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

90 MAY 17 AM 11:47

May 15, 1990

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

Attention: Mr. Larry Seto

RE: Unocal Service Station #6129
3420 - 35th Avenue
Oakland, California

Dear Mr. Seto:

Per the request of Mr. Ron Bock of Unocal Corporation, enclosed please find our report dated April 23, 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: Ron Bock, Unocal Corporation

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KEI-P89-0902.R6
April 23, 1990

Unocal Corporation
2175 N. California Blvd., #650
Walnut Creek, CA 94596

Attention: Mr. Ron Bock

RE: Continuing Subsurface Investigation at
Unocal Service Station #6129
3420 - 35th Avenue
Oakland, California

Dear Mr. Bock:

This report presents the results of our subsurface investigation for the referenced site in accordance with Kaprealian Engineering, Inc's. (KEI's) proposal KEI-P89-0902.P2 dated February 5, 1990. The purpose of the investigation was to determine the extent of subsurface soil contamination in the vicinity of the previously installed monitoring well MW3. The scope of the work performed by KEI consisted of the following:

Coordination with regulatory agencies.

Drilling four exploratory borings.

Soil sampling.

Laboratory analyses.

Data analyses, interpretation and report preparation.

SITE DESCRIPTION AND BACKGROUND

The subject site is presently used as a gasoline station. The site occupies the south corner at the intersection of 35th Avenue and Quigley Street in Oakland, California. A Location Map and Site Plan are attached to this report.

On September 11, 1989, KEI collected soil samples following the removal of two fuel storage tanks and one waste oil tank at the referenced site. Four soil samples were collected at a depth of 14 feet from the fuel tank pit, and one sample at a depth of 9.5 feet from the waste oil tank pit. Five piping trench samples were also collected at depth ranging from 3 to 7.5 feet. Analytical results of the soil samples collected from the fuel

storage tank pit showed total petroleum hydrocarbons (TPH) as gasoline ranging from 1.8 ppm to 10 ppm. Analyses of pipe trench soil samples indicate levels of TPH as gasoline ranging from non-detectable to 17 ppm for all samples, except for one sample (labeled P3) at a depth of 3.5 feet, which showed 690 ppm. However, after further excavation, analyses of soil sample P3 at a depth of 7.5 feet indicate non-detectable levels of TPH as BTX&E. The results of soil sample collected from the waste oil tank pit indicated levels of TPH as diesel at 3.3 ppm, and TOG at 58 ppm. Documentation of soil sample collection and analytical results are presented in KEI's report (KEI-J89-0902.R2) dated October 9, 1989. Based on the analytical results, KEI proposed installation of three monitoring wells.

On December 12, 1989, three two-inch diameter monitoring wells, designated as MW1, MW2 and MW3, were installed at the site. The three wells were each drilled and completed to total depths of 44 feet. Ground water was encountered at depths of about 35 feet beneath the surface during drilling. The wells were developed on December 28 and 29, 1989, and sampled on January 5, 1990. No free product or sheen was noted in any of the wells.

Soil sample analyses showed non-detectable levels of TPH as gasoline and BTX&E in all samples except in MW3 at 5 feet, which showed levels of TPH as gasoline at 1,200 ppm, and benzene at 4.5 ppm. The water sample analyses showed non-detectable levels of TPH as gasoline and BTX&E in all wells. Due to the levels of TPH as gasoline (1,200 ppm) encountered in the soil sample collected from well MW3 at a depth of 5 feet, KEI recommended the installation of four exploratory borings to a depth of 10 feet to define the extent of the reported soil contamination.

FIELD ACTIVITIES

On March 14, 1990, four exploratory borings (designated as EB1, EB2, EB3 and EB4 on the attached Site Plan) were drilled at the site. Subsurface materials penetrated and the depths at which soil samples were collected are shown in the attached Boring Logs.

The four borings were drilled to depths of 10.5 to 11 feet. Ground water was not encountered. Soil samples were collected at a maximum spacing of 5 feet beginning at a depth of 5 feet below grade in each of the borings. Undisturbed soil samples were collected by driving a California-modified split-spoon sampler ahead of the drilling augers. The clean, two-inch diameter brass tubes holding the samples were sealed with aluminum foil, plastic caps and tape, and stored in a cooled ice chest for delivery to a

state certified laboratory. After the soil samples were collected at approximately 10 feet below grade, the borings were backfilled to the surface with neat cement.

ANALYTICAL RESULTS

Samples were analyzed at Sequoia Analytical in Redwood City, California, and were accompanied by properly executed Chain of Custody documentation. Water and selected soil samples from each boring were analyzed for TPH as gasoline using EPA method 5030 in conjunction with modified 8015, and benzene, toluene, xylenes and ethylbenzene (BTX&E) using EPA method 8020. The results of soil analyses are summarized in Table 1. Copies of the laboratory analyses and Chain of Custody documentation are attached to this report.

The analytical results of the soil samples collected from the exploratory borings (EB1 through EB4) indicate non-detectable levels of TPH as gasoline in all soil samples except EB1(5), EB3(5) and EB3(10), which shows a level of TPH as gasoline at 1,100 ppm, 58 ppm and 3.0 ppm, respectively. In addition, the analytical results indicate non-detectable levels of benzene in all soil samples except EB1(5), EB1(10), EB3(10) and EB4(5), which shows a level of benzene at 1.8 ppm, 0.0050 ppm, 0.12 ppm and 0.010 ppm, respectively. Also, toluene was detected in all soil samples at level ranging from 0.034 ppm to 2.5 ppm.

HYDROLOGY AND GEOLOGY

Based on review of regional geologic maps (U.S. Geological Survey Map GQ-769, "Areal and Engineering Geology of the Oakland East Quadrangle, California" by Dorothy H. Radbruch, 1969), the site is underlain by the lower member of the Quaternary-age San Antonio Formation (Qsl). This unit typically consists of gravel with a silty clay matrix.

The results of our subsurface exploration (four borings) indicates that the site is underlain by artificial fill materials varying in thickness from about 4, up to about 6 feet. The native earth material at the site typically consists of clayey gravel with sand to the maximum depth explored (11 feet), with exception of the vicinity of boring EB1, where a 2-1/2 foot thick lens of clay materials was encountered directly below the fill materials.

DISCUSSION AND RECOMMENDATIONS

Based on the analytical results of the soil samples, collected from exploratory borings EB1 through EB4 and monitoring well MW3, soil contamination appears to exist in the vicinity of EB1 and MW3 at depths of approximately 4 to 7 feet. Therefore, KEI recommends the excavation of the contaminated soil between the pump island and exploratory boring EB3, as indicated on the attached Site Plan. In addition, as previously recommended in our Preliminary Ground Water Investigation Report, dated February 5, 1990, KEI is currently implementing the monthly monitoring and quarterly sampling of the existing monitoring wells (MW1, MW2 and MW3).

DISTRIBUTION

A copy of this report should be sent to the Alameda County Flood Control and Water Conservation District and to the Regional Water Quality Control Board, San Francisco Bay Region.

LIMITATIONS

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

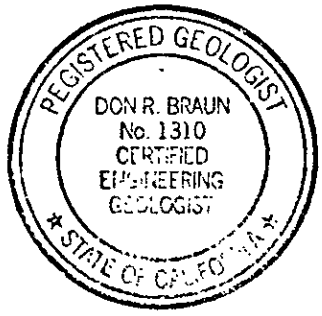
Should you have any questions regarding this report, please feel free to call me at (707) 746-6915.

Sincerely,

Kaprealian Engineering, Inc.

Don R. Braun
Certified Engineering Geologist

License No. 1310
Exp. Date 6/30/90



Mardo Kaprealian
President

cll

Attachments: Table 1
Location Map
Site Plan
Boring Logs
Laboratory Results
Chain of Custody documentation

KEI-P89-0902.R6
April 23, 1990

TABLE 1

SUMMARY OF LABORATORY ANALYSES
SOIL

(Collected on March 14, 1990)

Sample Number	TPH as Gasoline	Benzene	Toluene	Xylenes	Ethylbenzene
EB1(5)	1,100	1.8	2.5	7.0	10
EB1(10)	ND	0.0050	0.034	ND	ND
EB2(8)	ND	ND	0.080	ND	ND
EB2(10)	ND	ND	0.070	ND	ND
EB3(5)	58	ND	0.068	0.31	0.090
EB3(10)	3.0	0.12	0.036	0.0072	ND
EB4(4)	ND	0.10	0.060	0.024	0.013
EB4(10)	ND	ND	0.055	ND	ND
Detection Limits	1.0	0.0050	0.0050	0.0050	0.0050

ND = Non-detectable.

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

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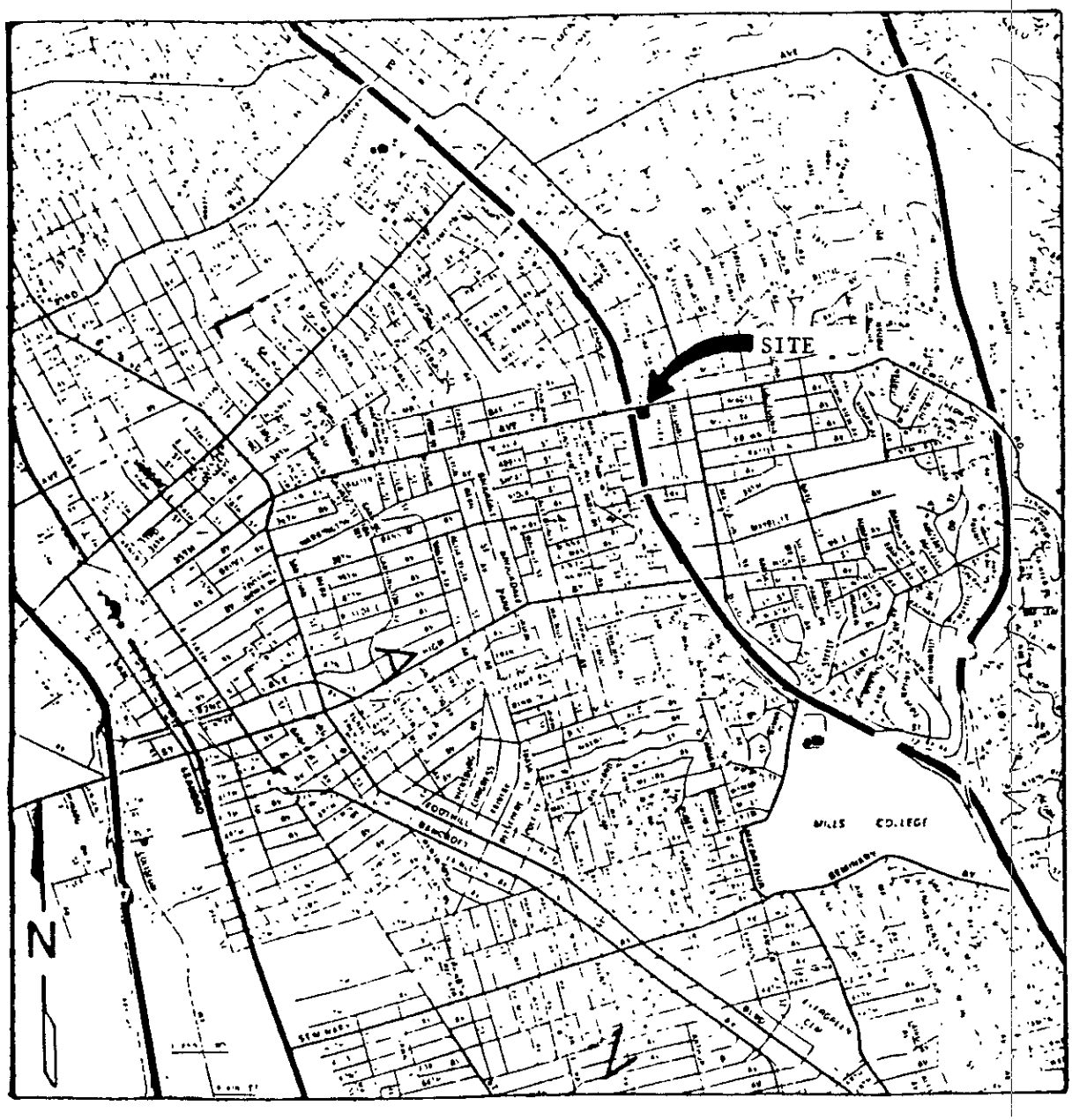

LOCATION MAP

Unocal Service Station #6129
3420 - 35th Avenue
Oakland, California

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Consulting Engineers
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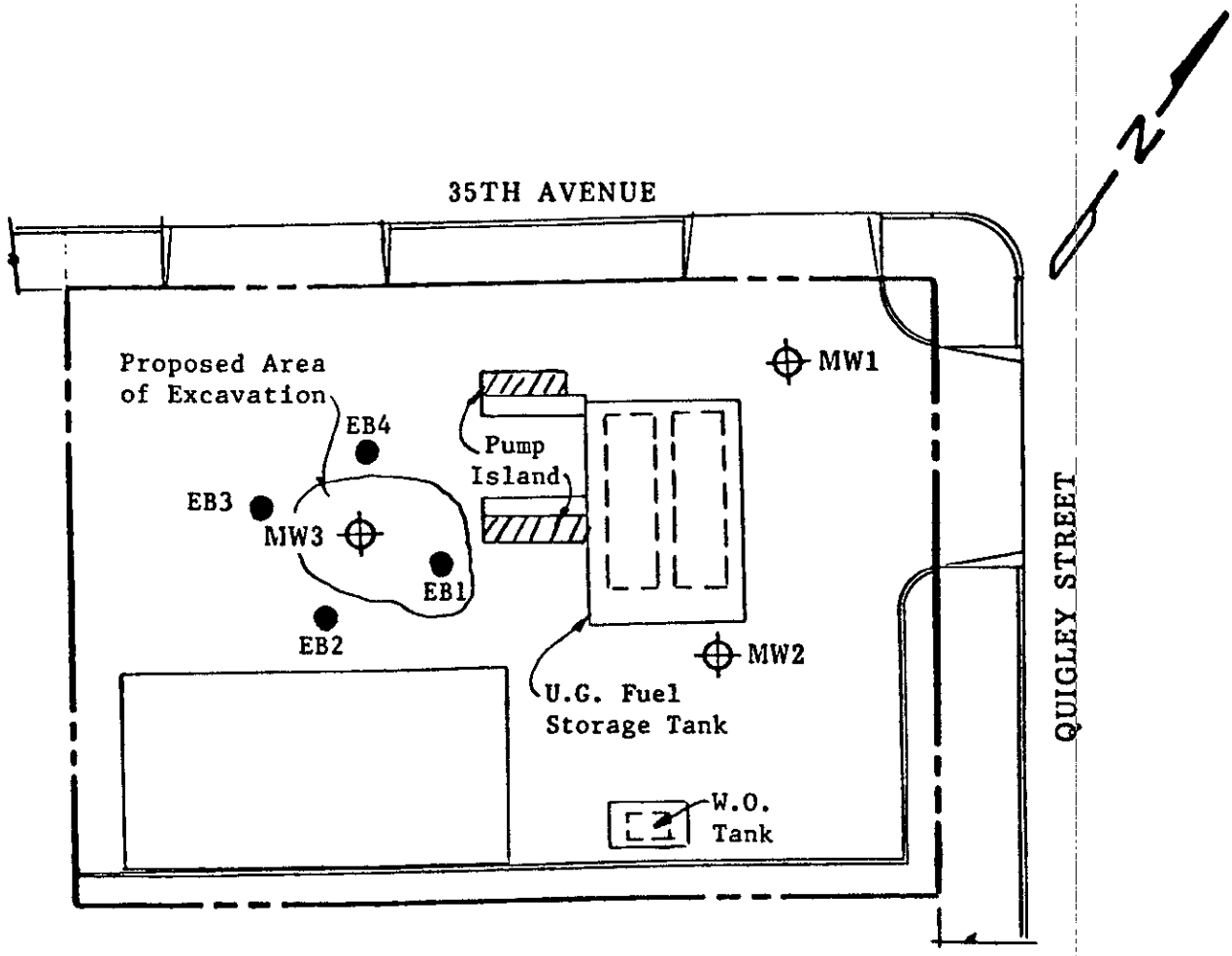

SITE PLAN

LEGEND

- ● Exploratory Boring
- ⊕ Monitoring Well

Unocal Service Station #6129
3420 - 35th Avenue
Oakland, California

BORING LOG

Project No. KEI-P89-0902	**Boring & Casing Diameter** 9" 2"	**Logged By** D.L.
Project Name Unocal Oakland - 35th Ave.	**Well Head Elevation** N/A	**Date Drilled** 3-14-90
Boring No. EB1	**Drilling Method** Hollow-stem Auger	**Drilling Company** EGI

Penetration blows/6"	G. W. level	Depth (ft) Samples	Stratigraphy USCS	Description
		0		Concrete Pavement Clay, sand and gravel: imported fill and disturbed native material, gravel to 4" diameter, dark yellowish brown, dark olive gray below 2 feet.
8/14/10		5	CL/ CH	Clay, with sand, trace silt, stiff, moist, olive brown.
			GC	Clayey gravel with sand, gravel to >2" diameter, very dense, moist, dark yellowish brown.
8/27/28		10		
		15		
		20		TOTAL DEPTH DRILLED: 9' TOTAL DEPTH SAMPLED: 10.5'

BORING LOG

Project No. KEI-P89-0902	Boring & Casing Diameter 9" 2"	Logged By D.L.
Project Name Unocal Oakland - 35th Ave.	Well Head Elevation N/A	Date Drilled 3-14-90
Boring No. EB2	Drilling Method Hollow-stem Auger	Drilling Company EGI

Penetration blows/6"	G. W. level	Depth (ft) Samples	Stratigraphy USCS	Description
		0		Concrete Pavement Sand: fill.
				Clay, sand and gravel: imported fill and disturbed native material, olive brown and olive gray.
14/12/7		5		Very poor recovery Fill: clay, sand and gravel, olive, wet (perched water?).
7/20/26			GC	Clayey gravel with sand, gravel to 1" diameter, dense, moist, dark yellowish brown.
16/19/25		10		
		15		
		20		TOTAL DEPTH DRILLED: 9.5' TOTAL DEPTH SAMPLED: 11'

BORING LOG

Project No.	Boring & Casing Diameter	Logged By
KEI-P89-0902	9" 2"	D.L.
Project Name Unocal Oakland - 35th Ave.	**Well Head Elevation** N/A	**Date Drilled** 3-14-90
Boring No. EB3	**Drilling Method** Hollow-stem Auger	**Drilling Company** EGI

Penetration blows/6"	G. W. level	Depth (ft) Samples	Stratigraphy USCS	Description
		0		A. C. Pavement
				Clay, sand, and gravel: imported fill and disturbed native material, dark yellowish brown grading to olive brown.
7/10/19		5		Poor sample recovery at 5 feet. Perched water, discoloration.
				Approximate base of fill.
			GC	Clayey gravel with sand, gravel to 1" diameter, very dense, moist, dark yellowish brown.
17/26/23		10		
		15		
		20		TOTAL DEPTH DRILLED: 9' TOTAL DEPTH SAMPLED: 10.5'

BORING LOG

Project No. KEI-P89-0902	**Boring & Casing Diameter** 9" 2"	**Logged By** D.L.
Project Name Unocal Oakland - 35th Ave.	**Well Head Elevation** N/A	**Date Drilled** 3-14-90
Boring No. EB4	**Drilling Method** Hollow-stem Auger	**Drilling Company** EGI

Penetration blows/6"	G. W. level	Depth (ft) Samples	Stratigraphy USCS	Description
		0		A. C. Pavement Clay, sand and gravel: fill and disturbed native material, dark yellowish brown.
9/14/22		5	GC	Clayey gravel with sand, gravel to >2" diameter, very dense, moist, dark yellowish brown.
12/28/30		10		
		15		
		20		TOTAL DEPTH DRILLED: 9' TOTAL DEPTH SAMPLED: 10.5'

SEQUOIA ANALYTICAL

680 Chesapeake Drive • Redwood City, CA 94063
(415) 364-9600 • FAX (415) 364-9233

Kaprealian Engineering, Inc.	Client Project ID:	Unocal, Oakland, 35th/Quigley	Sampled:	Mar 14, 1990
P.O. Box 996	Matrix Descript:	Soil	Received:	Mar 15, 1990
Benicia, CA 94510	Analysis Method:	EPA 5030/8015/8020	Analyzed:	Mar 28, 1990
Attention: Mardo Kapreallan, P.E.	First Sample #:	003-2245	Reported:	Mar 29, 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)
003-2245	EB1 (5)	1,100	1.8	2.5	10	7.0
003-2246	EB1 (10)	N.D.	0.0050	0.034	N.D.	N.D.
003-2247	EB2 (8)	N.D.	N.D.	0.080	N.D.	N.D.
003-2248	EB2 (10)	N.D.	N.D.	0.070	N.D.	N.D.
003-2249	EB3 (5)	58	N.D.	0.068	0.090	0.31
003-2250	EB3 (10)	3.0	0.12	0.036	N.D.	0.0072
003-2251	EB4 (5)	N.D.	0.010	0.060	0.013	0.024
003-2252	EB4 (10)	N.D.	N.D.	0.055	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
Project Manager

KAPREALIAN ENGINEERING, INC.

CHAIN OF CUSTODY

SAMPLER: [signature]

WITNESSING AGENCY:

SITE NAME & ADDRESS: UNOCAL/OAKLAND
35TH AVE AND GUIGLEY ST.

ANALYSES REQUESTED: TPH-D, TPH-G

TURN AROUND TIME: REGULAR

SAMPLE ID NO.	DATE	TIME	SOIL	WATER	GRAB	COMP	NO. OF CONT.	SAMPLING LOCATION	TPH-D	TPH-G	REMARKS
EB1-(5)	3-14-90		X		X		1	SEE SAMPLE ID NO.	X	X	0032245
EB1-(10)	3-14-90		X		X		1		X	X	0032246
EB2-(5)	3-14-90		X		X		1		X	X	HOLD
EB2-(8)	3-14-90		X		X		1		X	X	0032247
EB2-(10)	3-14-90		X		X		1		X	X	0032248
EB3-(5)	3-14-90		X		X		1		X	X	0032249
EB3-(10)	3-14-90		X		X		1		X	X	0032250
EB4-(5)	3-14-90		X		X		1		X	X	0032251
EB4-(10)	3-14-90		X		X		1		X	X	0032252

Relinquished by: (Signature)	Date/Time	Received by: (Signature)
[signature] (KEI)	3-15-90 8:20 AM	T. Bolan
[signature]	3/15/90 10:20 AM	[signature]
Relinquished by: (Signature)	Date/Time	Received by: (Signature)
[illegible]quished 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? NO
4. Were samples in appropriate containers and properly packaged? Yes

[signature] — Signature — Title — Date 3/15/90