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REPORT  
SUBSURFACE ENVIRONMENTAL INVESTIGATION  
SOIL BORINGS

at  
ARCO Service Station  
First and Ray Streets  
Pleasanton, California

AGS Job No. 87065-1

Report prepared for

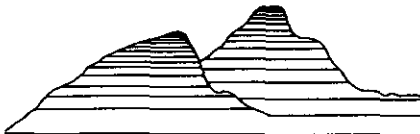
UNOCAL Corporation  
2175 N. California Blvd.  
Walnut Creek, California 94596

by

William R. Short  
Project Geologist

Michael N. Clark  
C.E.S. 1264

July 14, 1987



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July 14, 1987  
AGS 87065-1

Mr. Don Terry  
UNOCAL Corporation  
2175 N. California Blvd.  
Suite 650  
Walnut Creek, CA 94596

Subject: Transmittal of Report No. 87065-1, Subsurface  
Environmental Investigation, Soil Borings at  
ARCO Service Station, First and Ray Streets,  
Pleasanton, California.

Mr. Terry:

This report presents the results of our limited environmental investigation at the above-referenced site. The investigation included the drilling of three soil borings and the analysis of nine soil samples for potential hydrocarbon contamination.

Laboratory analyses of soil samples from the borings (B-1, B-2, and B-3) show low to relatively high concentrations of hydrocarbons. The hydrocarbon contamination appears to be derived from both gasoline and diesel. Because detectable levels of hydrocarbon contamination are present in soil at the base of the borings there is a possibility that the ground water may be affected by hydrocarbon contamination. The total depth of the borings range between 46.5 feet and 55 feet. Ground water is expected to be approximately 60 feet below the ground surface at the site.

We recommend that a ground water monitoring well be installed at the site to evaluate potential hydrocarbon contamination of the ground water as required by the San Francisco Bay Regional Water Quality Control Board's "Guidelines for Addressing Fuel Leaks" (September 1985). We recommend that the well be installed within 10 feet of soil containing hydrocarbon contamination in excess of 1000 parts per million (ppm).

We recommend that UNOCAL submit copies of this report to the owner of the property for their records. We further recommend that the property owner submit a copy of this report to Mr. Rick Mueller of the Pleasanton Fire Department at 44 Railroad Street, P.O. Box 520, Pleasanton, California 94566 and to Mr. Greg Zentner at the California Regional Water Quality Control Board - San Francisco Bay Region at 1111 Jackson Street, Room 6040, Oakland, CA 94607. If you have any questions regarding the content of this report, please do not hesitate to call.

Sincerely,  
Applied GeoSystems



William R. Short  
Project Geologist



**Applied GeoSystems**

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REPORT  
SUBSURFACE ENVIRONMENTAL INVESTIGATION  
SOIL BORINGS

at  
ARCO Service Station  
First and Ray Streets  
Pleasanton, California  
For: UNOCAL Corporation

INTRODUCTION

The following report describes the work performed to drill and sample three soil borings near the site of underground storage tanks at the ARCO Service Station located on the corner of First and Ray Streets in Pleasanton, California. UNOCAL contracted Applied GeoSystems to evaluate potential hydrocarbon contamination of subsurface soil prior to possible purchase of the subject station. This report describes the work elements conducted during the investigation, presents our interpretations of the data collected, and presents our conclusions and recommendations.

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ARCO Service Station - First and Ray Streets - Pleasanton

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#### SITE DESCRIPTION AND BACKGROUND

The ARCO Service Station site is located on the northwest corner of the intersection of First Street at Ray Street in Pleasanton, as shown on the Site Vicinity Map, Plate P-1. The Generalized Site Plan, Plate P-2, shows the service station property and approximate locations of the station facilities. We understand that four 12,000-gallon underground petroleum product storage tanks are buried at the site. The four petroleum product tanks are located adjacent to one another on the southern portion of the property.

It is our understanding that UNOCAL is currently considering purchase of the subject property and wishes to assess the presence and extent or absence of hydrocarbon contamination at the site. This assessment was conducted by drilling three soil borings and analyzing selected soil samples for hydrocarbon contamination concentration.

A permit was acquired from the Alameda County Flood Control and Water Conservation District prior to drilling. A copy of the permit is included in the appendix of this report. Underground

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Service Alert was contacted to locate utility lines on public property adjacent to the site prior to on site work.

#### FIELD WORK

A geologist from Applied GeoSystems observed drilling of soil borings B-1, B-2, and B-3 on June 30, 1987. The borings were drilled with a CME-75 truck-mounted drill rig operated by Datum Exploration, Inc. of Pittsburg, California. Steam-cleaned, 8-inch diameter, continuous flight hollow-stem augers were used to drill borings B-1 and B-2 to 46.5 feet, and B-3 to 55 feet. No ground water was encountered in any of the borings at the time of drilling. The borings were backfilled with neat cement to a few inches below grade and capped with asphalt to grade. Locations of the three borings with respect to other site features are shown on the Generalized Site Plan, Plate P-2.

The direction of ground water flow was inferred to be to the northwest prior to drilling. The flow direction was inferred from the location of the site in relation to the general surface topography in the area. Boring B-1 was drilled in the inferred downgradient direction from the product tanks and within ten feet of the tank pit. Boring B-2 was drilled roughly perpendicular to

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gradient near the northern portion of the product tanks. Boring B-3 was drilled in the inferred downgradient direction from the product lines and the southern end of the product tanks. Soil samples were collected from the boreholes with a California modified split spoon sampler. Plate P-3 gives a summary of the Unified Soil Classification System used to identify the soils. Descriptions of earth materials encountered in borings B-1, B-2, and B-3 are presented on the Boring Logs, Plate P-4 through Plate P-9. Plate P-10 presents a geologic cross section constructed through the borings at the site; Plate P-2 shows the location of the cross section. The earth materials encountered at the site consist primarily of intervals of silty clay and gravelly clay. Subjective analysis of soil cuttings excavated from the borings found evidence of hydrocarbon contamination from 5 feet to total depth in all three borings. Cuttings from the boreholes were spread at the site for aeration.

#### SOIL SAMPLING PROCEDURE

Each boring was hand augured to a depth of approximately 5 feet to confirm the absence of any underground lines or structures. Seven soil samples were collected and described from boring B-1 and nine samples each were collected and described from borings

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B-2 and B-3 during drilling. These samples, labeled as indicated on the Boring Logs, were collected at 5-foot intervals from the ground surface to total depth. Soil samples were collected by advancing the boring to a point immediately above the sampling depth and then driving a modified California split spoon sampler (2.5-inch inside diameter) into the soil through the hollow center of the auger. The sampler was driven 18 inches with a standard 140 pound hammer repeatedly dropped 30 inches. The number of blows to drive the sampler each 6 inches was counted and recorded to evaluate the relative consistency of soil materials. A subjective analysis for presence and degree or absence of hydrocarbon contamination was performed and the results recorded for each soil sample collected from the borings. The samples were removed from the sampler, immediately sealed in their brass sleeves with aluminum foil, plastic caps, air-tight tape, and were labeled and placed in iced storage. A Chain-of-Custody was initiated by the sampler and selected samples were delivered to Applied GeoSystems' certified laboratory for analytical testing. The completed Chain-of-Custody form and Laboratory Record-of-Analysis for the tested samples are included in the Appendix of this report.



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#### ANALYTICAL RESULTS

Nine soil samples (S-20-B1, S-35-B1, S-45-B1, S-25-B2, S-35-B2, S-45-B2, S-10-B3, S-30-B3, and S-40-B3) were analyzed for Total Volatile Hydrocarbons (TVH) and the hydrocarbon constituents Benzene, Ethyl Benzene, Toluene, and Xylenes (BETX) using gas chromatography with photo- and flame ionization detection (EPA Method 8020). Inspection of the chromatograms from the TVH analyses indicated that a significant portion of the contamination in some of the samples consisted of higher molecular weight hydrocarbons. A representative sample was chosen to be analyzed for Total Extractable Hydrocarbons (TEH) to determine the concentration of heavier hydrocarbons in the soil. One soil sample (S-35-B1) was analyzed for Total Extractable Hydrocarbons (TEH) using gas chromatography with flame ionization detection (EPA Method 3550). Table 1 presents the results of the analyses.

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TABLE 1  
 RESULTS OF CHEMICAL ANALYSES  
 OF SOIL SAMPLES  
 ARCO Service Station  
 First and Ray Streets  
 Pleasanton, California

| Sample Number | TVH    | Benzene | Ethyl Benzene | Toluene | Xylenes | TEH  |
|---------------|--------|---------|---------------|---------|---------|------|
| S-20-B1       | 281.9  | 17.1    | 17.0          | 73.6    | 92.3    | NA   |
| S-35-B1       | 126.13 | 2.06    | 0.84          | 1.02    | 6.59    | 1325 |
| S-45-B1       | 9.36   | 0.64    | 0.26          | 1.06    | 1.47    | NA   |
| S-25-B2       | 188.8  | 13.1    | 6.1           | 6.3     | 56.2    | NA   |
| S-35-B2       | 56.81  | 1.47    | 1.81          | 1.58    | 18.09   | NA   |
| S-45-B2       | 9.09   | 0.07    | 0.18          | 0.26    | 1.30    | NA   |
| S-10-B3       | ND     | ND      | ND            | ND      | ND      | NA   |
| S-30-B3       | 7.72   | 3.95    | 0.13          | 0.51    | 0.85    | NA   |
| S-40-B3       | 180.7  | 12.4    | 9.4           | 47.8    | 45.1    | NA   |

Results in milligrams/kilogram(mg/kg)=parts per million(ppm)

TVH: Total volatile hydrocarbons

TEH: Total extractable hydrocarbons

ND: Non Detectable

NA: Not Analyzed

Detection limits: 0.05 ppm (TVH - S-35-B1, S-45-B1, S-35-B2, S-45-B2, S-10-B3, B-30-B3)

0.5 ppm (TVH - S-20-B1, S-25-B2, S-40-B3)

5.0 ppm (TEH - S-35-B1)

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#### CONCLUSIONS AND RECOMMENDATIONS

The analytical results of the soil samples collected from the three borings at the site indicate that low to relatively high hydrocarbon contamination levels are present adjacent to the tank pit and product lines. Inspection of the chromatograms (graphical results of the analyses) suggests that the hydrocarbon contamination is derived from a combination of two sources. One portion of the contamination appears to be derived from gasoline; the other portion appears to be derived from diesel.

Ground water has been measured to be approximately 55 feet below the ground surface by the Alameda County Flood Control and Water Conservation District in the vicinity of the site. Based on the site elevation, and on the generally lower water table in the summer months, the ground water is expected to be approximately 60 feet below the ground surface at the subject site. Because detectable levels of hydrocarbon contamination are present at the base of the borings (near the ground water) there is a possibility that the ground water is affected by hydrocarbon contamination.

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We recommend that a ground water monitoring well be installed at the site to evaluate potential hydrocarbon contamination of the ground water as required by the San Francisco Bay Regional Water Quality Control Board's "Guidelines for Addressing Fuel Leaks" (September 1985). We recommend that the well be installed within 10 feet of the soil sample containing hydrocarbon contamination in excess of 1000 parts per million (ppm).

We recommend that UNOCAL submit copies of this report to the property owner for their records. We further recommend that the property owner submit a copy of this report to Mr. Rick Mueller of the Pleasanton Fire Department at 44 Railroad Street, P.O. Box 520, Pleasanton, California 94566 and to Mr. Greg Zentner at the California Regional Water Quality Control Board - San Francisco Bay Region at 1111 Jackson Street, Room 6040, Oakland, CA 94607.

#### LIMITATIONS

This report was prepared in accordance with generally accepted standards of environmental geological practice in California at the time this investigation was performed. This investigation was conducted solely for the purpose of evaluating environmental conditions of the soil and ground water with respect to hydro-

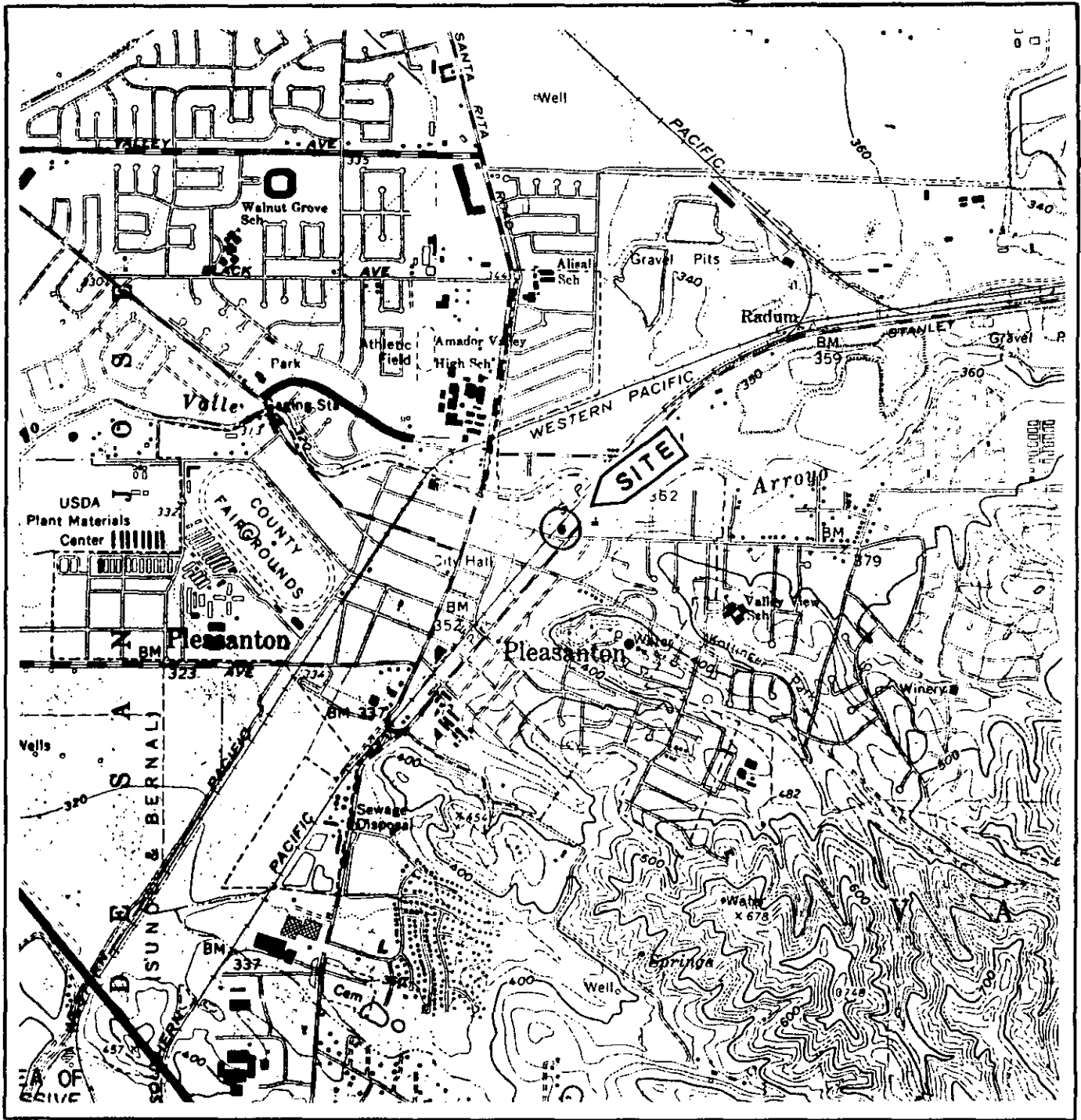
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carbon product contamination in the vicinity of the subject property. No soil engineering or geotechnical recommendations are implied or should be inferred. Evaluation of the geologic conditions at the site for the purpose of this investigation is made from a limited number of observation points. Subsurface conditions may vary away from the data points available. Additional work, including further subsurface investigation, can reduce the inherent uncertainties associated with this type of investigation.



Source: State of California  
 Special Studies Zone  
 Dublin/Livermore  
 7.5 Minute Quadrangle



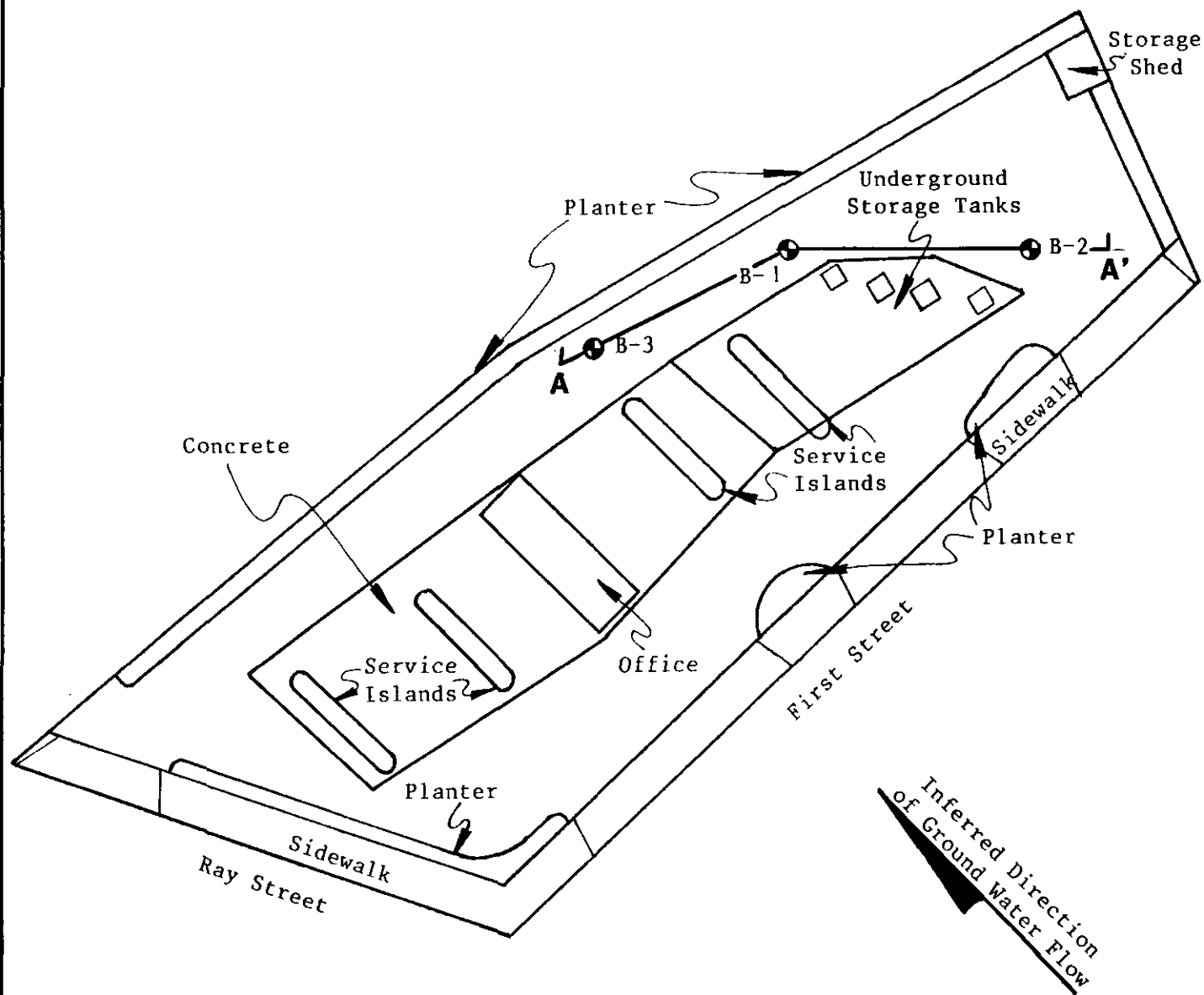
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**SITE VICINITY MAP**  
 Arco Station  
 First and Ray Street  
 Pleasanton, California

**PLATE**

P-1

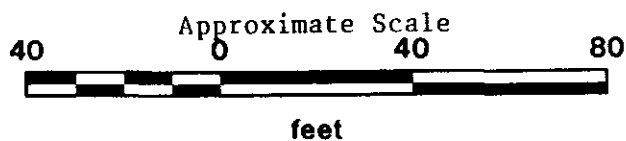
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Source: Measured by Tape

● Soil Boring Location

— A — A' Cross section



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GENERALIZED SITE PLAN  
Arco Station  
First and Ray Street  
Pleasanton, California

PLATE

P-2

## UNIFIED SOIL CLASSIFICATION SYSTEM

| MAJOR DIVISIONS      |                           | LIR | DESCRIPTION  | MAJOR DIVISIONS    |                       | LIR | DESCRIPTION   |
|----------------------|---------------------------|-----|--|--------------------|-----------------------|-----|---|
| COARSE GRAINED SOILS | GRAVEL AND GRAVELLY SOILS | GM  | Well-graded gravels or gravel sand mixtures, little or no fines. | FINE GRAINED SOILS | SILTS AND CLAYS LL<90 | ML  | Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity. |
|                      |                           | GP  | Poorly-graded gravels or gravel sand mixture, little or no fines |                    |                       | CL  | Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays.                  |
|                      |                           | GH  | Silty gravels, gravel-sand-clay mixtures.                        |                    |                       | OL  | Organic silts and organic silt-clays of low plasticity.   |
|                      |                           | GC  | Clayey gravels, gravel-sand-clay mixtures.                       |                    |                       | MH  | Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts.                                |
|                      | SAND AND SANDY SOILS      | SW  | Well-graded sands or gravelly sands, little or no fines.         |                    | SILTS AND CLAYS LL<50 | CH  | Inorganic clays of high plasticity, fat clays.  |
|                      |                           | SP  | Poorly-graded sands or gravelly sands, little or no fines.       |                    |                       | OH  | Organic clays of medium to high plasticity.   |
|                      |                           | SM  | Silty sands, sand-silt mixtures.                                 |                    |                       | Pt  | Peat and other highly organic soils.  |
|                      |                           | SC  | Clayey sands, sand-clay mixtures.                                |                    | HIGHLY ORGANIC SOILS  |     |   |

Depth through which sampler is driven

Relatively undisturbed sample

Missed sample

Ground water level observed in boring

S-10 Sample number

Sand pack

Bentonite annular seal

Neat cement annular seal

Blank PVC

Machine-slotted PVC

BLOW/FT. REPRESENTS THE NUMBER OF BLOWS OF A 140-POUND HAMMER FALLING 30 INCHES TO DRIVE THE SAMPLER THROUGH THE LAST 12 INCHES OF AN 18 INCH PENETRATION.

DASHED LINES SEPARATING UNITS ON THE LOG REPRESENT APPROXIMATE BOUNDARIES ONLY. ACTUAL BOUNDARIES MAY BE GRADUAL. LOGS REPRESENT SUBSURFACE CONDITIONS AT THE BORING LOCATION AT THE TIME OF DRILLING ONLY.

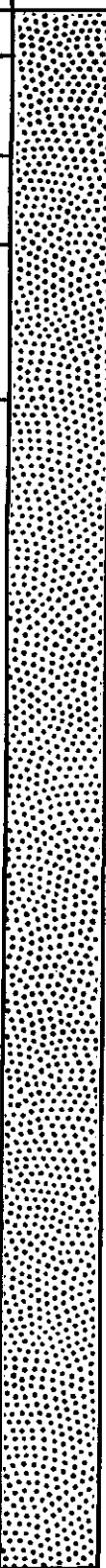


UNIFIED SOIL CLASSIFICATION SYSTEM  
AND SYMBOL KEY  
Arco Station  
First and Ray Street  
Pleasanton, California

PLATE  
P-3

PROJECT NO. AGS 87065-1



| DEPTH IN FEET | Blows/<br>Ft. | Sample<br>No. | USCS | DESCRIPTION  | WELL<br>CONST.   |
|---------------|---------------|---------------|------|--|--|
| 0             |               |               |      | Asphalt (4") over Road base (8")   |  |
| 2             |               |               | CL   | Silty clay, fill, black, dry, hard, high plasticity, slight product odor.            |  |
| 4             |               |               | GC   | Gravel, fill, dry, hard.   |  |
| 6             |               |               | CL   | Silty clay, green-orange, mottled, fill.   |  |
| 8             |               |               |      |  |  |
| 10            |               |               | CL   | Silty clay, dark brown, damp, medium plasticity, moderate product odor.              |  |
| 11            | 11            | S-11          |      | No recovery  |  |
| 16            | 100+          | S-16          |      | With green mottling, hard.   |  |
| 20            |               |               |      |  |  |
| 22            | 66            | S-21          |      | Brown-green, strong product odor.  |  |
| 24            |               |               | GC   | Gravelly clay, green-brown, damp, very stiff, strong product odor.                   |  |
| 26            | 19            | S-26          |      |  |  |
| 28            |               |               |      |  |  |
| 30            |               |               | CL   | Silty clay, gray-green, damp to moist, hard, medium plasticity, strong product odor. |  |

(Section continues downward)



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## LOG OF BORING B-1

Arco Station  
First and Ray Street  
Pleasanton, California

PLATE

P-4

PROJECT NO. AGS 87065-1

| DEPTH IN FEET | Blows/<br>Ft.  | Sample<br>No. | USCS | DESCRIPTION  | WELL<br>CONST. |
|---------------|--|---------------|------|--|----------------|
| 30            | 46   | S-30          | CL   | Silty clay, gray-green, damp to moist, hard, medium plasticity, strong product odor.         | Dotted pattern |
| 32            |  |               |      |  |                |
| 34            |  |               | GC   | Gravelly clay with sand, gray-green, moist, hard, strong product odor.                       |                |
| 36            | 84   | S-36          |      |  |                |
| 38            |  |               | CL   | Silty clay with some gravel, green-gray, damp, hard, medium plasticity, strong product odor. |                |
| 40            |  |               |      |  |                |
| 42            | 56   | S-41          |      |  |                |
| 44            |  |               |      |  |                |
| 46            | 64   | S-46          |      | Brown with green mottling, moderate product odor.  |                |
| 48            | Total Depth = 46.5 feet<br>No ground water encountered at time of drilling |               |      |  |                |
| 50            |  |               |      |  |                |



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## LOG OF BORING B-1

Arco Station  
First and Ray Street  
Pleasanton, California

PLATE

P-5

PROJECT NO. AGS 87065-1

| Blows/<br>Ft. | Sample<br>No. | USCS | DESCRIPTION   | WELL<br>CONST. |
|---------------|---------------|------|---|----------------|
| 0             |               |      | Asphalt (4") over road base (8")  |                |
| 2             |               | CL   | Silty clay, fill, black, dry, hard, high plasticity, slight product odor.                     |                |
| 4             |               | GC   | Gravel, fill, dry, hard,  |                |
| 6             | 74 S-6        | CL   | Silty clay with gravel, fill, black, dry, hard, medium plasticity, slight product odor.       |                |
| 8             |               | CL   | Silty clay, black, slightly damp, stiff, medium plasticity, slight product odor.              |                |
| 10            |               |      |   |                |
| 12            | 9 S-11        |      |   |                |
| 14            |               |      |   |                |
| 16            | 44 S-16       |      | Damp, hard.   |                |
| 18            |               |      |   |                |
| 20            | 61 S-21       |      | Orange-brown.   |                |
| 22            |               |      |   |                |
| 24            |               | GC   | Gravelly clay, green-brown to dark brown, damp, hard, medium plasticity, strong product odor. |                |
| 26            | 49 S-26       |      |   |                |
| 28            |               |      |   |                |
| 30            |               | CL   | Silty clay, gray-green, damp, medium plasticity, very stiff, strong product odor.             |                |

(Section continues downward)



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## LOG OF BORING B-2

Arco Station  
First and Ray Street  
Pleasanton, California

PLATE

P-6

PROJECT NO. AGS 87065-1

| DEPTH IN FEET | Blows/<br>Ft.   | Sample<br>No. | USCS | DESCRIPTION  | WELL<br>CONST. |
|---------------|---|---------------|------|--|----------------|
| 30            | 32  | S-30          | CL   | Silty clay, gray-green, damp, medium plasticity, very stiff, strong product odor.    | Dotted pattern |
| 32            |   |               |      |  |                |
| 34            |   |               | GC   | Gravelly clay, gray-green, moist, hard, medium plasticity, very strong product odor. |                |
| 36            | 90  | S-36          |      |  |                |
| 38            |   |               | CL   | Silty clay, green-gray, very strong product odor.                                    |                |
| 40            |   |               |      |  |                |
| 42            | 47  | S-41          | CL   | Silty clay, orange-brown, damp, hard, medium plasticity, strong product odor.        |                |
| 44            |   |               |      |  |                |
| 46            | 70  | S-46          |      | With green-gray mottling.  |                |
| 48            | Total Depth = 46.5 feet<br>No ground water encountered at time of drilling. |               |      |  |                |
| 50            |   |               |      |  |                |



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## LOG OF BORING B-2

Arco Station  
First and Ray Street  
Pleasanton, California

PLATE

P-7

PROJECT NO. AGS 87065-1

| DEPTH IN FEET | Blows/<br>Fl. | Sample<br>No. | USCS | DESCRIPTION  | WELL<br>CONST.                   |
|---------------|---------------|---------------|------|--|----------------------------------|
|               | 0             |               |      |  | Asphalt (4") over road base (8") |
| 2             |               |               | CL   | Silty clay, black, slightly damp, medium stiff, medium plasticity, slight product odor.          |                                  |
| 4             |               |               |      |  |                                  |
| 6             | 15            | S-6           |      |  |                                  |
| 8             |               |               |      |  |                                  |
| 10            |               |               |      |  |                                  |
| 12            | 33            | S-11          | CL   | Silty clay, green-gray, damp, stiff to hard, medium plasticity, moderate to strong product odor. |                                  |
| 14            |               |               |      |  |                                  |
| 16            | 56            | S-16          |      |  |                                  |
| 18            |               |               |      |  |                                  |
| 20            |               |               |      |  |                                  |
| 22            | 61            | S-21          |      | Orange-brown, hard.  |                                  |
| 24            |               |               |      |  |                                  |
| 26            | 38            | S-26          |      |  |                                  |
| 28            |               |               |      |  |                                  |
| 30            |               |               |      |  |                                  |



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## LOG OF BORING B-3

Arco Station  
First and Ray Street  
Pleasanton, California

PLATE

P-8

PROJECT NO. AGS 87065-1

| DEPTH IN FEET | Blows/<br>Ft. | Sample<br>No. | USCS | DESCRIPTION  | WELL<br>CONST. |
|---------------|---------------|---------------|------|--|----------------|
| 30            |               |               |      |  |                |
| 32            | 80            | S-31          | GC   | Gravelly clay, brown, green-brown, damp, hard,<br>medium plasticity, moderate to strong product<br>odor. | GRAVELLY CLAY  |
| 36            | 67            | S-36          |      | Strong product odor.   |                |
| 40            | 43            | S-41          |      |  |                |
| 44            | 63            | S-45          |      | No recovery.   |                |
| 46            |               |               |      |  |                |
| 56            |               |               |      | Total Depth = 55 feet<br>No ground water encountered at time of<br>drilling.                             |                |
| 58            |               |               |      |  |                |



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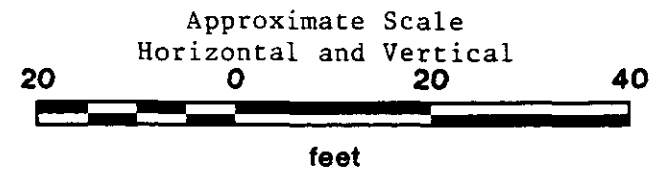
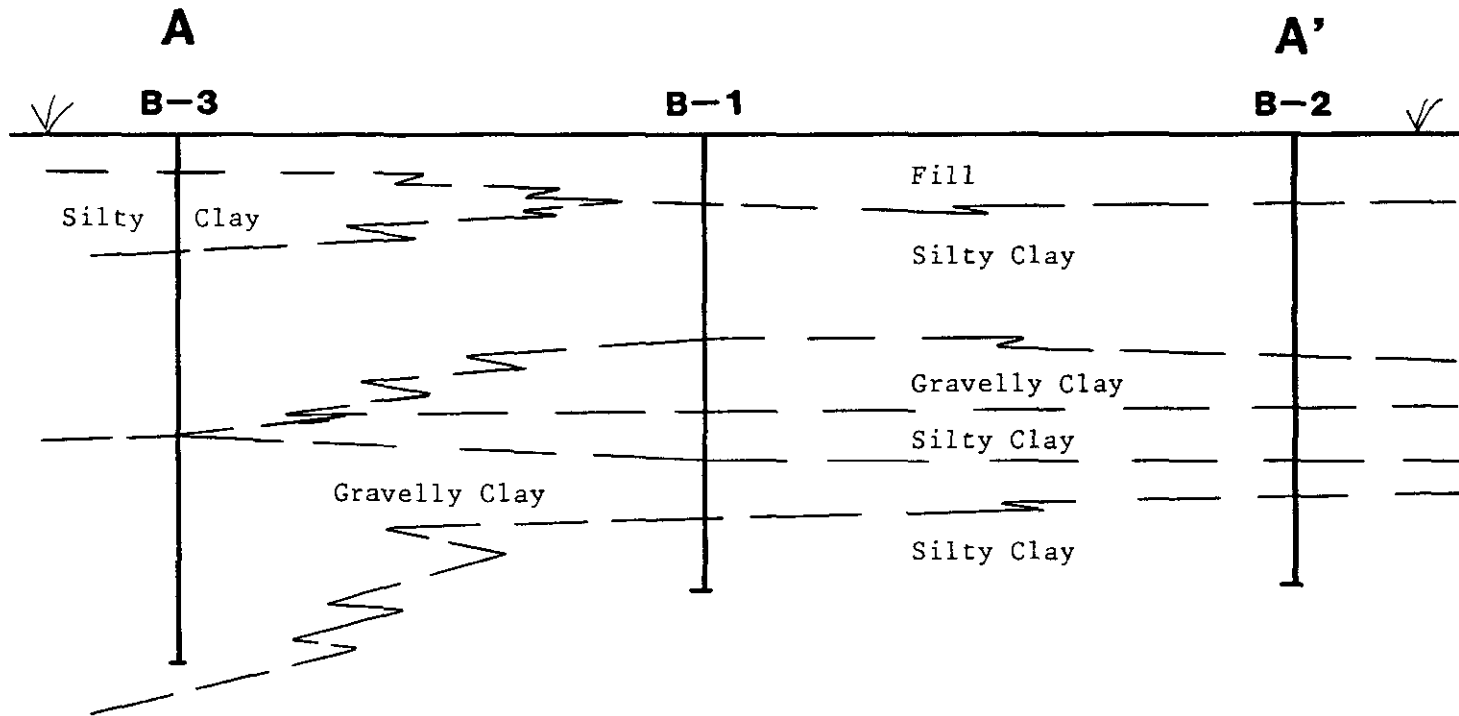
## LOG OF BORING B-3

Arco Station  
First and Ray Street  
Pleasanton, California

PLATE

P-9

PROJECT NO. AGS 87065-1



PLATE

P-10

CROSS SECTION A - A'  
Arco Station  
First and Ray Street  
Pleasanton, California



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PROJECT NO. AGS 87065-1

APPENDIX





ALAMEDA COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT

5997 PARKSIDE DRIVE PLEASANTON, CALIFORNIA 94566 (415) 484-2600

GROUNDWATER PROTECTION ORDINANCE PERMIT APPLICATION

FOR APPLICANT TO COMPLETE

FOR OFFICE USE

(1) LOCATION OF PROJECT Arco Service Station
First & Ray Streets
Pleasanton, CA

PERMIT NUMBER 87152
LOCATION NUMBER

(2) CLIENT
Name UNOCAL Corp
Address 2176 N. Calif. Ste 650 Phone 945-7676
City Walnut Creek Zip 94596

Approved Craig A. Mayfield Date 30 Jun 87
Craig A. Mayfield

(3) APPLICANT
Name Applied GeoSystems \*
Address 43255 Mission Blvd Phone 651-1906
City Fremont Zip 94539

PERMIT CONDITIONS

Circled Permit Requirements Apply

(4) DESCRIPTION OF PROJECT
Water Well Construction \_\_\_ Geotechnical X
Cathodic Protection \_\_\_ Well Destruction \_\_\_

GENERAL

- 1. A permit application should be submitted so as to arrive at the Zone 7 office five days prior to proposed starting date.
2. Notify this office (484-2600) at least one day prior to starting work on permitted work and before placing well seals.
3. Submit to Zone 7 within 60 days after completion of permitted work the original Department of Water Resources Water Well Drillers Report or equivalent for well projects, or bore hole logs and location sketch for geotechnical projects. Permitted work is completed when the last surface seal is placed or the last boring is completed.
4. Permit is void if project not begun within 90 days of approval date.

(5) PROPOSED WATER WELL USE
Domestic \_\_\_ Industrial \_\_\_ Irrigation \_\_\_
Municipal \_\_\_ Monitoring \_\_\_ Other 4 soil borings backfill w neat cement

WATER WELLS, INCLUDING PIEZOMETERS

- 1. Minimum surface seal thickness is two inches of cement grout placed by tremie, or equivalent.
2. Minimum seal depth is 50 feet for municipal and industrial wells or 20 feet for domestic, irrigation, and monitoring wells unless a lesser depth is specially approved.

(6) PROPOSED CONSTRUCTION
Drilling Method:
Mud Rotary \_\_\_ Air Rotary \_\_\_ Auger X
Cable \_\_\_ Other \_\_\_

GEOTECHNICAL. Backfill bore hole with compacted cuttings or heavy bentonite and upper two feet with compacted material.

WELL PROJECTS

Drill Hole Diameter \_\_\_ In. Depth \_\_\_ ft.
Casing Diameter \_\_\_ In. Number \_\_\_
Surface Seal Depth \_\_\_ ft.
Driller's License No. C-57 # 480802

CATHODIC. Fill hole above anode zone with concrete placed by tremie, or equivalent.

GEOTECHNICAL PROJECTS

Number 4
Diameter 8 In. Maximum Depth 45 ft.

WELL DESTRUCTION. See attached.

(7) ESTIMATED STARTING DATE 7/1/87 a
ESTIMATED COMPLETION DATE 7/2/87

\* Applied Geo Systems Representative: Mr. Glenn Dembroff

(8) I hereby agree to comply with all requirements of this permit and Alameda County Ordinance No. 73-68.

a Starting date: 30 Jun 87 according to Mr. Bill Short by phone 29 Jun 87

APPLICANT'S SIGNATURE

G. R. Dembroff DIRECTOR

Date 6-25-87







**Applied GeoSystems**

43255 Mission Blvd. Suite B Fremont, CA 94539 (415) 651-1906

## RECORD OF ANALYSIS

Date 7-7-87

Applied GeoSystems  
43255 Mission Blvd.  
Fremont, CA. 94539

Attention: William R. Short

Date Received: 7-1-87  
Date Analyzed: 7-1-87

Laboratory# 8707S011

### Procedure:

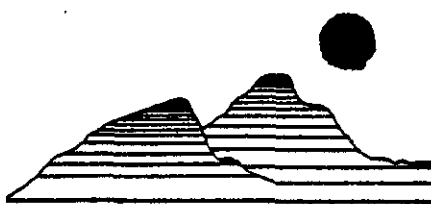
The soil samples referenced on the attached Chain-of-Custody were analyzed for the presence and concentration of Benzene, Ethyl-Benzene, Toluene, and Xylenes (BETX) and for Total Volatile Hydrocarbons (TVH) by EPA method 8020. The samples were concentrated on a Tekmar LSC-2 and ALS automatic sampler prior to injection into a 5890 Hewlett Packard gas chromatograph fitted with a Photo-Ionization detector (PID) and a Flame Ionization detector (FID). The limit of detection for these samples is 0.05 milligrams/kilogram (parts per million = ppm).

The results are presented in the table below:

| <u>SAMPLE</u> | <u>SITE</u> | <u>BENZENE</u> | <u>ETHYL<br/>BENZENE</u> | <u>TOLUENE</u> | <u>TOTAL<br/>XYLENES</u> | <u>TVH</u> |
|---------------|-------------|----------------|--------------------------|----------------|--------------------------|------------|
| S-35-B1       | 87065-1     | 2.06           | 0.84                     | 1.02           | 6.59                     | 126.13     |
| S-45-B1       | 87065-1     | 0.64           | 0.26                     | 1.06           | 1.47                     | 9.36       |
| S-35-B2       | 87065-1     | 1.47           | 1.81                     | 1.58           | 18.09                    | 56.81      |
| S-45-B2       | 87065-1     | 0.07           | 0.18                     | 0.26           | 1.30                     | 9.09       |
| S-10-B3       | 87065-1     | ND             | ND                       | ND             | ND                       | ND         |
| S-30-B3       | 87065-1     | 3.95           | 0.13                     | 0.51           | 0.85                     | 7.72       |

Results in milligrams/kilogram (parts per million = ppm).  
ND=Non Detectable - Less than 0.05 milligrams/kilogram (ppm).

Tia Tran, Chemist



**Applied GeoSystems**

43255 Mission Blvd. Suite B Fremont, CA 94539 (415) 651-1906

## RECORD OF ANALYSIS

Date 7-7-87

Applied GeoSystems  
43255 Mission Blvd.  
Fremont, CA. 94539

Attention: William R. Short

Date Received: 7-1-87  
Date Analyzed: 7-1-87

Laboratory# 8707S010

### Procedure:

The soil samples referenced on the attached Chain-of-Custody were analyzed for the presence and concentration of Benzene, Ethyl-Benzene, Toluene, and Xylenes (BETX) and for Total Volatile Hydrocarbons (TVH) by EPA method 8020. The samples were concentrated on a Tekmar LSC-2 and ALS automatic sampler prior to injection into a 5890 Hewlett Packard gas chromatograph fitted with a Photo-Ionization detector (PID) and a Flame Ionization detector (FID). The limit of detection for these samples is 0.5 milligrams/kilogram (parts per million = ppm).

The results are presented in the table below:

| <u>SAMPLE</u> | <u>SITE</u> | <u>BENZENE</u> | <u>ETHYL<br/>BENZENE</u> | <u>TOLUENE</u> | <u>TOTAL<br/>XYLENES</u> | <u>TVH</u> |
|---------------|-------------|----------------|--------------------------|----------------|--------------------------|------------|
| S-20-B1       | 87065-1     | 17.1           | 17.0                     | 73.6           | 92.3                     | 281.9      |
| S-25-B2       | 87065-1     | 13.1           | 6.1                      | 6.3            | 56.2                     | 188.8      |
| S-40-B3       | 87065-1     | 12.4           | 9.4                      | 47.8           | 45.1                     | 180.7      |

Results in milligrams/kilogram (parts per million = ppm).

Tia Tran, Chemist

Applied GeoSystems is a State of California, Department of Health Services Certified Hazardous Waste Testing Laboratory (No. 153).

## RECORD OF ANALYSIS

Date 7-7-87

Applied GeoSystems  
43255 Mission Blvd.  
Fremont, CA. 94539

Attention: William R. Short

Date Received: 7-1-87  
Date Analyzed: 7-7-87

Laboratory# 8707DS04

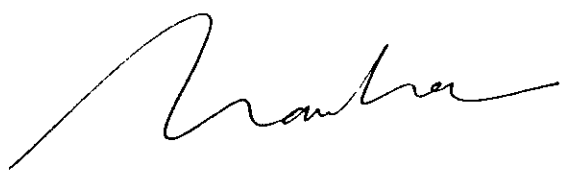
### Procedure:

The soil sample was analyzed for high boiling point hydrocarbons by EPA method 3550 for soil extraction. The sample was injected into a 5890 Hewlett Packard gas chromatograph fitted with a Flame Ionization detector (FID). The limit of detection for this sample is 5 milligrams/kilogram (parts per million = ppm).

The results are presented in the table below:

| <u>SAMPLE</u> | <u>SITE</u> | <u>TOTAL EXTRACTABLE<br/>HYDROCARBONS</u> |
|---------------|-------------|---|
| S-35-B1       | 87065-1     | 1320                                      |

Results in milligrams/kilogram (parts per million = ppm).



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Tia Tran, Chemist