

KAPREALIAN ENGINEERING
I N C O R P O R A T E D

See
10/5/93

KEI-P90-0606.QR7
October 22, 1993

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

Attention: Mr. Adadu Yemane

RE: Quarterly Report
Former Unocal Service Station #5901
11976 Dublin Boulevard
Dublin, California

Dear Mr. Yemane:

This report presents the results of the most recent quarter of ground water monitoring and sampling at the referenced site by Kaprealian Engineering, Inc. (KEI). Existing monitoring wells MW1, MW3, and MW4 are currently monitored and sampled on a quarterly basis, except for well MW4, which is no longer sampled. Well MW2 was previously destroyed. This report covers the work performed by KEI in September 1993.

BACKGROUND

The subject site formerly contained a Unocal service station facility. Two underground gasoline storage tanks, one waste oil tank, and the product piping were removed from the site in June of 1990 during tank replacement activities. The fuel tank pit and the waste oil tank pit were subsequently overexcavated in order to remove contaminated soil. Four monitoring wells were installed at the site in November of 1990. The two underground gasoline storage tanks, one waste oil tank, product piping, and the hydraulic lifts were then removed from the site in May of 1992 during station demolition activities. The product pipe trench and the hydraulic lift area were subsequently overexcavated in order to remove contaminated soil. Per Unocal's procedure for potential site divestment locations, 11 exploratory borings were drilled at the site in August of 1992. Monitoring well MW2 was destroyed on August 24, 1992, because the well was damaged during the station demolition activities. Three monitoring wells currently exist 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-P90-0606.R10) dated October 8, 1992.

RECENT FIELD ACTIVITIES

The three existing monitoring wells (MW1, MW3, and MW4) were monitored once during the quarter. Monitoring wells MW1 and MW3 were also sampled once during the quarter. Monitoring well MW2 was destroyed in August of 1992, and monitoring well MW4 is no longer sampled. During monitoring, the existing wells were checked for depth to water and the presence of free product. Prior to sampling, monitoring wells MW1 and MW3 were also checked for the presence of a sheen. No free product or sheen was noted in any of the wells during the quarter. The monitoring data collected this quarter are summarized in Table 1.

Water samples were collected from monitoring wells MW1 and MW3 on September 16, 1993. Prior to sampling, wells MW1 and MW3 were purged of 11 and 3 gallons of water, respectively, 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, labeled, 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 September 16, 1993, ranged between 4.80 feet (well MW1) and 15.29 feet (well MW3). Wells MW1 and MW4 are considered to be separated hydrologically from well MW3 by an unnamed splay of the Calaveras Fault. The direction of ground water flow on the west side of the fault has historically been towards the north-northeast.

ANALYTICAL RESULTS

The ground water samples collected this quarter were analyzed at Sequoia Analytical Laboratory and were accompanied by properly executed Chain of Custody documentation. The ground water sample collected from monitoring well MW3 was analyzed for total petroleum hydrocarbons (TPH) as gasoline by EPA method 5030/modified 8015, and benzene, toluene, ethylbenzene, and xylenes by EPA method 8020. The ground water sample collected from monitoring well MW1 was analyzed for polynuclear aromatic hydrocarbons (PNA) by EPA method 8100.

The analytical results of all of the ground water samples collected from the monitoring wells to date are summarized in Table 2. Copies of the laboratory analytical results and the Chain of Custody documentation are attached to this report.

DISCUSSION AND RECOMMENDATIONS

Based on the analytical results of the ground water samples collected from the monitoring wells at the site to date, KEI recommends the continuation of the current ground water monitoring and sampling program. Existing wells MW1, MW3, and MW4 are currently monitored and sampled on a quarterly basis, except for well MW4, which is no longer sampled. Well MW2 was previously destroyed. Recommendations for altering or terminating the ground water monitoring program will be made as warranted.

In order to comply with the Alameda County Health Care Services (ACHCS) Agency request (in their letter dated April 28, 1993) for additional subsurface investigation at the eastern portion of the site (the east side of an apparent unnamed splay of the Calaveras Fault), KEI installed two additional monitoring wells on October 4, 1993. The location of these wells are as shown on the attached Figure 1. It is anticipated that the monitoring and sampling data collected from the two new wells and from existing well MW3 will aid in defining ground water flow and assessing ground water quality in these areas. The installation of the two new monitoring wells will be documented in a separate technical report that will be submitted in the near future.

DISTRIBUTION

A copy of this report should be sent to Ms. Eva Chu of the ACHCS, and to Mr. Lester Feldman of 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 accor-


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dance with generally accepted professional principles and practices existing for such work.

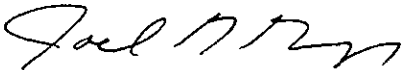
If you have any questions regarding this report, please do not hesitate to call us at (510) 602-5100.

Sincerely,

Kaprealian Engineering, Inc.



Thomas J. Berkins
Senior Environmental Engineer



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

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



Timothy R. Ross
Project Manager

/bp

Attachments: Tables 1 & 2
Location Map
Figure 1
Laboratory Analyses
Chain of Custody documentation

TABLE 1

SUMMARY OF MONITORING DATA

| <u>Well #</u> | <u>Ground Water Elevation (feet)</u> | <u>Depth to Water (feet)♦</u> | <u>Product Thickness (feet)</u> | <u>Sheen</u> | <u>Water Purged (gallons)</u> |
|---|--|---------------------------------------|---|--------------|-----------------------------------|
| (Monitored and Sampled on September 16, 1993) | | | | | |
| MW1 | 362.00 | 4.80 | 0 | No | 11 |
| MW3 | 351.57 | 15.29 | 0 | No | 3 |
| MW4* | 362.33 | 5.25 | 0 | -- | 0 |

| <u>Well #</u> | <u>Top of Casing Elevation in feet above Mean Sea Level (MSL)**</u> |
|---------------|---|
| MW1 | 366.80 |
| MW3 | 366.86 |
| MW4 | 367.58 |

♦ The depth to water level measurement was taken from the top of the well casing. Prior to September 16, 1993, the water level measurement was taken from the top of the well cover.

* Monitored only.

** Based on National Geodetic Survey disk stamped "I-1257, reset 1975" (elevation = 439.93 MSL).

-- Sheen determination was not performed.

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TABLE 2

SUMMARY OF LABORATORY ANALYSES
 WATER

| <u>Date</u> | <u>Sample Number</u> | <u>TPH as Diesel</u> | <u>TPH as Gasoline</u> | <u>Benzene</u> | <u>Toluene</u> | <u>Ethylbenzene</u> | <u>Xylenes</u> |
|-------------|----------------------|----------------------|------------------------|----------------|----------------|---------------------|----------------|
| 9/16/93 | MW1♦ | -- | -- | -- | -- | -- | -- |
| | MW3 | -- | ND | ND | ND | ND | ND |
| 6/18/93 | MW1♦ | -- | -- | -- | -- | -- | -- |
| | MW3 | -- | ND | ND | ND | ND | ND |
| 4/03/92 | MW1* | ND | ND | ND | ND | ND | ND |
| | MW2 | -- | ND | ND | ND | ND | ND |
| | MW3 | -- | ND | ND | ND | ND | ND |
| | MW4 | -- | ND | ND | ND | ND | ND |
| 1/02/92 | MW1* | ND | ND | ND | ND | ND | ND |
| | MW2 | -- | ND | ND | ND | ND | ND |
| | MW3** | -- | 38 | ND | ND | ND | ND |
| | MW4 | -- | ND | ND | ND | ND | ND |
| 10/03/91 | MW1* | ND | ND | ND | ND | ND | ND |
| | MW2 | -- | ND | ND | ND | ND | ND |
| | MW3 | -- | 32 | ND | ND | ND | ND |
| | MW4 | -- | ND | ND | ND | ND | ND |
| 7/02/91 | MW1* | ND | ND | ND | ND | ND | ND |
| | MW2 | -- | ND | ND | ND | ND | ND |
| | MW3 | -- | ND | ND | ND | ND | ND |
| | MW4 | -- | ND | ND | ND | ND | ND |
| 4/01/91 | MW1* | ND | ND | ND | ND | ND | ND |
| | MW2 | -- | ND | ND | ND | ND | ND |
| | MW3 | -- | ND | ND | ND | ND | ND |
| | MW4 | -- | ND | ND | ND | ND | ND |
| 11/16/90 | MW1* | ND | ND | ND | ND | ND | ND |
| | MW2 | -- | ND | ND | ND | ND | ND |
| | MW3 | -- | ND | ND | ND | ND | ND |
| | MW4 | -- | ND | ND | ND | ND | ND |

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TABLE 2 (Continued)

SUMMARY OF LABORATORY ANALYSES
WATER

♦ All EPA method 8100 constituents (polynuclear aromatic hydrocarbons) were non-detectable.

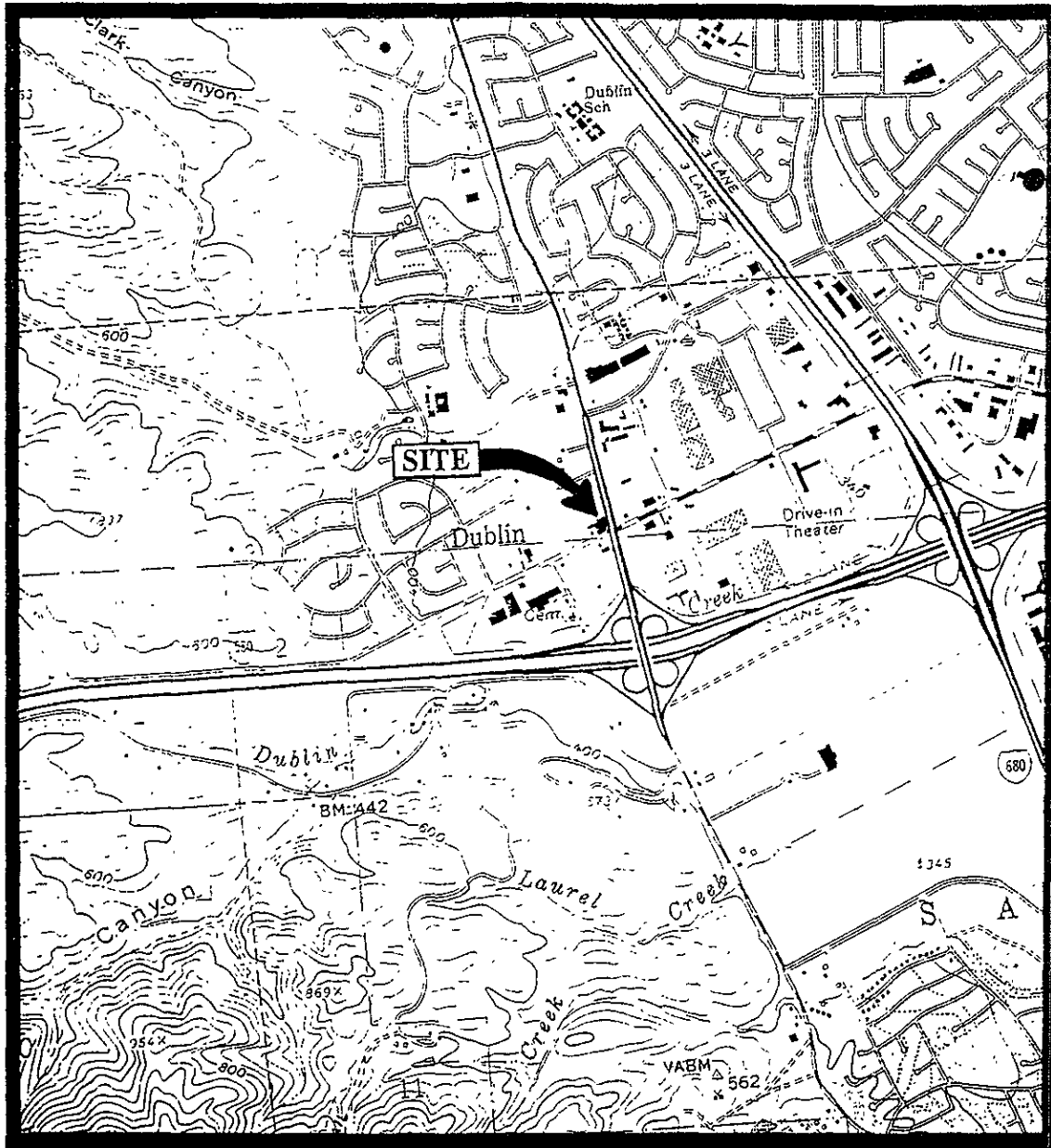
* TOG and all EPA method 8010 constituents were non-detectable.

** All EPA method 8010 constituents were non-detectable.

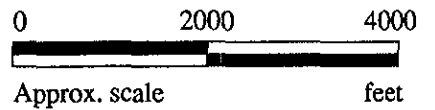
ND = Non-detectable.

-- Indicates analysis was not performed.

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



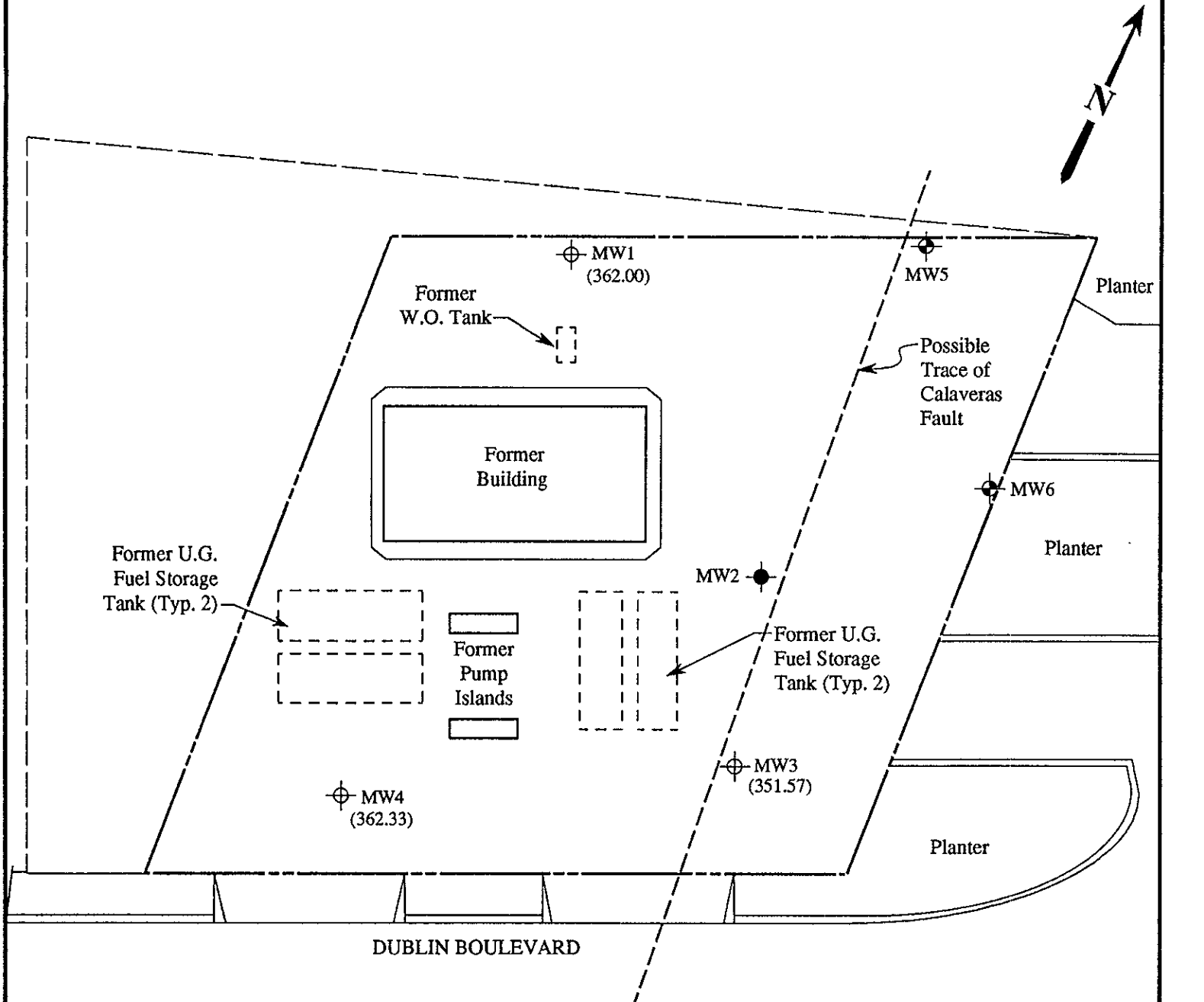
Base modified from 7.5 minute U.S.G.S. Dublin Quadrangle
(photorevised 1980)



**KAPREALIAN ENGINEERING
INCORPORATED**

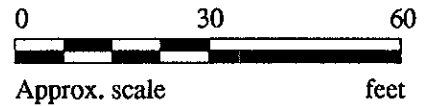
**UNOCAL SERVICE STATION #5901
11976 DUBLIN BOULEVARD
DUBLIN, CALIFORNIA**

**LOCATION
MAP**



LEGEND

- ⊕ Monitoring well (existing)
- ⊙ Monitoring well (Installed 10/4/93)
- Monitoring well (previously destroyed)
- () Ground water elevation in feet above Mean Sea Level



GROUND WATER ELEVATION MAP FOR THE SEPTEMBER 16, 1993 MONITORING EVENT



**FORMER UNOCAL S/S #5901
11976 DUBLIN BOULEVARD
DUBLIN, CALIFORNIA**

**FIGURE
1**



SEQUOIA ANALYTICAL

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

Kaprealian Engineering, Inc.
2401 Stanwell Dr., Ste. 400
Concord, CA 94520
Attention: Avo Avedessian

Client Project ID: Unocal #5901, 11976 Dublin Blvd., Dublin
Sample Descript: Water, MW 1
Analysis Method: EPA 8100
Lab Number: 309-0673

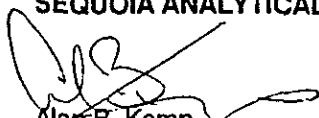
Sampled: Sep 16, 1993
Received: Sep 16, 1993
Extracted: Sep 21, 1993
Analyzed: Sep 2, 1993
Reported: Sep 28, 1993

POLYNUCLEAR AROMATIC HYDROCARBONS (EPA 8100)

| Analyte | Detection Limit µg/L | Sample Results µg/L |
|-------------------------------|-------------------------|------------------------|
| Acenaphthene..... | 2.0 | N.D. |
| Acenaphthylene..... | 2.0 | N.D. |
| Anthracene..... | 2.0 | N.D. |
| Benzo (a) anthracene..... | 2.0 | N.D. |
| Benzo (a) pyrene..... | 2.0 | N.D. |
| Benzo (b) fluoranthene..... | 2.0 | N.D. |
| Benzo (ghi) perylene..... | 2.0 | N.D. |
| Benzo (k) fluoranthene..... | 2.0 | N.D. |
| Chrysene..... | 2.0 | N.D. |
| Dibenzo (a,h) anthracene..... | 2.0 | N.D. |
| Fluoranthene..... | 2.0 | N.D. |
| Fluorene..... | 2.0 | N.D. |
| Indeno (1,2,3-cd) pyrene..... | 2.0 | N.D. |
| Naphthalene..... | 2.0 | N.D. |
| Phenanthrene..... | 2.0 | N.D. |
| Pyrene..... | 2.0 | N.D. |

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

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Alan B. Kemp
Project Manager



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Kapreallan Engineering, Inc.
2401 Stanwell Dr., Ste. 400
Concord, CA 94520
Attention: Avo Avedesslan

Client Project ID: Unocal #5901, 11976 Dublin Blvd., Dublin
Sample Matrix: Water
Analysis Method: EPA 5030/8015/8020
First Sample #: 309-0674

Sampled: Sep 16, 1993
Received: Sep 16, 1993
Reported: Sep 28, 1993

TOTAL PURGEABLE PETROLEUM HYDROCARBONS with BTEX DISTINCTION

| Analyte | Reporting Limit µg/L | Sample I.D. 309-0674 MW-3 | Sample I.D. Matrix Blank |
|------------------------|-------------------------|---------------------------------|--------------------------------|
| Purgeable Hydrocarbons | 50 | N.D. | |
| Benzene | 0.5 | N.D. | |
| Toluene | 0.5 | N.D. | |
| Ethyl Benzene | 0.5 | N.D. | |
| Total Xylenes | 0.5 | N.D. | |


Chromatogram Pattern: --

Quality Control Data

| | | |
|---|---------|---------|
| Report Limit Multiplication Factor: | 1.0 | 1.0 |
| Date Analyzed: | 9/24/93 | 9/24/93 |
| Instrument Identification: | HP-4 | HP-4 |
| Surrogate Recovery, %: (QC Limits = 70-130%) | 98 | 100 |

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

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Alan B. Kemp
Project Manager



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Kaprealian Engineering, Inc.
2401 Stanwell Dr., Ste. 400
Concord, CA 94520
Attention: Avo Avedesslan

Client Project ID: Unocal #5901, 11976 Dublin Blvd., Dublin
Matrix: Water

QC Sample Group: 309-0673

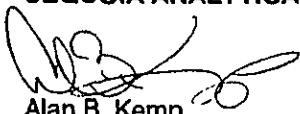
Reported: Sep 28, 1993

QUALITY CONTROL DATA REPORT

| ANALYTE | Pyrene | Acenaphthene | Naphthalene |
|--------------------------|-----------|--------------|-------------|
| Method: | EPA 8100 | EPA 8100 | EPA 8100 |
| Analyst: | D.C.T. | D.C.T. | D.C.T. |
| Conc. Spiked: | 50 | 50 | 50 |
| Units: | µg/L | µg/L | µg/L |
| LCS Batch#: | BLK092193 | BLK092193 | BLK092193 |
| Date Prepared: | 9/21/93 | 9/21/93 | 9/21/93 |
| Date Analyzed: | 9/22/93 | 9/22/93 | 9/22/93 |
| Instrument I.D.#: | GCHP-11 | GCHP-11 | GCHP-11 |
| LCS % Recovery: | 72 | 80 | 78 |
| Control Limits: | 46-118 | 47-116 | 37-135 |

| MS/MSD | Pyrene | Acenaphthene | Naphthalene |
|---|-----------|--------------|-------------|
| Batch #: | BLK092193 | BLK092193 | BLK092193 |
| Date Prepared: | 9/21/93 | 9/21/93 | 9/21/93 |
| Date Analyzed: | 9/22/93 | 9/22/93 | 9/22/93 |
| Instrument I.D.#: | GCHP-11 | GCHP-11 | GCHP-11 |
| Matrix Spike % Recovery: | 72 | 80 | 78 |
| Matrix Spike Duplicate % Recovery: | 70 | 78 | 72 |
| Relative % Difference: | 2.8 | 2.5 | 8.0 |

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Alan B. Kemp
Project Manager

Please Note:

The LCS is a control sample of known, interferent free matrix that is analyzed using the same reagents, preparation and analytical methods employed for the samples. The LCS % recovery data is used for validation of sample batch results. Due to matrix effects, the QC limits for MS/MSD's are advisory only and are not used to accept or reject batch results.



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Kapreallan Engineering, Inc.
2401 Stanwell Dr., Ste. 400
Concord, CA 94520
Attention: Avo Avedesslan

Client Project ID: Unocal #5901, 11976 Dublin Blvd., Dublin
Matrix: Water

QC Sample Group: 309-0674

Reported: Sep 28, 1993

QUALITY CONTROL DATA REPORT

| ANALYTE | Benzene | Toluene | Ethyl-Benzene | Xylenes |
|--------------------------|------------|------------|---------------|------------|
| Method: | EPA 8020 | EPA 8020 | EPA 8020 | EPA 8020 |
| Analyst: | J.F. | J.F. | J.F. | J.F. |
| Conc. Spiked: | 20 | 20 | 20 | 60 |
| Units: | µg/L | µg/L | µg/L | µg/L |
| LCS Batch#: | 2LCS092493 | 2LCS092493 | 2LCS092493 | 2LCS092493 |
| Date Prepared: | 9/24/93 | 9/24/93 | 9/24/93 | 9/24/93 |
| Date Analyzed: | 9/24/93 | 9/24/93 | 9/24/93 | 9/24/93 |
| Instrument I.D.#: | HP-4 | HP-4 | HP-4 | HP-4 |
| LCS % Recovery: | 91 | 94 | 95 | 97 |
| Control Limits: | 70-130 | 70-130 | 70-130 | 70-130 |

| | | | | |
|---|---------|---------|---------|---------|
| MS/MSD Batch #: | 3090713 | 3090713 | 3090713 | 3090713 |
| Date Prepared: | 9/24/93 | 9/24/93 | 9/24/93 | 9/24/93 |
| Date Analyzed: | 9/24/93 | 9/24/93 | 9/24/93 | 9/24/93 |
| Instrument I.D.#: | HP-4 | HP-4 | HP-4 | HP-4 |
| Matrix Spike % Recovery: | 95 | 100 | 100 | 102 |
| Matrix Spike Duplicate % Recovery: | 95 | 100 | 100 | 103 |
| Relative % Difference: | 0.0 | 0.0 | 0.0 | 0.0097 |

SEQUOIA ANALYTICAL

Please Note:

The LCS is a control sample of known, interferent free matrix that is analyzed using the same reagents, preparation and analytical methods employed for the samples. The LCS % recovery data is used for validation of sample batch results. Due to matrix effects, the QC limits for MS/MSD's are advisory only and are not used to accept or reject batch results.


Alan B. Kemp
Project Manager

