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

91 JAN 14 PM 3:04

January 10, 1991

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

Attention: ~~Mr. Gil Wistar~~ RA

RE: Unocal Service Station #5366
7375 Amador Valley Blvd.
Dublin, California

Dear Mr. Wistar:

Per the request of Mr. Ron Bock of Unocal Corporation, enclosed please find our report dated December 20, 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

existing file

cc: Ron Bock, Unocal Corporation

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KEI-P88-0205.QR10
December 20, 1990

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

Attention: Mr. Ron Bock

RE: Quarterly Report
Unocal Service Station #5366
7375 Amador Valley Blvd.
Dublin, California

Dear Mr. Bock:

This report presents the results of the most recent quarter of monitoring and sampling of the monitoring wells at the referenced site by Kaprealian Engineering, Inc. (KEI), per KEI's report KEI-P88-0205.QR3 dated February 15, 1989. The wells are currently being monitored monthly, and only downgradient well MW1 is being sampled on a quarterly basis. This report covers the work performed by KEI from September through November, 1990.

BACKGROUND

The subject site is presently used as a gasoline station. The site is located near the center of the southeast end of San Ramon Valley. A Location Map and Site Plans are attached to this report.

KEI's work at the site began February 18, 1988, and consisted of soil sampling following the removal of three underground fuel storage tanks. The tanks consisted of one 10,000 gallon unleaded fuel tank, one 10,000 gallon super unleaded fuel tank, and one 10,000 gallon diesel fuel tank. The tanks were made of steel and had various sized holes at the bottom of the tanks, ranging from a quarter-inch to one-inch in diameter. Ground water was encountered in the tank pit at a depth of 10.5 feet, thus prohibiting the collection of soil samples from beneath the tanks. Six soil samples were collected from the sidewalls of the fuel tank pit. The soil sample collection points are shown on the attached Site Plan, Figure 2. The fuel tank pit was then excavated to a depth of approximately 13 feet below grade. After pumping 9,000 gallons of water from the tank pit, one ground water sample, designated as W1,

was collected. In addition, a second water sample, labeled W2, was collected from a second excavation where the new tanks were installed. Samples were analyzed at HAZCAT Mobile Organics Laboratory in San Carlos, California, a state-certified hazardous waste testing laboratory. The analytical results for soil samples S2, S3 and S4 showed levels of total petroleum hydrocarbons (TPH) as gasoline of 14 ppm, 14 ppm and 1,700 ppm, respectively. The analytical results of the water samples showed 91,000 ppb of TPH as gasoline and 8,200 ppb of benzene in sample W1, and 120 ppb of TPH as gasoline, and a non-detectable level of benzene in sample W2. Analytical results of the soil and water samples are listed in Table 3. Documentation of sample collection and sample results are presented in KEI's report (KEI-J88-025) dated February 25, 1988. Based on the analytical results, KEI recommended the installation of four monitoring wells to begin to determine the extent of the soil and ground water contamination, and to determine the direction of ground water flow.

The four wells, designated as MW1 through MW4, were installed on April 14, 1988. The wells were drilled and completed to a total depth of 20 feet. Ground water was encountered at depths ranging from 14 to 16 feet beneath the surface during drilling. A total of six soil samples were taken at depths ranging from 5 to 10 feet. The soil sample results showed low to non-detectable levels of TPH as gasoline and benzene, toluene, xylenes and ethylbenzene (BTX&E) in all wells except well MW1, which showed a TPH as gasoline level at 340 ppm in the soil sample collected at a depth of 10 feet. Analytical results of the soil samples are summarized in Table 4.

The analytical results of the water samples, initially collected on April 29, 1988, indicated non-detectable levels of TPH as gasoline and benzene in wells MW3 and MW4. Analyses of the water samples from wells MW1 and MW2 showed TPH as gasoline at levels of 10,000 ppb and 170 ppb, respectively, with benzene levels at 960 ppb and 2.7 ppb, respectively. Analytical results of the water samples are summarized in Table 2. Documentation of monitoring well installation, sampling and sample results are presented in KEI's report (KEI-J88-025A-1) dated May 11, 1988. Based on the sample results, KEI recommended a monthly monitoring and quarterly sampling program of the four wells. The four wells have been monitored monthly since April 29, 1988. In addition, all four wells were sampled quarterly from April 29, 1988 until May 18, 1990. Since that time, wells MW2, MW3 and MW4 have not been sampled at the request of Unocal Corporation because samples collected from these wells indicated non-detectable levels of TPH as gasoline and benzene for three consecutive quarters. Beginning on August 15, 1990, only well MW1 has been sampled quarterly.

FIELD ACTIVITIES

The four wells (MW1, MW2, MW3 and MW4) were monitored three times during the quarter. During monitoring, the wells were checked for depth to water and presence of free product and sheen. No free product or sheen was noted in any of the wells during the quarter. Monitoring data are summarized in Table 1.

A water sample was collected from MW1 on November 14, 1990. Prior to sampling, the well was purged of 55 gallons using a surface pump. A sample was then collected using a clean Teflon bailer. The sample was decanted into clean VOA vials and/or one liter amber bottles as appropriate which were sealed with Teflon-lined screw caps and stored in a cooler on ice until delivery to the state certified laboratory.

HYDROLOGY AND GEOLOGY

The site is situated within the Dublin Subbasin of the Livermore Valley Ground Water Basin, as defined by the Alameda County Flood Control and Water Conservation District and the California Department of Water Resources Bulletin 118-2. Regionally, the ground water flow direction is toward the southeast. Based on the water level data gathered during the quarter, ground water flow direction appeared to be to the east-northeast on November 14, 1990, relatively unchanged from the previous quarter, with an approximate hydraulic gradient of .0065. Water levels have fluctuated during the quarter, showing a net decrease in all wells of 0.23 to 0.27 feet. The measured depth to ground water at the site on November 14, 1990 ranged between 11.46 to 11.83 feet.

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 at a mapped geologic contact separating Holocene-age Fine-grained Alluvium (Qhaf) and Late-Pleistocene Alluvium (Qpa). The Fine-grained Alluvium is described as typically consisting of unconsolidated silt and clay materials rich in organic material and is generally less than 10 feet thick. The Late-Pleistocene Alluvium is described as typically consisting of irregular interbedded clay, silt, sand and gravel, which has a maximum thickness up to 150 feet.

The results of our previous subsurface study indicate that the site is apparently underlain predominantly by clay and silty clay soil materials to the maximum depth explored (20 feet), which locally contain a trace of gravel.

ANALYTICAL RESULTS

The ground water sample was analyzed at Sequoia Analytical Laboratory in Concord, California, and was accompanied by properly executed Chain of Custody documentation. The sample was analyzed for TPH as gasoline using EPA method 5030 in conjunction with modified 8015, and BTX&E using EPA method 8020.

Analytical results of the water sample collected from MW1 indicate a level of TPH as gasoline of 2,000 ppb, and a level of benzene of 110 ppb. Toluene, xylenes, and ethylbenzene levels in MW1 were 0.52 ppb, 16 ppb and 410 ppb, respectively. Results of the ground water analysis is summarized in Table 2. Copies of the analytical results and Chain of Custody documentation are attached to this report.

DISCUSSION AND RECOMMENDATIONS

As previously indicated, past activities at the site have led to the situation where some residual soil contamination is still present in the area between the old tank pit and the southwest side of the pump islands. As much contaminated soil as possible was removed during tank replacement in February, 1988 without tearing down the pump islands.

Three of the four corners at the intersection of Village Parkway and Amador Valley Blvd. have active service stations (BP, Arco, Unocal). The fourth corner (southwest) was previously a Shell Station which has been converted into an oil changing store. During a site visit by KEI, it was determined that several monitoring wells have been installed at the former Shell Station site located south-southeast, and at the BP Station located southeast of the subject site. KEI will review files of the Regional Water Quality Control Board (RWQCB) concerning the above service stations.

Based on the analytical results collected and evaluated to date and no evidence of free product or sheen in any of the wells, KEI recommends the continuation of the current monthly monitoring program of the existing wells per KEI's report (KEI-P88-0205.QR3) dated February 15, 1989. In addition, KEI recommends quarterly sampling of downgradient monitoring well MW1 be continued.

DISTRIBUTION

A copy of this report should be sent to Alameda County Health Care Services, and to the RWQCB, San Francisco Bay Region.

LIMITATIONS

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.

If you have any questions regarding this report, please do not hesitate to call me at (707) 746-6915.

Sincerely,

Kaprealian Engineering, Inc.

Aram B. Kaloustian
Staff Engineer

Don R. Braun
Certified Engineering Geologist

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

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Attachments: Tables 1 through 4
Location Map
Site Plans - Figures 1 & 2
Laboratory Analyses
Chain of Custody documentation

KEI-P88-0205.QR10
December 20, 1990

TABLE 1

SUMMARY OF MONITORING DATA

Date	Well No.	Depth to Water (feet)	Product Thickness	Sheen	Water Bailed (gallons)
11/14/90	MW1	11.46	0	None	53
	MW2	11.66	0	None	0
	MW3	11.83	0	None	0
	MW4	11.77	0	None	0
10/15/90	MW1	11.36	0	None	55
	MW2	11.61	0	None	0
	MW3	11.75	0	None	0
	MW4	11.71	0	None	0
9/13/90	MW1	11.15	0	None	55
	MW2	11.32	0	None	0
	MW3	11.48	0	None	0
	MW4	11.45	0	None	0

KEI-P88-0205.QR10
December 20, 1990

TABLE 2

SUMMARY OF LABORATORY ANALYSES
WATER

Date	Sample Well #	TPH as Gasoline	Benzene	Toluene	Xylenes	Ethylbenzene
11/14/90	MW1	2,000	110	0.52	16	410
8/15/90	MW1	2,200	160	ND	45	570
5/18/90	MW1	2,000	140	1.8	19	460
	MW2	ND	ND	ND	ND	ND
	MW3+	ND	ND	ND	ND	ND
	MW4	ND	ND	ND	ND	ND
2/06/90	MW1	2,700	170	ND	29	350
	MW2	ND	ND	ND	ND	ND
	MW3+	ND	ND	ND	ND	ND
	MW4	ND	ND	ND	ND	ND
10/20/89	MW1	ND	ND	ND	ND	ND
	MW2	ND	ND	ND	ND	ND
	MW3*	ND	ND	ND	ND	0.38
	MW4	ND	ND	ND	ND	ND
7/27/89	MW1	1,900	130	6.3	68	ND
	MW2	ND	ND	ND	ND	ND
	MW3**	ND	ND	ND	ND	ND
	MW4	ND	0.34	ND	ND	ND
5/22/89	MW3	ND	ND	ND	ND	ND
4/28/89	MW1	1,000	97	0.8	24	170
	MW2	ND	ND	ND	ND	ND
	MW3***	880	9.6	9.7	12.7	19
	MW4	ND	0.3	ND	ND	ND
1/26/89	MW1	1,900	240	1.8	30	81
	MW2	ND	ND	ND	ND	ND
	MW3****	ND	ND	ND	ND	ND
	MW4	ND	0.67	ND	ND	ND
10/28/88	MW1	5,200	150	ND	12	250
	MW2	ND	ND	ND	ND	ND
	MW3****	--	ND	ND	ND	ND
	MW4	ND	ND	ND	ND	ND

TABLE 2 (Continued)

SUMMARY OF LABORATORY ANALYSES
WATER

Date	Sample Well #	TPH as Gasoline	Benzene	Toluene	Xylenes	Ethylbenzene
7/25/88	MW1	6,100	170	2.1	94	94
	MW2	ND	ND	ND	ND	ND
	MW3****	--	ND	ND	ND	ND
	MW4	ND	ND	ND	ND	ND
4/29/88	MW1	10,000	960	17	1,500	870
	MW2	170	2.7	0.6	13	ND
	MW3	ND	ND	ND	ND	ND
	MW4	ND	ND	ND	ND	ND

\+ TPH as diesel, EPA method 8010 constituents, and TOG were non-detectable.

* TPH as diesel and EPA method 8010 constituents were non-detectable. TOG showed 2.5 ppm.

** TPH as diesel and EPA method 8010 constituents were non-detectable. TOG showed 1.6 ppm.

*** TPH as diesel was 72 ppb, TOG and EPA method 8010 constituents were non-detectable.

**** TPH as diesel and EPA method 8010 constituents were non-detectable.

ND = Non-detectable.

-- Indicates analysis not performed.

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

KEI-P88-0205.QR10
December 20, 1990

TABLE 3

SUMMARY OF LABORATORY ANALYSES
SOIL

(Collected on February 18, 1988)

Sample #	TPH as Diesel	TPH as Gasoline	Benzene	Toluene	Xylenes	Ethylbenzene
S1	<10	--	--	--	--	--
S2	--	14	0.8	<0.1	2.7	4.6
S2D	<10	--	--	--	--	--
S3	--	14	1.1	<0.1	0.7	7.1
S4	--	1,700	8.0	22	340	62
S4D	83	--	--	--	--	--

-- Indicates analysis not performed.

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

SUMMARY OF LABORATORY ANALYSES
WATER

(Collected on February 19, 1988)

Sample #	TPH as Gasoline	Benzene	Toluene	Xylenes	Ethylbenzene
W1	91,000	8,200	1,200	5,300	4,300
W2	120	<0.5	5.0	12	2.4

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

TABLE 4

SUMMARY OF LABORATORY ANALYSES
SOIL

(Collected on April 14, 1988)

Sample Number	Depth (feet)	TPH as Gasoline	Benzene	Toluene	Xylenes	Ethylbenzene
MW1(10)	10	340	<0.1	<0.1	<0.1	<0.1
MW1(15)	15	11	<0.1	<0.1	<0.1	<0.1
MW2(10)	10	<1.0	<0.1	<0.1	<0.1	<0.1
MW3(5)*	5	<1.0	<0.1	<0.1	<0.1	<0.1
MW3(10)*	10	--	--	--	--	--
MW4(10)	10	4.9	<0.1	<0.1	<0.1	<0.1

* MW3(5) and MW3(10) showed non-detectable levels of TOG and TPH as diesel. MW3(10) had non-detectable levels of 8010 and 8020 priority pollutants.

-- Indicates analysis not performed.

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

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Consulting Engineers
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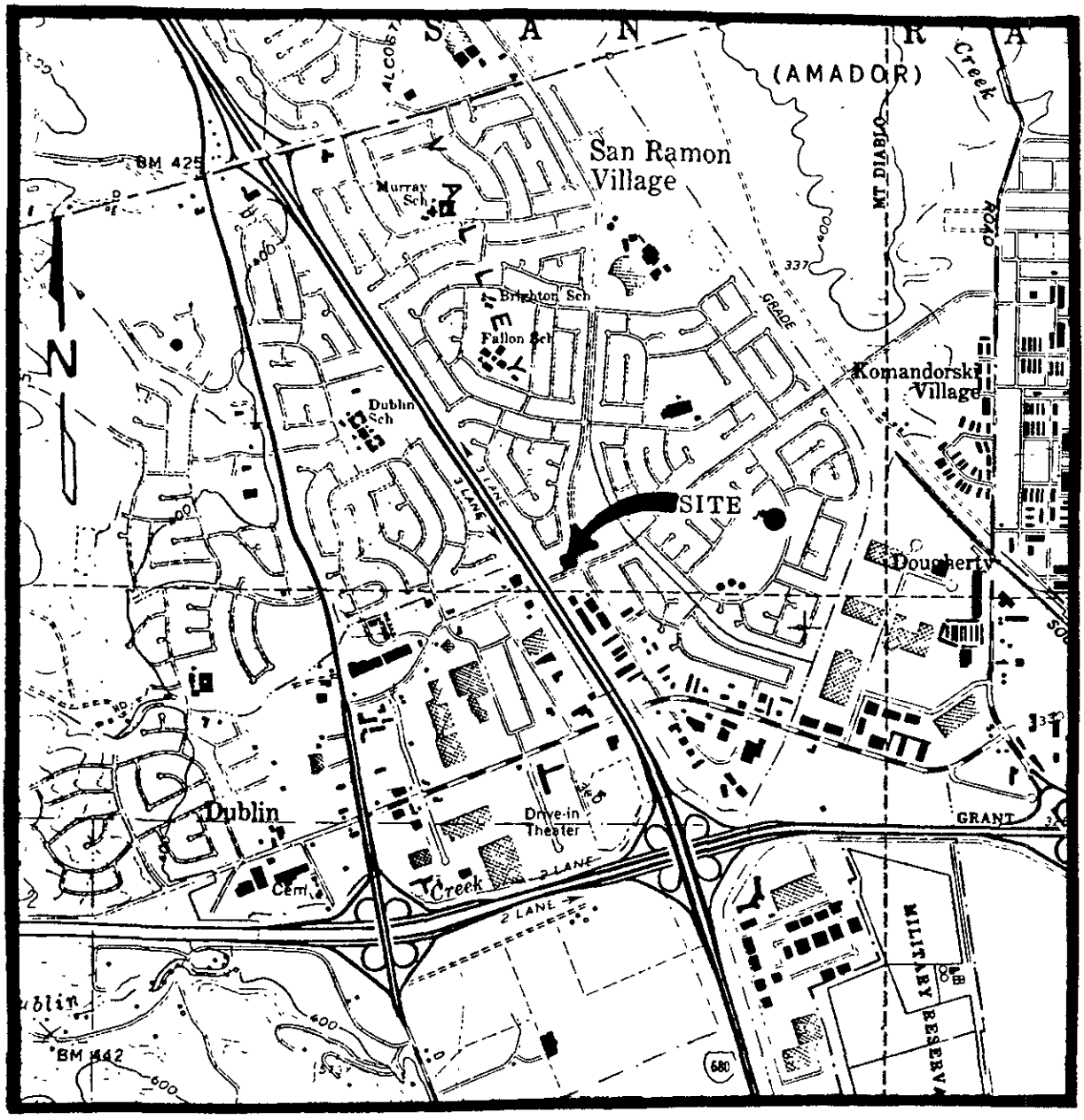

LOCATION MAP

Unocal S/S #5366
7375 Amador Valley Blvd.
Dublin, CA

KAPREALIAN ENGINEERING, INC.
Consulting Engineers
PO. BOX 996 • BENICIA, CA 94510
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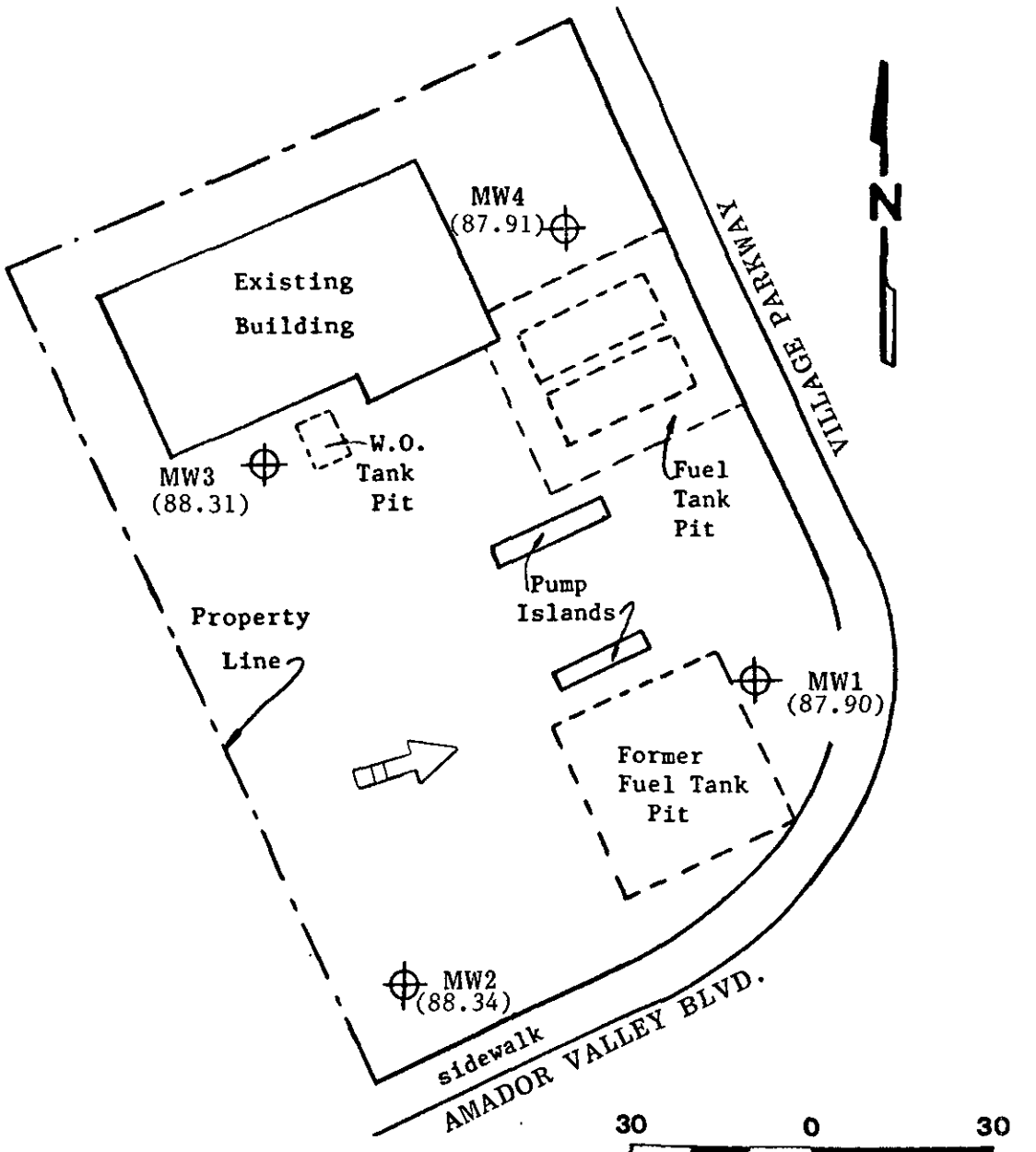

SITE PLAN
Figure 1

LEGEND

⊕ Monitoring Well

( ) Water Table Elevation on 11/14/90. Top of MW2 Well Cover assumed 100.00 feet as datum.

⇨ Ground Water Flow Direction.

Unocal S/S #5366
7375 Amador Valley Boulevard
Dublin, CA

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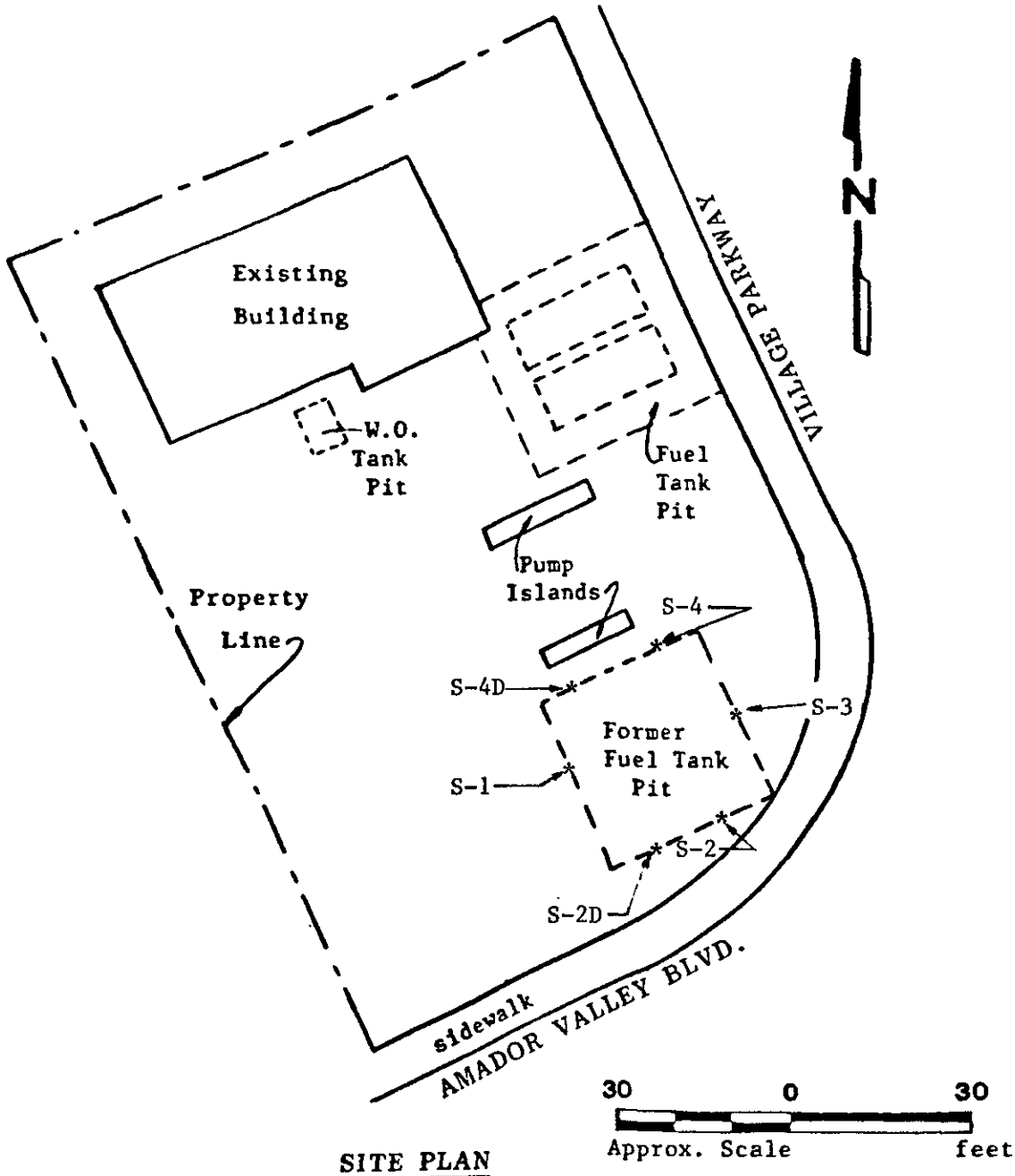

SITE PLAN
Figure 2

LEGEND

* Sample Point Location

Unocal S/S #5366
7375 Amador Valley Blvd.
Dublin, CA

SEQUOIA ANALYTICAL

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

Kaprealian Engineering, Inc.	Client Project ID:	Unocal Dublin	Sampled:	Nov 14, 1990
P.O. Box 996	Sample Descript.:	Water, MW1 7375 Amador Valley Rd.	Received:	Nov 14, 1990
Benicia, CA 94510	Analysis Method:	EPA 5030/ 8015/8020	Analyzed:	Nov 21, 1990
Attention: Mardo Kaprealian, P.E.	Lab Number:	011-0635	Reported:	Nov 26, 1990

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	2,000
Benzene	0.30	110
Toluene	0.30	0.52
Ethyl Benzene	0.30	410
Xylenes	0.30	16

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

KAPREALIAN ENGINEERING, INC.

CHAIN OF CUSTODY

SAMPLER: Ray (KEI)

WITNESSING AGENCY:

SITE NAME & ADDRESS: UNOCAL DUBLIN 7375 AMADOR VALLEY RD

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	11-14			X	X		2VOA		X	X	

Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Ray (KEI)	11-14-90	15:55
	11/14/90 1555	

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 — Signature; Toxon — Title; 11/14/90 — Date