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

KEI-P88-1203.P1
January 15, 1990

Unocal Corporation
2175 N. California Blvd., Suite 650
Walnut Creek, CA 94596

Attention: Mr. Tim Ross

RE: Work Plan/Proposal
Unocal Service Station #3135
845 - 66th Avenue
Oakland, California

I. INTRODUCTION

This work plan for Phase I and Phase II subsurface investigation is prepared in accordance with requirements and format of the San Francisco Bay "Regional Board Staff Recommendations for Initial Evaluation and Investigation of Underground Tanks", as provided by the Alameda County Health Agency (ACHA). A copy of the guideline is attached with this work plan. All work will be performed under the direct supervision of Mr. Don Braun, Certified Engineering Geologist #1310, expiration date 6/30/90.

A. Statement of Scope of Work

The scope of work in this work plan/proposal entails defining the extent of subsurface contamination at the site.

B. Site Location

The service station site occupies the northwest corner at the intersection of 66th Avenue and San Leandro Street in Oakland, California. A Site Location Map and Site Plan are attached to this work plan.

C. Background

The initial work performed by Kaprealian Engineering, Inc. (KEI) at this site occurred on December 8, 1988 during modifications to the pump island located along San Leandro Street. Three soil samples, labeled P1, P2 and P3, were collected from undisturbed native soil at depths ranging from 2.0 to 3.0 feet. The samples were

analyzed by Sequoia Analytical Laboratory in Redwood City, California, and were accompanied by properly executed Chain of Custody documentation. The samples were analyzed for total petroleum hydrocarbons (TPH) as gasoline using either EPA method 5030 or 3810 in conjunction with modified 8015, and benzene, toluene, xylenes and ethylbenzene (BTX&E) using EPA method 8020. Laboratory analyses indicate non-detectable levels of all constituents for all three samples. Laboratory results are summarized in Table 1, attached. The sample point locations are shown on the attached Site Plan, figure 1. This work was previously presented in KEI's report (KEI-J88-1203.R1) dated December 16, 1988.

Current site work began on November 29, 1989, when KEI collected soil samples following the removal of two fuel storage tanks and one waste oil tank at the referenced site. Water was encountered in the tank pit at a depth of 10.5 feet. Six soil samples, labeled SW1 through SW6, were collected from the sidewalls of the fuel tank pit at 1.5 to 2.5 feet above water. One soil sample from under the waste oil tank was collected at a depth of 8.5 feet. In addition, following excavation of the area beneath the waste oil tank to ground water, two soil samples, labeled SWA and SWB, were collected from waste oil tank pit sidewalls approximately 12-inches above water. Sample point locations are as shown on the attached Site Plan, Figure 2. All soil samples were analyzed by Sequoia Analytical Laboratory in Redwood City, California. All of the fuel tank pit sidewall samples were analyzed for TPH as gasoline and BTX&E. Analytical results showed TPH as gasoline ranging from non-detectable to 32 ppm, with benzene ranging from non-detectable to 1.2 ppm. The waste oil tank bottom and sidewall samples were analyzed for TPH as gasoline, BTX&E, TPH as diesel, total oil and grease (TOG), EPA 8010 constituents, and the metals cadmium, chromium, lead and zinc. Analyses of the waste oil samples indicate less than 50 ppm TOG, non-detectable levels of BTX&E, TPH as diesel and EPA 8010 constituents, and less than 5.0 ppm TPH as gasoline for all three samples. Metals concentrations are as indicated in Table 2, attached.

KEI collected eleven pipe trench samples, labeled P1, D1 through D6, and P2 through P5, at depths ranging from 3.5 to 6.0 feet on November 29, and December 5 and 29, 1989. Upon review of the laboratory analyses for

sample P2, KEI returned to the site on January 9, 1990, to collect additional soil samples. Following the trench excavation to a depth of 12 feet, one sample, labeled P2(12), was collected at a depth of 12 feet, and two samples, labeled SWP2E and SWP2W, were taken at a depth of 11.0 feet from the easterly and westerly sidewalls of the trench adjacent to sample point location P2(12). KEI completed the pipe trench sampling on January 10, 1990 when two samples, labeled P6 and P7, were collected at depths of 3.0 and 4.0 feet, respectively. Pipe trench sample point locations are as shown on the attached Site Plan, Figure 3. Laboratory analyses of the pipe trench sample indicate TPH as gasoline levels ranging from non-detectable to 20 ppm, with non-detectable to 0.13 ppm benzene for all samples except sample P2, which showed TPH as gasoline at 3,800 ppm and benzene at 6.1 ppm. Following the additional excavation in the area of sample point P2, laboratory analyses of samples P2(12), SWP2E and SWP2W indicate non-detectable levels of TPH as gasoline and benzene for samples P2(12) and SWP2W, while sample SWP2E showed TPH as gasoline at 20 ppm with non-detectable levels of benzene.

After fuel tank pit soil sampling was completed, approximately 5,000 gallons of ground water were pumped from the fuel tank pit. On December 5, 1989, one water sample, labeled W1, was collected from the fuel tank pit. The water sample was analyzed for TPH as gasoline, BTX&E and EPA 8010 constituents. Analyses of the water sample indicate 7,900 ppb TPH as gasoline, 850 ppb benzene, and non-detectable levels of EPA 8010 constituents.

C. Site History

1. The site is used as a gasoline station. Two 10,000 gallon capacity fuel tanks and one 280 gallon waste oil tank were at the site prior to their removal on November 29, 1989.

2. No previous businesses at the site are known to KEI.

3. a. Two underground fuel tanks and one waste oil tank were removed from the site on December 14, 1989. All of the tanks were made of steel. The fuel tanks were each 10,000 gallons in

capacity, and contained unleaded gasoline, and super unleaded gasoline. The waste oil tank was 280 gallons in capacity and contained waste oil.

b. The tanks were removed on November 29, 1989. Moderate pitting, but no holes or cracks were observed in any of the three tanks.

c. Tank removal was performed by Paradiso Construction, Inc. of Oakland, California. For tank removal documentation and associated manifests, the reader is referred to Paradiso Construction, Inc.

d. An Unauthorized Release Form dated 12/5/89 has been filed with the ACHA. A copy of the Unauthorized Release Form is attached with this work plan.

e. No tank testing results or inventory reconciliation methods or results for this site are known to KEI at this time.

f. An unknown quantity of petroleum hydrocarbons was released into the subsurface environment.

4. No other leaks, spills or previously removed tanks at the site are known to KEI.

5. No previous subsurface work at the site or adjacent sites, other than that previously summarized, is known to KEI.

II. SITE DESCRIPTION

A. Vicinity Description and Hydrogeologic Setting

The subject site is developed and consists of an Unocal Service Station. The station occupies the northwest corner at the intersection of 66th Avenue with San Leandro Street in Oakland, California.

The site is situated in the San Francisco Bay region, and is located closely adjacent to the eastern margins of the Bay. The depth of the water table was initially encountered at approximately 10.5 below grade, and after pumping activities, stabilized at a depth of about 14 feet. The ground water table direction of flow is presently unknown at the site; however, on a regional basis, the gradient of the water table is anticipated to be toward San Leandro Bay to the west of the site.

B. & C. Vicinity Map

A Site Location Map and four Site Plans showing various features of the site are attached with this work plan. Figure 4 shows the locations of subsurface utilities, the former tank locations and affiliated piping. No wells are known to KEI to be located on or adjacent to the site.

D. Existing Soil Contamination and Excavation Results

1. Soil sample collection associated with the removal of the fuel tanks, waste oil tank and piping was performed in the following manner:

   The collection of the soil samples taken on November 29, 1989 and January 9, 1990, was witnessed by ACHA personnel. All of the undisturbed soil samples were collected from bulk material excavated by backhoe. The samples were placed in clean, two-inch diameter brass tubes, sealed with aluminum foil, and plastic caps, and stored in a cooler on ice prior to delivery to a state-certified laboratory. Chain of Custody procedures were observed.

2. The water sample was collected using a clean Teflon bailer with the sample promptly decanted into four 40 ml VOA vials sealed with Teflon screw caps and tape, labeled and stored in a cooler on ice prior to delivery to a state-certified laboratory. chain of Custody procedures were observed. Ground water was encountered in the tank pit at a depth of approximately 10.5 to 14 feet.

3. Based on review of regional geologic maps (U.S. Geological Survey Professional paper 943, "Flatland Deposits - Their Geology and Engineering Properties and their Importance to Comprehensive Planning", 1979), the subject site is underlain by relatively unconsolidated alluvial deposits described as fine-grained alluvium (Qhaf) typically consisting of clay and silt materials. In addition, the site is closely adjacent to a mapped geologic contact with Bay Mud (Qhbm) to the west.

   Based on inspection of the tank pit excavation, the site is underlain by artificial fill materials to a depth of about 7.5 feet below grade. The fill materials are underlain by about 1.5 feet of adobe top soil materials, which are in turn underlain by light brown sandy silt containing a trace of fine gravel.

4. Soil sample collection locations associated with the tank pit are shown on the attached Site Plan, Figure 2. Soil sample collection locations associated with piping trenches are shown on the attached Site Plan, Figure 3.

   Soil and water samples were collected by Mr. Richard Bradish, Mr. Hagop Kevork and Mr. Don Braun of KEI, as indicated on the attached Chain of Custody documentation. Tabulated soil and water sample analytical results are provided in Tables 2 and 3. Current sample collection locations are shown on the attached Site Plans, Figures 2 and 3. Copies of the signed laboratory data sheets are attached with this work plan.

5. Any known subsurface conduits or utilities are identified on the attached Site Plan, Figure 4.

6. All soil excavated, as described in Section I. C., has been properly disposed of based on laboratory analyses of composite soil samples. Currently, 9 cubic yards of fuel contaminated stockpile soil and 25 cubic yards of waste oil contaminated soil remains on-site. All soil is covered with vis-queen.

7. All required permits for tank removal were acquired by Paradiso Construction, Inc. of Oakland. For copies of such permits, the reader is referred to Paradiso Construction, Inc.

III. PLAN FOR DETERMINING EXTENT OF SOIL CONTAMINATION ON-SITE

A. Method/Technique for Determining Extent of Contamination within the Excavation

The extent of contamination was determined within the fuel tank pit by collecting soil samples from the bottom and sidewalls of the pit as described in sections I. C. and II. D. 1. above.

KEI recommends no further excavation of the tank pit or piping trenches at this time, unless required by the regulatory agencies.

B. 2. Instead of soil borings, KEI proposes to install monitoring wells to further define the extent of subsurface contamination as described below in Section IV.

C. Security measures for open excavations (if needed) will be administered by Paradiso Construction, Inc.

IV. PLAN FOR DETERMINING GROUND WATER CONTAMINATION

A. Placement and Rationale for Location of Monitoring Wells

As Phase I subsurface investigation, KEI proposes the installation of three monitoring wells to determine if ground water has been impacted, and to determine ground water flow direction. The locations of the wells are shown on the attached Site Plan, Figure 4.

B. Drilling Method for Construction of Monitoring Wells, including Decontamination Procedures

KEI proposes to install three two-inch diameter monitoring wells using truck mounted eight-inch outside diameter hollow stem auger drilling equipment. Permits will be obtained from the ACHA 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.

Soil samples will be collected at a minimum of five foot intervals, changes in lithology, and at areas of obvious contamination beginning at a depth of five feet below grade. Sampling will continue until the first water table is encountered. Classification of soil will be done using the Unified Soil Classification System (USCS) by KEI's field engineer or geologist. Samples will be collected in a California modified split-spoon sampler 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. 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 in a cooler on ice for delivery to a state certified laboratory.

California modified split-spoon samplers and brass tubes will be decontaminated prior to each use with a trisodium phosphate or Liquinox solution wash followed by a clean water rinse. Hollow stem augers will be steam cleaned prior to each use. Steam cleaning will be performed on visqueen. Water from the steam cleaning will be contained on the visqueen and placed in DOT-approved 55-gallon drums, pending appropriate disposal.

The wells will be constructed in the following manner:

Casing Type: Schedule 40 PVC, flush threaded joints, 0.02 inch factory slot, two-inch diameter. Screen to run from total depth of the well to approximately 5 feet above first encountered ground water. Monterey

sand (#3) will fill the annular space from total depth to 2 feet above the screened interval. 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. A typical well construction diagram is attached to this work plan.

Drilled cuttings will be stored on-site in DOT-approved, 55-gallon drums, or under visqueen, until appropriate disposal can be determined.

Casing elevations will be surveyed to an established benchmark and to an accuracy of 0.01 feet.

The wells will be developed using a surge block in conjunction with 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 waste hauler.

C. Ground Water Sampling Plans

Wells will be checked for depth to the water table, the presence of free product and sheen (using an interface probe and/or paste tape) prior to both development and sampling. Water levels will be measured with an electronic sounder or paste tape.

The wells will be purged with a surface bailer of a minimum of four casing volumes prior to sampling, at least 24 hours after development. 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 in a cooler 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 prior to each use.

Selected soil and all water samples will be analyzed by Sequoia Analytical Laboratory in Redwood City, California, a state certified laboratory, for TPH as gasoline and BTX&E using EPA analytical methods (EPA 5030/8015/-8020) as recommended by the RWQCB, and specified in the Tri-regional guidelines.

For quality assurance purposes, one duplicate water sample will be collected from one well during each sampling event.

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.

If petroleum hydrocarbons in excess of action levels, as set by the regulatory agencies, are found in the soil during well installation, additional monitoring wells and/or borings will be proposed and installed until zero-lines for soil and ground water contamination are defined.

V. SITE SAFETY PLAN

A Site Safety Plan for Phase I of the monitoring well installation is attached to this work plan.

A report documenting field activities and sample results will be submitted within 45 days after the completion of the field work. The report will set out the collected information in an orderly fashion, and include any recommendations for additional needed work.

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. The proposal/work plan will be submitted to the regulatory agencies.

PHASE III

Once the zero line is established through the completion of Phase III, a final remedial plan (if needed) will be developed. This plan will also be submitted.

Interpretations of the subsurface stratigraphy will be used in consideration of various remedial options.

PHASE IV

Implementation of the remediation plan (if needed).

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 are based on the data obtained from the field work and laboratory analyses. 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, except that our services have been performed in accordance with generally accepted professional principles and practices existing for such work.

Sincerely,

Kaprealian Engineering, Inc.

Don R. Braun
Certified Engineering Geologist

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

Mardo Kaprealian
President

Attachments: Tables 1, 2 & 3
Site Location Map
Site Plans - Figures 1, 2, 3 & 4
Laboratory Analyses
Chain of Custody documentation
Unauthorized Release Form
Well Construction Diagram
Site Safety Plan
Guidelines for Work Plan Preparation

KEI-P88-1203.P1
January 15, 1990

TABLE 1

SUMMARY OF LABORATORY ANALYSES
SOIL

(Results in ppm)
(Samples collected on December 8, 1988)

Sample #	Depth (feet)	TPH as Gasoline	Benzene	Toluene	Xylenes	Ethylbenzene
P1	2.0	ND	ND	ND	ND	ND
P2	3.0	ND	ND	ND	ND	ND
P3	3.0	ND	ND	ND	ND	ND

ND = Non-detectable.

KEI-P88-1203.P1
January 15, 1990

TABLE 2

SUMMARY OF LABORATORY ANALYSES
SOIL

(Results in ppm)
(Samples Collected on November 29, and
December 5 & 29, 1989)

Sample	Depth (feet)	TPH as Diesel	TPH as Gasoline	Benzene	Toluene	Xylenes	Ethyl-benzene
SW1	9.0	--	1.6	ND	ND	ND	ND
SW2	9.0	--	3.8	ND	ND	ND	ND
SW3	9.0	--	5.6	ND	ND	2.3	0.42
SW4	9.0	--	32	1.2	ND	1.0	2.1
SW5	9.0	--	4.8	0.20	ND	0.11	ND
SW6	8.0	--	ND	ND	ND	ND	ND
D1	3.5	--	ND	ND	ND	ND	ND
D2	3.5	--	1.5	0.08	ND	ND	ND
D3	3.5	--	6.6	0.14	ND	0.31	ND
D4	3.5	--	7.4	0.11	ND	0.1	ND
D5	3.5	--	1.9	ND	ND	ND	ND
D6	3.5	--	2.0	ND	0.17	0.25	ND
P1	6.0	--	15	0.086	ND	8.5	0.18
P2	5.5	--	3,800	6.1	290	750	140
P2(12)	12.0	--	ND	ND	ND	ND	ND
P3	5.0	--	11	0.13	ND	1.3	0.18
P4	4.5	--	1.4	ND	ND	0.23	ND
P5	4.5	--	ND	ND	ND	ND	ND
P6	3.0	--	ND	ND	ND	ND	ND
P7	4.0	--	ND	ND	ND	ND	ND
P7	4.0	--	ND	ND	ND	ND	ND
SWP2E	11.0	--	2	ND	0.16	3.1	0.50
SWP2W	11.0	--	ND	ND	ND	ND	ND
WO1*	8.5	ND	1.6	ND	ND	ND	ND

KEI-P88-1203.P1
January 15, 1990

TABLE 2 (Continued)

SUMMARY OF LABORATORY ANALYSES
SOIL

(Results in ppm)
(Samples Collected on November 29, and
December 5 & 29, 1989)

Sample	Depth (feet)	TPH as Diesel	TPH as Gasoline	Benzene	Toluene	Xylenes	Ethyl-benzene
SWA**	9.5	ND	2.1	ND	ND	ND	ND
SWB***	9.5	ND	3.9	ND	ND	ND	ND
Detection Limits		1.0	1.0	0.05	0.1	0.1	0.1

* TOG was <50 ppm, and all 8010 constituents were non-detectable. Metal concentrations were as follows: cadmium non-detectable, chromium 20 ppm, lead 75 ppm, and zinc 65 ppm.

** TOG was <50 ppm, and all 8010 constituents were non-detectable. Metals concentrations were as follows: cadmium non-detectable, chromium 20 ppm, lead 5.9 ppm and zinc 44 ppm.

*** TOG was <50 ppm and all 8010 constituents were non-detectable. Metals concentrations were as follows: cadmium non-detectable, chromium 15 ppm, lead 5.0 ppm, an zinc 39 ppm.

ND = Non-detectable.

KEI-P88-1203.P1
January 15, 1990

TABLE 3

SUMMARY OF LABORATORY ANALYSES
WATER

(Results in ppb)
(Samples collected on December 5, 1989)

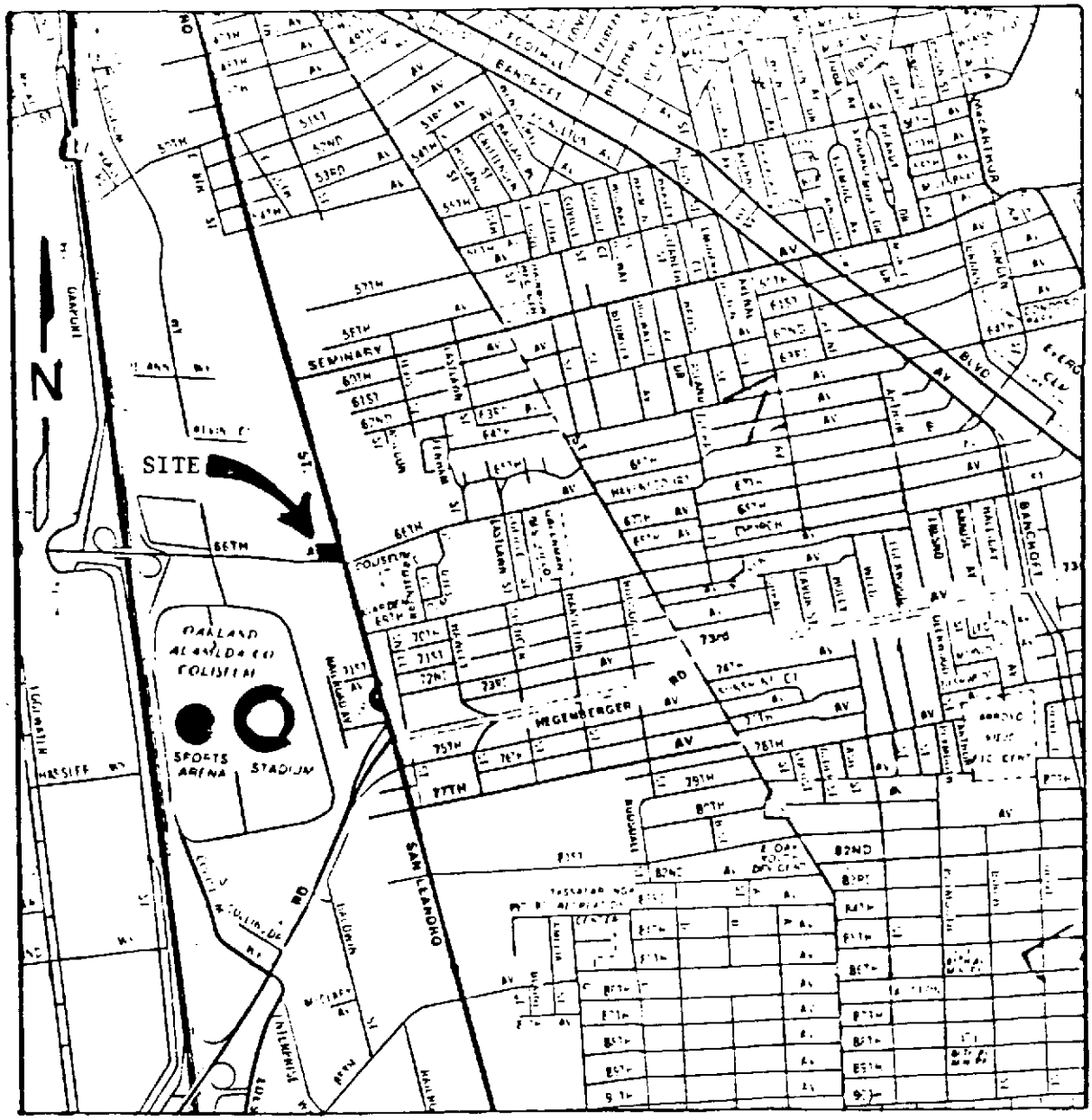
Sample #	TPH as Gasoline	Benzene	Toluene	Xylenes	Ethylbenzene
W1	7,900	850	150	720	ND
Detection Limits	30.0	0.3	0.3	0.3	0.3

NOTE: All 8010 constituents were non-detectable.

ND = Non-detectable.

TABLE 3

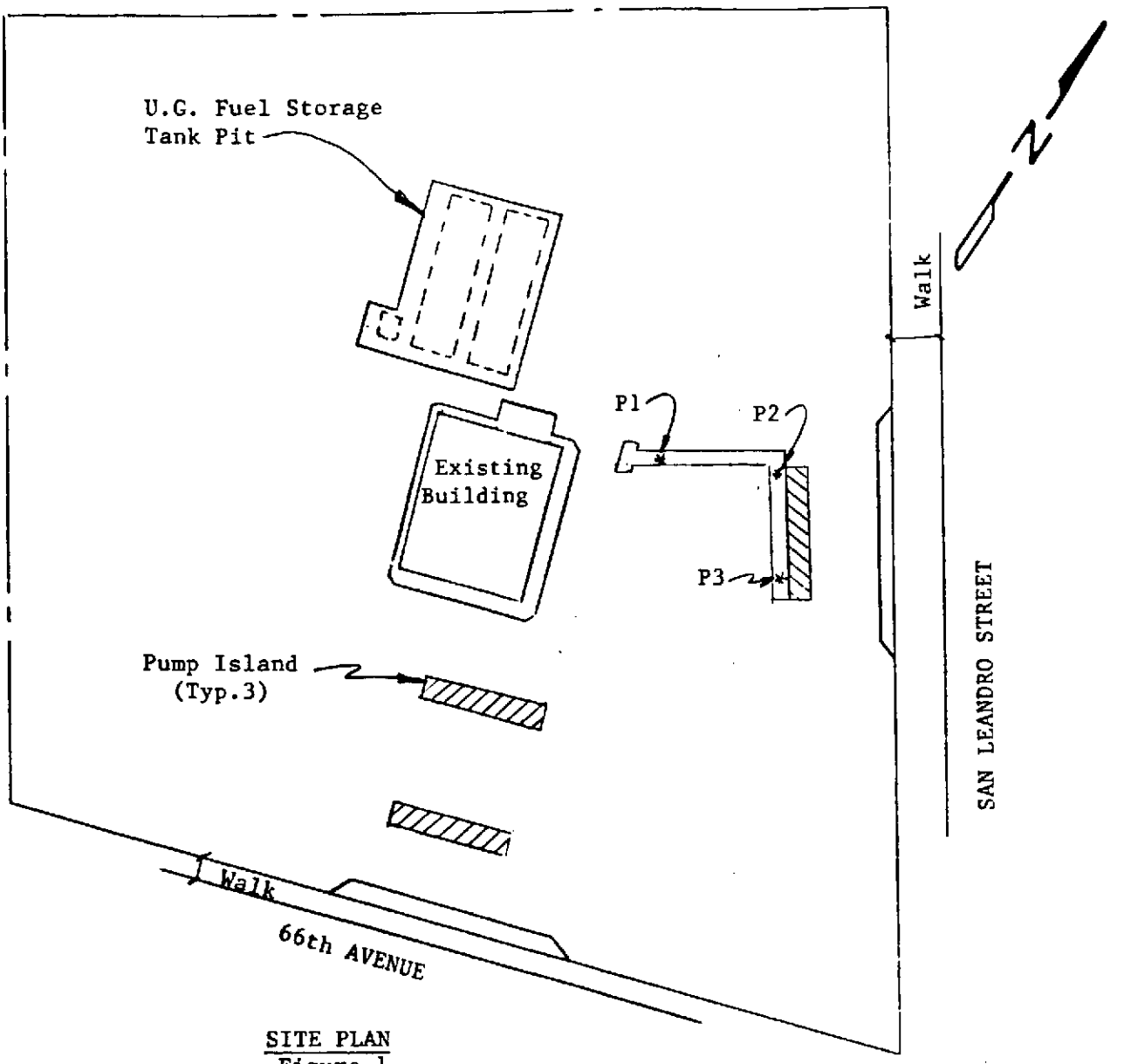
KAPREALIAN ENGINEERING, INC.
Consulting Engineers
PO BOX 996 • BENICIA, CA 94510
(707) 746-6915 • (707) 746-6916 • FAX (707) 746-5581



LOCATION MAP

Unocal S/S #3135
845 - 66th Avenue
Oakland, CA

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



SITE PLAN
Figure 1

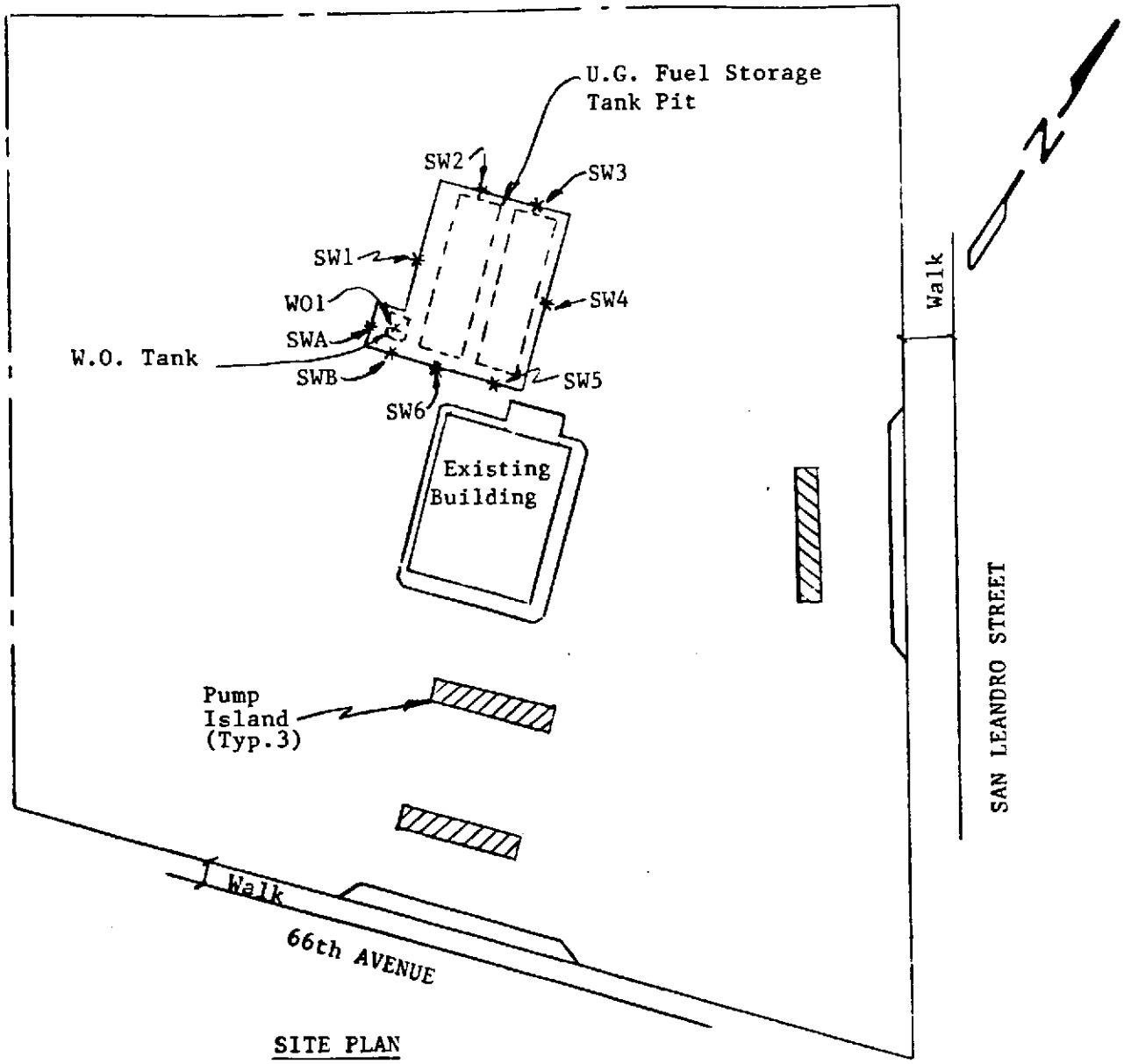
0 30 60
Approx. Scale feet

LEGEND

* Sample Point Location

Unocal SS #3135
845 66th AVENUE
OAKLAND, CALIFORNIA

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



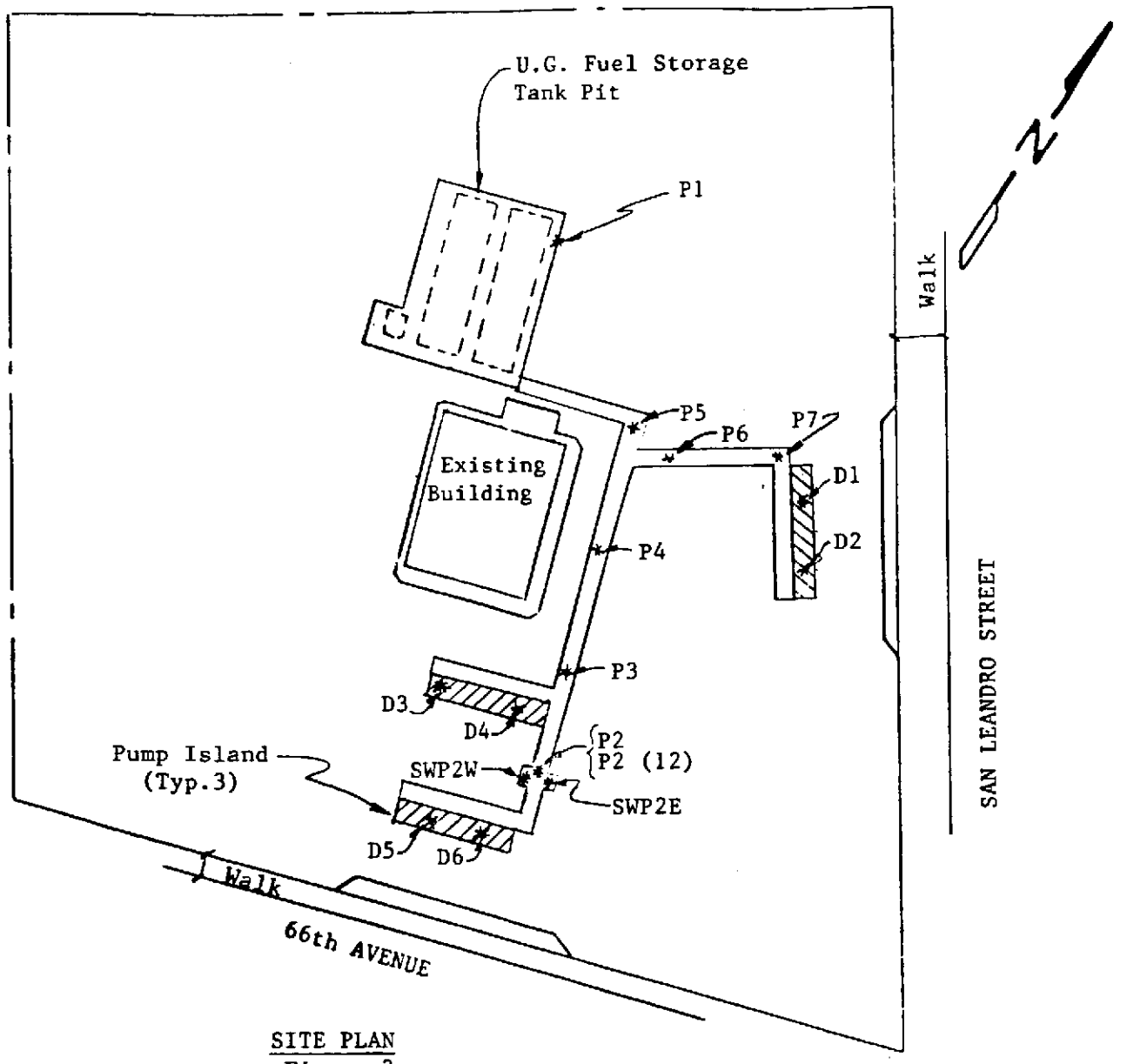
SITE PLAN
Figure 2

LEGEND

* Sample Point Location

Unocal SS #3135
845 66th AVENUE
OAKLAND, CALIFORNIA

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



SITE PLAN
Figure 3

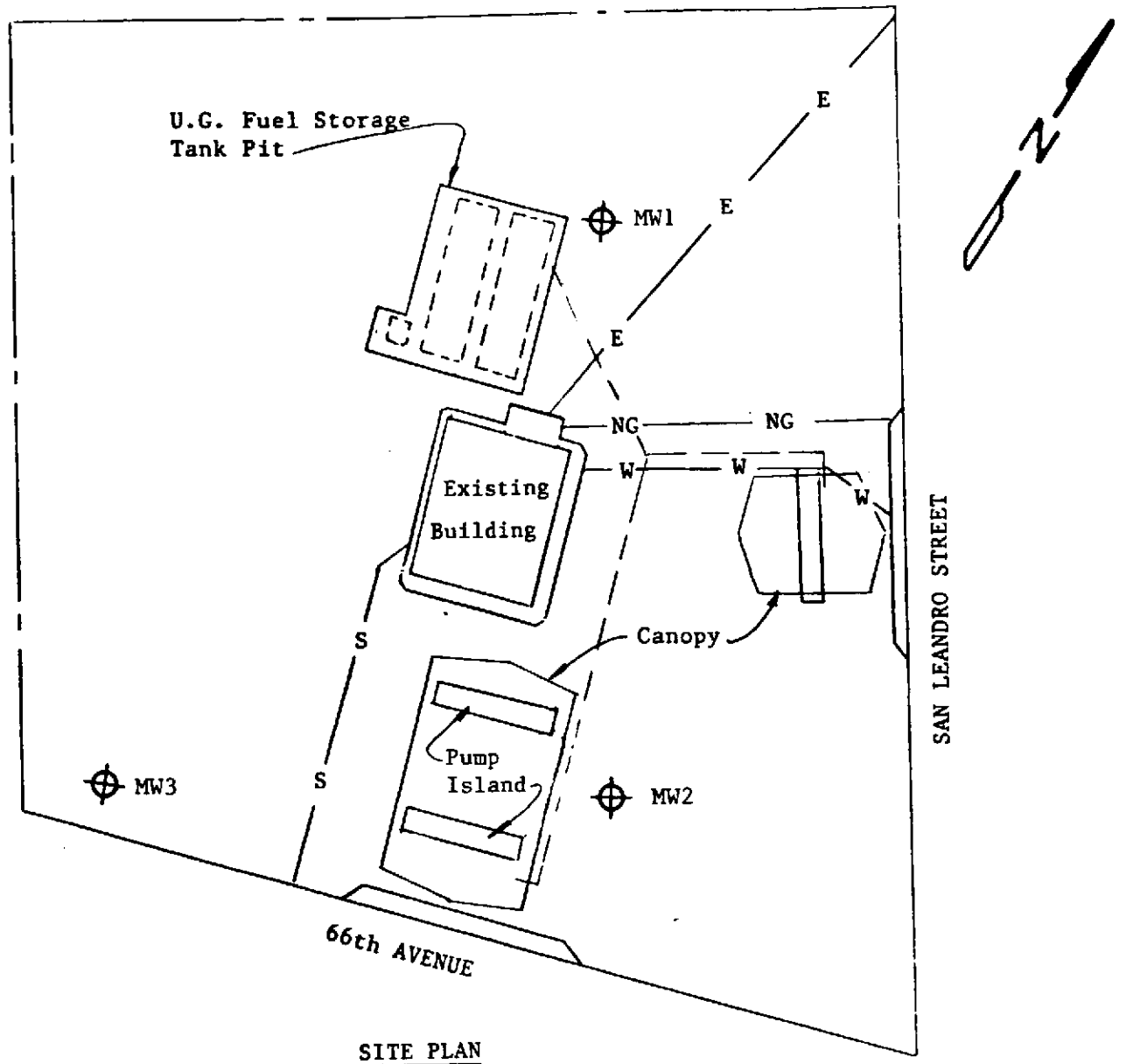
0 30 60
Approx. Scale feet

LEGEND

* Sample Point Location

Unocal SS #3135
845 66th AVENUE
OAKLAND, CALIFORNIA

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



SITE PLAN
Figure 4

LEGEND

- Monitoring Well (proposed)
- W U.G. Water Line
- E U.G. Electrical Line
- S U.G. Sewer Line
- NG U.G. Natural Gas

0 30 60
feet
Approx. Scale

Unocal Service Station #3135
845 66th Avenue
Oakland, California

SEQUOIA ANALYTICAL

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

Kaprealian Engineering, Inc.	Client Project ID:	Unocal, Oakland, 66th/San Leandro	Sampled:	Nov 29, 1989
P.O. Box 913	Matrix Descript:	Soil	Received:	Nov 29, 1989
Benicia, CA 94510	Analysis Method:	EPA 5030/8015/8020	Analyzed:	Nov 30, 1989
Attention: Mardo Kaprealian, P.E.	First Sample #:	911-3711	Reported:	Dec 1, 1989

TOTAL PETROLEUM FUEL HYDROCARBONS with BTEX DISTINCTION (EPA 8015/8020)

Sample Number	Sample Description	Low/Medium B.P. Hydrocarbons mg/kg (ppm)	Benzene mg/kg (ppm)	Toluene mg/kg (ppm)	Ethyl Benzene mg/kg (ppm)	Xylenes mg/kg (ppm)
911-3711	SW1	1.6	N.D.	N.D.	N.D.	N.D.
911-3712	SW2	3.8	N.D.	N.D.	N.D.	N.D.
911-3713	SW3	5.6	N.D.	N.D.	0.42	2.3
911-3714	SW4	32	1.2	N.D.	2.1	1.0
911-3715	SW5	4.8	0.20	N.D.	N.D.	0.11
911-3716	SW6	N.D.	N.D.	N.D.	N.D.	N.D.
911-3717	P1	15	0.086	N.D.	0.18	8.5
Detection Limits:		**1.0**	**0.05**	**0.1**	**0.1**	**0.1**

Low to Medium Boiling Point Hydrocarbons are quantitated against a gasoline standard.
Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL

Belinda C. Vega
Project Manager

Please Note:
Amended Report dated: 12/8/89

KAPREALIAN ENGINEERING, INC.

CHAIN OF CUSTODY

SAMPLER: Dick Bradish

WITNESSING AGENCY: Alameda County Health Agency

SITE NAME & ADDRESS: Unocal - Oakland, 66th + San Leandro

ANALYSES REQUESTED: TPH-G, BTXE

TURN AROUND TIME: 24 hrs

SAMPLE ID NO.	DATE	TIME	SOIL	WATER	GRAB	COMP	NO. OF CONT.	SAMPLING LOCATION	REMARKS
SW1	11/29		X		X		1	Fuel Tank Sidewall	9113711
SW2	11/29		X		X		1	"	12
SW3	11/29		X		X		1	"	13
SW4	11/29		X		X		1	"	14
SW5	11/29		X		X		1	"	15
SW6	11/29		X		X		1	"	16
P1	11/29		X		X		1	Pipe Trench	17

Relinquished by: (Signature)	Date/Time	Received by: (Signature)
K.M. Bradish	11-29-89 1605	Ben Lonard
Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Ben Lonard	11-29-89 5:57p	

The following MUST BE completed by the laboratory accepting samples for analysis:

1. Have all samples received for analysis been stored in ice? YES
2. Will samples remain refrigerated until analyzed? YES
3. Did any samples received for analysis have head space? ND
4. Were samples in appropriate containers and properly packaged? YES

Signature: [illegible] Title: [illegible] Date: 11-29-89

SEQUOIA ANALYTICAL

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

Kaprealian Engineering, Inc.	Client Project ID:	Unocal, Oakland, 66th/San Leandro	Sampled:	Nov 29, 1989
P.O. Box 913	Matrix Descript:	Soil	Received:	Nov 29, 1989
Benicia, CA 94510	Analysis Method:	EPA 5030/8015/8020	Analyzed:	Nov 30, 1989
Attention: Mardo Kaprealian, P.E.	First Sample #:	911-3725	Reported:	Dec 1, 1989

TOTAL PETROLEUM FUEL HYDROCARBONS with BTEX DISTINCTION (EPA 8015/8020)

Sample Number	Sample Description	Low/Medium B.P. Hydrocarbons mg/kg (ppm)	Benzene mg/kg (ppm)	Toluene mg/kg (ppm)	Ethyl Benzene mg/kg (ppm)	Xylenes mg/kg (ppm)
911-3725	SWA	2.1	N.D.	N.D.	N.D.	N.D.
911-3726	SWB	3.9	N.D.	N.D.	N.D.	N.D.
911-3727	WO1	1.6	N.D.	N.D.	N.D.	N.D.
Detection Limits:		**1.0**	**0.05**	**0.1**	**0.1**	**0.1**

Low to Medium Boiling Point Hydrocarbons are quantitated against a gasoline standard.
Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL

Belinda C. Vega
Project Manager

SEQUOIA ANALYTICAL

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

Kaprealian Engineering, Inc.	Client Project ID:	Unocal, Oakland, 66th/San Leandro	Sampled:	Nov 29, 1989
P.O. Box 913	Matrix Descript:	Soil	Received:	Nov 29, 1989
Benicia, CA 94510	Analysis Method:	EPA 3550/8015	Extracted:	Nov 30, 1989
Attention: Mardo Kaprealian, P.E.	First Sample #:	911-3725	Analyzed:	Nov 30, 1989
			Reported:	Dec 1, 1989

TOTAL PETROLEUM FUEL HYDROCARBONS (EPA 8015)

Sample Number	Sample Description	High B.P. Hydrocarbons mg/kg (ppm)
911-3725	SWA	N.D.
911-3726	SWB	N.D.
911-3727	WO1	N.D.

Detection Limits:	1.0

High Boiling Point Hydrocarbons are quantitated against a diesel fuel standard.
Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL

Belinda C. Vega
Project Manager

SEQUOIA ANALYTICAL

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

Kaprealian Engineering, Inc.	Client Project ID:	Unocal, Oakland, 66th/San Leandro	Sampled:	Nov 29, 1989
P.O. Box 913	Matrix Descript:	Soil	Received:	Nov 29, 1989
Benicia, CA 94510	Analysis Method:	SM 503 D&E (Gravimetric)	Extracted:	Dec 1, 1989
Attention: Mardo Kaprealian, P.E.	First Sample #:	911-3725	Analyzed:	Dec 1, 1989
			Reported:	Dec 1, 1989

TOTAL RECOVERABLE OIL & GREASE

Sample Number	Sample Description	Oil & Grease mg/kg (ppm)
911-3725	SWA	< 50
911-3726	SWB	< 50
911-3727	WO1	< 50

Detection Limits:	**30.0**

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

SEQUOIA ANALYTICAL

Belinda C. Vega
Project Manager

SEQUOIA ANALYTICAL

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

Kaprealian Engineering, Inc.	Client Project ID:	Unocal, Oakland, 66th/San Leandro	Sampled:	Nov 29, 1989
P.O. Box 913	Sample Descript:	Soil, SWA	Received:	Nov 29, 1989
Benicia, CA 94510	Analysis Method:	EPA 5030/8010	Analyzed:	Nov 30, 1989
Attention: Mardo Kaprealian, P.E.	Lab Number:	911-3725	Reported:	Dec 1, 1989

HALOGENATED VOLATILE ORGANICS (EPA 8010)

Analyte	Detection Limit µg/kg	Sample Results µg/kg
Bromodichloromethane	5.0	N.D.
Bromoform	5.0	N.D.
Bromomethane	5.0	N.D.
Carbon tetrachloride	5.0	N.D.
Chlorobenzene	5.0	N.D.
Chloroethane	25.0	N.D.
2-Chloroethylvinyl ether	5.0	N.D.
Chloroform	5.0	N.D.
Chloromethane	5.0	N.D.
Dibromochloromethane	5.0	N.D.
1,2-Dichlorobenzene	10.0	N.D.
1,3-Dichlorobenzene	10.0	N.D.
1,4-Dichlorobenzene	10.0	N.D.
1,1-Dichloroethane	5.0	N.D.
1,2-Dichloroethane	5.0	N.D.
1,1-Dichloroethene	5.0	N.D.
Total 1,2-Dichloroethene	5.0	N.D.
1,2-Dichloropropane	5.0	N.D.
cis-1,3-Dichloropropene	5.0	N.D.
trans-1,3-Dichloropropene	5.0	N.D.
Methylene chloride	10.0	N.D.
1,1,2,2-Tetrachloroethane	5.0	N.D.
Tetrachloroethene	5.0	N.D.
1,1,1-Trichloroethane	5.0	N.D.
1,1,2-Trichloroethane	5.0	N.D.
Trichloroethene	5.0	N.D.
Trichlorofluoromethane	5.0	N.D.
Vinyl chloride	10.0	N.D.

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

SEQUOIA ANALYTICAL

Belinda C. Vega
Project Manager

SEQUOIA ANALYTICAL

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

Kaprealian Engineering, Inc.	Client Project ID:	Unocal, Oakland, 66th/San Leandro	Sampled:	Nov 29, 1989
P.O. Box 913	Sample Descript:	Soil, SWB	Received:	Nov 29, 1989
Benicia, CA 94510	Analysis Method:	EPA 5030/8010	Analyzed:	Nov 30, 1989
Attention: Mardo Kaprealian, P.E.	Lab Number:	911-3726	Reported:	Dec 1, 1989

HALOGENATED VOLATILE ORGANICS (EPA 8010)

Analyte	Detection Limit µg/kg	Sample Results µg/kg
Bromodichloromethane	5.0	N.D.
Bromoform	5.0	N.D.
Bromomethane	5.0	N.D.
Carbon tetrachloride	5.0	N.D.
Chlorobenzene	5.0	N.D.
Chloroethane	25.0	N.D.
2-Chloroethylvinyl ether	5.0	N.D.
Chloroform	5.0	N.D.
Chloromethane	5.0	N.D.
Dibromochloromethane	5.0	N.D.
1,2-Dichlorobenzene	10.0	N.D.
1,3-Dichlorobenzene	10.0	N.D.
1,4-Dichlorobenzene	10.0	N.D.
1,1-Dichloroethane	5.0	N.D.
1,2-Dichloroethane	5.0	N.D.
1,1-Dichloroethene	5.0	N.D.
Total 1,2-Dichloroethene	5.0	N.D.
1,2-Dichloropropane	5.0	N.D.
cis-1,3-Dichloropropene	5.0	N.D.
trans-1,3-Dichloropropene	5.0	N.D.
Methylene chloride	10.0	N.D.
1,1,2,2-Tetrachloroethane	5.0	N.D.
Tetrachloroethene	5.0	N.D.
1,1,1-Trichloroethane	5.0	N.D.
1,1,2-Trichloroethane	5.0	N.D.
Trichloroethene	5.0	N.D.
Trichlorofluoromethane	5.0	N.D.
Vinyl chloride	10.0	N.D.

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

SEQUOIA ANALYTICAL

Belinda C. Vega
Project Manager

SEQUOIA ANALYTICAL

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

Kaprealian Engineering, Inc.	Client Project ID:	Unocal, Oakland, 66th/San Leandro	Sampled:	Nov 29, 1989
P.O. Box 913	Sample Descript:	Soil, WO1	Received:	Nov 29, 1989
Benicia, CA 94510	Analysis Method:	EPA 5030/8010	Analyzed:	Nov 30, 1989
Attention: Mardo Kaprealian, P.E.	Lab Number:	911-3727	Reported:	Dec 1, 1989

HALOGENATED VOLATILE ORGANICS (EPA 8010)

Analyte	Detection Limit µg/kg	Sample Results µg/kg
Bromodichloromethane	5.0	N.D.
Bromoform	5.0	N.D.
Bromomethane	5.0	N.D.
Carbon tetrachloride	5.0	N.D.
Chlorobenzene	5.0	N.D.
Chloroethane	25.0	N.D.
2-Chloroethylvinyl ether	5.0	N.D.
Chloroform	5.0	N.D.
Chloromethane	5.0	N.D.
Dibromochloromethane	5.0	N.D.
1,2-Dichlorobenzene	10.0	N.D.
1,3-Dichlorobenzene	10.0	N.D.
1,4-Dichlorobenzene	10.0	N.D.
1,1-Dichloroethane	5.0	N.D.
1,2-Dichloroethane	5.0	N.D.
1,1-Dichloroethene	5.0	N.D.
Total 1,2-Dichloroethene	5.0	N.D.
1,2-Dichloropropane	5.0	N.D.
cis-1,3-Dichloropropene	5.0	N.D.
trans-1,3-Dichloropropene	5.0	N.D.
Methylene chloride	10.0	N.D.
1,1,2,2-Tetrachloroethane	5.0	N.D.
Tetrachloroethene	5.0	N.D.
1,1,1-Trichloroethane	5.0	N.D.
1,1,2-Trichloroethane	5.0	N.D.
Trichloroethene	5.0	N.D.
Trichlorofluoromethane	5.0	N.D.
Vinyl chloride	10.0	N.D.

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

SEQUOIA ANALYTICAL

Belinda C. Vega
Project Manager

SEQUOIA ANALYTICAL

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

Kaprealian Engineering, Inc.	Client Project ID:	Unocal, Oakland, 66th/San Leandro	Sampled:	Nov 29, 1989
P.O. Box 996	Sample Descript:	Soil, SWA	Received:	relogged 12/8
Benicia, CA 94510			Extracted:	Dec 8, 1989
Attention: Mardo Kaprealian, P.E.	Lab Number:	911-3725	Analyzed:	Dec 8, 1989
			Reported:	Dec 11, 1989

LABORATORY ANALYSIS

Analyte	Detection Limit mg/kg	Sample Results mg/kg
Cadmium	0.5	N.D.
Chromium	0.5	20
Lead	0.5	7.5
Zinc	0.5	65

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

SEQUOIA ANALYTICAL

for Arthur G. Burton
Laboratory Director

SEQUOIA ANALYTICAL

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

Kaprealian Engineering, Inc.	Client Project ID:	Unocal, Oakland, 66th/San Leandro	Sampled:	Nov 29, 1989
P.O. Box 996	Sample Descript:	Soil, SWB	Received:	relogged 12/8
Benicia, CA 94510			Extracted:	Dec 8, 1989
Attention: Mardo Kaprealian, P.E.	Lab Number:	911-3726	Analyzed:	Dec 8, 1989
			Reported:	Dec 11, 1989

LABORATORY ANALYSIS

Analyte	Detection Limit mg/kg	Sample Results mg/kg
Cadmium	0.5	N.D.
Chromium	0.5	20
Lead	0.5	5.9
Zinc	0.5	44

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

SEQUOIA ANALYTICAL

FOR Arthur G. Burton
Laboratory Director

9113725.KEI <2>

SEQUOIA ANALYTICAL

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

Kaprealian Engineering, Inc.	Client Project ID:	Unocal, Oakland, 66th/San Leandro	Sampled:	Nov 29, 1989
P.O. Box 996	Sample Descript:	Soil, WO1	Received:	relogged 12/8
Benicia, CA 94510			Extracted:	Dec 8, 1989
Attention: Mardo Kaprealian, P.E.	Lab Number:	911-3727	Analyzed:	Dec 8, 1989
			Reported:	Dec 11, 1989

LABORATORY ANALYSIS

Analyte	Detection Limit mg/kg	Sample Results mg/kg
Cadmium	0.5	N.D.
Chromium	0.5	15
Lead	0.5	5.0
Zinc	0.5	39

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

SEQUOIA ANALYTICAL

for Arthur G. Burton
Laboratory Director

9113725.KEI <3>

SEQUOIA ANALYTICAL

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

Kaprealian Engineering, Inc.	Client Project ID:	Unocal, Oakland, 66th/San Leandro	Sampled:	Nov 29, 1989
P.O. Box 996	Sample Descript:	Soil, WO1	Received:	relogged 12/8
Benicia, CA 94510			Extracted:	Dec 8, 1989
Attention: Mardo Kaprealian, P.E.	Lab Number:	911-3727	Analyzed:	Dec 8, 1989
			Reported:	Dec 11, 1989

LABORATORY ANALYSIS

Analyte	Detection Limit mg/kg	Sample Results mg/kg
Cadmium	0.5	N.D.
Chromium	0.5	15
Lead	0.5	5.0
Zinc	0.5	39

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

SEQUOIA ANALYTICAL

Belinda C. Vega
Project Manager

KAPREALIAN ENGINEERING, INC.

CHAIN OF CUSTODY

SAMPLER: Dick Bradish

WITNESSING AGENCY: Alameda City Health Agency

SITE NAME & ADDRESS: Unocal - Oakland 66th & San Leandro

TURN AROUND TIME: 24 hrs

SAMPLE ID NO.	DATE	TIME	SOIL	WATER	GRAB	COMP	NO. OF CONT.	SAMPLING LOCATION	TPH Gas, BTXE	TPH-D	TOG (5030E)	8010	Cd. Cr. Pb. Zn.	REMARKS
SW A	11/29		X		X		1	W.O. Tank Pit Sidewall	✓	✓	✓	✓	✓	9113725
SW B	11/29		X		X		1	"	✓	✓	✓	✓	✓	26
WO 1	11/29		X		X		1	W.O. Tank Pit	✓	✓	✓	✓	✓	27

Relinquished by: (Signature)	Date/Time	Received by: (Signature)
L. M. Bradish	11/29/89 1605	Ben Ponanek
Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Ponanek	11-29-89 5:50 pm	

The following MUST BE completed by the laboratory accepting samples for analysis:

1. Have all samples received for analysis been stored in ice? YES
2. Will samples remain refrigerated until analyzed? YES
3. Did any samples received for analysis have head space? NO
4. Were samples in appropriate containers and properly packaged? YES

Signature _____ Title _____ Date 11-29-89

SEQUOIA ANALYTICAL

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

Kaprealian Engineering, Inc.	Client Project ID:	Unocal, Oakland, 66th. & San Leandro	Sampled:	Dec 5, 1989
P.O. Box 996	Matrix Descript:	Soil	Received:	Dec 6, 1989
Benicia, CA 94510	Analysis Method:	EPA 5030/8015/8020	Analyzed:	Dec 7, 1989
Attention: Mardo Kaprealian, P.E.	First Sample #:	912-0376	Reported:	Dec 7, 1989

TOTAL PETROLEUM FUEL HYDROCARBONS with BTEX DISTINCTION (EPA 8015/8020)

Sample Number	Sample Description	Low/Medium B.P. Hydrocarbons mg/kg (ppm)	Benzene mg/kg (ppm)	Toluene mg/kg (ppm)	Ethyl Benzene mg/kg (ppm)	Xylenes mg/kg (ppm)
912-0376	D1	N.D.	N.D.	N.D.	N.D.	N.D.
912-0377	D2	1.5	0.08	N.D.	N.D.	N.D.
912-0378	D3	6.6	0.14	N.D.	N.D.	0.31
912-0379	D4	7.4	0.11	N.D.	N.D.	0.1
912-0380	D5	1.9	N.D.	N.D.	N.D.	N.D.
912-0381	D6	2.0	N.D.	0.17	N.D.	0.25
Detection Limits:		**1.0**	**0.05**	**0.1**	**0.1**	**0.1**

Low to Medium Boiling Point Hydrocarbons are quantitated against a gasoline standard.
Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL

Belinda C. Vega
Project Manager

KAPREALIAN ENGINEERING, INC.

CHAIN OF CUSTODY

SAMPLER: DRB

WITNESSING AGENCY:

SITE NAME & ADDRESS: UnoCal Oakland - 66th & San Leandro

ANALYSES REQUESTED: TPH gas; BTXE

TURN AROUND TIME: 24 hr.

SAMPLE ID NO.	DATE	TIME	SOIL	WATER	GRAB OR COMP	NO. OF CONT.	SAMPLING LOCATION	REMARKS
D1	12/5/89	2:00 pm	✓		G	1	D1 @ -3.5'	
D2	"	"	✓		G	1	D2 @ -3.5'	
D3	"		✓		G	1	D3 @ -3.3'	
D4	"		✓		G	1	D4 @ -3.4'	
D5	"		✓		G	1	D5 @ -3.5'	
D6	"		✓		G	1	D6 @ -3.5'	

Relinquished by: (Signature)	Date/Time	Received by: (Signature)
[signature]	12/6/89 6:00 pm	[signature]
[signature]	12/6/89 9:45	Tim McLaren
Tim McLaren		
	12/6 11:30a	[signature]

The following MUST BE completed by the laboratory accepting samples for analysis:

1. Have all samples received for analysis been stored in ice? Y
2. Will samples remain refrigerated until analyzed? Y
3. Did any samples received for analysis have head space? NO
4. Were samples in appropriate containers and properly packaged? Y

[signature] — Signature; Sample control — Title; 12/6 — Date

SEQUOIA ANALYTICAL

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

Kaprealian Engineering, Inc.	Client Project ID:	Unocal, Oakland, 66th Ave/San Leandro	Sampled:	Dec 29, 1989
P.O. Box 996	Matrix Descript:	Soil	Received:	Jan 3, 1990
Benicia, CA 94510	Analysis Method:	EPA 5030/8015/8020	Analyzed:	Jan 3, 1990
Attention: Mardo Kaprealian, P.E.	First Sample #:	001-0082	Reported:	Jan 4, 1990

TOTAL PETROLEUM FUEL HYDROCARBONS with BTEX DISTINCTION (EPA 8015/8020)

Sample Number	Sample Description	Low/Medium B.P. Hydrocarbons mg/kg (ppm)	Benzene mg/kg (ppm)	Toluene mg/kg (ppm)	Ethyl Benzene mg/kg (ppm)	Xylenes mg/kg (ppm)
001-0082	P2	3,800	6.1	290	140	750
001-0083	P3	11	0.13	N.D.	0.18	1.3
001-0084	P4	1.4	N.D.	N.D.	N.D.	0.23
001-0085	P5	N.D.	N.D.	N.D.	N.D.	N.D.
Detection Limits:		**1.0**	**0.05**	**0.1**	**0.1**	**0.1**

Low to Medium Boiling Point Hydrocarbons are quantitated against a gasoline standard.
Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL

Belinda C. Vega
Project Manager

KAPREALIAN ENGINEERING, INC.

CHAIN OF CUSTODY

SAMPLER: HAGOP

WITNESSING AGENCY:

SITE NAME & ADDRESS: Unocal - Oakland - 845 - 66th Ave/San Leandro

ANALYSES REQUESTED: TPH-G; BTXE

TURN AROUND TIME: 24 Hrs
Priority - needed by 5:00 pm 1/3/89

SAMPLE ID NO.	DATE	TIME	SOIL	WATER	GRAB	COMP	NO. OF CONT.	SAMPLING LOCATION	REMARKS
P2	12/29		✓		✓		1	Pipe Trench	0010082
P3	12/29		✓		✓		1	Pipe Trench	03
P4	12/29		✓		✓		1	Pipe Trench	04
P5	12/29		✓		✓		1	Pipe Trench	05

	Relinquished by: (Signature)	Date/Time	Received by: (Signature)
1	Hagop Kevork	1/3/90 9:40	Tim McLain
2	Tim McLain	Date/Time	Received by: (Signature)
3	Relinquished by: (Signature)	Date/Time	Received by: (Signature)
4	Relinquished by: (Signature)	Date/Time 1/3/89 11:55 a.m.	Received by: (Signature) Brenda Olin

The following MUST BE completed by the laboratory accepting samples for analysis:

1. Have all samples received for analysis been stored in ice? yes
2. Will samples remain refrigerated until analyzed? yes
3. Did any samples received for analysis have head space? no
4. Were samples in appropriate containers and properly packaged? yes

Signature: [illegible] Title: login 1/3 Date:

SEQUOIA ANALYTICAL

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

Kaprealian Engineering, Inc.	Client Project ID:	Unocal, Oakland, 66th/San Leandro	Sampled:	Jan 9, 1990
P.O. Box 996	Matrix Descript:	Soil	Received:	Jan 9, 1990
Benicia, CA 94510	Analysis Method:	EPA 5030/8015/8020	Analyzed:	Jan 10, 1990
Attention: Mardo Kaprealian, P.E.	First Sample #:	001-0937	Reported:	Jan 11, 1990

TOTAL PETROLEUM FUEL HYDROCARBONS with BTEX DISTINCTION (EPA 8015/8020)

Sample Number	Sample Description	Low/Medium B.P. Hydrocarbons mg/kg (ppm)	Benzene mg/kg (ppm)	Toluene mg/kg (ppm)	Ethyl Benzene mg/kg (ppm)	Xylenes mg/kg (ppm)
001-0937	P2 (12)	N.D.	N.D.	N.D.	N.D.	N.D.
001-0938	SWP 2E	20	N.D.	0.16	0.50	3.1
001-0939	SWP 2W	N.D.	N.D.	N.D.	N.D.	N.D.
Detection Limits:		**1.0**	**0.05**	**0.1**	**0.1**	**0.1**

Low to Medium Boiling Point Hydrocarbons are quantitated against a gasoline standard.
Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL

Belinda C. Vega
Project Manager

KAPREALIAN ENGINEERING, INC.

CHAIN OF CUSTODY

SAMPLER: Hagop

WITNESSING AGENCY:

SITE NAME & ADDRESS: Unocal - Oakland - 66th Ave / San Leandro

ANALYSES REQUESTED: TPH-d; BTXE

TURN AROUND TIME: 24 Hrs

SAMPLE ID NO.	DATE	TIME	SOIL	WATER	GRAB	COMP	NO. OF CONT.	SAMPLING LOCATION	REMARKS
P2(12)	11/9/90		✓		✓		1	Pipe Trench (Bottom)	
SWP2E	11/9/90		✓		✓		1	Pipe Trench (Sidewall)	
SWP2W	11/9/90		✓		✓		1	Pipe Trench (Sidewall)	

Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Hagop Kework	11/9 3:40	
Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Relinquished by: (Signature)	Date/Time 11/9/90 1845	Received by: (Signature) B.L. Ohren

The following MUST BE completed by the laboratory accepting samples for analysis:

1. Have all samples received for analysis been stored in ice? Y
2. Will samples remain refrigerated until analyzed? Y
3. Did any samples received for analysis have head space? N
4. Were samples in appropriate containers and properly packaged? Y

BLO (Signature) Login (Title) 11/9 (Date)

SEQUOIA ANALYTICAL

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

Kaprealian Engineering, Inc.	Client Project ID:	Unocal, Oakland, 66th @ San Leandro	Sampled:	Dec 5, 1989
P.O. Box 996	Sample Descript.:	Water, W1	Received:	Dec 5, 1989
Benicia, CA 94510	Analysis Method:	EPA 5030/ 8015/8020	Analyzed:	Dec 7, 1989
Attention: Mardo Kaprealian, P.E.	Lab Number:	912-0375 C-D	Reported:	Dec 7, 1989

TOTAL PETROLEUM FUEL HYDROCARBONS WITH BTEX DISTINCTION (EPA 8015/8020)

Analyte	Detection Limit µg/L (ppb)	Sample Results µg/L (ppb)
Low to Medium Boiling Point Hydrocarbons	150.0	7,900
Benzene	1.5	850
Toluene	1.5	150
Ethyl Benzene	1.5	N.D.
Xylenes	1.5	720

Low to Medium Boiling Point Hydrocarbons are quantitated against a gasoline standard.
Analytes reported as N.D. were not present above the stated limit of detection. Because matrix effects and/or other factors required additional sample dilution, detection limits for this sample have been raised.

SEQUOIA ANALYTICAL

Belinda C. Vega
Project Manager

SEQUOIA ANALYTICAL

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

Kaprealian Engineering, Inc.	Client Project ID:	Unocal, Oakland, 66th @ San Leandro	Sampled:	Dec 5, 1989
P.O. Box 996	Sample Descript:	Water, W1	Received:	Dec 5, 1989
Benicia, CA 94510	Analysis Method:	EPA 5030/8010	Analyzed:	Dec 6, 1989
Attention: Mardo Kaprealian, P.E.	Lab Number:	912-0375 A-B	Reported:	Dec 7, 1989

HALOGENATED VOLATILE ORGANICS (EPA 8010)

Analyte	Detection Limit µg/L	Sample Results µg/L
Bromodichloromethane	1.0	N.D.
Bromoform	1.0	N.D.
Bromomethane	1.0	N.D.
Carbon tetrachloride	1.0	N.D.
Chlorobenzene	1.0	N.D.
Chloroethane	5.0	N.D.
2-Chloroethylvinyl ether	1.0	N.D.
Chloroform	0.5	N.D.
Chloromethane	0.5	N.D.
Dibromochloromethane	0.5	N.D.
1,2-Dichlorobenzene	2.0	N.D.
1,3-Dichlorobenzene	2.0	N.D.
1,4-Dichlorobenzene	2.0	N.D.
1,1-Dichloroethane	0.5	N.D.
1,2-Dichloroethane	0.5	N.D.
1,1-Dichloroethene	1.0	N.D.
Total 1,2-Dichloroethene	1.0	N.D.
1,2-Dichloropropane	0.5	N.D.
cis-1,3-Dichloropropene	5.0	N.D.
trans-1,3-Dichloropropene	5.0	N.D.
Methylene chloride	2.0	N.D.
1,1,2,2-Tetrachloroethane	0.5	N.D.
Tetrachloroethene	0.5	N.D.
1,1,1-Trichloroethane	0.5	N.D.
1,1,2-Trichloroethane	0.5	N.D.
Trichloroethene	0.5	N.D.
Trichlorofluoromethane	1.0	N.D.
Vinyl chloride	2.0	N.D.

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

SEQUOIA ANALYTICAL

Belinda C. Vega
Project Manager

KAPREALIAN ENGINEERING, INC.

CHAIN OF CUSTODY

SAMPLER: DRB

WITNESSING AGENCY:

SITE NAME & ADDRESS: UnoCal Oakland 66th & San Leandro

ANALYSES REQUESTED: TPH g | BTXE | 8010

TURN AROUND TIME: 24 hr.

SAMPLE ID NO.	DATE	TIME	SOIL	WATER	GRAB	COMP	NO. OF CONT.	SAMPLING LOCATION	REMARKS
W1	12/5/89	1:30 PM		X			4 vials	tank pit @ -16'	9120375A→D

Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Dan R Braun	12/5/89 6:50 PM	
	12/6/89 9:45	Tim McLean
Tim McLean		
		Brenda Oh 12/6 11:30 am

The following MUST BE completed by the laboratory accepting samples for analysis:

1. Have all samples received for analysis been stored in ice?
2. Will samples remain refrigerated until analyzed?
3. Did any samples received for analysis have head space?
4. Were samples in appropriate containers and properly packaged?

Signature | Title | Date

UNDERGROUND STORAGE TANK UNAUTHORIZED RELEASE (LEAK) / CONTAMINATION SITE REPORT

EMERGENCY ☐ YES ☒ NO

HAS STATE OFFICE OF EMERGENCY SERVICES REPORT BEEN FILED? ☐ YES ☐ NO

FOR LOCAL AGENCY USE ONLY
I HEREBY CERTIFY THAT I AM A DESIGNATED GOVERNMENT EMPLOYEE AND THAT I HAVE REPORTED THIS INFORMATION TO LOCAL OFFICIALS PURSUANT TO SECTION 25180.7 OF THE HEALTH AND SAFTY CODE.

SIGNED _____ DATE _____

REPORT DATE: 1 M 2 M 0 D 5 D 8 Y 9 Y

CASE #:

REPORTED BY

NAME OF INDIVIDUAL FILING REPORT: Christina Lecce

PHONE: (707) 746-6915

SIGNATURE: Christina Lecce

REPRESENTING ☒ OWNER/OPERATOR ☐ REGIONAL BOARD ☐ LOCAL AGENCY ☐ OTHER _____

COMPANY OR AGENCY NAME: Kaprealian Engineering, Inc.

ADDRESS: 638½ First Street (STREET) Benicia (CITY) CA (STATE) 94510 (ZIP)

RESPONSIBLE PARTY

NAME: Unocal Corporation ☐ UNKNOWN

CONTACT PERSON: Tim Ross

PHONE: (415) 945-7676

ADDRESS: 2175 N. California Blvd., #650 (STREET) Walnut Creek (CITY) CA (STATE) 94596 (ZIP)

SITE LOCATION

FACILITY NAME (IF APPLICABLE): Unocal Service Station #3135

OPERATOR: Johnson C.S. Chow & P. Chang

PHONE: (415) 430-8999

ADDRESS: 845 66th Avenue (STREET) Oakland (CITY) Alameda (COUNTY) 94621 (ZIP)

CROSS STREET: San Leandro

TYPE OF AREA ☒ COMMERCIAL ☐ INDUSTRIAL ☐ RURAL ☐ RESIDENTIAL ☐ OTHER _____

TYPE OF BUSINESS ☒ RETAIL FUEL STATION ☐ FARM ☐ OTHER _____

IMPLEMENTING AGENCIES

LOCAL AGENCY / AGENCY NAME: Alameda County Health Agency

CONTACT PERSON: Ariu Levy

PHONE: (415) 271-4320

REGIONAL BOARD: San Francisco Bay Region

PHONE: (415) 464-1255

SUBSTANCES INVOLVED

	NAME	QUANTITY LOST (GALLONS)
(1)	gasoline	☒ UNKNOWN
(2)	waste oil	☒ UNKNOWN

DISCOVERY/ABATEMENT

DATE DISCOVERED: 1 M 1 M 2 D 9 D 8 Y 9 Y

HOW DISCOVERED ☐ INVENTORY CONTROL ☐ SUBSURFACE MONITORING ☐ NUISANCE CONDITIONS ☐ TANK TEST ☒ TANK REMOVAL ☐ OTHER _____

DATE DISCHARGE BEGAN: M M D D Y Y ☒ UNKNOWN

METHOD USED TO STOP DISCHARGE (CHECK ALL THAT APPLY)
☒ REMOVE CONTENTS ☒ REPLACE TANK ☐ CLOSE TANK ☐ REPAIR TANK ☐ REPAIR PIPING ☐ CHANGE PROCEDURE ☐ OTHER _____

HAS DISCHARGE BEEN STOPPED? ☒ YES ☐ NO IF YES, DATE 1 M 1 M 2 D 9 D 8 Y 9 Y

SOURCE/CAUSE

SOURCE OF DISCHARGE ☐ TANK LEAK ☒ UNKNOWN ☐ PIPING LEAK ☐ OTHER

TANKS ONLY/CAPACITY: 2@10K & 1-280 GAL. AGE _____ YRS ☒ UNKNOWN

MATERIAL ☐ FIBERGLASS ☒ STEEL ☐ OTHER _____

CAUSE(S) ☐ OVERFILL ☐ RUPTURE/FAILURE ☐ CORROSION ☒ UNKNOWN ☐ SPILL ☐ OTHER _____

CASE TYPE

CHECK ONE ONLY
☒ UNDETERMINED ☐ SOIL ONLY ☐ GROUNDWATER ☐ DRINKING WATER - (CHECK ONLY IF WATER WELLS HAVE ACTUALLY BEEN AFFECTED)

CURRENT STATUS

CHECK ONE ONLY
☒ SITE INVESTIGATION IN PROGRESS (DEFINING EXTENT OF PROBLEM) ☐ CLEANUP IN PROGRESS ☐ SIGNED OFF (CLEANUP COMPLETED OR UNNECESSARY) ☐ NO ACTION TAKEN ☐ POST CLEANUP MONITORING IN PROGRESS ☐ NO FUNDS AVAILABLE TO PROCEED ☐ EVALUATING CLEANUP ALTERNATIVES

REMEDIAL ACTION

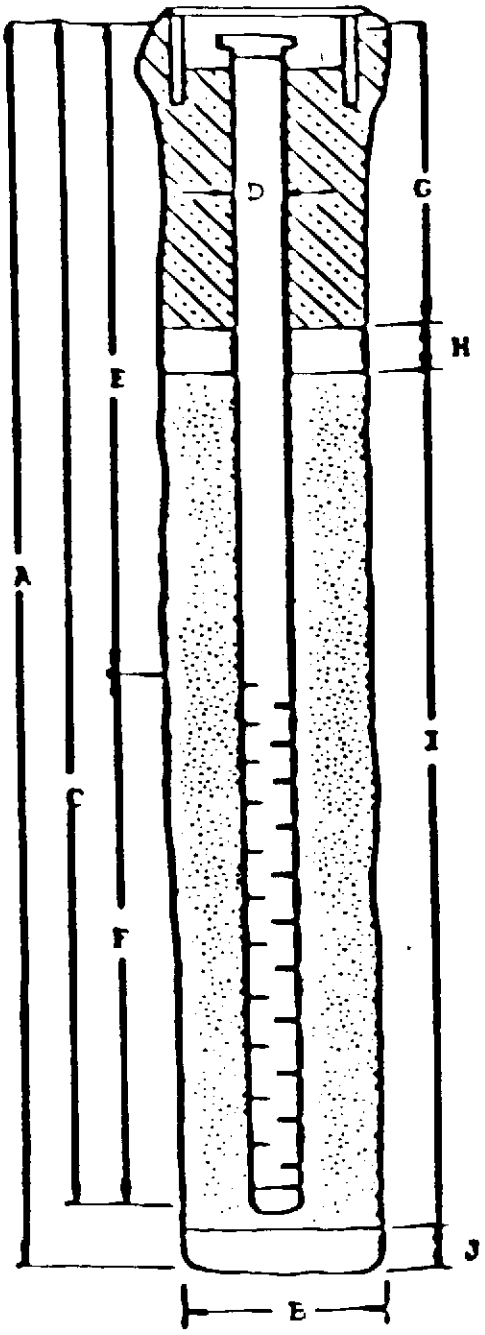
CHECK APPROPRIATE ACTION(S) (SEE BACK FOR DETAILS)
☐ CAP SITE (CD) ☒ EXCAVATE & DISPOSE (ED) ☐ REMOVE FREE PRODUCT (FP) ☐ ENHANCED BIO DEGRADATION (IT)
☐ CONTAINMENT BARRIER (CB) ☒ EXCAVATE & TREAT (ET) ☐ PUMP & TREAT GROUNDWATER (GT) ☐ REPLACE SUPPLY (RS)
☐ TREATMENT AT HOOKUP (HU) ☐ NO ACTION REQUIRED (NA) ☐ OTHER (OT) _____

COMMENTS

HSC 05144/87

WELL COMPLETION DIAGRAM
(SCHEMATIC)

Flush-mounted Well Cover



WELL DETAILS*

1. Well will be terminated 10 to 15 feet into first ground water unless a five foot thick aquitard is encountered below the water table, in which case the aquitard will be backfilled with bentonite pellets and the well terminated at the top of this aquitard [A].
2. Boring diameter [B] is 9 inches for 2 inch wells and 12 inches for 4 inch wells.
3. Perforated interval [F] will extend from bottom of casing to five feet above first ground water table (unless water <5 feet deep).
4. Schedule 40, PVC casing, 2 inch in diameter [D], will be used [C]. 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.) 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.

SITE SAFETY PLAN

A. GENERAL INFORMATION

SITE: Unocal Service Station #3135

LOCATION: 845 - 66th Avenue, Oakland, CA

PLAN PREPARED BY: Paul H. King DATE: 1/15/90

APPROVED BY: Don R. Braun DATE: 1/15/90

OBJECTIVE(S): To install three two-inch diameter monitoring wells.

PROPOSED DATE OF INVESTIGATION: To be determined, pending regulatory approval of work plan and necessary permits.

BACKGROUND REVIEW Complete: Preliminary: x

DOCUMENTATION/SUMMARY: OVERALL HAZARD: Serious: Moderate: Low: x Unknown:

B. SITE/WASTE CHARACTERISTICS

WASTE TYPE(S) Liquid: x Solid: Sludge: Gas:

CHARACTERISTIC(S): Corrosive: Ignitable: x Radioactive: Volatile: x Toxic: Reactive: Unknown: Other (Name):

FACILITY DESCRIPTION: Developed retail gasoline station.

Principal Disposal Method (type and location): Soil and water generated during investigation will be stockpiled on-site under visqueen or in drums pending appropriate disposal.

Unusual Features (power lines, terrain, utilities, etc.): No unusual features are known to KEI at this time.

HISTORY (Agency Action, Complaints, Injuries, etc.):

No agency actions, complaints or injuries to KEI personnel at this site are known to KEI at this time.

C. HAZARD EVALUATION:

PARAMETER	TLV (ppm)	IDLH (ppm)	LEL (%)	HEALTH skin	eyes	inge	inha

See attached MSDS for gasoline.

SPECIAL PRECAUTIONS AND COMMENTS: Watch for objects falling from drill rig mast. Keep bystanders at a safe distance.

D. SITE SAFETY WORK PLAN:

PERIMETER ESTABLISHMENT: Map/Sketch Attached: Yes Site Secured:
Perimeter Identified: Zone(s) of Contamination Identified: To be determined by work.

PERSONAL PROTECTION:
Level of Protection: A_____B_____C_____D__x__
Modifications:

Surveillance Equipment and Materials:

Instrument	Action Level
None	

SITE ENTRY PROCEDURES: Work areas to be defined by traffic cones, barricades, safety tape or fence. Nonessential personnel will be kept out of work area.

DECONTAMINATION PROCEDURES:
Personal: Wash with soap solution, clean water rinse.

Equipment: Steam clean or wash with soap solution followed by clean water rinse.

FIRST AID:

WORK LIMITATIONS (time of day, weather, heat/cold stress):

No adverse work conditions are anticipated; therefore, no work limitations are recommended.

INVESTIGATION-DERIVED MATERIAL DISPOSAL: Soil and water will be stored under visqueen or in drums pending analytical results to determine appropriate disposition.

TEAM COMPOSITION:

Team Member	Responsibility
Doug Lee	KEI Geologist
Driller & Helper Helpers	Subcontractors

E. EMERGENCY INFORMATION

LOCAL RESOURCES:
Ambulance: 911
Hospital Emergency Room: 911
Poison Control Center: 911
Police: 911
Fire Department: 911
Explosives Unit: 911
Agency Contact: Ariu Levi - Alameda County Health Agency
(415) 271-4320

SITE RESOURCES:
Water Supply: Unknown
Telephone: Unknown
Radio: None
Other: Unknown

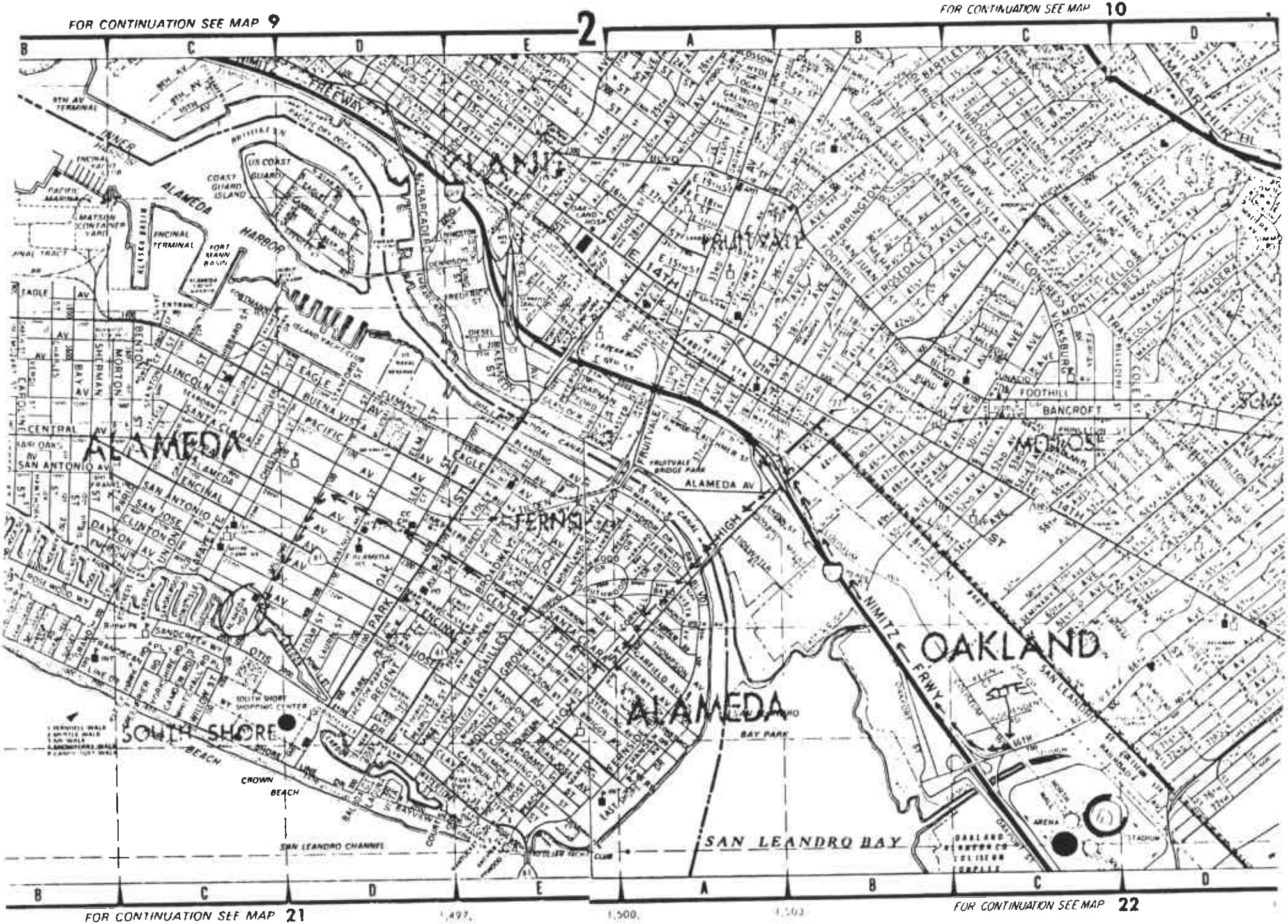
EMERGENCY CONTACTS:
Name: Mardo Kaprealian Phone: (707) 746-6915

EMERGENCY ROUTES: (Give road or other directions; attach map)
(415) 522-3700

Hospital: Alameda Hospital - 66th Avenue to 880 North - 880 North to High Street exit. Left from High Street exit onto High Street. High Street to Santa Clara Avenue. Right onto Santa Clara Avenue. Santa Clara Avenue to Willow Street. Left onto Willow Street. Hospital is on right, just past Clinton.

Other: None

SITE SKETCH: (Work zones, command post, etc.) See site Plan attached with work plan. Work zones will be marked with traffic cones, barricades, safety tape or fence immediately surrounding drill rig. The service station office will serve as command post.


FOR CONTINUATION SEE MAP 9
FOR CONTINUATION SEE MAP 10
2
B
C
D
E
A
B
C
D
FREEWAY
MACARTHUR FWY
ALAMEDA
HARBOR
COAST GUARD ISLAND
US COAST GUARD
FORT MANN BASIN
ENCINAL TERMINAL
9TH AV TERMINAL
MATSON CONTAINER YARD
PACIFIC MARINA
FRUITVALE
14TH
ALAMEDA
CENTRAL
SAN ANTONIO
FERRY
ALAMEDA AV
FOOTHILL
BANCROFT
MONROE
NIMITZ FRWY
OAKLAND
SOUTH SHORE
SOUTH SHORE SHOPPING CENTER
CROWN BEACH
BEACH
SAN LEANDRO CHANNEL
SAN LEANDRO BAY
BAY PARK
ARENA
STADIUM
FOR CONTINUATION SEE MAP 21
FOR CONTINUATION SEE MAP 22

Appendix A

Workplan for Initial Subsurface Investigation

There are a large number of initial site investigations related to unauthorized releases of fuel products. The number of workplans and reports to be reviewed and approved require that these documents have uniform organization and content. The purpose of this appendix is to present an outline to be followed by professional engineering or geologic consultants in preparing workplans to be submitted for approval to the Regional Board and local agencies.

A statement of qualifications and registration number for the California registered engineer and/or registered geologist responsible for the project will need to be included with the submitted workplan and reports.

This appendix should be referred to in context with the "Regional Board Staff Recommendations for Initial Evaluation and Investigation of Underground Tanks".

PROPOSAL FORMAT

I. Introduction

A. Statement of Scope of Work

B. Site location

C. Background

D. Site History

1. Brief description of the type of business and associated activities that take place at the site, including the number and capacity of operating tanks.

2. Description of previous businesses at the site.

3. Complete description of tank activities, tank contents, and tank removal.

a. Number of underground tanks, uses, etc. (include the volume of each tank, construction material, and tank condition)

b. Date of tank removal and condition of tank.

c. Description of all waste removal, including copies of all manifests.

d. Filing status and copy of unauthorized release form, if not previously submitted.

e. Previous tank testing results and date. Include discussion of inventory reconciliation methods and results for previous three years.

f. Estimate of the total quantity of product lost.

4. Other spill, leak and accident history at the site, including any previously removed tanks.

5. Describe any previous subsurface work at the site or adjacent sites.

II. Site Description

A. Vicinity description and hydrogeologic setting.

B. Vicinity map (including wells located on-site or on adjoining lots, as well as any nearby streams).

C. Site map to include:

1. Adjacent streets.

2. Site building locations.

3. Tank locations.

4. Island locations and piping to pumps from tanks.

5. Any known subsurface conduits, underground utilities, etc.

D. Existing soil contamination and excavation results.

1. Provide sampling procedures used.

2. Indicate depth to groundwater, if encountered.

3. Describe soil strata encountered in excavation.

4. Provide results in tabular form and location of all soil sampling (and water sampling, if appropriate). The date sampled, the identity of the sampler, and signed laboratory data sheets need to be included.

5. Identify underground utilities

6. Describe any unusual problems encountered.

7. Completely describe methods for storing and disposal of all contaminated soil.

8. Reference all required permits, including those issued by the Air Quality Management District and local underground tank permitting agency.

III. Plan for determining extent of soil contamination on site.

A. Describe method/technique for determining extent of contamination within the excavation.

B. Describe sampling methods and procedures to be used.

1. If a soil gas survey is planned, then:

   a. Identify number of boreholes, location, sampling depth, etc.

   b. Identify subcontractors, if any

   c. Identify methods or techniques used for analysis

   d. Provide quality assurance plan for field testing

2. If soil borings are to be used to determine the extent of soil contamination, then:

   a. Identify number and location (mapped) of proposed borings.

   b. Describe depth of borings

   c. Describe soil classification system, soil sampling method and rationale

   d. Describe boring drilling method, including decontamination procedures.

   e. Describe boring abandonment method

C. Describe method and criteria for screening clean versus contaminated soil, including a complete description of procedures to be used for storing and disposal of any excavated soil. If on-site soil aeration is to be utilized, then a complete description of the treatment method is required:

   1. Volume and rate of aeration/turning.

   2. Method of containment and cover

   3. Wet weather contingency plans.

Other on-site treatments (such as bioremediation) requires permits issued by the Regional Board. Off-site storage or treatment also requires permits issued bY the Regional Board.

D. Security measures planned for excavated hole and contaminated soil (i.e., six foot fence around hole, ripped up piping,m spoil piles, etc.)

IV. Plan for determining groundwater contamination.

Construction and placement of wells should adhere to the requirements of the "Regional Board Staff Recommendations for Initial Evaluation and Investigation of Underground Tanks". If the verified down gradient location has been established, then a complete description of the rationale must be provided. — 10/5

A. Placement and rationale for location of monitoring wells, including a map to scale.

B. Drilling method for construction of monitoring wells, including decontamination procedures.

1. Expected depth and diameter of monitoring wells

2. Date of expected drilling.

3. Method and location of soil sampling of borings.

4. Casing type, diameter, screen interval, and pack and slot sizing technique.

5. Depth and type of seal.

6. Construction diagram for wells.

7. Development method and criteria for determination of adequacy of development.

8. Plans for disposal of cuttings and development water.

9. Surveying plans for wells (requirements include surveying to established benchmark to 0.01 foot)

C. Groundwater sampling plans (include plans for sampling and on-site domestic wells)

1. Water level measurement procedure

2. Methods for free product measurement, observation of sheen and odor.

3. Well purging procedures.

4. Well purge water disposal plans.

5. Sample collection procedures.

6. Sample analyses to be used

7. Quality assurance plan

8. Chain of custody procedures

V. Include a site safety plan

A report will need to be submitted following collection of the information proposed and approved in the workplan. The report should set out the collected information in an orderly fashion and include any recommendations for additional needed work.