KAPREALIAN ENGINEERING
INCORPORATED

March 23, 1993

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

Attention: Mr. Scott Seery

RE: Unocal Service Station #6277
15803 E. 14th Street
San Leandro, California

Dear Mr. Seery:

Per the request of Mr. Dave Camille of Unocal Corporation, enclosed please find our report dated March 11, 1993, 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: Dave Camille, Unocal Corporation

2401 Stanwell Drive, Suite 400
Concord, California 94520
Tel 510 602.5100 Fax: 510.687.0602

KAPREALIAN ENGINEERING
INCORPORATED

KEI-P89-0301.QR13
March 11, 1993

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

Attention: Mr. David Camille

RE: Quarterly Report
Unocal Service Station #6277
15803 E. 14th Street
San Leandro, California

Dear Mr. Camille:

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-P89-0301.P4) dated July 23, 1991, and as modified in KEI's quarterly report (KEI-P89-0301.QR11) dated August 18, 1992. The wells are currently monitored and sampled on a quarterly basis. This report covers the work performed by KEI in January of 1993.

BACKGROUND

The subject site currently contains a Unocal service station facility. Two underground gasoline storage tanks, one waste oil tank, and the product piping were removed from the site in March of 1989 during tank replacement activities. The fuel tank pit and the waste oil tank pit were subsequently overexcavated in order to remove contaminated soil. Four monitoring wells and two exploratory borings have been installed at the site. On February 1, 1990, well MW2 was destroyed in preparation for additional soil excavation in the vicinity of this well. Soil excavation in the vicinity of well MW2 was completed in April of 1990. Monitoring well MW2 was then replaced with a new well (MW2A) in March of 1991. A water well survey has also been performed within a 1/2-mile radius of 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 quarterly report (KEI-P89-0301.QR10) dated June 2, 1992.

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

RECENT FIELD ACTIVITIES

The four existing wells (MW1, MW2A, MW3, and MW4) were monitored and sampled once during the quarter. During monitoring, the wells were checked for depth to water and the presence of free product or 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 all of the wells on January 29, 1993. Prior to sampling, the wells were each purged of 8 gallons of water by the use of a surface pump. The samples were collected by the use of 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 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 January 29, 1993, ranged between 9.55 and 11.15 feet below grade. The water levels in all of the wells have shown net increases ranging from 0.54 to 0.70 feet since October 20, 1992. Based on the water level data gathered on January 29, 1993, the ground water flow direction appeared to be to the north-northwest, as shown on the attached Potentiometric Surface Map, Figure 1. The flow direction reported this quarter is relatively similar to the northwesterly flow direction reported in the previous five quarters. The average hydraulic gradient across the site on January 29, 1993, was approximately 0.002.

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, benzene, toluene, xylenes, and ethylbenzene by EPA method 8020, TPH as diesel by EPA method 3510/modified 8015, and for EPA method 8010 constituents.

The ground water sample analytical results are summarized in Tables 2 and 3. The concentrations of TPH as gasoline, TPH as diesel, and benzene detected in the ground water samples collected this quarter are shown on the attached Figure 2, and the concentrations of tetrachloroethene and trichloroethene detected in the ground water samples collected this quarter are shown on the attached Figure 3.

Copies of the laboratory analytical results and the Chain of Custody documentation are attached to this report.

DISCUSSION AND RECOMMENDATIONS

As shown in Table 2, Sequoia Analytical Laboratory has reported that the contaminants detected in the ground water samples collected from wells MW3 and MW4 during the past five quarters of sampling did not appear to be gasoline. The laboratory further reported (see attached laboratory analytical sheets) that the hydrocarbons detected in wells MW3 and MW4 are "due mainly to EPA method 8010 peaks." The EPA method 8010 analyses performed on the ground water samples collected from all four wells during the past three quarters of sampling (see Table 3) confirms the presence of several chlorinated solvents in the ground water. The highest concentrations of the chlorinated solvents have been detected in Unocal's upgradient monitoring wells MW3 and MW4, as shown on the attached Figure 4. Based on the north-northwesterly ground water flow direction at the site, it appears that the chlorinated solvent contamination detected in the ground water may be from an off-site source(s).

In order to determine potential sources of the chlorinated solvent contamination, KEI previously recommended that the following tasks be conducted:

1. Conduct a site reconnaissance in order to determine whether any businesses that use solvents (dry cleaners, photo labs., etc.) are located upgradient (south, southeast, or east) of the Unocal site.

2. Review Unocal's historical General Arrangement Plans to determine whether any potential sources of solvent contamination may have previously existed in the vicinity of wells MW3 and MW4.

3. Review Unocal's real estate files to determine the previous uses of the site (prior to Unocal's occupation of the site). This task may also involve conducting a title search for the subject parcel.

4. Contact the Alameda County Health Care Services Agency (ACHCS) to obtain any information on known solvent contamination sources that may exist in the vicinity of the Unocal site.

In December 1992, a KEI representative visited the subject site to determine land use and the types of businesses in the area. The vicinity surrounding the site is a mixed commercial/residential

area. East of the site, across the East 14th Street and 159th Avenue intersection, is a SpeeDee Oil Change shop, and to the southeast lies a closed auto repair shop that was formerly ABC Auto Repair. Various other businesses, including a sign shop and a recreational vehicle storage lot, are located to the southeast of the Unocal site along East 14th Street. The Unocal site is surrounded on the southwest, west, and northwest by an apartment complex. To the northeast of the Unocal site, across E. 14th Street, is a vacant lot. The locations of these facilities in reference to the Unocal site are shown on the attached Site Vicinity Map, Figure 5.

KEI has reviewed the Unocal real estate file and the available general arrangement plans for the subject site. The general arrangement plans did not show any potential on-site sources of chlorinated solvent contamination in the vicinity of wells MW3 and MW4. From reviewing the real estate file, it was determined that the existing service station facility was constructed on a vacant lot in late 1969. When the station was built, two underground fuel tanks and one waste oil tank were located to the southwest of the existing, original building and directly north of well MW3. In 1989, these tanks were removed and two underground fuel tanks were installed in a new excavation located northwest of the existing building between wells MW1 and MW2A. A new waste oil tank was installed in approximately the same location as the original waste oil tank. The locations of the existing and former underground storage tanks are shown on the attached Figure 1.

Unocal pre-construction photographs show a former Richfield service station located on the property now occupied by the SpeeDee Oil Change shop. Aerial photographs from the same period show one definite and possibly two auto wrecking yards located to the southeast of the site. The confirmed wrecking yard in the aerial photos was located behind the former ABC Auto Repair and appeared to be part of their operations. The other possible wrecking yard was located approximately 500 feet southeast of the subject site.

A file review was conducted at the ACHCS in order to gain information on any known or potential contamination sources that may be located in the vicinity of the Unocal site. Four sites with existing or former underground storage tanks were located through the file review. These sites are as follows: 1.) Narou Properties, 1500 Thrush Avenue; 2.) ABC Auto Repair, 15960 East 14th Street; 3.) Petsas Property, 16035 East 14th Street, and; 4.) SpeeDee Oil Change, 15900 East 14th Street. Site locations in reference to the Unocal site are shown on the attached Site Vicinity Map, Figure 5.

1. Narou Properties, 1500 Thrush Avenue

The Narou Properties site is the location of a former nursery and is located approximately 150 feet to the north of the Unocal site.

One 250-gallon gasoline tank was removed from the site in 1989. Three monitoring wells were subsequently installed and have shown non-detectable levels of TPH as gasoline and BTX&E for four out of five quarters. The ground water flow direction at the Narou Property Site has consistently been to the west, varying to the northwest. In addition to the fuel tank removal/investigation, surface soil samples were collected from 11 separate locations at the site and tested for TPH as motor oil and organochlorine pesticides by EPA method 8080. TPH as motor oil levels ranged from non-detectable to 146 ppm, and organochlorine pesticide levels ranged from 64 to 2,218 ppb. An 8-foot square area was subsequently excavated to depths of 1 to 2 feet where the highest concentration of organochlorine pesticide was detected.

2. ABC Auto Repair (Former Auto Wrecker), 15954 E. 14th Street

The former ABC Auto Repair facility is located approximately 350 feet east-southeast of the Unocal site. Two 250 gallon underground storage tanks were removed from in front of this facility in March 1992. TPH as gasoline concentrations ranged from non-detectable to 1,100 ppm in the soil samples collected from the tank pit excavation. A water sample collected from the excavation showed 10,000 ppb of TPH as gasoline. One down-gradient well is currently being proposed at this site. The proposed location is based on the ground water flow direction at the Unocal site. No evidence of a subsurface investigation at the auto wrecking yard was found in the Alameda County file.

3. Petsas Property, 16035 E. 14th Street

The Petsas Property is a former service station and is located approximately 1,000 feet to the southeast of the Unocal site. On February 4, 1992, three underground tanks (two gasoline and one waste oil) were removed from the site. TPH as gasoline concentrations ranged from 0.72 to 1,300 ppm in the soil samples collected from the tank pit excavation. One soil sample collected from below the waste oil tank showed 54 ppm of TOG. A proposal has been submitted recommending overexcavation of contaminated soil areas and the installation of three monitoring wells.

4. Speedee Oil Change Shop (Former Richfield S/S), 15900 E. 14th Street

   Alameda County has no record of any unauthorized releases or existing underground tanks at the SpeeDee Oil Change facility or former Richfield service station. Alameda County Hazardous Materials Division has inspected the site and found no improper handling of hazardous materials taking place. KEI has contacted the Eden Consolidated Fire District in regard to underground storage tank removal at the former Richfield service station. Eden Consolidated records show that a tank closure permit was applied for on March 26, 1975, by Bay Excavators of Richmond, California. No information was available on the number, size, or contents of the underground tanks removed from the site, and no record of any field inspection by Eden Consolidated personnel was found.

In addition to possible site-specific sources of solvent contamination, the California Environmental Protection Agency, Department of Toxic Substances Control (DTSC), has identified regional chlorinated solvent contamination of the upper aquifer in the San Leandro area. Based upon information obtained from the report "Interim Groundwater Contamination Report for Central San Leandro" dated January 20, 1993, by Woodward-Clyde Consultants of Oakland, California, the DTSC is currently conducting investigations at three State Superfund sites in the San Leandro area, and will be conducting a regional Hydropunch ground water sampling program throughout the "San Leandro Plume" area. The subject site is located outside the study area (approximately 1/2-mile to the southeast).

In summary, based on the results of the site history research, site reconnaissance, and file review, and based upon the fact that no evidence of an on-site solvent source area in the vicinity of MW3 and MW4 is evident, there is no information indicating that the chlorinated solvents found in samples collected from upgradient wells MW3 and MW4 is emanating from the Unocal site. It appears that at least part of the chlorinated solvent contamination at the Unocal site may be from an unidentified source located upgradient of the subject site, or is part of the regional chlorinated solvent contamination previously noted. As a result, KEI recommends that the EPA method 8010 analysis be continued for upgradient monitoring well MW3 on an annual basis, and be discontinued for wells MW1, MW2A, and MW4.

Based on the analytical results of the soil and ground water samples collected and evaluated to date from the Unocal site, KEI recommends the continuation of the current ground water monitoring

and sampling program (except for the proposed modification for EPA method 8010 analyses) for the existing wells, per KEI's proposal (KEI-P89-0301.P4) dated July 23, 1991, and as modified in KEI's quarterly report (KEI-P89-0301.QR11) dated August 18, 1992.

Lastly, KEI previously recommended the installation of one additional downgradient well (MW5), as shown on the attached Figure 4. The proposed location of this well has been changed twice due to access problems and the presence of underground utilities. At the request of the ACHCS, an additional monitoring well (MW6) has also been proposed in the area to the northwest of the Unocal site, as shown on the attached Figure 4. The purpose of both wells is to further define the extent of the ground water contamination in the vicinity of the site. Off-site access permission and the necessary permits for these two wells has been obtained, and these wells were installed on March 9, 1993. A separate technical report documenting these well installations will be prepared and submitted within the upcoming quarter.

DISTRIBUTION

A copy of this report should be sent to Mr. Scott Seery of the ACHCS, to the City of San Leandro, 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 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

Robert H. Kezerian
Project Engineer

/bp

Attachments: Tables 1, 2 & 3
Location Map
Potentiometric Surface Map - Figure 1
Concentrations of Petroleum Hydrocarbons - Figure 2
Concentrations of Chlorinated Solvents - Figure 3
Proposed Well Location Map - Figure 4
Site Vicinity Map - Figure 5
Laboratory Analyses
Chain of Custody documentation

KEI-P89-0301.QR13
March 11, 1993

TABLE 1

SUMMARY OF MONITORING DATA

Well No.	Ground Water Elevation (feet)	Depth to Water (feet)	Product Thickness (feet)	Sheen	Water Purged (gallons)
(Monitored and Sampled on January 29, 1993)					
MW1	22.50	10.25	0	No	8
MW2A	22.63	11.15	0	No	8
MW3	22.89	9.67	0	No	8
MW4	22.77	9.55	0	No	8

Well #	Surface Elevation* (feet)
MW1	32.75
MW2A	33.78
MW3	32.56
MW4	32.32

* The elevations of the tops of the well covers have been surveyed relative to Mean Sea Level (elevation = 31.65).

KEI-P89-0301.QR13
March 11, 1993

TABLE 2

SUMMARY OF LABORATORY ANALYSES
WATER

Date	Sample Well #	TPH as Diesel	TPH as Gasoline	Benzene	Toluene	Xylenes	Ethyl-benzene
1/29/93	MW1	ND	740♦	69	ND	43	3.8
	MW2A	ND	66*	1.4	ND	ND	ND
	MW3	ND	130*	0.84	ND	ND	ND
	MW4	ND	130*	0.95	ND	ND	ND
10/20/92	MW1	ND	720	110	1.4	110	18
	MW2A	ND	96	2.8	ND	1.6	1.8
	MW3	ND	180*	ND	ND	ND	ND
	MW4	ND	110*	ND	ND	ND	ND
7/20/92	MW1	62+	630	100	2.8	52	6.3
	MW2A	ND	99	8.6	ND	0.95	2.4
	MW3	ND	120*	ND	ND	ND	ND
	MW4	ND	80*	ND	ND	ND	ND
4/23/92	MW1	--	530	100	7.9	60	4.6
	MW2A	ND	190	15	ND	2.0	15
	MW3	--	150*	1.6	ND	ND	ND
	MW4	--	120*	ND	ND	ND	ND
1/13/92	MW1	--	450	240	4.6	73	8.6
	MW2A	ND	160	11	2.0	5.9	10
	MW3	--	120*	ND	ND	ND	ND
	MW4	--	58*	ND	ND	ND	ND
9/10/91	MW1	--	280	38	3.1	22	4.1
	MW2A	65	180	8.7	0.93	13	15
	MW3	--	170	ND	ND	ND	ND
	MW4	--	56	ND	ND	ND	ND
6/10/91	MW1	--	310	1.5	ND	0.31	ND
	MW2A	100	54	1.2	ND	0.69	ND
	MW3	--	160	0.65	ND	ND	ND
	MW4	--	64	ND	ND	ND	ND
3/15/91	MW1	--	110	21	ND	8.4	ND
	MW2A	ND	160	2.5	ND	51	ND
	MW3	--	150	ND	ND	0.45	ND
	MW4	--	53	ND	ND	ND	ND

TABLE 2 (Continued)

SUMMARY OF LABORATORY ANALYSES
WATER

Date	Sample Well #	TPH as Diesel	TPH as Gasoline	Benzene	Toluene	Xylenes	Ethyl-benzene
12/14/90	MW1	--	450	150	6.8	49	0.28
	MW3	--	150	ND	ND	ND	ND
	MW4	--	54	ND	ND	ND	ND
9/19/90	MW1	--	140	ND	ND	3.5	ND
	MW3	--	74	0.74	ND	ND	ND
	MW4	--	61	ND	ND	ND	ND
6/25/90	MW1	--	310	10	0.89	2.1	0.37
	MW3	--	190	1.5	0.68	5.3	ND
	MW4	--	66	ND	ND	ND	ND
3/29/90	MW1	--	320	12	1.6	3.5	0.31
	MW3	--	85	ND	ND	ND	ND
	MW4	--	120	0.39	ND	ND	ND
12/12/89	MW1	--	340	100	13	44	3.4
	MW2	1,700	660	220	6.6	36	13
	MW3	--	120	6.7	0.64	1.5	0.46
	MW4	--	97	4.6	ND	ND	ND
9/13/89	MW1	--	550	32	17	52	3.4
	MW2	ND	170	2.0	0.38	9.5	ND
	MW3	--	76	ND	ND	ND	ND
	MW4	--	77	ND	ND	ND	ND
6/06/89	MW1	--	590	ND	ND	ND	ND
	MW2	ND	77	ND	ND	ND	ND
	MW3	--	32	ND	ND	ND	ND
	MW4	--	37	ND	ND	ND	ND

♦ Sequoia Analytical Laboratory reported that the hydrocarbons detected appeared to be a gasoline and non-gasoline mixture.
+ Sequoia Analytical Laboratory reported that the hydrocarbons detected did not appear to be diesel.
* Sequoia Analytical Laboratory reported that the hydrocarbons detected did not appear to be gasoline.
-- Indicates analysis was not performed.
ND = Non-detectable.
Results in parts per billion (ppb), unless otherwise indicated.

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TABLE 3

SUMMARY OF LABORATORY ANALYSES
WATER

Date	Well #	Tetra-chloroethene	Trichloro-ethene	1,2-Dichloro-ethane	Total 1,2-dichloro-ethene	TOG (ppm)
1/29/93	MW1	300	ND	ND	ND	--
	MW2A	140	10	ND	ND	--
	MW3	980	ND	ND	ND	--
	MW4	950	ND	ND	ND	--
10/20/92	MW1	230	22	ND	16**	--
	MW2A	64	11	ND	ND	--
	MW3	1,100	20	ND	ND	--
	MW4	360	17	ND	ND	--
7/20/92	MW1	200	7.4	ND	ND	--
	MW2A	35	7.2	ND	4.8**	ND
	MW3	1,400	25	ND	ND	--
	MW4	440	11	ND	ND	--
4/23/92	MW2A	17	5.6	ND	1.9**	ND
1/13/92	MW2A*	33	ND	ND	2.1**	ND
6/10/91	MW2A	150	10	ND	ND	ND
3/15/91	MW2A	67	8.2	ND	2.6**	ND
12/12/89	MW2	30	9.0	ND	ND	1.2
9/13/89	MW2	18	6.1	4.2	1.2	<50
6/06/89	MW2	110	4.4	2.8	ND	ND

* 1,1,2-Trichloroethane was also detected at a level of 9.9 ppb.

** Reported as cis-1,2-dichloroethene. Trans-1,2-dichloroethene was non-detectable.

ND = Non-detectable.

-- Indicates analysis was not performed.

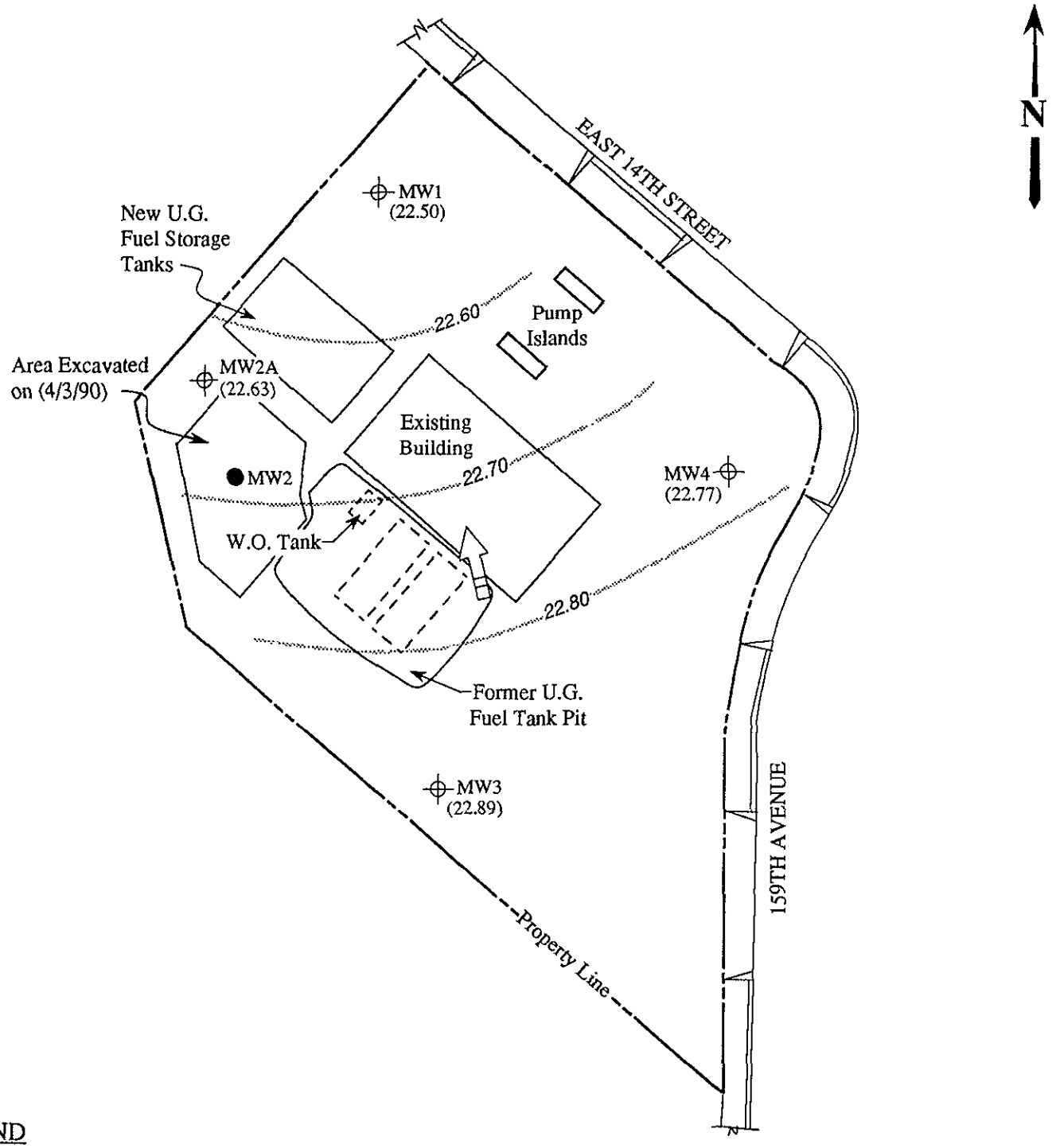
Results in parts per billion (ppb), unless otherwise indicated.

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

0 2000 4000

Approx. scale feet

KAPREALIAN ENGINEERING INCORPORATED	UNOCAL SERVICE STATION #6277 15803 EAST 14TH STREET SAN LEANDRO, CA	LOCATION MAP



LEGEND

- Monitoring well
- Monitoring well (destroyed 2/1/90)
- ( ) Ground water elevation in feet above Mean Sea Level
- Direction of ground water flow
- Contours of ground water elevation

0 40 80

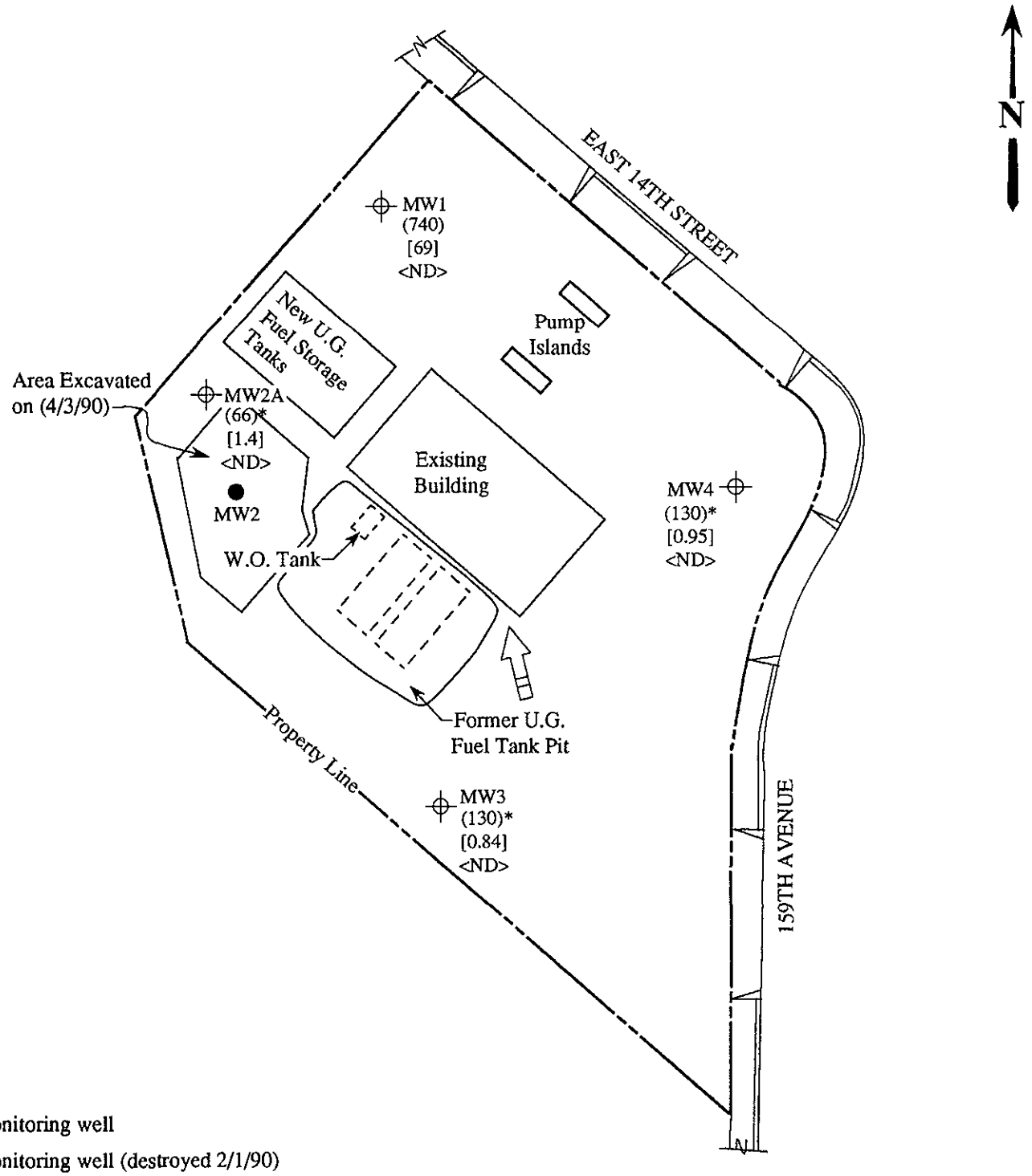
Approx. scale feet

POTENTIOMETRIC SURFACE MAP FOR THE JANUARY 29, 1993 MONITORING EVENT

KAPREALIAN ENGINEERING
INCORPORATED

UNOCAL SERVICE STATION #6277
15803 EAST 14TH STREET
SAN LEANDRO, CA

FIGURE
1



LEGEND

- Monitoring well
- Monitoring well (destroyed 2/1/90)
- ( ) Concentration of TPH as gasoline in ppb
- [ ] Concentration of benzene in ppb
- < > Concentration of TPH as diesel in ppb
- Direction of ground water flow

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

0 40 80

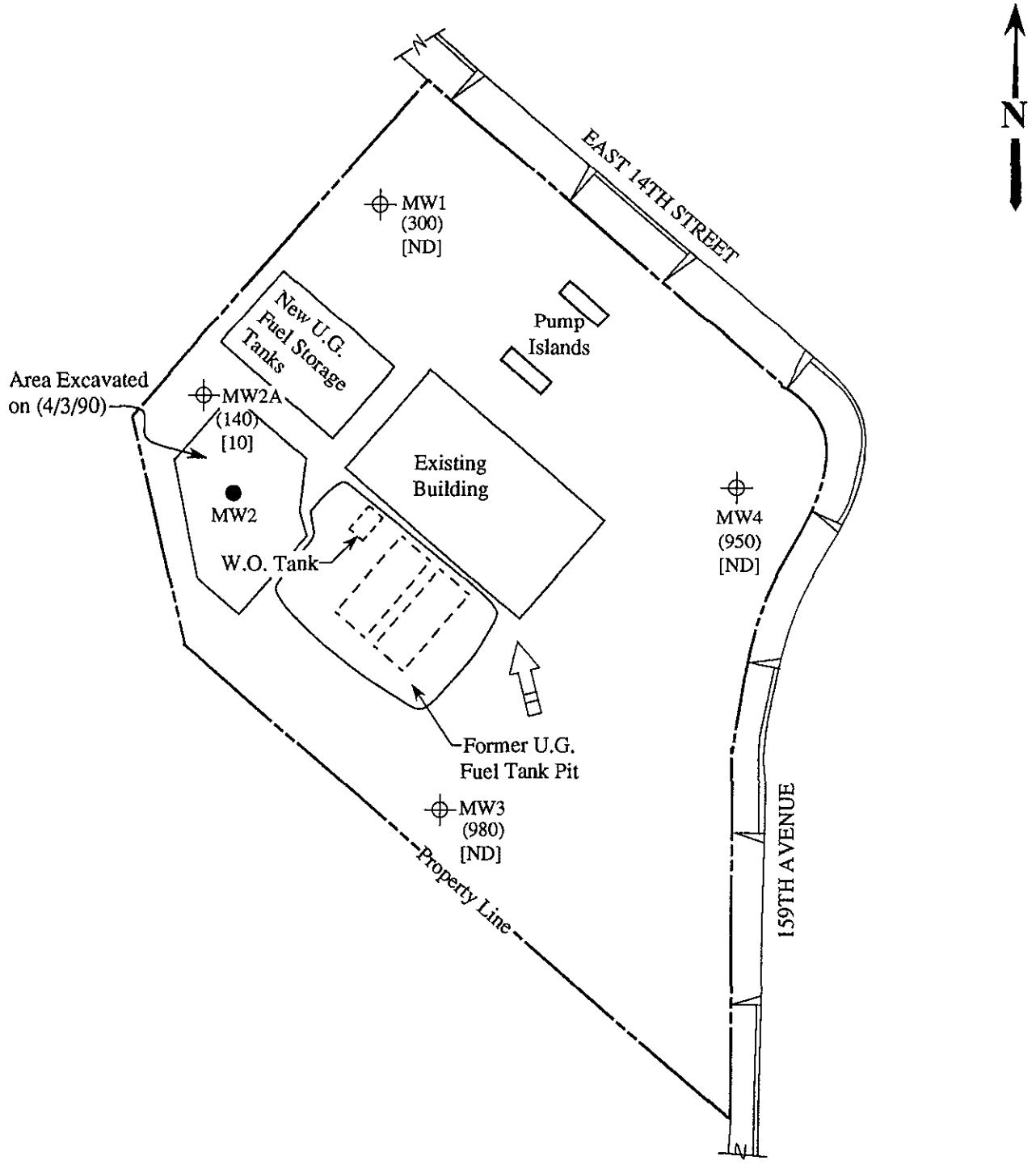
Approx. scale feet

PETROLEUM HYDROCARBON CONCENTRATIONS IN GROUND WATER ON JANUARY 29, 1993

KAPREALIAN ENGINEERING
INCORPORATED

UNOCAL SERVICE STATION #6277
15803 EAST 14TH STREET
SAN LEANDRO, CA

FIGURE
2



LEGEND

- Monitoring well
- Monitoring well (destroyed 2/1/90)
- ( ) Concentration of tetrachloroethene
- [ ] Concentration of trichloroethene
- Direction of ground water flow

0 40 80

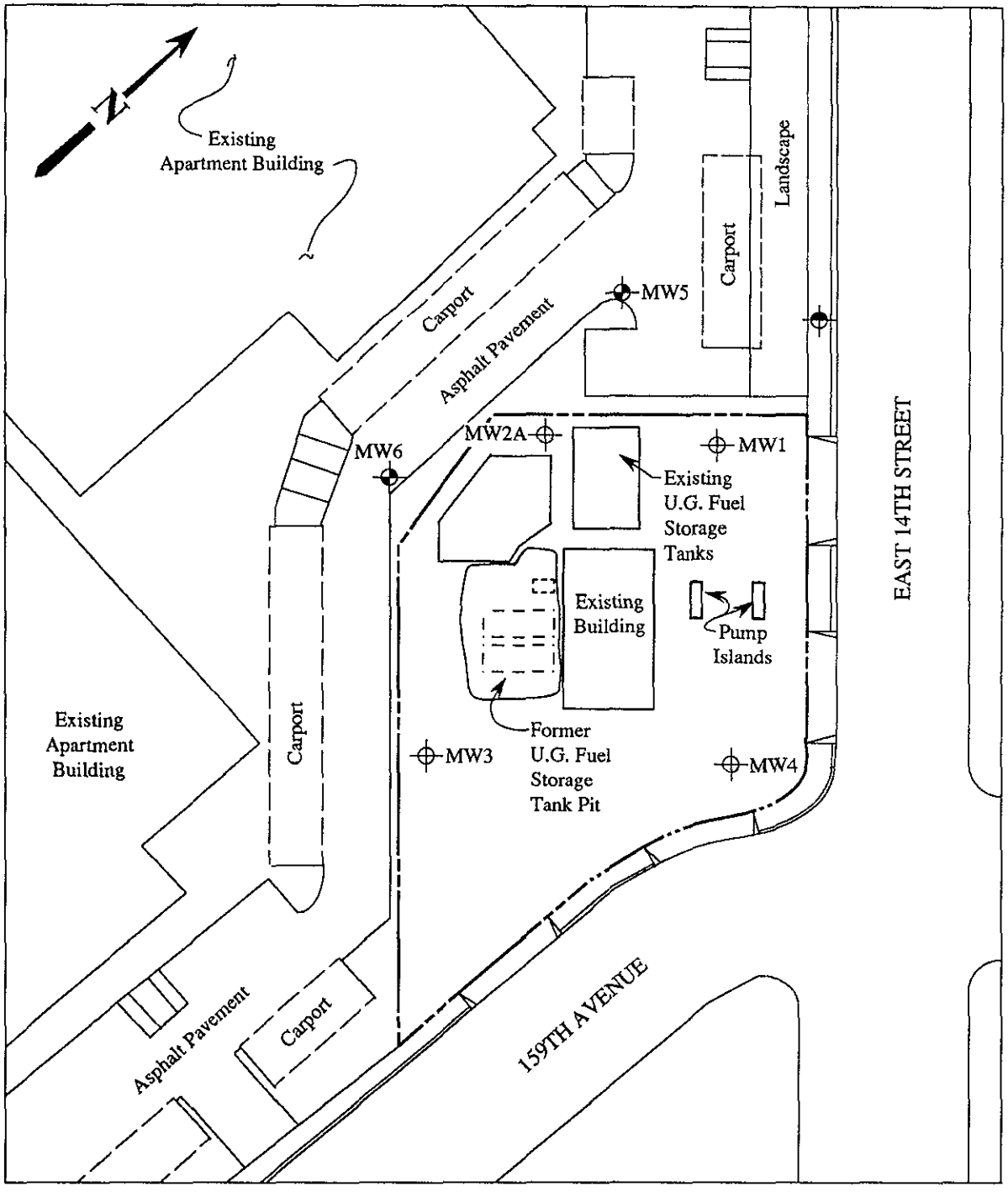
Approx. scale feet

CHLORINATED SOLVENT CONCENTRATIONS IN GROUND WATER ON JANUARY 29, 1993

KAPREALIAN ENGINEERING
INCORPORATED

UNOCAL SERVICE STATION #6277
15803 EAST 14TH STREET
SAN LEANDRO, CA

FIGURE
3



LEGEND

- Monitoring well
- Monitoring well (recently installed on March 9, 1993)
- Monitoring well (previously attempted)

0 60 120

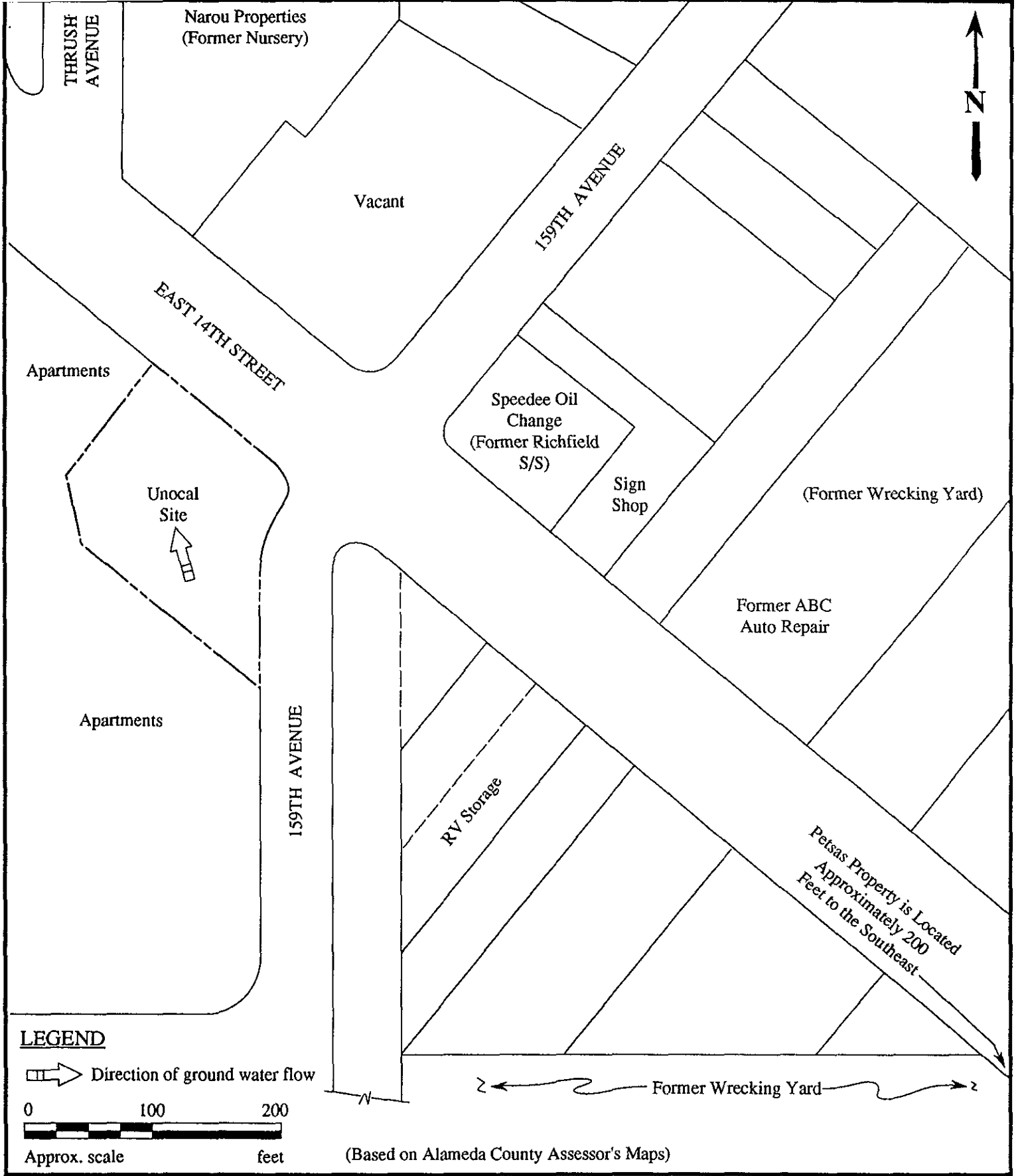
Approx. scale feet

PROPOSED MONITORING WELL LOCATION MAP

KAPREALIAN ENGINEERING
INCORPORATED

UNOCAL SERVICE STATION #6277
15803 E. 14TH STREET
SAN LEANDRO, CA

FIGURE
4



SITE VICINITY MAP

KAPREALIAN ENGINEERING
INCORPORATED

UNOCAL SERVICE STATION #6277
15803 EAST 14TH STREET
SAN LEANDRO, CALIFORNIA

FIGURE
5

SEQUOIA ANALYTICAL

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

Kaprealian Engineering, Inc.	Client Project ID:	Unocal, 15803 E. 14th St., San Leandro	Sampled:	Jan 29, 1993
2401 Stanwell Drive, Suite 400	Sample Matrix:	Water	Received:	Jan 29, 1993
Concord, CA 94520	Analysis Method:	EPA 5030/8015/8020	Reported:	Feb 11, 1993
Attention: Mardo Kaprealian, P.E.	First Sample #:	301-0796		

TOTAL PURGEABLE PETROLEUM HYDROCARBONS with BTEX DISTINCTION

Analyte	Reporting Limit µg/L	Sample I.D. 301-0796 MW-1^	Sample I.D. 301-0797 MW-2*	Sample I.D. 301-0798 MW-3*	Sample I.D. 301-0799 MW-4*	Sample I.D. Matrix Blank
Purgeable Hydrocarbons	50	740	66	130	130	
Benzene	0.5	69	1.4	0.84	0.95	
Toluene	0.5	N.D.	N.D.	N.D.	N.D.	
Ethyl Benzene	0.5	3.8	N.D.	N.D.	N.D.	
Total Xylenes	0.5	43	N.D.	N.D.	N.D.	
Chromatogram Pattern:		Gasoline and Discrete Peaks	Discrete Peaks	Discrete Peaks	Discrete Peaks	

Quality Control Data

Report Limit Multiplication Factor:	5.0	1.0	1.0	1.0	1.0
Date Analyzed:	2/4/93	2/1/93	2/1/93	2/1/93	2/1/93
Instrument Identification:	HP-5	HP-4	HP-4	HP-4	HP-4
Surrogate Recovery, %: (QC Limits = 70-130%)	108	106	101	100	103

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

Please Note:
* The above samples do not appear to contain gasoline. Purgeable Hydrocarbons are due mainly to EPA 8010 peaks.

^ In the above sample, "Discrete Peaks" refers to EPA 8010 peaks, and also, an unidentified peak in the MTBE range.

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Kapreallan Engineering, Inc.	Client Project ID:	Unocal, 15803 E. 14th St., San Leandro	Sampled:	Jan 29, 1993
2401 Stanwell Drive, Suite 400	Sample Matrix:	Water	Received:	Jan 29, 1993
Concord, CA 94520	Analysis Method:	EPA 3510/3520/8015	Reported:	Feb 11, 1993
Attention: Mardo Kapreallan, P.E.	First Sample #:	301-0796		

TOTAL EXTRACTABLE PETROLEUM HYDROCARBONS

Analyte	Reporting Limit µg/L	Sample I.D. 301-0796 MW-1	Sample I.D. 301-0797 MW-2	Sample I.D. 301-0798 MW-3	Sample I.D. 301-0799 MW-4	Sample I.D. Matrix Blank
Extractable Hydrocarbons	50	N.D.	N.D.	N.D.	N.D.	
Chromatogram Pattern:		--	--	--	--	

Quality Control Data

Report Limit Multiplication Factor:	1.0	1.0	1.0	1.0	1.0
Date Extracted:	2/4/93	2/4/93	2/4/93	2/4/93	2/4/93
Date Analyzed:	2/10/93	2/10/93	2/10/93	2/10/93	2/10/93
Instrument Identification:	HP-3A	HP-3A	HP-3A	HP-3A	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

Scott A. Chieffo
Project Manager

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Kapreallan Engineering, Inc.	Client Project ID:	Unocal, 15803 E. 14th St., San Leandro	Sampled:	Jan 29, 1993
2401 Stanwell Drive, Suite 400	Sample Descript:	Water, MW-1	Received:	Jan 29, 1993
Concord, CA 94520	Analysis Method:	EPA 5030/8010	Analyzed:	Feb 4, 1993
Attention: Mardo Kapreallan, P.E.	Lab Number:	301-0796	Reported:	Feb 11, 1993

HALOGENATED VOLATILE ORGANICS (EPA 8010)

Analyte	Detection Limit µg/L	Sample Results µg/L
Bromodichloromethane	50	N.D.
Bromoform	50	N.D.
Bromomethane	100	N.D.
Carbon tetrachloride	50	N.D.
Chlorobenzene	50	N.D.
Chloroethane	100	N.D.
2-Chloroethylvinyl ether	100	N.D.
Chloroform	50	N.D.
Chloromethane	100	N.D.
Dibromochloromethane	50	N.D.
1,3-Dichlorobenzene	50	N.D.
1,4-Dichlorobenzene	50	N.D.
1,2-Dichlorobenzene	50	N.D.
1,1-Dichloroethane	50	N.D.
1,2-Dichloroethane	50	N.D.
1,1-Dichloroethene	50	N.D.
cis-1,2-Dichloroethene	50	N.D.
trans-1,2-Dichloroethene	50	N.D.
1,2-Dichloropropane	50	N.D.
cis-1,3-Dichloropropene	50	N.D.
trans-1,3-Dichloropropene	50	N.D.
Methylene chloride	500	N.D.
1,1,2,2-Tetrachloroethane	50	N.D.
Tetrachloroethene	50	300
1,1,1-Trichloroethane	50	N.D.
1,1,2-Trichloroethane	50	N.D.
Trichloroethene	50	N.D.
Trichlorofluoromethane	50	N.D.
Vinyl chloride	100	N.D.

Analytes reported as N.D. were not present above the stated limit of detection. Because matrix effects and/or other factors required additional sample dilution, detection limits for this sample have been raised.

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Scott A. Chieffo
Project Manager

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Kaprealian Engineering, Inc.	Client Project ID:	Unocal, 15803 E. 14th St., San Leandro	Sampled:	Jan 29, 1993
2401 Stanwell Drive, Suite 400	Sample Descript:	Water, MW-2	Received:	Jan 29, 1993
Concord, CA 94520	Analysis Method:	EPA 5030/8010	Analyzed:	Feb 2, 1993
Attention: Mardo Kaprealian, P.E.	Lab Number:	301-0797	Reported:	Feb 11, 1993

HALOGENATED VOLATILE ORGANICS (EPA 8010)

Analyte	Detection Limit µg/L	Sample Results µg/L
Bromodichloromethane	10	N.D.
Bromoform	10	N.D.
Bromomethane	20	N.D.
Carbon tetrachloride	10	N.D.
Chlorobenzene	10	N.D.
Chloroethane	20	N.D.
2-Chloroethylvinyl ether	20	N.D.
Chloroform	10	N.D.
Chloromethane	20	N.D.
Dibromochloromethane	10	N.D.
1,3-Dichlorobenzene	10	N.D.
1,4-Dichlorobenzene	10	N.D.
1,2-Dichlorobenzene	10	N.D.
1,1-Dichloroethane	10	N.D.
1,2-Dichloroethane	10	N.D.
1,1-Dichloroethene	10	N.D.
cis-1,2-Dichloroethene	10	N.D.
trans-1,2-Dichloroethene	10	N.D.
1,2-Dichloropropane	10	N.D.
cis-1,3-Dichloropropene	10	N.D.
trans-1,3-Dichloropropene	10	N.D.
Methylene chloride	100	N.D.
1,1,2,2-Tetrachloroethane	10	N.D.
Tetrachloroethene	10	140
1,1,1-Trichloroethane	10	N.D.
1,1,2-Trichloroethane	10	N.D.
Trichloroethene	10	10
Trichlorofluoromethane	10	N.D.
Vinyl chloride	20	N.D.

Analytes reported as N.D. were not present above the stated limit of detection. Because matrix effects and/or other factors required additional sample dilution, detection limits for this sample have been raised.

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Scott A. Chieffo
Project Manager

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Kapreallan Engineering, Inc.	Client Project ID:	Unocal, 15803 E. 14th St., San Leandro	Sampled:	Jan 29, 1993
2401 Stanwell Drive, Suite 400	Sample Descript:	Water, MW-3	Received:	Jan 29, 1993
Concord, CA 94520	Analysis Method:	EPA 5030/8010	Analyzed:	Feb 4, 1993
Attention: Mardo Kapreallan, P.E.	Lab Number:	301-0798	Reported:	Feb 11, 1993

HALOGENATED VOLATILE ORGANICS (EPA 8010)

Analyte	Detection Limit µg/L	Sample Results µg/L
Bromodichloromethane	50	N.D.
Bromoform	50	N.D.
Bromomethane	100	N.D.
Carbon tetrachloride	50	N.D.
Chlorobenzene	50	N.D.
Chloroethane	100	N.D.
2-Chloroethylvinyl ether	100	N.D.
Chloroform	50	N.D.
Chloromethane	100	N.D.
Dibromochloromethane	50	N.D.
1,3-Dichlorobenzene	50	N.D.
1,4-Dichlorobenzene	50	N.D.
1,2-Dichlorobenzene	50	N.D.
1,1-Dichloroethane	50	N.D.
1,2-Dichloroethane	50	N.D.
1,1-Dichloroethene	50	N.D.
cis-1,2-Dichloroethene	50	N.D.
trans-1,2-Dichloroethene	50	N.D.
1,2-Dichloropropane	50	N.D.
cis-1,3-Dichloropropene	50	N.D.
trans-1,3-Dichloropropene	50	N.D.
Methylene chloride	500	N.D.
1,1,2,2-Tetrachloroethane	50	N.D.
Tetrachloroethene	50	980
1,1,1-Trichloroethane	50	N.D.
1,1,2-Trichloroethane	50	N.D.
Trichloroethene	50	N.D.
Trichlorofluoromethane	50	N.D.
Vinyl chloride	100	N.D.

Analytes reported as N.D. were not present above the stated limit of detection. Because matrix effects and/or other factors required additional sample dilution, detection limits for this sample have been raised.

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Scott A. Chieffo
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Kaprealian Engineering, Inc.	Client Project ID:	Unocal, 15803 E. 14th St., San Leandro	Sampled:	Jan 29, 1993
2401 Stanwell Drive, Suite 400	Sample Descript:	Water, MW-4	Received:	Jan 29, 1993
Concord, CA 94520	Analysis Method:	EPA 5030/8010	Analyzed:	Feb 4, 1993
Attention: Mardo Kaprealian, P.E.	Lab Number:	301-0799	Reported:	Feb 11, 1993

HALOGENATED VOLATILE ORGANICS (EPA 8010)

Analyte	Detection Limit µg/L	Sample Results µg/L
Bromodichloromethane	50	N.D.
Bromoform	50	N.D.
Bromomethane	100	N.D.
Carbon tetrachloride	50	N.D.
Chlorobenzene	50	N.D.
Chloroethane	100	N.D.
2-Chloroethylvinyl ether	100	N.D.
Chloroform	50	N.D.
Chloromethane	100	N.D.
Dibromochloromethane	50	N.D.
1,3-Dichlorobenzene	50	N.D.
1,4-Dichlorobenzene	50	N.D.
1,2-Dichlorobenzene	50	N.D.
1,1-Dichloroethane	50	N.D.
1,2-Dichloroethane	50	N.D.
1,1-Dichloroethene	50	N.D.
cis-1,2-Dichloroethene	50	N.D.
trans-1,2-Dichloroethene	50	N.D.
1,2-Dichloropropane	50	N.D.
cis-1,3-Dichloropropene	50	N.D.
trans-1,3-Dichloropropene	50	N.D.
Methylene chloride	500	N.D.
1,1,2,2-Tetrachloroethane	50	N.D.
Tetrachloroethene	**50**	**950**
1,1,1-Trichloroethane	50	N.D.
1,1,2-Trichloroethane	50	N.D.
Trichloroethene	50	N.D.
Trichlorofluoromethane	50	N.D.
Vinyl chloride	100	N.D.

Analytes reported as N.D. were not present above the stated limit of detection. Because matrix effects and/or other factors required additional sample dilution, detection limits for this sample have been raised.

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

Client Project ID: Unocal, 15803 E. 14th St., San Leandro
QC Sample Group: 3010796-799
Reported: Feb 11, 1993

QUALITY CONTROL DATA REPORT

ANALYTE	Benzene	Toluene	Ethyl-Benzene	Xylenes	Diesel
Method:	EPA 8015/8020	EPA 8015/8020	EPA 8015/8020	EPA 8015/8020	EPA8015
Analyst:	A.T.	A.T.	A.T.	A.T.	K.Wimer
Reporting Units:	µg/L	µg/L	µg/L	µg/L	µg/L
Date Analyzed:	Feb 1, 1993	Feb 1, 1993	Feb 1, 1993	Feb 1, 1993	Feb 10, 1993
QC Sample #:	301-0696	301-0696	301-0696	301-0696	Matrix Blank
Sample Conc.:	N.D.	N.D.	N.D.	N.D.	N.D.
Spike Conc. Added:	20	20	20	60	300
Conc. Matrix Spike:	20	21	21	72	254
Matrix Spike % Recovery:	100	105	105	120	85
Conc. Matrix Spike Dup.:	21	21	22	74	249
Matrix Spike Duplicate % Recovery:	105	105	110	123	83
Relative % Difference:	4.8	0.0	4.6	2.7	2.0

Quality Assurance Statement: All standard operating procedures and quality control requirements have been met.
Laboratory Blank contained the following analytes: None detected.

SEQUOIA ANALYTICAL

Scott A. Chieffo
Project Manager

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

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

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

Client Project ID: Unocal, 15803 E. 14th St., San Leandro
QC Sample Group: 3010796-799
Reported: Feb 11, 1993

QUALITY CONTROL DATA REPORT

ANALYTE	1,1-Dichloroethene	Trichloro-ethene	Chloro-benzene
Method:	EPA 8010	EPA 8010	EPA 8010
Analyst:	K.Nill	K.Nill	K.Nill
Reporting Units:	µg/L	µg/L	µg/L
Date Analyzed:	Feb 2, 1993	Feb 2, 1993	Feb 2, 1993
QC Sample #:	Matrix Blank	Matrix Blank	Matrix Blank
Sample Conc.:	N.D.	N.D.	N.D.
Spike Conc. Added:	10	10	10
Conc. Matrix Spike:	11	10	11
Matrix Spike % Recovery:	110	100	110
Conc. Matrix Spike Dup.:	9.8	9.5	9.7
Matrix Spike Duplicate % Recovery:	98	95	97
Relative % Difference:	1.2	5.1	13

Quality Assurance Statement: All standard operating procedures and quality control requirements have been met.
Laboratory Blank contained the following analytes: None detected.

SEQUOIA ANALYTICAL

Scott A. Chieffo
Project Manager

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

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

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Kapreallan Engineering, Inc.
P.O. Box 996
Benicia, CA 94510
Attention: Mardo Kaprealian, P.E.

Client Project ID: Unocal, 15803 E. 14th St., San Leandro
QC Sample Group: 3010796-799
Reported: Feb 11, 1993

QUALITY CONTROL DATA REPORT

SURROGATE

Method:	EPA 8015	EPA 8015	EPA 8015	EPA 8015	EPA 8015
Analyst:	Son Le	Son Le	Son Le	Son Le	Son Le
Reporting Units:	µg/L	µg/L	µg/L	µg/L	µg/L
Date Analyzed:	Feb 10, 1993	Feb 10, 1993	Feb 10, 1993	Feb 10, 1993	Feb 10, 1993
Sample #:	301-0796	301-0797	301-0798	301-0799	Matrix Blank
Surrogate % Recovery:	95	94	91	97	94

SEQUOIA ANALYTICAL

Scott A. Chieffo
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

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Kapreallan Engineering, Inc.
P.O. Box 996
Benicia, CA 94510
Attention: Mardo Kapreallan, P.E.

Client Project ID: Unocal, 15803 E. 14th St., San Leandro
QC Sample Group: 3010796-799
Reported: Feb 11, 1993

QUALITY CONTROL DATA REPORT

SURROGATE

Method:	EPA 8010	EPA 8010	EPA 8010	EPA 8010	EPA 8010
Analyst:	K. Nill	K. Nill	K. Nill	K. Nill	K. Nill
Reporting Units:	µg/L	µg/L	µg/L	µg/L	µg/L
Date Analyzed:	Feb 4, 1993	Feb 2, 1993	Feb 4, 1993	Feb 4, 1993	Feb 9, 1993
Sample #:	301-0796	301-0797	301-0798	301-0799	Matrix Blank
Surrogate #1 % Recovery:	100	95	97	82	89
Surrogate #2 % Recovery:	115	113	114	114	117

SEQUOIA ANALYTICAL

Scott A. Chieffo
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

KAPREALIAN ENGINEERING
INCORPORATED

CHAIN OF CUSTODY

SAMPLER: JOE

WITNESSING AGENCY:

SITE NAME & ADDRESS: Unocal / San Leandro
15803 E. 14th St.

ANALYSES REQUESTED: TPHG BTXE; 8010; TPHD

TURN AROUND TIME: Regular

SAMPLE ID NO.	DATE	TIME	SOIL	WATER	GRAB	COMP	NO. OF CONT.	SAMPLING LOCATION	TPHG BTXE	8010	TPHD
MW-1	1/29/93	12:10 p.m		✓	✓		5	MW	✓	✓	✓
MW-2	"			✓	✓		5	"	✓	✓	✓
MW-3	"			✓	✓		5	"	✓	✓	✓
MW-4	"	1:50 p.m		✓	✓		5	"	✓	✓	✓

REMARKS:
3010796AE
797AE
798AE
799AE

Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Joe Donlan	1-29-93 1525	
Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Relinquished by: (Signature)	Date/Time	Received by: (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? Y
2. Will samples remain refrigerated until analyzed? Y
3. Did any samples received for analysis have head space? NO
4. Were samples in appropriate containers and properly packaged? Y

SP — Signature; F.S. — Title; 1/29/93 — Date

2401 Stanwell Drive, Suite 400
Concord, California 94520
Tel: 510 602 5100 Fax: 510 687 0602