



GeoStrategies Inc.

June 18, 1993

Alameda County Health Agency
Department of Environmental Health
80 Swan Way, Room 200
Oakland, California 94621

HE 1059

Attention: Mr. Barney Chan

Reference: **UNOCAL Service Station No. 5325**
3220 Lakeshore Avenue
Oakland, California 94610

Mr. Chan:

As requested by Mr. Tim Howard of UNOCAL Corporation, we are forwarding a copy of the Quarterly Monitoring Report dated June 18, 1993, prepared for the above referenced location. This report presents the results of the first quarter 1993 groundwater monitoring and sampling.

If you should have any questions or comments, please call.

Sincerely,


Cliff M. Garratt
Project Manager

CMG:rt

Enclosure

cc: Mr. Tim Howard, UNOCAL Corporation
Mr. Richard Hiatt, Regional Water Quality Control Board

:ellenu\814final.wp



GeoStrategies Inc.

QUARTERLY MONITORING REPORT

UNOCAL Service Station #5325
3220 Lakeshore Avenue
Oakland, California

781480-14

June 18, 1993



GeoStrategies Inc.

June 18, 1993

UNOCAL Corporation
P.O. Box 5155
San Ramon, California 94583

Attn: Mr. Tim Howard

Re: QUARTERLY MONITORING REPORT
UNOCAL Service Station #5325
3220 Lakeshore Avenue
Oakland, California

Mr. Howard:

This Quarterly Monitoring Report has been prepared by GeoStrategies Inc. (GSI) and presents the results of the 1993 first quarter sampling for the above-referenced site (Plate 1).

There are currently three monitoring wells at the site; Wells U-1, U-2, and U-3 (Plate 2). These wells were installed in 1990 by GSI.

CURRENT QUARTER SAMPLING RESULTS

Depth to water measurements were obtained in each monitoring well on February 22, 1993. Static ground-water levels were measured from the surveyed top of the well box and recorded to the nearest ± 0.01 foot. Water-level elevations were referenced to Mean Sea Level (MSL) datum and are presented in Table 1. Water-level data were used to construct a quarterly potentiometric map (Plate 3). Historically, shallow ground-water flow direction has been to the southwest. However, the current groundwater flow direction which is to the southeast, is not consistent with historical norms. This is possibly due to recent heavy rains.

Each well was checked for the presence of floating product. Floating product was not observed in the wells this quarter. The field data sheets are included in Appendix A.

781480-14

GeoStrategies Inc.

Unocal Corporation

June 18, 1993

Page 2

Ground-water samples were collected on February 22, 1993. Samples were analyzed for Total Petroleum Hydrocarbons calculated as Gasoline (TPH-Gasoline), according to EPA Method 8015 (Modified) and for Benzene, Toluene, Ethylbenzene and Xylenes (BTEX) according to EPA Method 8020. The ground-water samples were analyzed by Anametrix Inc., a California State-certified laboratory located in San Jose, California. The laboratory analytical report and Chain-of-Custody form are included in Appendix B. These data are summarized and included with the historical chemical analytical data presented in Table 2. A chemical concentration map for benzene is presented on Plate 4. Field methods and procedures were presented in a previous GSI report dated April 28, 1992.

GeoStrategies Inc.

Unocal Corporation
June 18, 1993
Page 3

If you have any questions, please call.

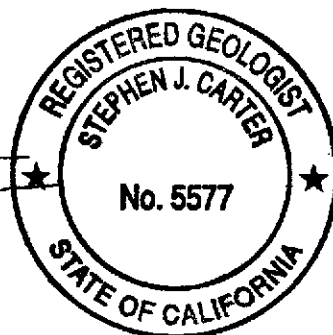
GeoStrategies Inc. by,

Ellen C. Fostersmith

Ellen C. Fostersmith
Geologist

Stephen J. Carter

Stephen J. Carter
Project Manager
RG 5577



ECF/SJC/rmt

- Plate 1. Vicinity Map
- Plate 2. Site Plan
- Plate 3. Potentiometric Map
- Plate 4. Benzene Concentration Map

- Appendix A: Field Data Sheets
- Appendix B: Laboratory Analytical Report and Chain-of-Custody Form

QC Review: *CMG*

TABLE 1
FIELD MONITORING DATA

WELL NO.	MONITORING DATE	CASING DIA. (IN)	TOTAL WELL DEPTH (FT)	WELL ELEV. (FT)	DEPTH TO WATER (FT)	PRODUCT THICKNESS (FT)	STATIC WATER ELEV. (FT)	PURGED WELL VOLUMES	pH	TEMP (F)	CONDUCTIVITY (uHMOS/cm)
U-1	22-Feb-93	3	20.3	5.75	8.66	----	(-2.91)	5	7.60	66.1	2870
U-2	22-Feb-93	3	20.0	4.94	7.57	----	(-2.63)	2	7.12	67.6	3040
U-3	22-Feb-93	3	20.0	8.14	11.58	----	(-3.44)	2	7.47	64.6	1527

- Notes: 1. Static water elevations referenced to Mean Sea Level (MSL)
2. Physical parameter measurements represent stabilized values.

TABLE 2
HISTORICAL GROUND-WATER QUALITY DATABASE

SAMPLE DATE	SAMPLE POINT	TPH-G (PPB)	BENZENE (PPB)	TOLUENE (PPB)	ETHYLBENZENE (PPB)	XYLENES (PPB)
08-Oct-90	U-1	690.	38.	75.	8.6	130.
07-Jan-91	U-1	250.	22.	16.	4.2	17.
01-Apr-91	U-1	160.	13.	8.6	1.0	15.
03-Jul-91	U-1	140	21	4.3	0.36	17
09-Oct-91	U-1	<30	<0.30	<0.30	<0.30	<0.30
12-Feb-92	U-1	250	<0.30	<0.30	<0.30	<0.30
05-May-92	U-1	230	1.2	<0.5	<0.5	<0.5
20-Aug-92	U-1	400*	1	<0.5	<0.5	0.6
06-Nov-92	U-1	1000	80	1.4	6.7	41
22-Feb-93	U-1	34000	1400	5500	910	7300
08-Oct-90	U-2	780.	27.	46.	15.	130.
07-Jan-91	U-2	1900.	67.	5.8	58.	69.
01-Apr-91	U-2	1700.	250.	89.	34.	190.
03-Jul-91	U-2	2100	150	25	3.1	290
09-Oct-91	U-2	230	7.1	<0.30	<0.30	11
12-Feb-92	U-2	410	1.9	<0.30	0.36	0.40
05-May-92	U-2	1600	120	52	6.2	290
20-Aug-92	U-2	700	28	6.5	1.3	4.6
06-Nov-92	U-2	620	17	2.1	<0.5	37
22-Feb-93	U-2	3400	2400	2100	1200	5800
08-Oct-90	U-3	<50.	<0.5	<0.5	<0.5	<0.5
07-Jan-91	U-3	<50.	<0.5	<0.5	<0.5	1.8
01-Apr-91	U-3	<50.	1.0	2.9	0.53	5.4
03-Jul-91	U-3	<30	<0.30	<0.30	<0.30	<0.30
09-Oct-91	U-3	<30	<0.30	<0.30	<0.30	<0.30
12-Feb-92	U-3	<30	<0.30	<0.30	<0.30	<0.30
05-May-92	U-3	<50	<0.5	<0.5	<0.5	<0.5
20-Aug-92	U-3	<50	<0.5	<0.5	<0.5	<0.5
06-Nov-92	U-3	<50	<0.5	<0.5	<0.5	<0.5
22-Feb-93	U-3	<50	<0.5	<0.5	<0.5	<0.5

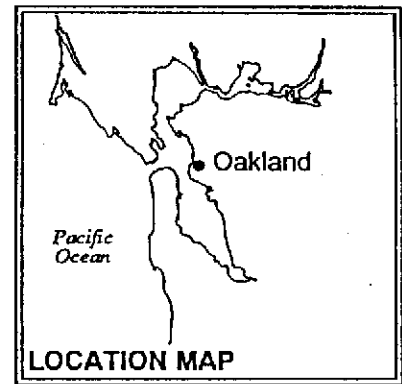
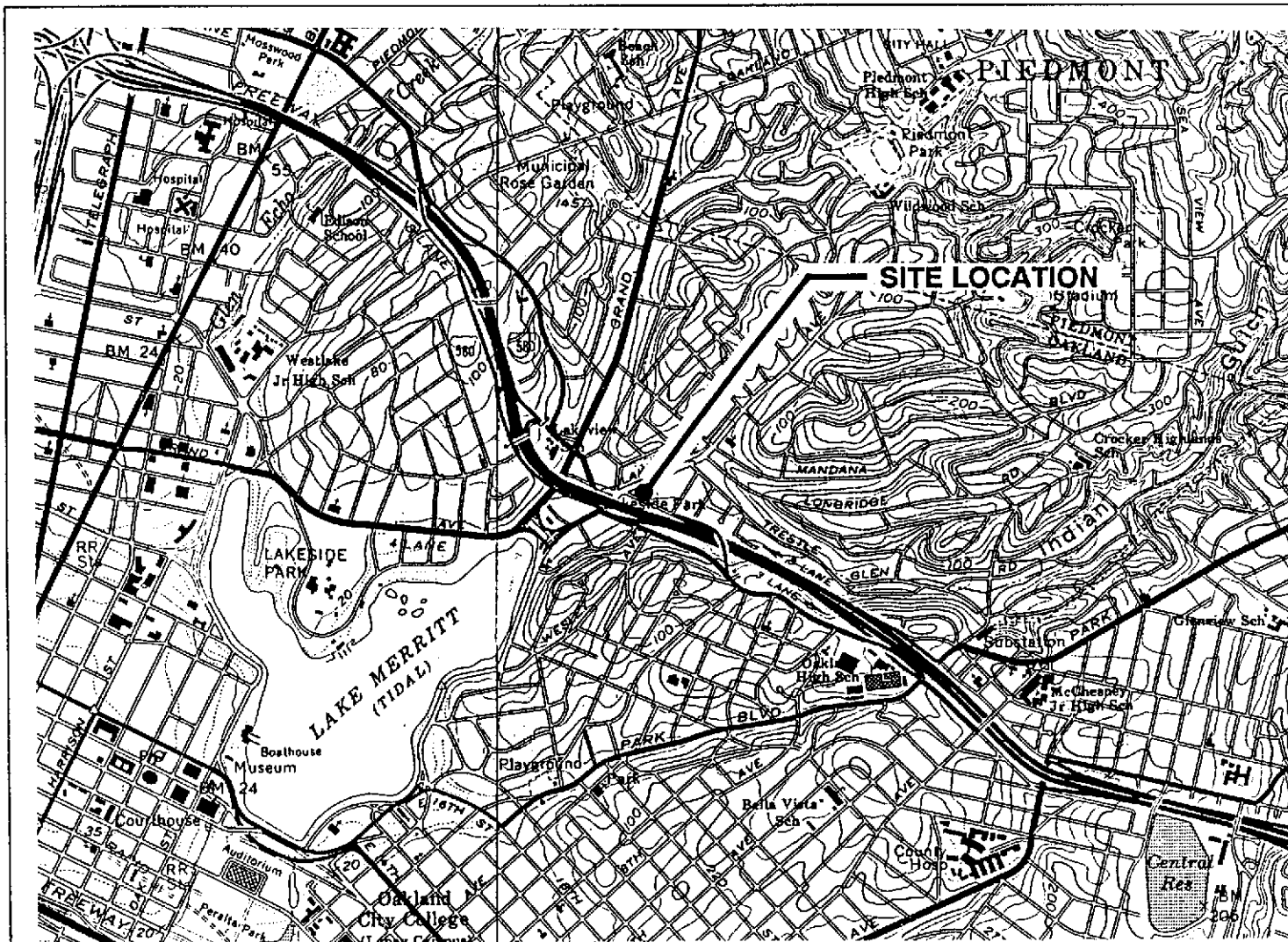
TABLE 2

HISTORICAL GROUND-WATER QUALITY DATABASE

TPH-G = Total Petroleum Hydrocarbons calculated as Gasoline.
PPB = Parts Per Billion.

Note: All data shown as < x are reported as ND (none detected).

* The positive result for gasoline does not appear to have a typical gasoline pattern.



Base Map: USGS Topographic Map

Approximate Scale: 1" = 2000'



GeoStrategies Inc.

Vicinity Map
 UNOCAL Service Station #5325
 3220 Lakeshore Avenue
 Oakland, California

PLATE

1

JOB NUMBER
7814

REVIEWED BY RG/CEG
RG

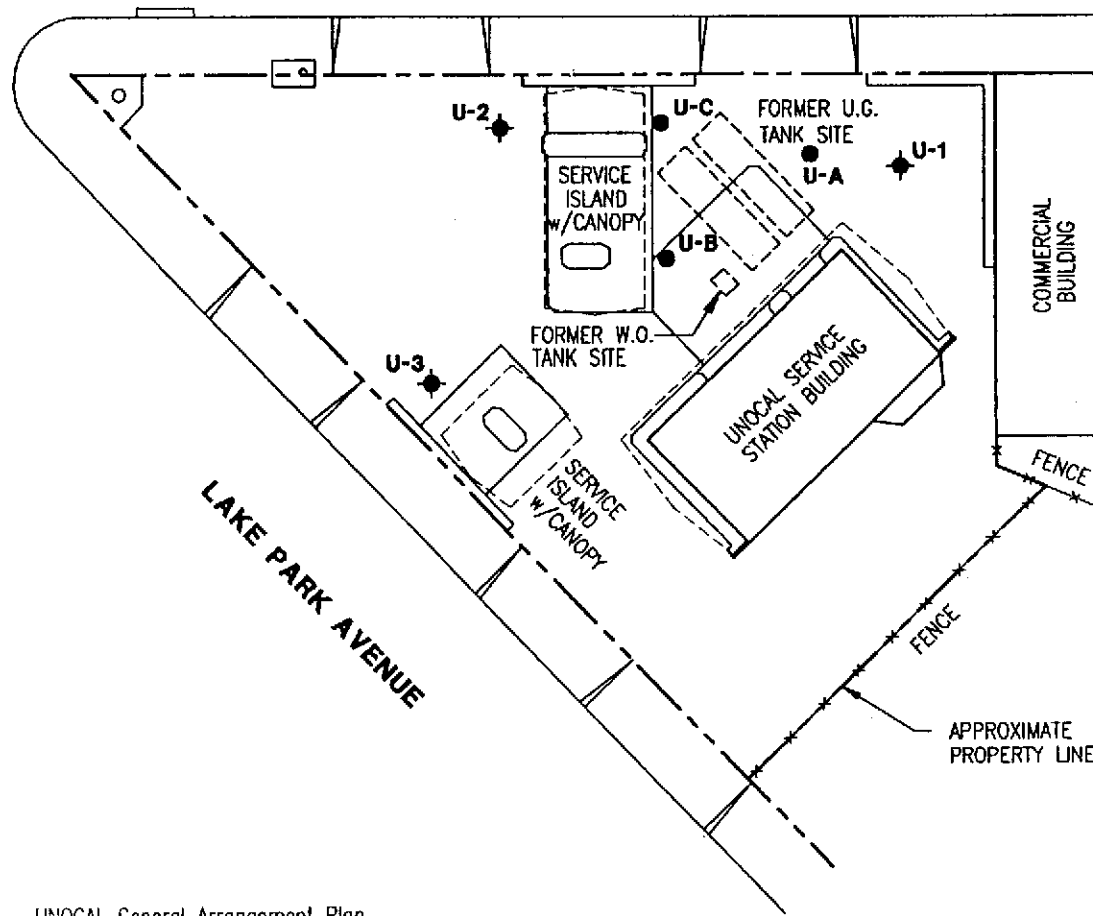
DATE
6/90

REVISED DATE

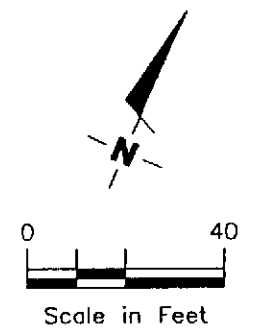
LAKESHORE AVENUE

EXPLANATION

- ◆ Ground-water monitoring well
- Soil boring



Base Map: UNOCAL General Arrangement Plan dated 7-8-66 (Rev, 12-4-84) and field observations



GeoStrategies Inc.

SITE PLAN
UNOCAL Service Station #5325
3220 Lakeshore Avenue
Oakland, California

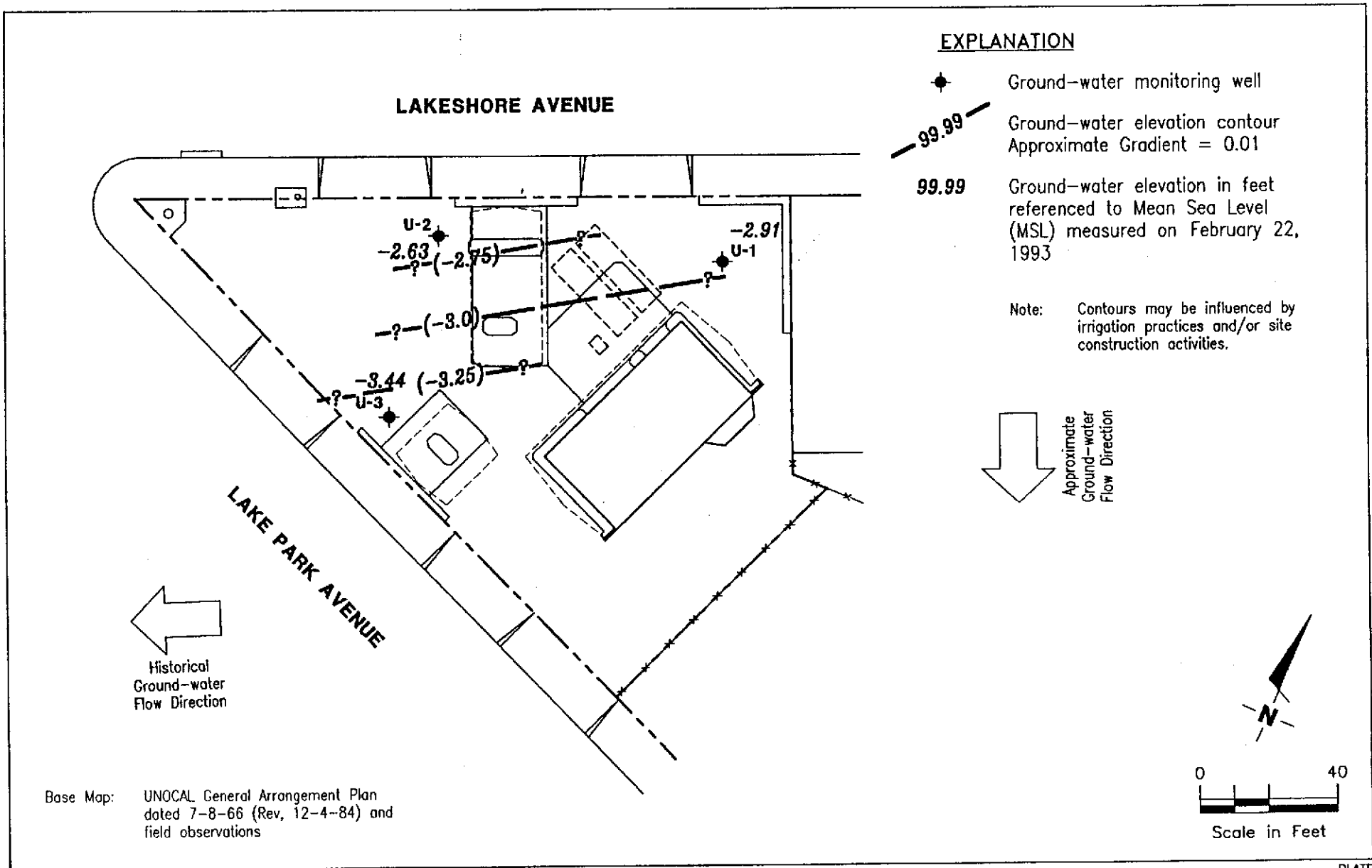
PLATE
2

JOB NUMBER
7814

REVIEWED BY
[Signature]

DATE
5/92

REVISED DATE



GeoStrategies Inc.

POTENTIOMETRIC MAP
 UNOCAL Service Station #5325
 3220 Lakeshore Avenue
 Oakland, California

PLATE

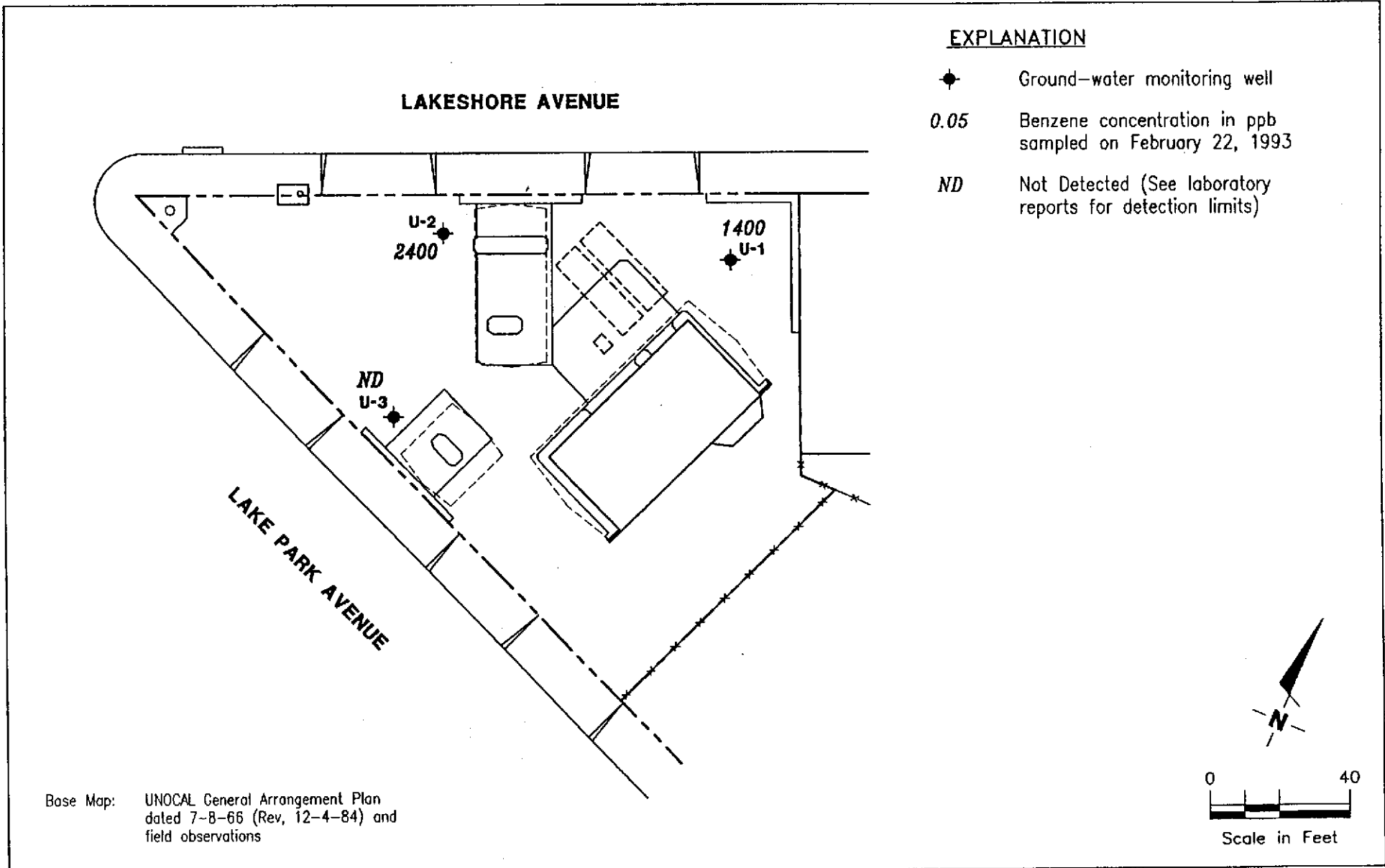
3

JOB NUMBER
781480-14

REVIEWED BY
GM

DATE
4/93

REVISED DATE



GeoStrategies Inc.

BENZENE CONCENTRATION MAP
 UNOCAL Service Station #5325
 3220 Lakeshore Avenue
 Oakland, California

PLATE

4

JOB NUMBER
781480-14

REVIEWED BY
am

DATE
4/93

REVISED DATE

GETTLER-RYAN INC.

General and Environmental Contractors

WELL SAMPLING FIELD DATA SHEET

COMPANY Unocal #5325 JOB # 9814.80
 LOCATION 3220 Lakeshore Ave DATE 2-22-93
 CITY Oakland TIME _____

Well ID. U-1 Well Condition OK
 Well Diameter 3 in. Hydrocarbon Thickness - ft.
 Total Depth 20.3 ft.
 Depth to Liquid- 8.66 ft.

Volume Factor (VF)	2" = 0.17	6" = 1.50	12" = 5.80
	3" = 0.38	8" = 2.80	
	4" = 0.66	10" = 4.10	

 (# of casing volumes) 5 x 11.64 x (VF) .38 = (Estimated Purge Volume) 22.0 gal.
 (4.4)
 Purging Equipment DD
 Sampling Equipment Bailer

Starting Time ~~946~~ 946 Purging Flow Rate 2 gpm.
 (Estimated Purge Volume) 22 gal. / (Purging Flow Rate) 2 gpm. = (Anticipated Purging Time) 11 min.

Time	pH	Conductivity	Temperature	Volume
946 947	7.03	1644 1644	63.8	2 gal
950	7.34	2420	65.4	8 gal
954	7.62	2830	65.5	16 gal
957	7.64	2890	65.8	22 gal
1002	7.60	2870	66.1	23 gal

Did well dewater? No If yes, time _____ Volume _____
 Sampling Time 1002 Weather Conditions rain
 Analysis gas BTXE Bottles Used 3x40 ml
 Chain of Custody Number _____

COMMENTS _____
 FOREMAN G. Sanchez ASSISTANT _____

GETTLER-RYAN INC.

General and Environmental Contractors

WELL SAMPLING FIELD DATA SHEET

COMPANY Unocal #5325 JOB # 5814-20
 LOCATION 3220 Lakeshore Ave DATE 2-22-93
 CITY Oakland TIME _____

Well ID. U-2 Well Condition OK
 Well Diameter 3 in. Hydrocarbon Thickness _____ ft.
 Total Depth 20.0 ft.
 Depth to Liquid- 7.57 ft.

Volume Factor (VF)	2" = 0.17	6" = 1.50	12" = 5.80
	3" = 0.38	8" = 2.60	
	4" = 0.66	10" = 4.10	

 (# of casing volumes) 5 x 12.43 x (VF) .78 = (Estimated Purge Volume) 27.5 gal. (4.7)
 Purging Equipment Bailer
 Sampling Equipment u

Starting Time 10:00 Purging Flow Rate _____ gpm.
 (Estimated Purge Volume) _____ gal. / (Purging Flow Rate) _____ gpm. = (Anticipated Purging Time) _____ min.

Time	pH	Conductivity	Temperature	Volume
<u>10:11</u>	<u>6.84</u>	<u>2210</u>	<u>65.6</u>	<u>1 gal</u>
<u>10:20</u>	<u>7.08</u>	<u>2720</u>	<u>67.3</u>	<u>8 gal</u>
<u>11:10</u>	<u>7.12</u>	<u>3040</u>	<u>67.6</u>	<u>9 gal</u>

Did well dewater? Yes If yes, time 6:20 Volume 8 gal
 Sampling Time 11:10 Weather Conditions rain
 Analysis gen BYE Bottles Used 3x40ml
 Chain of Custody Number _____

COMMENTS _____

FOREMAN G. Sauch ASSISTANT _____

GETTLER-RYAN INC.

General and Environmental Contractors

WELL SAMPLING FIELD DATA SHEET

COMPANY Unocal # 5325 JOB # 9814.80
 LOCATION 3220 Lakeshore Ave DATE 2-22-93
 CITY Oakland TIME _____

Well ID. U-3 Well Condition 0 ←
 Well Diameter 3 in. Hydrocarbon Thickness _____ ft.
 Total Depth 20.0 ft.
 Depth to Liquid- 11.58 ft.

Volume Factor (VF)	2" = 0.17	6" = 1.50	12" = 5.80
	3" = 0.38	8" = 2.60	
	4" = 0.66	10" = 4.10	

(# of casing volumes) 5 x 8.42 x (VF) .38 = (Estimated Purge Volume) 16.0 gal.
 (3.2)
 Purging Equipment Bailer
 Sampling Equipment "

Starting Time 1033 Purging Flow Rate _____ gpm.
 (Estimated Purge Volume) _____ gal. / (Purging Flow Rate) _____ gpm. = (Anticipated Purging Time) _____ min.

Time	pH	Conductivity	Temperature	Volume
<u>1034</u>	<u>7.36</u>	<u>1710</u>	<u>64.1</u>	<u>1 gal</u>
<u>1040</u>	<u>7.40</u>	<u>1595</u>	<u>64.3</u>	<u>6 gal</u>
<u>1120</u>	<u>7.47</u>	<u>1527</u>	<u>64.6</u>	<u>7 gal</u>

Did well dewater? Yes If yes, time 1040 Volume 6 gal
 Sampling Time 1120 Weather Conditions rain
 Analysis gas BTEX Bottles Used 3x40ml
 Chain of Custody Number _____

COMMENTS _____
 FOREMAN G. Sanchez ASSISTANT _____



GETTLER-RYAN INC.

MR. FRANK CLINE
GETTLER RYAN/GEOSTRATEGIES
2150 W. WINTON AVENUE
HAYWARD, CA 94545

Workorder.# : 9302340
Date Received : 02/25/93
Project ID : 9814.80
Purchase Order: 9814.80

The following samples were received at Anamatrix, Inc. for analysis :

ANAMETRIX ID	CLIENT SAMPLE ID
9302340- 1	U-1
9302340- 2	U-2
9302340- 3	U-3
9302340- 4	TRIP

This report consists of 6 pages not including the cover letter, and is organized in sections according to the specific Anamatrix laboratory group or section which performed the analysis(es) and generated the data. The Report Summary that precedes each section will help you determine which Anamatrix group is responsible for those test results, and will bear the signatures of the department supervisor and the chemist who have reviewed the analytical data. Please refer all questions to the department supervisor who signed the form.

Anamatrix is certified by the California Department of Health Services (DHS) to perform environmental testing under Certificate Number 1234. A detailed list of the approved fields of testing can be obtained by calling our office, or the DHS Environmental Laboratory Accreditation Program at (415)540-2800.

If you have any further questions or comments on this report, please give us a call as soon as possible. Thank you for using Anamatrix.

Sarah Schoen, Ph.D.
Laboratory Director

03-11-93
Date

REPORT SUMMARY
ANAMETRIX, INC. (408)432-8192

MR. FRANK CLINE
GETTLER RYAN/GEOSTRATEGIES
2150 W. WINTON AVENUE
HAYWARD, CA 94545

Workorder # : 9302340
Date Received : 02/25/93
Project ID : 9814.80
Purchase Order: 9814.80
Department : GC
Sub-Department: TPH

SAMPLE INFORMATION:

ANAMETRIX SAMPLE ID	CLIENT SAMPLE ID	MATRIX	DATE SAMPLED	METHOD
9302340- 1	U-1	WATER	02/22/93	TPHg/BTEX
9302340- 2	U-2	WATER	02/22/93	TPHg/BTEX
9302340- 3	U-3	WATER	02/22/93	TPHg/BTEX
9302340- 4	TRIP	WATER	02/12/93	TPHg/BTEX

REPORT SUMMARY
ANAMETRIX, INC. (408)432-8192

MR. FRANK CLINE
GETTLER RYAN/GEOSTRATEGIES
2150 W. WINTON AVENUE
HAYWARD, CA 94545

Workorder # : 9302340
Date Received : 02/25/93
Project ID : 9814.80
Purchase Order: 9814.80
Department : GC
Sub-Department: TPH

QA/QC SUMMARY :

- No QA/QC problems encountered for these samples.

Cheryl Balmer 3/5/93
Department Supervisor Date

Laura Sher 3/10/93
Chemist Date

ANALYSIS DATA SHEET - TOTAL PETROLEUM HYDROCARBONS
(GASOLINE WITH BTEX)
ANAMETRIX, INC. - (408) 432-8192

Anamatrix W.O.: 9302340
Matrix : WATER
Date Sampled : 02/12 & 22/93

Project Number : 9814.80
Date Released : 03/09/93

COMPOUNDS	Reporting Limit (ug/L)	Sample I.D.# U-1	Sample I.D.# U-2	Sample I.D.# U-3	Sample I.D.# TRIP	Sample I.D.# BM0302E3
Benzene	0.5	1400	2400	ND	ND	ND
Toluene	0.5	5500	2100	ND	ND	ND
Ethylbenzene	0.5	910	1200	ND	ND	ND
Total Xylenes	0.5	7300	5800	ND	ND	ND
TPH as Gasoline	50	34000	34000	ND	ND	ND
% Surrogate Recovery		94%	91%	104%	108%	103%
Instrument I.D.		HP12	HP12	HP12	HP12	HP12
Date Analyzed		03/03/93	03/03/93	03/04/93	03/03/93	03/03/93
RLMF		250	250	1	1	1

- ND - Not detected at or above the practical quantitation limit for the method.
- TPHg - Total Petroleum Hydrocarbons as gasoline is determined by GCFID using modified EPA Method 8015 following sample purge and trap by EPA Method 5030.
- BTEX - Benzene, Toluene, Ethylbenzene, and Total Xylenes are determined by modified EPA Method 8020 following sample purge and trap by EPA Method 5030.
- RLMF - Reporting Limit Multiplication Factor.

Anamatrix control limits for surrogate p-Bromofluorobenzene recovery are 61-139%

All testing procedures follow California Department of Health Services (Cal-DHS) approved methods.

Laura Sher 3/11/93
Analyst Date

Cheryl Balmer 3/11/93
Supervisor Date

ANALYSIS DATA SHEET - TOTAL PETROLEUM HYDROCARBONS
(GASOLINE WITH BTEX)
ANAMETRIX, INC. - (408) 432-8192

Anamatrix W.O.: 9302340
Matrix : WATER
Date Sampled : N/A

Project Number : 9814.80
Date Released : 03/09/93

COMPOUNDS	Reporting Limit (ug/L)	Sample I.D.# BM0401E3 BLANK
Benzene	0.5	ND
Toluene	0.5	ND
Ethylbenzene	0.5	ND
Total Xylenes	0.5	ND
TPH as Gasoline	50	ND
% Surrogate Recovery		125%
Instrument I.D.		HP12
Date Analyzed		03/04/93
RLMF		1

- ND - Not detected at or above the practical quantitation limit for the method.
- TPHg - Total Petroleum Hydrocarbons as gasoline is determined by GCFID using modified EPA Method 8015 following sample purge and trap by EPA Method 5030.
- BTEX - Benzene, Toluene, Ethylbenzene, and Total Xylenes are determined by modified EPA Method 8020 following sample purge and trap by EPA Method 5030.
- RLMF - Reporting Limit Multiplication Factor.

Anamatrix control limits for surrogate p-Bromofluorobenzene recovery are 61-139%

All testing procedures follow California Department of Health Services (Cal-DHS) approved methods.

Lina Sher 3/11/93
Analyst Date

Cheryl Balmer 3/11/93
Supervisor Date

TOTAL VOLATILE HYDROCARBON MATRIX SPIKE REPORT
 EPA METHOD 5030 WITH GC/FID
 ANAMETRIX, INC. (408) 432-8192

Sample I.D. : 9814.80 U-3	Anamatrix I.D. : 9302340-03
Matrix : WATER	Analyst : IS
Date Sampled : 02/22/93	Supervisor : IS
Date Analyzed : 03/03/93	Date Released : 03/09/93

COMPOUND	SPIKE AMT (ug/L)	SAMPLE CONC (ug/L)	MS AMT (ug/L)	% REC MS	MD AMT (ug/L)	% REC MD	RPD	% REC LIMITS
BENZENE	20.0	0.0	22.3	112%	22.4	112%	0%	45-139
TOLUENE	20.0	0.0	21.8	109%	21.5	108%	-1%	51-138
ETHYLBENZENE	20.0	0.0	23.3	117%	23.1	116%	-1%	48-146
TOTAL-XYLENES	20.0	0.0	21.0	105%	21.0	105%	0%	50-139
p-BFB				93%		92%		61-139

* Quality control limit established by Anamatrix, Inc.

BTEX LABORATORY CONTROL SAMPLE REPORT
 EPA METHOD 5030 WITH GC/PID
 ANAMETRIX, INC. (408) 432-8192

Sample I.D. : LAB CONTROL SAMPLE	Anamatrix I.D.: LCSW0303
Matrix : WATER	Analyst : JS
Date Sampled : N/A	Supervisor : <i>UB</i>
Date Analyzed : 03/03/93	Date Released : 03/09/93
	Instrument ID : HP12

COMPOUND	SPIKE AMT. (ug/L)	LCS (ug/L)	REC LCS	%REC LIMITS
Benzene	20.0	22.5	113%	52-133
Toluene	20.0	22.1	111%	57-136
Ethylbenzene	20.0	23.8	119%	56-139
TOTAL Xylenes	20.0	21.8	109%	56-141
P-BFB			90%	61-139

* Limits established by Anamatrix, Inc.

