STID 58/

August 4, 1993

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

Attention: Mr. Tom Peacock

RE: Unocal Service Station #5043

449 Hegenberger Road Oakland, California

Dear Mr. Peacock:

Per the request of Mr. Tim Howard of Unocal Corporation, enclosed please find our report dated April 2, 1993, for the above referenced site.

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

Sincerely,

Kaprealian Engineering, Inc.

Judy A. Dewey

jad\82

Enclosure

cc: Tim Howard, Unocal Corporation

KEI-P91-1004.QR3 April 2, 1993

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

Attention: Mr. Tim Howard

RE: Quarterly Report

Unocal Service Station #5043

449 Hegenberger Road Oakland, California

Dear Mr. Howard:

This report presents the results of the most recent quarter of monitoring and sampling of the monitoring wells at the referenced site by Kaprealian Engineering, Inc. (KEI), per KEI's proposal (KEI-P91-1004.P2) dated July 7, 1992. The wells are currently monitored monthly and sampled on a quarterly basis. This report covers the work performed by KEI from December of 1992 through February of 1993.

BACKGROUND

The subject site contains a Unocal service station facility. Six monitoring wells have been installed at the site.

A site description, detailed background information including a summary of all of the soil and ground water subsurface investigation/remediation work conducted to date, site hydrogeologic conditions, and tables that summarize all of the soil and ground water sample analytical results are presented in KEI's report (KEI-P91-1004.R4) dated October 12, 1992.

RECENT FIELD ACTIVITIES

The six wells (MW1 through MW6) were monitored three times and were sampled once during the quarter, except for well MW1, which was not sampled due to the presence of free product. During monitoring, the wells were checked for depth to water and the presence of free product. Prior to sampling, the wells were also checked for the presence of a sheen. No free product or sheen was noted in any of the wells during the quarter, except for 0.04 feet of free product that was observed in well MW1 on the sampling date. The monitoring data collected this quarter are summarized in Table 1.

KEI-P91-1004.QR3 April 2, 1993 Page 2

Water samples were collected from all of the wells (except well MW1) on February 4, 1993. Prior to sampling, the wells were each purged of between 7 and 9 gallons of water by the use of a surface pump. The samples were collected by the use of a clean Teflon bailer. The samples were decanted into clean VOA vials and/or one-liter amber bottles, as appropriate, which were then sealed with Teflon-lined screw caps and stored in a cooler, on ice, until delivery to a state-certified laboratory.

HYDROLOGY

The measured depth to ground water at the site on February 4, 1993, ranged between 2.03 and 3.92 feet below grade. The water levels in all of the wells have shown net increases ranging from 1.36 to 3.73 feet since November 30, 1992. Based on the water level data gathered during the quarter, the ground water flow direction varied from southwesterly at the eastern portion of the site, to southeasterly or southerly at the western portion of the site, as shown on the attached Potentiometric Surface Maps, Figures 1, 2, and 3. The ground water flow directions reported this quarter are generally similar to the flow directions reported since August of 1992. The hydraulic gradient at the site on February 4, 1993, varied from approximately 0.04 to 0.007.

ANALYTICAL RESULTS

The ground water samples were analyzed at Sequoia Analytical Laboratory and were accompanied by properly executed Chain of Custody documentation. The samples were analyzed for total petroleum hydrocarbons (TPH) as gasoline by EPA method 5030/modified 8015, TPH as diesel by EPA method 3510/modified 8015, and benzene, toluene, xylenes, and ethylbenzene by EPA method 8020. In addition, the ground water sample collected from monitoring well MW5 was analyzed for total oil and grease (TOG) by Standard Methods 5520B&F.

The ground water sample analytical results are summarized in Table 2. The concentrations of TPH as gasoline, TPH as diesel, and benzene detected in the ground water samples collected this quarter are shown on the attached Figures 4, 5, and 6, respectively. Copies of the laboratory analytical results and the Chain of Custody documentation are attached to this report.

<u>DISCUSSION AND RECOMMENDATIONS</u>

As previously noted in KEI's quarterly report (KEI-P91-1004.QR2) dated December 29, 1992, the analytical results of ground water samples collected from monitoring wells MW2, MW3, MW4, and MW6 on November 30, 1992, indicated total dissolved solids (TDS) at concentrations ranging from 3,800 ppm to 9,800 ppm (see Table 3).

KEI-P91-1004.QR3 April 2, 1993 Page 3

These TDS concentrations are in excess of the maximum limit for TDS (3,000 ppm) set forth for municipal or domestic water supply in the State Water Resources Control Board (SWRCB) Resolution 88-63.

Based on KEI's interpretation of Resolution 88-63, the ground water at the subject site is not considered suitable (or potentially suitable) for domestic or municipal supply, and therefore no further contamination delineation nor remediation work at the site appears to be warranted. KEI does, however, recommend the continuation of the current ground water monitoring and sampling program, per KEI's proposal (KEI-P91-1004.P2) dated July 7, 1993. The wells are currently monitored monthly and sampled quarterly. The results of the monitoring and sampling program will be documented and evaluated after each monitoring and sampling event. Recommendations for altering or terminating the program will be made as warranted.

Lastly, a continuous surface-skimming free product recovery device has been installed in well MW1. Any free product that accumulates in the skimming device is removed during the monthly monitoring events.

DISTRIBUTION

A copy of this report should be sent to Alameda County Health Care Services Agency, and to the Regional Water Quality Control Board, San Francisco Bay Region.

LIMITATIONS

Environmental changes, either naturally-occurring or artificially-induced, may cause changes in ground water levels and flow paths, thereby changing the extent and concentration of any contaminants.

Our studies assume that the field and laboratory data are reasonably representative of the site as a whole, and assume that subsurface conditions are reasonably conducive to interpolation and extrapolation.

The results of this study are based on the data obtained from the field and laboratory analyses obtained from a state-certified laboratory. We have analyzed these 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.

KEI-P91-1004.QR3 April 2, 1993 Page 4

If you have any questions regarding this report, please do not hesitate to call at (510) 602-5100.

Sincerely,

Kaprealian Engineering, Inc.

Thomas J. Berkins

Senior Environmental Engineer

For Thomas S.

Joel G. Greger, C.E.G.

Senior Engineering Geologist

License No. 1633 Exp. Date 6/30/94

Timothy R. Ross Project Manager

/bp

Attachments:

Tables 1, 2 & 3

Location Map

Potentiometric Surface Maps - Figures 1, 2 & 3

Concentrations of TPH as Gasoline - Figure 4

Concentrations of Benzene - Figure 5

Concentrations of TPH as Diesel - Figure 6

Laboratory Analyses

Chain of Custody documentation

TABLE 1
SUMMARY OF GROUND WATER MONITORING AND PURGING DATA

Well #	Ground Water Elevation (feet) (Monitored	Depth to Water <u>(feet)</u> and Sampled	Product Thickness (feet) on February	<u>Sheen</u> 4, 1993)	Water Pumped (gallons)
MW1	5.78*	2.03	0.04	N/A	0 with 6 oz. of product
MW2	6.87	2.09	0	No	9
MW3	5.27	2.40	. 0	No	8
MW4	5.72	3.28	0	No	7
MW5	5.73	3.54	0	No	7
MW6	5.20	3.92	0	No	7
MW1 MW2 MW3 MW4 MW5 MW6	5.24 6.64 5.23 5.77 4.81 1.87	2.54 2.32 2.44 3.23 4.46 7.25	0 0 0 0 0 0 0	993) 	0 0 0 0 0
	(Mon	itored on De	cember 10, 1	992)	
MW1 MW2 MW3 MW4 MW5 MW6	4.83 5.72 4.02 3.57 -1.80 -3.00	2.95 3.24 3.65 5.43 11.07 12.12	0 0 0 0 0	 	0 0 0 0 0

TABLE 1 (Continued)

SUMMARY OF GROUND WATER MONITORING AND PURGING DATA

Well #	Surface Elevation**(feet)
MW1	7.78
MW2	8.96
MW3	7.67
MW4	9.00
MW5	9.27
MW6	9.12

N/A = Not applicable.

- -- Sheen determination was not performed.
- * The ground water elevation was corrected for the presence of free product by the use of a specific gravity of 0.77.
- ** The elevations of the tops of the well covers were surveyed relative to Mean Sea Level (MSL), per the City of Oakland Benchmark #3880 (elevation = 20.37 MSL).

TABLE 2
SUMMARY OF LABORATORY ANALYSES
WATER

<u>Date</u>	Sample <u>Number</u>	TPH as <u>Diesel</u>	TPH as <u>Gasoline</u>	<u>Benzene</u>	<u>Toluene</u>	Xylenes	Ethyl- <u>benzene</u>
2/04/93	MW 1	NOT SAMI	PLED DUE T	O THE PRE	SENCE OF	FREE PRO	DUCT
_, _, _,	MW2	6,100+			3,000	6,900	ND
	MW3	² 550 ♦ ♦			ND	· 6.	1 96
	MW4	ND	ND	ND	ND	ND	ND
	MW5+	5,500++	5,700	38	ND	170	620
	MW6		3,600		ND	550	290
11/30/92	MW1	NOT SAMI	PLED DUE T	O THE PRE	SENCE OF	FREE PRO	DUCT
	MW2	5,700♦	29,000	2,000	3,400	6,900	1,200
	MM3	94	790*	ND	ND	ND	ND
	MW4	61		ND	ND	ND	ND
	MW5+		930				290
	MW6	1,400♦	9,200	550	ND	1,600	740
8/31/92		8,900+	64,000	13,000	12,000		
	MW2		9,000		640	2,000	140
	MW3		210*			ND	ND
	MW4		240*		ND		54 ND
	MW5	690♦		0.89			ND
	MW6	750♦♦	ND	ND	ND	ИĎ	ND
5/20/92			PLED DUE T				DUCT
	MW2	4,300♦	•			11,000	630
	MW3	WELL WAS	S INACCESS	IBLE FOR	SAMPLING		
2/18/92			150,000				
	MW2	4,300	29,000	1,000	5,300		260
	MW3	ND	230	4.8	22	33	1.8

- + TOG was non-detectable.
- * Sequoia Analytical Laboratory reported that the hydrocarbons detected did not appear to be gasoline.
- Sequoia Analytical Laboratory reported that the hydrocarbons detected did not appear to be diesel.
- ♦♦ Sequoia Analytical Laboratory reported that the hydrocarbons detected appeared to be diesel and non-diesel mixture.

ND = Non-detectable.

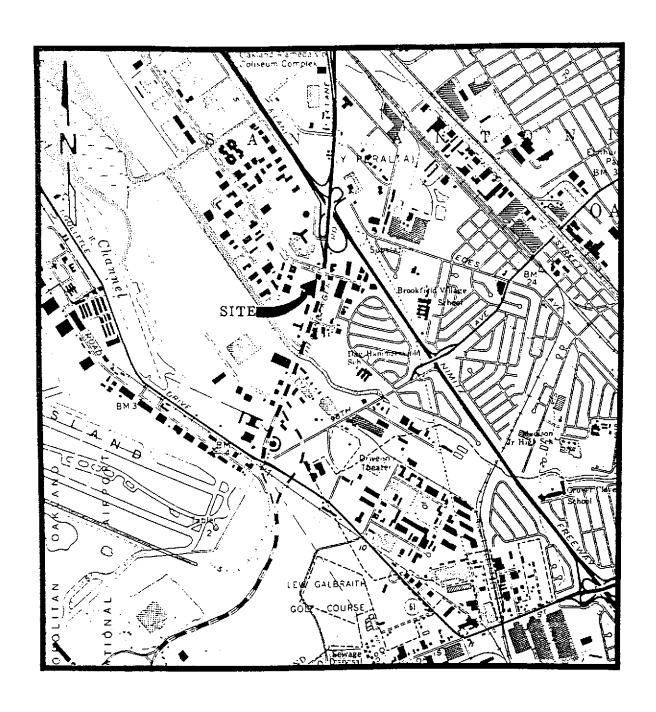
Results in parts per billion (ppb), unless otherwise indicated.

TABLE 3
SUMMARY OF LABORATORY ANALYSES
WATER

<u>Date</u>	Sample #	TDS							
11/30/92	MW1	NOT SAMPLED DUE TO THE PRESENCE OF FREE PRODUCT							
	MW2	6,400							
	MW3	6,500							
	MW4	3,800							
	MW5	*							
	MW6	9,800							

^{*} Not analyzed due to insufficient sample volume.

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

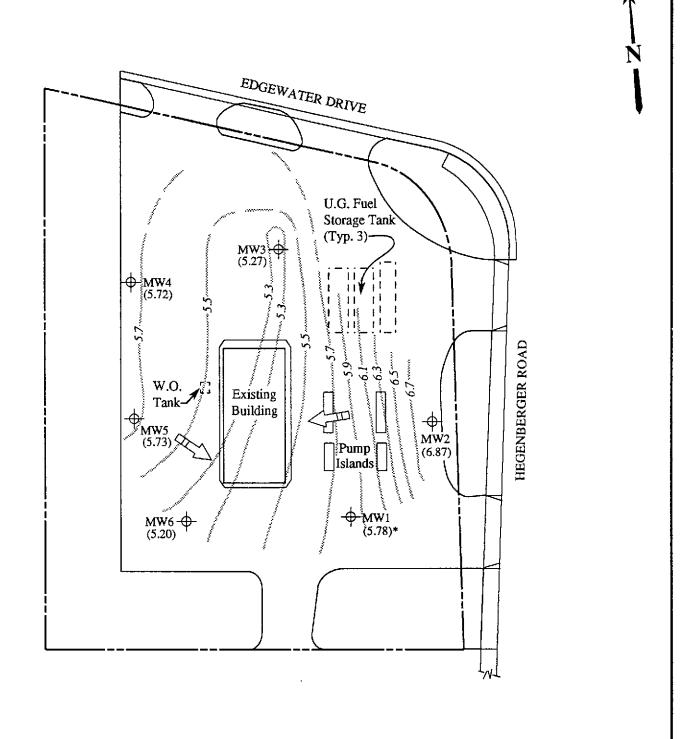


Base modified from 7.5 minute U.S.G.S. San Leandro Quadrangle (photorevised 1980)





UNOCAL SERVICE STATION #5043 449 HEGENBERGER ROAD OAKLAND, CA LOCATION MAP



→ Monitoring well

() Ground water elevation in feet above Mean Sea Level

Direction of ground water flow

··· Contours of ground water elevation

* The ground water elevation was corrected due to the presence of free product.

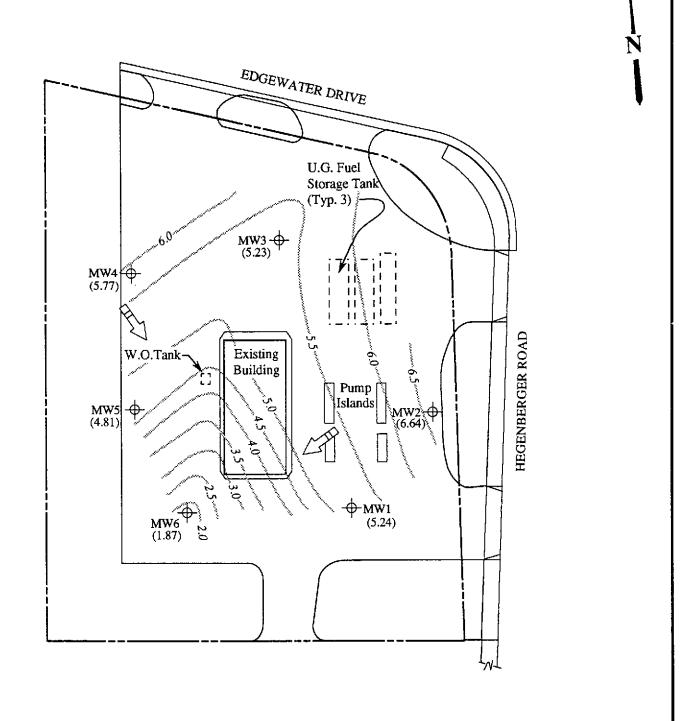


POTENTIOMETRIC SURFACE MAP FOR THE FEBRUARY 4, 1993 MONITORING EVENT



UNOCAL SERVICE STATION #5043 449 HEGENBERGER ROAD OAKLAND, CA FIGURE 1

1

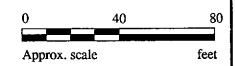


Monitoring well

) Ground water elevation in feet above Mean Sea Level

Direction of ground water flow

Contours of ground water elevation

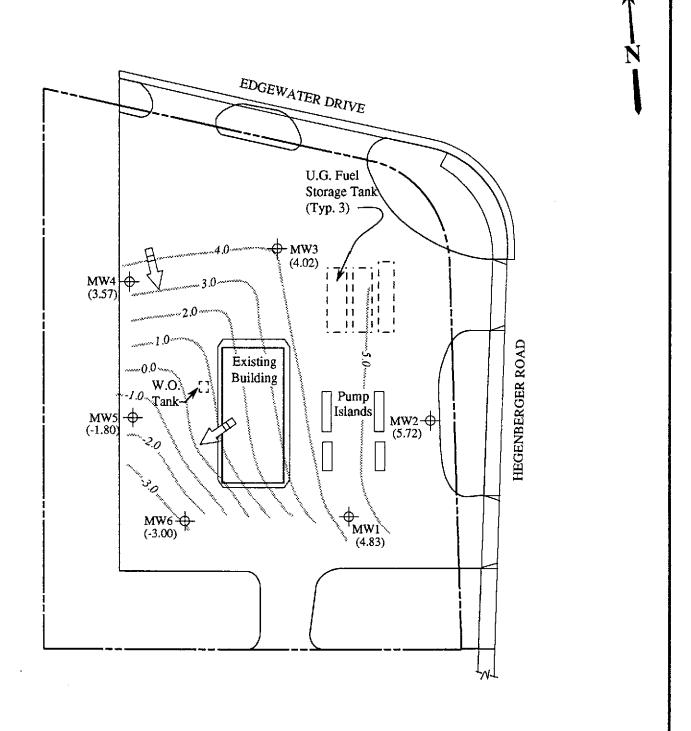


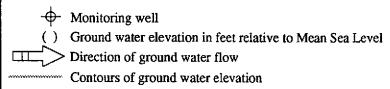
POTENTIOMETRIC SURFACE MAP FOR THE JANUARY 13, 1993 MONITORING EVENT



UNOCAL SERVICE STATION #5043 449 HEGENBERGER ROAD OAKLAND, CA FIGURE

2



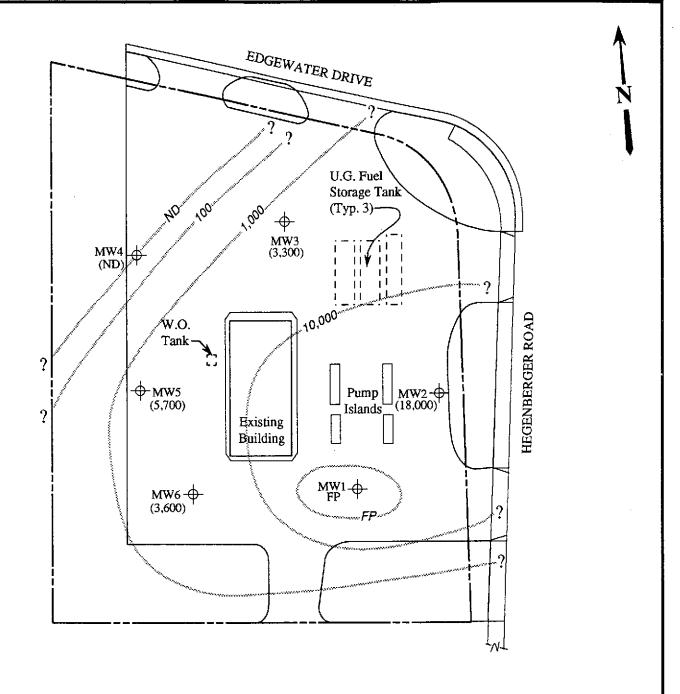




POTENTIOMETRIC SURFACE MAP FOR THE DECEMBER 10, 1992 MONITORING EVENT



UNOCAL SERVICE STATION #5043 449 HEGENBERGER ROAD OAKLAND, CA FIGURE 3



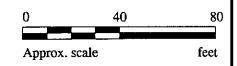
Monitoring well

() Concentrations of TPH as gasoline in ppb

Iso-concentration contours in ppb

ND = Non-detectable

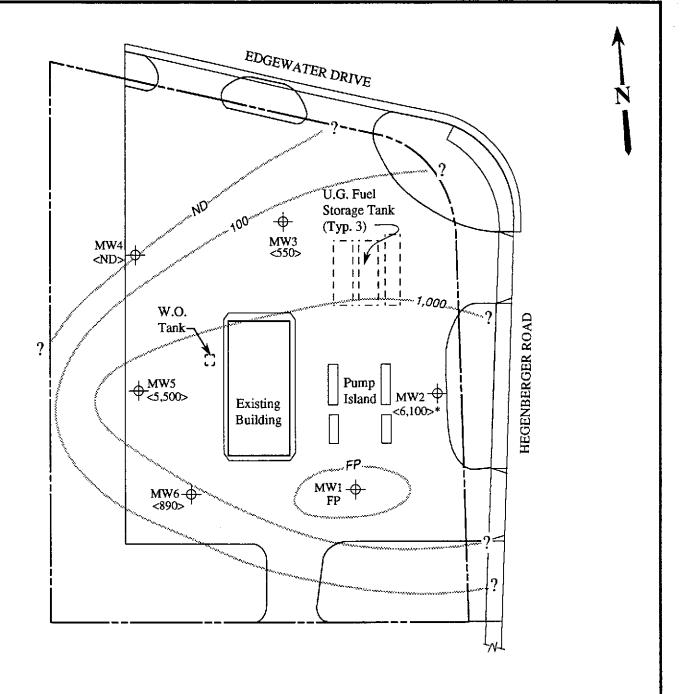
FP = Free product



TPH AS GASOLINE CONCENTRATIONS IN GROUND WATER ON FEBRUARY 4, 1993



UNOCAL SERVICE STATION #5043 449 HEGENBERGER ROAD OAKLAND, CA FIGURE 4



♦ Monitoring well

< > Concentrations of TPH as diesel in ppb

Iso-concentration contours in ppb

ND = Non-detectable

FP = Free product

* The lab reported that the hydrocarbons detected did not appear to be diesel.

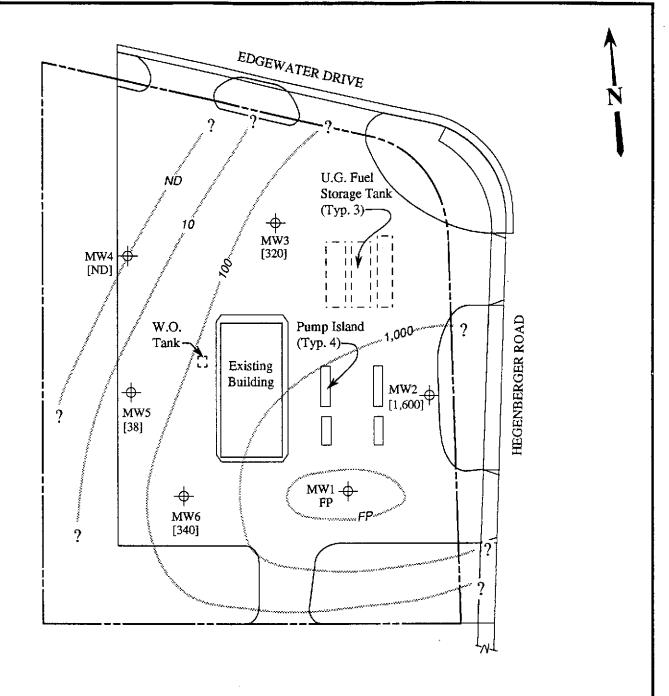


TPH AS DIESEL CONCENTRATIONS IN GROUND WATER ON FEBRUARY 4, 1993



UNOCAL SERVICE STATION #5043 449 HEGENBERGER ROAD OAKLAND, CA FIGURE

5



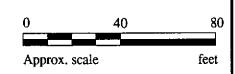
→ Monitoring well

[] Concentrations of benzene in ppb

Iso-concentration contours in ppb

ND = Non-detectable

FP = Free product



BENZENE CONCENTRATIONS IN GROUND WATER ON FEBRUARY 4, 1993



UNOCAL SERVICE STATION #5043 449 HEGENBERGER ROAD OAKLAND, CA FIGURE 6

Kaprealian Engineering, Inc. 2401 Stanwell Drive, Suite 400

Concord, CA 94520

Attention: Mardo Kaprealian, P.E.

Client Project ID: Sample Matrix:

First Sample #:

Analysis Method:

Unocal, 449 Hegenberger Rd., Oakland Water

EPA 5030/8015/8020

302-0247

Sampled:

Feb 4, 1993 Feb 4, 1993

Received: Reported:

Feb 19, 1993

TOTAL PURGEABLE PETROLEUM HYDROCARBONS with BTEX DISTINCTION

Anaiyte	Reporting Limit μg/L	Sample I.D. 302-0247 MW 2	Sample 1.D. 302-0248 MW 3	Sample I.D. 302-0249 MW 4	Sample I.D. 302-0250 MW 5	Sample I.D. 302-0251 MW 6	Sample I.D. Matrix Blank
Purgeable Hydrocarbons	50	18,000	3,300	N.D.	5,700	3,600	
Benzene	0.5	1,600	320	N.D.	38	340	
Toluene	0.5	3,000	N.D.	N.D.	N.D.	N.D.	
Ethyl Benzene	0.5	N.D.	96	N.D.	620	290	
Total Xylenes	0.5	6,900	6.1	N.D.	170	550	
Chromatogram Pat	tern:	Gasoline	Gasoline		Gasoline	Gasoline	

Quality Control Data

Report Limit Multiplication Factor:	20	10	1.0	10	10	1.0
Date Analyzed:	2/9/93	2/9/93	2/9/93	2/10/93	2/10/93	2/9/93
Instrument Identification:	HP-2	HP-2	HP-2	HP-5	HP-5	HP-2
Surrogate Recovery, %: (QC Limits = 70-130%)	102	106	101	86	98	104

Purgeable Hydrocarbons are quantitated against a fresh gasoline standard. Analytes reported as N.D. were not detected above the stated reporting limit.

SEQUOIA ANALYTICAL

Scott A. Chieffo Project Manager

3020247.KEI <1>

Kaprealian Engineering, Inc. 2401 Stanwell Drive, Suite 400

Concord, CA 94520

Attention: Mardo Kaprealian, P.E.

Client Project ID:

First Sample #:

Sample Matrix:

Unocal, 449 Hegenberger Rd., Oakland

Water

Analysis Method: EPA 3510/3520/8015 302-0247

Sampled:

Feb 4, 1993 Feb 4, 1993

Received: Reported:

Feb 19, 1993

TOTAL EXTRACTABLE PETROLEUM HYDROCARBONS

Analyte	Reporting Limit μg/L	Sample I.D. 302-0247 MW 2	Sample I.D. 302-0248 MW 3	Sample I.D. 302-0249 MW 4	Sample I.D. 302-0250 MW 5	Sample I.D. 302-0251 MW 6	Sample I.D. Matrix Blank
Extractable Hydrocarbons	50	6,100	550	N.D.	5,500	890	
Chromatogram Pa	ttern:	Non-Diesel Mixture (< C16)	Diesel and Non-Diesel Mixture (< C16)		Diesel and Non-Diesel Mixture (<c16)< td=""><td>Diesel and Non-Diesel Mixture (<c16)< td=""><td></td></c16)<></td></c16)<>	Diesel and Non-Diesel Mixture (<c16)< td=""><td></td></c16)<>	

Quality Control Data

Report Limit Multiplication Factor:	10	1.0	1.0	10	1.0	1.0
Date Extracted:	2/10/93	2/10/93	2/10/93	2/10/93	2/10/93	2/10/93
Date Analyzed:	2/17/93	2/17/93	2/17/93	2/17/93	2/17/93	2/17/93
Instrument Identification:	HP-3B	HP-3B	HP-3B	НР-ЗВ	HP-3B	HP-3B

Extractable Hydrocarbons are quantitated against a fresh diesel standard. Analytes reported as N.D. were not detected above the stated reporting limit.

SEQUOIA ANALYTICAL

Project Manager

3020247.KEI <2>



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

Kaprealian Engineering, Inc. 2401 Stanwell Drive, Suite 400

Concord, CA 94520

302-0250

Attention: Mardo Kaprealian, P.E.

Client Project ID:

Unocal, 449 Hegenberger Rd., Oakland

Sampled: Feb 4, 1993

Matrix Descript: Water

SM 5520 B&F (Gravimetric)

Received: Extracted: Feb 4, 1993 Feb 8, 1993

Analysis Method: First Sample #:

N.D.

302-0250

Analyzed: Reported:

Feb 9, 1993 Feb 19, 1993

TOTAL RECOVERABLE PETROLEUM OIL

Oil & Grease Sample Sample Number Description mg/L

MW 5

Detection Limits:

5.0

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

SEQUOIA ANALYTICAL

Scott A. Chieffo **Project Manager**

3020247.KEI <3>

Kaprealian Engineering, Inc.

Client Project ID: Unocal, 449 Hegenberger Rd., Oakland

2401 Stanwell Drive, Suite 400

Concord, CA 94520

Attention: Mardo Kaprealian, P.E. QC Sample Group: 3020247-251

Reported: Feb 19, 1993

QUALITY CONTROL DATA REPORT

NALYTE			Ethyl-			
	Benzene	Toluene	Benzene	Xylenes	Diesel	Oil and Grease
	EPA	EPA	EPA	EPA		
Method:	8015/8020	8015/8020	8015/8020	8015/8020	EPA 8015	SM 5520
Analyst:	J.F.	J.F.	J.F.	J.F.	K.Wimer	D. Newcomb
Reporting Units:	μg/L	μg/L	μg/L	μg/L	μg/L	mg/L
Date Analyzed:	Feb 9, 1993	Feb 9, 1993	Feb 9, 1993	Feb 9, 1993		
QC Sample #:	302-0173	302-0173	302-0173	302-0173	Matrix Blank	Matrix Blank
ample Conc.:	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Spike Conc. Added:	20	20	20	60	250	100
Conc. Matrix		0.4	0.4		207	105
Spike:	22	21	21	63	227	105
Matrix Spike	,					
% Recovery:	110	105	105	105	91	105
Conc. Matrix						
Spike Dup.:	22	21	21	63	233	93
Matrix Spike						
Duplicate						
6 Recovery:	110	105	105	105	93	93
Relative						
% Difference:	0.0	0.0	0.0	0.0	2.6	12

Laboratory blank contained the following analytes: None Detected

SEQUOIA ANALYTICAL

Scott A. Chieffo Project Manager % Recovery: Conc. of M.S. - Conc. of Sample x 100
Spike Conc. Added

Relative % Difference: Conc. of M.S. - Conc. of M.S.D.

(Conc. of M.S. + Conc. of M.S.D.) / 2

_ x 100

3020247.KEI <4>

Kaprealian Engineering, Inc. 2401 Stanwell Drive, Suite 400 Client Project ID: Unocal, 449 Hegenberger Rd., Oakland

Concord, CA 94520

Attention: Mardo Kaprealian, P.E. QC Sample Group: 3020247-251

Reported: Feb 19, 1993

QUALITY CONTROL DATA REPORT

SURROGATE

Method: Analyst: EPA 8015 K. Wimer

EPA 8015 K. Wimer

μg/L

EPA 8015 K. Wimer

μg/L

EPA 8015 K. Wimer

μg/L

EPA 8015 K. Wimer μg/L

EPA 8015 K. Wimer μg/L

Reporting Units: Date Analyzed:

Sample #:

μg/L Feb 17, 1993 302-0247

Feb 17, 1993 302-0248

Feb 17, 1993 Feb 17, 1993 Feb 17, 1993 Feb 17, 1993 302-0249 302-0250

302-0251

Matrix Blank

Surrogate % Recovery:

120

100

107

111

103

105

SEQUOIA ANALYTICAL

Project Manager

% Recovery:

Conc. of M.S. - Conc. of Sample Spike Conc. Added

x 100

Relative % Difference:

Conc. of M.S. - Conc. of M.S.D.

x 100

(Conc. of M.S. + Conc. of M.S.D.) / 2

3020247.KEI <5>

KAPREALIAN ENGINEERING INCORPORATED

CHAIN OF CUSTODY

SAMPLER Varthes Withessing Agency							ME & ADDRESS	, <u>, , , , , , , , , , , , , , , , , , </u>		ANALYSES REQUESTED				 I		TURN AROUND TIME:	
			Unocal / Oakland 449 Hegenberger Rd.				ВТХЕ		20 88					Regular.			
SAMPLE ID NO.	DATE	TIME	SOIL	VATER	GRA)	СОМР	NO. OF CONT.	SAMPLI LOCATIO		7P#6:	TPHD	706(sn	!				REMARKS
MW2	2/4/93	2:50 pus,		X	Х		3	Monitoring	Well	X	Х					-	3020247AC
MW3	ч			Х	Х		3	٠,	4	X	X						1 248 AC
MW4	44			Χ	Х		3	4	•	X	X						249AC
MW5	4	1		X	X		4	Cq	4	Х	X	Х					1 250AC
MW6	u	6:00 pu.		X	X		3	-1	4	X	Χ						251AC
																	-
									1,000000								-
	held.	ce.	2/4/9		1:10	1 / L	160		1		for a	inal ys i :	S :				the laboratory accepting samples
Revi inquishe	. (1/2	gnakure) Ch		ete/Tir 93			teceive	ed by: (Signature))		_		ye	•			analysis been stored in ice? ed until analyzed?
Relinquishe	d by: V. (Si	gna (ure)		ate/Tig			3	ed by? (Signature)		>	_		$\nu \sigma$				nalysis have head space?
Relinquishe	d by: (Si	gnature)		ate/Tir	, , ,		eceive	ed (Signature)	05	4. Were samples in appropriate containers and properly packaged? The packaged The packaged P				enst 2493			

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