2030 Addison Street, Suite 500, Berkeley, California 94704

April 11, 1995

Alameda County Health Agency
Department of Environmental Health
Hazardous Materials Division
1131 Harbor Bay Parkway, Room 250
Alameda, California 94502

Attention: Ms. Eva Chu

Subject: **LNAPL Assessment Report, Mill Springs Park Apartments, 1809 Railroad Avenue, Livermore**

Dear Ms. Chu:

Telephone
510.540.6954
Facsimile
510.540.7496

INTRODUCTION

This report presents EARTH TECH's assessment regarding the presence of a light non-aqueous phase liquid (LNAPL) detected in the monitoring well at the Mill Springs Park Apartment complex. As discussed in correspondence dated March 1, 1995, EARTH TECH attempted to abandon the monitoring well at the Mill Springs Park Apartment site located at 1809 Railroad Avenue (formerly 1799 Railroad Avenue) in Livermore, California on February 23, 1995. Upon opening the well, a petroleum hydrocarbon odor was detected. EARTH TECH's field engineer then removed the dedicated pump from the well, and obtained a water level depth measurement using an electric sounding device and collected a grab groundwater sample using a bailer.

When the bailer was removed, floating product was observed. The thickness of the product was estimated to be between ¼ to ½ - inch. The product was visually described as black and appeared more viscous than water. The source of the product and the type of petroleum product (i.e. gasoline, diesel, fuel oil etc.) could not be determined in the field.

This is the first instance where floating product has been detected in the monitoring well. Historically, no dissolved petroleum hydrocarbon (i.e. gasoline, diesel etc.) except benzene has been detected in the monitoring well. The benzene concentration in the groundwater ranged between 1 and 5 parts per billion (ppb). The results of previous groundwater analyses are summarized in Table 1.

The depth to water was determined to be 33.10 feet from the top of the monitoring well casing. The groundwater elevation was determined to be 445.08 feet; the groundwater elevation recorded from previous groundwater level measurements made by EARTH TECH are shown graphically on Figure 1 and presented in tabular form in Table 2. The current

groundwater elevation is the highest observed groundwater elevation recorded to date. This is believed to be due to the large amount of rainfall received this season, and the subsequent aquifer recharge that has occurred.

LNAPL CHARACTERIZATION AND GROUNDWATER IMPACT

A sample of the product was collected in a laboratory sample container, placed on ice and transported to Curtis & Tompkins,, Ltd., a state certified laboratory, under chain of custody. The laboratory performed a "fingerprint" analysis of the product to determine the type of petroleum hydrocarbon. A copy of the petroleum hydrocarbon fingerprint report is presented as an attachment to this report. The laboratory analyses indicate that the LNAPL is gasoline. No petroleum hydrocarbons in the heavier hydrocarbon range (i.e. fuel oil) were detected in the fingerprint analysis.

Since floating product was observed, EARTH TECH ceased further well abandonment and closed and secured the monitoring well.

On March 1, 1995, EARTH TECH purged and sampled the groundwater monitoring well. The well was purged of three casing volumes using a downhole pump. Prior to purging the well, an interface probe was used to measure the floating product thickness and depth to groundwater and total casing depth. The floating product thickness was estimated to be about ½ inch. The measured depth to groundwater and total casing depth were used to calculate purge volumes. Purge water was contained in a DOT approved 30 gallon closed head drum.

A bailer was used to collect the groundwater sample. Sample containers were provided by the analytical laboratory. The samples were labeled and placed in an ice chest maintained at 4°C. The groundwater samples were transported by EARTH TECH personnel under chain of custody.

The groundwater samples were analyzed for Total Petroleum Hydrocarbons as gasoline (TPHg), diesel (TPHd), fuel oil (TPHo) and Benzene, Toluene, Ethylbenzene and Xylenes (BTEX). TPH analyses were performed using EPA Method 8015 (LUFT Method). BTEX compounds were analyzed using EPA Method 8020. In addition, the groundwater sample was analyzed for semi-volatile compounds by EPA Method 8270. Results of the analyses are presented in the attached certified analytical report.

TPHg and TPHd were detected in the sample at a concentrations of 54 mg/L and 20 mg/L, respectively. The analytical laboratory also reported the extractable portion as kerosene (between gasoline and diesel range) at a concentration of 110 mg/L. The kerosene and diesel

concentrations reported are likely weathered gasoline. Fuel oil (TPHo) was also reported at a concentration of 38 mg/L. However, the analytical laboratory has determined that the reported fuel oil concentration is based on gasoline peaks that extend into the fuel oil range. These peaks are required to be reported as fuel oil. The analytical laboratory concluded that fuel oil was not present in the sample. Further details are presented in the attached certified analytical report.

BTEX compounds were also detected. Benzene was detected at .480 mg/L, toluene at 4.8 mg/L, ethylbenzene at 1.5 mg/L and xylenes at 8.9 mg/L.

Three EPA 8270 analytes were also detected in the groundwater sample. These included Naphthalene, 2-Methylnaphthalene and Bis(2-ethylhexy)phthalate at 1.4 mg/L, 1.3 mg/L and 2.0 mg/L, respectively.

Naphthalene and 2-Methylnaphthalene are constituents in gasoline. Bis(2-ethylhexy)phthalate is a plasticizer used in PVC products and could be a byproduct from either the bailer or well casing.

CONCLUSIONS AND RECOMMENDATIONS

Based on the above results, EARTH TECH presents the following conclusions and recommendations:

Conclusions

- The LNAPL phase detected in the groundwater monitoring well appears to be gasoline. The presence of the LNAPL has also resulted in groundwater impact with dissolved petroleum hydrocarbon compounds (TPHg, TPHd and BTXE) at concentrations above generally accepted regulatory limits (i.e. Maximum Contaminant Limits).

- The LNAPL detected in the monitoring well does not correspond with compounds (i.e. fuel oil) that were subject to remedial action at the Mill Springs Park Apartment site (see attached analytical reports). Hence, EARTH TECH concludes that the LNAPL originated offsite and appears to have been transported from an as yet unidentified offsite source by subsurface transport.

Recommendations

- The Mill Springs Park Apartment site has received regulatory closure from the San Francisco Regional Water Quality Control Board. EARTH TECH recommends that this case closure not be reopened since the LNAPL detected in the monitoring well appears to be from an offsite source and does not correspond with the petroleum hydrocarbon compounds (fuel oil) that were the remediated as part of closure activities conducted by EARTH TECH at the Mill Springs Park Apartment site.

- A search of regulatory records should be performed to identify potential sources of the LNAPL.

- The monitoring well should not be abandoned. However, the Mill Springs Park Apartment facility should not be required to perform any further groundwater monitoring at the site.

EARTH TECH is currently performing a search to identify potential sources and/or responsible parties for the LNAPL. EARTH TECH has also contacted the Alameda County Flood Control and Water Conservation District, Zone 7 regarding groundwater elevation maps to assist in correlating regulatory data with groundwater data so that upgradient sources can be identified. These data will be presented in an addendum to this report.

EARTH TECH requests that Alameda County Health Agency, Department of Environmental Health, Hazardous Materials Division (ACHA-DEH) issue a letter concurring that the floating product has occurred from an offsite source and that no further groundwater monitoring will be required by the Mill Springs Park Apartment facility.

The Mill Springs Park Apartment facility is prepared to enter into an access agreement with the potential responsible party identified by ACHA-DEH for the LNAPL contamination at the Mill Spring Park Apartment site. The access agreement would likely be limited to monitoring groundwater levels and collecting LNAPL and groundwater samples.

LIMITATIONS

Analyses of groundwater and LNAPL samples were performed by others not under direct EARTH TECH supervision. Laboratory data were used as reported by the analytical laboratory. The conclusions and recommendations contained herein represent professional opinions prepared consistent with the standards of care and diligence normally practiced by environmental consultants of a similar nature in the same locale. No other warranty, expressed or implied, is made.

If you have any questions, please contact the undersigned.

Sincerely,

EARTH TECH

REGISTERED PROFESSIONAL ENGINEER MARK MILLAM No. 35120 STATE OF CALIFORNIA

Mark Millam, P.E.
Managing Senior Engineer
CE 35120, Exp 9/30/95

for

Charles Comstock, R.G., C.E.G.
Vice President and Manager, Berkeley Office

cc: Wingfield Venture Fund, c/o Mr. Jim Hardy

Attachments: Table 1 - Summary of Groundwater Analytical Results
Figure 1 - Groundwater Elevation Over Time
Table 2 - Observed Groundwater Elevations
Certified Analytical Reports

687157/3/FREPROD2.LTR

Figure 1
Groundwater Elevation Over Time

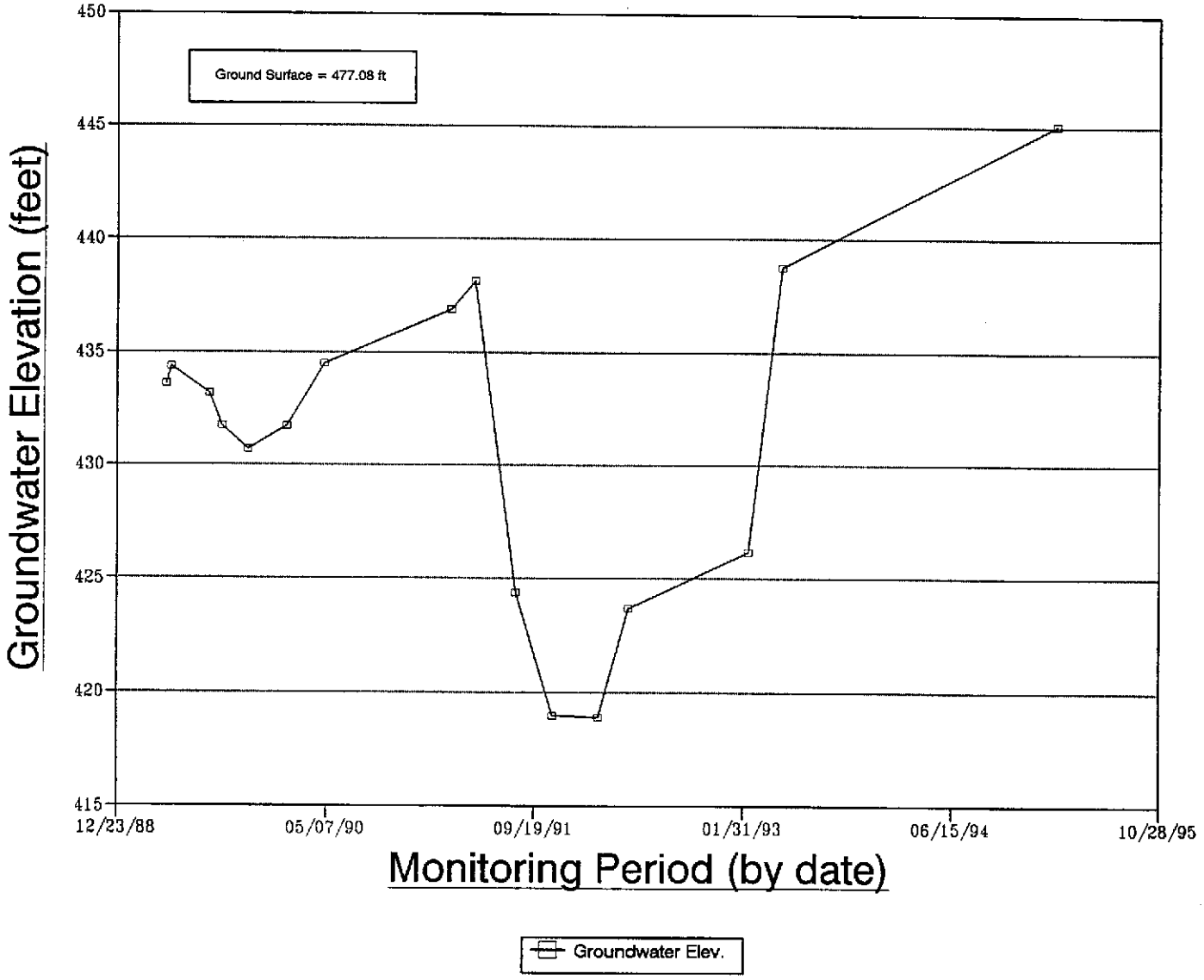


Table 1
Summary of Groundwater Analytical Results

Sample Date	TPH (mg/l)	Benzene (μg/l)	Toluene (μg/l)	Ethylbenzene (μg/l)	Xylene (μg/l)	TPH Analytical Method
5/2/89	ND	ND	ND	ND	ND	EPA 8015
8/1/89	ND	5	ND	ND	ND	EPA 8015
9/1/89	ND	ND	ND	ND	ND	EPA 8015
11/3/89	ND	3.6	ND	ND	ND	EPA 8015
2/5/90	ND	4.5	ND	ND	ND	EPA 8015
5/2/90	ND	ND	ND	ND	ND	EPA 8015
3/6/91	NA	2.8	ND	ND	ND	---
5/2/91	NA	2.0	ND	ND	ND	---
8/7/91	NA	ND	ND	ND	ND	---
11/5/91	NS	NS	NS	NS	NS	---
2/21/92	NS	NS	NS	NS	NS	---
5/4/92	NA	ND	ND	ND	ND	---
2/12/93	ND	ND	ND	ND	ND	EPA 418.1
5/4/93	ND	ND	ND	ND	ND	EPA 418.1
3/1/95	TPHg - 54 TPHd - 20 TPHo - 38	480	4,800	1,500	8,900	EPA 8015 (LUFT)

Notes:

1. ND = Not Detected above Method Detection Limit
2. NA = Not Analyzed
3. NS = Not Sampled (groundwater level below bottom of well casing)
4. EPA 8015 analyses included analyses for gasoline, diesel, kerosene and heavier petroleum hydrocarbons. ND = TPH constituents were not detected above the method detection level.
5. BTEX compounds analyzed by EPA Method 8020

Table 2
Observed Groundwater Elevations
(Mean Sea Level Datum)

Date of Observation	Groundwater Elevation (feet)
April 19, 1989	433.58
May 1, 1989	434.34
August 1, 1989	433.22
September 1, 1989	431.73
November 2, 1989	430.69
February 2, 1990	431.72
May 2, 1990	434.50
March 6, 1991	436.93
May 2, 1991	438.13
August 7, 1991	424.39
November 5, 1991	418.93*
February 21, 1992	418.91*
May 4, 1992	423.71
February 12, 1993	426.16
May 4, 1993	438.76
February 23, 1995	445.08

* Elevation at bottom of screened casing; groundwater elevation is at or below this point

Curtis & Tompkins, Ltd., Analytical Laboratories, Since 1878
2323 Fifth Street, Berkeley, CA 94710, Phone (510) 486-0900

A N A L Y T I C A L R E P O R T

Prepared for:

The Earth Technology Corporation
2030 Addison Street
Suite 500
Berkeley, CA 94704

Date: 01-MAR-95
Lab Job Number: 120024
Project ID: 87157.06
Location: Mill Spring

Reviewed by:

Reviewed by:

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 120024
CLIENT: Earth Technology
PROJECT ID: 87157.06
LOCATION: Mill Spring

DATE RECEIVED: 02/23/95
DATE REPORTED: 03/01/95

TOTAL EXTRACTABLE PETROLEUM HYDROCARBON FINGERPRINT REPORT

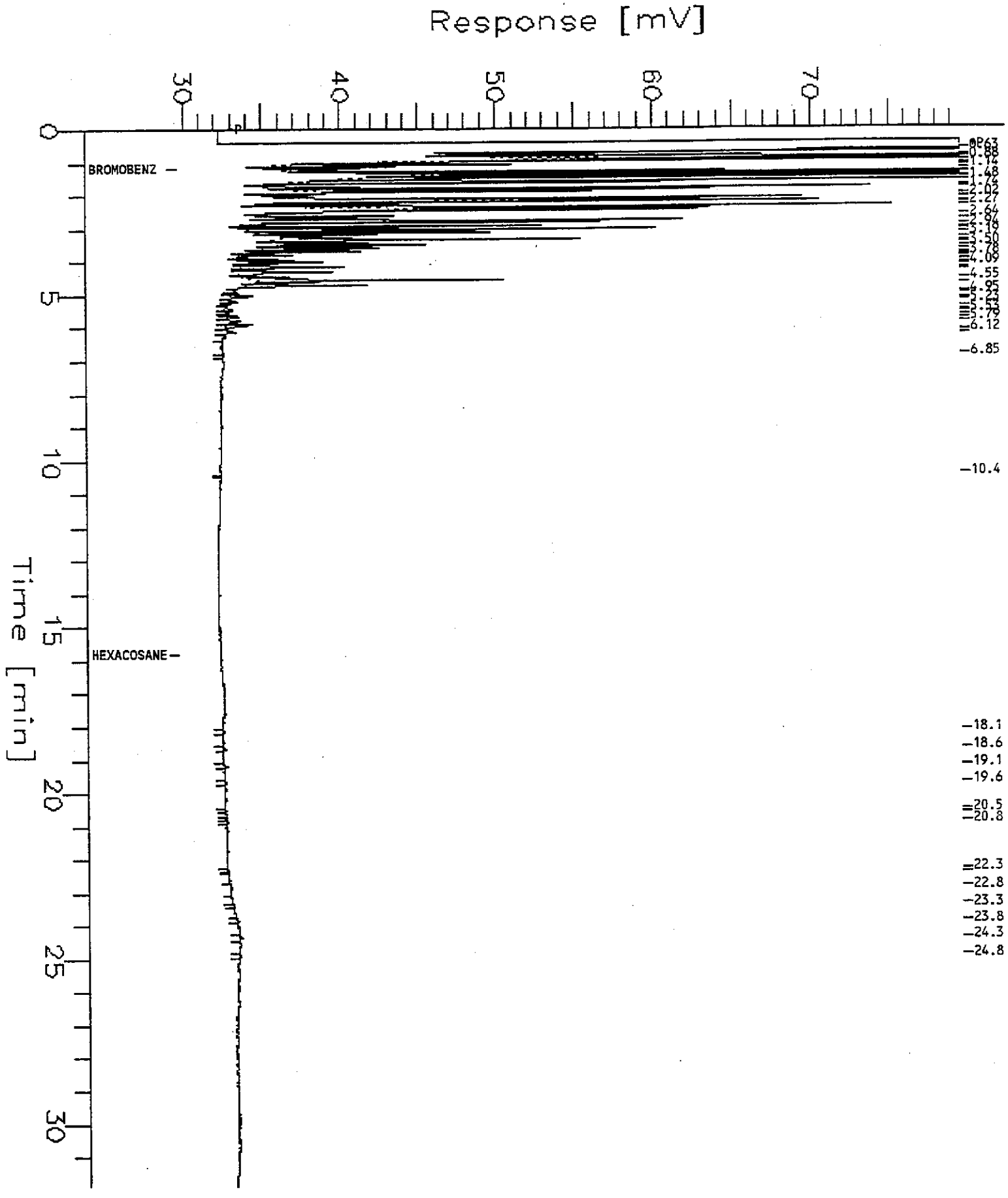
Curtis & Tompkins, Ltd. received two aqueous samples on Febuary 23, 1995 to be analyzed for Total Extractable petroleum Hydrocarbons (TEH) fingerprint analysis. Both samples had significant hydrocarbons in the gasoline range only. No hydrocarbons were present in the heavier hydrocarbon ranges.

All analysis occurred within holding times and no difficulties were encountered. The attached data include:

TEH Chromatogram GC13 CH B

Sample Name : 120024-001
FileName : g:\gc13\chb\0588008.raw
Method : TEH_CHB.ins
Start Time : 0.00 min End Time : 31.92 min
Scale Factor: -1 Plot Offset: 30 mV

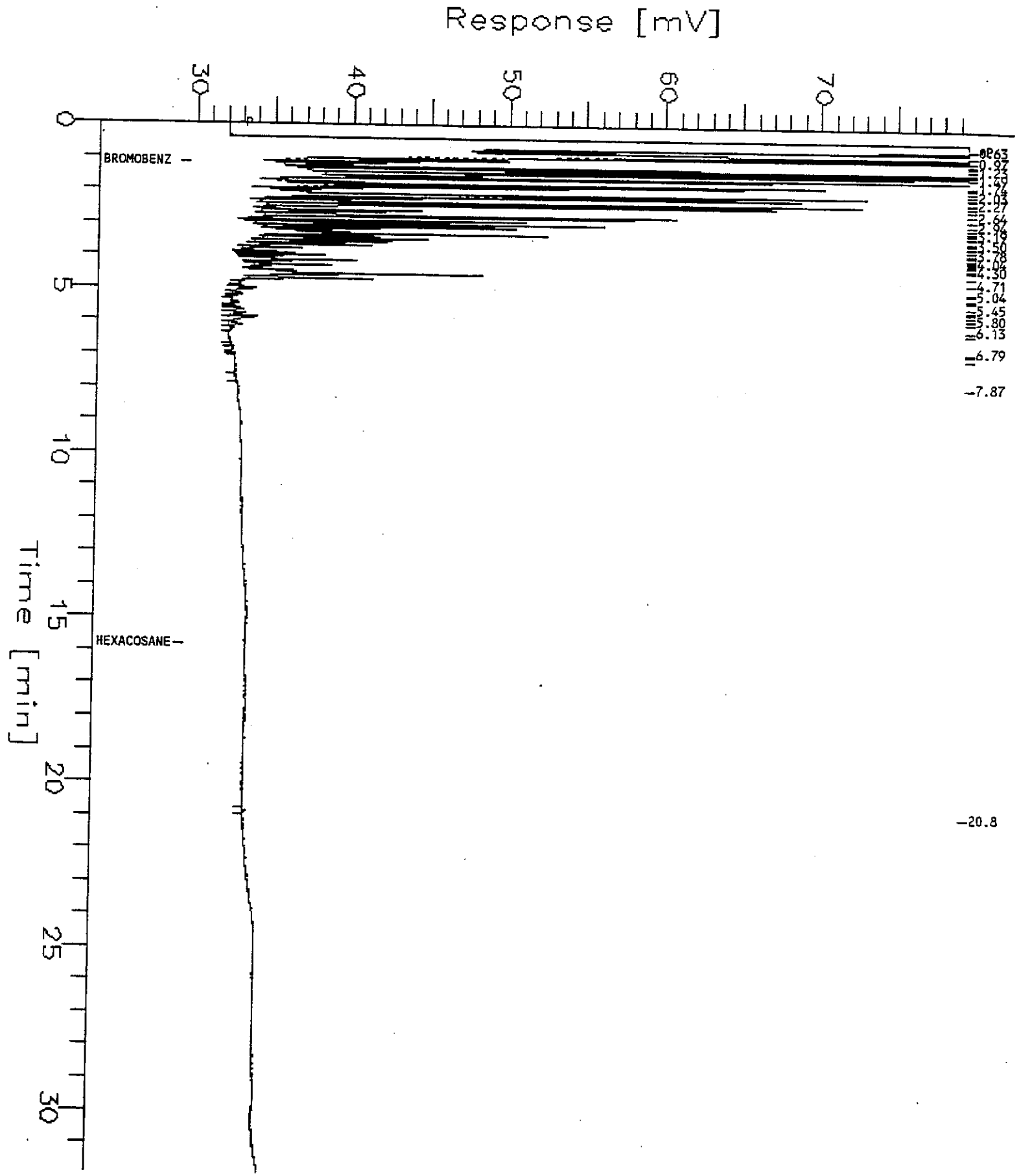
Sample #: FINGERPRNT Page 1 of 1
Date : 2/27/95 04:12 PM
Time of Injection: 2/27/95 03:27 PM
Low Point : 29.64 mV High Point : 79.64 mV
Plot Scale: 50 mV



TEH Chromatogram GC13 CH B

Sample Name : 120024-002
FileName : g:\gc13\chb\0588009.raw
Method : TEH_CHB.ins
Start Time : 0.00 min
End Time : 31.92 min
Scale Factor: -1
Plot Offset: 30 mV

Sample #: FINGERPRNT
Date : 2/27/95 04:42 PM
Time of Injection: 2/27/95 04:09 PM
Low Point : 29.50 mV
High Point : 79.50 mV
Plot Scale: 50 mV



Curtis & Tompkins, Ltd.

VERBAL ADDITIONS/CANCELLATIONS TO ANALYSIS REQUEST SHEET

Client: Earth Tech Date: 02/24/05

Requested By: Mark Milam Time: AM 2:00 PM

Recorded By:

5 DAY TAT (NO X CHARGE)

Current Lab ID (Previous Lab ID)	Client ID	Circle Matrix	Specify add or cancel	Analysis	Due Date
( )	MILLS-S1-33.1-GW	water soil waste (oil) other	ADD	(include oil range) TPH-D, TPH-G } Fingerprint; use oil laser only	
( )	MILLS-S2-33.1-GW	water soil waste (oil) other	ADD	↓	
( )		water soil waste oil other			
( )		water soil waste oil other			
( )		water soil waste oil other			
( )		water soil waste oil other			

120024

CHAIN OF CUSTODY FORM

Page 1 of 1

Curtis & Tompkins, Ltd.
2323 Fifth Street
Berkeley, CA 94710
(510) 486-0900 Phone
(510) 486-0532 Fax

Sampler: Tan Dinh

Report to: Mark Milani

Project No: 87157.06 Company: Earth Tech

Project Name: Mill Spring Telephone: 510/540-6954

Turnaround Time: _____ Fax: _____

Laboratory Number	Sample ID.	Sampling Date	Sampling Time	Matrix: Soil	Matrix: Water	Matrix: Waste	# of Containers	Preservative: HCl	Preservative: H_2SO_4	Preservative: HNO_3	Preservative: ICE	Field Notes
	Mills-51-33.1-GW	2/23	0930		X		1			X		3 Hold b b b
	Mills-52-33.1-GW	"	"		X		1			X		3

Analyses

TPHd TPHg

NOTES:

RELINQUISHED BY:

Ta Dinh 02/23/95 12:24 DATE/TIME

DATE/TIME

DATE/TIME

RECEIVED BY:

Mary Klesse 2/23/95 1229 DATE/TIME

DATE/TIME

DATE/TIME

Signature on this form constitutes a firm purchase order for the services requested above.

Curtis & Tompkins, Ltd., Analytical Laboratories, Since 1878
2323 Fifth Street, Berkeley, CA 94710, Phone (510) 486-0900

A N A L Y T I C A L R E P O R T

Prepared for:

The Earth Technology Corporation
2030 Addison Street
Suite 500
Berkeley, CA 94704

Date: 16-MAR-95
Lab Job Number: 120095
Project ID: 687157.08
Location: Mill Springs

Reviewed by: Teresa K Morrison

Reviewed by: Tracy Babcock

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 120095
CLIENT: The Earth Technology Corp.
PROJECT ID: 687157.08
LOCATION: Mill Springs

DATE SAMPLED: 03/01/95
DATE RECEIVED: 03/01/95
DATE ANALYZED: 03/07/95
DATE REPORTED: 03/16/95
BATCH NO: 19344

Total Volatile Hydrocarbons with BTXE in Aqueous Solutions
TVH by California DOHS Method/LUFT Manual October 1989
BTXE by EPA 5030/8020

LAB ID	SAMPLE ID	TVH AS GASOLINE (ug/L)	BENZENE (ug/L)	TOLUENE (ug/L)	ETHYL BENZENE (ug/L)	TOTAL XYLENES (ug/L)
120095-002	MW1	54,000	480	4,800	1,500	8,900
METHOD BLANK		ND(50)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)

ND = Not detected at or above reporting limit; Reporting limit indicated in parentheses.

QA/QC SUMMARY: BS/BSD

RPD, %	< 1
RECOVERY, %	98

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 120095
CLIENT: The Earth Technology Corp.
PROJECT ID: 687157.08
LOCATION: Mill Springs

DATE SAMPLED: 03/01/95
DATE RECEIVED: 03/01/95
DATE EXTRACTED: 03/14/95
DATE ANALYZED: 03/15/95
DATE REPORTED: 03/16/95
BATCH NO: 19445

Extractable Petroleum Hydrocarbons in Aqueous Solutions
California DOHS Method
LUFT Manual October 1989

LAB ID	CLIENT ID	KEROSENE RANGE (ug/L)	DIESEL RANGE (ug/L)	REPORTING LIMIT (ug/L)
120095-002	MW1	110,000 *	**	500
METHOD BLANK		ND	ND	50

ND = Not detected at or above reporting limit. Reporting limit applies to all analytes.

* Gasoline range components contributing to the quantitation of the kerosene range.

** Diesel range not reported due to overlap of hydrocarbon ranges.

QA/QC SUMMARY: BS/BSD

RPD, %	2
RECOVERY, %	96

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 120095
CLIENT: The Earth Technology Corporation
PROJECT #: 687157.08
LOCATION: Mill Springs

DATE SAMPLED: 03/01/95
DATE RECEIVED: 03/01/95
DATE ANALYZED: 03/14/95
DATE REPORTED: 03/16/95

ANALYSIS: TOTAL PHENOLIC COMPOUNDS
ANALYSIS METHOD: EPA 420.1

LAB ID	SAMPLE ID	RESULT	UNITS	REPORTING LIMIT
120095-002	MW1	ND	ug/L	50
METHOD BLANK	N/A	ND	ug/L	50

ND = Not detected at or above reporting limit.

QA/QC SUMMARY: BS/BSD

RPD, %	2
RECOVERY, %	99

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 120095-002
CLIENT: The Earth Technology Corp.
PROJECT #: 687157.08
LOCATION: Mill Springs
SAMPLE ID: MW1

DATE SAMPLED: 03/01/95
DATE RECEIVED: 03/01/95
DATE EXTRACTED: 03/02/95
DATE ANALYZED: 03/06/95
DATE REPORTED: 03/16/95
BATCH NO: 19282

EPA 8270: Base/Neutral and Acid Extractables in Water
Extraction Method: EPA 3520 Continuous Liquid/Liquid

ACID COMPOUNDS	RESULT ug/L	REPORTING LIMIT ug/L
Phenol	ND	9.4
2-Chlorophenol	ND	9.4
Benzyl Alcohol	ND	9.4
2-Methylphenol	ND	9.4
4-Methylphenol	ND	9.4
2-Nitrophenol	ND	47
2,4-Dimethylphenol	ND	9.4
Benzoic Acid	ND	47
2,4-Dichlorophenol	ND	9.4
4-Chloro-3-methylphenol	ND	9.4
2,4,6-Trichlorophenol	ND	9.4
2,4,5-Trichlorophenol	ND	47
2,4-Dinitrophenol	ND	47
4-Nitrophenol	ND	47
4,6-Dinitro-2-methylphenol	ND	47
Pentachlorophenol	ND	47
BASE/NEUTRAL COMPOUNDS		
N-Nitrosodimethylamine	ND	9.4
Aniline	ND	9.4
Bis(2-chloroethyl)ether	ND	9.4
1,3-Dichlorobenzene	ND	9.4
1,4-Dichlorobenzene	ND	9.4
1,2-Dichlorobenzene	ND	9.4
Bis(2-chloroisopropyl)ether	ND	9.4
N-Nitroso-di-n-propylamine	ND	9.4
Hexachloroethane	ND	9.4
Nitrobenzene	ND	9.4
Isophorone	ND	9.4
Bis(2-chloroethoxy)methane	ND	9.4
1,2,4-Trichlorobenzene	ND	9.4
Naphthalene	1,400 *	190
4-Chloroaniline	ND	9.4
Hexachlorobutadiene	ND	9.4
2-Methylnaphthalene	1,300 *	190
Hexachlorocyclopentadiene	ND	9.4
2-Chloronaphthalene	ND	9.4
2-Nitroaniline	ND	47

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 120095-002 EPA 8270
SAMPLE ID: MW1

BASE/NEUTRAL COMPOUNDS	RESULT ug/L	REPORTING LIMIT ug/L
Dimethylphthalate	ND	9.4
Acenaphthylene	ND	9.4
2,6-Dinitrotoluene	ND	9.4
3-Nitroaniline	ND	47
Acenaphthene	ND	9.4
Dibenzofuran	ND	9.4
2,4-Dinitrotoluene	ND	9.4
Diethylphthalate	ND	9.4
4-Chlorophenyl-phenylether	ND	9.4
Fluorene	ND	9.4
4-Nitroaniline	ND	47
N-Nitrosodiphenylamine	ND	9.4
Azobenzene	ND	9.4
4-Bromophenyl-phenylether	ND	9.4
Hexachlorobenzene	ND	9.4
Phenanthrene	ND	9.4
Anthracene	ND	9.4
Di-n-butylphthalate	ND	9.4
Fluoranthene	ND	9.4
Pyrene	ND	9.4
Butylbenzylphthalate	ND	9.4
3,3'-Dichlorobenzidine	ND	47
Benzo(a)anthracene	ND	9.4
Chrysene	ND	9.4
Bis(2-ethylhexyl)phthalate	2,000 **	380
Di-n-octylphthalate	ND	9.4
Benzo(b)fluoranthene	ND	9.4
Benzo(k)fluoranthene	ND	9.4
Benzo(a)pyrene	ND	9.4
Indeno(1,2,3-cd)pyrene	ND	9.4
Dibenzo(a,h)anthracene	ND	9.4
Benzo(g,h,i)perylene	ND	9.4

* Analyzed at a 1:20 dilution on 03/07/95.
** Analyzed at a 1:40 dilution on 03/07/95.
ND = Not detected at or above reporting limit.

SURROGATE RECOVERIES

2-Fluorophenol	1+	Nitrobenzene-d5	15+
Phenol-d5	14	2-Fluorobiphenyl	45
2,4,6-Tribromophenol	18	Terphenyl-d14	47
2-Chlorophenol-d4	12+	1,2-Dichlorobenzene-d4	33

+ Low surrogate recovery due to matrix interference.

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 120095-Method Blank
CLIENT: The Earth Technology Corp.
PROJECT #: 687157.08
LOCATION: Mill Springs
SAMPLE ID: N/A

DATE EXTRACTED: 03/02/95
DATE ANALYZED: 03/06/95
DATE REPORTED: 03/16/95
BATCH NO: 19282

EPA 8270: Base/Neutral and Acid Extractables in Water
Extraction Method: EPA 3520 Continuous Liquid/Liquid

ACID COMPOUNDS	RESULT ug/L	REPORTING LIMIT ug/L
Phenol	ND	10
2-Chlorophenol	ND	10
Benzyl Alcohol	ND	10
2-Methylphenol	ND	10
4-Methylphenol	ND	10
2-Nitrophenol	ND	50
2,4-Dimethylphenol	ND	10
Benzoic Acid	ND	50
2,4-Dichlorophenol	ND	10
4-Chloro-3-methylphenol	ND	10
2,4,6-Trichlorophenol	ND	10
2,4,5-Trichlorophenol	ND	50
2,4-Dinitrophenol	ND	50
4-Nitrophenol	ND	50
4,6-Dinitro-2-methylphenol	ND	50
Pentachlorophenol	ND	50
BASE/NEUTRAL COMPOUNDS		
N-Nitrosodimethylamine	ND	10
Aniline	ND	10
Bis(2-chloroethyl)ether	ND	10
1,3-Dichlorobenzene	ND	10
1,4-Dichlorobenzene	ND	10
1,2-Dichlorobenzene	ND	10
Bis(2-chloroisopropyl)ether	ND	10
N-Nitroso-di-n-propylamine	ND	10
Hexachloroethane	ND	10
Nitrobenzene	ND	10
Isophorone	ND	10
Bis(2-chloroethoxy)methane	ND	10
1,2,4-Trichlorobenzene	ND	10
Naphthalene	ND	10
4-Chloroaniline	ND	10
Hexachlorobutadiene	ND	10
2-Methylnaphthalene	ND	10
Hexachlorocyclopentadiene	ND	10
2-Chloronaphthalene	ND	10
2-Nitroaniline	ND	50

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 120095-Method Blank
SAMPLE ID: N/A

EPA 8270

BASE/NEUTRAL COMPOUNDS	RESULT ug/L	REPORTING LIMIT ug/L
Dimethylphthalate	ND	10
Acenaphthylene	ND	10
2,6-Dinitrotoluene	ND	10
3-Nitroaniline	ND	50
Acenaphthene	ND	10
Dibenzofuran	ND	10
2,4-Dinitrotoluene	ND	10
Diethylphthalate	ND	10
4-Chlorophenyl-phenylether	ND	10
Fluorene	ND	10
4-Nitroaniline	ND	50
N-Nitrosodiphenylamine	ND	10
Azobenzene	ND	10
4-Bromophenyl-phenylether	ND	10
Hexachlorobenzene	ND	10
Phenanthrene	ND	10
Anthracene	ND	10
Di-n-butylphthalate	ND	10
Fluoranthene	ND	10
Pyrene	ND	10
Butylbenzylphthalate	ND	10
3,3'-Dichlorobenzidine	ND	50
Benzo(a)anthracene	ND	10
Chrysene	ND	10
Bis(2-ethylhexyl)phthalate	ND	10
Di-n-octylphthalate	ND	10
Benzo(b)fluoranthene	ND	10
Benzo(k)fluoranthene	ND	10
Benzo(a)pyrene	ND	10
Indeno(1,2,3-cd)pyrene	ND	10
Dibenzo(a,h)anthracene	ND	10
Benzo(g,h,i)perylene	ND	10

ND = Not detected at or above reporting limit.

SURROGATE RECOVERIES

2-Fluorophenol	51	Nitrobenzene-d5	50
Phenol-d5	60	2-Fluorobiphenyl	52
2,4,6-Tribromophenol	50	Terphenyl-d14	66
2-Chlorophenol-d4	54	1,2-Dichlorobenzene-d4	56

Curtis & Tompkins, Ltd
8270 BS/BSD Report

Lab No: QC86408 QC86409
Date Analyzed: 06-MAR-95
Matrix: WATER
Dilution Factor: 1
Spike File: 05_bs_19282.d
Spike Dup File: 06_bsd_18282.d
Analyst: KC

Batch No: 19282 505065172005 505065179006 0306.b

Compound	ng SpikeAmt	BSamt	BS Rec		BSDamt	BSD Rec	Limits	Rpd	Limit
Phenol	150	70	47%		68	45%	12-110%	4%	<42%
2-Chlorophenol	150	68	45%		67	45%	27-123%	0%	<40%
4-Chloro-3-methylphenol	150	66	44%		71	47%	23-97%	7%	<42%
4-Nitrophenol	150	59	39%		61	41%	10-80%	5%	<50%
Pentachlorophenol	150	50	33%		53	35%	9-103%	6%	<50%
1,4-Dichlorobenzene	100	46	46%		47	47%	36-97%	2%	<28%
N-Nitroso-di-n-propylamine	100	48	48%		51	51%	41-116%	6%	<38%
1,2,4-Trichlorobenzene	100	46	46%		49	49%	39-98%	6%	<28%
Acenaphthene	100	42	42%	*	46	46%	46-118%	9%	<31%
2,4-Dinitrotoluene	100	47	47%		50	50%	24-96%	6%	<38%
Pyrene	100	50	50%		51	51%	26-127%	2%	<31%
Surrogate Recoveries									
2-Fluorophenol	150	71	47%		72	48%	21-100%		
Phenol-d5	150	81	54%		80	53%	10-94%		
2,4,6-Tribromophenol	150	72	48%		73	49%	10-123%		
Nitrobenzene-d5	100	52	52%		53	53%	35-114%		
2-Fluorobiphenyl	100	50	50%		52	52%	43-116%		
Terphenyl-d14	100	63	63%		64	64%	33-141%		
2-Chlorophenol-d4	150	72	48%		72	48%	33-110%		
1,2-Dichlorobenzene-d4	100	51	51%		52	52%	16-110%		

* Result is out of limits

Curtis & Tompkins, Ltd.

1200695

CHAIN OF CUSTODY FORM

Curtis & Tompkins, Ltd.
2323 Fifth Street
Berkeley, CA 94710
(510) 486-0900 Phone
(510) 486-0532 Fax

Sampler: TD/MP

Report to: Mark Milani

Project No: 687157.08

Company: Earth Tech

Project Name: Mill Springs

Telephone: 510/540-6954

Turnaround Time: Standard

Fax: 510/540-7949

Laboratory Number	Sample ID.	Sampling Date	Sampling Time	Matrix: Soil	Matrix: Water	Matrix: Waste	# of Containers	Preservative: HCl	Preservative: H_2SO_4	Preservative: HNO_3	Preservative: ICE	Field Notes
-1	MW1-PROD	03/01/95	1420		X		2 VOAs					Hold ▽▽▽ TD 3-2-95
-2	MW1	"	1550		X		3 VOAs	X				
	MW1	"	"		X		1 L					
	MW1	"	"		X		1 L					
	MW1	"	"		X		1 L					
-3	MW1-PURGE	"	1625		X		3 VOAs	X				Hold ▽▽▽
	MW1-PURGE	"	"		X		3 1-Lit					Hold ▽▽▽

Analyses: TVH/BTEX; TPHd; Phenols; 8270; Fuel Oil; Engr Stop

NOTES:
Hold MW1-PROD & MW1-Purge until approval for analyses from Mark Milani.

RELINQUISHED BY:

Ja DL 1745 DATE/TIME

DATE/TIME

DATE/TIME

RECEIVED BY:

Mary Plesse 3/1/95 1745 DATE/TIME

DATE/TIME

DATE/TIME

Signature on this form constitutes a firm purchase order for the services requested above.

Curtis & Tompkins, Ltd., Analytical Laboratories, Since 1878
2323 Fifth Street, Berkeley, CA 94710, Phone (510) 486-0900

27 March 1995

Mr. Mark Milani
Earth Tech
2030 Addison Street
Suite 500
Berkeley, CA 94710

RE: Earth Tech Project #687157.08

Dear Mr. Milani:

Curtis & Tompkins, Ltd. received a sample identified as MW-1 for analysis in support of the above-referenced project (C&T Id 120095-002). Among the analyses requested was Total Extractable Hydrocarbons (TEH), including fuel oil. The revised report for this analysis is attached.

As you can see by the attached chromatograms, the presence of low molecular weight hydrocarbons is indicated. Total Volatile Hydrocarbon (TVH) analysis confirms this contamination as resembling gasoline. These gasoline peaks extend into the kerosene range and thus a kerosene concentration is reported and flagged. A fuel oil is also reported for this sample, but this result is based on the gasoline peaks that extend into the fuel oil range as well as a few peaks that do not correspond to any fuel hydrocarbon that we recognize. The TEH chromatogram does not indicate the presence of fuel oil in this sample.

Please let me know if you have any further questions.

Sincerely,

CURTIS & TOMPKINS, LTD.

John Goyette
Operations Manager

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 120095
CLIENT: The Earth Technology Corp.
PROJECT ID: 687157.08
LOCATION: Mill Springs

DATE SAMPLED: 03/01/95
DATE RECEIVED: 03/01/95
DATE EXTRACTED: 03/14/95
DATE ANALYZED: 03/15/95
DATE REPORTED: 03/16/95
DATE REVISED: 03/27/95
BATCH NO: 19445

Extractable Petroleum Hydrocarbons in Aqueous Solutions
California DOHS Method
LUFT Manual October 1989

LAB ID	CLIENT ID	KEROSENE RANGE (ug/L)	DIESEL RANGE (ug/L)	FUEL OIL RANGE (ug/L)
120095-002	MW1	110,000*	**	38,000***
METHOD BLANK		ND(50)	ND(50)	ND(1,250)

ND = Not detected at or above reporting limit. Reporting limit applies to all analytes.

* Gasoline range components contributing to the quantitation of the kerosene range.
** Diesel range not reported due to overlap of hydrocarbon ranges.
*** Does not resemble hydrocarbon standard.

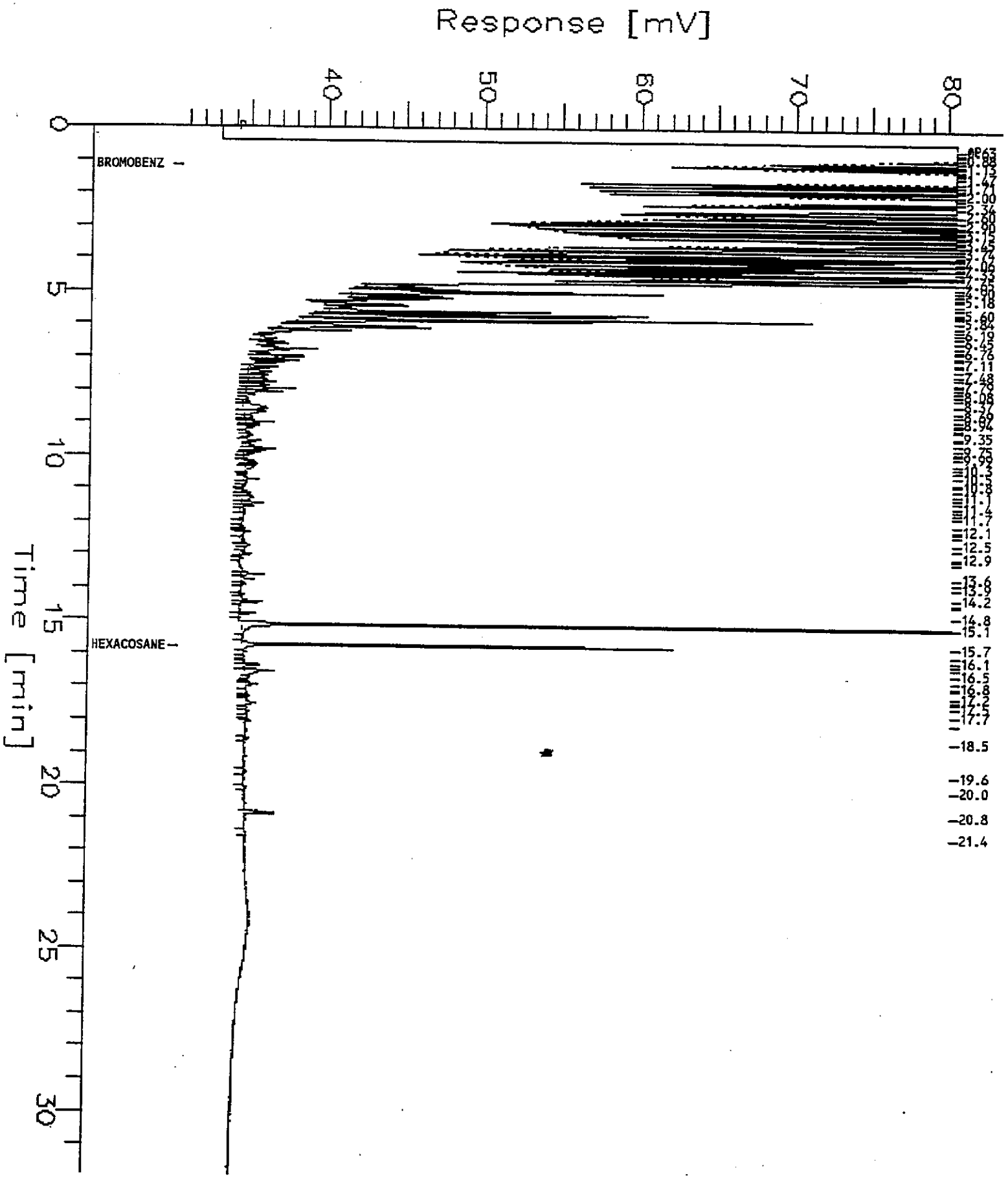
QA/QC SUMMARY: BS/BSD

RPD, %	2
RECOVERY, %	96

TEH Chromatogram GC13 CH B

Sample Name : 120095-002 500:25
FileName : g:\gc13\chb\0738025.raw
Method : TEH_CHB.ins
Start Time : 0.00 min End Time : 31.92 min
Scale Factor: -1 Plot Offset: 31 mV

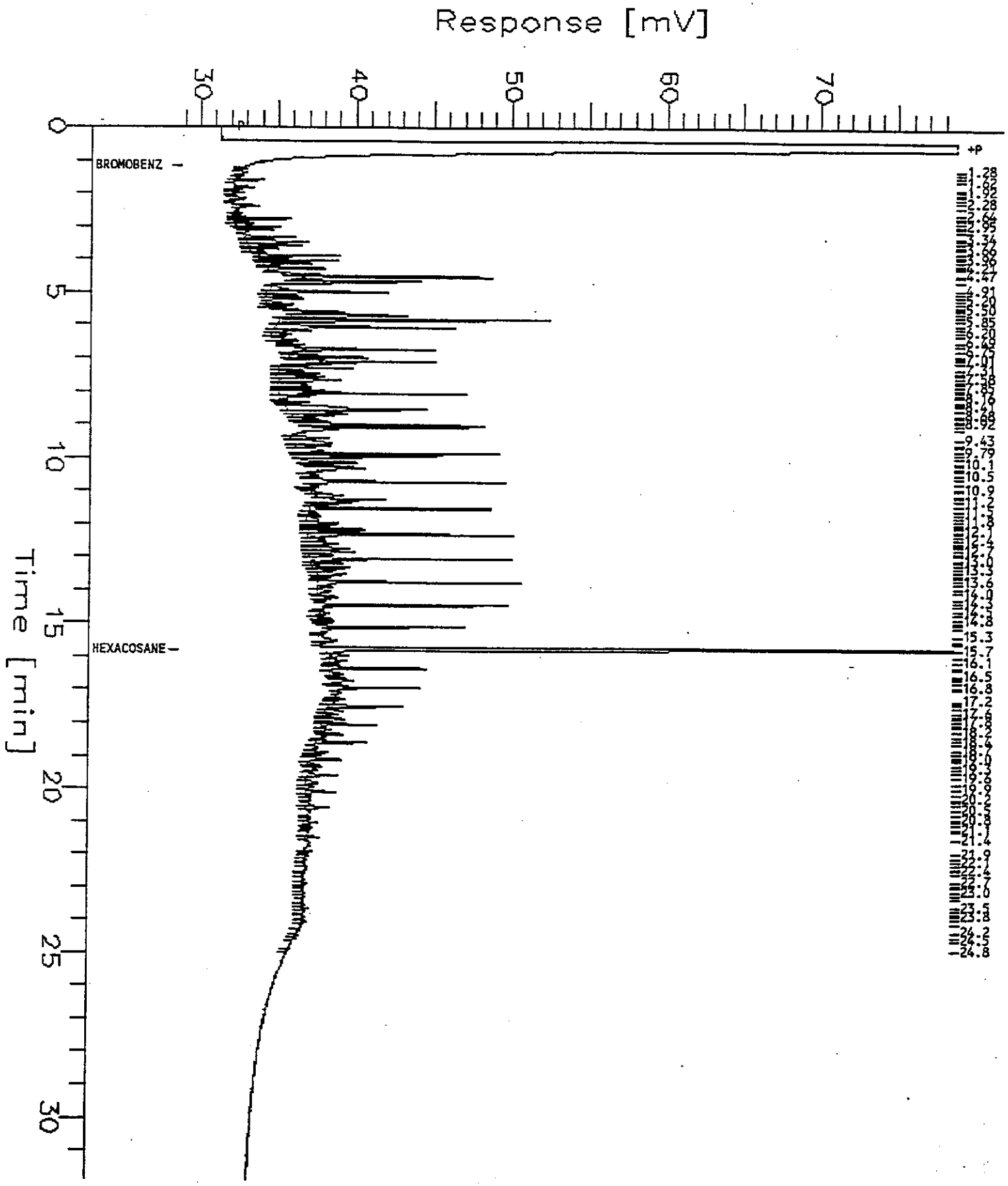
Sample #: 19445
Date : 3/15/95 01:17 PM
Time of Injection: 3/15/95 03:06 AM
Low Point : 30.52 mV High Point : 80.52 mV
Plot Scale: 50 mV



TEH Chromatogram GC13 CH B

Sample Name : MWP FUEL OIL 1150MG/L
FileName : g:\gc13\chb\0738017.raw
Method . : TEH_CHB.ins
Start Time : 0.00 min End Time : 31.92 min
Scale Factor: -1 Plot Offset: 29 mV

Sample #: 94WS8365 Page 1 of 1
Date : 3/14/95 09:57 PM
Time of Injection: 3/14/95 09:23 PM
Low Point : 28.73 mV High Point : 78.73 mV
Plot Scale: 50 mV



M E M O R A N D U M:

Date: April 11, 1995

To: LNAPL Assessment Report cc:

From: Mark Milani

Subject: **[Analytical Report from Previous Remedial Action Completed at Mill Springs Park Apartments]**

As part of closure activities conducted previous at the site, EARTH TECH (formerly Aqua Resources Inc.) collected a sample of the fuel oil for analysis. A copy of the analyses was obtained from Curtis & Tompkins archives. The analytical report is attached and includes analyses of the product for TPH as gasoline, diesel and heavier hydrocarbons. A copy of the gas chromatogram is attached. The analytical report is provided for comparison with chemical analyses performed on a LNAPL sample and groundwater sample collected from monitoring well MW-1 at the site.

FILE

Curtis & Tompkins, Ltd., Analytical Laboratories, Since 1878
2323 Fifth Street, Berkeley, CA 94710, Phone (415) 486-0900

LABORATORY NUMBER: 15950
CLIENT: AQUA RESOURCES, INC.
PROJECT NAME: LIVERMORE SUPERBLOCK

DATE RECEIVED: 10-14-88
DATE ANALYZED: 10-15,17-88
DATE REPORTED: 10-20-88

Results of Analysis for Petroleum Hydrocarbons/Oil & Grease

Method References: O&G: Oil and Grease, SMWW 503 A
TPH: Total Petroleum Hydrocarbons, EPA 3510/8015

LAB ID	CLIENT ID	GASOLINE (mg/L)	KEROSINE (mg/L)	DIESEL (mg/L)	OTHER (mg/L)	O&G (mg/L)
15950-1	1-1,2	ND(10)	ND(10)	ND(10)	0.08 *	165

* Fingerprint pattern does not match Hydrocarbon Standard. Quantitation based on largest peaks within C12-C22 boiling range.

ND = Not Detected; Limit of detection indicated in parentheses.

QA/QC SUMMARY

	TPH
Duplicate: Relative % Difference	16
Spike: % Recovery	105

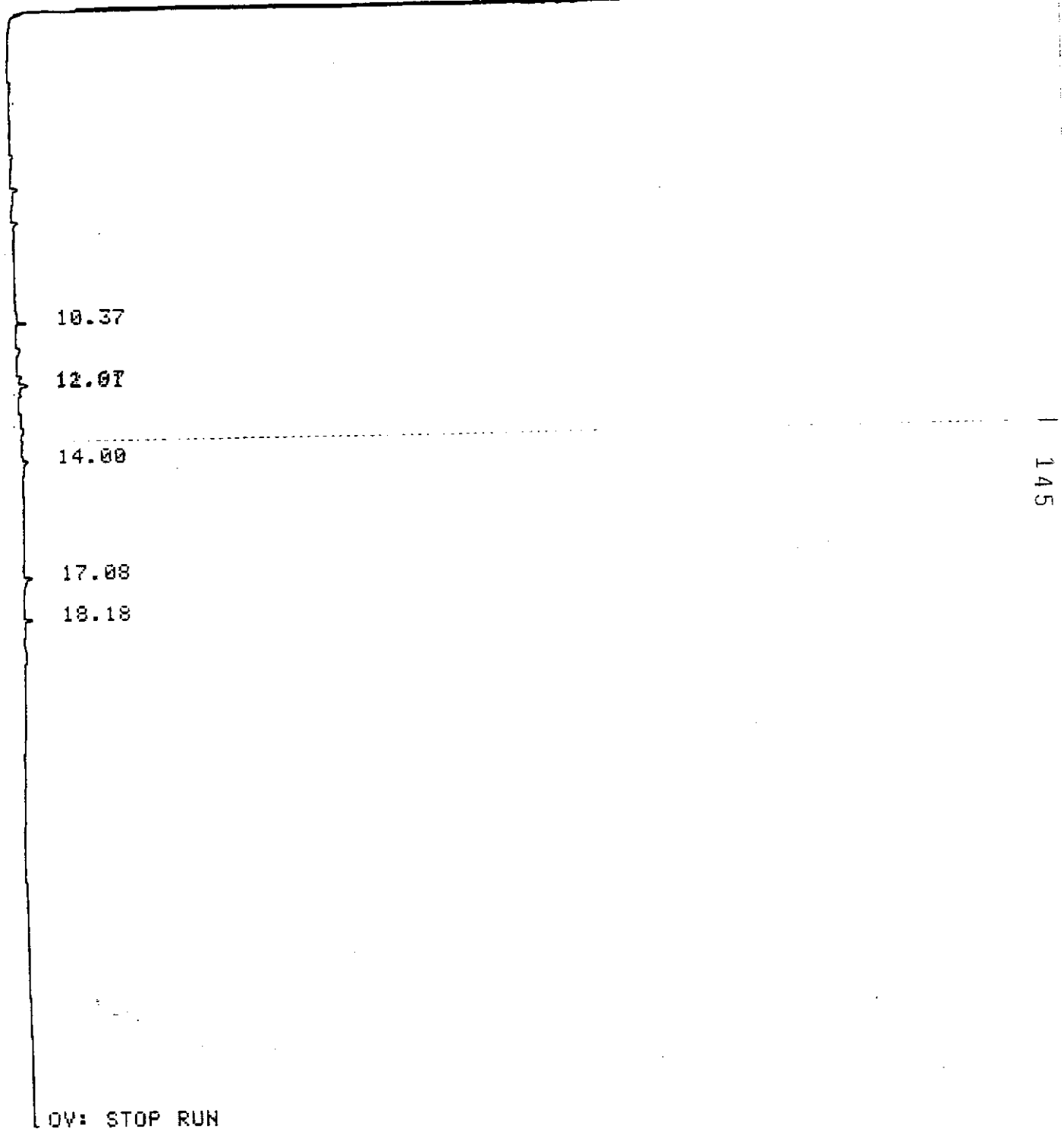
LABORATORY DIRECTOR

Curtis & Tompkins, Ltd., Analytical Laboratories, Since 1878
2323 Fifth Street, Berkeley, CA 94710, Phone (415) 486-0900

LABORATORY NUMBER: 15950
CLIENT: AQUA RESOURCES
PROJECT NAME: LIVERMORE SUPERBLOCK

DATE RECEIVED: 10-14-88
DATE ANALYZED: 10-17,19-88
DATE REPORTED: 10-21-88

C&T ID	SAMPLE ID	OIL & GREASE SMWW 503A
15950-2	2-1	>50%



[hp] 5880A SAMPLER INJECTION @ 07:32 OCT 15, 1988
SAMPLE # : ID CODE :
21 5950-1, 200

AREA %

RT	AREA	TYPE	WIDTH	HEIGHT	BASELINE	AREA %
0.00			BASELINE @ START RUN = 13.34			
0.00			THRESHOLD @ START RUN = 1			
0.00			PEAK WIDTH @ START RUN = 0.04			
0.01			RT: INTG → OFF			
2.10			RT: INTG → ON			
10.37	1.98	BB	-----	0.82	14.05	22.327
11.97	1.76	BV	-----	0.64	14.15	19.791
12.01	1.27	VB	-----	0.56	14.17	14.359
14.00	0.78	BB	-----	0.36	14.46	8.807
17.08	1.62	BB	-----	0.61	14.38	18.250

15950

AQUA RESOURCES, INC.

SHIPMENT NO.: 1

CHAIN OF CUSTODY RECORD

PAGE 1 OF 1

DATE 10/14/88

PROJECT NAME: Livermore Superblock

PROJECT NO.:

Sample Number	Location	Type of Sample		Type of Container	Type of Preservation		Analysis Required
		Material	Method		Temp	Chemical	
#1-1,2		Water		Glass			TPH
~~#1-3,4,5,6~~							TOG
#2-1		Soil		Glass			TPH
							TOG
#1-3,4,5,6		Water		Glass			Hold
#2-2		Soil		Glass			Hold

Total Number of Samples Shipped: 8

Sampler's Signature: H. L. S. L.

Relinquished By:	Received By:	Date
Signature: H. L. S. L.	Signature: Gabriella Stephan	10/14/88
Printed Name: HUGH S. WONG	Printed Name: Gabriella (Stephan)	Time
Company: AQUA RESOURCE	Company: Curtis & Tompkins, Ltd	11:15 am
Reason:		
Relinquished By:	**Received By:**	**Date**
Signature:	Signature:	/ /
Printed Name:	Printed Name:	Time
Company:	Company:	
Reason:		

REMARKS:

24 hr TAT

Special Shipment / Handling / Storage Requirements:

2030 Addison Street, Suite 500, Berkeley, California 94704

#4618

TRANSMITTAL MEMORANDUM

TO: Alameda County Health Agency
Department of Environmental Health
Hazardous Materials Division
1131 Harbor Bay Parkway, Room 250
Alameda, California 94502

DATE: April 13, 1995

ATTENTION: Ms. Eva Chu

FILE: 687157.08

SUBJECT: **LNAPL Assessment Report, Mill Springs Park Apartments, 1809 Railroad Avenue, Livermore**

WE ARE SENDING:
- ☑ HEREWITH
- ☐ UNDER SEPARATE COVER
- ☑ VIA MAIL
- ☐ VIA _____

THE FOLLOWING: Our check in the amount of $200.00 to cover your review of our report of April 11, 1995.

Telephone
510.540.6954
Facsimile
510.540.7496

- ☑ AS REQUESTED
- ☐ FOR YOUR APPROVAL
- ☐ FOR REVIEW
- ☐ FOR YOUR USE
- ☐ FOR SIGNATURE
- ☐ FOR PAYMENT

REMARKS:

ENVIRONMENTAL PROTECTION
95 APR 14 PM 2:38

BY: MWagner
Maria Wagner

COPIES TO: file

EARTH TECH

687157.08\MW0413.MEM