KAPREALIAN ENGINEERING
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March 31, 1992

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

Attention: Mr. Larry Seto

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

Dear Mr. Seto:

Per the request of Mr. Robert Boust of Unocal Corporation, enclosed please find our report and work plan/proposal, both dated March 23, 1992, for the above referenced site.

If you have any questions, please 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.QR2
March 23, 1992

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

Attention: Mr. Robert A. 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. The wells are currently monitored on a monthly basis and sampled on a quarterly basis. Also included in this report are the results of KEI's recent well recovery tests. This report covers the work performed by KEI from November 1991 through January 1992.

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.

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Concord, California 94520
Tel: 510.602.5100 Fax: 510.687.0602

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 of 15 feet below grade to a depth of 19 feet below grade. 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 feasible, 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 P1 and P3, respectively. 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. The 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 the 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 the boring for well MW3 at 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. The 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 results of the preliminary investigation, KEI proposed the installation of three additional monitoring wells. Documentation of the initial well installation protocol, sampling techniques, and the 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. The 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. The 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 the analytical results are presented in KEI's report (KEI-P90-1003.R5) dated August 16, 1991.

KEI reviewed a letter (dated October 9, 1991), from the Alameda County Health Care Services Agency (County) to Unocal that requested 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 any wells exhibiting free product, (3) monthly ground water level measurements in each well (with contour maps generated), and (4) geologic cross sections.

With respect to a remediation plan, KEI recommended in KEI's report (KEI-P90-1003.QR1) dated November 21, 1991, that water recovery tests be performed on wells MW3 and MW5 the following 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, would be installed at the site. A pump test would then be performed using the recovery well. The results of the pump test would 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 action plan, KEI stated that a ground water remediation system would then be designed and installed (after obtaining all required permits).

RECENT FIELD ACTIVITIES

The six wells (MW1 through MW6) were monitored three times and were sampled once during the quarter. During monitoring, the wells were checked for depth to water and the presence of free product. In addition, during sampling on January 14, 1992, 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 January 14, 1992. Prior to sampling, monitoring data were collected, the wells were each purged of between 5 and 7 gallons, and water samples were then collected by the use of a clean Teflon bailer. The samples were decanted into clean glass VOA vials that were then sealed with Teflon-lined screw caps, labeled, and stored in a cooler, on ice, until delivery to a state-certified laboratory.

WELL RECOVERY TESTS

On December 12, 1991, water recovery tests were conducted on wells MW3 and MW5 in an attempt to gain a better understanding of the local aquifer beneath the site. Well MW3 was pumped of 55 gallons of water during a 55 minute period, resulting in an average extraction rate of approximately one gallon per minute (gpm). Well MW5 was pumped of 55 gallons of water during a 35 minute period, resulting in an average extraction rate of approximately 1.57 gpm. Neither well was significantly dewatered as a result of pumping. The water level in well MW3 was lowered approximately 2.2 feet at the end of pumping and the water level in MW5 was lowered approximately 0.25 feet at the end of the pumping. The level of water in each well was measured at intervals ranging from one to seven minutes after the pumping of that well was completed. Field data indicate that full recovery of the water level in MW3 was achieved within 20 minutes and in MW5 within 10 minutes. The field data is presented in Table 6.

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 0.0017, which is relatively unchanged from the previous quarters. Water levels have fluctuated during the quarter, showing a net increase in all wells ranging from 0.15 to 0.25 feet since October 14, 1991. The measured depth to ground water at the site on January 14, 1992, ranged between 16.16 and 17.81 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 of 1.5 below grade to about 3.5 feet below grade. 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 of about 10 to 13.25 feet below grade at MW2, and about 8.25 to 12 feet below grade at MW1, but was not encountered at MW3. The deeper and generally saturated clayey sand lens was encountered at depths of about 17.5 to 20 feet below grade at MW3, and at about 16.5 to 19.75 feet below grade 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 of about 2 to 3.5 feet below grade. The fill materials are inturn underlain by clayey silt and/or silty clay materials to depths of about 8 feet below grade, which are inturn underlain by a 2 to 3 foot thick bed of well-graded sand to depths of about 10 to 11 feet below grade (except at MW4, where the fill materials are underlain by silt to a depth of about 4 feet below grade, and by silt with interbedded poorly graded sand lenses to a depth of about 12 feet below grade). The above soil materials are inturn underlain by clay and/or silt materials to depths of about 20 to 20.5 feet below grade. 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 of about 22

to 23 feet below grade. 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' (Plate 4) 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 3. Sandy intervals encountered in the construction of these wells (and shown on the attached Cross-Section) appear to be discontinuous across the site.

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, MW5, and MW6 indicated non-detectable levels of TPH as gasoline and BTX&E, except at MW5, where a level of TPH as gasoline was detected at a concentration of 60 ppb. In well MW3, a level of TPH as gasoline was detected at a concentration of 13,000 ppb, with a benzene level at 6,600 ppb. The results of the water analyses are summarized in Table 2. Concentrations of TPH as gasoline and benzene detected in the ground water samples collected on January 14, 1992, are shown on the attached Site Plan, Figure 1c. Copies of the laboratory analyses and Chain of Custody documentation are attached to this report.

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 of which are located in the apparent downgradient direction of the underground fuel tank pit.

Results of the water recovery tests conducted on wells MW3 and MW5 on December 12, 1991, indicate that removal of 55 gallons from each well had a minimal influence on the water level. Field data also indicate that water recovery is relatively greater in the vicinity of MW5 than in the vicinity of MW3. Based on the concentrations of dissolved hydrocarbon constituents in the ground water, and based on the results of the water recovery tests, KEI recommends the installation of a ground water recovery well. Subsequent to well installation, KEI further recommends that a pump test be conducted to determine the radius of influence of pumping from the recovery well (at various flow rates). Data gathered during the pump test will be used to determine the location and number of any additional recovery wells that may be necessary to achieve hydraulic control of the contamination plume. A ground water remediation system will then be designed and installed (after all required permits are obtained). Our work plan/proposal for the installation of the recovery well and the subsequent pump test is attached for your review and consideration.

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 Regional Water Quality Control Board, 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 (510) 602-5100.

Sincerely,

Kaprealian Engineering, Inc.

Thomas J. Berkins
Senior Environmental Engineer

Don R. Braun
Certified Engineering Geologist

License No. 1310
Exp. Date 6/30/92

Timothy R. Ross
Project Manager

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Attachments: Tables 1 through 6
Location Map
Site Plans - Figures 1, 1a, 1b, 1c, 2 & 3
Cross-Section A-A'- Plate 4
Laboratory Analyses
Chain of Custody documentation
Work Plan/Proposal

KEI-P90-1003.QR2
March 23, 1992

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 January 14, 1992)					
MW1	19.78	17.11	0	No	6
MW2	19.83	17.52	0	No	5
MW3	19.71	17.51	0	No	5.5
MW4	19.65	16.16	0	No	7
MW5	19.63	17.38	0	No	6.5
MW6	19.74	17.81	0	No	6
(Monitored on December 12, 1991)					
MW1	19.26	17.63	0	--	0
MW2	19.32	18.03	0	--	0
MW3	19.19	18.03	0	--	55
MW4	19.13	16.68	0	--	0
MW5	19.07	17.94	0	--	55
MW6	19.19	18.36	0	--	0
(Monitored on November 14, 1991)					
MW1	19.51	17.38	0	--	0
MW2	19.56	17.79	0	--	0
MW3	19.42	17.80	0	No	51
MW4	19.35	16.46	0	--	0
MW5	19.29	17.72	0	--	0
MW6	19.41	18.14	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 was not performed.

* The elevations of the tops of the well covers were surveyed to MSL by Kier & Wright of Pleasanton, California.

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March 23, 1992

TABLE 2

SUMMARY OF LABORATORY ANALYSES
WATER

Date	Sample Number	TPH as Gasoline	Benzene	Toluene	Xylenes	Ethylbenzene
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
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	0.30	0.30	0.30	0.30

* Laboratory reports that sample does not appear to contain gasoline.

ND = Non-detectable.

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

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March 23, 1992

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.

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March 23, 1992

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.QR2
March 23, 1992

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.

KEI-P90-1003.QR2
March 23, 1992

TABLE 6

SUMMARY OF WELL RECOVERY DATA

(Measured on December 12, 1991)

Well #	Average Flow Rate (gpm)	Casing Volume (gallons)	Amount Purged (gallons)	Amount Purged Casing (volumes)	Recovery (%)	Recovery Time (hours)
MW3	1.00	1.21	55	45.6	70	0.03
					97	0.17
					99	0.23
					100	0.33
MW5	1.57	1.43	55	38.6	97	0.02
					99	0.05
					100	0.17

NOTE: Could not dewater MW3 or MW5 after 55 gallons at the given flow rates.

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

0 2000 4000

Approx. scale feet

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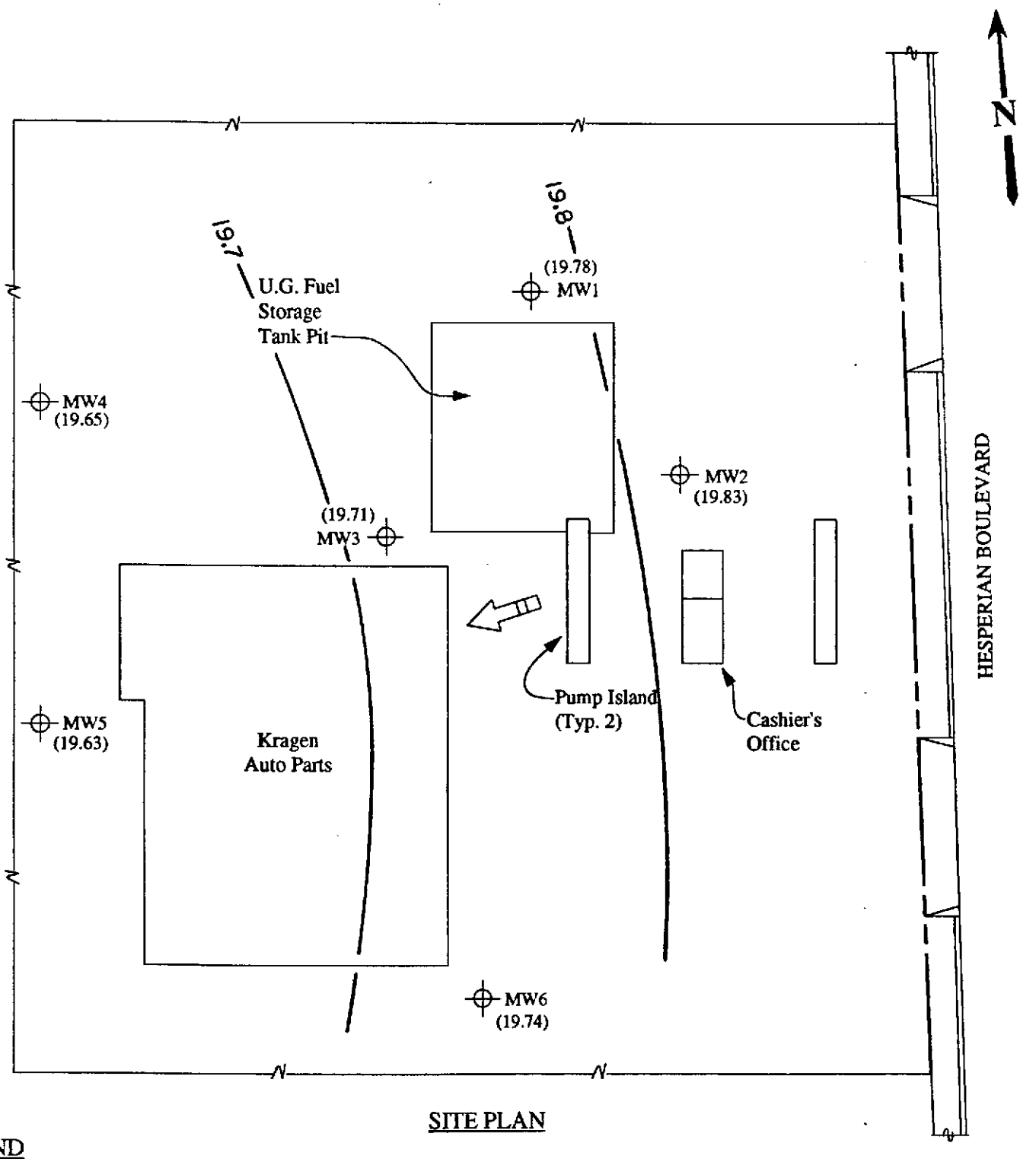
15599 HESPERIAN BOULEVARD
SAN LEANDRO, CA

LOCATION MAP



SITE PLAN

LEGEND

- Monitoring Well
- ( ) Ground water elevation in feet above Mean Sea Level on 1/14/92
- Direction of ground water flow
- Contours of ground water elevation

0 30 60

Approx. scale feet

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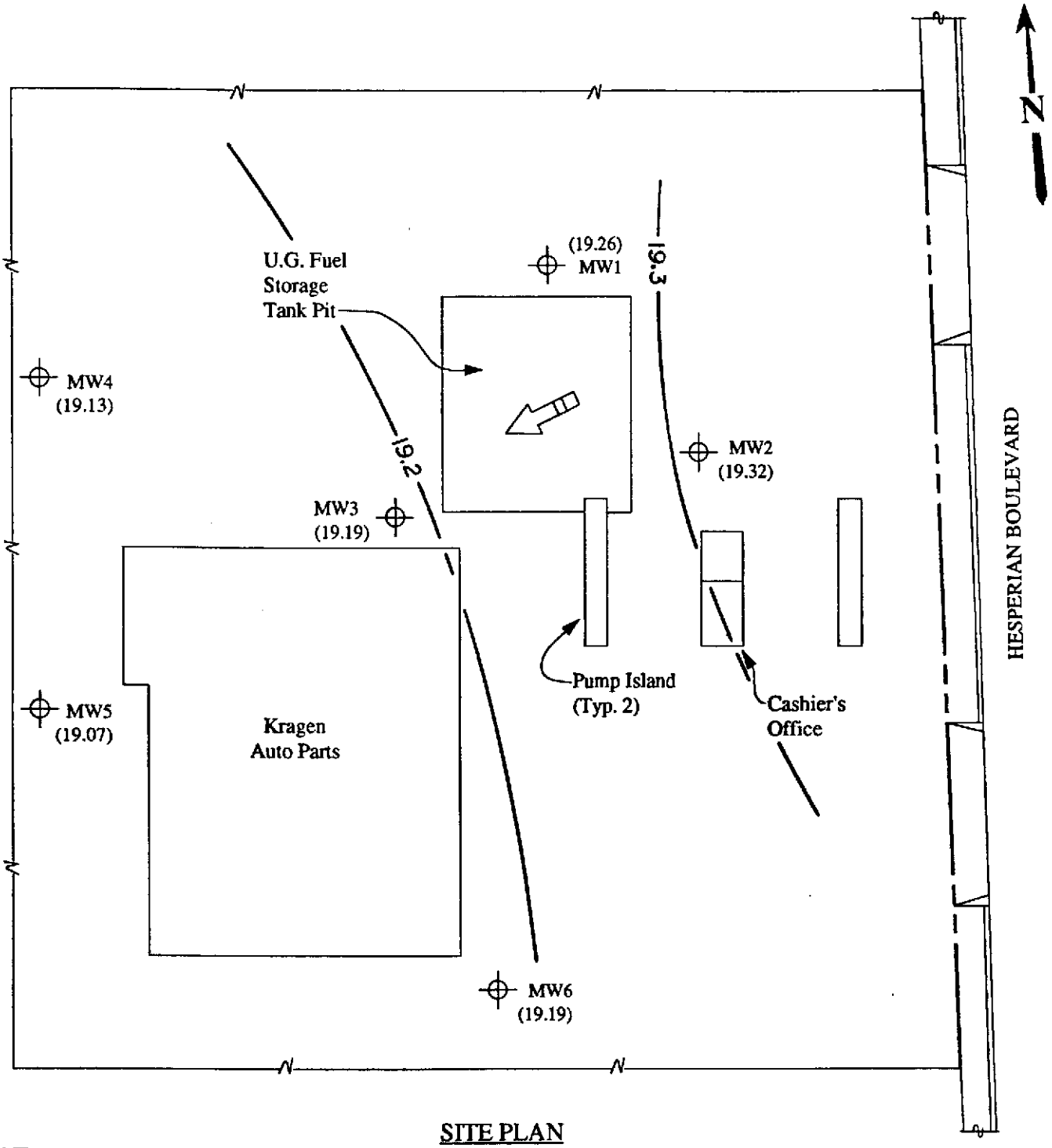
SAN LEANDRO, CA

FIGURE
1



SITE PLAN

LEGEND

- Monitoring Well
- ( ) Ground water elevation in feet above Mean Sea Level on 12/12/91
- Direction of ground water flow
- Contours of ground water elevation

0 30 60

Approx. scale feet

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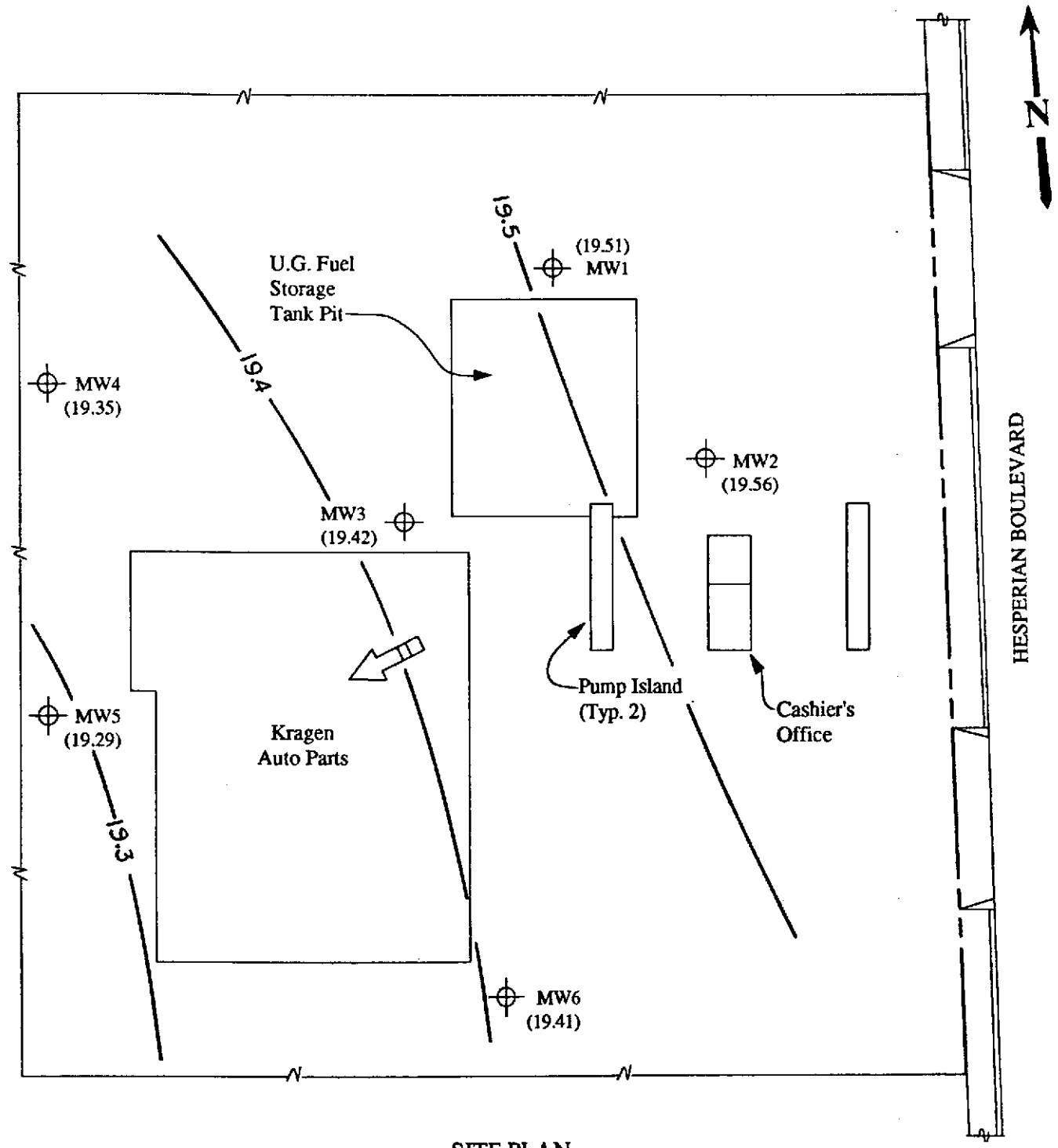
SAN LEANDRO, CA

FIGURE
1a



SITE PLAN

LEGEND

- Monitoring Well
- ( ) Ground water elevation in feet above Mean Sea Level on 11/14/91
- Direction of ground water flow
- Contours of ground water elevation

0 30 60

Approx. scale feet

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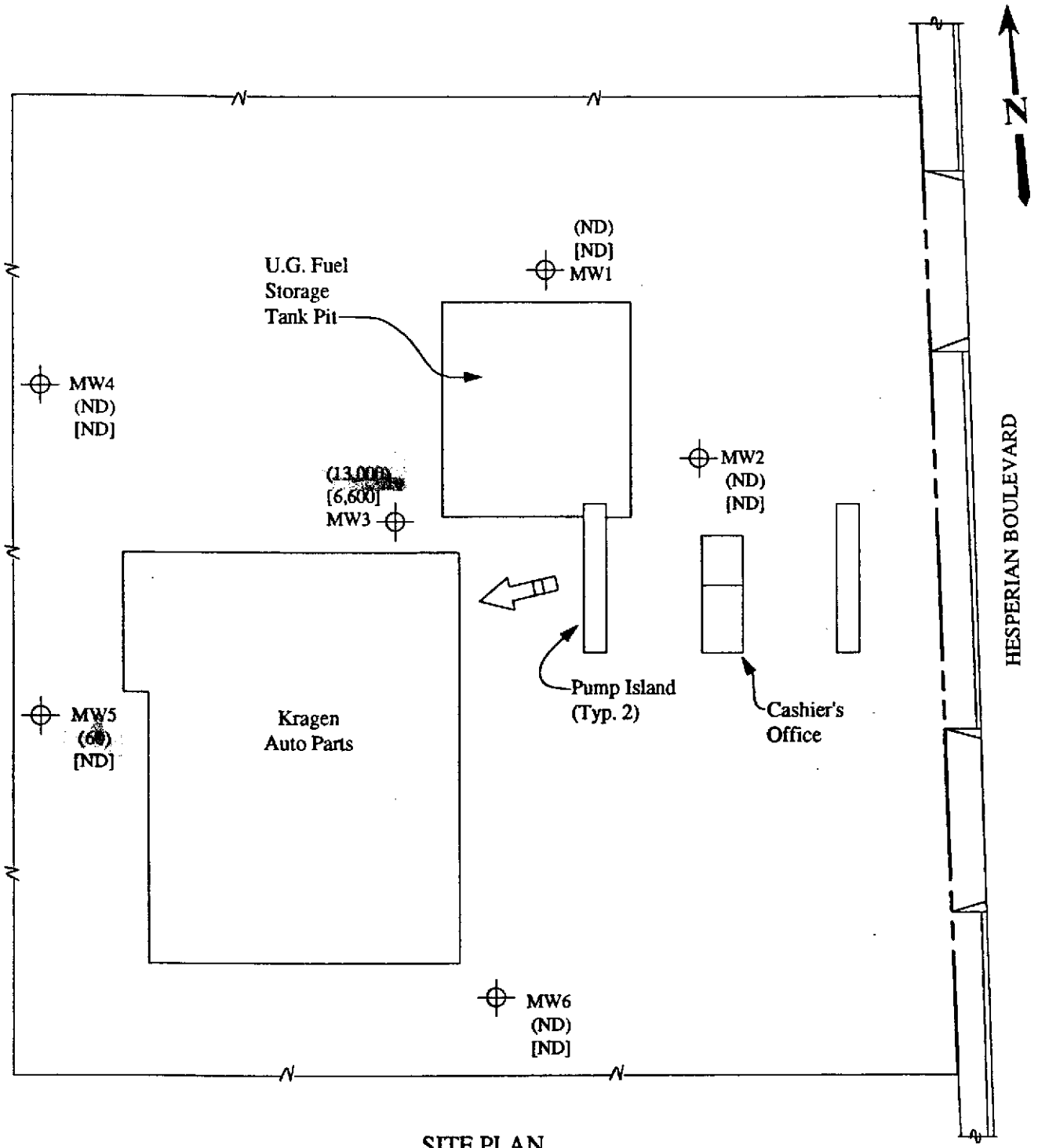
SAN LEANDRO, CA

FIGURE
1b



SITE PLAN

(Samples Collected on 1/14/92)

LEGEND

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

0 30 60

Approx. scale feet

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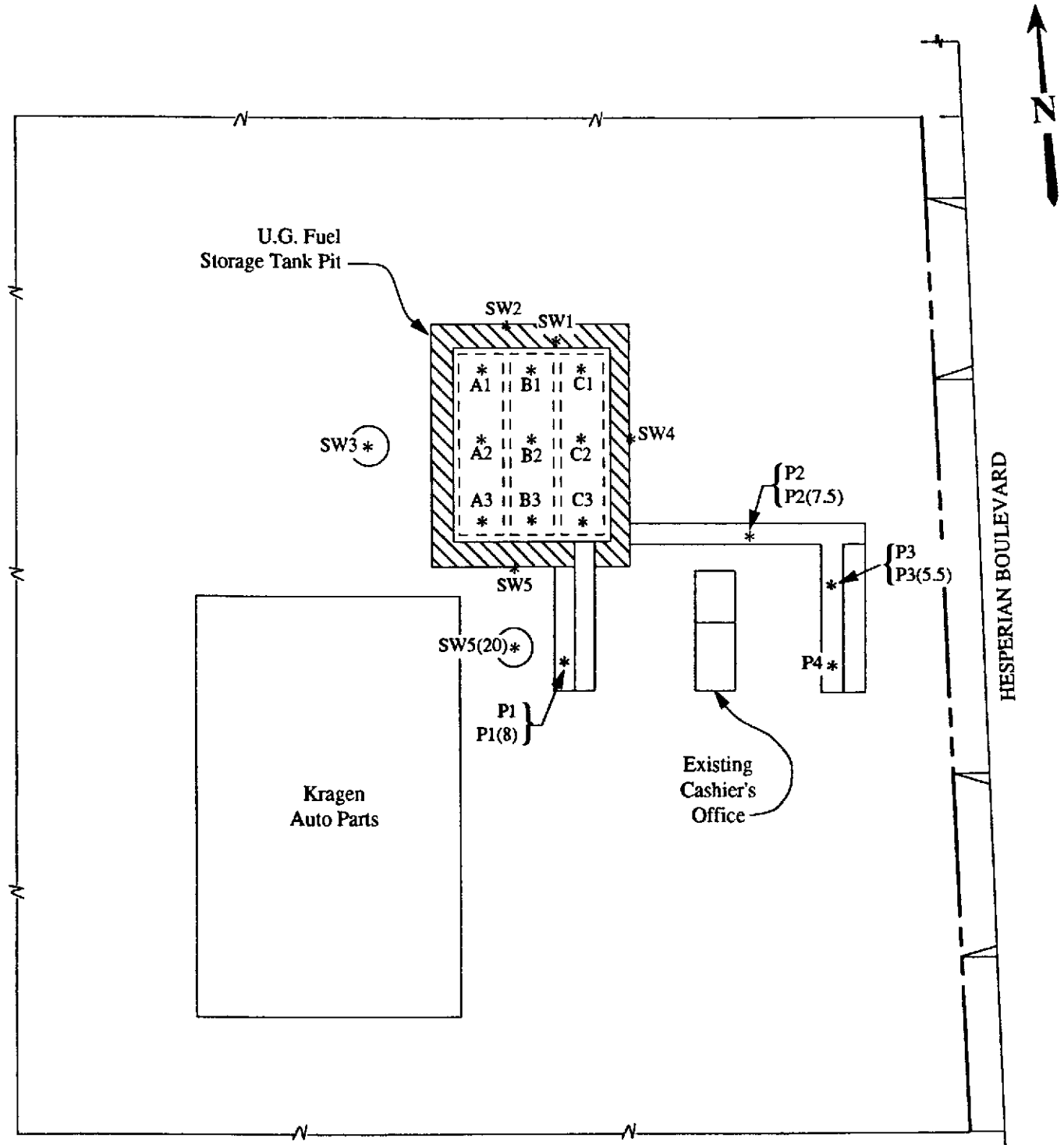
SAN LEANDRO, CA

FIGURE
1c



SITE PLAN

LEGEND

* Sample Point Location

Area of Additional Excavation

0 30 60

Approx. scale feet

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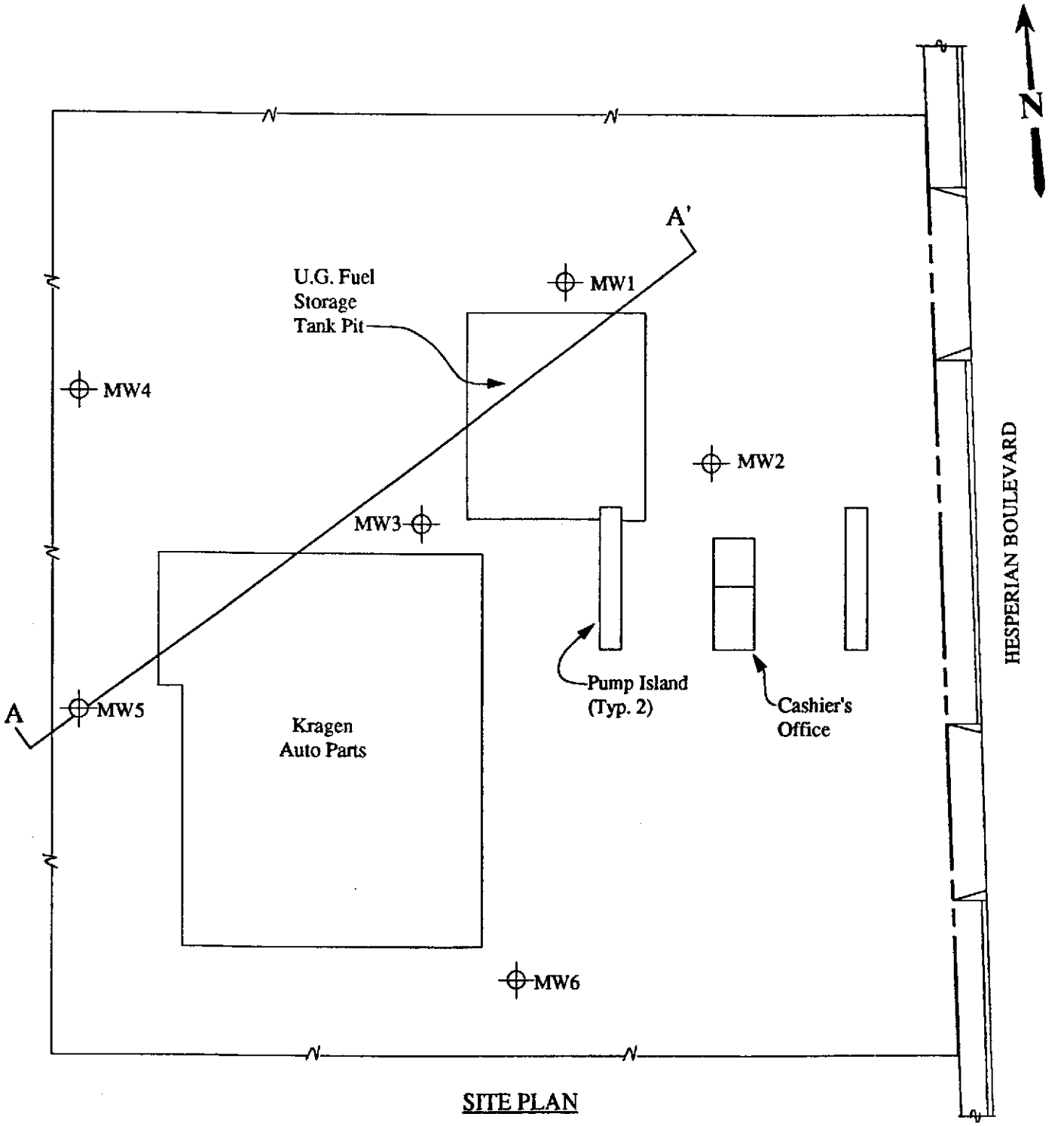
SAN LEANDRO, CA

FIGURE
2



SITE PLAN

LEGEND

Monitoring Well

A ⊢⊣ A' Location of Cross-Section A-A'

0 30 60

Approx. scale feet

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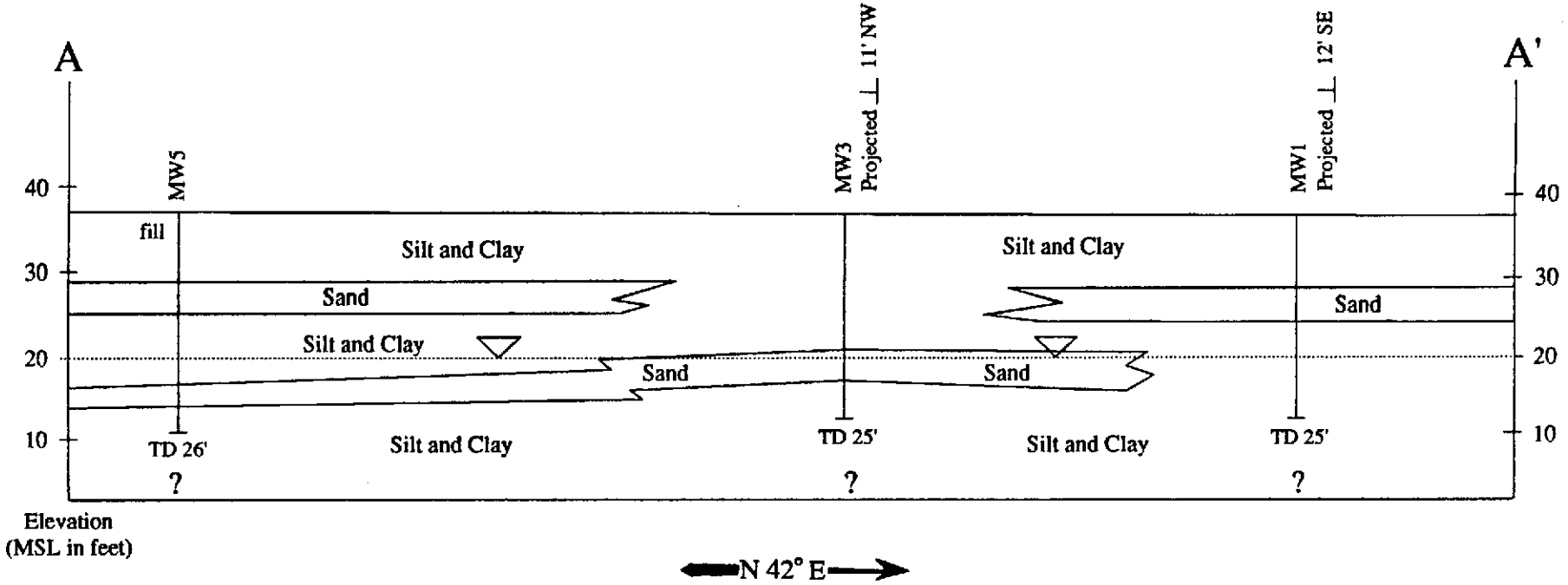
SAN LEANDRO, CA

FIGURE
3



GEOLOGIC
CROSS-SECTION A-A'

▽ Ground water elevation in feet above Mean Sea Level on 1/14/92

Approved by: Dr R Brown 3/24/92

0 20 40

Approx. scale feet

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INCORPORATED

UNOCAL SERVICE STATION #7004
15599 HESPERIAN BLVD.
SAN LEANDRO, CALIFORNIA

PLATE
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.,	Sampled:	Jan 14, 1992
P.O. Box 996	Matrix Descript:	Water San Leandro	Received:	Jan 14, 1992
Benicia, CA 94510	Analysis Method:	EPA 5030/8015/8020	Analyzed:	Jan 20, 1992
Attention: Mardo Kaprealian, P.E.	First Sample #:	201-0416	Reported:	Jan 29, 1992

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)
201-0416	MW-1	N.D.	N.D.	N.D.	N.D.	N.D.
201-0417	MW-2	N.D.	N.D.	N.D.	N.D.	N.D.
201-0418	MW-3	13,000	6,600	19	2,600	1,800
201-0419	MW-4	N.D.	N.D.	N.D.	N.D.	N.D.
201-0420	MW-5*	60	N.D.	N.D.	N.D.	N.D.
201-0421	MW-6	N.D.	N.D.	N.D.	N.D.	N.D.
Method Detection Limits:		**30**	**0.30**	**0.30**	**0.30**	**0.30**

Low to Medium Boiling Point Hydrocarbons are quantitated against a gasoline standard.

SEQUOIA ANALYTICAL

Belinda C. Vega
Laboratory Director

Please Note:
*Note: The above sample does not appear to contain gasoline.
LMBP is due mostly to a hydrocarbon matrix.

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

Client Project ID: Unocal/ 15599 Hesperian Blvd., San Leandro
QC Sample Group: 2010416-0421
Reported: Jan 29, 1992

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:	J.F.	J.F.	J.F.	J.F.	J.F.	J.F.	J.F.
Reporting Units:	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Date Analyzed:	Jan 20, 1992	Jan 20, 1992	Jan 20, 1992	Jan 20, 1992	Jan 20, 1992	Jan 20, 1992	Jan 20, 1992
Sample #:	201-0416	201-0417	201-0418	201-0419	201-0420	201-0421	Blank
Surrogate % Recovery:	100	110	110	100	100	100	99

SEQUOIA ANALYTICAL

Belinda C. Vega
Laboratory Director

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

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

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Attention: Mardo Kaprealian, P.E.

Client Project ID: Unocal/ 15599 Hesperian Blvd., San Leandro
QC Sample Group: 2010416-0421
Reported: Jan 29, 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:	K.N./J.F.	K.N./J.F.	K.N./J.F.	K.N./J.F.
Reporting Units:	µg/L	µg/L	µg/L	µg/L
Date Analyzed:	Jan 20, 1992	Jan 20, 1992	Jan 20, 1992	Jan 20, 1992
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:	22	22	23	73
Matrix Spike % Recovery:	110	110	115	121
Conc. Matrix Spike Dup.:	22	22	22	71
Matrix Spike Duplicate % Recovery:	110	110	110	118
Relative % Difference:	0.0	0.0	4.4	2.8

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: Vartkes
WITNESSING AGENCY:
SITE NAME & ADDRESS: Unocal / San Leandro, 15599 Hesperian Blvd.
ANALYSES REQUESTED
TURN AROUND TIME: Regular

SAMPLE ID NO.	DATE	TIME	SOIL	WATER	GRAB	COMP	NO. OF CONT.	SAMPLING LOCATION	TPHG & BTXE	8010	REMARKS
MW-1	1/14/92	10:40 A.M.		✓	✓		2	Monitoring well	✓	416 AB	VOA's Preserved in HCl.
MW-2	"			✓	✓		2	" "	✓	417 AB	
MW-3	"			✓	✓		2	" "	✓	418 AB	
MW-4	"			✓	✓		2	" "	✓	419 AB	
MW-5	"			✓	✓		2	" "	✓	420 AB	
MW-6	"	2:00 P.M.		✓	✓		2	" "	✓	421 AB	

Relinquished by: (Signature)	Date/Time	Received by: (Signature)
W. Thekdian	1/14/92 3:00 PM	[signature] 1/14 3:10
[signature]	1/15	[signature] 1:00 PM

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 — 1/14 Date