KAPREALIAN ENGINEERING
INCORPORATED

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11/24/92
SDS

May 22, 1992

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

RE: Unocal Service Station #5484
18950 Lake Chabot Road
Castro Valley, California

Gentlemen:

Per the request of Mr. Ron Bock of Unocal Corporation, enclosed please find our report dated April 27, 1992, for the above referenced site.

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

Sincerely,

Kaprealian Engineering, Inc.

Judy A. Dewey

jad\82

Enclosure

cc: Ron Bock, Unocal Corporation

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

KAPREALIAN ENGINEERING
INCORPORATED

KEI-P90-0806.QR3
April 27, 1992

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

Attention: Mr. Ron Bock

RE: Quarterly Report
Unocal Service Station #5484
18950 Lake Chabot Road
Castro Valley, 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 proposal KEI-P90-0806.P1 dated January 9, 1991, and per KEI's report KEI-P90-0806.R2, dated June 27, 1991. The wells are currently monitored monthly and sampled on a quarterly basis, except for wells MW4 and MW6, which are sampled on a semi-annual basis. This report covers the work performed by KEI from January through March 1992.

BACKGROUND

The site is presently used as a Unocal service station. The site is located at the southeast corner at the intersection of Lake Chabot Road and Quail Avenue in Castro Valley, California. The site is situated on gently to moderately sloping, south-southeast trending topography, and is located near the base of moderately steep, southward sloping, hillside areas. In addition, the site is located approximately 600 feet northeast of an unnamed creek, and is situated near the northern boundary of the valley that incorporates Castro Valley. A Location Map, a Site Vicinity Map, and Site Plans are attached to this report.

Previous activities at the site have been conducted by Applied GeoSystems (AGS) of Fremont, California. The activities have included the installation of six monitoring wells and five soil borings, and have also included soil sampling activities related to underground storage tank removal operations. The following discussion of the background data for this site is based on review of the following AGS reports:

1. Quarterly Ground-Water Monitoring for First Quarter 1991, AGS 18061-6, dated April 19, 1991;

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

2. Quarterly Ground-Water Monitoring for First and Second Quarter 1990, AGS 18061-6, dated 7/3/90;

3. Report, Supplemental Subsurface Investigation, Quarterly Ground-Water Monitoring and Evaluation of Soil Remediation Alternatives, AGS 18061-5, dated 7/3/90;

4. Report, Soil Excavation, Aeration, and Sampling Related to Underground Storage Tank Removal, AGS 18061-4, dated 3/30/90;

5. Report, Supplemental Subsurface Environmental Investigation, AGS 18061-3, dated 9/11/89;

6. Letter Report No. 18061-2 regarding quarterly ground water monitoring, dated 1/6/89;

7. Report, Subsurface Environmental Investigation, AGS 18061-1, dated 8/30/88.

As reported by AGS in the above reports, work began on the site when three two-inch diameter monitoring wells (designated as MW1, MW2, and MW3 on the attached Site Plans, Figures 1 and 2) were installed on July 12 and 13, 1988, to depths of 30.5, 19.5, and 20.5 feet below grade, respectively. Ground water was initially encountered at a depth of 8 feet below grade in MW1, and at 20 feet below grade in MW3, but was apparently not encountered during drilling in MW2.

Analytical results of the soil samples collected from the borings for wells MW1 through MW3 showed levels of total petroleum hydrocarbons (TPH) as gasoline ranging from 3 ppm to 79 ppm, with benzene levels ranging from 0.006 ppm to 0.83 ppm. Results of the soil analyses are presented in Table 4.

A well search was conducted by AGS within 1/2-mile radius of the site. Two wells are apparently located approximately 1/2 mile south of the site. One well (State Well No. 3S/2W 4F 1) is a test well located on Betrose Court; the water level is unknown, but the total well depth is 52 feet below grade. The second well (State Well No. 3S/2W 4H 2) is a domestic well located on Lenard Drive with a water level at 36 feet below grade, and a total depth of 220 feet below grade. Both wells are considered downgradient from the subject site.

Apparently, during a site monitoring visit on October 14, 1988, AGS observed a nine-inch thick, brown, floating product in well MW3. Through bailing techniques, the product thickness was reduced to less than 0.01 inches on April 14, 1989, and was not detected on May 19, 1989.

On May 23 and 24, 1989, and June 5, 1989, three four-inch diameter monitoring wells (designated as MW4, MW5, and MW6 on the attached Site Plan, Figure 2) were installed to depths of 24 to 29 feet below grade. Analytical results of the soil samples collected during drilling showed non-detectable levels of TPH as gasoline and benzene, toluene, xylenes, and ethylbenzene (BTX&E) in all samples, except soil sample S-13.5-B5, collected from well MW5 at a depth of 13.5 feet below grade, which showed a TPH as gasoline level of 2.4 ppm. Analytical results of the soil samples are presented in Table 4.

On June 12 through June 16, 1989, two 10,000 gallon (unleaded and super unleaded) underground gasoline storage tanks and one 280 gallon waste oil storage tank were excavated and removed from the site. The fuel tank pit was excavated to a depth of 14.5 feet below grade, and the waste oil tank pit was excavated to a depth of 8 feet below grade. Only a small amount of ground water was reported to be encountered in the fuel tank pit. The condition of the excavated tanks was not noted in the AGS reports.

Between June 21, 1989, and August 1, 1989, further excavation of soil around the former gasoline tank pit and service islands was conducted. Soil was excavated to the east edge of the City sidewalk and to a depth of 15 feet below grade.

The highest concentrations of TPH as gasoline encountered in the soil samples collected after tank removal (up to 4,300 ppm) were detected in samples from the southwest corner of the tank pit. Composite soil samples from the floor and sidewalls of the final excavation apparently indicated TPH as gasoline concentrations of less than the detection limits, while discreet soil samples are reported to contain 8.9 ppm or less of TPH as gasoline. Analytical results of two soil samples collected from the waste oil tank pit at depths of 8 feet below grade indicated 480 ppm and 87 ppm of TPH as gasoline, and 1,300 ppm and 1,800 ppm of total oil and grease (TOG). Analytical results of all soil samples collected from the tank pit excavations are presented as Table 5, and location of soil sample points are presented on the attached Site Plans, Figures 3, 4, and 5. The final depth of the excavation pit, as determined by AGS, is presented as Figure 6.

On June 19, 1989, two new 12,000 gallon fiberglass-coated double wall steel fuel tanks, and a new 520 gallon fiberglass-coated

double wall steel waste oil tank, were placed at the north side of the station building, at the locations identified on the attached Site Plan, Figure 7. Monitoring wells MW1 and MW3 are reported to have been destroyed and removed during the soil excavation activities.

Five soil borings (designated as B7 through B11 on the attached Site Plan, Figure 7) were drilled at the site on November 17 and 18, 1989, for further evaluation of the lateral and vertical extent of soil contamination at the southwestern and southern portions of the site. The borings were drilled to depths ranging from 15.5 to 20.5 feet below grade. The borings were left open until November 22, 1989, and the water levels in the borings reportedly ranged between 6.48 to 12.65 feet below grade. Soil samples collected from depths ranging from 4 to 19.5 feet below grade were analyzed at a laboratory. Analytical results of the soil samples collected from depths of 10 feet below grade showed levels of TPH as gasoline ranging from 6.1 ppm to 220 ppm. In addition, analytical results of the soil samples collected from depths at and below 15 feet below grade showed levels of TPH as gasoline ranging from 3.4 ppm to 66 ppm. The analytical results are presented in Table 6.

The analytical results of all ground water samples previously collected from the monitoring wells by AGS (from July 1988 through February 1991) are presented in Table 2a.

On May 7, 1991, one two-inch diameter monitoring well and one exploratory boring (designated as MW7 and EB1, respectively, on the attached Site Plan, Figure 2) were installed at the site by KEI. The monitoring well was drilled and completed to a total depth of 19.8 feet below grade, while the exploratory boring was drilled to a total depth of 7 feet below grade. Ground water was not encountered within boring EB1 and is estimated to have been initially encountered in well MW7 at a depth of about 17 feet below grade (but was measured approximately four hours after completion of the drilling activities at a depth of about 13.25 feet below grade in MW7). Ground water did not rapidly enter the borehole for MW7 during drilling, and therefore a precise depth to initial ground water cannot be provided. Well MW7 was developed on May 15, 1991, and wells MW2 and MW4 through MW7 were sampled on May 23, 1991.

Water samples collected from monitoring wells MW2 and MW4 through MW7, and selected soil samples collected from EB1 and MW7, were analyzed at Sequoia Analytical Laboratory in Concord, California. Soil and water samples were analyzed for TPH as gasoline and BTX&E. In addition, soil and water samples collected from MW7 (adjacent to the waste oil tank) were analyzed for TPH as diesel, TOG, and EPA method 8010 constituents.

Analytical results of the soil samples collected from the boring for monitoring well MW7 and from boring EB1 indicated levels of TPH as gasoline ranging from non-detectable to 130 ppm, with benzene levels ranging from non-detectable to 0.51 ppm. In MW7, levels of TPH as diesel ranged from non-detectable to 9.1 ppm, and TOG and all EPA method 8010 constituents were all non-detectable.

Analytical results of the ground water samples collected from monitoring wells MW2 through MW6 indicated non-detectable levels of TPH as gasoline and BTX&E. In MW7, TPH as gasoline was 3,000 ppb, benzene was 160 ppb, TPH as diesel was 540 ppb, while TOG and all EPA method 8010 constituents were non-detectable, except for 3.4 ppb of 1,2-dichloroethane. Results of the soil analyses are summarized in Table 3, and results of the water analyses are summarized in Table 2.

Documentation of well installation protocol, sample collection techniques, and analytical results are presented in KEI's report (KEI-P90-0806.R2) dated June 27, 1991. Based on the analytical results, KEI recommended the implementation of a modified monitoring and sampling program. All wells were recommended to be monitored monthly, wells MW2, MW5, and MW7 were recommended for quarterly sampling, and wells MW4 and MW6 were recommended for bi-annual sampling.

RECENT FIELD ACTIVITIES

The five wells (MW2, MW4, MW5, MW6, and MW7) were monitored three times during the quarter. Wells MW2, MW5, and MW7 were sampled once during the quarter. Wells MW4 and MW6 are sampled semi-annually and were thus not sampled during the quarter. During monitoring, the wells were checked for depth to water and the presence of free product. Additionally, during sampling, the wells were checked for the presence of sheen. **No free product or sheen was noted in any of the wells during the quarter.** Monitoring data are summarized in **Table 1.**

Water samples were collected from wells MW2, MW5, and MW7 on March 20, 1992. Prior to sampling, the wells were each purged of between 8.5 and 47 gallons by the use of a bailer. Samples were then collected by the use of a clean Teflon bailer. Samples were decanted into clean VOA vials and/or one-liter amber bottles, as appropriate, which were then sealed with Teflon-lined screw caps and stored in a cooler, on ice, until delivered to the state-certified laboratory.

HYDROLOGY AND GEOLOGY

Based on water level data gathered on March 20, 1992, the ground water flow direction appeared to be toward the south-southwest, with a hydraulic gradient varying from approximately 0.077 to 0.131, which is virtually unchanged from the flow directions and gradients recorded since May 23, 1991. Water levels have fluctuated during the quarter, showing a net increase of between 3.07 and 4.17 feet in all wells since December 19, 1991. The measured depth to ground water at the site on March 20, 1992, ranged between 4.70 and 7.81 feet below grade.

Based on review of regional geologic maps (U.S. Geological Survey Open File Report 80-540 "Preliminary Geologic Map of the Hayward Quadrangle, Alameda and Contra Costa Counties, California" by Thomas W. Dibblee, Jr., 1980), the subject site is underlain directly by Quaternary alluvium. However, the site is situated closely adjacent to a geologic contact separating the alluvium materials from bedrock materials of the Upper Cretaceous marine Panoche formation (Kp). The Panoche Formation is described as typically consisting of gray clayey shale, with minor thin sandstone beds. Structurally, the Panoche Formation strikes northwesterly and locally dips toward the northeast. Also, the site is located approximately 1,600 feet northeast of the mapped trace of the East Chabot Fault, and approximately 1.2 miles northeast of the mapped trace of the active Hayward Fault.

A review of boring logs prepared by AGS for wells MW1 through MW6, and borings B7 through B11, indicate that mudstone, siltstone, and shale bedrock materials underlie the site at relatively shallow depths (varying from approximately 3 to 12 feet below grade).

The ground water flow direction at the site, as previously determined by AGS, has apparently remained reasonably consistent from July 1988 through May 1990, and has been reported to be toward the southwest and south-southwest.

The results of our subsurface study indicate that the site is underlain by silt and/or clay soil materials to depths below grade of about 3 feet at EB1, and 4 feet at MW7. These soil materials are inturn underlain by bedrock materials that consist of highly sheared shale and that are generally moderately to highly weathered. It is unclear where ground water was encountered during drilling of MW7, but it may be in the range of about 17 feet below grade. However, about four hours after completion of the drilling, ground water was measured at about 13-1/4 feet below grade in the well, and eventually stabilized at 9.63 feet below grade on May 23, 1991.

ANALYTICAL RESULTS

Ground water samples were analyzed at Sequoia Analytical Laboratory in Concord, California, and were accompanied by properly executed Chain of Custody documentation. The 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, the ground water samples collected from monitoring wells MW5 and MW7 were analyzed for TPH as diesel by EPA method 3510 in conjunction with modified 8015.** Well MW7 was also analyzed for TOG by Standard Method 5520B&F, and for EPA method 8010 constituents. As previously stated, wells MW4 and MW6 were not sampled during the quarter.

Analytical results of the ground water samples collected from monitoring well MW5 on March 20, 1992, indicated non-detectable levels of TPH as gasoline and BTX&E. **Analytical results of ground water samples collected from wells MW2 and MW7 indicated concentrations of TPH as gasoline of 120 ppb and 11,000 ppb, respectively.** Benzene was non-detectable in well MW2, but was detected in well MW7 at a level of 980 ppb. **TPH as diesel was detected in wells MW5 and MW7 at concentrations of 170 ppb and 3,200 ppb, respectively.** In monitoring well MW7, TOG and all EPA method 8010 constituents were non-detectable. Results of the analyses are summarized in Table 2. Copies of the analytical results and Chain of Custody documentation are attached to this report.

DISCUSSION AND RECOMMENDATIONS

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 monitoring and sampling **program of the existing wells, per KEI's proposal (KEI-P90-0806.P1) dated January 9, 1991, and as modified in KEI's report (KEI-P90-0806.R2) dated June 27, 1991.**

DISTRIBUTION

A copy of this report should be sent to the Alameda County Health Care Services Agency, 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 do not hesitate to call me at (510) 602-5100.

Sincerely,

Kaprealian Engineering, Inc.

Thomas J. Berkins
Senior Environmental Engineer

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

License No. 1633
Exp. Date 6/30/92

Timothy R. Ross
Project Manager

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Attachments: Tables 1, 2, 2a, 3, 4, 5 & 6
Location Map
Site Vicinity Map - Figure 1
Site Plans - Figures 2 through 7
Laboratory Results
Chain of Custody documentation

KEI-P90-0806.QR3
April 27, 1992

TABLE 1

SUMMARY OF MONITORING DATA

Well No.	Ground Water Elevation (feet)	Depth to Water (feet)	Product Thickness	Sheen	Water Purged (gallons)
(Monitored and Sampled on March 20, 1992)					
MW2	224.77	4.70	0	No	10.5
MW4*	220.62	7.46	0	No	35
MW5	217.61	7.81	0	No	37
MW6*	232.95	6.43	0	No	47
MW7	224.16	7.50	0	No	8.5
(Monitored on February 20, 1992)					
MW2	223.67	5.80	0	--	0
MW4	220.63	7.45	0	--	0
MW5	216.88	8.54	0	--	0
MW6	232.22	7.16	0	--	0
MW7	223.02	8.64	0	--	17
(Monitored on January 20, 1992)					
MW2	221.87	7.60	0	--	0
MW4	217.96	10.12	0	--	0
MW5	215.03	10.39	0	--	0
MW6	230.97	8.41	0	--	0
MW7	220.86	10.80	0	--	0

Well	Well Cover Elevation** (feet)
MW2	229.47
MW4	228.08
MW5	225.42
MW6	239.38
MW7	231.66

* Monitored only.

** Elevations of the tops of the well covers have been surveyed relative to Mean Sea Level.

-- Sheen determination was not performed.

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TABLE 2

SUMMARY OF LABORATORY ANALYSES
WATER

Date	Sample Number	TPH as Diesel	TPH as Gasoline	Benzene	Toluene	Xylenes	Ethylbenzene
3/20/92	MW2	--	120	ND	ND	ND	ND
	MW4		SAMPLED ON A SEMI-ANNUAL BASIS				
	MW5	170	ND	ND	ND	ND	ND
	MW6		SAMPLED ON A SEMI-ANNUAL BASIS				
	MW7*	3,200	11,000	980	ND	1,600	990
12/19/91	MW2	--	140	0.66	ND	1.2	0.64
	MW4	--	ND	ND	ND	ND	ND
	MW5	--	ND	ND	ND	ND	ND
	MW6	--	ND	ND	ND	ND	ND
	MW7**	770	3,900	240	2.4	270	280
10/10/91	MW5	ND	--	--	--	--	--
9/20/91	MW2	--	ND	ND	ND	ND	ND
	MW5	450	ND	ND	ND	ND	ND
	MW7*	580	1,400	160	0.75	130	89
5/23/91	MW2	--	ND	ND	ND	ND	ND
	MW4	--	ND	ND	ND	ND	ND
	MW5	--	ND	ND	ND	ND	ND
	MW6	--	ND	ND	ND	ND	ND
	MW7***	540	3,000	160	1.2	120	25
Detection Limits		50	30	0.30	0.30	0.30	0.30

-- Indicates analysis was not performed.

ND = Non-detectable.

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

** TOG and all EPA method 8010 constituents were non-detectable, except for 3.1 ppb of 1,2-dichloroethane.

*** TOG and all EPA method 8010 constituents were non-detectable, except for 3.4 ppb of 1,2-dichloroethane.

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

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TABLE 2a

WATER - MONITORING WELLS

(Data derived from AGS Report 18061-6, dated 4/19/91)

Sample	TPH as Gasoline	Benzene	Toluene	Xylenes	Ethylbenzene
		(Collected in February 1991)			
MW2	280	2.6	<0.50	0.9	0.7
		(Collected in November 1990)			
MW2*	190	1.6	<0.50	0.8	0.7
MW4	<20	<0.50	<0.50	<0.50	<0.50
MW5*	<20	<0.50	<0.50	<0.50	<0.50
MW6	<20	<0.50	<0.50	<0.50	<0.50
		(Collected in August 1990)			
MW2*	630	13	1.0	10	7.2
MW4	<20	<0.50	<0.50	<0.50	<0.50
MW5*	<20	<0.50	<0.50	<0.50	<0.50
MW6	<20	<0.50	<0.50	<0.50	<0.50
		(Collected in May 1990)			
MW2	1,100	9.7	0.95	48	14
MW4	<20	<0.50	<0.50	<0.50	<0.50
MW5	<20	<0.50	<0.50	<0.50	<0.50
MW6	<20	<0.50	<0.50	<0.50	<0.50
		(Collected in March 1990)			
MW2*	420	5.0	<0.50	17	3.0
MW4	<20	<0.50	<0.50	<0.50	<0.50
MW5*	<20	<0.50	<0.50	<0.50	<0.50
MW6	<20	<0.50	<0.50	<0.50	<0.50
		(Collected in November 1989)			
MW2*	720	1.4	1.4	34	5.9
MW4	<20	<0.50	<0.50	<0.50	<0.50
MW5*	<20	<0.50	<0.50	0.63	<0.50
MW6	<20	<0.50	<0.50	<0.50	<0.50

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TABLE 2a (Continued)

WATER - MONITORING WELLS

(Data derived from AGS Report 18061-6, dated 4/19/91)

Sample	TPH as Gasoline	Benzene	Toluene	Xylenes	Ethylbenzene
		(Collected in August 1989)			
MW6	26	<0.50	<0.50	<0.50	<0.50
		(Collected in June 1989)			
MW1	WELL DESTROYED DURING TANK EXCAVATION				
MW2	550	2.7	1.9	34	10
MW3	WELL DESTROYED DURING TANK EXCAVATION				
MW4	<20	<0.50	<0.50	<0.50	<0.50
MW5	<20	0.83	<0.50	0.94	0.57
		(Collected in January 1989)			
MW1	410	6.5	10.4	44.2	11.8
MW2	4,040	103	673	527	78
MW3	WELL NOT SAMPLED - FLOATING PRODUCT				
		(Collected in October 1988)			
MW1	1,420	13.2	4.1	58.1	163.8
MW2	1,140	80	10	26.0	25
MW3	WELL NOT SAMPLED - FLOATING PRODUCT				
		(Collected in July 1988)			
MW1	540	6.1	82.7	180.3	35.6
MW2	1,080	72	139	157.0	33
MW3	7,800	385	640	2,258	369

< = Less than the reported limit of detection for the method of analysis used.

* TOG and all EPA method 601 or 624 compounds were non-detectable.

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

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TABLE 3

SUMMARY OF LABORATORY ANALYSES
SOIL

Date	Sample Number	Depth (feet)	TPH as Diesel	TPH as Gasoline	Benzene	Toluene	Xylenes	Ethyl-benzene
5/7/91	EB1(3)	3.0	--	1.8	ND	0.0066	0.12	0.050
	EB1(6.5)	6.5	--	33	0.16	0.13	3.6	0.73
	MW7(4.5)*	4.5	ND	ND	ND	0.013	0.013	ND
	MW7(10)*	10.0	3.1	19	0.048	0.0086	1.6	0.50
	MW7(13)*	13.0	9.1	130	0.51	0.25	2.5	1.9
Detection Limits			1.0	1.0	0.0050	0.0050	0.0050	0.0050

-- Indicates analysis not performed.

ND = Non-detectable.

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

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

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TABLE 4

SOIL SAMPLES

(Data obtained from AGS Report 18061-1, dated 8/3/88 for MW1, MW2 and MW3, collected on 7/12-13/88)

Sample #	Depth (feet)	TPH as Gasoline	Benzene	Toluene	Xylenes	Ethyl-benzene
S-15-B1	15	3	0.06	0.56	1.21	0.24
S-5-B2	5	12	0.16	0.92	3.58	0.66
S-5-B3	5	79	0.83	6.63	26.12	3.81

(Data obtained from AGS Report 18061-3, dated 9/11/89 for MW4, MW5 and MW6, collected on 5/23-24/89 and 6/5/89)

Sample #	Depth (feet)	TPH as Gasoline	Benzene	Toluene	Xylenes	Ethyl-benzene
S-8.5-B4	8.5	<2.0	<0.050	<0.050	<0.050	<0.050
S-13.5-B4	13.5	<2.0	<0.050	<0.050	<0.050	<0.050
S-8.5-B5	8.5	<2.0	<0.050	<0.050	<0.050	<0.050
S-13.5-B5	13.5	2.4	<0.050	<0.050	<0.050	<0.050
S-8.5-B6	8.5	<2.0	<0.050	<0.050	<0.050	<0.050
S-13.5-B6	13.5	<2.0	<0.050	<0.050	<0.050	<0.050

NOTE: B1 in sample designation refers to MW1, etc.

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

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TABLE 5

SOIL SAMPLES - TANK PIT EXCAVATION

(Data obtained from AGS Report 18061-4, dated March 30, 1990)

Sample #	Depth (feet)	TPH as Gasoline	Benzene	Toluene	Xylenes	Ethyl-benzene	TOG
S-6-T1a	6	2,100	13	110	230	37	--
S-6-T1b	6	1,800	5.6	89	210	35	--
S-6-T2a	6	4,300	12	150	350	57	--
S-6-T2b	6	1,400	9.7	100	270	47	--
S-6-T2S	6	1,800	4.2	48	240	39	--
S-15-Tb1	15	<2.0	<0.050	0.056	0.15	<0.050	--
S-14-Tb2	14	<2.0	<0.050	<0.050	<0.050	<0.050	--
S-14-Tb3	14	<2.0	<0.050	<0.050	<0.050	<0.050	--
S-15-Tb4	15	8.9	<0.050	0.27	0.88	0.13	--
S-12-WF	12(?)	<2.0	<0.050	<0.050	<0.050	<0.050	--
S-0728-1A	*	<2.0	<0.050	<0.050	<0.050	<0.050	--
S-15-PIT	15	3.4	<0.050	<0.050	<0.050	<0.050	--
S-0803-1B	*	<2.0	<0.050	<0.050	<0.050	<0.050	--
S-0803-1W	**	<2.0	<0.050	<0.050	<0.050	<0.050	--
S-0711-WT1+	8	480	<1.0	12.0	74.0	15.0	1,300
S-0711-WT2+	8	87	<0.5	1.3	9.1	2.1	1,800
S-0719-1A/1B	11.5	<2.0	<0.050	<0.050	<0.050	<0.050	--
S-0724-1A/1B	12	<2.0	<0.050	<0.050	<0.050	<0.050	--
S-0628-WT1,2+	7	650	<2.0	8.0	26.0	3.0	19,000
S-0705-4A-4B+	7	110	0.026	0.110	0.480	0.065	1,200

-- Indicates analysis not performed.

* Floor of Excavation.

** Sidewall of Excavation.

+ VOC was non-detectable other than BTX&E, except in composite sample S-00628-WT1,2, which showed levels of various halogenated volatile organics ranging from non-detectable to 0.0078 ppm.

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

KEI-P90-0806.QR3
April 27, 1992

TABLE 6

SOIL SAMPLES FROM BORINGS B7 THROUGH B11

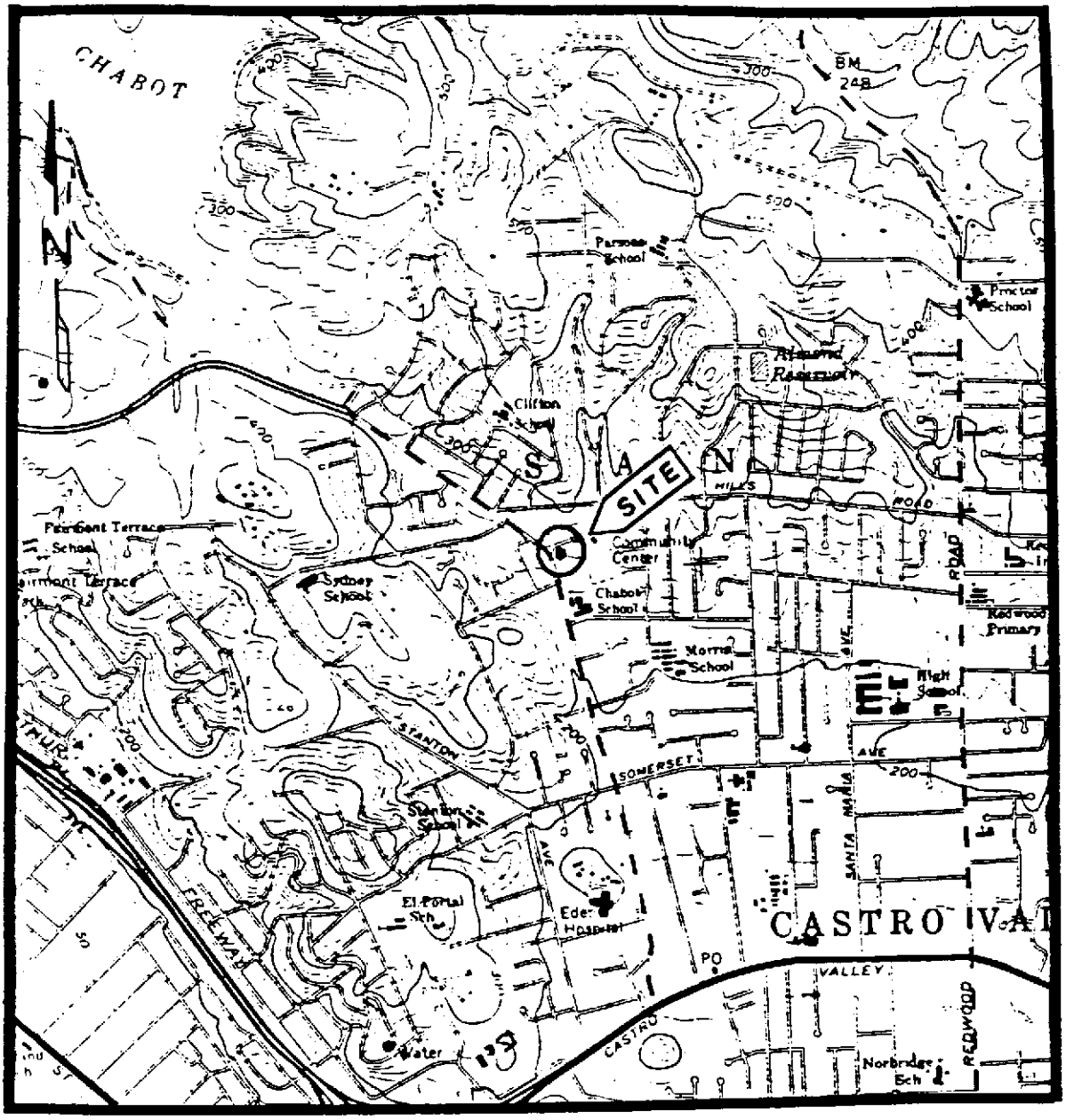
(Collected on November 17-18, 1989 - Data obtained from AGS Report 18061-5, dated July 3, 1990)

Sample #	Depth (feet)	TPH as Gasoline	Benzene	Toluene	Xylenes	Ethyl-benzene	TOG	EPA 8010
S-5.0-B7	5	<2	<0.050	<0.050	0.090	<0.050	--	--
S-10.0-B7	10	6.1	0.062	0.540	0.910	160	--	--
S-15.0-B7	15	--	--	--	--	--	--	ND
S-20.0-B7	20	--	--	--	--	--	--	ND
S-5.0-B8	5	--	--	--	--	--	--	ND
S-9.5-B8	9.5	200	0.340	0.910	23.0	4.1	--	--
S-10.0-B8	10	--	--	--	--	--	--	ND
S-15.0-B8	15	66	0.120	0.430	5.90	1.1	--	--
S-10.0-B9	10	86	1.1	0.670	3.70	2.0	--	--
S-17.0-B9	17	3.7	<0.050	0.092	0.130	0.076	--	--
S-10.0-B10	10	220	0.270	<0.050	16.0	5.6	--	--
S-19.5-B10	19.5	16	0.081	0.120	1.80	0.620	--	--
S-10.0-B11	10	45	0.074	0.330	3.10	1.2	<50	--
S-14.5-B11	14.5	--	--	--	--	--	--	ND
S-15.0-B11	15	3.4	<0.050	0.061	2.50	0.086	<50	--

-- Indicates analysis was not performed.

ND = Non-detectable.

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

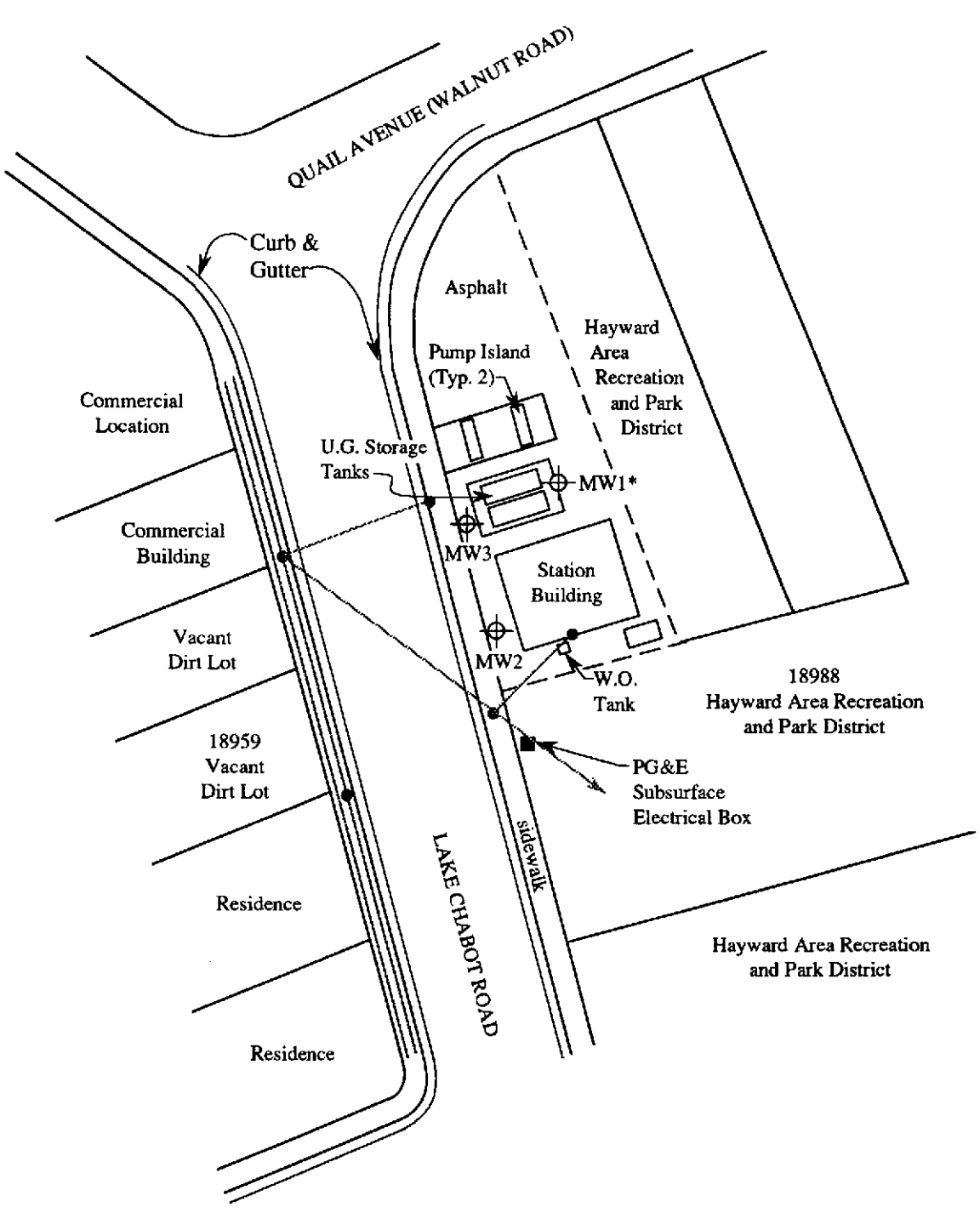


Base modified from 7.5 minute U.S.G.S. Hayward Quadrangle
(photorevised 1980)

0 2000 4000

Approx. scale feet

KAPREALIAN ENGINEERING INCORPORATED	UNOCAL SERVICE STATION #5484 18950 LAKE CHABOT ROAD CASTRO VALLEY, CA	LOCATION MAP



SITE VICINITY MAP

LEGEND

- Monitoring well
- Overhead power/telephone line
- Poles
- * Wells MW1 and MW3 were destroyed during tank removal activities

0 70 140

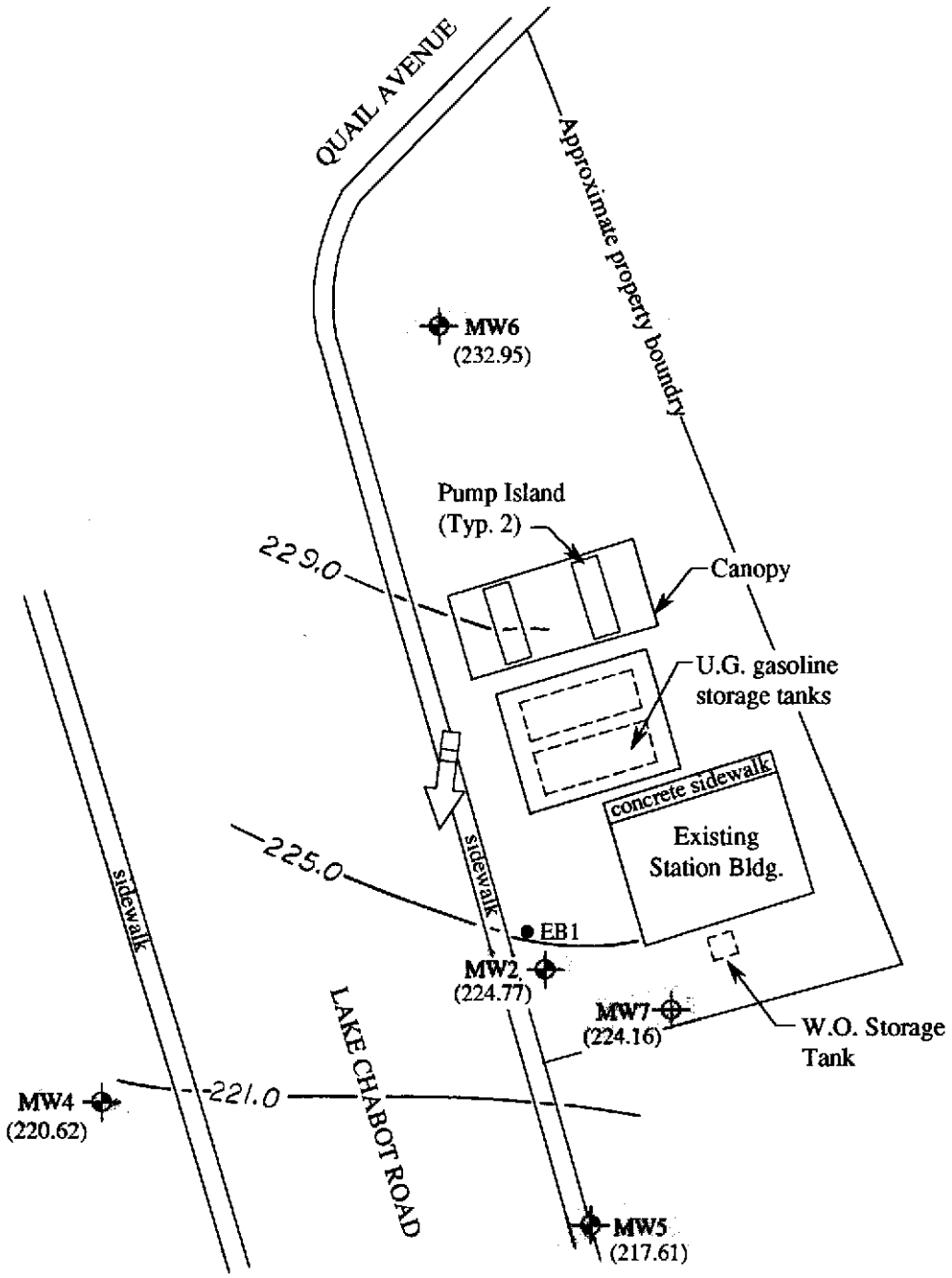
Approx. scale feet

(Base modified from AGS report 18061-3 Plate P-1)

KAPREALIAN ENGINEERING
INCORPORATED

UNOCAL SERVICE STATION #5484
18950 LAKE CHABOT ROAD
CASTRO VALLEY, CA

FIGURE
1



LEGEND

- Monitoring well (by KEI)
- Monitoring well (by AGS)
- Exploratory boring (by KEI)
- ( ) Elevation of gound water table in feet above Mean Sea Level on 3/20/92
- Contours of ground water elevation
- Direction of ground water flow

SITE PLAN

0 40 80

Approx. scale feet

(Base modified from AGS report 18061-4 Plate P-2)

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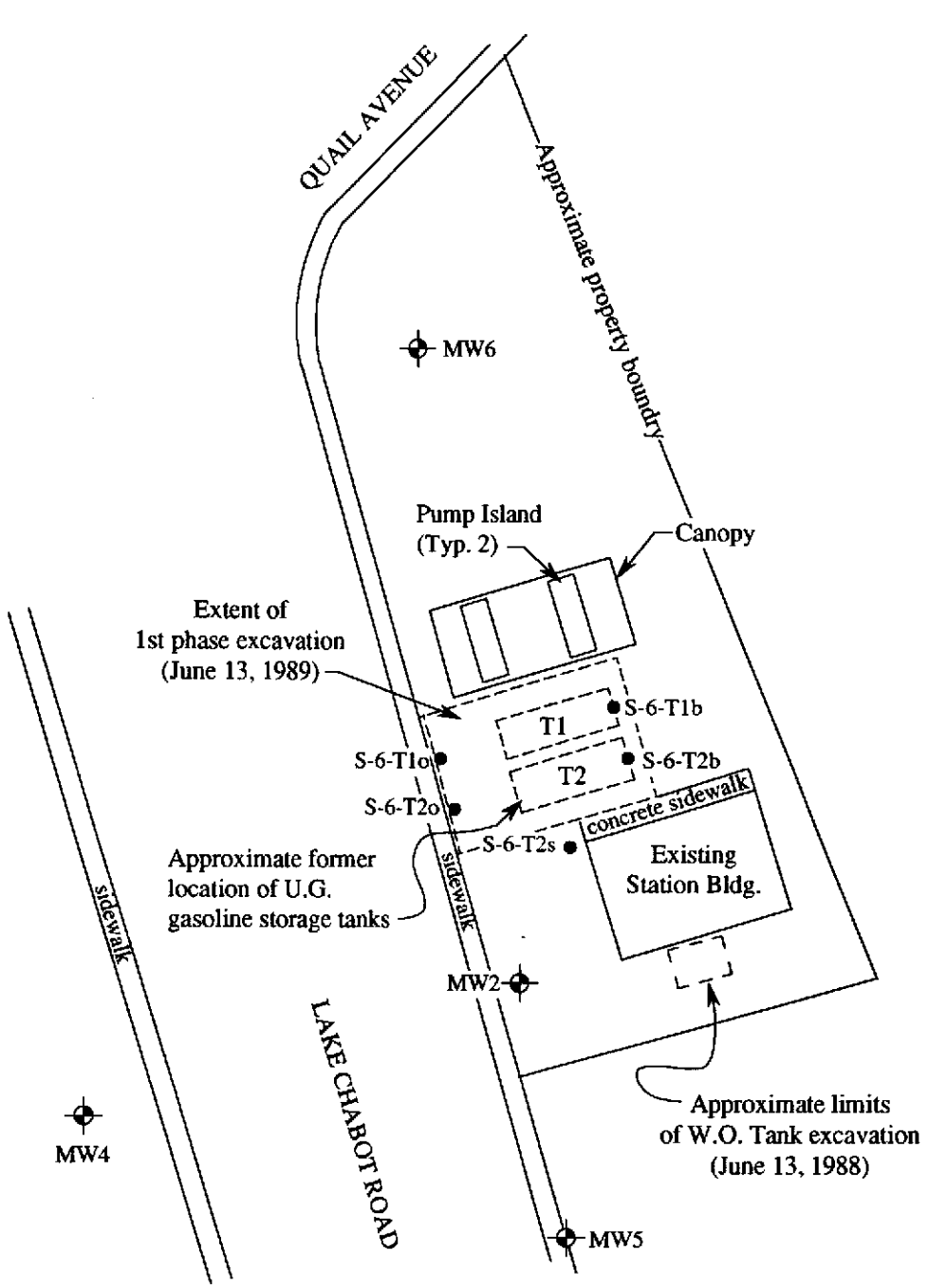
INCORPORATED

UNOCAL SERVICE STATION #5484
18950 LAKE CHABOT ROAD
CASTRO VALLEY, CA

FIGURE
2



SITE PLAN

LEGEND

MW6 ⊕ Monitoring well

- - - - - - - Sidewalls of excavation

● Soil sample point

S-6-T2s Sample depth

0 40 80

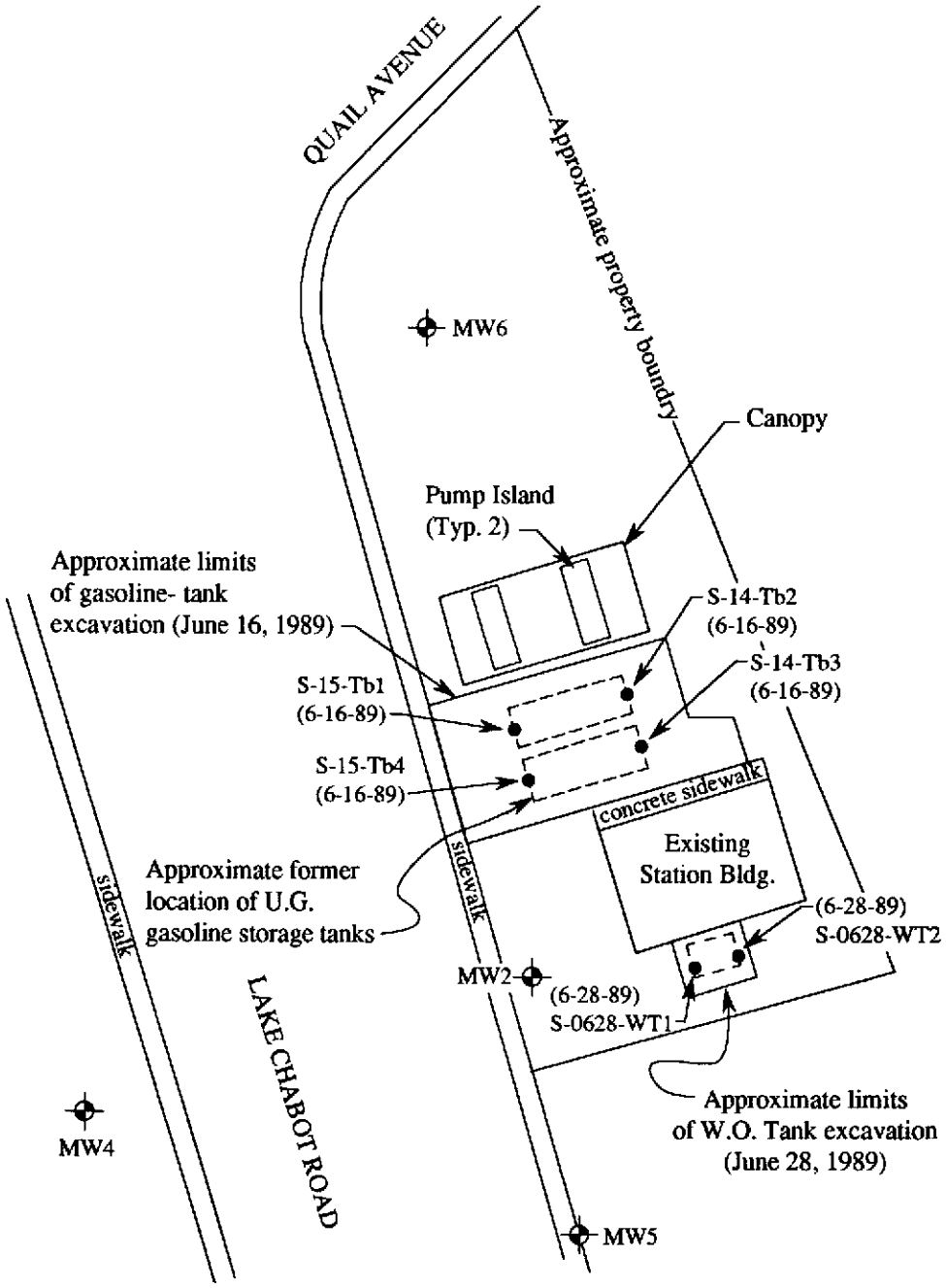
Approx. scale feet

(Base modified from AGS report 18061-4 Plate P-3)

KAPREALIAN ENGINEERING
INCORPORATED

UNOCAL SERVICE STATION #5484
18950 LAKE CHABOT ROAD
CASTRO VALLEY, CA

FIGURE
3



LEGEND

MW6 ⊕ Monitoring well

● Soil sample point

S-15-Tb4 Sample depth

0 40 80

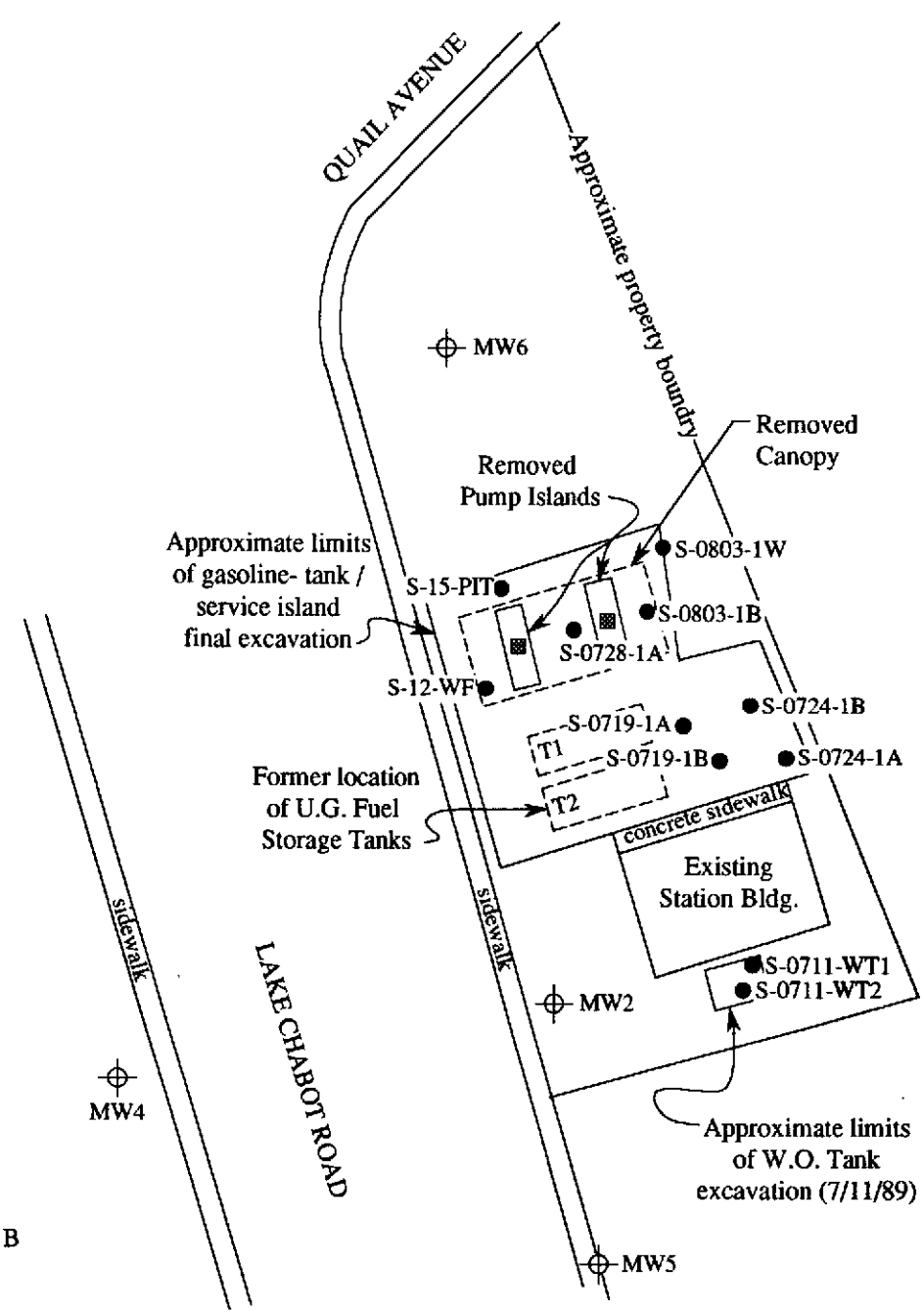
Approx. scale feet

(Base modified from AGS report 18061-4 Plate P-4)

KAPREALIAN ENGINEERING
INCORPORATED

UNOCAL SERVICE STATION #5484
18950 LAKE CHABOT ROAD
CASTRO VALLEY, CA

FIGURE
4



SITE PLAN

LEGEND

MW6 ⊕ Monitoring well

S-0803-1B ● Soil sample point

▪ Canopy posts

0 40 80

Approx. scale feet

(Base modified from AGS report 18061-4, Plate P-6)

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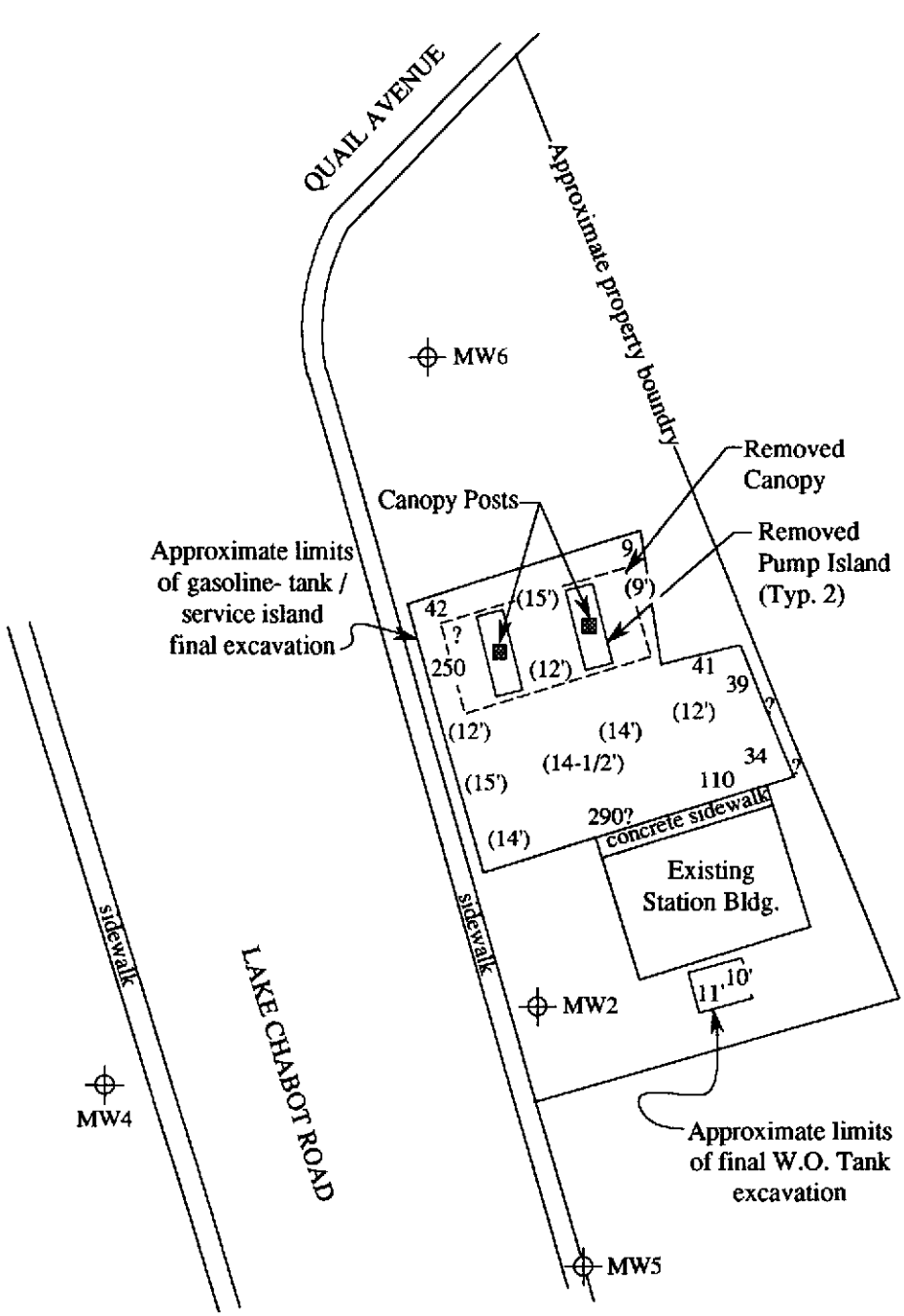
18950 LAKE CHABOT ROAD
CASTRO VALLEY, CA

FIGURE
5



SITE PLAN

LEGEND

MW6 ⊕ = Monitoring well

290 = OVM reading in sidewall of excavation in ppm

(15') = Approximate depth of excavation in feet

0 40 80

Approx. scale feet

(Base modified from AGS report 18061-4, Plate P-7)

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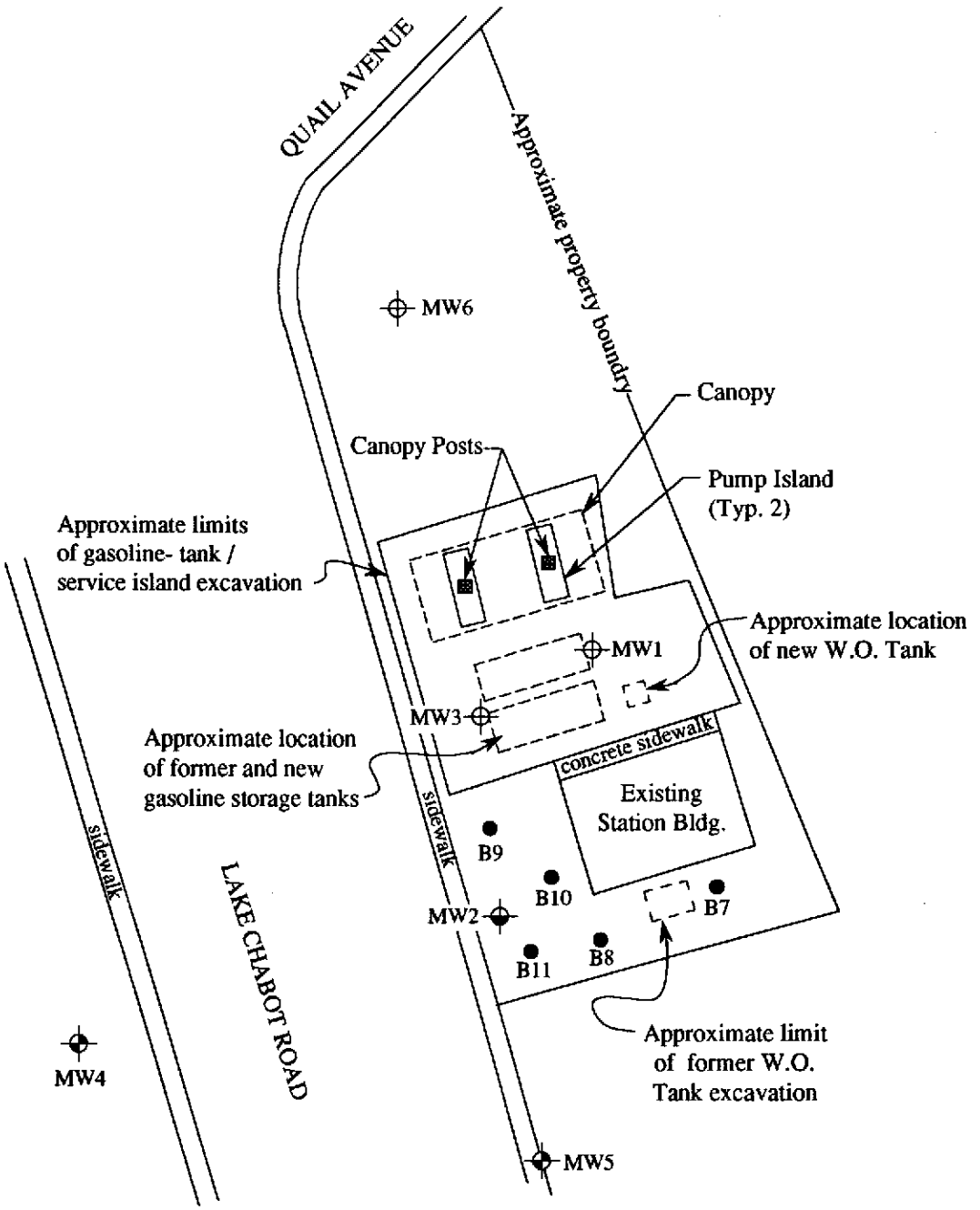
UNOCAL SERVICE STATION #5484
18950 LAKE CHABOT ROAD
CASTRO VALLEY, CA

FIGURE
6



LEGEND

B12 ● Soil boring

MW6 ⊕ Monitoring well installed by Applied GeoSystmes (1989)

MW2 ⊕ Monitoring well installed by Applied GeoSystems (1988)

MW3 ⊕ Former monitoring well installed by Applied GeoSystems (1988)

SITE PLAN

0 40 80

Approx. scale feet

(Base modified from AGS report 18061-5, Plate P-9)

KAPREALIAN ENGINEERING
INCORPORATED

UNOCAL SERVICE STATION #5484
18950 LAKE CHABOT ROAD
CASTRO VALLEY, CA

FIGURE
7

SEQUOIA ANALYTICAL

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

Kaprealian Engineering, Inc.	Client Project ID:	Unocal, 18950 Lake Chabot Rd., Castro Valley	Sampled:	Mar 20, 1992
P.O. Box 996	Matrix Descript:	Water	Received:	Mar 20, 1992
Benicia, CA 94510	Analysis Method:	EPA 5030/8015/8020	Analyzed:	Mar 30, 1992
Attention: Mardo Kaprealian, P.E.	First Sample #:	203-1049	Reported:	Apr 7, 1992

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

Sample Number	Sample Description	Low/Medium B.P. Hydrocarbons µg/L (ppb)	Benzene µg/L (ppb)	Toluene µg/L (ppb)	Ethyl Benzene µg/L (ppb)	Xylenes µg/L (ppb)
203-1049	MW-2	120	N.D.	N.D.	N.D.	N.D.
203-1051	MW-5	N.D.	N.D.	N.D.	N.D.	N.D.
203-1053	MW-7	11,000	980	N.D.	990	1,600
Method Detection Limits:		**30**	**0.30**	**0.30**	**0.30**	**0.30**

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

SEQUOIA ANALYTICAL

Belinda C. Vega
Laboratory Director

SEQUOIA ANALYTICAL

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Kaprealian Engineering, Inc.	Client Project ID:	Unocal, 18950 Lake Chabot Rd., Castro Valley	Sampled:	Mar 20, 1992
P.O. Box 996	Matrix Descript:	Water	Received:	Mar 20, 1992
Benicia, CA 94510	Analysis Method:	EPA 3510/8015	Extracted:	Mar 26, 1992
Attention: Mardo Kaprealian, P.E.	First Sample #:	203-1051	Analyzed:	Apr 2, 1992
			Reported:	Apr 7, 1992

TOTAL PETROLEUM FUEL HYDROCARBONS (EPA 8015)

Sample Number	Sample Description	High B.P. Hydrocarbons µg/L (ppb)
203-1051	MW-5	170
203-1053	MW-7	3,200

Method Detection Limits:	**50**

High Boiling Point Hydrocarbons are quantitated against a diesel fuel standard.

SEQUOIA ANALYTICAL

Belinda C. Vega
Laboratory Director

SEQUOIA ANALYTICAL

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Kaprealian Engineering, Inc.	Client Project ID:	Unocal, 18950 Lake Chabot Rd., Castro Valley	Sampled:	Mar 20, 1992
P.O. Box 996	Matrix Descript:	Water	Received:	Mar 20, 1992
Benicia, CA 94510	Analysis Method:	SM 5520 B&F (Gravimetric)	Extracted:	Mar 27, 1992
Attention: Mardo Kaprealian, P.E.	First Sample #:	203-1053	Analyzed:	Mar 31, 1992
			Reported:	Apr 7, 1992

TOTAL RECOVERABLE PETROLEUM OIL

Sample Number	Sample Description	Oil & Grease mg/L (ppm)
203-1053	MW-7	N.D.

Detection Limits:	5.0

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

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Belinda C. Vega
Laboratory Director

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Kaprealian Engineering, Inc.	Client Project ID:	Unocal, 18950 Lake Chabot Rd., Castro Valley	Sampled:	Mar 20, 1992
P.O. Box 996	Sample Descript:	Water, MW-7	Received:	Mar 20, 1992
Benicia, CA 94510	Analysis Method:	EPA 5030/8010	Analyzed:	Apr 2, 1992
Attention: Mardo Kaprealian, P.E.	Lab Number:	203-1053	Reported:	Apr 7, 1992

HALOGENATED VOLATILE ORGANICS (EPA 8010)

Analyte	Detection Limit µg/L	Sample Results µg/L
Bromodichloromethane	20	N.D.
Bromoform	20	N.D.
Bromomethane	20	N.D.
Carbon tetrachloride	20	N.D.
Chlorobenzene	20	N.D.
Chloroethane	20	N.D.
2-Chloroethylvinyl ether	20	N.D.
Chloroform	20	N.D.
Chloromethane	20	N.D.
Dibromochloromethane	20	N.D.
1,3-Dichlorobenzene	20	N.D.
1,4-Dichlorobenzene	20	N.D.
1,2-Dichlorobenzene	20	N.D.
1,1-Dichloroethane	20	N.D.
1,2-Dichloroethane	20	N.D.
1,1-Dichloroethene	20	N.D.
cis-1,2-Dichloroethene	20	N.D.
trans-1,2-Dichloroethene	20	N.D.
1,2-Dichloropropane	20	N.D.
cis-1,3-Dichloropropene	20	N.D.
trans-1,3-Dichloropropene	20	N.D.
Methylene chloride	200	N.D.
1,1,2,2-Tetrachloroethane	20	N.D.
Tetrachloroethene	20	N.D.
1,1,1-Trichloroethane	20	N.D.
1,1,2-Trichloroethane	20	N.D.
Trichloroethene	20	N.D.
Trichlorofluoromethane	20	N.D.
Vinyl chloride	20	N.D.

Analytes reported as N.D. were not present above the stated limit of detection. Because matrix effects and/or other factors required additional sample dilution, detection limits for this sample have been raised.

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Belinda C. Vega
Laboratory Director

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

Client Project ID: Unocal, 18950 Lake Chabot Rd., Castro Valley
QC Sample Group: 2031049-1053
Reported: Apr 7, 1992

QUALITY CONTROL DATA REPORT

ANALYTE	Benzene	Toluene	Ethyl-Benzene	Xylenes	Diesel	Oil and Grease
Method:	EPA 8015/8020	EPA 8015/8020	EPA 8015/8020	EPA 8015/8020	EPA8015	SM5520
Analyst:	K.N.	K.N.	K.N.	K.N.	A. Tuzon	D. Newcomb
Reporting Units:	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L
Date Analyzed:	Mar 30, 1992	Mar 30, 1992	Mar 30, 1992	Mar 30, 1992	Apr 2, 1992	Mar 31, 1992
QC Sample #:	Matrix Blank	Matrix Blank	Matrix Blank	Matrix Blank	Matrix Blank	Matrix Blank
Sample Conc.:	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Spike Conc. Added:	20	20	20	60	300	100
Conc. Matrix Spike:	21	21	22	68	246	96
Matrix Spike % Recovery:	105	105	110	113	82	96
Conc. Matrix Spike Dup.:	22	23	26	75	254	92
Matrix Spike Duplicate % Recovery:	110	115	130	125	84	92
Relative % Difference:	4.7	9.1	17	9.8	3.2	4.0

Laboratory blank contained the following analytes: None Detected

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

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

Client Project ID: Unocal, 18950 Lake Chabot Rd., Castro Valley
QC Sample Group: 2031049-1053
Reported: Apr 7, 1992

QUALITY CONTROL DATA REPORT

ANALYTE	1,1-Dichloroethene	Trichloro-ethene	Chloro-benzene
Method:	EPA 8010	EPA 8010	EPA 8010
Analyst:	M. Nguyen	M. Nguyen	M. Nguyen
Reporting Units:	ug/L	ug/L	ug/L
Date Analyzed:	Apr 2, 1992	Apr 2, 1992	Apr 2, 1992
QC Sample #:	Matrix Blank	Matrix Blank	Matrix Blank
Sample Conc.:	N.D.	N.D.	N.D.
Spike Conc. Added:	10	10	10
Conc. Matrix Spike:	10	10	11
Matrix Spike % Recovery:	100	100	110
Conc. Matrix Spike Dup.:	10	10	12
Matrix Spike Duplicate % Recovery:	100	100	120
Relative % Difference:	0.0	0.0	8.7

Laboratory blank contained the following analytes: None Detected

Quality Assurance Statement: All standard operating procedures and quality control requirements have been met.

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
(510) 686-9600 • FAX (510) 686-9689

Kaprealian Engineering, Inc. Client Project ID: Unocal, 18950 Lake Chabot Rd., Castro Valley
P.O. Box 996
Benicia, CA 94510
Attention: Mardo Kaprealian, P.E. QC Sample Group: 2031049-1053 Reported: Apr 7, 1992

QUALITY CONTROL DATA REPORT

SURROGATE

Method:	EPA 8015/8020	EPA 8015/8020	EPA 8015/8020	EPA 8015/8020	EPA8015	EPA8015	EPA8015
Analyst:	K.N.	K.N.	K.N.	K.N.	A. Tuzon	A. Tuzon	A. Tuzon
Reporting Units:	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Date Analyzed:	Mar 30, 1992	Mar 30, 1992	Mar 30, 1992	Mar 30, 1992	Apr 2, 1992	Apr 2, 1992	Apr 2, 1992
Sample #:	203-1049	203-1051	203-1053	Blank	203-1051	203-1053	Blank
Surrogate % Recovery:	98	95	88	99	110	108	110

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

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

Client Project ID: Unocal, 18950 Lake Chabot Rd., Castro Valley
QC Sample Group: 203-1053
Reported: Apr 7, 1992

QUALITY CONTROL DATA REPORT

SURROGATE

Method:	EPA 8010	EPA 8010
Analyst:	M.N.	M.N.
Reporting Units:	ug/L	ug/L
Date Analyzed:	Apr 2, 1992	Apr 2, 1992
Sample #:	203-1053	Blank
Surrogate #1 % Recovery:	100	105
Surrogate #2 % Recovery:	85	85

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

KAPREALIAN ENGINEERING, INC.

CHAIN OF CUSTODY

SAMPLER: Vartkes

WITNESSING AGENCY:

SITE NAME & ADDRESS: Unocal / Castro Valley
18950 Lake Chabot Rd.

TURN AROUND TIME: Regular

SAMPLE ID NO.	DATE	TIME	SOIL	WATER	GRAB	COMP	NO. OF CONT.	SAMPLING LOCATION	TPHG + BTXE	TPHD	TOG (5520 B&F)	8010	REMARKS
MW-2	3/20/92	11:00 AM.		✓	✓		2	Monitoring Well	✓				203/1049 AB
MW-4	"			✓	✓		2	" "	✓				1050 AB
MW-5	"			✓	✓		3	" "	✓	✓			1051 AC
MW-6	"			✓	✓		2	" "	✓				1052 AB
MW-7	"	2:50 pm.		✓	✓		6	" "	✓	✓	✓	✓	1053 AF

Relinquished by: (Signature)	Date/Time	Received by: (Signature)
W. Thelgin	3/20/92 7:00 PM	
	3/23	3-23-92 2:20PM

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: Log-in Tech Date: 3-20-92