Received
7/12/91
SDS

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

July 10, 1991

Alameda County
Department of Environmental Health
470 - 27th Street, Room 322
Oakland, CA 94612

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 June 27, 1991, for the above referenced site.

Should you have any questions, please feel free to call our office at (707) 746-6915.

Sincerely,

Kaprealian Engineering, Inc.

Judy A. Dewey

jad\32

Enclosure

cc: Ron Bock, Unocal Corporation

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Consulting Engineers
P.O. BOX 996 • BENICIA, CA 94510
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KEI-P90-0806.R2
June 27, 1991

Unocal Corporation
P.O. Box 5155
San Ramon, California 94583

Attention: Mr. Ron Bock

RE: Ground Water Investigation at
Unocal Service Station #5484
18950 Lake Chabot Road
Castro Valley, California

Dear Mr. Bock:

This report presents the results of soil and ground water investigation for the referenced site in accordance with Kaprealian Engineering, Inc's. (KEI) proposal KEI-P90-0806.P1 dated January 9, 1991. The purpose of the investigation was to determine the degree and extent of the subsurface soil and ground water contamination at the site. The scope of the work performed by KEI consisted of the following:

Coordination with regulatory agencies.

Geologic logging of two borings, one of which was converted into a monitoring well.

Soil sampling.

Ground water monitoring, purging and sampling.

Laboratory analyses.

Data analysis and report preparation.

SITE DESCRIPTION AND 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 which incorporates Castro Valley. A Location Map and numerous Site Plans are attached to this report.

Previous activities at the site have been conducted by Applied GeoSystems (AGS) of Fremont, California, and have included the installation of six monitoring wells and five soil borings, and 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 4/19/91;

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, respectively. Ground water was initially encountered at a depth of 8 feet in MW1 and at 20 feet 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, and are presented in Table 4.

Also, 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, water level is unknown, but total

depth is 52 feet. 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 and a total depth of 220 feet. Both wells are considered downgradient from the subject site.

Apparently during a site monitoring visit conducted 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 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. 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 S-13.5-B5 collected from well MW5 at a depth of 13.5 feet, 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 underground 10,000 gallon (unleaded and super unleaded) 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, and the waste oil tank pit was excavated to a depth of 8 feet. 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 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, to a depth of 15 feet.

The highest concentrations of TPH as gasoline (up to 4,300 ppm) encountered in soil samples collected promptly after tank removal 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 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 a depth of 8 feet 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 additional 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. The borings were left open until November 22, 1989, and water levels in the borings reportedly ranged between 6.48 to 12.65 feet. Soil samples collected from depths ranging from 4 to 19.5 feet below grade were analyzed at a laboratory. Analytical results of soil samples collected from the 10 foot depth show 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 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.

RECENT FIELD ACTIVITIES

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. The well was drilled, constructed and completed in accordance with the guidelines of the Regional Water Quality Control Board (RWQCB), and the California Well Standards per Bulletin 74-90. Boring EB1 was backfilled with neat cement grout from the bottom of the boring up to the surface.

The subsurface materials penetrated and details of the construction of well MW7 are described in the attached Boring Logs.

The monitoring well was drilled and completed to a total depth of 19.8 feet, while the exploratory boring was drilled to a total depth of 7 feet. 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, but was measured approximately four hours after completion of the drilling activities at a depth of about 13-1/4 feet. Ground water did not rapidly enter the borehole during drilling, and therefore a precise depth to initial ground water cannot be provided. Soil and bedrock samples were taken for laboratory analysis and lithologic logging purposes at a maximum interval of 5 foot, at significant changes in lithology, at obvious areas of contamination, and at the bedrock/ground water interface beginning at a depth of approximately 4 to 5 feet below grade until ground water was encountered. Soil samples were obtained below the first encountered ground water at the depths indicated on the attached Boring Logs for lithologic logging purposes only. The undisturbed soil samples were taken by driving a California-modified split-spoon sampler lined with brass liners ahead of the drilling augers. The two-inch diameter brass liners holding the samples were sealed with aluminum foil, plastic caps and tape and placed in plastic zip-lock baggies, and stored in a cooled ice chest for delivery to a certified laboratory. The well casing was installed with a watertight cap and padlock. A round, watertight, flush-mounted well cover was cemented in place over the well casing of MW7.

The surface of all existing well covers were surveyed by Kier & Wright of Pleasanton, California to Mean Sea Level (MSL) and to a vertical accuracy of 0.01 feet.

Well MW7 was developed on May 15, 1991. Prior to development, all wells were checked for depth to the water table using an electronic sounder, presence of free product (using an interface probe or paste tape) and sheen. No free product or sheen was noted in any of the wells. After recording the monitoring data, well MW7 was developed with a surface pump until the evacuated water was reasonably clear and free of suspended sediment. During development, well MW7 was purged of 20 gallons. Also, well MW2 was purged of 11 gallons and well MW6 was purged of 27 gallons. Monitoring and well development data are summarized in Table 1.

Monitoring wells MW2 and MW4 through MW7 were sampled on May 23, 1991. Prior to sampling, monitoring data was collected and the wells purged of between 9 and 15 gallons. Water samples were then collected using a clean Teflon bailer, which was rinsed with distilled water prior to sampling each well. The samples were decanted into clean glass VOA vials, sealed with Teflon-lined screw caps, and labeled and stored in a cooler on ice until delivery to a certified laboratory.

ANALYTICAL RESULTS

Water samples from monitoring wells MW2 and MW4 through MW7, and selected soil samples from EB1 and MW7 were analyzed at Sequoia Analytical Laboratory in Concord, California. All samples were accompanied by properly executed Chain of Custody documentation. Soil and water samples were analyzed for TPH as gasoline by EPA method 5030 in conjunction with modified 8015, and BTX&E by EPA method 8020. In addition, soil and water samples collected from MW7 (adjacent to the waste oil tank) were analyzed for TPH as diesel by EPA method 3550 (soil) and 3510 (water) in conjunction with 8015, for TOG by Standard Method 5520E&F (soil) and 5520B&F (water), and for chlorinated solvents (halogenated volatile organics) using EPA method 8010.

Analytical results of the soil samples, collected from the borings for monitoring well MW7 and from boring EB1, indicate levels of TPH as gasoline ranging from non-detectable up to 130 ppm, with benzene levels ranging from non-detectable up to 0.51 ppm. In MW7, levels of TPH as diesel ranged from non-detectable up 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 indicate 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 the water analyses in Table 2. Copies of the laboratory analyses and Chain of Custody documentation are attached to this report.

MCL 0.5 ppb Carcinogen

HYDROLOGY AND GEOLOGY

The water table stabilized in the monitoring wells at depths ranging from 6.58 to 9.63 feet below the surface. The ground water flow direction appeared to be toward the south-southwest on May 23, 1991, with a hydraulic gradient of approximately .08 to .12, (based on water level data collected from the five monitoring wells prior to purging and sampling).

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.

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

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 consisting of highly sheared shale, which is 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. However, about four hours after completion of the drilling, ground water was measured at about 13-1/4 feet in the well, and eventually stabilized at 9.63 feet on May 23, 1991.

DISCUSSION AND RECOMMENDATIONS

Monitoring well MW2 is currently being monitored and sampled on a quarterly basis. Monitoring wells MW4, MW5 and MW6 are currently being monitored on a quarterly basis and sampled on a bi-annual basis. Based upon the analytical results of the recent field work, and a review of past monitoring data, KEI recommends the implementation of a modified monitoring and sampling program. All of the monitoring wells should be monitored on a monthly basis. Wells MW2, MW7 and downgradient well MW5 should be sampled on a quarterly basis. Wells MW4 and MW6 should continue to be sampled on a bi-annual basis. The proposed program should be conducted for a period of six months. The results of the monitoring program will be documented and evaluated after each monitoring and sampling event. Recommendations for altering or terminating the program will be made as needed.

In addition, off-site well MW5 should be analyzed on a one-time basis for TPH as diesel using EPA method 3510 in conjunction with modified 8015.

DISTRIBUTION

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

LIMITATIONS

Soil deposits and rock formations may vary in thickness, lithology, saturation, strength and other properties across any site. In addition, environmental changes, either naturally-occurring or artificially-induced, may cause changes in ground water levels and flow paths, thereby changing the extent and concentration of any contaminants. Our studies assume that the field and laboratory data are reasonably representative of the site as a whole, and assume that subsurface conditions are reasonably conducive to interpolation and extrapolation.

The results of this study are based on the data obtained from the field and laboratory analyses obtained from a state certified laboratory. We have analyzed this data using what we believe to be currently applicable engineering techniques and principles in the Northern California region. We make no warranty, either expressed or implied, regarding the above, including laboratory analyses, except that our services have been performed in accordance with generally accepted professional principles and practices existing for such work.

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

Sincerely,

Kaprealian Engineering, Inc.

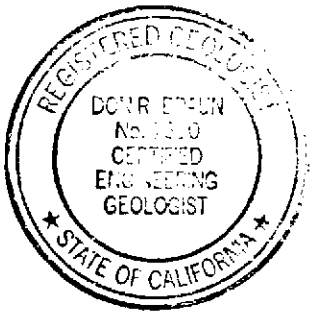
Thomas J. Berkins

Thomas J. Berkins
Senior Environmental Engineer

Don R. Braun

Don R. Braun
Certified Engineering Geologist

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



Timothy R. Ross

Timothy R. Ross
Project Manager

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

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June 27, 1991

TABLE 1

SUMMARY OF GROUND WATER MONITORING AND PURGING DATA

Well #	Ground Water Elevation (feet)	Depth to Water (feet)	Product Thickness	Sheen	Gallons Pumped
(Monitored and Developed on May 15, 1991)					
MW2	223.10	6.37	0	No	11
MW4*	219.04	9.04	0	No	0
MW5*	216.14	9.28	0	No	0
MW6	235.09	4.29	0	No	27
MW7	222.29	9.37	0	No	20
(Monitored and Sampled on May 23, 1991)					
MW2	222.89	6.58	0	No	12
MW4	218.88	9.20	0	No	15
MW5	215.95	9.47	0	No	15
MW6	232.00	7.38	0	No	15
MW7	222.03	9.63	0	No	9

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

* Monitored only.

** Elevation of top of well covers surveyed to MSL.

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TABLE 2

SUMMARY OF LABORATORY ANALYSES
WATER

Date	Sample Number	TPH as Diesel	TPH as Gasoline	Benzene	Toluene	Xylenes	Ethyl-benzene
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	0.3	0.3	0.3	0.3

-- Indicates analysis not performed.

ND = Non-detectable.

* 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

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

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

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

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June 27, 1991

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	--	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	3.1	19	0.048	0.0086	1.6	0.50
	MW7(13)*	13	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.R2
June 27, 1991

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 not performed.

ND = Non-detectable.

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

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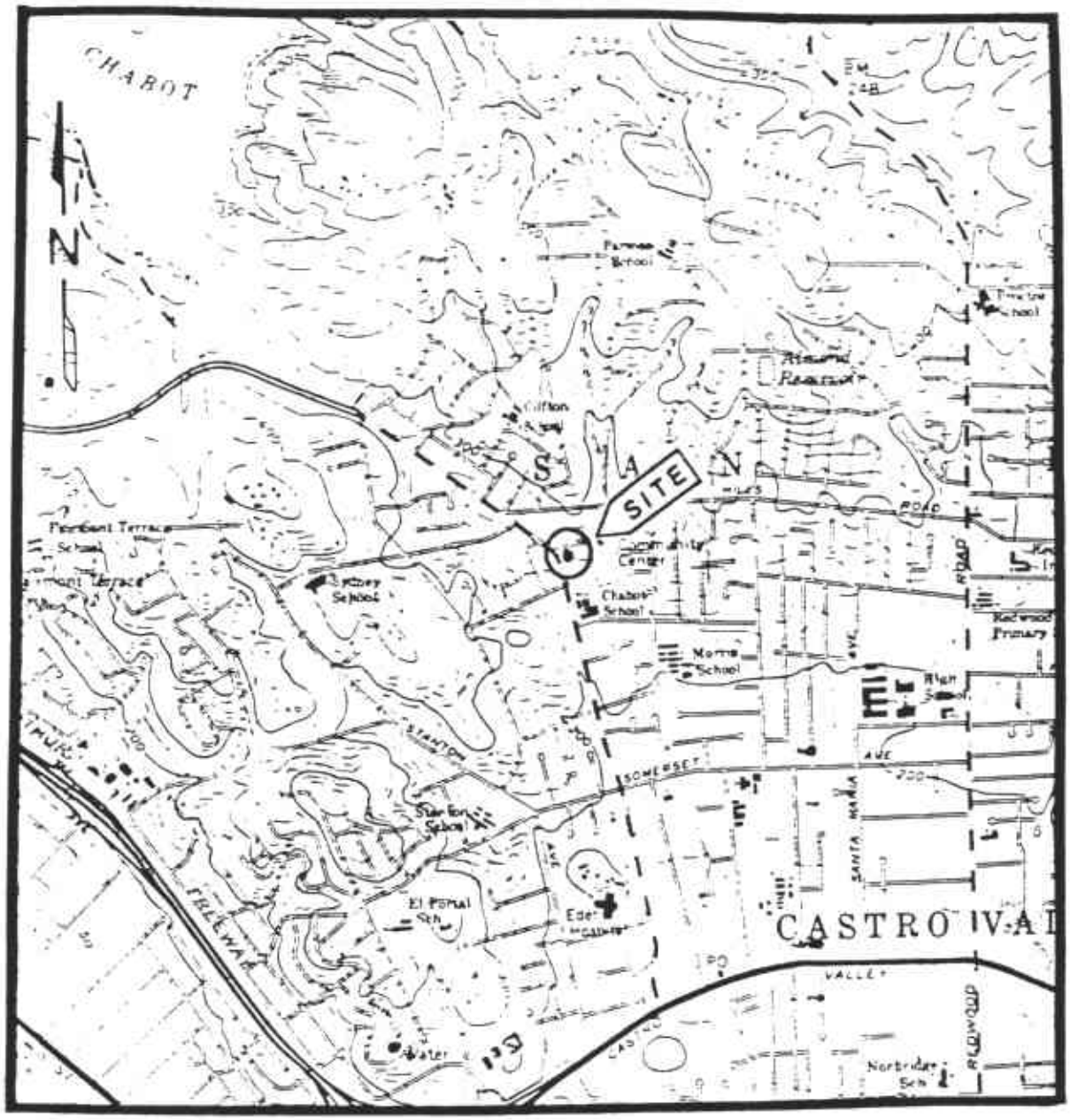

LOCATION MAP

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

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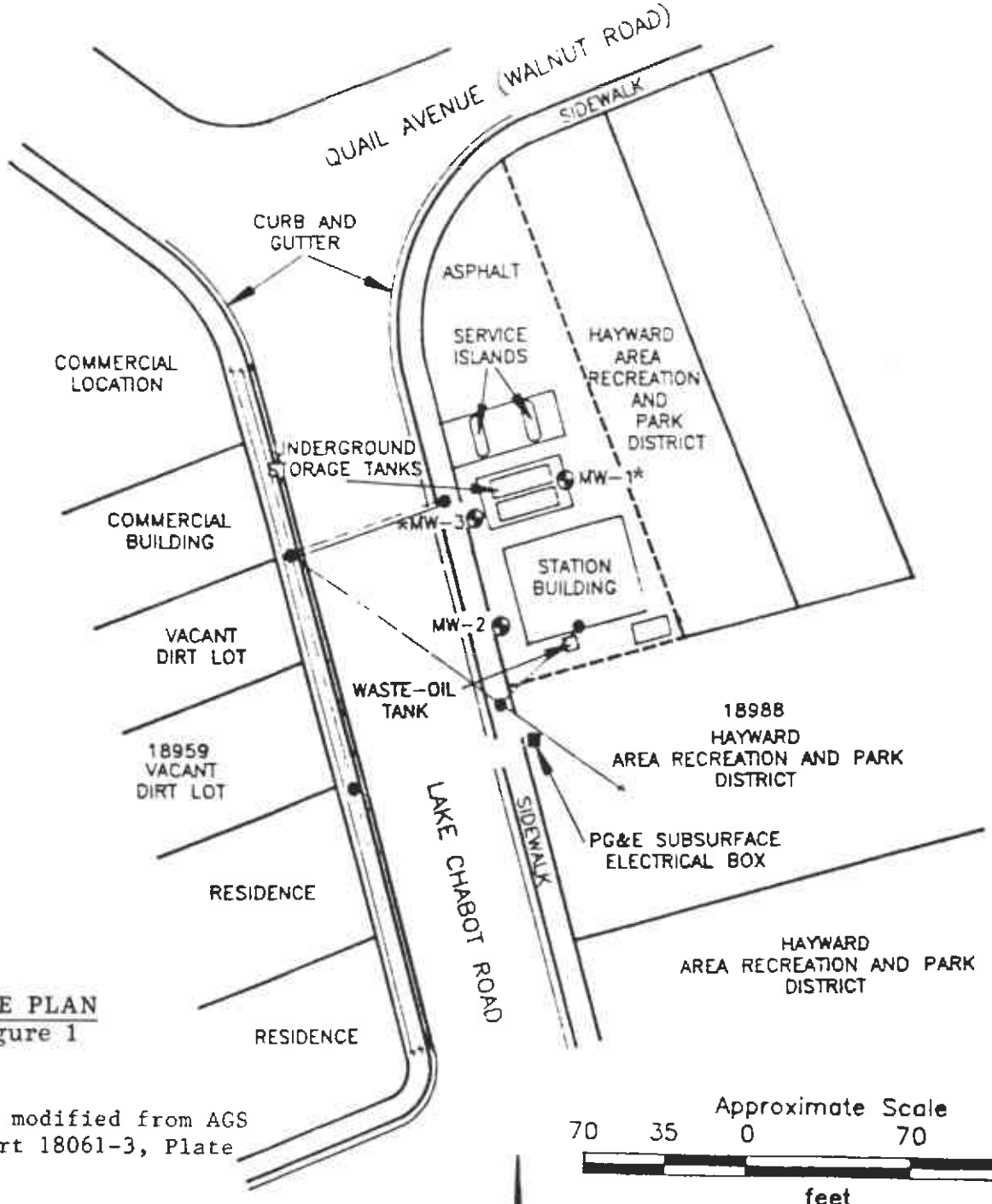

SITE PLAN
Figure 1

Base modified from AGS report 18061-3, Plate P-1

Approximate Scale
70 35 0 70 140
feet

● = Existing monitoring well location

—— = Overhead power/telephone line

● = Poles

* Wells MW-1 and MW-3 were destroyed

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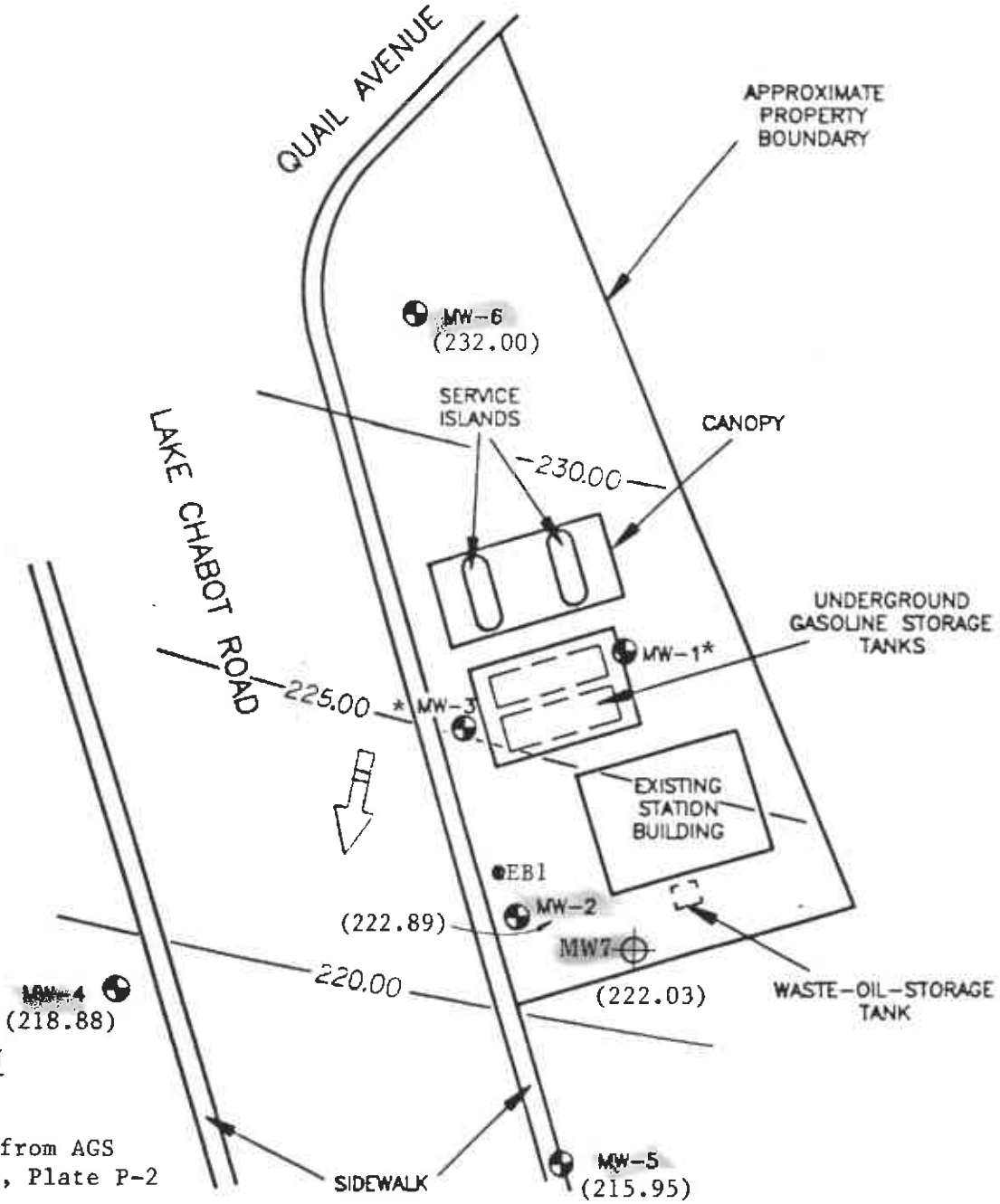

SITE PLAN
Figure 2

Base modified from AGS
Report 18061-4, Plate P-2

——— Contours of ground water table elevation
⊕ Monitoring well (by KEI)
● Exploratory boring (by KEI)
◔ Monitoring well (by AGS)
( ) Elevation of ground water table in feet above Mean Sea Level on 5/23/91
⇨ Direction of ground water flow
* Wells MW-1 and MW-3 were destroyed

Approximate Scale
40 20 0 40 80
feet

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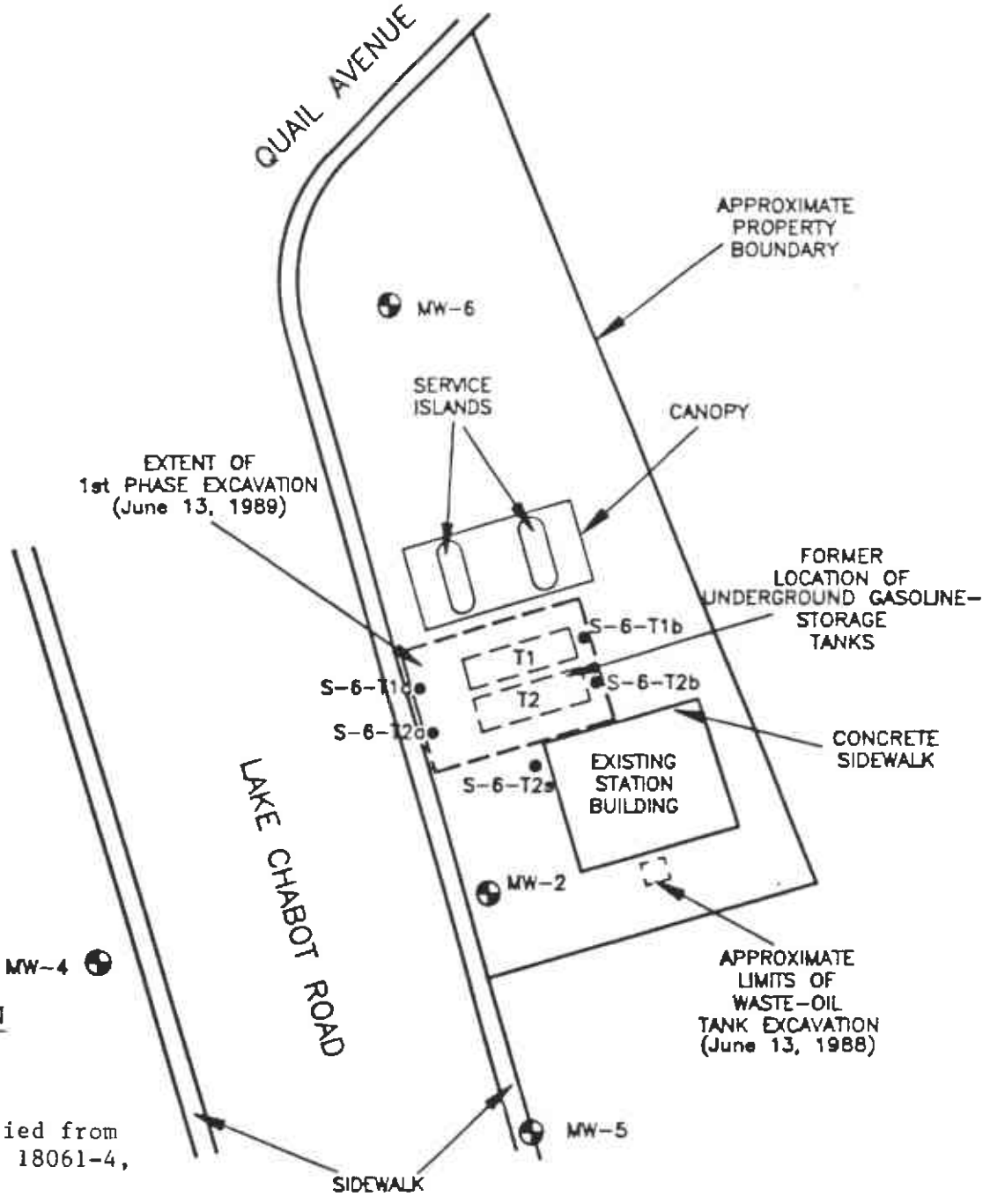

SITE PLAN
Figure 3

Base modified from AGS report 18061-4, Plate, P-3

– – – – – = Sidewalls of excavation
S-6-T2s● = Soil sample point
└→ = Sample depth
MW-6 = Monitoring well

Approximate Scale
40 20 0 40 80
feet

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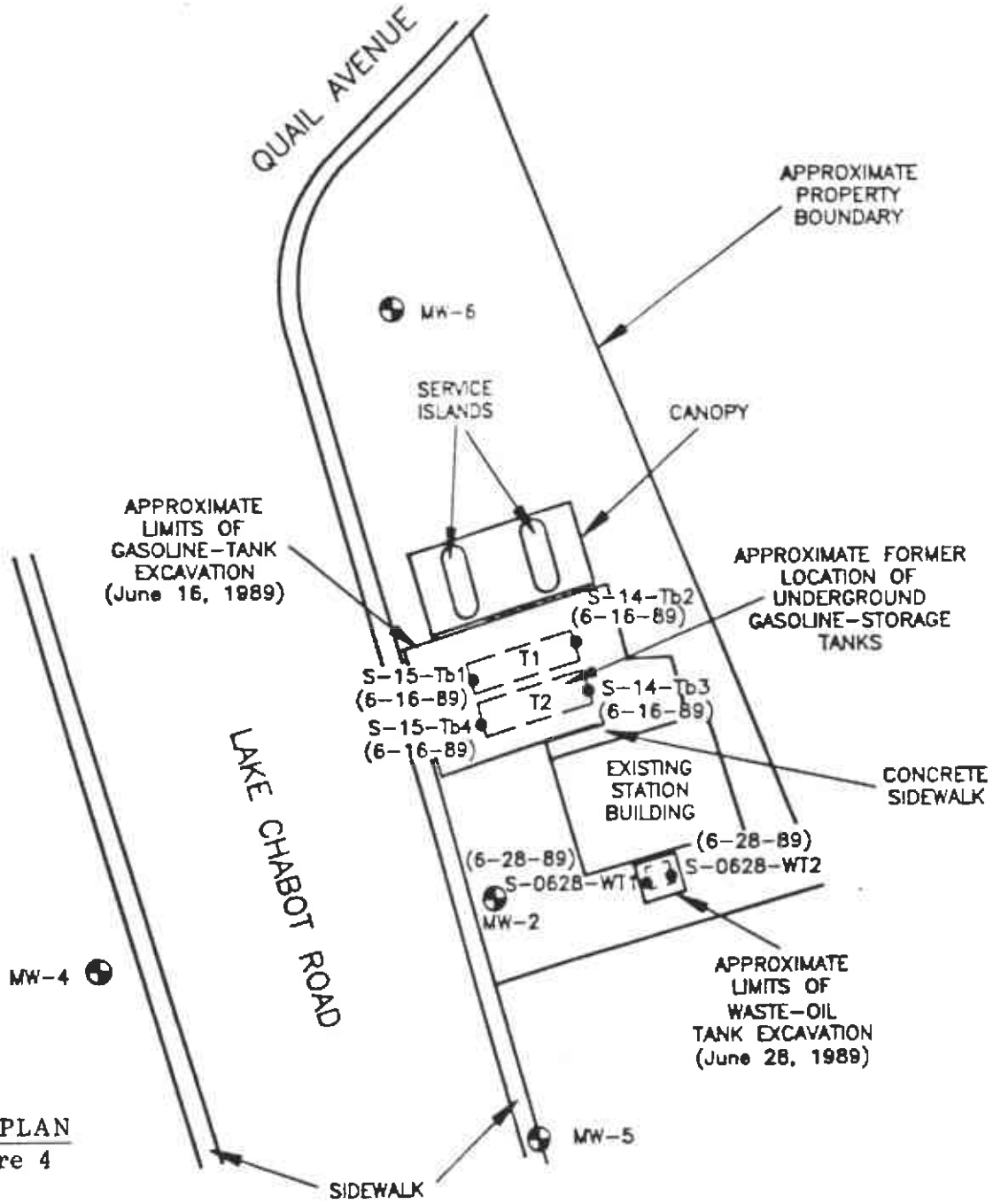

SITE PLAN
Figure 4

Base modified from AGS report 18061-4, Plate P-4

S-15-Tb4 ● = Soil sample point
└→ = Sample depth
MW-8 ⊕ = Monitoring well

Approximate Scale
40 20 0 40 80
feet

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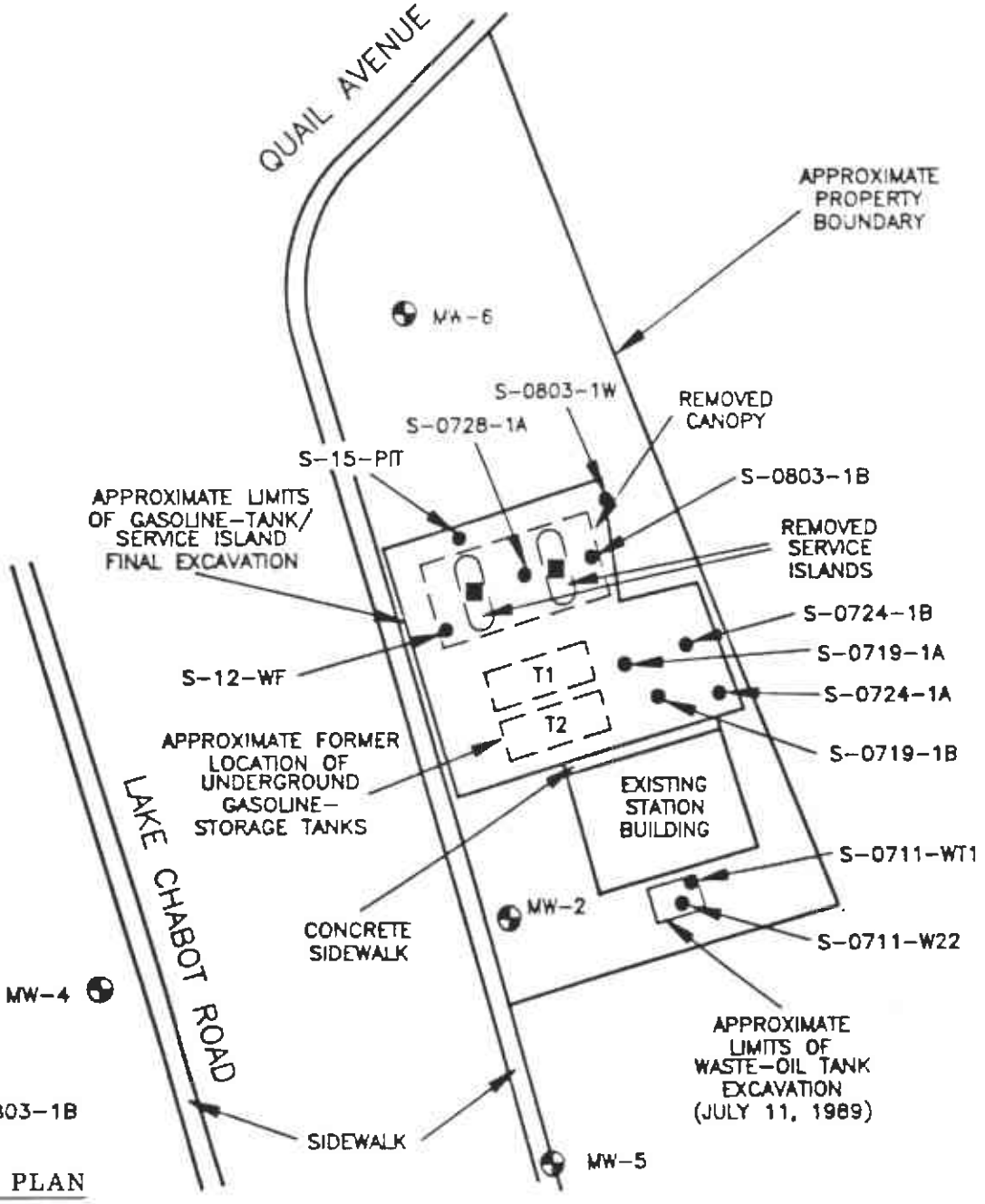

SITE PLAN

Figure 5

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

S-0803-1B ● = Soil sample point

■ = Canopy posts

MW-6 ⊕ = Monitoring well

Approximate Scale

40 20 0 40 80

feet

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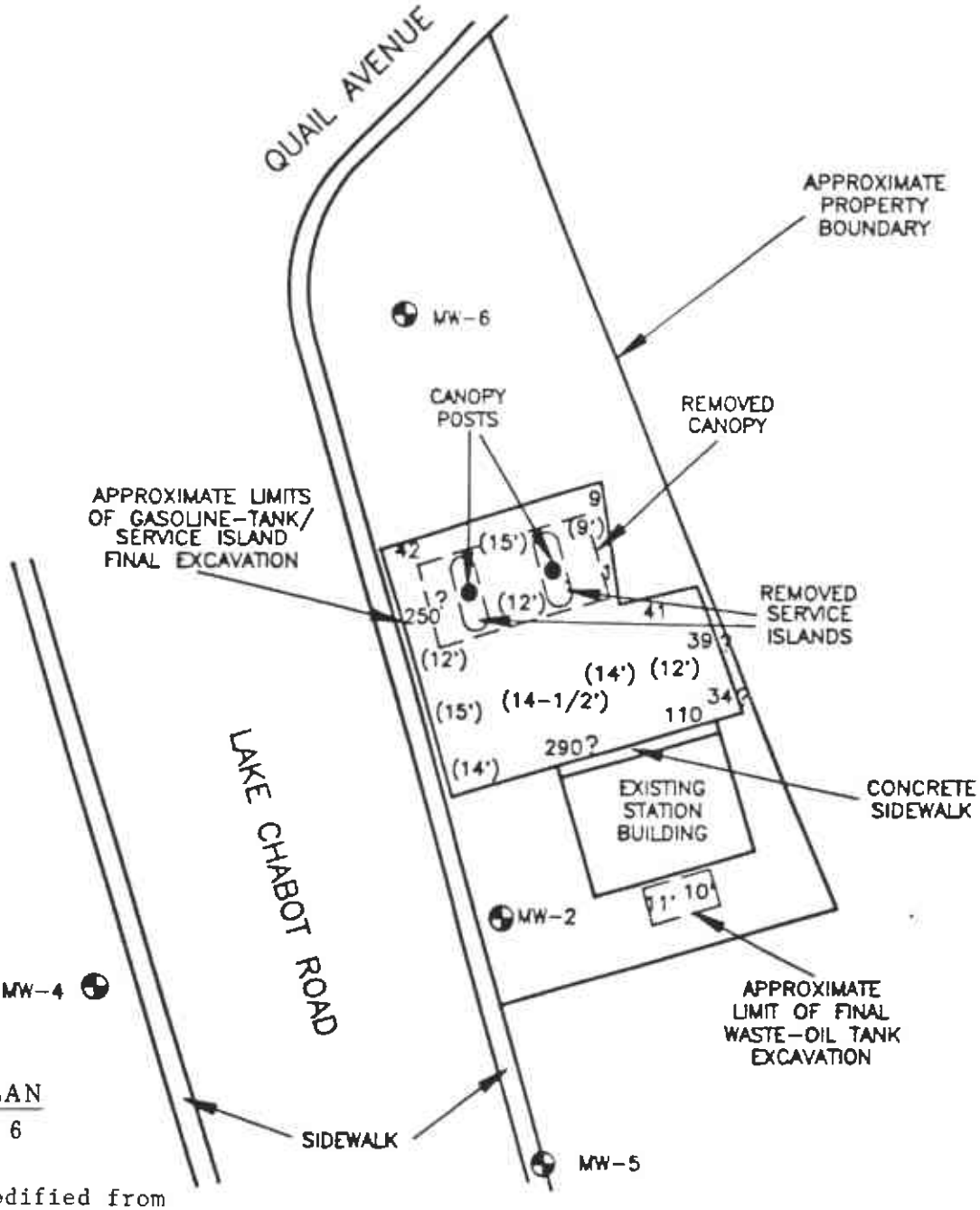

SITE PLAN
Figure 6

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

(15') = Approximate depth of excavation in feet

290 = OVM reading in sidewall of excavation in ppm

MW-6 = Monitoring well

Approximate Scale
40 20 0 40 80
feet

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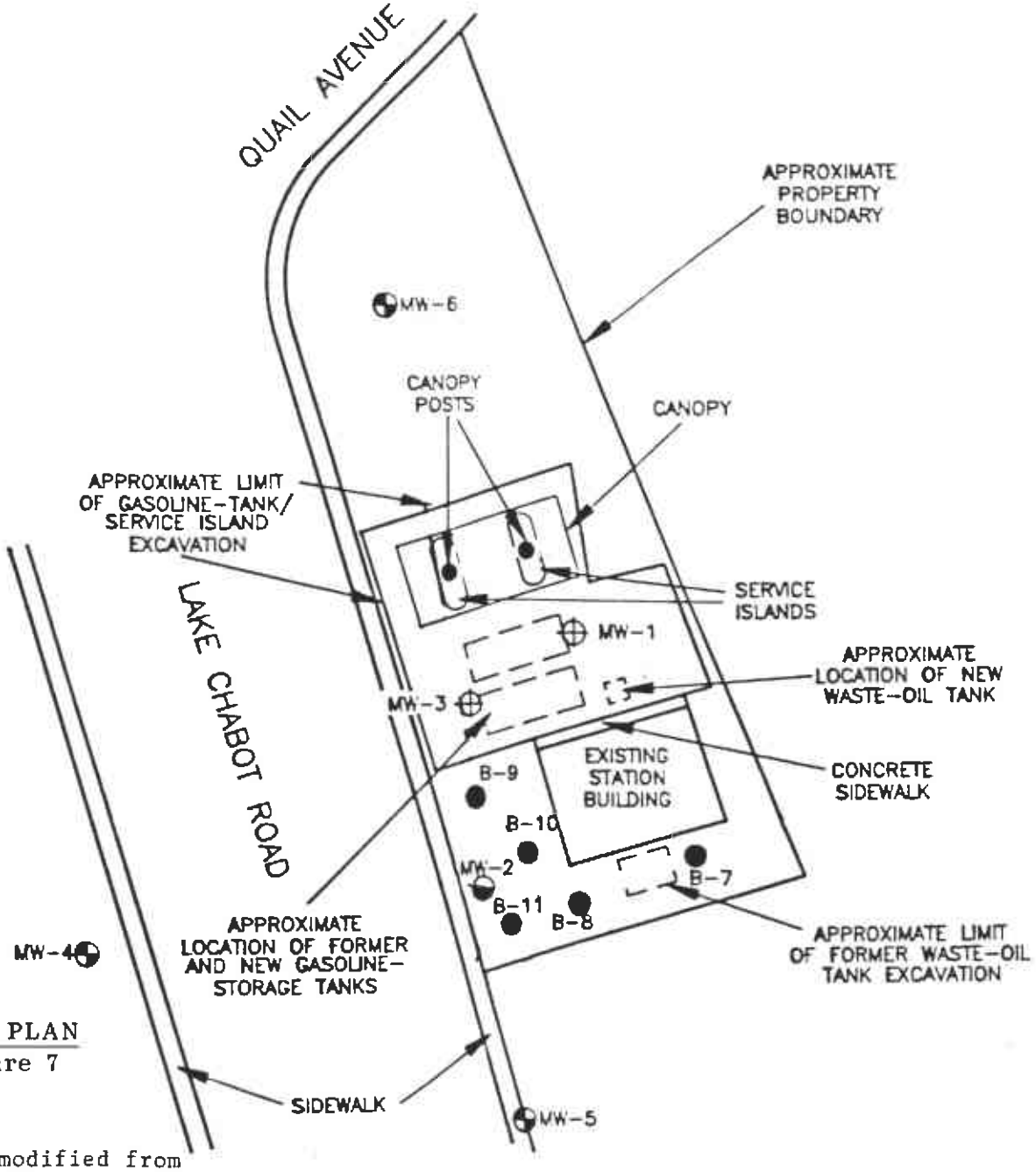

SITE PLAN
Figure 7

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

B-12 ● = Soil boring

MW-6 ◓ = Monitoring well installed by Applied GeoSystems (1989)

MW-2 ◒ = Monitoring well installed by Applied GeoSystems (1988)

MW-3 ⊕ = Former monitoring well installed by Applied GeoSystems (1988)

N

Approximate Scale

40 20 0 40 80

feet

Unocal S/S #5484
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Castro Valley, CA

BORING LOG

Project No. KEI-P90-0806	**Boring Diameter** 8"	**Logged By** W.W.
Project Name Unocal Castr. Val. Lake Chab	**Well Cover Elevation** N/A	**Date Drilled** 5/7/91
Boring No. EB1	**Drilling Method** Hollow-stem Auger	**Drilling Company** EGI

Penetration blows/6"	G. W. level	Depth (feet) Samples	Strati-graphy USCS	Description
		0		Asphalt pavement over sand and gravel.
			ML	Silt, trace sand and gravel, moist, grayish brown.
10/30/45			CH	Clay, trace fine-grained sand, moist, hard, olive gray and strong brown mottled, trace rootlets.
		5	N/A	Bedrock - shale, highly sheared, variably weathered, dry, gray to olive gray, with strong brown staining, waxy.
88				Bedrock, as above, less weathered, moist, gray to olive gray with olive brown staining.
		10		
		15		
		20		TOTAL DEPTH: 7'

BORING LOG

Project No. KEI-P90-0806	**Boring & Casing Diameter** 9" 2"	**Logged By** W.W.
Project Name Unocal Castr. Val. Lake Chab	**Well Cover Elevation**	**Date Drilled** 5/7/91
Boring No. MW7	**Drilling Method** Hollow-stem Auger	**Drilling Company** EGI

Penetration blows/6"	G. W. level	Depth (feet) Samples	Strati-graphy USCS	Description
		0		Asphalt pavement over silty gravel.
				Silt, trace sand, trace clay, moist, firm, trace rootlets, dark brown.
			ML	Clayey silt, with clay and sand, moist, stiff, pale brown.
45/59-4"				Bedrock- Shale, moderately weathered to highly weathered, highly sheared, slightly moist, gray with dark yellowish brown staining.
		5		
80-3"				
70-4"			N/A	
		10		
80-5"				Shale, highly sheared, variably weathered, slightly moist, gray with dark yellowish brown staining. yellowish brown staining.
35/60-5"				Shale, highly sheared, waxy appearance, slightly moist, dark yellowish brown.
	▽ After 4 hours			
		15		
42/50-5"				
				Shale, highly sheared, variably weathered, slight waxy appearance, very moist, gray to olive gray.
60-5"				
		20		TOTAL DEPTH: 19.8'

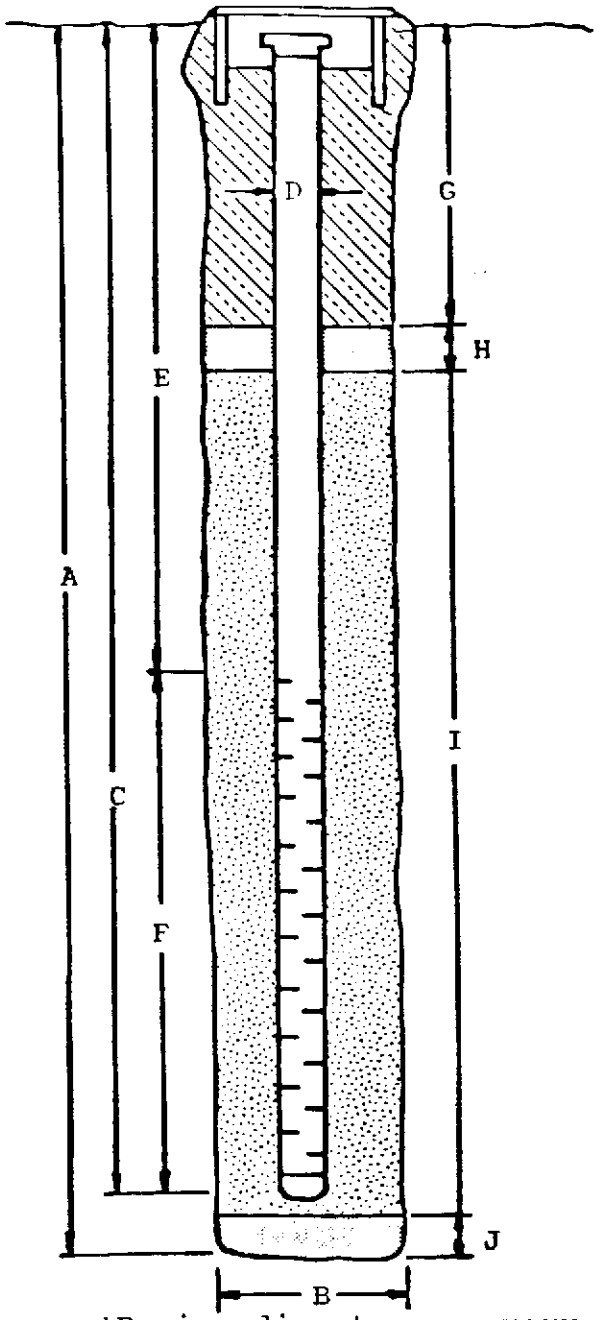
WELL COMPLETION DIAGRAM

PROJECT NAME: Unocal Castro Valley, 18950 Lake Ch BORING/WELL NO. MW7

PROJECT NUMBER: KEI-P90-0806

WELL PERMIT NO.:

Flush-mounted Well Cover



A. Total Depth: 19.8'

B. Boring Diameter*: 9"

Drilling Method: Hollow Stem Auger

C. Casing Length: 19.8'

Material: Schedule 40 PVC

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

E. Depth to Perforations: 4.8'

F. Perforated Length: 15'

Perforation Type: Machined Slot

Perforation Size: 0.020"

G. Surface Seal: 1.8'

Seal Material: Concrete

H. Seal: 2'

Seal Material: Bentonite

I. Gravel Pack: 16'

Pack Material: RMC Lonestar Sand

Size: #3

J. Bottom Seal: None

Seal Material: N/A

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

SEQUOIA ANALYTICAL

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Kaprealian Engineering, Inc.	Client Project ID:	Unocal, 13950 Lake Chabot Rd., Castro Valley	Sampled:	May 23, 1991
P.O. Box 996	Matrix Descript:	Water	Received:	May 24, 1991
Benicia, CA 94510	Analysis Method:	EPA 5030/8015/8020	Analyzed:	Jun 4, 1991
Attention: Mardo Kaprealian, P.E.	First Sample #:	105-0800 AB	Reported:	Jun 11, 1991

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

Sample Number	Sample Description	Low/Medium B.P. Hydrocarbons µg/L (ppb)	Benzene µg/L (ppb)	Toluene µg/L (ppb)	Ethyl Benzene µg/L (ppb)	Xylenes µg/L (ppb)
105-0800 AB	MW2	N.D.	N.D.	N.D.	N.D.	N.D.
105-0801 AB	MW4	N.D.	N.D.	N.D.	N.D.	N.D.
105-0802 AB	MW5	N.D.	N.D.	N.D.	N.D.	N.D.
105-0803 AB	MW6	N.D.	N.D.	N.D.	N.D.	N.D.
105-0804 AB	MW7	3,000	160	1.2	25	120
Detection Limits:		**30**	**0.30**	**0.30**	**0.30**	**0.30**

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

SEQUOIA ANALYTICAL

Belinda C. Vega
Laboratory Director

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Kaprealian Engineering, Inc.	Client Project ID:	Unocal, 13950 Lake Chabot Rd., Castro Valley	Sampled: - - - - - -
P.O. Box 996	Sample Descript.:	D I Blank	Received: - - - - - -
Benicia, CA 94510	Analysis Method:	EPA 5030/ 8015/8020	Analyzed: Jun 4, 1991
Attention: Mardo Kaprealian, P.E.	Lab Number:	- - - - - -	Reported: Jun 11, 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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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, 13950 Lake Chabot Rd., Castro Valley
QC Sample Group: 1050800-04
Reported: Jun 11, 1991

QUALITY CONTROL DATA REPORT

ANALYTE	Benzene	Toluene	Ethyl Benzene	Xylenes
Method:	EPA8015/8020	EPA8015/8020	EPA8015/8020	EPA8015/8020
Analyst:	J. Fontecha	J. Fontecha	J. Fontecha	J. Fontecha
Reporting Units:	ppb	ppb	ppb	ppb
Date Analyzed:	Jun 4, 1991	Jun 4, 1991	Jun 4, 1991	Jun 4, 1991
QC Sample #:	105-0785	105-0785	105-0785	105-0785
Sample Conc.:	N.D.	N.D.	N.D.	N.D.
Spike Conc. Added:	20	20	20	60
Conc. Matrix Spike:	21	20	20	58
Matrix Spike % Recovery:	100	100	100	97
Conc. Matrix Spike Dup.:	21	21	20	60
Matrix Spike Duplicate % Recovery:	100	100	100	100
Relative % Difference:	0	4.9	0	3.4

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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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Benicia, CA 94510
Attention: Mardo Kaprealian, P.E.

Client Project ID: Unocal, 13950 Lake Chabot Rd., Castro Valley
QC Sample Group: 1050800-04
Reported: Jun 11, 1991

QUALITY CONTROL DATA REPORT

SURROGATE

Method:	EPA8015/8020	EPA8015/8020	EPA8015/8020	EPA8015/8020	EPA8015/8020	EPA8015/8020
Analyst:	J. Fontecha	J. Fontecha	J. Fontecha	J. Fontecha	J. Fontecha	J. Fontecha
Reporting Units:	ppb	ppb	ppb	ppb	ppb	ppb
Date Analyzed:	Jun 4, 1991	Jun 4, 1991	Jun 4, 1991	Jun 4, 1991	Jun 4, 1991	Jun 4, 1991
Sample #:	105-0800	105-0801	105-0802	105-0803	105-0804	Blank
Surrogate % Recovery:	82	100	100	100	84	100

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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.	Client Project ID:	Unocal, 13950 Lake Chabot Rd., Castro Valley	Sampled:	May 23, 1991
P.O. Box 996	Matrix Descript:	Water	Received:	May 24, 1991
Benicia, CA 94510	Analysis Method:	EPA 3510/8015	Extracted:	May 30, 1991
Attention: Mardo Kaprealian, P.E.	First Sample #:	105-0804 C	Analyzed:	Jun 3, 1991
			Reported:	Jun 11, 1991

TOTAL PETROLEUM FUEL HYDROCARBONS (EPA 8015)

Sample Number	Sample Description	High B.P. Hydrocarbons µg/L (ppb)
105-0804 C	MW7	540

Detection Limits:	**50**

High Boiling Point Hydrocarbons are quantitated against a diesel fuel standard.
Analytes reported as N.D. were not present above the stated limit of detection.

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Laboratory Director

Please Note:
The above samples appear to contain diesel.

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Kaprealian Engineering, Inc.	Client Project ID:	Unocal, 13950 Lake Chabot Rd., Castro Valley	Sampled: - - - - - -
P.O. Box 996	Matrix Descript:	D I Blank	Received: - - - - - -
Benicia, CA 94510	Analysis Method:	EPA 3510/8015	Extracted: May 30, 1991
Attention: Mardo Kaprealian, P.E.	First Sample #:	- - - - - -	Analyzed: Jun 3, 1991
			Reported: Jun 11, 1991

TOTAL PETROLEUM FUEL HYDROCARBONS (EPA 8015)

Sample Number	Sample Description	High B.P. Hydrocarbons µg/L (ppb)
- - - - - -	D I Blank	N.D.

Detection Limits:	50

High Boiling Point Hydrocarbons are quantitated against a diesel fuel standard.
Analytes reported as N.D. were not present above the stated limit of detection.

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Belinda C. Vega
Laboratory Director

1050800.KEI <6>

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

Client Project ID: Unocal, 13950 Lake Chabot Rd., Castro Valley
QC Sample Group: 1050800-04
Reported: Jun 11, 1991

QUALITY CONTROL DATA REPORT

ANALYTE
Diesel

Method:	EPA 8015
Analyst:	JRM
Reporting Units:	µg/L
Date Analyzed:	Jun 3, 1991
QC Sample #:	BLK053091

Sample Conc.:	N.D.
Spike Conc. Added:	300
Conc. Matrix Spike:	260
Matrix Spike % Recovery:	86
Conc. Matrix Spike Dup.:	280
Matrix Spike Duplicate % Recovery:	92
Relative % Difference:	7.4

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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.	Client Project ID:	Unocal, 13950 Lake Chabot Rd., Castro Valley	Sampled:	May 23, 1991
P.O. Box 996	Matrix Descript:	Water	Received:	May 24, 1991
Benicia, CA 94510	Analysis Method:	SM 5520 B&F (Gravimetric)	Extracted:	May 28, 1991
Attention: Mardo Kaprealian, P.E.	First Sample #:	105-0804 D	Analyzed:	Jun 3, 1991
			Reported:	Jun 11, 1991

TOTAL RECOVERABLE PETROLEUM OIL

Sample Number	Sample Description	Oil & Grease mg/L (ppm)
105-0804 D	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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Laboratory Director

1050800.KEI <8>

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

Client Project ID: Unocal, 13950 Lake Chabot Rd., Castro Valley
QC Sample Group: 1050800-04
Reported: Jun 11, 1991

QUALITY CONTROL DATA REPORT

ANALYTE	Oil & Grease
Method:	SM 5520 B&F
Analyst:	T. Mascarenas
Reporting Units:	mg/L
Date Analyzed:	Jun 3, 1991
QC Sample #:	Matrix Blank 052891M
Sample Conc.:	N.D.
Spike Conc. Added:	100
Conc. Matrix Spike:	82
Matrix Spike % Recovery:	82
Conc. Matrix Spike Dup.:	86
Matrix Spike Duplicate % Recovery:	86
Relative % Difference:	4.8

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Laboratory Director

$$\%\ \text{Recovery:}\quad \frac{\text{Conc. of M.S. - Conc. of Sample}}{\text{Spike Conc. Added}} \times 100$$

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

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Kaprealian Engineering, Inc.	Client Project ID:	Unocal, 13950 Lake Chabot Rd., Castro Valley	Sampled:	May 23, 1991
P.O. Box 996	Sample Descript:	Water, MW7	Received:	May 24, 1991
Benicia, CA 94510	Analysis Method:	EPA 5030/8010	Analyzed:	Jun 3, 1991
Attention: Mardo Kaprealian, P.E.	Lab Number:	105-0804 EF	Reported:	Jun 11, 1991

HALOGENATED VOLATILE ORGANICS (EPA 8010)

Analyte	Detection Limit µg/L	Sample Results µg/L
Bromodichloromethane	1.0	N.D.
Bromoform	1.0	N.D.
Bromomethane	1.0	N.D.
Carbon tetrachloride	1.0	N.D.
Chlorobenzene	1.0	N.D.
Chloroethane	5.0	N.D.
2-Chloroethylvinyl ether	1.0	N.D.
Chloroform	0.50	N.D.
Chloromethane	0.50	N.D.
Dibromochloromethane	0.50	N.D.
1,2-Dichlorobenzene	2.0	N.D.
1,3-Dichlorobenzene	2.0	N.D.
1,4-Dichlorobenzene	2.0	N.D.
1,1-Dichloroethane	0.50	N.D.
1,2-Dichloroethane	**0.50**	**3.4**
1,1-Dichloroethene	1.0	N.D.
cis-1,2-Dichloroethene	1.0	N.D.
trans-1,2-Dichloroethene	1.0	N.D.
1,2-Dichloropropane	0.50	N.D.
cis-1,3-Dichloropropene	5.0	N.D.
trans-1,3-Dichloropropene	5.0	N.D.
Methylene chloride	2.0	N.D.
1,1,2,2-Tetrachloroethane	0.50	N.D.
Tetrachloroethene	0.50	N.D.
1,1,1-Trichloroethane	0.50	N.D.
1,1,2-Trichloroethane	0.50	N.D.
Trichloroethene	0.50	N.D.
Trichlorofluoromethane	1.0	N.D.
Vinyl chloride	2.0	N.D.

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

SEQUOIA ANALYTICAL

Belinda C. Vega
Laboratory Director

SEQUOIA ANALYTICAL

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

Kaprealian Engineering, Inc.	Client Project ID:	Unocal, 13950 Lake Chabot Rd., Castro Valley	Sampled: - - - - - -
P.O. Box 996	Sample Descript:	D I Blank	Received: - - - - - -
Benicia, CA 94510	Analysis Method:	EPA 5030/8010	Analyzed: Jun 3, 1991
Attention: Mardo Kaprealian, P.E.	Lab Number:	- - - - - -	Reported: Jun 11, 1991

HALOGENATED VOLATILE ORGANICS (EPA 8010)

Analyte	Detection Limit µg/L	Sample Results µg/L
Bromodichloromethane	1.0	N.D.
Bromoform	1.0	N.D.
Bromomethane	1.0	N.D.
Carbon tetrachloride	1.0	N.D.
Chlorobenzene	1.0	N.D.
Chloroethane	5.0	N.D.
2-Chloroethylvinyl ether	1.0	N.D.
Chloroform	0.50	N.D.
Chloromethane	0.50	N.D.
Dibromochloromethane	0.50	N.D.
1,2-Dichlorobenzene	2.0	N.D.
1,3-Dichlorobenzene	2.0	N.D.
1,4-Dichlorobenzene	2.0	N.D.
1,1-Dichloroethane	0.50	N.D.
1,2-Dichloroethane	0.50	N.D.
1,1-Dichloroethene	1.0	N.D.
cis-1,2-Dichloroethene	1.0	N.D.
trans-1,2-Dichloroethene	1.0	N.D.
1,2-Dichloropropane	0.50	N.D.
cis-1,3-Dichloropropene	5.0	N.D.
trans-1,3-Dichloropropene	5.0	N.D.
Methylene chloride	2.0	N.D.
1,1,2,2-Tetrachloroethane	0.50	N.D.
Tetrachloroethene	0.50	N.D.
1,1,1-Trichloroethane	0.50	N.D.
1,1,2-Trichloroethane	0.50	N.D.
Trichloroethene	0.50	N.D.
Trichlorofluoromethane	1.0	N.D.
Vinyl chloride	2.0	N.D.

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

Client Project ID: Unocal, 13950 Lake Chabot Rd., Castro Valley
QC Sample Group: 1050800-04
Reported: Jun 11, 1991

QUALITY CONTROL DATA REPORT

ANALYTE	1,1-Dichloroethene	Trichloro-ethene	Chloro-benzene	Benzene	Toluene	Chloro-benzene (PID)
Method:	EPA 8010	EPA 8010	EPA 8010	EPA 8020	EPA 8020	EPA 8020
Analyst:	S. Le	S. Le	S. Le	S. Le	S. Le	S. Le
Reporting Units:	ppb	ppb	ppb	ppb	ppb	ppb
Date Analyzed:	Jun 4, 1991	Jun 4, 1991	Jun 4, 1991	Jun 4, 1991	Jun 4, 1991	Jun 4, 1991
QC Sample #:	105-0794	105-0794	105-0794	105-0794	105-0794	105-0794
Sample Conc.:	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Spike Conc. Added:	10	10	10	10	10	10
Conc. Matrix Spike:	7.6	9.5	11	8.7	8.3	9.2
Matrix Spike % Recovery:	76	95	110	87	83	92
Conc. Matrix Spike Dup.:	7.7	9.3	10	8.5	8.3	9.2
Matrix Spike Duplicate % Recovery:	77	93	100	85	83	92
Relative % Difference:	1.3	2.1	9.5	2.3	0	0

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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, 13950 Lake Chabot Rd., Castro Valley
QC Sample Group: 105-0804
Reported: Jun 11, 1991

QUALITY CONTROL DATA REPORT

SURROGATE

Method:	EPA 8010	EPA 8010
Analyst:	S. Le	S. Le
Reporting Units:	ppb	ppb
Date Analyzed:	Jun 4, 1991	Jun 4, 1991
Sample #:	105-0804	Blank
Surrogate #1 % Recovery:	140	120
Surrogate #2 % Recovery:	72	87

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Belinda C. Vega
Laboratory Director

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

KAPREALIAN ENGINEERING, INC.

CHAIN OF CUSTODY

SAMPLER: RAY (KEI)

WITNESSING AGENCY:

SITE NAME & ADDRESS: UNOCAL CASTRO VALLEY, 13950 CAN'E CHABOT RD

ANALYSES REQUESTED: TPHG; BTXE; TOG 5520 C&M; TPHD w/ Silica Gel Cleanup; 8010

TURN AROUND TIME: REGULAR

SAMPLE ID NO.	DATE	TIME	SOIL	WATER	GRAB	COMP	NO. OF CONT.	SAMPLING LOCATION	TPHG	BTXE	TOG 5520 C&M	TPHD w/ Silica Gel Cleanup	8010
MW2	5/23			X	X		2 40ml		X	X			
MW4	"			X	X		"		X	X			
MW5	"			X	X		"		X	X			
MW6	"			X	X		"		X	X			
MW7	"			X	X		4 40A 2 AMB		X	X	X	X	X

REMARKS: 1050800 AB; 801; 802; 803; 804 AF

Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Ray (KEI)	5-23-91	K. Walters 5/23
Craig Lee	5/24/91 1110	Jeff Coons
Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Relinquished by: (Signature)	Date/Time	Received by: (Signature)

The following MUST BE completed by the laboratory accepting samples for analysis:

1. Have all samples received for analysis been stored in ice? —
2. Will samples remain refrigerated until analyzed? —
3. Did any samples received for analysis have head space? no
4. Were samples in appropriate containers and properly packaged? —

Signature	Title	Date
KW	KCQA	5/23

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Kaprealian Engineering, Inc.	Client Project ID:	Unocal, 18950 Lake Chabot Rd., Castro Valley	Sampled:	May 7, 1991
P.O. Box 996	Matrix Descript:	Soil	Received:	May 9, 1991
Benicia, CA 94510	Analysis Method:	EPA 5030/8015/8020	Analyzed:	May 16, 1991
Attention: Mardo Kaprealian, P.E.	First Sample #:	105-0296	Reported:	May 23, 1991

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

Sample Number	Sample Description	Low/Medium B.P. Hydrocarbons mg/kg (ppm)	Benzene mg/kg (ppm)	Toluene mg/kg (ppm)	Ethyl Benzene mg/kg (ppm)	Xylenes mg/kg (ppm)
105-0296	EB1-(3)	1.8	N.D.	0.0066	0.050	0.12
105-0297	EB1-(6.5)	33	0.16	0.13	0.73	3.6
Detection Limits:		**1.0**	**0.0050**	**0.0050**	**0.0050**	**0.0050**

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

SEQUOIA ANALYTICAL

Belinda C. Vega
Laboratory Director

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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: 1050296-97
Reported: May 23, 1991

QUALITY CONTROL DATA REPORT

ANALYTE	Benzene	Toluene	Ethyl Benzene	Xylenes
Method:	EPA8015/8020	EPA8015/8020	EPA8015/8020	EPA8015/8020
Analyst:	J. Fontecha	J. Fontecha	J. Fontecha	J. Fontecha
Reporting Units:	ppm	ppm	ppm	ppm
Date Analyzed:	May 16, 1991	May 16, 1991	May 16, 1991	May 16, 1991
QC Sample #:	105-0433	105-0433	105-0433	105-0433
Sample Conc.:	N.D.	0.012	0.023	0.020
Spike Conc. Added:	0.40	0.40	0.40	1.2
Conc. Matrix Spike:	0.38	0.38	0.39	1.2
Matrix Spike % Recovery:	95	92	92	98
Conc. Matrix Spike Dup.:	0.39	0.40	0.40	1.3
Matrix Spike Duplicate % Recovery:	98	97	94	110
Relative % Difference:	2.6	5.1	2.5	8.0

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.	Client Project ID:	Unocal, 18950 Lake Chabot Rd., Castro Valley	Sampled: - - - - - -
P.O. Box 996	Sample Descript.:	Matrix Blank	Received: - - - - - -
Benicia, CA 94510	Analysis Method:	EPA 5030/8015/8020	Analyzed: May 16, 1991
Attention: Mardo Kaprealian, P.E.	Lab Number:	- - - - - -	Reported: May 23, 1991

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

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

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

SEQUOIA ANALYTICAL

Belinda C. Vega
Laboratory Director

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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: 1050296-97
Reported: May 23, 1991

QUALITY CONTROL DATA REPORT

SURROGATE

Method:	EPA8015/8020	EPA8015/8020	EPA8015/8020
Analyst:	J. Fontecha	J. Fontecha	J. Fontecha
Reporting Units:	ppm	ppm	ppm
Date Analyzed:	May 16, 1991	May 16, 1991	May 16, 1991
Sample #:	105-0296	105-0297	Blank
Surrogate % Recovery:	89	81	100

SEQUOIA ANALYTICAL

Belinda C. Vega
Laboratory Director

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

KAPREALIAN ENGINEERING, INC.

CHAIN OF CUSTODY

SAMPLER: Wade Weston

WITNESSING AGENCY:

SITE NAME & ADDRESS: Unocal - Castro Valley, 18950 Lake Chabot 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
EB1-(3)	5/7/91		✓		✓		1	See Sample ID #	✓	1050296
EB1-(6.5)	"		✓		✓		1	2	✓	297

Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Wade Weston	5/9 10:15	
Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Relinquished by: (Signature)	Date/Time	Received by: (Signature)

The following MUST BE completed by the laboratory accepting samples for analysis:

1. Have all samples received for analysis been stored in ice? ✓
2. Will samples remain refrigerated until analyzed? ✓
3. Did any samples received for analysis have head space? no
4. Were samples in appropriate containers and properly packaged? ✓

Signature	Title	Date
	SR	5/9

SEQUOIA ANALYTICAL

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Kaprealian Engineering, Inc.	Client Project ID:	Unocal, 18950 Lake Chabot Rd., Castro Valley	Sampled:	May 7, 1991
P.O. Box 996	Matrix Descript:	Soil	Received:	May 9, 1991
Benicia, CA 94510	Analysis Method:	EPA 5030/8015/8020	Analyzed:	May 17, 1991
Attention: Mardo Kaprealian, P.E.	First Sample #:	105-0304	Reported:	May 23, 1991

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

Sample Number	Sample Description	Low/Medium B.P. Hydrocarbons mg/kg (ppm)	Benzene mg/kg (ppm)	Toluene mg/kg (ppm)	Ethyl Benzene mg/kg (ppm)	Xylenes mg/kg (ppm)
105-0304	MW7-(4.5)	N.D.	N.D.	0.013	N.D.	0.013
105-0305	MW7-(10)	19	0.048	0.0086	.50	1.6
105-0306	MW7-(13)	130	0.51	0.25	1.9	2.5
Detection Limits:		**1.0**	**0.0050**	**0.0050**	**0.0050**	**0.0050**

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

SEQUOIA ANALYTICAL

Belinda C. Vega
Laboratory Director

1050304.KEI <1>

SEQUOIA ANALYTICAL

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Kaprealian Engineering, Inc.	Client Project ID:	Unocal, 18950 Lake Chabot Rd., Castro Valley	
P.O. Box 996	Sample Descript.:	Matrix Blank	
Benicia, CA 94510	Analysis Method:	EPA 5030/8015/8020	Analyzed: May 17, 1991
Attention: Mardo Kaprealian, P.E.	Q.C. Sample Grou	1050304-06	Reported: May 23, 1991

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

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

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

SEQUOIA ANALYTICAL

Belinda C. Vega
Laboratory Director

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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: 1050304-06
Reported: May 23, 1991

QUALITY CONTROL DATA REPORT

ANALYTE	Benzene	Toluene	Ethyl Benzene	Xylenes
Method:	EPA8015/8020	EPA8015/8020	EPA8015/8020	EPA8015/8020
Analyst:	J.F./S.L.	J.F./S.L.	J.F./S.L.	J.F./S.L.
Reporting Units:	ppm	ppm	ppm	ppm
Date Analyzed:	May 17, 1991	May 17, 1991	May 17, 1991	May 17, 1991
QC Sample #:	105-0625	105-0625	105-0625	105-0625
Sample Conc.:	N.D.	N.D.	N.D.	N.D.
Spike Conc. Added:	0.40	0.40	0.40	1.2
Conc. Matrix Spike:	0.40	0.38	0.38	1.2
Matrix Spike % Recovery:	100	95	95	100
Conc. Matrix Spike Dup.:	0.40	0.38	0.38	1.2
Matrix Spike Duplicate % Recovery:	100	95	95	100
Relative % Difference:	0	0	0	0

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: 1050304-06
Reported: May 23, 1991

QUALITY CONTROL DATA REPORT

SURROGATE

Method:	EPA8015/8020	EPA8015/8020	EPA8015/8020	EPA8015/8020
Analyst:	J.F./S.L.	J.F./S.L.	J.F./S.L.	J.F./S.L.
Reporting Units:	ppm	ppm	ppm	ppm
Date Analyzed:	May 17, 1991	May 17, 1991	May 17, 1991	May 17, 1991
Sample #:	105-0304	105-0305	105-0306	Blank
Surrogate % Recovery:	110	97	92	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

1050304.KEI <4>

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Kaprealian Engineering, Inc.	Client Project ID:	Unocal, 18950 Lake Chabot Rd., Castro Valley	Sampled:	May 7, 1991
P.O. Box 996	Matrix Descript:	Soil	Received:	May 9, 1991
Benicia, CA 94510	Analysis Method:	EPA 3550/8015	Extracted:	May 16, 1991
Attention: Mardo Kaprealian, P.E.	First Sample #:	105-0304	Analyzed:	May 17, 1991
			Reported:	May 23, 1991

TOTAL PETROLEUM FUEL HYDROCARBONS (EPA 8015)

Sample Number	Sample Description	High B.P. Hydrocarbons mg/kg (ppm)
105-0304	MW7-(4.5)	N.D.
105-0305	MW7-(10)	3.1
105-0306	MW7-(13)	9.1

Detection Limits:	1.0

High Boiling Point Hydrocarbons are quantitated against a diesel fuel standard.
Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL

Belinda C. Vega
Laboratory Director

1050304.KEI <5>

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: 1050304-06
Reported: May 23, 1991

QUALITY CONTROL DATA REPORT

ANALYTE	
	Diesel

Method:	EPA 8015
Analyst:	JRM
Reporting Units:	mg/kg
Date Analyzed:	May 17, 1991
QC Sample #:	BLK051691

Sample Conc.:	N.D.
Spike Conc. Added:	10
Conc. Matrix Spike:	7.3
Matrix Spike % Recovery:	73
Conc. Matrix Spike Dup.:	7.1
Matrix Spike Duplicate % Recovery:	71
Relative % Difference:	2.8

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.	Client Project ID:	Unocal, 18950 Lake Chabot Rd., Castro Valley	Sampled: ------
P.O. Box 996	Matrix Descript:	Matrix Blank	Received: ------
Benicia, CA 94510	Analysis Method:	EPA 3550/8015	Extracted: May 16, 1991
Attention: Mardo Kaprealian, P.E.	First Sample #:	------	Analyzed: May 17, 1991
			Reported: May 23, 1991

TOTAL PETROLEUM FUEL HYDROCARBONS (EPA 8015)

Sample Number	Sample Description	High B.P. Hydrocarbons mg/kg (ppm)
------	Matrix Blank	N.D.

Detection Limits:	1.0

High Boiling Point Hydrocarbons are quantitated against a diesel fuel standard.
Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL

Belinda C. Vega
Laboratory Director

1050304.KEI <7>

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Kaprealian Engineering, Inc.	Client Project ID:	Unocal, 18950 Lake Chabot Rd., Castro Valley	Sampled:	May 7, 1991
P.O. Box 996	Matrix Descript:	Soil	Received:	May 9, 1991
Benicia, CA 94510	Analysis Method:	SM 5520 E&F (Gravimetric)	Extracted:	May 17, 1991
Attention: Mardo Kaprealian, P.E.	First Sample #:	105-0304	Analyzed:	May 20, 1991
			Reported:	May 23, 1991

TOTAL RECOVERABLE PETROLEUM OIL

Sample Number	Sample Description	Oil & Grease mg/kg (ppm)
105-0304	MW7-(4.5)	N.D.
105-0305	MW7-(10)	N.D.
105-0306	MW7-(13)	N.D.

Detection Limits:	**30**

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

SEQUOIA ANALYTICAL

Belinda C. Vega
Laboratory Director

1050304.KEI <8>

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

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

Client Project ID: Unocal, 18950 Lake Chabot Rd., Castro Valley
QC Sample Group: 1050304-06
Reported: May 23, 1991

QUALITY CONTROL DATA REPORT

ANALYTE	Oil & Grease
Method:	SM 5520 E&F
Analyst:	R. Halsne
Reporting Units:	mg/kg
Date Analyzed:	May 20, 1991
QC Sample #:	Matrix Blank 051791M
Sample Conc.:	N.D.
Spike Conc. Added:	5,000
Conc. Matrix Spike:	4,400
Matrix Spike % Recovery:	88
Conc. Matrix Spike Dup.:	4,200
Matrix Spike Duplicate % Recovery:	84
Relative % Difference:	4.7

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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.	Client Project ID:	Unocal, 18950 Lake Chabot Rd., Castro Valley	Sampled:	May 7, 1991
P.O. Box 996	Sample Descript:	Soil, MW7-(4.5)	Received:	May 9, 1991
Benicia, CA 94510	Analysis Method:	EPA 5030/8010	Analyzed:	May 15, 1991
Attention: Mardo Kaprealian, P.E.	Lab Number:	105-0304	Reported:	May 23, 1991

HALOGENATED VOLATILE ORGANICS (EPA 8010)

Analyte	Detection Limit µg/kg	Sample Results µg/kg
Bromodichloromethane	5.0	N.D.
Bromoform	10	N.D.
Bromomethane	10	N.D.
Carbon tetrachloride	5.0	N.D.
Chlorobenzene	5.0	N.D.
Chloroethane	10	N.D.
2-Chloroethylvinyl ether	10	N.D.
Chloroform	5.0	N.D.
Chloromethane	10	N.D.
Dibromochloromethane	5.0	N.D.
1,2-Dichlorobenzene	5.0	N.D.
1,3-Dichlorobenzene	5.0	N.D.
1,4-Dichlorobenzene	5.0	N.D.
1,1-Dichloroethane	5.0	N.D.
1,2-Dichloroethane	5.0	N.D.
1,1-Dichloroethene	5.0	N.D.
cis-1,2-Dichloroethene	5.0	N.D.
trans-1,2-Dichloroethene	5.0	N.D.
1,2-Dichloropropane	5.0	N.D.
cis-1,3-Dichloropropene	10	N.D.
trans-1,3-Dichloropropene	10	N.D.
Methylene chloride	20	N.D.
1,1,2,2-Tetrachloroethane	5.0	N.D.
Tetrachloroethene	5.0	N.D.
1,1,1-Trichloroethane	5.0	N.D.
1,1,2-Trichloroethane	5.0	N.D.
Trichloroethene	5.0	N.D.
Trichlorofluoromethane	10	N.D.
Vinyl chloride	10	N.D.

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:	May 7, 1991
P.O. Box 996	Sample Descript:	Soil, MW7-(10)	Received:	May 9, 1991
Benicia, CA 94510	Analysis Method:	EPA 5030/8010	Analyzed:	May 15, 1991
Attention: Mardo Kaprealian, P.E.	Lab Number:	105-0305	Reported:	May 23, 1991

HALOGENATED VOLATILE ORGANICS (EPA 8010)

Analyte	Detection Limit µg/kg	Sample Results µg/kg
Bromodichloromethane	5.0	N.D.
Bromoform	10	N.D.
Bromomethane	10	N.D.
Carbon tetrachloride	5.0	N.D.
Chlorobenzene	5.0	N.D.
Chloroethane	10	N.D.
2-Chloroethylvinyl ether	10	N.D.
Chloroform	5.0	N.D.
Chloromethane	10	N.D.
Dibromochloromethane	5.0	N.D.
1,2-Dichlorobenzene	5.0	N.D.
1,3-Dichlorobenzene	5.0	N.D.
1,4-Dichlorobenzene	5.0	N.D.
1,1-Dichloroethane	5.0	N.D.
1,2-Dichloroethane	5.0	N.D.
1,1-Dichloroethene	5.0	N.D.
cis-1,2-Dichloroethene	5.0	N.D.
trans-1,2-Dichloroethene	5.0	N.D.
1,2-Dichloropropane	5.0	N.D.
cis-1,3-Dichloropropene	10	N.D.
trans-1,3-Dichloropropene	10	N.D.
Methylene chloride	20	N.D.
1,1,2,2-Tetrachloroethane	5.0	N.D.
Tetrachloroethene	5.0	N.D.
1,1,1-Trichloroethane	5.0	N.D.
1,1,2-Trichloroethane	5.0	N.D.
Trichloroethene	5.0	N.D.
Trichlorofluoromethane	10	N.D.
Vinyl chloride	10	N.D.

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

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Laboratory Director

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Kaprealian Engineering, Inc.	Client Project ID:	Unocal, 18950 Lake Chabot Rd., Castro Valley	Sampled:	May 7, 1991
P.O. Box 996	Sample Descript:	Soil, MW7-(13)	Received:	May 9, 1991
Benicia, CA 94510	Analysis Method:	EPA 5030/8010	Analyzed:	May 15, 1991
Attention: Mardo Kaprealian, P.E.	Lab Number:	105-0306	Reported:	May 23, 1991

HALOGENATED VOLATILE ORGANICS (EPA 8010)

Analyte	Detection Limit µg/kg	Sample Results µg/kg
Bromodichloromethane	5.0	N.D.
Bromoform	10	N.D.
Bromomethane	10	N.D.
Carbon tetrachloride	5.0	N.D.
Chlorobenzene	5.0	N.D.
Chloroethane	10	N.D.
2-Chloroethylvinyl ether	10	N.D.
Chloroform	5.0	N.D.
Chloromethane	10	N.D.
Dibromochloromethane	5.0	N.D.
1,2-Dichlorobenzene	5.0	N.D.
1,3-Dichlorobenzene	5.0	N.D.
1,4-Dichlorobenzene	5.0	N.D.
1,1-Dichloroethane	5.0	N.D.
1,2-Dichloroethane	5.0	N.D.
1,1-Dichloroethene	5.0	N.D.
cis-1,2-Dichloroethene	5.0	N.D.
trans-1,2-Dichloroethene	5.0	N.D.
1,2-Dichloropropane	5.0	N.D.
cis-1,3-Dichloropropene	10	N.D.
trans-1,3-Dichloropropene	10	N.D.
Methylene chloride	20	N.D.
1,1,2,2-Tetrachloroethane	5.0	N.D.
Tetrachloroethene	5.0	N.D.
1,1,1-Trichloroethane	5.0	N.D.
1,1,2-Trichloroethane	5.0	N.D.
Trichloroethene	5.0	N.D.
Trichlorofluoromethane	10	N.D.
Vinyl chloride	10	N.D.

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

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Belinda C. Vega
Laboratory Director

1050304.KEI <12>

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Kaprealian Engineering, Inc.	Client Project ID:	Unocal, 18950 Lake Chabot Rd., Castro Valley	Sampled: - - - - - -
P.O. Box 996	Sample Descript:	Matrix Blank	Received: - - - - - -
Benicia, CA 94510	Analysis Method:	EPA 5030/8010	Analyzed: May 15, 1991
Attention: Mardo Kaprealian, P.E.	Lab Number:	- - - - - -	Reported: May 23, 1991

HALOGENATED VOLATILE ORGANICS (EPA 8010)

Analyte	Detection Limit µg/kg	Sample Results µg/kg
Bromodichloromethane	5.0	N.D.
Bromoform	10	N.D.
Bromomethane	10	N.D.
Carbon tetrachloride	5.0	N.D.
Chlorobenzene	5.0	N.D.
Chloroethane	10	N.D.
2-Chloroethylvinyl ether	10	N.D.
Chloroform	5.0	N.D.
Chloromethane	10	N.D.
Dibromochloromethane	5.0	N.D.
1,2-Dichlorobenzene	5.0	N.D.
1,3-Dichlorobenzene	5.0	N.D.
1,4-Dichlorobenzene	5.0	N.D.
1,1-Dichloroethane	5.0	N.D.
1,2-Dichloroethane	5.0	N.D.
1,1-Dichloroethene	5.0	N.D.
cis-1,2-Dichloroethene	5.0	N.D.
trans-1,2-Dichloroethene	5.0	N.D.
1,2-Dichloropropane	5.0	N.D.
cis-1,3-Dichloropropene	10	N.D.
trans-1,3-Dichloropropene	10	N.D.
Methylene chloride	20	N.D.
1,1,2,2-Tetrachloroethane	5.0	N.D.
Tetrachloroethene	5.0	N.D.
1,1,1-Trichloroethane	5.0	N.D.
1,1,2-Trichloroethane	5.0	N.D.
Trichloroethene	5.0	N.D.
Trichlorofluoromethane	10	N.D.
Vinyl chloride	10	N.D.

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

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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: 1050304-06
Reported: May 23, 1991

QUALITY CONTROL DATA REPORT

ANALYTE	1,1-Dichloroethene	Trichloro-ethene	Chloro-benzene	Benzene	Toluene	Chloro-benzene (PID)
Method:	EPA8010	EPA8010	EPA8010	EPA 8020	EPA 8020	EPA 8020
Analyst:	S.Le	S.Le	S.Le	S.Le	S.Le	S.Le
Reporting Units:	ppb	ppb	ppb	ppb	ppb	ppb
Date Analyzed:	May 15, 1991	May 15, 1991	May 15, 1991	May 15, 1991	May 15, 1991	May 15, 1991
QC Sample #:	BLK051591	BLK051591	BLK051591	BLK051591	BLK051591	BLK051591
Sample Conc.:	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Spike Conc. Added:	10	10	10	10	10	10
Conc. Matrix Spike:	7.8	9.8	11	8.9	8.6	9.4
Matrix Spike % Recovery:	78	98	110	89	86	94
Conc. Matrix Spike Dup.:	6.2	9.4	11	8.7	8.3	9.3
Matrix Spike Duplicate % Recovery:	62	94	110	87	83	93
Relative % Difference:	23	4.2	0	2.3	3.6	1.1

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Belinda C. Vega
Laboratory Director

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

KAPREALIAN ENGINEERING, INC.

CHAIN OF CUSTODY

SAMPLER: Wade Weston

WITNESSING AGENCY:

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

ANALYSES REQUESTED: TPH-G/BTXE; TPH-D; TOG 503 D+E; 8010

TURN AROUND TIME: Regular

SAMPLE ID NO.	DATE	TIME	SOIL	WATER	GRAB	COMP	NO. OF CONT.	SAMPLING LOCATION	REMARKS
MW7-(4.5)	5/7/91		✓		✓		1	See Sample ID *	1050304
MW7-(10)	"		✓		✓		1		305
MW7-(13)	"		✓		✓		1		306

Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Wade Weston	5/9 10:15	
Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Relinquished by: (Signature)	Date/Time	Received by: (Signature)
·hed 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? ✓
2. Will samples remain refrigerated until analyzed? —
3. Did any samples received for analysis have head space? no
4. Were samples in appropriate containers and properly packaged? —

Signature	Title	Date
[illegible]	SR	5/9

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Attention: Mardo Kaprealian, P.E.

Client Project ID: Unocal, 18950 Lake Chabot Rd., Castro Valley
QC Sample Group: 1050304-06
Reported: May 23, 1991

QUALITY CONTROL DATA REPORT

SURROGATE

Method:	EPA8010	EPA8010	EPA8010	EPA 8020
Analyst:	S.Le	S.Le	S.Le	S.Le
Reporting Units:	ppb	ppb	ppb	ppb
Date Analyzed:	May 15, 1991	May 15, 1991	May 15, 1991	May 15, 1991
Sample #:	105-0304	105-0305	105-0306	Blank
Surrogate #1 % Recovery:	330	103	130	120
Surrogate #2 % Recovery:	80	82	120	110

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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