



KAPREALIAN ENGINEERING, INC.

Consulting Engineers

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APPROVED

JUL 30 1991

RONALD E. BOCK

KEI-P89-0111.QR8

July 3, 1991

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

Attention: Mr. Ron Bock

RE: Quarterly Report
Unocal Service Station #5487
28250 Hesperian Boulevard
Hayward, California

FILE #	5487	SS	<input checked="" type="checkbox"/>	BP	<input type="checkbox"/>
RPT	QM	<input checked="" type="checkbox"/>	TRANSMITTAL	<input type="checkbox"/>	
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RECEIVED

9:46 am, Jun 09, 2009

Alameda County
Environmental Health

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 proposal KEI-P89-0111.P3 dated June 4, 1990. The wells are currently monitored and sampled on a quarterly basis. This report covers the work performed by KEI from March through May, 1991.

SITE DESCRIPTION AND BACKGROUND

The subject site is presently used as a gasoline station. The vicinity of the site is characterized by gently sloping, south-southwest trending topography, and is located approximately 0.8 miles northwest of Alameda Creek and approximately four miles northeast of the present shoreline of San Francisco Bay. A Location Map and Site Plans are attached to this report.

KEI's initial work at the site began on January 30, 1989, when KEI was asked to collect soil samples following the removal of two 10,000 gallon underground fuel storage tanks and one 280 gallon waste oil tank at the site. The tanks were made of steel and no apparent holes or cracks were observed in the fuel tanks; however, the waste oil tank was corroded. Water was encountered in the excavation at a depth of 10.5 feet, thus prohibiting the collection of any soil samples from beneath the tanks.

Ten soil samples, labeled SW1 through SW6 and SW2A, SW3A, SW5A and SW6A, were collected from the sidewalls of the fuel tank pit at a depth of approximately six inches above the water table. Samples SW2A, SW3A, SW5A and SW6A were collected from the sidewalls after additional excavation (see the attached Site Plan, Figure 2). One soil sample, labeled W01, was collected from beneath the waste oil tank at a depth of 9 feet (see the attached Site Plan, Figure 2).

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After the soil sampling was completed, approximately 2,000 gallons of ground water was pumped from the fuel tank pit.

On February 1, 1989, the waste oil tank pit was excavated laterally on all sides. The side nearest the existing building was excavated approximately 1 foot laterally, while the other three sides were each excavated approximately 10 feet laterally. The pit was excavated to approximately 21 feet x 29 feet. Four sidewall samples (labeled SWA, SWB, SWC and SWD) were collected (see the attached Site Plan, Figure 3). In addition, three soil samples were collected from the pipe trenches (labeled P1, P2 and P3), also shown on the attached Site Plan, Figure 3.

On February 14, 1989, in preparation for setting of the new fuel tanks, approximately 17,500 gallons of water was pumped from the fuel tank pit. On this date, after pumping, water samples W1A and W1B were then collected.

On February 17, 1989, KEI returned to the site to observe additional excavation of the northeast sidewall of the waste oil tank pit (SWC) for a distance of approximately 3 feet. Sample SWC2 was then collected. Also on this date, a water sample (WO-W1) was collected from the waste oil tank pit. The water sample was taken after having pumped 4,500 gallons from the waste oil excavation. Based on the analytical results from SWC2 (680 ppm of total oil and grease [TOG]), KEI returned to the site on February 24, 1989 to observe excavation of an additional 5 feet of soil. Soil sample SWC3 was then collected. Sample locations are shown on the attached Site Plans, Figures 2 through 5.

Soil and water samples were analyzed by Sequoia Analytical Laboratory in Redwood City, California, for total petroleum hydrocarbons (TPH) as gasoline, and benzene, toluene, xylenes and ethylbenzene (BTX&E). The waste oil tank pit samples were also analyzed for TPH as diesel, TOG, EPA methods 8010 and 8270 constituents, and metals cadmium, chromium, lead and zinc. All pipe trench samples were analyzed for TPH as gasoline and BTX&E. After additional excavation, analytical results of soil samples from the fuel tank pit showed less than 1.4 ppm of TPH as gasoline for all samples representing the final pit excavation. After additional excavation in the waste oil pit, the soil sample analytical results showed low residual levels of contamination, indicating that the majority of contaminated soil had been excavated.

Based on the results of the laboratory analyses, and in order to comply with the requirements of the regulatory agencies, KEI proposed the installation of five monitoring wells. Documentation of sample collection and results of the soil and ground water

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samples collected in January and February, 1989, are summarized in KEI's reports (KEI-J89-0111.R2) dated March 1, 1989 and (KEI-J89-0111.R3) March 29, 1989. Results of soil sample analyses are summarized in Tables 4 and 5, and water sample analyses in Table 3.

Five two-inch diameter monitoring wells, designated as MW1 through MW5 on the attached Site Plan, Figure 1, were installed on April 20 and 21, 1989. The five wells were drilled and completed to total depths ranging from 24 to 28 feet. Ground water was encountered at depths ranging from 7 to 10 feet beneath the surface during drilling. The wells were developed on April 25, 1989, and initially sampled on April 26, 1989.

Water and selected soil samples were analyzed at Sequoia Analytical Laboratory in Redwood City, California, for TPH as gasoline and BTX&E. In addition, the soil samples collected from MW1 and MW2 and all the water samples were analyzed for TPH as diesel, TOG and EPA method 8010 compounds. Analytical results of soil samples collected from the borings for monitoring wells MW1 through MW4 showed non-detectable levels of TPH as gasoline and BTX&E, except for sample MW4(9) collected at a depth of 9 feet, which showed 1.4 ppm of TPH as gasoline. The soil sample collected from MW5, at a depth of 5 feet, showed 900 ppm of TPH as gasoline and 3.1 ppm of benzene. Analytical results of water samples, collected from MW1 and MW4, showed benzene levels of 2.1 ppb and 0.33 ppb, respectively. Analytical results for all other water samples indicated non-detectable levels for all constituents analyzed. Documentation of the installation, development and sampling of the monitoring wells is presented in KEI's report (KEI-P89-0111.R5) dated May 18, 1989. Soil sample analyses from that report are summarized in Table 6, and water sample analyses in Table 2.

Subsequently, KEI proposed a monthly monitoring and quarterly sampling program of existing wells which was initiated in June, 1989, which has been modified to quarterly monitoring and sampling as of January, 1991, as recommended in KEI's quarterly report (KEI-P89-0111.QR6) dated January 4, 1991.

RECENT FIELD ACTIVITIES

The five wells were monitored and sampled once 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.

Water samples were collected from the wells on May 10, 1991. In addition, a duplicate water sample (MWD) was collected from

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monitoring well MW5. Prior to sampling, the wells were each purged of between 15 and 55 gallons using a surface pump. Samples were then collected using a clean Teflon bailer. Samples were 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.

All wells were also recently surveyed to Mean Sea Level (MSL) by Kier & Wright of Pleasanton, California.

HYDROLOGY AND GEOLOGY

Based on the water level data gathered during the quarter, ground water flow direction appeared to be toward the southwest on May 10, 1991. Although the ground water flow direction was most recently reported to be to the northeast, the ground water flow direction has remained relatively unchanged from the previous quarters. A recently uncovered survey error had resulted in southwesterly ground water flow directions being reported as to the northeast in the past. Water levels have shown a net increase of between 0.35 and 0.73 feet in all of the wells since the previous quarter. The measured depth to ground water at the site on May 10, 1991 ranged between 6.76 and 7.79 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 underlain by Holocene-age coarse-grained alluvium (Q_{hac}). The coarse-grained alluvium typically consists of unconsolidated, moderated sorted sand and silt materials with local gravel lenses. In addition, the site is situated closely adjacent to a mapped geologic contact with Holocene-age medium-grained alluvium (Q_{ham}), which is described as typically consisting of unconsolidated fine sand, silt, and clayey silt with a trace of coarse sand.

The results of our previous subsurface investigation (borings for MW1 through MW5) indicate that the site is predominantly underlain by sandy to silty clay materials. However, in the vicinity of MW1 and MW4, the relatively thick sequence of clay materials are underlain by a clayey sand bed at a depth of about 24 feet in MW1 and about 23 feet in MW4, and extend to the maximum depth explored (28 feet). Clayey sand materials were not encountered in MW2, MW3 or MW5.

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 using EPA method 5030 in conjunction with modified 8015, and BTX&E using EPA method 8020.

Analytical results of the ground water samples, collected from monitoring wells MW1 through MW5, indicate non-detectable levels of TPH as gasoline and BTX&E. In addition, the analytical results of the duplicate water sample (MWD), collected from well MW5, indicate non-detectable levels of TPH as gasoline and BTX&E. 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

A review of Regional Water Quality Control Board (RWQCB) files was conducted in June, 1991, in order to locate and gain information on nearby underground tank sites.

A review of ground water elevation data from three monitoring wells at the Rotten Robbie Service Station at 27814 Hesperian Boulevard, located approximately 1,800 feet northwest of Unocal, indicates a ground water flow direction to the southwest. Results of ground water analysis from the three wells showed high levels of TPH as gasoline and BTX&E as well as free product being observed in one of the wells. No other underground fuel tank sites within a one-half mile radius of the subject site are known to KEI.

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-P89-0111.P3) dated June 4, 1990. KEI recommends that the wells be monitored and sampled for one additional quarter. Recommendations for altering or terminating the current monitoring and sampling program will be made after reviewing the analytical results from the next quarterly sampling.

DISTRIBUTION

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

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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.

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If 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:jad

Attachments: Tables 1 through 6
Location Map
Site Plans - Figures 1 through 5
Laboratory Analyses
Chain of Custody documentation

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TABLE 1

SUMMARY OF MONITORING DATA

<u>Well No.</u>	<u>Ground Water Elevation (feet)</u>	<u>Depth to Water (feet)</u>	<u>Product Thickness</u>	<u>Sheen</u>	<u>Gallons Pumped</u>
(Monitored and Sampled on May 10, 1991)					
MW1	5.25	7.32	0	No	15
MW2	5.10	7.79	0	No	15
MW3	4.98	7.48	0	No	15
MW4	4.95	7.14	0	No	15
MW5	4.42	6.76	0	No	55

<u>Well #</u>	<u>Surface Elevation* (feet)</u>
MW1	12.57
MW2	12.89
MW3	12.46
MW4	12.09
MW5	11.18

* Elevation of top of well covers surveyed to MSL.

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TABLE 2

SUMMARY OF LABORATORY ANALYSES
 WATER

<u>Date</u>	<u>Sample Well #</u>	<u>TPH as Diesel</u>	<u>TPH as Gasoline</u>	<u>Benzene</u>	<u>Toluene</u>	<u>Xylenes</u>	<u>Ethyl-benzene</u>
5/10/91	MW1	--	ND	ND	ND	ND	ND
	MW2	--	ND	ND	ND	ND	ND
	MW3	--	ND	ND	ND	ND	ND
	MW4	--	ND	ND	ND	ND	ND
	MW5	--	ND	ND	ND	ND	ND
	MWD+	--	ND	ND	ND	ND	ND
2/11/91	MW1*	ND	ND	ND	ND	ND	ND
	MW2	--	ND	ND	ND	ND	ND
	MW3	--	ND	ND	ND	ND	ND
	MW4	--	ND	ND	ND	ND	ND
	MW5	--	58	23	ND	1.3	2.9
11/15/90	MW1*	ND	ND	ND	ND	ND	ND
	MW2	--	ND	ND	ND	ND	ND
	MW3	--	ND	ND	ND	ND	ND
	MW4	--	ND	ND	ND	ND	ND
	MW5	--	ND	ND	ND	0.47	ND
8/29/90	MW1*	ND	ND	ND	ND	0.74	ND
	MW2	--	ND	ND	ND	ND	ND
	MW3	--	ND	ND	0.52	ND	ND
	MW4	--	ND	ND	ND	ND	ND
	MW5	--	ND	0.70	ND	1.1	0.57
5/16/90	MW1*	ND	ND	ND	ND	ND	ND
	MW2*	ND	ND	ND	ND	ND	ND
	MW3	--	ND	ND	ND	ND	ND
	MW4	--	ND	ND	ND	ND	ND
	MW5	--	1,100	310	2.8	110	70
2/16/90	MW1*	ND	ND	ND	ND	ND	ND
	MW2	--	ND	ND	ND	ND	ND
	MW3	--	ND	ND	ND	ND	ND
	MW4	--	ND	ND	ND	ND	ND
	MW5	--	ND	ND	ND	ND	ND
11/14/89	MW1*	ND	ND	ND	ND	ND	ND
	MW2*	ND	ND	ND	ND	ND	ND
	MW3	--	ND	ND	ND	ND	ND
	MW4	--	ND	ND	ND	ND	ND
	MW5	--	73	4.7	0.97	16	2.9

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TABLE 2 (Continued)

SUMMARY OF LABORATORY ANALYSES
 WATER

<u>Date</u>	<u>Sample Well #</u>	<u>TPH as Diesel</u>	<u>TPH as Gasoline</u>	<u>Benzene</u>	<u>Toluene</u>	<u>Xylenes</u>	<u>Ethyl-benzene</u>
8/16/89	MW1**	ND	ND	ND	ND	ND	ND
	MW2**	ND	ND	ND	ND	ND	ND
	MW3	--	ND	ND	ND	ND	ND
	MW4	--	ND	ND	ND	ND	ND
	MW5	--	4,400	1,400	84	950	200
8/31/89	MW5	--	910	120	7.1	53	50
4/26/89	MW1***	ND	ND	2.1	ND	ND	ND
	MW2***	ND	ND	ND	ND	ND	ND
	MW3***	ND	ND	ND	ND	ND	ND
	MW4***	ND	ND	0.33	ND	ND	ND
	MW5***	ND	ND	ND	ND	ND	ND
Detection Limits		50	30	0.3	0.3	0.3	0.3

+ MWD is a quality assurance duplicate water sample collected from well MW5.

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

** TOG for these samples were 23 ppm and 7.4 ppm, respectively. EPA method 8010 constituents were non-detectable for both samples.

*** These samples were non-detectable for TPH as diesel, TOG, and EPA method 8010 constituents.

-- Indicates analysis not performed.

ND = Non-detectable.

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

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TABLE 3

SUMMARY OF LABORATORY ANALYSES
WATER

<u>Date</u>	<u>Sample Well #</u>	<u>TPH as Diesel</u>	<u>TPH as Gasoline</u>	<u>Benzene</u>	<u>Toluene</u>	<u>Xylenes</u>	<u>Ethyl-benzene</u>
2/14/89	W1A	110	--	2.2	0.55	12	<0.5
	W1B*	--	--	--	--	--	--
2/17/89	WO-W1+	1,300	500	52	8.6	100	9.2

* All EPA method 601 constituents were non-detectable.

+ TOG and all EPA method 601 constituents were non-detectable.

-- Indicates analysis not performed.

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

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TABLE 4

SUMMARY OF LABORATORY ANALYSES
 SOIL

(Collected on January 30, and February 2, 14 & 17, 1989)

<u>Sample #</u>	<u>Depth (feet)</u>	<u>TPH as Gasoline</u>	<u>TPH as Diesel</u>	<u>Benzene</u>	<u>Toluene</u>	<u>Xylenes</u>	<u>Ethyl- benzene</u>
SW1	10	1.4	--	0.14	<0.1	<0.1	<0.1
SW2A	10	1.1	--	<0.05	<0.1	<0.1	<0.1
SW3A	10	<1.0	--	<0.05	<0.1	<0.1	<0.1
SW4	10	<1.0	--	<0.05	<0.1	<0.1	<0.1
SW5	10	130	--	1.1	4.6	18	3.7
SW5A	10	<1.0	--	<0.05	<0.1	<0.1	<0.1
SW6A	10	<1.0	--	<0.05	<0.1	<0.1	<0.1
P1	3.5	7.8	--	2.0	<0.1	2.4	0.53
P2	3.5	12	--	1.9	0.91	0.70	3.0
P3	3.5	11	--	0.37	0.36	0.29	1.7
SWA*	10	<1.0	1.0	<0.05	<0.1	<0.1	<0.1
SWB*	10	1.1	2.4	<0.05	<0.1	<0.1	<0.1
SWC*	10	110	180	0.68	<0.1	5.6	1.9
SWC2*	10	89	57	<0.05	<0.1	0.42	0.76
SWC3*	10	<1.0	<1.0	<0.05	<0.1	<0.1	<0.1
SWD*	10	<1.0	<1.0	<0.05	<0.1	<0.1	<0.1
WO1**	9	60	800	3.6	9.2	9.5	2.5

* TOG for SWA was 35 ppm, SWB was 44 ppm, SWC was 500 ppm, SWC2 was 680 ppm, SWC3 was <30 ppm, and SWD was 77 ppm.

** TOG for WO1 was 1,900 ppm; cadmium was 0.3 ppm; chromium was 39 ppm; lead was 10 ppm, and zinc was 42 ppm.

-- Indicates analysis not performed.

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

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TABLE 5
SUMMARY OF LABORATORY ANALYSES
SOIL

<u>Date</u>	<u>Sample Number</u>	<u>Cadmium</u>	<u>Chromium</u>	<u>Lead</u>	<u>Zinc</u>
3/09/89	SWA*	0.2	96	4.7	35
	SWB*	0.16	91	5.1	29
	SWC3*	0.33	140	6.8	41
	SWD*	0.19	92	4.8	32
	Detection Limits	0.1	0.05	0.05	0.1

* All EPA method 8010 and 8270 constituents were non-detectable.
Results in parts per billion (ppb), unless otherwise indicated.

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TABLE 6
SUMMARY OF LABORATORY ANALYSES
SOIL

<u>Date</u>	<u>Sample Number</u>	<u>Depth (feet)</u>	<u>TPH as Gasoline</u>	<u>Benzene</u>	<u>Toluene</u>	<u>Xylenes</u>	<u>Ethylbenzene</u>
4/20/89	MW1*	5	ND	ND	ND	ND	ND
	MW2*	5	ND	ND	ND	ND	ND
	MW3	5	ND	ND	ND	ND	ND
	MW3	9	ND	ND	ND	ND	ND
	MW4	5	ND	ND	ND	ND	ND
	MW4	9	1.4	ND	ND	ND	ND
	MW5	5	900	3.1	3.1	110	30
	MW5	9	ND	ND	ND	ND	ND
Detection Limits			1.0	0.05	0.1	0.1	0.1

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

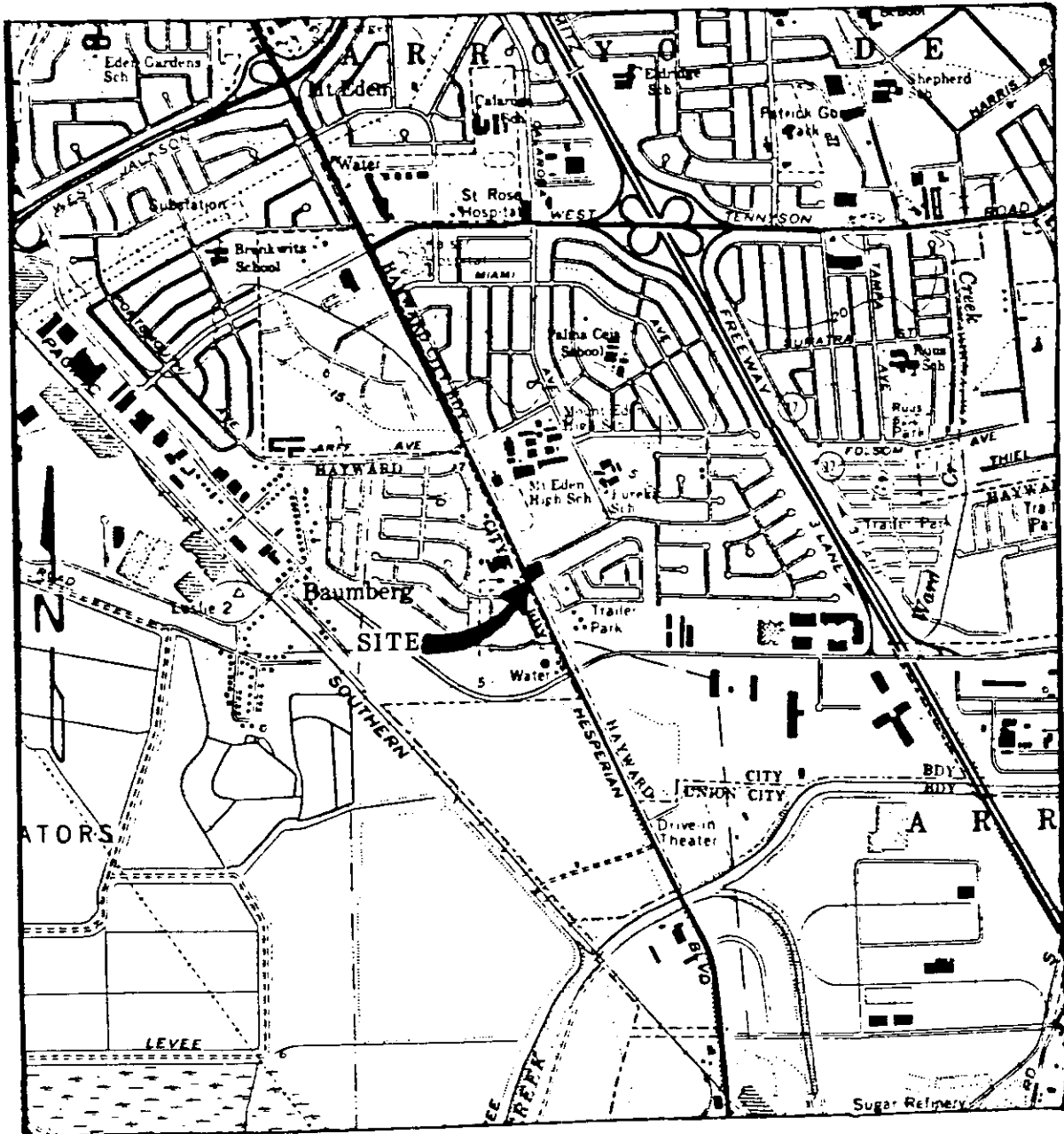
ND = Non-detectable.

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



KAPREALIAN ENGINEERING, INC.
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LOCATION MAP

Unocal S/S #5487
28250 Hesperian Boulevard
Hayward, CA

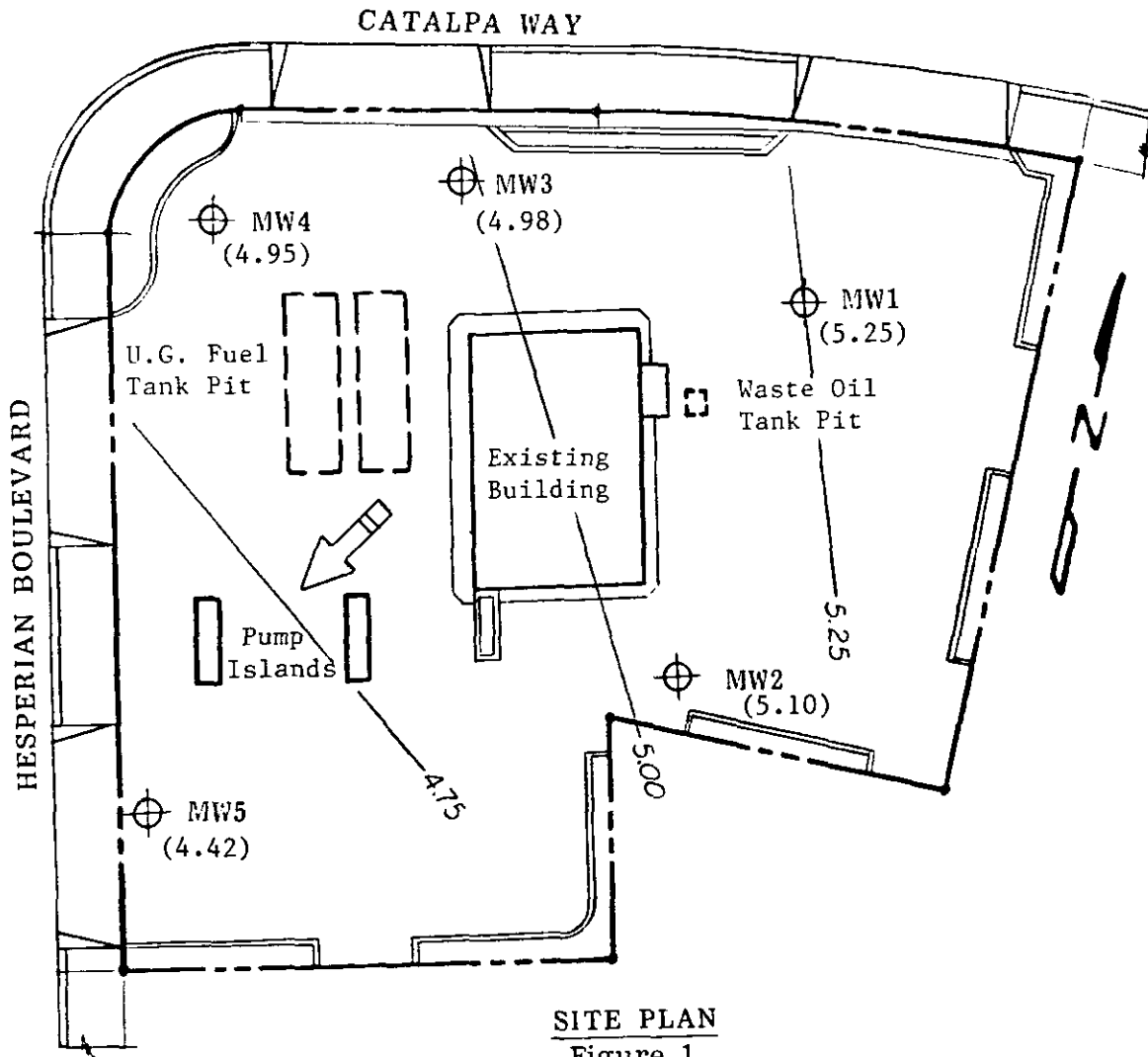


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SITE PLAN
Figure 1

LEGEND

-  Monitoring Well
-  Direction of Ground Water Flow
- () Water Table elevation in feet on 5/10/91 . MW1 well cover assumed 100.00 feet as datum.
- Contours of ground water surface in feet

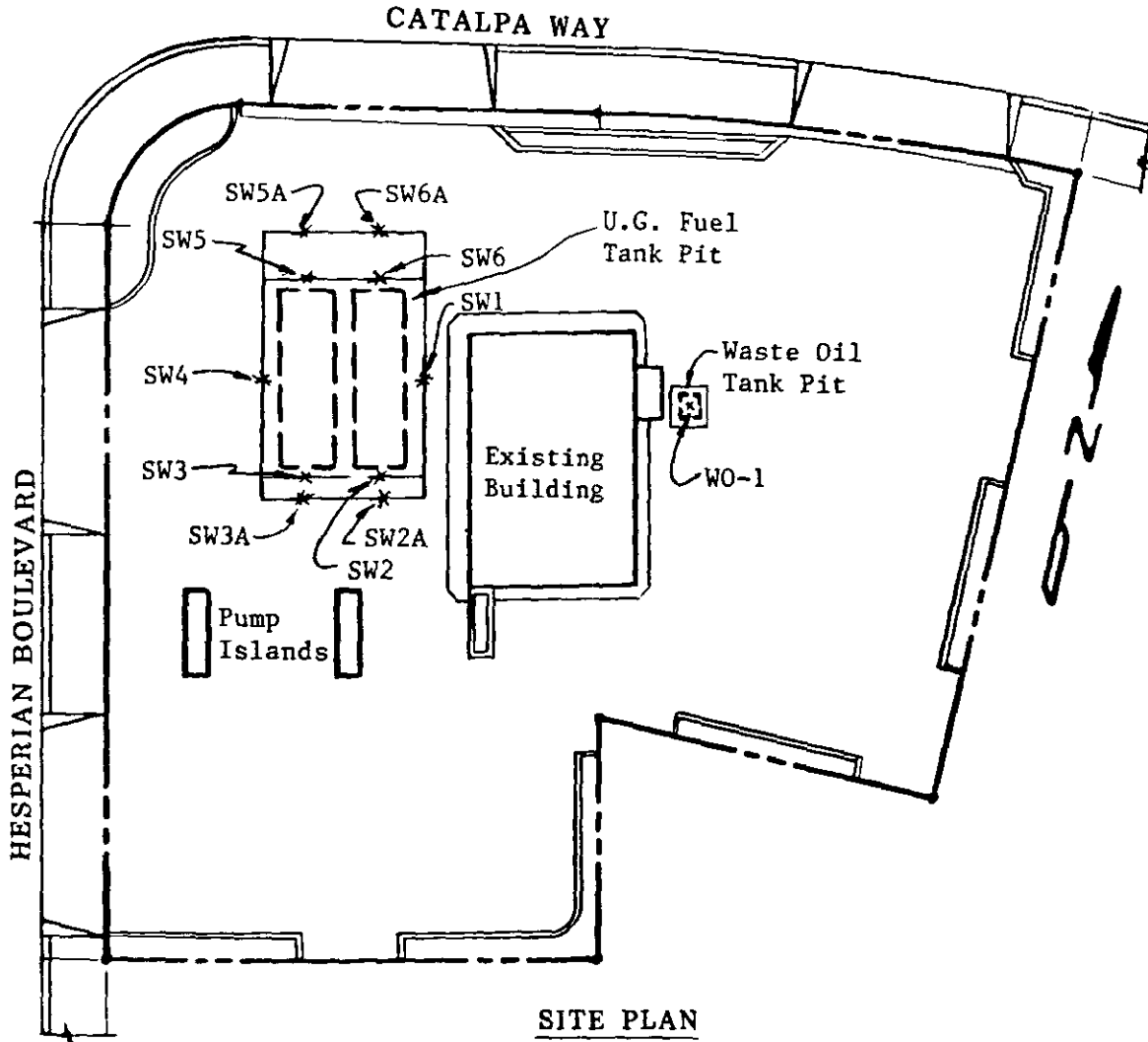
0 30 60
Approx. scale feet

Unocal S/S #5487
28250 Hesperian Boulevard
Hayward, CA



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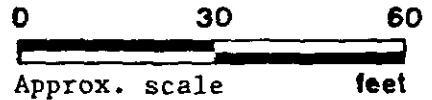
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SITE PLAN
Figure 2

LEGEND

* Sample Point Location



Unocal S/S #5487
28250 Hesperian Boulevard
Hayward, CA

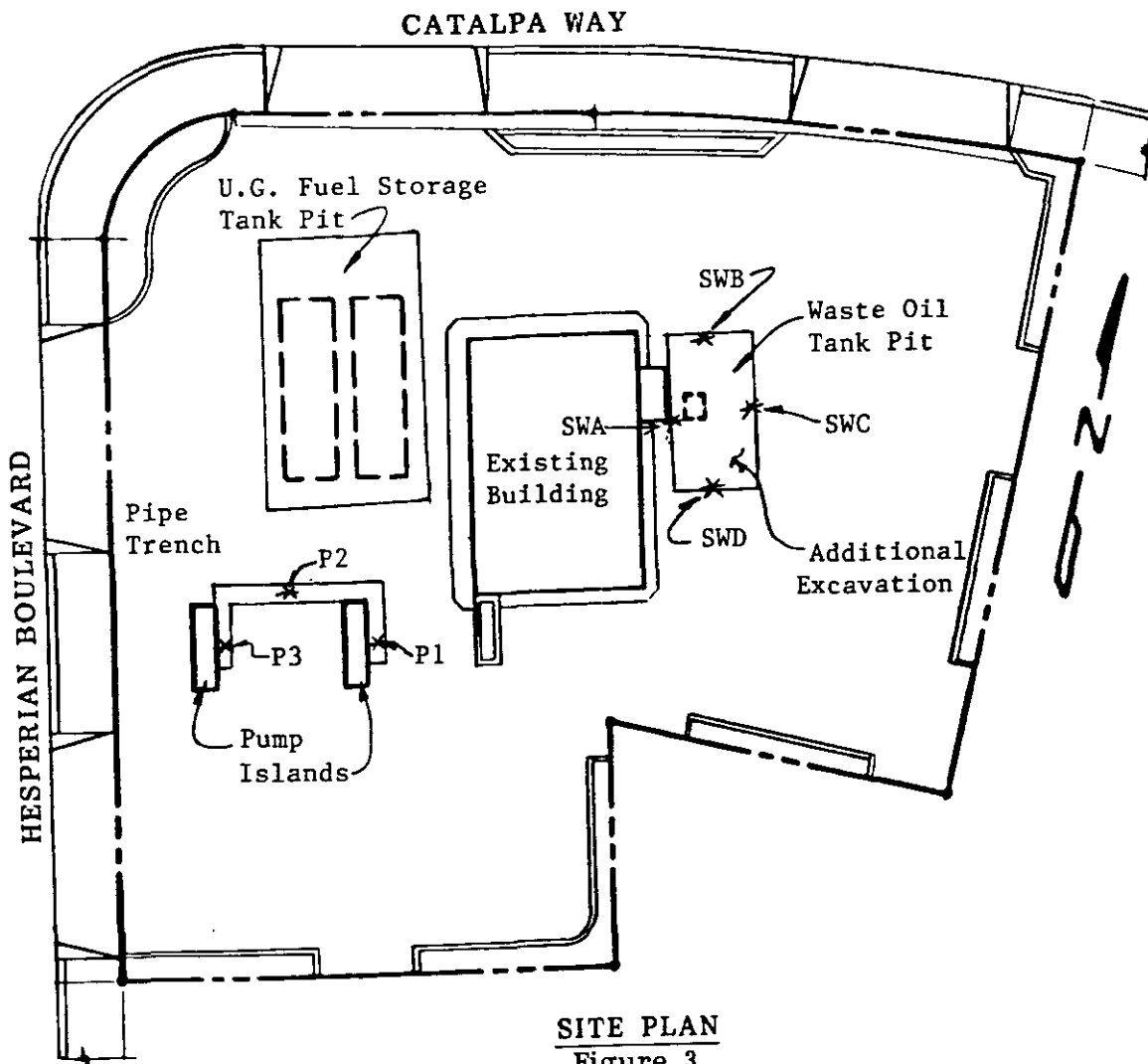


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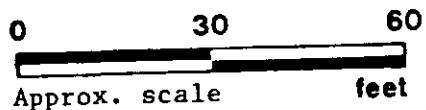
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SITE PLAN
Figure 3

LEGEND

* Sample Point Location

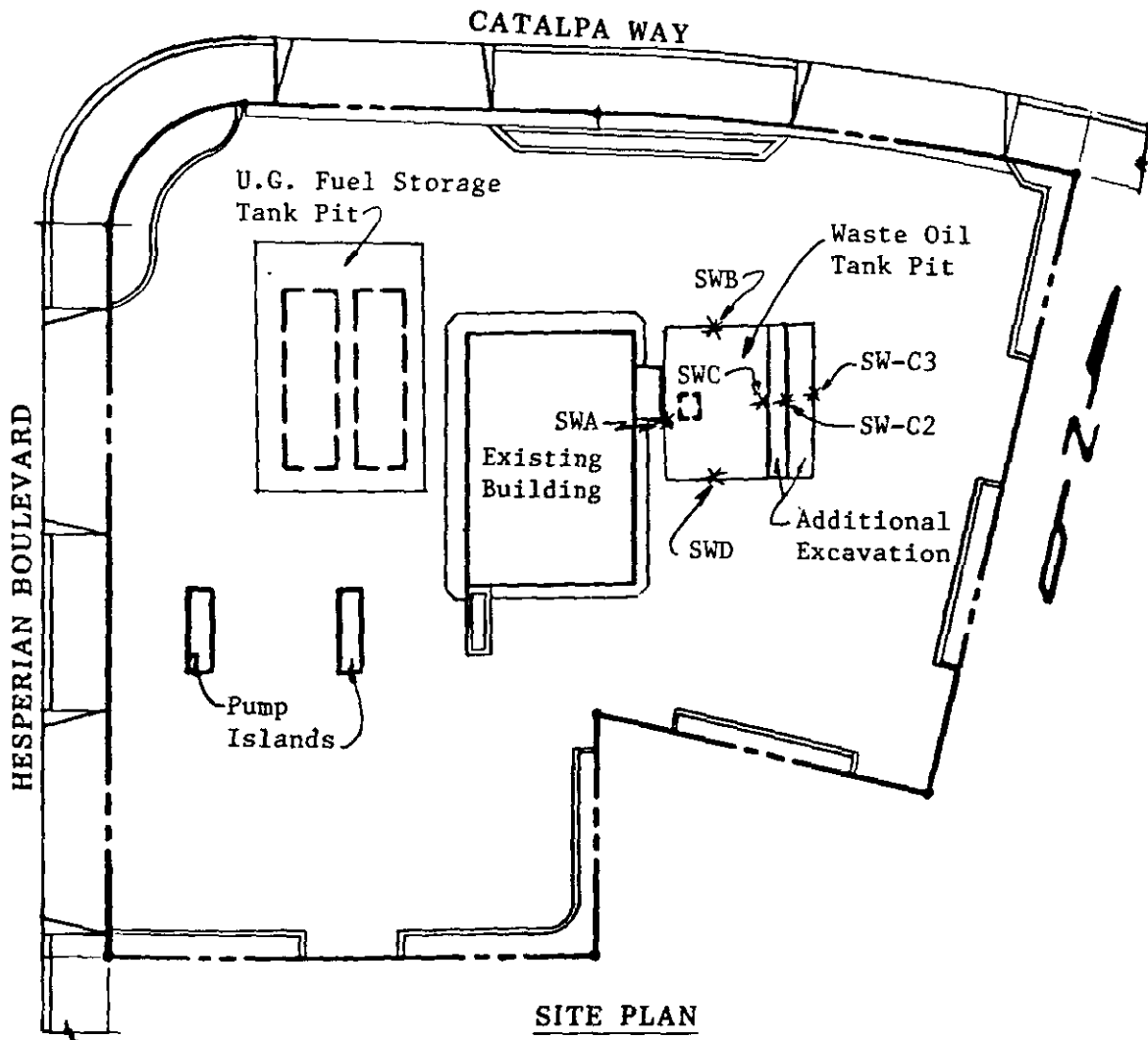


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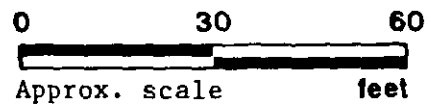
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SITE PLAN
Figure 4

LEGEND

* Sample Point Location

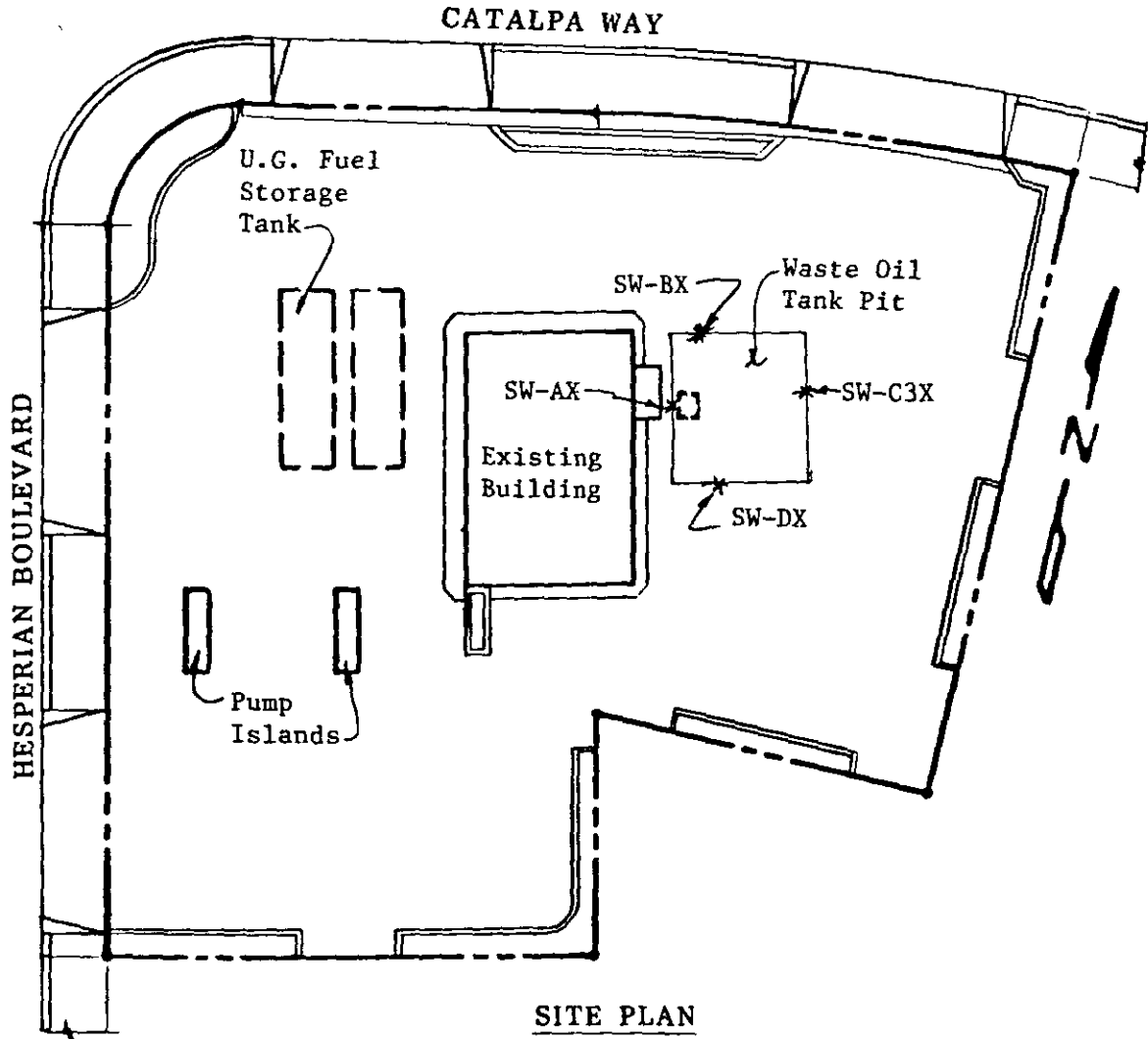


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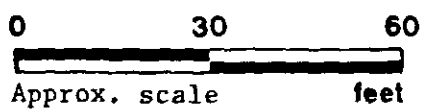
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SITE PLAN
Figure 5

LEGEND

* Sample Point Location



Unocal S/S #5487
28250 Hesperian Boulevard
Hayward, 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, 28250 Hesperian Blvd., Hayward	Sampled: May 10, 1991
P.O. Box 996	Matrix Descript: Water	Received: May 14, 1991
Benicia, CA 94510	Analysis Method: EPA 5030/8015/8020	Analyzed: May 22, 1991
Attention: Mardo Kaprealian, P.E.	First Sample #: 105-0457 AB	Reported: May 24, 1991

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

Sample Number	Sample Description	Low/Medium B.P.	Ethyl			
		Hydrocarbons	Benzene	Toluene	Benzene	Xylenes
		$\mu\text{g/L}$ (ppb)	$\mu\text{g/L}$ (ppb)	$\mu\text{g/L}$ (ppb)	$\mu\text{g/L}$ (ppb)	$\mu\text{g/L}$ (ppb)
105-0457 AB	MW-1	N.D.	N.D.	N.D.	N.D.	N.D.
105-0458 AB	MW-2	N.D.	N.D.	N.D.	N.D.	N.D.
105-0459 AB	MW-3	N.D.	N.D.	N.D.	N.D.	N.D.
105-0460 AB	MW-4	N.D.	N.D.	N.D.	N.D.	N.D.
105-0461 AB	MW-5	N.D.	N.D.	N.D.	N.D.	N.D.
105-0462 AB	MW-D	N.D.	N.D.	N.D.	N.D.	N.D.

Detection Limits:	30	0.30	0.30	0.30	0.30
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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.

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Belinda C. Vega
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Laboratory Director



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

Client Project ID: Unocal, 28250 Hesperian Blvd., Hayward
Sample Descript.: D I Blank
Analysis Method: EPA 5030/ 8015/8020
Lab Number: -----

Sampled: -----
Received: -----
Analyzed: May 22, 1991
Reported: May 24, 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.

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Client Project ID: Unocal, 28250 Hesperian Blvd., Hayward

P.O. Box 996

Benicia, CA 94510

Attention: Mardo Kaprealian, P.E. QC Sample Group: 1050457-62

Reported: May 24, 1991

QUALITY CONTROL DATA REPORT

ANALYTE	Benzene		Ethyl	
	Benzene	Toluene	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 22, 1991	May 22, 1991	May 22, 1991	May 22, 1991
QC Sample #:	105-0403	105-0403	105-0403	105-0403
Sample Conc.:	0.55	N.D.	N.D.	N.D.
Spike Conc. Added:	20	20	20	60
Conc. Matrix Spike:	19	19	18	57
Matrix Spike % Recovery:	92	95	90	95
Conc. Matrix Spike Dup.:	19	18	18	54
Matrix Spike Duplicate % Recovery:	92	90	90	90
Relative % Difference:	0	5.4	0	5.4

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% Recovery:	$\frac{\text{Conc. of M.S.} - \text{Conc. of Sample}}{\text{Spike Conc. Added}} \times 100$
Relative % Difference:	$\frac{\text{Conc. of M.S.} - \text{Conc. of M.S.D.}}{(\text{Conc. of M.S.} + \text{Conc. of M.S.D.}) / 2} \times 100$



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Client Project ID: Unocal, 28250 Hesperian Blvd., Hayward

Attention: Mardo Kaprealian, P.E. QC Sample Group: 1050457-62

Reported: May 24, 1991

QUALITY CONTROL DATA REPORT

SURROGATE

Method:	EPA8015/8020	EPA8015/8020	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	J. Fontecha	J. Fontecha
Reporting Units:	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
Date Analyzed:	May 22, 1991	May 22, 1991	May 22, 1991	May 22, 1991	May 22, 1991	May 22, 1991	May 22, 1991	May 22, 1991
Sample #:	105-0457	105-0458	105-0459	105-0460	105-0461	105-0462		Blank

Surrogate	100	100	100	98	94	96	100
% Recovery:							

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% Recovery:	$\frac{\text{Conc. of M.S.} - \text{Conc. of Sample}}{\text{Spike Conc. Added}} \times 100$
Relative % Difference:	$\frac{\text{Conc. of M.S.} - \text{Conc. of M.S.D.}}{(\text{Conc. of M.S.} + \text{Conc. of M.S.D.}) / 2} \times 100$



KAPREALIAN ENGINEERING, INC.

CHAIN OF CUSTODY

SAMPLER		SITE NAME & ADDRESS					ANALYSES REQUESTED		TURN AROUND TIME:
JOE		Unocal / Hayward 28250 Hesperian Blvd.					TPHG, BTX		Regular
WITNESSING AGENCY									REMARKS
SAMPLE ID NO.	DATE	TIME	SOIL	WATER	GRAB	NO. OF CONT.	SAMPLING LOCATION		
MW-1	5/10/91			✓	✓	2	MW	✓	1050457 Δ
MW-2	"	P.M. 1:50		✓	✓	2	"	✓	458
MW-3	"			✓	✓	2	"	✓	459
MW-4	"	A.M. 5:05		✓	✓	2	"	✓	460
MW-5	"	11:05		✓	✓	2	"	✓	461
MW-D	"			✓	✓	2	"	✓	462

VOA -> preserved

Relinquished by: (Signature) <i>[Signature]</i>	Date/Time 5/10/91	Received by: (Signature) <i>[Signature]</i>	5/10/91 1450
Relinquished by: (Signature) <i>[Signature]</i>	Date/Time 5/13/91	Received by: (Signature) <i>[Signature]</i>	
Relinquished by: (Signature) <i>[Signature]</i>	Date/Time 5-13 18:15	Received by: (Signature) <i>[Signature]</i>	
Relinquished by: (Signature)	Date/Time	Received by: (Signature)	

- The following MUST BE completed by the laboratory accepting samples for analysis:
- Have all samples received for analysis been stored in ice?
yes
 - Will samples remain refrigerated until analyzed?
yes
 - Did any samples received for analysis have head space?
no
 - Were samples in appropriate containers and properly packaged?
yes
- [Signature]* *[Signature]* 5-10
Signature Title Date