KAPREALIAN ENGINEERING, INC.
Consulting Engineers
P.O. BOX 996 • BENICIA, CA 94510
(707) 746-6915 • (707) 746-6916 • FAX: (707) 746-5581

January 9, 1992

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

RE: Unocal Service Station #7004
15599 Hesperian Boulevard
San Leandro, California 78

Gentlemen:

Per the request of Mr. Bob Boust of Unocal Corporation, enclosed please find our report dated November 22, 1991, for the above referenced site.

If you have any questions, please call our office at (707) 746-6915.

Sincerely,

Kaprealian Engineering, Inc.

Judy A. Dewey

jad\82

Enclosure

cc: Bob Boust, Unocal Corporation

KAPREALIAN ENGINEERING, INC.
Consulting Engineers
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KEI-P90-1003.QR1
November 22, 1991

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

Attention: Mr. Rick Sisk

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

Dear Mr. Sisk:

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. The wells are currently monitored on a monthly basis and sampled on a quarterly basis. This report covers the work performed by KEI from August through October, 1991.

SITE DESCRIPTION AND BACKGROUND

The subject site is presently used as a self-service gasoline station, and is located adjacent to a Kragen Auto Parts store. The site is situated on gently sloping, southwest trending topography, and is located approximately 700 to 800 feet northeast of San Lorenzo Creek, and 2.1 miles northeast of the present shoreline of San Francisco Bay. A former Chevron service station is located approximately 450 feet north-northeast from the Unocal site, at the intersection of Sycamore Street and Hesperian Boulevard. A Location Map and Site Plans are attached to this report.

KEI's initial field work was conducted on October 12, 1990, when three underground storage tanks were removed from the site. The tanks consisted of one 12,000 gallon super unleaded gasoline storage tank and two 12,000 gallon regular unleaded gasoline storage tanks. The tanks were made of steel, and no apparent holes or cracks were observed in any of the tanks.

Nine soil samples, labeled A1, A2, A3, B1, B2, B3, C1, C2, and C3, were collected from beneath the fuel tanks at depths of approximately 14 to 15 feet below grade. Sample point locations are as shown on the attached Site Plan, Figure 2.

In an attempt to remove as much of the contaminated soil as possible, KEI returned to the site on October 19, 1990, in order to observe additional soil excavation in the fuel tank pit. Soil was excavated from a depth below grade of 15 feet to a depth of 19 feet. Water was encountered in the fuel tank pit at a depth of approximately 18.5 feet below grade, thus prohibiting the collection of any additional soil samples from the bottom of the fuel tank pit. Four soil samples, labeled SW1 through SW4, were collected from trenches that were excavated near the sidewalls of the fuel tank pit. Each sample was collected at approximately six inches above the observed water table, and at lateral distances of 2, 4, 17, and 4 feet, respectively, from the original tank pit sidewalls. Sample point locations are as shown on the attached Site Plan, Figure 2.

KEI returned to the site on October 22, 1990, in order to complete the fuel tank pit sidewall sampling. One soil sample, labeled SW5, was collected from the south sidewall at a depth of about 18 feet below grade. Due to obvious contamination observed in the area of sample point SW5, one additional soil sample, labeled SW5(20), was collected from a trench that was excavated to a depth of 18 feet below grade, and to a lateral distance of 20 feet from the original tank pit south sidewall.

After soil sampling was completed, the entire fuel tank pit was excavated 4 feet laterally and to a depth of approximately 19 feet below grade. Following soil excavation, approximately 5,000 gallons of ground water were pumped from the fuel tank pit. On October 24, 1990, one water sample, labeled W1, was collected from the fuel tank pit.

KEI returned to the site on October 31, 1990, in order to collect soil samples from the product pipe trenches. Four samples, labeled P1 through P4, were collected from the pipe trenches at depths ranging from 2.5 to 3 feet below grade. After additional excavation in the area of sample point P2, one soil sample, labeled P2(7.5), was collected directly beneath sample point P2 at a depth of 7.5 feet below grade. After the soil sampling was completed, the pipe trenches were excavated to the depth of the sample points.

After reviewing the laboratory analyses and in an attempt to remove as much of the contaminated soil as possible, KEI returned to the site on November 2, 1990, in order to observe additional soil excavation in the area of sample points P1 and P3. Additional soil samples, labeled P1(8) and P3(5.5), were collected at depths of 8 and 5.5 feet below grade, respectively, beneath the initial sample points. Sample point locations are shown on the attached Site Plan, Figure 2.

All samples were analyzed by Sequoia Analytical Laboratory in Concord, California. All soil and water samples were analyzed for total petroleum hydrocarbons (TPH) as gasoline, and benzene, toluene, xylenes, and ethylbenzene (BTX&E).

Analytical results of the soil samples collected from beneath the fuel tanks indicated levels of TPH as gasoline ranging from 180 ppm to 1,900 ppm, and levels of benzene ranging from 0.64 ppm to 9.7 ppm. Samples collected from the fuel tank pit sidewalls showed levels of TPH as gasoline ranging from non-detectable to 4.5 ppm, except for sample SW5, which showed 998 ppm of TPH as gasoline. However, the additional sample SW5(20), collected at a depth of 18 feet below grade and at a lateral distance of 16 feet from sample SW5, indicated 30 ppm of TPH as gasoline.

Analytical results of the soil samples (P1 through P4) collected from the pipe trenches indicated levels of TPH as gasoline at 1,400 ppm, 3,900 ppm, 100 ppm, and 19 ppm, respectively. However, after additional excavation, the levels of TPH as gasoline in samples P1(8), P2(7.5), and P3(5.5), collected beneath the samples P1, P2, and P3, respectively, were detected at 5.7 ppm, 20 ppm, and 9.8 ppm, respectively. Results of the soil analyses are summarized in Table 4.

Analytical results of the water sample (W1) collected from the fuel tank pit indicated 4,300 ppb of TPH as gasoline and 40 ppb of benzene. The results of the water analyses are summarized in Table 5.

Documentation of the tank and piping removal procedures, sampling techniques, and analytical results of the soil and ground water samples collected from the tank excavation are summarized in KEI's report (KEI-J90-1003.R1) dated November 26, 1990. To comply with the requirements of the regulatory agencies and based on the analytical results, KEI proposed the installation of three monitoring wells.

On April 22, 1991, three two-inch diameter monitoring wells (designated as MW1, MW2, and MW3 on the attached Site Plan, Figure 1) were installed at the site. The monitoring wells were each drilled and completed to total depths of 25 feet below grade. Ground water was encountered at depths ranging from 16.5 to 18 feet beneath the surface during drilling. The surface of each well cover was surveyed by Kier & Wright of Pleasanton, California, to Mean Sea Level (MSL) and to a vertical accuracy of 0.01 feet. The wells were developed on April 23, 1991, and were initially sampled on May 4, 1991.

Water and selected soil samples collected from MW1, MW2, and MW3 were analyzed at Sequoia Analytical Laboratory in Concord, California, for TPH as gasoline and BTX&E.

Analytical results of the soil samples collected from the borings for monitoring wells MW1, MW2, and MW3 indicated levels of TPH as gasoline and benzene ranging from non-detectable to 6.8 ppm, and non-detectable to 0.025 ppm, respectively, except for samples MW3(15) and MW3(17.5) collected from depths of 15 feet and 17.5 feet below grade, respectively, which showed TPH as gasoline levels of 4,800 ppm and 1,000 ppm, and benzene levels of 23 ppm and 8.4 ppm, respectively.

Analytical results of the ground water samples collected from monitoring wells MW1 and MW2 indicated non-detectable levels of TPH as gasoline and BTX&E. In well MW3, TPH as gasoline was detected at 34,000 ppb and benzene was detected at 6,100 ppb. Results of the soil analyses are summarized in Table 3, and results of the water analyses are summarized in Table 2.

Based on the results of the preliminary investigation, KEI proposed the installation of three additional monitoring wells. Documentation of the initial well installation protocol, sampling techniques, and analytical results of the preliminary ground water investigation are presented in KEI's report (KEI-P90-1003.R4) dated May 31, 1991.

On July 2, 1991, three additional two-inch diameter monitoring wells (designated as MW4, MW5, and MW6 on the attached Site Plan, Figure 1) were installed at the site. The three wells were each drilled and completed to total depths of 26 feet below grade. Ground water was encountered at depths ranging from 17.5 to 20.5 feet beneath the surface during drilling. The surface of each well cover was surveyed by Kier & Wright of Pleasanton, California, to MSL and to a vertical accuracy of 0.01 feet. The new wells (MW4, MW5, and MW6) were developed on July 15, 1991, and all of the wells were sampled on July 23, 1991.

Water samples from all wells, and selected soil samples collected from the borings of MW4, MW5, and MW6, were analyzed at Sequoia Analytical Laboratory in Concord, California. Soil and water samples were analyzed for TPH as gasoline and BTX&E.

Analytical results of the soil samples collected from the borings for monitoring wells MW4, MW5, and MW6 indicated non-detectable levels of TPH as gasoline and benzene in all analyzed samples.

Analytical results of the water samples collected from monitoring wells MW1, MW2, MW4, and MW6 indicated non-detectable levels of TPH as gasoline and BTX&E. In wells MW3 and MW5, levels of TPH as gasoline were detected at concentrations of 17,000 ppb and 260 ppb, respectively, and levels of benzene were detected at concentrations of 5,500 ppb and 1.2 ppb, respectively. Results of the soil analyses are summarized in Table 3, and the results of the water analyses are summarized in Table 2.

Based on the analytical results, KEI recommended the continuation of the monthly monitoring and quarterly sampling program, as well as monthly purging of well MW3 in an attempt to reduce the levels of contamination detected in the vicinity of this well. Documentation of the well installation procedures, sample collection techniques, and analytical results are presented in KEI's report (KEI-P90-1003.R5) dated August 16, 1991.

RECENT FIELD ACTIVITIES

The six wells (MW1 through MW6) were monitored three times and sampled once during the quarter. During monitoring, the wells were checked for depth to water and presence of free product. In addition, during sampling on October 14, 1991, the wells were also checked for the presence of sheen. **No free product or sheen was noted in any of the wells during the quarter.** Monitoring data is summarized in Table 1.

All wells were sampled on October 14, 1991. Prior to sampling, monitoring data were collected, the wells were each purged of between 7.5 and 10 gallons, and water samples were then collected by the use of a clean Teflon bailer. The samples were decanted into clean glass VOA vials, which were then sealed with Teflon-lined screw caps, labeled, and stored in a cooler, on ice, until delivery to a State certified laboratory.

ANALYTICAL RESULTS

Water samples from all wells were analyzed at Sequoia Analytical Laboratory in Concord, California. All samples analyzed were accompanied by properly executed Chain of Custody documentation. The samples were analyzed for TPH as gasoline by EPA method 5030 in conjunction with modified 8015, and BTX&E by EPA method 8020.

Analytical results of the water samples collected from monitoring wells MW1, MW2, MW4, and MW6 indicated non-detectable levels of TPH as gasoline and BTX&E. **In wells MW3 and MW5, levels of TPH as gasoline were detected at concentrations of 25,000 ppb and 140 ppb, respectively, and benzene levels were detected at concentrations of**

6,300 ppb and 0.72 ppb, respectively. Results of the water analyses are summarized in Table 2. Concentrations of TPH as gasoline and benzene that were detected in ground water samples collected on October 14, 1991, are shown on the attached Site Plan, Figure 1c. Copies of the laboratory analyses and Chain of Custody documentation are attached to this report.

HYDROLOGY AND GEOLOGY

Based on the water level data gathered during the quarter, the ground water flow direction appeared to be consistently toward the southwest, with an average hydraulic gradient of approximately 0.002, which is relatively unchanged from the previous quarter. Water levels have steadily decreased during the quarter, showing a net decrease in all wells ranging from 0.96 to 1.01 feet since July 23, 1991. The measured depth to ground water at the site on October 14, 1991, ranged between 16.37 and 18.05 feet below grade. Ground water table contours and flow direction for the three monitoring events are shown on the attached Site Plans, Figures 1, 1a and 1b.

Based on review of regional geologic maps (U.S. Geological Survey Professional Paper 943 "Flatland Deposits of the San Francisco Bay Region, California - Their Geology and Engineering Properties and their Importance to Comprehensive Planning," by E.J. Helley and K.R. Lajoie, 1979), the subject site is underlain by Holocene Coarse-grained Alluvium (Qhac). The coarse-grained alluvium is described as typically consisting of unconsolidated, moderately sorted, permeable sand and silt, with a thickness ranging from less than 10 feet to as much as 50 feet.

The results of our previous subsurface study (the installation of monitoring wells MW1, MW2, and MW3) indicated that these wells are underlain by artificial fill materials to depths below grade of 1.5 to about 3.5 feet. The fill materials are inturn underlain predominantly be silty clay and clayey silt materials to the maximum depth drilled (25 feet below grade). However, two distinct sand lenses (varying from about 2.5 to 3.75 feet in thickness) were encountered. The upper sand lens was encountered at depths below grade of about 10 to 13.25 feet at MW2, and about 8.25 to 12 feet at MW1, but was not encountered at MW3. The deeper and generally saturated clayey sand lens was encountered at depths below grade of about 17.5 to 20 feet at MW3, and at about 16.5 to 19.75 feet at MW2. This deeper saturated clayey sand lens was not observed at MW1; however, the interval below 16.5 to 20 feet below grade was not sampled, and it is inferred that this deeper clayey sand lens may be present at MW1, representing the upper aquifer at the subject site.

The results of our recent subsurface study (the installation of monitoring wells MW4, MW5, and MW6) indicate that these wells are directly underlain by fill materials that extend to depths below grade of about 2 to 3.5 feet. The fill materials are inturn underlain by clayey silt and/or silty clay materials to depths below grade of about 8 feet, which are inturn underlain by a 2 to 3 foot thick bed of well-graded sand, to depths below grade of about 10 to 11 feet; except at MW4, where the fill materials are underlain by silt to a depth of about 4 feet below grade, and silt with interbedded poorly graded sand lenses to a depth below grade of about 12 feet. The above soil materials are inturn underlain by clay and/or silt materials to depths below grade of about 20 to 20.5 feet. However, at MW4, a 1 foot thick lens of silty sand was encountered at a depth of about 17.5 to 18.5 feet below grade that was not observed in MW5 or MW6. This second clay and/or silt zone is inturn underlain by a more laterally consistent silty sand bed, which is about 2 to 3 feet thick and extends to depths below grade of about 22 to 23 feet. The silty sand bed is inturn underlain by a silty clay zone that extends to at least the maximum depth explored.

Cross Section A-A' illustrates subsurface conditions in the direction of ground water flow and in the vicinity of wells MW1, MW3, and MW5. The location of the section is shown on the attached Site Plan, Figure 1. Sandy intervals encountered in the construction of these wells (and shown on the attached Cross-Section) appear to be discontinuous across the site.

DISCUSSION AND RECOMMENDATIONS

Based on the analytical results 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 of the existing wells, per KEI's proposal (KEI-P90-1003.P2) dated May 31, 1991. **KEI also recommends the continuation of monthly purging of ground water from well MW3, in an attempt to reduce the level of contamination detected in the vicinity of this well.**

As shown on the attached Site Plan, Figure 1c, the extent of ground water contamination appears to be confined to the vicinity of wells MW3 and MW5, both located directly downgradient of the underground fuel tank pit.

KEI has reviewed a letter dated October 9, 1991, from the Alameda County Health Care Services Agency (County) to Unocal requesting development of "a viable remediation plan for this site." The County also requested the following: (1) monthly monitoring of

well MW3 for the presence of free product, (2) the monthly purging of wells exhibiting free product, (3) monthly ground water level measurements in each well, and contour maps generated, and (4) geologic cross sections. This report satisfies the above four requirements specified by the County.

With respect to a remediation plan, KEI recommends that water recovery tests be performed on wells MW3 and MW5 next quarter in order to determine recovery rates in the vicinity of these wells. Based on the results of the water recovery tests, a ground water recovery well, if appropriate, will be installed at the site. A pump test will then be performed using the recovery well. The results of the pump test will then be used to determine the location and number of additional recovery wells that may be necessary to achieve hydraulic gradient control of the contamination plume. Based on the above steps, a ground remediation system will then be designed and installed (after obtaining all required permits).

DISTRIBUTION

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

LIMITATIONS

Soil deposits and rock formations may vary in thickness, lithology, saturation, strength and other properties across any site. In addition, environmental changes, either naturally-occurring or artificially-induced, may cause changes in 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 this 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.

Should you have any questions regarding this report, please call me at (707) 746-6915.

Sincerely,

Kaprealian Engineering, Inc.

Thomas J. Berkins
Senior Environmental Engineer

Joel G. Greger
Certified Engineering Geologist

License No. 1633
Exp. Date 6/30/92

Timothy R. Ross
Project Manager

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Attachments: Tables 1 through 5
Location Map
Site Plans - Figures 1, 1a, 1b, 1c & 2
Cross-Section A-A'- Figure 3
U.S.C.S. Classification Chart
Laboratory Results
Chain of Custody documentation

KEI-P90-1003.QR1
November 22, 1991

TABLE 1

SUMMARY OF GROUND WATER MONITORING AND PURGING DATA

Well #	Ground Water Elevation (feet)	Depth to Water (feet)	Product Thickness	Sheen	Water Purged (gallons)
(Monitored and Sampled on October 14, 1991)					
MW1	19.63	17.26	0	No	7.5
MW2	19.67	17.68	0	No	7.5
MW3	19.51	17.71	0	No	9
MW4	19.44	16.37	0	No	10
MW5	19.38	17.63	0	No	8.5
MW6	19.50	18.05	0	No	7.5
(Monitored on September 6, 1991)					
MW1	20.06	16.83	0	--	0
MW2	20.10	17.25	0	--	0
MW3	19.94	17.28	0	--	48
MW4	19.88	15.93	0	--	0
MW5	19.81	17.20	0	--	0
MW6	19.91	17.64	0	--	0
(Monitored on August 21, 1991)					
MW1	21.28	15.61	0	--	0
MW2	20.31	17.04	0	--	0
MW3	20.16	17.06	0	--	42
MW4	20.09	15.72	0	--	0
MW5	20.03	16.98	0	--	0
MW6	20.12	17.43	0	--	0

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

-- Sheen determination not performed.

* Elevation of top of well covers surveyed to MSL by Kier & Wright of Pleasanton, California.

KEI-P90-1003.QR1
November 22, 1991

TABLE 2

SUMMARY OF LABORATORY ANALYSES
WATER

Date	Sample Number	TPH as Gasoline	Benzene	Toluene	Xylenes	Ethyl-benzene
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
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
Detection Limits		30	0.3	0.3	0.3	0.3

ND = Non-detectable.

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

KEI-P90-1003.QR1
November 22, 1991

TABLE 3

SUMMARY OF LABORATORY ANALYSES
SOIL

Date	Sample Number	Depth (feet)	TPH as Gasoline	Benzene	Toluene	Xylenes	Ethyl-benzene
4/22/91	MW1(5)	5.0	ND	ND	ND	0.012	ND
	MW1(10)	10.0	ND	ND	ND	ND	ND
	MW1(16)	16.0	1.5	ND	ND	ND	ND
	MW2(5)	5.0	4.5	0.015	ND	0.079	0.034
	MW2(10)	10.0	6.8	0.025	ND	0.043	0.035
	MW2(15.5)	15.5	ND	ND	ND	ND	ND
	MW2(17)	17.0	ND	0.014	ND	ND	ND
	MW3(5)	5.0	2.0	0.025	ND	0.011	ND
	MW3(10)	10.0	ND	0.018	ND	ND	ND
	MW3(15)	15.0	4,800	23	9.1	290	63
	MW3(17.5)	17.5	1,000	8.4	4.6	64	17
7/02/91	MW4(5)	5.0	ND	ND	0.0084	ND	ND
	MW4(10)	10.0	ND	ND	0.0051	ND	ND
	MW4(15)	15.0	ND	ND	0.016	0.017	ND
	MW4(17)	17.0	ND	ND	0.015	0.015	ND
	MW5(5)	5.0	ND	ND	0.030	ND	ND
	MW5(10)	10.0	ND	ND	0.0074	0.012	ND
	MW5(15)	15.0	ND	ND	0.011	0.0094	ND
	MW5(17.5)	17.5	ND	ND	0.0098	0.0077	0.0052
	MW6(5)	5.0	ND	ND	0.0086	ND	ND
	MW6(10)	10.0	ND	ND	0.0061	ND	ND
	MW6(15)	15.0	ND	ND	ND	ND	ND
	MW6(17.5)	17.5	ND	ND	0.0084	0.0063	ND
Detection Limits			1.0	0.0050	0.0050	0.0050	0.0050

ND = Non-detectable.

Results in parts per million (ppm), unless otherwise indicated.

KEI-P90-1003.QR1
November 22, 1991

TABLE 4

SUMMARY OF LABORATORY ANALYSES
SOIL

(Collected on October 12, 19, 22 & 31, and
November 2, 1990)

Sample	Depth (feet)	TPH as Gasoline	Benzene	Toluene	Xylenes	Ethylbenzene
A1	14.5	350	2.0	3.6	47	7.7
A2	14.5	480	2.4	7.3	49	7.4
A3	14.0	570	0.97	5.6	50	8.3
B1	15.0	180	0.64	0.84	11	3.0
B2	15.0	1,900	9.7	120	250	33
B3	15.0	990	6.3	52	120	16
C1	15.0	270	0.64	3.7	22	5.4
C2	15.0	1,200	4.9	41	150	24
C3	15.0	590	4.6	23	80	9.4
SW1	18.0	3.7	0.21	0.024	0.42	0.14
SW2	18.0	4.5	0.46	0.024	0.46	0.26
SW3	18.0	4.1	0.024	0.0080	0.088	0.058
SW4	18.0	ND	0.0090	ND	0.0070	ND
SW5	18.0	998	0.58	ND	21	19
SW5(20)	18.0	30	0.054	0.047	0.054	0.46
P1	2.5	1,400	0.22	3.3	72	8.9
P1(8)	8.0	5.7	0.0078	0.0054	0.18	0.033
P2	3.0	3,900	1.1	23	280	41
P2(7.5)	7.5	20	ND	0.11	1.3	0.12
P3	2.5	100	0.057	0.63	12	0.97
P3(5.5)	5.5	9.8	0.015	0.15	1.3	0.13
P4	2.5	19	ND	0.10	0.13	ND
Detection Limits		1.0	0.0050	0.0050	0.0050	0.0050

ND = Non-detectable.

Results in parts per million (ppm), unless otherwise indicated.

KEI-P90-1003.QR1
November 22, 1991

TABLE 5

SUMMARY OF LABORATORY ANALYSES
WATER

Date	Sample Number	TPH as Gasoline	Benzene	Toluene	Xylenes	Ethyl-benzene
10/24/90	W1	4,300	40	1.9	520	0.54
Detection Limits		30.0	0.3	0.3	0.3	0.3

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

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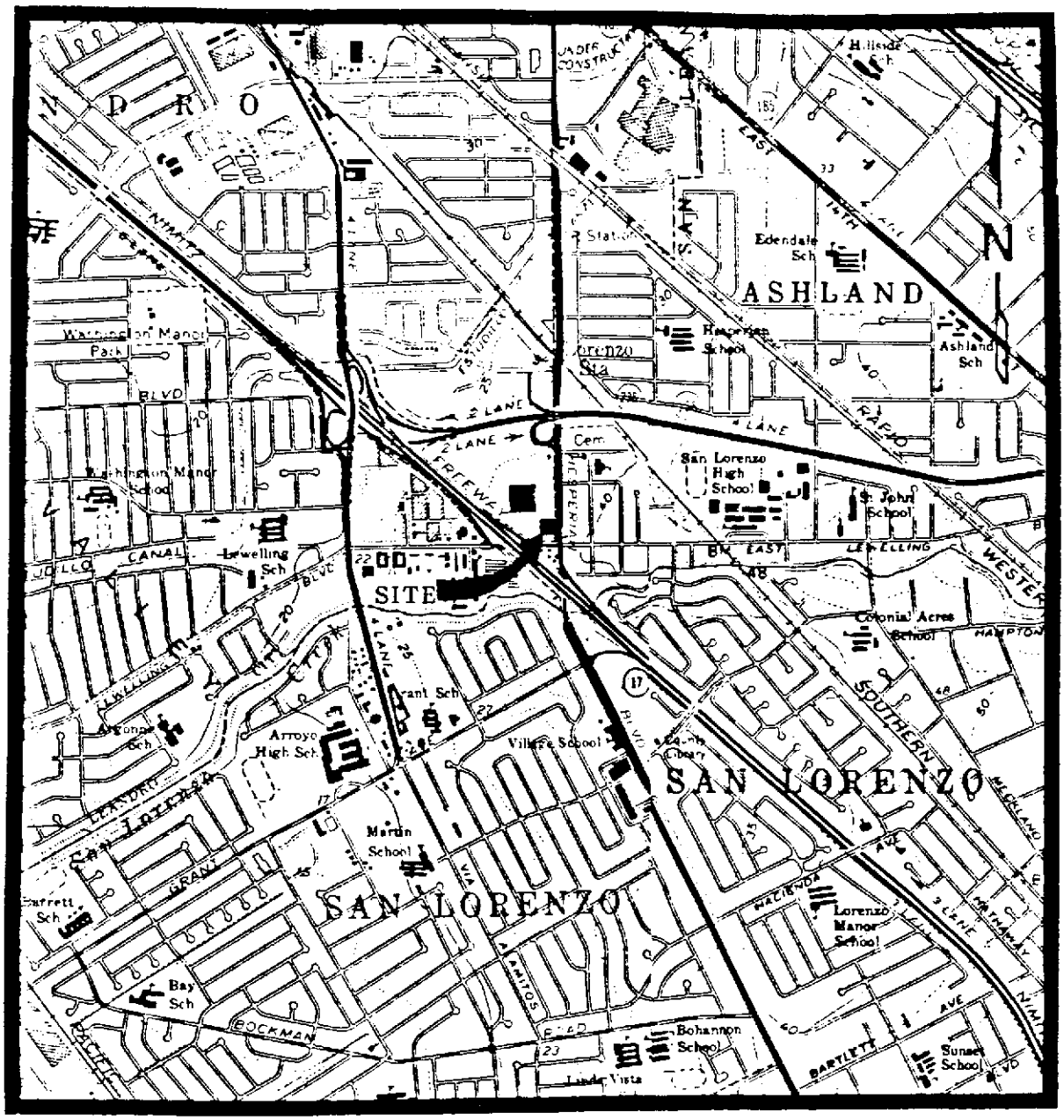

LOCATION MAP

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

Unocal S/S #7004
15599 Hesperian Boulevard
San Leandro, CA

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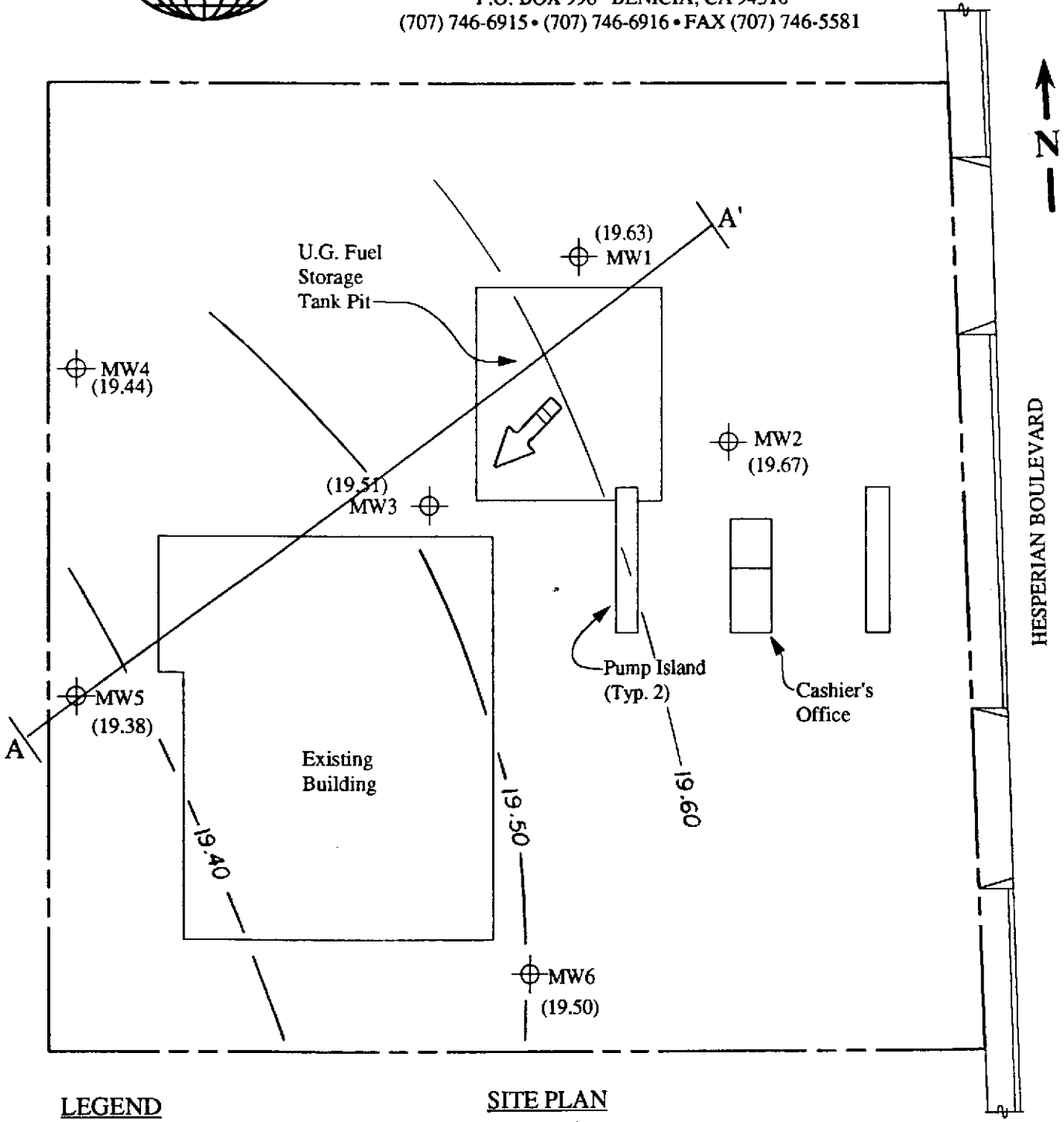

SITE PLAN

Figure 1

LEGEND

- Monitoring Well
- ( ) Ground water elevation in feet above Mean Sea Level on 10/14/91
- Direction of ground water flow
- Contours of ground water elevation
- A ⊢⊣ A' Location of Cross-Section A-A'

0 30 60

Approx. scale feet

Unocal Service Station #7004
15599 Hesperian Boulevard
San Leandro, CA

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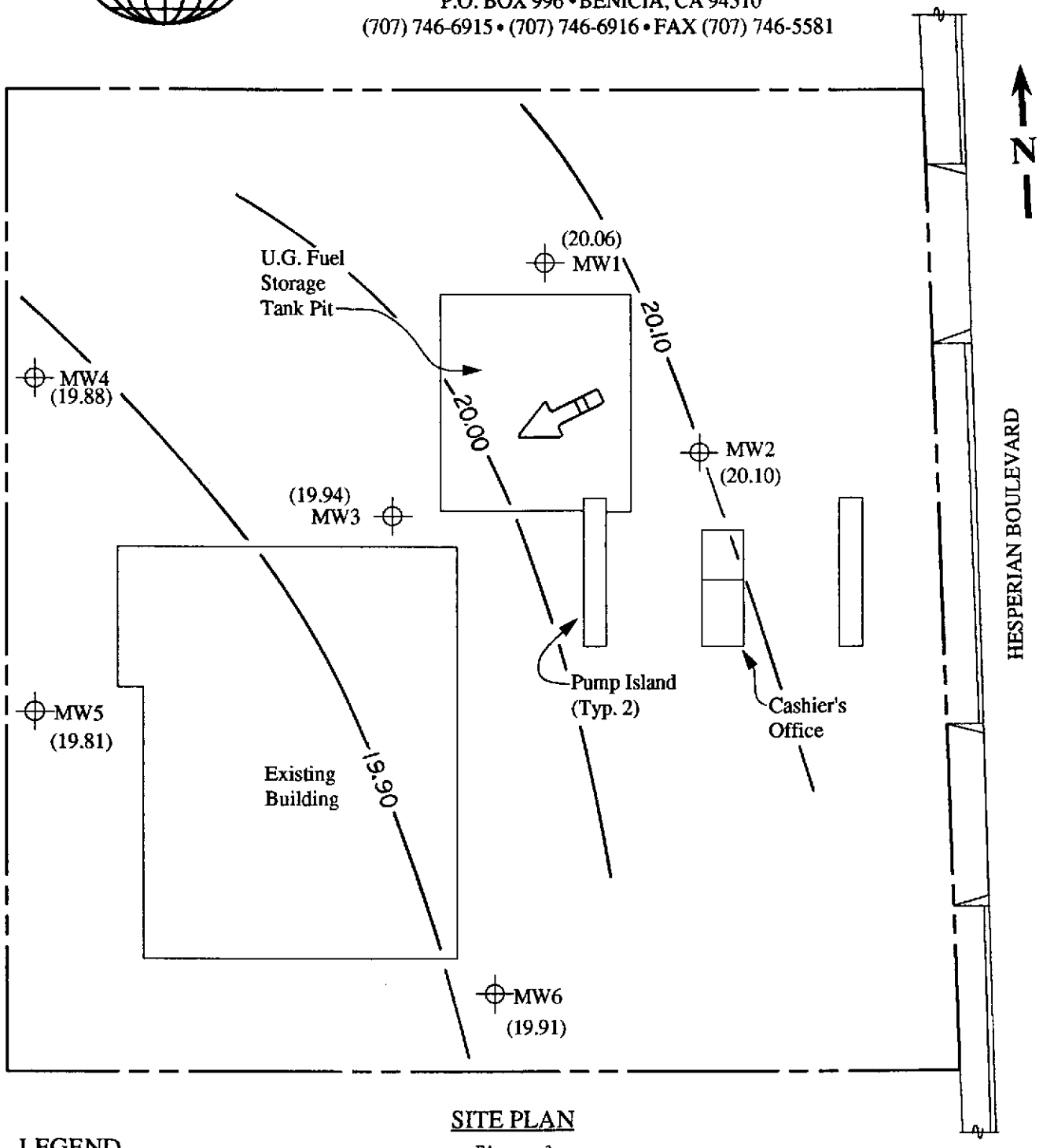

SITE PLAN

Figure 1a

LEGEND

- Monitoring Well
- ( ) Ground water elevation in feet above Mean Sea Level on 9/6/91
- Direction of ground water flow
- Contours of ground water elevation

0 30 60

Approx. scale feet

Unocal Service Station #7004
15599 Hesperian Boulevard
San Leandro, CA

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Consulting Engineers
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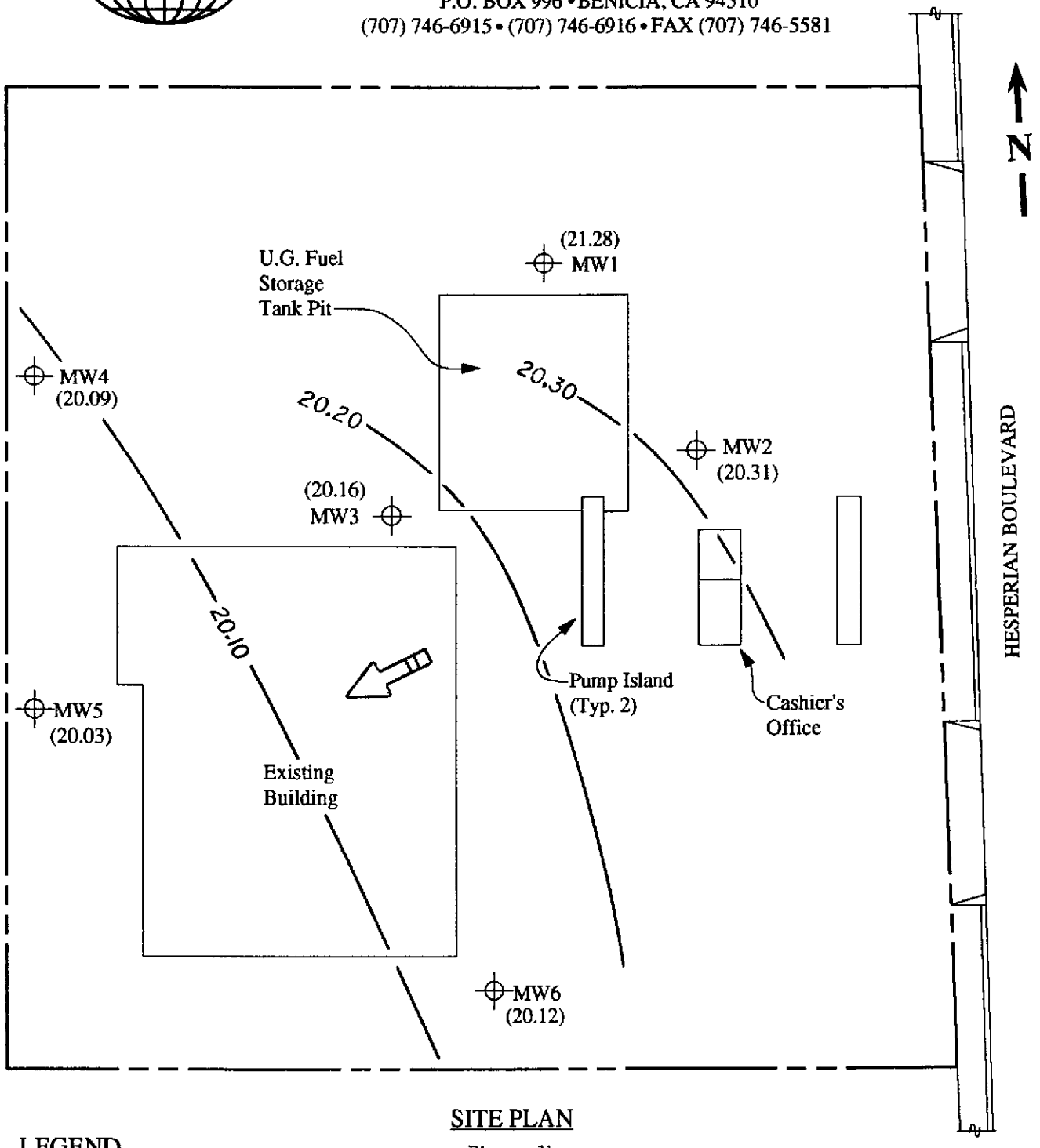

SITE PLAN

Figure 1b

LEGEND

- Monitoring Well
- ( ) Ground water elevation in feet above Mean Sea Level on 8/21/91
- Direction of ground water flow
- Contours of ground water elevation

0 30 60

Approx. scale feet

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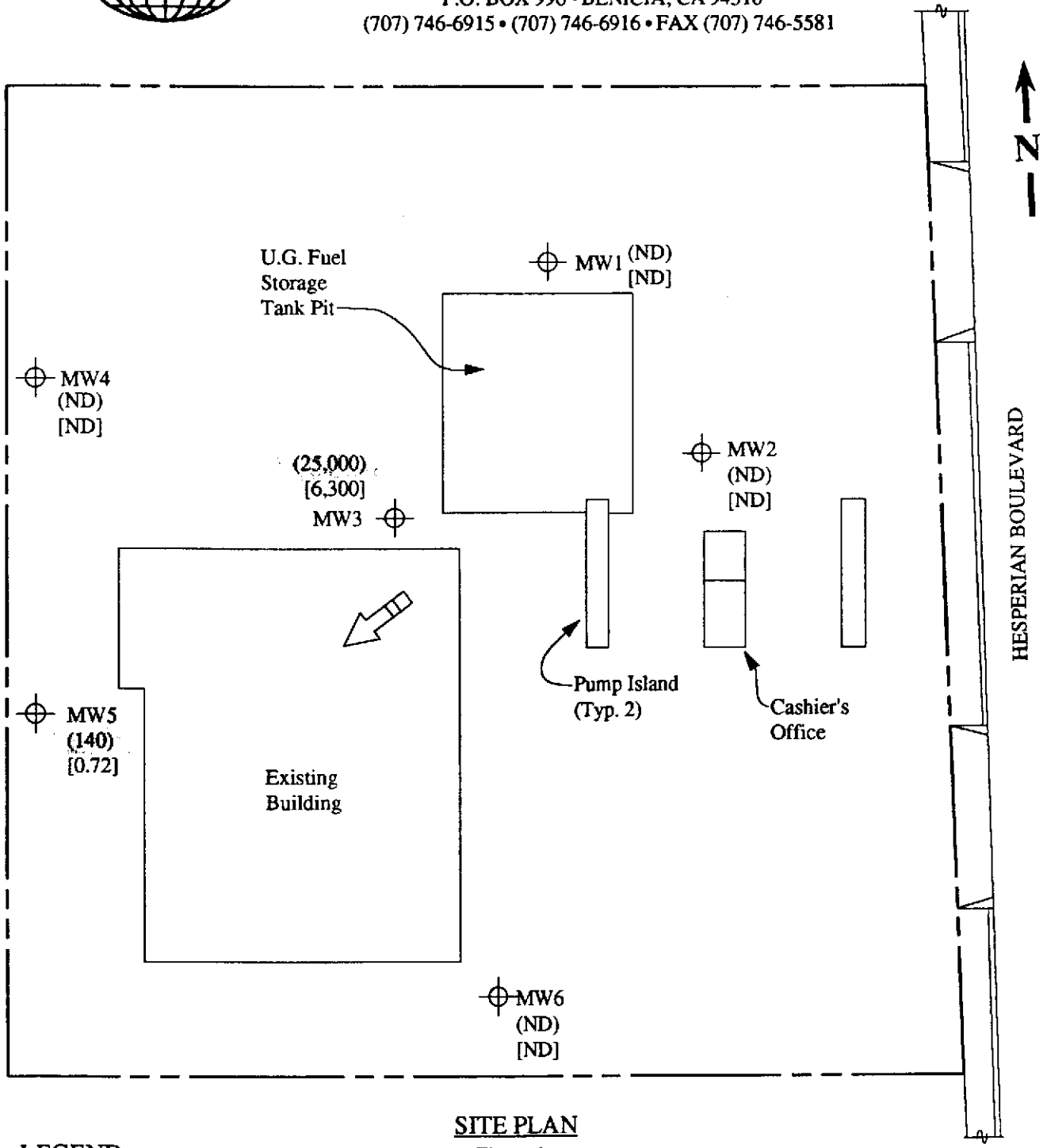

SITE PLAN
Figure 1c
(Samples Collected on 10/14/91)

LEGEND

- Monitoring Well
- ( ) Concentration of TPH as gasoline in ppb
- [ ] Concentration of benzene in ppb
- Direction of ground water flow

0 30 60
Approx. scale feet

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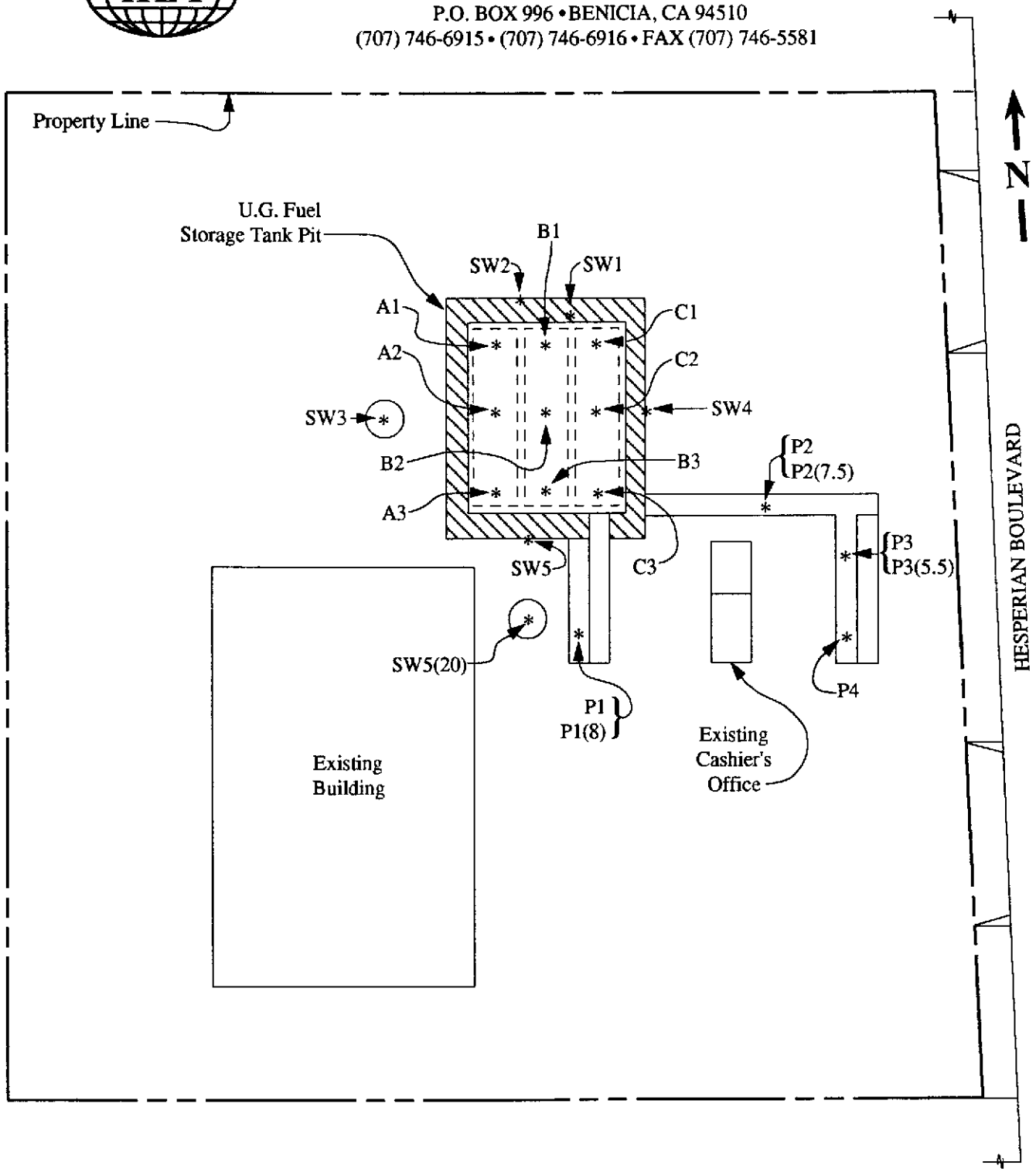

LEGEND

* Sample Point Location

Area of Additional Excavation

SITE PLAN

Figure 2

0 30 60

Approx. scale feet

Unocal Service Station #7004
15599 Hesperian Boulevard
San Leandro, CA

MAJOR DIVISIONS	SYMBOLS		TYPICAL SOIL DESCRIPTIONS
GRAVELS (More than 1/2 of coarse fraction > No. 4 sieve size)	GW		Well graded gravels or gravel - sand mixtures, little or no fines
	GP		Poorly graded gravels or gravel - sand mixtures, little or no fines
	GM		Silty gravels, gravel - sand - silt mixtures
	GC		Clayey gravels, gravel - sand - clay mixtures
SANDS (More than 1/2 of coarse fraction < No. 4 sieve size)	SW		Well graded sands or gravelly sands, little or no fines
	SP		Poorly graded sands or gravelly sands, little or no fines
	SM		Silty sands, sand - silt mixtures
	SC		Clayey sands, sand - clay mixtures
SILTS & CLAYS LL < 50	ML		Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity
	CL		Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays
	OL		Organic silts and organic silty clays of low plasticity
SILTS & CLAYS LL > 50	MH		Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts
	CH		Inorganic clays of high plasticity, fat clays
	OH		Organic clays of medium to high plasticity, organic silty clays, organic silts
HIGHLY ORGANIC SOILS	Pt		Peat and other highly organic soils
DUAL (TRANSITION) SOILS	CL/CH		Soil characterisitics are transitional between the soil classifications listed above
	ML/MH		
	CH/MH		
	CL/ML		
	SC/SP		
	SM/SP		
	GW/SW		
	GP/SP		
	GC/SP		
	GM/GP		

CLASSIFICATION CHART (Unified Soil Classification System)

SEQUOIA ANALYTICAL

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

Kaprealian Engineering, Inc.	Client Project ID:	Unocal, San Leandro, 15599 Hesperi	Sampled:	Oct 14, 1991
P.O. Box 996	Matrix Descript:	Water	Received:	Oct 14, 1991
Benicia, CA 94510	Analysis Method:	EPA 5030/8015/8020	Analyzed:	Oct 22, 1991
Attention: Mardo Kaprealian, P.E.	First Sample #:	110-0701	Reported:	Oct 28, 1991

TOTAL PETROLEUM FUEL HYDROCARBONS with BTEX DISTINCTION (EPA 8015/8020)

Sample Number	Sample Description	Low/Medium B.P. Hydrocarbons µg/L (ppb)	Benzene µg/L (ppb)	Toluene µg/L (ppb)	Ethyl Benzene µg/L (ppb)	Xylenes µg/L (ppb)
110-0701	MW1	N.D.	N.D.	N.D.	N.D.	N.D.
110-0702	MW2	N.D.	N.D.	N.D.	N.D.	N.D.
110-0703	MW3	25,000	6,300	78	2,000	1,400
110-0704	MW4	N.D.	N.D.	N.D.	N.D.	N.D.
110-0705	MW5	140	0.72	N.D.	1.3	0.89
110-0706	MW6	N.D.	N.D.	N.D.	N.D.	N.D.
Detection Limits:		**30**	**0.30**	**0.30**	**0.30**	**0.30**

Low to Medium Boiling Point Hydrocarbons are quantitated against a gasoline standard.
Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL

Belinda C. Vega
Laboratory Director

SEQUOIA ANALYTICAL

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

Client Project ID: Unocal, San Leandro, 15599 Hesperian
QC Sample Group: 1100701-6
Reported: Oct 28, 1991

QUALITY CONTROL DATA REPORT

ANALYTE	Benzene	Toluene	Ethyl-Benzene	Xylenes
Method:	EPA 8015/8020	EPA 8015/8020	EPA 8015/8020	EPA 8015/8020
Analyst:	R.H./J.F.	R.H./J.F.	R.H./J.F.	R.H./J.F.
Reporting Units:	ug/L	ug/L	ug/L	ug/L
Date Analyzed:	Oct 23, 1991	Oct 23, 1991	Oct 23, 1991	Oct 23, 1991
QC Sample #:	Matrix Blank	Matrix Blank	Matrix Blank	Matrix Blank
Sample Conc.:	N.D.	N.D.	N.D.	N.D.
Spike Conc. Added:	20	20	20	60
Conc. Matrix Spike:	24	21	17	68
Matrix Spike % Recovery:	120	105	85	113
Conc. Matrix Spike Dup.:	24	21	16	66
Matrix Spike Duplicate % Recovery:	120	105	80	110
Relative % Difference:	0	0	6.1	3

Laboratory blank contained the following analytes: None Detected

SEQUOIA ANALYTICAL

Belinda C. Vega
Laboratory Director

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

Client Project ID: Unocal, San Leandro, 15599 Hesperian
QC Sample Group: 1100701-6
Reported: Oct 28, 1991

QUALITY CONTROL DATA REPORT

SURROGATE

Method:	EPA 8015/8020	EPA 8015/8020	EPA 8015/8020	EPA 8015/8020	EPA 8015/8020	EPA 8015/8020	EPA 8015/8020
Analyst:	R.H./J.F.	R.H./J.F.	R.H./J.F.	R.H./J.F.	R.H./J.F.	R.H./J.F.	R.H./J.F.
Reporting Units:	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Date Analyzed:	Oct 23, 1991	Oct 23, 1991	Oct 23, 1991	Oct 23, 1991	Oct 23, 1991	Oct 23, 1991	Oct 23, 1991
Sample #:	110-0701	110-0702	110-0703	110-0704	110-0705	110-0706	Blank
Surrogate % Recovery:	110	109	107	109	114	108	113

SEQUOIA ANALYTICAL

Belinda C. Vega
Laboratory Director

% 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, INC.

CHAIN OF CUSTODY

SAMPLER

WITNESSING AGENCY

SITE NAME & ADDRESS: UNOCAL SAN LEANDRO, 15599 HESPERIAN

ANALYSES REQUESTED: TPH G; BTXE

TURN AROUND TIME: REGULAR

SAMPLE ID NO.	DATE	TIME	SOIL	WATER	GRAB	COMP	NO. OF CONT.	SAMPLING LOCATION	REMARKS
MW1	10-14			X	X		2	VOA	1100701 AB
MW2	"			X	X		"		702
MW3	"			X	X		"		703
MW4	"			X	X		"		704
MW5	"			X	X		"		705
MW6	"			X	X		"		706

Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Date/Time
Ray (KEI)	10-14-91	[signature]	4:45 10/14
[signature]	10-15-91 9:05a	[signature]	
[signature]	10/15/91/2050	[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? YES GOOD
2. Will samples remain refrigerated until analyzed? YES
3. Did any samples received for analysis have head space? NO
4. Were samples in appropriate containers and properly packaged? YES

[signature] — Signature; LOG-IN — Title; 10-14 — Date