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

KEI-P89-1204.P1
January 10, 1990

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

Attention: Mr. Rick Sisk

RE: Work Plan/Proposal
Unocal Service Station #5781
3535 Pierson Street
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) in the letter dated January 5, 1990 and concerning the subject site. 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 Pierson Street and MacArthur Boulevard in Oakland, California. A Site Location Map and Site Plan are attached to this work plan.

C. Background

On December 14, 1989, Kaprealian Engineering, Inc. (KEI) collected soil samples following the removal of two fuel storage tanks and one waste oil tank at the referenced site. Three soil samples, labeled A1, B1 and A2/B2, were collected from under the fuel storage

tanks at a depth of 12.5 feet. In addition, two fuel tank pit sidewall samples, labeled SW1 and SW2, were collected at depths of 10.5 and 10.0 feet, respectively. The soil sample under the waste oil tank was collected at a depth of 6.0 feet. All soil samples were analyzed by Sequoia Analytical Laboratory in Redwood City, California. The samples collected from the fuel storage tank pit were analyzed for total petroleum hydrocarbons (TPH) as gasoline, and benzene, toluene, xylenes and ethylbenzene (BTX&E). Analytical results showed TPH ranging from non-detectable to 46 ppm, with non-detectable BTX&E concentrations in all samples, except for samples A2/B2 and SW2, which showed benzene at 0.10 ppm and 0.65 ppm, respectively. The soil sample collected from under the waste oil tank was analyzed for TPH as gasoline, BTX&E, TPH as diesel, total oil and grease (TOG), EPA method 8010 constituents, and the metals cadmium, chromium, lead and zinc. Laboratory analyses showed TPH as gasoline at 670 ppm, 5.4 ppm benzene, TPH as diesel at 8,300 ppm, and TOG at 48,000 ppm. EPA method 8010 results showed 1,2-dichlorobenzene at 10 ppb, tetrachloroethene at 77 ppb, and 1,1,1-trichloroethane at 15 ppb. Metals concentrations were as follows: cadmium non-detectable, chromium 8.3 ppm, lead 340 ppm, and zinc 70 ppm.

Soil sample point locations are shown on the attached Site Plan, Figure 1. Laboratory results are summarized in Table 1. Laboratory analyses and Chain of Custody documentation are also attached.

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 December 14, 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 regular 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 14, 1989. Extensive pitting, but no holes or cracks were observed in the regular unleaded and super unleaded gasoline tanks. At least one hole, 1/2 inch by 2-1/2 inch in size was observed in the waste oil tank.

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 1/8/90 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 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 Pierson Street with MacArthur Boulevard in Oakland, California. In addition, the site is situated southwest of and adjacent to the Highway 580 off-ramp for MacArthur Boulevard. The site is located near the base of a east-northeast trending hillside area.

The depth of the water table is presently unknown. In addition, the ground water 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 the bay, roughly paralleling the generally northwest sloping topography.

B. & C. Vicinity Map

A Site Location Map and two Site Plans showing various features of the site are attached with this work plan. Figure 2 shows the locations of subsurface utilities, the former tank locations and affiliated piping. No wells are known to KEI to be located on or near the site.

D. Existing Soil Contamination and Excavation Results

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

   The collection of the soil samples taken on December 14, 1989, was witnessed by ACHA personnel. The undisturbed 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. No ground water was encountered in the tank pits.

3. Based on review of regional geologic maps ("Areal and Engineering Geology of the Oakland East Quadrangle, California" by Dorothy H. Radbruch (1969) in U.S.G.S. Map GQ-769; and "Map Showing Recently Active Breaks Along the Hayward Fault Zone and the Southern Part of the Calaveras Fault Zone, California" by Dorothy H. Radbruch-Hall (1974) in U.S.G.S. Map I-813), the subject site is underlain by undivided Quaternary deposits (Qu) and is closely adjacent to a mapped geologic contact with the upper member of the Quaternary San Antonio Formation (Qsu). In addition, the site is situated approximately 1,200 to 2,800 feet southwest of mapped splays of the active Hayward Fault Zone.

   The site is located topographically at the base of an east-northeast sloping hillside area near MacArthur Boulevard at the freeway off-ramp.

4. Soil sample collection locations associated with the tank pit are shown on the attached Site Plan, Figure 1.

   Soil samples were collected by Mr. Richard Bradish of KEI. Tabulated soil and water sample analytical results are provided in Table 1. Sample collection locations are shown on the attached Site Plan, Figure 1. 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 2.

6. During tank removal, a water pipe was broken, causing water to temporarily appear in the tank pit.

7. All soil excavated, as described in Section I. C., is currently stockpiled on-site.

8. 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.

As Phase I subsurface investigation, KEI proposes further excavation of the waste oil tank pit in the vicinity of sample point location WO1 to determine the vertical extent of contamination. In addition, KEI proposes that one additional tank bottom soil sample be taken at the maximum depth of this excavation.

KEI also proposes excavation of the easterly, southerly and westerly waste oil tank pit sidewalls to remove additional contaminated soil laterally to the tank pit excavation depth. Again, KEI proposes that three sidewall soil samples be collected at the tank pit

excavation depth, taking one sample from each sidewall excavated. Samples will be collected after lateral excavation. The lateral extent of excavation may be terminated in the event that further excavation, considering soil conditions, presents an unacceptable level of risk of damage to the public walkway located at the property boundary along Pierson Street.

Sample frequency and depth may be reasonably adjusted for any sidewall excavated to account for post excavation sidewall face lithology.

All samples will be analyzed for TPH as gasoline (EPA 5030/8015), BTX&E (EPA 5030/8020), TPH as diesel (EPA 3550/8015), TOG (EPA 418.1), and EPA 8010 constituents.

All excavated soil will be stockpiled on-site for further sampling to determine appropriate disposition.

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. Soil excavated during subsurface investigation will be stockpiled and covered with visqueen on-site. Composite samples will be collected to determine appropriate disposal.

D. Security measures for open excavations are administered by Paradiso Construction, Inc.

IV. PLAN FOR DETERMINING GROUND WATER CONTAMINATION

A. Placement and Rationale for Location of Monitoring Wells

As Phase II 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 will be determined once soil samples have been collected from the waste oil tank pit following additional excavation as described above in Section III. A.

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 five foot intervals, changes in lithology, and at areas of obvious contamination beginning at a depth of five feet. 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 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 excavation of the waste oil tank pit (prepared by Paradiso Construction Company) 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 III

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

Phase III 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 II.

The main purpose of Phase III will be to establish a zero line of ground water contamination. The proposal/work plan will be submitted to the regulatory agencies.

PHASE IV

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

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

PHASE V

Implementation of the remediation plan.

Sincerely,

Kaprealian Engineering, Inc.

Don R Braun

Don R. Braun
Certified Engineering Geologist

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

Mardo Kaprealian

Mardo Kaprealian
President

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

KEI-P89-1204.P1
January 10, 1990

TABLE 1

SUMMARY OF LABORATORY ANALYSES
SOIL

(Results in ppm)
(Samples collected on December 14, 1989)

Sample	Depth (feet)	TPH as Gasoline	Benzene	Toluene	Xylenes	Ethylbenzene
A1	12.5	3.5	ND	ND	ND	ND
B1	12.5	ND	ND	ND	ND	ND
A2/B2	12.5	5.8	0.10	ND	ND	ND
SW1	10.5	15	ND	ND	ND	ND
SW2	10.5	46	0.65	ND	ND	ND
WO1*	6	670	5.4	15	17	2.3
Detection Limits		1.0	0.05	0.1	0.1	0.1

* All EPA method 8010 constituents were non-detectable, except 1,2-dichlorobenzene at 10 ppb, tetrachloroethene at 77 ppb, and 1,1,1-trichloroethane at 15 ppb. Metals concentrations were as follows: cadmium non-detectable, chromium 8.3 ppm, lead 340 ppm, and zinc 70 ppm.

ND = Non-detectable.

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.

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Consulting Engineers
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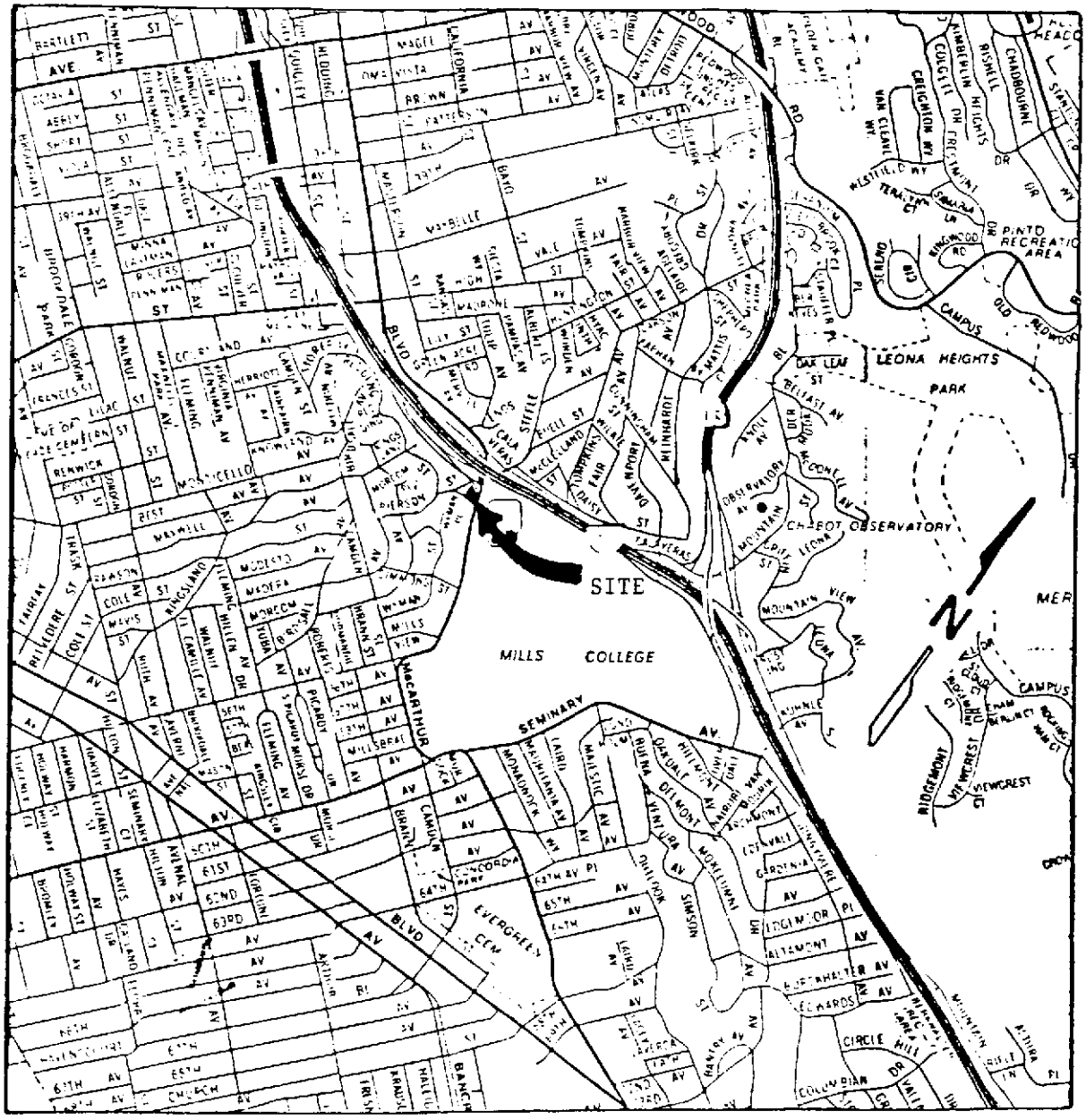

LOCATION MAP

Unocal Service Station #5781
3535 Pierson Street
Oakland, California

KAPREALIAN ENGINEERING, INC.
Consulting Engineers
P.O. BOX 996 • BENICIA, CA 94510
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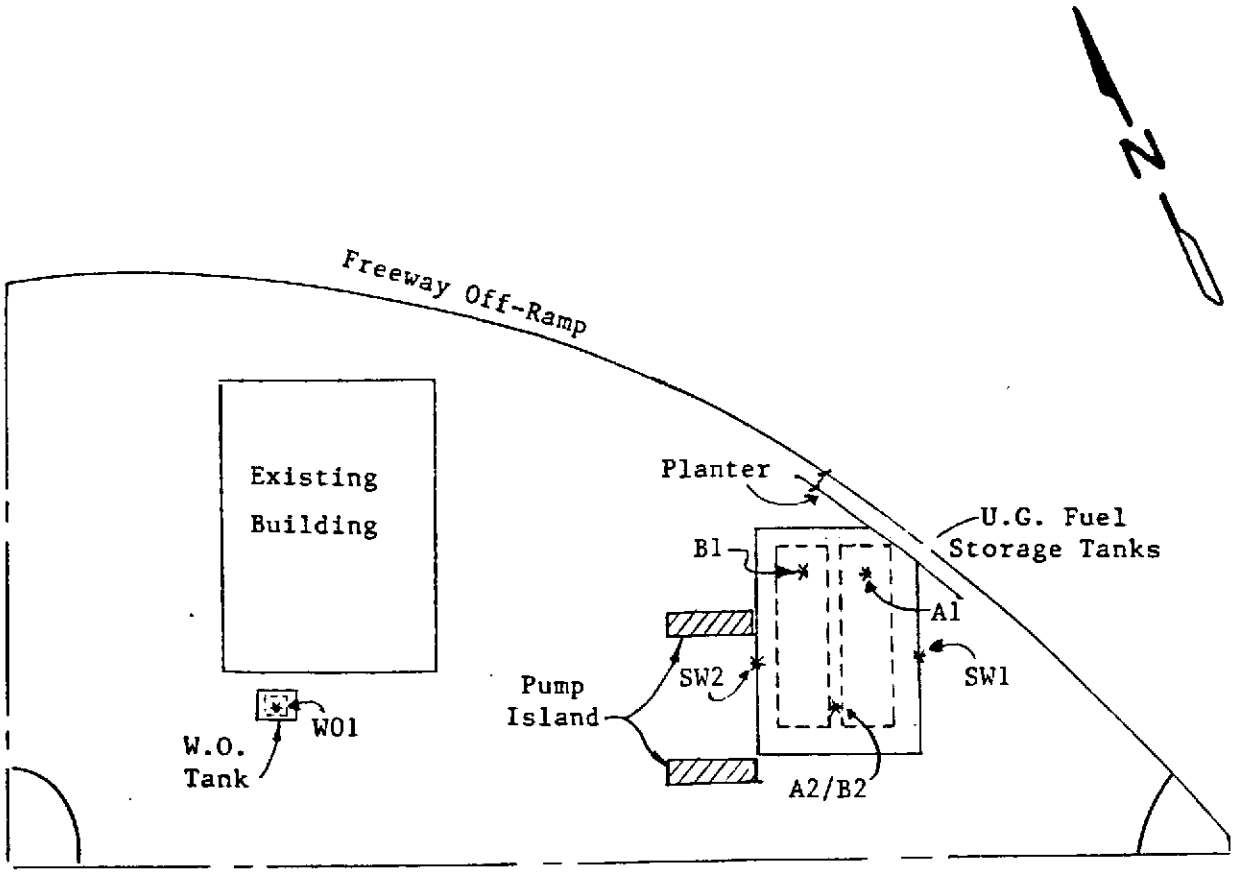

SITE PLAN

Figure 1

0 30 60
Approx. Scale feet

LEGEND

* Sample Point Location

Unocal Service Station #5781
3535 Pierson Street
Oakland, California

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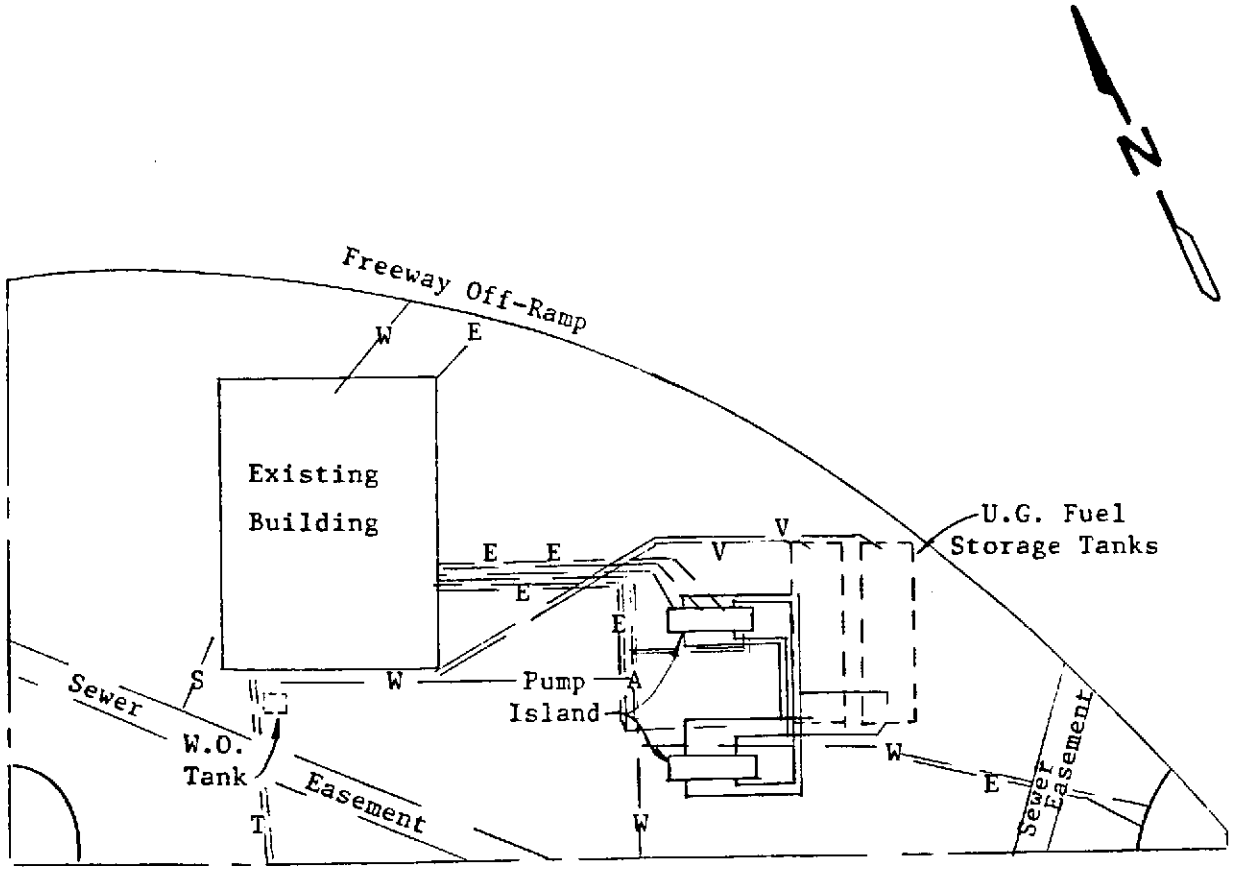

PIERSON STREET

SITE PLAN
Figure 2

0 30 60
Approx. Scale feet

A Air Line
E Electric Line
S Sewer Line
V Vent Line
W Water Line

Unocal Service Station #5781
3535 Pierson Street
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 #5781, Oakland, 3535 Pierson	Sampled:	Dec 14, 1989
P.O. Box 996	Matrix Descript:	Soil	Received:	Dec 15, 1989
Benicia, CA 94510	Analysis Method:	EPA 5030/8015/8020	Analyzed:	Dec 18, 1989
Attention: Mardo Kaprealian, P.E.	First Sample #:	912-2064	Reported:	Dec 19, 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)
912-2064	A1	3.5	N.D.	N.D.	N.D.	N.D.
912-2065	B1	N.D.	N.D.	N.D.	N.D.	N.D.
912-2066	A2/B2	5.8	0.10	N.D.	N.D.	N.D.
912-2067	SW1	15	N.D.	N.D.	N.D.	N.D.
912-2068	SW2	46	0.65	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: R.M. Bradish

WITNESSING AGENCY: Ariu Levi – Alameda City Hazmat Agency

SITE NAME & ADDRESS: Unocal SS # 5781, 3535 Pierson (Pierson & MacArthur), Oakland

ANALYSES REQUESTED: TPH-g / BTXE

TURN AROUND TIME: 24 HR

SAMPLE ID NO.	DATE	TIME	SOIL	WATER	GRAB	COMP	NO. OF CONT.	SAMPLING LOCATION	REMARKS
A1	12/14/89		✓		✓		1	Fuel Tk Pit – Btm	
B1	"		✓		✓		1	" " " "	
A2/B2	"		✓		✓		1	" " " "	
SW1	"		✓		✓		1	Fuel Tk Pit – Sidewall	
SW2	"		✓		✓		1	" " " "	

Relinquished by: (Signature)	Date/Time	Received by: (Signature)
R.M. Bradish	12/15/89 11:30	Tim McLain
Tim McLain		
	12-15-89 1:10pm	

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: SK | Date: 12-15-89

SEQUOIA ANALYTICAL

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

Kaprealian Engineering, Inc.	Client Project ID:	Unocal #5781, Oakland, 3535 Pierson	Sampled:	Dec 14, 1989
P.O. Box 996	Sample Descript.:	Soil, WO1	Received:	Dec 15, 1989
Benicia, CA 94510	Analysis Method:	EPA 5030/8015/8020	Analyzed:	Dec 18, 1989
Attention: Mardo Kaprealian, P.E.	Lab Number:	912-2063	Reported:	Dec 19, 1989

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

Analyte	Detection Limit mg/kg (ppm)	Sample Results mg/kg (ppm)
Low to Medium Boiling Point Hydrocarbons	1.0	670
Benzene	0.05	5.4
Toluene	0.1	15
Ethyl Benzene	0.1	2.3
Xylenes	0.1	17

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 #5781, Oakland, 3535 Pierson	Sampled:	Dec 14, 1989
P.O. Box 996	Matrix Descript:	Soil	Received:	Dec 15, 1989
Benicia, CA 94510	Analysis Method:	EPA 3550/8015	Extracted:	Dec 15, 1989
Attention: Mardo Kaprealian, P.E.	First Sample #:	912-2063	Analyzed:	Dec 15, 1989
			Reported:	Dec 19, 1989

TOTAL PETROLEUM FUEL HYDROCARBONS (EPA 8015)

Sample Number	Sample Description	High B.P. Hydrocarbons mg/kg (ppm)
912-2063	WO1	8,300

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

9122064.KEI <4>

SEQUOIA ANALYTICAL

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

Kaprealian Engineering, Inc.	Client Project ID:	Unocal #5781, Oakland, 3535 Pierson	Sampled:	Dec 14, 1989
P.O. Box 996	Matrix Descript:	Soil	Received:	Dec 15, 1989
Benicia, CA 94510	Analysis Method:	EPA 418.1 (I.R. with clean-up)	Extracted:	Dec 18, 1989
Attention: Mardo Kaprealian, P.E.	First Sample #:	912-2063	Analyzed:	Dec 18, 1989
			Reported:	Dec 19, 1989

TOTAL RECOVERABLE PETROLEUM HYDROCARBONS

Sample Number	Sample Description	Petroleum Oil mg/kg (ppm)
912-2063	WO1	48,000

Detection Limits:	1.0

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

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Project Manager

9122064.KEI <6>

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Kaprealian Engineering, Inc.	Client Project ID:	Unocal #5781, Oakland, 3535 Pierson	Sampled:	Dec 14, 1989
P.O. Box 996	Sample Descript:	Soil, WO1	Received:	Dec 15, 1989
Benicia, CA 94510	Analysis Method:	EPA 5030/8010	Analyzed:	Dec 18, 1989
Attention: Mardo Kaprealian, P.E.	Lab Number:	912-2063	Reported:	Dec 19, 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**	**10**
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**	**77**
1,1,1-Trichloroethane	**5.0**	**15**
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.

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			Reported:	Dec 19, 1989

LABORATORY ANALYSIS

Analyte	Detection Limit mg/kg	Sample Results mg/kg
Cadmium	0.5	N.D.
Chromium	0.5	8.3
Lead	2.5	340
Zinc	0.5	70

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: K.M. Bradish

WITNESSING AGENCY: A. Newstein ACHA

SITE NAME & ADDRESS: Unocal SS # 5781, 3535 Pierson (Pierson & MacArthur), Oakland

ANALYSES REQUESTED: TPH-g & BTXE; TPH-D; TOG (5030 IR); 8010; Metals - Cr, Cd, Pb (TTLC)

TURN AROUND TIME: 24HR

SAMPLE ID NO.	DATE	TIME	SOIL	WATER	GRAB	COMP	NO. OF CONT.	SAMPLING LOCATION	REMARKS
W01	12/14/89		✓		✓		1	W.O. Tk Pit - Btm	

Relinquished by: (Signature)	Date/Time	Received by: (Signature)
K.M. Bradish	12/15/89 1130	Tim McLain
Tim McLain		
	12-15-89 1:19pm	

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

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: 01/08/90 | CASE #:

REPORTED BY

NAME OF INDIVIDUAL FILING REPORT: Paul H. King | PHONE: (707) 746-6915 | SIGNATURE: Paul H King

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

COMPANY OR AGENCY NAME: Kaprealian Engineering, Inc.

ADDRESS: 638 1/2 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 # 5781 | OPERATOR: Jack Chi Chan | PHONE: (415) 553-2439

ADDRESS: 3535 Pierson St. (STREET) | Oakland (CITY) | Alameda (COUNTY) | 94619 (ZIP)

CROSS STREET: MacArthur

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 Levi | PHONE: (415) 271-4320

REGIONAL BOARD: San Francisco Bay Region | PHONE: (415) 464-1255

SUBSTANCES INVOLVED

(1) NAME: Gasoline | QUANTITY LOST (GALLONS): _____ ☒ UNKNOWN

(2) Waste Oil _____ ☒ UNKNOWN

DISCOVERY/ABATEMENT

DATE DISCOVERED: 12/14/89

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

DATE DISCHARGE BEGAN: ☒ 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 12/14/89

SOURCE/CAUSE

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

TANKS ONLY/CAPACITY: 2@10K & 1@280GAL. 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

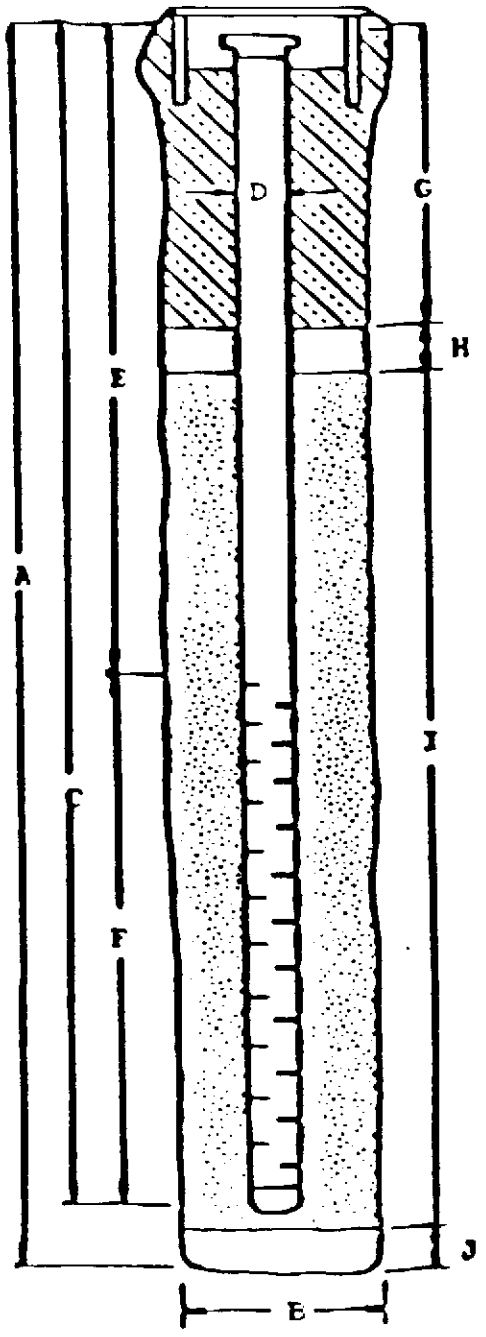
CHECK APPROPRIATE ACTION(S) (SEE BACK FOR DETAILS)
☐ CAP SITE (CD) ☒ EXCAVATE & DISPOSE (ED) ☐ REMOVE FREE PRODUCT (FP) ☐ ENHANCED BIO DEGRADATION (IT)
☐ CONTAINMENT BARRIER (CB) ☒ EXCAVATE & TREAT (ET) ☐ PUMP & TREAT GROUNDWATER (GT) ☐ REPLACE SUPPLY (RS)
☐ TREATMENT AT HOOKUP (HU) ☐ NO ACTION REQUIRED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

COMMENTS

HSC 05 (4/87)

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.

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SOIL AND GROUNDWATER SAMPLING PROCEDURE
Gasoline, Diesel and Waste Oil Tank Removal

Underground storage tanks require two soil samples per tank of 1000 gallon capacity or greater. Tanks of a smaller capacity require one sample per tank unless otherwise required by local agencies. Samples are collected at a depth of two feet below the tank backfill.

Soil samples from beneath gasoline storage tanks are analyzed for Total Petroleum Hydrocarbons (TPH) as gasoline (low to medium boiling fraction) using EPA method 8020. Samples from beneath diesel fuel storage tanks are analyzed for TPH as diesel (high boiling fraction) using EPA methods 3550 and 8015.

If groundwater is encountered in a fuel tank pit, water sample is collected. The sample is collected in a glass VOA (Volatile Organic Analysis) vial, insuring that no head space remains in the vial. The vial is sealed with a Teflon-lined screw cap. Water from a gasoline tank pit is analyzed for TPH as gasoline and BTX using EPA methods 602 and 5030. Water samples from a diesel tank pit are analyzed for TPH as diesel and BTX using EPA methods 3510 and 8020.

Soil samples collected from beneath waste oil tanks are analyzed for TPH high boiling fraction, using EPA method 3550 and 8015; total oil and grease (TOG) using EPA extraction method 3550 and gravimetric determination method 8010 and 8020 or EPA method 8240. Groundwater samples collected are collected as described above and are analyzed for TPH, high boiling fraction using EPA methods 3510 and 8020, and volatile organic compounds using EPA method 6240.

The analysis for all soil and water samples are done by a state certified lab.

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GENERAL

The company will furnish all safety equipment and tools to keep your place of work safe as possible, "use them".

Housekeeping: Keep the jobsite clear of scrap materials and debris especially near the trenches and excavations.

Barricades: The bulk of our work involves underground tanks and piping, so it involves trrenching and excavation and a good many sites are kept in operation; we also have to provide safety for the general public. Use an ample amount of barricades and trench covers so that customers that are trying to use the facility are aware of the hazard that exists. Be especially aware of children that come on the site to see what is going on, and keep them well away from the excavation and equipment, or better yet keep them off the site entirely.

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PERSONAL PROTECTIVE EQUIPMENT

1. EYE PROTECTION: When cutting or burning, chipping or breaking concrete, or anytime you are subjected to eye injury, wear your goggles or safety glasses.

2. HEAD PROTECTION: When you are working in an area where you are subjected to falling objects or the site is a hard hat area, wear your hard hat.

3. BODY PROTECTION: Clothing appropriate for the work must be worn.

4. FOOT PROTECTION: Wear sturdy shoes appropriate to the work you are doing. When using a pavement breaker wear your toe protection devices.

5. HAND PROTECTION: When handling rough materials such as timbers, steel sheets, bars, and scrap; wear your gloves.

6. HEARING PROTECTION: When using a pavement breaker or operating noisy equipment, use your ear protection.

7. RESPIRATORY PROTECTION: Respirators must be worn when working in a confined space where dangerous air contamination exists, when sand blasting where toxic material evolves or when welding where there may be toxic substances.

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EQUIPMENT

1. Only trained or experienced employees may operate equipment.

2. Equipment operators must be sure other workers are clear before moving or operating this equipment. When changing buckets, be certain that the workers helping to change the bucket is clear before moving the boom. When using the boom for hoisting or moving equipment and or materials be sure the worker is clear before lifting or taking a strain on rigging.

3. Don't use damaged slings or cables, if they are questionable, call the office for replacement.

4. Avoid operations that expose employees to over head loads.

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TOOLS

1. Don't use tools and equipment that are not in good repair; notify the office of the repairs that are needed.

2. All power tools are to be grounded.

3. SKILL SAWS: Saw guard must not be blocked open.

4. AIR COMPRESSORS: Air tank must be drained often, safety valve must be popped daily, all hoses to have safety clasp, and don't disconnect under pressure.

5. LADDERS: Defective or unsafe ladders will not be used, they shall be repaired or scrapped.

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FIRE PROTECTION/PREVENTION

1. SMOKING: No smoking on any service station site except in an approved area away from the islands and tanks.

2. FLAMMABLE LIQUIDS: No sources of ignition are allowed in any work area where there is presence of flammable liquids, gasoline etc...

3. FIRE EXTINGUISHERS: All trucks and heavy equipment are to be equipped with one 5 lb. A.B.C. extinguisher.

4. Gasoline should not be used as a cleaning agent.

5. No burning or welding should be done in an enclosed tank or vessel until it has been determined that there is no possibility of fire or explosion.

6. A gas detection device is available, all persons should be familiar with this device and know how to use it.

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EXCAVATION

1. Prior to excavating, the location of underground utilities must be determined and utility owners must be notified. This function will normally be done by the office but if you are not sure, call the office, especially, if you are to excavate in the street or sidewalk area.

2. All excavations 5' or more in depth that are to be entered, must be sloped 3/4 to 1 foot or shored.

3. All excavation must be inspected and monitored for ground movement on a continuing basis.

4. There must be proper qualified supervision at all times during excavation.

5. Safety provisions must be taken while installing and removing shoring, the work can be extremely dangerous if good practice is ignored.

6. Keep spoils well back 2' or more from the edge of all excavations.

7. Effective barriers and barricades are to be used around all excavations for your protection as well as others that may want to see the work going on. Keep all others not involved in the work well back from the excavations, especially children.

8. Watch for overhead power lines, keep at least 10' away from these conductors.

9. Trench covers: A facility that is to be kept in operation, as many are, set up barricades and cover trenches to reduce the possibility of a customer driving or walking into an open trench. When work is done for the day, insure that you leave the site in a safe condition.

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CONFINED SPACES

Before employees are allowed to enter confined spaces:

1. Lines containing hazardous substances must be disconnected, blinded, or blocked.
2. The space must be emptied, flushed or purged.
3. The air must be tested for dangerous contamination or oxygen deficiency. Ventilation is required if testing reveals any hazard.

Working in a confined space where dangerous air contamination exists requires:

1. Appropriate respiratory protection.
2. Safety belt (or harness) protection.
3. One standby employee (with respirator).