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

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File

July 3, 1990

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

RE: *Unocal Service Station #5366*
7375 Amador Valley Blvd.
Dublin, California

Gentlemen:

Per the request of Mr. Ron Bock of Unocal Corporation, enclosed please find our report dated June 7, 1990, 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\82

Enclosure

cc: Ron Bock, Unocal Corporation

**KAPREALIAN ENGINEERING, INC.**
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KEI-P88-0205.QR8
June 7, 1990

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

Attention: Mr. Ron Bock

RE: Quarterly Report
Unocal Service Station #5366
7375 Amador Valley Blvd.
Dublin, California

Dear Mr. Bock:

This report presents the results of the eighth quarter of monitoring and sampling of the monitoring wells at the referenced site by Kaprealian Engineering, Inc. (KEI), per KEI's report KEI-P88-0205.QR3 dated February 15, 1989. The wells are currently monitored monthly and sampled on a quarterly basis. This report covers the work performed by KEI from March through May, 1990.

BACKGROUND

The subject site is presently used as a gasoline station. A Location Map and Site Plan are attached to this report.

KEI's work at the site began February 18, 1988, and consisted of soil sampling following the removal of three underground fuel storage tanks. Ground water was encountered in the tank pit at a depth of 10.5 feet, thus prohibiting the collection of soil samples from beneath the tanks. Six soil samples were collected from the sidewalls of the fuel tank pit. The fuel tank pit was then excavated to a depth of approximately 13 feet below grade. After pumping 9,000 gallons of water from the tank pit, one ground water sample, designated as W1, was collected. In addition, a second water sample, labeled W2, was collected from a second excavation where the new tanks were installed. Samples were analyzed at HAZCAT Mobile Organics Laboratory in San Carlos, California, a state-certified hazardous waste testing laboratory. The analytical results for the soil samples showed levels of total petroleum hydrocarbons (TPH) as gasoline at 14 ppm, except for one sample, which showed 1,700 ppm. The analytical results of the water samples showed 91,000 ppb TPH as gasoline and 8,200 ppb benzene in sample W1, and 120 ppb TPH as gasoline and non-detectable levels of benzene in sample W2. Documentation of

sample collection and sample results are presented in KEI's report (KEI-J88-025) dated February 25, 1988. Based on the analytical results, KEI recommended the installation of four monitoring wells to begin to determine the extent of the soil and ground water contamination, and to determine the direction of ground water flow.

The four wells, designated as MW1 through MW4, were installed on April 14, 1988. Water samples, initially collected from the four wells had benzene levels ranging from non-detectable to 2.7 ppb, except for well MW1 which showed benzene levels of 960 ppb. Documentation of monitoring well installation, sampling and sample results are presented in KEI's report (KEI-J88-025A-1) dated May 11, 1988. Based on the sample results, KEI recommended a monthly monitoring and quarterly sampling program of the four wells. The wells have been monitored monthly and sampled quarterly since that time.

FIELD ACTIVITIES

The four wells (MW1, MW2, MW3 and MW4) were monitored three times and sampled once during the quarter. During monitoring, the wells were checked for depth to water and presence of free product and sheen. No free product or sheen was noted in any of the wells during the quarter. Monitoring data are summarized in Table 1.

Water samples were collected from the wells on May 18, 1990. Prior to sampling, the wells were purged of 15 to 35 gallons each using a surface pump. Samples were then collected using a clean Teflon bailer. Samples were decanted into clean VOA vials and/or one liter amber bottles as appropriate which were sealed with Teflon-lined screw caps and stored in a cooler on ice until delivery to the state certified laboratory.

HYDROLOGY AND GEOLOGY

Based on the water level data gathered during the quarter, ground water flow direction appeared to be to the east on May 18, 1990, relatively unchanged from the previous quarter. Water levels have fluctuated during the quarter, showing a net decrease of 0.43 to 0.52 feet. The measured depth to ground water at the site on May 18, 1990 ranged between 10.98 to 11.25 feet.

Based on review of regional geologic maps (U.S. Geological Survey Professional Paper 943 "Flatland Deposits - Their Geology and Engineering Properties and their Importance to Comprehensive Planning" by E.J. Helley and K.R. Lajoie, 1979), the subject site

is situated at a mapped geologic contact separating Holocene-age Fine-grained Alluvium (Qhaf) and Late-Pleistocene Alluvium (Qpa). The Fine-grained Alluvium is described as typically consisting of unconsolidated silt and clay materials rich in organic material and is generally less than 10 feet thick. The Late-Pleistocene Alluvium is described as typically consisting of irregular interbedded clay, silt, sand and gravel, which has a maximum thickness up to 150 feet.

The results of our previous subsurface study indicate that the site is underlain predominantly by clay and silty clay soil materials, which locally contain up to approximately 15% fine gravel to the maximum depth explored (20 feet).

## ANALYTICAL RESULTS

Ground water samples were analyzed at Sequoia Analytical Laboratory in Redwood City, California, and were accompanied by properly executed Chain of Custody documentation. The samples were analyzed for TPH as gasoline using EPA method 5030 in conjunction with modified 8015, and benzene, toluene, xylenes and ethylbenzene (BTX&E) using EPA method 8020. In addition, the ground water sample collected from MW1 was analyzed for TPH as diesel using EPA method 3510 in conjunction with modified 8015, total oil and grease (TOG) using EPA method 418.1 with clean up, and halogenated volatile organics using EPA method 8010.

Analytical results of the ground water samples, collected from monitoring wells MW2, MW3 and MW4, indicate non-detectable levels of TPH as gasoline and BTX&E. Analytical results of the ground water samples, collected from MW1, indicate level of TPH as gasoline at 2,000 ppb, and level of benzene at 140 ppb. In MW3, TPH as diesel, TOG and 8010 were non-detectable. Results of the analyses are summarized in Table 2. Copies of the analytical results and Chain of Custody documentation are attached to this report.

## DISCUSSION AND RECOMMENDATIONS

As previously indicated, past activities at the site have led to the situation where some residual soil contamination is still present in the area between the old tank pit and the southwest side of the pump islands. As much contaminated soil as possible was removed during tank replacement in February, 1988 without tearing down the pump islands.

Three of the four corners at the intersection of Village Parkway and Amador Valley Blvd. have active service stations (Mobil, Arco, Unocal). The fourth corner (southwest) was previously a Shell station which has been converted into an oil changing store. During a site visit by KEI, it was determined that several monitoring wells have been installed at the former Shell station site.

Based on the analytical results collected and evaluated to date and no evidence of free product or sheen in any of the wells, KEI recommends the continuation of the current monitoring and sampling program of the existing wells per KEI's report (KEI-P88-0205.QR3) dated February 15, 1989.

DISTRIBUTION

A copy of this report should be sent to Alameda County Health Care Services, 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 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.

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

Sincerely,

Kaprealian Engineering, Inc.

Michael E. Heckathorn
Environmental Engineer

Don R. Braun
Certified Engineering Geologist

License No. 1310
Exp. Date 6/30/90

Mardo Kaprealian
President

jad

Attachments: Tables 1 and 2
Location Map
Site Plan
Laboratory Analyses
Chain of Custody documentation

KEI-P88-0205.QR8
June 7, 1990

TABLE 1

SUMMARY OF MONITORING DATA

| Date | Well No. | Depth to Water (feet) | Product Thickness | Sheen | Water Bailed (gallons) |
|---|---|---|---|---|---|
| 5/18/90 | MW1 | 10.98 | 0 | None | 35 |
| | MW2 | 11.14 | 0 | None | 15 |
| | MW3 | 11.25 | 0 | None | 15 |
| | MW4 | 11.25 | 0 | None | 15 |
| 4/11/90 | MW1 | 10.82 | 0 | None | 55 |
| | MW2 | 10.68 | 0 | None | 0 |
| | MW3 | 10.80 | 0 | None | 0 |
| | MW4 | 10.87 | 0 | None | 0 |
| 3/16/90 | MW1 | 10.25 | 0 | None | 55 |
| | MW2 | 10.31 | 0 | None | 0 |
| | MW3 | 10.45 | 0 | None | 0 |
| | MW4 | 10.52 | 0 | None | 0 |

KEI-P88-0205.QR8
June 7, 1990

TABLE 2

SUMMARY OF LABORATORY ANALYSES

| Date | Sample Well # | TPH as Gasoline | Benzene | Toluene | Xylenes | Ethylbenzene |
|---|---|---|---|---|---|---|
| 5/18/90 | MW1 | 2,000 | 140 | 1.8 | 19 | 460 |
| | MW2 | ND | ND | ND | ND | ND |
| | +MW3 | ND | ND | ND | ND | ND |
| | MW4 | ND | ND | ND | ND | ND |
| 2/06/90 | MW1 | 2,700 | 170 | ND | 29 | 350 |
| | MW2 | ND | ND | ND | ND | ND |
| | +MW3 | ND | ND | ND | ND | ND |
| | MW4 | ND | ND | ND | ND | ND |
| 10/20/89 | MW1 | ND | ND | ND | ND | ND |
| | MW2 | ND | ND | ND | ND | ND |
| | *MW3 | ND | ND | ND | ND | 0.38 |
| | MW4 | ND | ND | ND | ND | ND |
| 7/27/89 | MW1 | 1,900 | 130 | 6.3 | 68 | ND |
| | MW2 | ND | ND | ND | ND | ND |
| | **MW3 | ND | ND | ND | ND | ND |
| | MW4 | ND | 0.34 | ND | ND | ND |
| 5/22/89 | MW3 | ND | ND | ND | ND | ND |
| 4/28/89 | MW1 | 1,000 | 97 | 0.8 | 24 | 170 |
| | MW2 | ND | ND | ND | ND | ND |
| | ***MW3 | 880 | 9.6 | 9.7 | 12.7 | 19 |
| | MW4 | ND | 0.3 | ND | ND | ND |
| 1/26/89 | MW1 | 1,900 | 240 | 1.8 | 30 | 81 |
| | MW2 | ND | ND | ND | ND | ND |
| | ****MW3 | ND | ND | ND | ND | ND |
| | MW4 | ND | 0.67 | ND | ND | ND |
| 10/28/88 | MW1 | 5,200 | 150 | ND | 12 | -- |
| | MW2 | ND | ND | ND | ND | -- |
| | ****MW3 | -- | ND | ND | ND | -- |
| | MW4 | ND | ND | ND | ND | -- |

TABLE 2 (Continued)

SUMMARY OF LABORATORY ANALYSES

| Date | Sample Well # | TPH as Gasoline | Benzene | Toluene | Xylenes | Ethylbenzene |
|---|---|---|---|---|---|---|
| 7/25/88 | MW1 | 6,100 | 170 | 2.1 | 94 | -- |
| | MW2 | ND | ND | ND | ND | -- |
| | ****MW3 | -- | ND | ND | ND | -- |
| | MW4 | ND | ND | ND | ND | -- |
| 4/29/88 | MW1 | 10,000 | 960 | 17 | 1,500 | -- |
| | MW2 | 170 | 2.7 | 0.6 | 13 | -- |
| | ****MW3 | ND | ND | ND | ND | -- |
| | MW4 | ND | ND | ND | ND | -- |

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

* TPH as diesel and EPA method 8010 constituents were non-detectable. TOG showed 2.5 ppm.

** TPH as diesel and EPA method 8010 constituents were non-detectable. TOG showed 1.6 ppm.

*** TPH as diesel was 72 ppb, TOG and EPA method 8010 constituents were non-detectable.

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

ND = Non-detectable.

-- Indicates analysis not performed.

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

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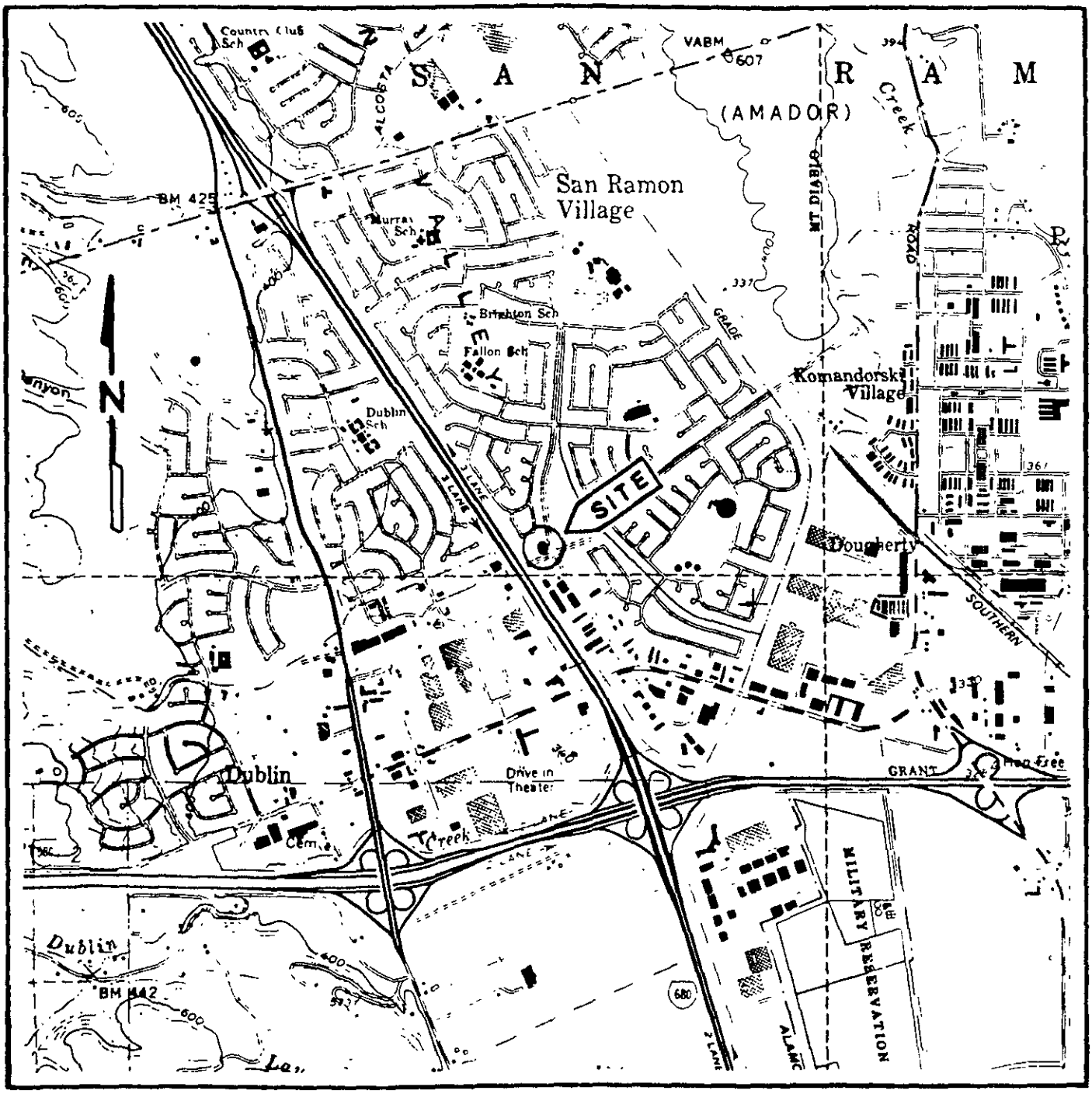


LOCATION MAP

Unocal Service Station #5366
7375 Amador Valley Blvd.
Dublin, California

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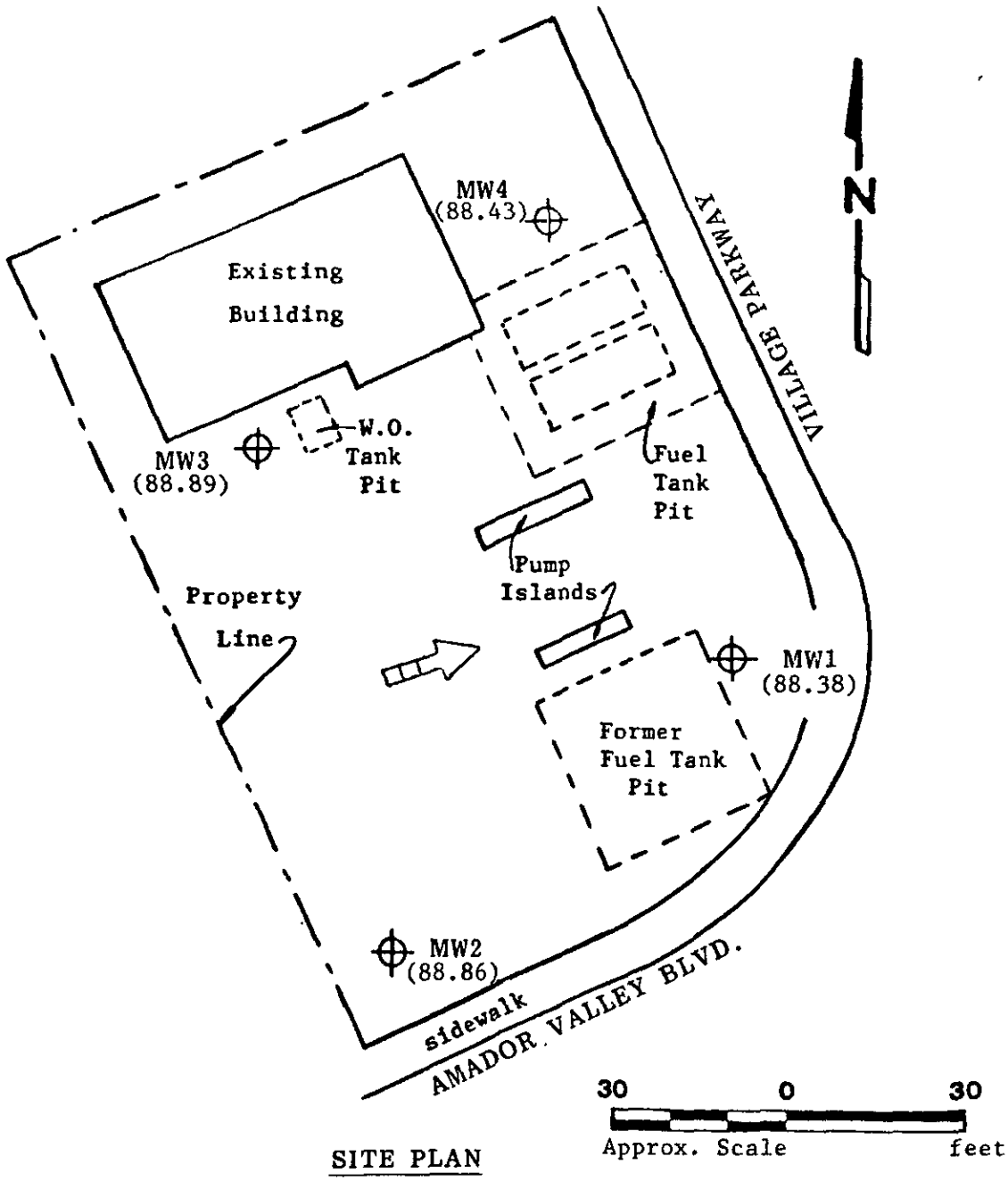


SITE PLAN

LEGEND

⊕ Monitoring Well

( ) Water Table Elevation on 5/18/90. Top of MW2 Well Cover assumed 100.00 feet as datum.

⇨ Ground Water Flow Direction.

Unocal Service Station #5366
7375 Amador Valley Blvd.
Dublin, California

# SEQUOIA ANALYTICAL

680 Chesapeake Drive • Redwood City, CA 94063
(415) 364-9600 • FAX (415) 364-9233


| | | | |
|---|---|---|---|
| Kaprealian Engineering, Inc. | Client Project ID: | Unocal, Dublin, 7375 Amador Valley Blvd | Sampled: May 18, 1990 |
| P.O. Box 996 | Matrix Descript: | Water | Received: May 18, 1990 |
| Benicia, CA 94510 | Analysis Method: | EPA 5030/8015/8020 | Analyzed: May 23, 1990 |
| Attention: Mardo Kapreallan, P.E. | First Sample #: | 005-3113 A-B | Reported: May 29, 1990 |

## 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) |
|---|---|---|---|---|---|---|
| 0053113 A-B | MW1 | 2,000 | 140 | 1.8 | 460 | 19 |
| 0053114 A-B | MW2 | N.D. | N.D. | N.D. | N.D. | N.D. |
| 0053115 A-B | MW3 | N.D. | N.D. | N.D. | N.D. | N.D. |
| 0053116 A-B | MW4 | N.D. | N.D. | N.D. | N.D. | N.D. |
| **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
Project Manager

Please Note:
Amended report dated: 5/4/90

# SEQUOIA ANALYTICAL

680 Chesapeake Drive • Redwood City, CA 94063
(415) 364-9600 • FAX (415) 364-9233


| | | | | |
|---|---|---|---|---|
| Kaprealian Engineering, Inc. | Client Project ID: | Unocal, Dublin, 7375 Amador Valley Blvd | Sampled: | May 18, 1990 |
| P.O. Box 996 | Matrix Descript: | Water | Received: | May 18, 1990 |
| Benicia, CA 94510 | Analysis Method: | EPA 418.1 (I.R. with clean-up) | Extracted: | May 24, 1990 |
| Attention: Mardo Kaprealian, P.E. | First Sample #: | 005-3115 D | Analyzed: | May 24, 1990 |
| | | | Reported: | May 29, 1990 |

## TOTAL RECOVERABLE PETROLEUM HYDROCARBONS

| Sample Number | Sample Description | Petroleum Oil mg/L (ppm) |
|---|---|---|
| 0053115 D | MW3 | N.D. |

| | |
|---|---|
| **Detection Limits:** | **1.0** |

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

**SEQUOIA ANALYTICAL**

Belinda C. Vega
Project Manager

# SEQUOIA ANALYTICAL

680 Chesapeake Drive • Redwood City, CA 94063
(415) 364-9600 • FAX (415) 364-9233


| | | | | |
|---|---|---|---|---|
| Kapreallan Engineering, Inc. | Client Project ID: | Unocal, Dublin, 7375 Amador Valley Blvd | Sampled: | May 18, 1990 |
| P.O. Box 996 | Matrix Descript: | Water | Received: | May 18, 1990 |
| Benicia, CA 94510 | Analysis Method: | EPA 3510/8015 | Extracted: | May 24, 1990 |
| Attention: Mardo Kapreallan, P.E. | First Sample #: | 005-3115 C | Analyzed: | May 25, 1990 |
| | | | Reported: | May 29, 1990 |

## TOTAL PETROLEUM FUEL HYDROCARBONS (EPA 8015)

| Sample Number | Sample Description | High B.P. Hydrocarbons µg/L (ppb) |
|---|---|---|
| 0053115 C | MW3 | 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.

**SEQUOIA ANALYTICAL**

Belinda C. Vega
Project Manager

# SEQUOIA ANALYTICAL

680 Chesapeake Drive • Redwood City, CA 94063
(415) 364-9600 • FAX (415) 364-9233


| | | | | |
|---|---|---|---|---|
| Kaprealian Engineering, Inc. | Client Project ID: | Unocal, Dublin, 7375 Amador Valley Blvd | Sampled: | May 18, 1990 |
| P.O. Box 996 | Sample Descript: | Water, MW3 | Received: | May 18, 1990 |
| Benicia, CA 94510 | Analysis Method: | EPA 5030/8010 | Analyzed: | May 20, 1990 |
| Attention: Mardo Kaprealian, P.E. | Lab Number: | 005-3115 E-F | Reported: | May 29, 1990 |

## 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. |
| Total 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
Project Manager

# KAPREALIAN ENGINEERING, INC.

## CHAIN OF CUSTODY

SAMPLER: Wade Weston

WITNESSING AGENCY:

SITE NAME & ADDRESS: Unocal Dublin
7375 Amador Valley Blvd

ANALYSES REQUESTED: TPH-G, BTXE, TPH-D, 109, 601

TURN AROUND TIME: 1 Week

| SAMPLE ID NO. | DATE | TIME | SOIL | WATER | GRAB | COMP | NO. OF CONT. | SAMPLING LOCATION | REMARKS |
|---|---|---|---|---|---|---|---|---|---|
| MW 1 | 5-18-90 | | | ✓ | ✓ | | 2 Vo | See Sample I.D. * | 0053113 AB |
| MW 2 | " | | | ✓ | ✓ | | 2 Vo | | 3114 AB |
| MW 3 | " | | | ✓ | ✓ | | 4V 2L | | 3115 AF |
| MW 4 | " | | | ✓ | ✓ | | 2 Vo | | 3116 AB |

| Relinquished by: (Signature) | Date/Time | Received by: (Signature) |
|---|---|---|
| Wade Weston | 5-18-90 6 PM | John Comer |
| | Date/Time | Received by: (Signature) |
| | Date/Time | Received by: (Signature) |
| | Date/Time | Received by: (Signature) |
| | 8:00PM | |

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: [signature] Title: SR Date: 5/18