Scott

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

June 18, 1991

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

Attention: Mr. William Faulhaber

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

Dear Mr. Faulhaber:

Per the request of Mr. Ron Bock of Unocal Corporation, enclosed please find our report and proposal, both dated May 29, 1991, 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: Ron Bock, Unocal Corporation

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

KEI-P91-0102.P2
May 29, 1991

PROPOSAL TO
UNOCAL CORPORATION
for the
Unocal Service Station #3292
15008 E. 14th Street
San Leandro, California

GROUND WATER MONITORING, SAMPLING AND ANALYSIS

INTRODUCTION

Per the recommendations described in Kaprealian Engineering, Inc's. (KEI) report KEI-P91-0102.R4 dated May 29, 1991, KEI proposes the following work plan.

PROPOSED TASK

1. Monitor all existing 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, wells MW1 and MW5 should be purged of a minimum of 55 gallons on a monthly basis in an attempt to reduce the levels of contamination. 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.

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

KEI-P91-0102.R4
May 29, 1991

Unocal Corporation
2000 Crow Canyon Place, Suite 400
San Ramon, CA 94583

Attention: Mr. Ron Bock

RE: Preliminary Ground Water Investigation at
Unocal Service Station #3292
15008 E. 14th Street
San Leandro, California

Dear Mr. Bock:

This report presents the results of soil and ground water investigation for the referenced site in accordance with Kaprealian Engineering, Inc's. (KEI) proposal KEI-P91-0102.P1 dated March 8, 1991. 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 five borings for the installation of five 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 gently sloping, northeast trending topography, and is located at the east corner of the intersection of East 14th and 150th Avenue in San Leandro, California. A Location Map and Site Plans are attached to this report.

KEI's initial field work was conducted on January 16, 1991, when two underground fuel storage tanks and one waste oil tank were

removed from the site. The tanks consisted of one 10,000 gallon regular unleaded fuel tank, one 10,000 gallon super unleaded fuel storage tank and one 280 gallon waste oil tank. The tanks were made of steel and two holes about 1/2 inch in diameter were observed in the super unleaded fuel tank. Mr. William Faulhaber of the Alameda County Health Agency (ACHA) 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 tank 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, thus prohibiting the collection of any additional soil samples from beneath sample points A1, A2, B1 and B2. Sample locations are as shown on the attached Site Plan, Figure 2.

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 requested by Mr. William Faulhaber of the ACHA. 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, respectively. After the soil sampling was completed, pipe trenches were excavated to the depth of the sample points. Pipe trench sample point locations are shown on the attached Site Plan, Figure 2.

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

toluene, xylenes and ethylbenzene (BTX&E). In addition, the soil sample WO1, collected from the waste oil tank pit, was analyzed for TPH as diesel, total oil and grease (TOG), metals - cadmium, chromium, lead, nickel and zinc, and for 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. Note that soil represented by these samples was removed during excavation of the fuel tank pit to a depth of about 17.5 feet or approximately 1 foot below 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 detectable levels of gasoline 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 WO1, collected from beneath the waste oil tank pit, indicated non-detectable levels of all constituents analyzed except for zinc which showed 31 ppm. 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 installation of five monitoring wells. Results of the soil samples from the tank excavation are summarized in KEI's report (KEI-J91-0102.R1) dated March 6, 1991.

RECENT FIELD ACTIVITIES

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 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 19.5 to 22.5 feet. Ground water was encountered at depths ranging from 12-1/4 to 13-1/4 feet beneath the surface during drilling except in MW5 where water was not initially encountered until a depth of 15 feet, but quickly rose to a depth of about 12 feet. Soil samples were taken for laboratory analysis and lithologic logging purposes at a maximum interval of 5 foot, at obvious areas of contamination, and at the soil/ground water interface beginning at a depth of approximately 4 to 5 feet below grade until ground water was encountered. Soil samples were obtained below the first encountered ground water at the depths indicated on the attached Boring Logs for lithologic logging purposes only. 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.

The surface of each well cover was surveyed by Kier & Wright of Pleasanton, California, to Mean Sea Level and to a vertical accuracy of 0.01 feet.

The wells were developed on April 29 and 30, 1991. Prior to development, the wells were checked for depth to the water table using an electronic sounder, presence of free product (using an interface probe or paste tape) and sheen. No free product or sheen was noted in any of the wells except for well MW5 where a trace of product was observed. After recording the monitoring data, the wells were developed with a surface pump until the evacuated water was clear and free of suspended sediment. During development, the wells were purged of 40 to 90 gallons. Monitoring and well development data are summarized in Table 1.

The wells were sampled on May 4, 1991. Prior to sampling, monitoring data was collected and the wells purged of 15 gallons each. No free product or sheen was noted in any of the wells on May 4, 1991, except for a sheen in well MW5. 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. Soil and water samples were analyzed for TPH as gasoline by EPA method 5030 in conjunction with modified 8015, and BTX&E by EPA method 8020.

Analytical results of the soil samples, collected from the borings for monitoring wells MW1 through MW5, indicate 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 from monitoring wells MW1 through MW5 indicate 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, which was non-detectable. Concentrations of TPH as gasoline and BTX&E constituents for the ground water samples collected from the five monitoring wells are shown on the attached Site Plan, Figure 1a. 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 11.69 to 12.62 feet below the surface on May 4, 1991. The ground water flow direction appeared to be toward the south-southwest and southwest on May 4, 1991, with a hydraulic gradient varying from approximately .0005 to .003, (based on water level data collected from the three monitoring wells prior to purging and sampling).

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 closely adjacent to 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 locally with 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 indicate that the site is underlain by clay and/or silt materials to the maximum depth explored (22.5 feet) 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 present across the site but was missed by the sampling interval used. Ground water was encountered within this clayey sand lens at MW3 and MW4.

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. In addition, wells MW1 and MW5 should be purged of a minimum of 55 gallons on a monthly basis in an attempt to reduce the levels of contamination in the vicinity of these wells.

Upgradient wells MW3 and MW4 show levels of TPH as gasoline at 9,100 ppb and 6,300 ppb, respectively, which indicate a probable off-site upgradient source of contamination. It is clear that the extent of ground water contamination has not been defined in the vicinity of the site. However, prior to recommending additional monitoring wells at this time, KEI proposes to evaluate the adjacent area for possible monitoring well locations and to review RWQCB files on adjacent properties. A work plan/proposal will be prepared for your review and consideration at a later date after our data on adjacent properties is complete.

DISTRIBUTION

A copy of this report should be sent to Mr. Lou Jug of Tri-Equity Properties of San Ramon, Mr. William Faulhaber of the ACHA, 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.

Thomas J. Berkins
Senior Environmental Engineer

Don R. Braun
Certified Engineering Geologist

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

Timothy R. Ross
Project Manager

\bam

Attachments: Tables 1 through 5
Location Map
Site Plans - Figures 1, 1a & 2
Boring Logs
Laboratory Results
Chain of Custody documentation
Proposal

KEI-P91-0102.R4
May 29, 1991

TABLE 1

SUMMARY OF GROUND WATER MONITORING AND PURGING DATA

Well #	Ground Water Elevation (feet)	Depth to Water (feet)	Product Thickness	Sheen	Gallons Pumped
(Monitored and Developed on April 29 & 30, 1991)					
MW1	24.88	11.84	0	No	40
MW2	24.93	11.96	0	No	70
MW3	25.00	11.84	0	No	90
MW4	25.02	12.38	0	No	85
MW5	24.90	11.50	Trace	N/A	70 w/trace product
(Monitored and Sampled on May 4, 1991)					
MW1	24.68	12.04	0	No	15
MW2	24.77	12.12	0	No	15
MW3	24.80	12.04	0	No	15
MW4	24.78	12.62	0	No	15
MW5	24.71	11.69	0	Yes	15

Well #	Surface Elevation* (feet)
MW1	36.72
MW2	36.89
MW3	36.84
MW4	37.40
MW5	36.40

* Elevation of top of well covers surveyed to Mean Sea Level.

KEI-P91-0102.R4
May 29, 1991

TABLE 2

SUMMARY OF LABORATORY ANALYSES
WATER

Date	Sample Number	TPH as Gasoline	Benzene	Toluene	Xylenes	Ethylbenzene
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	0.3	0.3	0.3	0.3

ND = Non-detectable.

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

KEI-P91-0102.R4
May 29, 1991

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	ND	ND	ND	0.0070	ND
	MW1(10)	10	82	0.20	0.23	0.31	0.14
	MW1(12)	12	420	1.2	1.3	0.72	0.78
	MW2(5)	5	ND	ND	ND	0.022	0.0085
	MW2(10)	10	2.2	0.089	ND	0.0064	ND
	MW2(12)	12	12	ND	0.017	0.075	0.14
	MW3(5)	5	ND	ND	ND	ND	ND
	MW3(10)	10	1.4	0.015	0.0051	0.014	ND
	MW3(13)	13	3.5	0.026	0.026	0.030	0.0088
	MW4(5)	5	ND	ND	ND	ND	ND
	MW4(10)	10	ND	ND	ND	0.0060	ND
	MW4(13)	13	ND	ND	ND	0.012	0.0088
	MW5(5)	5	ND	ND	ND	ND	ND
	MW5(10)	10	7.7	0.029	0.14	0.090	0.13
	MW5(14.5)	14.5	620	6.8	4.4	75	18
	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.R4
May 29, 1991

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.R4
May 29, 1991

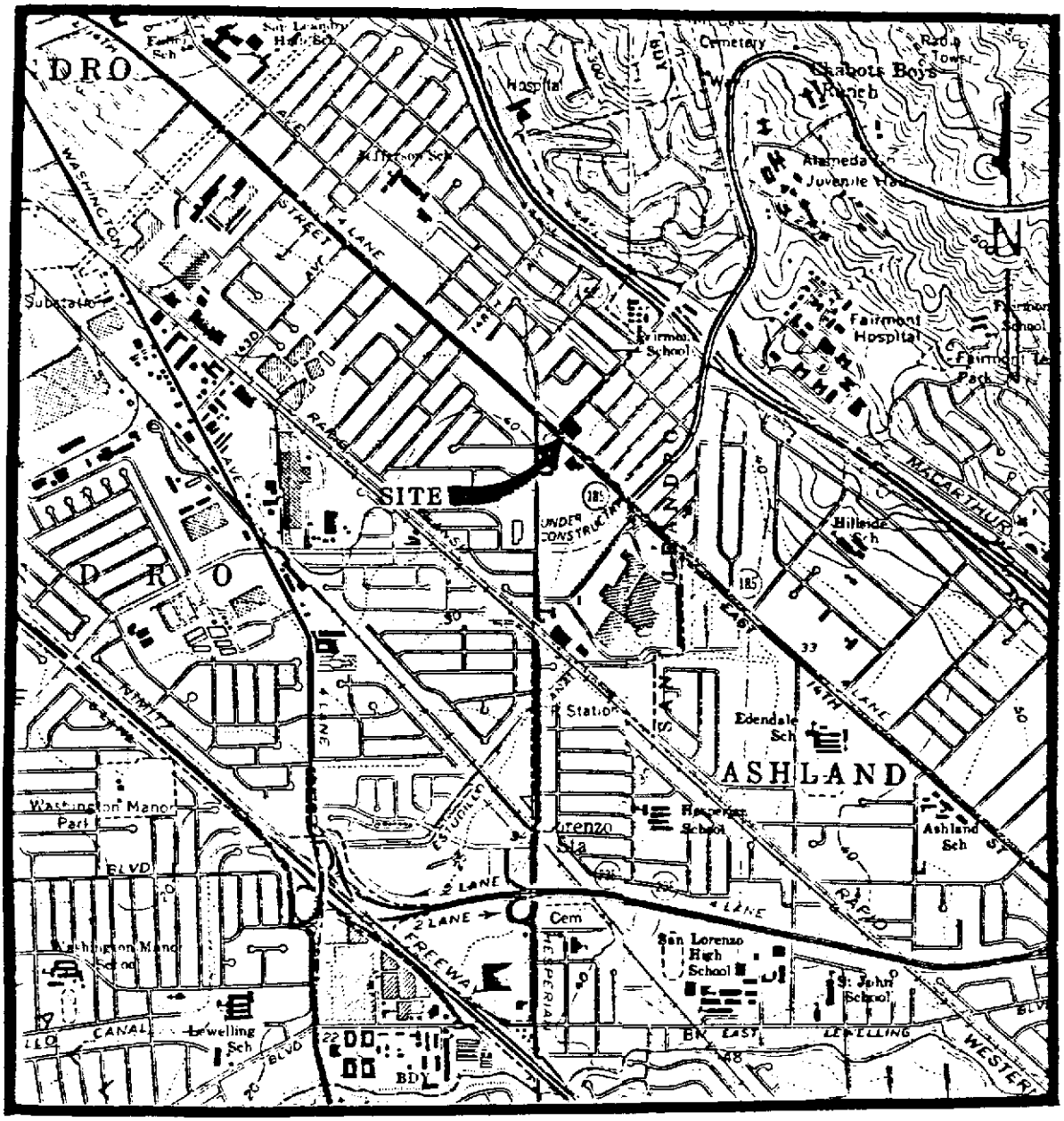
TABLE 5

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.

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

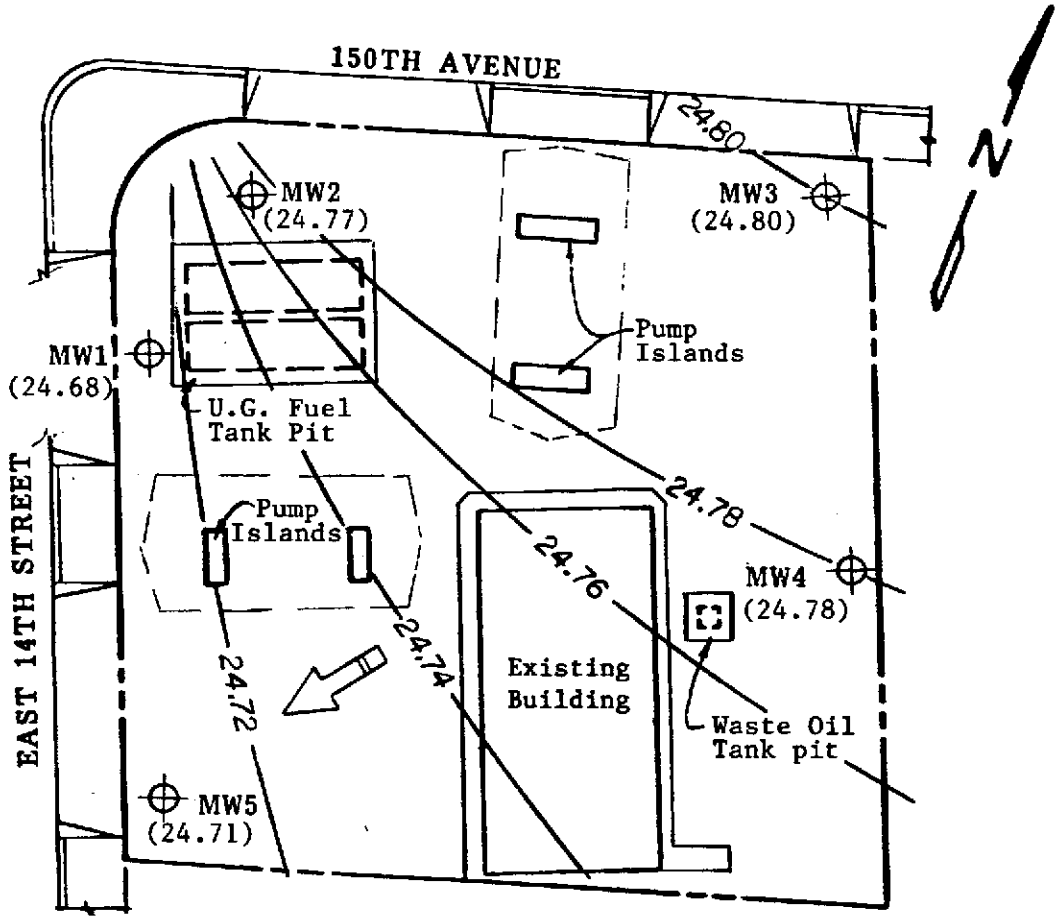


LOCATION MAP

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

Unocal S/S #3292
15008 E. 14th Street
San Leandro, CA

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



SITE PLAN
Figure 1

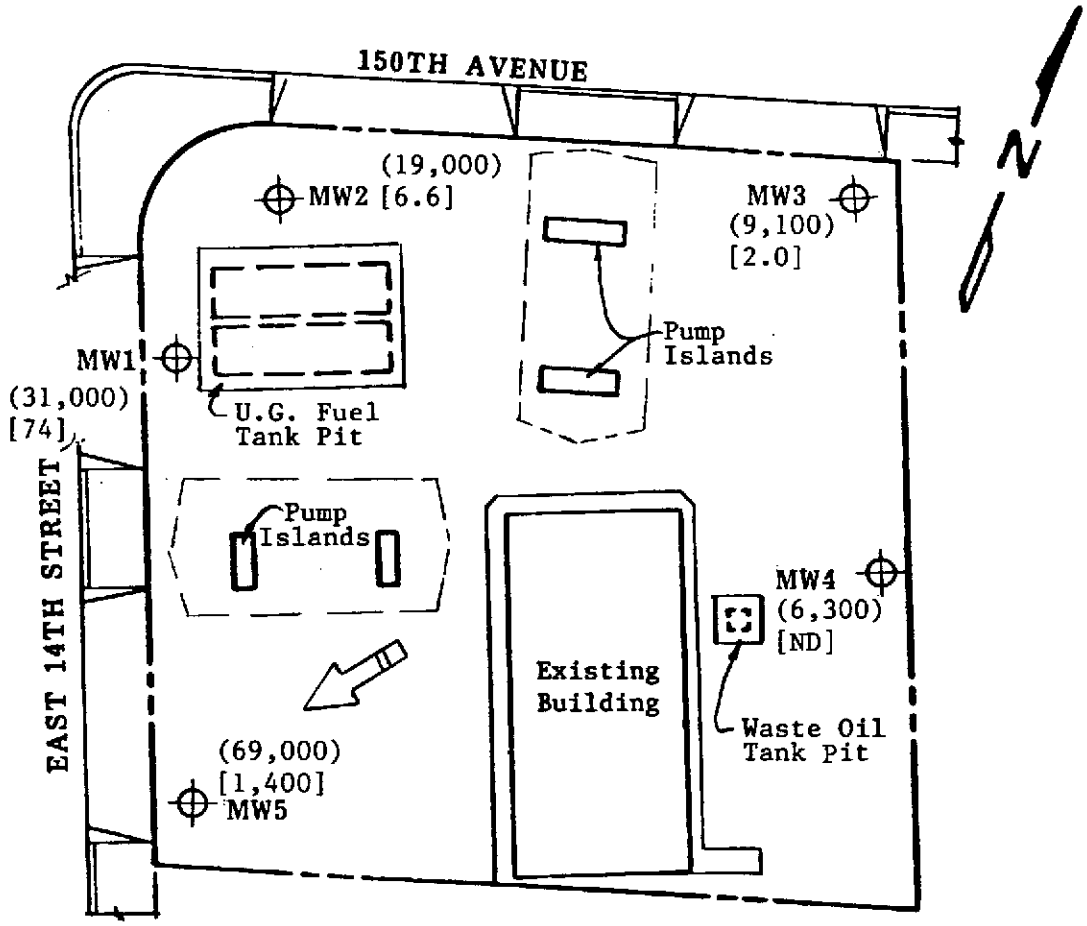
0 30 60
Approx. scale feet

LEGEND

- Monitoring well
- ( ) Ground water table elevation in feet above Mean Sea Level on 5/4/91
- Direction of ground water flow
- Contours of ground water table elevation in feet above Mean Sea Level

Unocal S/S #3292
15008 E. 14th Street
San Leandro, CA

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



SITE PLAN
Figure 1a

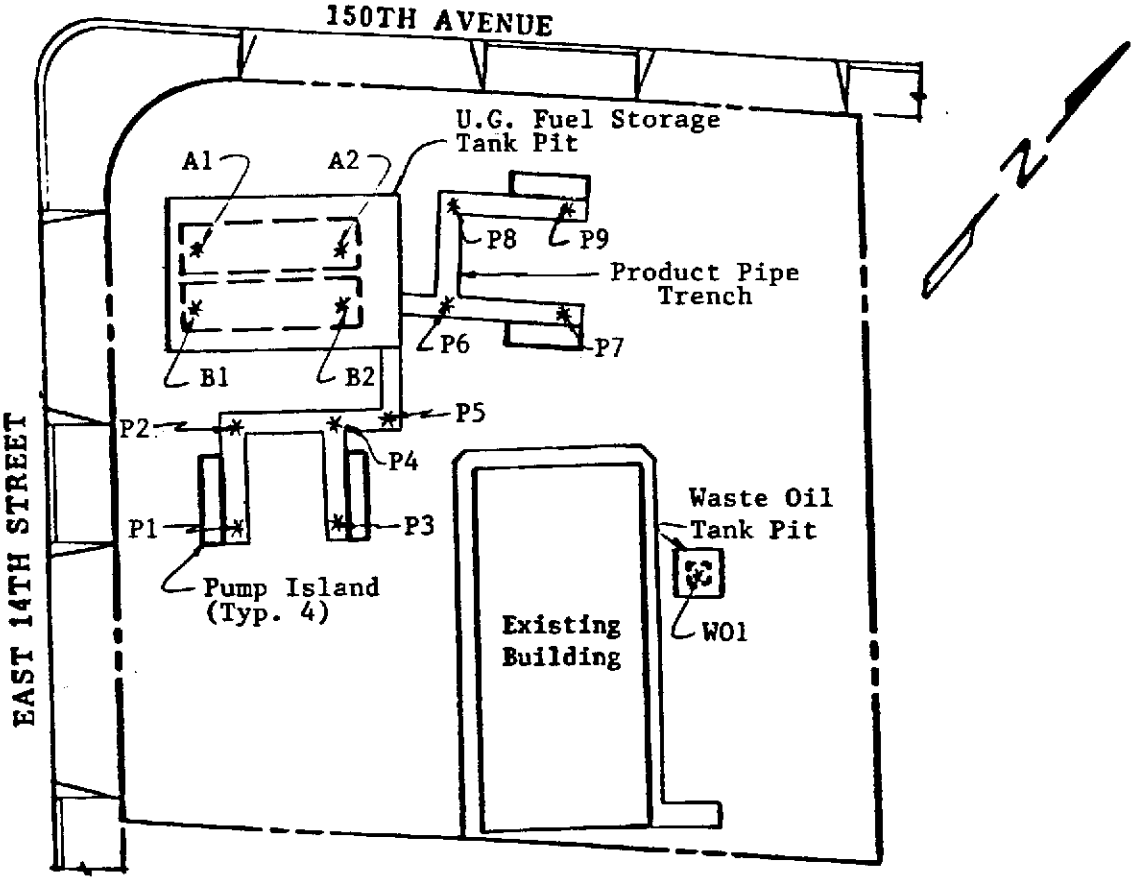
0 30 60
Approx. scale feet

LEGEND

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

Unocal S/S #3292
15008 E. 14th Street
San Leandro, CA

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



SITE PLAN
Figure 2

LEGEND

* Sample Point Location

Unocal S/S #3292
15008 E. 14th Street
San Leandro, CA

BORING LOG

Project No. KEI-P91-0102	**Boring & Casing Diameter** 9" 2"	**Logged By** W.W.
Project Name Unocal 15008 E. 14th San L	**Well Cover Elevation**	**Date Drilled** 4/24/91
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. Fill material consisting of gravelly clay with sand and silt, gravel to 4" diameter, moist, stiff, brown.
			ML/ MH	Clayey silt, with fine-grained sand, trace gravel to 1/2" diaemter, trace caliche, very stiff, moist, very dark grayish brown.
6/11/12		5		
				Clay, withsilt, root holes common, a 2" sandy clay lens observed at 9-1/2', moist, stiff, olive to olive gray.
4/5/6		10	CL/ CH	
5/6/9	▽			Clay, trace silt, sand and caliche, root holes common, moist to very moist, light olive brown and dark yellowish brown.
				Clay, as above, sheen present, firm, gray and olive brown mottled.
3/2/4		15		
			MH	Silt, saturated, sheen present, firm, dark greenish gray.
			CL/ CH	Clay, trace sand and caliche, porous, moist, stiff, gray and brown mottled.
6/7/9		20		Clayey silt, trace sand, very moist, stiff to very stiff, olive gray.
			MH	TOTAL DEPTH: 20.5'

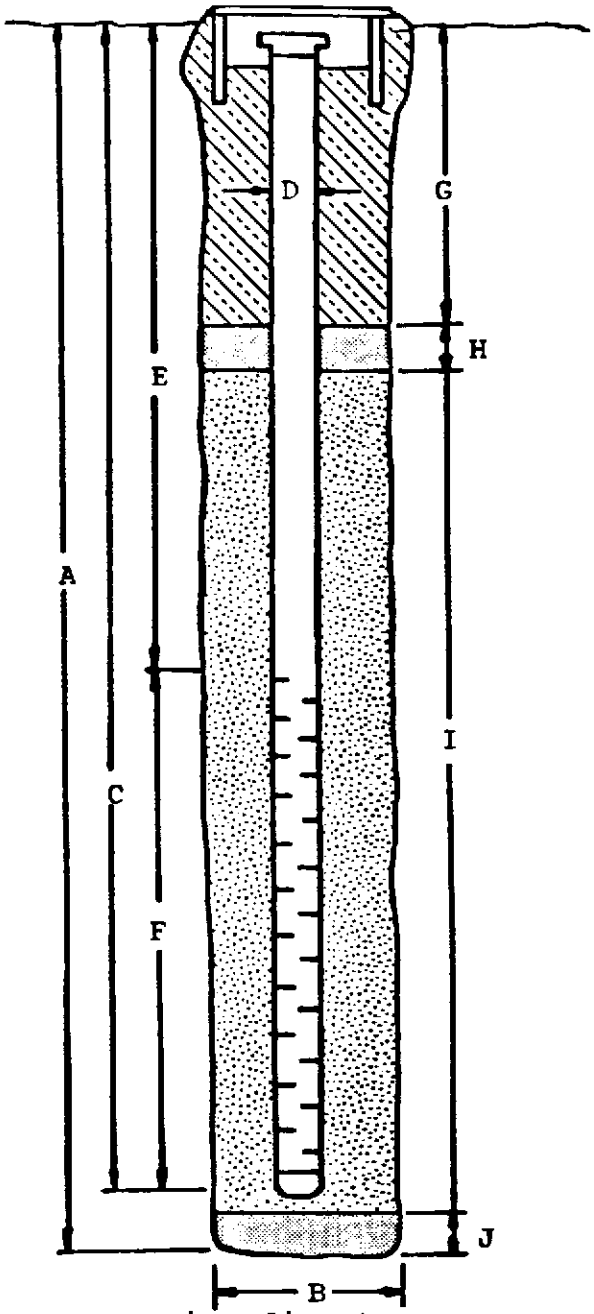
WELL COMPLETION DIAGRAM

PROJECT NAME: Unocal 15008 E. 14th San Leandro BORING/WELL NO. MW1

PROJECT NUMBER: KEI-P91-0102

WELL PERMIT NO.:

Flush-mounted Well Cover



A. Total Depth: 20.5'

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: 7'

F. Perforated Length: 12'

Perforation Type: Machined Slot

Perforation Size: 0.010"

G. Surface Seal: 3'

Seal Material: Concrete

H. Seal: 2'

Seal Material: Bentonite

I. Gravel Pack: 14'

Pack Material: RMC Lonestar Sand

Size: #2/16

J. Bottom Seal: 1.5'

Seal Material: Bentonite

*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.
Project Name Unocal 15008 E. 14th San L	**Well Cover Elevation**	**Date Drilled** 4/24/91
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. Fill material consisting of gravelly clay with silt, with cobbles to 12" diameter, moist, stiff, gray to greenish gray.
			CH	Silty clay, trace sand, moist, stiff, black.
3/4/5		5	ML/ MH	Clayey silt with fine-grained sand, trace caliche, moist, stiff, dark brown to very dark grayish brown.
				Clayey silt, trace fine-grained sand, porous, moist, stiff, olive gray.
4/5/6		10	CL	Clay, with silt, trace fine-grained sand, trace caliche, gray staining around roots, moist, olive brown mottled with dark grayish brown.
3/4/5	▽			Silty clay, saturated, trace caliche nodules to 3/8" diameter, stiff, olive brown and olive gray mottled with gray staining.
3/4/6		15		Silty clay, as above, olive gray and dark yellowish brown.
			MH	Clayey silt, trace caliche, saturated, free product present, stiff, olive gray and dark yellowish brown.
4/5/8			CL/ CH	Clay, trace very fine sand, trace caliche, porous, very moist, stiff, dark gray and very dark grayish brown mottled.
		20		TOTAL DEPTH: 19.5'

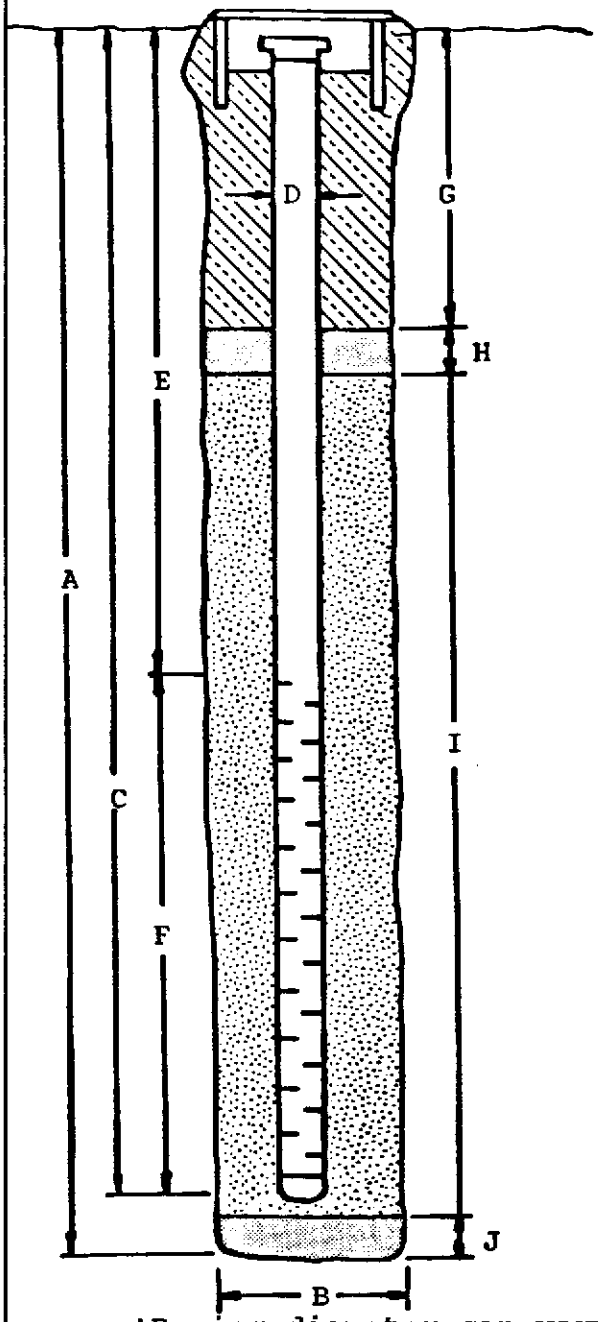
WELL COMPLETION DIAGRAM

PROJECT NAME: Unocal 15008 E. 14th San Leandro BORING/WELL NO. MW2

PROJECT NUMBER: KEI-P91-0102

WELL PERMIT NO.:

Flush-mounted Well Cover



A. Total Depth: 19.5'

B. Boring Diameter*: 9"

Drilling Method: Hollow Stem Auger

C. Casing Length: 19.5'

Material: Schedule 40 PVC

D. Casing Diameter: OD = 2.375" ID = 2.067"

E. Depth to Perforations: 7'

F. Perforated Length:

Perforation Type: Machined Slot

Perforation Size: 0.010"

G. Surface Seal: 3'

Seal Material: Concrete

H. Seal: 2'

Seal Material: Bentonite

I. Gravel Pack: 14.5'

Pack Material: RMC Lonestar Sand

Size: #2/16

J. Bottom Seal: None

Seal Material: N/A

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

B O R I N G L O G

Project No. KEI-P91-0102	**Boring & Casing Diameter** 9" 2"	**Logged By** W.W.
Project Name Unocal 15008 E. 14th San L	**Well Cover Elevation**	**Date Drilled** 4/23/91
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. Fill material consisting of gravelly clay with silt, trace sand, gravel to 3-1/2" diameter, firm, dark brown.
			CL/ CH	Silty clay, trace sand, firm, very dark gray.
7/9/13		5	ML	Clayey silt, trace gap graded sand, trace gravel to 1/2" diameter, moist, very stiff, dark gray to dark greenish gray.
			ML/ MH to CL/ CH	Clayey silt to silty clay, porous, caliche common, stiff, greenish gray.
4/4/5		10		Clayey silt to silty clay, trace fine-grained sand, very moist, porous, trace caliche, firm greenish gray.
2/3/2	▽		SC	Clayey sand, trace gravel to 1/2" dia. saturated, loose, greenish gray.
		15	ML/ MH	Clayey silt, trace sand, very moist to saturated, firm, greenish gray.
4/6/7			CL/ CH	Clay, with fine-grained sand, trace silt, caliche common, porous, very moist, dark gray and dark greenish gray.
		20		

BORING LOG

Project No. KEI-P91-0102	**Boring & Casing Diameter** 9" 2"	**Logged By** W.W.
Project Name Unocal 15008 E. 14th San L	**Well Cover Elevation**	**Date Drilled** 4/23/91
Boring No. MW3	**Drilling Method** Hollow-stem Auger	**Drilling Company** EGI

Penetration blows/6"	G. W. level	Depth (feet) Samples	Strati-graphy USCS	Description
6/8/11			CL/ CH	Clay, trace fine-grained sand, trace caliche, porous, moist, very stiff, very dark gray.
		25		
		30		
		35		
		40		TOTAL DEPTH: 22.5'

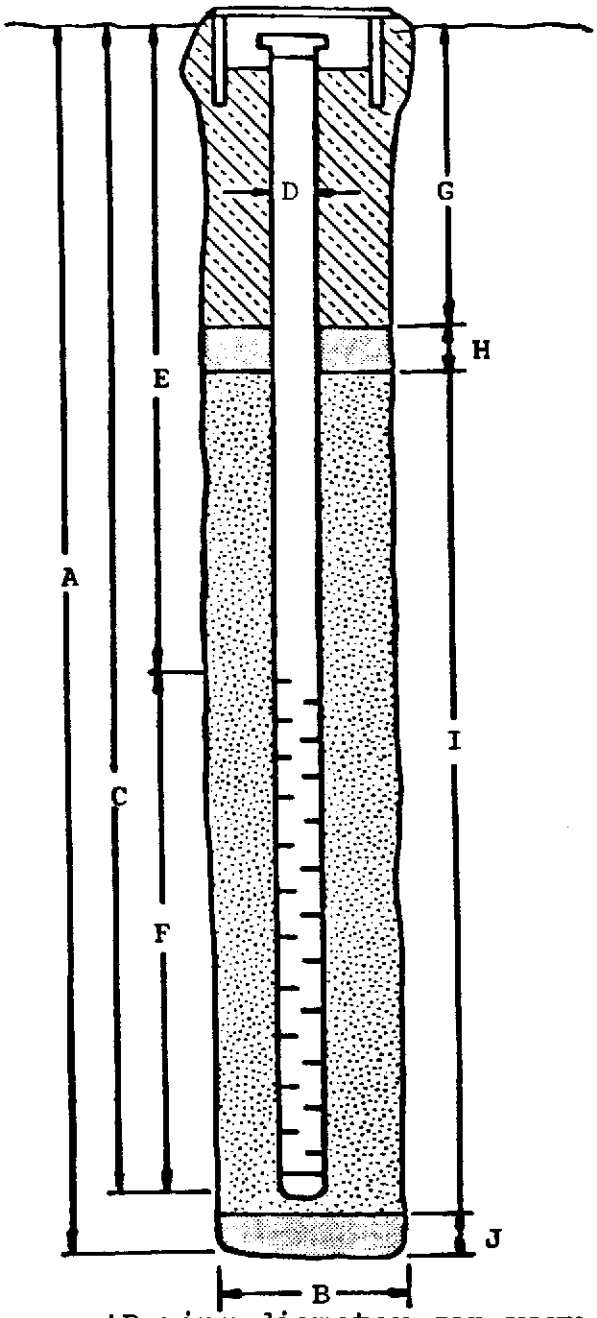
WELL COMPLETION DIAGRAM

PROJECT NAME: Unocal 15008 E. 14th San Leandro BORING/WELL NO. MW3

PROJECT NUMBER: KEI-P91-0102

WELL PERMIT NO.:

Flush-mounted Well Cover



A. Total Depth: 22.5'

B. Boring Diameter*: 9"

Drilling Method: Hollow Stem Auger

C. Casing Length: 22.5'

Material: Schedule 40 PVC

D. Casing Diameter: OD = 2.375" ID = 2.067"

E. Depth to Perforations: 7'

F. Perforated Length: 15.5'

Perforation Type: Machined Slot

Perforation Size: 0.010"

G. Surface Seal: 3'

Seal Material: Concrete

H. Seal: 2'

Seal Material: Bentonite

I. Gravel Pack: 17.5'

Pack Material: RMC Lonestar Sand

Size: #2/16

J. Bottom Seal: None

Seal Material: N/A

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

B O R I N G L O G

Project No. KEI-P91-0102	**Boring & Casing Diameter** 9" 2"	**Logged By** W.W.
Project Name Unocal 15008 E. 14th San L	**Well Cover Elevation**	**Date Drilled** 4/23/91
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. Fill material consisting of gravelly clay with silt and sand, gravel to 3-1/2" diameter, moist, firm, brown.
			CH	Silty clay, with fine-grained sand, porous, moist, stiff to very stiff, very dark gray.
7/9/7		5	ML/ MH	Clayey silt, with fine-grained sand, porous, trace angular gravel to 1/2" diameter, moist, stiff, dark brown.
				Sandy silt, trace clay, trace organic matter, very moist to saturated, stiff, brown to light olive brown.
4/5/7		10	CL/ CH	Clay, trace sand and silt, porous, caliche common, moist, stiff, brown and light olive brown mottled.
				Clay, as above, except greenish gray.
3/5/6	▽		SC	Clayey sand with gravel to 1/2" diameter, saturated, medium dense, greenish gray.
		15	ML/ MH	Clayey silt, trace fine-grained sand, porous, very moist to saturated, stiff, light olive gray.
			CL/ CH	Clay, trace silt, trace fine-grained sand, saturated, stiff, moist, very dark gray.
3/6/8		20		Clayey silt, trace sand and caliche, very moist, stiff, greenish gray.
			MH	TOTAL DEPTH: 20.5'

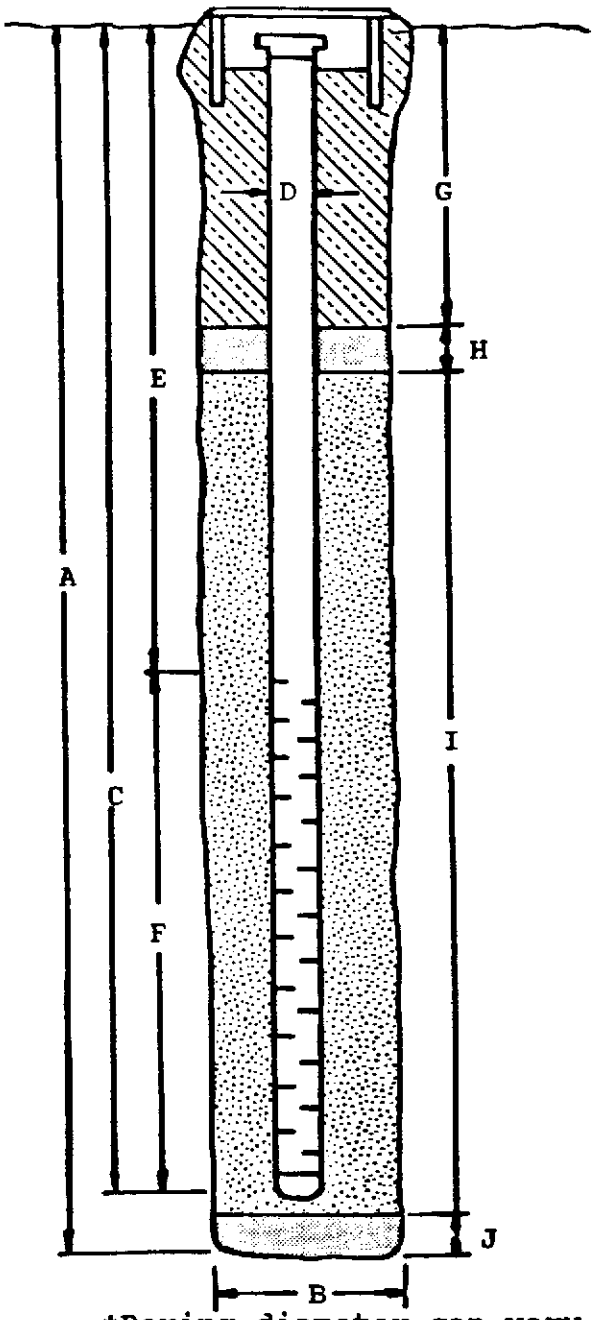
WELL COMPLETION DIAGRAM

PROJECT NAME: Unocal 15008 E. 14th San Leandro BORING/WELL NO. MW4

PROJECT NUMBER: KEI-P91-0102

WELL PERMIT NO.:

Flush-mounted Well Cover



A. Total Depth: 20.5'

B. Boring Diameter*: 9"

Drilling Method: Hollow Stem Auger

C. Casing Length: 19.5'

Material: Schedule 40 PVC

D. Casing Diameter: OD = 2.375"

ID = 2.067"

E. Depth to Perforations: 7'

F. Perforated Length: 12.5'

Perforation Type: Machined Slot

Perforation Size: 0.010"

G. Surface Seal: 3'

Seal Material: Concrete

H. Seal: 2'

Seal Material: Bentonite

I. Gravel Pack: 15.5'

Pack Material: RMC Lonestar Sand

Size: #2/16

J. Bottom Seal: None

Seal Material: N/A

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

B O R I N G L O G

Project No. KEI-P91-0102	**Boring & Casing Diameter** 9" 2"	**Logged By** W.W.
Project Name Unocal 15008 E. 14th San L	**Well Cover Elevation**	**Date Drilled** 4/23/91
Boring No. MW5	**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. Fill material consisting of gravelly clay with silt, trace sand, moist, gravel to 3" diameter, firm, dark brown.
			CL/ CH	Silty clay, trace sand, moist, firm, trace rootlets, very dark gray.
7/9/13		5	ML/ MH	Clayey silt, trace sand and trace gravel to 1/2" diameter, moist, very stiff, brown with slight mottling of yellowish brown.
			CL/ CH	Clay, with silt, trace sand, porous, caliche nodules to 3/8" diameter, moist, olive gray.
4/4/5		10		
	▽			
			ML/ MH to CL/ CH	Clayey silt to silty clay, pores locally contain free product, very moist to saturated, firm, olive gray to greenish gray.
	initially ▽			
2/2/3		15		
			CL/ CH	Silty clay, trace sand, very moist to saturated, porous, trace caliche, stiff, dark gray to olive gray to 20-1/4 feet.
4/5/		20		

B O R I N G L O G

Project No. KEI-P91-0102	**Boring & Casing Diameter** 9" 2"	**Logged By** W.W.
Project Name Unocal 15008 E. 14th San L	**Well Cover Elevation**	**Date Drilled** 4/23/91
Boring No. MW5	**Drilling Method** Hollow-stem Auger	**Drilling Company** EGI

Penetration blows/6"	G. W. level	Depth (feet) Samples	Strati-graphy USCS	Description
/7 6/6/11		25 30 35 40	CL/ CH	Clay, trace very fine-grained sand, slightly moist, trace caliche, very stiff, very dark gray with slight dark greenish gray mottling. TOTAL DEPTH: 22.5'

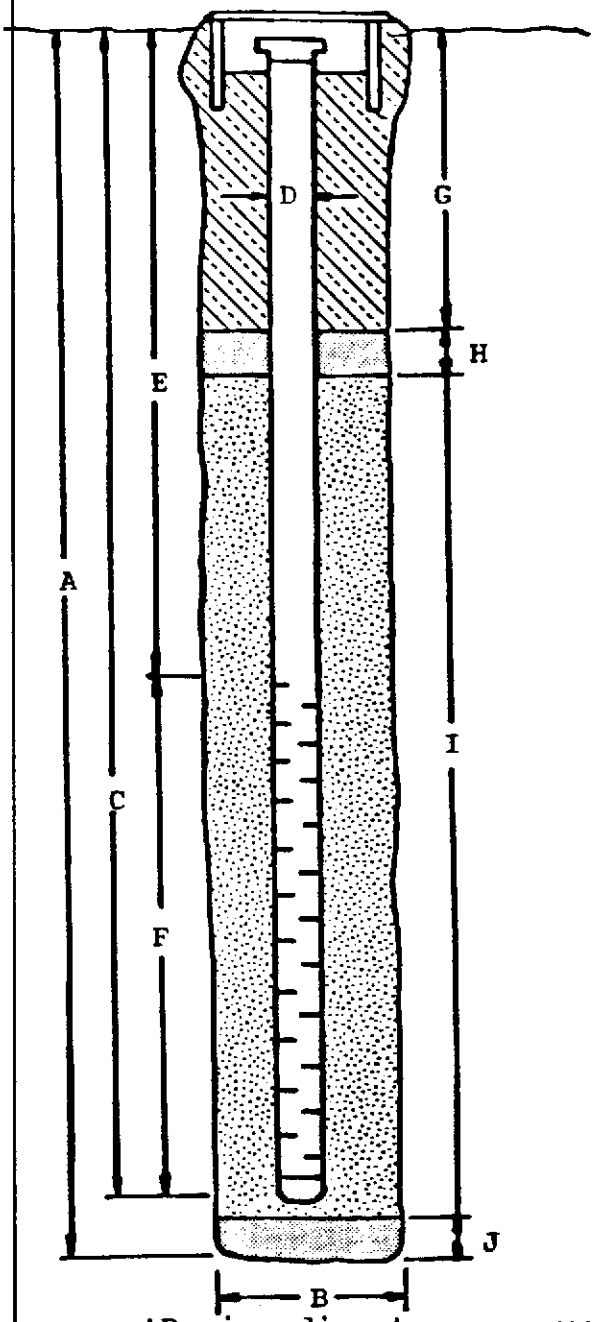
WELL COMPLETION DIAGRAM

PROJECT NAME: Unocal 15008 E. 14th San Leandro BORING/WELL NO. MW5

PROJECT NUMBER: KEI-P91-0102

WELL PERMIT NO.:

Flush-mounted Well Cover



A. Total Depth: 22.5'

B. Boring Diameter*: 9"

Drilling Method: Hollow Stem Auger

C. Casing Length: 22.5'

Material: Schedule 40 PVC

D. Casing Diameter: OD = 2.375" ID = 2.067"

E. Depth to Perforations: 7'

F. Perforated Length: 15.5'

Perforation Type: Machined Slot

Perforation Size: 0.010"

G. Surface Seal: 3'

Seal Material: Concrete

H. Seal: 2'

Seal Material: Bentonite

I. Gravel Pack: 17.5'

Pack Material: RMC Lonestar Sand

Size: #2/16

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, 15006 E. 14th St., San Leandro	Sampled:	4/23-4/24/91
P.O. Box 996	Matrix Descript:	Soil	Received:	Apr 25, 1991
Benicia, CA 94510	Analysis Method:	EPA 5030/8015/8020	Analyzed:	May 1, 1991
Attention: Mardo Kaprealian, P.E.	First Sample #:	104-0864	Reported:	May 13, 1991

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)
104-0864	MW1(5)	N.D.	N.D.	N.D.	N.D.	0.0070
104-0865	MW1(10)	82	0.20	0.23	0.14	0.31
104-0866	MW1(12)	420	1.2	1.3	0.78	0.72
104-0867	MW2(5)	N.D.	N.D.	N.D.	0.0085	0.022
104-0868	MW2(10)	2.2	0.0089	N.D.	N.D.	0.0064
104-0869	MW2(12)	12	N.D.	0.017	0.14	0.075
104-0870	MW3(5)	N.D.	N.D.	N.D.	N.D.	N.D.
104-0871	MW3(10)	1.4	0.015	0.0051	N.D.	0.014
104-0872	MW3(13)	3.5	0.026	0.026	0.0088	0.030
104-0873	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

SEQUOIA ANALYTICAL

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

Kaprealian Engineering, Inc.	Client Project ID:	Unocal, 15008 E. 14th St., San Leandro	Sampled:	Apr 24, 1991
P.O. Box 996	Matrix Descript:	Soil	Received:	Apr 25, 1991
Benicia, CA 94510	Analysis Method:	EPA 5030/8015/8020	Analyzed:	May 1, 1991
Attention: Mardo Kaprealian, P.E.	First Sample #:	104-0874	Reported:	May 13, 1991

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)
104-0874	MW4(10)	N.D.	N.D.	N.D.	N.D.	0.0060
104-0875	MW4(13)	N.D.	N.D.	N.D.	0.0088	0.012
104-0876	MW5(5)	N.D.	N.D.	N.D.	N.D.	N.D.
104-0877	MW5(10)	7.7	0.029	0.14	0.13	0.090
104-0878	MW5(14.5)	620	6.8	4.4	18	75
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

1040864.KEI <2>

SEQUOIA ANALYTICAL

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

Kaprealian Engineering, Inc.	Client Project ID:	Unocal, 15008 E. 14th St., San Leandro	Sampled: - - - - - -
P.O. Box 996	Sample Descript.:	Blank	Received: - - - - - -
Benicia, CA 94510	Analysis Method:	EPA 5030/8015/8020	Analyzed: May 1, 1991
Attention: Mardo Kaprealian, P.E.	Lab Number:	- - - - - -	Reported: May 13, 1991

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

Analyte	Detection Limit mg/kg (ppm)	Sample Results mg/kg (ppm)
Low to Medium Boiling Point Hydrocarbons	1.0	N.D.
Benzene	0.0050	N.D.
Toluene	0.0050	N.D.
Ethyl Benzene	0.0050	N.D.
Xylenes	0.0050	N.D.

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

SEQUOIA ANALYTICAL

Belinda C. Vega
Laboratory Director

SEQUOIA ANALYTICAL

1900 Bates Avenue • Suite LM • Concord, California 94520
(415) 686-9600 • FAX (415) 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: 1040864-78
Reported: May 13, 1991

QUALITY CONTROL DATA REPORT

ANALYTE	Benzene	Toluene	Ethyl Benzene	Xylenes
Method:	EPA8015/8020	EPA8015/8020	EPA8015/8020	EPA8015/8020
Analyst:	J. Fontecha	J. Fontecha	J. Fontecha	J. Fontecha
Reporting Units:	ppm	ppm	ppm	ppm
Date Analyzed:	May 1, 1991	May 1, 1991	May 1, 1991	May 1, 1991
QC Sample #:	104-0864	104-0864	104-0864	104-0864
Sample Conc.:	N.D.	N.D.	N.D.	0.0070
Spike Conc. Added:	0.40	0.40	0.40	1.2
Conc. Matrix Spike:	0.42	0.40	0.36	1.1
Matrix Spike % Recovery:	110	100	90	92
Conc. Matrix Spike Dup.:	0.44	0.38	0.36	1.1
Matrix Spike Duplicate % Recovery:	110	95	90	92
Relative % Difference:	4.6	5.1	0	0

SEQUOIA ANALYTICAL

Belinda C. Vega
Laboratory Director

% 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
(415) 686-9600 • FAX (415) 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: 1040864-78
Reported: May 13, 1991

QUALITY CONTROL DATA REPORT

SURROGATE

Method:	EPA8015/8020	EPA8015/8020	EPA8015/8020	EPA8015/8020	EPA8015/8020	EPA8015/8020	EPA8015/8020
Analyst:	J.F.	J.F.	J.F.	J.F.	J.F.	J.F.	J.F.
Reporting Units:	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Date Analyzed:	May 1, 1991	May 1, 1991	May 1, 1991	May 1, 1991	May 1, 1991	May 1, 1991	May 1, 1991
QC Sample #:	104-0864	104-0865	104-0866	104-0867	104-0868	104-0869	104-0870
Surrogate % Recovery:	89	80	71	89	90	93	92

SEQUOIA ANALYTICAL

Belinda C. Vega
Laboratory Director

% Recovery:	Conc. of M.S. - Conc. of Sample / Spike Conc. Added	x 100
Relative % Difference:	Conc. of M.S. - Conc. of M.S.D. / (Conc. of M.S. + Conc. of M.S.D.) / 2	x 100

SEQUOIA ANALYTICAL

1900 Bates Avenue • Suite LM • Concord, California 94520
(415) 686-9600 • FAX (415) 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: 1040864-78
Reported: May 13, 1991

QUALITY CONTROL DATA REPORT

SURROGATE

Method:	EPA8015/8020	EPA8015/8020	EPA8015/8020	EPA8015/8020	EPA8015/8020	EPA8015/8020	EPA8015/8020
Analyst:	J.F.	J.F.	J.F.	J.F.	J.F.	J.F.	J.F.
Reporting Units:	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Date Analyzed:	May 1, 1991	May 1, 1991	May 1, 1991	May 1, 1991	May 1, 1991	May 1, 1991	May 1, 1991
QC Sample #:	104-0871	104-0872	104-0873	104-0874	104-0875	104-0876	104-0877
Surrogate % Recovery:	92	91	92	90	100	98	93

SEQUOIA ANALYTICAL

Belinda C. Vega
Laboratory Director

% Recovery:	Conc. of M.S. - Conc. of Sample / Spike Conc. Added	x 100
Relative % Difference:	Conc. of M.S. - Conc. of M.S.D. / (Conc. of M.S. + Conc. of M.S.D.) / 2	x 100

SEQUOIA ANALYTICAL

1900 Bates Avenue • Suite LM • Concord, California 94520
(415) 686-9600 • FAX (415) 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:
Reported: May 13, 1991

QUALITY CONTROL DATA REPORT

SURROGATE

Method:	EPA8015/8020	EPA8015/8020
Analyst:	J.F.	J.F.
Reporting Units:	ppm	ppm
Date Analyzed:	May 1, 1991	May 1, 1991
QC Sample #:	104-0878	Blank
Surrogate % Recovery:	100	94

SEQUOIA ANALYTICAL

Belinda C. Vega
Laboratory Director

% Recovery:	Conc. of M.S. - Conc. of Sample / Spike Conc. Added	x 100
Relative % Difference:	Conc. of M.S. - Conc. of M.S.D. / (Conc. of M.S. + Conc. of M.S.D.) / 2	x 100

KAPREALIAN ENGINEERING, INC.

CHAIN OF CUSTODY

SAMPLER: Wade Weston
WITNESSING AGENCY:

SITE NAME & ADDRESS: Unocal- San Leandro
15008 E 14th ST.

ANALYSES REQUESTED: TPH-G/BTXE

TURN AROUND TIME: Regular

SAMPLE ID NO.	DATE	TIME	SOIL	WATER	GRAB	COMP	NO. OF CONT.	SAMPLING LOCATION	TPH-G/BTXE	REMARKS
MW1-(5)	4/24/91		✓		✓		1	See Sample ID #	✓	10408864
MW1-(10)	"		✓		✓		1		✓	865
MW1-(12)	"		✓		✓		1		✓	866
MW2-(5)	"		✓		✓		1		✓	867
MW2-(10)	"		✓		✓		1		✓	868
MW2-(12)	"		✓		✓		1		✓	869
MW3-(5)	4/23/91		✓		✓		1		✓	870
MW3-(10)	"		✓		✓		1		✓	871
MW3-(13)	"		✓		✓		1		✓	872

Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Wade Weston	4/25/91 930	

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: PM | Date: 4/25/91

KAPREALIAN ENGINEERING, INC.

CHAIN OF CUSTODY

SAMPLER: Wade Weston

WITNESSING AGENCY:

SITE NAME & ADDRESS: Unocal- San Leandro, 15008 E. 14th ST.

ANALYSES REQUESTED: TPH-G/BTXE

TURN AROUND TIME: Regular

SAMPLE ID NO.	DATE	TIME	SOIL	WATER	GRAB	COMP	NO. OF CONT.	SAMPLING LOCATION	REMARKS
MW4-(5)	4/23/91		✓		✓		1	See Sample ID*	10410873
MW4-(10)	"		✓		✓		1		874
MW4-(13)	"		✓		✓		1		875
MW5-(5)	"		✓		✓		1		876
MW5-(10)	"		✓		✓		1		877
MW5-(14.5)	"		✓		✓		1		878

Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Wade Weston	4/25 9:30	
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? yes
2. Will samples remain refrigerated until analyzed? yes
3. Did any samples received for analysis have head space? n/a
4. Were samples in appropriate containers and properly packaged? yes

Signature | Title: PM | Date: 4/25/91

SEQUOIA ANALYTICAL

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

Kaprealian Engineering, Inc.	Client Project ID:	Unocal, 15008 E. 14th St., San Leandro	Sampled: May 4, 1991
P.O. Box 996	Matrix Descript:	Water	Received: May 8, 1991
Benicia, CA 94510	Analysis Method:	EPA 5030/8015/8020	Analyzed: May 16, 1991
Attention: Mardo Kaprealian, P.E.	First Sample #:	105-0261 AB	Reported: May 22, 1991

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

Sample Number	Sample Description	Low/Medium B.P. Hydrocarbons µg/L (ppb)	Benzene µg/L (ppb)	Toluene µg/L (ppb)	Ethyl Benzene µg/L (ppb)	Xylenes µg/L (ppb)
105-0261 AB	MW-1	31,000	74	20	920	1,500
105-0262 AB	MW-2	19,000	6.6	1.4	460	630
105-0263 AB	MW-3	9,100	2.0	N.D.	55	180
105-0264 AB	MW-4	6,300	N.D.	N.D.	2.8	61
105-0265 AB	MW-5	69,000	1,400	2,500	3,500	15,000
Detection Limits:		**30**	**0.30**	**0.30**	**0.30**	**0.30**

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

SEQUOIA ANALYTICAL

Belinda C. Vega
Laboratory Director

SEQUOIA ANALYTICAL

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

Kaprealian Engineering, Inc.	Client Project ID:	Unocal, 15008 E. 14th St., San Leandro	Sampled: - - - - - -
P.O. Box 996	Sample Descript.:	D I Blank	Received: - - - - - -
Benicia, CA 94510	Analysis Method:	EPA 5030/ 8015/8020	Analyzed: May 16, 1991
Attention: Mardo Kaprealian, P.E.	Lab Number:	- - - - - -	Reported: May 22, 1991

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

Analyte	Detection Limit µg/L (ppb)	Sample Results µg/L (ppb)
Low to Medium Boiling Point Hydrocarbons	30	N.D.
Benzene	0.30	N.D.
Toluene	0.30	N.D.
Ethyl Benzene	0.30	N.D.
Xylenes	0.30	N.D.

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

SEQUOIA ANALYTICAL

Belinda C. Vega
Laboratory Director

SEQUOIA ANALYTICAL

1900 Bates Avenue • Suite LM • Concord, California 94520
(415) 686-9600 • FAX (415) 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: 1050261-65
Reported: May 22, 1991

QUALITY CONTROL DATA REPORT

ANALYTE	Benzene	Toluene	Ethyl Benzene	Xylenes
Method:	EPA8015/8020	EPA8015/8020	EPA8015/8020	EPA8015/8020
Analyst:	J. Fontecha	J. Fontecha	J. Fontecha	J. Fontecha
Reporting Units:	ppb	ppb	ppb	ppb
Date Analyzed:	May 16, 1991	May 16, 1991	May 16, 1991	May 16, 1991
QC Sample #:	105-0092	105-0092	105-0092	105-0092
Sample Conc.:	N.D.	N.D.	N.D.	N.D.
Spike Conc. Added:	20	20	20	60
Conc. Matrix Spike:	21	20	21	61
Matrix Spike % Recovery:	110	100	110	100
Conc. Matrix Spike Dup.:	21	20	21	62
Matrix Spike Duplicate % Recovery:	110	100	110	100
Relative % Difference:	0	0	0	1.6

SEQUOIA ANALYTICAL

Belinda C. Vega
Laboratory Director

% Recovery:	Conc. of M.S. - Conc. of Sample / Spike Conc. Added	x 100
Relative % Difference:	Conc. of M.S. - Conc. of M.S.D. / (Conc. of M.S. + Conc. of M.S.D.) / 2	x 100

SEQUOIA ANALYTICAL

1900 Bates Avenue • Suite LM • Concord, California 94520
(415) 686-9600 • FAX (415) 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: 1050261-65
Reported: May 22, 1991

QUALITY CONTROL DATA REPORT

SURROGATE

Method:	EPA8015/8020	EPA8015/8020	EPA8015/8020	EPA8015/8020	EPA8015/8020	EPA8015/8020
Analyst:	J. Fontecha	J. Fontecha	J. Fontecha	J. Fontecha	J. Fontecha	J. Fontecha
Reporting Units:	ppb	ppb	ppb	ppb	ppb	ppb
Date Analyzed:	May 16, 1991	May 16, 1991	May 16, 1991	May 16, 1991	May 16, 1991	May 16, 1991
Sample #:	105-0261	105-0262	105-0263	105-0264	105-0265	Blank
Surrogate % Recovery:	97	97	92	94	100	100

SEQUOIA ANALYTICAL

Belinda C. Vega
Laboratory Director

% Recovery:	Conc. of M.S. - Conc. of Sample / Spike Conc. Added	x 100
Relative % Difference:	Conc. of M.S. - Conc. of M.S.D. / (Conc. of M.S. + Conc. of M.S.D.) / 2	x 100

KAPREALIAN ENGINEERING, INC.

CHAIN OF CUSTODY

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

SAMPLE ID NO.	DATE	TIME	SOIL	WATER	GRAB	COMP	NO. OF CONT.	SAMPLING LOCATION	TPHG, BTXE							REMARKS
MW-1	5/4/91	12:30 - 2:10		✓	✓		2	MW	✓	1050261 AB						VOAs - preserved
MW-2	"			✓	✓		2	"	✓	262						
MW-3	"			✓	✓		2	"	✓	263						
MW-4	"			✓	✓		2	"	✓	264						
MW-5	"			✓	✓		2	"	✓	265						

Relinquished by: (Signature)	Date/Time	Received by: (Signature)
[signature]	5/6/91 1430	[signature]
[signature]	5/8 1555	
	5/6/91 1830	[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

BS	login	5/6/91
Signature	Title	Date