KAPREALIAN ENGINEERING
INCORPORATED

December 3, 1992

Alameda County Health Care Services
80 Swan Way, Room 200
Oakland, CA 94621

Attention: Mr. Scott Seery

RE: Unocal Service Station #7004
15599 Hesperian Boulevard
San Leandro, California

Dear Mr. Seery:

Per the request of Mr. Bob Boust of Unocal Corporation, enclosed please find our reports dated November 16, 1992, and November 19, 1992, for the above referenced site.

If you should have any questions, please feel free to call our office at (510) 602-5100.

Sincerely,

Kaprealian Engineering, Inc.

Judy A. Dewey

jad\82

Enclosure

cc: Bob Boust, Unocal Corporation

2401 Stanwell Drive, Suite 400
Concord, California 94520
Tel: 510.602.5100 Fax: 510.687.0602

KAPREALIAN ENGINEERING
INCORPORATED

KEI-P90-1003.QR4
November 19, 1992

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

Attention: Mr. Bob Boust

RE: **Quarterly Report**
Unocal Service Station #7004
15599 Hesperian Boulevard
San Leandro, California

Dear Mr. Boust:

This report presents the results of the most recent quarter of monitoring and sampling of the monitoring wells at the referenced site by Kaprealian Engineering, Inc. (KEI), per KEI's proposal (KEI-P90-1003.P2) dated May 31, 1991, and as modified in KEI's quarterly report (KEI-P90-1003.QR3) dated August 10, 1992. The wells are currently monitored monthly, and wells MW3 and MW5 are sampled on a quarterly basis. Wells MW1, MW2, MW4, and MW6 are sampled on a semi-annual basis. **This report covers the work performed by KEI from August through October of 1992.**

BACKGROUND

The subject site contains a Unocal service station facility. Three underground gasoline storage tanks and the product piping were removed from the site in October of 1990 during tank replacement activities. The fuel tank pit and the product pipe trenches were subsequently overexcavated in order to remove contaminated soil. Six monitoring wells and one aquifer testing well have been installed at the site.

A site description, detailed background information including a summary of all of the soil and ground water subsurface investigation/remediation work conducted to date, site hydrogeologic conditions, and tables that summarize all of the soil and ground water sample analytical results are presented in KEI's report (KEI-P90-1003.R6) dated May 29, 1992.

RECENT FIELD ACTIVITIES

The six wells (MW1 through MW6) were monitored three times, and wells MW3 and MW5 were sampled once during the quarter. Wells MW1, MW2, MW4, and MW6 are sampled semi-annually, and thus were not sampled this quarter. During monitoring, the wells were checked for depth to water and the presence of free product. Prior to

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sampling, the wells were also checked for the presence of a sheen. **No free product or sheen was noted in any of the wells during the quarter.** The monitoring data collected this quarter are summarized in Table 1.

Water samples were collected from wells MW3 and MW5 on October 28, 1992. Prior to sampling, the wells were each purged of 6 gallons of water by the use of a surface pump. Samples were collected by the use of a clean Teflon bailer. The samples were decanted into clean VOA vials that were then sealed with Teflon-lined screw caps and stored in a cooler, on ice, until delivery to a state-certified laboratory.

HYDROLOGY

The measured depth to ground water at the site on October 28, 1992, ranged between 16.37 and 18 feet below grade. The water levels in all of the wells have shown net decreases ranging from 1.34 to 1.38 feet since July 9, 1992. Based on the water level data gathered on **August 31, 1992, and October 28, 1992, the ground water flow direction appeared to be to the west-southwest**, as shown on the attached Potentiometric Surface Maps, Figures 1 and 3. The flow direction reported for these two monitoring events were similar to the flow direction reported in the previous quarters. The average hydraulic gradient across the site during August 31, 1992, and October 28, 1992, was approximately 0.002. However, **on September 28, 1992, the ground water flow direction appeared to be towards the northwest**, as shown on the attached Potentiometric Surface Map, Figure 2, with a hydraulic gradient of approximately 0.012.

ANALYTICAL RESULTS

The ground water samples were analyzed at Sequoia Analytical Laboratory and were accompanied by properly executed Chain of Custody documentation. The samples were analyzed for total petroleum hydrocarbons (TPH) as gasoline by EPA method 5030/modified 8015, and benzene, toluene, xylenes, and ethylbenzene by EPA method 8020. **In addition, the ground water sample collected from monitoring well MW5 was also analyzed for methyl tert butyl ether (MTBE) by EPA method 8020/modified.**

The ground water sample analytical results are summarized in Table 2. The concentrations of TPH as gasoline and benzene detected in the ground water samples collected this quarter are shown on the attached Figure 4. Copies of the laboratory analytical results and the Chain of Custody documentation are attached to this report.

DISCUSSION AND RECOMMENDATIONS

Based on the analytical results for the ground water samples collected and evaluated to date, and no evidence of free product or sheen in any of the wells, KEI recommends the continuation of the current monitoring and sampling program, per KEI's proposal (KEI-P90-1003.P2) dated May 31, 1991, and as modified in KEI's quarterly report (KEI-P90-1003.QR3) dated August 10, 1992.

DISTRIBUTION

A copy of this report should be sent to the Alameda County Health Care Services Agency, Mr. Michael Bakaldin of the City of San Leandro Fire Department, and to the Regional Water Quality Control Board, San Francisco Bay Region.

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.

Our studies assume that the field and laboratory data are reasonably representative of the site as a whole, and assume that subsurface conditions are reasonably conducive to interpolation and extrapolation.

The results of this study are based on the data obtained from the field and laboratory analyses obtained from a state-certified laboratory. We have analyzed these data using what we believe to be currently applicable engineering techniques and principles in the Northern California region. We make no warranty, either expressed or implied, regarding the above, including laboratory analyses, except that our services have been performed in accordance with generally accepted professional principles and practices existing for such work.

If you have any questions regarding this report, please do not hesitate to call me at (510) 602-5100.

Sincerely,

Kaprealian Engineering, Inc.

Thomas J. Berkins
Senior Environmental Engineer

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

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

Aram B. Kaloustian
Project Engineer

/jad

Attachments: Tables 1 & 2
Location Map
Potentiometric Surface Maps - Figures 1, 2 & 3
Concentrations of Petroleum Hydrocarbons - Figure 4
Laboratory Analyses
Chain of Custody documentation

KEI-P90-1003.QR4
November 19, 1992

TABLE 1

SUMMARY OF GROUND WATER MONITORING AND PURGING DATA

Well #	Ground Water Elevation (feet)	Depth to Water (feet)	Product Thickness (feet)	Sheen	Water Purged (gallons)
(Monitored and Sampled on October 28, 1992)					
MW1*	19.64	17.25	0	--	0
MW2*	19.69	17.66	0	--	0
MW3	19.53	17.69	0	No	6
MW4*	19.44	16.37	0	--	0
MW5	19.40	17.61	0	No	6
MW6*	19.55	18.00	0	--	0
(Monitored on September 28, 1992)					
MW1	20.12	16.77	0	--	0
MW2	20.36	16.99	0	--	0
MW3	20.04	17.18	0	--	0
MW4	18.76	17.05	0	--	0
MW5	19.79	17.22	0	--	0
MW6	20.28	17.27	0	--	0
(Monitored on August 31, 1992)					
MW1	20.33	16.56	0	--	0
MW2	20.36	16.99	0	--	0
MW3	20.22	17.00	0	--	0
MW4	20.12	15.69	0	--	0
MW5	20.07	16.94	0	--	0
MW6	20.23	17.32	0	--	0

Well #	Surface Elevation** (feet)
MW1	36.89
MW2	37.35
MW3	37.22
MW4	35.81
MW5	37.01
MW6	37.55

TABLE 1 (Continued)

SUMMARY OF GROUND WATER MONITORING AND PURGING DATA

-- Sheen determination was not performed.

* Monitored only.

** The elevations of the tops of the well covers have been surveyed relative to Mean Sea Level, per a City of San Leandro Benchmark located at the southwest corner of Hesperian Boulevard and Sycamore.

KEI-P90-1003.QR4
November 19, 1992

TABLE 2

SUMMARY OF LABORATORY ANALYSES
WATER

Date	Sample Number	TPH as Gasoline	Benzene	Toluene	Xylenes	Ethylbenzene	MTBE
10/28/92	MW1	SAMPLED SEMI-ANNUALLY					
	MW2	SAMPLED SEMI-ANNUALLY					
	MW3	15,000	4,400	15	800	2,400	--
	MW4	SAMPLED SEMI-ANNUALLY					
	MW5	ND	ND	ND	ND	ND	45
	MW6	SAMPLED SEMI-ANNUALLY					
7/09/92	MW1	70*	ND	ND	ND	ND	130
	MW2	ND	ND	ND	ND	ND	49
	MW3	13,000	3,200	12	1,100	1,900	--
	MW4	ND	ND	ND	ND	ND	--
	MW5	ND	ND	ND	ND	ND	71
	MW6	ND	ND	ND	ND	ND	--
4/14/92	MW1	76**	ND	ND	ND	ND	--
	MW2	45**	ND	ND	ND	ND	--
	MW3	16,000	3,400	19	1,300	1,400	--
	MW4	ND	ND	ND	ND	ND	--
	MW5	86**	ND	ND	ND	ND	--
	MW6	ND	ND	ND	ND	ND	--
1/14/92	MW1	ND	ND	ND	ND	ND	--
	MW2	ND	ND	ND	ND	ND	--
	MW3	13,000	6,600	19	1,800	2,600	--
	MW4	ND	ND	ND	ND	ND	--
	MW5	60**	ND	ND	ND	ND	--
	MW6	ND	ND	ND	ND	ND	--
10/14/91	MW1	ND	ND	ND	ND	ND	--
	MW2	ND	ND	ND	ND	ND	--
	MW3	25,000	6,300	78	1,400	2,000	--
	MW4	ND	ND	ND	ND	ND	--
	MW5	140	0.72	ND	0.89	1.3	--
	MW6	ND	ND	ND	ND	ND	--
7/23/91	MW1	ND	ND	ND	ND	ND	--
	MW2	ND	ND	ND	ND	ND	--
	MW3	17,000	5,500	26	2,800	1,800	--
	MW4	ND	ND	ND	ND	ND	--
	MW5	260	1.2	0.39	0.71	10	--
	MW6	ND	ND	ND	ND	ND	--

TABLE 2 (Continued)

SUMMARY OF LABORATORY ANALYSES
WATER

Date	Sample Number	TPH as Gasoline	Benzene	Toluene	Xylenes	Ethylbenzene	MTBE
5/04/91	MW1	ND	ND	ND	ND	ND	--
	MW2	ND	ND	ND	ND	ND	--
	MW3	34,000	6,100	32	6,100	1,200	--

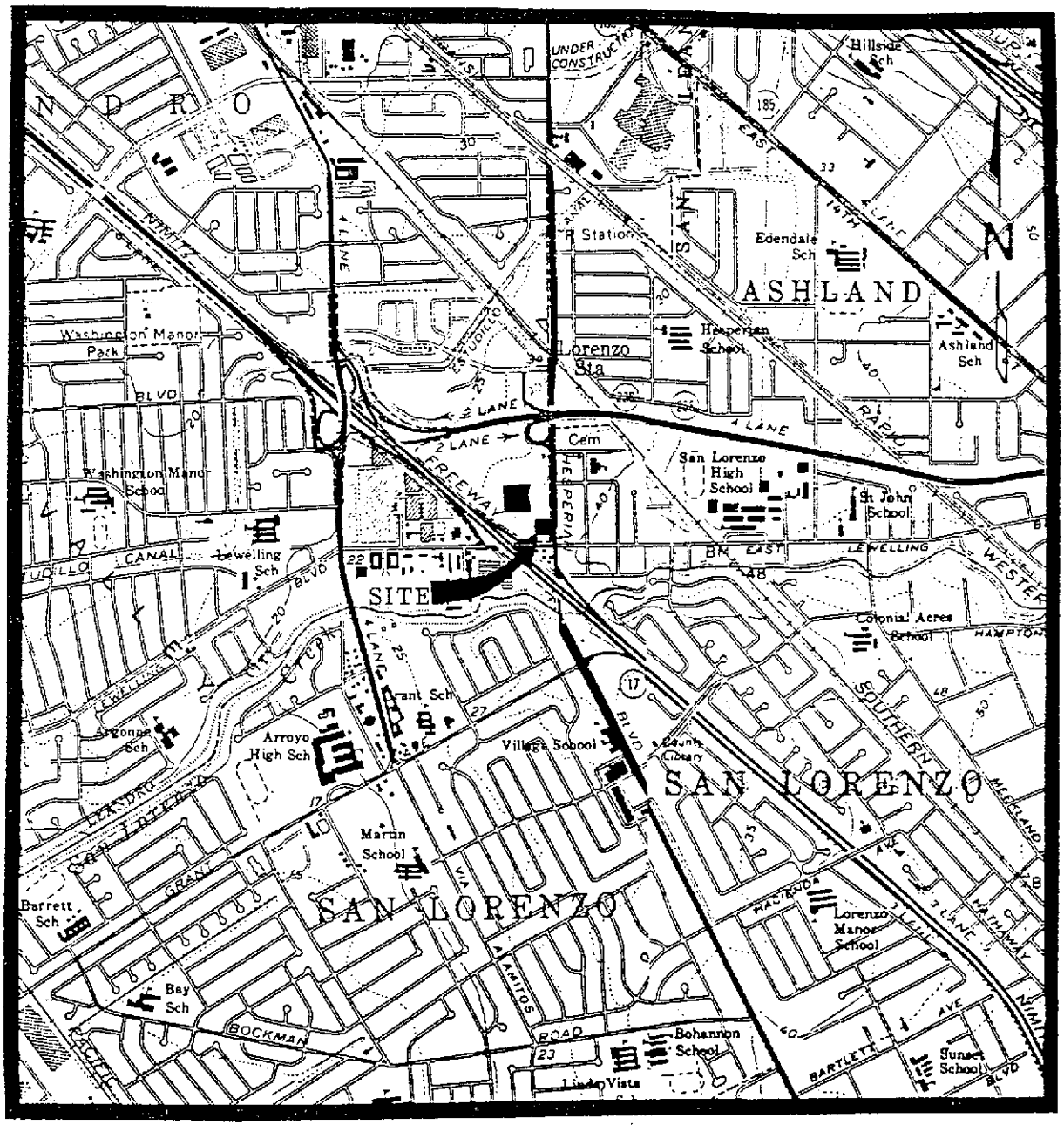
* Sequoia Analytical Laboratory reported that "the above sample does not appear to contain gasoline. LMBP is due to MTBE."

** Sequoia Analytical Laboratory reported that "the above samples does not appear to contain gasoline. LMBP is due to one unidentified peak."

ND = Non-detectable.

-- Indicates analysis was not performed.

Results in parts per billion (ppb), unless otherwise indicated.

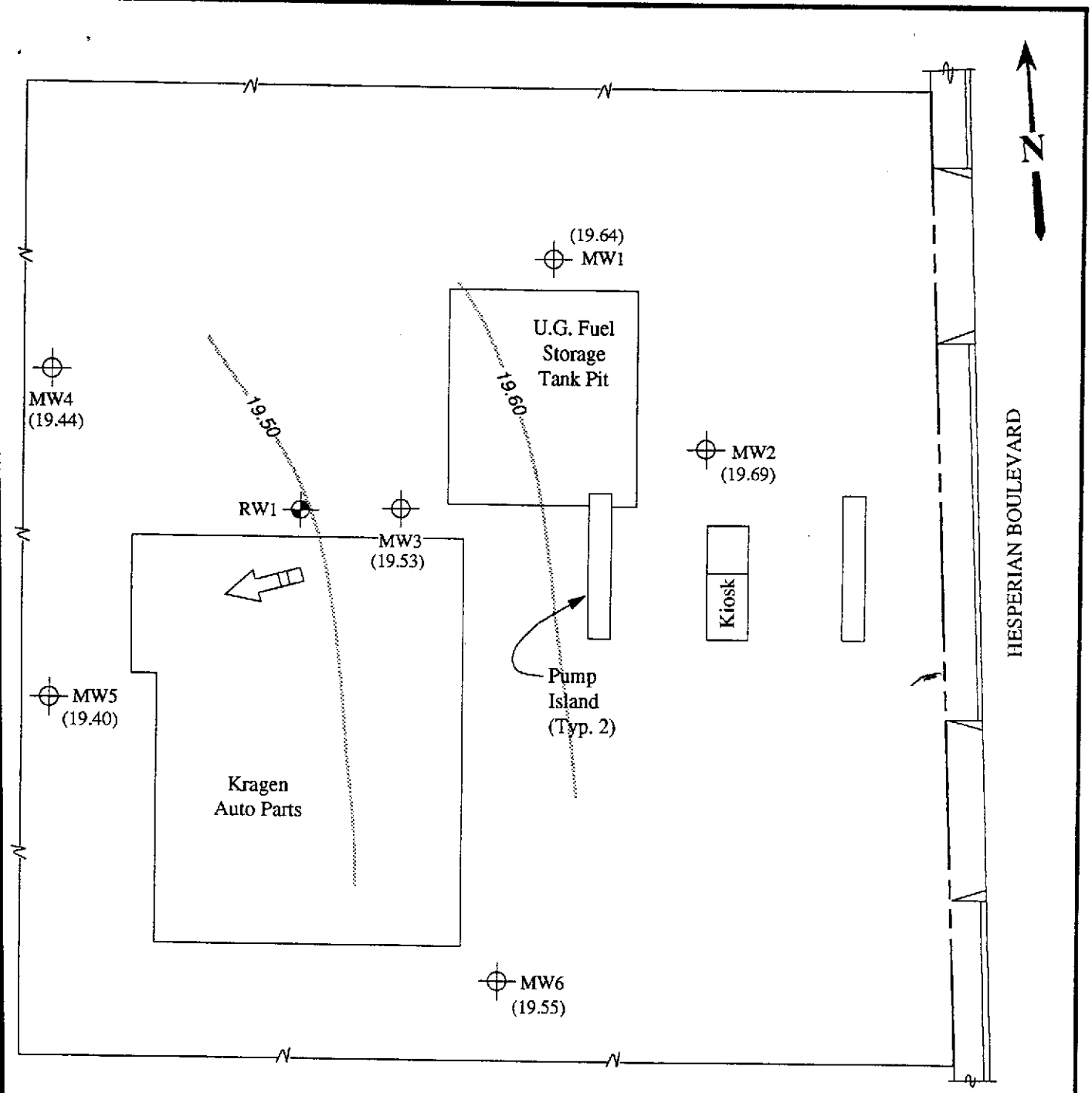


Base modified from 7.5 minute U.S.G.S. Hayward and San Leandor Quadrangles (photorevised 1980)

0 2000 4000

Approx. scale feet

KAPREALIAN ENGINEERING INCORPORATED	**UNOCAL SERVICE STATION #7004** **15599 HESPERIAN BOULEVARD** **SAN LEANDRO, CA**	**LOCATION MAP**



D

Monitoring well

Aquifer testing well

Ground water elevation in feet above Mean Sea Level

Direction of ground water flow

Contours of ground water elevation

0 30 60

Approx. scale feet

60

feet

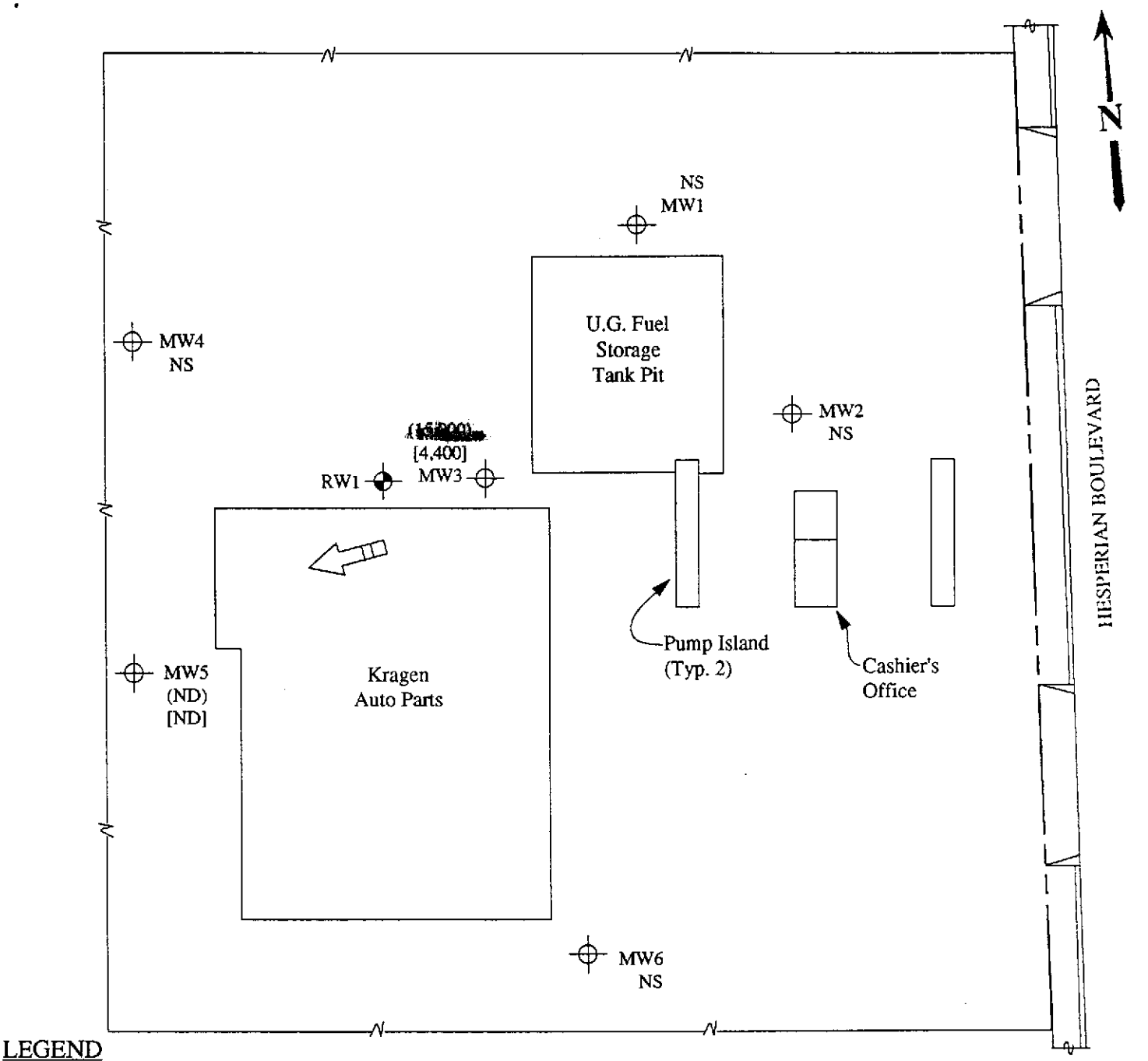
POTENTIOMETRIC SURFACE MAP FOR THE OCTOBER 28, 1992 MONITORING EVENT

KAPREALIAN ENGINEERING
INCORPORATED

UNOCAL SERVICE STATION #7004
15599 HESPERIAN BOULEVARD
SAN LEANDRO, CA

FIGURE
1

RE



LEGEND

- Monitoring well
- Aquifer testing well
- ( ) Concentrations of TPH as gasoline in ppb
- [ ] Concentrations of benzene in ppb
- ND = Non-detectable
- NS = Not sampled
- Direction of ground water flow

0 30 60

Approx. scale feet

PETROLEUM HYDROCARBON CONCENTRATIONS IN GROUND WATER ON OCTOBER 28, 1992

KAPREALIAN ENGINEERING
INCORPORATED

UNOCAL SERVICE STATION #7004
15599 HESPERIAN BOULEVARD
SAN LEANDRO, CA

FIGURE
4

SEQUOIA ANALYTICAL

1900 Bates Avenue • Suite LM • Concord, California 94520
(510) 686-9600 • FAX (510) 686-9689

Kaprealian Engineering, Inc.	Client Project ID:	Unocal, 15599 Hesperian Blvd., San Leandro	Sampled:	Oct 28, 1992
2401 Stanwell Drive, Suite 400	Sample Matrix:	Water	Received:	Oct 28, 1992
Concord, CA 94520	Analysis Method:	EPA 5030/8015/8020	Reported:	Nov 9, 1992
Attention: Mardo Kaprealian, P.E.	First Sample #:	210-0986		

TOTAL PURGEABLE PETROLEUM HYDROCARBONS with BTEX DISTINCTION

Analyte	Reporting Limit µg/L	Sample I.D. 210-0986 MW 3	Sample I.D. 210-0987 MW 5	Sample I.D. Matrix Blank
Purgeable Hydrocarbons	50	15,000	N.D.	
Benzene	0.5	4,400	N.D.	
Toluene	0.5	15	N.D.	
Ethyl Benzene	0.5	2,400	N.D.	
Total Xylenes	0.5	800	N.D.	
Chromatogram Pattern:		Gasoline	--	

Quality Control Data

Report Limit Multiplication Factor:	20	1.0	1.0
Date Analyzed:	10/30/92	10/30/92	10/30/92
Instrument Identification:	HP-2	HP-2	HP-2
Surrogate Recovery, %: (QC Limits = 70-130%)	115	101	102

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

SEQUOIA ANALYTICAL

Scott A. Chieffo
Project Manager

SEQUOIA ANALYTICAL

1900 Bates Avenue • Suite LM • Concord, California 94520
(510) 686-9600 • FAX (510) 686-9689

Kaprealian Engineering, Inc.	Client Project ID:	Unocal, 15599 Hesperian Blvd., San Leandro	Sampled:	Oct 28, 1992
2401 Stanwell Drive, Suite 400	Sample Descript:	Water	Received:	Oct 28, 1992
Concord, CA 94520	Analysis for:	MTBE (EPA 8020 - Modified)		
Attention: Mardo Kaprealian, P.E.	First Sample #:	210-0987	Analyzed:	Oct 30, 1992
			Reported:	Nov 9, 1992

LABORATORY ANALYSIS FOR: MTBE (EPA 8020 - Modified)

Sample Number	Sample Description	Detection Limit µg/L	Sample Result µg/L
210-0987	MW 5	0.60	45

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

SEQUOIA ANALYTICAL

Scott A. Chieffo
Project Manager

SEQUOIA ANALYTICAL

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(510) 686-9600 • FAX (510) 686-9689

Kaprealian Engineering, Inc.
2401 Stanwell Drive, Suite 400
Concord, CA 94520
Attention: Mardo Kaprealian, P.E.

Client Project ID: Unocal, 15599 Hesperian Blvd., San Leandro
QC Sample Group: 2100986-987
Reported: Nov 9, 1992

QUALITY CONTROL DATA REPORT

ANALYTE	Benzene	Toluene	Ethyl-Benzene	Xylenes
Method:	EPA 8015/8020	EPA 8015/8020	EPA 8015/8020	EPA 8015/8020
Analyst:	J.F.	J.F.	J.F.	J.F.
Reporting Units:	µg/L	µg/L	µg/L	µg/L
Date Analyzed:	Oct 30, 1992	Oct 30, 1992	Oct 30, 1992	Oct 30, 1992
QC Sample #:	210-1003	210-1003	210-1003	210-1003
Sample Conc.:	N.D.	N.D.	N.D.	N.D.
Spike Conc. Added:	20	20	20	60
Conc. Matrix Spike:	17	19	20	62
Matrix Spike % Recovery:	85	95	100	103
Conc. Matrix Spike Dup.:	17	19	20	65
Matrix Spike Duplicate % Recovery:	85	95	100	108
Relative % Difference:	0.0	0.0	0.0	4.7

Laboratory blank contained the following analytes: None Detected

SEQUOIA ANALYTICAL

Scott A. Chieffo
Project Manager

$$\%\ \text{Recovery:} = \frac{\text{Conc. of M.S. - Conc. of Sample}}{\text{Spike Conc. Added}} \times 100$$

$$\text{Relative \% Difference:} = \frac{\text{Conc. of M.S. - Conc. of M.S.D.}}{(\text{Conc. of M.S. + Conc. of M.S.D.}) / 2} \times 100$$

KAPREALIAN ENGINEERING, INC.

CHAIN OF CUSTODY

SAMPLER: Vartkes

WITNESSING AGENCY:

SITE NAME & ADDRESS: Unocal / San Leandro
15599 Hesperian Blvd.

TURN AROUND TIME: Regular.

SAMPLE ID NO.	DATE	TIME	SOIL	WATER	GRAB	COMP	NO. OF CONT.	SAMPLING LOCATION	TPHG + BTXE	MTBE	REMARKS
MW 3	10/28/92	4:15 pm		X	X		2	Monitoring Well	X		210986AB 987AD
MW 5	"	3:40 pm.		X	X		4	" "	X	X	

Relinquished by: (Signature)	Date/Time	Received by: (Signature)
W. Thekdjian	10/28/92 5:15	[signature] 10/28/10 17:5
Tim Cobb	10-29-92 1325	[signature]
[signature]	10-29-92 1500	[signature]
Relinquished by: (Signature)	Date/Time	Received by: (Signature)

The following MUST BE completed by the laboratory accepting samples for analysis:

1. Have all samples received for analysis been stored in ice? /
2. Will samples remain refrigerated until analyzed? /
3. Did any samples received for analysis have head space? No
4. Were samples in appropriate containers and properly packaged? /

[signature] — Signature; Analyst — Title; 10/28/92 — Date