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

January 23, 1991

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

RE: Unocal Service Station #5901
11976 Dublin Boulevard
Dublin, California

RA

Gentlemen:

Per the request of Mr. Rick Sisk of Unocal Corporation, enclosed please find our report and proposal, both dated December 17, 1990, for the above referenced site.

Should you have any questions, please feel free to call our office at (707) 746-6915.

Sincerely,

Kaprealian Engineering, Inc.

Judy A. Dewey

jad\82

Enclosure

cc: Rick Sisk, Unocal Corporation

91 JAN 25 AM 11:35

KAPREALIAN ENGINEERING, INC.
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KEI-P90-0606.P2
December 17, 1990

PROPOSAL TO
UNOCAL CORPORATION
for the
Unocal Service Station #5901
11976 Dublin Boulevard
Dublin, California

GROUND WATER MONITORING, SAMPLING AND ANALYSIS

INTRODUCTION

Per our recommendations described in Kaprealian Engineering, Inc's. (KEI) report KEI-P90-0606.R6 dated December 17, 1990, KEI proposes the following work.

PROPOSED TASK

1. Monitor all monitoring wells on-site on a monthly basis. Record the elevation of the water table and any abnormal conditions noted during inspection, including presence of product and sheen.

2. Purge and sample ground water from all monitoring wells on a quarterly basis, and analyze for total petroleum hydrocarbons (TPH) as gasoline and benzene, toluene, xylenes and ethylbenzene on a quarterly basis. In addition, ground water from well MW1 (adjacent to the waste oil tank), will be analyzed for TPH as diesel, total oil and grease, and EPA method 8010 constituents. Prior to sampling, water table elevation will be recorded as well as the presence of any free product.

3. Prepare quarterly technical reports summarizing the field activity water sampling and analyses with discussion and recommendations.

The purging of ground water and sampling should continue for 12 months. This proposed monitoring and sampling program should be re-evaluated after 12 months.

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KEI-P90-0606.R6
December 17, 1990

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

Attention: Mr. Rick Sisk

RE: Preliminary Ground Water Investigation at
Unocal Service Station #5901
11976 Dublin Boulevard
Dublin, California

Dear Mr. Sisk:

This report presents the results of the preliminary ground water investigation for the referenced site in accordance with Kaprealian Engineering, Inc's. (KEI) proposal KEI-J90-0606.P1 dated July 16, 1990. The purpose of the investigation was to determine the ground water flow direction, and to begin to determine the degree and extent of the subsurface soil and ground water contamination at the site. 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 and report preparation.

SITE DESCRIPTION AND BACKGROUND

The subject site is presently used as a gasoline station. The site is situated on relatively gently sloping, eastward trending topography, and is located approximately 700 feet northwest of a channelized portion of Dublin Creek. The site is also located near the southwest end of the San Ramon Valley near Amador Valley. A Location Map and Site Plans are attached to this report.

KEI's initial field work was conducted on June 13, 1990, when two underground fuel storage tanks and one waste oil tank were removed from the site. The tanks consisted of one 10,000 gallon super unleaded fuel storage tank, one 10,000 gallon regular unleaded fuel storage tank, and one 280 gallon waste oil tank. The tanks were made of steel and at least one hole of 1/4-inch diameter was observed in each of the fuel tanks. Numerous holes up to 1/2-inch in diameter were observed in the waste oil tank. Mr. Ravi Arulanantham of the ACHA was present during tank removal and subsequent soil sampling.

Water was encountered in the fuel tank pit at a depth of approximately 7 feet below grade, thus prohibiting the collection of any soil samples from immediately beneath the tanks. Six soil samples, labeled SW1 through SW6, were collected from the sidewalls of the fuel tank pit approximately 6 to 12 inches above the observed water table. One soil sample, labeled WO1, was collected from beneath the waste oil tank at a depth of approximately 6.5 feet. An additional soil sample, labeled SWA, was collected from the waste oil tank pit sidewall at a depth of approximately 6.5 feet. Sample point locations are as shown on the attached Site Plan, Figure 2.

KEI returned to the site on June 15, 1990, in order to collect soil samples from the product pipe trenches. Four samples, labeled P1 through P4, were collected from trenches by using a driven tube-type soil sampler at a depth of 6 feet. After the soil sampling was completed, pipe trenches were excavated to ground water over the area indicated on the attached Site Plan, Figure 3. Pipe trench sample point locations are shown on the attached Site Plan, Figure 2.

On June 15, 1990, after reviewing the analytical results of the soil samples (SW1 through SW6), four additional soil samples, labeled SW1(3), SW2(3), SW5(2.5) and SW6(3), were collected from the sidewalls of the fuel tank pit approximately 6 to 12 inches above ground water in the vicinity of sample point locations SW1, SW2, SW5 and SW6, respectively.

After soil sampling was completed, approximately 25,000 gallons of ground water were pumped from the fuel tank pit. On June 20, 1990, one water sample, labeled W1, was collected from the fuel tank pit.

Also on June 20, 1990, based on analytical results of soil samples SW1(3) and SW2(3), two additional soil samples, labeled SW1(6.5) and SW2(6.5), were collected from the northerly sidewall of the fuel tank pit approximately 6 to 12 inches above ground water in the vicinity of sample point locations SW1(3) and SW2(3). The sample point locations and the area excavated are as indicated on the attached Site Plan, Figure 2.

On June 26, 1990, KEI again returned to the site in order to collect soil samples from the sidewalls of the new underground fuel storage tank pit located to the west of the pump islands. Four soil samples, labeled SW11, SW12, SW13 and SW14, were collected from the sidewalls of the excavation 6 to 12 inches above ground water. Sample point locations are as shown on the attached Site Plan, Figure 4.

On July 3, 1990, after having pumped approximately 10,000 gallons of ground water from the new fuel tank pit, a water sample, labeled W2, was collected from the pit.

All samples were analyzed by Sequoia Analytical Laboratory in Redwood City, California and were accompanied by properly executed Chain of Custody documentation. All soil samples, except the waste oil tank pit sidewall sample SWA, were analyzed for total petroleum hydrocarbons (TPH) as gasoline using EPA method 5030 in conjunction with modified 8015, and benzene, toluene, xylenes and ethylbenzene (BTX&E) using EPA method 8020. In addition to TPH as gasoline and BTX&E, the soil sample WO1, collected from the waste oil tank pit, was analyzed for TPH as diesel using EPA method 3550 in conjunction with modified 8015, total oil and grease (TOG) by EPA 503D&E, and EPA 8010 constituents. The waste oil tank pit sidewall sample, SWA, was analyzed for TOG only. In addition to TPH as gasoline and BTX&E, sample SW11 from the new fuel tank pit was also analyzed for TOG.

Both water samples were analyzed for TPH as gasoline and BTX&E. In addition, water sample W2 collected from the new fuel tank pit was analyzed for TOG.

Analytical results of the soil samples SW1, SW2, SW5 and SW6, collected from the sidewalls of the former fuel tank pit, indicated levels of TPH as gasoline ranging from 120 ppm to 5,700 ppm. Samples SW3 and SW4 indicated levels of TPH as gasoline at non-detectable and 8.0 ppm, respectively. However, after additional excavation, analyses of final sidewall soil samples SW1(6.5), SW2(6.5), SW5(2.5) and SW6(3), collected laterally beyond the samples SW1, SW2, SW5 and SW6 at a depth of approximately 6 feet, indicated levels of TPH as gasoline ranging from 1.2 ppm to 32 ppm.

Analyses of soil samples collected from the pipe trenches, indicated levels of TPH as gasoline ranging from 2.5 ppm to 37 ppm. Benzene was detected in all pipe trench samples at concentrations ranging from 0.28 ppm to 0.78 ppm.

Analytical results of the soil sample WO1, collected from beneath the waste oil tank pit, indicated levels of TPH as gasoline at 36 ppm, TPH as diesel at 120 ppm, and TOG at 1,500 ppm, with non-detectable concentrations of all EPA 8010 constituents, except 1,2-

dichlorobenzene at 210 ppb. Analysis of soil sample SWA, collected from the sidewall of the waste oil tank pit, indicated levels of TOG at 3,500 ppm.

Analyses of the soil samples (SW11, SW12, SW13 and SW14), collected from the new fuel tank pit, indicated non-detectable levels of TPH as gasoline and benzene for all samples. Analysis of sample SW11 for TOG indicated 78 ppm. Results of all soil analyses are summarized in Table 4.

Analytical results of the water sample (W1), collected from the former fuel tank pit, indicated levels of TPH as gasoline at 2,300 ppb, and levels of benzene at 3.1 ppb. Analyses of the water samples (W2), collected from the new fuel tank pit, indicated non-detectable levels of TPH as gasoline, TOG, and benzene. The results of the water analyses are summarized in Table 5.

KEI returned to the site on July 16, 1990 when three trenches were excavated laterally from the easterly, northerly and westerly waste oil tank pit sidewalls. Water was encountered at a depth of approximately 7 feet below grade. Three soil samples, labeled SWB(13), SWC(10) and SWD(14), were collected from the sidewalls of the trenches at approximately 6 to 12 inches above the observed water table. Sample point locations are as shown on the attached Site Plan, Figure 4. After sampling, the sidewalls of the waste oil tank pit were excavated laterally to the sample point locations to a depth of approximately 1 foot below the water table (or about 8 feet below grade).

On July 19, 1990, after having pumped approximately 5,000 gallons of ground water from the waste oil excavation, a water sample, labeled W3, was collected from the pit.

On July 20, 1990, KEI returned to the site to collect the additional soil samples required by the ACHA. Four soil samples, labeled SWE, SWF, SWG and SWH, were collected approximately 6 to 12 inches above the ground water level from the four corners of the waste oil tank excavation. Sample point locations are also shown on the attached Site Plan, Figure 5.

All samples were analyzed by Sequoia Analytical Laboratory in Redwood City, California. All soil samples were analyzed for TPH as gasoline using EPA method 5030 in conjunction with modified 8015; BTX&E using EPA method 8020; TPH as diesel using EPA method 3550 in conjunction with modified 8015; TOG by EPA 503D&E; and EPA 8010 constituents. The water sample was analyzed for TPH as gasoline, BTX&E, TPH as diesel, TOG and 8010 constituents.

Laboratory analyses of the soil samples indicated non-detectable levels of TPH as diesel, TOG and all EPA method 8010 constituents

for all samples. Analyses also indicated non-detectable levels of TPH as gasoline for all samples except SWC(10), which showed a level of TPH as gasoline at 1.1 ppm. Laboratory analyses of the water sample indicated non-detectable levels of all constituents. Results of all soil analyses are summarized in Table 6. The results of the water analyses are summarized in Table 7.

To comply with the requirements of the regulatory agencies and based on the analytical results, KEI proposed installation of four monitoring wells. Results of the soil samples from the fuel and waste oil tank excavations are summarized in KEI's reports (KEI-J90-0606.R1 and KEI-J90-0606.R4) dated July 16, 1990 and July 30, 1990, respectively.

FIELD ACTIVITIES

On November 6 and 7, 1990, four two-inch diameter monitoring wells (designated as MW1, MW2, MW3 and MW4 on the attached Site Plan, Figure 1) were installed at the site. The wells were drilled, constructed and completed in accordance with the guidelines of the Regional Water Quality Control Board (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 monitoring wells were drilled and completed to total depths ranging from 20 to 24 feet. Ground water was encountered at depths ranging from about 5.4 to 9.5 feet beneath the surface during drilling in all wells except MW3 in which ground water was not encountered until a depth of about 15.2 feet below grade. Soil samples were taken for laboratory analysis and lithologic logging purposes at a maximum spacing of 5 foot intervals, significant changes in lithology, obvious areas of contamination, and at the soil/ground water interface beginning at a depth of approximately 5 feet below grade until ground water was encountered. Soil samples were obtained below the first encountered ground water for lithologic logging purposes only at the depths indicated on the attached Boring Logs. The undisturbed soil samples were taken by driving a California-modified split-spoon sampler lined with brass liners ahead of the drilling augers. The two-inch diameter brass liners holding the samples were sealed with aluminum foil, plastic caps and tape and placed in plastic zip-lock baggies, and stored in a cooled ice chest for delivery to a 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. All four wells were surveyed by a licensed land surveyor (Kier & Wright of Pleasanton, California) to Mean Sea Level and to a vertical accuracy of 0.01 feet.

The wells were developed on November 12, 1990. Prior to development, the wells were checked for depth to the water table using an electronic sounder, presence of free product (using paste tape) and sheen. No free product or sheen was noted in any of the wells. After recording the monitoring data, the wells were developed with a surface pump until the evacuated water was clear and free of suspended sediment. Monitoring and well development data are summarized in Table 1.

The wells were sampled on November 16, 1990. Prior to sampling, monitoring data was collected and the wells purged of between 4.5 and 15 gallons. Water samples were then collected using a clean Teflon bailer, which was rinsed with distilled water prior to sampling each well. The samples were decanted into clean glass VOA vials, sealed with Teflon-lined screw caps, and labeled and stored in a cooler on ice until delivery to a certified laboratory.

ANALYTICAL RESULTS

Water and selected soil samples were analyzed at Sequoia Analytical Laboratory in Concord, California. All samples were accompanied by properly executed Chain of Custody documentation. Samples were analyzed for TPH as gasoline by EPA method 5030 in conjunction with modified 8015, and BTX&E by EPA method 8020. In addition, samples collected from MW1 were analyzed for TPH as diesel by EPA method 3550 in conjunction with 8015, for TOG by SM 503D&E, and for EPA method 8010 compounds.

Analytical results of the soil samples, collected from the borings for monitoring wells (MW1 through MW4), indicate non-detectable levels of TPH as gasoline and BTX&E in all soil samples. Analyses of the soil sample, MW1(5), indicate non-detectable levels of TPH as diesel, TOG and EPA method 8010 compounds.

Analytical results of the ground water samples collected from monitoring wells MW1 through MW4 indicate non-detectable levels of TPH as gasoline and BTX&E. Analyses of the water sample, collected from MW1, indicate non-detectable levels of TPH as diesel, TOG and halogenated volatile organics (EPA 8010). Results of the soil analyses are summarized in Table 3, and the water analyses in Table 2. Copies of the laboratory analyses and Chain of Custody documentation are attached to this report.

HYDROLOGY AND GEOLOGY

The water table stabilized in the monitoring wells at depths ranging from 5.63 to 6.27 feet below the surface in all wells except MW3, which stabilized at a depth below grade of 16.65 feet. The ground water flow direction appeared to be toward the north-northeast over the majority of the site at a hydraulic grade of

0.0026 on November 16, 1990, (based on water level data collected from the four monitoring wells prior to purging and sampling). However, the ground water flow direction at the southeast corner of the site appears to be toward the southeast at a gradient of 0.500. As this extremely steep apparent gradient is not considered reasonable, it is assumed that a splay of the Calaveras Fault crosses the site somewhere between MW3 and MW2, as shown on Figure 1.

The site is situated within the Dublin Subbasin of the larger Livermore Valley Ground Water Basin as defined by the Alameda County Flood Control and Water Conservation District and the regional ground water flow direction, as of Spring, 1990, is toward the southeast.

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 underlain by Quaternary-age alluvium. The surficial alluvium has been mapped as Holocene coarse-grained alluvium (Qhac) typically consisting of unconsolidated, permeable sand and silt with locally coarse sand and gravel materials and ranges in thickness from less than 10 feet to as much as 50 feet. This coarse-grained alluvium zone appears to have been deposited from sediments generated from erosion within Dublin Canyon situated immediately west of the site. The site is situated at the northern perimeter of the coarse-grained alluvium near a mapped geologic contact with Late-Pleistocene alluvium (Qpa). The Late Pleistocene alluvium is described as typically consisting of weakly consolidated, irregular interbedded clay, silt, sand, and gravel materials. The overall thickness of the alluvium underlying the site is presently unknown to KEI.

In addition, the site is situated at or is closely adjacent to the mapped trace of the active Calaveras Fault. The Calaveras Fault is a major structural break within the Coast Ranges near San Francisco Bay and most likely forms a significant barrier to the migration of ground water in the alluvial materials from the hillside areas immediately west of the site.

As exposed in the waste oil tank pit, the subsurface soil materials consisted of artificial fill materials to a depth below grade of about 4.5 feet, which are inturn underlain by expansive silty clay native top soil materials to a depth of at least 6 feet below grade.

The results of our subsurface study indicate that the site is underlain by fill materials extending to depths below grade of about 5 feet at MW1 and MW2 and extending to a depth of about 1

foot at MW3 and MW4. The fill materials are inturn underlain predominantly by silty clay and clayey silt materials, which extend to a depth of at least 23.5 feet. However, at MW3, an approximately 1 foot thick silty gravel lens was encountered at depths of about 15 to 16 feet below grade, and at MW2, a silty sand/sandy silt lens was encountered at a depth of 23.5 to 24 feet (maximum depth explored). These two relatively coarse-grained lenses discussed above were the only coarse-grained soils encountered during our subsurface study.

Also, the significant decrease (about 11 feet) in the observed ground water table elevation at MW3 in comparison to the other wells is difficult to explain and may be possibly related to a fault contact (of the adjacent Calaveras Fault zone), which may cross the subject site somewhere between well MW3 and well MW2.

In addition, KEI conducted a review of geologic fault study reports available for inspection at the California Division of Mines and Geology (CDMG) in Pleasant Hill, California on November 13, 1990. Studies conducted at the adjacent parcel immediately north of the subject site encountered what is described as the western side of the Calaveras Fault zone. This fault was determined to be between approximately 130 to 136 feet west of the curb along San Ramon Road, and roughly parallel to San Ramon Road. The fault trends approximately N4°W and significant changes in the color of the soil materials and depth to ground water on either side of the fault were noted. Depth to ground water on the western side of the fault is significantly higher than on the eastern side of the fault. Geologic maps produced for this study project the trace of the Calaveras Fault onto the subject Unocal site.

Based on the results of our file review at the CDMG and our monitoring activities of the four wells at the subject site, it is KEI's opinion that the trace of the active Calaveras Fault crosses the eastern portion of the site in such a manner that well MW3 is east of the fault, while wells MW1, MW2 and MW4 are west of the fault, as shown on the attached Site Plan, Figure 5. Therefore, all future ground water gradient determinations at the site should represent two distinct ground water tables with data from wells MW1, MW2 and MW4 representing one distinct ground water table and data from well MW3 representing a separate ground water table with the fault representing a significant ground water barrier.

DISCUSSION AND RECOMMENDATIONS

Based on the analytical results, KEI recommends implementation of a monitoring and sampling program. The wells should be monitored on a monthly basis, and should be purged and sampled on a quarterly basis. The proposed program should be conducted for a period of 12 months. The results of the monitoring program will be documented

and evaluated after each monitoring and sampling event. Recommendations for altering or terminating the program will be made as needed. Our proposal for this work is attached for your review and consideration.

DISTRIBUTION

A copy of this report should be sent to the Alameda County Department of Environmental Health, Alameda County Flood Control and Water Conservation District, and to the RWQCB, San Francisco Bay Region.

LIMITATIONS

Soil deposits and rock formations may vary in thickness, lithology, saturation, strength and other properties across any site. In addition, environmental changes, either naturally-occurring or artificially-induced, may cause changes in ground water levels and flow paths, thereby changing the extent and concentration of any contaminants. Our studies assume that the field and laboratory data are reasonably representative of the site as a whole, and assume that subsurface conditions are reasonably conducive to interpolation and extrapolation.

The results of this study are based on the data obtained from the field and laboratory analyses obtained from a state certified laboratory. We have analyzed 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 do not hesitate to call me at (707) 746-6915.

Sincerely,

Kaprealian Engineering, Inc.

Don R. Braun
Certified Engineering Geologist

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

Mardo Kaprealian
President

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Attachments: Tables 1 through 7
Location Map
Site Plans - Figures 1 through 5
Boring Logs
Laboratory Results
Chain of Custody documentation
Proposal

KEI-P90-0606.R6
December 17, 1990

TABLE 1

SUMMARY OF GROUND WATER MONITORING AND PURGING DATA

Well #	Depth to Water (feet)	Product Thickness	Sheen	Gallons Pumped
(Monitored and Developed on November 12, 1990)				
MW1	5.82	0	None	72
MW2	5.63	0	None	75
MW3	16.57	0	None	5
MW4	6.28	0	None	88
(Monitored and Sampled on November 16, 1990)				
MW1	5.82	0	None	15
MW2	5.63	0	None	15
MW3	16.65	0	None	4.5
MW4	6.27	0	None	15

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December 17, 1990

TABLE 2

SUMMARY OF LABORATORY ANALYSES
WATER

(Collected on November 16, 1990)

Sample Number	TPH as Diesel	TPH as Gasoline	Benzene	Toluene	Xylenes	Ethylbenzene
MW1*	ND	ND	ND	ND	ND	ND
MW2	--	ND	ND	ND	ND	ND
MW3	--	ND	ND	ND	ND	ND
MW4	--	ND	ND	ND	ND	ND
Detection Limits	50	30	0.3	0.3	0.3	0.3

* TOG and EPA method 8010 constituents were all non-detectable.

ND = Non-detectable.

-- Indicates analysis not performed.

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

KEI-P90-0606.R6
December 17, 1990

TABLE 3

SUMMARY OF LABORATORY ANALYSES
SOIL

(Collected on November 6 & 7, 1990)

Sample Number	Depth (feet)	TPH as Diesel	TPH as Gasoline	Benzene	Toluene	Xylenes	Ethyl-benzene
MW1(5)*	5	ND	ND	ND	ND	ND	ND
MW1(8)	8	--	ND	ND	ND	ND	ND
MW2(5)	5	--	ND	ND	ND	ND	ND
MW2(7.5)	7.5	--	ND	ND	ND	ND	ND
MW2(9)	9	--	ND	ND	ND	ND	ND
MW3(5)	5	--	ND	ND	ND	ND	ND
MW3(10)	10	--	ND	ND	ND	ND	ND
MW3(15)	15	--	ND	ND	ND	ND	ND
MW4(5)	5	--	ND	ND	ND	ND	ND
Detection Limits		1.0	1.0	0.0050	0.0050	0.0050	0.0050

* TOG and EPA method 8010 constituents were non-detectable.

ND = Non-detectable.

-- Indicates analysis not performed.

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

KEI-P90-0606.R6
December 17, 1990

TABLE 4

SUMMARY OF LABORATORY ANALYSES
SOIL

(Collected on June 13, 15, 20 & 26, 1990)

Sample	Depth (feet)	TPH as Diesel	TPH as Gasoline	Benzene	Toluene	Xylenes	Ethyl-benzene
SW1	6.0	--	5,700	2.1	41	640	110
SW1(3)	6.0	--	2,200	1.8	6.3	76	30
SW1(6.5)	6.0	--	32	0.020	0.14	0.17	0.13
SW2	6.0	--	1,500	0.35	0.57	56	8.0
SW2(3)	6.0	--	360	ND	1.0	2.0	3.0
SW2(6.5)	6.5	--	6.8	0.020	0.052	0.063	0.029
SW3	6.0	--	ND	ND	ND	ND	ND
SW4	6.0	--	8.0	0.019	0.088	0.16	0.0071
SW5	6.5	--	340	0.80	0.26	3.6	2.5
SW5(2.5)	6.0	--	11	0.027	0.054	0.12	0.070
SW6	6.5	--	120	ND	0.21	0.14	0.19
SW6(3)	6.0	--	1.2	0.0084	0.012	0.021	0.012
P1	6.0	--	2.5	0.099	0.079	0.034	ND
P2	6.0	--	37	0.78	0.14	3.8	0.43
P3	6.0	--	8.5	0.028	0.016	0.080	0.35
P4	6.0	--	16	0.091	ND	1.3	0.52
SW11***	6.0	--	ND	ND	ND	0.0079	ND
SW12	6.0	--	ND	ND	ND	ND	ND
SW13	6.0	--	ND	ND	0.022	ND	ND
SW14	6.0	--	ND	ND	ND	0.020	ND
WO1*	6.5	120	36	0.091	0.17	1.8	0.38
SWA**	6.0	--	--	--	--	--	--
Detection Limits		1.0	1.0	0.0050	0.0050	0.0050	0.0050

-- Indicates analysis not performed.

ND = Non-detectable.

* TOG was 1,500 ppm, and all EPA 8010 constituents were non-detectable, except 1,2-dichlorobenzene at 210 ppb.

** TOG was 3,500 ppm.

*** TOG was 78 ppm.

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

KEI-P90-0606.R6
December 17, 1990

TABLE 5

SUMMARY OF LABORATORY ANALYSES
WATER

(Collected on June 20 & July 3, 1990)

Sample #	TOG	TPH as Gasoline	Benzene	Toluene	Xylenes	Ethylbenzene
W1*	--	2,300	3.1	0.88	250	0.39
W2**	ND	ND	ND	0.96	ND	ND
Detection Limits		30	0.30	0.30	0.30	0.30

* Collected from the former fuel storage tank pit.

** Collected from the new fuel storage tank pit.

-- Indicates analysis not performed.

ND = Non-detectable.

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

KEI-P90-0606.R6
December 17, 1990

TABLE 6

SUMMARY OF LABORATORY ANALYSES
SOIL

(Collected on July 16 & 20, 1990)

Sample	Depth (feet)	TPH as Diesel	TPH as Gasoline	Benzene	Toluene	Xylenes	Ethyl-benzene
SWB(13)*	6.0	ND	ND	ND	0.0095	ND	ND
SWC(10)*	6.0	ND	1.1	0.0061	0.0330	0.044	0.024
SWD(14)*	6.0	ND	ND	0.0052	0.015	ND	ND
SWE*	6.3	ND	ND	ND	0.031	ND	ND
SWF*	6.3	ND	ND	ND	0.029	0.013	0.0059
SWG*	6.3	ND	ND	ND	0.028	ND	ND
SWH*	6.3	ND	ND	ND	0.015	ND	ND
Detection Limits		1.0	1.0	0.005	0.005	0.005	0.005

* TOG and all EPA method 8010 constituents were non-detectable for all samples.

ND = Non-detectable.

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

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December 17, 1990

TABLE 7

SUMMARY OF LABORATORY ANALYSES
WATER

(Collected on July 19, 1990)

Sample #	TPH as Diesel	TPH as Gasoline	Benzene	Toluene	Xylenes	Ethyl-benzene
W3*	ND	ND	ND	ND	ND	ND
Detection Limits	50	30	0.30	0.30	0.30	0.30

ND = Non-detectable.

* TOG and all EPA method 8010 constituents were non-detectable.

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

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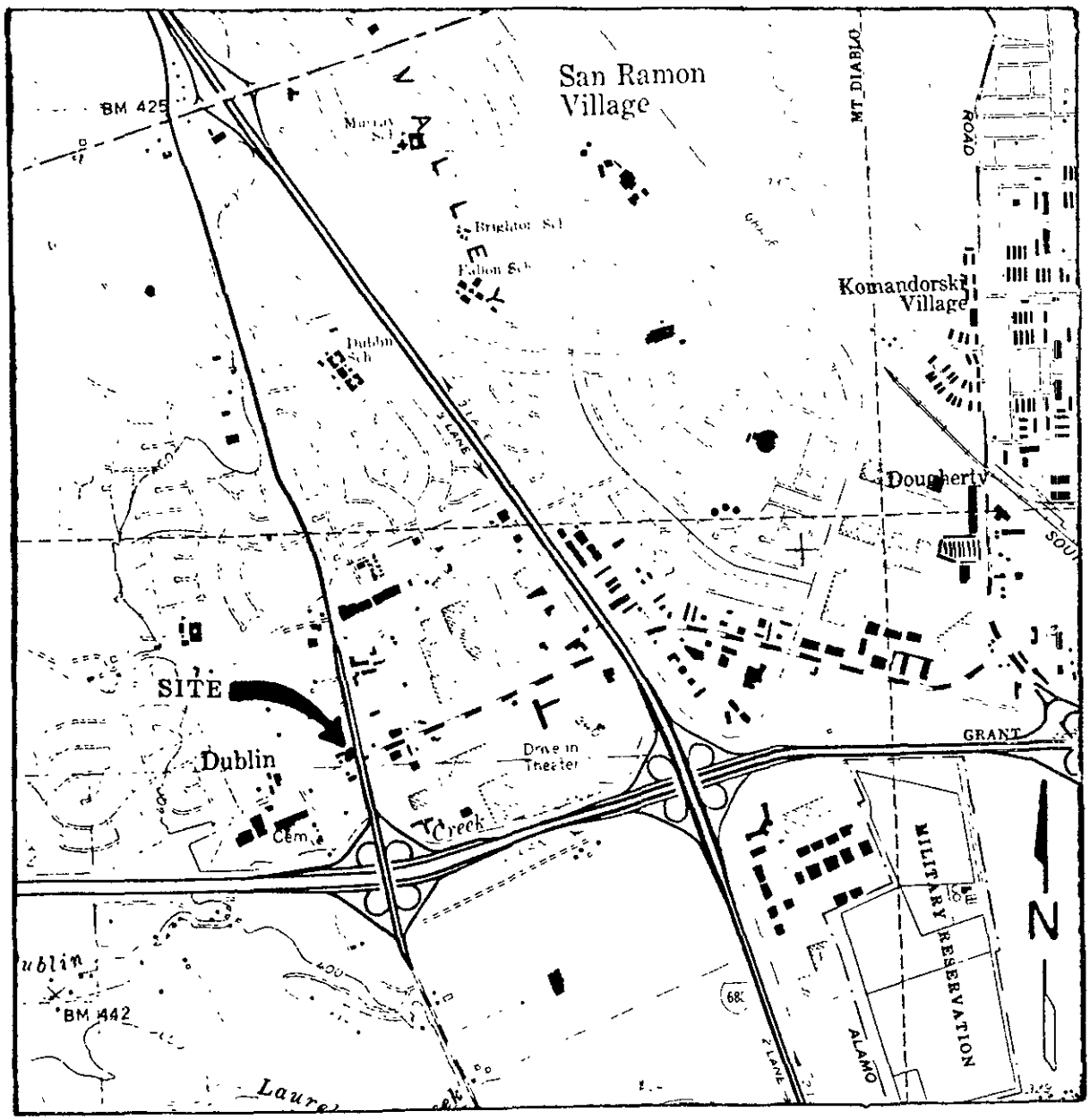
P.O. BOX 996 • BENICIA, CA 94510
(707) 746-6915 • (707) 746-6916 • FAX: (707) 746-5581



LOCATION MAP

Unocal S/S #5901
11976 Dublin Blvd.
Dublin, CA

KAPREALIAN ENGINEERING, INC.
Consulting Engineers
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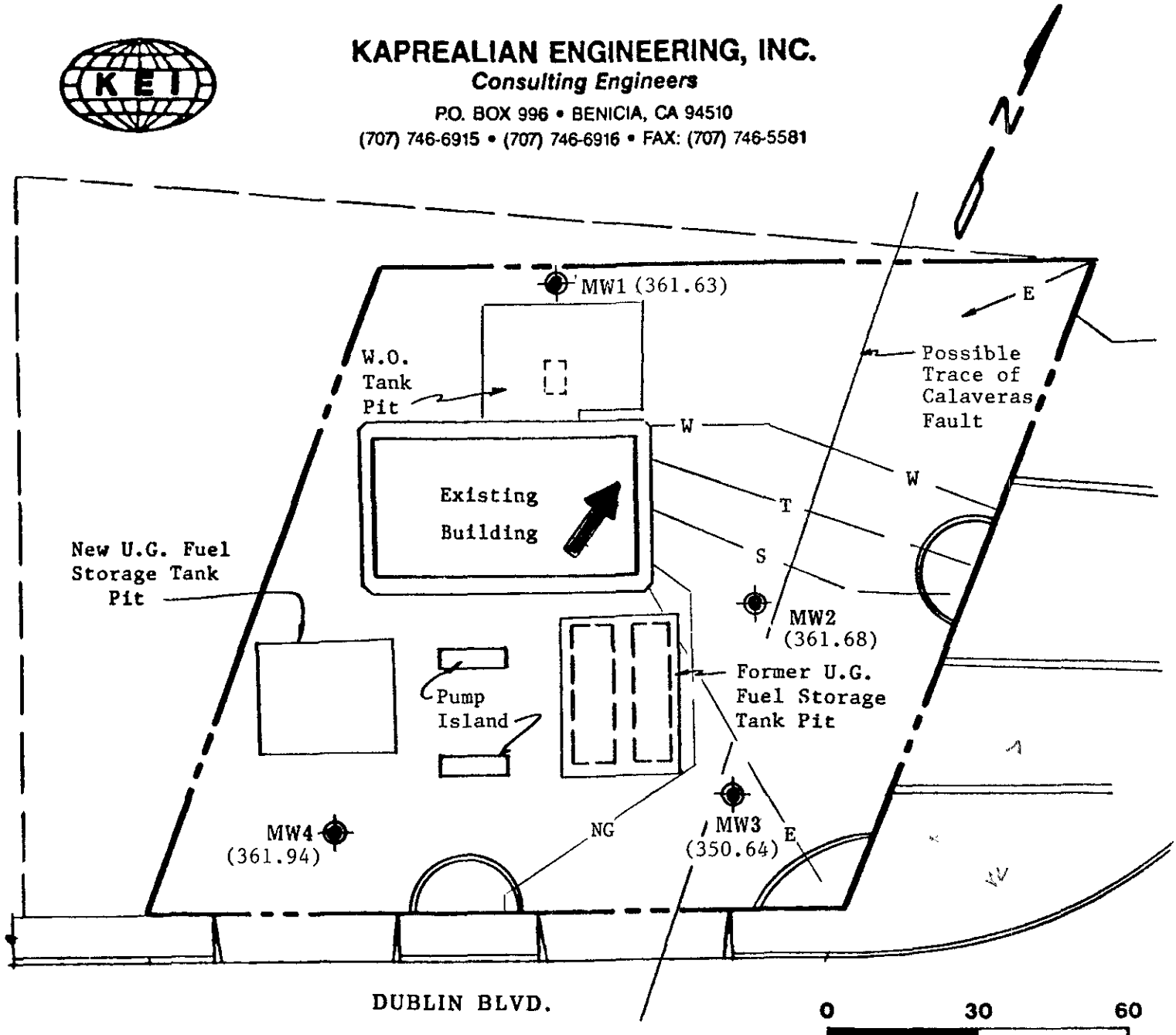

SITE PLAN
Figure 1

LEGEND

Monitoring Well

Direction of Ground Water flow

Ground Water Table Elevation in feet
Mean Sea Level on 11/16/90

Unocal S/S #5901
11976 Dublin Blvd.
Dublin, CA

KAPREALIAN ENGINEERING, INC.
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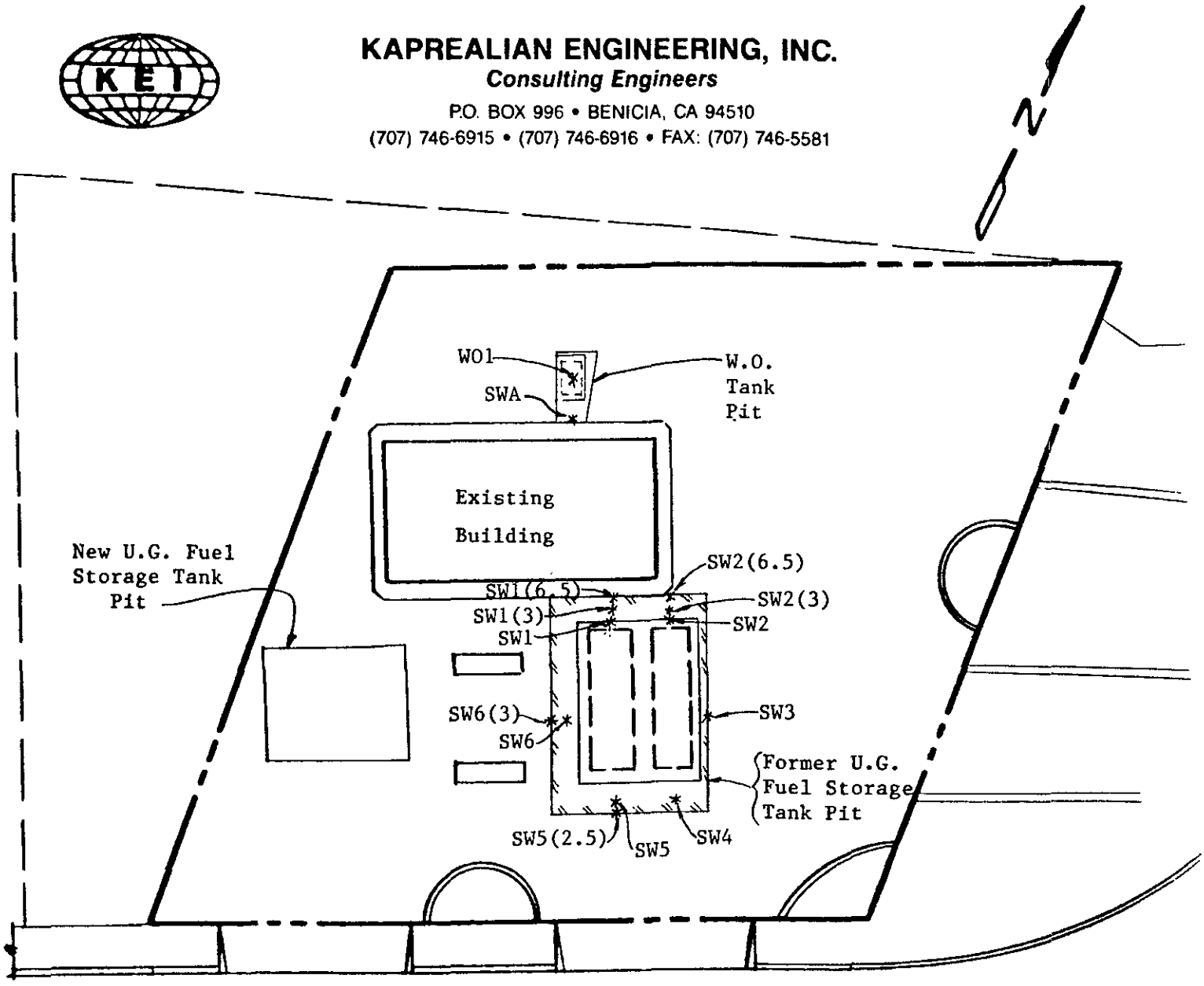

SITE PLAN
Figure 2

LEGEND

* Sample Point Location

Additional Area Excavated

Unocal S/S #5901
11976 Dublin Blvd.
Dublin, CA

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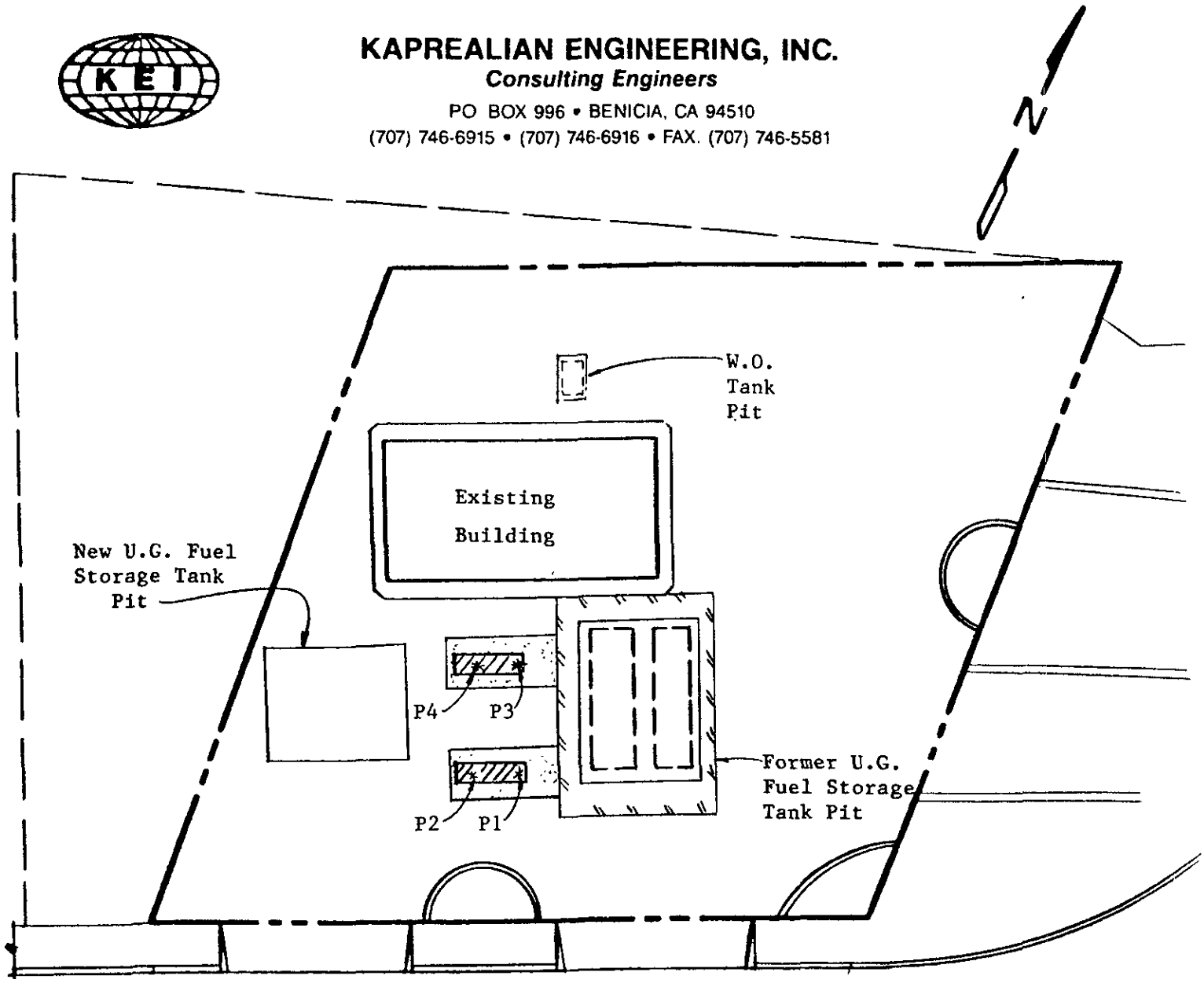

SITE PLAN
Figure 3

✱ Sample Point Location

Area of Additional Tank Pit Excavation

Area of Additional Pipe Trench Excavation

Unocal S/S #5901
11976 Dublin Blvd.
Dublin, CA

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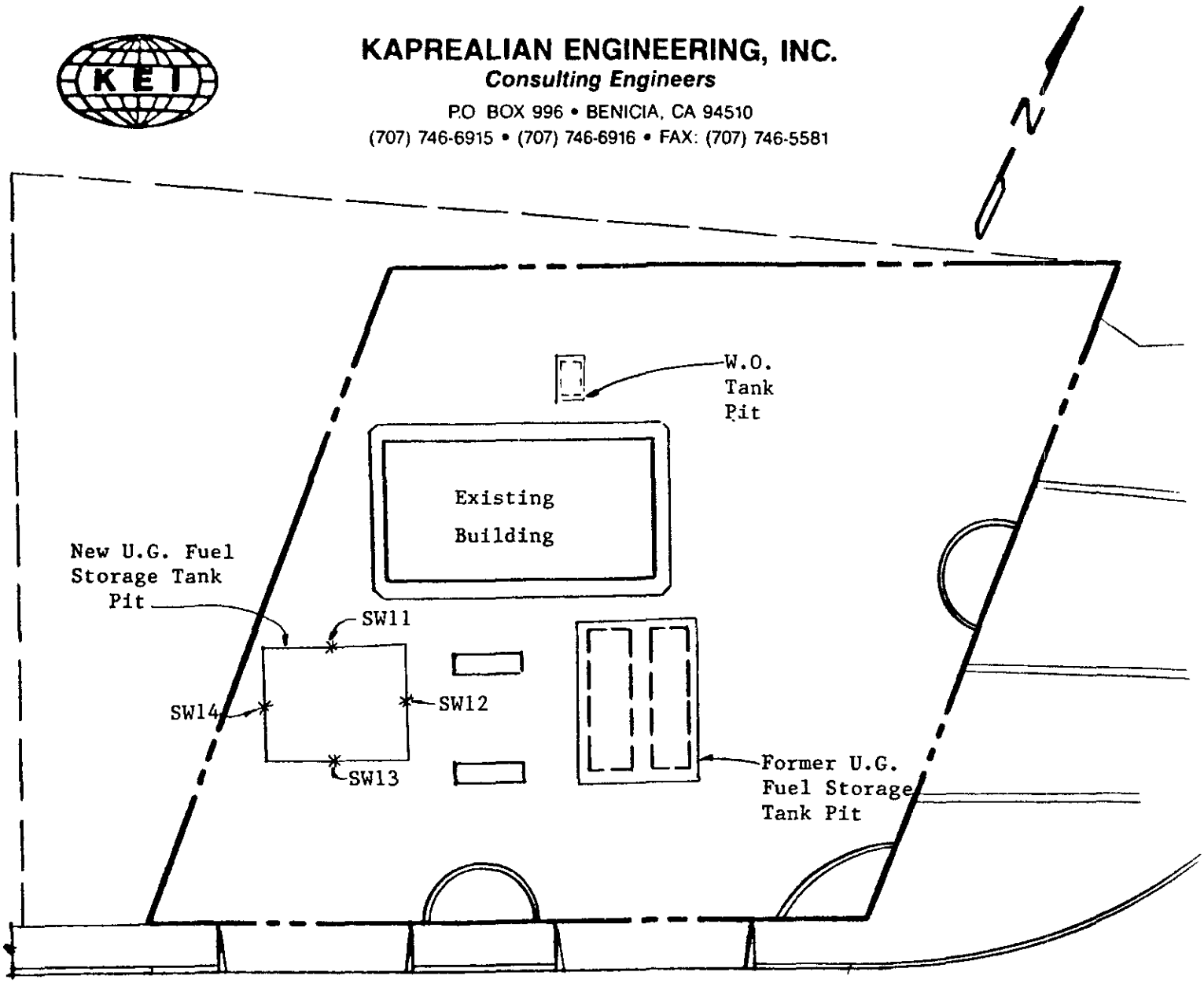

SITE PLAN
Figure 4

LEGEND

* Sample Point Location

Unocal S/S #5901
11976 Dublin Blvd.
Dublin, CA

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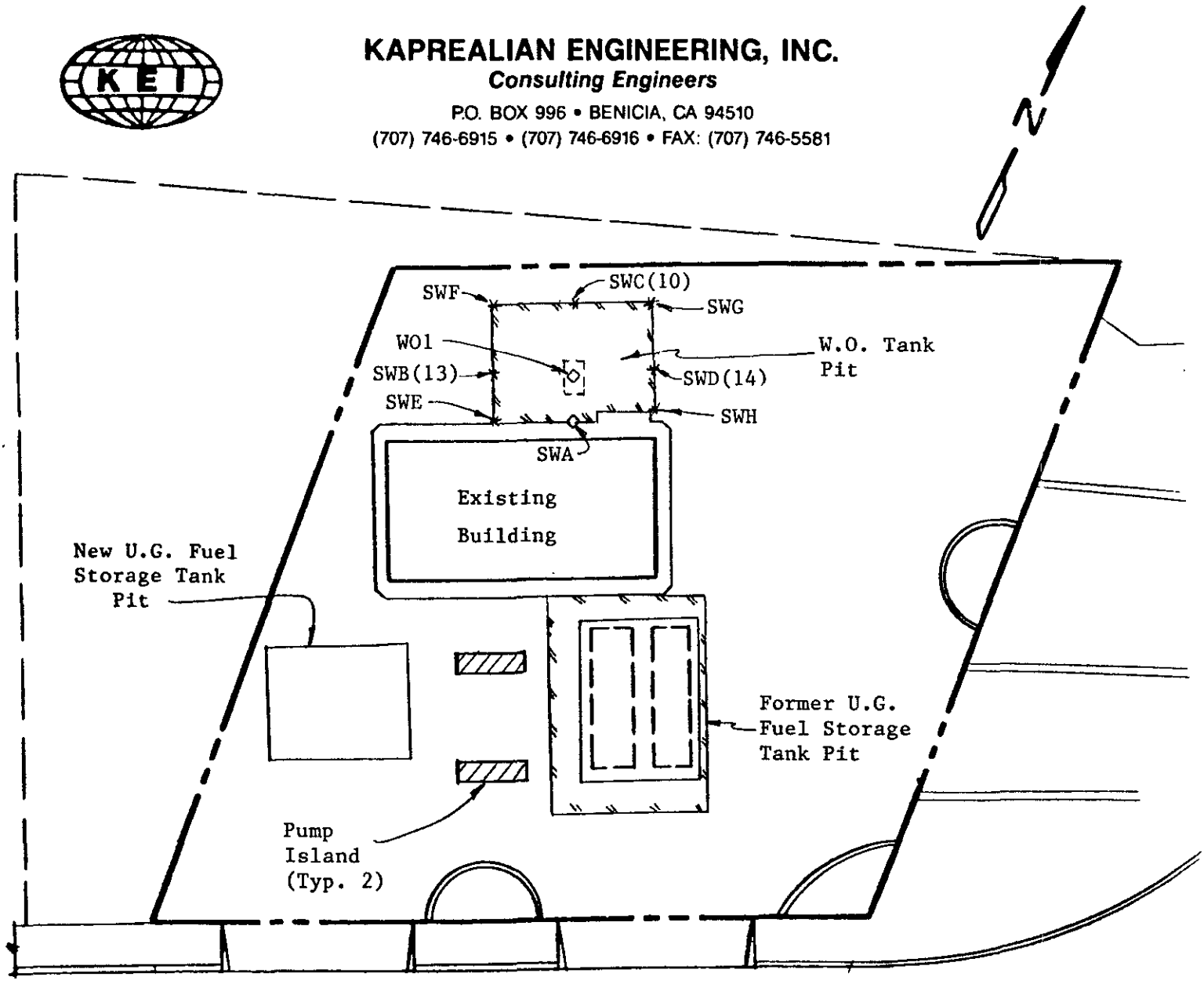
Consulting Engineers
P.O. BOX 996 • BENICIA, CA 94510
(707) 746-6915 • (707) 746-6916 • FAX: (707) 746-5581



SITE PLAN
Figure 5

LEGEND

* Sample Point Location

◇ Previous Sample Point Location

Area of Additional Excavation

Unocal S/S #5901
11976 Dublin Blvd.
Dublin, CA

BORING LOG

Project No. KEI-P90-0606	**Boring & Casing Diameter** 9" 2"	**Logged By** D.L. DRB
Project Name Unocal Dublin, 11976 Dublin	**Well Head Elevation** N/A	**Date Drilled** 11/07/90
Boring No. MW1	**Drilling Method** Hollow-stem Auger	**Drilling Company** EGI

Penetration blows/6"	G. W. level	Depth (feet) Samples	Strati-graphy USCS	Description
		0		Asphalt pavement over sand and gravel.
			ML	Clayey silt, very moist, stiff, dark grayish brown Silt, trace clay, very moist, soft to firm, brown. Base of Fill Materials?
3/3/6		5	CH	Silty clay, trace rootlets, common caliche, moist, stiff, very dark gray.
4/5/8	▼		ML/ MH to CL/ CH	Clayey silt/silty clay, trace rootlets, common caliche nodules, trace gravel to 3/4" diameter, moist to saturated below 8.4 feet, stiff, gray with olive brown mottling.
		10		
3/3/3		15	CL/ CH	Silty clay, with sand, trace gravel to 1/2" diameter, trace organic matter, trace caliche, very moist to saturated, firm, gray with slight olive brown mottling.
6/9/10		20	CL/ CH to ML/ MH	Silty clay/clayey silt, trace gravel to 3/8" diameter, trace fine sand, saturated, very stiff, gray. TOTAL DEPTH: 20'

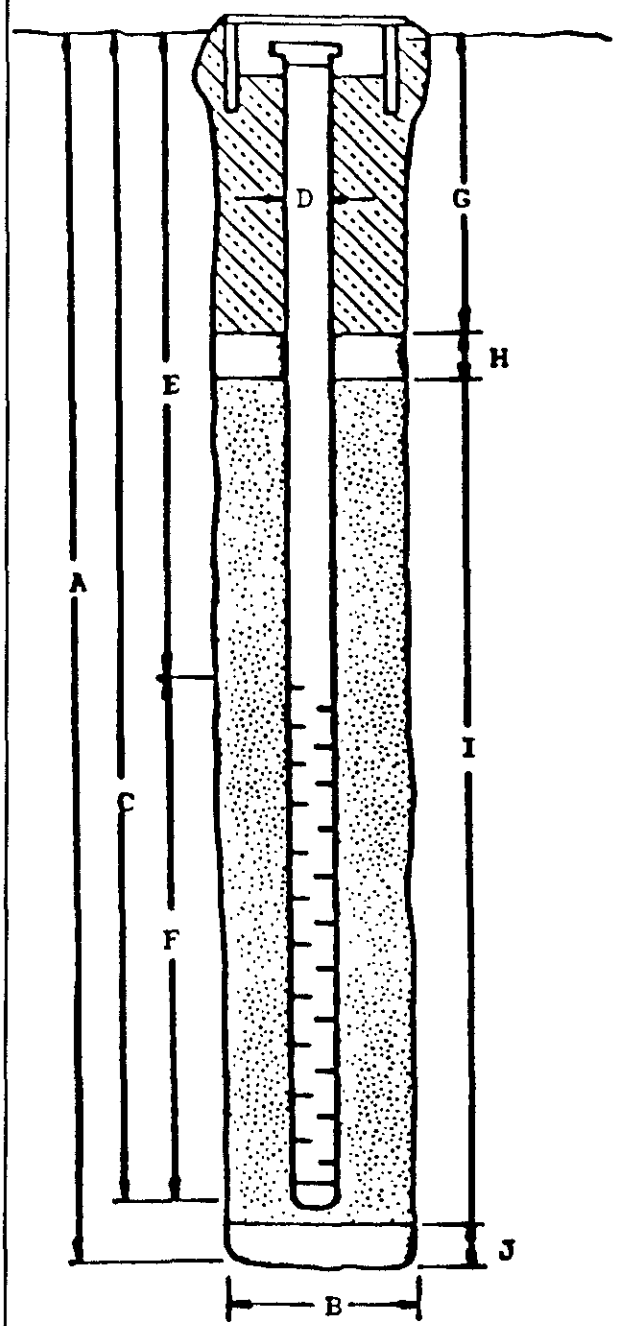
WELL COMPLETION DIAGRAM

PROJECT NAME: Unocal 11976 Dublin Blvd. Dublin BORING/WELL NO. MW1

PROJECT NUMBER: KEI-P90-0606

WELL PERMIT NO.:

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: 4'

F. Perforated Length: 16'

Perforation Type: Machined Slot

Perforation Size: 0.020"

G. Surface Seal: 2'

Seal Material: Neat Cement

H. Seal: 1'

Seal Material: Bentonite

I. Gravel Pack: 17'

Pack Material: RMC Lonestar Sand

Size: #3

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-P90-0606	**Boring & Casing Diameter** 9" 2"	**Logged By** W.W. ORB
Project Name Unocal 11976 Dublin, Dublin	**Well Head Elevation** N/A	**Date Drilled** 11/06/90
Boring No. MW2	**Drilling Method** Hollow-stem Auger	**Drilling Company** EGI

Penetration blows/6"	G. W. level	Depth (feet) Samples	Strati-graphy USCS	Description
		0		Asphalt pavement over sand and gravel.
			CL/ CH	Clay, trace gravel to 1/4" diameter moist, stiff, very dark gray. Silty clay, trace organic matter with rootlets, moist, firm, dark grayish brown.
				Silt, trace clay, very moist, soft, gray.
2/5/7		5	ML	Base of fill materials?
			CH	Clay, trace caliche, moist, stiff, very dark gray
2/7/8				
4/8/11			CL/ CH	Clay, with silt, trace caliche, trace rootlets, very moist, very stiff, gray.
	▼			
6/7/10		10		
3/3/5			ML/ MH	Clayey silt, trace rootlets, very moist, firm, gray with slight olive brown mottling.
				Clayey silt, trace caliche, trace rootlets, moist, stiff, olive gray
3/7/8		15		
6/7/9				Clayey silt, trace rootlets, trace caliche, moist, stiff to very stiff, light olive brown with gray mottling
6/9		20		

BORING LOG

Project No.	Boring & Casing Diameter	Logged By
KEI-P90-0606	9" 2"	W.W. DRB
Project Name Unocal 11976 Dublin, Dublin	**Well Head Elevation** N/A	**Date Drilled** 11/06/90
Boring No. MW2	**Drilling Method** Hollow-stem Auger	**Drilling Company** EGI

Penetration blows/6"	G. W. level	Depth (feet) Samples	Strati-graphy USCS	Description
10			ML/MH	Clayey silt, trace rootlets, trace caliche, moist, very stiff, gray mottled with light olive brown.
6/9/14			ML/SM	Sandy silt/silty sand, trace fine gravel to 1/4" diameter, trace caliche, saturated, medium dense, gray.
		25		
		30		
		35		
		40		TOTAL DEPTH: 24'

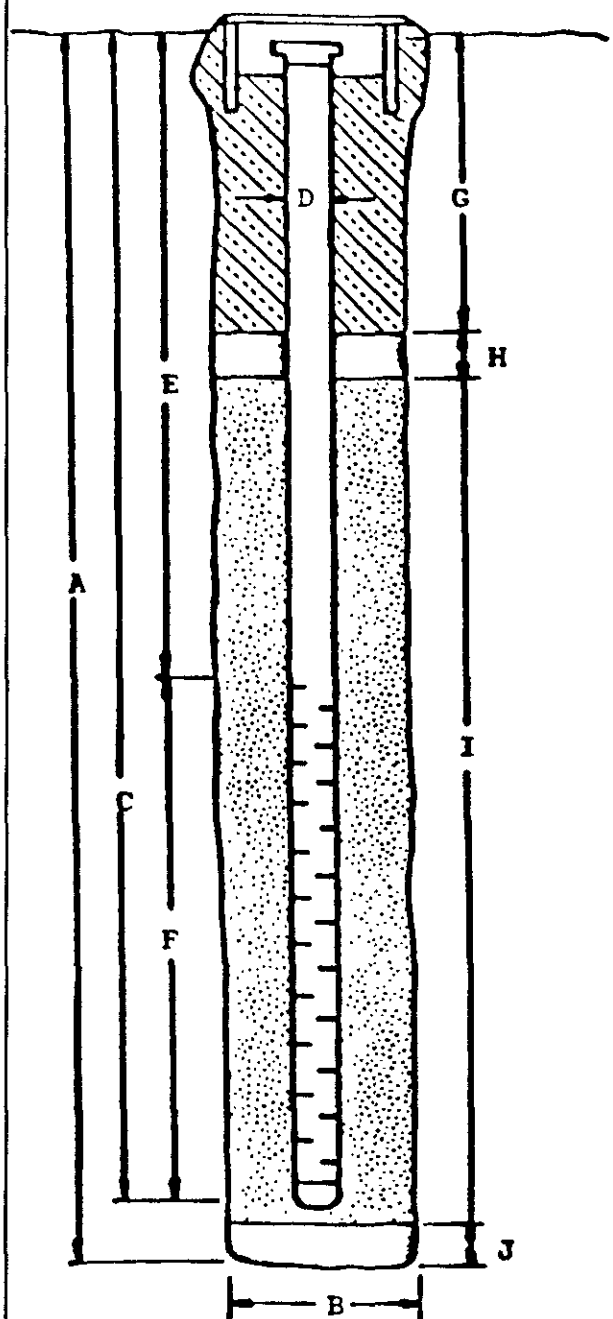
WELL COMPLETION DIAGRAM

PROJECT NAME: Unocal 11976 Dublin Blvd. Dublin BORING/WELL NO. MW2

PROJECT NUMBER: KEI-P90-0606

WELL PERMIT NO.:

Flush-mounted Well Cover



A. Total Depth: 24'

B. Boring Diameter*: 9"

Drilling Method: Hollow Stem Auger

C. Casing Length: 23'

Material: Schedule 40 PVC

D. Casing Diameter: OD = 2.375"

ID = 2.067"

E. Depth to Perforations: 4'

F. Perforated Length: 19'

Perforation Type: Machined Slot

Perforation Size: 0.020"

G. Surface Seal: 2'

Seal Material: Neat Cement

H. Seal: 1'

Seal Material: Bentonite

I. Gravel Pack: 20'

Pack Material: RMC Lonestar Sand

Size: #3

J. Bottom Seal: 1'

Seal Material: Bentonite

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

BORING LOG

Project No.	Boring & Casing Diameter	Logged By
KEI-P90-0606	9" 2"	W.W.
Project Name Unocal 11976 Dublin, Dublin	**Well Head Elevation** N/A	**Date Drilled** 11/06/90
Boring No. MW3	**Drilling Method** Hollow-stem Auger	**Drilling Company** EGI

Penetration blows/6"	G. W. level	Depth (feet) Samples	Strati-graphy USCS	Description
		0		Asphalt pavement over sand and gravel.
			ML/ MH	Silt, trace clay, moist, stiff, gray.
6/9/9		5		Silt, with clay, trace rootlets, moist, very stiff, gray.
10/11/14				Clayey silt, moist, very stiff, dark grayish brown
5/7/11			ML/ MH to CL/ CH	Clayey silt/silty clay, trace root holes, moist, very stiff, gray with olive brown mottling
8/8/9		10		Clayey silt, trace very fine sand, trace gravel to 1/2" diameter, trace rootlets, moist, very stiff, dark grayish brown mottled with dark gray.
No data obtained 7/9/11			ML/ MH	Clayey silt, trace caliche, moist, very stiff, trace gravel to 1/4"gray diameter, dark olive brown, mottled with yellowish brown and greenish gray.
10/14/12	▼	15	GM	Silty gravel with sand, gravel to 1" diameter, saturated, medium dense, yellowish brown.
			ML	Silt, saturated, very stiff, yellowish brown
10/10/13		20		TOTAL DEPTH: 20'

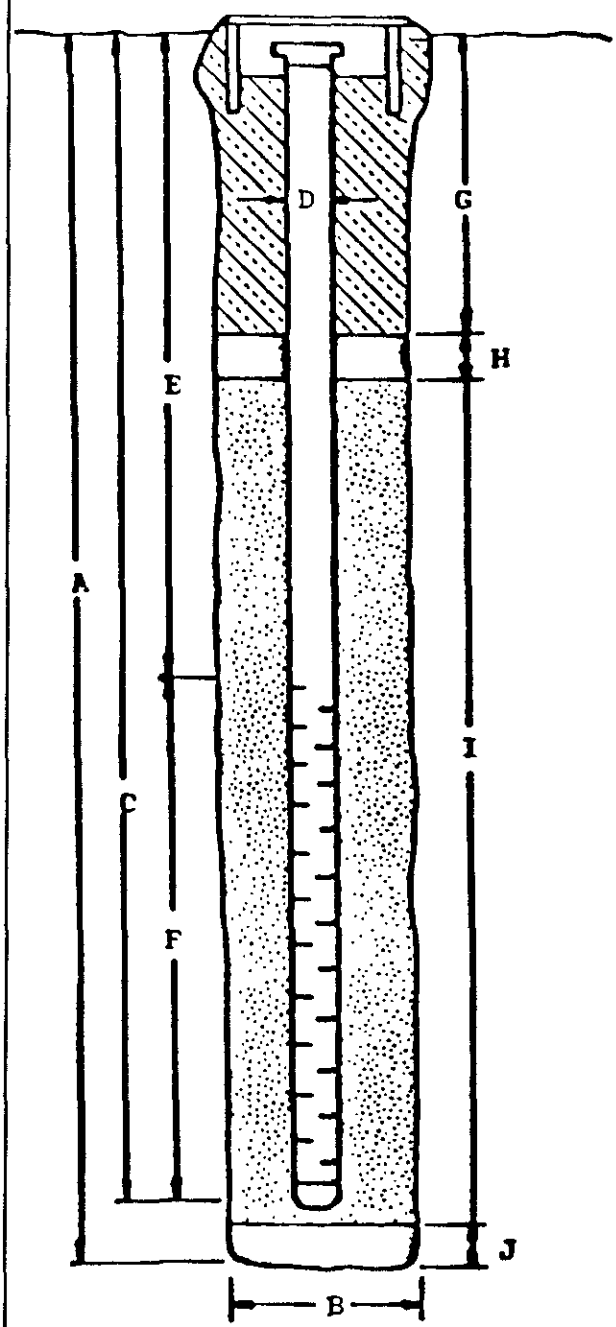
WELL COMPLETION DIAGRAM

PROJECT NAME: Unocal 11976 Dublin Blvd., Dublin BORING/WELL NO. MW3

PROJECT NUMBER: KEI-P90-0606

WELL PERMIT NO.:

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: 4'

F. Perforated Length: 16'

Perforation Type: Machined Slot

Perforation Size: 0.020"

G. Surface Seal: 2'

Seal Material: Neat Cement

H. Seal: 1'

Seal Material: Bentonite

I. Gravel Pack: 17'

Pack Material: RMC Lonestar Sand

Size: #3

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-P90-0606	**Boring & Casing Diameter** 9" 2"	**Logged By** W.W.
Project Name Unocal 11976 Dublin, Dublin	**Well Head Elevation** N/A	**Date Drilled** 11/06/90
Boring No. MW4	**Drilling Method** Hollow-stem Auger	**Drilling Company** EGI

Penetration blows/6"	G. W. level	Depth (feet) Samples	Strati-graphy USCS	Description
		0		Asphalt pavement over sand and gravel.
			MH	Clayey silt, trace organic matter, trace gravel to 1/4" diameter, moist, firm, dark gray and dark olive gray.
				Silt, trace clay, trace gravel to 1/2" diameter, moist, firm, trace rootlets, olive gray.
3/2/3	▼	5		Silt, saturated, firm, dark yellowish brown
			ML/ MH	Clayey silt, common caliche nodules and rootlets, very moist to saturated, stiff, dark gray with brown mottling.
4/5/7		10		
			MH/ CH	
5/6/6				Clayey silt to silty clay, trace rootlets, saturated, stiff, gray.
		15	CL/ CH	Silty clay, trace rootlets, common caliche nodules, moist, stiff, greenish gray.
			MH	Clayey silt, trace sand, trace rootlets, trace gravel to 1/2" diameter, trace caliche, very moist to saturated, very stiff, gray.
9/11/11		20		TOTAL DEPTH: 20'

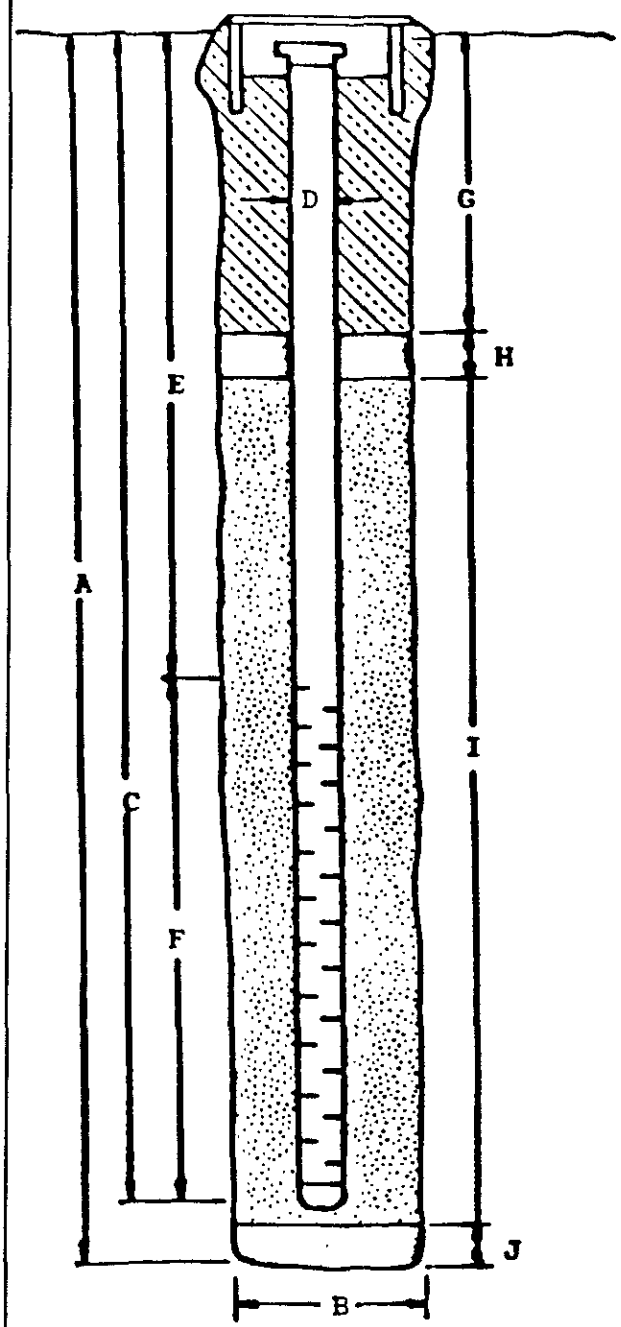
WELL COMPLETION DIAGRAM

PROJECT NAME: Unocal 11976 Dublin Blvd., Dublin BORING/WELL NO. MW4

PROJECT NUMBER: KEI-P90-0606

WELL PERMIT NO.:

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: 4'

F. Perforated Length: 16'

Perforation Type: Machined Slot

Perforation Size: 0.020"

G. Surface Seal: 2'

Seal Material: Neat Cement

H. Seal: 1'

Seal Material: Bentonite

I. Gravel Pack: 17'

Pack Material: RMC Lonestar Sand

Size: #3

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
(415) 686-9600 • FAX (415) 686-9689

Kaprealian Engineering, Inc.	Client Project ID:	Unocal, 11976 Dublin Blvd., Dublin	Sampled:	11/6-11/7/90
P.O. Box 996	Matrix Descript:	Soil	Received:	Nov 8, 1990
Benicia, CA 94510	Analysis Method:	EPA 5030/8015/8020	Analyzed:	Nov 19, 1990
Attention: Mardo Kaprealian, P.E.	First Sample #:	011-0306	Reported:	Nov 21, 1990

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)
011-0306	MW1 (5)	N.D.	N.D.	N.D.	N.D.	N.D.
011-0307	MW1 (8)	N.D.	N.D.	N.D.	N.D.	N.D.
011-0308	MW2 (5)	N.D.	N.D.	N.D.	N.D.	N.D.
011-0309	MW2 (7.5)	N.D.	N.D.	N.D.	N.D.	N.D.
011-0310	MW2 (9)	N.D.	N.D.	N.D.	N.D.	N.D.
011-0311	MW3 (5)	N.D.	N.D.	N.D.	N.D.	N.D.
011-0312	MW3 (10)	N.D.	N.D.	N.D.	N.D.	N.D.
011-0313	MW3 (15)	N.D.	N.D.	N.D.	N.D.	N.D.
011-0314	MW4 (5)	N.D.	N.D.	N.D.	N.D.	N.D.
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

Belinda C. Vega
Laboratory Director

110306.KEI <1>

SEQUOIA ANALYTICAL

1900 Bates Avenue • Suite LM • Concord, California 94520
(415) 686-9600 • FAX (415) 686-9689

Kaprealian Engineering, Inc.	Client Project ID:	Unocal, 11976 Dublin Blvd., Dublin	Sampled:	Nov 7, 1990
P.O. Box 996	Sample Descript:	Soil, MW1(5)	Received:	Nov 8, 1990
Benicia, CA 94510	Analysis Method:	EPA 5030/8010	Analyzed:	Nov 19, 1990
Attention: Mardo Kaprealian, P.E.	Lab Number:	011-0306	Reported:	Nov 21, 1990

HALOGENATED VOLATILE ORGANICS (EPA 8010)

Analyte	Detection Limit µg/kg	Sample Results µg/kg
Bromodichloromethane	5.0	N.D.
Bromoform	5.0	N.D.
Bromomethane	5.0	N.D.
Carbon tetrachloride	5.0	N.D.
Chlorobenzene	5.0	N.D.
Chloroethane	25	N.D.
2-Chloroethylvinyl ether	5.0	N.D.
Chloroform	5.0	N.D.
Chloromethane	5.0	N.D.
Dibromochloromethane	5.0	N.D.
1,2-Dichlorobenzene	10	N.D.
1,3-Dichlorobenzene	10	N.D.
1,4-Dichlorobenzene	10	N.D.
1,1-Dichloroethane	5.0	N.D.
1,2-Dichloroethane	5.0	N.D.
1,1-Dichloroethene	5.0	N.D.
Total 1,2-Dichloroethene	5.0	N.D.
1,2-Dichloropropane	5.0	N.D.
cis-1,3-Dichloropropene	5.0	N.D.
trans-1,3-Dichloropropene	5.0	N.D.
Methylene chloride	10	N.D.
1,1,2,2-Tetrachloroethane	5.0	N.D.
Tetrachloroethene	5.0	N.D.
1,1,1-Trichloroethane	5.0	N.D.
1,1,2-Trichloroethane	5.0	N.D.
Trichloroethene	5.0	N.D.
Trichlorofluoromethane	5.0	N.D.
Vinyl chloride	10	N.D.

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

SEQUOIA ANALYTICAL

Belinda C. Vega
Laboratory Director

SEQUOIA ANALYTICAL

1900 Bates Avenue • Suite LM • Concord, California 94520
(415) 686-9600 • FAX (415) 686-9689

Kapreallan Engineering, Inc.	Client Project ID:	Unocal, 11976 Dublin Blvd., Dublin	Sampled:	Nov 7, 1990
P.O. Box 996	Matrix Descript:	Soil	Received:	Nov 8, 1990
Benicia, CA 94510	Analysis Method:	SM 503 D&E (Gravimetric)	Extracted:	Nov 14, 1990
Attention: Mardo Kapreallan, P.E.	First Sample #:	011-0306	Analyzed:	Nov 14, 1990
			Reported:	Nov 21, 1990

TOTAL RECOVERABLE PETROLEUM OIL

Sample Number	Sample Description	Oil & Grease mg/kg (ppm)
011-0306	MW1 (5)	N.D.

Detection Limits:	30

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

SEQUOIA ANALYTICAL

Belinda C. Vega
Laboratory Director

SEQUOIA ANALYTICAL

1900 Bates Avenue • Suite LM • Concord, California 94520
(415) 686-9600 • FAX (415) 686-9689

Kaprealian Engineering, Inc.	Client Project ID:	Unocal, 11976 Dublin Blvd., Dublin	Sampled:	Nov 7, 1990
P.O. Box 996	Matrix Descript:	Soil	Received:	Nov 8, 1990
Benicia, CA 94510	Analysis Method:	EPA 3550/8015	Extracted:	Nov 13, 1990
Attention: Mardo Kaprealian, P.E.	First Sample #:	011-0306	Analyzed:	Nov 15, 1990
			Reported:	Nov 21, 1990

TOTAL PETROLEUM FUEL HYDROCARBONS (EPA 8015)

Sample Number	Sample Description	High B.P. Hydrocarbons mg/kg (ppm)
011-0306	MW1 (5)	N.D.

Detection Limits:	1.0

High Boiling Point Hydrocarbons are quantitated against a diesel fuel standard.
Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL

Belinda C. Vega
Laboratory Director

110306.KEI <2>

KAPREALIAN ENGINEERING, INC.

CHAIN OF CUSTODY

SAMPLER: Wade Weston

WITNESSING AGENCY:

SITE NAME & ADDRESS: Unocal- Dublin
11976 Dublin Blvd.

TURN AROUND TIME: Regular

SAMPLE ID NO.	DATE	TIME	SOIL	WATER	GRAB	COMP	NO. OF CONT.	SAMPLING LOCATION	TPH-G	BTXE	TPH-D	TOG	8010	REMARKS
MW1-(5)	11/7/90		✓		✓		1	See Sample ID #	✓	✓	✓	✓	✓	0110306
MW1-(8)	"		✓		✓		1		✓	✓				307
MW2-(5)	11/6/90		✓		✓		1		✓	✓				308
MW2-(7.5)	"		✓		✓		1		✓	✓				309
MW2-(9)	"		✓		✓		1		✓	✓				310
MW3-(5)	"		✓		✓		1		✓	✓				311
MW3-(8)	"		✓		✓		1		✓	✓				312
MW3-(10)	"		✓		✓		1		✓	✓				313
MW4-(5)	"		✓		✓		1		✓	✓				314

Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Wade Weston	11/8 9:40	
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? NO
4. Were samples in appropriate containers and properly packaged? ✓

Signature	Title	Date
[illegible]	SR	11/8

SEQUOIA ANALYTICAL

1900 Bates Avenue • Suite LM • Concord, California 94520
(415) 686-9600 • FAX (415) 686-9689

Kapreallan Engineering, Inc.	Client Project ID:	Unocal, 11976 Dublin, Dublin	Sampled:	Nov 16, 1990
P.O. Box 996	Matrix Descript:	Water	Received:	Nov 19, 1990
Benicia, CA 94510	Analysis Method:	EPA 5030/8015/8020	Analyzed:	Nov 29, 1990
Attention: Mardo Kapreallan, P.E.	First Sample #:	011-0747 A-B	Reported:	Nov 30, 1990

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)
011-0747 A-B	MW-1	N.D.	N.D.	N.D.	N.D.	N.D.
011-0748 A-B	MW-2	N.D.	N.D.	N.D.	N.D.	N.D.
011-0749 A-B	MW-3	N.D.	N.D.	N.D.	N.D.	N.D.
011-0750 A-B	MW-4	N.D.	N.D.	N.D.	N.D.	N.D.
Detection Limits:		**30**	**0.30**	**0.30**	**0.30**	**0.30**

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

SEQUOIA ANALYTICAL

Belinda C. Vega
Laboratory Director

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(415) 686-9600 • FAX (415) 686-9689

Kapreallan Engineering, Inc.	Client Project ID:	Unocal, 11976 Dublin, Dublin	Sampled:	Nov 16, 1990
P.O. Box 996	Matrix Descript:	Water	Received:	Nov 19, 1990
Benicia, CA 94510	Analysis Method:	EPA 3510/8015	Extracted:	Nov 26, 1990
Attention: Mardo Kapreallan, P.E.	First Sample #:	011-0747 C	Analyzed:	Nov 26, 1990
			Reported:	Nov 30, 1990

TOTAL PETROLEUM FUEL HYDROCARBONS (EPA 8015)

Sample Number	Sample Description	High B.P. Hydrocarbons µg/L (ppb)
011-0747 C	MW-1	N.D.

Detection Limits:	50

High Boiling Point Hydrocarbons are quantitated against a diesel fuel standard.
Analytes reported as N.D. were not present above the stated limit of detection.

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Kaprealian Engineering, Inc.	Client Project ID:	Unocal, 11976 Dublin, Dublin	Sampled:	Nov 16, 1990
P.O. Box 996	Sample Descript:	Water, MW-1	Received:	Nov 19, 1990
Benicia, CA 94510	Analysis Method:	EPA 5030/8010	Analyzed:	Nov 26, 1990
Attention: Mardo Kaprealian, P.E.	Lab Number:	011-0747 D-E	Reported:	Nov 30, 1990

HALOGENATED VOLATILE ORGANICS (EPA 8010)

Analyte	Detection Limit µg/L	Sample Results µg/L
Bromodichloromethane	1.0	N.D.
Bromoform	1.0	N.D.
Bromomethane	1.0	N.D.
Carbon tetrachloride	1.0	N.D.
Chlorobenzene	1.0	N.D.
Chloroethane	5.0	N.D.
2-Chloroethylvinyl ether	1.0	N.D.
Chloroform	0.50	N.D.
Chloromethane	0.50	N.D.
Dibromochloromethane	0.50	N.D.
1,2-Dichlorobenzene	2.0	N.D.
1,3-Dichlorobenzene	2.0	N.D.
1,4-Dichlorobenzene	2.0	N.D.
1,1-Dichloroethane	0.50	N.D.
1,2-Dichloroethane	0.50	N.D.
1,1-Dichloroethene	1.0	N.D.
Total 1,2-Dichloroethene	1.0	N.D.
1,2-Dichloropropane	0.50	N.D.
cis-1,3-Dichloropropene	5.0	N.D.
trans-1,3-Dichloropropene	5.0	N.D.
Methylene chloride	2.0	N.D.
1,1,2,2-Tetrachloroethane	0.50	N.D.
Tetrachloroethene	0.50	N.D.
1,1,1-Trichloroethane	0.50	N.D.
1,1,2-Trichloroethane	0.50	N.D.
Trichloroethene	0.50	N.D.
Trichlorofluoromethane	1.0	N.D.
Vinyl chloride	2.0	N.D.

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

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Kaprealian Engineering, Inc.	Client Project ID:	Unocal, 11976 Dublin, Dublin	Sampled:	Nov 16, 1990
P.O. Box 996	Matrix Descript:	Water	Received:	Nov 19, 1990
Benicia, CA 94510	Analysis Method:	SM 503 A&E (Gravimetric)	Extracted:	Nov 20, 1990
Attention: Mardo Kaprealian, P.E.	First Sample #:	011-0747	Analyzed:	Nov 21, 1990
			Reported:	Nov 30, 1990

TOTAL RECOVERABLE PETROLEUM OIL

Sample Number	Sample Description	Oil & Grease mg/L (ppm)
011-0747	MW-1	N.D.

Detection Limits:	5.0

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

SEQUOIA ANALYTICAL

Belinda C. Vega
Laboratory Director

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KET

KAPREALIAN ENGINEERING, INC.

CHAIN OF CUSTODY

SAMPLER	SITE NAME & ADDRESS	ANALYSES REQUESTED	TURN AROUND TIME:
JOE	Unocal / Dublin 11976 Dublin Blvd.	TPHG, BTXE / 8010 / TOC (5310 Cr) / TPHD	Regular
WITNESSING AGENCY			[redacted]

SAMPLE ID NO.	DATE	TIME	SOIL	WATER	GRAB	COMP	NO. OF CONT.	SAMPLING LOCATION	TPHG, BTXE	8010	TOC (5310 Cr)	TPHD				REMARKS
MW1	11/16/90			✓	✓		6	0110747ΔE	✓	✓	✓	✓				Voas preserved; 0112384
" 2	"	P.M. 1:45		✓	✓		2	748ΔB	✓							
" 3	"			✓	✓		2	749	✓							
" 4	"	A.M. 9:30		✓	✓		2	750	✓							

Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Joe [signature]	11/16/90	
Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Relinquished by: (Signature)	Date/Time	Received by: (Signature)
KNill	11/19 2:25	[signature]
Relinquished by: (Signature)	Date/Time	Received by: (Signature)
	11/16/90 1925	[signature]

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

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

Signature	Title	Date
BS	Login	11/16/90