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January 14, 1994

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

Attention: Ms. Eva Chu

RE: Unocal Service Station #6419  
6401 Dublin Blvd.  
Dublin, California

Dear Ms. Chu:

Per the request of Mr. Edward C. Ralston of Unocal Corporation, enclosed please find our work plan/proposal dated January 7, 1994, 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: Edward C. Ralston, Unocal Corporation

*4/11 - per Tim Ross - yes MWS were installed. Report at Ed Ralston for review*



KAPREALIAN ENGINEERING  
INCORPORATED

KEI-P93-0401.P2  
January 7, 1994

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

Attention: Mr. Edward C. Ralston

RE: Work Plan/Proposal  
Unocal Service Station #6419  
6401 Dublin Boulevard  
Dublin, California

Dear Mr. Ralston:

In Kaprealian Engineering, Inc's. (KEI) most recent report (KEI-P93-0401.R1) dated October 15, 1993, KEI recommended the installation of three monitoring wells at the referenced site. The purpose of these wells is to further determine the extent of any remaining soil contamination in the vicinity of the fuel storage tanks at the site, to determine the ground water flow direction at the site, and to determine the lateral extent of any existing ground water contamination at the site. This work plan/proposal for the installation of these wells is based on the analytical results of the water samples collected following the removal of underground storage tanks at the subject site in September of 1993, and is presented for your review and consideration. The site background information, recent field activities, and a discussion of our recommendations are included in the referenced report.

#### PROPOSED FIELD WORK

##### PHASE I - WELL INSTALLATION

1. KEI proposes the installation of three two-inch diameter monitoring wells, designated as MW1 through MW3 on the attached Figure 1, by the use of hollow-stem auger equipment. Permits will be obtained from the Alameda County Flood Control and Water Conservation District (Zone 7), as necessary, prior to beginning work.

The wells will be drilled 10 feet into the saturated zone of the first encountered ground water, unless a clay aquitard of at least 5 feet in thickness is encountered first, at which time drilling will be terminated.

Ground water is anticipated at approximately 12 feet below grade, based on the ground water levels detected within the

fuel tank pit during the removal of the underground fuel storage tanks at the site.

2. Soil samples will be collected at a maximum spacing of 5 foot intervals, at significant changes in lithology, at obvious areas of contamination, and at/or within the soil/ground water interface, beginning at a depth of about 4 to 5 feet below grade. Sample intervals will be chosen so that an accurate profile of the subsurface soil conditions can be determined. Sampling for laboratory analyses and lithologic logging purposes will continue until the first water table is encountered. A representative sample(s) of the saturated zone will be collected and submitted to a laboratory for particle size analysis (sieve and hydrometer) for verification of the choice of sand filter pack material and screen slot size. Additional sampling for lithologic logging purposes only will continue below the water table to the total depth drilled. Classification of soil will be done using the Unified Soils Classification System (USCS) by KEI's field geologist. Samples will be collected in a California-modified split-spoon sampler lined with two-inch diameter brass liners. The sampler will be advanced ahead of the drilling augers at designated depths by dropping a 140 pound hammer 30 inches. Blow counts will be recorded. Samples will be removed from the sampler and retained in the brass liners. The liners will then be sealed with aluminum foil, plastic caps, and tape. They will be labeled and stored in a cooler, on crushed ice or "blue ice," for delivery to a state-certified laboratory. Properly executed Chain of Custody documentation will accompany all soil samples.
3. During drilling operations, all soil materials will be stored on-site in DOT-approved, 55-gallon drums, or else covered by visqueen. Each drum (if used) will be properly labeled and will include, at a minimum, the date, the interval that soil materials were obtained from, a contact individual, and the phone number at KEI.
4. Finalized Boring Logs will be prepared from the field logs and submitted to Zone 7, and to the Regional Water Quality Control Board (RWQCB), San Francisco Bay Region.
5. Well Construction:

Casing Type: Schedule 40 PVC, flush threaded joints, .010 inch factory slot, two-inch diameter. Screen to run from total depth of the well to approximately 5 feet above the depth of the first encountered ground water. Monterey sand (#2/12) will fill the annular space from total depth to 2 feet above the perforated casing interval. The choice of sand

filter pack material and screen slot size will be verified by particle size analysis. A 2-foot thick bentonite seal will be placed in the annular space on top of the sand pack. Neat cement grout will be placed on top of the bentonite seal to the surface. A proposed Well Construction Diagram is attached to this work plan.

The well casings will each be secured with a waterproof cap and a padlock. A round, watertight, flush-mounted well cover will be concreted in place over the top of each casing. The elevation of each well casing will be surveyed by a licensed land surveyor to Mean Sea Level and to a vertical accuracy of 0.01 feet.

6. The wells will be developed approximately one week after well completion. Prior to development, the wells will be checked for depth to the water table (by the use of an electronic sounder) and the presence of free product (by the use of an interface probe or paste tape). After recording the monitoring data, the wells will be developed by the use of a surge block and a subsurface pump. Effluent generated during well development will be contained in DOT-approved drums and hauled from the site by a licensed hazardous materials hauler.

7. Ground Water Sampling:

The wells will be purged (by the use of a surface pump or bailer) of a minimum of four casing volumes. Purging will be conducted prior to sampling and at least 72 hours after development. During purging operations, the field parameters pH, temperature, and electrical conductivity will be recorded. Once the field parameters are observed to stabilize and a minimum of approximately four casing volumes have been removed from each well, water samples will be collected by the use of a clean Teflon bailer. The samples will then be promptly decanted into 40 ml VOA vials. The vials will be sealed with Teflon-lined screw caps, labeled, and stored, on ice, for delivery to a state-certified laboratory. The sampling bailer will be cleaned with non-phosphate soap and clean water rinses between uses.

The wells will be checked for free product (by the use of an interface probe and/or paste tape) prior to development and sampling. The wells will also be checked for the presence of a sheen prior to sampling.

Properly executed Chain of Custody documentation will accompany all water samples.

*Amendment  
M.W. include analysis  
for TPH-D, Metals, etc*

8. Laboratory Analyses:

Water and selected soil samples will be analyzed by Sequoia Analytical Laboratory, a state-certified laboratory, for total petroleum hydrocarbons (TPH) as gasoline by EPA method 5030/modified 8015, and benzene, toluene, ethylbenzene, and xylenes (BTEX) by EPA method 8020.

The analytical results will be presented in tabular form, showing the sample depths and results. The analytical results will be used to delineate the vertical and lateral extent of any contaminants in the soil or ground water.

9. Hydrology:

The ground water flow direction and ground water gradient will be determined from the water level elevations measured in each monitoring well. The ground water flow direction will be shown on a Site Plan.

10. Conclusions:

Conclusions and results of Phase I will be described in a technical report. The technical report will be submitted to Zone 7, to Ms. Eva Chu of the Alameda County Health Care Services Agency, and to Mr. Lester Feldman of 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 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 will be based on the data obtained from the field and laboratory analyses obtained from a state-certified laboratory. We will analyze 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 will be performed in accordance with generally accepted professional principles and practices existing for such work.

KEI-P93-0401.P2  
January 7, 1994  
Page 5

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

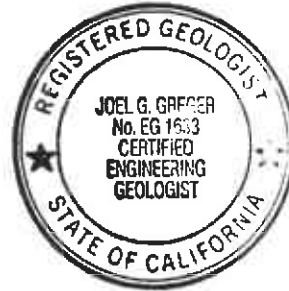
Sincerely,

Kaprealian Engineering, Inc.



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

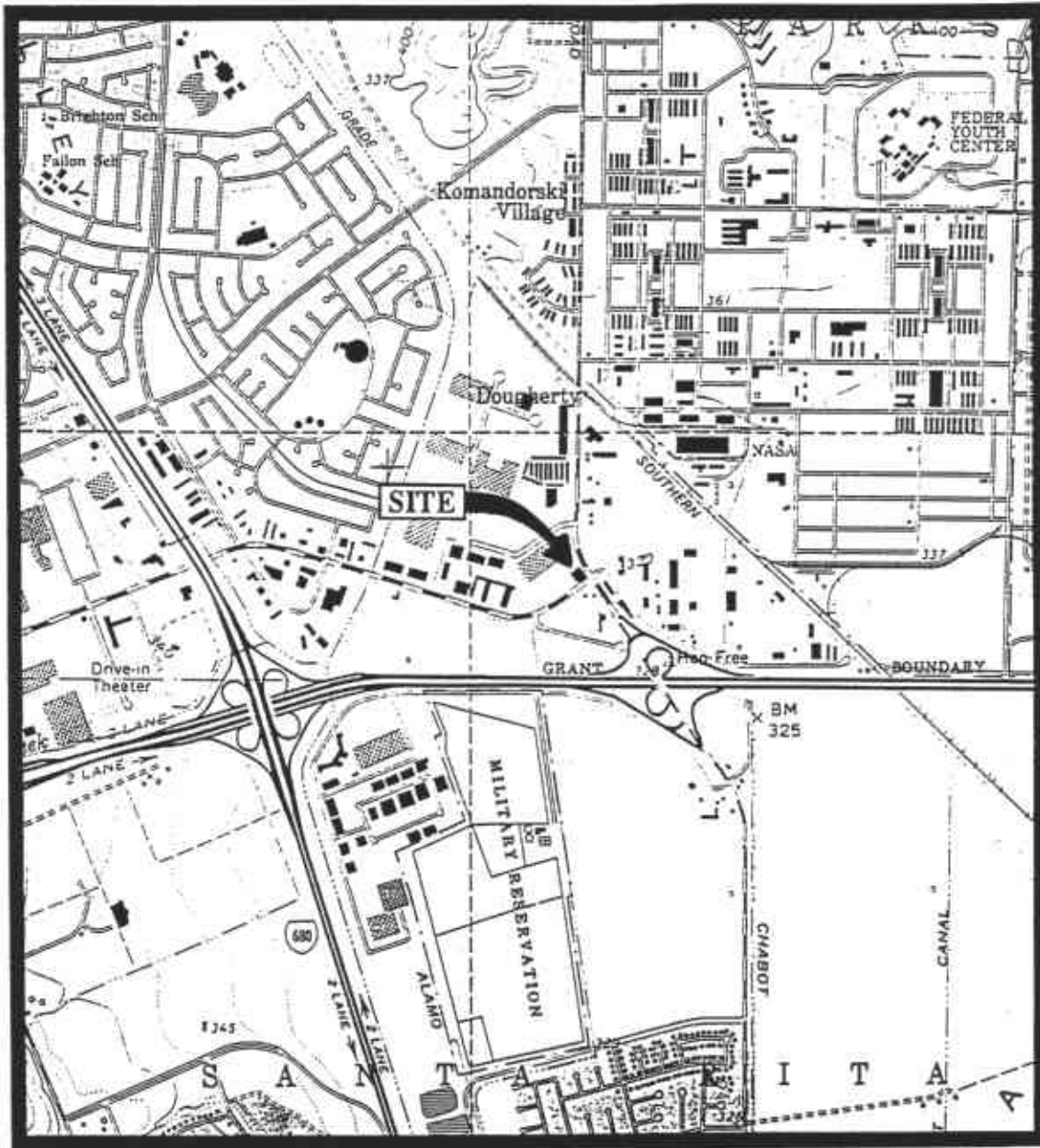
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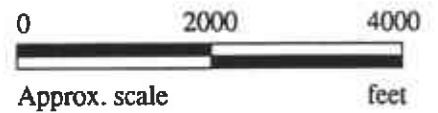
Timothy R. Ross  
General Manager


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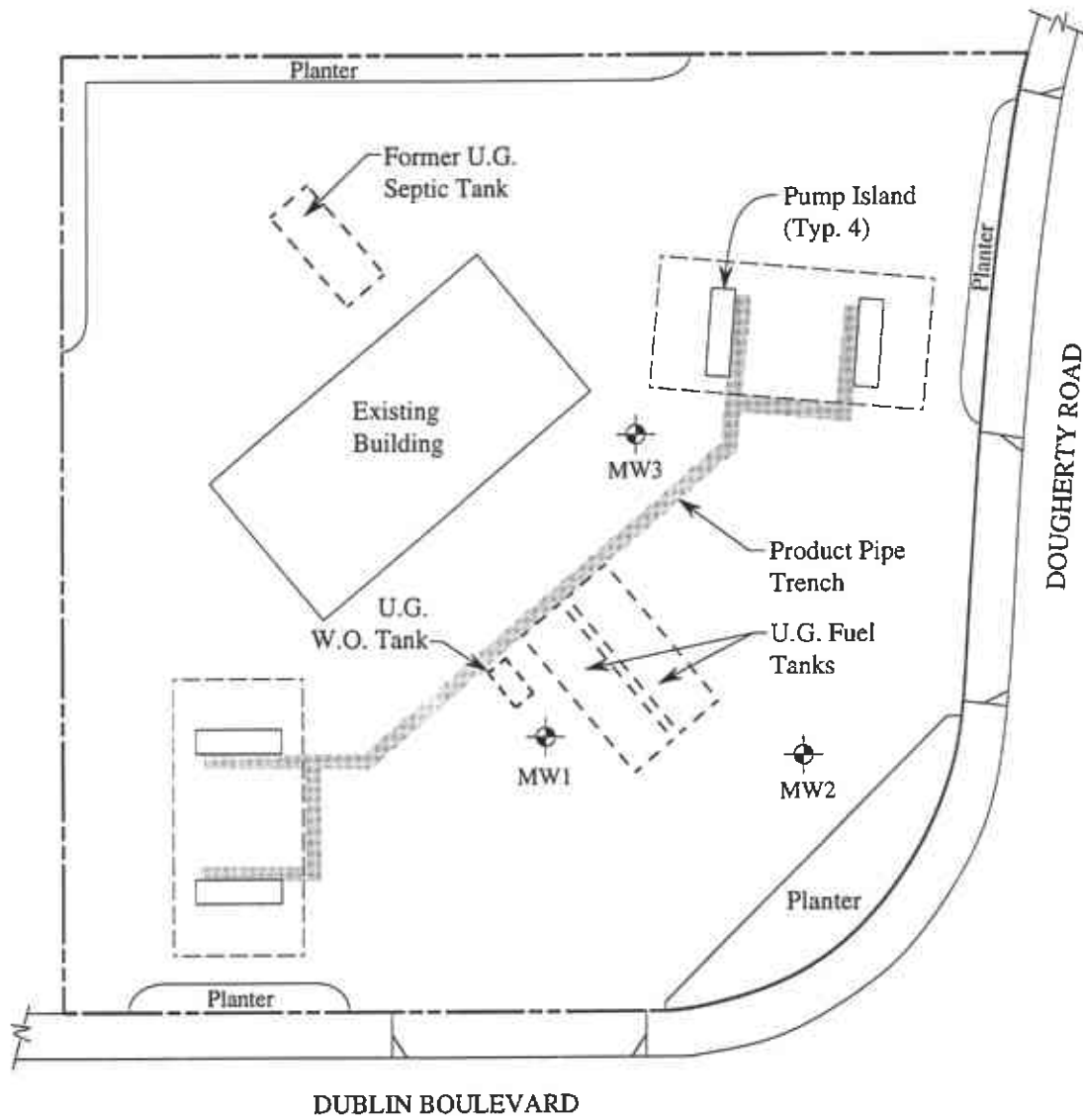
Attachments: Location Map  
Figure 1  
Proposed Well Construction Diagram



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

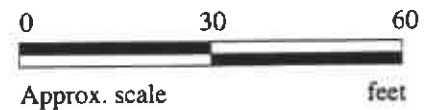


 <p><b>KAPREALIAN ENGINEERING INCORPORATED</b></p>	<p><b>UNOCAL SERVICE STATION #6419 6401 DUBLIN BOULEVARD DUBLIN, CALIFORNIA</b></p>	<p><b>LOCATION MAP</b></p>
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**LEGEND**

⊕ Monitoring well (proposed)



**PROPOSED MONITORING WELL LOCATION MAP**



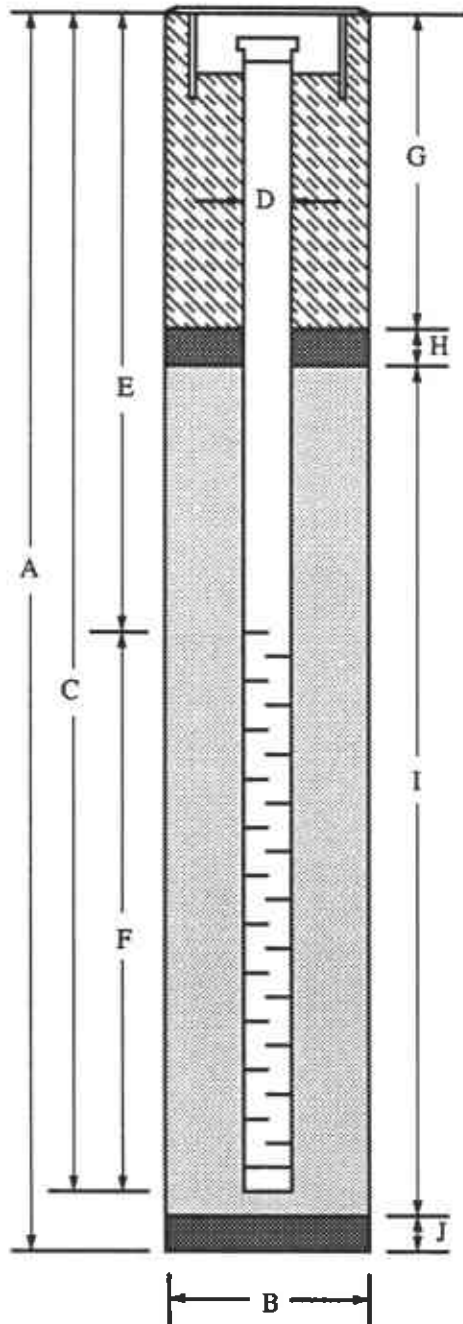
**UNOCAL SERVICE STATION #6419  
6401 DUBLIN BOULEVARD  
DUBLIN, CALIFORNIA**

**FIGURE  
1**



## PROPOSED WELL CONSTRUCTION DIAGRAM

Flush-mounted Well Cover



### WELL DETAILS\*

1. Well will be terminated 10 feet into the first encountered ground water, unless an aquitard five feet or greater in thickness is encountered below the water table, in which case the bottom of the boring will be backfilled with bentonite pellets and the well terminated at the top of this aquitard [A].
2. Boring diameter [B] is 8 inches for 2 inch wells, 10 inches for 4 inch wells, and 12 inches for 6 inch wells.
3. Perforated interval [F] will extend from bottom of casing to five feet above the first encountered ground water table (unless water <5 feet deep).
4. Schedule 40 PVC casing, 2 inch in diameter [D], will be used. Screen is 0.020 or 0.010 inch factory machined slots, depending on filter pack grain size.
5. Filter pack will be placed from bottom of casing to two feet above perforated interval [I]. (Bottom seal [J] is not installed unless required.) One to two feet of bentonite [H] will be placed above the filter pack. Concrete grout [G] will be placed from top of bentonite seal to the surface (unless modified due to shallow water). Blank casing [E] will extend from the top of the perforated casing to the top of the hole.
6. The well will be installed with a waterproof cap, padlock and a flush-mounted well cover.

\* See text for additional information.