GeoStrategies Inc.

QUARTERLY MONITORING REPORT

UNOCAL Service Station No. 1871
96 MacArthur Boulevard
Oakland, California

786880-3

June 17, 1993

GeoStrategies Inc.

June 17, 1993

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

Attention: Mr. ~~Barney Chan~~ Jennifer

Reference: UNOCAL Service Station No. 1871
96 MacArthur Boulevard
Oakland, California

Mr. Chan:

As requested by Mr. Robert A. Boust of UNOCAL Corporation, we are forwarding a copy of the Quarterly Monitoring Report dated June 17, 1993 prepared for the above referenced location. This report presents the results of groundwater monitoring and sampling performed during the second quarter of 1993.

If you have any questions or comments, please call.

Sincerely,

Cliff M. Garratt
Project Manager

CMG/rmt

Enclosure

cc: Mr. Robert A. Boust, UNOCAL Corporation
Mr. Paul Supple, ROUX Associates
Mr. Lester Feldman, Regional Water Quality Control Board

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GeoStrategies Inc.

June 17, 1993

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

Attn: Mr. Robert A. Boust

Re: **QUARTERLY MONITORING REPORT**
UNOCAL Service Station No. 1871
96 MacArthur Boulevard
Oakland, California

Mr. Boust:

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

There are currently three monitoring wells at the site; Wells MW-1 MW-2 and MW-3 (Plate 2). These wells were installed in 1992 by ROUX Associates.

CURRENT QUARTER SAMPLING RESULTS

Depth to water measurements were obtained in each monitoring well on April 29, 1993. Static ground-water levels were measured from the surveyed top of each well casing 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). Shallow groundwater flow [redacted] southwest with an approximate hydraulic gradient of 0.03.

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.

786880-3

Groundwater samples were collected on April 29, 1993. Samples were analyzed for Total Petroleum Hydrocarbons calculated as Gasoline (TPH-Gasoline), according to EPA Method 8015 and for Benzene, Toluene, Ethylbenzene, Xylenes (BTEX) according to EPA Method 8020. The groundwater 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 groundwater quality database presented in Table 2. A chemical concentration map for benzene is presented on Plate 4. Groundwater sampling field methods and procedures are included in the initial GSI report for the site, dated January 28, 1993.

If you have any questions, please call.

GeoStrategies Inc. by,

Ellen C. Fostersmith
Geologist

Stephen J. Carter
Project Manager
R.G. 5577

REGISTERED GEOLOGIST
STEPHEN J. CARTER
No. 5577
STATE OF CALIFORNIA

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

786880-3

TABLE 2

HISTORICAL GROUNDWATER QUALITY DATABASE

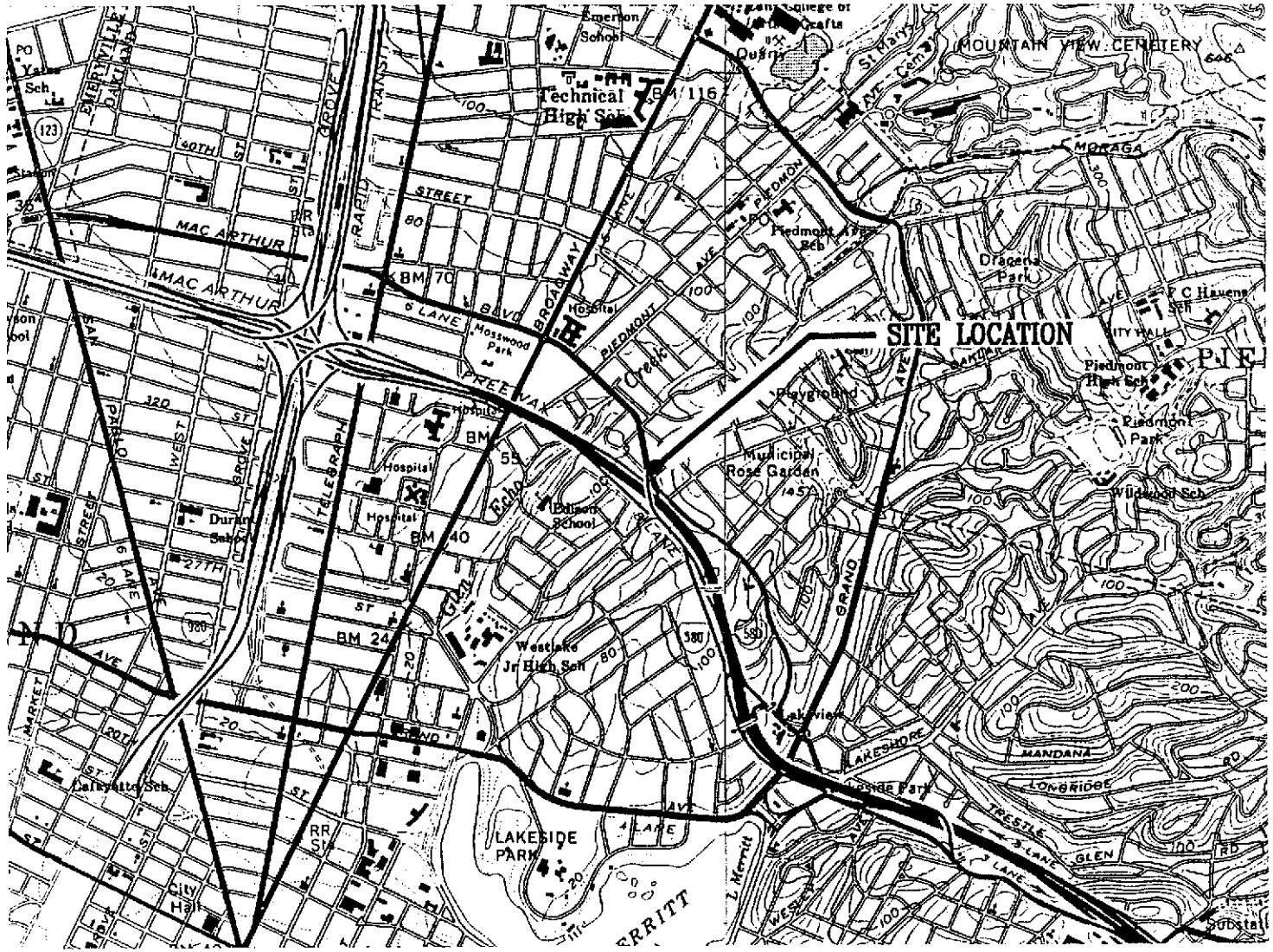
SAMPLE DATE	SAMPLE POINT	TPH-G (PPB)	BENZENE (PPB)	TOLUENE (PPB)	ETHYLBENZENE (PPB)	XYLENES (PPB)
03-Nov-92	MW-1	260000	2300	4600	3700	17000
25-Jan-93	MW-1	120000	2100	4600	4900	22000
29-Apr-93	MW-1	✓100000 ↓	~~850~~ ↓	2000	4300	19000
03-Nov-92	MW-2	140	2.2	<0.5	<0.5	2
25-Jan-93	MW-2	2100	56	1.1	90	140
29-Apr-93	MW-2	✓1500 ↓	~~290~~ ↑	<5	33	11
03-Nov-92	MW-3	2100	120	15	38	200
25-Jan-93	MW-3	2300	80	1.0	55	52
29-Apr-93	MW-3	✓4500 ↑	✓700 ↑	<25	200	140

↑ Plume appears to be migrating due to higher conc.

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

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

Laboratory values are reported in units of µg/l, which for practical purposes are synonymous with parts per billion (ppb).



N

0 2000

Scale in Feet

Base Map: USGS Topographic Map

GeoStrategies Inc.

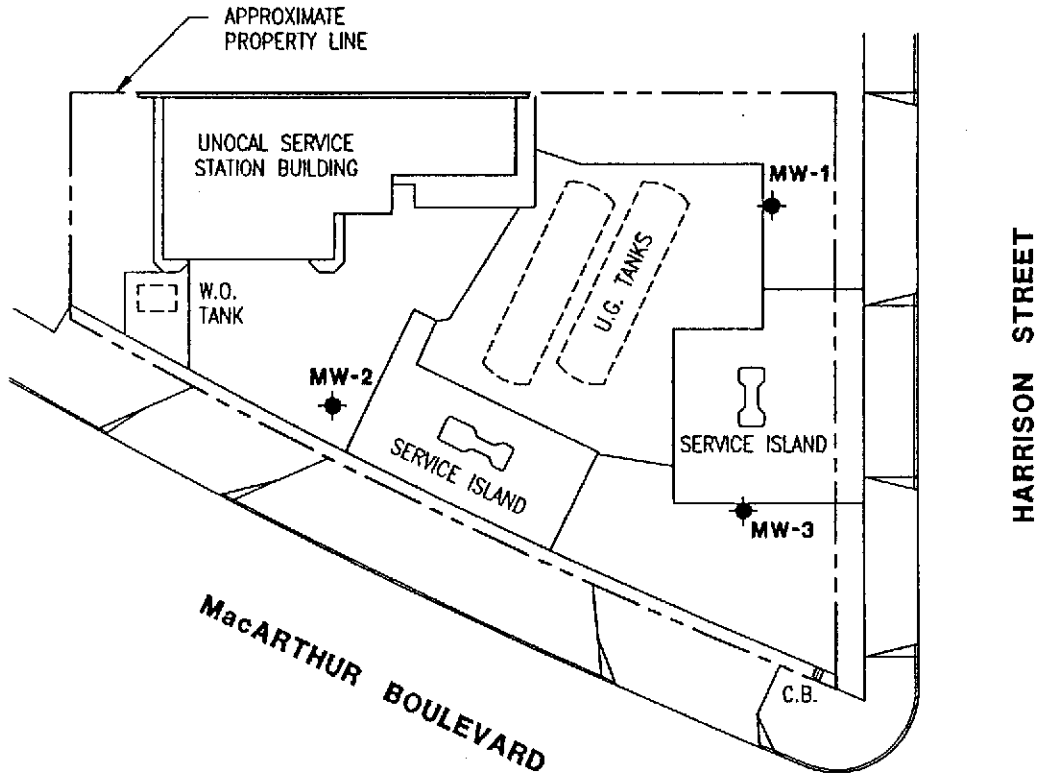
VICINITY MAP
UNOCAL Service Station #1871
96 MacArthur Boulevard
Oakland, California

PLATE 1

JOB NUMBER	REVIEWED BY	DATE	REVISED DATE
7868		12/92	

EXPLANATION

Ground--water monitoring well



Base Map: UNOCAL Waste Oil Tank Replacement plan dated 04-14-92 and ROUX Assoc Well Location Fig. 4 dated 05/92

N

0 30

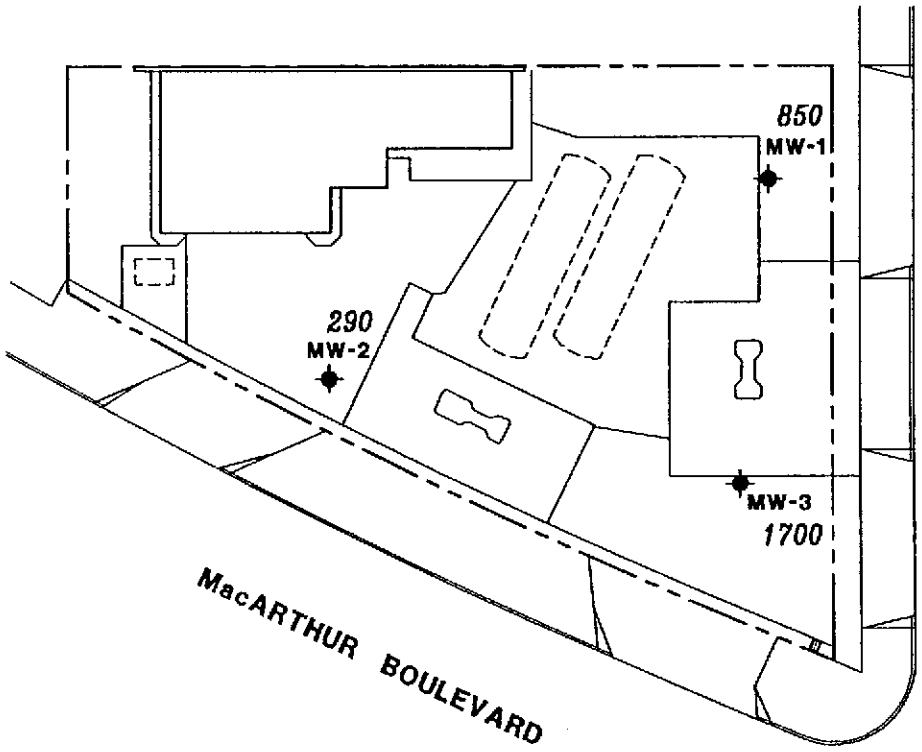
Scale in Feet

GeoStrategies Inc.

SITE PLAN
UNOCAL Service Station #1871
96 MacArthur Boulevard
Oakland, California

PLATE
2

JOB NUMBER	REVIEWED BY	DATE	REVISED DATE
7868		12/92	



EXPLANATION

- Ground-water monitoring well
- ***0.05*** Benzene concentration in ppb sampled on April 29, 1993
- ***ND*** Not Detected (See laboratory reports for detection limits)

N

0 30

Scale in Feet

Base Map: UNOCAL Waste Oil Tank Replacement plan dated 04-14-92 and ROUX Assoc Well Location Fig. 4 dated 05/92

GeoStrategies Inc.

BENZENE CONCENTRATION MAP
UNOCAL Service Station #1871
96 MacArthur Boulevard
Oakland, California

PLATE
4

JOB NUMBER	REVIEWED BY	DATE	REVISED DATE
786880-3		6/93	

APPENDIX A
FIELD DATA SHEETS

GETTLER-RYAN INC.

General and Environmental Contractors

OBSERVATION WELL DAILY MONITOR RECORD

COMPANY Unocal # 1871 JOB # 7813.80

LOCATION 96 Mac Arthur DATE 4-29-93

CITY Oakland CA TIME

WELL	DEPTH TO LIQUID (DTH) OR (DTW)	HYDROCARBON THICKNESS (HT) BEFORE	HYDROCARBON THICKNESS (HT) AFTER	AMOUNT PUMPED	COMMENTS
MW-1	13.71	~~24~~	24.0 TP 5/19		
MW-2	9.73	~~25.3~~	24.5 TP 5/19		
MW-3	11.37	25.0			

PRODUCT TANK: TOTAL FLOWMETER

WATER OTHER

COMMENTS

FOREMAN

GETTLER-RYAN INC.

General and Environmental Contractors

WELL SAMPLING
FIELD DATA SHEET

COMPANY Unocal - 1871 JOB # 9868.80

LOCATION 96 Mac Arthur DATE 4-29-93

CITY Oakland TIME

Well ID. MW-1 Well Condition OK

Well Diameter 4 in. Hydrocarbon Thickness ft.

Total Depth 24.0 ft.

Depth to Liquid- 13.71 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 10.39 x(VF) .66 = (Estimated Purge Volume) 6.934.5 gal.

Purging Equipment DD

Sampling Equipment Bailer

Starting Time 7:09 Purging Flow Rate 3.5 gpm.

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

Time	pH	Conductivity	Temperature	Volume
19:12 ~~7:12~~	6.86	855	19.7	7.5 gal
19:15 ~~7:15~~	7.32	890	20.0	15
19:18 ~~7:18~~	7.50	872	20.1	22.5
19:21 ~~7:21~~	7.18	878	20.0	30
19:24 ~~7:28~~	7.20	878	19.8	37

Did well dewater? NO If yes, time Volume

Sampling Time 19:26 Weather Conditions Sunny

Analysis Gas - BTXE Bottles Used 3 x 40 ml

Chain of Custody Number

COMMENTS

FORM NO. F.C. Nice

GETTLER-RYAN INC.

General and Environmental Contractors

WELL SAMPLING
FIELD DATA SHEET

COMPANY Unocal #1871 JOB # 986880

LOCATION 96 MacArthur DATE 4-29-93

CITY Oakland CA TIME

Well ID. MW-2 Well Condition clay

Well Diameter 4" in. Hydrocarbon Thickness — ft.

Total Depth 24.15 ft.

Depth to Liquid- 9.73 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 14.77 x(VF) 0.66 = (Estimated Purge Volume) 9.749 gal.

Purging Equipment DD

Sampling Equipment Bailer

Starting Time 18:25 Purging Flow Rate 3.3 gpm.

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

Time	pH	Conductivity	Temperature	Volume
18:28	7.50	755	19.9	19
18:31	7.51	698	19.9	28
18:34	7.40	695	19.5	36
18:37	7.39	689	20.1	46
18:40	7.40	690	20.0	50

Did well dewater? No If yes, time ____ Volume ____

Sampling Time 18:45 Weather Conditions ____

Analysis Gas BTXE Bottles Used ____

Chain of Custody Number ____

COMMENTS ____

FORMAT: 15 Cline

GETTLER-RYAN INC.

General and Environmental Contractors

WELL SAMPLING
FIELD DATA SHEET

COMPANY Unocal #1871 JOB # 9868.80

LOCATION 96 MacArthur DATE 4-29-93

CITY Oakland CA TIME

Well ID. MW-3 Well Condition

Well Diameter 4" in Hydrocarbon Thickness ft.

Total Depth 25' ft

Depth to Liquid- 11.37 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 13.63 x(VF) 0.66 = (Estimated Purge Volume) 9.045 gal.

Purging Equipment DD

Sampling Equipment Bailer

Starting Time 18:48 Purging Flow Rate 3 gpm.

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

Time	pH	Conductivity	Temperature	Volume
18:51	7.23	840	20.9	9
18:54	6.93	852	20.8	18
18:57	6.78	857	20.9	27
19:00	6.84	857	20.8	36
19:03	6.85	858	20.9	45

Did well dewater? No If yes, time Volume

Sampling Time 19:08 Weather Conditions

Analysis Gas BTXE Bottles Used

Chain of Custody Number

COMMENTS

E. Cline

APPENDIX B
LABORATORY ANALYTICAL REPORT
AND
CHAIN-OF-CUSTODY FORM

ANAMETRIX INC

REPORT

MR. CLIFF GARRETT
GETTLER RYAN/GEOSTRATEGIES
2150 W. WINTON AVENUE
HAYWARD, CA 94545

Workorder # : 9304370
Date Received : 04/30/93
Project ID : 9868.80
Purchase Order: 9868.80

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

ANAMETRIX ID	CLIENT SAMPLE ID
9304370- 1	MW-1
9304370- 2	MW-2
9304370- 3	MW-3
9304370- 4	TRIP

This report consists of 5 pages not including the cover letter, and is organized in sections according to the specific Anametrix 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 Anametrix 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.

Anametrix 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 Anametrix.

Sarah Schoen, Ph.D.
Laboratory Director

05-20-93
Date

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

MR. CLIFF GARRETT
GETTLER RYAN/GEOSTRATEGIES
2150 W. WINTON AVENUE
HAYWARD, CA 94545

Workorder # : 9304370
Date Received : 04/30/93
Project ID : 9868.80
Purchase Order: 9868.80
Department : GC
Sub-Department: TPH

SAMPLE INFORMATION:

ANAMETRIX SAMPLE ID	CLIENT SAMPLE ID	MATRIX	DATE SAMPLED	METHOD
9304370- 1	MW-1	WATER	04/29/93	TPHg/BTEX
9304370- 2	MW-2	WATER	04/29/93	TPHg/BTEX
9304370- 3	MW-3	WATER	04/29/93	TPHg/BTEX
9304370- 4	TRIP	WATER	04/23/93	TPHg/BTEX

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

MR. CLIFF GARRETT
GETTLER RYAN/GEOSTRATEGIES
2150 W. WINTON AVENUE
HAYWARD, CA 94545

Workorder # : 9304370
Date Received : 04/30/93
Project ID : 9868.80
Purchase Order: 9868.80
Department : GC
Sub-Department: TPH

QA/QC SUMMARY :

- No QA/QC problems encountered for these samples.

Cheryl Bulmer 5/19/93
Department Supervisor Date

Reggie Davison 5/19/93
Chemist Date

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

Anametrix W.O.: 9304370
Matrix : WATER
Date Sampled : 04/23 & 29/93

Project Number : 9868.80
Date Released : 05/11/93

COMPOUNDS	Reporting Limit (ug/L)	Sample I.D.# MW-1 -01	Sample I.D.# MW-2 -02	Sample I.D.# MW-3 -03	Sample I.D.# TRIP -04	Sample I.D.# BY0501E2 BLANK
Benzene	0.5	850	290	1700	ND	ND
Toluene	0.5	2000	ND	ND	ND	ND
Ethylbenzene	0.5	4300	33	200	ND	ND
Total Xylenes	0.5	19000	11	140	ND	ND
TPH as Gasoline	50	100000	1500	4500	ND	ND
% Surrogate Recovery		128%	129%	138%	123%	125%
Instrument I.D.		HP4	HP4	HP4	HP4	HP4
Date Analyzed		05/05/93	05/06/93	05/06/93	05/06/93	05/05/93
RLMF		500	10	50	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.

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

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

Reggie Dawson 5/19/93
Analyst Date

Cheryl Bauman 5/19/93
Supervisor Date

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

Anametrix W.O.: 9304370
Matrix : WATER
Date Sampled : N/A

Project Number : 9868.80
Date Released : 05/11/93

COMPOUNDS	Reporting Limit (ug/L)	Sample I.D.# BY0601E2 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		114%
Instrument I.D.		HP4
Date Analyzed		05/06/93
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.

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

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

Peggie Davison 5/19/93
Analyst Date

Cheryl Balman 5/14/93
Supervisor Date

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

Sample I.D.	: LAB CONTROL SAMPLE	Anametrix I.D.	: LCSW0505
Matrix	: WATER	Analyst	: RD
Date Sampled	: N/A	Supervisor	:
Date Analyzed	: 05/05/93	Date Released	: 05/10/93
		Instrument ID	: HP4

COMPOUND	SPIKE AMT. (ug/L)	LCS (ug/L)	REC LCS	%REC LIMITS
Benzene	20.0	18.7	94%	52-133
Toluene	20.0	22.3	112%	57-136
Ethylbenzene	20.0	23.4	117%	56-139
TOTAL Xylenes	20.0	24.1	121%	56-141
P-BFB			133%	61-139

* Limits established by Anametrix, Inc.

Gettler - Ryan Inc. ENVIRONMENTAL DIVISION — 3163 Chain of Custody

COMPANY Unocal # 1871 — JOB NO. TF 5/11/93

JOB LOCATION 96 MacArthur — PHONE NO. 9868.80

CITY Oakland, CA

AUTHORIZED Cliff Garnet — DATE 4-30-93 — P.O. NO. ~~9868.80~~

SAMPLE ID	NO. OF CONTAINERS	SAMPLE MATRIX	DATE/TIME SAMPLED	ANALYSIS REQUIRED	SAMPLE CONDITION LAB ID
MW-1	3	Liquid	4-29-93/09:20	TPH (Gas) BTXE	(1)
MW-2	3	↓	/18745	↓	(2)
MW-3	3		/19:55		(3)
Trip	1		—		(4)

RELINQUISHED BY: [signature] 4-30-93 14:30 — RECEIVED BY:

RELINQUISHED BY: — RECEIVED BY:

RELINQUISHED BY: — RECEIVED BY LAB: Michelle Aquilar 4-30-93 14:30

DESIGNATED LABORATORY: Anametrix — DHS #:

REMARKS: Normal TAT

DATE COMPLETED 4-30-93 — FOREMAN R Clin