KAPREALIAN ENGINEERING
INCORPORATED

July 23, 1992

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

Attention: Mr. Larry Seto

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

Dear Mr. Seto:

Per the request of Mr. Bob Boust of Unocal Corporation, enclosed please find our report dated July 14, 1992, for the above referenced site.

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

Sincerely,

Kaprealian Engineering, Inc.

Judy A. Dewey

jad\82

Enclosure

cc: Bob Boust, Unocal Corporation

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

KAPREALIAN ENGINEERING
INCORPORATED

KEI-P91-0102.R5
July 14, 1992

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

Attention: Mr. Bob Boust

RE: Continuing Ground Water Investigation
and Quarterly Report
Unocal Service Station #3292
15008 E. 14th Street
San Leandro, California

Dear Mr. Boust:

This report presents the results of Kaprealian Engineering, Inc's. (KEI) soil and ground water investigation for the referenced site, in accordance with KEI's proposal KEI-P91-0102.P3 dated August 6, 1991. The purpose of the investigation was to investigate the extent of ground water contamination in both the upgradient and downgradient directions from the subject site.

This report also presents the results of the most recent quarter of monitoring and sampling of the monitoring wells at the referenced site by KEI, per KEI's proposal KEI-P91-0102.P3 dated August 6, 1991. The wells are currently monitored monthly and sampled on a quarterly basis. This report covers the work performed by KEI in April and May of 1992.

The scope of the work performed by KEI consisted of the following:

Coordination with regulatory agencies

Geologic logging of four borings for the installation of four monitoring wells

Soil sampling

Ground water monitoring, purging, and sampling

Laboratory analyses

Data analysis, interpretation, and report preparation

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

SITE DESCRIPTION AND BACKGROUND

The subject site is presently used as a service station. The site is situated on gently sloping, southwest trending topography, and is located at the east corner of the intersection of East 14th Street and 150th Avenue in San Leandro, California. The site is also located southeast of a former Mobil service station (across 150th Avenue), approximately due east of a former Phillips service station (at the intersection of Hesperian Boulevard, 150th Avenue, and East 14th Street), and is northeast of a Chevron service station (on Hesperian Boulevard). A Location Map, Site Vicinity Maps, and Site Plans are attached to this report.

KEI's initial field work was conducted on January 16, 1991, when two underground gasoline storage tanks and one waste oil tank were removed from the site. The tanks consisted of one 10,000 gallon regular unleaded gasoline tank, one 10,000 gallon super unleaded gasoline storage tank, and one 280 gallon waste oil tank. The tanks were made of steel, and two holes of about 1/2-inch in diameter were observed in the super unleaded gasoline tank. Mr. William Faulhaber of the Alameda County Health Care Services Agency (ACHCS) was present during tank removal and subsequent soil sampling. Mr. James Kneeland of the Eden Consolidated Fire Protection District was also present during tank removal.

One soil sample, labeled WO1, was collected from beneath the waste oil tank at a depth of approximately 8.25 feet below grade. Four soil samples, labeled A1, A2, B1, and B2, were collected from beneath the fuel tanks at depths between 15 and 16 feet below grade. Due to obvious contamination, additional soil was excavated beneath sample points A1, A2, B1, and B2, in order to further define the vertical extent of soil contamination. During excavation activities, ground water was encountered in the fuel tank pit at a depth of approximately 16.5 feet below grade, thus prohibiting the collection of any additional soil samples from beneath sample points A1, A2, B1, and B2. Sample point locations are as shown on the attached Site Plan, Figure 3.

In an attempt to remove as much of the contaminated soil as possible, and in order to collect a tank pit water sample, the fuel tank pit was excavated to a depth of about 17.5 feet below grade. After soil excavation was completed, approximately 15,700 gallons of ground water were pumped from the fuel tank pit. On January 28, 1991, one water sample, labeled W1, was collected from the fuel tank pit.

KEI returned to the site on February 11, 1991, in order to collect soil samples from the product pipe trenches, as requested by Mr.

Faulhaber. Seven samples, labeled P1 through P7, were collected at depths ranging from 3.5 to 5 feet below grade.

KEI again returned to the site on February 12, 1991, in order to complete the collection of pipe trench soil samples. Two samples, labeled P8 and P9, were collected at depths of 3.5 feet and 7.5 feet below grade, respectively. After the soil sampling was completed, the pipe trenches were excavated to the depth of the sample points. Pipe trench sample point locations are shown on the attached Site Plan, Figure 3.

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). In addition, the soil sample collected from the waste oil tank pit (WO1) was also analyzed for TPH as diesel, total oil and grease (TOG), the metals cadmium, chromium, lead, nickel, and zinc, and EPA method 8010 constituents.

Analytical results of the soil samples collected from the fuel tank pit indicated levels of TPH as gasoline ranging from 150 ppm to 840 ppm, except for sample A1, which showed a level of TPH as gasoline at 2,600 ppm. Please note that soil represented by these samples was removed during excavation of the fuel tank pit to a depth of about 17.5 feet below grade (or approximately 1 foot below the observed ground water level).

Analytical results of soil samples collected from the product pipe trenches indicated non-detectable levels of TPH as gasoline for samples P1, P3 through P6, and P8. The levels of TPH as gasoline detected in samples P2, P7, and P9 were 1.2 ppm, 7.1 ppm, and 130 ppm, respectively. Benzene was detected at concentrations ranging from non-detectable to 0.89 ppm.

Analytical results of the soil sample collected from beneath the waste oil tank pit (WO1) indicated non-detectable levels of all constituents analyzed, except for zinc, which showed 31 ppm. 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 13,000 ppb of TPH as gasoline and 64 ppb of benzene. The results of the water analyses are summarized in Table 5.

To comply with the requirements of the regulatory agencies and based on the analytical results, KEI proposed the installation of five monitoring wells. Documentation of the tank removal protocol,

sample collection techniques, and the analytical results are summarized in KEI's report (KEI-J91-0102.R1) dated March 6, 1991.

On April 23 and 24, 1991, five two-inch diameter monitoring wells (designated as MW1, MW2, MW3, MW4, and MW5 on the attached Site Plan, Figure 2) were installed at the site. The monitoring wells were drilled and completed to total depths ranging from 19.5 to 22.5 feet below grade. Ground water was encountered at depths ranging from 12.25 to 13.25 feet beneath the surface during drilling, except in MW5, where water was not initially encountered until a depth of 15 feet below grade but quickly rose to a depth of about 12 feet below grade.

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 29 and 30, 1991, and were initially sampled on May 4, 1991. No free product or sheen was noted in any of the wells, except for well MW5, where a trace of product was observed on April 30, 1991, and where only a sheen was detected on May 4, 1991.

Water and selected soil samples 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 MW1 through MW5 indicated levels of TPH as gasoline ranging from non-detectable to 7.7 ppm, with benzene levels ranging from non-detectable to 0.029 ppm in all samples, except for MW1(10), MW1(12), and MW5(14.5), which showed levels of TPH as gasoline at 82 ppm, 420 ppm, and 620 ppm, respectively, and benzene levels at 0.20 ppm, 1.2 ppm, and 6.8 ppm, respectively.

Analytical results of the ground water samples collected on May 4, 1991, from monitoring wells MW1 through MW5 indicated levels of TPH as gasoline ranging from 6,300 ppb to 69,000 ppb, with benzene levels ranging from 2.0 ppb to 1,400 ppb, except in MW4, where benzene was non-detectable. 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 implementation of a monthly monitoring and quarterly sampling program. In addition, KEI recommended monthly purging of wells MW1 and MW5 in an attempt to reduce the level of contamination in the vicinity of these wells.

KEI concluded that because upgradient wells MW3 and MW4 showed levels of TPH as gasoline at 9,100 ppb and 6,300 ppb, respectively, a possible off-site upgradient source of contamination is present. Also, KEI concluded that the extent of ground water contamination had not been defined in the vicinity of the Unocal site. However, prior to recommending additional monitoring wells at that time, KEI proposed to evaluate the adjacent area for possible monitoring well locations and to review Regional Water Quality Control Board (RWQCB) files on adjacent properties. Documentation of the well installation protocol, sample collection techniques, and the analytical results are presented in KEI's report (KEI-P91-0102.R4) dated May 29, 1991.

KEI has reviewed a letter from Law Environmental, Inc., dated October 29, 1990, and titled "Preliminary Findings - Phase II Site Assessment." Apparently, three monitoring wells have been installed at the Shandrall property at 15035 East 14th Street (presently used as a Liquor Barn facility and related parking lot). Ground water is present at a depth of about 14 feet below grade, with a gradient toward the south-southwest at 0.0003. In addition, upgradient well MW3 apparently showed a level of TPH as gasoline at 11,000 ppb, with a benzene level of 540 ppb. KEI has not reviewed any technical reports or boring logs prepared for the installation of these wells. The letter from Law Environmental, Inc. also indicates that an adjacent Chevron service station has eight monitoring wells, which (as of April 11, 1990) showed a ground water flow direction toward the southeast at a gradient of 0.005.

In July of 1991, a representative of KEI reviewed the RWQCB file for the adjacent Chevron service station. The ground water flow direction, as of April 5, 1991, was toward the southwest. Also, it appears that a former Mobil station was located northwest of the Unocal site across 150th Avenue, and a former Phillips station was located west of Unocal and northwest of the Shandrall property.

KEI subsequently recommended the installation of six off-site monitoring wells (see the attached Site Vicinity Map) in KEI's work plan (KEI-P91-0102.P3) dated August 6, 1991.

Additionally, KEI has reviewed a letter from the ACHCS dated October 4, 1991, which approved KEI's work plan (KEI-P91-0102.P3) dated August 6, 1991, but also stated that Unocal must immediately begin the engineering of a dedicated ground water remediation system. As discussed in KEI's report (KEI-P91-0102.QR1) dated October 23, 1991, KEI is evaluating various pump and treatment methods for the remediation of the contaminated ground water in the vicinity of the Unocal site. Once the extent of ground water contamination has been completely delineated, KEI will conduct

aquifer testing on all of the affected areas, and complete the design of a remediation system.

RECENT FIELD ACTIVITIES - WELL INSTALLATION

On May 5 and 6, 1992, four additional two-inch diameter monitoring wells (designated as MW6 through MW9 on the attached Site Vicinity Map, Figure 1) were installed at the site. The wells were each drilled, constructed, and completed in accordance with the guidelines of the RWQCB and the California Well Standards (per Bulletin 74-90). The subsurface materials penetrated and details of the construction of the wells are described in the attached Boring Logs.

The four wells were each drilled and completed to total depths ranging from 19 to 21.5 feet below grade. Ground water was encountered at depths ranging from 11.0 to 13.5 feet beneath the surface during drilling. Soil samples were collected for laboratory analysis and for lithologic logging purposes at a maximum spacing of 5 foot intervals, at significant changes in lithology, at obvious areas of contamination, and at or within the soil/ground water interface, beginning at a depth of approximately 5 feet below grade and continuing until ground water was encountered. Soil sampling conducted below the ground water table was for lithologic logging purposes only. The undisturbed soil samples were collected by driving a California-modified split-spoon sampler ahead of the drilling augers. A 5-foot long continuous coring device was also used for sampling purposes in addition to the California-modified split spoon sampler. The two-inch diameter brass liners holding the samples were sealed with aluminum foil, plastic caps and tape, and were then stored in a cooled ice chest for delivery to a state-certified laboratory. Each well casing was installed with a watertight cap and padlock. A round, watertight, flush-mounted well cover was cemented in place over each well casing. 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 wells were developed on May 13, 1992. Prior to development, the wells were checked for depth to the water table (by the use of an electronic sounder) and the presence of free product (by the use of an interface probe or paste tape). No free product was noted in any of the wells. After recording the monitoring data, the wells were each purged by the use of a surface pump of 25 to 50 gallons until the evacuated water was clear and free of suspended sediment. Monitoring and well development data are summarized in Table 1.

RECENT FIELD ACTIVITIES - QUARTERLY MONITORING AND SAMPLING

Wells MW1 through MW9 were monitored twice and sampled once during the quarter. During monitoring, the wells were checked for depth to water and the presence of free product. In addition, wells MW1 through MW5 were monitored on one additional occasion. During sampling, 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 are summarized in Table 1.

Water samples were collected from wells MW1 through MW9 on May 19, 1992. Prior to sampling, the wells were each purged of between 5 and 8 gallons by the use of a surface pump. Samples were then collected by the use of a clean Teflon bailor. Samples were decanted into clean VOA vials that were then sealed with Teflon-lined screw caps and stored in a cooler, on ice, until delivery to the state-certified laboratory.

ANALYTICAL RESULTS

Water samples from all of the wells, and selected soil samples from the borings for MW6 through MW9, 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/modified 8015, and BTX&E by EPA method 8020.

The concentrations of TPH as gasoline and benzene detected in the ground water samples collected on May 19, 1992, are shown on the attached Site Vicinity Map, Figure 1a. The results of the water analyses are summarized in Table 2, and the results of the soil analyses are summarized in Table 3. Copies of the analytical results and Chain of Custody documentation are attached to this report.

HYDROLOGY AND GEOLOGY

Based on water level data gathered on May 19, 1992, the ground water flow direction at and near the vicinity of the site was south and southwest, as shown on the attached Site Vicinity Map, Figure 1. This flow direction is relatively unchanged from the previous quarter. On May 19, 1992, the hydraulic gradient at and near the vicinity of the site ranged between 0.001 and 0.004. Water levels have steadily decreased during the quarter, showing a net decrease of between 1.08 and 1.27 feet in all wells since March 17, 1992. The measured depth to ground water at the site on May 19, 1992, ranged between 10.98 and 12.41 feet below grade.

Based on review of regional geologic maps (U.S. Geological Survey Professional Paper 943 "Flatland Deposits - Their Geology and Engineering Properties and Their Importance to Comprehensive Planning" by E.J. Helley and K.R. Lajoie, 1979), the subject site is situated near a mapped geologic contact separating Coarse-grained alluvium (Qhac) from Late Pleistocene alluvium (Qpa). The Coarse-grained alluvium is described as typically consisting of unconsolidated, permeable sand and silt, with local areas of coarse sand and gravel. The thickness of this unit ranges from less than 10 feet to as much as 50 feet. The Late Pleistocene alluvium is described as consisting of weakly consolidated, irregular interbedded clay, silt, sand, and gravel. This unit has a reported maximum thickness of at least 150 feet. Also, the site is located approximately 2,000 feet southwest of a mapped splay of the active Hayward Fault Zone.

The results of our subsurface study (borings of monitoring wells MW1 through MW5) indicate that the site is underlain by clay and/or silt to the maximum depth explored (22.5 feet below grade), except for a 3/4 to 1-foot-thick clayey sand lens encountered in wells MW3 and MW4 at depths below grade of about 13 to 14 feet. It is unclear if this relatively thin sand lens is continuous across the site. Ground water was encountered within this clayey sand lens at MW3 and MW4.

The results of our most recent subsurface study (borings of monitoring wells MW6 through MW9) indicate that the vicinity of these four wells is underlain by a succession of clay and silty clay interbedded with thin beds of silty sand and clayey silt to the maximum depth explored (21.5 feet below grade).

DISCUSSION AND RECOMMENDATIONS

Based on the analytical results for samples collected and evaluated to date, KEI recommends the continuation of the current monthly monitoring and quarterly sampling program of the existing wells, per KEI's proposal (KEI-P91-0102.P3) dated August 6, 1991.

KEI previously recommended the installation of six off-site monitoring wells (MW6 through MW11). Monitoring wells MW6 through MW9 have been installed. KEI understands that Unocal has been unable to obtain satisfactory off-site access agreements for MW10 and MW11. Therefore, Unocal has instructed KEI to relocate proposed wells MW10 and MW11 onto the sidewalk adjacent to East 14th Street (as shown on Figure 1). KEI will schedule the installation of the remaining two wells as soon as possible once all required encroachment and well installation permits have been obtained.

Based on analytical results for ground water and soil samples from the four newly installed wells (MW6 through MW9), and based on the direction of ground water flow, which has been consistently to the south and southwest since at least May of 1991, it appears that significant contamination from off-site source(s) may be impacting the vicinity of the Unocal site both upgradient and downgradient of the Unocal facility. The extent of this contamination is not yet defined.

As previously reported, a KEI representative conducted a file review at the RWQCB offices in July of 1991 for the adjacent Chevron and Shandrell property sites. KEI will perform another file review at the RWQCB during the next quarter to obtain updated information for these sites, and to obtain information on the adjacent former Phillips and Mobil stations. In addition, KEI will perform a site vicinity reconnaissance. Based on the information obtained from the file reviews and site reconnaissance, and from the installation of additional wells MW10 and MW11, KEI will make recommendations for additional site characterization and remediation work, as warranted.

DISTRIBUTION

Copies of this report should be sent to Mr. Larry Seto of the ACHCS, and to Mr. Lester Feldman of 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 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.

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

Sincerely,

Kaprealian Engineering, Inc.

Thomas J. Berkins
Senior Environmental Engineer

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

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

Mark R. Lafferty, R.G.
Project Manager

License No. 4701
Exp. Date 6/30/94

\bp

Attachments: Tables 1 through 5
Location Map
Site Vicinity Maps - Figures 1 & 1a
Site Plans - Figure 2 & 3
Boring Logs
Well Completion Diagrams
Laboratory Analyses
Chain of Custody documentation

KEI-P91-0102.R5
July 14, 1992

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 May 19, 1992)					
MW1	24.86	11.86	0	No	6
MW2	24.99	11.90	0	No	6
MW3	24.98	11.86	0	No	8
MW4	24.99	12.41	0	No	6
MW5	24.84	11.56	0	No	8
MW6	25.05	10.98	0	No	7
MW7	25.06	11.34	0	No	7
MW8	24.77	12.37	0	No	5
MW9	24.78	12.14	0	No	6
(Monitored and Developed on May 13, 1992)					
MW1*	24.97	11.75	0	--	0
MW2*	25.07	11.82	0	--	0
MW3*	25.08	11.76	0	--	0
MW4*	25.06	12.34	0	--	0
MW5*	24.62	11.78	0	--	0
MW6	25.16	10.87	0	--	40
MW7	25.17	11.23	0	--	25
MW8	24.86	12.28	0	--	50
MW9	25.16	11.76	0	--	39
(Monitored on April 17, 1992)					
MW1	25.45	11.27	0	--	24
MW2	25.58	11.31	0	--	0
MW3	25.66	11.18	0	--	0
MW4	25.62	11.78	0	--	0
MW5	25.47	10.93	0	--	55

KEI-P91-0102.R5
July 14, 1992

TABLE 1 (Continued)

SUMMARY OF MONITORING DATA

Well #	Well Cover Elevation** (feet)
MW1	36.72
MW2	36.89
MW3	36.84
MW4	37.40
MW5	36.40
MW6	36.03
MW7	36.40
MW8	37.14
MW9	36.92

-- Sheen determination was not performed.

* Monitored only.

** The elevations of the tops of the well covers have been surveyed relative to MSL, per a benchmark (Elevation = 36.88 MSL) located at the northwest corner of East 14th Street and 150th Avenue.

KEI-P91-0102.R5
July 14, 1992

TABLE 2

SUMMARY OF LABORATORY ANALYSES
WATER

Date	Sample Well #	TPH as Gasoline	Benzene	Toluene	Xylenes	Ethylbenzene
5/19/92	MW1	29,000	650	370	1,200	1,100
	MW2	17,000	140	87	170	680
	MW3	3,400	25	3.6	41	66
	MW4	2,000	20	3.5	8.3	42
	MW5	84,000	760	1,500	17,000	4,000
	MW6	1,300	2.0	2.1	2.7	ND
	MW7	17,000	540	90	1,900	1,200
	MW8	5,300	28	3.3	2.1	2.6
	MW9	8,100	11	ND	5.8	25
3/17/92	MW1	23,000	320	19	940	1,000
	MW2	16,000	110	ND	220	730
	MW3	5,800	66	7.5	58	100
	MW4	1,800	3.7	1.4	21	90
	MW5	81,000	850	1,600	18,000	4,800
12/18/91	MW1	17,000	160	20	1,600	1,400
	MW2	10,000	110	5.1	96	420
	MW3	5,900	54	6.4	64	110
	MW4	2,500	28	2.5	22	54
	MW5	31,000	1,600	3,100	19,000	4,800
9/19/91	MW1	26,000	130	16	1,800	1,300
	MW2	19,000	100	6.8	310	790
	MW3	7,600	ND	13	170	190
	MW4	1,800	0.83	ND	46	54
	MW5	57,000	1,600	2,700	20,000	5,200
5/04/91	MW1	31,000	74	20	1,500	920
	MW2	19,000	6.6	1.4	630	460
	MW3	9,100	2.0	ND	180	55
	MW4	6,300	ND	ND	61	2.8
	MW5	69,000	1,400	2,500	15,000	3,500
Detection Limits		30	0.30	0.30	0.30	0.30

ND = Non-detectable.

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

KEI-P91-0102.R5
July 14, 1992

TABLE 3

SUMMARY OF LABORATORY ANALYSES
SOIL

Date	Sample Number	Depth (feet)	TPH as Gasoline	Benzene	Toluene	Xylenes	Ethyl-benzene
4/23/91	MW1(5)	5.0	ND	ND	ND	0.0070	ND
	MW1(10)	10.0	82	0.20	0.23	0.31	0.14
	MW1(12)	12.0	420	1.2	1.3	0.72	0.78
	MW2(5)	5.0	ND	ND	ND	0.022	0.0085
	MW2(10)	10.0	2.2	0.089	ND	0.0064	ND
	MW2(12)	12.0	12	ND	0.017	0.075	0.14
	MW3(5)	5.0	ND	ND	ND	ND	ND
	MW3(10)	10.0	1.4	0.015	0.0051	0.014	ND
	MW3(13)	13.0	3.5	0.026	0.026	0.030	0.0088
	MW4(5)	5.0	ND	ND	ND	ND	ND
	MW4(10)	10.0	ND	ND	ND	0.0060	ND
	MW4(13)	13.0	ND	ND	ND	0.012	0.0088
	MW5(5)	5.0	ND	ND	ND	ND	ND
	MW5(10)	10.0	7.7	0.029	0.14	0.090	0.13
	MW5(14.5)	14.5	620	6.8	4.4	75	18
5/05/92	MW6(5.5)	5.5	ND	ND	ND	ND	ND
	MW6(10.5)	10.5	ND	ND	ND	ND	ND
	MW7(9)	9.0	280	0.45	0.45	23	7.2
	MW7(12.5)	12.5	540	1.9	0.47	47	15
5/06/92	MW8(5)	5.0	ND	ND	ND	ND	ND
	MW8(10)	10.0	ND	ND	ND	ND	ND
	MW8(11.5)	11.5	ND	ND	ND	ND	ND
	MW8(13.5)	13.5	1.2	0.011	0.0054	0.014	ND
	MW9(5)	5.0	ND	ND	0.0053	0.014	ND
	MW9(10)	10.0	ND	ND	ND	0.0078	ND
	MW9(12)	12.0	ND	ND	ND	0.0074	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-P91-0102.R5
July 14, 1992

TABLE 4

SUMMARY OF LABORATORY ANALYSES
SOIL

(Collected on January 16, and
February 11 & 12, 1991)

Sample	Depth (feet)	TPH as Gasoline	Benzene	Toluene	Xylenes	Ethylbenzene
A1	15.5	2,600	7.1	55	170	55
A2	16.0	290	1.3	1.1	1.2	1.5
B1	15.5	840	1.5	2.7	9.9	1.3
B2	15.0	150	1.6	3.3	11	2.0
P1	3.5	ND	0.0072	0.019	0.026	ND
P2	4.75	1.2	0.014	0.041	0.11	0.019
P3	3.75	ND	ND	ND	ND	ND
P4	3.75	ND	ND	ND	ND	ND
P5	3.5	ND	ND	ND	ND	ND
P6	5.0	ND	ND	ND	ND	ND
P7	5.0	7.1	0.89	0.23	0.70	0.57
P8	3.5	ND	ND	ND	ND	ND
P9	7.5	130	0.068	0.37	0.076	0.66
WO1*	8.25	ND	ND	ND	ND	ND
Detection Limits		1.0	0.0050	0.0050	0.0050	0.0050

ND = Non-detectable.

* TOG, TPH as diesel, and all EPA method 8010 constituents were non-detectable. Metals were non-detectable, except for zinc, which showed 31 ppm.

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

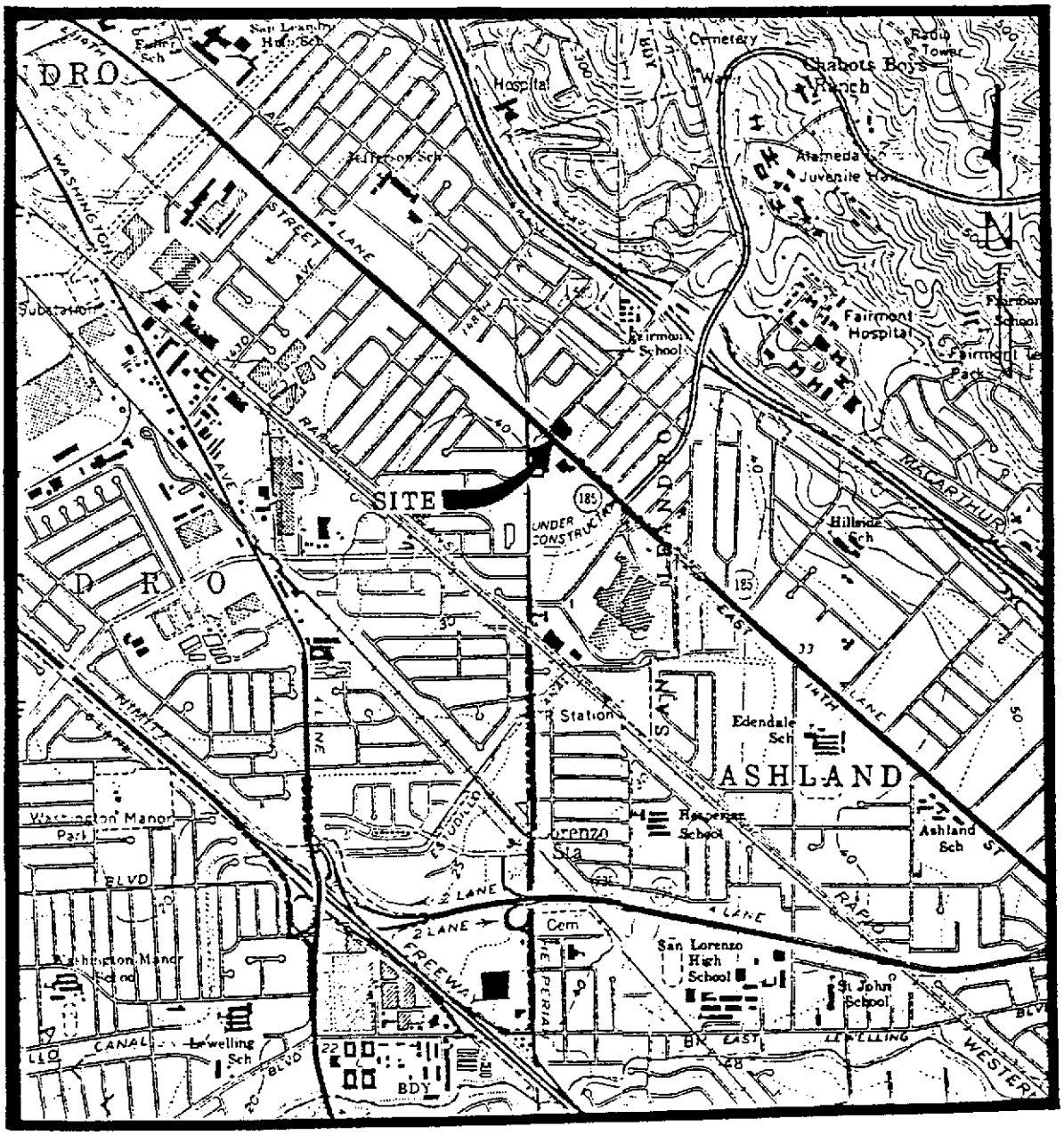
KEI-P91-0102.R5
July 14, 1992

TABLE 5

SUMMARY OF LABORATORY ANALYSES
WATER

Date	Sample #	TPH as Gasoline	Benzene	Toluene	Xylenes	Ethyl-benzene
1/28/91	W1	13,000	64	37	85	25
Detection Limits		30	0.30	0.30	0.30	0.30

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



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

0 2000 4000

Approx. scale feet

KAPREALIAN ENGINEERING INCORPORATED	UNOCAL SERVICE STATION #3292 15008 EAST 14TH STREET SAN LEANDRO, CA	LOCATION MAP

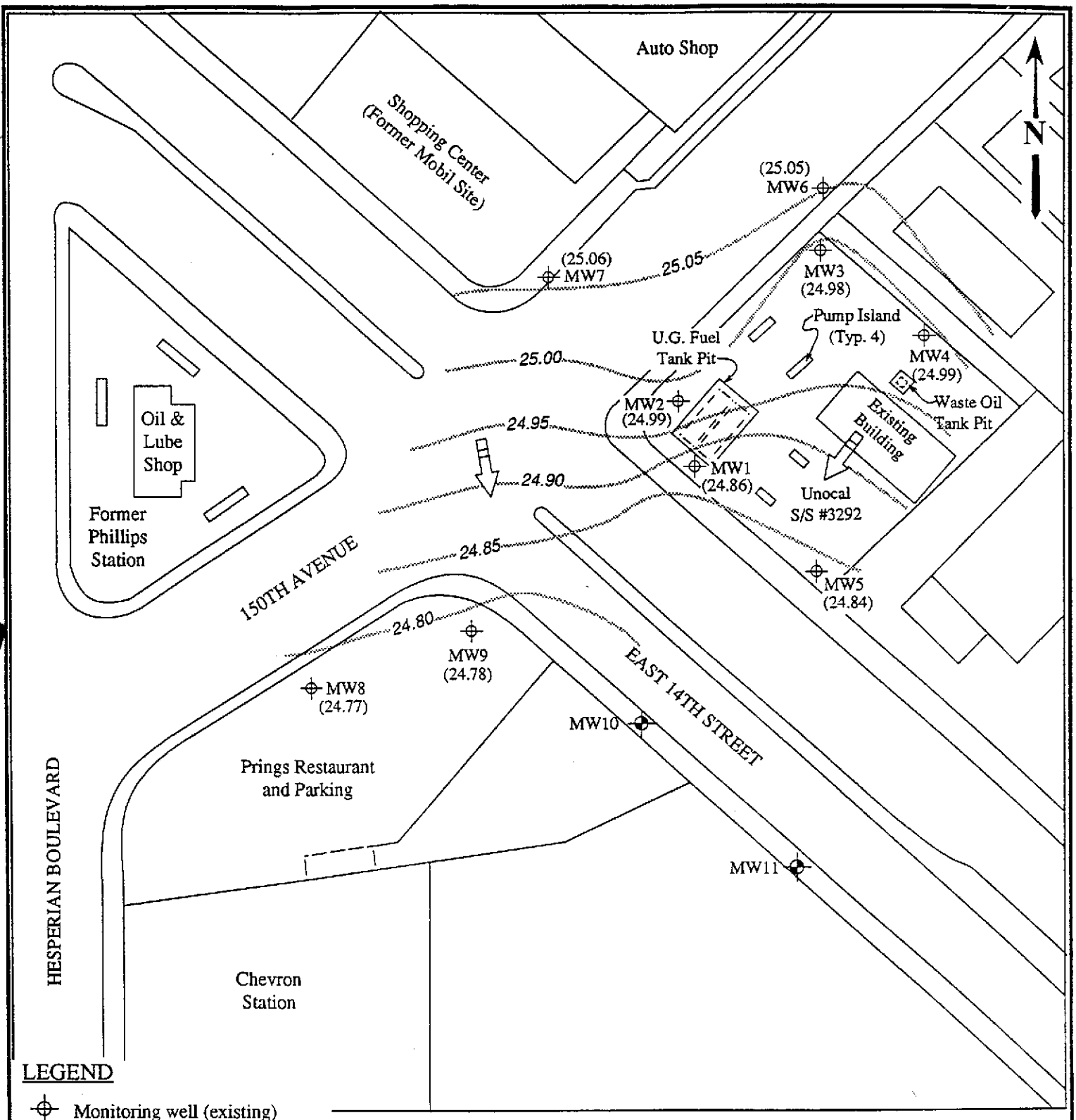


FIGURE 1. POTENTIOMETRIC SURFACE MAP FOR MAY 19, 1992 MONITORING EVENT.

KAPREALIAN ENGINEERING
INCORPORATED

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

FIGURE
1

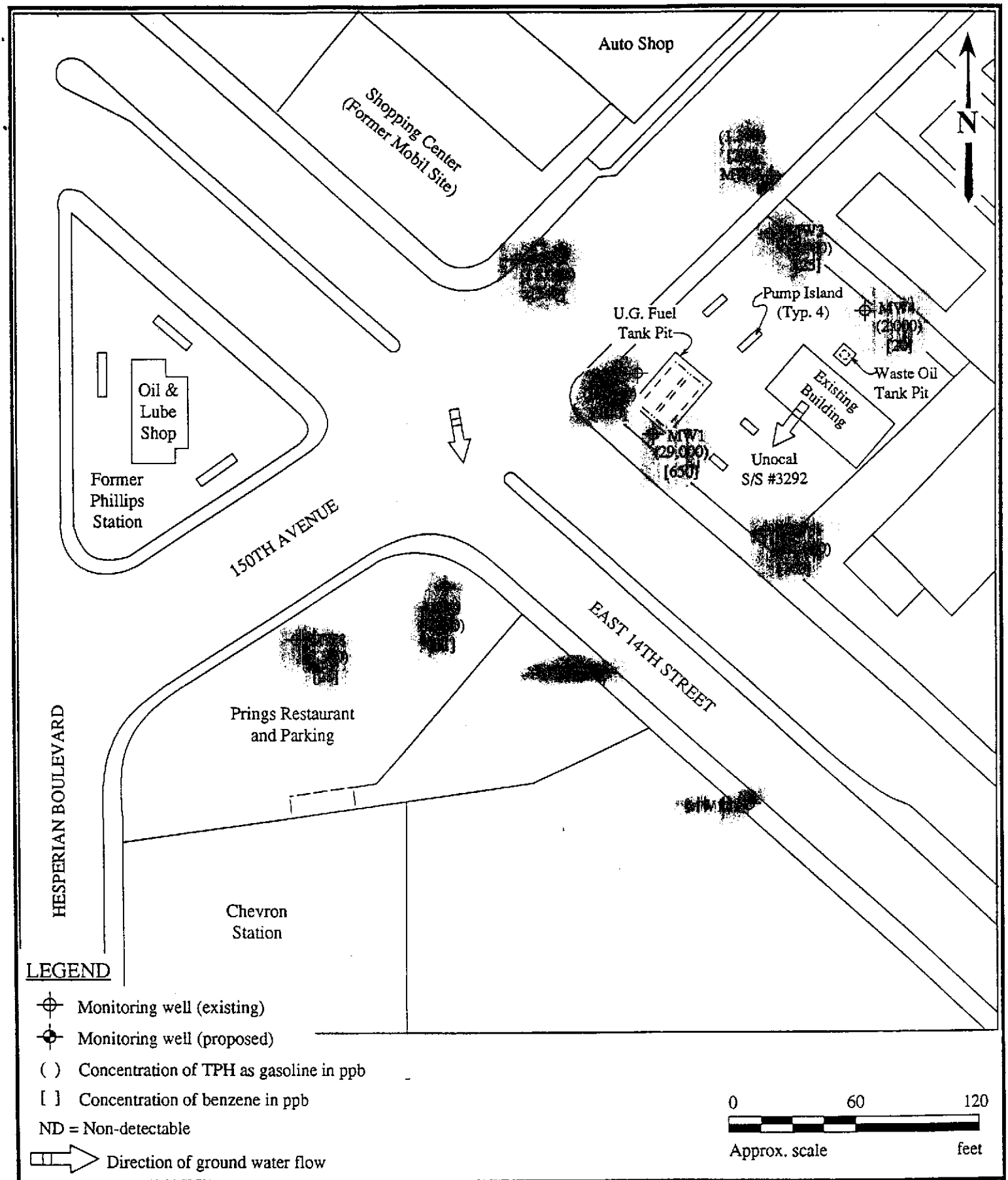
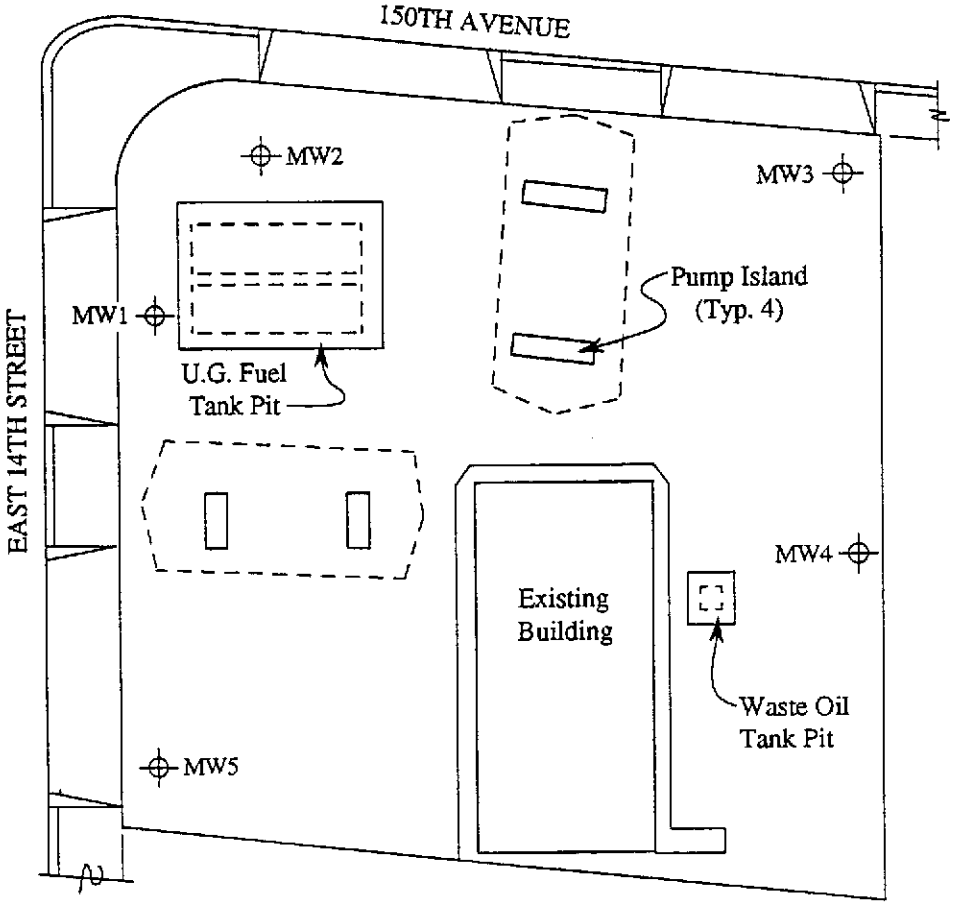


FIGURE 1A. PETROLEUM HYDROCARBON CONCENTRATIONS IN GROUND WATER.

KAPREALIAN ENGINEERING
INCORPORATED

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

FIGURE
1a



LEGEND

Monitoring well

0 30 60

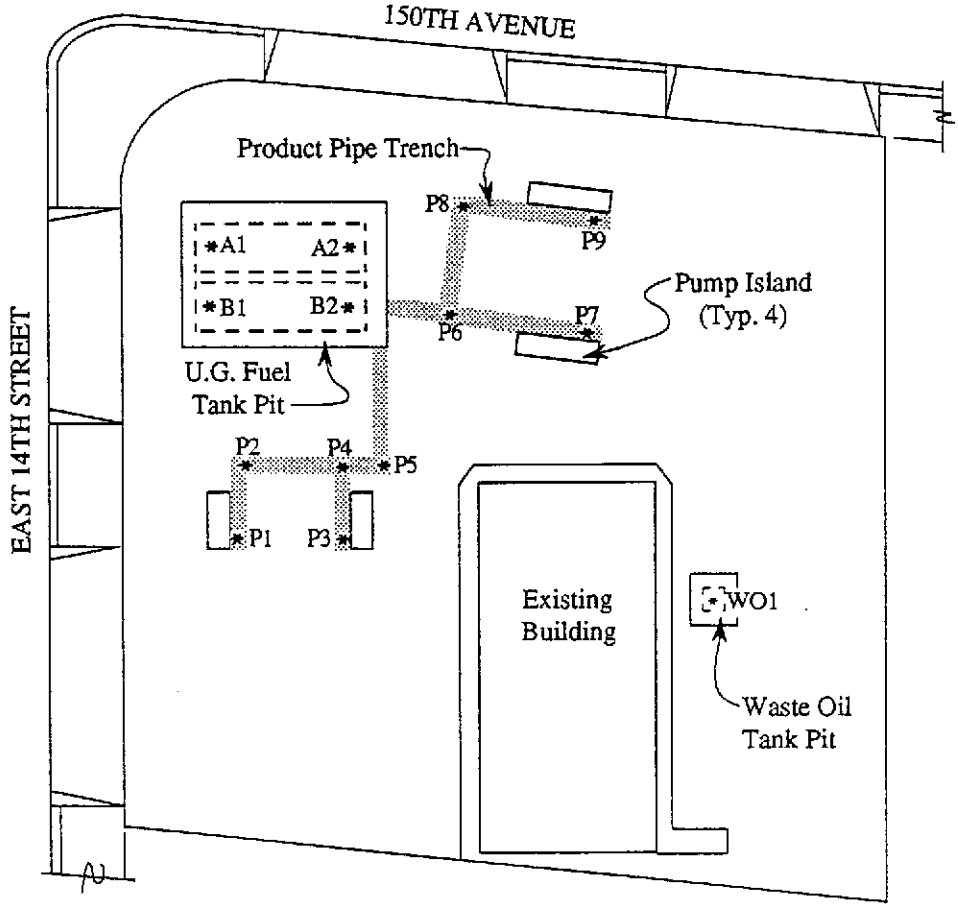
Approx. scale feet

FIGURE 3. SITE PLAN SHOWING FUEL AND WASTE OIL TANK PITS.

KAPREALIAN ENGINEERING
INCORPORATED

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

FIGURE
2



LEGEND

* Sample point location

(Samples collected during January and February of 1991)

0 30 60

Approx. scale feet

FIGURE 3. SITE PLAN SHOWING TANK PIT AND FUEL LINE SOIL SAMPLE LOCATIONS.

KAPREALIAN ENGINEERING
INCORPORATED

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

FIGURE
3

BORING LOG

Project No. KEI-P91-0101	**Boring & Casing Diameter** 9" 2"	**Logged By** JGG D.L. EG 1633
Project Name Unocal S/S #3292 15008 E. 14th, San Leandro	**Well Cover Elevation**	**Date Drilled** 5-5-92
Boring No. MW6	**Drilling Method** Hollow-stem Auger	**Drilling Company** Woodward Drilling

Penetration blows/6"	G. W. level	Depth (feet) Samples	Strati-graphy USCS	Description
		0		Asphalt pavement over sand and gravel base.
NO BLOW COUNT DATA-CONTINUOUSLY CORED			CL	Clay, very stiff, slightly moist, black.
				Silty clay, trace sand, stiff, moist, very dark grayish brown.
		5	SM	Silty sand, trace gravel to 3/4 inches in diameter, trace clay, sand is fine to coarse-grained, medium dense, moist, olive brown.
			ML	Sandy silt, trace clay, sand is fine to medium-grained, stiff, moist, olive brown.
No recovery 7 - 9.5 feet.			CH	Silty clay, stiff, moist, dark grayish brown and olive brown mottled with root holes.
		10		
	▽		ML	Sandy silt, trace clay, sand is fine to medium-grained, firm to stiff, wet, olive brown.
			SM	Silty sand, estimated at 15% silt, sand is fine to medium-grained, medium dense, saturated, dark greenish gray.
			ML/CL	Clayey silt, firm to stiff, moist to wet, olive brown and olive gray mottled, grades to olive gray, locally grades to very silty clay, occasional blocky texture.
		15		
			CH	Clay with silt, trace fine-grained sand, stiff, moist, olive brown and very dark grayish brown mottled.
			SC	Clayey sand, medium dense, moist, dark grayish brown.
			CL	Clay, very stiff, moist, black.
		20		TOTAL DEPTH: 20'

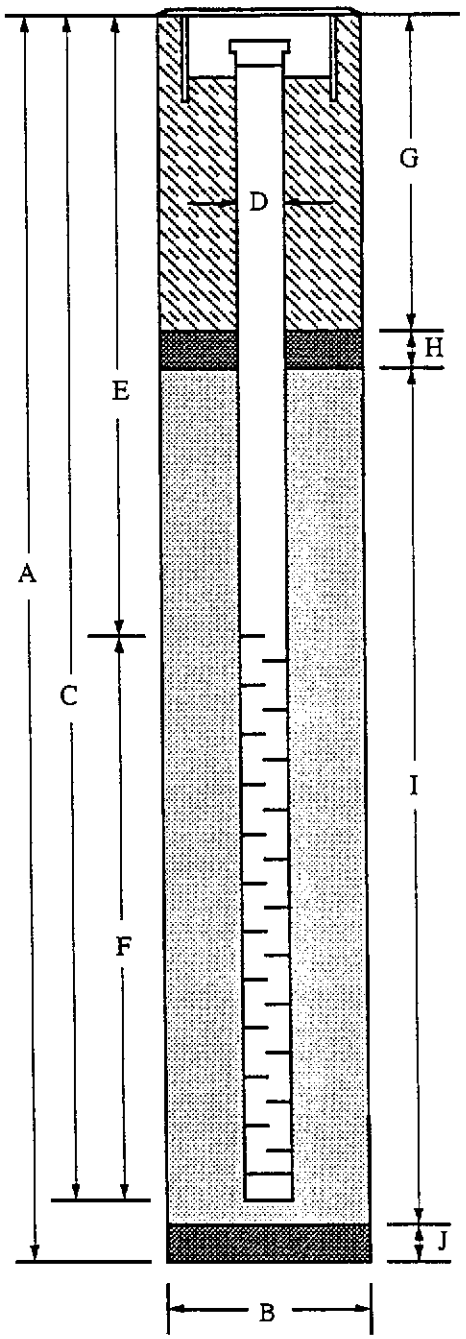
WELL COMPLETION DIAGRAM

PROJECT NAME: Unocal S/S #3292, 15008 E. 14th, San Leandro WELL NO. MW6

PROJECT NUMBER: KEI-P91-0102

WELL PERMIT NO.: ACFC & WCD 92201

Flush-mounted Well Cover



A. Total Depth : 20'

B. Boring Diameter*: 9"

Drilling Method: Hollow Stem Auger

C. Casing Length: 20'

Material: Schedule 40 PVC

D. Casing Diameter: OD = 2.375"

ID = 2.067"

E. Depth to Perforations: 8'

F. Perforated Length: 12'

Perforation Type: Machined Slot

Perforation Size: 0.010"

G. Surface Seal: 4'

Seal Material: Neat Cement

H. Seal: 2'

Seal Material: Bentonite

I. Filter Pack: 14'

Pack Material: RMC Lonestar Sand

Size: #2/12

J. Bottom Seal: None

Seal Material: N/A

* Boring diameter can vary from 8 1/4" to 9" depending on bit wear.

BORING LOG

Project No. KEI-P91-0102	**Boring & Casing Diameter** 9" 2"	**Logged By** JGG D.L. EG 1633
Project Name Unocal S/S #3292 15008 E. 14th, San Leandro	**Well Cover Elevation**	**Date Drilled** 5-5-92
Boring No. MW7	**Drilling Method** Hollow-stem Auger	**Drilling Company** Woodward Drilling

Penetration blows/6"	G. W. level	Depth (feet) Samples	Strati-graphy USCS	Description
		0		Concrete slab over sand and gravel base.
NO BLOW COUNT DATA - SAMPLES PUSHED			ML/CL	Silt, clayey silt, and silty clay in pockets, with minor sand and gravel, soft to firm, moist, yellowish brown to black (fill and disturbed native soil).
		5		
Very poor recovery at 7.5 feet.			CL/SM	Pocketed clay, silt, and sand, soft, moist (fill).
			CH	Silty clay, stiff, moist, olive brown and dark grayish brown mottled, very dark gray discolored root holes, occasionally wet inside root holes.
		10		Silty clay as above except olive brown.
			ML	Silt, trace very fine-grained sand, firm, wet, olive gray.
			MH	Clayey silt, firm to stiff, very moist, dark olive gray, root holes common.
		15	ML	Sandy silt, trace clay, sand is very fine-grained, firm to stiff, wet, dark olive gray.
			CH	Clay with silt, trace very fine-grained sand, stiff, moist, very dark grayish brown and dark gray mottled. Lenses of grayish brown clayey silt below 19.5 feet.
		20		Clay, very stiff, moist, black, trace caliche.
				TOTAL DEPTH: 21.5'

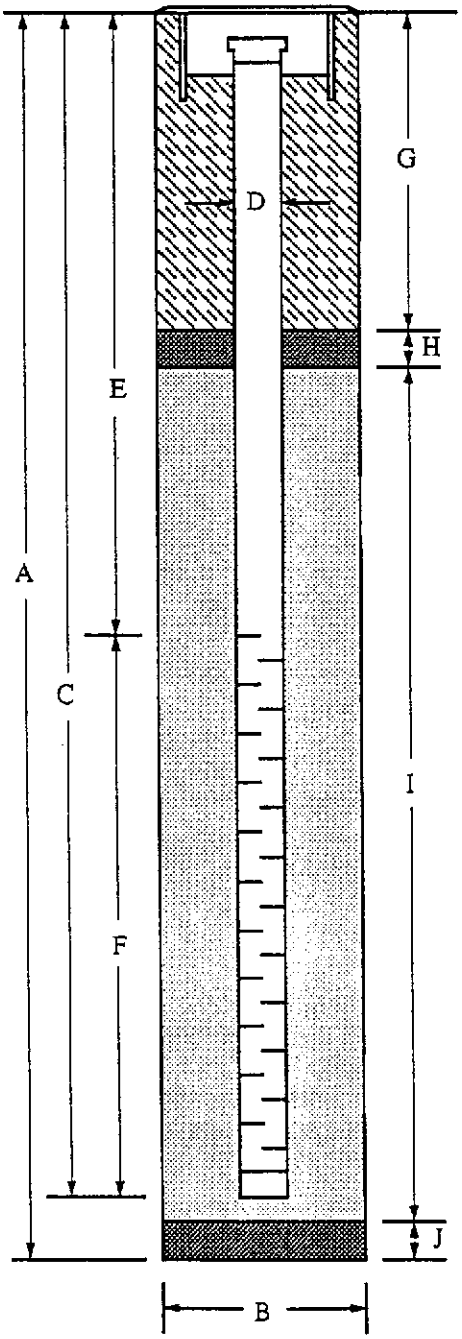
WELL COMPLETION DIAGRAM

PROJECT NAME: Unocal S/S #3292, 15008 E. 14th, San Leandro WELL NO. MW7

PROJECT NUMBER: KEI-P91-0102

WELL PERMIT NO.: ACF & WCD 92201

Flush-mounted Well Cover



A. Total Depth : 21.5'

B. Boring Diameter*: 9"

Drilling Method: Hollow Stem Auger

C. Casing Length: 21.5'

Material: Schedule 40 PVC

D. Casing Diameter: OD = 2.375"

ID = 2.067"

E. Depth to Perforations: 11'

F. Perforated Length: 10.5'

Perforation Type: Machined Slot

Perforation Size: 0.010

G. Surface Seal: 8'

Seal Material: Neat Cement

H. Seal: 2'

Seal Material: Bentonite

I. Filter Pack: 11.5'

Pack Material: RMC Lonestar Sand

Size: #2/12

J. Bottom Seal: None

Seal Material: N/A

* Boring diameter can vary from 8-1/4" to 9" depending on bit wear.

BORING LOG

Project No. KEI--91-0102	**Boring & Casing Diameter** 9" 2"	**Logged By** JGG W.W. EG 1633
Project Name Unocal S/S #3292 15008 E. 14th, San Leandro	**Well Cover Elevation**	**Date Drilled** 5/6/92
Boring No. MW8	**Drilling Method** Hollow-stem Auger	**Drilling Company** Woodward Drilling

Penetration blows/6"	G. W. level	Depth (feet) Samples	Strati-graphy USCS	Description
		0		2 inches of asphalt pavement and 4 inches of concrete pavement over sand and gravel base.
			CL	Silty clay, minor gravel, moist, grayish green.
			ML	Clayey silt, estimated at 25% clay, 5% sand and gravel to 1/2 inches in diameter, stiff, moist, very dark grayish brown.
7/9/13		5	CL	Clay, estimated at 10-15% fine sand and 5% subrounded gravel to 3/4 inches in diameter, trace silt, very stiff, moist, brown to dark yellowish brown.
4/7/9		10		Clay, stiff to very stiff, moist, light olive brown, root pores with decomposed rootlets common.
6/7/5	▽		GC	Clayey gravel with well graded sand and well rounded gravel to 3/4 inches in diameter, moist, medium dense.
			ML	Clayey silt, estimated at 5% fine-grained sand, very moist, olive gray.
2/2/3	▽		SC	Clayey sand with silt, estimated at 30% clay and 10-15% silt sand, well graded, saturated, greenish gray.
		15	CL	Clay, trace silt and sand, moist, firm, olive gray and light olive brown mottled, trace root pores.
			ML	Clayey silt, saturated, firm, greenish gray.
3/4/6			SM	Silty sand, estimated at 25% silt, sand is well sorted, fine grained, saturated, olive gray and greenish gray mottled,
4/5/7			CL/CH	Clay, high plasticity, trace silt, moist, stiff, gray and brown mottled, saturated root pores.
			CL	Sandy clay with silt, very moist, olive gray.
		20		TOTAL DEPTH: 19.0'

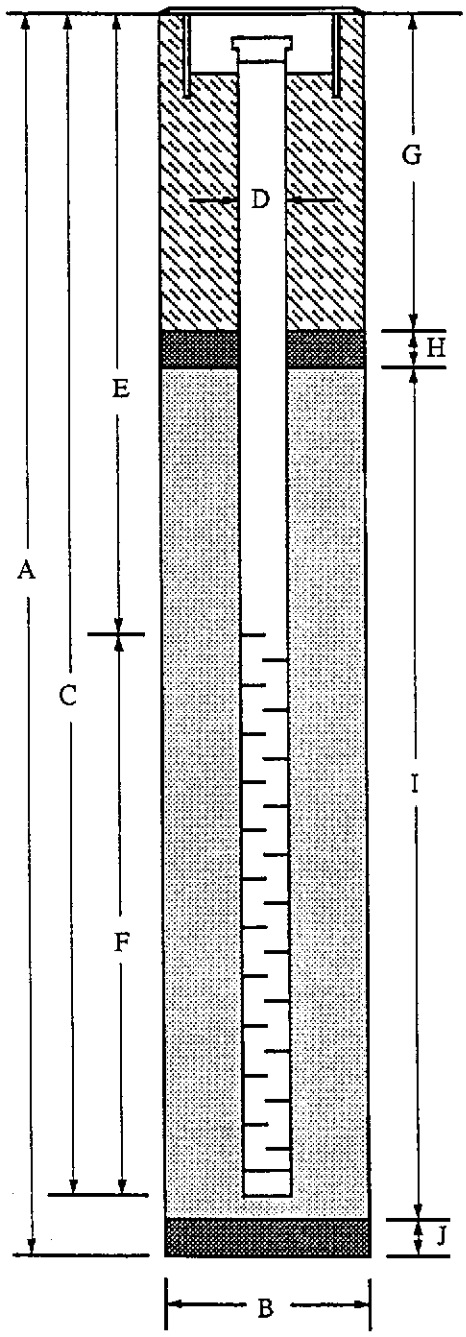
WELL COMPLETION DIAGRAM

PROJECT NAME: Unocal S/S #3292, 15008 E. 14th, San Leandro WELL NO. MW8

PROJECT NUMBER: KEI-P91-0102

WELL PERMIT NO.: ACFC & WCD 92201

Flush-mounted Well Cover



A. Total Depth : 20'

B. Boring Diameter*: 9"

Drilling Method: Hollow Stem Auger

C. Casing Length: 19"

Material: Schedule 40 PVC

D. Casing Diameter: OD = 2.375"

ID = 2.067"

E. Depth to Perforations: 8'

F. Perforated Length: 11

Perforation Type: Machined Slot

Perforation Size: 0.010"

G. Surface Seal: 4'

Seal Material: Neat Cement

H. Seal: 2'

Seal Material: Bentonite

I. Filter Pack: 13'

Pack Material: RMC Lonestar Sand

Size: #2/12

J. Bottom Seal: 1'

Seal Material: Benton chips.

* Boring diameter can vary from 8 1/4" to 9" depending on bit wear.

BORING LOG

Project No. KEI-P91-0102	**Boring & Casing Diameter** 9" 2"	**Logged By** W.W JG G EG 1633
Project Name Unocal S/S #3292 15008 E. 14th, San Leandro	**Well Cover Elevation**	**Date Drilled** 5/6/92
Boring No. MW9	**Drilling Method** Hollow-stem Auger	**Drilling Company** Woodward Drilling

Penetration blows/6"	G. W. level	Depth (feet) Samples	Strati-graphy USCS	Description
		0		2 inches of asphalt over 4 inches of concrete pavement.
			CL	Silty clay with fine sand, estimated at 15% fine-grained sand, trace gravel, yellowish brown.
				As above except dark grayish brown.
				Silty clay, estimated 20% silt, stiff, moist, very dark gray.
7/15/15		5		Silty clay, estimated 15-20% silt and 5% sand, minor gravel, very stiff, brown.
7/9/9		10		Clay, estimated at 5-10% silt, trace sand and caliche, very stiff, light olive brown and brownish gray, root pores common.
				Clay, estimated at 5-10% silt, trace sand and caliche, stiff, very moist to saturated, grayish brown to light olive brown, root pores common.
7/7/6				Clay as above, color change to gray and greenish gray.
		15		Silty clay, estimated at 15% silt, stiff, saturated, greenish gray and light olive brown mottled, root pores common.
4/5/6				Silty clay, estimated at 15-20% silt, trace sand, saturated, stiff, greenish gray and grayish brown mottled.
4/6/8			CL/CH	Clay, high plasticity, trace fine sand, stiff, moist, mottled brown and dark gray, trace root pores.
		20		TOTAL DEPTH 19'

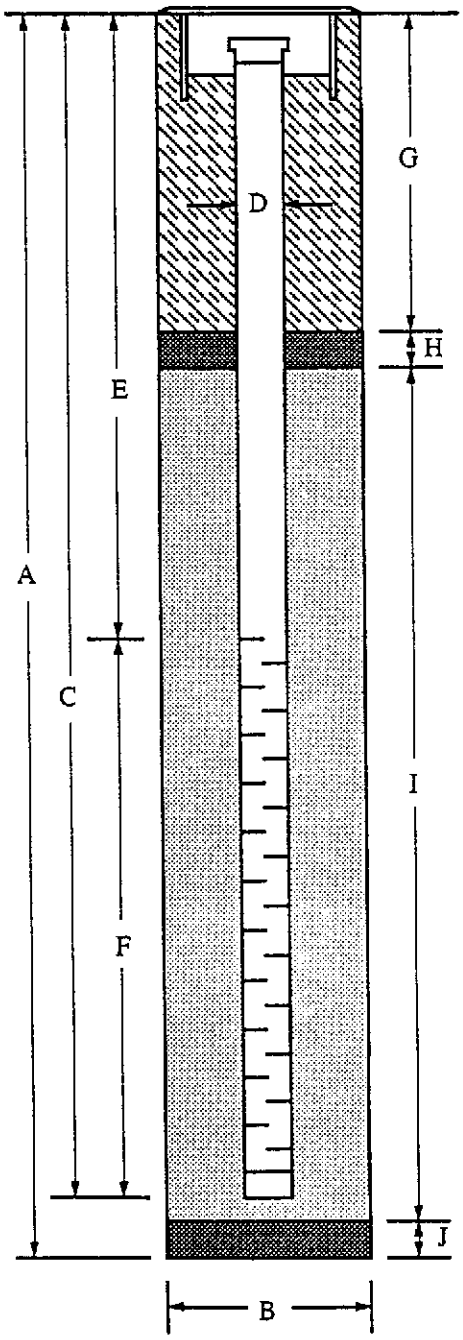
WELL COMPLETION DIAGRAM

PROJECT NAME: Unocal S/S #3292, 15008 E. 14th, San Leandro WELL NO. MW9

PROJECT NUMBER: KEI-P91-0102

WELL PERMIT NO.: ACFC & WCD 92201

Flush-mounted Well Cover



A. Total Depth : 19'

B. Boring Diameter*: 9"

Drilling Method: Hollow Stem Auger

C. Casing Length: 19"

Material: Schedule 40 PVC

D. Casing Diameter: OD = 2.375"

ID = 2.067"

E. Depth to Perforations: 8'

F. Perforated Length: 11

Perforation Type: Machined Slot

Perforation Size: 0.010"

G. Surface Seal: 4'

Seal Material: Neat Cement

H. Seal: 2'

Seal Material: Bentonite

I. Filter Pack: 13'

Pack Material: RMC Lonestar Sand

Size: #2/12

J. Bottom Seal: None

Seal Material: N/A

* Boring diameter can vary from 8 1/4" to 9" depending on bit wear.

SEQUOIA ANALYTICAL

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

Kaprealian Engineering, Inc.	Client Project ID:	Unocal, 15008 E. 14th. St., San Leandro	Sampled:	May 19, 1992
2401 Stanwell Drive, Suite 400	Matrix Descript:	Water	Received:	May 19, 1992
Concord, CA 94520	Analysis Method:	EPA 5030/8015/8020	Analyzed:	May 28, 1992
Attention: Mardo Kaprealian, P.E.	First Sample #:	205-0932	Reported:	Jun 2, 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)
205-0932	MW-1	29,000	650	370	1,100	1,200
205-0933	MW-2	17,000	140	87	680	170
205-0934	MW-3	3,400	25	3.6	66	41
205-0935	MW-4	2,000	20	3.5	42	8.3
205-0936	MW-5	84,000	760	1,500	4,000	17,000
205-0937	MW-6	1,300	2.0	2.1	N.D.	2.7
205-0938	MW-7	17,000	540	90	1,200	1,900
205-0939	MW-8	5,300	28	3.3	2.6	2.1
205-0940	MW-9	8,100	11	N.D.	25	5.8
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

Scott A. Chieffo
Project Manager

SEQUOIA ANALYTICAL

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

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

Client Project ID: Unocal, 15008 E. 14th. St., San Leandro
QC Sample Group: 2050932-940
Reported: Jun 2, 1992

QUALITY CONTROL DATA REPORT

ANALYTE	Benzene	Toluene	Ethyl-Benzene	Xylenes
Method:	EPA 8015/8020	EPA 8015/8020	EPA 8015/8020	EPA 8015/8020
Analyst:	J.Dinsay	J.Dinsay	J.Dinsay	J.Dinsay
Reporting Units:	ug/L	ug/L	ug/L	ug/L
Date Analyzed:	May 28, 1992	May 28, 1992	May 28, 1992	May 28, 1992
QC Sample #:	Matrix Blank	Matrix Blank	Matrix Blank	Matrix Blank
Sample Conc.:	N.D.	N.D.	N.D.	N.D.
Spike Conc. Added:	10	10	10	30
Conc. Matrix Spike:	10	10	10	30
Matrix Spike % Recovery:	100	100	100	100
Conc. Matrix Spike Dup.:	9.9	9.8	10	30
Matrix Spike Duplicate % Recovery:	99	98	100	99
Relative % Difference:	1.0	2.0	0.0	1.3

Laboratory blank contained the following analytes: None Detected

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

SEQUOIA ANALYTICAL

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

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

Client Project ID: Unocal, 15008 E. 14th. St., San Leandro
QC Sample Group: 2050932-940
Reported: Jun 2, 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.Dinsay	J.Dinsay	J.Dinsay	J.Dinsay	J.Dinsay	J.Dinsay	J.Dinsay
Reporting Units:	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Date Analyzed:	May 28, 1992	May 28, 1992	May 28, 1992	May 28, 1992	May 28, 1992	May 28, 1992	May 28, 1992
Sample #:	205-0932	205-0933	205-0934	205-0935	205-0936	205-0937	205-0938
Surrogate % Recovery:	98	96	80	94	93	88	82

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

SEQUOIA ANALYTICAL

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

Kaprealian Engineering, Inc. Client Project ID: Unocal, 15008 E. 14th. St., San Leandro
P.O. Box 996
Benicia, CA 94510
Attention: Mardo Kaprealian, P.E. QC Sample Group: 2050932-940 Reported: Jun 2, 1992

QUALITY CONTROL DATA REPORT

SURROGATE

	EPA	EPA	EPA
Method:	8015/8020	8015/8020	8015/8020
Analyst:	J.Dinsay	J.Dinsay	J.Dinsay
Reporting Units:	ug/L	ug/L	ug/L
Date Analyzed:	May 28, 1992	May 28, 1992	May 28, 1992
Sample #:	205-0939	205-0940	Blank
Surrogate % Recovery:	98	102	110

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, INC.

KEI

CHAIN OF CUSTODY

SAMPLER	SITE NAME & ADDRESS	ANALYSES REQUESTED	TURN AROUND TIME:
Vartkes	Unocal / San Leandro 15008 E. 14th street	TPHG : BTXE	Regular
WITNESSING AGENCY			

SAMPLE ID NO.	DATE	TIME	SOIL	WATER	GRAB	COMP	NO. OF CONT.	SAMPLING LOCATION	TPHG : BTXE						REMARKS
MW-1	5/19/92	10:00 A.M.		✓	✓		2	Monitoring Well	✓						2050932 AB
MW-2	"			✓	✓		2	" "	✓						933 AB
MW-3	"			✓	✓		2	" "	✓						934 AB
MW-4	"			✓	✓		2	" "	✓						935 AB
MW-5	"			✓	✓		2	" "	✓						936 AB
MW-6	"			✓	✓		2	" "	✓						937 AB
MW-7	"			✓	✓		2	" "	✓						938 AB
MW-8	"			✓	✓		2	" "	✓						939 AB
MW-9	"	3:00 P.M.		✓	✓		2	" "	✓						940 AB

Relinquished by: (Signature)	Date/Time	Received by: (Signature)
W. Taliaferro	5/19/92 4:45	Tim Cottell
Tim Cottell	5/20/92	[signature] 5-20-92 1:40 PM

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? N
4. Were samples in appropriate containers and properly packaged? /

Signature	Title	Date
J.C.	analyst	5/19/92

SEQUOIA ANALYTICAL

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

Kaprealian Engineering, Inc.	Client Project ID:	Unocal #3292 / 15008 E 14th Street	Sampled:	May 6, 1992
2401 Stanwell Drive, Suite 400	Matrix Descript:	Soil San Leandro	Received:	May 8, 1992
Concord, CA 94520	Analysis Method:	EPA 5030/8015/8020	Analyzed:	5/15 & 5/19/92
Attention: Mardo Kaprealian, P.E.	First Sample #:	205-0451	Reported:	May 22, 1992

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

Sample Number	Sample Description	Low/Medium B.P. Hydrocarbons mg/kg (ppm)	Benzene mg/kg (ppm)	Toluene mg/kg (ppm)	Ethyl Benzene mg/kg (ppm)	Xylenes mg/kg (ppm)
205-0451	MW8 (5)	N.D.	N.D.	N.D.	N.D.	N.D.
205-0452	MW8 (10)	N.D.	N.D.	N.D.	N.D.	N.D.
205-0453	MW8 (11.5)	N.D.	N.D.	N.D.	N.D.	N.D.
205-0454	MW8 (13.5)	1.2	0.011	0.0054	N.D.	0.014
205-0455	MW9 (5)	N.D.	N.D.	0.0053	N.D.	0.014
205-0456	MW9 (10)	N.D.	N.D.	N.D.	N.D.	0.0078
205-0457	MW9 (12)	N.D.	N.D.	N.D.	N.D.	0.0074
Method Detection Limits:		**1.0**	**0.0050**	**0.0050**	**0.0050**	**0.0050**

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

SEQUOIA ANALYTICAL

Scott A. Chieffo
Project Manager

SEQUOIA ANALYTICAL

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

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

Client Project ID: Unocal #3292 / 15008 E 14th Street, San Leandro
QC Sample Group: 2050451-457
Reported: May 22, 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:	A.T.	A.T.	A.T.	A.T.
Reporting Units:	mg/kg	mg/kg	mg/kg	mg/kg
Date Analyzed:	May 15, 1992	May 15, 1992	May 15, 1992	May 15, 1992
QC Sample #:	Matrix Blank	Matrix Blank	Matrix Blank	Matrix Blank
Sample Conc.:	N.D.	N.D.	N.D.	N.D.
Spike Conc. Added:	0.40	0.40	0.40	1.2
Conc. Matrix Spike:	0.37	0.37	0.42	1.2
Matrix Spike % Recovery:	93	93	105	100
Conc. Matrix Spike Dup.:	0.37	0.37	0.42	1.2
Matrix Spike Duplicate % Recovery:	93	93	105	100
Relative % Difference:	0.0	0.0	0.0	0.0

Laboratory blank contained the following analytes: None Detected

SEQUOIA ANALYTICAL

Scott A. Chieffo
Project Manager

% Recovery:	$\frac{\text{Conc. of M.S. - Conc. of Sample}}{\text{Spike Conc. Added}}$	x 100
Relative % Difference:	$\frac{\text{Conc. of M.S. - Conc. of M.S.D.}}{\text{(Conc. of M.S. + Conc. of M.S.D.) / 2}}$	x 100

SEQUOIA ANALYTICAL

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

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

Client Project ID: Unocal #3292 / 15008 E 14th Street, San Leandro
QC Sample Group: 2050451-457
Reported: May 22, 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:	A.T.	A.T.	A.T.	A.T.
Reporting Units:	mg/kg	mg/kg	mg/kg	mg/kg
Date Analyzed:	May 20, 1992	May 20, 1992	May 20, 1992	May 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:	0.40	0.40	0.40	1.2
Conc. Matrix Spike:	0.43	0.45	0.47	1.5
Matrix Spike % Recovery:	108	113	118	125
Conc. Matrix Spike Dup.:	0.44	0.46	0.48	1.5
Matrix Spike Duplicate % Recovery:	110	115	120	125
Relative % Difference:	2.3	2.2	2.1	0.0

Laboratory blank contained the following analytes: None Detected

SEQUOIA ANALYTICAL

Scott A. Chieffo
Project Manager

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

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

SEQUOIA ANALYTICAL

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

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

Client Project ID: Unocal #3292 / 15008 E 14th Street
QC Sample Group: 2050451-457
Reported: May 22, 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:	A.T.	A.T.	A.T.	A.T.	A.T.	A.T.	A.T.
Reporting Units:	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Date Analyzed:	May 20, 1992	May 20, 1992	May 20, 1992	May 20, 1992	May 20, 1992	May 20, 1992	May 20, 1992
Sample #:	205-0451	205-0452	205-0453	205-0454	205-0455	205-0456	205-0457
Surrogate % Recovery:	110	89	90	98	111	108	96

SEQUOIA ANALYTICAL

Scott A. Chieffo
Project Manager

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

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

2050451.KEI <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 #3292, 15008 E. 14th Street, San Leandro
P.O. Box 996
Benicia, CA 94510
Attention: Mardo Kapreallan, P.E. QC Sample Group: 2050451-457 Reported: May 22, 1992

QUALITY CONTROL DATA REPORT

SURROGATE

	EPA
Method:	8015/8020
Analyst:	A.T.
Reporting Units:	mg/kg
Date Analyzed:	May 20, 1992
Sample #:	Matrix Blank

Surrogate	
% Recovery:	92

SEQUOIA ANALYTICAL

Scott A. Chieffo
Project Manager

% Recovery:	$\frac{\text{Conc. of M.S. - Conc. of Sample}}{\text{Spike Conc. Added}}$	x 100
Relative % Difference:	$\frac{\text{Conc. of M.S. - Conc. of M.S.D.}}{\text{(Conc. of M.S. + Conc. of M.S.D.) / 2}}$	x 100

KAPREALIAN ENGINEERING
INCORPORATED

CHAIN OF CUSTODY

SAMPLER: Wade Weston
WITNESSING AGENCY:

SITE NAME & ADDRESS: UNOCAL #3292 / SAN LEANDRO
15008 E. 14TH STREET

ANALYSES REQUESTED: 8015 M / BTEX

TURN AROUND TIME: REGULAR

SAMPLE ID NO.	DATE	TIME	SOIL	WATER	GRAB	COMP	NO. OF CONT.	SAMPLING LOCATION	8015 M	BTEX	REMARKS
MW8(5)	5-6-92		X		X		1	SEE SAMPLE ID NO.	X	X	2050451
MW8(10)	5-6-92		X		X		1		X	X	452
MW8(11.5)	5-6-92		X		X		1		X	X	453
MW8(13.5)	5-6-92		X		X		1		X	X	454
MW9(5)	5-6-92		X		X		1		X	X	455
MW9(10)	5-6-92		X		X		1		X	X	456
MW9(12)	5-6-92		X		X		1		X	X	457

Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Wade Weston	5-8-92 5:25 PM	
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?
2. Will samples remain refrigerated until analyzed?
3. Did any samples received for analysis have head space?
4. Were samples in appropriate containers and properly packaged?

Signature: ABK Title: FS Date: 5-8-92

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

SEQUOIA ANALYTICAL

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

Kaprealian Engineering, Inc.	Client Project ID:	Unocal#3292, 15008 E. 14th Street,	Sampled:	May 5, 1992
2401 Stanwell Drive, Suite 400	Matrix Descript:	Soil San Leandro	Received:	May 6, 1992
Concord, CA 94520	Analysis Method:	EPA 5030/8015/8020	Analyzed:	May 13, 1992
Attention: Mardo Kaprealian, P.E.	First Sample #:	205-0264	Reported:	May 18, 1992

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

Sample Number	Sample Description	Low/Medium B.P. Hydrocarbons mg/kg (ppm)	Benzene mg/kg (ppm)	Toluene mg/kg (ppm)	Ethyl Benzene mg/kg (ppm)	Xylenes mg/kg (ppm)
205-0264	MW 6(5.5)	N.D.	N.D.	N.D.	N.D.	N.D.
205-0265	MW 6(10.5)	N.D.	N.D.	N.D.	N.D.	N.D.
205-0266	MW 7(9)	280	0.45	0.45	7.2	23
205-0267	MW 7(12.5)	540	1.9	0.47	15	47
Method Detection Limits:		**1.0**	**0.0050**	**0.0050**	**0.0050**	**0.0050**

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

Scott A. Chieffo
Project Manager

SEQUOIA ANALYTICAL

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

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

Client Project ID: Unocal#3292, 15008 E. 14th Street, San Leandro
QC Sample Group: 2050264-0267
Reported: May 18, 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.	K.N.	K.N.	K.N.
Reporting Units:	mg/kg	mg/kg	mg/kg	mg/kg
Date Analyzed:	May 13, 1992	May 13, 1992	May 13, 1992	May 13, 1992
QC Sample #:	Matrix Blank	Matrix Blank	Matrix Blank	Matrix Blank
Sample Conc.:	N.D.	N.D.	N.D.	N.D.
Spike Conc. Added:	0.40	0.40	0.40	1.2
Conc. Matrix Spike:	0.34	0.44	0.45	1.3
Matrix Spike % Recovery:	85	110	113	108
Conc. Matrix Spike Dup.:	0.34	0.43	0.43	1.2
Matrix Spike Duplicate % Recovery:	85	108	108	100
Relative % Difference:	0.0	2.3	4.5	8.0

Laboratory Blank contained the following analytes: None detected.

SEQUOIA ANALYTICAL

Scott A. Chieffo
Project Manager

% Recovery:	$\frac{\text{Conc. of M.S. - Conc. of Sample}}{\text{Spike Conc. Added}}$	x 100
Relative % Difference:	$\frac{\text{Conc. of M.S. - Conc. of M.S.D.}}{\text{(Conc. of M.S. + Conc. of M.S.D.) / 2}}$	x 100

SEQUOIA ANALYTICAL

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

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

Client Project ID: Unocal#3292, 15008 E. 14th Street, San Leandro
QC Sample Group: 2050264-0267
Reported: May 18, 1992

QUALITY CONTROL DATA REPORT

SURROGATE

Method:	EPA 8015/8020	EPA 8015/8020	EPA 8015/8020	EPA 8015/8020	EPA 8015/8020
Analyst:	K.N.	K.N.	K.N.	K.N.	K.N.
Reporting Units:	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Date Analyzed:	May 13, 1992	May 13, 1992	May 13, 1992	May 13, 1992	May 13, 1992
Sample #:	205-0264	205-0265	205-0266	205-0267	Blank
Surrogate % Recovery:	98	99	110	98	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, INC.

CHAIN OF CUSTODY

SAMPLER: [signature]

WITNESSING AGENCY:

SITE NAME & ADDRESS: UNOCAL #3292/SAN LEANDRO
5008 E. 14TH STREET

ANALYSES REQUESTED: TPH/G, BTEX

TURN AROUND TIME: REGULAR

SAMPLE ID NO.	DATE	TIME	SOIL	WATER	GRAB	COMP	NO. OF CONT.	SAMPLING LOCATION	REMARKS
MW4(5.5)	5-5-92		X		X		1	SEE SAMPLE ID NO.	2050264
MW4(10.5)	5-5-92		X		X		1		265
MW7(9)	5-5-92		X		X		1		266
MW7(12.5)	5-5-92		X		X		1		267

Relinquished by: (Signature)	Date/Time	Received by: (Signature)
[signature] (KEI)	5-6-92 4:20PM	[signature]
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?
2. Will samples remain refrigerated until analyzed?
3. Did any samples received for analysis have head space? N/A
4. Were samples in appropriate containers and properly packaged?

ABK	ES	5-6-92
Signature	Title	Date