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**CITY OF EMERYVILLE
REDEVELOPMENT AGENCY**

2200 POWELL STREET, SUITE 1200
EMERYVILLE, CALIFORNIA 94608

(415) 596-4350

November 4, 1991

Susan Hugo
Alameda County Health Care Services Agency
Hazardous Materials Program
80 Swan Way, Room 200
Oakland, CA 94621

**RE: Environmental Assessment
1056 - 48th Street, Emeryville, CA 94608**

Dear Ms. Hugo:

The Emeryville Redevelopment Agency conducted a Phase 3 Assessment for the above referenced property to address your department's concerns regarding; subsurface conditions, groundwater gradient and direction, extent of on-site soil and/or groundwater contamination - particularly lead, PNAs, and oil and grease, and finally remediation alternatives.

As you have requested in your letter dated June 3, 1991, a copy of the Phase 3 Assessment Final Report has been enclosed. A copy has also been sent to the Regional Water Quality Control Board to the attention of Lester Feldman.

We look forward to our next meeting to be scheduled at the Regional Board's offices to discuss more reasonable remediation alternatives for this site. Please let me know as soon as possible when the date and time has been determined.

We hope to bring this situation to a resolution together.

Sincerely,

Maria B. Bigornia
Assistant Projects Coordinator

ENVIRONMENTAL ASSESSMENT
PHASE 3
1056-48TH STREET
EMERYVILLE, CALIFORNIA
SCI 537.006

Prepared for:

Ms. Maria Bigornia
City of Emeryville Redevelopment Agency
2200 Powell Street, 12th Floor
Emeryville, California 94608

By:



Sean O. Carson
Civil Engineer 45074 (expires 3/31/94)



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171 - 12th Street, Suite 201
Oakland, California 94607
(415) 268-0461

September 29, 1991



I INTRODUCTION

This report records the results of a Phase 3 environmental assessment performed by Subsurface Consultants, Inc. (SCI) for the site at 1056 48th Street in Emeryville, California. The project location is shown on the Site Plan, Plate 1. SCI previously performed Phase 1 and 2 preliminary environmental assessments of the site and presented the results in correspondence dated February 8, March 11, and April 5, 1991.

During the Phase 1 study, SCI obtained four near-surface soil samples for analytical testing. The samples were composited and analytically tested for petroleum hydrocarbons, benzene, toluene, xylenes, and ethylbenzene (BTXE), volatile halocarbons, heavy metals, cyanide, and semi-volatile organics. Each of the samples from the composite were then individually analyzed for the detected contaminants. The results indicated the presence of diesel, polynuclear aromatic hydrocarbons (PNA's) and lead that were considered high enough to warrant further investigation. The concentrations of cyanide, cadmium, BTXE and volatile halocarbons were low; accordingly, the risks associated with these materials were also considered to be low.

During the Phase 2 assessment, SCI drilled eight test borings and performed analytical tests to determine the extent of diesel, PNA and lead contaminated soils at the site. The results indicated that relatively low concentrations of diesel exist in the approximate upper 1 foot of soil across the site. PNA and

significant lead concentrations also exist in the approximate upper one foot of soil near the former residence, and motor oil was detected in soil (Boring 8 @ 9') adjacent to the former Temescal Creek channel. None of the analytes were detected in a "grab" groundwater sample from one of the test borings (Boring 6).

We concluded that the diesel concentrations in the near-surface soils were low enough to not warrant remediation, and recommended that the soil containing PNA's and significant lead concentrations be remediated. We also concluded that because the motor oil concentration in Boring 8 @ 9' was 15,000 mg/kg, the regulatory agencies may require further study and/or groundwater monitoring. In their letter dated June 3, 1991, the Alameda County Health Care Services Agency (ACHCSA) required that the extent of soil and groundwater contamination at the site be investigated and characterized.

The purpose of this Phase 3 assessment, as outlined in our Work Plan dated June 18, 1991, was to explore subsurface conditions with test borings and monitoring wells, collect soil and groundwater samples, and perform analytical tests to develop conclusions and/or recommendations regarding:

1. Subsurface conditions,
2. Groundwater gradient and direction,
3. The presence of oil and grease, total extractable hydrocarbons, soluble lead and/or PNA's in the soil and groundwater samples tested,
4. The extent of on-site soil and/or groundwater contamination,

5. The significance of contaminant levels with respect to state and local regulatory criteria,
6. The scope of future investigation/monitoring, if necessary, and
7. Remediation alternatives.

II FIELD EXPLORATION

A. Test Borings

Subsurface conditions at the site were explored by drilling 7 test borings (in addition to those which were drilled during the previous assessment phases) at the locations shown on Plate 1. Test borings 9 through 11 were drilled using trailer-mounted, 6-inch-diameter solid flight auger equipment to depths of about 12 feet. Test borings MW-1 through MW-3 and Boring 12 were drilled using trailer-mounted, 8-inch-diameter, hollow stem auger equipment to depths ranging from about 17 to 28 feet. The drilling and sampling equipment was steam cleaned prior to each use. Soil cuttings generated during drilling were encapsulated in polyethylene sheets and left on-site for later disposal by others.

At the completion of drilling, test borings 9 through 12 were backfilled with cement grout. Groundwater monitoring wells were installed in Test Borings MW-1 through MW-3.

Our geologist/engineer observed drilling operations and prepared logs of the soils encountered. The logs of the test borings are presented on Plates 4 through 9. The logs of all borings drilled during the Phase 1 and 2 assessments are presented

in Appendix A. Undisturbed soil samples were obtained from the test borings at frequent intervals. The samples were retained in brass sample liners. Teflon sheets were placed over the liner ends prior to capping, taping and labeling. The samples were refrigerated until delivery to the analytical laboratory. The samples were accompanied by Chain-of-Custody forms, copies of which are presented in Appendix B.

B. Groundwater Monitoring Wells

Schematic diagrams of the groundwater monitoring wells, as installed, are shown on the logs of test borings MW-1 through MW-3 (Plates 4 through 6). In summary, the monitoring wells consist of 2-inch-diameter, machine-slotted PVC pipe. The pipe is joined by threads (no gluing or riveting). The wells extend about 10 feet below the groundwater level measured in Boring 6 during the Phase 2 assessment. The well heads are locked, and are set below grade in utility boxes.

The wells were developed by surging and bailing with a pneumatic pump until the water became relatively clear. About 50 gallons of water was removed from each well. The well development logs are presented in Appendix C. The wells were relatively quick to recharge. The water was placed in steel drums and left on-site for later disposal by others. Prior to sampling, each well was purged of about 5 gallons of water. The groundwater samples were obtained using a pre-cleaned Teflon sampler. The water samples were placed in containers (that were pre-cleaned by the supplier) and refrigerated until delivery to the analytical laboratory. The

samples were accompanied by Chain-of-Custody records; copies of which are presented in Appendix B.

C. Groundwater Level Measurements

The depth to groundwater, below the top of each well casing, was periodically measured using an electronic well sounder. A level survey, using an assumed elevation reference, was performed to determine the top of casing (TOC) elevation of the monitoring wells. The direction and gradient of groundwater flow was determined based upon this data. The groundwater elevation contours for the August 22, 1991 reading are shown on Plate 1. Results of all groundwater readings to date are summarized in Table 1.

Table 1.
Groundwater Elevations

| <u>Well</u> | <u>Top of Casing Elevation</u> | <u>Date</u> | <u>Groundwater</u> | |
|-------------|------------------------------------|-------------|--------------------|-----------------------|
| | | | <u>Depth (ft)</u> | <u>Elevation (ft)</u> |
| MW-1 | 99.08 | 7/16/91 | 23.64 | 75.44 |
| | | 7/17/91 | 20.81 | 78.27 |
| | | 7/23/91 | 20.80 | 78.28 |
| | | 8/22/91 | 20.85 | 78.23 |
| MW-2 | 99.04 | 7/16/91 | 21.11 | 77.93 |
| | | 7/17/91 | 21.09 | 77.95 |
| | | 7/23/91 | 21.09 | 77.95 |
| | | 8/22/91 | 21.13 | 77.91 |
| MW-3 | 99.43 | 7/16/91 | 21.48 | 77.95 |
| | | 7/17/91 | 21.45 | 77.98 |
| | | 7/23/91 | 21.47 | 77.96 |
| | | 8/22/91 | 21.54 | 77.89 |

¹ Elevation Reference: Top of curb at southeast corner of the property (see Plate 1) is assumed to be at elevation 100.00 feet

III ANALYTICAL TESTING

Analytical testing was performed by Curtis and Tompkins, Ltd., a State of California Department of Health Services (DHS) certified analytical laboratory for the tests performed. The analytical testing program was limited to contaminants detected during our previous investigations. Accordingly, the samples were analyzed for:

1. Total extractable hydrocarbons, TEH, EPA Methods 8015 modified/3550,
2. Total and soluble lead, EPA 7421 and CCR Title 26 Section 22-66700,
3. Polynuclear aromatic hydrocarbons (EPA 8270/3520), and
4. Hydrocarbon oil and grease (SMWW 17:5520 B&F)

The results of the analytical tests are presented in Tables 2 and 3. For completeness, the results of analytical tests performed during the Phase 1 and 2 assessments are also included. Copies of the laboratory analytical test reports are presented in Appendix B.

Table 2.
Analytical Test Results for Soil

| Sample | Total Extractable Hydrocarbons (mg/kg) ¹ | Oil and Grease (mg/kg) | Total Lead (mg/kg) |
|--------------|---|---------------------------|--------------------------|
| 1 @ 1' | 11 | -- ² | 23 |
| 2 @ 1' | 10 | -- | 18 |
| 3 @ 1' | 24 | -- | 280 |
| 4 @ 1' | 97 | -- | 91 |
| 5 @ 2' | <10 ³ | -- | 6.5 |
| 5 @ 7' | <10 | -- | 4.4 |
| 6 @ 3' | <10 | -- | 3.0 |
| 6 @ 6' | <10 | -- | <3.0 |
| 6 @ 10' | <10 | -- | 3.5 |
| 7 @ 4' | <10 | -- | 5.4 |
| 7 @ 8' | <10 | -- | <3.0 |
| 8 @ 5' | <10 | -- | |
| 8 @ 9' | 15,000 ⁴ | -- | |
| 8 @ 16' | <10 | -- | |
| 9 @ 4' | <1.0 | <50 | |
| 9 @ 7' | <1.0 | <50 | |
| 10 @ 9' | <100 | 5000 | |
| 11 @ 7' | <100 | 3100 | |
| 11 @ 11' | <1.0 | <50 | |
| MW-1 @ 5.5' | <100 | 8800 | |
| MW-1 @ 11.5' | <1.0 | <50 | |
| MW-1 @ 13' | <1.0 | <50 | |
| MW-2 @ 3' | <1.0 | <50 | |
| MW-2 @ 8' | <1.0 | <50 | |

¹ mg/kg = milligrams per kilogram = parts per million (ppm)

² -- = Test not requested

³ Less than the reporting limit specified

⁴ Motor oil range

Table 3.
Analytical Test Results for Groundwater

| <u>Sample</u> | <u>Total Extractable Hydrocarbons (ug/l)</u> | <u>Hydrocarbon Oil and Grease (mg/l)</u> | <u>Soluble Lead (ug/l)</u> | <u>Polynuclear Aromatic Hydrocarbons (ug/l)</u> |
|---------------|--|--|------------------------------------|---|
| MW-1 | <50 | <5 | -- | -- |
| MW-2 | <50 | <5 | -- | -- |
| MW-3 | <50 | <5 | <3 | <5 |

IV SITE CONDITIONS

A. Geology

The site is located on a broad alluvial plain bordered by the Berkeley Hills on the east and San Francisco Bay on the west. According to a geologic map by Radbruch (1957)¹, the site is underlain by the Temescal Formation, an alluvial fan deposit comprised of interfingered lenses of clayey gravel, sandy silty clay and sand-clay-silt mixtures. The historic alignment of Temescal Creek is directly north of the site.

B. Surface Conditions

The relatively level, rectangular site measures about 40 by 120 feet. It is bordered on the south by 48th Street, on the north by the Alameda County Flood Control and Water Conservation District easement, and on east and west by residences.

¹ "Areal and Engineering Geology of the Oakland West Quadrangle, California," U.S.G.S. Map I-239.

Based upon our review of aerial photographs of the area taken in 1959 and 1977² and plans for the ACFC&WCD³, the site was formerly occupied by a single family house. The footprint of the structure is shown on Plate 1. In addition, Temescal Creek extended along the north property boundary. According to long-term neighborhood residents, the house burned during the early 1970's. By the 1977 photo, the house had been removed. The Temescal Creek channel was filled by August 1974 according to "as-built" plans by the ACFC&WCD.

We understand that Temescal Creek currently runs through a reinforced concrete arch culvert along the north property line. Part of the culvert runs beneath the property, as shown on Plate 1. The culvert extends to a depth of about 20 feet, as shown on Plate 2, Cross Sections. Fill was placed in the area above and adjacent to the culvert to create the existing relatively level site.

The site is currently vacant and used for vehicle parking. Vegetation consists mostly of sparse grasses, trees and bushes.

C. Subsurface Conditions

1. Soil Conditions

Based upon the results of our field explorations, subsurface conditions at the site primarily consist of fill overlying native clayey soils, as shown on Plate 2. The north part of the site is

² Pacific Aerial Surveys AV-337-07-23/24 (1959) and AV-1377-06-18/19 (1977)

³ Alameda County Flood Control and Water Conservation District, Zone No. 12 Project, Line A, Plan and Profile, File CB-381 Sheets 2 and 9.

blanketed by fill which was apparently placed above and adjacent to the culvert and within the previous creek alignment. It extends to depths of 4 feet in Boring 1, 11 feet in Boring 11 and 20 feet adjacent to the culvert. The fill thickness decreases with distance away from the north property line. The estimated limit of creek channel fill is shown on Plate 1. The fill at the center of the site is likely associated with the former house. It extends to a depth of about 4 feet in Test Borings 4 and 5. The fill consists of silty clays and clayey sands. It also contains brick fragments, gravel and fire related debris.

Beneath the fill, and at the groundsurface elsewhere, are native soils which consist of interbedded layers of sandy and silty clays and clayey sands.

During drilling, there were no visual or olfactory indications of contamination. No organic vapors were detected by an organic vapor meter (OVM) which was used to screen selected soil samples.

2. Groundwater Conditions

Groundwater was encountered at depths of about 20 to 21 feet during drilling in Boring 6 and Monitoring Wells MW-1 thru MW-3. Groundwater was not encountered in the other borings during drilling. During the most recent reading, groundwater depths in the monitoring wells ranged from about 21 to 22 feet. The direction of groundwater flow was to the west. The groundwater gradient on August 22, 1991 is shown on Plate 1. No free product was present in the wells. No sheen was noted on the groundwater samples.

V CONCLUSIONS

A. General

As discussed in our previous report, the analytical test results indicate that diesel, motor oil, cyanide, polynuclear aromatic hydrocarbons (PNA), cadmium and lead exist in soils at the site. The analytical results for groundwater samples did not detect lead, diesel, oil and grease or PNA's at concentrations above detection limits. As a result, we conclude that groundwater has not been impacted. A summary of the analytical results for soil is presented on the Site Plan, Plate 1. Our conclusions regarding each contaminant are presented in the following paragraphs.

B. Diesel

Diesel was detected in the shallow soil samples from Borings 1 through 4 at concentrations ranging from 10 to 97 mg/kg. Diesel was not detected below a depth of about one foot. The source of diesel is currently uncertain. There are no indications that an underground diesel storage tank formerly existed on the property. We judge that the diesel is most likely related to the use of the site as a parking area.

Given that diesel concentrations are less than 100 ppm and appear to involve only the upper foot of soil, we conclude that the diesel concentrations will likely not require remediation. However, since the samples containing the highest concentrations of

diesel also contain elevated lead and PNA's, most of the diesel will be removed as part of lead/PNA remediation.

C. Oil and Grease

Oil and grease range hydrocarbons were detected in soils along the previous Temescal Creek channel alignment. Oil and grease were present at concentrations ranging from 3100 mg/kg (Boring 11 @ 7 feet) to 15,000 mg/kg (Boring 8 @ 4 feet). It appears that the contamination exists primarily within soils used to fill the creek channel. The source of the contamination is currently unknown. In our opinion, it may be associated with (1) asphaltic concrete debris in the fill, (2) an oil release in the rear yard area, or (3) contaminated soils brought to the site as fill. Given the relatively high oil and grease concentrations, remediation and/or additional study will likely be required.

D. Cyanide

Cyanide was encountered in Borings 1, 3 and 8 at concentrations of 0.3 and 0.4 mg/kg. These concentrations are low and are at or near the analytical detection limit (0.3 mg/kg). The source of cyanide is unknown. However, we speculate that the cyanide is related to the use of pest control materials at the site. We judge that the cyanide contamination does not require further study or remediation. However, from a practical standpoint these materials will likely be removed during other remedial activities on-site.

E. Polynuclear Aromatic Hydrocarbons

Polynuclear aromatic hydrocarbons (PNA's) were detected in soils from Borings 3 and 4, which were located near the former structure on-site. The cumulative concentration of total PNA's ranged from 1,060 ug/kg (Boring 3 @ 1 foot) to 31,020 ug/kg (Boring 4 @ 1 foot). PNA's were not encountered below a depth of 1 foot. In our opinion, the PNA's are likely associated with fire related debris from the previous structure on site or possibly, contaminated fill materials brought on-site. No specific regulatory criteria exists for the cleanup of PNA's in soil. However, given that the concentrations are relatively high, and the soils containing PNA's also contain high lead concentrations, we recommend remediation of the soils which contain the PNA's.

F. Cadmium and Lead

Cadmium and lead were detected in many of the soil samples selected for analysis. The cadmium and lead concentrations were generally relatively low and consistent with typical background concentrations in an urban environment. However, the lead concentrations in Borings 3 and 4, which were located near the former structure, were considered relatively high. The elevated lead concentrations do not appear to exist at depths in excess of about 3 feet. The soluble lead concentration in soil from Test Boring 3 (9.4 mg/l) is above the Soluble Threshold Limit Concentration for lead of 5.0 mg/l. Accordingly, this material will likely require remediation. The source of lead is uncertain. However, it is likely paint and other building materials from the

former structure, or possibly contaminated fill material imported to the site.

G. Remedial Alternatives

Various remedial alternatives exist, as discussed in our letter dated September 17, 1991. These alternatives include the following:

1. Cap the site and monitor groundwater,
2. Mass excavation and disposal of all fill materials, and
3. Identification and disposal of contaminant hot spots.

Based on our discussion with you, we have developed the following Work Plan to implement Alternative 3.

VI REMEDIATION

A. Lead/PNA Remediation

1. Obtaining and analyzing additional soil samples.

Additional soil samples should be obtained from shallow test pits within the previous building area. Two samples should be obtained from each pit, one at a depth of 6 inches and one at a depth of 18 to 24 inches below grade. The samples should be obtained and analytically tested for PNA's, total lead, oil and grease and diesel, in accordance with the protocol outlined in Section D.

2. Remove Contaminated Soil Near Hot Spots

The surface soils near Borings 3 and 4 and other hot spots identified by the additional sampling should be removed. We anticipate excavations on the order of 1 to 2 feet deep. All soils containing lead greater than 100 ppm and total PNA's and cyanide above detection limits should be removed. The lateral extent of excavation should be determined in the field by our engineer based on (1) the results of the analytical tests, and (2) visual observations. In general, soils within about 5 to 10 feet of the samples containing elevated contaminant levels and those containing visually apparent contaminants should be removed and stockpiled on-site.

3. Obtain and Analytically Test Confirmation Soil Samples from Excavations

In order to document soil clean up efforts, soil samples should be obtained and analyzed from the side walls and bottoms of the excavations. The samples should be obtained and analyzed in accordance with the protocol outlined in Section D. A sidewall sample should be obtained at a depth of about 1 foot for every ten linear feet of excavation sidewall. A bottom sample should be obtained for about every 250 square feet of excavation bottom. The samples should be analytically tested for PNA's, total lead, diesel and cyanide.

4. Backfill Excavations

The excavation should be backfilled with clean imported fill satisfying the requirements of the SCI soil report dated January 29, 1991. The fill should be placed and compacted in accordance with the recommendations presented in the report.

B. Oil and Grease Hydrocarbon Remediation

The oil and grease contaminated soils near Borings 8, 10, 11 and MW-1 should be remediated by excavation and disposal. Based on the test borings, and analytical data the contaminants appear to extend to depths of about 10 feet. The lateral extent of the contamination should be determined in the field during excavation. Visually contaminated soils should be excavated and stockpiled separately on-site. Samples should be obtained at the limits of the excavation to document contaminant concentrations left in-place. If practical, all soils containing more than 100 ppm of oil and grease should be removed. *

C. Stockpile Characterization and Soil Disposal

The soil stockpiles should be sampled at a rate of 1 composite of 4 soil samples per 50 cubic yards of soil. * Analytical testing of the stockpiled soils will be conducted in order to qualify the soils for landfill disposal. The selected testing program will depend on individual landfill requirements.

D. Environmental Sampling and Analytical Testing Protocol

Soil samples will be obtained along the sidewalls and bottom of the excavations to (1) document the extent of contamination, and (2) to confirm that adequate cleanup has been achieved. Soil samples will be obtained in clean 2-inch-diameter brass liners utilizing hand sampling equipment. The ends of the liners will be sealed with Teflon sheeting, plastic caps and duct tape. The samples will be refrigerated on-site until delivery to the analytical laboratory.

Soil samples will be transmitted to a Department of Health Services certified analytical laboratory along with appropriate chain-of-custody documents. The analytical testing program will include the analyses presented in Section III of this report.

E. Groundwater Monitoring

It appears that groundwater has not been significantly impacted to date. In accordance with Regional Water Quality Control Board requirements (RWQCB), a groundwater monitoring program will need to be implemented at the site using the present wells. The proposed program is outlined below.

The downgradient well MW-2 will be sampled and analyzed on a quarterly basis for one year. The other two wells will be monitored during the last event for the year. During each event, groundwater levels will be measured to reevaluate gradient and flow direction. If the gradient and/or flow direction changes significantly, the other wells will be sampled and analyzed during the year. Prior to sampling, the wells will be purged of at least

3 volumes of water and allowed to recharge to 80 percent of there initial volume. The samples will be analyzed for oil and grease, diesel and BTXE. If the test results indicate no detectable concentrations for one hydrogeologic cycle (4 consecutive monitoring events) and no significant concentrations of hydrocarbon contaminants have been left in-place, a request to cease monitoring will be filed with the Alameda County Health Care Services Agency and the RWQCB. Once the RWQCB acknowledges and accepts the request, the wells will be properly abandoned.

F. Reporting

Written reports will be prepared upon completion of each phase of remediation/monitoring. The reports will summarize services performed at the site and will include site plans and analytical test reports, as appropriate.

A copy of this report should be provided to the following regulatory agencies:

Ms. Susan Hugo
Alameda County Health Care Services Agency
Hazardous Materials Program
80 Swan Way, Room #200
Oakland, CA 94621

Mr. Eddy So
California Regional Water Quality Control Board
San Francisco Bay Region
1800 Harrison Street
Oakland, CA 94612

List of Tables:

| | |
|---------|--|
| Table 1 | Groundwater Elevations |
| Table 2 | Analytical Test Results in Soil |
| Table 3 | Analytical Test Results in Groundwater |

List of Illustrations

| | |
|----------------|---|
| Plate 1 | Site Plan |
| Plate 2 | Cross Sections A and B |
| Plate 3 thru 8 | Logs of Monitoring Wells 1 thru 3 and Test Borings 9 thru 12 |
| Plate 9 | Unified Soil Classification System |

Appendix A:

Test Borings 1 through 8,
from Phase 1 and 2 Assessment

Appendix B:

Laboratory Analytical Test Reports,
Chain-of-Custody Forms

Appendix C:

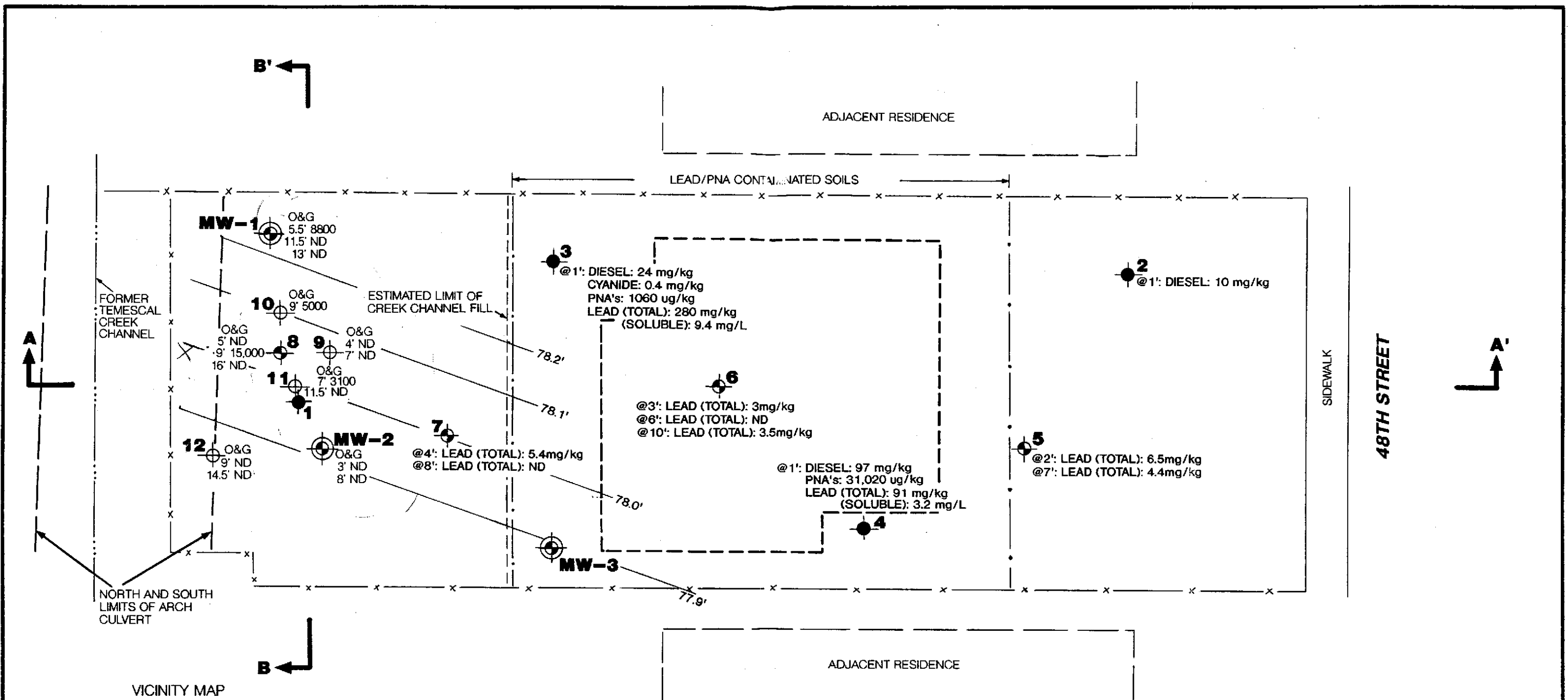
Well Development Logs

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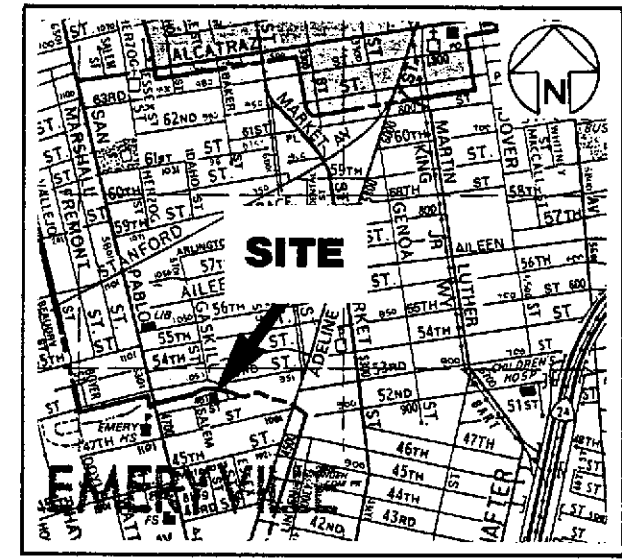
6 copies:

Ms. Maria Bigornia
City of Emeryville Redevelopment Agency
2200 Powell Street, 12th Floor
Emeryville, California 94608

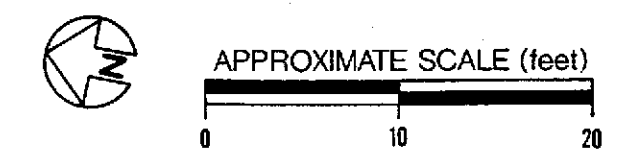
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VICINITY MAP

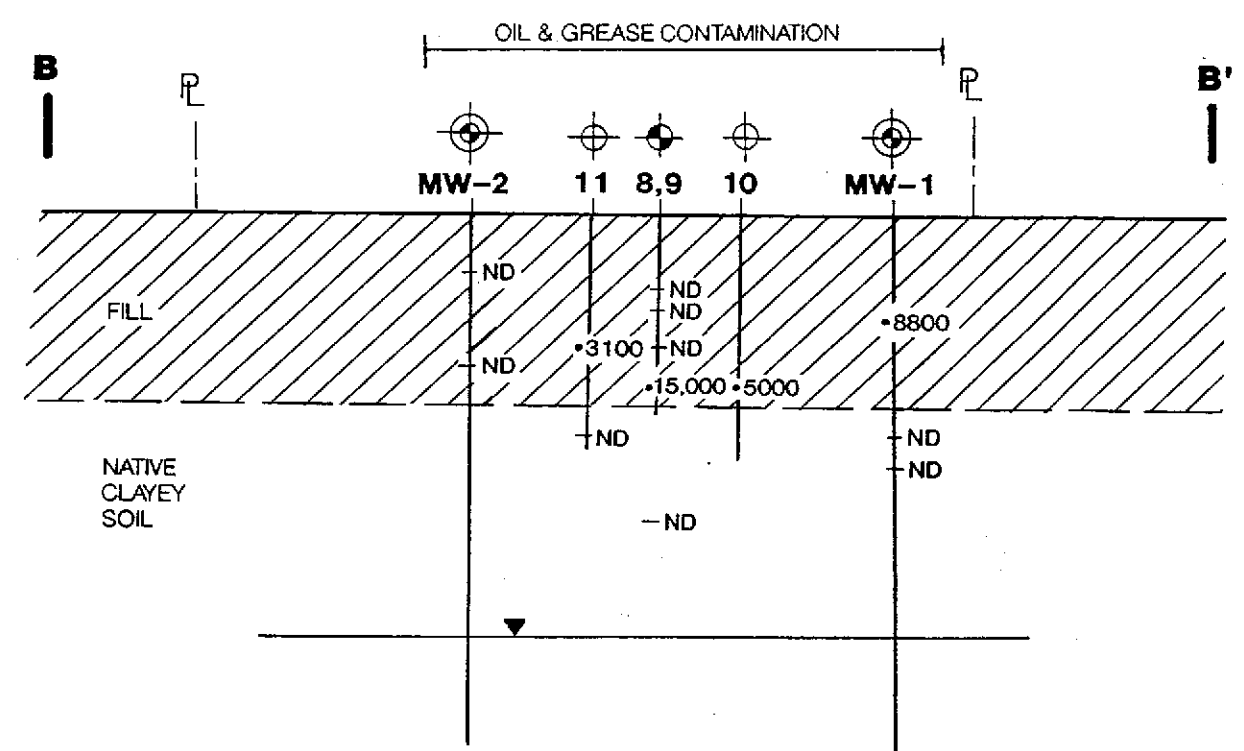
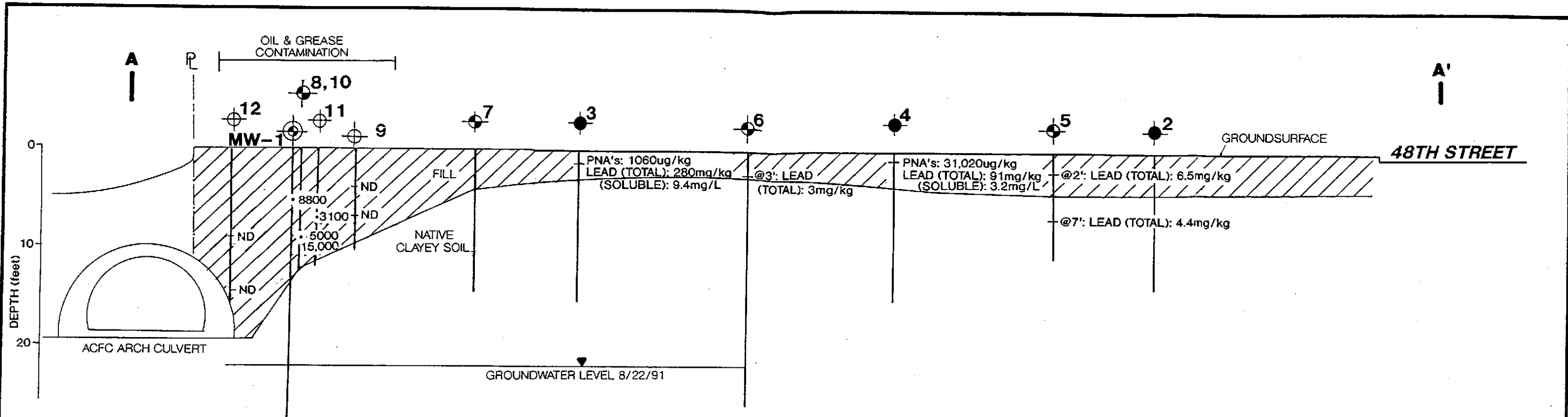


- APPROXIMATE OUTLINE OF FORMER RESIDENCE
- TEST BORING, PHASE 1 STUDY
- ⊙ TEST BORING, PHASE 2 STUDY
- ⊕ TEST BORING, PHASE 3 STUDY
- ⊗ MONITORING WELL
- x- FENCE
- 78.0' GROUNDWATER CONTOURS FOR AUGUST 22, 1991 READING
- ▲▲ CROSS SECTION (see plate 2)
- 8800 HIGHEST OIL AND GREASE CONCENTRATION ENCOUNTERED IN SOIL (mg/kg) (ND=NOT DETECTED, <50mg/kg)

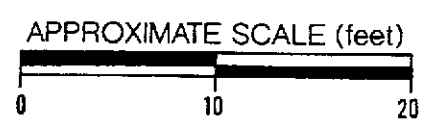


Subsurface Consultants

| | | | |
|-----------------------------------|------|--------------------------------|-------------------|
| SITE PLAN | | | PLATE 1 |
| 1056 48TH STREET - EMERYVILLE, CA | | | |
| JOB NUMBER 537.006 | DATE | APPROVED <i>[Signature]</i> | |



• OIL AND GREASE CONCENTRATION (mg/kg)
 ND = NONE DETECTED (<50mg/kg)



**CROSS SECTIONS
A - A' & B - B'**

| | | | |
|-------------------------------|-----------------------------------|-----------------|--------------------------------|
| Subsurface Consultants | 1056 48TH STREET - EMERYVILLE, CA | | PLATE |
| | JOB NUMBER 537.006 | DATE 8/26/91 | APPROVED <i>[Signature]</i> |

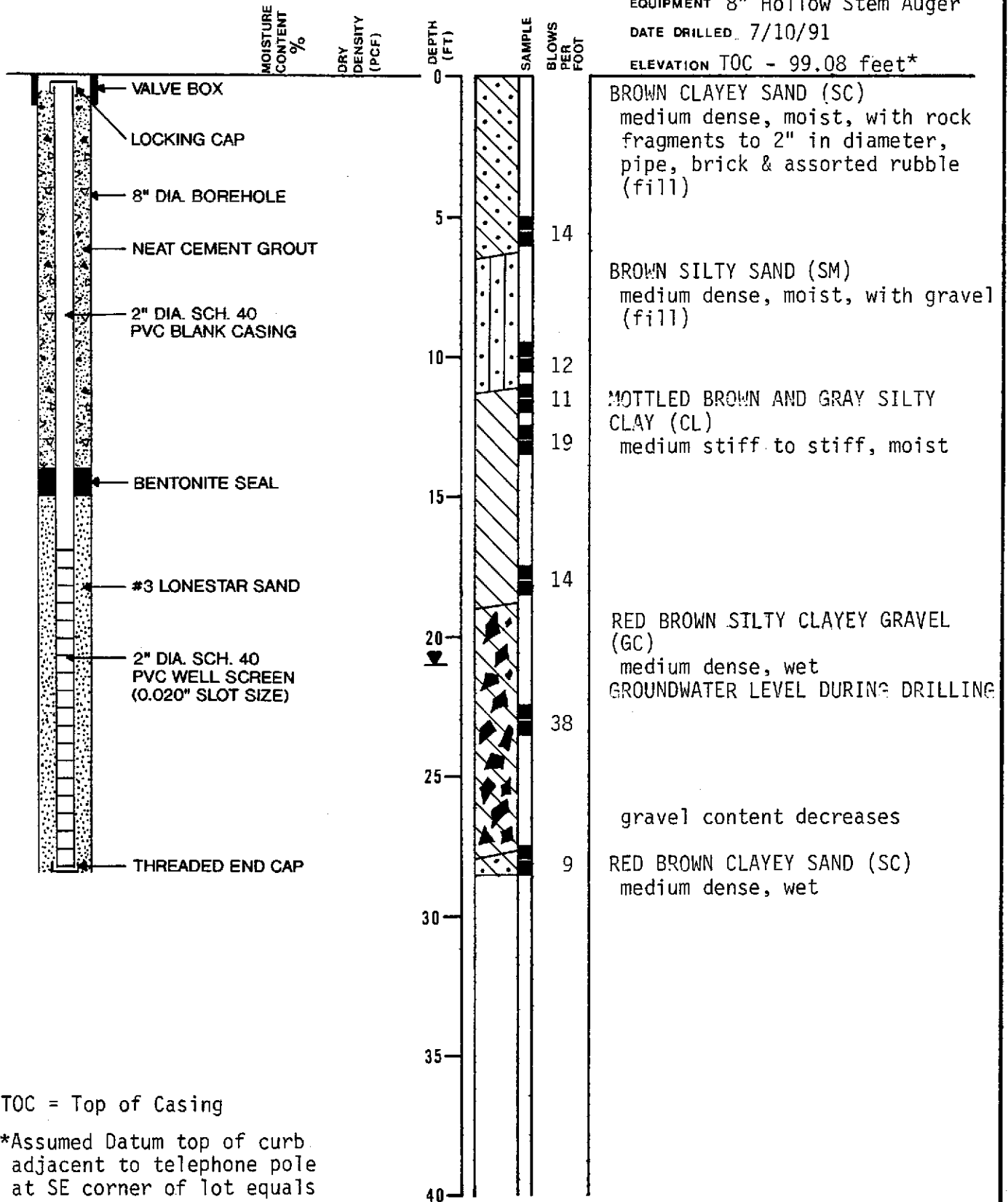
2

LOG OF TEST BORING MW-1

EQUIPMENT 8" Hollow Stem Auger

DATE DRILLED 7/10/91

ELEVATION TOC - 99.08 feet*



TOC = Top of Casing

*Assumed Datum top of curb adjacent to telephone pole at SE corner of lot equals 100 feet.

Subsurface Consultants

1056 48TH STREET - EMERYVILLE, CA

JOB NUMBER
537.006

DATE
7/19/91

APPROVED
[Signature]

PLATE

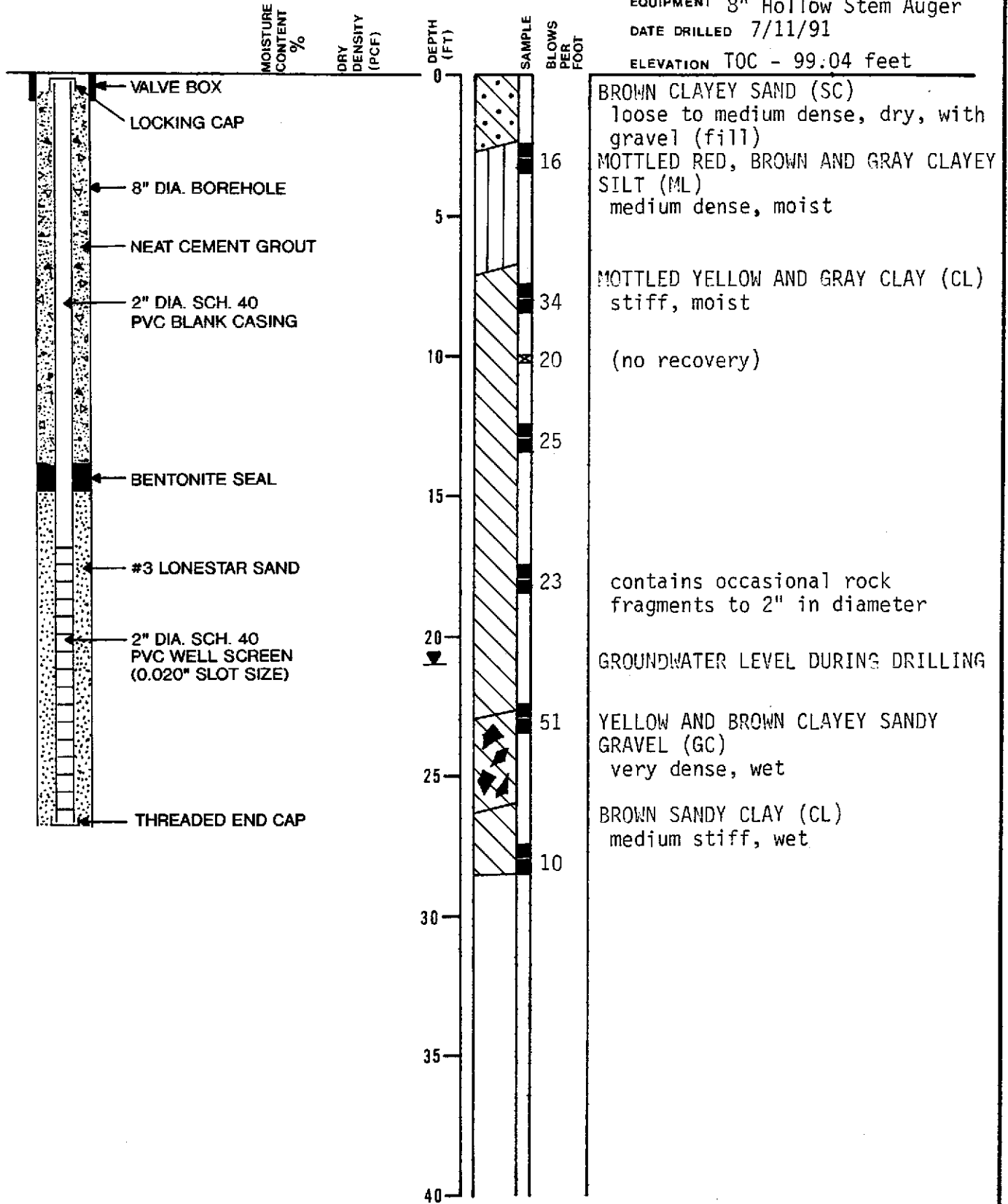
3

LOG OF TEST BORING MW-2

EQUIPMENT 8" Hollow Stem Auger

DATE DRILLED 7/11/91

ELEVATION TOC - 99.04 feet



Subsurface Consultants

1056 48TH STREET - EMERYVILLE, CA

PLATE

JOB NUMBER

DATE

APPROVED

537.006

7/19/91

[Signature]

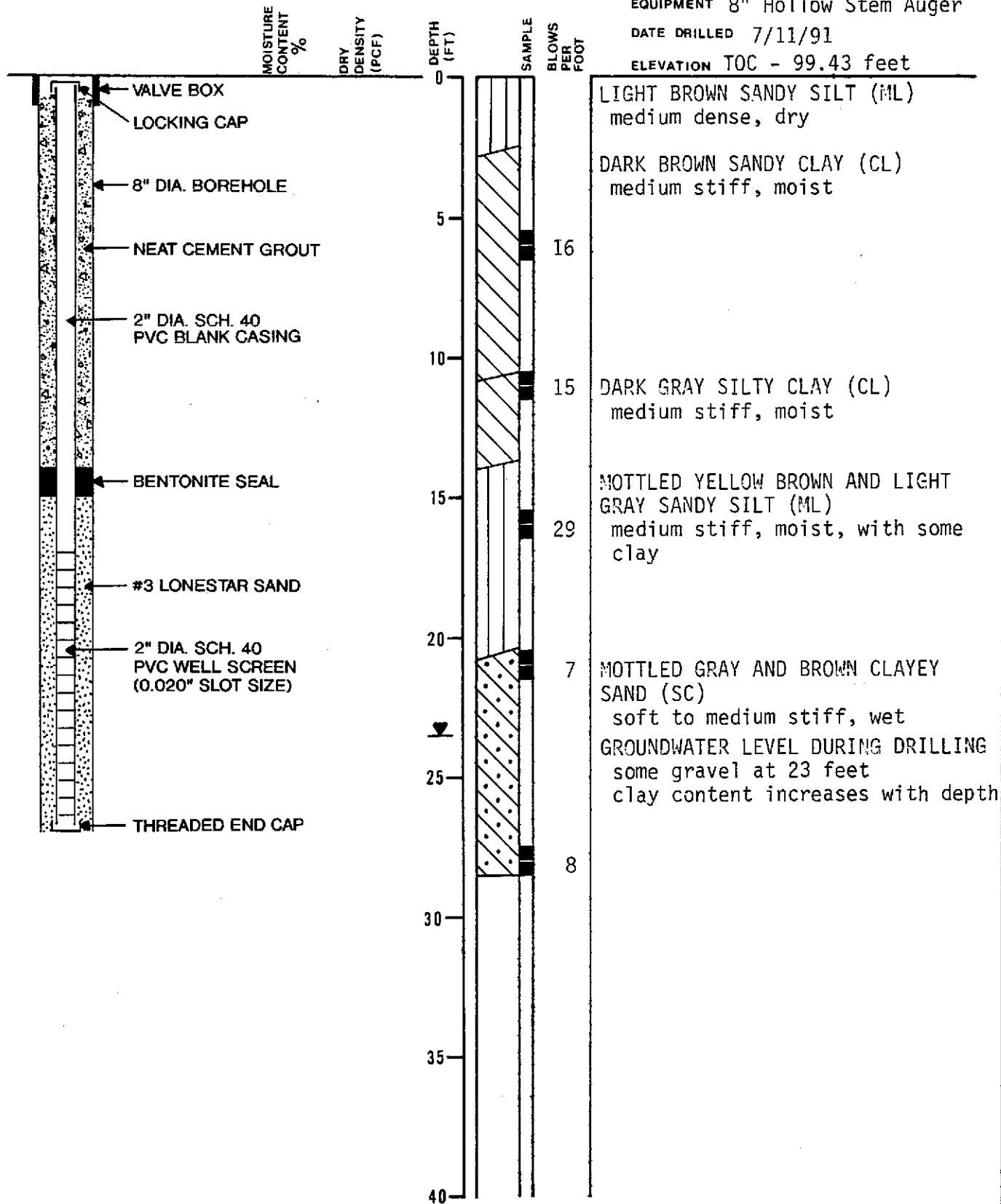
4

LOG OF TEST BORING MW-3

EQUIPMENT 8" Hollow Stem Auger

DATE DRILLED 7/11/91

ELEVATION TOC - 99.43 feet



Subsurface Consultants

1056 48TH STREET - EMERYVILLE, CA

JOB NUMBER
537.006

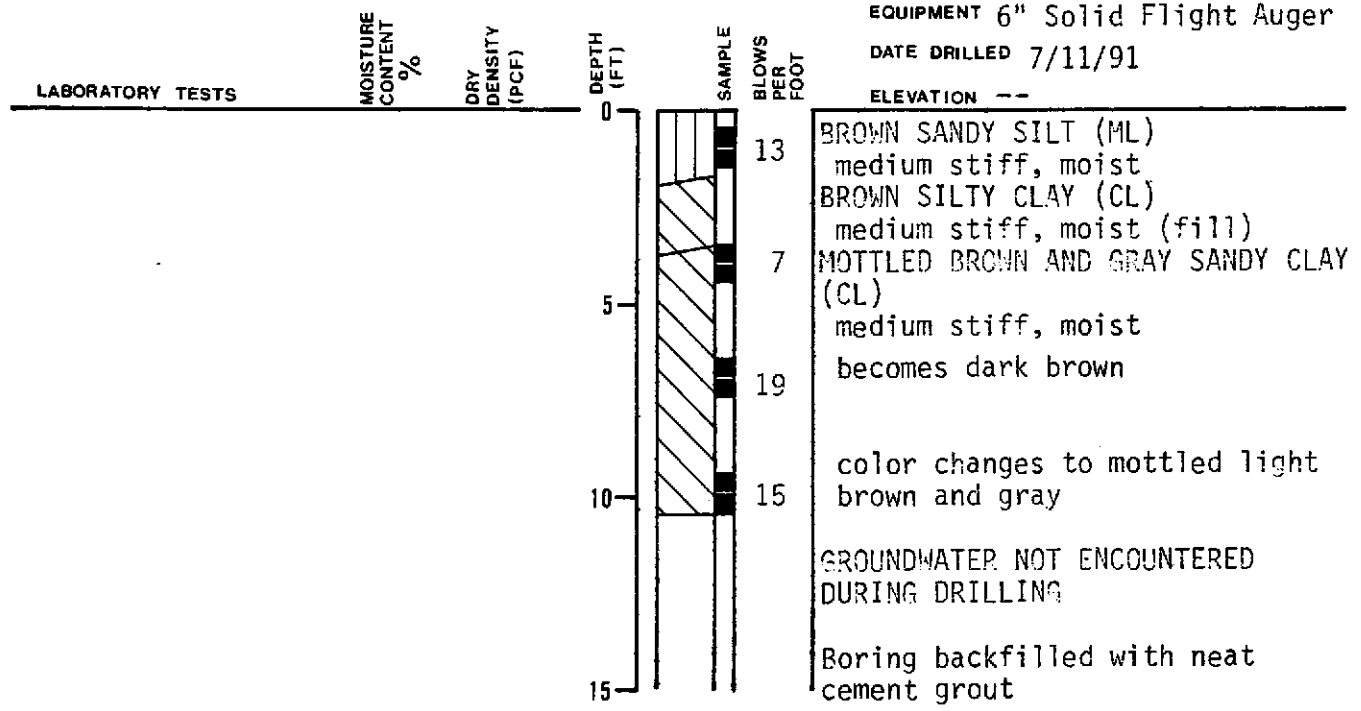
DATE
7/19/91

APPROVED
[Signature]

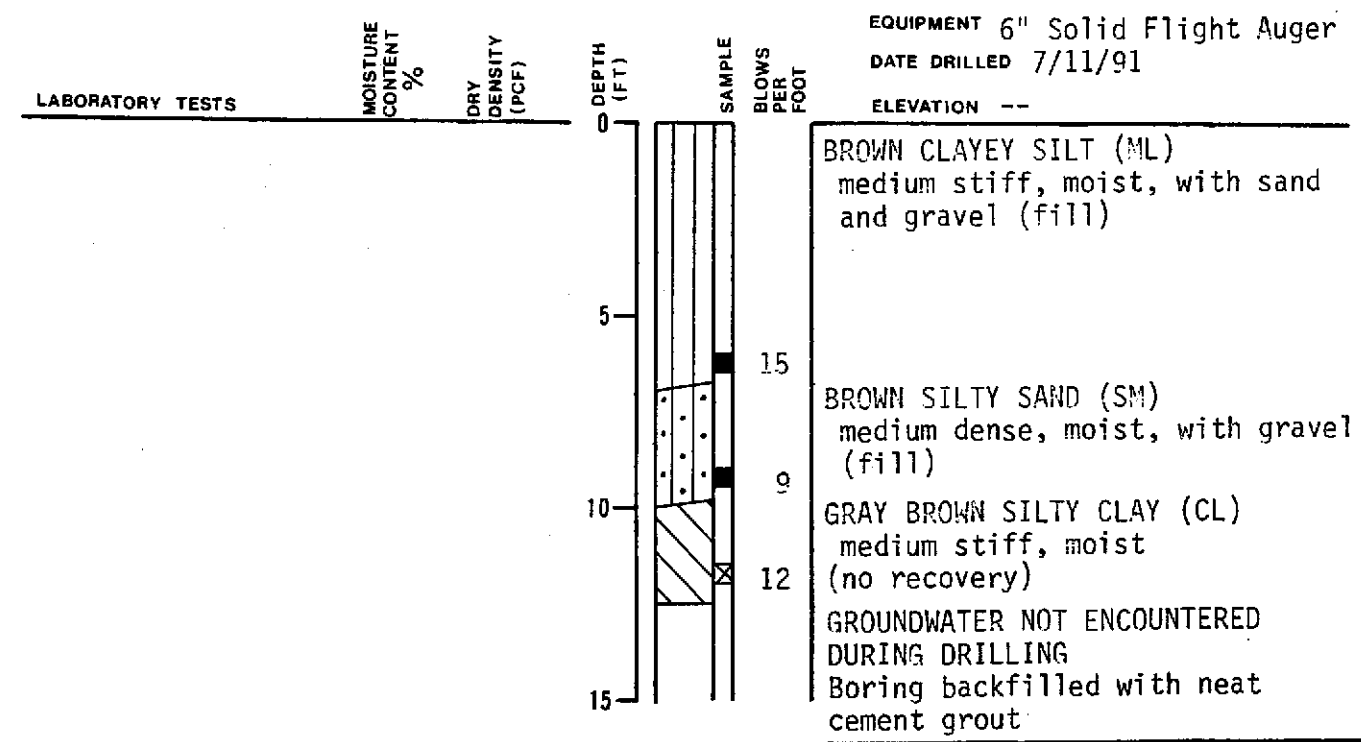
PLATE

5

LOG OF TEST BORING 9



LOG OF TEST BORING 10



Subsurface Consultants

1056 48TH STREET - EMERYVILLE, CA

JOB NUMBER
537.006

DATE
7/19/91

APPROVED
See

PLATE

6

LOG OF TEST BORING 11

EQUIPMENT 6" Solid Flight Auger

DATE DRILLED 7/11/91

ELEVATION --

LABORATORY TESTS

MOISTURE
CONTENT
%

DRY
DENSITY
(PCF)

DEPTH
(FT)

SAMPLE

BLOWS
PER
FOOT



DARK BROWN CLAYEY SILT (ML)
loose to medium dense, dry (fill)

MOTTLED BROWN SANDY CLAY (CL)
medium stiff, moist (fill)

18

32

DARK BROWN AND BLACK SILTY SAND (SM)
medium dense, moist, with asphalt concrete fragments (fill)

15 (no recovery)

16

GRAY SILTY CLAY (CL)
medium stiff, moist

GROUNDWATER NOT ENCOUNTERED DURING DRILLING

Boring backfilled with neat cement grout

Subsurface Consultants

1056 48TH STREET - EMERYVILLE, CA

JOB NUMBER
537.006

DATE
7/19/91

APPROVED
[Signature]

PLATE

7

LOG OF TEST BORING 12

EQUIPMENT 8" Hollow Stem Auger

DATE DRILLED 7/10/91

ELEVATION --

LABORATORY TESTS

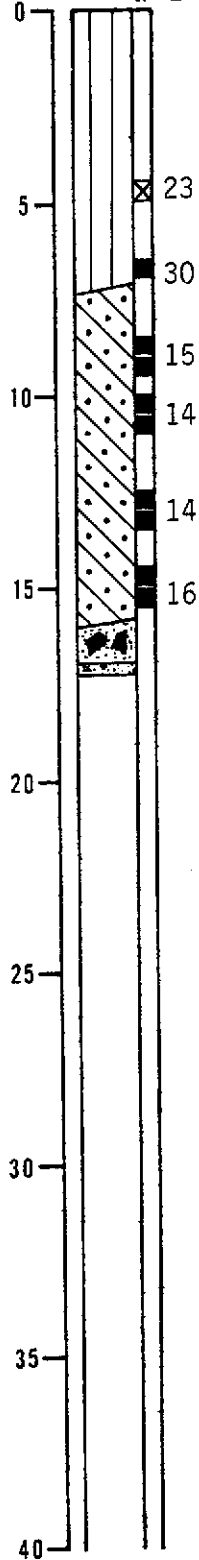
MOISTURE
CONTENT
%

DRY
DENSITY
(PCF)

DEPTH
(FT)

SAMPLE

BLOWS
PER
FOOT



BROWN SANDY SILT (ML)
medium stiff, moist, with plastic
glass and concrete fragments
(fill)

(no recovery)
concrete rubble from 4 to 7 feet

MOTTLED BROWN YELLOW CLAYEY
GRAVELLY SAND (SC)
medium dense, moist (fill)

GRAY SANDY GRAVEL (GP)
medium dense, moist (fill)
CONCRETE
very hard, slow drilling

GROUNDWATER NOT ENCOUNTERED
DURING DRILLING

Boring backfilled with neat
cement grout

Subsurface Consultants

1056 48TH STREET - EMERYVILLE, CA

JOB NUMBER
537.006

DATE
7/19/91

APPROVED
See

PLATE

8

| GENERAL SOIL CATEGORIES | | | SYMBOLS | TYPICAL SOIL TYPES |
|--|---|--------------------------------------|---|--|
| COARSE GRAINED SOILS More than half is larger than No. 200 sieve | GRAVEL More than half coarse fraction is larger than No. 4 sieve size | Clean Gravel with little or no fines | GW | Well Graded Gravel, Gravel-Sand Mixtures |
| | | | GP | Poorly Graded Gravel, Gravel-Sand Mixtures |
| | | Gravel with more than 12% fines | GM | Silty Gravel, Poorly Graded Gravel-Sand-Silt Mixtures |
| | | | GC | Clayey Gravel, Poorly Graded Gravel-Sand-Clay Mixtures |
| | SAND More than half coarse fraction is smaller than No. 4 sieve size | Clean sand with little or no fines | SW | Well Graded Sand, Gravelly Sand |
| | | | SP | Poorly Graded Sand, Gravelly Sand |
| | | Sand with more than 12% fines | SM | Silty Sand, Poorly Graded Sand-Silt Mixtures |
| | | | SC | Clayey Sand, Poorly Graded Sand-Clay Mixtures |
| FINE GRAINED SOILS More than half is smaller than No. 200 sieve | SILT AND CLAY Liquid Limit Less than 50% | ML | Inorganic Silt and Very Fine Sand, Rock Flour, Silty or Clayey Fine Sand, or Clayey Silt with Slight Plasticity | |
| | | CL | Inorganic Clay of Low to Medium Plasticity, Gravelly Clay, Sandy Clay, Silty Clay, Lean Clay | |
| | | OL | Organic Clay and Organic Silty Clay of Low Plasticity | |
| | SILT AND CLAY Liquid Limit Greater than 50% | MH | Inorganic Silt, Micaceous or Diatomaceous Fine Sandy or Silty Soils, Elastic Silt | |
| | | CH | Inorganic Clay of High Plasticity, Fat Clay | |
| | | OH | Organic Clay of Medium to High Plasticity, Organic Silt | |
| HIGHLY ORGANIC SOILS | | | PT | Peat and Other Highly Organic Soils |

UNIFIED SOIL CLASSIFICATION SYSTEM

Subsurface Consultants

1056 48TH STREET - EMERYVILLE, CA

JOB NUMBER
537.006

DATE
9/16/91

APPROVED
[Signature]

PLATE

9

LOG OF TEST BORING 1

EQUIPMENT 6" Solid Flight Auger

DATE DRILLED 12/4/90

ELEVATION --

LABORATORY TESTS

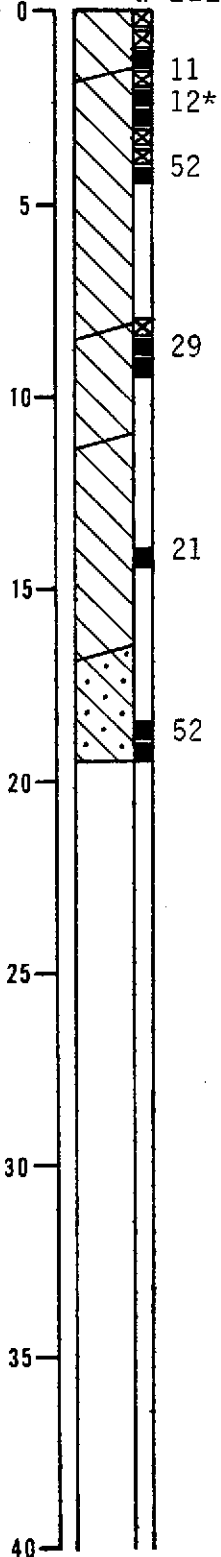
MOISTURE
CONTENT
%

DRY
DENSITY
(PCF)

DEPTH
(FT)

SAMPLE

BLOWS
PER
FOOT



DARK BROWN GRAVELLY CLAY (CL)
medium stiff, moist, with brick
fragments and rootlets

DARK BROWN SILTY CLAY (CL)
medium stiff, moist, with gravel
and brick fragments (fill)
stiff below 3 feet

MOTTLED LIGHT BROWN AND ORANGE
SANDY CLAY (CL)
medium stiff, moist, fine
grained sand with gravel (fill)

DARK BROWN SILTY CLAY (CL)
medium stiff, moist, with gravel

MOTTLED BROWN AND ORANGE CLAYEY
SAND (SC)
dense, moist, fine grained sand
with gravel

NO GROUNDWATER ENCOUNTERED
DURING DRILLING

PI = Plasticity Index
LL = Liquid Limit
UC = Unconfined compressive
Shear Strength

SAMPLER TYPE:
MODIFIED CALIFORNIA DRIVE
I.D.: 2.5 inches
O.D.: 3.0 inches
*CALIFORNIA DRIVE
I.D.: 2.0 inches
O.D.: 2.5 inches

HAMMER WEIGHT: 140 pounds
HAMMER DROP: 30 inches

Subsurface Consultants

1056 48TH STREET - EMERYVILLE, CA

JOB NUMBER
537.006

DATE
12/7/90

APPROVED
[Signature]

PLATE

2

LOG OF TEST BORING 2

EQUIPMENT 6" Solid Flight Auger

DATE DRILLED 12/4/90

ELEVATION --

| LABORATORY TESTS | MOISTURE CONTENT % | DRY DENSITY (PCF) | DEPTH (FT) | SAMPLE | BLOWS PER FOOT | DESCRIPTION | |
|--------------------------------------|--------------------|-------------------|------------|--------|----------------|---|--|
| PI = 29% LL = 56% UC = 2340psf | 9.3 | 96 | 0 | | | BROWN SANDY CLAY (CL) | |
| | 12.3 | -- | | | 14 | medium stiff, moist, fine grained sand, porous | |
| | 24.0 | 84 | | | 8* | | |
| | | | | 5 | | 18 | BLACK SILTY CLAY (CH) medium stiff, moist |
| | 14.7 | 109 | | | 20 | MOTTLED BROWN AND ORANGE CLAYEY SAND (SC) medium dense, moist, fine to coarse grained sand | |
| | 29.6 | 93 | | | 27* | DARK BROWN SILTY CLAY (CL) stiff, moist NO GROUNDWATER ENCOUNTERED DURING DRILLING | |

LOG OF TEST BORING 3

EQUIPMENT 6" Solid Flight Auger

DATE DRILLED 12/4/90

ELEVATION --

| LABORATORY TESTS | MOISTURE CONTENT % | DRY DENSITY (PCF) | DEPTH (FT) | SAMPLE | BLOWS PER FOOT | DESCRIPTION |
|--------------------------------------|--------------------|-------------------|------------|--------|----------------|--|
| PI = 12% LL = 32% UC = 2130psf | 10.3 | | 0 | | | BROWN SANDY CLAY (CL) |
| | 12.7 | 85 | | | 13 | medium stiff, moist, fine grained sand |
| | | | | | 9* | |
| | 22.0 | 85 | 5 | | 17 | BLACK SILTY CLAY (CH) medium stiff, moist |
| | 21.4 | 98 | 10 | | 25 | occasional gravel below 10 feet |
| | 24.0 | 99 | 15 | | 28 | NO GROUNDWATER ENCOUNTERED DURING DRILLING |

Subsurface Consultants

1056 48TH STREET - EMERYVILLE, CA

JOB NUMBER

537.006

DATE

12/7/90

APPROVED

PLATE

3

LOG OF TEST BORING 4

EQUIPMENT 6" Solid Flight Auger

DATE DRILLED 12/4/90

ELEVATION --

| LABORATORY TESTS | MOISTURE CONTENT % | DRY DENSITY (PCF) | DEPTH (FT) | SAMPLE | BLOWS PER FOOT | DESCRIPTION |
|------------------|--------------------|-------------------|------------|--------|----------------|--|
| | 8.9 | 109 | 0 | | 18 | DARK BROWN CLAYEY SAND (SC) medium dense, moist, with gravel (fill) |
| PI = 9% | | | | | 11* | |
| LL = 25% | 17.5 | 104 | 5 | | 16 | BROWN SILTY CLAY (CL) medium stiff, moist |
| | | | | | | with occasional gravel below 7 feet |
| UC = 3070psf | 17.4 | 106 | 10 | | 19 | |
| | 25.4 | 93 | 15 | | 27 | NO GROUNDWATER ENCOUNTERED DURING DRILLING |

Subsurface Consultants

1056 48TH STREET - EMERYVILLE, CA

PLATE

JOB NUMBER
537.006

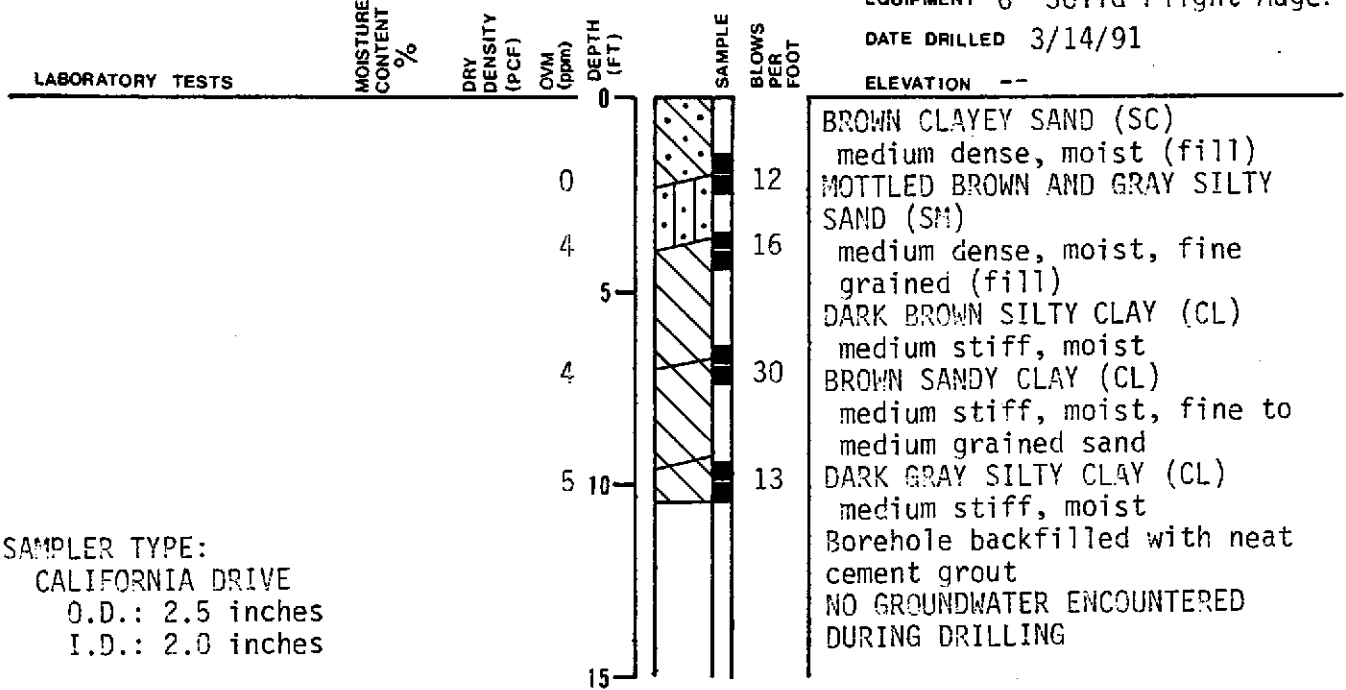
DATE
12/7/90

APPROVED
[Signature]

4

LOG OF TEST BORING 5

EQUIPMENT 6" Solid Flight Auger
 DATE DRILLED 3/14/91
 ELEVATION --



SAMPLER TYPE:
 CALIFORNIA DRIVE
 O.D.: 2.5 inches
 I.D.: 2.0 inches

HAMMER WEIGHT: 140 pounds
 HAMMER DROP: 30 inches

BROWN CLAYEY SAND (SC)
 medium dense, moist (fill)
 MOTTLED BROWN AND GRAY SILTY SAND (SM)
 medium dense, moist, fine grained (fill)
 DARK BROWN SILTY CLAY (CL)
 medium stiff, moist
 BROWN SANDY CLAY (CL)
 medium stiff, moist, fine to medium grained sand
 DARK GRAY SILTY CLAY (CL)
 medium stiff, moist
 Borehole backfilled with neat cement grout
 NO GROUNDWATER ENCOUNTERED DURING DRILLING

Subsurface Consultants

1056 48TH STREET - EMERYVILLE, CA
 JOB NUMBER 537.006
 DATE 3/15/91
 APPROVED

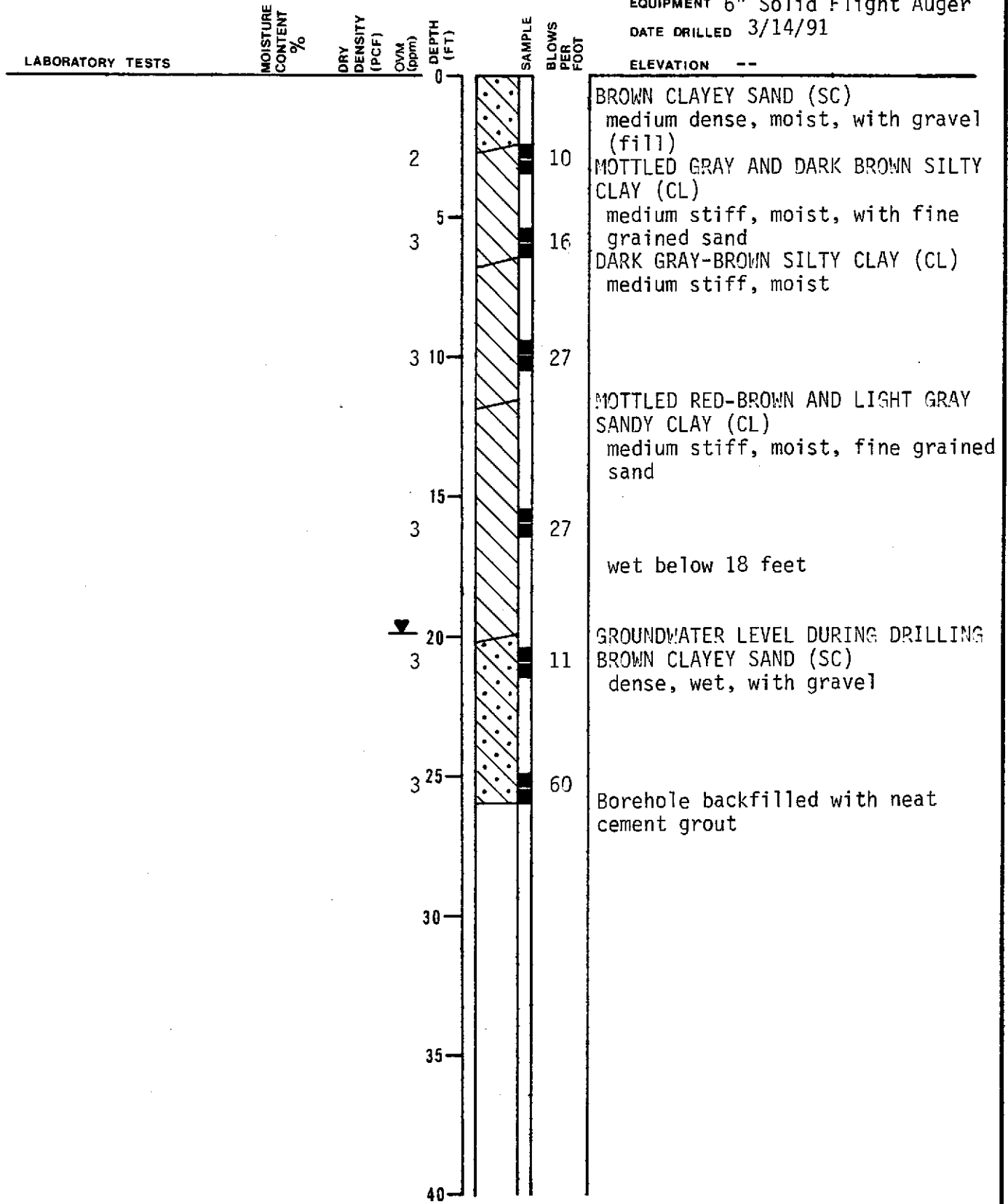
PLATE
5

LOG OF TEST BORING 6

EQUIPMENT 6" Solid Flight Auger

DATE DRILLED 3/14/91

ELEVATION --



Subsurface Consultants

1056 48TH STREET - EMERYVILLE, CA

PLATE

JOB NUMBER
537.006

DATE
3/15/91

APPROVED

6

LOG OF TEST BORING 7

EQUIPMENT 6" Solid Flight Auger

DATE DRILLED 3/14/91

ELEVATION --

LABORATORY TESTS

MOISTURE
CONTENT
%

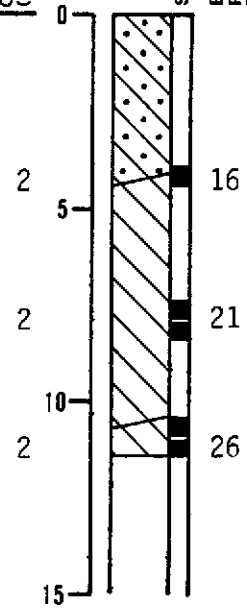
DRY
DENSITY
(PCF)

QVM
(ppm)

DEPTH
(FT)

SAMPLE

BLOWS
PER
FOOT



DARK BROWN CLAYEY SAND (SC)
medium dense, moist (fill)

DARK BROWN SILTY CLAY (CL)
medium stiff, moist, with sand

DARK GRAY SILTY CLAY (CL)
medium stiff, moist
Borehole backfilled with neat
cement grout
NO GROUNDWATER ENCOUNTERED
DURING DRILLING

Subsurface Consultants

1056 48TH STREET - EMERYVILLE, CA

JOB NUMBER
537.006

DATE
3/15/91

APPROVED

PLATE

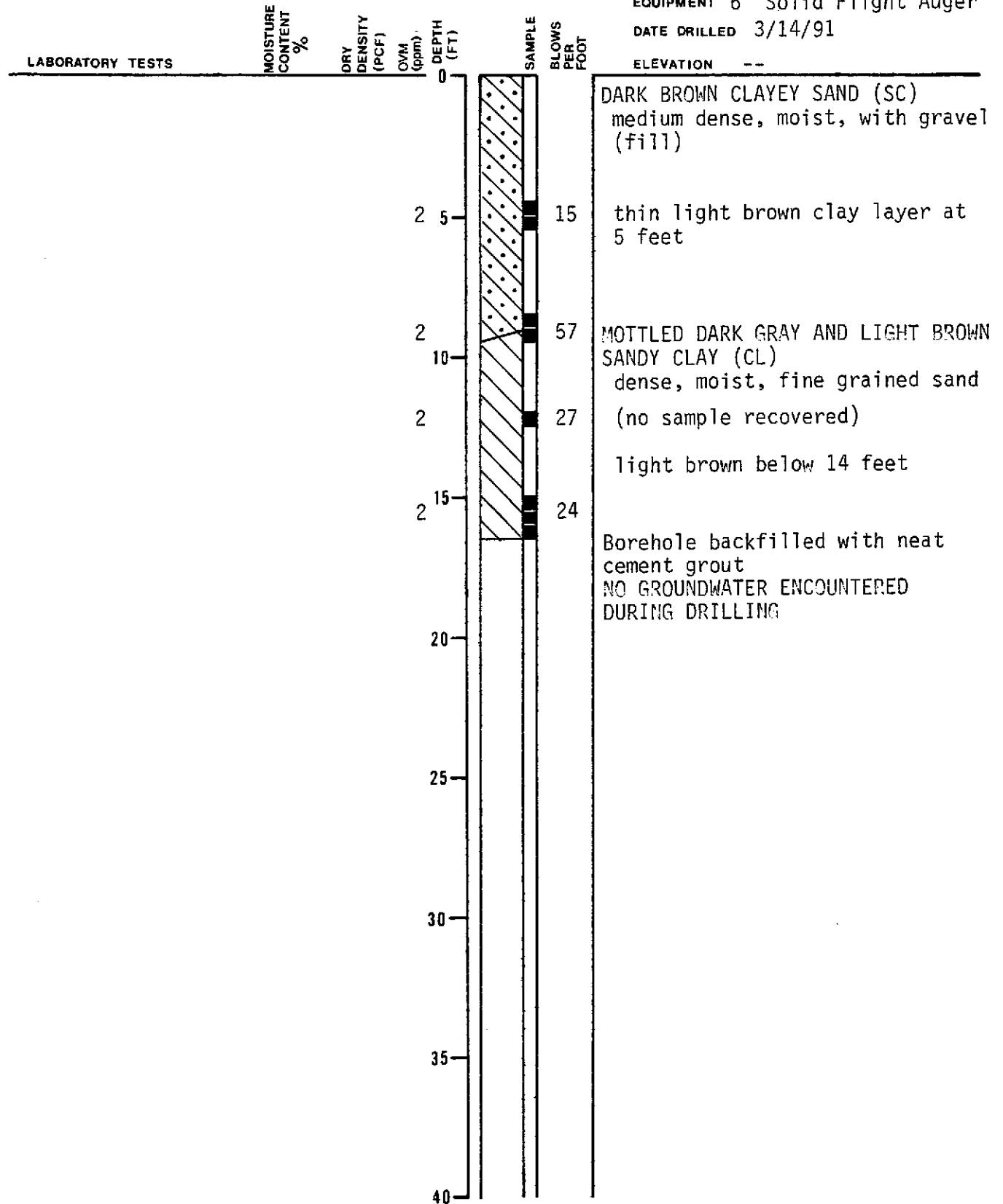
7

LOG OF TEST BORING 8

EQUIPMENT 6" Solid Flight Auger

DATE DRILLED 3/14/91

ELEVATION --



Subsurface Consultants

1056 48TH STREET - EMERYVILLE, CA

JOB NUMBER
537.006

DATE
3/15/91

APPROVED

PLATE

8



Curtis & Tompkins, Ltd., Analytical Laboratories, Since 1878

2323 Fifth Street, Berkeley, CA 94710, Phone (415) 486-0900

DATE RECEIVED: 07/15/91

DATE REPORTED: 07/23/91


LAB NUMBER: 104495

CLIENT: SUBSURFACE CONSULTANTS

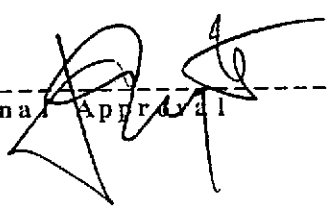
PROJECT ID: 537.006

LOCATION: 1056 48TH STREET

RESULTS: SEE ATTACHED



QA/QC Approval



Final Approval

Berkeley

Wilmington

Los Angeles



LABORATORY NUMBER: 104495
 CLIENT: SUBSURFACE CONSULTANTS
 PROJECT ID: 537.006
 LOCATION: 1056 48TH STREET

DATE RECEIVED: 07/15/91
 DATE EXTRACTED: 07/17/91
 DATE ANALYZED: 07/20/91
 DATE REPORTED: 07/23/91

Extractable Petroleum Hydrocarbons in Soils & Wastes
 California DOHS Method
 LUFT Manual October 1989

| LAB ID | SAMPLE ID | KEROSENE RANGE (mg/Kg) | DIESEL RANGE (mg/Kg) | REPORTING LIMIT* (mg/Kg) |
|-----------|-------------|------------------------------|----------------------------|--------------------------------|
| 104495-1 | MW-1@ 5.5' | ND | ND | 100 |
| 104495-2 | MW-1@ 11.5' | ND | ND | 1.0 |
| 104495-3 | MW-1@ 13' | ND | ND | 1.0 |
| 104495-4 | MW-2@ 3' | ND | ND | 1.0 |
| 104495-5 | MW-2@ 8' | ND | ND | 1.0 |
| 104495-6 | 9@ 4' | ND | ND | 1.0 |
| 104495-7 | 9@ 7' | ND | ND | 1.0 |
| 104495-8 | 10@ 9' | ND | ND | 100 |
| 104495-9 | 11@ 7' | ND | ND | 100 |
| 104495-10 | 11@ 11.5' | ND | ND | 1.0 |

ND = Not Detected at or above reporting limit.

*Reporting limit applies to all analytes.

QA/QC SUMMARY

| | |
|-------------|----|
| RPD, % | 14 |
| RECOVERY, % | 83 |

Client: Subsurface Consultants

Laboratory Login Number: 104495

 Project Name: 1056 48th Street'
 Project Number: 537.006

Report Date: 23 July 91

ANALYSIS: Hydrocarbon Oil & Grease (Gravimetric) METHOD: SMWW 17:5520EF

| Lab ID | Sample ID | Matrix | Sampled | Received | Analyzed | Result | Units | RL | Analyst | QC Batch |
|------------|--------------|--------|-----------|-----------|-----------|--------|-------|----|---------|----------|
| 104495-001 | MW-1 @ 5.5' | Soil | 10-JUL-91 | 15-JUL-91 | 22-JUL-91 | 8800 | mg/Kg | 50 | TR | 2108 |
| 104495-002 | MW-1 @ 11.5' | Soil | 10-JUL-91 | 15-JUL-91 | 22-JUL-91 | ND | mg/Kg | 50 | TR | 2108 |
| 104495-003 | MW-1 @ 13' | Soil | 10-JUL-91 | 15-JUL-91 | 22-JUL-91 | ND | mg/Kg | 50 | TR | 2108 |
| 104495-004 | MW-2 @ 3' | Soil | 11-JUL-91 | 15-JUL-91 | 22-JUL-91 | ND | mg/Kg | 50 | TR | 2108 |
| 104495-005 | MW-2 @ 8' | Soil | 11-JUL-91 | 15-JUL-91 | 22-JUL-91 | ND | mg/Kg | 50 | TR | 2108 |
| 104495-006 | 9 @ 4' | Soil | 11-JUL-91 | 15-JUL-91 | 22-JUL-91 | ND | mg/Kg | 50 | TR | 2108 |
| 104495-007 | 9 @ 7' | Soil | 11-JUL-91 | 15-JUL-91 | 22-JUL-91 | ND | mg/Kg | 50 | TR | 2108 |
| 104495-008 | 10 @ 9' | Soil | 11-JUL-91 | 15-JUL-91 | 22-JUL-91 | 5000 | mg/Kg | 50 | TR | 2108 |
| 104495-009 | 11 @ 7' | Soil | 11-JUL-91 | 15-JUL-91 | 22-JUL-91 | 3100 | mg/Kg | 50 | TR | 2108 |
| 104495-010 | 11 @ 11.5' | Soil | 11-JUL-91 | 15-JUL-91 | 22-JUL-91 | ND | mg/Kg | 50 | TR | 2108 |

ND = Not Detected at or above Reporting Limit (RL).



Q C Batch Report

Client: Subsurface Consultants
Project Name: 1056 48th Street'
Project Number: 537.006

Laboratory Login Number: 104495
Report Date: 23 July 91

ANALYSIS: Hydrocarbon Oil & Grease (Gravimetric)

QC Batch Number: 2108

Blank Results

Table with 6 columns: Sample ID, Result, MDL, Units, Method, Date Analyzed. Row 1: BLANK, ND, 50, mg/Kg, SMWW 17:552OEF, 22-JUL-91

Spike/Duplicate Results

Table with 4 columns: Sample ID, Recovery, Method, Date Analyzed. Rows: BS (92%), BSD (94%), SMWW 17:552OEF (22-JUL-91)

Summary table with 3 columns: Metric, Value, Control Limits. Rows: Average Spike Recovery (93%, 80% - 120%), Relative Percent Difference (1.7%, < 20%)



Curtis & Tompkins, Ltd., Analytical Laboratories, Since 1878

2323 Fifth Street, Berkeley, CA 94710, Phone (415) 486-0900

DATE RECEIVED: 08/05/91

DATE REPORTED: 08/08/91


LABORATORY NUMBER: 104717

CLIENT: SUBSURFACE CONSULTANTS

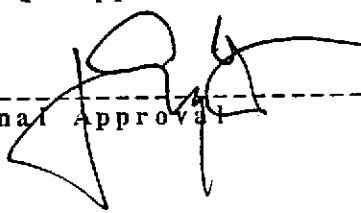
PROJECT ID: 537.006

LOCATION: 1056 48th STREET

RESULTS: SEE ATTACHED



QA/QC Approval



Final Approval

Berkeley

Wilmington

Los Angeles

Client: Subsurface Consultants

Laboratory Login Number: 104717

 Project Name: 1056 48th Street
 Project Number: 537.006

Report Date: 08 August 91

ANALYSIS: Hydrocarbon Oil & Grease (Gravimetric) METHOD: SMWW 17:5520EF

| Lab ID | Sample ID | Matrix | Sampled | Received | Analyzed | Result | Units | RL | Analyst | QC Batch |
|------------|-----------|--------|-----------|-----------|-----------|--------|-------|----|---------|----------|
| 104717-001 | 12 @ 9 | Soil | 10-JUL-91 | 05-AUG-91 | 07-AUG-91 | ND | mg/Kg | 50 | TR | 2264 |
| 104717-002 | 12 @ 14.5 | Soil | 10-JUL-91 | 05-AUG-91 | 07-AUG-91 | ND | mg/Kg | 50 | TR | 2264 |

ND = Not Detected at or above Reporting Limit (RL).

Q C B a t c h R e p o r t

 Client: Subsurface Consultants
 Project Name: 1056 48th Street
 Project Number: 537.006

 Laboratory Login Number: 104717
 Report Date: 08 August 91

ANALYSIS: Hydrocarbon Oil & Grease (Gravimetric)

QC Batch Number: 2264

Blank Results

| Sample ID | Result | MDL | Units | Method | Date Analyzed |
|-----------|--------|-----|-------|----------------|---------------|
| BLANK | ND | 50 | mg/Kg | SMWW 17:552OEF | 07-AUG-91 |

Spike/Duplicate Results

| Sample ID | Recovery | Method | Date Analyzed |
|-----------|----------|----------------|---------------|
| BS | 91% | SMWW 17:552OEF | 07-AUG-91 |
| BSD | 93% | SMWW 17:552OEF | 07-AUG-91 |

| | | Control Limits |
|-----------------------------|------|----------------|
| Average Spike Recovery | 92% | 80% - 120% |
| Relative Percent Difference | 2.1% | < 20% |



Curtis & Tompkins, Ltd., Analytical Laboratories, Since 1878

2323 Fifth Street, Berkeley, CA 94710, Phone (415) 486-0900

DATE RECEIVED: 07/24/91
DATE REPORTED: 07/31/91

LAB NUMBER: 104599

CLIENT: SUBSURFACE CONSULTANTS

PROJECT ID: 537.006

LOCATION: 1056 48TH STREET

RESULTS: SEE ATTACHED

BCC

QA/QC Approval

[Signature]

Final Approval

LABORATORY NUMBER: 104599
 CLIENT: SUBSURFACE CONSULTANTS
 PROJECT ID: 537.006
 LOCATION: 1056 48TH STREET

DATE RECEIVED: 07/24/91
 DATE ANALYZED: 07/27/91
 DATE REPORTED: 07/31/91

=====
 ANALYSIS: LEAD
 ANALYSIS METHOD: EPA 7421
 =====

| LAB ID | SAMPLE ID | RESULT | UNITS | REPORTING LIMIT |
|----------|-----------|--------|-------|-----------------|
| 104599-3 | MW-3 | ND | ug/L | 3.0 |

ND = Not detected at or above reporting limit.

QA/QC SUMMARY

=====
 RPD, % <1
 Recovery, % 108
 =====

Client: Subsurface Consultants

Laboratory Login Number: 104599

Project Name: 1056 48th Street

Report Date: 31 July 91

Project Number: 537.006

ANALYSIS: Hydrocarbon Oil & Grease (Gravimetric)

METHOD: SMWW 17:5520BF

| Lab ID | Sample ID | Matrix | Sampled | Received | Analyzed | Result | Units | RL | Analyst | QC Batch |
|------------|-----------|--------|-----------|-----------|-----------|--------|-------|----|---------|----------|
| 104599-001 | MW-1 | Water | 23-JUL-91 | 24-JUL-91 | 26-JUL-91 | ND | mg/L | 5 | TR | 2163 |
| 104599-002 | MW-2 | Water | 23-JUL-91 | 24-JUL-91 | 26-JUL-91 | ND | mg/L | 5 | TR | 2163 |
| 104599-003 | MW-3 | Water | 23-JUL-91 | 24-JUL-91 | 26-JUL-91 | ND | mg/L | 5 | TR | 2163 |

ND = Not Detected at or above Reporting Limit (RL).

Q C B a t c h R e p o r t

Client: Subsurface Consultants
 Project Name: 1056 48th Street
 Project Number: 537.006

Laboratory Login Number: 104599
 Report Date: 31 July 91

ANALYSIS: Hydrocarbon Oil & Grease (Gravimetric)

QC Batch Number: 2163

Blank Results

| Sample ID | Result | MDL | Units | Method | Date Analyzed |
|-----------|--------|-----|-------|----------------|---------------|
| BLANK | ND | 5 | mg/L | SMWW 17:5520BF | 26-JUL-91 |

Spike/Duplicate Results

| Sample ID | Recovery | Method | Date Analyzed |
|-----------|----------|----------------|---------------|
| BS | 88% | SMWW 17:5520BF | 26-JUL-91 |
| BSD | 85% | SMWW 17:5520BF | 26-JUL-91 |

| | | Control Limits |
|-----------------------------|------|----------------|
| Average Spike Recovery | 86% | 80% - 120% |
| Relative Percent Difference | 3.5% | < 20% |

LABORATORY NUMBER: 104599
 CLIENT: SUBSURFACE CONSULTANTS
 PROJECT ID: 537.006
 LOCATION: 1056 48TH STREET

DATE RECEIVED: 07/24/91
 DATE EXTRACTED: 07/25/91
 DATE ANALYZED: 07/27/91
 DATE REPORTED: 07/31/91

Extractable Petroleum Hydrocarbons in Aqueous Solutions
 California DOHS Method
 LUFT Manual October 1989

| LAB ID | CLIENT ID | KEROSENE RANGE (ug/L) | DIESEL RANGE (ug/L) | REPORTING LIMIT* (ug/L) |
|----------|-----------|-----------------------------|---------------------------|-------------------------------|
| 104599-1 | MW-1 | ND | ND | 50 |
| 104599-2 | MW-2 | ND | ND | 50 |
| 104599-3 | MW-3 | ND | ND | 50 |

ND = Not detected at or above reporting limit.

*Reporting limit applies to all analytes.

QA/QC SUMMARY

| | |
|-------------|----|
| RPD, % | <1 |
| RECOVERY, % | 89 |

LABORATORY NUMBER: 104599-3
 CLIENT: SUBSURFACE CONSULTANTS
 PROJECT ID: 537.006
 LOCATION: 1056 48TH STREET
 SAMPLE ID: MW-3

DATE RECEIVED: 07/24/91
 DATE EXTRACTED: 07/25/91
 DATE ANALYZED: 07/29/91
 DATE REPORTED: 07/31/91

POLYNUCLEAR AROMATIC HYDROCARBONS IN WATER BY EPA METHOD 8270
 EXTRACTION METHOD: EPA 3520

| COMPOUND | RESULTS ug/L | REPORTING LIMIT ug/L |
|------------------------|-----------------|----------------------------|
| Naphthalene | ND | 5.0 |
| Acenaphthylene | ND | 5.0 |
| Acenaphthene | ND | 5.0 |
| Fluorene | ND | 5.0 |
| Phenanthrene | ND | 5.0 |
| Anthracene | ND | 5.0 |
| Pyrene | ND | 5.0 |
| Benzo(a)anthracene | ND | 5.0 |
| Chrysene | ND | 5.0 |
| Benzo(b)fluoranthene | ND | 5.0 |
| Benzo(k)fluoranthene | ND | 5.0 |
| Fluoranthene | ND | 5.0 |
| Benzo(a)pyrene | ND | 5.0 |
| Indeno(1,2,3-cd)pyrene | ND | 5.0 |
| Dibenzo(a,h)anthracene | ND | 5.0 |
| Benzo(g,h,i)perylene | ND | 5.0 |

ND = Not detected at or above reporting limit.

QA/QC SUMMARY: SURROGATE RECOVERIES

| | |
|------------------|-------|
| Nitrobenzene-d5 | 117 % |
| 2-Fluorobiphenyl | 98 % |
| Terphenyl-d14 | 69 % |

Subsurface Consultants

CHAIN OF CUSTODY RECORD & ANALYTICAL TEST REQUEST

Project Name: 1056 48th St.
 SCI Job Number: 537.006
 Project Contact at SCI: Sean Carson
 Sampled By: John Wolfe
 Analytical Laboratory: Curtis + Tompkins Ltd.
 Analytical Turnaround: Normal

| Sample ID | Sample Type ¹ | Container Type ² | Sampling Date | Hold | Analysis | Analytical Method |
|------------|--------------------------|-----------------------------|---------------|------|------------|--------------------------|
| MW-1e5.5' | S | T | 7/10/91 | | TEH O+G | 8015/3550 SMWW 5520 E |
| MW-1e11.5' | S | T | 7/10/91 | | TEH O+G | 8015/3550 SMWW 5520 E |
| MW-1e13' | S | T | 7/10/91 | | TEH O+G | 8015/3550 SMWW 5520 |
| MW-2e3' | S | T | 7/11/91 | | TEH O+G | 8015/3550 SMWW 5520 |
| MW-2e8' | S | T | 7/11/91 | | TEH O+G | 8015/3550 SMWW 5520 |
| 9e4' | S | T | 7/11/91 | | TEH O+G | 8015/3550 SMWW 5520 |
| 9e7' | S | T | 7/11/91 | | TEH O+G | 8015/3550 SMWW 5520 |
| 10e9' | S | T | 7/11/91 | | TEH O+G | 8015/3550 SMWW 5520 |
| 11e7' | S | T | 7/11/91 | | TEH O+G | 8015/3550 SMWW 5520 |
| 11e11.5' | S | T | 7/11/91 | | TEH O+G | 8015/3550 SMWW 5520 |

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Released by: D. A. [Signature] Received by: _____ Date: 7/15/91
 Released by: _____ Received by: _____ Date: _____
 Received by Laboratory: [Signature] Date: 7/15/91
 Released by Laboratory: _____ Date: _____
 Released by: _____ Date: _____

- ¹ Sample Type: W = Water, S = Soil, O = Other (specify)
² Container Type: V = VOA, P = Plastic, G = Glass, T = Brass Tube,
 O = Other (specify)

NOTES TO LABORATORY:

- Notify SCI if there are any anomalous peaks on GC or other scans
- Questions/clarifications - Contact SCI at (415) 268-0461

Subsurface Consultants

CHAIN OF CUSTODY RECORD & ANALYTICAL TEST REQUEST

Project Name: 1056 48th St.
 SCI Job Number: 537.006
 Project Contact at SCI: Sean Carson
 Sampled By: John Wolfe
 Analytical Laboratory: Curtis + Tompkins
 Analytical Turnaround: Normal

| Sample ID | Sample Type ¹ | Container Type ² | Sampling Date | Hold | Analysis | Analytical Method |
|-----------|--------------------------|-----------------------------|---------------|------|----------|-------------------|
| 12e9' | S | T | 7/10/91 | | O+G | SMWW 503E |
| 12e14.5' | S | T | 7/10/91 | | O+G | SMWW 503E |
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Released by: D. Alford Received by: _____ Date: 8/5/91
 Released by: _____ Received by: _____ Date: _____
 Received by Laboratory: Normal Date: 8/5/91
 Released by Laboratory: _____ Date: _____
 Released by: _____ Date: _____

¹ Sample Type: W = Water, S = Soil, O = Other (specify)
² Container Type: V = VOA, P = Plastic, G = Glass, T = Brass Tube, O = Other (specify)

NOTES TO LABORATORY:
 - Notify SCI if there are any anomalous peaks on GC or other scans
 - Questions/clarifications - Contact SCI at (415) 268-0461

Subsurface Consultants

CHAIN OF CUSTODY RECORD & ANALYTICAL TEST REQUEST

Project Name: 1056 48th St.
 SCI Job Number: 537,006
 Project Contact at SCI: Sean Carson
 Sampled By: Dennis Alexander
 Analytical Laboratory: Curtis + Tompkins
 Analytical Turnaround: Normal

| Sample ID | Sample Type ¹ | Container Type ² | Sampling Date | Hold | Analysis | Analytical Method |
|-----------|--------------------------|-----------------------------|---------------|------|----------------------------|-------------------|
| MW-1 | W | 2x2 | 7/23/91 | | TEH O+G | |
| MW-2 | W | 2x2 | 7/23/91 | | TEH O+G | |
| MW-3 | W | 2x3 P x 1 | 7/23/91 | | { TEH O+G Lead PNA's | |
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Released by: Dennis Alexander Date: 7/24/91
 Released by Courier: _____ Date: _____
 Received by Laboratory: Jeanne Deaton Date: 7/24/91
 Relinquished by Laboratory: _____ Date: _____
 Received by: _____ Date: _____

¹ Sample Type: W = water, S = soil, O = other (specify)
² Container Type: V = VOA, P = plastic, G = glass, T = brass tube, O = other (specify)

Notes to Laboratory:
 -Notify SCI if there are any anomalous peaks on GC or other scans
 -Questions/clarifications...contact SCI at (415) 268-0461

WELL DEVELOPMENT LOG

JOB NAME 1056 48th St.

JOB NUMBER 537,006 WELL NUMBER MW-1

DATE 7/23/91 - 7/24/91 INITIALS D.A.

GROUNDWATER DEPTH BEFORE DEVELOPMENT 20.80' FEET TIME 10:49 a.m.
20.81' FEET TIME 9:00 a.m.

GROUNDWATER DEPTH AFTER DEVELOPMENT 21.30' FEET TIME 12:43 p.m.

EQUIPMENT USED flexible hand boiler

CLEANING METHOD clean solution

FATE OF REMOVED WATER (CIRCLE) drum sewer tank other

| GALLONS REMOVED | TURBIDITY (murky, semi-clear, or clear) | COMMENTS (odor, recharge rate, etc.) |
|-----------------|--|---|
| 0 | murky | no odor - just red mud |
| 5 | murky | |
| 10 | murky | |
| 15 | murky | |
| 20 | murky | |
| 25 | murky | |
| 30 | murky (Sand present) | |
| 35 | murky | |
| 40 | murky | |
| 45 | murky | |
| 50 | murky | |
| 55 | murky (thumb full of sand per liter) | |

WELL DEVELOPMENT LOG

JOB NAME 1056 48th St.

JOB NUMBER 537.006 WELL NUMBER MW-2

DATE 7/23/01 - 7/24/01 INITIALS D.T.

GROUNDWATER DEPTH BEFORE DEVELOPMENT 21.09' FEET TIME 10:52 a.m. - 7/23
21.03' FEET TIME 8:53 a.m. - 7/24

GROUNDWATER DEPTH AFTER DEVELOPMENT 21.62 FEET TIME 11:03 a.m.

EQUIPMENT USED nitrocon pump then diaphragm hand brailer

CLEANING METHOD lean sludge

FATE OF REMOVED WATER (CIRCLE) drum sewer tank other _____

| GALLONS REMOVED | TURBIDITY (murky, semi-clear, or clear) | COMMENTS (odor, recharge rate, etc.) |
|-----------------|---|--------------------------------------|
| 0 | murky | no odor - moderately fast |
| 5 | murky (fast pumping) | redlines after 5 gals. |
| 10 | murky | purged Pump system |
| 15 | murky (slight decreasing) | closed. Had to |
| 20 | semi-clear | switch to hand |
| 25 | semi-clear (fast) | bailing. 1/2 liter |
| 30 | clear | was taken each |
| 35 | clear | line with bailer |
| 40 | clear | after 5 gals. purged |
| | | returned 7/24/01 to |
| | | finish w/ nitrocon pump. |

7/23

7/24

WELL DEVELOPMENT LOG

JOB NAME 1056 48th Ave.

JOB NUMBER _____ WELL NUMBER MW-3

DATE 7/23/91 INITIALS D.A.

GROUNDWATER DEPTH BEFORE DEVELOPMENT 21.47' FEET TIME 10:54 a.m.

GROUNDWATER DEPTH AFTER DEVELOPMENT 22.81' FEET TIME 12:48 p.m.

EQUIPMENT USED nitrogen tank

CLEANING METHOD steam cleaning equip.

FATE OF REMOVED WATER (CIRCLE) drum sewer tank other _____

| GALLONS REMOVED | TURBIDITY (murky, semi-clear, or clear) | COMMENTS (odor, recharge rate, etc.) |
|-----------------|--|---|
| <u>0</u> | <u>murky</u> | <u>No odor - recharge</u> |
| <u>5</u> | <u>murky (small amount)</u> | <u>Rate slower than</u> |
| <u>10</u> | <u>murky (no sand)</u> | <u>drawn up by pump,</u> |
| <u>15</u> | <u>semi-clear ↓</u> | <u>but still a steady</u> |
| <u>20</u> | <u>semi-clear ↓</u> | <u>flow w/ increase</u> |
| <u>25</u> | <u>semi-clear (very little silt)</u> | <u>in refill rate.</u> |
| <u>30</u> | <u>semi-clear</u> | |
| <u>35</u> | <u>semi-clear/clear</u> | |
| <u>40</u> | <u>clear</u> | |
| | | |
| | | |