

MPDS-UN6034-02  
May 19, 1994

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

Attention: Ms. Tina R. Berry

RE: Quarterly Data Report  
Unocal Service Station #6034  
4700 First Street  
Livermore, 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 Unocal monitoring wells that were monitored and sampled during this quarter are indicated in Table 1. Prior to sampling, the Unocal wells were checked for depth to water and the presence of free product or sheen. The monitoring data and the ground water elevations for the Unocal wells are summarized in Table 1. The ground water flow direction at the Unocal site during the most recent quarter is shown on the attached Figure 1.

A joint monitoring and sampling event was conducted with the consultant for the nearby Chevron site on April 21, 1994. The monitoring data collected for the monitoring wells (provided by Groundwater Technology, Inc.) are summarized in Table 2. The ground water flow direction at the Chevron site during the most recent quarter is also shown on the attached Figure 1.

Ground water samples were collected from the Unocal wells on April 21, 1994. Prior to sampling, the wells were each purged of between 6 and 8.5 gallons of water. Samples were then collected using a clean Teflon bailer. The samples were decanted into clean VOA vials and/or one-liter amber bottles, as appropriate, 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 collected from the Unocal wells 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 from the Unocal wells to date are summarized in Table 3. The concentrations of Total Petroleum Hydrocarbons (TPH) as gasoline, TPH as diesel, and benzene detected in the ground water samples collected from the Unocal wells this quarter are shown on the attached Figure 2. Copies of the laboratory analytical results and the Chain of Custody documentation for the Unocal wells are attached to this report.

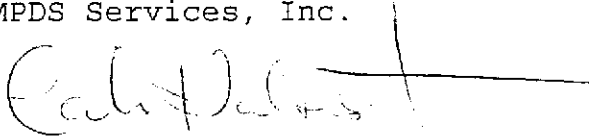
DISTRIBUTION

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

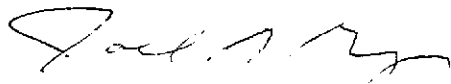
If you have any questions regarding this report, please do not hesitate to call at (510) 602-5120.

Sincerely,

MPDS Services, Inc.



Talin Kaloustian  
Staff Engineer



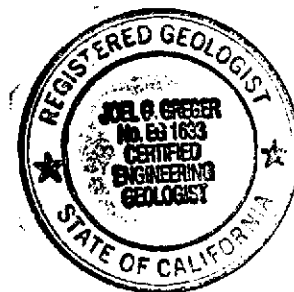
Joel G. Greger, C.E.G.  
Senior Engineering Geologist

License No. EG 1633  
Exp. Date 6/30/94

/dlh

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

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



**TABLE 1**

**SUMMARY OF MONITORING DATA  
UNOCAL MONITORING WELLS**

Well #	Ground Water Elevation (feet)	Depth to Water (feet)◆	Product Thickness (feet)	Sheen	Water Purged (gallons)	Total Well Depth (feet)◆
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(Monitored and Sampled on April 21, 1994)

MW1	505.06	15.58	0	No	8.5	27.93
MW2	504.86	14.96	0	No	7.5	25.65
MW3	505.36	14.30	0	No	8	25.43
MW4	505.48	14.13	0	No	8	25.48
MW5	504.86	15.41	0	No	6	23.61
MW6	504.65	14.10	0	No	6.5	23.27
MW7	504.66	14.17	0	No	6.5	23.66

(Monitored and Sampled on January 20, 1994)

MW1*	504.99	15.65	0	--	0	27.90
MW2	504.80	15.02	0	No	7.5	25.64
MW3*	505.29	14.37	0	--	0	25.40
MW4	505.46	14.15	0	No	7.5	25.45
MW5	504.88	15.39	0	No	6	23.58
MW6	504.61	14.14	0	No	6.5	23.25
MW7	504.61	14.22	0	No	6.5	23.64

(Monitored and Sampled on October 20, 1993)

MW1*	504.95	15.69	0	--	0	
MW2	504.74	15.08	0	No	8	
MW3	505.24	14.42	0	No	8	
MW4	505.45	14.16	0	No	8	
MW5	504.71	15.56	0	No	8	
MW6	504.55	14.20	0	No	8	
MW7	504.54	14.29	0	No	8	

(Monitored and Sampled on July 20, 1993)

MW1*	502.84	18.04	0	--	0	
MW2	502.76	17.41	0	No	6	
MW3	503.01	16.90	0	No	6.5	
MW4*	503.77	16.35	0	No	0	
MW5	503.20	17.38	0	No	5	
MW6	WELL WAS OBSTRUCTED					
MW7	502.69	16.68	0	No	5.5	

TABLE 1 (Continued)

SUMMARY OF MONITORING DATA  
UNOCAL MONITORING WELLS

<u>Well #</u>	<u>Well Cover Elevation (feet)**</u>	<u>Well Casing Elevation (feet)***</u>
MW1	520.88	520.64
MW2	520.17	519.82
MW3	519.91	519.66
MW4	520.12	519.61
MW5	520.58	520.27
MW6	519.34	518.75
MW7	519.37	518.83

◆ The depth to water level and total well depth measurements were taken from the top of the well casings. Prior to October 20, 1993, the depth to water level and total well depth measurements were taken from the top of the well covers.

\* Monitored only.

\*\* The elevations of the top of the well covers have been surveyed relative to Mean Sea Level (MSL), per the City of Livermore Benchmark No. C-18-5 (elevation = 551.77 MSL).

\*\*\* Relative to MSL.

-- Sheen determination was not performed.

Note: Monitoring data prior to January 20, 1994, were provided by Kaprealian Engineering, Inc.

TABLE 2

SUMMARY OF MONITORING DATA  
CHEVRON MONITORING WELLS

(Provided by Groundwater Technology, Inc.)

<u>Well #</u>	<u>Ground Water Elevation (feet)</u>	<u>Depth to Water (feet)</u>	<u>Well Casing Elevation (feet)*</u>
(Monitored on April 21, 1994)			
C1	506.93	13.46	520.39
C2	506.66	14.10	520.76
C3	506.98	14.33	521.31
C5	507.01	13.81	520.82
C6	506.74	12.88	519.62
C7	506.97	13.33	520.30
C8	506.06	13.68	519.74
C9	506.58	13.14	519.72
C10	505.79	14.62	520.41
C11	505.80	14.24	520.04
C12	505.76	14.06	519.82
C13	507.36	14.88	522.24
C14	508.15	11.93	520.08
C15	507.19	15.22	522.41
C16	505.76	13.92	519.68
C17	505.87	14.95	520.82
C18	WELL PAVED OVER		518.96
C19	505.73	15.26	520.99

★ Relative Mean Sea Level (MSL).



TABLE 3 (Continued)

SUMMARY OF LABORATORY ANALYSES  
WATER  
UNOCAL MONITORING WELLS

<u>Date</u>	<u>Well #</u>	<u>TPH as Diesel</u>	<u>TPH as Gasoline</u>	<u>Benzene</u>	<u>Toluene</u>	<u>Ethyl-benzene</u>	<u>Xylenes</u>	
1/14/93	MW2	--	19,000	75	430	900	8,400	
	MW3	--	ND	ND	ND	ND	ND	
	MW4	--	920	ND	6.3	12	3.9	
	MW5▲	--	91	ND	0.53	1.2	11	
	MW6	WELL WAS OBSTRUCTED						
	MW7	--	ND	ND	ND	ND	ND	
	10/16/92	MW2	--	290	2.3	ND	5.1	15
MW3		--	ND	ND	ND	ND	ND	
MW4		--	300	2.1	ND	4.8	13	
MW5▲		--	180	7.8	1.1	17	6.4	
MW6		WELL WAS OBSTRUCTED						
MW7		--	ND	ND	ND	ND	ND	
7/07/92		MW2	--	44,000	160	1,100	1,000	17,000
	MW3	--	ND	ND	ND	ND	ND	
	MW4	--	340	ND	2.2	2.4	2.4	
	MW5▲	--	76	0.48	1.1	0.32	1.3	
	MW6	--	ND	ND	ND	ND	ND	
	MW7	--	ND	ND	ND	ND	ND	
	4/06/92	MW2	--	760	6.3	2.1	ND	130
MW3		--	ND	ND	ND	ND	ND	
MW4		--	660	1.3	3.8	2.9	4.1	
MW5		--	240◆	ND	ND	0.35	ND	
MW6		--	ND	ND	ND	ND	ND	
MW7		--	ND	ND	ND	ND	ND	
1/14/92		MW2	--	5,600	36	120	450	2,600
	MW3	--	ND	ND	ND	ND	ND	
	MW4	--	1,500	4.2	7.1	18	9.2	
	MW5	--	99	1.0	1.2	ND	0.32	
	MW6	--	ND	ND	ND	ND	ND	
	MW7	--	ND	ND	ND	ND	ND	

**TABLE 3 (Continued)**

SUMMARY OF LABORATORY ANALYSES  
WATER  
UNOCAL MONITORING WELLS

Date	Well #	TPH as Diesel	TPH as Gasoline	Benzene	Toluene	Ethyl-benzene	Xylenes
10/14/91	MW2	--	11,000	79	130	660	4,700
	MW3	--	ND	ND	ND	ND	ND
	MW4	--	880	3.8	2.2	8.6	5.8
	MW5	--	660	55	4.4	50	66
	MW6	--	ND	ND	ND	ND	ND
	MW7	--	ND	ND	ND	ND	ND
	7/10/91	MW1*	ND	ND	ND	ND	ND
MW2		--	14,000	70	160	570	5,400
MW3		--	ND	ND	ND	ND	ND
MW4		--	830	8.4	19	7.7	7.2
MW5		--	220	5.1	8.7	9.1	9.7
MW6		--	ND	ND	ND	ND	ND
MW7		--	ND	ND	ND	ND	ND
4/10/91	MW1*	ND	ND	ND	ND	ND	ND
	MW2	--	22,000	170	190	490	6,200
	MW3	--	ND	ND	ND	ND	ND
	MW4	--	950	0.84	4.3	9.6	5.0
	MW5	--	630	35	14	47	30
	MW6	--	ND	ND	ND	ND	ND
	MW7	--	ND	ND	ND	ND	ND
12/24/90	MW1*	ND	ND	ND	ND	ND	0.40
	MW2	--	32,000	440	340	460	13,000
	MW3	--	ND	ND	ND	ND	ND
	MW4	--	1,400	ND	8.7	15	10
9/07/90	MW1*	ND	ND	ND	1.2	ND	ND
	MW2	--	ND	ND	1.5	ND	ND
	MW3	--	1,100	11	ND	6.6	16
	MW4	--	15,000	100	140	210	4,600
6/05/90	MW1*	ND	ND	ND	ND	ND	ND
	MW2	--	31,000	250	460	950	9,200
	MW3	--	ND	ND	ND	ND	ND
	MW4	--	1,400	1.2	4.7	24	12



TABLE 3 (Continued)

SUMMARY OF LABORATORY ANALYSES  
WATER  
UNOCAL MONITORING WELLS

<u>Date</u>	<u>Well #</u>	<u>TPH as Diesel</u>	<u>TPH as Gasoline</u>	<u>Benzene</u>	<u>Toluene</u>	<u>Ethyl-benzene</u>	<u>Xylenes</u>
3/08/90	MW1**	ND	ND	ND	ND	ND	ND
	MW2	--	26,000	230	410	1,300	2,100
	MW3	--	ND	ND	ND	ND	ND
	MW4	--	1,200	18	8.4	37	28
11/18/89	MW1***	400	ND	ND	ND	ND	ND
	MW2	--	53,000	540	500	130	22,000
	MW3	--	ND	0.35	ND	ND	ND
	MW4	--	990	9.8	10	7.1	4.7

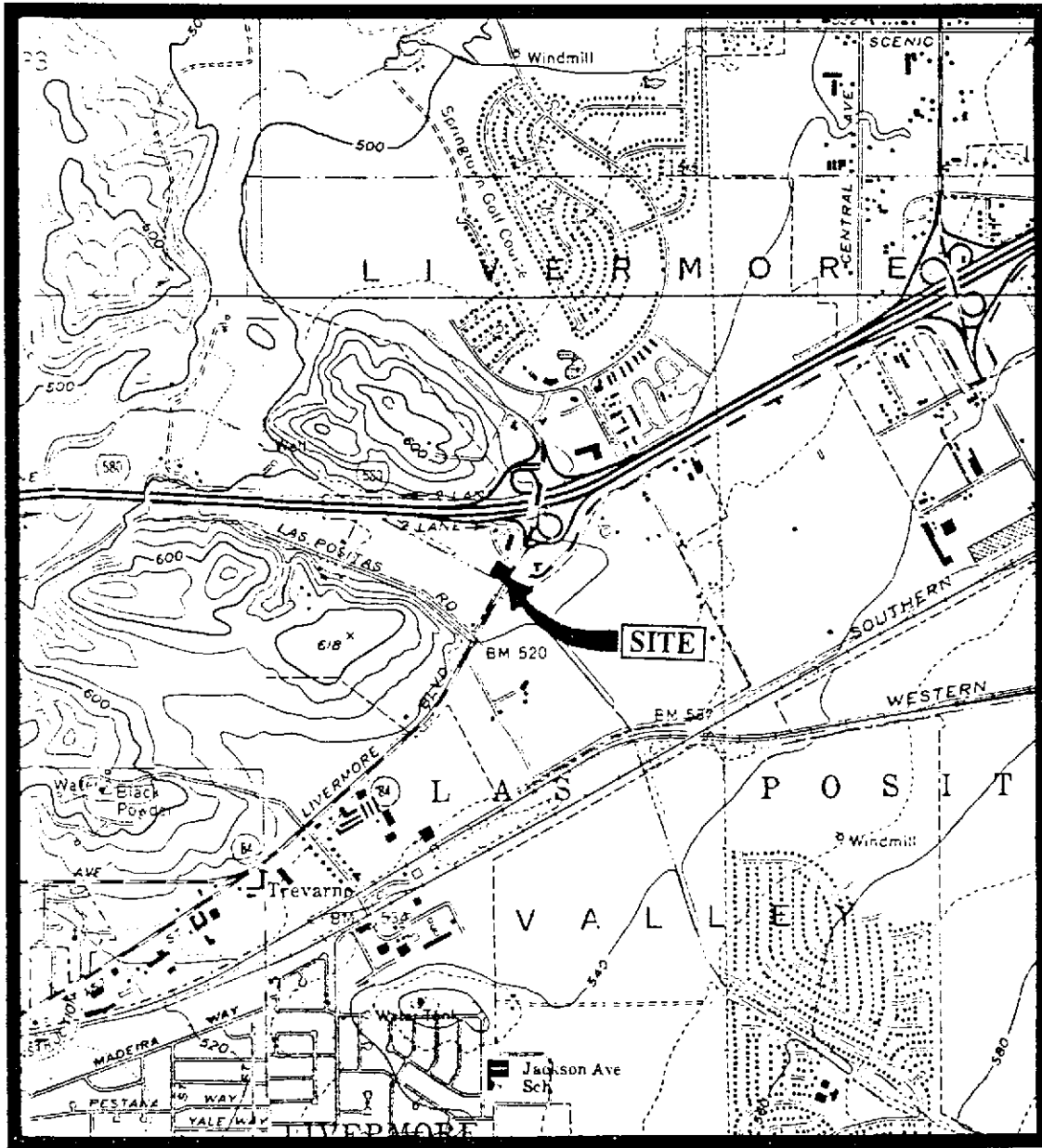
- ◆ Sequoia Analytical Laboratory reported that the hydrocarbons detected did not appear to be gasoline.
- \* Total Oil & Grease (TOG) and all EPA method 8010 constituents were non-detectable.
- \*\* TOG was detected at 4.7 milligrams per liter (mg/L). All EPA method 8010 compounds were non-detectable.
- \*\*\* TOG was detected at 3.1 mg/L. All EPA method 8010 compounds were non-detectable, except for trichloroethene at 0.55 µg/L.
- ▲ Methyl tert butyl ether was detected at a concentration of 2.2 µg/L on July 20, 1993, 0.82 µg/L on April 22, 1993, 1.2 µg/L on January 14, 1994, 2.0 µg/L on October 16, 1992, and 1.5 µg/L on July 7, 1992.

ND = Non-detectable.

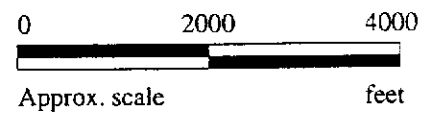
-- Indicates analysis was not performed.

Results are in micrograms per liter (µg/L), unless otherwise indicated.

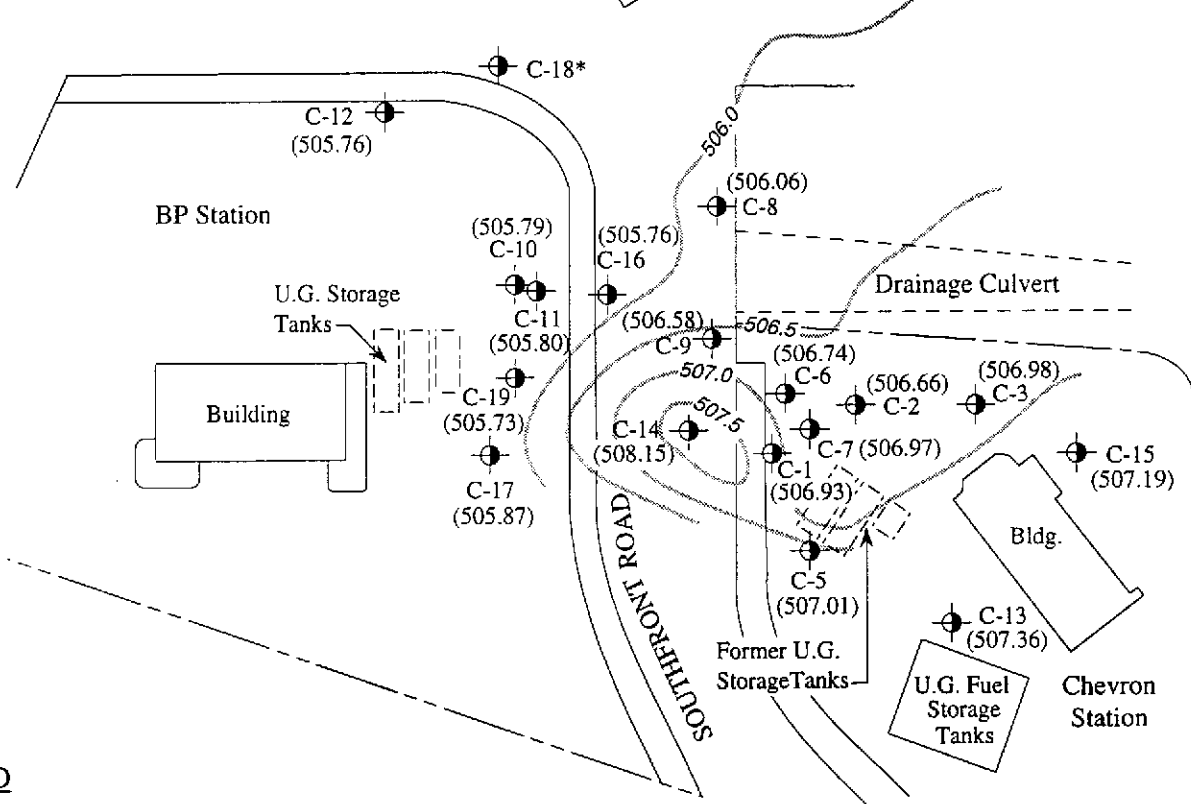
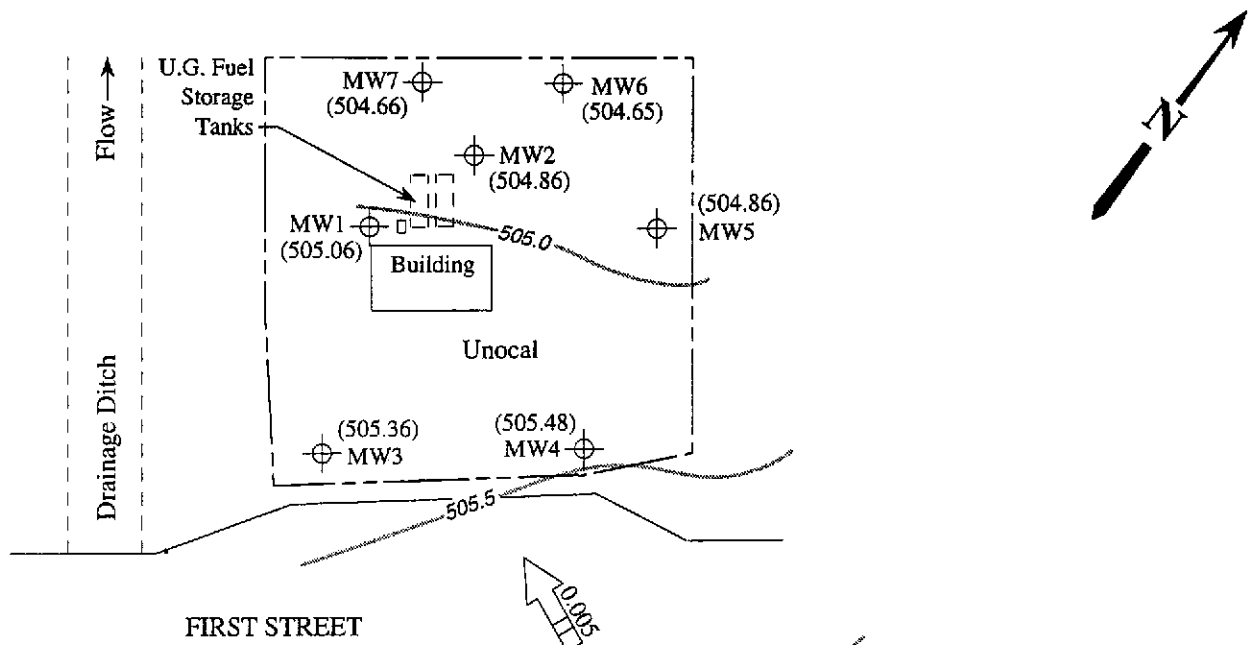
Note: Laboratory analyses data prior to January 20, 1994, were provided by Kaprealian Engineering, Inc.



Base modified from 7.5 minute U.S.G.S. Livermore and Altamont Quadrangles  
 (photorevised 1980 and 1981, respectively)

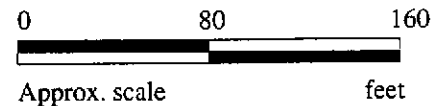


	<p>UNOCAL SERVICE STATION # 6034          4700 FIRST STREET          LIVERMORE, CALIFORNIA</p>	<p>LOCATION          MAP</p>
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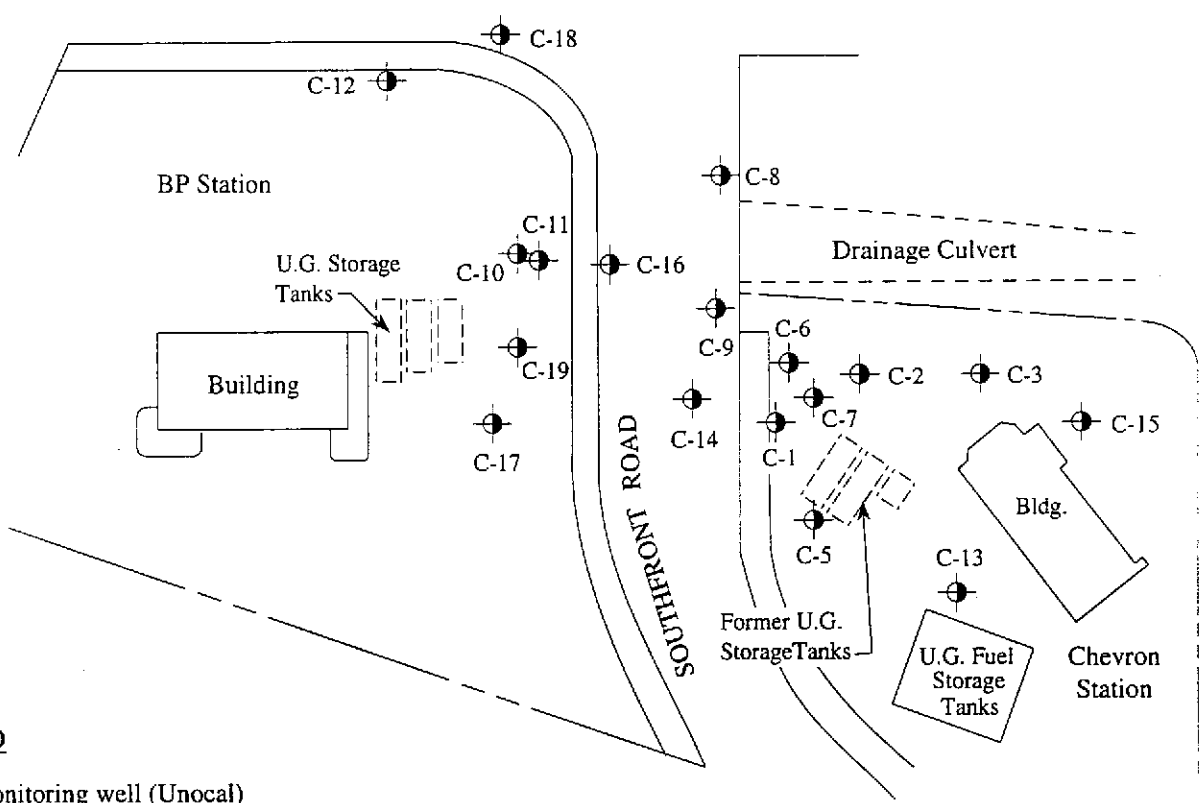
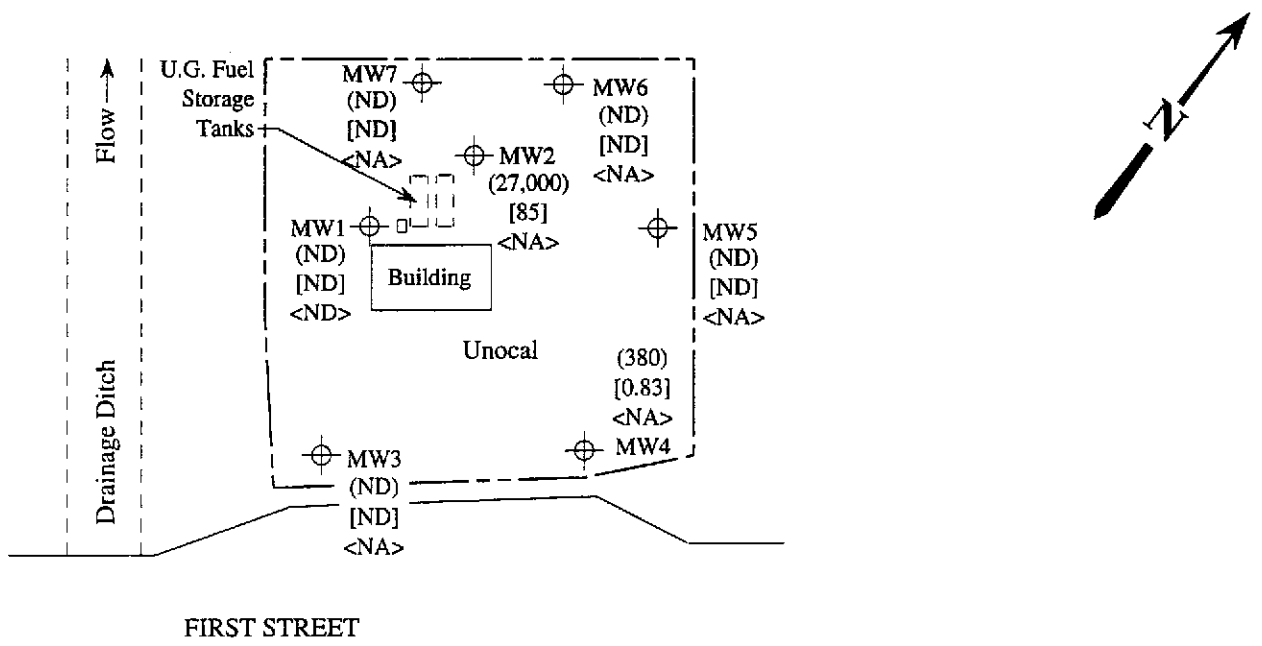


**LEGEND**

- ⊕ Monitoring well (Unocal)
- ⊙ Monitoring well (Chevron)
- ( ) Ground water elevation in feet above Mean Sea Level
- ### → Direction of ground water flow with approximate hydraulic gradient
- Contours of ground water elevation
- \* Well paved over

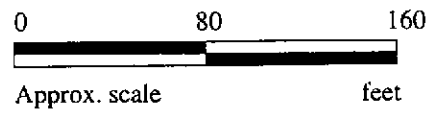


**POTENTIOMETRIC SURFACE MAP FOR THE APRIL 21, 1994 JOINT MONITORING EVENT**



**LEGEND**

- ⊕ Monitoring well (Unocal)
- ⊙ Monitoring well (Chevron)
- ( ) Concentration of TPH as gasoline in µg/L
- [ ] Concentration of benzene in µg/L
- < > Concentration of TPH as diesel in µg/L
- ND = Non-detectable, NA = Not analyzed



**PETROLEUM HYDROCARBON CONCENTRATIONS IN GROUND WATER ON APRIL 21, 1994**



**UNOCAL SERVICE STATION # 6034  
4700 FIRST STREET  
LIVERMORE, CALIFORNIA**

**FIGURE  
2**



MPDS Services	Client Project ID: Unocal #6034, 4700 First St., Livermore	Sampled: Apr 21, 1994
2401 Stanwell Dr., Ste. 400	Sample Matrix: Water	Received: Apr 21, 1994
Concord, CA 94520	Analysis Method: EPA 5030/8015/8020	Reported: May 6, 1994
Attention: Avo Avedessian	First Sample #: 404-0960	

**TOTAL PURGEABLE PETROLEUM HYDROCARBONS with BTEX DISTINCTION**

Analyte	Reporting Limit µg/L	Sample I.D. 404-0960 MW-1	Sample I.D. 404-0961 MW-2	Sample I.D. 404-0962 MW-3	Sample I.D. 404-0963 MW-4	Sample I.D. 404-0964 MW-5	Sample I.D. 404-0965 MW-6
Purgeable Hydrocarbons	50	N.D.	27,000	N.D.	380	N.D.	N.D.
Benzene	0.5	N.D.	85	N.D.	0.83	N.D.	N.D.
Toluene	0.5	N.D.	65	N.D.	1.2	N.D.	N.D.
Ethyl Benzene	0.5	N.D.	880	N.D.	1.2	N.D.	N.D.
Total Xylenes	0.5	N.D.	5,300	N.D.	1.7	N.D.	N.D.
Chromatogram Pattern:		--	Gasoline	--	Gasoline	--	--

**Quality Control Data**

Report Limit Multiplication Factor:	1.0	100	1.0	1.0	1.0	1.0
Date Analyzed:	4/28/94	4/28/94	4/28/94	4/28/94	4/28/94	4/28/94
Instrument Identification:	HP-5	HP-5	HP-5	HP-5	HP-5	HP-5
Surrogate Recovery, %: (QC Limits = 70-130%)	112	90	84	83	85	93

Purgeable Hydrocarbons are quantitated against a fresh gasoline standard.  
 Analytes reported as N.D. were not detected above the stated reporting limit.

**SEQUOIA ANALYTICAL, #1271**

  
 Alan B. Kern  
 Project Manager





MPDS Services	Client Project ID: Unocal #6034, 4700 First St., Livermore	Sampled: Apr 21, 1994
2401 Stanwell Dr., Ste. 400	Sample Matrix: Water	Received: Apr 21, 1994
Concord, CA 94520	Analysis Method: EPA 5030/8015/8020	Reported: May 6, 1994
Attention: Avo Avedessian	First Sample #: 404-0966	

**TOTAL PURGEABLE PETROLEUM HYDROCARBONS with BTEX DISTINCTION**

Analyte	Reporting Limit μg/L	Sample I.D. 404-0966 MW-7	Sample I.D. Matrix Blank
Purgeable Hydrocarbons	50	N.D.	
Benzene	0.5	N.D.	
Toluene	0.5	N.D.	
Ethyl Benzene	0.5	N.D.	
Total Xylenes	0.5	N.D.	

Chromatogram Pattern: --

**Quality Control Data**

Report Limit Multiplication Factor:	1.0	1.0
Date Analyzed:	4/28/94	4/28/94
Instrument Identification:	HP-5	HP-5
Surrogate Recovery, %: (QC Limits = 70-130%)	93	88

Purgeable Hydrocarbons are quantitated against a fresh gasoline standard.  
 Analytes reported as N.D. were not detected above the stated reporting limit.

**SEQUOIA ANALYTICAL, #1271**

  
 Alan B. Kemp  
 Project Manager





<b>MPDS Services</b>	<b>Client Project ID:</b>	Unocal #6034, 4700 First St., Livermore	<b>Sampled:</b>	Apr 21, 1994
2401 Stanwell Dr., Ste. 400	<b>Sample Matrix:</b>	Water	<b>Received:</b>	Apr 21, 1994
Concord, CA 94520	<b>Analysis Method:</b>	EPA 3510/3520/8015	<b>Reported:</b>	May 6, 1994
Attention: Avo Avedessian	<b>First Sample #:</b>	404-0960		

**TOTAL EXTRACTABLE PETROLEUM HYDROCARBONS**

<b>Analyte</b>	<b>Reporting Limit µg/L</b>	<b>Sample I.D. 404-0960 MW-1</b>	<b>Sample I.D. Matrix Blank</b>
Extractable Hydrocarbons	50	N.D.	

Chromatogram Pattern: --

**Quality Control Data**

Report Limit Multiplication Factor:	1.0	1.0
Date Extracted:	4/27/94	4/27/94
Date Analyzed:	4/28/94	4/28/94
Instrument Identification:	HP-3B	HP-3A

Extractable Hydrocarbons are quantitated against a fresh diesel standard.  
Analytes reported as N.D. were not detected above the stated reporting limit.

**SEQUOIA ANALYTICAL, #1271**

  
Alan B. Kemp  
Project Manager





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

Client Project ID: Unocal #6034, 4700 First St., Livermore  
Matrix Descript: Water  
Analysis Method: SM 5520 B&F (Gravimetric)  
First Sample #: 404-0960

Sampled: Apr 21, 1994  
Received: Apr 21, 1994  
Extracted: Apr 29, 1994  
Analyzed: May 3, 1994  
Reported: May 6, 1994

### TOTAL RECOVERABLE PETROLEUM OIL

Sample Number	Sample Description	Oil & Grease mg/L (ppm)
404-0960	MW-1	N.D.

**Detection Limits:**

**5.0**

Analytes reported as N.D. were not present above the stated limit of detection.

**SEQUOIA ANALYTICAL, #1271**

  
Alan B. Kemp  
Project Manager







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

Client Project ID: Unocal #6034, 4700 First St., Livermore  
Sample Descript: Water, MW-1  
Analysis Method: EPA 5030/8010  
Lab Number: 404-0960

Sampled: Apr 21, 1994  
Received: Apr 21, 1994  
Analyzed: Apr 25, 1994  
Reported: May 6, 1994

**HALOGENATED VOLATILE ORGANICS (EPA 8010)**

Analyte	Detection Limit µg/L	Sample Results µg/L
Bromodichloromethane.....	0.50	N.D.
Bromoform.....	0.50	N.D.
Bromomethane.....	1.0	N.D.
Carbon tetrachloride.....	0.50	N.D.
Chlorobenzene.....	0.50	N.D.
Chloroethane.....	1.0	N.D.
2-Chloroethylvinyl ether.....	1.0	N.D.
Chloroform.....	0.50	N.D.
Chloromethane.....	1.0	N.D.
Dibromochloromethane.....	0.50	N.D.
1,3-Dichlorobenzene.....	0.50	N.D.
1,4-Dichlorobenzene.....	0.50	N.D.
1,2-Dichlorobenzene.....	0.50	N.D.
1,1-Dichloroethane.....	0.50	N.D.
1,2-Dichloroethane.....	0.50	N.D.
1,1-Dichloroethene.....	0.50	N.D.
cis-1,2-Dichloroethene.....	0.50	N.D.
trans-1,2-Dichloroethene.....	0.50	N.D.
1,2-Dichloropropane.....	0.50	N.D.
cis-1,3-Dichloropropene.....	0.50	N.D.
trans-1,3-Dichloropropene.....	0.50	N.D.
Methylene chloride.....	5.0	N.D.
1,1,2,2-Tetrachloroethane.....	0.50	N.D.
Tetrachloroethene.....	0.50	N.D.
1,1,1-Trichloroethane.....	0.50	N.D.
1,1,2-Trichloroethane.....	0.50	N.D.
Trichloroethene.....	0.50	N.D.
Trichlorofluoromethane.....	0.50	N.D.
Vinyl chloride.....	1.0	N.D.

Analytes reported as N.D. were not present above the stated limit of detection.

**SEQUOIA ANALYTICAL, #1271**

  
Alan B. Kemp  
Project Manager





MPDS Services Client Project ID: Unocal #6034, 4700 First St., Livermore  
 2401 Stanwell Dr., Ste. 400 Matrix: Liquid  
 Concord, CA 94520  
 Attention: Avo Avedessian QC Sample Group: 4040960-66 Reported: May 11, 1994

**QUALITY CONTROL DATA REPORT**

ANALYTE	Benzene	Toluene	Ethyl Benzene	Xylenes	Diesel	Oil & Grease
<b>Method:</b>	EPA 8020	EPA 8020	EPA 8020	EPA 8020	EPA 8015 Mod.	SM 5520 BF
<b>Analyst:</b>	J. Fontecha	J. Fontecha	J. Fontecha	J. Fontecha	K. Wimer	K. Wimer

<b>MS/MSD Batch#:</b>	4040990	4040990	4040990	4040990	BLK042794	BLK042994
<b>Date Prepared:</b>	4/28/94	4/28/94	4/28/94	4/28/94	4/27/94	4/29/94
<b>Date Analyzed:</b>	4/28/94	4/28/94	4/28/94	4/28/94	4/28/94	5/5/94
<b>Instrument I.D.#:</b>	HP-5	HP-5	HP-5	HP-5	HP-3A	N.A.
<b>Conc. Spiked:</b>	20 µg/L	20 µg/L	20 µg/L	60 µg/L	300 µg/L	5,000 mg/L
<b>Matrix Spike % Recovery:</b>	105	105	100	100	96	99
<b>Matrix Spike Duplicate % Recovery:</b>	110	105	100	103	93	93
<b>Relative % Difference:</b>	4.7	0.0	0.0	2.9	3.5	6.3

<b>LCS Batch#:</b>	3LCS042894	3LCS042894	3LCS042894	3LCS042894	BLK042794	BLK042994
<b>Date Prepared:</b>	4/28/94	4/28/94	4/28/94	4/28/94	4/27/94	4/29/94
<b>Date Analyzed:</b>	4/28/94	4/28/94	4/28/94	4/28/94	4/28/94	5/5/94
<b>Instrument I.D.#:</b>	HP-5	HP-5	HP-5	HP-5	HP-3A	N.A.
<b>LCS % Recovery:</b>	97	98	95	96	96	99

<b>% Recovery Control Limits:</b>	71-133	72-128	72-130	71-120	28-122	75-125
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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**

*Alan B. Kemp*  
 Alan B. Kemp  
 Project Manager





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

Client Project ID: Unocal #6034, 4700 First St., Livermore  
Matrix: Liquid

QC Sample Group: 4040960-66

Reported: May 11, 1994

### QUALITY CONTROL DATA REPORT

ANALYTE	1,1-Dichloro-ethene	Trichloro-ethene	Chloro-benzene
<b>Method:</b>	EPA 8010	EPA 8010	EPA 8010
<b>Analyst:</b>	K. Nill	K. Nill	K. Nill

<b>MS/MSD Batch#:</b>	4040960	4040960	4040960
<b>Date Prepared:</b>	4/25/94	4/25/94	4/25/94
<b>Date Analyzed:</b>	4/25/94	4/25/94	4/25/94
<b>Instrument I.D.#:</b>	HP5890/1	HP5890/1	HP5890/1
<b>Conc. Spiked:</b>	10 µg/L	10 µg/L	10 µg/L
<b>Matrix Spike % Recovery:</b>	90	115	106
<b>Matrix Spike Duplicate % Recovery:</b>	99	117	109
<b>Relative % Difference:</b>	9.5	1.7	2.8


<b>LCS Batch#:</b>	LCS042594	LCS042594	LCS042594
<b>Date Prepared:</b>	4/25/94	4/25/94	4/25/94
<b>Date Analyzed:</b>	4/25/94	4/25/94	4/25/94
<b>Instrument I.D.#:</b>	HP5890/1	HP5890/1	HP5890/1
<b>LCS % Recovery:</b>	94	118	111

<b>% Recovery Control Limits:</b>	28-167	35-146	38-150
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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**

  
Alan B. Kemp  
Project Manager





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

Client Project ID: Unocal #6034, 4700 First St., Livermore

QC Sample Group: 4040960-66

Reported: May 11, 1994

QUALITY CONTROL DATA REPORT

SURROGATE

Method: EPA 8015 Mod. EPA 8015 Mod.
Analyst: K. Wimer K. Wimer
Reporting Units: ug/L ug/L
Date Analyzed: 4/28/94 4/28/94
Sample #: 404-0960 Matrix Blank

Surrogate % Recovery: 91 103

SEQUOIA ANALYTICAL, #1271

Alan B. Kemp
Project Manager

Table with formulas for % Recovery and Relative % Difference.





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

Client Project ID: Unocal #6034, 4700 First St., Livermore

QC Sample Group: 4040960-66

Reported: May 11, 1994

QUALITY CONTROL DATA REPORT

SURROGATE

Method: EPA 8010 EPA 8010
Analyst: K.NIII K.NIII
Reporting Units: µg/L µg/L
Date Analyzed: 4/25/94 4/25/94
Sample #: 404-0960 Matrix Blank

Surrogate #1
% Recovery: 124 102

Surrogate #2
% Recovery: 116 99

SEQUOIA ANALYTICAL, #1271

Alan B. Kemp
Project Manager

% Recovery: (Conc. of M.S. - Conc. of Sample) / Spike Conc. Added x 100
Relative % Difference: (Conc. of M.S. - Conc. of M.S.D.) / ((Conc. of M.S. + Conc. of M.S.D.) / 2) x 100



# M P D S Services, Inc.

2401 Stanwell Drive, Suite 400, Concord, CA 94520  
 Tel: (510) 602-6120 Fax: (510) 689-1918

## CHAIN OF CUSTODY

SAMPLER			UNOCAL					ANALYSES REQUESTED							TURN AROUND TIME:	
STEVE BALIAN			SIS # <u>6034</u> CITY: <u>LIVERMORE</u>					TPH-GAS BTEX	TPH-DIESEL	TOG	8010					REGULAR
WITNESSING AGENCY			ADDRESS: <u>4700 FIRST STREET</u>													
SAMPLE ID NO	DATE	TIME	WATER	GRAB	COMP	NO OF CONT	SAMPLING LOCATION									
MW-1	4-21-99	11:30 AM	X	X		4-V 2-A	WELL	X	X	X	X				4090960A 961A-1 962 963 964 965 V 966 V	
MW-2	"	2:50 PM	X	X		2-V	"	X								
MW-3	"	11:55 AM	X	X		"	"	X								
MW-4	"	2:08 PM	X	X		"	"	X								
MW-5	"	12:22 PM	X	X		"	"	X								
MW-6	"	1:15 PM	X	X		"	"	X								
MW-7	"	1:40 PM	X	X		"	"	X								

RELINQUISHED BY:		DATE/TIME	RECEIVED BY:	THE FOLLOWING <u>MUST BE</u> COMPLETED BY THE LABORATORY ACCEPTING SAMPLES FOR ANALYSES:		
STEVE BALIAN		4-21-99 5:45 PM	R. B. Kelley 4/21/99 5:45 PM	1. HAVE ALL SAMPLES RECEIVED FOR ANALYSIS BEEN STORED ON ICE? Yes		
(SIGNATURE)			(SIGNATURE)	2. WILL SAMPLES REMAIN REFRIGERATED UNTIL ANALYZED? Yes		
(SIGNATURE)			(SIGNATURE)	3. DID ANY SAMPLES RECEIVED FOR ANALYSIS HAVE HEAD SPACE? No		
(SIGNATURE)			(SIGNATURE)	4. WERE SAMPLES IN APPROPRIATE CONTAINERS AND PROPERLY PACKAGED? Yes		
(SIGNATURE)			(SIGNATURE)	SIGNATURE:	TITLE:	DATE:
				R. B. Kelley	Sample Log-sh	4/21/99