

MONITORING
PURGING
DISPOSING
SAMPLING



SERVICES, INCORPORATED

January 15, 1996

Mr. Scott Seery
Alameda County Health Care Services
1131 Harbor Bay Parkway
Alameda, California 94501

RE: Unocal Service Station #3292
15008 E. 14th Street
San Leandro, California

Dear Mr. Seery:

Per the request of the Unocal Corporation Project Manager, Mr. Edward C. Ralston, enclosed please find our report (MPDS-UN3292-09) dated December 11, 1995 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) 277-2311.

Sincerely,

MPDS Services, Inc.

A handwritten signature in cursive script that reads "Jarrel F. Crider".

Jarrel F. Crider

/jfc

Enclosure

cc: Mr. Edward C. Ralston



MPDS-UN3292-09
December 11, 1995

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

Attention: Mr. Edward C. Ralston

RE: Quarterly Data Report
Unocal Service Station #3292
15008 E. 14th Street
San Leandro, California

Dear Mr. Ralston:

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.

A joint monitoring event was conducted with the consultant for the nearby former Mobil site on November 2, 1995. The monitoring data collected from the monitoring wells at the former Mobil site (provided by Alton GeoScience) are summarized in Table 4. The ground water flow direction in the vicinity of Unocal and Mobil sites during the most recent quarter is shown on the attached Figure 1.

Ground water samples were collected from the Unocal wells on November 2, 1995. Unocal monitoring well MW1 was resampled on November 20, 1995. Prior to sampling, the Unocal wells were each purged of between 5 and 8 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. Trip blank and Field blank samples (denoted as ES1 and ES3, respectively) were also collected for quality assurance and control. 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 to date from the Unocal wells 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 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.

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 Mr. Scott Seery of the Alameda County Health Care Services Agency.

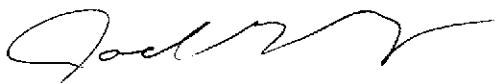
If you have any questions regarding this report, please do not hesitate to call Mr. Nubar Srabian at (510) 602-5120.

Sincerely,

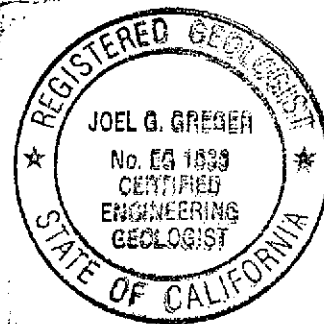
MPDS Services, Inc.



Haig (Gary) Tejirian
Senior Staff Geologist



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



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

/bp

Attachments: Tables 1 through 4
Location Map
Figures 1 & 2
Laboratory Analyses
Chain of Custody documentation

cc: Mr. Robert H. Kezerian, Kaprealian Engineering, Inc.

TABLE 1

SUMMARY OF MONITORING DATA

<u>Well #</u>	<u>Ground Water Elevation (feet)</u>	<u>Depth to Water (feet)◆</u>	<u>Total Well Depth (feet)◆</u>	<u>Product Thickness (feet)</u>	<u>Sheen</u>	<u>Water Purged (gallons)</u>
---------------	--	---------------------------------------	---	---	--------------	---------------------------------------

(Monitored and Sampled on November 20, 1995)

MW1★	25.18	11.19	19.00	0	No	6
------	-------	-------	-------	---	----	---

(Monitored and Sampled on November 2, 1995)

MW1★	25.26	11.11	18.98	0	No	5.5
MW2	25.39	10.95	19.11	0	No	6
MW3	25.42	11.00	22.16	0	No	8
MW4	25.37	11.67	19.65	0	No	5.5
MW5	25.24	10.70	22.18	0	No	8
MW6	25.47	10.20	20.15	0	No	7
MW7	25.54	10.55	21.30	0	No	7.5
MW8	25.09	11.80	19.10	0	No	5
MW9	25.13	11.16	19.12	0	No	5.5
MW10	25.01	11.03	19.90	0	No	6.5
MW11	24.65	10.85	19.01	0	No	6

(Monitored and Sampled on August 2, 1995)

MW1	26.37	10.00	18.95	0	No	7
MW2	26.98	9.36	19.10	0	No	7
MW3	26.93	9.49	22.15	0	No	9
MW4	26.86	10.18	19.64	0	No	7
MW5	26.71	9.23	22.13	0	No	9
MW6	26.99	8.68	20.15	0	No	8
MW7	27.07	9.02	21.21	0	No	8.5
MW8	26.49	10.40	19.09	0	No	6
MW9	26.54	9.75	19.10	0	No	7
MW10	26.49	9.55	19.88	0	No	7.5
MW11	26.19	9.31	19.00	0	No	7

TABLE 1 (Continued)

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 May 10, 1995)

MW1	27.86	8.51	18.96	0	No	7.5
MW2	27.96	8.38	19.10	0	No	7.5
MW3	28.04	8.38	22.13	0	No	10
MW4	27.07	9.97	19.62	0	No	7
MW5	27.74	8.20	22.13	0	No	10
MW6	28.14	7.53	20.13	0	No	9
MW7	28.21	7.88	21.20	0	No	9.5
MW8	27.54	9.35	19.08	0	No	7
MW9	27.59	8.70	19.08	0	No	7.5
MW10	27.34	8.70	19.88	0	No	8
MW11	27.14	8.36	19.00	0	No	7.5

(Monitored and Sampled on February 3, 1995)

MW1	28.36	8.01	18.94	0	No	7.5
MW2	28.47	7.87	19.08	0	No	8
MW3	28.60	7.82	22.12	0	No	10
MW4	28.52	8.52	19.60	0	No	8
MW5	28.25	7.69	22.12	0	No	9.5
MW6	28.68	6.99	20.12	0	No	9
MW7	28.60	7.49	21.19	0	No	9.5
MW8	27.73	9.16	19.07	0	No	7
MW9	27.84	8.45	19.07	0	No	7.5
MW10	27.72	8.32	19.86	0	No	8
MW11	27.48	8.02	18.98	0	No	7.5

TABLE 1 (Continued)

SUMMARY OF MONITORING DATA

<u>Well #</u>	<u>Well Casing Elevation (feet)*</u>
MW1	36.37
MW2	36.34
MW3	36.42
MW4	37.04
MW5	35.94
MW6	35.67
MW7	36.09
MW8	36.89
MW9	36.29
MW10	36.04
MW11	35.50

- ◆ The depth to water level and total well depth measurements were taken from the top of the well casings.
- ★ Monitoring well MW1 was resampled on November 20, 1995. The vial containing the ground water sample collected from this well on November 2, 1995, was inadvertently broken by the laboratory.
- * The elevations of the top of the well casings are relative to Mean Sea Level (MSL), per a Benchmark located at the northwest corner of East 14th Street and 150th Avenue (elevation = 36.88 feet MSL).

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>
5/04/91	MW1	31,000	74	20	920	1,500
9/19/91	MW1	26,000	130	16	1,300	1,800
12/18/91	MW1	17,000	160	20	1,400	1,600
3/17/92	MW1	23,000	320	19	1,000	940
5/19/92	MW1	29,000	650	370	1,100	1,200
8/20/92	MW1	18,000	230	22	640	950
11/10/92	MW1	18,000	220	ND	690	830
2/20/93	MW1	19,000	190	ND	880	620
5/21/93	MW1	27,000	150	200	1,200	950
8/23/93	MW1	24,000	160	110	840	810
11/23/93	MW1	18,000	210	63	900	620
2/24/94	MW1	18,000	74	30	940	480
5/25/94	MW1▲	6,400	72	ND	170	67
8/23/94	MW1	24,000	130	57	970	320
11/23/94	MW1	23,000	180	44	970	270
2/03/95	MW1	20,000	77	17	950	390
5/10/95	MW1	16,000	230	27	880	630
8/02/95	MW1	18,000	190	ND	860	590
11/20/95	MW1▼	20,000	180	ND	960	450
5/04/91	MW2	19,000	6.6	1.4	460	630
9/19/91	MW2	19,000	100	6.8	790	310
12/18/91	MW2	10,000	110	5.1	420	96
3/17/92	MW2	16,000	110	ND	730	220
5/19/92	MW2	17,000	140	87	680	170
8/20/92	MW2	13,000	52	ND	660	70
11/10/92	MW2	11,000	36	7.2	570	45
2/20/93	MW2	1,500	2.9	3.8	9.1	ND
5/21/93	MW2	9,500	37	ND	470	62
8/23/93	MW2	15,000	110	ND	590	64
11/23/93	MW2	11,000	80	10	480	20
2/24/94	MW2◆	11,000	44	ND	580	32
5/25/94	MW2	11,000	50	ND	400	22
8/23/94	MW2	12,000	45	10	360	20
11/23/94	MW2	15,000	61	24	440	ND
2/03/95	MW2	9,700	5.7	ND	250	10
5/10/95	MW2	7,500	56	4.7	310	33
8/02/95	MW2	8,200	53	22	220	25
11/02/95	MW2	5,000	56	4.5	170	7.7

TABLE 2 (Continued)

SUMMARY OF LABORATORY ANALYSES
 WATER

Date	Well #	TPH as Gasoline	Benzene	Toluene	Ethyl-benzene	Xylenes
5/04/91	MW3	9,100	2.0	ND	55	180
9/19/91	MW3	7,600	ND	13	190	170
12/18/91	MW3	5,900	54	6.4	110	64
3/17/92	MW3	5,800	66	7.5	100	58
5/19/92	MW3	3,400	25	3.6	66	41
8/20/92	MW3	4,500	58	ND	65	35
11/10/92	MW3	3,400	37	ND	85	34
2/20/93	MW3	1,600	12	18	8.9	12
5/21/93	MW3	2,600	42	ND	43	15
8/23/93	MW3	2,900	25	ND	50	18
11/23/93	MW3	2,300	34	ND	24	5.6
2/24/94	MW3	3,400	46	ND	53	11
5/25/94	MW3	1,400	20	ND	ND	ND
8/23/94	MW3	2,900	37	49	14	2.9
11/23/94	MW3	3,200	48	ND	22	ND
2/03/95	MW3	780	13	ND	2.1	ND
5/10/95	MW3	1,300	ND	ND	ND	ND
8/02/95	MW3	1,500	6.3	ND	16	2.1
11/02/95	MW3	1,100	5.2	2.1	7.4	0.50
5/04/91	MW4	6,300	ND	ND	2.8	61
9/19/91	MW4	1,800	0.83	ND	54	46
12/18/91	MW4	2,500	28	2.5	54	22
3/17/92	MW4	1,800	3.7	1.4	90	21
5/19/92	MW4	2,000	20	3.5	42	8.3
8/20/92	MW4	1,000	15	ND	11	3.0
11/10/92	MW4	690	9.1	ND	16	2.8
2/20/93	MW4	2,400	40	2.1	33	ND
5/21/93	MW4	1,900	31	ND	20	4.5
8/23/93	MW4	1,200	5.0	ND	16	ND
11/23/93	MW4	720	10	ND	8.7	ND
2/24/94	MW4	1,300	8.9	ND	20	ND
5/25/94	MW4	1,700	22	ND	4.5	ND
8/23/94	MW4	690	9.2	1.3	7.1	1.9
11/23/94	MW4	420	5.0	1.1	4.2	1.2
2/03/95	MW4	620	6.4	ND	9.3	ND
5/10/95	MW4	280	2.8	ND	2.7	2.4
8/02/95	MW4	290	3.6	ND	2.8	ND
11/02/95	MW4	42,000	390	210	2,800	6,300

TABLE 2 (Continued)

**SUMMARY OF LABORATORY ANALYSES
 WATER**

Date	Well #	TPH as Gasoline	Benzene	Toluene	Ethyl-benzene	Xylenes
5/04/91	MW5	69,000	1,400	2,500	3,500	15,000
9/19/91	MW5	57,000	1,600	2,700	5,200	20,000
12/18/91	MW5	31,000	1,600	3,100	4,800	19,000
3/17/92	MW5	81,000	850	1,600	4,800	18,000
5/19/92	MW5	84,000	760	1,500	4,000	17,000
8/20/92	MW5	58,000	660	1,700	4,200	19,000
11/10/92	MW5	57,000	800	1,800	4,400	18,000
2/20/93	MW5	17,000	75	ND	1,000	620
5/21/93	MW5	55,000	ND	160	3,500	12,000
8/23/93	MW5	61,000	340	380	3,600	14,000
11/23/93	MW5	46,000	290	310	4,100	15,000
2/24/94	MW5	57,000	140	400	4,400	16,000
5/25/94	MW5	53,000	ND	ND	4,000	14,000
8/23/94	MW5	61,000	360	380	4,800	17,000
11/23/94	MW5	46,000	230	260	3,900	14,000
2/03/95	MW5	56,000	140	330	3,500	13,000
5/10/95	MW5	27,000	160	170	2,200	5,200
8/02/95	MW5	65,000	260	300	3,500	12,000
11/02/95	MW5	240	0.76	ND	1.1	ND
5/19/92	MW6	1,300	2.0	2.1	ND	2.7
8/20/92	MW6	280	8.4	ND	0.51	0.84
11/10/92	MW6	490	7.0	1.2	1.7	ND
2/20/93	MW6	2,400	43	ND	33	2.0
5/21/93	MW6	940	18	1.0	7.1	2.7
8/23/93	MW6	1,000	9.4	2.3	5.0	2.3
11/23/93	MW6	520	ND	1.7	1.9	0.82
2/24/94	MW6◆	810	12	ND	2.6	0.77
5/25/94	MW6	500	11	ND	ND	0.73
8/23/94	MW6	570	8.8	2.5	3.2	2.6
11/23/94	MW6	460	6.4	1.1	1.9	1.1
2/03/95	MW6	660	4.8	13	1.4	ND
5/10/95	MW6	470	ND	0.65	1.4	0.67
8/02/95	MW6	360	3.2	ND	1.6	ND
11/02/95	MW6	470	ND	0.92	0.89	0.58

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>
5/19/92	MW7	17,000	540	90	1,200	1,900
8/20/92	MW7	13,000	460	54	ND	3,100
11/10/92	MW7	1,800	74	ND	230	350
2/20/93	MW7	1,800	37	4.6	11	7.7
5/21/93	MW7	22,000	330	37	2,100	2,900
8/23/93	MW7	33,000	360	ND	2,500	4,300
11/23/93	MW7	19,000	310	30	2,500	2,300
2/24/94	MW7♦	16,000	220	19	2,400	3,200
5/25/94	MW7	14,000	200	ND	1,500	1,800
8/23/94	MW7	19,000	210	50	2,000	2,800
11/23/94	MW7	10,000	220	ND	1,000	730
2/03/95	MW7	26,000	170	ND	2,300	3,700
5/10/95	MW7	1,300	13	1.5	170	230
8/02/95	MW7	15,000	200	ND	2,200	2,000
11/02/95	MW7	18,000	190	9.4	2,100	2,200
5/19/92	MW8	5,300	28	3.3	2.6	2.1
8/20/92	MW8	3,500*	67	11	ND	ND
11/10/92	MW8	1,800	20	ND	ND	ND
2/20/93	MW8	2,200	32	ND	42	5.0
5/21/93	MW8	2,500	44	ND	ND	ND
8/23/93	MW8	280*	49	4.5	ND	ND
11/23/93	MW8	1,800	ND	3.4	ND	ND
2/24/94	MW8	1,200	10	2.3	ND	3.2
5/25/94	MW8	14,000	29	ND	ND	ND
8/23/94	MW8	3,200	46	18	2.0	7.2
11/23/94	MW8	1,700	34	ND	ND	3.1
2/03/95	MW8	800	6.1	ND	ND	ND
5/10/95	MW8	1,400	15	1.5	0.65	0.84
8/02/95	MW8	690	8.3	1.9	ND	ND
11/02/95	MW8	1,200	ND	1.9	0.56	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>
5/19/92	MW9	8,100	11	ND	25	5.8
8/20/92	MW9	3,800*	37	ND	ND	ND
11/10/92	MW9	4,200	ND	ND	21	23
2/20/93	MW9	2,300	47	ND	32	ND
5/21/93	MW9	3,200	32	ND	8.1	ND
8/23/93	MW9	3,000	29	ND	ND	ND
11/23/93	MW9	2,500	23	2.1	ND	ND
2/24/94	MW9	2,900	35	ND	ND	ND
5/25/94	MW9	ND	ND	ND	ND	ND
8/23/94	MW9	2,800	28	32	ND	ND
11/23/94	MW9	2,000	24	2.2	2.2	2.5
2/03/95	MW9	2,100	26	2.5	ND	ND
5/10/95	MW9	1,700	0.81	2.2	1.0	1.4
8/02/95	MW9	1,900	26	6.6	ND	3.9
11/02/95	MW9	1,600	ND	1.3	ND	ND
8/20/92	MW10	15,000	230	ND	1,000	350
11/10/92	MW10	15,000	300	42	3,500	330
2/20/93	MW10	17,000	74	ND	1,000	620
5/21/93	MW10	23,000	250	ND	3,000	240
8/23/93	MW10	20,000	230	13	3,200	140
11/23/93	MW10	18,000	300	10	2,800	110
2/24/94	MW10	15,000	330	19	2,000	83
5/25/94	MW10	14,000	240	ND	230	62
8/23/94	MW10	16,000	250	41	1,800	74
11/23/94	MW10	16,000	260	ND	1,600	49
2/03/95	MW10	17,000	310	ND	1,500	93
5/10/95	MW10	12,000	260	16	1,200	54
8/02/95	MW10	8,900	240	ND	780	40
11/02/95	MW10	9,300	190	ND	470	1.7

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>
8/20/92	MW11	4,600*	62	ND	ND	54
11/10/92	MW11	5,800	130	ND	260	42
2/20/93	MW11	18,000	76	ND	1,000	630
5/21/93	MW11	7,100	64	ND	340	120
8/23/93	MW11	5,400	68	ND	230	43
11/23/93	MW11	3,400	105	ND	120	43
2/24/94	MW11	4,600	170	ND	140	36
5/25/94	MW11	1,400	49	ND	26	ND
8/23/94	MW11	7,300	250	13	150	42
11/23/94	MW11	5,800	250	10	120	22
2/03/95	MW11	4,400	110	ND	150	37
5/10/95	MW11	4,200	120	ND	170	38
8/02/95	MW11	4,200	110	ND	110	22
11/02/95	MW11	6,100	150	ND	78	6.8

- ▲ The analytical results of the ground water sample for well MW1 was inconsistent with the previous analytical results for this well. Therefore, Sequoia Analytical Laboratory re-analyzed the sample past hold time; therefore the results may be biased low.
- ▼ Monitoring wells MW1 was resampled on November 20, 1995. The vial containing the water sample collected from this well on November 2, 1995, was inadvertently broken by the laboratory.
- * Sequoia Analytical Laboratory reported that the hydrocarbons detected appeared to be a gasoline and non-gasoline mixture.
- ◆ All EPA 8010 constituents were non-detectable.

ND = Non-detectable.

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

Note: Laboratory analyses data prior to November 23, 1993, were provided by Kaprealian Engineering, Inc.

TABLE 3

**SUMMARY OF LABORATORY ANALYSES
 WATER**

Date	Well #	Dissolved Oxygen (mg/L) ♦	Dissolved Oxygen (mg/L) ♦♦	MTBE (µg/L)
11/20/95	MW1	--	--	970
11/02/95	MW1	1.8	2.83	--
	MW2	2.3	2.80	110
	MW3	2.2	4.98	15
	MW4	3.0	7.91	270
	MW5	3.0	2.30	ND
	MW6	3.8	4.55	5.5
	MW7	--	--	72
	MW8	--	--	6.4
	MW9	--	--	11
	MW10	3.1	3.96	110
	MW11	2.6	3.55	6,200

♦ Dissolved oxygen reading taken in the laboratory.

♦♦ Dissolved oxygen readings taken in the field.

ND = Non-detectable.

-- Indicates analysis was not performed or reading not taken.

µg/L = micrograms per liter

mg/L = milligrams per liter

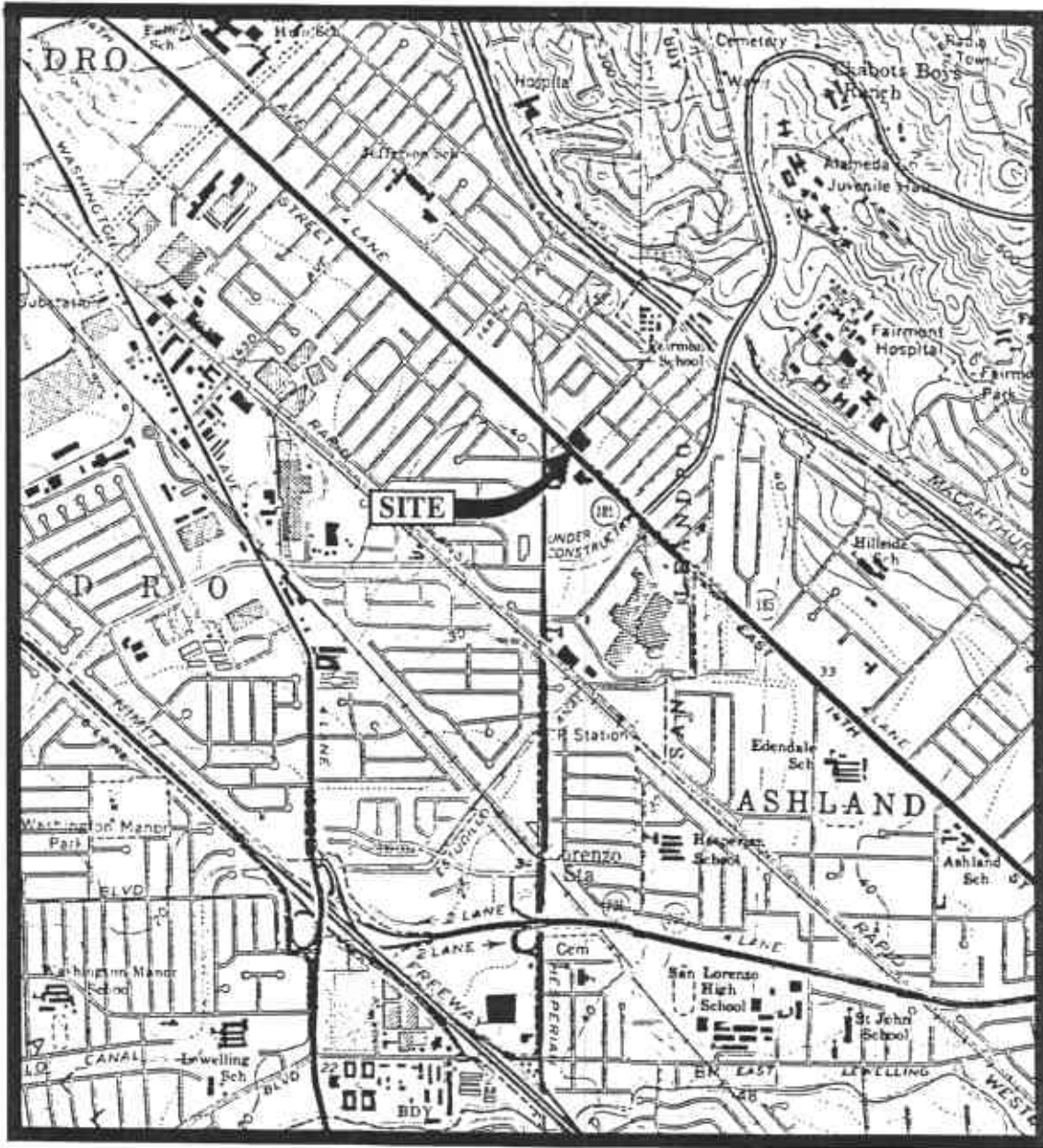
TABLE 4

SUMMARY OF MONITORING DATA
FORMER MOBIL SERVICE STATION MONITORING WELLS
(Provided by Alton GeoScience)

<u>Well #</u>	<u>Ground Water Elevation (feet)</u>	<u>Depth to Water (feet)♦</u>	<u>Well Casing Elevation (feet)*</u>
(Monitored on November 2, 1995)			
MW-1A	25.58	11.05	36.63
MW-2A	25.54	11.08	36.62
MW-3A	25.64	11.29	36.93
MW-4A	25.70	11.48	37.18
MW-5A	25.57	10.34	35.91
MW-6A	25.84	11.26	37.10
MW-7A	25.62	11.77	37.39

♦ The depth to water level measurements were taken from the top of the well casings.

* The elevations of the top of the well casings have been surveyed relative to Mean Sea Level.



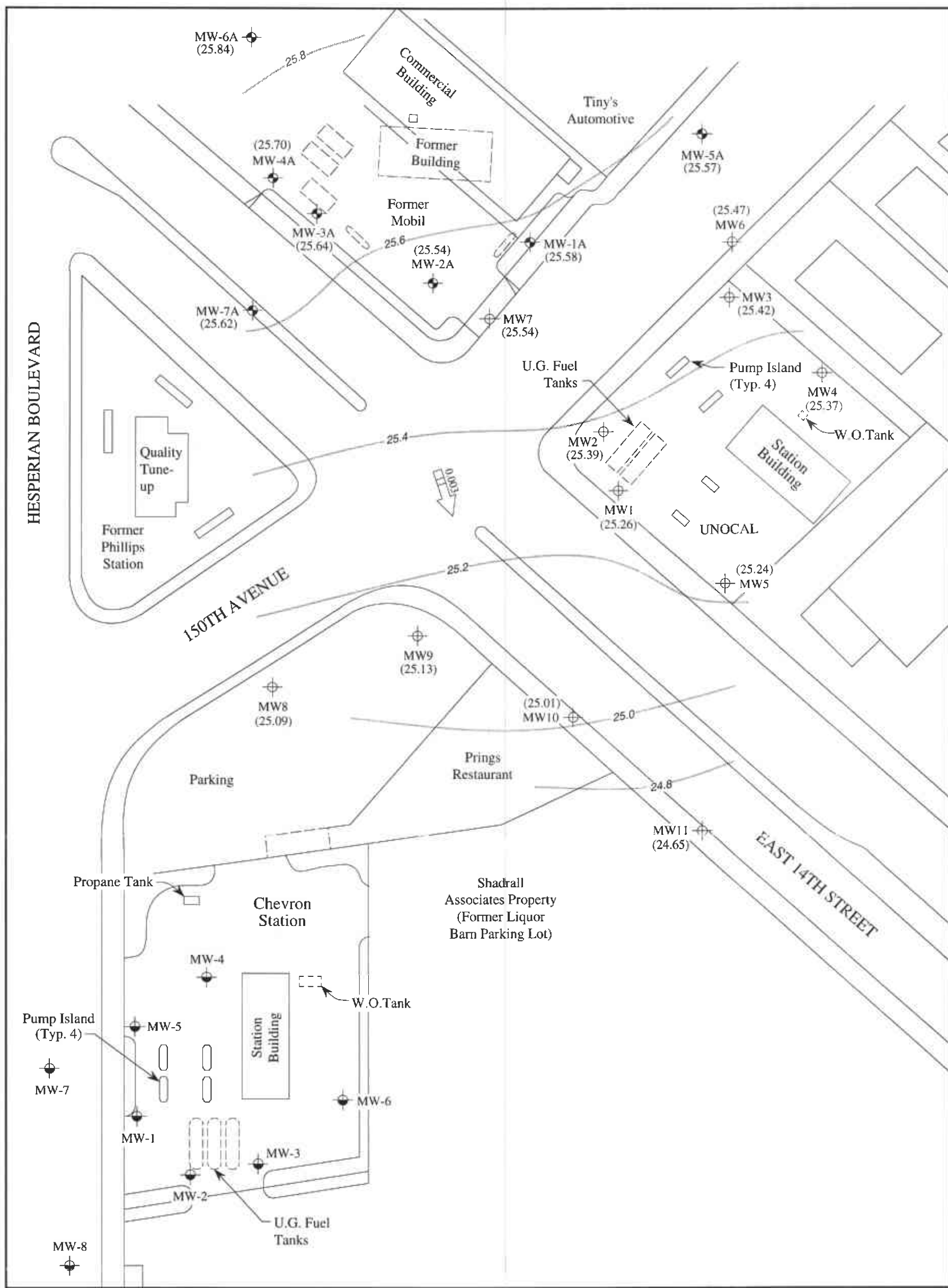
Base modified from 7.5 minute U.S.G.S.
 Hayward and San Leandro Quadrangles
 (both photorevised 1980)



MPDS SERVICES, INCORPORATED

**UNOCAL SERVICE STATION #3292
 15008 E. 14TH STREET
 SAN LEANDRO, CALIFORNIA**

**LOCATION
 MAP**



LEGEND

- ⊕ Monitoring well (Unocal)
- ⊙ Monitoring well (Former Mobil)
- ⊙ 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

POTENTIOMETRIC SURFACE MAP FOR THE NOVEMBER 2, 1995 MONITORING EVENT

UNOCAL SERVICE STATION #3292
15008 E. 14TH STREET
SAN LEANDRO, CALIFORNIA

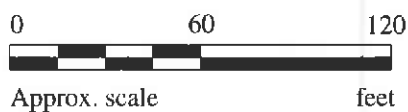
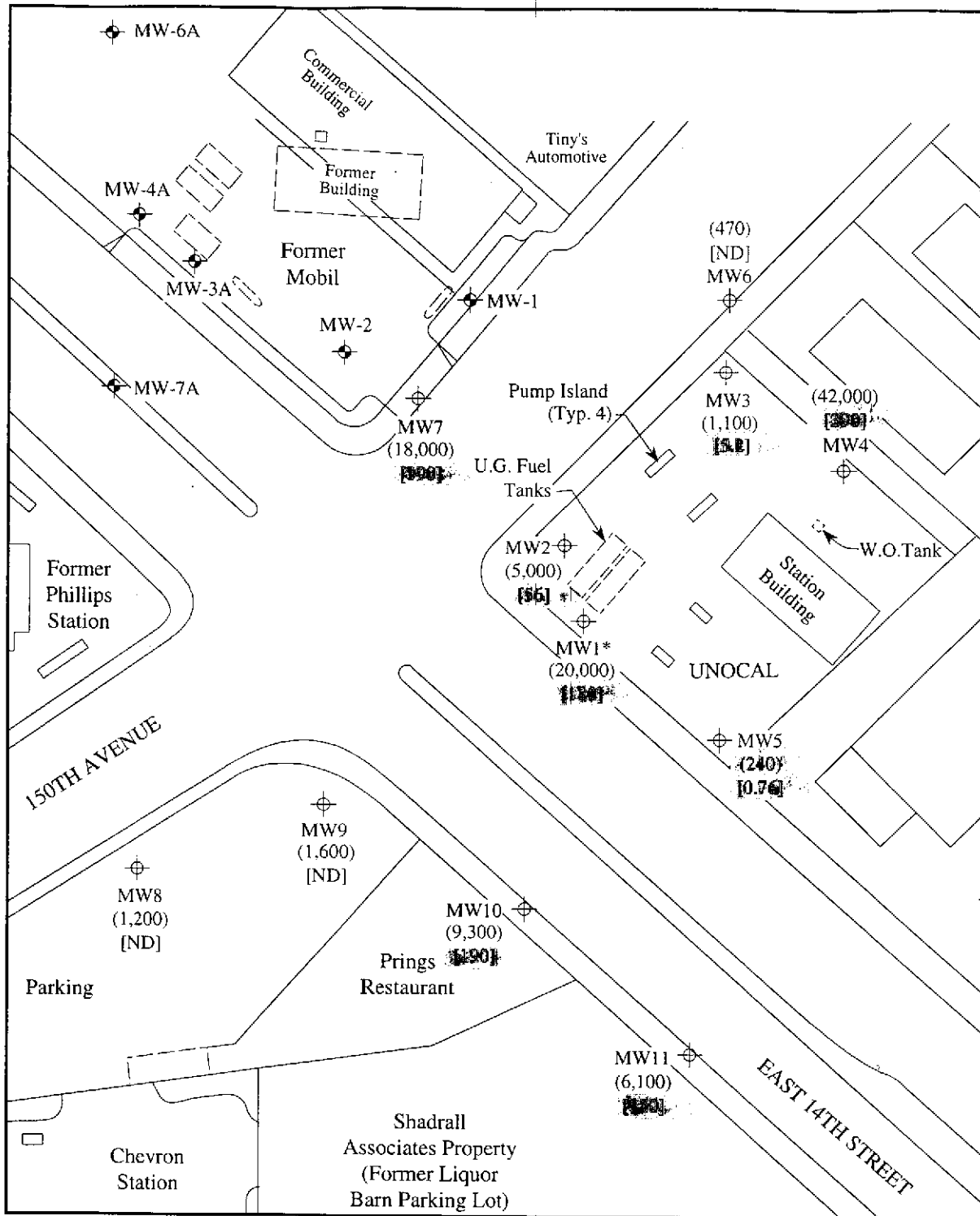


FIGURE
1



LEGEND

- ⊕ Monitoring well (Unocal)
- ⊙ Monitoring well (Former Mobil)
- ⊙ Monitoring well (Chevron)
- () Concentration of TPH as gasoline in µg/L
- [] Concentration of benzene in µg/L
- ND Non-detectable

* MW1 was sampled on November 20, 1995

PETROLEUM HYDROCARBON CONCENTRATIONS IN GROUND WATER ON NOVEMBER 2, 1995

UNOCAL SERVICE STATION #3292
15008 E. 14TH STREET
SAN LEANDRO, CALIFORNIA

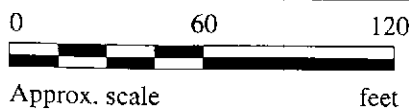


FIGURE
2



MPDS Services 2401 Stanwell Dr., Ste. 300 Concord, CA 94520 Attention: Jarrel Crider	Client Project ID: Unocal #3292, 15008 E. 14th St., Matrix Descript: Water Analysis Method: EPA 5030/8015 Mod./8020 First Sample #: 511-0301	San Leandro	Sampled: Nov 2, 1995 Received: Nov 2, 1995 Reported: Nov 21, 1995
---	---	-------------	---

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
511-0301	MW2	5,000	56	4.5	170	7.7
511-0302	MW3	1,100	5.2	2.1	7.4	0.50
511-0303	MW4	42,000	390	210	2,800	6,300
511-0304	MW5	240	0.76	ND	1.1	ND
511-0305	MW6	470	ND	0.92	0.89	0.58
511-0306	MW7	18,000	190	9.4	2,100	2,200
511-0307	MW8	1,200	ND	1.9	0.56	ND
511-0308	MW9	1,600	ND	1.3	ND	ND
511-0309	MW10	9,300	190	ND	470	1.7
511-0310	MW11	6,100	150	ND	78	6.8

Detection Limits:	50	0.50	0.50	0.50	0.50
--------------------------	-----------	-------------	-------------	-------------	-------------

Total Purgeable Petroleum Hydrocarbons are quantitated against a fresh gasoline standard.
Analytes reported as ND were not present above the stated limit of detection.

SEQUOIA ANALYTICAL, #2000

Signature on File

Alan B. Kemp
Project Manager





MPDS Services
2401 Stanwell Dr., Ste. 300
Concord, CA 94520
Attention: Jarrel Crider

Client Project ID: Unocal #3292, 15008 E. 14th St.,
Matrix Descript: Water San Leandro
Analysis Method: EPA 5030/8015 Mod./8020
First Sample #: 511-0301

Sampled: Nov 2, 1995
Received: Nov 2, 1995
Reported: Nov 21, 1995

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
511-0301	MW2	Gasoline	1.0	11/15/95	HP-1	153
511-0302	MW3	Gasoline	1.0	11/15/95	HP-1	105
511-0303	MW4	Gasoline	10	11/15/95	HP-1	119
511-0304	MW5	Gasoline	1.0	11/15/95	HP-1	100
511-0305	MW6	Gasoline	1.0	11/15/95	HP-1	100
511-0306	MW7	Gasoline	10	11/15/95	HP-1	106
511-0307	MW8	Gasoline	1.0	11/15/95	HP-1	94
511-0308	MW9	Gasoline	2.0	11/15/95	HP-1	107
511-0309	MW10	Gasoline	10	11/15/95	HP-1	118
511-0310	MW11	Gasoline	10	11/15/95	HP-1	100

SEQUOIA ANALYTICAL, #2000

Signature on File

Alan B. Kemp
Project Manager





MPDS Services 2401 Stanwell Dr., Ste. 300 Concord, CA 94520 Attention: Jarrel Crider	Client Project ID: Unocal #3292, 15008 E. 14th St., Matrix Descript: Water Analysis Method: EPA 5030/8015 Mod./8020 First Sample #: 511-0311	San Leandro	Sampled: Nov 2, 1995 Received: Nov 2, 1995 Reported: Nov 21, 1995
---	---	-------------	---

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
511-0311	ES1	ND	ND	ND	ND	ND
511-0312	ES3	ND	ND	ND	ND	ND

Detection Limits:	50	0.50	0.50	0.50	0.50
--------------------------	-----------	-------------	-------------	-------------	-------------

Total Purgeable Petroleum Hydrocarbons are quantitated against a fresh gasoline standard.
Analytes reported as ND were not present above the stated limit of detection.

SEQUOIA ANALYTICAL, #2000

Signature on File

Alan B. Kemp
Project Manager





MPDS Services 2401 Stanwell Dr., Ste. 300 Concord, CA 94520 Attention: Jarrel Crider	Client Project ID: Unocal #3292, 15008 E. 14th St., Matrix Descript: Water Analysis Method: EPA 5030/8015 Mod./8020 First Sample #: 511-0311	San Leandro	Sampled: Nov 2, 1995 Received: Nov 2, 1995 Reported: Nov 21, 1995
---	---	-------------	---

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
511-0311	ES1	--	1.0	11/15/95	HP-1	96
511-0312	ES3	--	1.0	11/15/95	HP-1	86

SEQUOIA ANALYTICAL, #2000

Signature on File

Alan B. Kemp
Project Manager





MPDS Services 2401 Stanwell Dr., Ste. 300 Concord, CA 94520 Attention: Jarrel Crider	Client Project ID: Unocal #3292, 15008 E. 14th St., Sample Descript: Water Analysis for: MTBE (Modified EPA 8020) First Sample #: 511-0301	San Leandro	Sampled: Nov 2, 1995 Received: Nov 2, 1995 Analyzed: Nov 15, 1995 Reported: Nov 21, 1995
---	---	-------------	---

LABORATORY ANALYSIS FOR: MTBE (Modified EPA 8020)

Sample Number	Sample Description	Detection Limit µg/L	Sample Result µg/L
511-0301	MW2	2.5	110
511-0302	MW3	2.5	15
511-0303	MW4	2.5	270
511-0304	MW5	2.5	N.D.
511-0305	MW6	2.5	5.5
511-0306	MW7	2.5	72
511-0307	MW8	2.5	6.4
511-0308	MW9	2.5	11
511-0309	MW10	2.5	110
511-0310	MW11	2.5	6,200

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





MPDS Services
2401 Stanwell Dr., Ste. 300
Concord, CA 94520
Attention: Jarrel Crider

Client Project ID: Unocal #3292, 15008 E. 14th St.,
Sample Descript: Water San Leandro
Analysis for: Dissolved Oxygen
First Sample #: 511-0300

Sampled: Nov 2, 1995
Received: Nov 2, 1995
Analyzed: Nov 2, 1995
Reported: Nov 21, 1995

LABORATORY ANALYSIS FOR: Dissolved Oxygen

Sample Number	Sample Description	Detection Limit mg/L	Sample Result mg/L
511-0300	MW1	1.0	1.8
511-0301	MW2	1.0	2.3
511-0302	MW3	1.0	2.2
511-0303	MW4	1.0	3.0
511-0304	MW5	1.0	3.0
511-0305	MW6	1.0	3.8
511-0309	MW10	1.0	3.1
511-0310	MW11	1.0	2.6

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

SEQUOIA ANALYTICAL, #1210

Signature on File

Alan B. Kemp
Project Manager





MPDS Services
2401 Stanwell Dr., Ste. 300
Concord, CA 94520
Attention: Jarrel Crider

Client Project ID: Unocal #3292, 15008 E. 14th St., San Leandro
Matrix: Liquid

QC Sample Group: 5110301-312

Reported: Nov 21, 1995

QUALITY CONTROL DATA REPORT

ANALYTE	Benzene	Toluene	Ethyl Benzene	Xylenes
Method:	EPA 8020	EPA 8020	EPA 8020	EPA 8020
Analyst:	N.Zahedi	N.Zahedi	N.Zahedi	N.Zahedi

MS/MSD Batch#:	5110198	5110198	5110198	5110198
Date Prepared:	11/15/95	11/15/95	11/15/95	11/15/95
Date Analyzed:	11/15/95	11/15/95	11/15/95	11/15/95
Instrument I.D.#:	HP-1	HP-1	HP-1	HP-1
Conc. Spiked:	10 µg/L	10 µg/L	10 µg/L	30 µg/L
Matrix Spike % Recovery:	103	106	106	109
Matrix Spike Duplicate % Recovery:	104	107	105	108
Relative % Difference:	0.97	0.94	0.95	0.92

LCS Batch#:	-	-	-	-
Date Prepared:	-	-	-	-
Date Analyzed:	-	-	-	-
Instrument I.D.#:	-	-	-	-
LCS % Recovery:	-	-	-	-

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

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, #2000

Signature on File

Alan B. Kemp
Project Manager



CHAIN OF CUSTODY

9511081

SAMPLER			UNOCAL					ANALYSES REQUESTED							TURN AROUND TIME:			
RAY MARANGOSIAN			S/S # <u>3292</u> CITY: <u>SAN LEANDRO</u>					TPH-GAS BTEX	TPH- DIESEL	TOG	8010	MTBE	DISOLVED OXYGEN					REGULAR
WITNESSING AGENCY			ADDRESS: <u>15008 E 14TH ST.</u>															
SAMPLE ID NO.	DATE	TIME	WATER	GRAB	COMP	NO. OF CONT.	SAMPLING LOCATION											
MW1	11-2-95	13:35	X	X		3	Well	X			5110300	ACX	X					VOLS BROKEN IN LAB - RESAMPLED
MW2	"	13:05	X	X		"	"	X			5110301	X	X					
MW3	"	10:45	X	X		"	"	X			5110302	X	X					
MW4	"	10:15	X	X		"	"	X			5110303	X	X					
MW5	"	14:45	X	X		"	"	X			5110304	X	X					
MW6	"	9:40	X	X		"	"	X			5110305	X	X					
MW7	"	14:15	X	X		2	"	X			5110306	X						
MW8	"	11:50	X	X		"	"	X			5110307	X						
MW9	"	12:20	X	X		"	"	X			5110308	X						
MW10	"	11:30	X	X		3	"	X			5110309	ACX	X					

RELINQUISHED BY:	DATE/TIME	RECEIVED BY:	DATE/TIME	THE FOLLOWING <u>MUST BE</u> COMPLETED BY THE LABORATORY ACCEPTING SAMPLES FOR ANALYSES:
<i>Ray Marangosian</i>	11-2-95 16:15	<i>[Signature]</i>	11-2-95 16:25	1. HAVE ALL SAMPLES RECEIVED FOR ANALYSIS BEEN STORED ON ICE? _____ 2. WILL SAMPLES REMAIN REFRIGERATED UNTIL ANALYZED? _____ 3. DID ANY SAMPLES RECEIVED FOR ANALYSIS HAVE HEAD SPACE? _____ 4. WERE SAMPLES IN APPROPRIATE CONTAINERS AND PROPERLY PACKAGED? _____
(SIGNATURE)	1407	(SIGNATURE)	1407	
(SIGNATURE)	11-3	(SIGNATURE)	11-3	
(SIGNATURE)	11-3	(SIGNATURE)	11-3-95	
(SIGNATURE)		(SIGNATURE)		SIGNATURE: _____ TITLE: _____ DATE: _____

Note: All water containers to be sampled for TPHG/BTEX, 8010 & B240 are preserved with HCL. All water containers to be sampled for Lead or Metals are preserved with HN03. All other containers are unpreserved.

CHAIN OF CUSTODY

9511081

SAMPLER			UNOCAL					ANALYSES REQUESTED							TURN AROUND TIME:	
RAY MARANGOSIAN			S/S # <u>3252</u> CITY: <u>SAN LEANDRO</u>					TPH-GAS BTEX	TPH- DIESEL	TOG	8010	MTBE	DISSOLVED OXYGEN			REGULAR
WITNESSING AGENCY			ADDRESS: <u>15008 E 14TH ST.</u>													
SAMPLE ID NO.	DATE	TIME	WATER	GRAB	COMP	NO. OF CONT.	SAMPLING LOCATION									
<u>MW11</u>	<u>11-2-95</u>	<u>11:10</u>	<u>X</u>	<u>X</u>		<u>3</u>	<u>Well</u>	<u>X</u>			<u>5110310</u>	<u>ALX</u>	<u>X</u>			
RELINQUISHED BY:		DATE/TIME	RECEIVED BY:		DATE/TIME	THE FOLLOWING <u>MUST BE</u> COMPLETED BY THE LABORATORY ACCEPTING SAMPLES FOR ANALYSES:										
<u>Ray Marangosian</u>		<u>11-2-95</u>	<u>[Signature]</u>		<u>11-2-95</u>	1. HAVE ALL SAMPLES RECEIVED FOR ANALYSIS BEEN STORED ON ICE? _____										
(SIGNATURE)		<u>16:15</u>	(SIGNATURE)		<u>1625</u>	2. WILL SAMPLES REMAIN REFRIGERATED UNTIL ANALYZED? _____										
(SIGNATURE)			(SIGNATURE)			3. DID ANY SAMPLES RECEIVED FOR ANALYSIS HAVE HEAD SPACE? _____										
(SIGNATURE)			(SIGNATURE)		<u>11-3-95</u>	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.

CHAIN OF CUSTODY

9511081

SAMPLER RAY MARANGOSIAN			UNOCAL S/S # <u>3292</u> CITY: <u>SAN LEANDRO</u>					ANALYSES REQUESTED					TURN AROUND TIME: <u>REGULAR</u>	
WITNESSING AGENCY			ADDRESS: <u>15008 E 14TH ST</u>					TPH-GAS BTEX	TPH-DIESEL	TOG	8010			REMARKS
SAMPLE ID NO.	DATE	TIME	WATER	GRAB	COMP	NO. OF CONT.	SAMPLING LOCATION							
✓ <u>ES1</u>	<u>11-2-95</u>		<u>X</u>	<u>X</u>		<u>1</u>		<u>X</u>			<u>5110311</u>			
✓ <u>ES3</u>	<u>"</u>		<u>X</u>	<u>X</u>		<u>1</u>		<u>X</u>			<u>5110312</u>			
RELINQUISHED BY: <u>Ray Marangosian</u> (SIGNATURE)	DATE/TIME <u>11-2-95</u> <u>16:15</u>	RECEIVED BY: <u>[Signature]</u> (SIGNATURE)	DATE/TIME <u>11-2-95</u> <u>16:25</u>	THE FOLLOWING <u>MUST</u> BE COMPLETED BY THE LABORATORY ACCEPTING SAMPLES FOR ANALYSES:										
(SIGNATURE)	<u>11-3</u>	(SIGNATURE)	<u>11-3</u>	1. HAVE ALL SAMPLES RECEIVED FOR ANALYSIS BEEN STORED ON ICE? _____										
(SIGNATURE)	<u>11-3</u>	(SIGNATURE)	<u>11-3</u>	2. WILL SAMPLES REMAIN REFRIGERATED UNTIL ANALYZED? _____										
(SIGNATURE)	<u>11-3</u>	(SIGNATURE)	<u>11-3</u>	3. DID ANY SAMPLES RECEIVED FOR ANALYSIS HAVE HEAD SPACE? _____										
(SIGNATURE)	<u>11-3</u>	(SIGNATURE)	<u>11-3</u>	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.



MPDS Services 2401 Stanwell Dr., Ste. 300 Concord, CA 94520 Attention: Jarrel Crider	Client Project ID: Unocal #3292, 15008 E. 14th Street Matrix Descript: Water Analysis Method: EPA 5030/8015 Mod./8020 First Sample #: 511-1676	San Leandro	Sampled: Nov 20, 1995 Received: Nov 20, 1995 Reported: Nov 21, 1995
---	---	-------------	---

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
511-1676	MW-1	20,000	180	ND	960	450

Detection Limits:	50	0.50	0.50	0.50	0.50
--------------------------	-----------	-------------	-------------	-------------	-------------

Total Purgeable Petroleum Hydrocarbons are quantitated against a fresh gasoline standard.
Analytes reported as ND 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
404 N. Wiget Lane	Walnut Creek, CA 94598	(510) 988-9600	FAX (510) 988-9673
819 Striker Avenue, Suite 8	Sacramento, CA 95834	(916) 921-9600	FAX (916) 921-0100

MPDS Services	Client Project ID: Unocal #3292, 15008 E. 14th Street	Sampled: Nov 20, 1995
2401 Stanwell Dr., Ste. 300	Matrix Descript: Water San Leandro	Received: Nov 20, 1995
Concord, CA 94520	Analysis Method: EPA 5030/8015 Mod./8020	Reported: Nov 21, 1995
Attention: Jarrel Crider	First Sample #: 511-1676	

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
511-1676	MW-1	Gasoline	100	11/20/95	HP-5	76

SEQUOIA ANALYTICAL, #1271

Signature on File

Alan B. Kemp
Project Manager

5111676.MPD <2>





Sequoia Analytical

680 Chesapeake Drive
404 N. Wiget Lane
819 Striker Avenue, Suite 8

Redwood City, CA 94063
Walnut Creek, CA 94598
Sacramento, CA 95834

(415) 364-9600
(510) 988-9600
(916) 921-9600

FAX (415) 364-9233
FAX (510) 988-9673
FAX (916) 921-0100

MPDS Services
2401 Stanwell Dr., Ste. 300
Concord, CA 94520
Attention: Jarrel Crider

Client Project ID: Unocal #3292, 15008 E. 14th Street
Sample Descript: Water San Leandro
Analysis for: MTBE (Modified EPA 8020)
First Sample #: 511-1676

Sampled: Nov 20, 1995
Received: Nov 20, 1995
Analyzed: Nov 20, 1995
Reported: Nov 21, 1995

LABORATORY ANALYSIS FOR: MTBE (Modified EPA 8020)

Sample Number	Sample Description	Detection Limit µg/L	Sample Result µg/L
511-1676	MW-1	60	970

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

5111676.MPD <3>





MPDS Services
2401 Stanwell Dr., Ste. 300
Concord, CA 94520
Attention: Jarrel Crider

Client Project ID: Unocal #3292, 15008 E. 14th Street, San Leandro
Matrix: Liquid

QC Sample Group: 511-1676

Reported: Nov 21, 1995

QUALITY CONTROL DATA REPORT

ANALYTE	Benzene	Toluene	Ethyl Benzene	Xylenes
Method:	EPA 8020	EPA 8020	EPA 8020	EPA 8020
Analyst:	M. Creusere	M. Creusere	M. Creusere	M. Creusere

MS/MSD Batch#:	5111371	5111371	5111371	5111371
Date Prepared:	11/20/95	11/20/95	11/20/95	11/20/95
Date Analyzed:	11/20/95	11/20/95	11/20/95	11/20/95
Instrument I.D.#:	HP-5	HP-5	HP-5	HP-5
Conc. Spiked:	20 µg/L	20 µg/L	20 µg/L	60 µg/L
Matrix Spike % Recovery:	95	95	95	97
Matrix Spike Duplicate % Recovery:	85	85	85	87
Relative % Difference:	11	11	11	11

LCS Batch#:	3LCS112095	3LCS112095	3LCS112095	3LCS112095
Date Prepared:	11/20/95	11/20/95	11/20/95	11/20/95
Date Analyzed:	11/20/95	11/20/95	11/20/95	11/20/95
Instrument I.D.#:	HP-5	HP-5	HP-5	HP-5
LCS % Recovery:	85	84	84	85

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

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



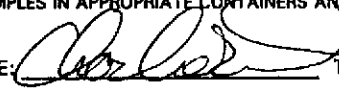
Alan B. Kemp
Project Manager



CHAIN OF CUSTODY

9511443

SAMPLER			UNOCAL					ANALYSES REQUESTED						TURN AROUND TIME:		
ALEXANDER ARZOMANOV			S/S # <u>3292</u> CITY: <u>San Leandro</u>					TPH-GAS BTEX	TPH-DIESEL	TOG	8010	MDE				2 1/2 REGULAR
WITNESSING AGENCY			ADDRESS: <u>15008 E. 14 st</u>													
SAMPLE ID NO.	DATE	TIME	WATER	GRAB	COMP	NO. OF CONT.	SAMPLING LOCATION									
MW1	11-20-95		✓	✓		2VOA'S		✓		51115768	✓					

RELINQUISHED BY:	DATE/TIME	RECEIVED BY:	DATE/TIME	THE FOLLOWING <u>MUST BE</u> COMPLETED BY THE LABORATORY ACCEPTING SAMPLES FOR ANALYSES:
	2:30 11-20-95		11/20 1430	1. HAVE ALL SAMPLES RECEIVED FOR ANALYSIS BEEN STORED ON ICE? <u>Y</u>
(SIGNATURE)		(SIGNATURE)		2. WILL SAMPLES REMAIN REFRIGERATED UNTIL ANALYZED? <u>Y</u>
(SIGNATURE)		(SIGNATURE)		3. DID ANY SAMPLES RECEIVED FOR ANALYSIS HAVE HEAD SPACE? <u>N</u>
(SIGNATURE)		(SIGNATURE)		4. WERE SAMPLES IN APPROPRIATE CONTAINERS AND PROPERLY PACKAGED? <u>Y</u>
(SIGNATURE)		(SIGNATURE)		SIGNATURE:  TITLE: _____ DATE: 11/20