

MONITORING  
PURGING  
DISPOSING  
SAMPLING

MPDS

SERVICES, INCORPORATED

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November 21, 1994

Alameda County Health Care Services  
1131 Harbor Bay Parkway  
Alameda, California 94501

RE: Unocal Service Station #3538  
411 W. MacArthur Boulevard  
Oakland, California

Per the request of the Unocal Corporation Project Manager, Ms. Tina R. Berry, enclosed please find our report (MPDS-UN3538-04) dated October 31, 1994 for the above referenced site.

Should you have any questions regarding the reporting of data, please feel free to call our office at (510) 602-5120. Any other questions may be directed to the Project Manager at (510) 277-2354.

Sincerely,

MPDS Services, Inc.



Jarrel F. Crider

/jfc

Enclosure

cc: Ms. Tina R. Berry

MPDS-UN3538-04  
October 31, 1994

Unocal Corporation  
2000 Crow Canyon Place, Suite 400  
P.O. Box 5155  
San Ramon, California 94583

Attention: Mr. Tina R. Berry

RE: Quarterly Data Report  
Unocal Service Station #3538  
411 W. MacArthur Boulevard  
Oakland, California

Dear Ms. Berry:

This data report presents the results of the most recent quarter of monitoring and sampling of the monitoring wells at the referenced site by MPDS Services, Inc.

#### RECENT FIELD ACTIVITIES

The monitoring wells that were monitored and sampled during this quarter are indicated in Table 1. Prior to sampling, the wells were checked for depth to water and the presence of free product or sheen. The monitoring data and the ground water elevations are summarized in Table 1. The ground water flow direction during the most recent quarter is shown on the attached Figure 1.

Ground water samples were collected October 5, 1994. Prior to sampling, the wells were each purged of between 5 and 7 gallons of water. Samples were then collected using a clean Teflon bailer. The samples were decanted into clean VOA vials, which were then sealed with Teflon-lined screw caps, labeled, and stored in a cooler, on ice, until delivery to a state-certified laboratory. MPDS Services, Inc. transported the purged ground water to the Unocal Refinery located in Rodeo, California, for treatment and discharge to San Pablo Bay under NPDES permit.

#### ANALYTICAL RESULTS

The ground water samples were analyzed at Sequoia Analytical Laboratory and were accompanied by properly executed Chain of Custody documentation. The analytical results of the ground water samples collected to date are summarized in Tables 2 and 3. The concentrations of Total Petroleum Hydrocarbons (TPH) as gasoline and benzene detected in the ground water samples collected this quarter are shown on the attached Figure 2. Copies of the laboratory analytical results and the Chain of Custody documentation are attached to this report.

LIMITATIONS

Environmental changes, either naturally-occurring or artificially-induced, may cause changes in ground water levels and flow paths, thereby changing the extent and concentration of any contaminants.

DISTRIBUTION

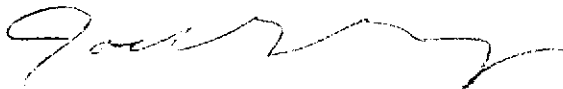
A copy of this report should be sent to the Alameda County Health Care Services Agency.

If you have any questions regarding this report, please do not hesitate to call Mr. Nubar Srabian at (510) 602-5120.

Sincerely,

MPDS Services, Inc.

  
Sarkis Karkarian  
Staff Engineer



Joel G. Greger, C.E.G.  
Senior Engineering Geologist

License No. EG 1633  
Exp. Date 8/31/96

/bp

Attachments: Tables 1, 2 & 3  
Location Map  
Figures 1 & 2  
Laboratory Analyses  
Chain of Custody documentation

cc: Mr. Thomas Berkins, Kaprealian Engineering, Inc.



**TABLE 1**

SUMMARY OF MONITORING DATA

Well #	Ground Water Elevation (feet)	Depth to Water (feet)◆	Total Well Depth (feet)◆	Product Thickness (feet)	Sheen	Water Purged (gallons)
(Monitored and Sampled on October 5, 1994)						
MW1*	53.55	18.55	27.25	0	--	0
MW2	53.05	18.33	27.90	0	No	7
MW3	53.28	18.58	25.09	0	No	5
MW4*	53.36	18.28	29.01	0	--	0
MW5*	53.25	17.98	30.12	0	--	0
MW6*	57.28	14.16	30.08	0	--	0
(Monitored and Sampled on July 7, 1994)						
MW1	53.82	18.28	27.30	0	No	6.5
MW2	53.57	17.81	26.95	0	No	6.5
MW3	53.65	18.21	25.03	0	No	5
MW4	53.84	17.80	28.72	0	No	7.5
MW5	53.73	17.50	30.05	0	No	9
MW6	57.39	14.05	30.19	0	No	11
(Monitored and Sampled on April 9, 1994)						
MW2	53.41	17.97	27.93	0	--	7
MW3	53.67	18.19	25.11	0	--	5
(Monitored and Sampled on January 12, 1994)						
MW1*	53.92	18.18	27.34	0	--	0
MW2	53.30	18.08	28.10	0	No	7
MW3	53.52	18.34	25.12	0	No	5
MW4*	53.67	17.97	28.75	0	--	0
MW5	53.49	17.74	30.14	0	No	8.5
MW6	54.00	17.44	30.07	0	No	9

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**TABLE 1 (Continued)**

SUMMARY OF MONITORING DATA

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<u>Well #</u>	<u>Well Casing Elevation (feet)**</u>
MW1	72.10
MW2	71.38
MW3	71.86
MW4	71.64
MW5	71.23
MW6	71.44

- ◆ The depth to water level and total well depth measurements were taken from the top of the well casings.
- \* Monitored only.
- \*\* The elevations of top of well casings are relative to Mean Seal Level (MSL), per the City of Oakland Benchmark #9NW10 (elevation = 75.50' MSL).
- Sheen determination was not performed.

**TABLE 2**

**SUMMARY OF LABORATORY ANALYSES  
WATER**

<u>Date</u>	<u>Well #</u>	<u>TPH as Gasoline</u>	<u>Benzene</u>	<u>Toluene</u>	<u>Ethyl-Benzene</u>	<u>Xylenes</u>
10/05/94	MW1	SAMPLED ANNUALLY				
	MW2	720♦	20	ND	ND	3.1
	MW3	ND	ND	ND	ND	ND
	MW4	SAMPLED ANNUALLY				
	MW5	SAMPLED ANNUALLY				
	MW6	SAMPLED ANNUALLY				
7/07/94	MW1	ND	ND	ND	ND	ND
	MW2	110♦	4.4	ND	ND	ND
	MW3	110♦	4.5	ND	ND	ND
	MW4	ND	ND	ND	ND	ND
	MW5	ND	ND	ND	ND	ND
	MW6	ND	ND	ND	ND	ND
4/09/94	MW2	120	10	0.88	1.1	4.9
	MW3	1,800	22	ND	140	280
1/12/94	MW2	300	7.8	3.8	1.8	10
	MW3	3,800	78	ND	180	390
	MW5	ND	ND	0.84	ND	1.6
	MW6	ND	ND	1.2	ND	2.9
10/14/93	MW2	230♦	5.3	ND	ND	2.1
	MW3	2,500	52	ND	110	250
	MW5	ND	ND	ND	ND	ND
	MW6	ND	ND	0.64	ND	ND
7/14/93	MW1	ND	2.2	2.1	1.1	6.2
	MW2	110♦	6.5	ND	ND	1.1
	MW3	6,300	190	ND	430	1,000
	MW4	ND	ND	ND	ND	ND
	MW5	ND	ND	0.57	ND	ND
	MW6	ND	0.99	2.4	ND	1.9

**TABLE 2 (Continued)**

SUMMARY OF LABORATORY ANALYSES  
WATER

Date	Well #	TPH as Gasoline	Benzene	Toluene	Ethyl-Benzene	Xylenes
4/13/93	MW2	410◆◆	42	7.7	6.4	28
	MW3	12,000◆◆	290	38	760	2,300
	MW5	ND	ND	ND	ND	ND
	MW6	ND	ND	ND	ND	ND
1/08/93	MW2	510◆	ND	ND	ND	ND
	MW3	1,100◆◆	48	0.99	0.90	93
	MW5	ND	ND	ND	ND	ND
	MW6	ND	ND	ND	ND	ND
11/30/92	MW5	ND	ND	ND	ND	ND
	MW6	ND	ND	ND	ND	ND
10/12/92	MW2	370	3.4	0.56	ND	11
	MW3	3,200	160	10	230	540
7/14/92	MW1	ND	ND	ND	ND	ND
	MW2	130	3.7	ND	ND	ND
	MW3	21,000	890	200	1,200	4,300
	MW4	ND	1.3	2.5	ND	1.0
4/14/92	MW2	150	6.2	ND	ND	1.4
	MW3	14,000	660	48	560	2,000
1/15/92	MW2	220	37	0.52	1.1	7.0
	MW3	3,000	590	14	310	750
10/15/91	MW2	140	44	0.56	1.5	12
	MW3	3,100	390	34	150	390
7/15/91	MW1	ND	ND	ND	ND	ND
	MW2	2,200	770	12	72	370
	MW3	9,200	1,300	230	490	1,900
	MW4	ND	ND	ND	ND	ND

**TABLE 2 (Continued)**

**SUMMARY OF LABORATORY ANALYSES  
WATER**

<u>Date</u>	<u>Well #</u>	<u>TPH as Gasoline</u>	<u>Benzene</u>	<u>Toluene</u>	<u>Ethyl-Benzene</u>	<u>Xylenes</u>
4/12/91	MW1	ND	ND	ND	ND	ND
	MW2	2,200	160	4.3	23	62
	MW3	880	170	1.1	34	110
	MW4	ND	ND	ND	ND	ND
1/15/91	MW1	ND	ND	ND	ND	ND
	MW2	680	170	0.7	19	81
	MW3	3,200	460	1.5	120	270
	MW4	ND	ND	ND	--	ND
10/16/90	MW1	ND	ND	ND	ND	ND
	MW2	1,400	430	2.0	48	240
	MW3	740	210	1.4	2.5	82
	MW4	ND	ND	ND	ND	ND
7/17/90	MW1	ND	ND	ND	ND	ND
	MW2	490	76	0.59	11	46
	MW3	4,000	270	48	130	250
	MW4	ND	ND	ND	ND	ND
4/19/90	MW1	ND	ND	ND	ND	ND
	MW2	3,900	550	5.1	91	390
	MW3	3,100	600	27	54	220
	MW4	ND	ND	0.48	ND	ND
1/23/90	MW1	ND	1.5	2.3	ND	4.3
	MW2	400	73	36	10	40
	MW3	450	110	1.2	4.4	11
	MW4	ND	ND	0.40	ND	ND
9/15/89	MW1	ND	ND	0.61	ND	ND
	MW2	290	ND	12	ND	ND
	MW3	32	ND	ND	ND	ND
	MW4	ND	ND	ND	ND	ND



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TABLE 2 (Continued)

SUMMARY OF LABORATORY ANALYSES  
WATER

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- ◆ Sequoia Analytical Laboratory reported that the hydrocarbons detected did not appear to be gasoline.
- ◆◆ Sequoia Analytical Laboratory reported that the hydrocarbons detected appeared to be a gasoline and a non-gasoline mixture.

ND = Non-detectable.

Results are in micrograms per liter ( $\mu\text{g/L}$ ), unless otherwise indicated.

Note: Laboratory analyses data prior to January 12, 1994, were provided by Kaprealian Engineering, Inc.

**TABLE 3**  
**SUMMARY OF LABORATORY ANALYSES**  
**WATER**

<u>Date</u>	<u>Well #</u>	<u>TPH as Diesel</u>	<u>Total Oil &amp; Grease (mg/L)</u>	<u>Tetrachloro-ethene*</u>	<u>MTBE</u>
7/07/94	MW1	--	--	0.83	--
7/14/93	MW1	--	--	0.95	--
	MW2	--	--	--	250
	MW3	--	--	--	860
4/13/93	MW2	--	--	--	200
	MW3	--	--	--	1,400
7/14/92	MW1	--	--	1.4	--
7/15/91	MW1	ND	ND	1.8	--
4/12/91	MW1	ND	ND	2.0	--
1/15/91	MW1	ND	ND	2.1	--
10/16/90	MW1	ND	ND	2.0	--
7/17/90	MW1	ND	ND	1.7	--
4/19/90	MW1	ND	ND	2.2	--
1/23/90	MW1	ND	1.5	2.1	--
9/15/89	MW1	ND	ND	2.7	--

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TABLE 3 (Continued)

SUMMARY OF LABORATORY ANALYSES  
WATER

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\* All EPA method 8010 constituents were non-detectable, except for tetrachloroethene as indicated.

-- Indicates analysis was not performed.

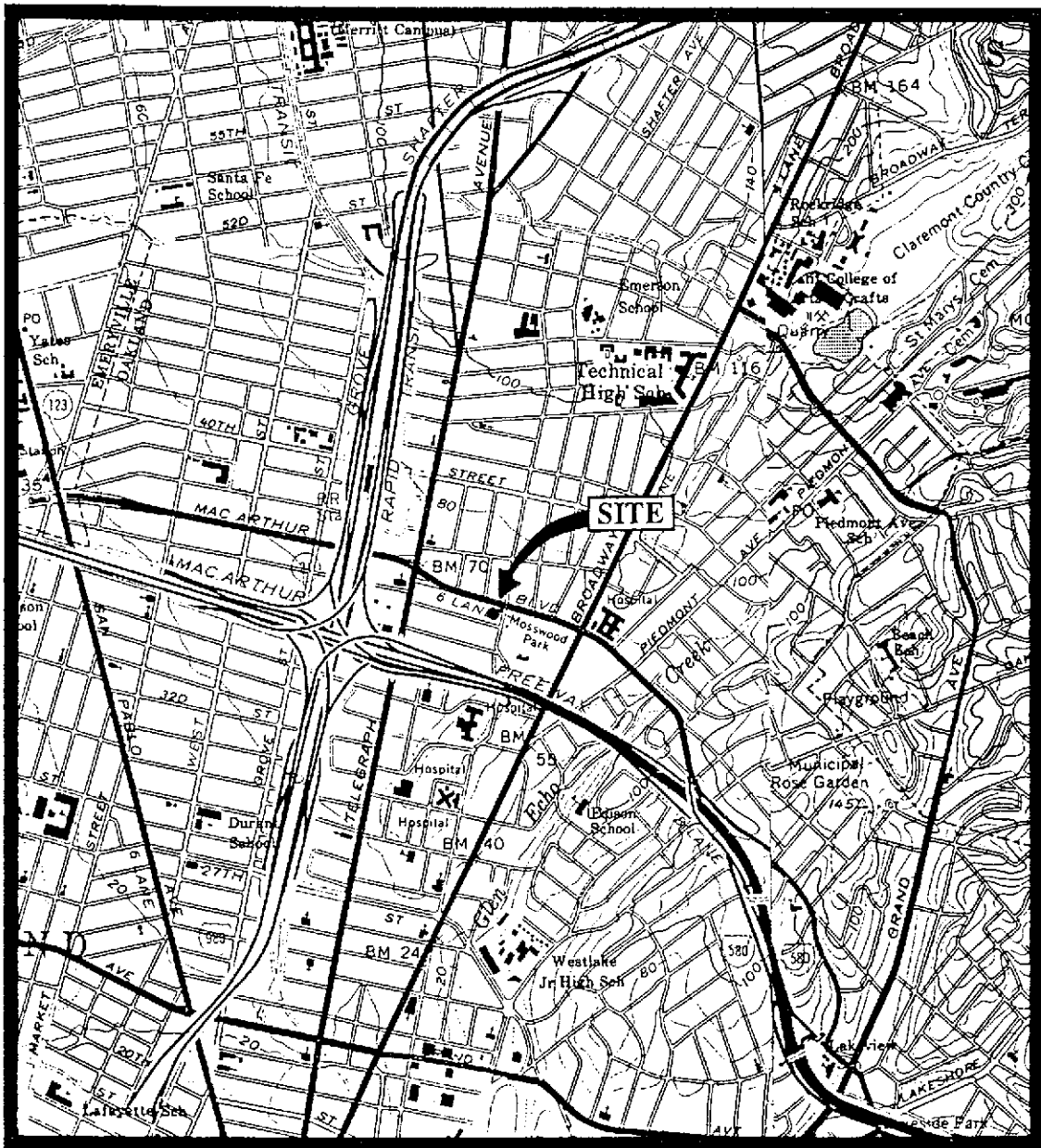
MTBE = methyl tert butyl ether.

ND = Non-detectable.

mg/L = milligrams per liter.

Results are in micrograms per liter ( $\mu\text{g/L}$ ), unless otherwise indicated.

Note: Laboratory analyses data were provided by Kaprealian Engineering, Inc.



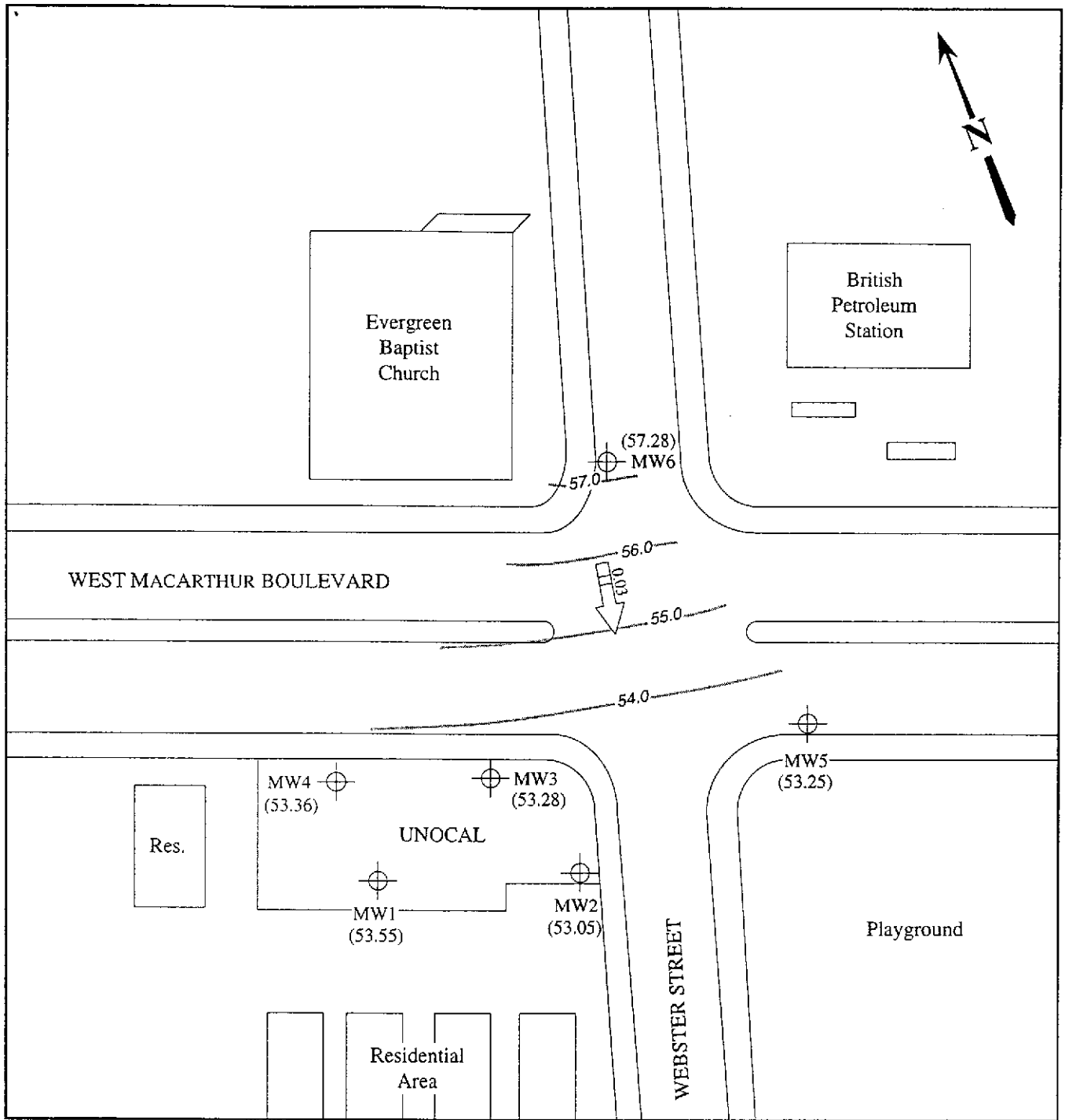
Base modified from 7.5 minute U.S.G.S. Oakland East & West Quadrangles  
 (both photorevised 1980)





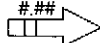

**mpds** SERVICES, INCORPORATED

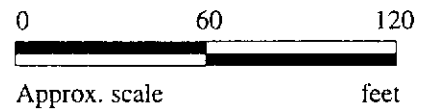
UNOCAL SERVICE STATION # 3538  
 411 W. MACARTHUR BOULEVARD  
 OAKLAND, CALIFORNIA

LOCATION  
 MAP

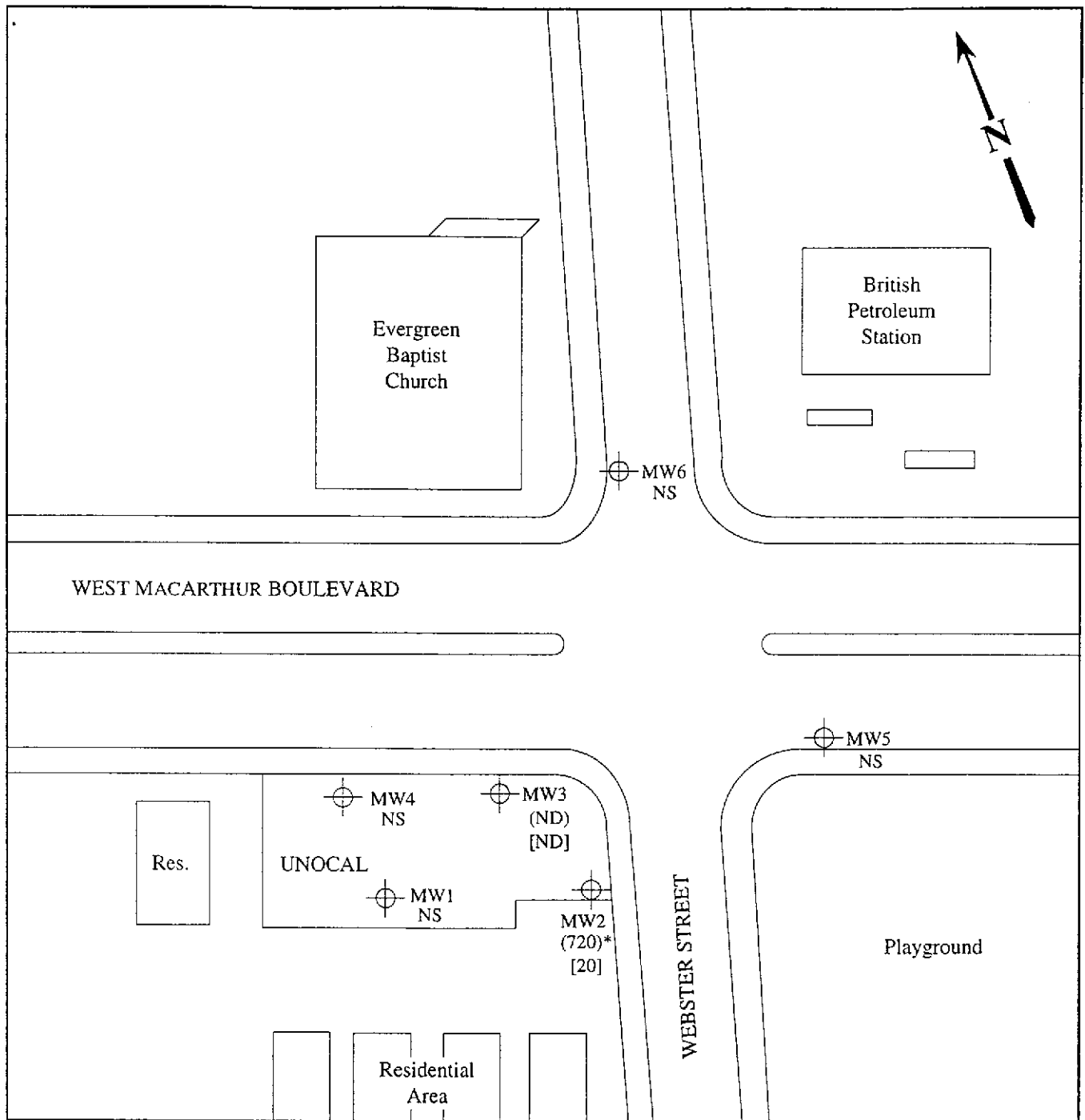


**LEGEND**

-  Monitoring well
-  Ground water elevation in feet above Mean Sea Level
-  Direction of ground water flow with approximate hydraulic gradient
-  Contours of ground water elevation



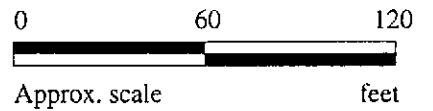
**POTENTIOMETRIC SURFACE MAP FOR THE OCTOBER 5, 1994 MONITORING EVENT**



**LEGEND**

- ⊕ Monitoring well
- ( ) Concentration of TPH as gasoline in  $\mu\text{g/L}$
- [ ] Concentration of benzene in  $\mu\text{g/L}$
- ND = Non-detectable, NS = Not sampled

\* The lab reported that the hydrocarbons detected did not appear to be gasoline.



**PETROLEUM HYDROCARBON CONCENTRATIONS IN GROUND WATER ON OCTOBER 5, 1994**



**UNOCAL SERVICE STATION # 3538  
411 W. MACARTHUR BOULEVARD  
OAKLAND, CALIFORNIA**

**FIGURE  
2**



MPDS Services 2401 Stanwell Dr., Ste. 400 Concord, CA 94520 Attention: Avo Avedessian	Client Project ID: Unocal #3538, 411 MacArthur Blvd., Matrix Descript: Water Analysis Method: EPA 5030/8015/8020 First Sample #: 410-0630	Oakland	Sampled: Oct 5, 1994 Received: Oct 5, 1994 Reported: Oct 20, 1994
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**TOTAL PURGEABLE PETROLEUM HYDROCARBONS with BTEX DISTINCTION**

Sample Number	Sample Description	Purgeable Hydrocarbons µg/L	Benzene µg/L	Toluene µg/L	Ethyl Benzene µg/L	Total Xylenes µg/L
410-0630	MW-2	720*	20	N.D.	N.D.	3.1
410-0631	MW-3	N.D.	N.D.	N.D.	N.D.	N.D.

\* Hydrocarbons detected did not appear to be gasoline.

<b>Detection Limits:</b>	<b>50</b>	<b>0.50</b>	<b>0.50</b>	<b>0.50</b>	<b>0.50</b>
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Total Purgeable Petroleum Hydrocarbons are quantitated against a fresh gasoline standard. Analytes reported as N.D. were not present above the stated limit of detection.

**SEQUOIA ANALYTICAL, #1271**

Signature on File

Alan B. Kemp  
Project Manager





# Sequoia Analytical

680 Chesapeake Drive Redwood City, CA 94063 (415) 364-9600 FAX (415) 364-9233  
 1900 Bates Avenue, Suite L Concord, CA 94520 (510) 686-9600 FAX (510) 686-9689  
 819 Striker Avenue, Suite 8 Sacramento, CA 95834 (916) 921-9600 FAX (916) 921-0100

MPDS Services	Client Project ID: Unocal #3538, 411 MacArthur Blvd.,	Sampled: Oct 5, 1994
2401 Stanwell Dr., Ste. 400	Matrix Descript: Water	Oakland Received: Oct 5, 1994
Concord, CA 94520	Analysis Method: EPA 5030/8015/8020	Reported: Oct 20, 1994
Attention: Avo Avedessian	First Sample #: 410-0630	

## TOTAL PURGEABLE PETROLEUM HYDROCARBONS with BTEX DISTINCTION

Sample Number	Sample Description	Chromatogram Pattern	DL Mult. Factor	Date Analyzed	Instrument ID	Surrogate Recovery, % QC Limits: 70-130
410-0630	MW-2	Unidentified Hydrocarbons <C6	5.0	10/18/94	HP-4	91
410-0631	MW-3	--	1.0	10/17/94	HP-4	94

SEQUOIA ANALYTICAL, #1271

Signature on File

Alan B. Kemp  
Project Manager

Please Note:  
 \* "Unidentified Hydrocarbons <C6" refers to unidentified peaks in the EPA 8010 range.







MPDS Services  
 2401 Stanwell Dr., Ste. 400  
 Concord, CA 94520  
 Attention: Avo Avedessian

Client Project ID: Unocal #3538, 411 MacArthur Blvd., Oakland  
 Matrix: Liquid

QC Sample Group: 4100630-631

Reported: Oct 25, 1994

**QUALITY CONTROL DATA REPORT**

ANALYTE	Benzene	Toluene	Ethyl Benzene	Xylenes
<b>Method:</b>	EPA 8020	EPA 8020	EPA 8020	EPA 8020
<b>Analyst:</b>	A. Tuzon	A. Tuzon	A. Tuzon	A. Tuzon

**MS/MSD**

**Batch#:** 4100396 4100396 4100396 4100396

**Date Prepared:** 10/17/94 10/17/94 10/17/94 10/17/94

**Date Analyzed:** 10/17/94 10/17/94 10/17/94 10/17/94

**Instrument I.D.#:** HP-4 HP-4 HP-4 HP-4

**Conc. Spiked:** 20 µg/L 20 µg/L 20 µg/L 60 µg/L

**Matrix Spike**

**% Recovery:** 85 95 100 102

**Matrix Spike**

**Duplicate % Recovery:** 85 95 100 102

**Relative %**

**Difference:** 0.0 0.0 0.0 0.0

**LCS Batch#:** 2LCS101794 2LCS101794 2LCS101794 2LCS101794

**Date Prepared:** 10/17/94 10/17/94 10/17/94 10/17/94

**Date Analyzed:** 10/17/94 10/17/94 10/17/94 10/17/94

**Instrument I.D.#:** HP-4 HP-4 HP-4 HP-4

**LCS %**

**Recovery:** 77 93 90 93

% Recovery Control Limits:	71-133	72-128	72-130	71-120
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**Please Note:**

The LCS is a control sample of known, interferent free matrix that is analyzed using the same reagents, preparation, and analytical methods employed for the samples. The matrix spike is an aliquot of sample fortified with known quantities of specific compounds and subjected to the entire analytical procedure. If the recovery of analytes from the matrix spike does not fall within specified control limits due to matrix interference, the LCS recovery is to be used to validate the batch.

**SEQUOIA ANALYTICAL, #1271**

Signature on File

Alan B. Kemp  
 Project Manager





MPDS Services  
 2401 Stanwell Dr., Ste. 400  
 Concord, CA 94520  
 Attention: Avo Avedessian

Client Project ID: Unocal #3538, 411 MacArthur Blvd., Oakland  
 Matrix: Liquid

QC Sample Group: 4100630-631

Reported: Oct 25, 1994

**QUALITY CONTROL DATA REPORT**

ANALYTE	Benzene	Toluene	Ethyl Benzene	Xylenes
<b>Method:</b>	EPA 8020	EPA 8020	EPA 8020	EPA 8020
<b>Analyst:</b>	A. Tuzon	A. Tuzon	A. Tuzon	A. Tuzon

<b>MS/MSD Batch#:</b>	4100600	4100600	4100600	4100600
<b>Date Prepared:</b>	10/18/94	10/18/94	10/18/94	10/18/94
<b>Date Analyzed:</b>	10/18/94	10/18/94	10/18/94	10/18/94
<b>Instrument I.D.#:</b>	HP-4	HP-4	HP-4	HP-4
<b>Conc. Spiked:</b>	20 µg/L	20 µg/L	20 µg/L	60 µg/L
<b>Matrix Spike % Recovery:</b>	85	105	110	108
<b>Matrix Spike Duplicate % Recovery:</b>	85	100	100	102
<b>Relative % Difference:</b>	0.0	4.9	9.5	5.7

<b>LCS Batch#:</b>	2LCS101894	2LCS101894	2LCS101894	2LCS101894
<b>Date Prepared:</b>	10/18/94	10/18/94	10/18/94	10/18/94
<b>Date Analyzed:</b>	10/18/94	10/18/94	10/18/94	10/18/94
<b>Instrument I.D.#:</b>	HP-4	HP-4	HP-4	HP-4
<b>LCS % Recovery:</b>	81	92	95	97

<b>% Recovery Control Limits:</b>	71-133	72-128	72-130	71-120
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**Please Note:**

The LCS is a control sample of known, interferent free matrix that is analyzed using the same reagents, preparation, and analytical methods employed for the samples. The matrix spike is an aliquot of sample fortified with known quantities of specific compounds and subjected to the entire analytical procedure. If the recovery of analytes from the matrix spike does not fall within specified control limits due to matrix interference, the LCS recovery is to be used to validate the batch.

**SEQUOIA ANALYTICAL, #1271**

Signature on File

Alan B. Kemp  
 Project Manager



**CHAIN OF CUSTODY**

SAMPLER		UNOCAL		ANALYSES REQUESTED										TURN AROUND TIME:				
ALEXANDER ARZOMANOV		S/S # <u>3538</u> CITY: <u>Oakland</u>												REGULAR				
WITNESSING AGENCY		ADDRESS: <u>411 W MacArthur Blvd</u>												REMARKS				
SAMPLE ID NO.	DATE	TIME	WATER	GRAB	COMP	NO. OF CONT.	SAMPLING LOCATION	TPH-GAS BTEX	TPH- DIESEL	TOG	8010							
MW-2	10-5-94	12:35	X	X	2	4100630	BWW	X										
MW-3	10-5-94	13:40	X	X	2	4100631	↓ "	X										
RELINQUISHED BY:		DATE/TIME		RECEIVED BY:		DATE/TIME		THE FOLLOWING <u>MUST</u> BE COMPLETED BY THE LABORATORY ACCEPTING SAMPLES FOR ANALYSES:										
(SIGNATURE) <i>[Signature]</i>		8:10		(SIGNATURE) <i>[Signature]</i>		8:10		1. HAVE ALL SAMPLES RECEIVED FOR ANALYSIS BEEN STORED ON ICE? _____										
(SIGNATURE) <i>[Signature]</i>		10-5-94		(SIGNATURE) <i>[Signature]</i>		10-5-94		2. WILL SAMPLES REMAIN REFRIGERATED UNTIL ANALYZED? _____										
(SIGNATURE) <i>[Signature]</i>		9:22 10-5-94		(SIGNATURE) <i>[Signature]</i>		10-5-94 9:22		3. DID ANY SAMPLES RECEIVED FOR ANALYSIS HAVE HEAD SPACE? _____										
(SIGNATURE) <i>[Signature]</i>		10-6-94 3:10		(SIGNATURE) <i>[Signature]</i>		10/6/94 3:10 pm		4. WERE SAMPLES IN APPROPRIATE CONTAINERS AND PROPERLY PACKAGED? _____										
(SIGNATURE)				(SIGNATURE)				SIGNATURE: _____ TITLE: _____ DATE: _____										

Note: All water containers to be sampled for TPHG/BTEX, 8010 & 8240 are preserved with HCL. All water containers to be sampled for Lead or Metals are preserved with HNO3. All other containers are unpreserved.