KAPREALIAN ENGINEERING
INCORPORATED

KEI-P90-0606.R15
October 24, 1995

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

Attention: Mr. Adadu Yemane

RE: Continuing Subsurface Investigation at
Former Unocal Service Station #5901
11976 Dublin Boulevard
Dublin, California

Dear Mr. Yemane:

This report presents the results of Kaprealian Engineering, Inc's. (KEI) most recent subsurface investigation for the referenced site, in accordance with KEI's proposal (KEI-P90-0606.P8) dated April 25, 1995. The purpose of the investigation was to attempt to determine the extent of hydrocarbon-impacted soil and ground water in the vicinity of monitoring well MW6. The scope of the work performed by KEI consisted of the following:

Coordination with regulatory agencies

Geologic logging of three exploratory borings

Soil sampling

Ground water sampling

Delivery of soil and ground water samples (including properly executed Chain of Custody documentation) to a California-certified analytical laboratory for laboratory analyses

Data analyses, interpretation, and report preparation

SITE DESCRIPTION AND BACKGROUND

The subject site is currently occupied by a Petco pet food store. Previously the site was occupied by a Unocal service station facility.

The site is situated on topography that slopes gently eastward, and is located approximately 700 feet northwest of a channelized portion of Dublin Creek. The site is also located near the southwest end of the San Ramon Valley, near Amador Valley. The

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station building, pump islands, and other station facilities have been demolished and removed from the site. A Location Map is attached to this report.

KEI's initial field work was conducted on June 13, 1990, when two underground gasoline storage tanks and one waste oil tank were removed from the site. The tanks consisted of one 10,000 gallon super unleaded gasoline storage tank, one 10,000 gallon regular unleaded gasoline storage tank, and one 280 gallon waste oil tank. The tanks were made of steel, and at least one hole (of up to 1/4-inch diameter) was observed in both of the fuel tanks. Numerous holes (up to 1/2-inch in diameter) were observed in the waste oil tank. Mr. Ravi Arulanantham of the Alameda County Health Care Services (ACHCS) Agency was present during tank removal and subsequent soil sampling.

Water was encountered in the fuel tank pit at a depth of approximately 7 feet below grade, thus prohibiting the collection of any soil samples from immediately beneath the tanks. Six soil samples, labeled SW1 through SW6, were collected from the sidewalls of the fuel tank pit (each sample was collected at approximately 6 to 12 inches above the observed water table). One soil sample, labeled WO1, was collected from beneath the waste oil tank at a depth of approximately 6.5 feet below grade. An additional soil sample, labeled SWA, was collected from the waste oil tank pit sidewall at a depth of approximately 6.5 feet below grade. Sample point locations are as shown on the attached Figure 2.

KEI returned to the site on June 15, 1990, in order to collect soil samples from the product pipe trenches. Four samples, labeled P1 through P4, were collected from the trenches at depths of 6 feet below grade. After the soil sampling was completed, the pipe trenches were excavated to ground water at the areas indicated on the attached Figure 3. Pipe trench sample point locations are also shown on the attached Figure 3.

On June 15, 1990, after reviewing the analytical results of the soil samples SW1 through SW6, additional soil excavation was performed. Four additional soil samples, labeled SW1(3), SW2(3), SW5(2.5), and SW6(3), were collected from the sidewalls of the fuel tank pit (each sample was collected approximately 6 to 12 inches above ground water), in the vicinity of sample point locations SW1, SW2, SW5, and SW6, respectively.

After soil sampling was completed, approximately 25,000 gallons of ground water were pumped from the fuel tank pit. On June 20, 1990, one water sample, labeled W1, was collected from the fuel tank pit.

Also on June 20, 1990, based on the analytical results of soil samples SW1(3) and SW2(3), additional soil excavation was again performed. Two additional soil samples, labeled SW1(6.5) and SW2(6.5), were collected from the northerly sidewall of the fuel tank pit (each sample was collected approximately 6 to 12 inches above ground water), in the vicinity of sample point locations SW1(3) and SW2(3). The sample point locations and the area excavated are as indicated on the attached Figure 2.

On June 26, 1990, KEI again returned to the site, in order to collect soil samples from the sidewalls of the new underground fuel storage tank pit located to the west of the pump islands. Four soil samples, labeled SW11, SW12, SW13, and SW14, were collected from the sidewalls of the excavation (each sample was collected at 6 to 12 inches above ground water). Sample point locations are as shown on the attached Figure 4.

On July 3, 1990, after approximately 10,000 gallons of ground water were pumped from the new fuel tank pit, KEI collected a water sample (labeled W2) from the pit.

All samples were analyzed by Sequoia Analytical Laboratory in Redwood City, California. All soil samples, except the waste oil tank pit sidewall sample SWA, were analyzed for total petroleum hydrocarbons (TPH) as gasoline and benzene, toluene, ethylbenzene, and xylenes (BTEX). In addition to TPH as gasoline and BTEX, soil sample WO1 (collected from the waste oil tank pit) was also analyzed for TPH as diesel, total oil and grease (TOG), and EPA method 8010 constituents. The waste oil tank pit sidewall sample (SWA) was analyzed for TOG only. In addition to TPH as gasoline and BTEX, a soil sample (SW11) collected from the new fuel tank pit was also analyzed for TOG.

Both water samples were analyzed for TPH as gasoline and BTEX. In addition, water sample W2, collected from the new fuel tank pit, was analyzed for TOG. The results of the soil analyses are summarized in Table 8, and the results of the water analyses are summarized in Table 9.

KEI returned to the site on July 16, 1990, when three trenches were excavated laterally from the easterly, northerly, and westerly waste oil tank pit sidewalls. Water was encountered at a depth of approximately 7 feet below grade. Three soil samples, labeled SWB(13), SWC(10), and SWD(14), were collected from the sidewalls of the trenches, each approximately 6 to 12 inches above the observed water table. Sample point locations are as shown on the attached Figure 5. After sampling, the sidewalls of the waste oil tank pit were excavated laterally to the sample point locations and to depths of approximately 1 foot below the water table (or about 8 feet below grade).

On July 19, 1990, after having pumped approximately 5,000 gallons of ground water from the waste oil tank pit excavation, a water sample, labeled W3, was collected from the pit.

On July 20, 1990, KEI returned to the site to collect the additional soil samples required by the ACHCS. Four soil samples, labeled SWE, SWF, SWG, and SWH, were collected (each approximately 6 to 12 inches above the ground water level) from the four corners of the waste oil tank excavation. Sample point locations are also shown on the attached Figure 5.

All samples were analyzed by Sequoia Analytical Laboratory in Redwood City, California. All soil samples were analyzed for TPH as gasoline, BTEX, TPH as diesel, TOG, and EPA method 8010 constituents. The water sample was analyzed for TPH as gasoline, BTEX, TPH as diesel, TOG, and EPA method 8010 constituents. The results of the soil analyses are summarized in Table 10, and the results of the water analyses are summarized in Table 11.

To comply with the requirements of the regulatory agencies and based on the analytical results, KEI proposed the installation of four monitoring wells. Documentation of the tank removal procedures, sample collection techniques, and the analytical results of the soil samples collected from the fuel and waste oil tank excavations are summarized in KEI's reports (KEI-J90-0606.R1 and KEI-J90-0606.R4) dated July 16, 1990, and July 30, 1990, respectively.

On November 6 and 7, 1990, four two-inch diameter monitoring wells (designated as MW1, MW2, MW3, and MW4 on the attached Figure 1) were installed at the site. The monitoring wells were drilled and completed to total depths ranging from 20 to 24 feet below grade. Ground water was encountered at depths ranging from about 5.4 to 9.5 feet below grade during drilling in all wells, except MW3, in which ground water was not encountered until a depth of about 15.2 feet below grade. All four wells were surveyed by a licensed land surveyor (Kier & Wright of Pleasanton, California) to Mean Sea Level (MSL) and to a vertical accuracy of 0.01 feet. The wells were developed on November 12, 1990, and were initially sampled on November 16, 1990.

Water and selected soil samples were analyzed at Sequoia Analytical Laboratory. Samples were analyzed for TPH as gasoline and BTEX.

In addition, samples collected from MW1 (adjacent to the waste oil tank pit) were analyzed for TPH as diesel, TOG, and for EPA method 8010 compounds.

The results of the soil analyses are summarized in Table 5, and the results of the water analyses are summarized in Table 4. Based on the analytical results, KEI recommended the implementation of a monthly ground water monitoring and quarterly ground water sampling program. Documentation of the well installation procedures, sample collection techniques, and the analytical results are presented in KEI's report (KEI-P90-0606.R6) dated December 17, 1990. The monitoring and sampling program was initiated in February of 1991.

KEI conducted additional field work on May 21, 1992, when two 12,000 gallon storage tanks (formerly containing regular unleaded and super unleaded gasoline) and one 520 gallon waste oil tank were removed from the site. The tanks, which had been installed in July 1990, were made of double-walled steel. No apparent holes or cracks were observed in any of the tanks. Mr. Scott Seery of the ACHCS was present during tank removal and subsequent soil sampling. Mr. Tom Hathcox of the Dougherty Regional Fire Authority was also present during tank removal. Ground water was encountered in the fuel tank pit at a depth of about 7 feet below grade, and in the waste oil tank pit at a depth of about 6.5 feet below grade, thus prohibiting the collection of any soil samples from immediately beneath the tanks. Four soil samples, labeled F-SW1 through F-SW4, were collected from the sidewalls of the fuel tank pit at depths of about 6.5 feet below grade. Four soil samples, labeled WO-1 through WO-4, were collected from the sidewalls of the waste oil tank pit at depths of about 6 feet below grade. Two soil samples, labeled H1 and H2, were collected from beneath the former hydraulic lifts at depths of about 5 and 5.5 feet, respectively. Five soil samples, labeled PT-1 through PT-5, were collected from beneath the abandoned product piping found during excavation activities at depths of about 1.75 feet below grade, except for samples PT-1 and PT-2, which were collected at depths of approximately 11.5 feet and 5 feet below grade. The undisturbed samples were collected from bulk material excavated by backhoe. The sample point locations are as shown on the attached Figure 6. In addition, one water sample, labeled Water-1, was collected from the fuel tank pit. A second water sample, labeled Water-2, was collected from the waste oil tank pit.

Upon review of the analytical results, KEI returned to the site on June 15, 1992, in order to attempt to define the extent of soil contamination in the vicinity of sample points PT-1 and PT-2 (in the former product pipe trench) and H2 (the former hydraulic lift area). Following additional soil excavation in the vicinity of the former product pipe trench (over an area of approximately 19 feet by 15 feet, and to a depth of about 16.5 feet below grade), four soil samples, labeled PT(SW1) through PT(SW4), were collected from the sidewalls of the new excavation at depths of about 12 feet below grade, and one soil sample, labeled PT(16.5), was collected from the bottom of the new excavation at a depth of approximately 16.5 feet below grade. Following additional soil excavation in the vicinity of the former hydraulic lift area (over an area of approximately 10 feet by 10 feet, and to a depth of about 6.5 feet below grade), four soil samples, labeled H2(SW1) through H2(SW4), were collected from the excavation sidewalls at depths of approximately 5.5 feet below grade, and one soil sample, labeled H2(6.5), was collected from beneath sample point location H2 at a depth of about 6.5 feet below grade. The sample point locations and the areas of additional excavation are shown on the attached Figure 6. After the soil sampling was completed, ground water was observed seeping through the former hydraulic lift area excavation.

On June 17, 1992, KEI returned to the site in order to collect one water sample from the former hydraulic lift area excavation. Water was stabilized at a depth of approximately 5.75 feet below grade. One water sample, labeled Water-3, was collected from the former hoist pit.

All soil and water samples were analyzed by Sequoia Analytical Laboratory. All soil and water samples were analyzed for TPH as gasoline and BTEX. In addition, all initial soil samples, except samples PT-2 and H1, were also analyzed for total lead. Soil and water samples collected from the waste oil tank pit were also analyzed for TPH as diesel, TOG, EPA method 8010 and 8270 constituents, and the metals cadmium, chromium, lead, nickel, and zinc. In addition to TPH as gasoline and BTEX, the soil sample H2, collected from beneath the former hydraulic lift, was analyzed for TPH as hydraulic fluid, TOG, EPA method 8010 and 8270 constituents, and the metals cadmium, chromium, lead, nickel, and zinc. All additional soil samples collected from the former hoist pit were analyzed for TPH as gasoline, BTEX, TPH as hydraulic fluid, TOG, and EPA method 8270 constituents. The water sample (Water-1) was analyzed for TPH as gasoline, BTEX, and organic lead. The water sample (Water-3) collected from the former hoist pit was analyzed for TPH as gasoline, BTEX, TPH as hydraulic fluid, TOG, EPA method 8270 constituents, and the metals cadmium, chromium, lead, nickel, and zinc. Analytical results of the soil samples are summarized in Tables 12, 13, and 14, and the analytical results of the water samples are summarized in Table 15.

Also, on August 24, 1992, monitoring well MW2 was properly destroyed. Destruction of monitoring well MW2 was necessary because the well was damaged during the second tank removal project.

All samples were analyzed at Sequoia Analytical Laboratory. Water and selected soil samples were analyzed for TPH as gasoline and BTEX. In addition, water and selected soil samples from exploratory borings EB3 and EB6 (adjacent to the former waste oil tank) were analyzed for TPH as diesel, TOG, and for EPA method 8010 constituents. The samples collected from borings EB4 and EB5 (drilled inside the former service bay facility) were also analyzed for TPH as hydraulic fluid, TOG, and EPA method 8010 constituents. The results of soil analyses are summarized in Table 6, and the results of water analyses are summarized in Table 7. Because the water samples were collected during drilling, the results of the analyses may not be representative of formation water, and should be used for comparative informational purposes only. Documentation of the exploratory boring drilling procedures, sample collection techniques, and the analytical results are presented in KEI's report (KEI-P90-0606.R10) dated October 8, 1992.

A request for site closure was submitted to the ACHCS on January 5, 1993. In a response by the ACHCS to Unocal dated April 28, 1993, further assessment of the eastern portion of the site was requested. The depth to ground water in the easternmost well (MW3), which historically had been significantly lower than all other wells, and regional geologic data indicated that an apparent splay of the Calaveras fault crosses the site. The fault splay was believed to separate well MW3 from the other wells to the west. The request for further assessment work was for the area on the east side of the inferred fault. Therefore, KEI proposed the installation of two additional monitoring wells in KEI's work plan/proposal (KEI-P90-0606.P6) dated June 11, 1993.

On October 4, 1993, two additional two-inch diameter monitoring wells (designated as MW5 and MW6 on the attached Figure 1) were installed at the site. It was anticipated that these wells, in conjunction with well MW3, would allow a determination of ground water flow direction and an assessment of ground water contamination on the eastern side of the inferred fault. The two new wells were each drilled and completed to a total depth of 25 feet below grade. Ground water was encountered during drilling at depths of 15 and 24 feet below grade in wells MW5 and MW6, respectively.

Well MW5 was developed on October 6, 1993. Well MW6 was dry on that date. Wells MW5 and MW6 were initially sampled on October 9, 1993. These wells have dewatered quickly and recovered slowly during all sampling events to date.

Water and selected soil samples from the borings of MW5 and MW6 were analyzed at Sequoia Analytical Laboratory. The samples were analyzed for TPH as gasoline by EPA method 5030/modified 8015, and BTEX by EPA method 8020.

The results of the soil analyses are summarized in Table 5, and the results of the water analyses are summarized in Table 4. Documentation of well installation procedures, sampling techniques, and the analytical results are presented in KEI's report (KEI-P90-0606.R11) dated November 17, 1993.

KEI's Case Closure Report (KEI-P90-0606.R13) dated February 17, 1995, was presented to the ACHCS and to the RWQCB, San Francisco Bay Region, during the first quarter of 1995. The report presented a comprehensive summary of all of the soil sampling, ground water monitoring, ground water sampling, and soil remediation activities that were conducted by KEI at the referenced site from June 1990 to February 1995.

On April 6, 1995, monitoring wells MW1 and MW3 through MW5 were destroyed by fully drilling out the existing well seals, well casings, and filter pack sand materials. The former wells were then grouted from the total depth drilled to the surface with neat cement. The former wells were grouted from the bottom up with the use of a 1.5 inch diameter PVC tremie pipe plumbed with flexible hose to a grout pump. Permission to destroy the wells was granted by the ACHCS in order to facilitate the transfer of the title of the property.

Documentation of well destruction procedures are presented in KEI's report (KEI-P90-0606.R14) dated April 11, 1995.

GROUND WATER MONITORING AND SAMPLING

A ground water monitoring and sampling program was initiated on November 16, 1990, for monitoring wells MW1 through MW4. Well MW2 was destroyed on August 24, 1992, and two additional monitoring wells (MW5 and MW6) were installed at the site. The most recent monitoring and sampling event was conducted on December 1, 1994, when wells MW1 and MW3 through MW6 were monitored, and wells MW5 and MW6 were sampled. From March 3, 1994, to December 1, 1994, only monitoring wells MW5 and MW6 were sampled. The analytical results of all of the ground water samples collected from the monitoring wells to date are summarized in Table 5. As stated previously, monitoring wells MW1 and MW3 through MW5 were destroyed on April 6, 1995.

RECENT FIELD ACTIVITIES

On September 25, 1995, three additional exploratory borings (designated as EB11A*, EB12, and EB13 on the attached Figure 1) were drilled at the site. The subsurface materials penetrated and the depths at which soil samples were collected are shown on the attached Boring Logs.

The three borings were drilled to total depths ranging from 24 to 27 feet below grade. Ground water was encountered at depths ranging from 23 to 26 feet below grade during drilling. Soil samples were collected for laboratory analysis and for lithologic logging purposes 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 approximately 5 feet below grade. The undisturbed soil samples were collected by driving a California-modified split-spoon sampler (lined with brass liners) ahead of the drilling augers. The two-inch diameter brass liners holding the samples were sealed with Teflon-lined plastic caps, labeled, and placed in individually sealed plastic bags, which were then stored in a cooler, on ice, until delivery to a state-certified laboratory. Drilling was terminated about 1 to 2 feet after intersecting the first water table. Water samples were collected from each of the borings by the use of a clean Teflon bailer. The water samples were decanted into clean VOA vials that were then sealed with Teflon-lined screw caps, labeled, and stored in a cooler, on ice, until delivery to a state-certified laboratory.

After the water samples were collected, bentonite was used to seal the borings within the saturated zone. Neat cement grout was then placed from the bentonite plug to the surface in one continuous pour. A hardening agent was used for the upper 1 to 2 feet of the borings to reduce curing time.

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*Boring EB11A was inadvertently initially designated as EB11 and is listed as such on the laboratory data sheets and Chain of Custody forms attached to this report. The boring was renamed as EB11A in all text and figures. A boring designated as EB11 was previously completed at the site in August 1992.

HYDROLOGY AND GEOLOGY

During the most recent drilling activities, ground water was encountered in the three exploratory borings at depths ranging from 23 to 26 feet below the surface. The most recent monitoring and sampling event at the subject site was conducted on December 1, 1994, by MPDS Services, Inc. of Concord, California. On that date, the measured depth to ground water in the monitoring wells ranged from 4.67 to 20.64 feet below the tops of the casings. The depth to ground water in wells MW3 and MW5 was approximately 10 feet greater than the depth in wells MW1 and MW4. Also, the depth to ground water in well MW6 was approximately 6 to 7 feet greater than the depth in the nearest other wells (MW3 and MW5).

Historically, the ground water flow direction over the western portion of the site (MW1, MW2, and MW4) has appeared to be to the north-northeast at a relatively flat gradient (approximately 0.004).

The subject site is situated within the Dublin Subbasin of the larger Livermore Valley Ground Water Basin, as defined by the Alameda County Flood Control and Water Conservation District. As of the fall of 1994, the regional ground water flow direction was toward the southeast.

Based on a 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 underlain by Quaternary-age alluvium. The surficial alluvium has been mapped as Holocene coarse-grained alluvium (Qhac) that typically consists of unconsolidated, permeable sand and silt (with locally coarse sand and gravel materials) and that ranges in thickness from less than 10 feet to as much as 50 feet. This coarse-grained alluvium zone appears to have been deposited from sediments generated from erosion within Dublin Canyon, which is situated immediately west of the site. The site is also situated near a mapped geologic contact with Late-Pleistocene alluvium (Qpa). The Late Pleistocene alluvium is described as typically consisting of weakly consolidated, irregularly interbedded clay, silt, sand, and gravel materials. The overall thickness of the alluvium underlying the site is presently unknown to KEI.

In addition, the site is situated closely adjacent to the mapped trace of the active Calaveras Fault. A section of the Alquist-Priolo map (Dublin quadrangle) showing the fault zone as defined by the California Division of Mines and Geology is included as Figure 7.

On November 13, 1990, KEI conducted a review of available geologic fault study reports at the California Division of Mines and Geology (CDMG) in Pleasant Hill, California. Studies conducted at the adjacent parcel immediately north of the subject site encountered what was described as the western side of the Calaveras Fault zone. A fault was determined to be located between approximately 130 to 136 feet west of the curb along San Ramon Road, roughly parallel to San Ramon Road, and trending approximately N4°W. Significant changes in the color of the soil materials on opposite sides of the fault were noted, and the depth to ground water on the western side of the fault was noted to be significantly higher than on the eastern side of the fault. Geologic maps produced for this study project the trace of the Calaveras Fault onto the subject Unocal site.

Based on the results of our file review at the CDMG (November 1990), and our monitoring activities of former wells MW1 through MW4 at the subject site, it was KEI's opinion at that time that a splay (or splays) of the Calaveras Fault crossed the eastern portion of the site. It was inferred that one fault splay crossed between well MW3 and wells MW1, MW2, and MW4. Wells MW1, MW2, and MW4 appeared to overlie a ground water aquifer separate from that of well MW3, with the inferred fault splay representing a ground water barrier. In addition, based on the ground water elevation measured following the installation of well MW6 at the easternmost portion of the site, ground water in that area appeared to occur in a third separate zone.

Based on the results of our subsurface studies, the site is underlain by fill materials to a depth of between 1 and 6 feet below grade. The fill is in turn underlain by alluvium to the maximum depth explored of 24 feet below grade, except for exploratory boring EB9, which was drilled and sampled to a total depth of 35.5 feet below grade.

The alluvium underlying the site consists predominantly of silty clay and clayey silt layers that extend to a depth of at least 35.5 feet below grade. Based on ground water levels encountered in the existing monitoring wells at the site, the unsaturated zone west of well MW2 is approximately 6 feet thick. The unsaturated zone on the east side of well MW2 in the vicinity of wells MW3 and MW5 is about 16 feet thick. Finally, the unsaturated zone in the vicinity of well MW6 varies from approximately 20 to 25 feet in thickness.

The first water bearing unit underlying the site also predominantly consists of fine grained silty clay or clayey silt soils. However, in MW3, an approximately 1 foot thick silty gravel lens was encountered at a depth of 15 to 16 feet below grade, and in MW2, a 0.5 foot thick silty sand and sandy silt layer was encountered at a depth of 23.5 feet below grade. In exploratory boring EB8, a 1 foot thick sandy gravel layer was encountered at a depth of 17 feet below grade, and in EB9, a silty sand layer approximately 3 feet thick was encountered at a depth of 10.5 feet below grade. Also, in MW6, a 0.5 foot thick silty gravel layer was encountered at a depth of 9 feet below grade. These units do not appear to be laterally continuous across the site. Subsurface conditions are depicted on Geologic Cross-Sections A-A' through D-D' (Figures 9 through 12). The locations of the cross-sections are shown on Figure 8.

During the drilling of the initial 11 exploratory borings, ground water was first encountered at depths of 10.5 to 13 feet below grade in the borings situated west of well MW2, and at depths of 16 to 35.5 feet below grade in the three borings located to the east of well MW2. However, within minutes of the termination of drilling of each exploratory boring, water levels were observed to rise, suggesting that a semi-confined condition may exist for the first aquifer(s) underlying the site.

The results of the particle size analysis (sieve and hydrometer) of the composite soil sample collected from the saturated zone in the boring for monitoring well MW5 at depths of 15 feet and 20 feet below grade indicate that the sample consists of approximately 49% silt, 28% sand, and 23% clay. The composite sample is classified as clayey silt/silty clay with sand (CL-ML).

Due to the fact that the site was intended to be sold and redeveloped, Unocal contracted with the geotechnical firm TerraSearch, Inc., of Dublin, California, to perform a fault hazard investigation of the subject site. This work is summarized in TerraSearch's reports (Project No. 6858) dated October 28 and December 20, 1994. TerraSearch excavated and logged trenches trending perpendicular to the inferred fault and extending the length of the Unocal property. The trenches were excavated to depths of between 7 and 10 feet below grade. No evidence of the fault was encountered in the trenches by TerraSearch. Also, based on additional trenching work recently performed by TerraSearch, it is KEI's understanding that no evidence of the fault was found in a trench extending 25 feet to the east of the southeastern corner of the site. Therefore, TerraSearch concluded that the Calaveras Fault was located to the east of the Unocal site, and at least 25 feet east of the south-eastern corner of the site.

Based on this additional data, it is KEI's opinion that irrespective of whether the Calaveras fault has a recognizable surface expression at the site or whether it is located further to the east, separate hydrologic regimes are present within the relatively soft, low permeability sediments beneath the site. It is likely that the deformation accompanying movement along the Calaveras fault has created gouge zones which are barriers to ground water flow. This interpretation is supported by the previous study by Applied Soil Mechanics, Inc. (File No. A9-1044-J2) dated April 16, 1979, which documents higher ground water levels and a natural spring (Amillo Springs) to the west of the fault zone, in a study for "The Springs" Proposed 176-Unit Apartment Project located directly north of the Unocal site.

ANALYTICAL RESULTS

All samples were analyzed at Sequoia Analytical Laboratory in Walnut Creek, California, and were accompanied by properly executed Chain of Custody documentation. Water and selected soil samples from the three borings were analyzed for TPH as gasoline by EPA method 5030/modified 8015, and BTEX by EPA method 8020.

The results of the soil analyses are summarized in Table 1, and the results of the water analyses are summarized in Table 2. Copies of the laboratory analyses and the Chain of Custody documentation are attached to this report.

DISCUSSION AND RECOMMENDATIONS

The analytical results of the soil and "grab" ground water samples collected from the three most recent borings indicate that the extent of hydrocarbon contamination in the vicinity of monitoring well MW6 appears to be relatively well defined and limited in extent. The analytical results of the soil samples collected from the borings ranged from non-detectable to 4.9 mg/kg. Benzene was non-detectable in all of these samples.

The analytical results of the grab water samples collected from borings EB12 and EB13 indicated non-detectable concentrations of TPH as gasoline and BTEX. The analytical results of the water sample collected from boring EB11 indicated a concentration of benzene at 4.0 μg/L.

Based on all of the analytical data that has been collected to date, it is KEI's opinion that no further sampling work is warranted at the site. For a more detailed discussion of the results of the work previously performed at the site, please refer to KEI's Case Closure Report (KEI-P90-0606.R13) dated February 17, 1995.

DISTRIBUTION

A copy of this report should be sent to ACHCS, and to the Regional Water Quality Control Board, 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 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.

Should you have any questions on this report, please call me at (510) 602-5100.

Sincerely,

Kaprealian Engineering, Inc.

Thomas E. Seeliger
Staff Geologist

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

License No. EG 1633
Exp. Date 8/31/96

Timothy R. Ross
General Manager

/jad

Attachments: Tables 1 through 15
List of Reports
Location Map
Figures 1 through 12
Boring Logs
Laboratory Analyses
Chain of Custody documentation

TABLE 1

SUMMARY OF LABORATORY ANALYSES
SOIL

Date	Sample Number	TPH as Gasoline	Benzene	Toluene	Ethyl-benzene	Xylenes
9/25/95	EB11A(5)	1.9*	ND	ND	ND	ND
	EB11A(10)	1.7*	ND	ND	ND	ND
	EB11A(15)	2.5*	ND	ND	ND	ND
	EB11A(20)	4.4	ND	ND	0.0083	0.031
	EB11A(22.5)	4.9	ND	ND	0.0087	0.043
	EB11A(25.5)	1.7*	ND	ND	ND	ND
	EB12(5)	2.2*	ND	ND	ND	ND
	EB12(10)	1.2*	ND	ND	ND	ND
	EB12(15)	ND	ND	ND	ND	ND
	EB12(20)	ND	ND	ND	ND	ND
	EB12(22.5)	ND	ND	ND	ND	ND
	EB13(5)	ND	ND	ND	ND	ND
	EB13(10)	1.4*	ND	ND	ND	0.024
	EB13(15)	1.6*	ND	ND	ND	0.023
	EB13(20)	1.4*	ND	0.0051	ND	0.027
	EB13(21)	1.9*	ND	ND	ND	0.025

NOTE: The soil samples were collected at the depths below grade indicated in the ( ) of the respective sample number.

ND = Non-detectable.

* Sequoia Analytical Laboratory reported that the hydrocarbons detected did not appear to be gasoline.

Results are in milligrams per kilogram (mg/kg), unless otherwise indicated.

TABLE 2

SUMMARY OF LABORATORY ANALYSES
WATER

Date	Sample Number	TPH as Gasoline	Benzene	Toluene	Ethyl-benzene	Xylenes
9/25/95	EB11A	110*	4.0	1.2	ND	ND
	EB12	ND	ND	ND	ND	ND
	EB13	ND	ND	ND	ND	ND

* Sequoia Analytical Laboratory reported that the hydrocarbons detected did not appear to be gasoline.

ND = Non-detectable.

Results are in micrograms per liter (μg/L), unless otherwise indicated.

KEI-P90-0606.R15
October 24, 1995

TABLE 3

SUMMARY OF MONITORING DATA

Well #	Ground Water Elevation (feet)	Depth to Water (feet)♦	Total Well Depth (feet)♦	Product Thickness (feet)	Sheen	Water Purged (gallons)
(Monitored and Sampled on December 1, 1994)						
MW1*	362.13	4.67	19.75	0	--	0
MW3*	352.13	14.73	19.67	0	--	0
MW4*	362.48	5.10	19.70	0	--	0
MW5	351.55	14.00	24.97	0	No	7.5
MW6	345.04	20.64	25.13	0	No	3.5
(Monitored and Sampled on September 1, 1994)						
MW1*	361.80	5.00	19.73	0	--	0
MW3*	351.83	15.03	19.66	0	--	0
MW4*	362.10	5.48	19.72	0	--	0
MW5	350.73	14.82	24.97	0	No	7
MW6	343.33	22.35	25.12	0	No	2
(Monitored and Sampled on June 3, 1994)						
MW1*	362.01	4.79	NM	0	--	0
MW3*	351.94	14.92	NM	0	--	0
MW4*	362.35	5.23	NM	0	--	0
MW5	351.25	14.30	25.02	0	No	5.5
MW6	344.34	21.34	25.12	0	No	2
(Monitored and Sampled on March 3, 1994)						
MW1*	362.05	4.75	19.81	--	0	
MW3*	352.05	14.81	19.71	--	0	
MW4*	362.42	5.16	19.74	--	0	
MW5	351.64	13.91	25.03	No	8	
MW6	346.47	19.21	25.11	No	4.5	

TABLE 3 (Continued)

SUMMARY OF MONITORING DATA

Well #	Well Casing Elevation (feet)**
MW1	366.80
MW3	366.86
MW4	367.58
MW5	365.55
MW6	365.68

♦ The depth to water level and total well depth measurements were taken from the top of the well casings.

* Monitored only.

** The elevations of the top of the well casings have been surveyed relative to Mean Sea Level (MSL), per the National Geodetic Survey disk stamped "I-1257, reset 1975" (elevation = 439.93 feet MSL).

-- Sheen determination was not performed.

NM = Not measured.

NOTE: 1. Wells MW1 and MW4, wells MW3 and MW5, and well MW6 are considered to be located in three separate hydrologic regimes.

2. Monitoring and sampling data are supplied by MPDS Services, Inc. of Concord, California

TABLE 4

SUMMARY OF LABORATORY ANALYSES
WATER

Date	Well #	TPH as Gasoline	Benzene	Toluene	Ethylbenzene	Xylenes
12/01/94	MW5	ND	ND	ND	ND	1.3
	MW6	240	5.1	2.6	ND	1.8
9/01/94	MW5	ND	ND	1.6	ND	2.1
	MW6	490	8.1	2.9	ND	1.9
6/03/94	MW5	ND	ND	ND	ND	ND
	MW6	ND	ND	ND	ND	ND
3/03/94	MW5	ND	ND	0.84	ND	0.60
	MW6	150	2.4	2.8	ND	1.2
12/09/93	MW1♦	--	--	--	--	--
	MW3	ND	ND	ND	ND	ND
	MW5	ND	ND	ND	ND	ND
	MW6	790	0.64	1.0	ND	ND
10/09/93	MW5	ND	ND	ND	ND	ND
	MW6	480	1.8	0.63	0.81	ND
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
	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
	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
	MW2	ND	ND	ND	ND	ND
	MW3	32	ND	ND	ND	ND
	MW4	ND	ND	ND	ND	ND

TABLE 4 (Continued)

SUMMARY OF LABORATORY ANALYSES
WATER

Date	Well #	TPH as Gasoline	Benzene	Toluene	Ethylbenzene	Xylenes
7/02/91	MW1*	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
	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
	MW2	ND	ND	ND	ND	ND
	MW3	ND	ND	ND	ND	ND
	MW4	ND	ND	ND	ND	ND

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

* TPH as diesel, TOG, and EPA method 8010 constituents were all non-detectable for MW1.

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

ND = Non-detectable.

-- Indicates analysis was not performed.

Results are in micrograms per liter (µg/L), unless otherwise indicated.

NOTE: Laboratory analyses data subsequent to October 9, 1993, were provided by MPDS Services, Inc., of Concord, California.

TABLE 5

SUMMARY OF LABORATORY ANALYSES
SOIL

Date	Sample Number	Depth (feet)	TPH as Diesel	TPH as Gasoline	Benzene	Toluene	Ethyl-benzene	Xylenes
11/06/90	MW1(5)*	5.0	ND	ND	ND	ND	ND	ND
& 11/07/90	MW1(8)	8.0	--	ND	ND	ND	ND	ND
	MW2(5)	5.0	--	ND	ND	ND	ND	ND
	MW2(7.5)	7.5	--	ND	ND	ND	ND	ND
	MW2(9)	9.0	--	ND	ND	ND	ND	ND
	MW3(5)	5.0	--	ND	ND	ND	ND	ND
	MW3(10)	10.0	--	ND	ND	ND	ND	ND
	MW3(15)	15.0	--	ND	ND	ND	ND	ND
	MW3(5)	5.0	--	ND	ND	ND	ND	ND
	MW3(10)	10.0	--	ND	ND	ND	ND	ND
	MW3(15)	15.0	--	ND	ND	ND	ND	ND
	MW4(5)	5.0	--	ND	ND	ND	ND	ND
10/04/93	MW5(5)	5.0	--	ND	ND	ND	ND	ND
	MW5(9.5)	9.5	--	ND	ND	ND	ND	ND
	MW5(14.5)	14.5	--	ND	ND	ND	ND	ND
	MW6(5)	5.0	--	ND	ND	ND	ND	ND
	MW6(9.5)	9.5	--	ND	ND	ND	ND	ND
	MW6(15)	15.0	--	ND	ND	ND	ND	ND
	MW6(19.5)	19.5	--	ND	ND	ND	ND	ND
	MW6(24)	24.0	--	120	0.74	0.072	0.036	0.15

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

ND = Non-detectable.

-- Indicates analysis was not performed.

Results are in milligrams per kilogram (mg/kg), unless otherwise indicated.

TABLE 6

SUMMARY OF LABORATORY ANALYSES
SOIL

(Collected on August 24 & 25, 1992)

Sample Number	Depth (feet)	TPH as Diesel	TPH as Gasoline	Benzene	Toluene	Ethyl-benzene	Xylenes	TOG
EB1(5)	5.0	--	ND	ND	ND	ND	ND	--
EB1(8)	8.0	--	ND	ND	ND	ND	ND	--
EB1(10)	10.0	--	2.3	ND	ND	0.0057	0.11	--
EB1(12.5)	12.5	--	ND	ND	ND	ND	ND	--
EB2(5)	5.0	--	ND	ND	ND	ND	ND	--
EB2(10.5)	10.5	--	ND	ND	ND	ND	ND	--
EB3(5)*	5.0	ND	ND	ND	ND	ND	ND	ND
EB3(10)*	10.0	ND	ND	ND	ND	ND	ND	ND
EB3(13)*	13.0	ND	ND	ND	ND	ND	ND	ND
EB4(5)*+	5.0	--	ND	ND	ND	ND	ND	ND
EB4(10)*+	10.0	--	ND	ND	ND	ND	ND	ND
EB5(5)*+	5.0	--	ND	ND	ND	ND	ND	ND
EB5(10.5)*+	10.5	--	ND	ND	ND	ND	ND	ND
EB6(5.5)*	5.5	ND	ND	ND	ND	ND	ND	ND
EB6(10)*	10.0	ND	ND	ND	ND	ND	ND	ND
EB7(5)	5.0	--	ND	ND	ND	ND	ND	--
EB7(10)	10.0	--	ND	ND	ND	ND	ND	--
EB8(5)	5.0	--	ND	ND	ND	ND	ND	--
EB8(10)	10.0	--	ND	ND	ND	ND	ND	--
EB8(13)	13.0	--	ND	ND	ND	ND	ND	--
EB8(15.5)	15.5	--	ND	ND	ND	ND	ND	--
EB8(17.0)	17.0	--	ND	ND	ND	ND	ND	--
EB9(5)	5.0	--	ND	ND	ND	ND	ND	--
EB9(10)	10.0	--	ND	ND	ND	ND	ND	--
EB9(15)	15.0	--	ND	ND	ND	ND	0.010	--
EB9(17.5)	17.5	--	2.6	ND	0.010	0.015	0.018	--
EB9(20)	20.0	--	ND	ND	ND	ND	ND	--
EB9(25)	25.0	--	10	0.028	0.032	0.41	2.1	--
EB9(30)	30.0	--	ND	ND	ND	ND	ND	--
EB9(35)	35.0	--	ND	ND	ND	ND	ND	--

TABLE 6 (Continued)

SUMMARY OF LABORATORY ANALYSES
SOIL

(Collected on August 24 & 25, 1992)

Sample Number	Depth (feet)	TPH as Diesel	TPH as Gasoline	Benzene	Toluene	Ethyl-benzene	Xylenes	TOG
EB10(5)	5.0	--	ND	ND	ND	ND	ND	--
EB10(10)	10.0	--	ND	ND	ND	ND	ND	--
EB10(15.5)	15.5	--	ND	ND	ND	ND	ND	--
EB11(5.5)	5.5	--	ND	ND	ND	ND	ND	--
EB11(10)	10.0	--	ND	ND	ND	ND	ND	--
EB11(15.5)	15.5	--	ND	ND	ND	ND	ND	--

* All EPA method 8010 constituents were non-detectable, except in samples EB3(13), EB5(10.5), and EB6(10), where tetrachloroethene was detected at a concentration of 11 µg/kg in each case. Tetrachloroethene was also detected in sample EB6(5.5) at a concentration of 19 µg/kg.

\+ TPH as Hydraulic Fluid was non-detectable.

ND = Non-detectable.

-- Indicates analysis was not performed.

Results are in milligrams per kilogram (mg/kg), unless otherwise indicated.

TABLE 7

SUMMARY OF LABORATORY ANALYSES
WATER

(Collected on August 24 & 25, 1992)

Sample Number	TPH as Hydraulic Fluid	TPH as Diesel	TPH as Gasoline	Benzene	Toluene	Ethyl-benzene	Xylenes	TOG (mg/L)
EB1	--	--	ND	ND	ND	ND	ND	--
EB2	--	--	ND	ND	ND	ND	ND	--
EB3*	--	ND	ND	ND	ND	ND	ND	ND
EB4*	510	--	ND	ND	ND	ND	ND	ND
EB5*	ND	--	ND	ND	ND	ND	ND	ND
EB6*	--	500**	ND	ND	ND	ND	ND	ND
EB7	--	--	ND	ND	ND	ND	ND	--
EB8	--	--	ND	ND	ND	ND	ND	--
EB9	--	--	840***	0.70	ND	ND	98	--
EB10	--	--	ND	ND	ND	ND	ND	--
EB11	--	--	ND	ND	ND	ND	ND	--

-- Indicates analysis was not performed.

ND = Non-detectable.

* All EPA method 8010 constituents were non-detectable.

** Sequoia Analytical Laboratory reported that the hydrocarbons detected appeared to be a diesel and non-diesel mixture.

*** Sequoia Analytical Laboratory reported that the hydrocarbons detected did not appear to be gasoline.

NOTE: Water samples were collected during drilling. The results of the analyses may not be representative of formation water, and should be used for comparative informational purposes only.

Results are in micrograms per liter ($\mu g/L$), unless otherwise indicated.

TABLE 8

SUMMARY OF LABORATORY ANALYSES
SOIL

(Collected on June 13, 15, 20 & 26, 1990)

Sample	Depth (feet)	TPH as Diesel	TPH as Gasoline	Benzene	Toluene	Ethyl-benzene	Xylenes
SW1	6.0	--	5,700	2.1	41	110	640
SW1(3)	6.0	--	2,200	1.8	6.3	30	76
SW1(6.5)	6.0	--	32	0.020	0.14	0.13	0.17
SW2	6.0	--	1,500	0.35	0.57	8.0	56
SW2(3)	6.0	--	360	ND	1.0	3.0	2.0
SW2(6.5)	6.5	--	6.8	0.020	0.052	0.029	0.063
SW3	6.0	--	ND	ND	ND	ND	ND
SW4	6.0	--	8.0	0.019	0.088	0.0071	0.16
SW5	6.5	--	340	0.80	0.26	2.5	3.6
SW5(2.5)	6.0	--	11	0.027	0.054	0.070	0.12
SW6	6.5	--	120	ND	0.21	0.19	0.14
SW6(3)	6.0	--	1.2	0.0084	0.012	0.012	0.021
P1	6.0	--	2.5	0.099	0.079	ND	0.034
P2	6.0	--	37	0.78	0.14	0.43	3.8
P3	6.0	--	8.5	0.028	0.016	0.35	0.080
P4	6.0	--	16	0.091	ND	0.52	1.3
SW11*	6.0	--	ND	ND	ND	ND	0.0079
SW12	6.0	--	ND	ND	ND	ND	ND
SW13	6.0	--	ND	ND	0.022	ND	ND
SW14	6.0	--	ND	ND	ND	ND	0.020
WO1**	6.5	120	36	0.091	0.17	0.38	1.8
SWA***	6.0	--	--	--	--	--	--

-- Indicates analysis was not performed.

ND = Non-detectable.

* TOG was 78 mg/kg.

** TOG was 1,500 mg/kg, and all EPA method 8010 constituents were non-detectable, except 1,2-dichlorobenzene at 210 µg/kg.

*** TOG was 3,500 mg/kg.

Results are in milligrams per kilogram (mg/kg), unless otherwise indicated.

TABLE 9

SUMMARY OF LABORATORY ANALYSES
WATER

(Collected on June 20 & July 3, 1990)

Sample #	TOG (mg/L)	TPH as Gasoline	Benzene	Toluene	Ethyl-benzene	Xylenes
W1*	--	2,300	3.1	0.88	0.39	250
W2**	ND	ND	ND	0.96	ND	ND

* Collected from the former fuel storage tank pit.

** Collected from the new fuel storage tank pit.

-- Indicates analysis was not performed.

ND = Non-detectable.

Results are in micrograms per liter (μg/L), unless otherwise indicated.

TABLE 10

SUMMARY OF LABORATORY ANALYSES
SOIL

(Collected on July 16 & 20, 1990)

Sample	Depth (feet)	TPH as Diesel	TPH as Gasoline	Benzene	Toluene	Ethyl-benzene	Xylenes
SWB(13)*	6.0	ND	ND	ND	0.0095	ND	ND
SWC(10)*	6.0	ND	1.1	0.0061	0.0330	0.024	0.044
SWD(14)*	6.0	ND	ND	0.0052	0.015	ND	ND
SWE*	6.3	ND	ND	ND	0.031	ND	ND
SWF*	6.3	ND	ND	ND	0.029	0.0059	0.013
SWG*	6.3	ND	ND	ND	0.028	ND	ND
SWH*	6.3	ND	ND	ND	0.015	ND	ND

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

ND = Non-detectable.

Results are in milligrams per kilogram (mg/kg), unless otherwise indicated.

TABLE 11

SUMMARY OF LABORATORY ANALYSES
WATER

(Collected on July 19, 1990)

Sample #	TPH as Diesel	TPH as Gasoline	Benzene	Toluene	Ethyl-benzene	Xylenes
W3*	ND	ND	ND	ND	ND	ND

ND = Non-detectable.

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

Results are in micrograms per liter (µg/L), unless otherwise indicated.

TABLE 12

SUMMARY OF LABORATORY ANALYSES
SOIL

Date	Sample Number	Depth (feet)	TPH as Diesel	TPH as Gasoline	Benzene	Toluene	Ethyl-benzene	Xylenes	Total Lead
5/21/92	F-SW1	6.5	--	ND	ND	ND	ND	ND	7.4
	F-SW2	6.5	--	ND	ND	ND	ND	ND	4.1
	F-SW3	6.5	--	ND	ND	ND	ND	ND	4.9
	F-SW4	6.5	--	ND	ND	ND	ND	ND	3.8
	PT-1	11.5	--	6.2	0.0072	0.072	0.054	0.33	4.0
	PT-2	5.0	--	940	ND	0.81	12	100	--
	PT-3	1.75	--	ND	0.0078	0.061	0.026	0.14	5.1
	PT-4	1.75	--	ND	ND	ND	ND	ND	6.5
	PT-5	1.75	--	ND	ND	ND	ND	ND	4.8
	WO-1*	6.0	ND	ND	ND	ND	ND	ND	4.9
	WO-2*	6.0	ND	ND	ND	ND	ND	ND	5.2
	WO-3*	6.0	ND	ND	ND	ND	ND	ND	5.0
	WO-4*	6.0	ND	ND	ND	ND	ND	ND	5.3
	H1**	5.0	--	ND	ND	ND	ND	ND	--
	H2***	5.5	--	230	ND	ND	1.3	0.66	4.4

-- Indicates analysis was not performed.

ND = Non-detectable.

* TOG and EPA method 8010 and 8270 constituents were all non-detectable.

** TPH as hydraulic fluid was 1.3 mg/kg.

*** TOG was non-detectable. TPH as hydraulic fluid was detected at a concentration of 120 mg/kg. EPA method 8010 and 8270 constituents were non-detectable, except for bis(2-ethylhexyl)phthalate at 670 µg/kg, 2-methylnaphthalene at 5,800 µg/kg, naphthalene at 4,100 µg/kg, phenanthrene at 240 µg/kg, and pyrene at 120 µg/kg.

Results are in milligrams per kilogram (mg/kg), unless otherwise indicated.

TABLE 13

SUMMARY OF LABORATORY ANALYSES
SOIL

Date	Sample Number	Cadmium	Chromium	Nickel	Zinc
5/21/92	WO-1	ND	29	35	44
	WO-2	ND	24	27	37
	WO-3	ND	24	26	39
	WO-4	ND	32	39	49
	H2	ND	33	43	55

ND = Non-detectable.

Results are in milligrams per kilogram (mg/kg), unless otherwise indicated.

TABLE 14

SUMMARY OF LABORATORY ANALYSES
SOIL

Date	Sample Number	Depth (feet)	TPH as Hydraulic Fluid	TPH as Gasoline	Benzene	Toluene	Ethyl-benzene	Xylenes	TOG
6/15/92	PT(16.5)	16.5	--	ND	ND	ND	ND	ND	--
	PT(SW1)	12.0	--	ND	ND	ND	ND	ND	--
	PT(SW2)	12.0	--	ND	ND	ND	ND	ND	--
	PT(SW3)	12.0	--	ND	ND	ND	ND	ND	--
	PT(SW4)	12.0	--	ND	ND	ND	ND	ND	--
	H2(6.5)*	6.5	ND	ND	ND	ND	ND	ND	ND
	H2(SW1)*	5.5	ND	ND	ND	ND	ND	ND	ND
	H2(SW2)*	5.5	ND	ND	ND	0.0098	ND	0.022	ND
	H2(SW3)*	5.5	ND	ND	0.069	0.068	0.064	0.21	ND
	H2(SW4)*	5.5	ND	ND	ND	ND	ND	ND	ND

-- Indicates analysis was not performed.

ND = Non-detectable.

* EPA method 8270 constituents were all non-detectable

Results are in milligrams per kilogram (mg/kg), unless otherwise indicated.

TABLE 15

SUMMARY OF LABORATORY ANALYSES
WATER

Date	Sample	TPH as Diesel	TPH as Gasoline	Benzene	Toluene	Ethyl-benzene	Xylenes	Organic Lead
5/21/92	Water-1	--	ND	ND	ND	ND	2.7	ND
	Water-2*	86	ND	ND	ND	ND	ND	--
6/17/92	Water-3**	--	ND	ND	ND	ND	ND	--

-- Indicates analysis was not performed.

ND = Non-detectable.

* TOG, cadmium, chromium, lead, nickel, EPA method 8010 and 8270 constituents were all non-detectable. Zinc was detected at 0.037 ppb.

** TPH as hydraulic fluid, TOG, EPA method 8270 constituents, and the metals cadmium, chromium, lead, nickel, and zinc were all non-detectable.

Results are in micrograms per liter (μg/L), unless otherwise indicated.

LIST OF REPORTS

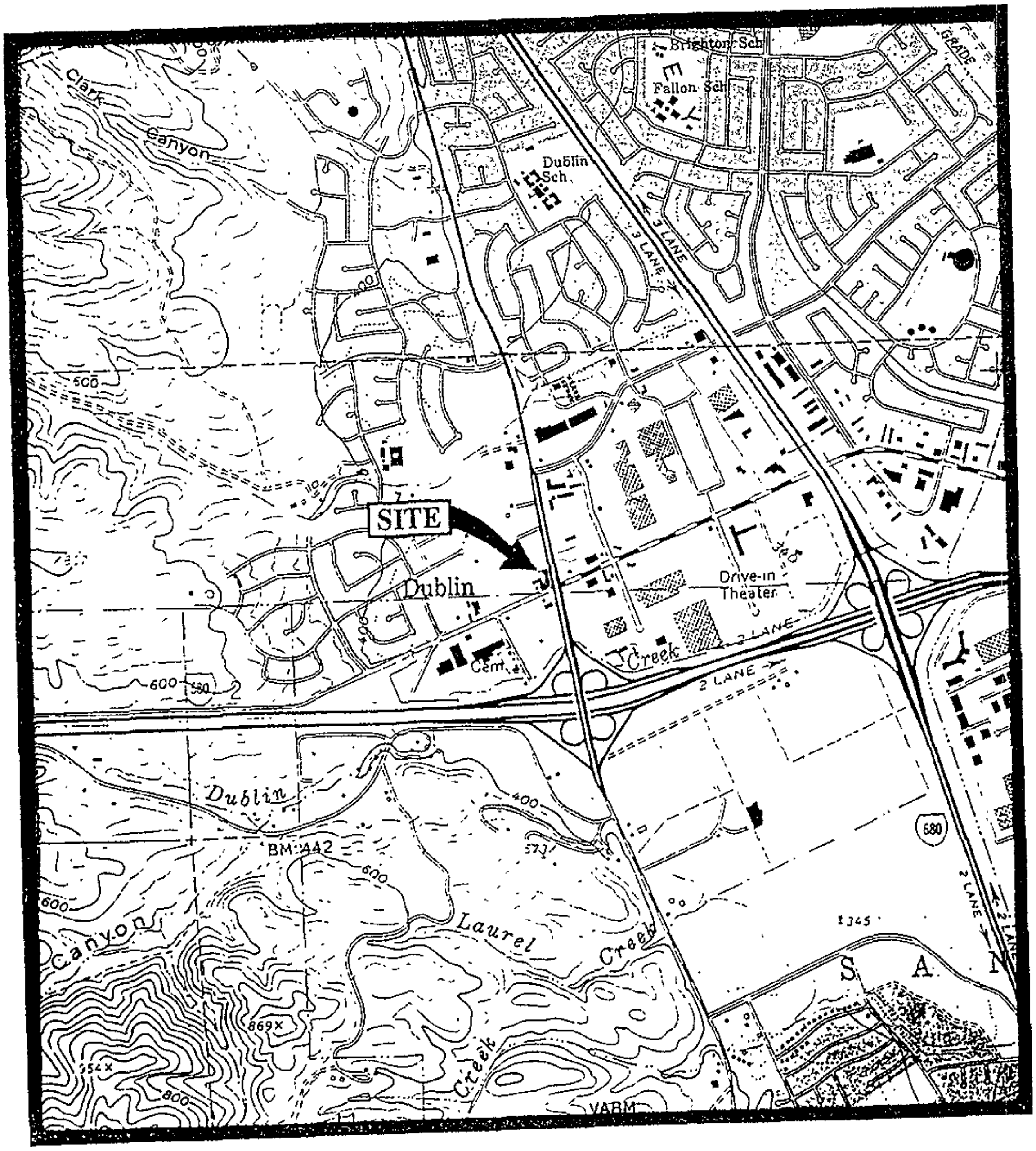
REPORT TITLE	REPORT DESCRIPTION	REPORT NUMBER	REPORT DATE
Work Plan/Proposal	Work Plan/Proposal for the Installation of Exploratory Borings EB11 through EB13	KEI-P90-0606.P8	4/25/95
Report of Destruction of Monitoring Wells	Report of Destruction of Monitoring Wells MW1, and MW3 through MW5	KEI-P90-0606.R14	4/11/95
Work Plan/Proposal	Work Plan/Proposal for the Destruction of Monitoring Wells MW1, and MW3 through MW5	KEI-P90-0606.P7	3/30/95
Case Closure Report	Case Closure Report	KEI-P90-0606.R3	2/17/95
Quarterly Data Report	December 1994 Monitoring and Sampling Results	MPDS-UN5901-05	12/21/94
Quarterly Data Report	September 1994 Monitoring and Sampling Results	MPDS-UN5901-04	9/29/94
Quarterly Data Report	June 1994 Monitoring and Sampling Results	MPDS-UN5901-03	7/07/94
Quarterly Data Report	March 1994 Monitoring and Sampling Results	MPDS-UN5901-02	4/04/94
Drill Cuttings Disposal	Drill Cuttings Disposal Monitoring Wells MW5 and MW6	KEI-P90-0606.R12	2/28/94
Quarterly Data Report	December 1993 Monitoring and Sampling Results	MPDS-UN5901-01	1/17/94
Continuing Ground Water Investigation	Installation of Monitoring Wells MW5 and MW6	KEI-P90-0606.R11	11/17/93

LIST OF REPORTS (Continued)

REPORT TITLE	REPORT DESCRIPTION	REPORT NUMBER	REPORT DATE
Proposal	Additional Soil Sampling and Additional Excavation 2 Former Product Pipe Trenches and Hydraulic Lifts	KEI-P90-0606.P4	5/29/92
Quarterly Report	April 1992 Monitoring and Sampling Results	KEI-P90-0606.QR5	4/27/92
Quarterly Report	November 1991 - January 1992 Monitoring and Sampling Results	KEI-P90-0606.QR4	2/28/92
Quarterly Report	August - October 1991 Monitoring and Sampling Results	KEI-P90-0606.QR3	11/12/91
Quarterly Report	May - July 1991 Monitoring and Sampling Results	KEI-P90-0606.QR2	7/29/91
Quarterly Report	February - April 1991 Monitoring and Sampling Results	KEI-P90-0606.QR2	4/23/91
Preliminary Ground Water Investigation	Installation of Monitoring Wells MW1 through MW4	KEI-P90-0606.R6	12/17/90
Follow-Up Soil Sampling Report	Collection Soil and Water Samples from Waste Oil Tank Pit	KEI-J90-0606.R4	7/30/90
Proposal	Work Plan/Proposal for the Installation Monitoring Wells MW1 through MW4 Excavation of Waste Oil Tank Pit Sidewalls	KEI-J90-0606.P1	7/16/90
Soil Sampling Report	Collection of Soil Samples from Former and New Fuel Tank Pits, Waste Oil Tank Pit, and beneath Product Dispensers	KEI-J90-0606.R1	7/16/90

LIST OF REPORTS (Continued)

REPORT TITLE	REPORT DESCRIPTION	REPORT NUMBER	REPORT DATE
Stockpiled Soil Sampling	Sampling of Stockpiled Soil On-Site	KEI-J90-0606.R3	7/13/90
Waste Oil Stockpiled Soil Sampling	Sampling of Stockpiled Soil On-Site	KEI-J90-0606.R2	7/12/90

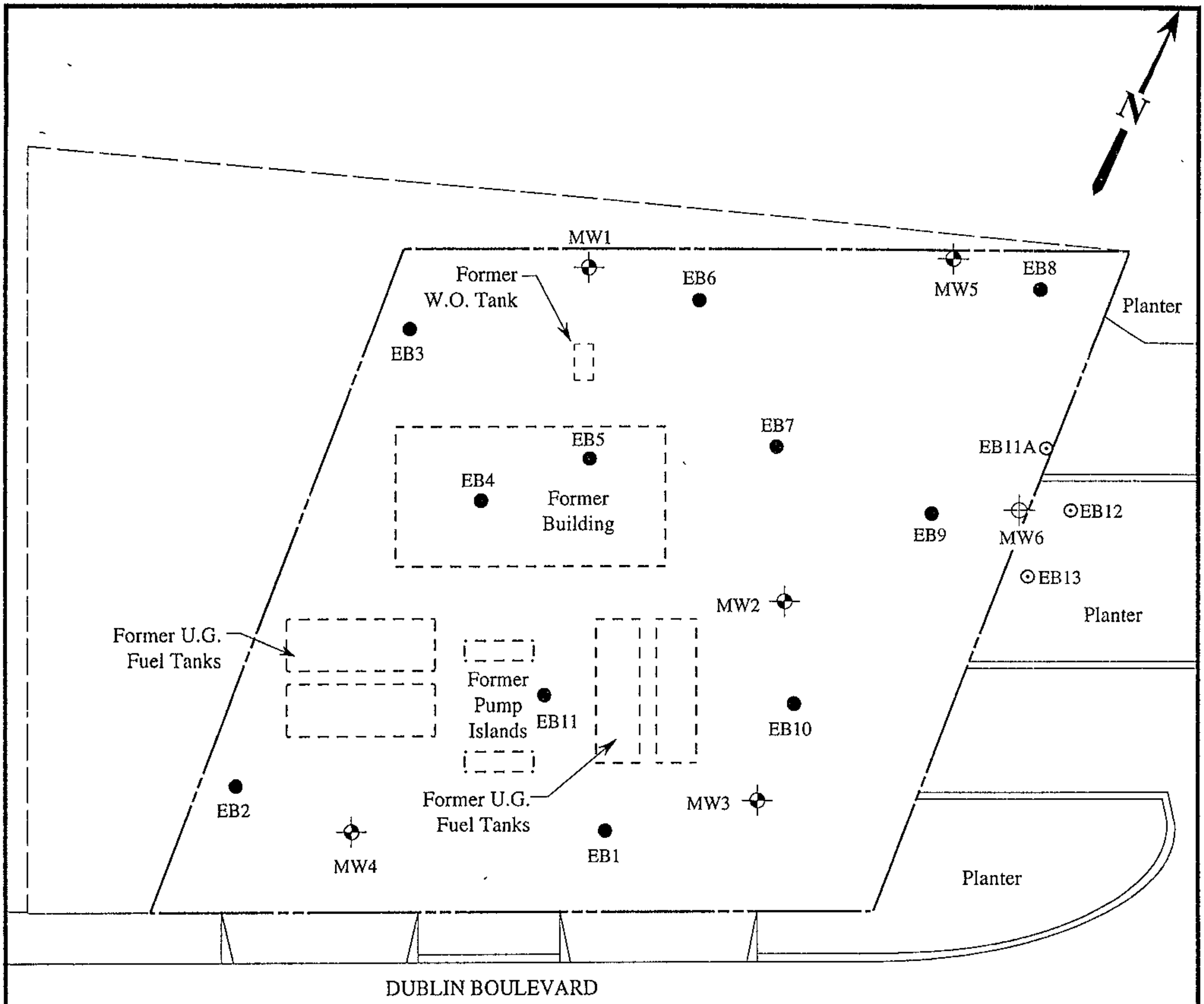


Base modified from 7.5 minute U.S.G.S. Dublin Quadrangle
(photorevised 1980)

0 2000 4000

Approx. scale feet

KAPREALIAN ENGINEERING INCORPORATED	**FORMER UNOCAL S/S #5901** **11976 DUBLIN BOULEVARD** **DUBLIN, CALIFORNIA**	**LOCATION MAP**



LEGEND

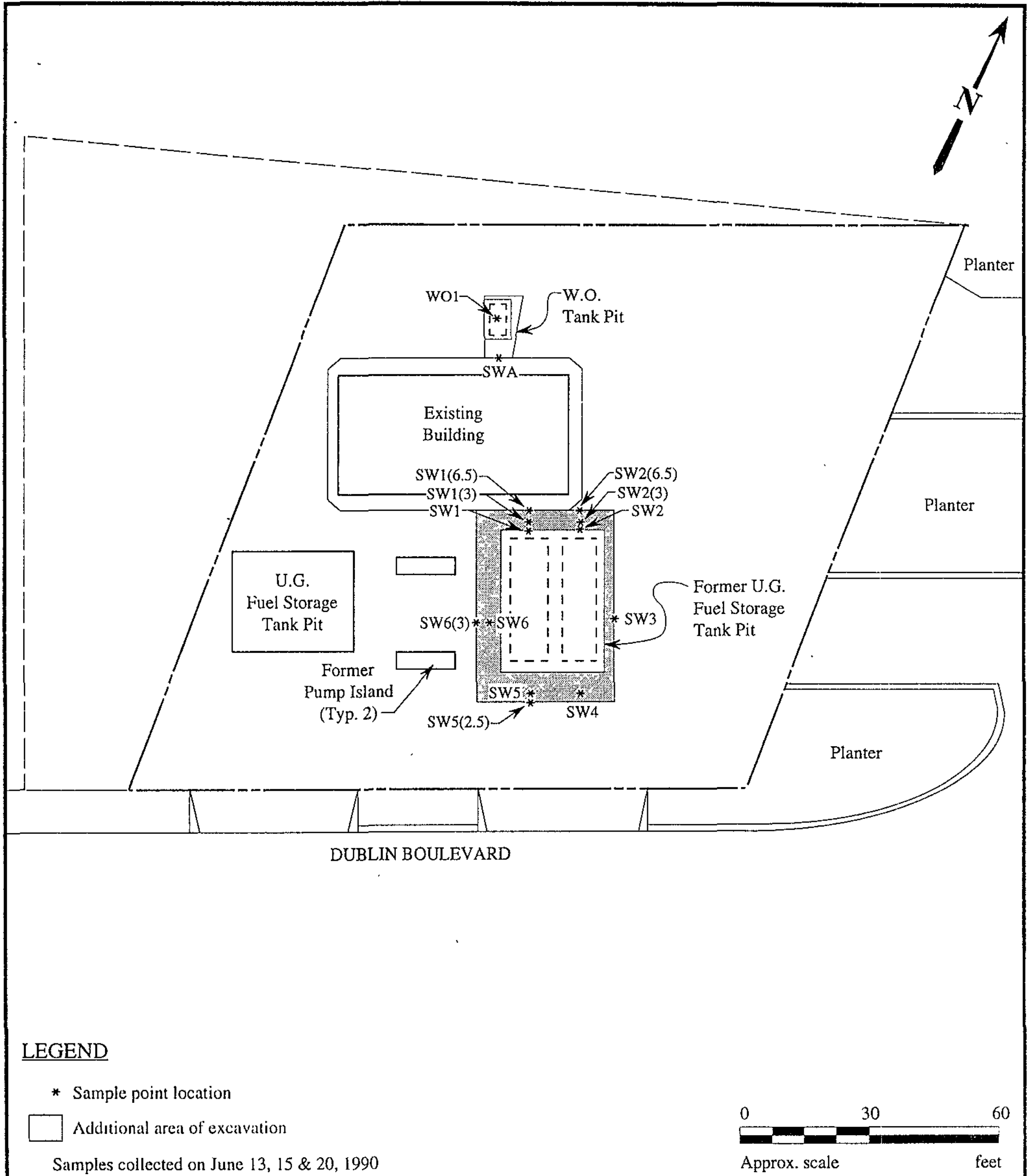
- Monitoring well
- Monitoring well (destroyed)
- Exploratory boring (drilled 8/24-25/92)
- Exploratory boring (drilled 9/25/95)

0 30 60

Approx. scale feet

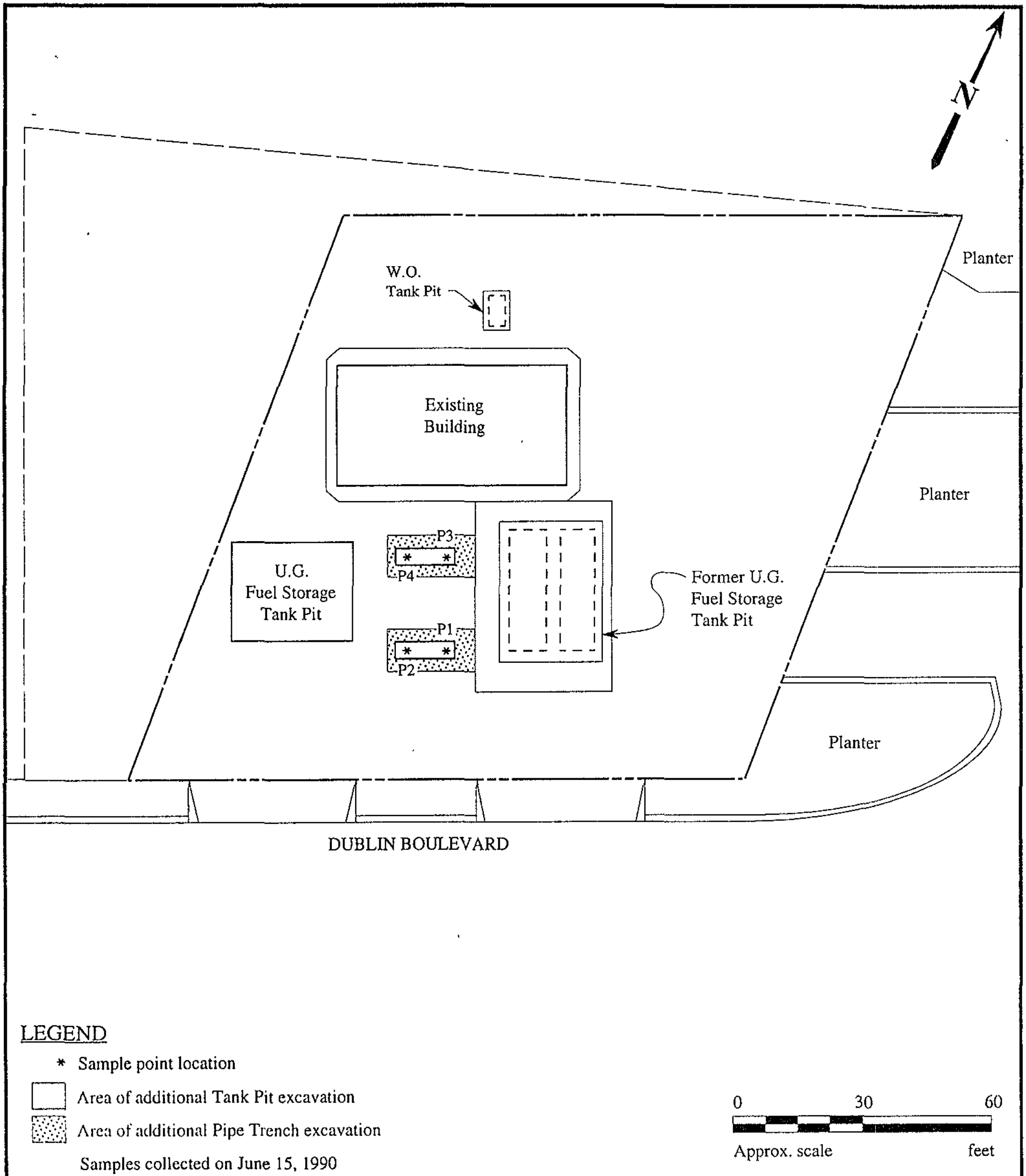
EXPLORATORY BORING AND MONITORING WELL LOCATION MAP

KAPREALIAN ENGINEERING INCORPORATED	FORMER UNOCAL S/S #5901 11976 DUBLIN BOULEVARD DUBLIN, CALIFORNIA	FIGURE 1



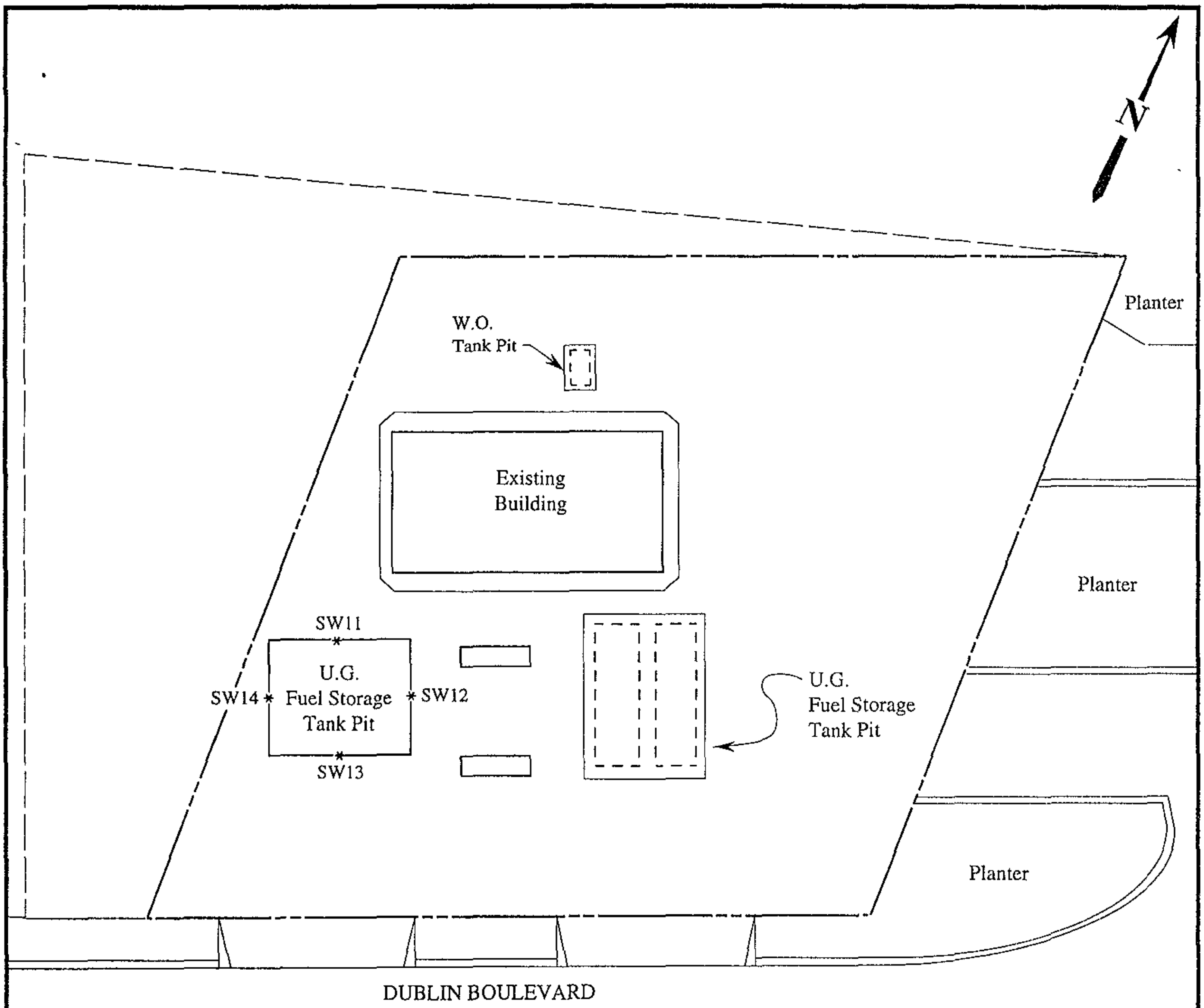
SOIL SAMPLE POINT LOCATIONS MAP

KAPREALIAN ENGINEERING INCORPORATED	**FORMER UNOCAL S/S #5901** **11976 DUBLIN BOULEVARD** **DUBLIN, CALIFORNIA**	FIGURE **2**



SOIL SAMPLE POINT LOCATIONS MAP

KAPREALIAN ENGINEERING INCORPORATED	FORMER UNOCAL S/S #5901 11976 DUBLIN BOULEVARD DUBLIN, CALIFORNIA	FIGURE 3



LEGEND

* Sample point location

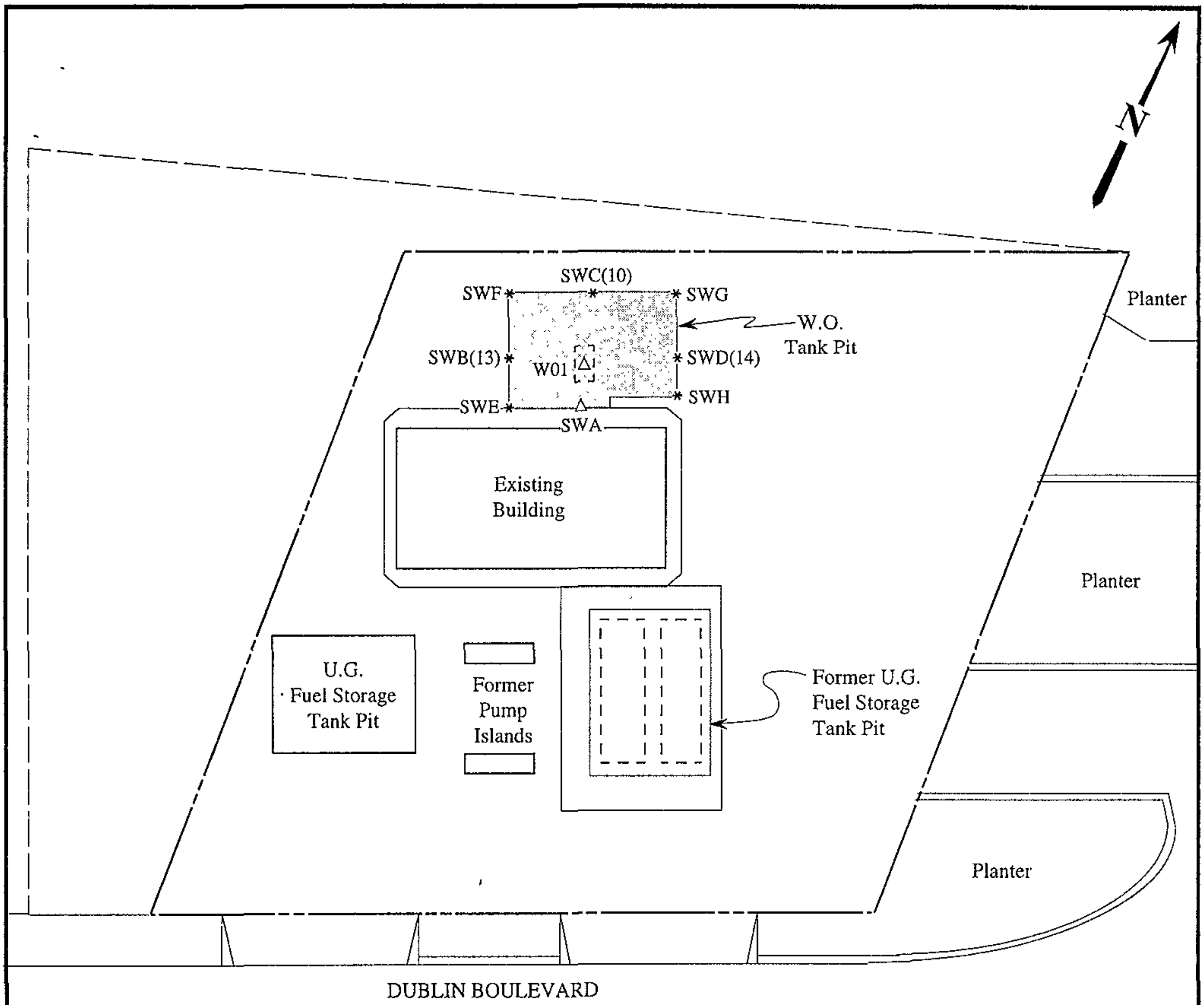
Samples collected on June 26, 1990

0 30 60

Approx. scale feet

SOIL SAMPLE POINT LOCATIONS MAP

KAPREALIAN ENGINEERING INCORPORATED	**FORMER UNOCAL S/S #5901** **11976 DUBLIN BOULEVARD** **DUBLIN, CALIFORNIA**	FIGURE **4**



LEGEND

* Sample point location

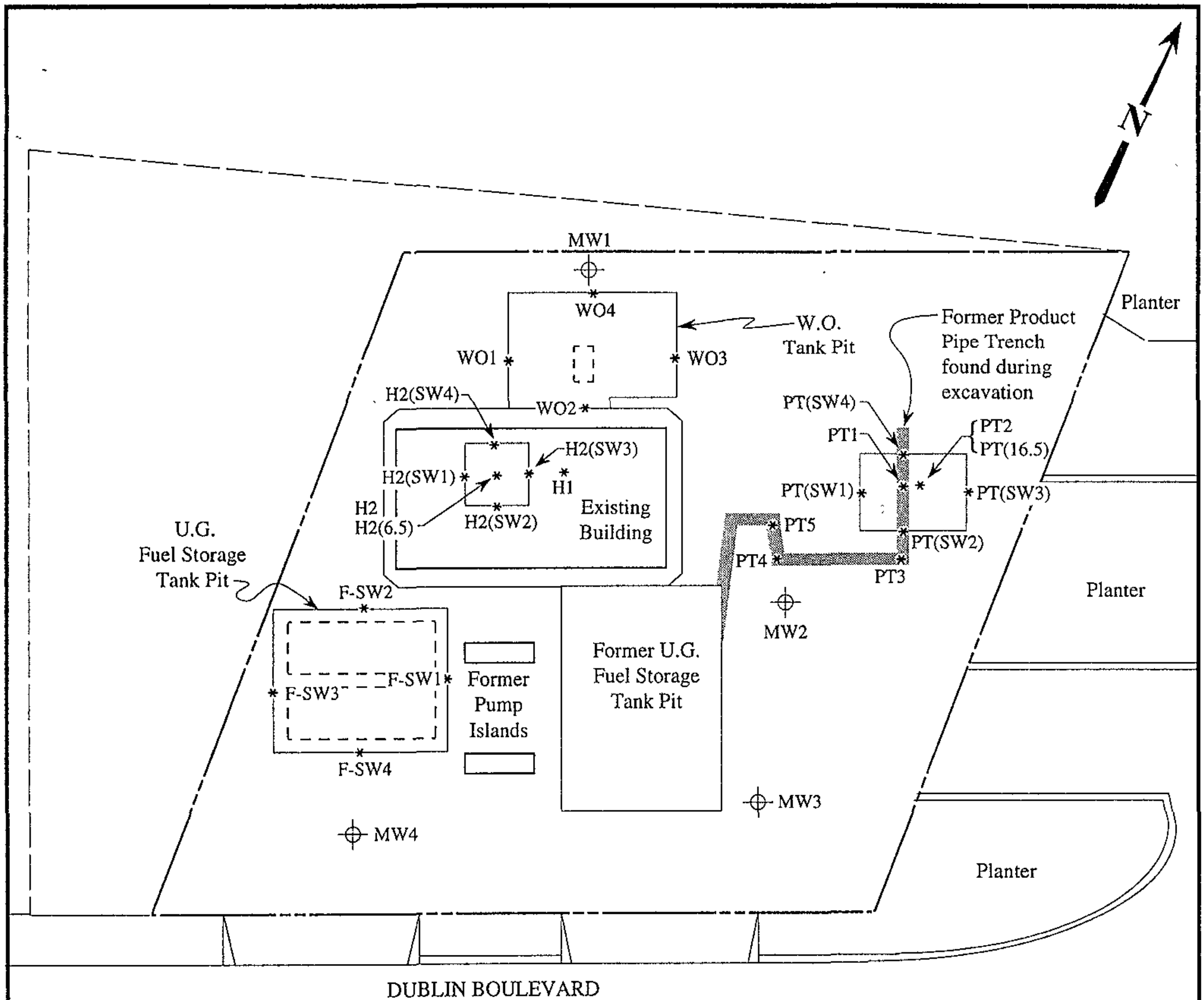
△ Previous sample point location

☐ Area of additional Tank Pit excavation

Samples collected on July 16 & 20, 1990

SOIL SAMPLE POINT LOCATIONS MAP

KAPREALIAN ENGINEERING INCORPORATED	**FORMER UNOCAL S/S #5901** **11976 DUBLIN BOULEVARD** **DUBLIN, CALIFORNIA**	FIGURE **5**



LEGEND

- Monitoring well
- * Sample point location
- Area of additional excavation

Samples collected on May 21 and June 15, 1992

0 30 60

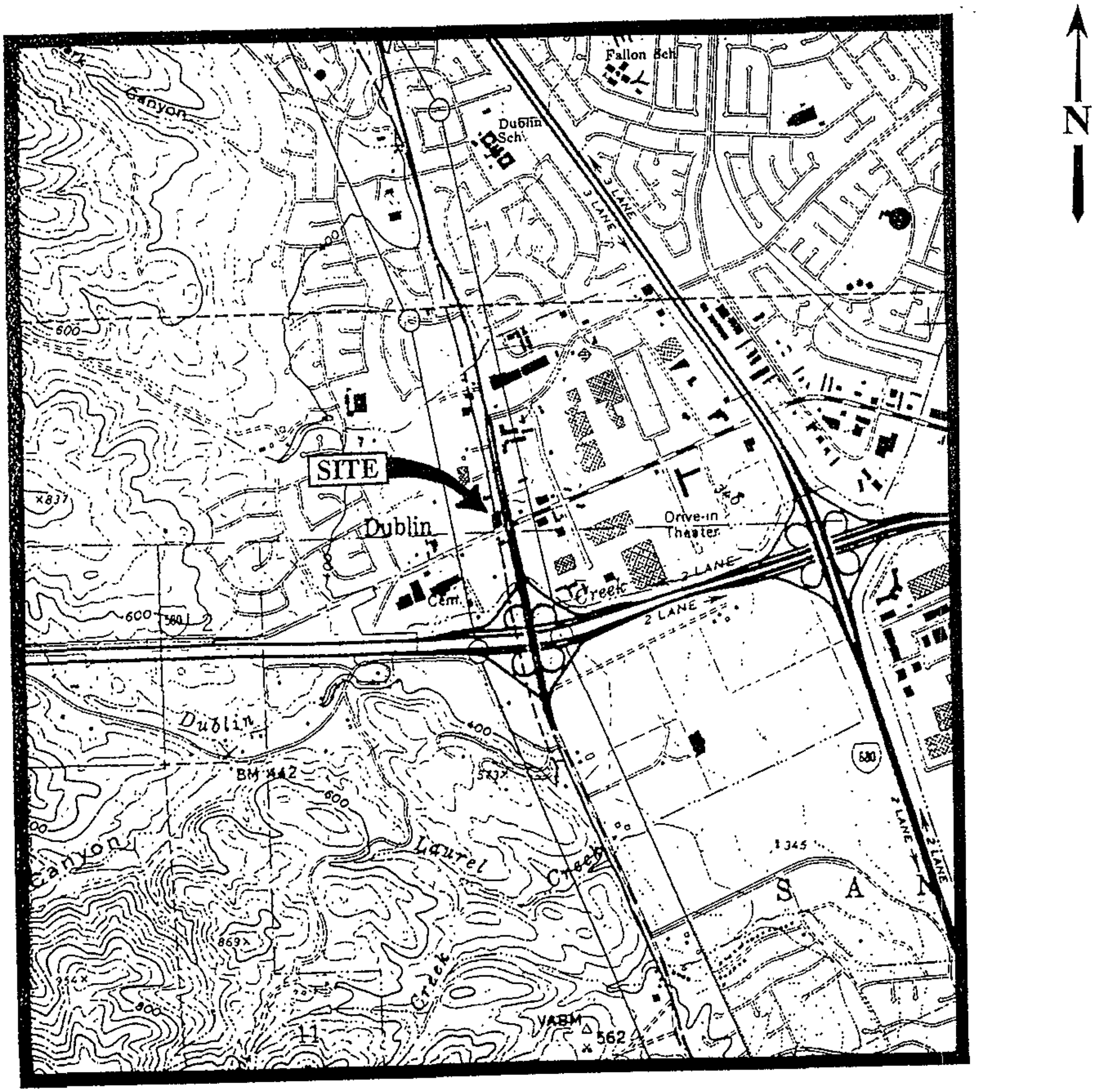
Approx. scale feet

SOIL SAMPLE POINT LOCATIONS MAP

KAPREALIAN ENGINEERING INCORPORATED

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

FIGURE **6**



MAP EXPLANATION

Potentially Active Faults
Faults considered to have been active during Holocene time and to have a relatively high potential for surface rupture; solid line where accurately located, long dash where approximately located, short dash where inferred.

Special Studies Zone Boundaries
These are delineated as straight-line segments that connect encircled turning points so as to define special studies zone segments.

Base modified from a portion of a State of California Special Studies Zones, Dublin, Revised Official Map. (Alquist-Priolo Special Studies Act)

0 2000 4000
Approx. scale feet

LOCATION OF CALAVERAS FAULT (ZONED POTENTIALLY ACTIVE) IN RELATION TO SUBJECT SITE		
KAPREALIAN ENGINEERING INCORPORATED	UNOCAL SERVICE STATION #5901 11976 DUBLIN BOULEVARD DUBLIN, CALIFORNIA	FIGURE 7

BORING LOG

Project No. KEI-P90-0606.P8	**Boring Diameter** 8.75" **Casing Diameter** N/A	**Logged By** JGG T.S. LEG1633
Project Name Unocal S/S # 5901 11976 Dublin Blvd., Dublin	**Well Cover Elevation** N/A	**Date Drilled** 9-25-95
Boring No. EB11	**Drilling Method** Hollow-stem Auger	**Drilling Company** Woodward Drilling

Penetration blows/6"	G.W. level	O.V.M. (P.P.M.)	Depth (feet) Samples	Stratigraphy USCS	Description
			0		A.C. pavement over sand and gravel base.
				ML	Silt, estimated at 5-15% clay, trace sand, stiff, moist, black.
5/6/8			5	ML	Silt, trace clay, trace sand, trace gravel to 1/2 inch in diameter, stiff, moist, olive brown.
3/5/9			10	GM	Silty gravel, estimated at 30-35% silt, 10-15% fine to coarse-grained sand, gravel to 3/4 inch in diameter, loose to medium dense, moist, dark yellowish brown.
7/3/5			15	GM	Silty gravel with sand, estimated at 15-25% silt, and 20-25% fine to coarse-grained sand, loose, moist, dark yellowish brown.
3/4/7				GW-GM	Well graded gravel with silt and sand, estimated at 30-35% predominantly fine-grained sand, and 10-15% silt, gravel to 1/2 inch in diameter, loose to medium dense, very moist, olive brown.
				SM	Silty sand, estimated at 20-25% silt, predominantly fine-grained sand, loose, very moist, olive brown.
3/3/4			20	ML	Silt, estimated at 10-20% fine-grained sand, firm, moist, greenish gray.
2/3/5					

BORING LOG

Project No. KEI-P90-0606.P8	**Boring Diameter** 8.75" / **Casing Diameter** N/A	**Logged By** T.S. JGG CEG 1633
Project Name Unocal S/S # 5901 11976 Dublin Blvd., Dublin	**Well Cover Elevation** N/A	**Date Drilled** 9-25-95
Boring No. EB11	**Drilling Method** Hollow-stem Auger	**Drilling Company** Woodward Drilling

Penetration blows/6"	G.W. level	O.V.M. (P.P.M.)	Depth (feet) Samples	Stratigraphy USCS	Description
5/6/9				CL	Silty clay, estimated at 30-35% silt, trace sand, stiff, moist, dark yellowish brown and greenish gray mottled. Silty clay, as above.
13/21/28	▽		25	GP-GM	Poorly graded gravel with silt and sand, estimated at 35-40% medium to coarse-grained sand, and 10-15% silt, gravel to 3/4 inch in diameter, dense, greenish gray.
			30		TOTAL DEPTH: 27'
			35		
			40		

BORING LOG

Project No. KEI-P90-0606.P8	**Boring Diameter** 8.75" **Casing Diameter** N/A	**Logged By** JGG T.S. CEG 1633
Project Name Unocal S/S # 5901 11976 Dublin Blvd., Dublin	**Well Cover Elevation** N/A	**Date Drilled** 9-25-95
Boring No. EB12	**Drilling Method** Hollow-stem Auger	**Drilling Company** Woodward Drilling

Penetration blows/6"	G.W level	O.V.M. (P.P.M.)	Depth (feet) Samples	Stratigraphy USCS	Description
			0		A.C. pavement over sand and gravel base.
					Silt, estimated at 5-15% clay, trace sand, stiff, moist, very dark brown, with bricks and other debris, (fill).
					Native Soil
4/5/7			5	ML	Silt, estimated at 5-15% clay, stiff, moist, olive brown.
4/4/6			10	ML	Silt, estimated at 10-15% gravel to 1/2 inch in diameter, and 5-15% clay, trace sand, stiff, very moist, olive brown.
5/4/6			15	SM	Silty sand, sand is predominantly fine to medium-grained, estimated at 20-30% silt, and 5-15% gravel to 1/2 inch in diameter, loose, wet, olive brown.
3/3/4			20	ML	Sandy silt, estimated at 30-35% predominantly fine-grained sand, trace gravel to 1/2 inch in diameter, firm, very moist, olive grading to dark greenish gray.

BORING LOG

Project No. KEI-P90-0606.P8	**Boring Diameter** 8.75" **Casing Diameter** N/A	**Logged By** JGG T.S. CEG 1633
Project Name Unocal S/S # 5901 11976 Dublin Blvd., Dublin	**Well Cover Elevation** N/A	**Date Drilled** 9-25-95
Boring No. EB12	**Drilling Method** Hollow-stem Auger	**Drilling Company** Woodward Drilling

Penetration blows/6"	G.W. level	O.V.M. (P.P.M.)	Depth (feet) Samples	Stratigraphy USCS	Description
3/5/7				CL	Silty clay, estimated at 5-15% fine to medium-grained sand, stiff, moist, very dark gray.
3/8/12	▽				Clay, estimated at 10-20% silt, stiff to very stiff, moist, very dark gray.
			25		TOTAL DEPTH: 25'
			30		
			35		
			40		

BORING LOG

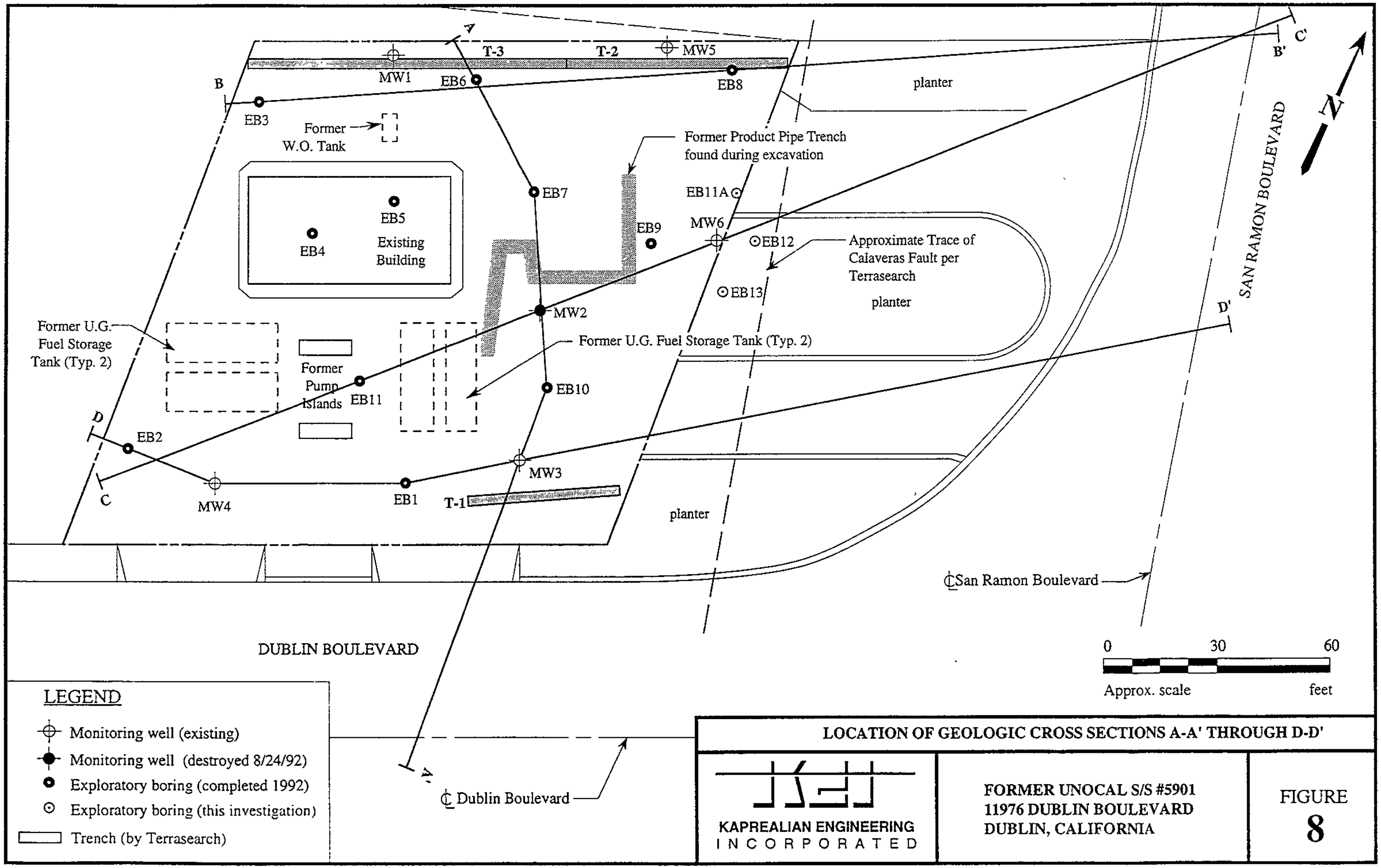
Project No. KEI-P90-0606.P8	**Boring Diameter** 8.75" **Casing Diameter** N/A	**Logged By** JGG T.S. CEG 1633
Project Name Unocal S/S # 5901 11976 Dublin Blvd., Dublin	**Well Cover Elevation** N/A	**Date Drilled** 9-25-95
Boring No. EB13	**Drilling Method** Hollow-stem Auger	**Drilling Company** Woodward Drilling

Pene-tration blows/6"	G.W level	O.V.M. (P.P.M.)	Depth (feet) Samples	Stratigraphy USCS	Description
			0		A.C. pavement over sand and gravel base.
					Native Soil
				ML	Silt, estimated at 5-15% clay, trace sand, firm, moist, very dark brown, rootlets.
5/8/9			5	ML	Silt, trace clay, trace sand, stiff to very stiff, moist, olive brown.
4/3/4			10	ML	Silt, trace clay, trace sand, firm, very moist, olive brown, rootlets.
				SM	Silty sand with gravel, estimated at 15-20% silt, and 15-20% gravel, sand is fine to coarse-grained, loose, moist, olive brown.
3/2/2			15	ML	Sandy silt, estimated at 30-35% very fine to fine-grained, firm, very moist, olive brown.
				ML	Silt, estimated at 20-30% clay, soft to firm, moist, olive brown.
2/2/3			20	ML	
2/2/3				ML	Clayey silt, estimated at 35-45% clay, trace sand, soft to firm, moist, olive brown.

BORING LOG

Project No. KEI-P90-0606.P8	**Boring Diameter** 8.75" **Casing Diameter** N/A	**Logged By** T.S. JGG CEG/1633
Project Name Unocal S/S # 5901 11976 Dublin Blvd., Dublin	**Well Cover Elevation** N/A	**Date Drilled** 9-25-95
Boring No. EB13	**Drilling Method** Hollow-stem Auger	**Drilling Company** Woodward Drilling

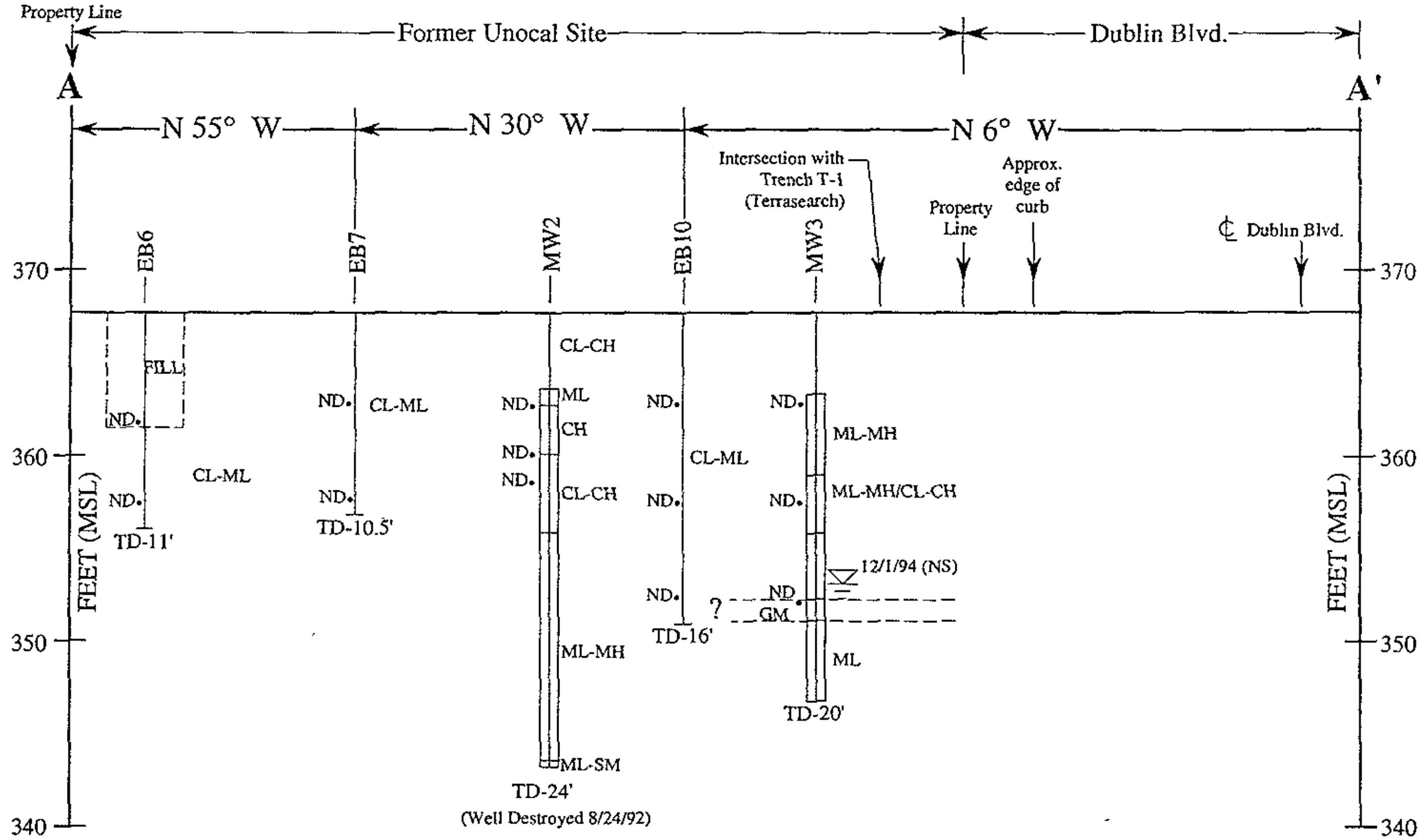
Penetration blows/6"	G.W. level	O.V.M. (P.P.M.)	Depth (feet) Samples	Stratigraphy USCS	Description
				ML	Clayey silt, estimated at 35-45% clay, trace sand, soft to firm, moist, olive brown.
7/8/9	▽			CL	Silty clay, trace sand, stiff to very stiff, moist, dark olive brown.
			25		TOTAL DEPTH: 24'
			30		
			35		
			40		



LOCATION OF GEOLOGIC CROSS SECTIONS A-A' THROUGH D-D'

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

FIGURE
8



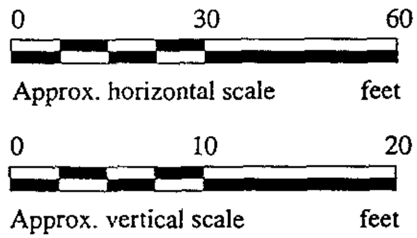
LEGEND

Soil classification symbols per USCS

- Ground water level on 12/1/94
- Screened interval of well
- ( ) Concentration of TPH as gasoline (µg/L) in ground water sample collected on date shown.
- • Concentration of TPH as gasoline (mg/kg) in soil sample collected at depth shown.

NS Not sampled

ND Non-detectable

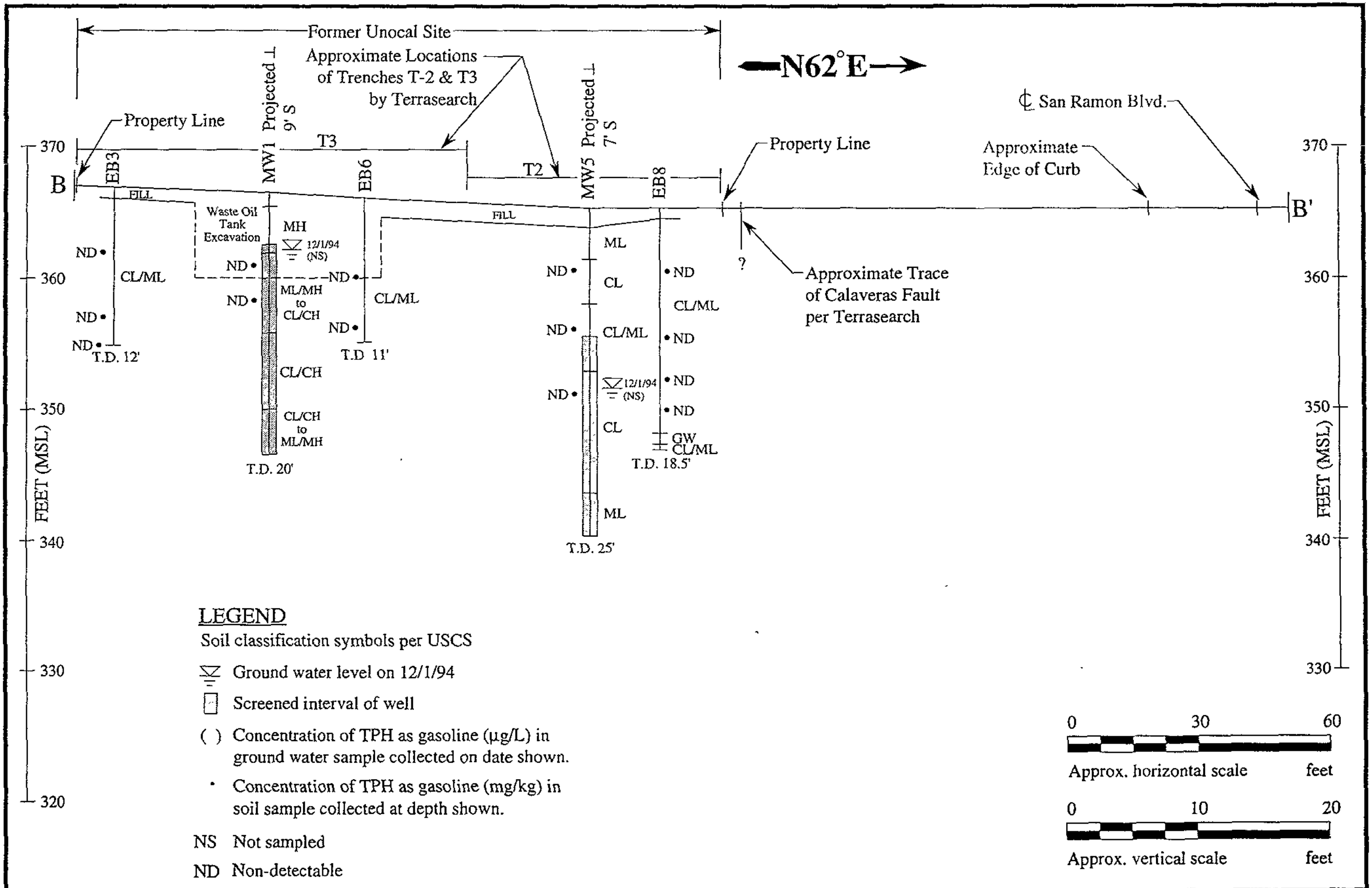


GEOLOGIC CROSS SECTION A–A'

KAPREALIAN ENGINEERING INCORPORATED

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

FIGURE **9**

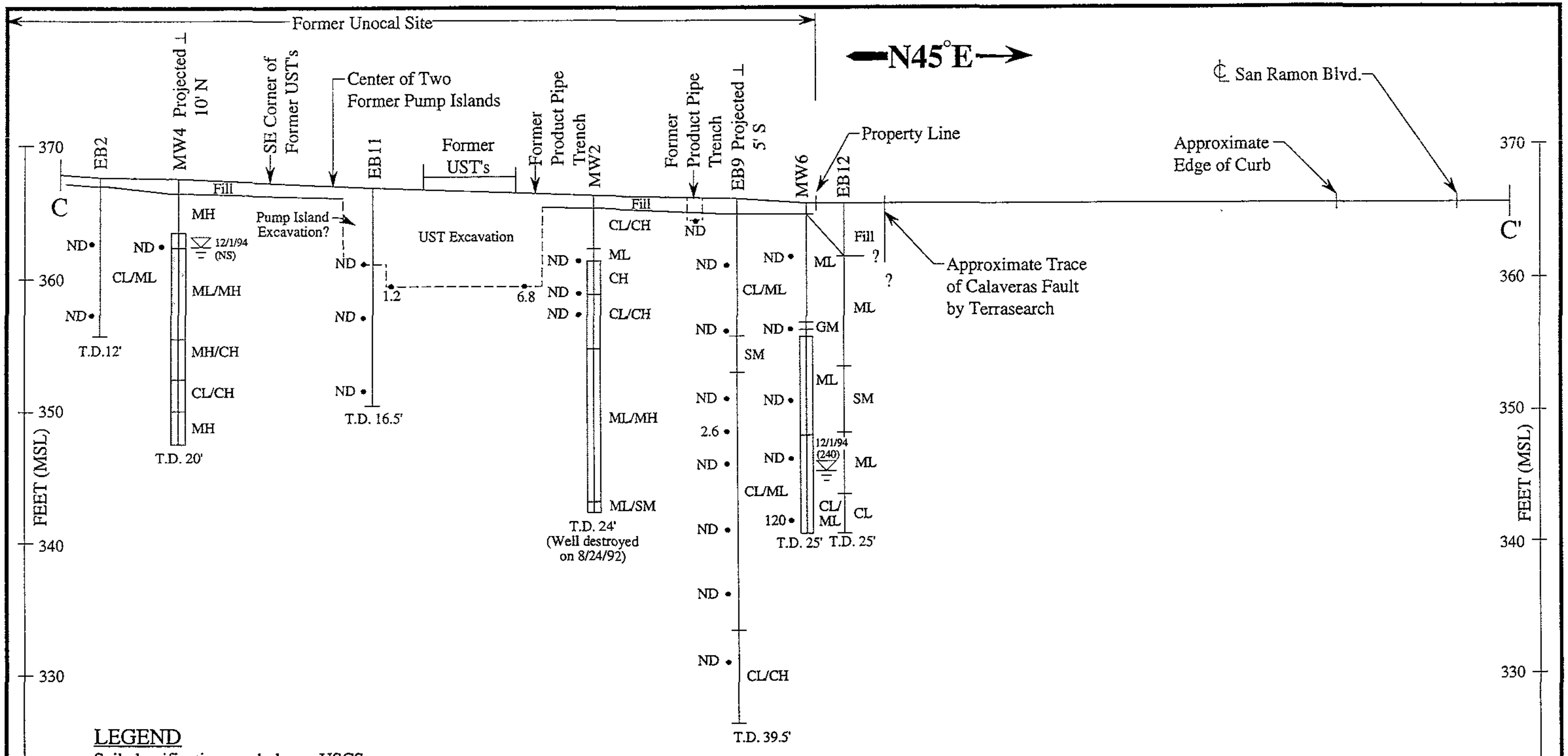


GEOLOGIC CROSS SECTION B-B'

KAPREALIAN ENGINEERING INCORPORATED

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

FIGURE
10

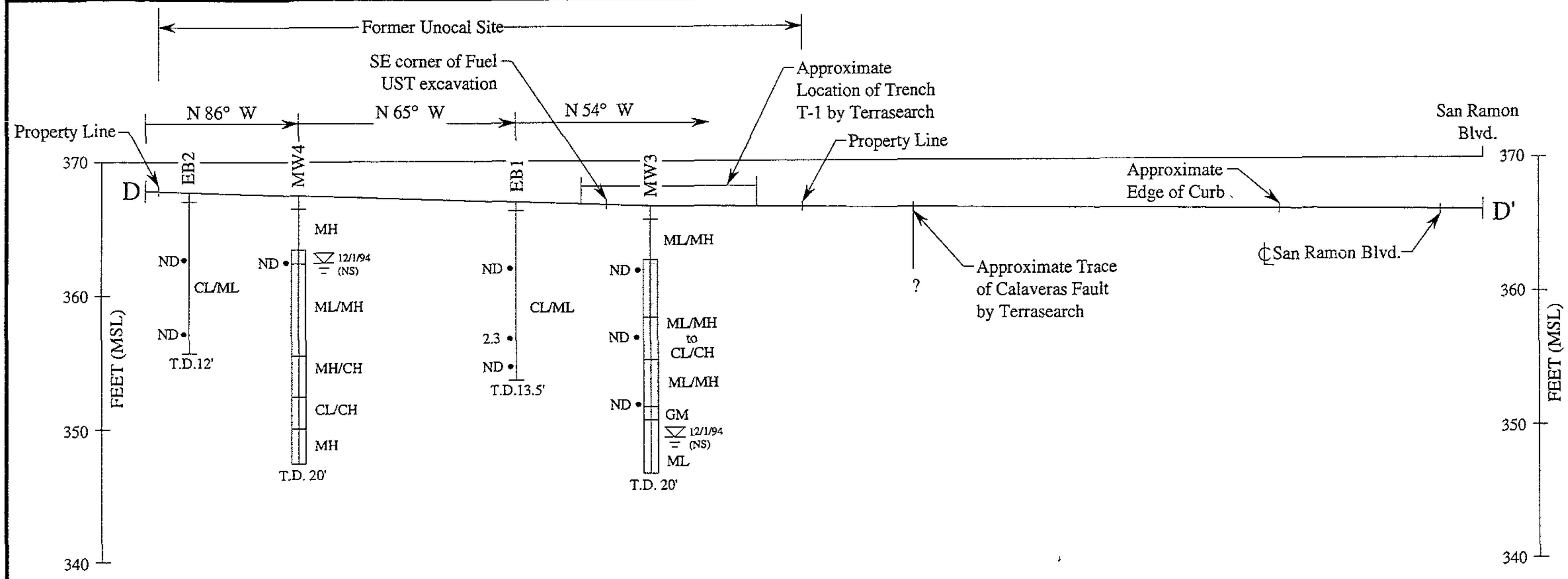


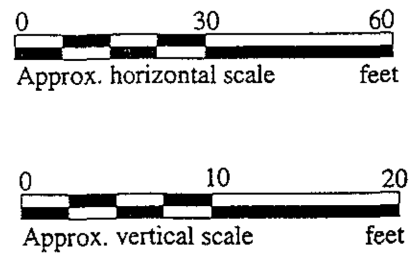
LEGEND

Soil classification symbols per USCS

- Ground water level on 12/1/94
- Screened interval of well
- ( ) Concentration of TPH as gasoline (µg/L) in ground water sample collected on date shown.
- • Concentration of TPH as gasoline (mg/kg) in soil sample collected at depth shown.
- ND Non-detectable
- NS Not sampled

GEOLOGIC CROSS SECTION C – C'		
KAPREALIAN ENGINEERING INCORPORATED	FORMER UNOCAL S/S #5901 11976 DUBLIN BOULEVARD DUBLIN, CALIFORNIA	FIGURE 11





LEGEND

Soil classification symbols per USCS

- Ground water level on 12/1/94
- Screened interval of well
- ( ) Concentration of TPH as gasoline (µg/L) in ground water sample collected on date shown.
- • Concentration of TPH as gasoline (mg/kg) in soil sample collected at depth shown.

ND Non-detectable

NS Not sampled

GEOLOGIC CROSS SECTION D-D'		
KAPREALIAN ENGINEERING INCORPORATED	FORMER UNOCAL S/S #5901 11976 DUBLIN BOULEVARD DUBLIN, CALIFORNIA	FIGURE 12

Sequoia Analytical

680 Chesapeake Drive, Redwood City, CA 94063, (415) 364-9600, FAX (415) 364-9233
404 N. Wiget Lane, Walnut Creek, CA 94598, (510) 988-9600, FAX (510) 988-9673
819 Striker Avenue, Suite 8, Sacramento, CA 95834, (916) 921-9600, FAX (916) 921-0100

Kaprealian Engineering, Inc.
2401 Stanwell Dr., Ste. 400
Concord, CA 94520
Attention: Dennis Royce

Client Project ID: Unocal #5901, 11976 Dublin Blvd., Dublin
Sample Matrix: Soil
Analysis Method: EPA 5030/8015 Mod./8020
First Sample #: 509-2297

Sampled: Sep 25, 1995
Received: Sep 26, 1995
Reported: Oct 11, 1995

TOTAL PURGEABLE PETROLEUM HYDROCARBONS with BTEX DISTINCTION

Analyte	Reporting Limit mg/kg	Sample I.D. 509-2297 EB13(10)*	Sample I.D. 509-2298 EB13(15)*	Sample I.D. 509-2299 EB13(20)*	Sample I.D. 509-2300 EB13(21)*
Purgeable Hydrocarbons	1.0	1.4	1.6	1.4	1.9
Benzene	0.0050	N.D.	N.D.	N.D.	N.D.
Toluene	0.0050	N.D.	N.D.	0.0051	N.D.
Ethyl Benzene	0.0050	N.D.	N.D.	N.D.	N.D.
Total Xylenes	0.0050	0.024	0.023	0.027	0.025
Chromatogram Pattern:		Unidentified Hydrocarbons >C8	Unidentified Hydrocarbons >C8	Unidentified Hydrocarbons >C8	Unidentified Hydrocarbons >C8

Quality Control Data

Report Limit Multiplication Factor:	1.0	1.0	1.0	1.0
Date Analyzed:	10/9/95	10/9/95	10/9/95	10/9/95
Instrument Identification:	HP-3	HP-3	HP-3	HP-3
Surrogate Recovery, %: (QC Limits = 70-130%)	99	103	116	115

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

SEQUOIA ANALYTICAL, #1894

Alan B. Kemp
Project Manager

Please Note:
*This sample does not appear to contain gasoline.
"Unidentified Hydrocarbons >C8" refers to unidentified peaks in the total extractable petroleum hydrocarbons range.

Sequoia Analytical

680 Chesapeake Drive Redwood City, CA 94063 (415) 364-9600 FAX (415) 364-9233
404 N. Wiget Lane Walnut Creek, CA 94598 (510) 988-9600 FAX (510) 988-9673
819 Striker Avenue, Suite 8 Sacramento, CA 95834 (916) 921-9600 FAX (916) 921-0100

Kaprealian Engineering, Inc.	Client Project ID: Unocal #5901, 11976 Dublin Blvd.,Dublin	Sampled:	Sep 25, 1995
2401 Stanwell Dr., Ste. 400	Sample Matrix: Water	Received:	Sep 26, 1995
Concord, CA 94520	Analysis Method: EPA 5030/8015 Mod./8020	Reported:	Oct 11, 1995
Attention: Dennis Royce	First Sample #: 509-2301		

TOTAL PURGEABLE PETROLEUM HYDROCARBONS with BTEX DISTINCTION

Analyte	Reporting Limit μg/L	Sample I.D. 509-2301 EB11*	Sample I.D. 509-2302 EB12	Sample I.D. 509-2303 EB13
Purgeable Hydrocarbons	50	110	N.D.	N.D.
Benzene	0.50	4.0	N.D.	N.D.
Toluene	0.50	1.2	N.D.	N.D.
Ethyl Benzene	0.50	N.D.	N.D.	N.D.
Total Xylenes	0.50	N.D.	N.D.	N.D.
Chromatogram Pattern:		Unidentified Hydrocarbons <C7	--	--

Quality Control Data

Report Limit Multiplication Factor:	1.0	1.0	1.0
Date Analyzed:	10/6/95	10/6/95	10/6/95
Instrument Identification:	HP-9	HP-9	HP-9
Surrogate Recovery, %: (QC Limits = 70-130%)	119	107	101

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

SEQUOIA ANALYTICAL, #1271

Alan B. Kemp
Project Manager

Please Note:
*This sample does not appear to contain gasoline.
"Unidentified Hydrocarbons <C7" refers to unidentified peaks in the EPA 8010 range.

Sequoia Analytical

680 Chesapeake Drive · Redwood City, CA 94063 · (415) 364-9600 · FAX (415) 364-9233
404 N. Wiget Lane · Walnut Creek, CA 94598 · (510) 988-9600 · FAX (510) 988-9673
819 Striker Avenue, Suite 8 · Sacramento, CA 95834 · (916) 921-9600 · FAX (916) 921-0100

Kaprealian Engineering, Inc.
2401 Stanwell Dr., Ste. 400
Concord, CA 94520
Attention: Dennis Royce

Client Project ID: Unocal #5901, 11976 Dublin Blvd.,Dublin
Matrix: Liquid
QC Sample Group: 5092301-03

Reported: Oct 11, 1995

QUALITY CONTROL DATA REPORT

ANALYTE	Benzene	Toluene	Ethyl Benzene	Xylenes
Method:	EPA 8020	EPA 8020	EPA 8020	EPA 8020
Analyst:	K. Nill	K. Nill	K. Nill	K. Nill
MS/MSD Batch#:	5092032	5092032	5092032	5092032
Date Prepared:	10/6/95	10/6/95	10/6/95	10/6/95
Date Analyzed:	10/6/95	10/6/95	10/6/95	10/6/95
Instrument I.D.#:	HP-9	HP-9	HP-9	HP-9
Conc. Spiked:	20 µg/L	20 µg/L	20 µg/L	60 µg/L
Matrix Spike % Recovery:	115	115	115	127
Matrix Spike Duplicate % Recovery:	110	115	110	125
Relative % Difference:	4.4	0.0	4.4	1.3
LCS Batch#:	4LCS100695	4LCS100695	4LCS100695	4LCS100695
Date Prepared:	10/6/95	10/6/95	10/6/95	10/6/95
Date Analyzed:	10/6/95	10/6/95	10/6/95	10/6/95
Instrument I.D.#:	HP-9	HP-9	HP-9	HP-9
LCS % Recovery:	110	103	104	113
% Recovery Control Limits:	71-133	72-128	72-130	71-120

SEQUOIA ANALYTICAL, #1271

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 matrix spike is an aliquot of sample fortified with known quantities of specific compounds and subjected to the entire analytical procedure. If the recovery of analytes from the matrix spike does not fall within specified control limits due to matrix interference, the LCS recovery is to be used to validate the batch.

UUUUJ110

UNOCAL 76

☐ 680 Chesapeake Drive • Redwood City, CA 94063 • (415) 364-9600
☐ 819 Striker Ave., Suite 8 • Sacramento, CA 95834 • (916) 921-9600
☐ 1900 Bates Ave., Suite LM • Concord, CA 94520 • (510) 686-9600
☐ 18939 120th Ave., N.E., Suite 101 • Bothell, WA 98011 • (206) 481-9200
☐ East 11115 Montgomery, Suite B • Spokane, WA 99206 • (509) 924-9200
☐ 15055 S.W. Sequoia Pkwy, Suite 110 • Portland, OR 97222 • (503) 624-9800

Company Name: Kaprealian Engineering, Inc.	Project Name: 11976 Dublin Blvd., Dublin
Address: 2401 Stanwell Dr., Suite 400	UNOCAL Project Manager: Adadu Yemane
City: Concord State: CA Zip Code: 94520	Release #:
Telephone: (510) 602-5100 FAX #: (510) 687-0602	Site #: 5401
Report To: Dennis Sampler: Tom Seelig	QC Data: ☒ Level D (Standard) ☐ Level C ☐ Level B ☐ Level A

Turnaround Time: ☒ 10 Work Days ☐ 5 Work Days ☐ 3 Work Days ☐ 2 Work Days ☐ 1 Work Day ☐ 2-8 Hours

CODE: ☐ Misc. ☒ Detect. ☐ Eval. ☐ Remed. ☐ Demol. ☐ Closure

☐ Drinking Water ☐ Waste Water ☒ Other

Analyses Requested

Client Sample I.D.	Date/Time Sampled	Matrix Desc.	# of Cont.	Cont. Type	Laboratory Sample #	TPH-G	BTEX							Comments
1. EB 11	9/25/95	water	2	VOA	5092301	ABX	X							
2. EB 12	↓	↓	↓	↓	5092302	↓	↓							
3. EB 13	↓	↓	↓	↓	5092303	↓	↓							
4.														
5.														
6.														
7.														
8.														
9.														
10.														

Relinquished By: Tom E. Seelig	Date: 9-26	Time: 10:10	Received By: [signature]	Date: 9-26	Time: 10:10
Relinquished By: [signature]	Date: 9-26	Time: 4:45	Received By:	Date:	Time:
Relinquished By:	Date:	Time:	Received By Lab: [signature]	Date: 9/26	Time: 1645

Were Samples Received in Good Condition? ☐ Yes ☐ No Samples on Ice? ☐ Yes ☐ No Method of Shipment________ Page __ of __

To be completed upon receipt of report:

1) Were the analyses requested on the Chain of Custody reported? ☐ Yes ☐ No If no, what analyses are still needed? ________

2) Was the report issued within the requested turnaround time? ☐ Yes ☐ No If no, what was the turnaround time? ________

Approved by: ________ Signature: ________ Company: ________ Date: ________

Pink - Client Yellow - Laboratory White - Laboratory

Sequoia Analytical

680 Chesapeake Drive, Redwood City, CA 94063, (415) 364-9600, FAX (415) 364-9233
404 N. Wiget Lane, Walnut Creek, CA 94598, (510) 988-9600, FAX (510) 988-9673
819 Striker Avenue, Suite 8, Sacramento, CA 95834, (916) 921-9600, FAX (916) 921-0100

Kaprealian Engineering, Inc.	Client Project ID:	Unocal #5901, 11976 Dublin Blvd., Dublin	Sampled:	Sep 25, 1995
2401 Stanwell Dr., Ste. 400	Sample Matrix:	Soil	Received:	Sep 26, 1995
Concord, CA 94520	Analysis Method:	EPA 5030/8015 Mod./8020	Reported:	Oct 11, 1995
Attention: Dennis Royce	First Sample #:	509-2291		

TOTAL PURGEABLE PETROLEUM HYDROCARBONS with BTEX DISTINCTION

Analyte	Reporting Limit mg/kg	Sample I.D. 509-2291 EB12(5) *	Sample I.D. 509-2292 EB12(10)*	Sample I.D. 509-2293 EB12(15)	Sample I.D. 509-2294 EB12(20)	Sample I.D. 509-2295 EB12(22.5)	Sample I.D. 509-2296 EB13(5)
Purgeable Hydrocarbons	1.0	2.2	1.2	N.D.	N.D.	N.D.	N.D.
Benzene	0.0050	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Toluene	0.0050	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Ethyl Benzene	0.0050	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Total Xylenes	0.0050	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Chromatogram Pattern:		Unidentified Hydrocarbons >C8	Unidentified Hydrocarbons >C8	--	--	--	--

Quality Control Data

Report Limit Multiplication Factor:	1.0	1.0	1.0	1.0	1.0	1.0
Date Analyzed:	10/6/95	10/6/95	10/6/95	10/6/95	10/6/95	10/6/95
Instrument Identification:	HP-3	HP-3	HP-3	HP-3	HP-3	HP-3
Surrogate Recovery, %: (QC Limits = 70-130%)	110	107	99	96	104	111

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

SEQUOIA ANALYTICAL, #1894

Alan B. Kemp
Project Manager

Please Note:
*This sample does not appear to contain gasoline.
"Unidentified Hydrocarbons >C8" refers to unidentified peaks in the total extractable petroleum hydrocarbons range.

Sequoia Analytical

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Kaprealian Engineering, Inc.
2401 Stanwell Dr., Ste. 400
Concord, CA 94520
Attention: Dennis Royce

Client Project ID: Unocal #5901, 11976 Dublin Blvd., Dublin
Sample Matrix: Soil
Analysis Method: EPA 5030/8015 Mod./8020
First Sample #: 509-2297

Sampled: Sep 25, 1995
Received: Sep 26, 1995
Reported: Oct 11, 1995

TOTAL PURGEABLE PETROLEUM HYDROCARBONS with BTEX DISTINCTION

Analyte	**Reporting Limit** mg/kg	**Sample I.D.** 509-2297 EB13(10)*	**Sample I.D.** 509-2298 EB13(15)*	**Sample I.D.** 509-2299 EB13(20)*	**Sample I.D.** 509-2300 EB13(21)*
Purgeable Hydrocarbons	1.0	1.4	1.6	1.4	1.9
Benzene	0.0050	N.D.	N.D.	N.D.	N.D.
Toluene	0.0050	N.D.	N.D.	0.0051	N.D.
Ethyl Benzene	0.0050	N.D.	N.D.	N.D.	N.D.
Total Xylenes	0.0050	0.024	0.023	0.027	0.025
Chromatogram Pattern:		Unidentified Hydrocarbons >C8	Unidentified Hydrocarbons >C8	Unidentified Hydrocarbons >C8	Unidentified Hydrocarbons >C8

Quality Control Data

Report Limit Multiplication Factor:	1.0	1.0	1.0	1.0
Date Analyzed:	10/9/95	10/9/95	10/9/95	10/9/95
Instrument Identification:	HP-3	HP-3	HP-3	HP-3
Surrogate Recovery, %: (QC Limits = 70-130%)	99	103	116	115

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

SEQUOIA ANALYTICAL, #1894

Alan B. Kemp
Project Manager

Please Note:
*This sample does not appear to contain gasoline.
"Unidentified Hydrocarbons >C8" refers to unidentified peaks in the total extractable petroleum hydrocarbons range.

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819 Striker Avenue, Suite 8 Sacramento, CA 95834 (916) 921-9600 FAX (916) 921-0100

Kaprealian Engineering, Inc.
2401 Stanwell Dr., Ste. 400
Concord, CA 94520
Attention: Dennis Royce

Client Project ID: Unocal #5901, 11976 Dublin Blvd., Dublin
Matrix: Solid
QC Sample Group: 5092285-300
Reported: Oct 11, 1995

QUALITY CONTROL DATA REPORT

ANALYTE	Benzene	Toluene	Ethyl Benzene	Xylenes
Method:	EPA 8020	EPA 8020	EPA 8020	EPA 8020
Analyst:	Z.T.	Z.T.	Z.T.	Z.T.
MS/MSD Batch#:	5100065	5100065	5100065	5100065
Date Prepared:	10/6/95	10/6/95	10/6/95	10/6/95
Date Analyzed:	10/6/95	10/6/95	10/6/95	10/6/95
Instrument I.D.#:	HP-3	HP-3	HP-3	HP-3
Conc. Spiked:	0.20 mg/kg	0.20 mg/kg	0.20 mg/kg	0.60 mg/kg
Matrix Spike % Recovery:	107	110	107	131
Matrix Spike Duplicate % Recovery:	104	107	107	130
Relative % Difference:	2.8	2.8	0.0	0.77
LCS Batch#:	LCS100695	LCS100695	LCS100695	LCS100695
Date Prepared:	10/6/95	10/6/95	10/6/95	10/6/95
Date Analyzed:	10/6/95	10/6/95	10/6/95	10/6/95
Instrument I.D.#:	HP-3	HP-3	HP-3	HP-3
LCS % Recovery:	104	101	97	108
% Recovery Control Limits:	80-120	80-120	80-120	80-120

SEQUOIA ANALYTICAL, #1894

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 matrix spike is an aliquot of sample fortified with known quantities of specific compounds and subjected to the entire analytical procedure. If the recovery of analytes from the matrix spike does not fall within specified control limits due to matrix interference, the LCS recovery is to be used to validate the batch.

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Kaprealian Engineering, Inc.
2401 Stanwell Dr., Ste. 400
Concord, CA 94520
Attention: Dennis Royce

Client Project ID: Unocal #5901, 11976 Dublin Blvd., Dublin
Matrix: Solid
QC Sample Group: 5092285-300

Reported: Oct 11, 1995

QUALITY CONTROL DATA REPORT

ANALYTE	Benzene	Toluene	Ethyl Benzene	Xylenes
Method:	EPA 8020	EPA 8020	EPA 8020	EPA 8020
Analyst:	Z.T.	Z.T.	Z.T.	Z.T.
MS/MSD Batch#:	5100145	5100145	5100145	5100145
Date Prepared:	10/9/95	10/9/95	10/9/95	10/9/95
Date Analyzed:	10/9/95	10/9/95	10/9/95	10/9/95
Instrument I.D.#:	HP-3	HP-3	HP-3	HP-3
Conc. Spiked:	0.20 mg/kg	0.20 mg/kg	0.20 mg/kg	0.60 mg/kg
Matrix Spike % Recovery:	73	74	71	75
Matrix Spike Duplicate % Recovery:	77	79	76	81
Relative % Difference:	5.3	6.5	6.8	7.7
LCS Batch#:	LCS100995	LCS100995	LCS100995	LCS100995
Date Prepared:	10/9/95	10/9/95	10/9/95	10/9/95
Date Analyzed:	10/9/95	10/9/95	10/9/95	10/9/95
Instrument I.D.#:	HP-3	HP-3	HP-3	HP-3
LCS % Recovery:	111	110	107	120
% Recovery Control Limits:	80-120	80-120	80-120	80-120

SEQUOIA ANALYTICAL, #1894

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 matrix spike is an aliquot of sample fortified with known quantities of specific compounds and subjected to the entire analytical procedure. If the recovery of analytes from the matrix spike does not fall within specified control limits due to matrix interference, the LCS recovery is to be used to validate the batch.

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UNOCAL 76

☐ 680 Chesapeake Drive • Redwood City, CA 94063 • (415) 364-9600
☐ 819 Striker Ave., Suite 8 • Sacramento, CA 95834 • (916) 921-9600
☐ 1900 Bates Ave., Suite LM • Concord, CA 94520 • (510) 686-9600
☐ 18939 120th Ave., N.E., Suite 101 • Bothell, WA 98011 • (206) 481-9200
☐ East 11115 Montgomery, Suite B • Spokane, WA 99206 • (509) 924-9200
☐ 15055 S.W. Sequoia Pkwy, Suite 110 • Portland, OR 97222 • (503) 624-9800

Company Name: Kaprealian Engineering, Inc.	Project Name: 11976 Dublin Blvd, Dublin
Address: 2401 Stanwell Drive, Suite 400	UNOCAL Project Manager: Adadu Yemane
City: Concord State: CA Zip Code: 94520	Release #:
Telephone: (510)602-5100 FAX #: (510)687-0602	Site #: 5901
Report To: Dennis Sampler: Tom Seeliger	QC Data: ☒ Level D (Standard) ☐ Level C ☐ Level B ☐ Level A

Turnaround Time: ☒ 10 Work Days ☐ 5 Work Days ☐ 3 Work Days ☐ 2 Work Days ☐ 1 Work Day ☐ 2-8 Hours

CODE: ☐ Misc. ☒ Detect. ☐ Eval. ☐ Remed. ☐ Demol. ☐ Closure

☐ Drinking Water ☐ Waste Water ☒ Other

Analyses Requested

Client Sample I.D.	Date/Time Sampled	Matrix Desc.	# of Cont.	Cont. Type	Laboratory Sample #	TPH-G	BTEX							Comments
1. EB11(5)	9/25/95	soil	1	tube	5092285	X	X							
2. EB11(10)	↓	↓	↓	↓	5092286	↓	↓							
3. EB11(15)	↓	↓	↓	↓	5092287	↓	↓							
4. EB11(20)	↓	↓	↓	↓	5092288	↓	↓							
5. EB11(22.5)	↓	↓	↓	↓	5092289	↓	↓							
6. EB11(25.5)	↓	↓	↓	↓	5092290	↓	↓							
7. EB12(5)	↓	↓	↓	↓	5092291	↓	↓							
8. EB12(10)	↓	↓	↓	↓	5092292	↓	↓							
9. EB12(15)	↓	↓	↓	↓	5092293	↓	↓							
10. EB12(20)	↓	↓	↓	↓	5092294	↓	↓							

Relinquished By: Tom G. Seeliger	Date: 9-26	Time: 10:10	Received By: [illegible]	Date: 9-26	Time: 10:10
Relinquished By: [illegible]	Date: [illegible]	Time: 4:15	Received By:	Date:	Time:
Relinquished By:	Date:	Time:	Received By Lab: [illegible]	Date: 9/26	Time: 1645

Were Samples Received in Good Condition? ☐ Yes ☐ No Samples on Ice? ☐ Yes ☐ No Method of Shipment______ Page __ of __

To be completed upon receipt of report:
1) Were the analyses requested on the Chain of Custody reported? ☐ Yes ☐ No If no, what analyses are still needed?
2) Was the report issued within the requested turnaround time? ☐ Yes ☐ No If no, what was the turnaround time?

Approved by: Signature: Company: Date:

Pink - Client
Yellow - Laboratory
White - Laboratory

95C[illegible]

UNOCAL 76

- ❑ 680 Chesapeake Drive • Redwood City, CA 94063 • (415) 364-9600
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- ❑ 15055 S.W. Sequoia Pkwy, Suite 110 • Portland, OR 97222 • (503) 624-9600

Company Name: Kaprealian Engineering, Inc

Address: 2401 Stanwell Dr., Suite 400

City: Concord State: CA Zip Code: 94520

Telephone: (510) 602-5100 FAX #: (510) 687-0602

Report To: Dennis Sampler: Tom Seeliger

Project Name: 11976 Dublin Blvd, Dublin

UNOCAL Project Manager: Adadu Yemane

Release #:

Site #: 5901

QC Data: ☒ Level D (Standard) ❑ Level C ❑ Level B ❑ Level A

Turnaround Time: ☒ 10 Work Days ❑ 5 Work Days ❑ 3 Work Days ❑ 2 Work Days ❑ 1 Work Day ❑ 2-8 Hours

CODE: ❑ Misc. ☒ Detect. ❑ Eval. ❑ Remed. ❑ Demol. ❑ Closure

❑ Drinking Water ❑ Waste Water ☒ Other

Analyses Requested

Client Sample I.D.	Date/Time Sampled	Matrix Desc.	# of Cont.	Cont. Type	Laboratory Sample #	TPH-G	BTEX							Comments
1. EB12(22.5)	9/25/95	soil	1	tube	5092295	X	X							
2. EB13(5)	↓	↓	↓	↓	5092296	↓	↓							
3. EB13(10)	↓	↓	↓	↓	5092297	↓	↓							
4. EB13(15)	↓	↓	↓	↓	5092298	↓	↓							
5. EB13(20)	↓	↓	↓	↓	5092299	↓	↓							
6. EB13(21)	↓	↓	↓	↓	5092300	↓	↓							
7.														
8.														
9.														
10.														

Relinquished By	Date	Time	Received By	Date	Time
Relinquished By: Tom E. Seeliger	Date: 9-26	Time: 10:10	Received By: [illegible signature]	Date: 9-26	Time: 10:10
Relinquished By: [illegible signature]	Date: 9/26	Time: 4:45	Received By:	Date:	Time:
Relinquished By:	Date:	Time:	Received By Lab: [illegible signature]	Date: 9/26	Time: 1645

Were Samples Received in Good Condition? ❑ Yes ❑ No Samples on Ice? ❑ Yes ❑ No Method of Shipment________ Page __ of __

To be completed upon receipt of report:

1) Were the analyses requested on the Chain of Custody reported? ❑ Yes ❑ No If no, what analyses are still needed?

2) Was the report issued within the requested turnaround time? ❑ Yes ❑ No If no, what was the turnaround time?

Approved by: Signature: Company: Date:

Pink - Client Yellow - Laboratory White - Laboratory