KAPREALIAN ENGINEERING, INC.
Consulting Engineers
P. O. BOX 913
BENICIA, CA 94510
(415) 676 - 9100 (707) 746 - 6915

KEI-P89-0301.W1
March 16, 1989

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

Attention: Mr. Larry Seto

RE: Work Plan
Unocal Service Station #6277
15803 East 14th Street
San Leandro, California

INTRODUCTION

1. Background:

On March 13 and 14, 1989, Kaprealian Engineering, Inc. (KEI) collected soil samples following the removal of two fuel storage tanks and one waste oil tank at the referenced site. Sampling and analysis are not yet complete; however, field observations and preliminary results received thus far (KEI Report KEI-P89-0301.R2 dated March 16, 1989) suggest that ground water may have been impacted at the site. Based on the data gathered, KEI first proposes installation of four monitoring wells at the site.

2. Site Description:

The service station site occupies the western corner at the intersection of 14th Street and 159th Avenue in San Leandro.

PROPOSED FIELD WORK

PHASE I - WELL INSTALLATION

1. KEI proposes to install four 2" diameter monitoring wells using hollow stem auger equipment. Permits will be obtained from the Alameda County Health Agency as necessary prior to beginning work.

The wells will be drilled 15 feet into the saturated zone of the first encountered ground water unless a five foot thick clay aquitard is encountered first, at which time drilling will be terminated.

2. Soil samples will be collected at five foot intervals beginning at a depth of five feet until the first water table is encountered. Classification of soil will be done using the Unified Soils Classification System (USCS) by KEI's field engineer or geologist. Samples will be collected in a California modified split-spoon sampler with 2" diameter brass liners. The sampler will be advanced ahead of the drilling augers at designated depths by dropping a 140 pound hammer 30". Blow counts will be recorded. The samples will be removed from the sampler, retained in the brass liners, and sealed with aluminum foil, plastic caps and tape. They will be labeled and stored on ice for delivery to a state certified laboratory.

3. Finalized boring logs will be prepared from field logs and submitted to the Department of Water Resources, the Alameda County Health Agency, and to the Regional Water Quality Control Board (RWQCB), San Francisco Bay Region.

4. Ground water is anticipated at approximately 11 feet below grade based on the ground water level found during tank removal.

5. Well Construction:

   Casing Type: Schedule 40 PVC, flush threaded joints, 0.02" factory slot, 2" diameter. Screen to run from total depth of the well to approximately 25 feet below grade. Monterey sand (#3) will fill the annular space from total depth to approximately five feet below grade. A two foot thick bentonite seal will be placed in the annular space on top of the sand pack. Concrete will be poured from the top of the bentonite seal to the surface.

   Well casings will 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 the casing.

6. Wells will be checked for depth to the water table, the presence of free product and sheen prior to both development and sampling. Water levels will be measured with an electronic sounder. The wells will be developed using a surface pump approximately one week after well completion. Wells will be pumped until expelled water is clear and free of turbidity. Effluent generated during well development will be contained in barrels and hauled from the site by a licensed hazardous materials hauler.

   Casing elevations will be surveyed to an assumed datum.

7. Ground Water Sampling:

   The wells will be purged with a surface bailer a minimum of four casing volumes prior to sampling, at least 24 hours after development. After recovery, samples will be collected using a clean Teflon bailer and will be promptly decanted into 40 ml VOA vials and/or one liter amber bottles as appropriate. Vials and/or bottles will be sealed with Teflon-lined screw caps, labeled and stored on ice for delivery to a state certified laboratory. Properly executed chain of custody documentation will accompany all samples. The sampling bailer will be cleaned with soap and a clean water rinse between uses.

8. Laboratory Analyses:

   Selected soil and all water samples will be analyzed by Sequoia Analytical Laboratory in Redwood City, California, a state certified laboratory, for TPH and BTX&E using EPA analytical methods recommended by the RWQCB, as specified in the Tri-regional guidelines.

   Analytical results will be presented in tabular form, showing sample depths, results and detection limits. The results will be used to delineate the vertical and lateral extent of the subsurface contaminants. A cross sectional profile will be constructed as appropriate showing subsurface lithology to depth drilled and first water table depth.

9. Hydrology:

   Ground water flow direction will be determined from survey data and water table depths. The ground water flow direction will be shown on the Site Plan.

10. Discussion and Recommendations:

Results of Phase I will be described in a technical report. If levels of contaminants in the ground water are found to be near or below action levels, KEI will recommend a 12 month program of monthly monitoring and quarterly sampling to document the levels.

If contaminant levels in the ground water are found to significantly exceed action levels, Phase II will be initiated.

The technical report will be submitted to the Alameda County Health Agency and to the RWQCB, San Francisco Bay Region.

PHASE II

Phase II will discuss the alternatives for continuing the subsurface investigation if Phase I reveals contamination levels in the ground water significantly in excess of action levels.

Phase II will include a proposal for additional monitoring wells to define a zero line of ground water contamination. It will also propose a ground water monitoring and sampling program for the wells installed during Phase I.

The main purpose of Phase II will be to establish a zero line of ground water contamination.

PHASE III

Once the zero line is established through the completion of Phase II, a final remedial plan will be developed.

The first step of phase III will be to conduct pumping tests to define aquifer characteristics.

Interpretations of the subsurface stratigraphy will be used in consideration of various remedial options such as soil venting and/or air stripping.

PHASE IV

Implementation of the remediation plan.

Sincerely,

Kaprealian Engineering, Inc.

Gary S. Johnson
Registered Geologist

License No. 4315
Exp. Date 6/30/90

Mardo Kaprealian
President

cc: Tim Ross, Unocal