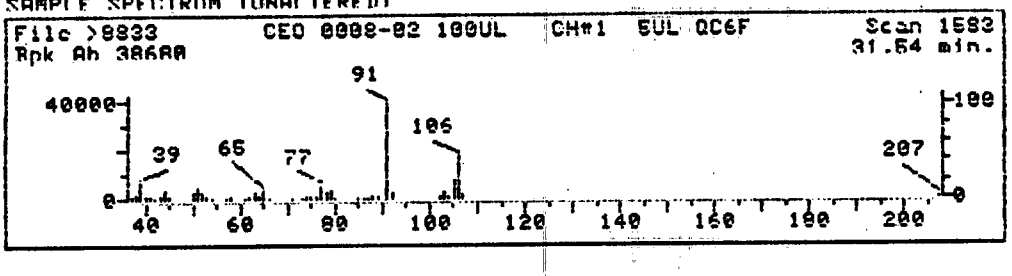
REFERENCE STANDARD SPECTRUM



SAMPLE SPECTRUM (BACKGROUND SUBTRACTED)



SAMPLE SPECTRUM (UNALTERED)



Data File: >8833::D3
Name: GEO 0008-02 100UL
Misc: CH#1 5UL QC6F
Quant Time: 880629 19:35
Injected at: 880629 18:49

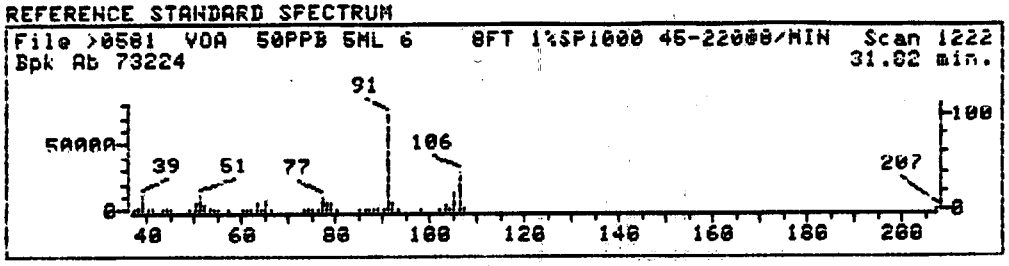
Quant Output File: ^8833::ZZ

Quant ID File: VOAID2::$$
Last Calibration: 880629 12:05

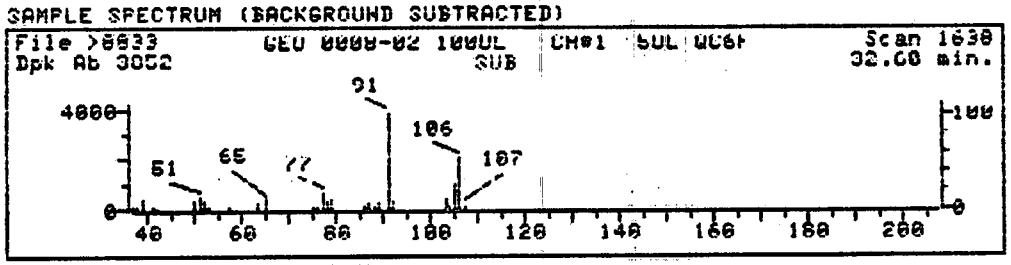
Compound No: 39
Compound Name: Xylene (m)
Scan Number: 1583
Retention Time: 31.54 min.
Quant Ion: 106.0
Area: 374956
Concentration: 63.16 UG/L
q-value: 92

0200-2

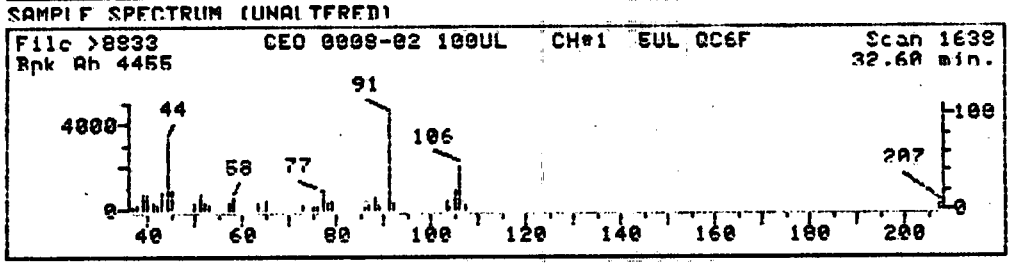
REFERENCE STANDARD SPECTRUM



SAMPLE SPECTRUM (BACKGROUND SUBTRACTED)



SAMPLE SPECTRUM (UNALTERED)



Data File: >8833::D3
Name: GEO 0008-02 100UL
Misc: CH#1 5UL QC6F
Quant Time: 880629 19:35
Injected at: 880629 18:49

Quant Output File: ^8833::ZZ
Quant ID File: VHAID2::$$
Last Calibration: 880629 12:05

Compound No: 41
Compound Name: Xylenes (o , p)
Scan Number: 1638
Retention Time: 32.60 min.
Quant Ion: 106.0
Area: 48812
Concentration: 8.88 UG/L
q-value: 89

0200-2

Enseco

HAZARDOUS SUBSTANCE LIST (HSL) VOLATILE ORGANICS

EPA Method 624/HSL List

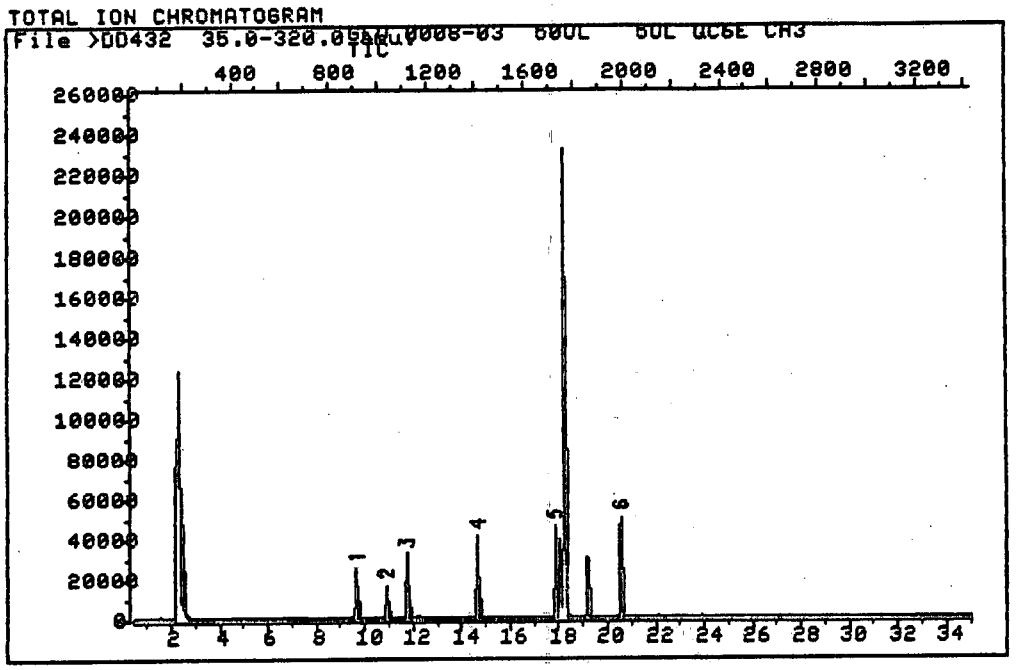
Client Name: GeoEngineering, Inc.
Client ID: 0200-3
Laboratory ID: 0008-03
Matrix: Aqueous Sampled: 06/20/88 Received: 06/21/88
Authorized: 06/21/88 Prepared: 06/26/88 Analyzed: 06/26/88

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	µg/L	500
Bromomethane	ND	µg/L	500
Vinyl chloride	ND	µg/L	500
Chloroethane	ND	µg/L	500
Methylene chloride	ND	µg/L	500
Acetone	ND	µg/L	2,500
Carbon disulfide	ND	µg/L	200
1,1-Dichloroethene	ND	µg/L	200
1,1-Dichloroethane	ND	µg/L	200
trans-1,2-Dichloroethene	ND	µg/L	200
Chloroform	ND	µg/L	200
1,2-Dichloroethane	ND	µg/L	200
2-Butanone	ND	µg/L	1,000
1,1,1-Trichloroethane	ND	µg/L	200
Carbon tetrachloride	ND	µg/L	200
Vinyl acetate	ND	µg/L	1,000
Bromodichloromethane	ND	µg/L	200
1,2-Dichloropropane	ND	µg/L	200
trans-1,3-Dichloropropene	ND	µg/L	200
Trichloroethene	ND	µg/L	200
Dibromochloromethane	ND	µg/L	200
1,1,2-Trichloroethane	ND	µg/L	200
Benzene	ND	µg/L	200
cis-1,3-Dichloropropene	ND	µg/L	200
2-Chloroethyl vinyl ether	ND	µg/L	1,000
Bromoform	ND	µg/L	200
4-Methyl-2-pentanone	ND	µg/L	1,000
2-Hexanone	ND	µg/L	1,000
1,1,2,2-Tetrachloroethane	ND	µg/L	200
Tetrachloroethene	ND	µg/L	200
Toluene	ND	µg/L	200
Chlorobenzene	ND	µg/L	200
Ethyl benzene	3,400	µg/L	200
Styrene	ND	µg/L	200
Total xylenes	22,000	µg/L	200

ND = Not detected.

Reported by _____ Approved by _____

TOTAL ION CHROMATOGRAM



Data File: >DD432::L2
Name: GEO 0008-03 50UL
Misc: 5UL QC6E CH3

Quant Output File: ^DD432::QT

Id File: VOC4::$$
Title: HSL VOLATILES: 60M VOCOL GCMS4 ERCO/ENSECO
Last Calibration: 880627 12:04

Operator ID: KERY
Quant Time: 880627 12:14
Injected at: 880626 16:18

FOR INTERNAL USE ONLY
Erco VOA GC/MS Lab

Previous sample FRN DD431 Erco ID_____
Major contaminants _____
Previously in chamber FRN DD417 Erco ID_____
Major contaminants _____
Carryover? Yes___ No ✓ If yes, what?_____
I.S. and surrogate areas checked_____
Integration checked_____
Spectra checked_____
All peaks accounted for? Yes___ No_____
If no, number of unknowns_____
Dilution factor____ Calculations checked_____
Blank FRN DD429 Contaminants_____
LCS FRN DD430 LCSD FRN DD431
Extraction weight_____ Date_____
% solid_____ Date_____
Methanol blank FRN ✓
Initials_____

0200-3

2

QUANT REPORT

Operator ID: KERY
Output File: ^DD432::QT
Data File: >DD432::L2
Name: GEO 0008-03 50UL
Misc: 5UL QC6E CH3

Quant Rev: 6 Quant Time: 880627 12:14
Injected at: 880626 16:18
Dilution Factor: 1.00000

ID File: VOC4::$$
Title: HSL VOLATILES: 60M VOCOL GCMS4 ERCO/ENSECO
Last Calibration: 880627 12:04

X100

	Compound	R.T.	Scan#	Area	Conc	Units		q
1)	*Bromochloromethane	9.66	910	37352	50.00	UG/L		100
6)	1,1-Dichloroethene	5.07	455	376	~~.42~~	~~UG/L~~	BMDL	80
9)	Methylene Chloride	6.20	567	78	~~.13~~	~~UG/L~~	BMDL	80
14)	D4-1,2-Dichloroethane	10.86	1029	31813	50.77	UG/L	101	90
15)	*1,4-Difluorobenzene	11.73	1115	82057	50.00	UG/L		100
20)	Benzene	10.93	1035	4457	2.23	UG/L		100
21)	Trichloroethene	12.17	1158	1933	2.22	UG/L		81
30)	*D5-Chlorobenzene	17.82	1717	71196	50.00	UG/L		100
31)	D8-Toluene	14.66	1405	53703	51.56	UG/L	103	96
33)	Toluene	14.84	1422	493	~~.45~~	~~UG/L~~	BMDL	98
36)	Chlorobenzene	17.89	1724	3207	2.20	UG/L		82
37)	Ethylbenzene	18.07	1742	25205	33.93	UG/L		97
38)	Xylene (m,p)	18.24	1759	191121	192.48	UG/L		89
39)	Xylenes (o)	19.15	1849	25454	28.89	UG/L		96
40)	Styrene	19.15	1849	1261	~~.78~~	~~UG/L~~	BMDL	100
42)	Bromofluorobenzene (BFB)	20.53	1985	46099	43.59	UG/L	87	83

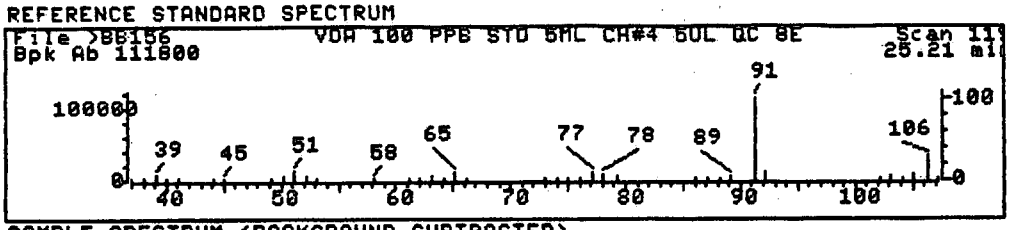
Below reporting limit B.S.

Below reporting limit B.S.

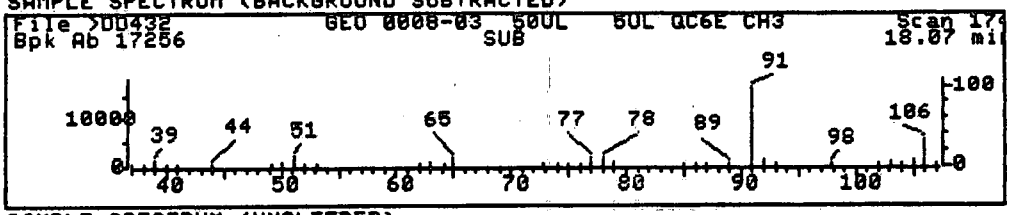
* Compound is ISTD

0200-3

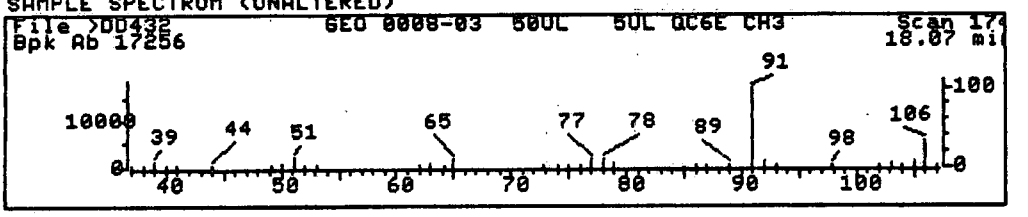
REFERENCE STANDARD SPECTRUM



SAMPLE SPECTRUM (BACKGROUND SUBTRACTED)



SAMPLE SPECTRUM (UNALTERED)



Data File: >DD432::L2
Name: GEO 0008-03 50UL
Misc: 5UL QC6E CH3
Quant Time: 880626 16:54
Injected at: 880626 16:18

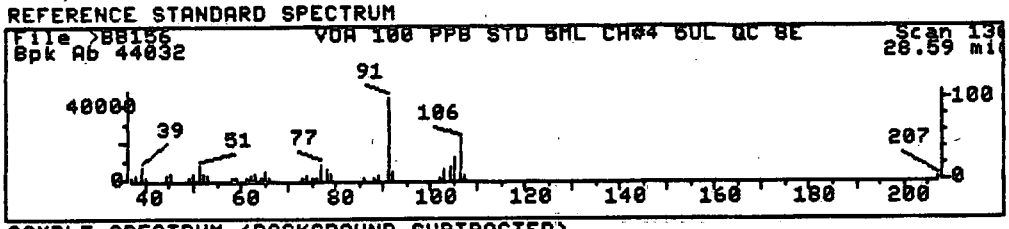
Quant Output File: ^DD432::QT

Quant ID File: VOC4::$$
Last Calibration: 880626 12:32

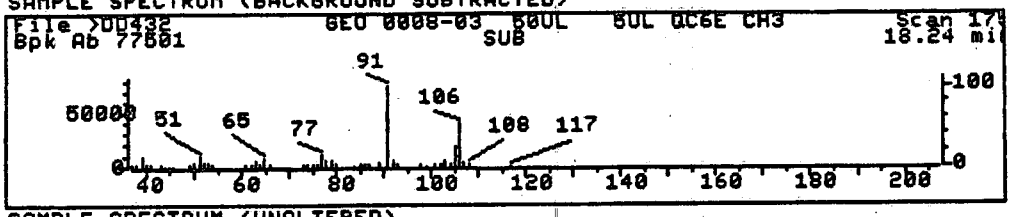
Compound No: 37
Compound Name: Ethylbenzene
Scan Number: 1742
Retention Time: 18.07 min.
Quant Ion: 106.0
Area: 25205
Concentration: 32.51 UG/L
q-value: 97

0200-3

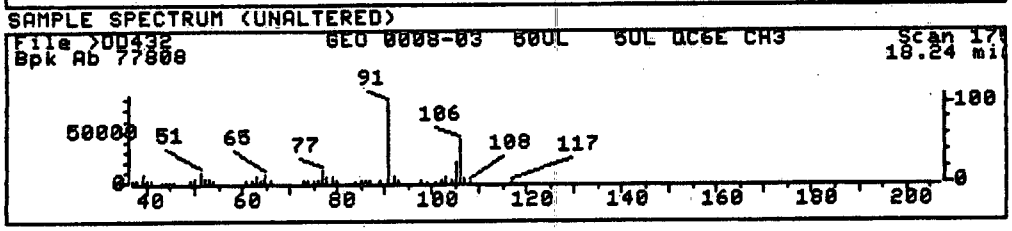
REFERENCE STANDARD SPECTRUM



SAMPLE SPECTRUM (BACKGROUND SUBTRACTED)



SAMPLE SPECTRUM (UNALTERED)



Data File: >DD432::L2
Name: GEO 0008-03 50UL
Misc: 5UL QC6E CH3
Quant Time: 880626 16:54
Injected at: 880626 16:18

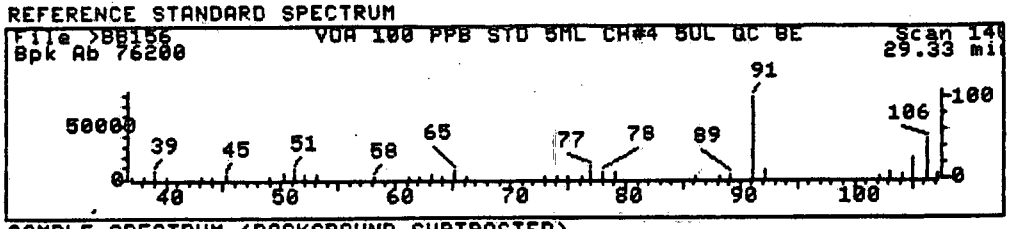
Quant Output File: ^DD432::QT

Quant ID File: VOC4::$$
Last Calibration: 880626 12:32

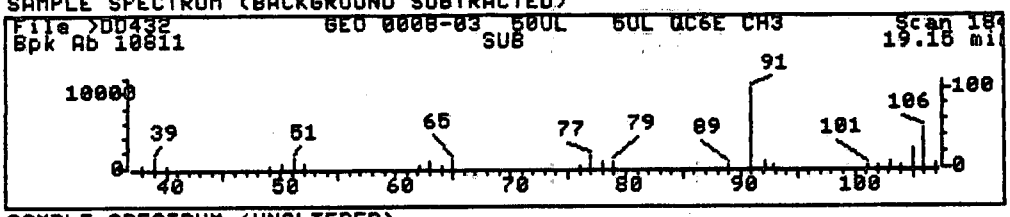
Compound No: 38
Compound Name: Xylene (m,p)
Scan Number: 1759
Retention Time: 18.24 min.
Quant Ion: 106.0
Area: 191121
Concentration: 193.57 UG/L
q-value: 89

0200-3

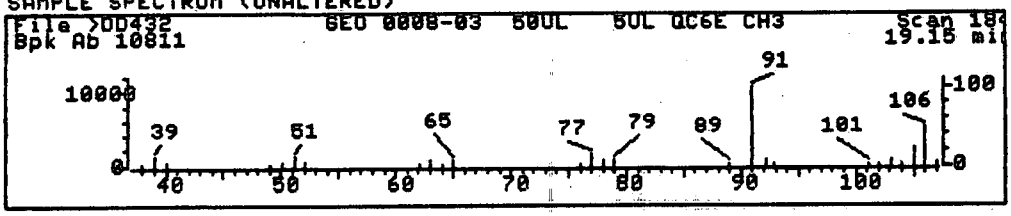
REFERENCE STANDARD SPECTRUM



SAMPLE SPECTRUM (BACKGROUND SUBTRACTED)



SAMPLE SPECTRUM (UNALTERED)



Data File: >DD432::L2
Name: GEO 0008-03 50UL
Misc: 5UL QC6E CH3
Quant Time: 880626 16:54
Injected at: 880626 16:18

Quant Output File: ^DD432::QT

Quant ID File: VOC4::$$
Last Calibration: 880626 12:32

Compound No: 39
Compound Name: Xylenes (o)
Scan Number: 1849
Retention Time: 19.15 min.
Quant Ion: 106.0
Area: 25454
Concentration: 28.76 UG/L
q-value: 96

0200-3

Enseco

HAZARDOUS SUBSTANCE LIST (HSL) VOLATILE ORGANICS

EPA Method 624/HSL List

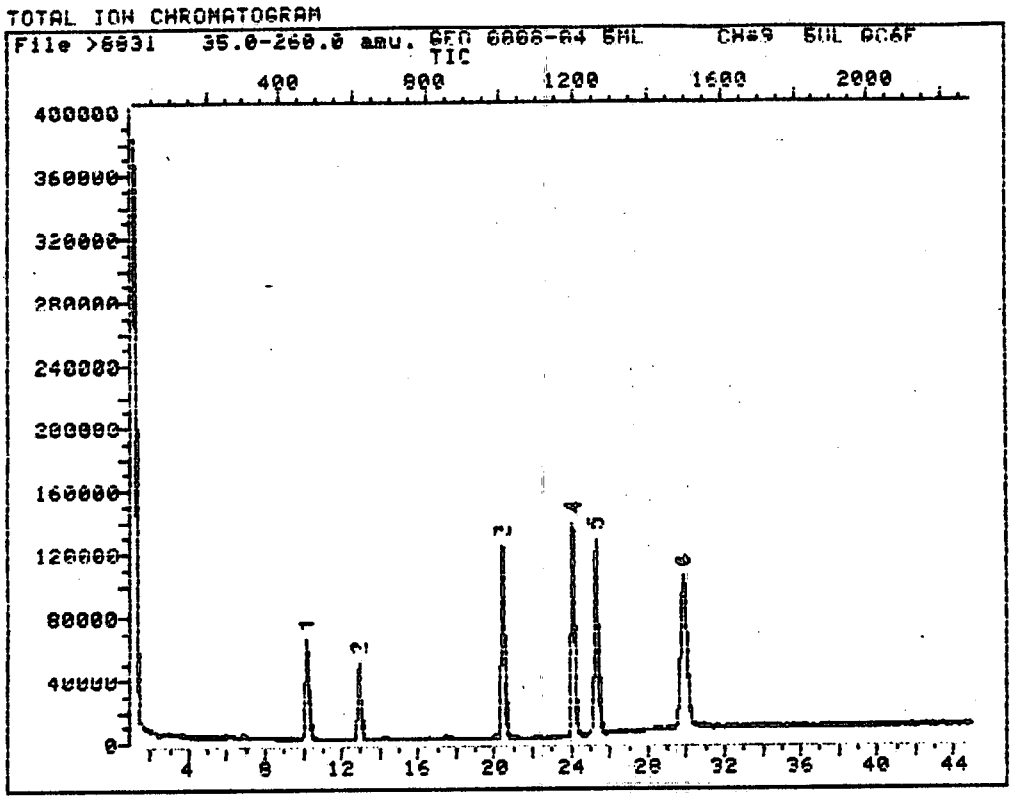
Client Name: GeoEngineering, Inc.
Client ID: 0200-4
Laboratory ID: 0008-04
Matrix: Aqueous Sampled: 06/20/88 Received: 06/21/88
Authorized: 06/21/88 Prepared: 06/29/88 Analyzed: 06/29/88

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	µg/L	5.0
Bromomethane	ND	µg/L	5.0
Vinyl chloride	ND	µg/L	5.0
Chloroethane	ND	µg/L	5.0
Methylene chloride ----------	1.8*B	µg/L	5.0
Acetone	ND	µg/L	25
Carbon disulfide	ND	µg/L	2.0
1,1-Dichloroethene	ND	µg/L	2.0
1,1-Dichloroethane	ND	µg/L	2.0
trans-1,2-Dichloroethene	ND	µg/L	2.0
Chloroform	ND	µg/L	2.0
1,2-Dichloroethane	ND	µg/L	2.0
2-Butanone	ND	µg/L	10
1,1,1-Trichloroethane	ND	µg/L	2.0
Carbon tetrachloride	ND	µg/L	2.0
Vinyl acetate	ND	µg/L	10
Bromodichloromethane	ND	µg/L	2.0
1,2-Dichloropropane	ND	µg/L	2.0
trans-1,3-Dichloropropene	ND	µg/L	2.0
Trichloroethene	ND	µg/L	2.0
Dibromochloromethane	ND	µg/L	2.0
1,1,2-Trichloroethane	ND	µg/L	2.0
Benzene	ND	µg/L	2.0
cis-1,3-Dichloropropene	ND	µg/L	2.0
2-Chloroethyl vinyl ether	ND	µg/L	10
Bromoform	ND	µg/L	2.0
4-Methyl-2-pentanone	ND	µg/L	10
2-Hexanone	ND	µg/L	10
1,1,2,2-Tetrachloroethane	ND	µg/L	2.0
Tetrachloroethene	ND	µg/L	2.0
Toluene	ND	µg/L	2.0
Chlorobenzene	ND	µg/L	2.0
Ethylbenzene	ND	µg/L	2.0
Styrene	ND	µg/L	2.0
Total xylenes	ND	µg/L	2.0

*Trace concentrations detected below the reporting limit.
B = Analyte also detected in Erco blank.
ND = Not detected.

Reported by _____ Approved by _____

TOTAL ION CHROMATOGRAM



Data File: >8831::D3
Name: GFD 0008-04 5ML
Misc: CH#9 50L QC6F

Quant Output File: ^8831::ZZ

Id File: VOAID2::$$
Title: HSI VOLATILES:BFT1%SP1000:45-220@8/MIN:GCMS V2:FRCO/FNSFCO
Last Calibration: 880629 12:05

Operator ID: KFRY
Quant Time: 880629 17:47
Injected at: 880629 17:01

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Erco VOA GC/MS Lab

Previous sample File 8830 Erco ID 8255-06
Major contaminants
Previously in chamber File 8816 8262-6
Major contaminants
Carryover? Yes X
I.S. and surr. [illegible]
Integration check
Spectra checked
All peaks accounted for? Yes No
If no, number of [illegible]
Dilution factor 1
Blank File 8826
LCS File 8827 8828
Extraction or weight
% solid Date
Reshand? Blank File
Initials

0200-4

QUANT REPORT

Operator ID: KERY
Output File: ^8831::77
Data File: >8831::D3
Name: GEO 0008-04 5ML
Misc: CH#9 5ML QC6F

Quant Rev: 6
Quant Time: 880629 17:47
Injected at: 880629 17:01
Dilution Factor: 1.00000

ID File: VOA102::$$
Title: HSL VOLATILES:BFT1%SP1000:45-220@8/MIN:GCMS V2:FRCO/ENSECO
Last Calibration: 880629 12:05

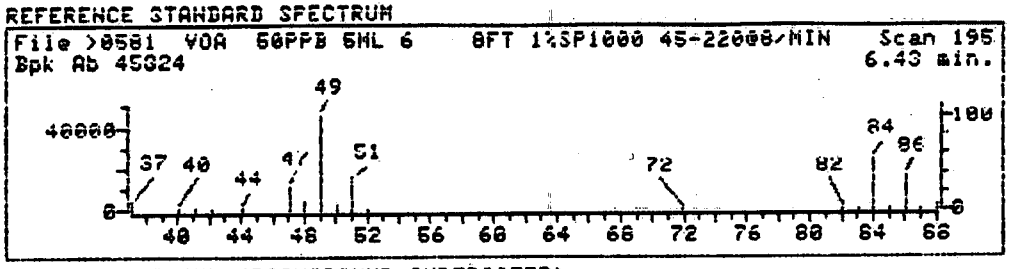
	Compound	R.T.	Q ion	Area	Conc	Units		Q
1)	*Bromochloromethane	10.14	49.0	177712	50.00	UG/L		100
6)	Methylene Chloride	6.85	84.0	7802	1.78	UG/L		31
14)	D4-1,2-Dichloroethane	12.85	65.0	191384	48.94	UG/L	98	93
15)	*1,4-Difluorobenzene	20.42	114.0	535409	50.00	UG/L		100
30)	*D5-Chlorobenzene	25.25	117.0	421907	50.00	UG/L		71
36)	D8-Toluene	24.07	100.0	338069	51.09	UG/L	102	99
42)	Bromofluorobenzene (BFB)	29.83	95.0	336469	52.23	UG/L	104	92

* Compound is ISTD

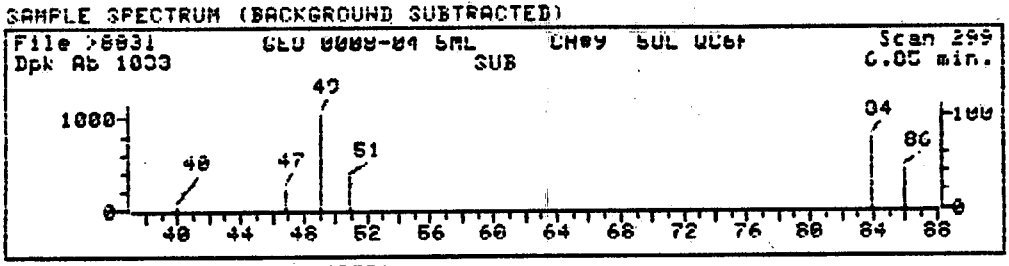
LA

0200-4

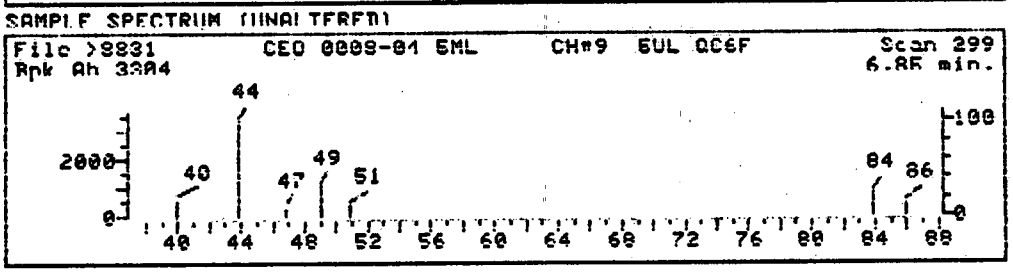
REFERENCE STANDARD SPECTRUM



SAMPLE SPECTRUM (BACKGROUND SUBTRACTED)



SAMPLE SPECTRUM (UNALTERED)



Data File: >8831::D3 Quant Output File: ^8831::Z7
Name: GEO 0008-04 5ML
Misc: CH#9 5UL QC6F
Quant Time: 880629 17:47 Quant ID File: UOAID2::$$
Injected at: 880629 17:01 Last Calibration: 880629 12:05

Compound No: 6
Compound Name: Methylene Chloride
Scan Number: 299
Retention Time: 6.85 min.
Quant Ion: 84.0
Area: 7802
Concentration: 1.78 UG/L
q-value: 31

0200-4

Enseco

HAZARDOUS SUBSTANCE LIST (HSL) VOLATILE ORGANICS

EPA Method 624/HSL List

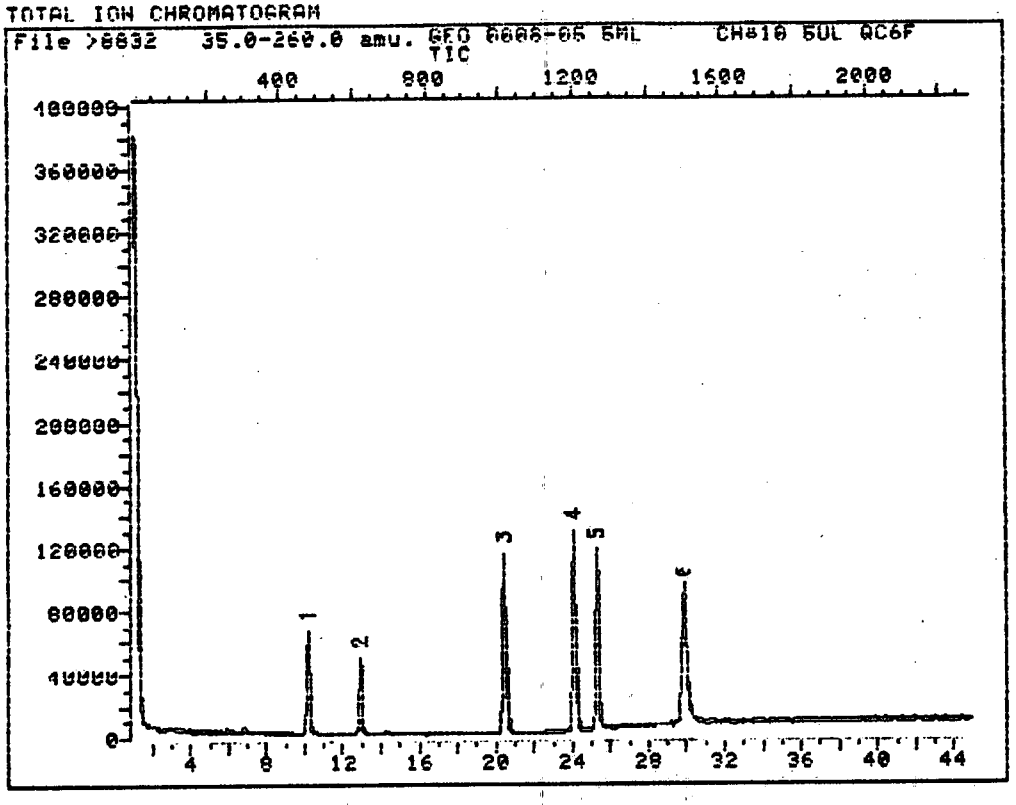
Client Name: GeoEngineering, Inc.
Client ID: 0200-5
Laboratory ID: 0008-05
Matrix: Aqueous Sampled: 06/20/88 Received: 06/21/88
Authorized: 06/21/88 Prepared: 06/29/88 Analyzed: 06/29/88

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	µg/L	5.0
Bromomethane	ND	µg/L	5.0
Vinyl chloride	ND	µg/L	5.0
Chloroethane	ND	µg/L	5.0
Methylene chloride ----------	2.0*B	µg/L	5.0
Acetone	ND	µg/L	25
Carbon disulfide	ND	µg/L	2.0
1,1-Dichloroethene	ND	µg/L	2.0
1,1-Dichloroethane	ND	µg/L	2.0
trans-1,2-Dichloroethene	ND	µg/L	2.0
Chloroform	ND	µg/L	2.0
1,2-Dichloroethane	ND	µg/L	2.0
2-Butanone	ND	µg/L	10
1,1,1-Trichloroethane	ND	µg/L	2.0
Carbon tetrachloride	ND	µg/L	2.0
Vinyl acetate	ND	µg/L	10
Bromodichloromethane	ND	µg/L	2.0
1,2-Dichloropropane	ND	µg/L	2.0
trans-1,3-Dichloropropene	ND	µg/L	2.0
Trichloroethene	ND	µg/L	2.0
Dibromochloromethane	ND	µg/L	2.0
1,1,2-Trichloroethane	ND	µg/L	2.0
Benzene	ND	µg/L	2.0
cis-1,3-Dichloropropene	ND	µg/L	2.0
2-Chloroethyl vinyl ether	ND	µg/L	10
Bromoform	ND	µg/L	2.0
4-Methyl-2-pentanone	ND	µg/L	10
2-Hexanone	ND	µg/L	10
1,1,2,2-Tetrachloroethane	ND	µg/L	2.0
Tetrachloroethene	ND	µg/L	2.0
Toluene	ND	µg/L	2.0
Chlorobenzene	ND	µg/L	2.0
Ethylbenzene	ND	µg/L	2.0
Styrene	ND	µg/L	2.0
Total xylenes	ND	µg/L	2.0

*Trace concentrations detected below the reporting limit.
B = Analyte also detected in Erco blank.
ND = Not detected.

Reported by LA Approved by

TOTAL ION CHROMATOGRAM



Data File: >8832::D3 Quant Output File: ^8832::ZZ
Name: GEO 0008-05 5ML
Misc: CH#10 50L QC6F

Id File: VOAID2::$$
Title: HSL VOLATILES:RFT1%SP1000:45-220@4/MIN:GCMS V2:FRCO/ENSECO
Last Calibration: 880629 12:05

Operator ID: KERY
Quant Time: 880629 18:41
Injected at: 880629 17:56

0200-5

FOR INTERNAL USE ONLY
BEFORE YOU COMPLETE

8831 0008-04
8817 8262-8
X
8826
8827 8828

QUANT REPORT

Operator ID: KERY
Output File: ^8832::ZZ
Data File: >8832::D3
Name: GFO 0008-05 5ML
Misc: CH#10 5UL QC6F

Quant Rev: 6 Quant Time: 880629 18:41
Injected at: 880629 17:56
Dilution Factor: 1.00000

ID File: VOAID2::$$
Title: HSL VOLATILES:8FT1%SP1000:45-220@8/MIN:GCMS V2:FRCO/ENSECO
Last Calibration: 880629 12:05

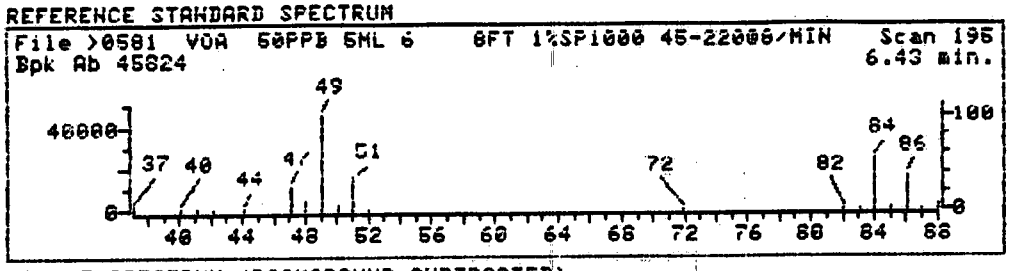
	Compound	R.T.	Q ion	Area	Conc	Units		Q
1)	*Bromochloromethane	10.13	49.0	175759	50.00	UG/L		100
6)	Methylene Chloride	6.86	84.0	8506	1.96	UG/L		94
14)	D4-1,2-Dichloroethane	12.86	65.0	190397	49.23	UG/L	98	92
15)	*1,4-Difluorobenzene	20.43	114.0	505887	50.00	UG/L		100
30)	*D5-Chlorobenzene	25.26	117.0	389424	50.00	UG/L		71
32)	2-Hexanone per spec.	~~23.16~~	43.0	1938	~~2.34~~	UG/L		93
35)	Toluene	24.27	92.0	1081	~~.15~~	~~UG/L~~	BMDL	61
36)	D8-Toluene	24.06	100.0	313942	51.40	UG/L	103	98
42)	Bromofluorobenzene (BFB)	29.82	95.0	305140	51.32	UG/L	103	94

* Compound is ISTD

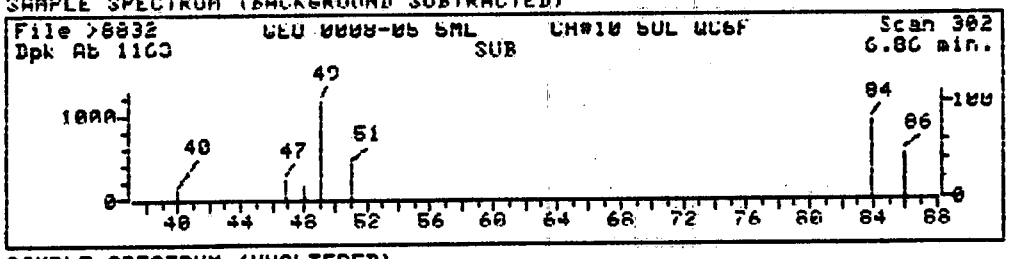
LA.

0200-5

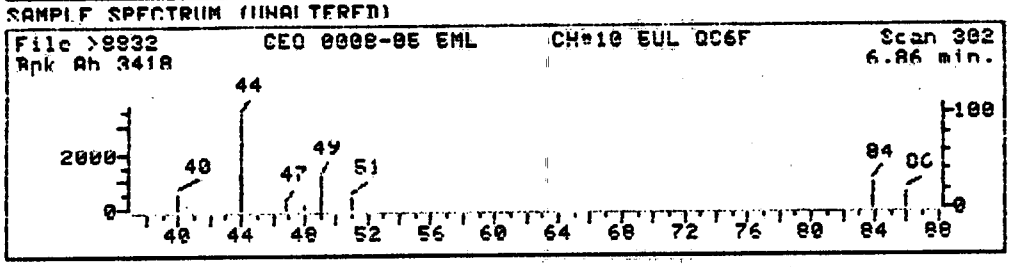
REFERENCE STANDARD SPECTRUM



SAMPLE SPECTRUM (BACKGROUND SUBTRACTED)



SAMPLE SPECTRUM (UNALTERED)



Data File: >8832::D3
Name: GEO 0008-05 5ML
Misc: CH#10 5UL QC6F
Quant Time: 880629 18:41
Injected at: 880629 17:56

Quant Output File: ^8832::7Z
Quant ID File: VOAID2::$$
Last Calibration: 880629 12:05

Compound No: 6
Compound Name: Methylene Chloride
Scan Number: 302
Retention Time: 6.86 min.
Quant Ion: 84.0
Area: 8506
Concentration: 1.96 UG/L
q-value: 24

0200-5

Enseco

HAZARDOUS SUBSTANCE LIST (HSL) VOLATILE ORGANICS

EPA Method 624/HSL List

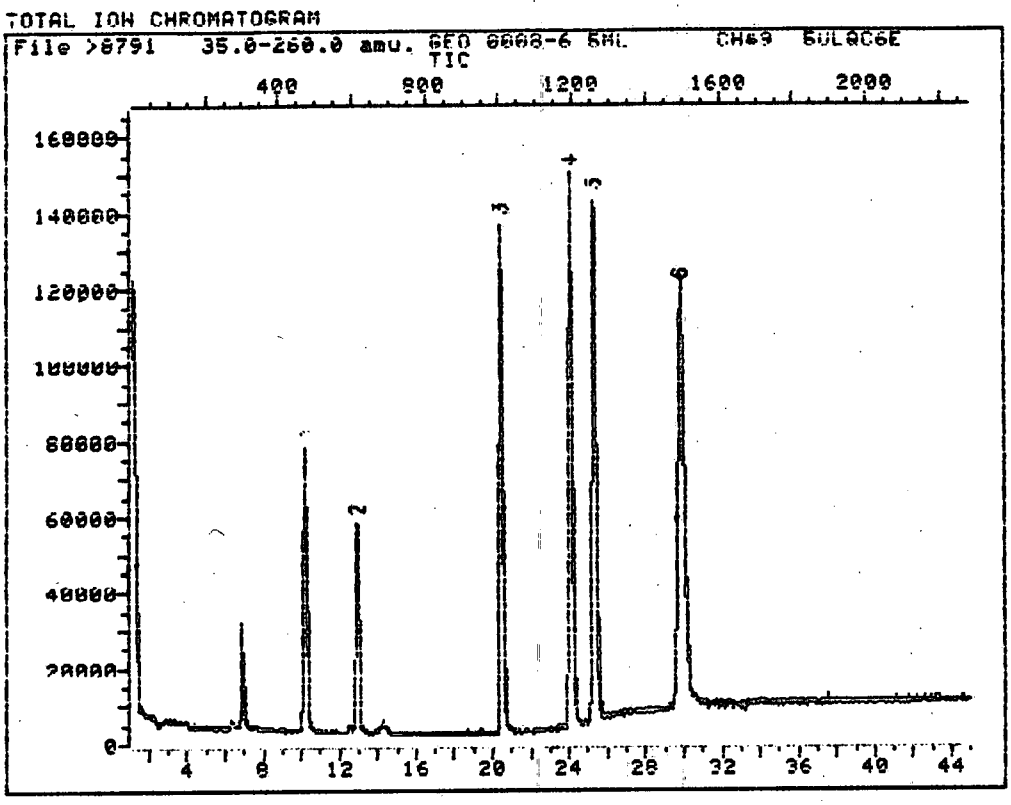
Client Name: GeoEngineering, Inc.
Client ID: 0200-TB
Laboratory ID: 0008-06
Matrix: Aqueous Sampled: 06/20/88 Received: 06/21/88
Authorized: 06/21/88 Prepared: 06/28/88 Analyzed: 06/28/88

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	µg/L	5.0
Bromomethane	ND	µg/L	5.0
Vinyl chloride	ND	µg/L	5.0
Chloroethane	ND	µg/L	5.0
Methylene chloride	13B	µg/L	5.0
Acetone	5.7*	µg/L	25
Carbon disulfide	ND	µg/L	2.0
1,1-Dichloroethene	ND	µg/L	2.0
1,1-Dichloroethane	ND	µg/L	2.0
trans-1,2-Dichloroethene	ND	µg/L	2.0
Chloroform	ND	µg/L	2.0
1,2-Dichloroethane	ND	µg/L	2.0
2-Butanone	ND	µg/L	10
1,1,1-Trichloroethane	ND	µg/L	2.0
Carbon tetrachloride	ND	µg/L	2.0
Vinyl acetate	ND	µg/L	10
Bromodichloromethane	ND	µg/L	2.0
1,2-Dichloropropane	ND	µg/L	2.0
trans-1,3-Dichloropropene	ND	µg/L	2.0
Trichloroethene	ND	µg/L	2.0
Dibromochloromethane	ND	µg/L	2.0
1,1,2-Trichloroethane	ND	µg/L	2.0
Benzene	ND	µg/L	2.0
cis-1,3-Dichloropropene	ND	µg/L	2.0
2-Chloroethyl vinyl ether	ND	µg/L	10
Bromoform	ND	µg/L	2.0
4-Methyl-2-pentanone	ND	µg/L	10
2-Hexanone	ND	µg/L	10
1,1,2,2-Tetrachloroethane	ND	µg/L	2.0
Tetrachloroethene	ND	µg/L	2.0
Toluene	ND	µg/L	2.0
Chlorobenzene	ND	µg/L	2.0
Ethylbenzene	ND	µg/L	2.0
Styrene	ND	µg/L	2.0
Total xylenes	ND	µg/L	2.0

*Trace concentrations detected below the reporting limit.
B = Analyte also detected in Erco blank.
ND = Not detected.

Reported by LA Approved by Ar

TOTAL ION CHROMATOGRAM



Data File: >8791::D3
Name: GFD 0008-6 5ML
Misc: CH#9 5ULQC6E

Quant Output File: ^8791::Z2

Id File: VOAID2::$$
Title: HSL VOLATILES:BFT1%SP1000:45-220@8/MIN:GCMS V2:ERCO/ENSECO
Last Calibration: 880627 22:55

Operator ID: KERY
Quant Time: 880628 02:34
Injected at: 880628 01:48

FOR INTERNAL USE ONLY
Erco VOA GC/MS Lab

Previous sample FRN 8790 Erco ID 0008-4
Major contaminants
Previously in chamber FRN 8783 Erco ID 8189-3
Major contaminants
Carryover Yes X
I.S. and surrogate areas checked
Integration checked
Spectra checked
All peaks accounted for
If no, number of peaks
Dilution factor
Blank FRN 8788
Lab Blank
Lab/Field Matrix
% solids
Methanol added
Initials MY

0200-TB

QUANT REPORT

Operator ID: KERY
Output File: ^8791::ZZ
Data File: >8791::D3
Name: GFD 0008-6 5ML
Misc: CH#9 5ULQC6E

Quant Rev: 6 Quant Time: 880628 02:54
Injected at: 880628 01:48
Dilution Factor: 1.00000

ID File: VOAID2::$$
Title: HSL VOLATILES:8FT1%SP1000:45-220@8/MIN:GCMS V2:ERCO/ENSECO
Last Calibration: 880627 22:55

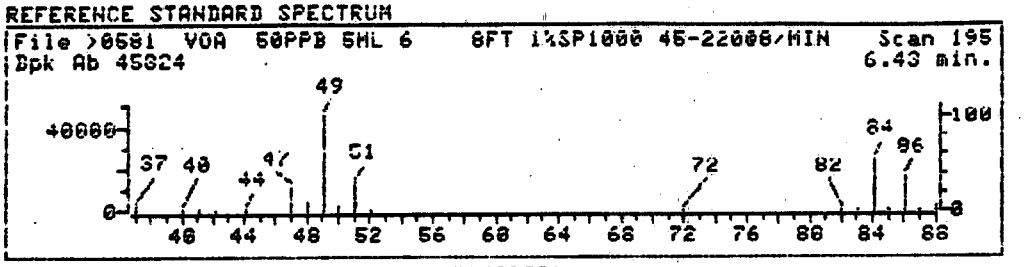
	Compound	R.T.	Q ion	Area	Conc	Units		Q
1)	*Bromochloromethane	10.16	49.0	210828	50.00	UG/L		100
6)	Methylene Chloride	6.88	84.0	63711	13.33	UG/L		50
7)	Acetone	7.53	43.0	6275	5.77	UG/L		87
14)	D4-1,2-Dichloroethane	12.89	65.0	221285	49.80	UG/L	100	96
15)	*1,4-Difluorobenzene	20.45	114.0	607418	50.00	UG/L		100
30)	*D5-Chlorobenzene	25.28	117.0	478917	50.00	UG/L		71
32)	2-Hexanone	22.89	43.0	2051	~~.88~~	UG/L	BMDL	75
35)	Toluene	24.27	92.0	4467	~~.49~~	UG/L	BMDL	93
36)	D8-Toluene	24.08	100.0	375998	49.32	UG/L	99	97
42)	Bromofluorobenzene (BFB)	29.84	95.0	383219	49.52	UG/L	99	98

* Compound is ISTD

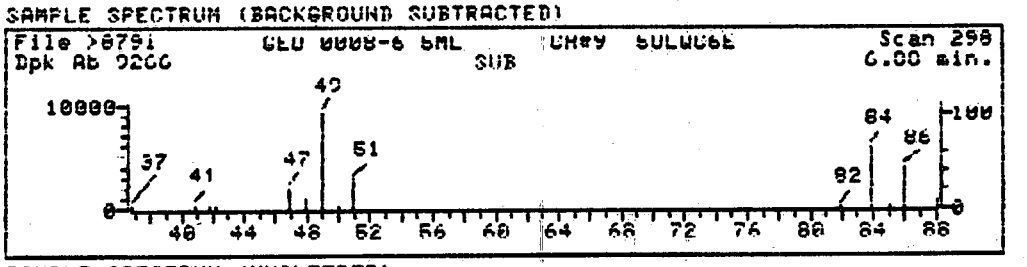
WA

0200-TB

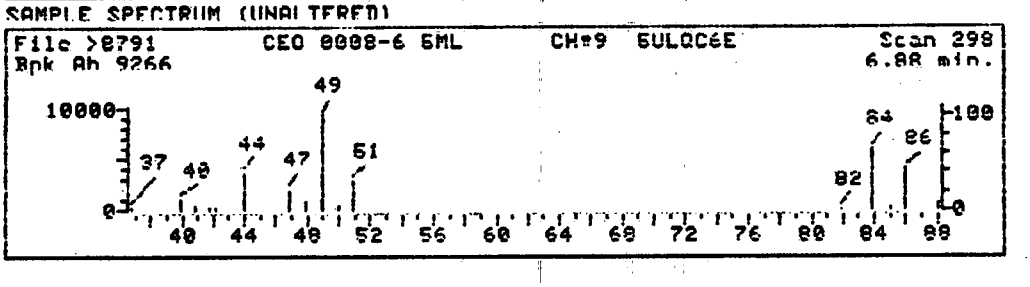
REFERENCE STANDARD SPECTRUM



SAMPLE SPECTRUM (BACKGROUND SUBTRACTED)



SAMPLE SPECTRUM (UNALTERED)

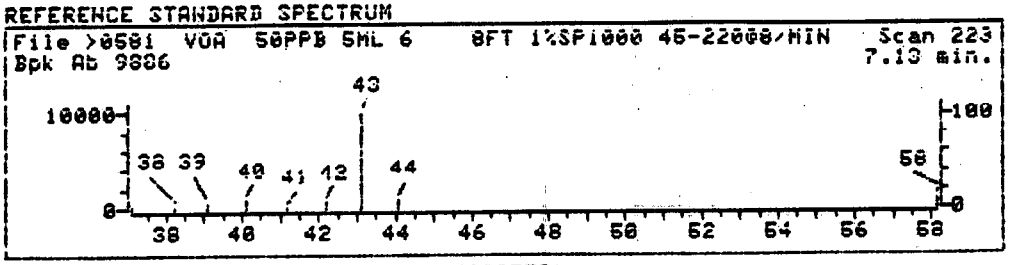


Data File: >8791::D3 Quant Output File: ^8791::ZZ
Name: GEO 0008-6 5ML
Misc: CH#9 5ULQC6E
Quant Time: 880628 02:34 Quant ID File: VUAID2::$$
Injected at: 880628 01:48 Last Calibration: 880627 22:55

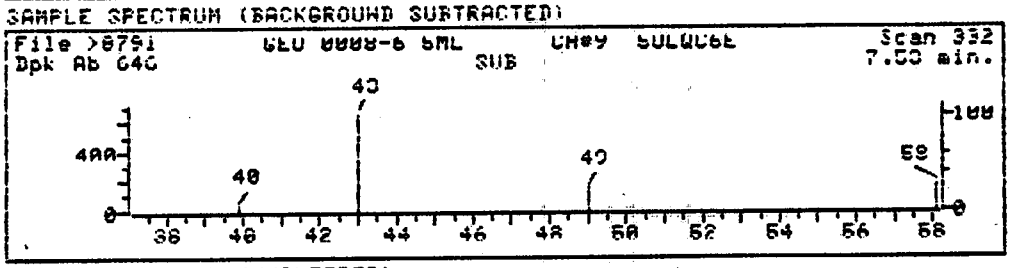
Compound No: 6
Compound Name: Methylene Chloride
Scan Number: 298
Retention Time: 6.88 min.
Quant Ion: 84.0
Area: 63711
Concentration: 13.33 UG/L
q-value: 50

0200-TB

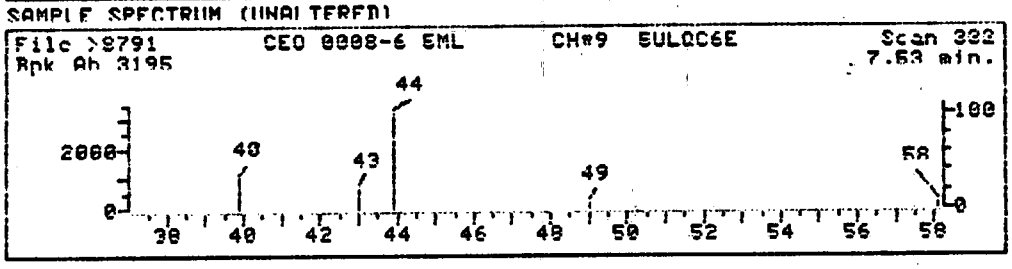
REFERENCE STANDARD SPECTRUM



SAMPLE SPECTRUM (BACKGROUND SUBTRACTED)



SAMPLE SPECTRUM (UNALTERED)



Data File: >8791::D3
Name: GEO 0008-6 5ML
Misc: CH#9 SUL QC6E
Quant Time: 880628 02:34
Injected at: 880628 01:48

Quant Output File: ^8791::77

Quant ID File: VOAID2::$$
Last Calibration: 880627 22:55

Compound No: 7
Compound Name: Acetone
Scan Number: 332
Retention Time: 7.53 min.
Quant Ion: 43.0
Area: 6275
Concentration: 5.72 UG/L
q-value: 87

0200-TB

Enseco

HAZARDOUS SUBSTANCE LIST (HSL) VOLATILE ORGANICS

EPA Method 624/HSL List

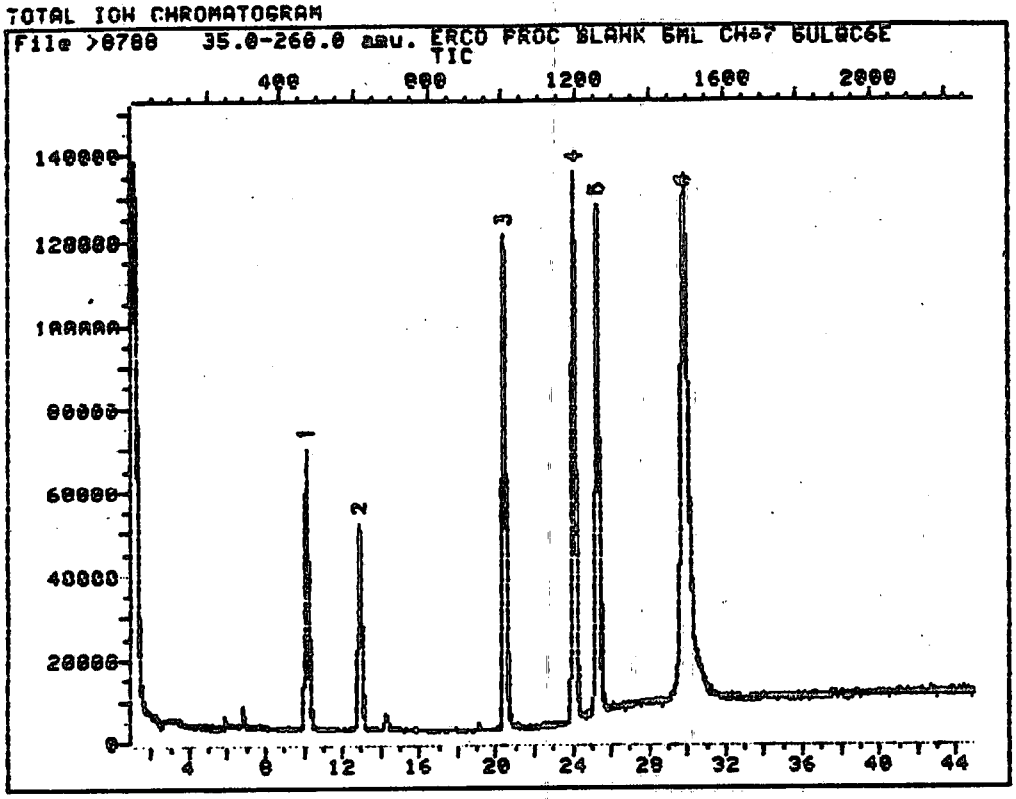
Client Name: GeoEngineering, Inc.
Client ID: Erco Procedural Blank - Water
Laboratory ID: 8788B
Matrix: Aqueous Sampled: NA Received: NA
Authorized: NA Prepared: 06/27/88 Analyzed: 06/27/88

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	µg/L	5.0
Bromomethane	ND	µg/L	5.0
Vinyl chloride	ND	µg/L	5.0
Chloroethane	ND	µg/L	5.0
Methylene chloride	2.9*	µg/L	5.0
Acetone	ND	µg/L	25
Carbon disulfide	ND	µg/L	2.0
1,1-Dichloroethene	ND	µg/L	2.0
1,1-Dichloroethane	ND	µg/L	2.0
trans-1,2-Dichloroethene	ND	µg/L	2.0
Chloroform	ND	µg/L	2.0
1,2-Dichloroethane	ND	µg/L	2.0
2-Butanone	ND	µg/L	10
1,1,1-Trichloroethane	ND	µg/L	2.0
Carbon tetrachloride	ND	µg/L	2.0
Vinyl acetate	ND	µg/L	10
Bromodichloromethane	ND	µg/L	2.0
1,2-Dichloropropane	ND	µg/L	2.0
trans-1,3-Dichloropropene	ND	µg/L	2.0
Trichloroethene	ND	µg/L	2.0
Dibromochloromethane	ND	µg/L	2.0
1,1,2-Trichloroethane	ND	µg/L	2.0
Benzene	ND	µg/L	2.0
cis-1,3-Dichloropropene	ND	µg/L	2.0
2-Chloroethyl vinyl ether	ND	µg/L	10
Bromoform	ND	µg/L	2.0
4-Methyl-2-pentanone	ND	µg/L	10
2-Hexanone	ND	µg/L	10
1,1,2,2-Tetrachloroethane	ND	µg/L	2.0
Tetrachloroethene	ND	µg/L	2.0
Toluene	ND	µg/L	2.0
Chlorobenzene	ND	µg/L	2.0
Ethylbenzene	ND	µg/L	2.0
Styrene	ND	µg/L	2.0
Total xylenes	ND	µg/L	2.0

*Trace concentrations detected below the reporting limit.
NA = Not applicable.
ND = Not detected.

Reported by LA Approved by A

TOTAL ION CHROMATOGRAM



Data File: >A7AA::D2 Quant Output File: ^A7AA::ZZ
Name: ERCO PROC BLANK 5ML
Misc: CH#7 50LQC6F

Id File: VOAID2::$$
Title: HSI VOLATILES:AFT1%SP1000:45-220@A/MIN:GCMS V2:ERCO/ENSECO
Last Calibration: AA0627 22:55

Operator ID: KERY
Quant Time: AA0627 23:37
Injected at: AA0627 22:50

QUANT REPORT

Operator ID: KERY
Output File: ^8788::ZZ
Data File: >8788::D2
Name: ERCO PROC BLANK 5ML
Misc: CH#7 5ULQC6E

Quant Rev: 6
Quant Time: 880627 23:37
Injected at: 880627 22:50
Dilution Factor: 1.00000

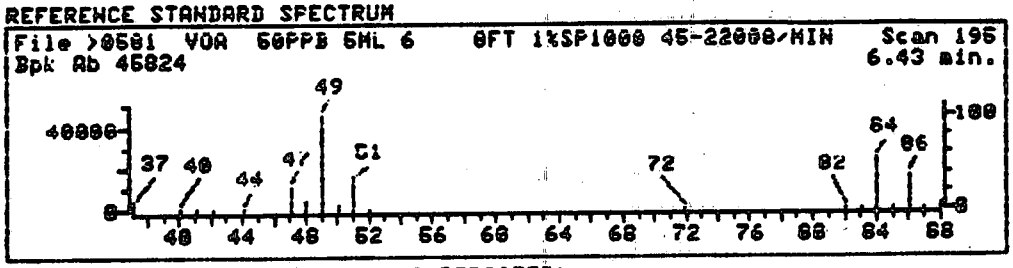
ID File: VOAID2::$$
Title: HSL VOLATILES:8FT1%SP1000:45-220@4/MIN:GCMS V2:ERCO/ENSECO
Last Calibration: 880627 22:55

	Compound	R.T.	Scan#	Area	Conc	Units	q
1)	*Bromochloromethane	10.08	467	190067	50.00	UG/L	100
6)	Methylene Chloride	6.83	298	12526	2.91	UG/L	52
14)	D4-1,2-Dichloroethane	12.83	610	196216	48.98	UG/L 98	92
15)	*1,4-Difluorobenzene	20.42	1005	546230	50.00	UG/L	100
30)	*D5-Chlorobenzene	25.24	1255	431401	50.00	UG/L	72
32)	2-Hexanone	22.77	1127	1735	.88	~~UG/L~~ BMDL	79
35)	Toluene	24.23	1203	2698	.33	~~UG/L~~ BMDL	71
36)	D8-Toluene	24.05	1194	335733	48.89	UG/L 98	97
42)	Bromofluorobenzene (BFB)	29.76	1490	339692	48.73	UG/L 97	96

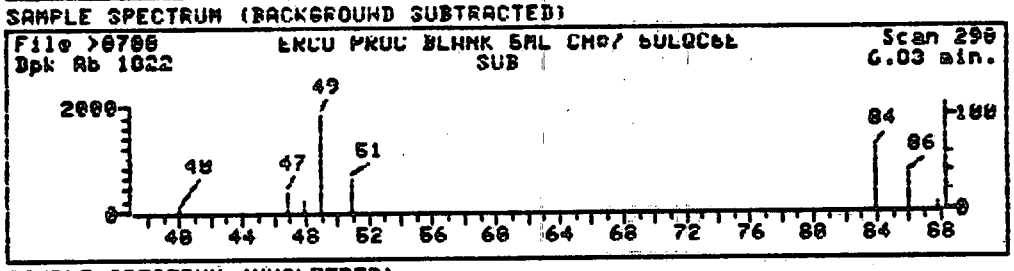
* Compound is ISTD

KA

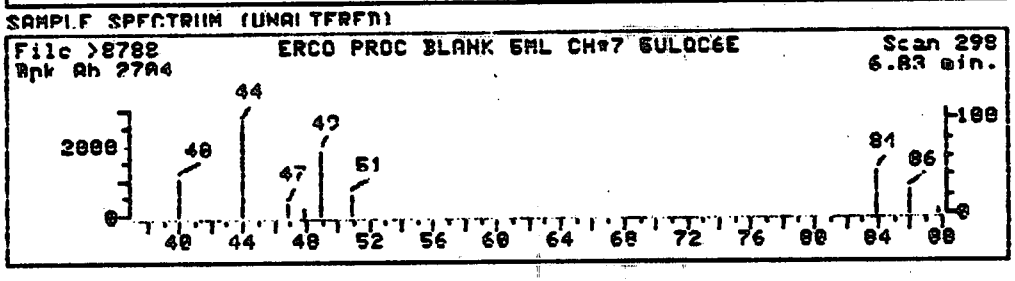
REFERENCE STANDARD SPECTRUM



SAMPLE SPECTRUM (BACKGROUND SUBTRACTED)



SAMPLE SPECTRUM (UNALTERED)



Data File: >A7AA::D2 Quant Output File: ^A7AA::ZZ
Name: ERCO PROC BLANK 5ML
Misc: CH#7 5ULQC6E
Quant Time: 880627 23:37 Quant ID File: UNAID2::$$
Injected at: 880627 22:50 Last Calibration: 880627 22:55

Compound No: 6
Compound Name: Methylene Chloride
Scan Number: 298
Retention Time: 6.83 min.
Quant Ion: 84.0
Area: 12526
Concentration: 2.91 UG/L
q-value: 52

Enseco

HAZARDOUS SUBSTANCE LIST (HSL) VOLATILE ORGANICS

EPA Method 624/HSL List

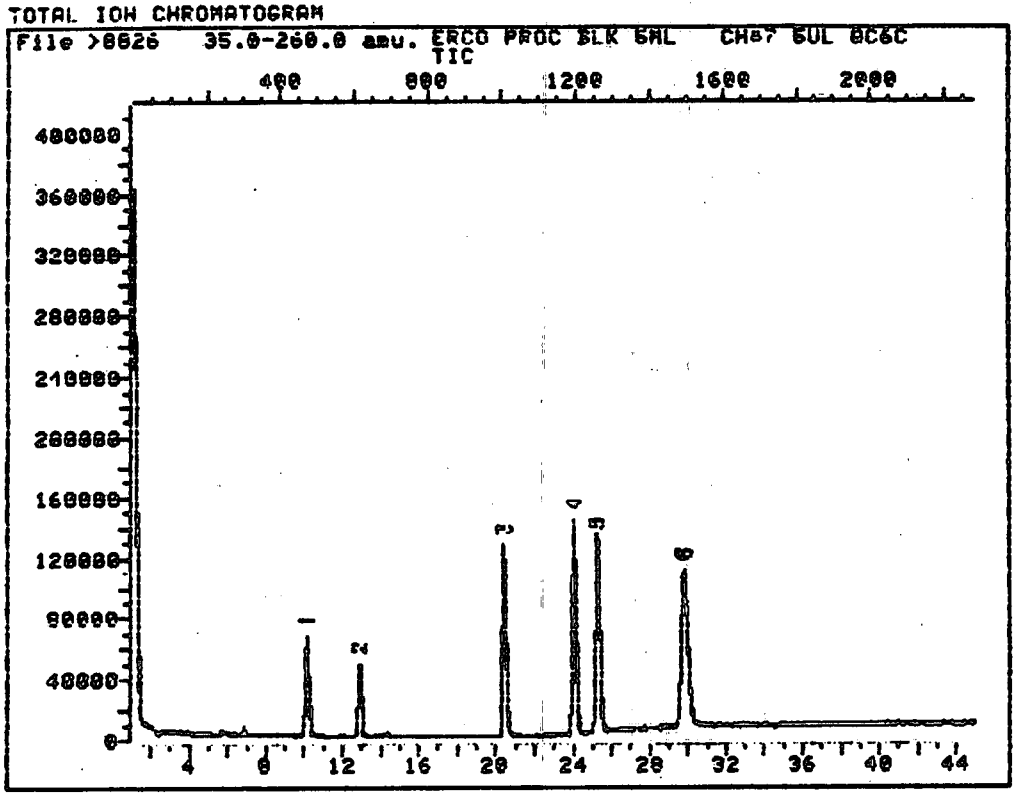
Client Name: GeoEngineering, Inc.
Client ID: Erco Procedural Blank - Water
Laboratory ID: 8826B
Matrix: Aqueous Sampled: NA Received: NA
Authorized: NA Prepared: 06/29/88 Analyzed: 06/29/88

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	µg/L	5.0
Bromomethane	ND	µg/L	5.0
Vinyl chloride	ND	µg/L	5.0
Chloroethane	ND	µg/L	5.0
Methylene chloride	2.9*	µg/L	5.0
Acetone	ND	µg/L	25
Carbon disulfide	ND	µg/L	2.0
1,1-Dichloroethene	ND	µg/L	2.0
1,1-Dichloroethane	ND	µg/L	2.0
trans-1,2-Dichloroethene	ND	µg/L	2.0
Chloroform	ND	µg/L	2.0
1,2-Dichloroethane	ND	µg/L	2.0
2-Butanone	ND	µg/L	10
1,1,1-Trichloroethane	ND	µg/L	2.0
Carbon tetrachloride	ND	µg/L	2.0
Vinyl acetate	ND	µg/L	10
Bromodichloromethane	ND	µg/L	2.0
1,2-Dichloropropane	ND	µg/L	2.0
trans-1,3-Dichloropropene	ND	µg/L	2.0
Trichloroethene	ND	µg/L	2.0
Dibromochloromethane	ND	µg/L	2.0
1,1,2-Trichloroethane	ND	µg/L	2.0
Benzene	ND	µg/L	2.0
cis-1,3-Dichloropropene	ND	µg/L	2.0
2-Chloroethyl vinyl ether	ND	µg/L	10
Bromoform	ND	µg/L	2.0
4-Methyl-2-pentanone	ND	µg/L	10
2-Hexanone	ND	µg/L	10
1,1,2,2-Tetrachloroethane	ND	µg/L	2.0
Tetrachloroethene	ND	µg/L	2.0
Toluene	ND	µg/L	2.0
Chlorobenzene	ND	µg/L	2.0
Ethylbenzene	ND	µg/L	2.0
Styrene	ND	µg/L	2.0
Total xylenes	ND	µg/L	2.0

*Trace concentrations detected below the reporting limit.
NA = Not applicable.
ND = Not detected.

Reported by LA Approved by

TOTAL ION CHROMATOGRAM



Data File: >8826::D3 Quant Output File: ^8826::7Z
Name: ERCO PROC BLK 5ML
Misc: CH#7 5UL QC6C

Id File: VOAID2::$$
Title: HSL VOLATILES:BFT1%SP1000:45-220@4/MIN:GCMS V2:ERCO/ENSECO
Last Calibration: 880629 12:05

Operator ID: KERY
Quant Time: 880629 12:59
Injected at: 880629 12:06

QUANT REPORT

Operator ID: KERY
Output File: ^AB26::77
Data File: >AB26::D3
Name: ERCO PROC BLK 5ML
Misc: CH#7 5UL QC6C

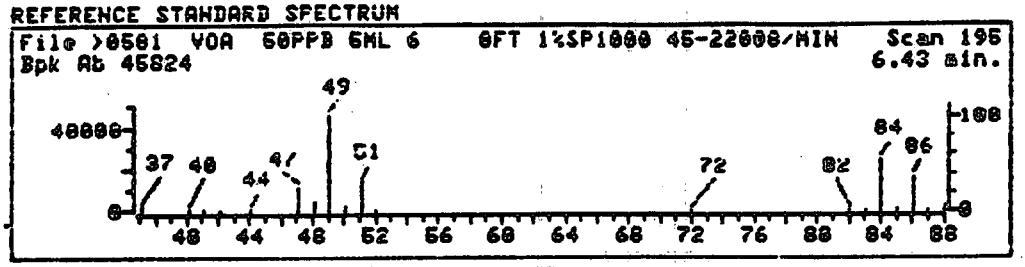
Quant Rev: 6
Quant Time: 880629 12:59
Injected at: 880629 12:06
Dilution Factor: 1.00000

ID File: VOAID2::$$
Title: HSL VOLATILES:BFT1%SP1000:45-220@8/MIN:GCMS V2:ERCO/ENSECO
Last Calibration: 880629 12:05

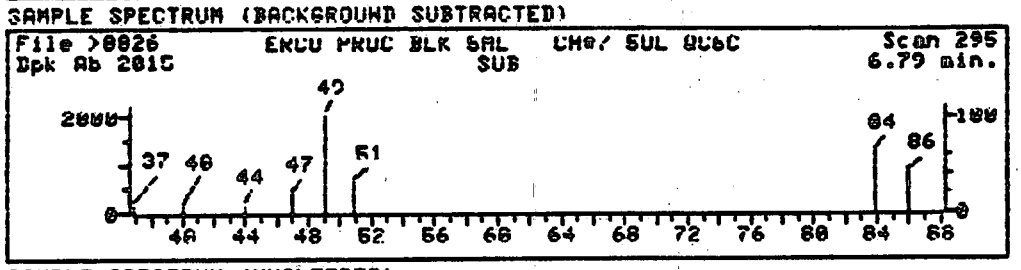
	Compound	R.T.	Scan#	Area	Conc	Units	q
1)	*Bromochloromethane	10.09	467	181884	50.00	UG/L	100
6)	Methylene Chloride	6.79	295	13286	2.95	UG/L	55
14)	D4-1,2-Dichloroethane	12.84	610	193367	48.31	UG/L 97	93
15)	*1,4-Difluorobenzene	20.41	1004	570216	50.00	UG/L	100
30)	*D5-Chlorobenzene	25.23	1254	451911	50.00	UG/L	70
32)	2-Hexanone	23.18	1148	1500	~~.89~~	UG/L BMDL	81
35)	Toluene	24.22	1202	1032	~~.13~~	UG/L BMDL	72
36)	D8-Toluene	24.04	1193	359693	50.74	UG/L 101	97
42)	Bromofluorobenzene (BFB)	29.78	1491	346089	50.15	UG/L 100	99

* Compound is ISTD

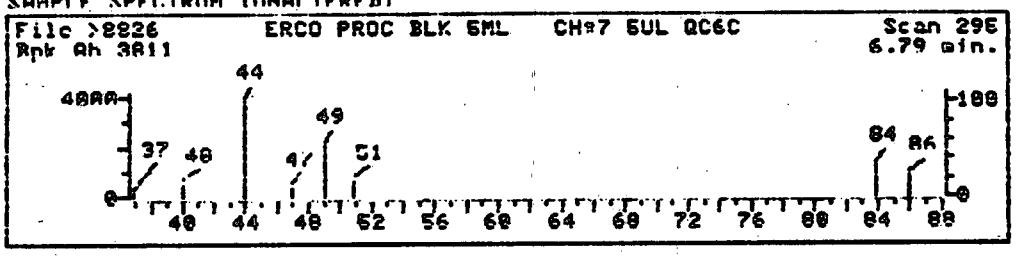
REFERENCE STANDARD SPECTRUM



SAMPLE SPECTRUM (BACKGROUND SUBTRACTED)



SAMPLE SPECTRUM (UNAVERAGED)



Data File: >0826::D3 Quant Output File: ^0826::7Z
Name: ERCO PROC BLK 5ML
Misc: CH#7 5UL QC6C
Quant Time: 880629 12:59 Quant ID File: VOAID2::88
Injected at: 880629 12:06 Last Calibration: 880629 12:05

Compound No: 6
Compound Name: Methylene Chloride
Scan Number: 295
Retention Time: 6.79 min.
Quant Ion: 84.0
Area: 13286
Concentration: 2.95 UG/L
q-value: 55

Enseco

HAZARDOUS SUBSTANCE LIST (HSL) VOLATILE ORGANICS

EPA Method 624/HSL List

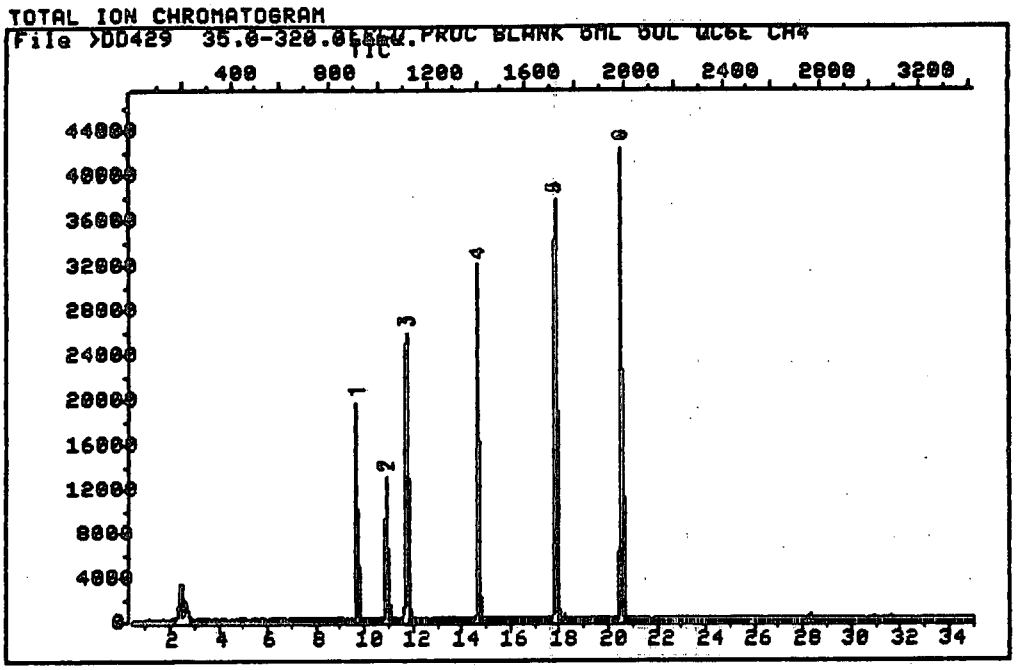
Client Name: GeoEngineering, Inc.
Client ID: Erco Procedural Blank - Water
Laboratory ID: DD429B
Matrix: Aqueous Sampled: NA Received: NA
Authorized: NA Prepared: 06/26/88 Analyzed: 06/26/88

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	µg/L	5.0
Bromomethane	ND	µg/L	5.0
Vinyl chloride	ND	µg/L	5.0
Chloroethane	ND	µg/L	5.0
Methylene chloride	ND	µg/L	5.0
Acetone	ND	µg/L	25
Carbon disulfide	ND	µg/L	2.0
1,1-Dichloroethene	ND	µg/L	2.0
1,1-Dichloroethane	ND	µg/L	2.0
trans-1,2-Dichloroethene	ND	µg/L	2.0
Chloroform	ND	µg/L	2.0
1,2-Dichloroethane	ND	µg/L	2.0
2-Butanone	ND	µg/L	10
1,1,1-Trichloroethane	ND	µg/L	2.0
Carbon tetrachloride	ND	µg/L	2.0
Vinyl acetate	ND	µg/L	10
Bromodichloromethane	ND	µg/L	2.0
1,2-Dichloropropane	ND	µg/L	2.0
trans-1,3-Dichloropropene	ND	µg/L	2.0
Trichloroethene	ND	µg/L	2.0
Dibromochloromethane	ND	µg/L	2.0
1,1,2-Trichloroethane	ND	µg/L	2.0
Benzene	ND	µg/L	2.0
cis-1,3-Dichloropropene	ND	µg/L	2.0
2-Chloroethyl vinyl ether	ND	µg/L	10
Bromoform	ND	µg/L	2.0
4-Methyl-2-pentanone	ND	µg/L	10
2-Hexanone	ND	µg/L	10
1,1,2,2-Tetrachloroethane	ND	µg/L	2.0
Tetrachloroethene	ND	µg/L	2.0
Toluene	ND	µg/L	2.0
Chlorobenzene	ND	µg/L	2.0
Ethylbenzene	ND	µg/L	2.0
Styrene	ND	µg/L	2.0
Total xylenes	ND	µg/L	2.0

NA = Not applicable.
ND = Not detected.

Reported by LA Approved by

TOTAL ION CHROMATOGRAM



Data File: >DD429::D3 Quant Output File: ^DD429::QT
Name: ERCO PROC BLANK 5ML
Misc: 5UL QC6E CH4

Id File: VOC4::$$
Title: HSL VOLATILES: 60M VOCOL GCMS4 ERCO/ENSECO
Last Calibration: 880627 12:04

Operator ID: KERY
Quant Time: 880627 12:05
Injected at: 880626 12:49

QUANT REPORT

Operator ID: KERY
Output File: ^DD429::QT
Data File: >DD429::D3
Name: ERCO PROC BLANK 5ML
Misc: 5UL QC6E CH4

Quant Rev: 6
Quant Time: 880627 12:05
Injected at: 880626 12:49
Dilution Factor: 1.00000

ID File: VOC4::$$
Title: HSL VOLATILES: 60M VOCOL GCMS4 ERCO/ENSECO
Last Calibration: 880627 12:04

	Compound	R.T.	Scan#	Area	Conc	Units	q
1)	*Bromochloromethane	9.65	909	29484	50.00	UG/L	100
14)	D4-1,2-Dichloroethane	10.84	1027	27279	55.15	UG/L 110	91
15)	*1,4-Difluorobenzene	11.71	1113	61770	50.00	UG/L	100
30)	*D5-Chlorobenzene	17.77	1713	58571	50.00	UG/L	100
31)	D8-Toluene	14.62	1401	42246	49.30	UG/L 99	94
37)	Ethylbenzene	18.20	1755	243	~~.40 UG/L~~	BMDL	56
38)	Xylene (m,p)	18.20	1755	243	~~.30 UG/L~~		86
42)	Bromofluorobenzene (BFB)	20.49	1982	37948	43.62	UG/L 87	78
43)	Dichlorobenzene (m)	22.84	2214	78	~~.06 UG/L~~	BMDL	100
44)	Dichlorobenzene (p)	23.14	2244	241	~~.18 UG/L~~	BMDL	100
45)	Dichlorobenzene (o)	23.93	2322	199	~~.17 UG/L~~	BMDL	100

MA

* Compound is ISTD

Enseco

HAZARDOUS SUBSTANCE LIST (HSL) VOLATILE ORGANICS

EPA Method 624/HSL List

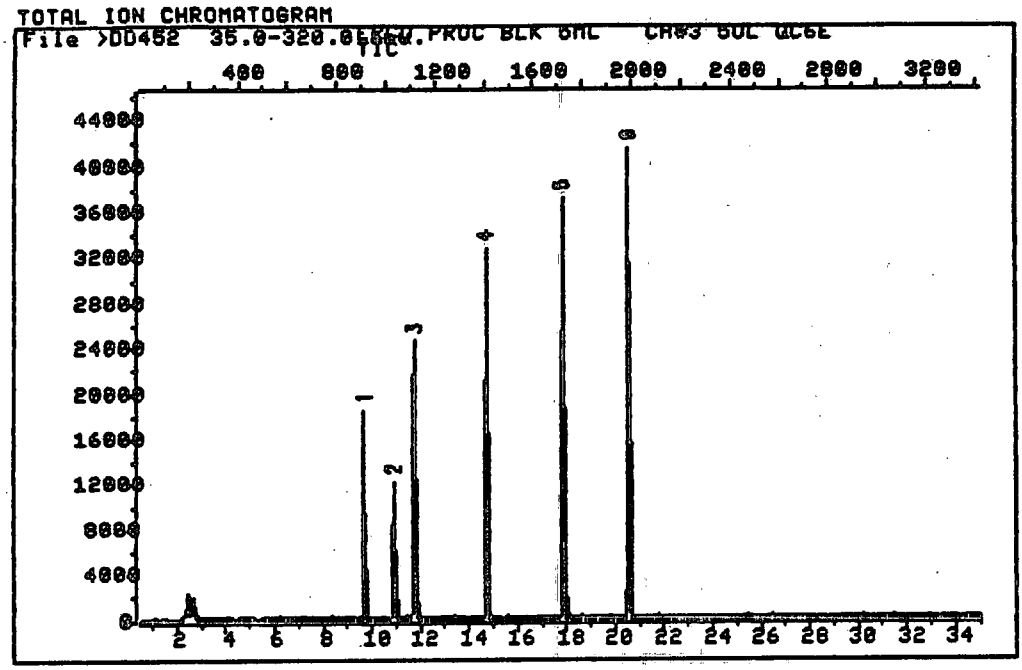
Client Name: GeoEngineering, Inc.
Client ID: Erco Procedural Blank - Water
Laboratory ID: DD452B
Matrix: Aqueous Sampled: NA Received: NA
Authorized: NA Prepared: 06/27/88 Analyzed: 06/27/88

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	µg/L	5.0
Bromomethane	ND	µg/L	5.0
Vinyl chloride	ND	µg/L	5.0
Chloroethane	ND	µg/L	5.0
Methylene chloride	ND	µg/L	5.0
Acetone	ND	µg/L	25
Carbon disulfide	ND	µg/L	2.0
1,1-Dichloroethene	ND	µg/L	2.0
1,1-Dichloroethane	ND	µg/L	2.0
trans-1,2-Dichloroethene	ND	µg/L	2.0
Chloroform	ND	µg/L	2.0
1,2-Dichloroethane	ND	µg/L	2.0
2-Butanone	ND	µg/L	10
1,1,1-Trichloroethane	ND	µg/L	2.0
Carbon tetrachloride	ND	µg/L	2.0
Vinyl acetate	ND	µg/L	10
Bromodichloromethane	ND	µg/L	2.0
1,2-Dichloropropane	ND	µg/L	2.0
trans-1,3-Dichloropropene	ND	µg/L	2.0
Trichloroethene	ND	µg/L	2.0
Dibromochloromethane	ND	µg/L	2.0
1,1,2-Trichloroethane	ND	µg/L	2.0
Benzene	ND	µg/L	2.0
cis-1,3-Dichloropropene	ND	µg/L	2.0
2-Chloroethyl vinyl ether	ND	µg/L	10
Bromoform	ND	µg/L	2.0
4-Methyl-2-pentanone	ND	µg/L	10
2-Hexanone	ND	µg/L	10
1,1,2,2-Tetrachloroethane	ND	µg/L	2.0
Tetrachloroethene	ND	µg/L	2.0
Toluene	ND	µg/L	2.0
Chlorobenzene	ND	µg/L	2.0
Ethylbenzene	ND	µg/L	2.0
Styrene	ND	µg/L	2.0
Total xylenes	ND	µg/L	2.0

NA = Not applicable.
ND = Not detected.

Reported by LA Approved by Am

TOTAL ION CHROMATOGRAM



Data File: >DD452::D3 Quant Output File: ^DD452::QT
Name: ERCO PROC BLK 5ML
Misc: CH#3 5UL QC6E

Id File: VOC4::$$
Title: HSL VOLATILES: 60M VOCOL GCMS4 ERCO/ENSECO
Last Calibration: 880627 12:26

Operator ID: KERY
Quant Time: 880627 12:26
Injected at: 880627 11:13

QUANT REPORT

Operator ID: KERY
Output File: ^DD452::QT
Data File: >DD452::D3
Name: ERCO PROC BLK 5ML
Misc: CH#3 5UL QC6E

Quant Rev: 6
Quant Time: 880627 12:26
Injected at: 880627 11:13
Dilution Factor: 1.00000

ID File: VOC4::$$
Title: HSL VOLATILES: 60M VOCOL GCMS4 ERCO/ENSECO
Last Calibration: 880627 12:26

	Compound	R.T.	Scan#	Area	Conc	Units	q
1)	*Bromochloromethane	9.67	910	27580	50.00	UG/L	100
14)	D4-1,2-Dichloroethane	10.86	1027	25499	52.12	UG/L 104	90
15)	*1,4-Difluorobenzene	11.74	1114	62404	50.00	UG/L	100
30)	*D5-Chlorobenzene	17.80	1714	59125	50.00	UG/L	100
31)	D8-Toluene	14.66	1403	42857	50.19	UG/L 100	95
42)	Bromofluorobenzene (BFB)	20.52	1983	37659	43.16	UG/L 86	82
45)	Dichlorobenzene (o)	23.96	2323	58	~~.84~~	UG/L 8 ppb	100

WA

* Compound is ISTD

Four

SUMMARY OF METHODS

The analytical EPA Methods 608 (Pesticides/PCBs), 624 (Volatile Organics) and 625 (Base/Neutrals and Acids) are designed to analyze water, sediment, and soil for the organic compounds on the Hazardous Substance List (HSL).

Volatile Organic Compounds

Analyses are conducted using purge and trap gas chromatographic/mass spectrometer (GC/MS) procedure in accordance with EPA Method 624. For sediment/soil samples, the purge device is heated.

Extractable Organic Compounds

Base/Neutrals and Acids (Semivolatiles)

The analyses are conducted in accordance with EPA Method 625. The method involves solvent extraction of the matrix, using a separatory funnel for waters and a sonicator for solids, concentration, and analysis by a GC/MS.

Pesticide/PCBs

The analysis of certain organochloride pesticides and polychlorinated biphenyls is conducted in accordance with EPA Method 608. The method involves solvent extraction of the matrix, concentration, and analysis. The extract is screened on a gas chromatograph/electron capture detector (GC/ECD) using a packed column. The sample is quantitated and confirmed on a GC/ECD using a second packed column.

Inorganic Analyses

All inorganic analyses are performed according to EPA Protocols described in "Methods for Chemical Analysis of Water and Wastes" EPA-600/4-79-020, Revised March 1983 or in "Methods for the Analysis of Solid Waste, Physical/Chemical Methods", 2nd edition, U.S. EPA SW 846.

Priority Pollutant Metals

To determine the metal content of a sample, ENSECO uses either atomic absorption spectroscopy (cold vapor techniques, hydride generation, and flame or furnace) or inductively coupled plasma spectroscopy (ICP). Acid digestion procedures are found in the U.S. EPA Contract Laboratory Program Protocols.

EPA Methods 601 and 602

The analyses are conducted in accordance with the methods found in the Federal Register, 40 CFR Part 136, October 26, 1984. These are purge and trap gas chromatographic (GC) methods.

The Method 601 covers the determination of 29 purgeable halocarbons and the Method 602 covers the determination of various purgeable aromatics.

Petroleum Hydrocarbons by EPA Method 418.1

(Spectrophotometric, Infrared)

The analysis is conducted in accordance with EPA Method 418.1 as stated in the "Manual of Methods for Chemical Analysis of Water and Wastes," EPA-600/4-82-055, December 1982. There is a modification of the method for soils and sediments. This interim guideline is found in the New Jersey Department of Environmental Protection's "Environmental Cleanup Responsibility Act (ECRA), Sampling Plan Guide."

Method 418.1 defines petroleum hydrocarbons as those organic materials extractable by Freon 113 that are not adsorbed by silica gel and that are measured by infrared spectroscopy (IR) at the specified wavelength. It is applicable to the measurement of light fuels, although the loss of about half of any gasoline present during the extraction procedure can be expected.

The sample is acidified to a low pH and serially extractable with Freon 113 in a separatory funnel. A soxhlet extraction apparatus is used for the soil/sediment samples. Interferences are removed with silica gel adsorbant.

EPA Method 418.1 measures the mineral oils, whereas the oil and grease method (413.2) is a measure of biodegradable animal grease and vegetable oils as well as the relative nonbiodegradable mineral oils. EPA Method 418.1 suggests the use of both methods to obtain the maximum information needed to characterize the oil and grease of all sources.

Enseco

CHAIN-OF-CUSTODY RECORD

SAMPLER: (Signature) Kenny A. Corrette
Phone 201 625 2434

Date Shipped 6/20/88
Airbill No.

Carrier
Cooler No.

SHIP TO:
Enseco-ERCO Lab
205 Alewife Brook Parkway
Cambridge, MA 02138
(617) 661-3111
ATTENTION:

SEND RESULTS TO:
Client Name William Dunnell
Company Geo Engineering
Address 100 Field Rd
Denville NJ 07834
Phone (201) 625-0700

PROJECT NAME
PROJECT NO.
P.O. NO.

Relinquished by: (Signature)	Received by: (Signature)	Date	Time
Kenny A. Corrette	Shipped Fed Ex at	6/20/88	16:00
Relinquished by: (Signature)	Received by: (Signature)	Date	Time
Relinquished by: (Signature)	Received at lab by: (Signature)	Date	Time
Relinquished from lab by: (Signature)	Received by: (Signature)	Date	Time

ANALYSIS REQUEST

Sample ID Number	Sample Description	Date/Time Sampled	Analysis Requested	Sample Condition Upon Receipt
0200-5	water	6/20/88 9:42	VO Method 624	
0200-2	↓	10:09	↓	
0200-3	↓	10:19	↓	
0200-4	↓	10:43	↓	
0200-1	↓	11:15	↓	
0200-TB				bas herbicide

Special Instructions/Comments:
Shipped Fed Ex at 6/20/88 16:00

NOTE: UNUSED PORTIONS OF NON-AQUEOUS SAMPLES WILL BE RETURNED TO CLIENT

Expected Analytical T.A.T's: ____ Immediate Attention (200% surcharge) ____ RUSH (50-100% surcharge) ____ Standard

ERCO Booking Log Number: (for lab use only)

Client Retains White Copy Only

(Revised 1/87)

Booking Log No.: ~~8249~~ 0008

Enseco - Erco Laboratory

Client: GEO ENGINEERING

Client Project: LE Carpenter

CSR/Tech. Dir.: Clyde Tressler

Date Received: 06/21/88

Date Due: 07/12/88

Date Due To D.C.:

Reporting Format (Please Circle)

CLP Tier I A, B Tier II A, B ECRA RCRA

HSL PP Unknowns ☐ Yes ☐ No

Other

Project Information

Client Contact: Project No.:

Account No.: P.O. No.:

Bill No.: Program:

Comments: Fed Exp # 7237055486

Samples

Rec'd by		Date Rec'd
	Metals ☐	
	GWQ ☐	
	VOA/GC ☐	
Kangti K.	VOA/MS ☐	6/21/88
	Prep. ☐	
	SEA ☐	

Paperwork Check

	Date Rec'd		Date Rec'd
CSR/TD ☒		Pest. ☐	
Prep. ☐		GC/MS ☐	
GWQ ☐		D.C. ☐	
VOA/GC ☐		Computer ☒	
VOA/MS ☒		Metals ☐	
SEA ☐			

Surcharge (Please Circle)

50% 100% 200%

Logged by: BJK

Date: 06/21/88

Approved by:

Date:

Booking Log No.: ~~8249~~ 0008

Enseco - Erco Laboratory

Erco ID	Client ID	Date Sampled	Matrix	Condition	Analyses
01	012010-11	06/20	A	G	624
02	012010-12				
03	012010-13				
04	012010-14				
05	012010-15				
06	012010-17B				

Date rec'd.	Client (sample lot size) ERCO IDs	Client ID	Run deadline	Matrix	Analysis	Screen info.	Rerun amount	Good run	# vials rec'd.	Comments	Project due date	Out	Sample Custodian
6/21	GEO Engineering										7/5		DD
	0008 - 01	0200 - 1	6/27	H/O	624	5ML	20µl	DD460	3	6/27			
	- 02	- 2				5ML	100 µl	8833		6/29			
	- 03	- 3				30µl	50µl	DD482		6/26			
	- 04	- 4				5ML	5ML 300µl	8831		6/29			
	-05	- 5				500µl	5ML 300µl	8832		[illegible]			
	-06	- TB				5ML	5ML	8791	2	[illegible]			
6/20	[redacted]		6/22										
	8239-1	56835	6/23	S	8240	200µl			2		7/3		KK
	2	56836				50µl			2				
	3	56837				200µl			2				
	4	56838				200µl			2				
6/17	[redacted]		6/22										
	8240-1	C-D-1	6/23	S	8240	200µl		DD475	2	7/6	7/1		KK
	2	C-D-2							2				
	3	L-D-4						DD650	2	7/7			
	4	C-SB-1						DD651	2	7/7			
	5	C-SB-2						DD652	2	7/7			

Erco Laboratory

Volatile Organics Laboratory

Analysis

FRN	Arcv. Tape	Ch. No.	Sample ID	Conc. or Vol.	E.M. Volt	Column Length	Column Type	Analyst	Date	Check if Good Run	Comments
>8779	/	7	LAB SPIKE 5µl QC6E/MSBE	5ml	2007	8'	1% SP1000	KH	6/27/88	OK	
>8780	VOA	6	[redacted] 8062-8 5µl QC6E	5ml				KH		1st RR 5ml	
>8781		7	[redacted] 8180-5	1ml				KH		/	
>8782		8	[redacted] 8189-5	10µl				KH		RR 5ml	
>8783		9	[redacted] 8189-3	10µl				KH		X	
>8784		10	[redacted] 8189-1	200µl Dil				KH		X	Dil 100µl/10ml
>8785		1	[redacted] 8189-7	100µl Dil				KH		RR 100µl	
>8786	/		BFB D. I.	50ng	2007	8'	1% SP1000	MM	6.27.88		218 21:03
8787 ~~>8786~~ MM	/	7	VOA ST D 50ppb 5µl QC6F	5ml				MM			25µl/100ml A+B+C+HSL
>8788	/	7	ERCO PROC. Blank	5ml				MM			
>8789	VOA 312	7	GEO 0008-5	500µl				MM		RR 5ml	
>8790		8	GEO 0008-4	500µl				MM		RR Dil	

Erco Laboratory | Volatile Organics Laboratory | Analysis Log

FRN	Arcv. Tape	Ch. No.	Sample ID	Conc. or Vol.	E.M. Volt	Column Length	Column Type	Analyst	Date	Check if Good Run	Comments
>8791		9	GEO 0008-6 5µl QC6E	5ml	2007	8'	1% sp1000	WW	6.27.88	X	
>8792		10	[redacted] 8534-3 [illegible]	100µl				WW		X	
>8793		1	[redacted] 8255 -1	5ml				WW		✓	
>8794		2	[redacted] 8255 -2	5ml				WW		RR 5ML 1SL	
>8795		3	[redacted] 8255 -3	5ml				WW		✓	
>8796		4	[redacted] 8255 -4	5ml				WW		✓	
>8797		5	[redacted] 8255 -5	5ml				WW		✓	
>8798		6	[redacted] 8255 -6	5ml				WW		1SL RR 5ML	
>8799	VOA 312		BFB Di	5ng	2007	8'	1% sp1000	WWD	6.28.88		9:31 219
>8800		5	VOA 50ppb STD 5ul QC6F	5ml				WWD			
>8801		5	ERCO Proc Blank 5ul QC6F	5ml				WWD			
[illegible]		5	[redacted] 8062-08	5ml				WWD		✓	

FDM	Accv. Tape	Ch. No.	Sample ID	Conc. or Vol.	F.M. Volt	Column Length	Column Type	Analyst	Date	Check if Good Run	Comments
>8826	/	7	ERCO PROC BLK 5µl GC/MS	5ml	2007	8'	1% SP 1000	KH	6/29/88		
>8827	/	7	Lab Spike 5µl MSSD	5ml				KH		OK	
>8828	/	7	Lab Spike ↓	5ml				KH		OK	
>8829	VOA 312	7	[redacted] 8255-2	5ml				DD		X	
>8830		8	[redacted] 8255-6	5ml				DD		X	
>8831		9	GEO 0008-4	5ml				DD		X	
>8832		10	GEO 0008-5	5ml				DD		X	
>8833		1	GEO 0008-2	100µl				DD		X	
>8834		2	[redacted] 8305-1	100µl				DD		RR 100µl	Dil: 100µl/10ml
>8835	/		BFB D.I.	50ng	2007	8'	1% Sp1000	MM	6.29.88		217 20:41
>8836	/	7	VOA STD 50ppb 5µl GC/GF	5ml				MM			25µl/100ml A+B+C+1/SL
>8837	/	7	ERCO PROC. Blank	5ml				MM			

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Erco Laboratory | Volatile Organics Laboratory | Analysis Log

FRN	Arcv. Tape	Ch. No.	Sample ID	Conc. or Vol.	E.M. Volt	Column Length	Column Type	Analyst	Date	Check if Good Run	Comments
DD427	VOA 11		BFBDI	5ng	2811	60m	VOCOL	WmD	6/26/88		842 11:10
DD428	/	4	VOA 50ppb STD. 5ul QC6E	5ml				WmD			25ul/100ml A,B,C & HSL
DD429	/	4	ERCO Proc Blank 5ul QC6E	5ml				WmD			
DD430	/	4	Lab spike 5ul QC6E/5ulMS8C	5ml				WmD		OK	
DD431	/	4	Lab spike 5ul QC6E/5ulMS8C	5ml				WmD		OK	
DD432		3	GCO 0008-03 5ul QC6E	50ml				WmD			
DD433		4	GCO 0008-04	5ml				WmD		RR 50ppb	
DD434		5	GCO 0008-05	5ml				WmD		RR 50ppb	
DD435		6	GCO 0008-06	5ml				WmD		RR 5ML	
DD436		7	H2O Blank	5ml							Clean
DD437	/		BFB DI	50ng	2838	60M	VOCOL	KH	6/26/88		843 20:25
DD438	/	4	VOA 50ppb STD 5ul QC6E	5ml							25ul/100ml SVPA,B,C & HSL

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Erco Laboratory

Volatile Organics Laboratory

Analysis Log

FRN	Arcv. Tape	Ch. No.	Sample ID	Conc. or Vol.	E.M. Volt	Column Length	Column Type	Analyst	Date	Check if Good Run	Comments
DD450	/		BFB DI S	50ng	2811	60m	VOC2	KH	6/27/88		9:37 546
DD451	/	3	VOA 50ppb STD SUPERCLEE	5ml	2811			KH			25ul/100ml SupA, B, C & F SC
DD452	/	3	ERCO PROC BLK	5ml				KH			
DD453	/	3	Lab Spike MSBE	5ml				KH		OK	
DD454	/	3	Lab Spike	5ml				KH		OK	
DD455	VOA 11	3	[redacted] 0007-2	500µl				KH		X	
DD456		4	[redacted] 0007-3	500µl				KH		X	
DD457		5	[redacted] 8219-11	323g				KH		X	
DD458		6	[redacted] 8213-3	50µl				KH		X	
DD459		7	[redacted] 8213-7	60µl				KH		X	
DD460		8	GED 0008-1	20µl				KH		X	
DD461		9	GED 0008-2	20µl				KH		RR 10µl	