



91 JAN 14 PM 3:03

**CITY OF EMERYVILLE  
REDEVELOPMENT AGENCY**

2200 POWELL STREET, SUITE 1200

EMERYVILLE, CALIFORNIA 94608

(415) 596-4350

January 10, 1991

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

Dear Sir/Madam:

Please find enclosed a copy of the Phase 3 Preliminary Environmental Assessment of 4300 San Pablo Avenue in Emeryville, prepared by Subsurface Consultants Inc. (SCI) for the City of Emeryville Redevelopment Agency. On July 31, 1990, our office transmitted a copy of the Phase 2 Preliminary Environmental Assessment of 4300 - 4310 San Pablo Avenue. That study concluded that the property located at 4310 San Pablo Avenue did not appear to be contaminated with chemicals. It also concluded that the soil at 4300 San Pablo Avenue had petroleum hydrocarbons ranging up to 120 ppm and that the groundwater contained petroleum hydrocarbons. Since the Agency is in the process of acquiring this parcel, the Agency elected to perform additional tests in order to ascertain the extent of the contamination.

In the Phase 3 assessment, SCI recommends that soils containing petroleum hydrocarbon concentrations greater than 100 ppm be remediated. They also recommend that soils excavated during construction with concentrations between 10 and 99 ppm be properly disposed off site or remediated, and that ground water monitoring be conducted.

The Agency accepts these recommendations and proposes to undertake remediation after site acquisition. In this regard, please review the attached report and advise us if you concur with its findings. We appreciate your timely response on this matter. Thank you.

Sincerely,

IGNACIO DAYRIT  
Projects Coordinator

cc. Subsurface Consultants  
Erickson, Beasley & Hewitt

HO 22 : IG06:SH-HAZ1.LTR

PRELIMINARY ENVIRONMENTAL ASSESSMENT  
PHASE 3  
EMERYVILLE SENIOR HOUSING PROJECT  
4300 SAN PABLO AVENUE  
SCI 537.004

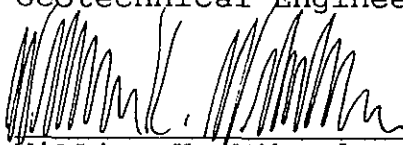
Prepared for:

Mr. Ignacio M. Dayrit  
City of Emeryville  
2200 Powell Street, 12th Floor  
Emeryville, California 94608

By:



R. William Rudolph  
Geotechnical Engineer 741 (expires 12/31/92)



William K. Wikander  
Geotechnical Engineer 892 (expires 12/31/92)

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

January 8, 1991



## I INTRODUCTION

This report records results of our Phase 3 Preliminary Environmental Assessment of 4300 San Pablo Avenue in Emeryville, California. The project location is shown on the Site Plan, Plate 1. We previously performed a Phase 1 Preliminary Environmental Assessment and a Geotechnical Investigation of 4300-4328 San Pablo Avenue and presented the results in our reports dated December 4, 1989 and January 19, 1990. We also performed Phase 2 Preliminary Environmental Assessments of 4300-4310 and 4320-4328 San Pablo Avenue and presented the results in reports dated January 30 and July 13, 1990.

Research conducted during our Phase 1 assessment indicated that the 4300 San Pablo Avenue site was vacant until a service station was constructed in about 1930. The station remained in operation until 1966. The site has been occupied by a car wash since 1969. During our Phase 2 Assessment, analytical tests of soil and groundwater samples from the site revealed petroleum hydrocarbon concentrations of up to 120 parts per million (ppm) and 1,800 parts per billion (ppb), respectively.

Old service station site plans that were obtained after completion of the Phase 2 Assessment, show that after 1936, the station had three 550-gallon, underground gasoline storage tanks. The tanks were located beneath the sidewalks along San Pablo Avenue (2 tanks) and 43rd Street (1 tank). The plans indicate that two of the tanks had been relocated from a different and currently unknown

on-site location. Records have not been found to date, documenting the tank removal.

The purpose of this Phase 3 assessment, as outlined in our agreement dated October 26, 1990, was to collect and analytically test soil and groundwater samples to check for indications of contamination near the previous tank locations. Based upon the results of our investigation, we were to develop conclusions and/or recommendations regarding:

1. Subsurface conditions,
2. The presence of tanks at the locations shown on the plans,
3. Groundwater gradient and flow direction,
4. The presence of TVH and BTXE contamination in the samples tested,
5. The significance of contaminant levels with respect to state and local regulatory criteria, and
6. The scope of future investigation/monitoring, if necessary.

## II FIELD EXPLORATION

### A. Former Fuel Tank Locations

Subsurface conditions were explored at the former tank locations shown on the old service station plans. Three (3) test borings were drilled to a depth of about 11 feet. The test borings were drilled using truck-mounted, 6-inch-diameter, continuous flight augers. Our geologist/engineer observed drilling operations and prepared logs of the soils encountered. The logs of the test borings are presented on Plates 2 and 3. Undisturbed soil

samples were obtained at frequent intervals as described in the following section of this report. The samples were checked in the field for organic vapors using an Organic Vapor Meter (OVM). The results are shown on the Logs of Test Borings. Upon completion of drilling, the boreholes were backfilled with neat cement grout.

#### B. Groundwater Monitoring Wells

Three groundwater monitoring wells were installed down gradient from the former tank locations, as shown on the Site Plan. The wells extend to a depth of about 20 feet. The boreholes for the wells were drilled using truck-mounted, 8-inch-diameter, hollow stem auger equipment. The drilling and sampling equipment was steam-cleaned prior to each use. Soil cuttings generated during drilling were encapsulated in polyethylene sheets for later disposal by others.

Our geologist/engineer observed drilling operations and prepared logs of the soils encountered. The Logs of Test Borings for the monitoring wells installed for this investigation, as well as for wells installed during the previous Phase 2 Assessment, are presented on Plates 4 through 10. Soils are classified in accordance with the Unified Soil Classification System described on Plate 11. Undisturbed soil samples were obtained from all of the test borings at frequent intervals. The samples were retained in brass sample liners. Teflon sheets were placed over the sample 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 Records, copies of

which are presented in the Appendix.

Schematic diagrams of the groundwater monitoring wells, as installed, are shown on the Logs of Test Borings. In summary, the monitoring wells consist of 2-inch-diameter, machine-slotted PVC pipe. All of the pipe is joined by threads (no gluing nor riveting). The wells extend about 10 feet below the groundwater level measured in the wells previously installed during the Phase 2 Assessment. The well heads are provided with locks, and are set below grade in utility boxes.

The wells were developed by surging and bailing until the water became relatively clear. About 5 gallons of water were removed from each well. The wells were relatively slow to recharge. The removed water was placed in steel drums for later disposal by others. Groundwater samples were obtained using pre-cleaned Teflon samplers dedicated to each well. The water samples were placed in pre-cleaned containers and refrigerated until delivery to the analytical laboratory. The samples were accompanied by Chain-of-Custody Records, copies of which are presented in the Appendix.

### III GROUNDWATER LEVEL MEASUREMENTS

A level survey, using an assumed elevation reference, was performed to determine the top of casing (TOC) elevation of each of the monitoring wells. ~~The depth to groundwater, below the top of~~ each casing, was periodically measured using a well sounder. The direction and gradient of groundwater flow was determined, based upon this data. The groundwater contours for the ~~January 2~~, 1991 reading are shown on the Site Plan. The results of the readings to date are summarized in Table 1.

Table 1. Summary of Groundwater Data

<u>Well</u>	<u>Date</u>	<u>TOC Elevation<sup>1</sup> (ft)</u>	<u>Groundwater Depth<sup>2</sup> (ft)</u>	<u>Groundwater Elevation (ft)</u>
1	06/06/90	101.13	5.33	95.80
	06/11/90		5.52	95.61
	06/18/90		5.50	95.63
	06/22/90		6.18	94.95
	06/29/90		6.50	92.63
	10/30/90		9.10	92.03
	12/11/90		7.18	93.95
	12/26/90		7.90	93.23
	01/02/91		8.27	92.86
2	06/06/90	101.49	7.15	94.34
	06/11/90		6.98	94.51
	06/18/90		7.04	94.45
	06/22/90		7.60	93.89
	06/29/90		9.96	91.53
	10/30/90		10.66	90.83
	12/11/90		9.88	91.61
	12/26/90		9.19	92.30
	01/02/91		9.65	91.84
3	06/06/90	100.20	6.22	93.98
	06/11/90		6.50	93.70
	06/18/90		6.49	93.71
	06/22/90		7.11	93.09
	06/29/90		9.34	90.86
	10/30/90		10.11	90.09
	12/11/90		9.36	90.84
	12/26/90		9.00	91.20
	01/02/91		9.28	90.92
4	12/26/90	100.25	6.93	93.32
	01/02/91		7.31	92.94
5	12/26/90	99.54	7.74	91.80
	01/02/91		7.95	91.59
6	12/26/90	99.26	9.20	90.06
	01/02/91		9.40	89.86

<sup>1</sup> Elevation reference: Top of curb at fire hydrant on 43rd Street (see Site Plan) assumed at Elevation 100.00 feet

<sup>2</sup> Measured below top of casing (TOC)



#### IV ANALYTICAL TESTING

Selected soil and groundwater samples were analyzed by Curtis & Tompkins, Ltd., a laboratory certified by the Department of Health Services for hazardous waste and water testing. During our Phase 2 assessment, soil and groundwater samples were analytically tested for a wide range of petroleum hydrocarbons, volatile and semi-volatile organic compounds, and metals. The only significant contaminant concentrations encountered were of gasoline, diesel, and benzene, toluene, xylenes and ethylbenzene. Accordingly, during his investigation, soil and groundwater samples were analytically tested for:

1. Total volatile hydrocarbons (TVH), sample preparation and analysis using EPA Methods 5030 (purge and trap) and 8015 modified (gas chromatograph coupled to a flame ionization detector),
2. Total extractable hydrocarbons (TEH), sample preparation and analysis using EPA Methods 3550 (sonication) and 8015 (modified gas chromatograph coupled to a flame ionization detector), and
3. Benzene, toluene, xylenes and ethylbenzene (BTXE), sample preparation and analysis using EPA Methods 5030 and 8020 (gas chromatograph coupled to a flame ionization detector).

The analytical test results from the Phase 2 and 3 Assessments are summarized in Tables 2 and 3. Copies of the analytical test reports from the Phase 3 Assessment are presented in the Appendix.

Table 2. Petroleum Hydrocarbon and Purgeable Aromatic Concentrations in Soil

Sample	TVH <sup>2</sup> (ppm) <sup>5</sup>	TEH <sup>3</sup> (ppm)	Purgeable Aromatics <sup>1</sup>				
			B (ppb) <sup>6</sup>	T (ppb)	X (ppb)	E (ppb)	Other <sup>4</sup> (ppm)
1 @ 5.5'	-- <sup>7</sup>	ND <sup>8</sup>	--	--	--	--	--
1 @ 9.5'	--	120 <sup>9</sup>	--	--	--	--	--
B1 @ 7'	490	--	ND	280	2,200	810	--
B1 @ 10'	ND	--	ND	ND	ND	ND	--
B2 @ 8'	21	--	ND	15	260	68	--
B2 @ 11'	ND	--	ND	ND	ND	ND	--
B3 @ 7'	ND	--	ND	16	28	ND	--
B3 @ 11'	57	--	14	86	1,100	370	--
MW-1 @ 6'	ND	ND <sup>10</sup>	ND	11	20	ND	ND
MW-1 @ 10'	63	ND <sup>10</sup>	ND	ND	ND	ND	ND
MW-2 @ 7'	4.1	ND <sup>10</sup>	ND <sup>11</sup>	ND <sup>11</sup>	ND <sup>11</sup>	ND <sup>11</sup>	ND
MW-2 @ 12'	ND	ND <sup>10</sup>	ND	7	7	ND	ND
MW-2 @ 16.5'	ND	--	ND	ND	ND	ND	ND
MW-3 @ 6'	ND	ND <sup>10</sup>	ND <sup>11</sup>	ND <sup>11</sup>	ND <sup>11</sup>	ND <sup>11</sup>	ND
MW-4 @ 5'	ND	--	ND	ND	ND	ND	--
MW-4 @ 11'	ND	--	ND	ND	ND	ND	--
MW-5 @ 7'	18	45 <sup>12</sup>	5.2	18	100	61	--
MW-5 @ 11.5'	52	--	ND	39	390	160	--
MW-6 @ 7'	ND	--	ND	ND	ND	ND	--
MW-6 @ 16'	ND	--	ND	ND	ND	ND	--

- <sup>1</sup> Benzene, toluene total xylenes and ethylbenzene determined by EPA 5030/8020 unless noted otherwise
- <sup>2</sup> Total volatile hydrocarbons (EPA Method 5030/8015 mod.)
- <sup>3</sup> Total extractable hydrocarbons (EPA Method 3550/8015)
- <sup>4</sup> As determined by EPA Method 5030/8240
- <sup>5</sup> Parts per million (mg/kg)
- <sup>6</sup> Parts per billion (ug/kg)
- <sup>7</sup> Test not requested
- <sup>8</sup> None detected, see test data sheets in the Appendix for detection limits
- <sup>9</sup> Quantified by the analytical laboratory as gasoline
- <sup>10</sup> Also analytically tested for oil and grease, with none detected
- <sup>11</sup> Determined by EPA Method 5030/8240
- <sup>12</sup> Gasoline range, kerosene: ND, diesel: ND

Table 6. Petroleum Hydrocarbon, and BTXE Concentrations In Groundwater

Sample	Date	TVH <sup>2</sup> (ppb) <sup>4</sup>	TEH <sup>3</sup> (ppb)	Purgeable Aromatics <sup>1</sup>			
				B (ppb)	T (ppb)	X (ppb)	E (ppb)
MW-1	6/11/90	940	1,900	5.3	1.8	1.9	1.8
MW-1	12/11/90	260	-- <sup>5</sup>	0.5	0.8	0.7	ND
MW-2	6/11/90	1,800	2,800	ND <sup>6</sup>	ND	3.8	3.8
MW-2	12/11/90	1,600	--	3.0	2.5	3.8	2.1
MW-3	6/11/90	ND	ND	ND	ND	ND	0.5
MW-3	12/11/90	ND	--	ND	ND	ND	ND
MW-4	12/10/90	300	--	ND	1.1	1.3	0.6
MW-5	12/10/90	420	--	ND	ND	2.8	1.5
MW-6	12/11/90	ND	--	ND	ND	ND	ND

- <sup>1</sup> Benzene, toluene, total xylenes and ethylbenzene determined by EPA 5030/8020
- <sup>2</sup> Total volatile hydrocarbons (EPA Method 5030/8015 mod.)
- <sup>3</sup> Total extractable hydrocarbons (EPA 3550/8015)
- <sup>4</sup> Parts per billion (ug/L)
- <sup>5</sup> Not tested
- <sup>6</sup> None detected, see test data sheets in the Appendix for detection limits

## V SITE CONDITIONS

### A. Surface Conditions

The site is located at the northeast corner of the intersection of San Pablo Avenue and 43rd Street. The relatively level lot covers an area measuring about 100 by 110 feet in plan. The site is bordered by a post office and residential areas to the north and east. The site is paved and occupied by a car wash facility.

### B. Subsurface Conditions

Information regarding subsurface conditions at the site was obtained from test borings drilled during our previous and current investigations. The site is blanketed with silty and sandy clays to a depth of about 15 feet. Localized areas of surface fills (consisting of clays) up to about 5 feet deep were encountered. At former underground fuel tank locations, fill was encountered to depths of 7 to 8 feet. Beneath the silty and sandy clays, are interbedded layers of clays, silty sands and clayey gravels to the depths explored.

Soil from the former fuel tank locations smelled strongly of petroleum hydrocarbons. Organic vapor meter readings were greatest on soil samples from the former fuel tank locations; OVM concentrations decreased with distance away from the previous tanks.

C. Groundwater

Groundwater was measured at depths ranging from about 11 to 18 feet below the groundsurface during drilling and about 6 to 7.5 feet during subsequent measurements in the monitoring wells. The measurements to date indicate that the direction of groundwater flow is to the northwest at a gradient of about 2 percent.

VI CONCLUSIONS

A. General

The studies to date indicate that underground storage tanks do not exist at the known former locations. Relatively low levels of petroleum hydrocarbons (gasoline), and fuel constituents (benzene, toluene, xylenes and ethylbenzene) exist at and near the former tank sites. Contamination appears to exist both on-site and off-site. Gasoline concentrations are highest near the former tank location along 43rd Street. In addition, groundwater has been locally impacted by petroleum hydrocarbons.

B. Former Fuel Tanks

Our research of available records indicates that underground fuel storage tanks were located as shown on the Site Plan. No records of their removal have been found. Our test borings, at the former tank locations, encountered fill but no tanks, suggesting that they have likely been removed. However, because at least three different service station structures formerly occupied the site, it is possible that additional unidentified underground tanks

and/or associated pipelines may still exist.

### C. Soil Contamination

The petroleum hydrocarbon concentrations identified in soil vary up to 490 ppm. Gasoline was detected in soil near all tank locations. However, the only concentrations greater than 100 ppm were encountered at or near the former tank location along 43rd street. It is our opinion that the soil contamination is most likely associated with the past use of the site as a service station.

The lateral extent of soil contamination has not been fully defined to date. However, based on the data available, we judge that its extent is limited primarily to areas near the southern corner of the property. Gasoline concentrations greater than 100 ppm likely exist off-site beneath the sidewalk and possibly, a portion of the roadway.

### D. Groundwater Contamination

Petroleum hydrocarbons were encountered in water samples from wells MW-1, MW-2, MW-4 and MW-5. Floating product was not observed in any of the wells. No petroleum hydrocarbons were detected in groundwater samples from wells MW-3 and MW-6, which are cross and directly down-gradient from the former tank locations, respectively. This data suggests that the contaminated groundwater plume does not extend beneath the adjacent property at 4310 San Pablo Avenue, nor beyond the west side of San Pablo Avenue. Petroleum hydrocarbons were detected in groundwater samples from well MW-1, which is situated upgradient from the known former tank locations. The source of contamination in well MW-1 is currently

unknown. It could be other former on-site tank(s) or pipe lines or possibly, an unrelated off-site source.

#### E. Remediation

The regulatory agencies will likely require that soil containing petroleum hydrocarbon concentrations greater than 100 ppm be remediated. Based upon our investigation to date, this would include soil near the former tank location along 43rd Street.

It is possible that during construction of the proposed on-site improvements, soils with petroleum hydrocarbon concentrations less than 100 ppm will be excavated. The regulatory agencies will likely require that this soil either be properly disposed of off-site, or remediated to petroleum hydrocarbon concentrations less than 10 ppm prior to reuse on-site.

Because the petroleum hydrocarbon concentrations in groundwater are relatively low, and the extent of contamination appears to be limited, groundwater remediation will not likely be required by the regulatory agencies. We anticipate that their most probable response will be to monitor groundwater quality to demonstrate that soil remediation has eliminated the source of contamination.

#### F. Future Services

To date, the extent of groundwater contamination upgradient from the site has not been determined. If desired, a groundwater monitoring well can be installed upgradient from the site to evaluate if the contaminants could be from an up gradient source. Prior to remediation, a work plan should be prepared and submitted to the appropriate regulatory agencies.

In addition, a monitoring program should be developed which meets requirements of the regulatory agencies.

G. Submittals to Regulatory Agencies

We recommend that this report be provided to the following regulatory agencies:

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

Mr. Lester Feldman  
California Regional Water Quality Control Board  
San Francisco Bay Region  
1800 Harrison Street  
Oakland, California 94612

H. Limitations

This study was intended to provide a preliminary means of checking the site for indications of soil contamination, based upon the previous known use of the site. If areas of contamination exist on other portions of the property, away from the areas investigated, it is probable that they would not have been detected by the analyses. In addition, if chemicals that were not tested for were used at the site, they would not have been detected during this study.



List of Attached Plates:

Plate 1	Site Plan
Plate 2 and 3	Logs of Test Borings B-1 thru B-3
Plates 4 thru 9	Logs of Monitoring Wells MW-1 thru MW-6
Plate 10	Log of Test Boring 1
Plate 11	Unified Soil Classification System

Appendix:

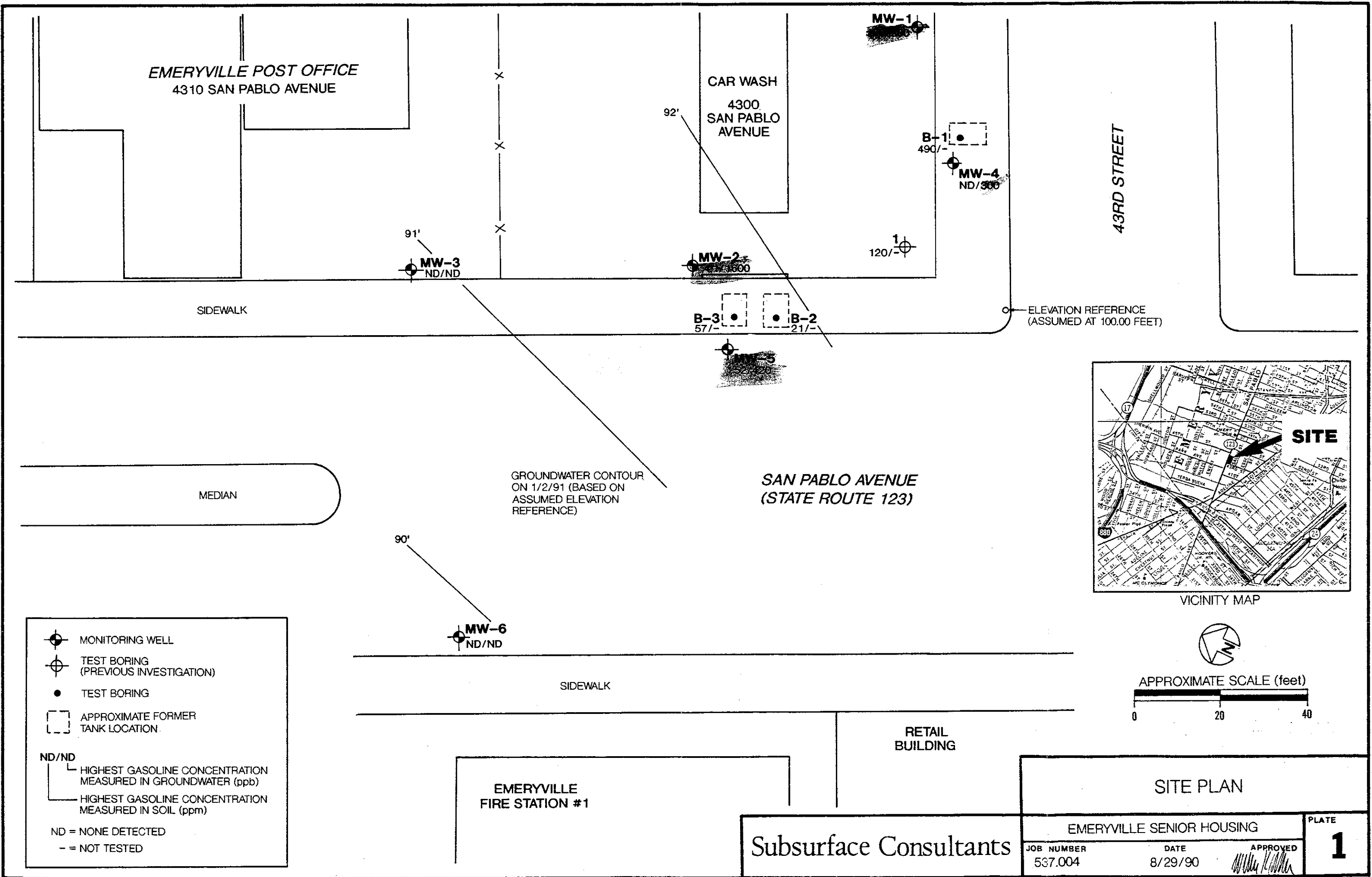
Analytical Test Results  
Chain-of-Custody Records  
Logs of Test Borings 1 and 2 (from previous investigation)

Distribution:

3 copies: Mr. Ignacio M. Dayrit  
City of Emeryville  
2200 Powell Street, 12th Floor  
Emeryville, California 94608

3 copies: Ms. Bebe Anderson  
Erickson, Beasley & Hewitt  
Attorney's At Law  
12 Geary Street, Eighth Floor  
San Francisco, California 94108

JNA:WKW:RWR:JPB:sld



EMERYVILLE POST OFFICE  
4310 SAN PABLO AVENUE

CAR WASH  
4300  
SAN PABLO  
AVENUE

43RD STREET

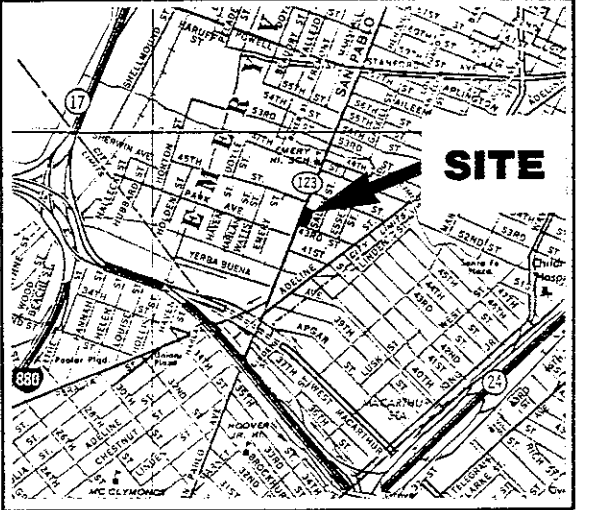
SIDEWALK

MEDIAN

GROUNDWATER CONTOUR  
ON 1/2/91 (BASED ON  
ASSUMED ELEVATION  
REFERENCE)

SAN PABLO AVENUE  
(STATE ROUTE 123)

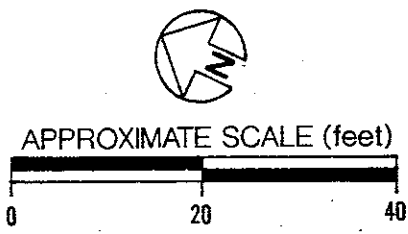
ELEVATION REFERENCE  
(ASSUMED AT 100.00 FEET)



- MONITORING WELL
- TEST BORING (PREVIOUS INVESTIGATION)
- TEST BORING
- APPROXIMATE FORMER TANK LOCATION

ND/ND  
 ┌── HIGHEST GASOLINE CONCENTRATION MEASURED IN GROUNDWATER (ppb)  
 └── HIGHEST GASOLINE CONCENTRATION MEASURED IN SOIL (ppm)

ND = NONE DETECTED  
 - = NOT TESTED



EMERYVILLE  
FIRE STATION #1

RETAIL  
BUILDING

SITE PLAN

Subsurface Consultants

EMERYVILLE SENIOR HOUSING

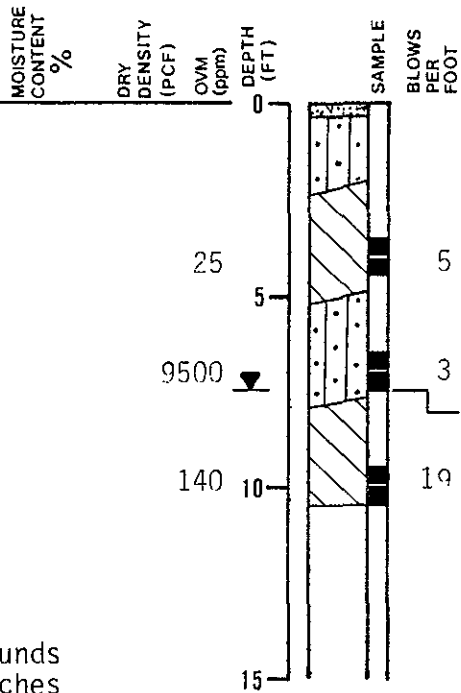
JOB NUMBER 537.004	DATE 8/29/90	APPROVED 
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PLATE  
**1**

# LOG OF TEST BORING B-1

EQUIPMENT 6" Solid Flight Auger  
 DATE DRILLED 12/6/90  
 ELEVATION --

LABORATORY TESTS



CONCRETE SLAB - 5" thick  
 GRAY-BROWN SILTY SAND (SM)  
 medium dense, moist, with gravel  
 (fill)  
 MOTTLED BROWN AND GRAY SANDY  
 CLAY (CL)  
 medium stiff, moist (fill)  
 GREEN-BROWN SILTY SAND (SM)  
 loose, moist (fill)  
 GROUNDWATER LEVEL DURING DRILLING  
 MOTTLED BROWN AND GRAY-GREEN  
 SILTY CLAY (CL)  
 medium stiff, moist  
  
 borehole backfilled with neat  
 cement grout

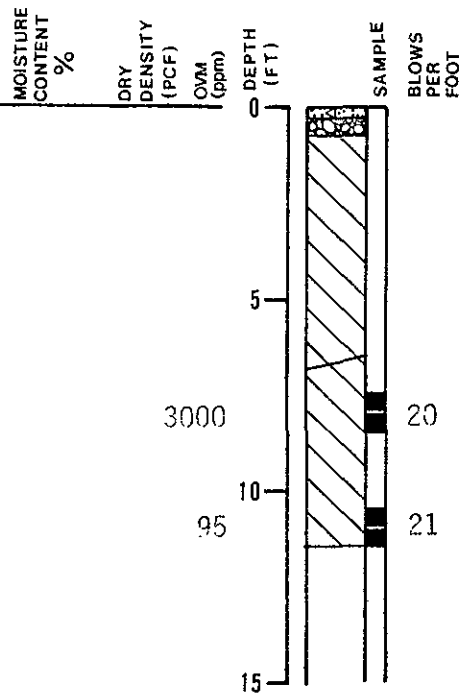
SAMPLER TYPE:  
 CALIFORNIA DRIVE  
 O.D.: 2.5 inches  
 I.D.: 2.0 inches

HAMMER WEIGHT: 140 pounds  
 HAMMER DROP: 30 inches

# LOG OF TEST BORING B-2

EQUIPMENT 6" Solid Flight Auger  
 DATE DRILLED 12/7/90  
 ELEVATION --

LABORATORY TESTS



CONCRETE SLAB - 4" thick  
 BASE ROCK - 5" thick  
 MOTTLED DARK BROWN AND BROWN  
 SILTY CLAY (CL)  
 medium stiff, moist, with gravel  
 (fill)  
 GRAY-GREEN SILTY CLAY (CL)  
 medium stiff, moist, with gravel  
  
 borehole backfilled with neat  
 cement grout  
  
 NO GROUNDWATER ENCOUNTERED DURING  
 DRILLING

Subsurface Consultants

EMERYVILLE SENIOR HOUSING

PLATE

JOB NUMBER  
 537.004

DATE  
 12/14/90

APPROVED

2

# LOG OF TEST BORING B-3

EQUIPMENT 6" Solid Flight Auger

DATE DRILLED 12/7/90

ELEVATION --

LABORATORY TESTS

MOISTURE  
CONTENT  
%

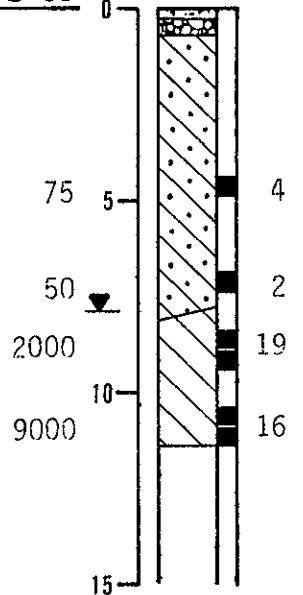
DRY  
DENSITY  
(PCF)

QVW  
(ppm)

DEPTH  
(FT)

SAMPLE

BLOWS  
PER  
FOOT



CONCRETE SLAB - 4" thick  
 BASE ROCK - 5" thick  
 GRAY-BROWN CLAYEY SAND (SC)  
 loose, moist, with gravel (fill)

GROUNDWATER LEVEL DURING DRILLING  
 MOTTLED BROWN AND GRAY-GREEN  
 SILTY CLAY (CL)  
 medium stiff, moist, with gravel

borehole backfilled with neat  
 cement grout

Subsurface Consultants

EMERYVILLE SENIOR HOUSING

PLATE

JOB NUMBER

DATE

APPROVED

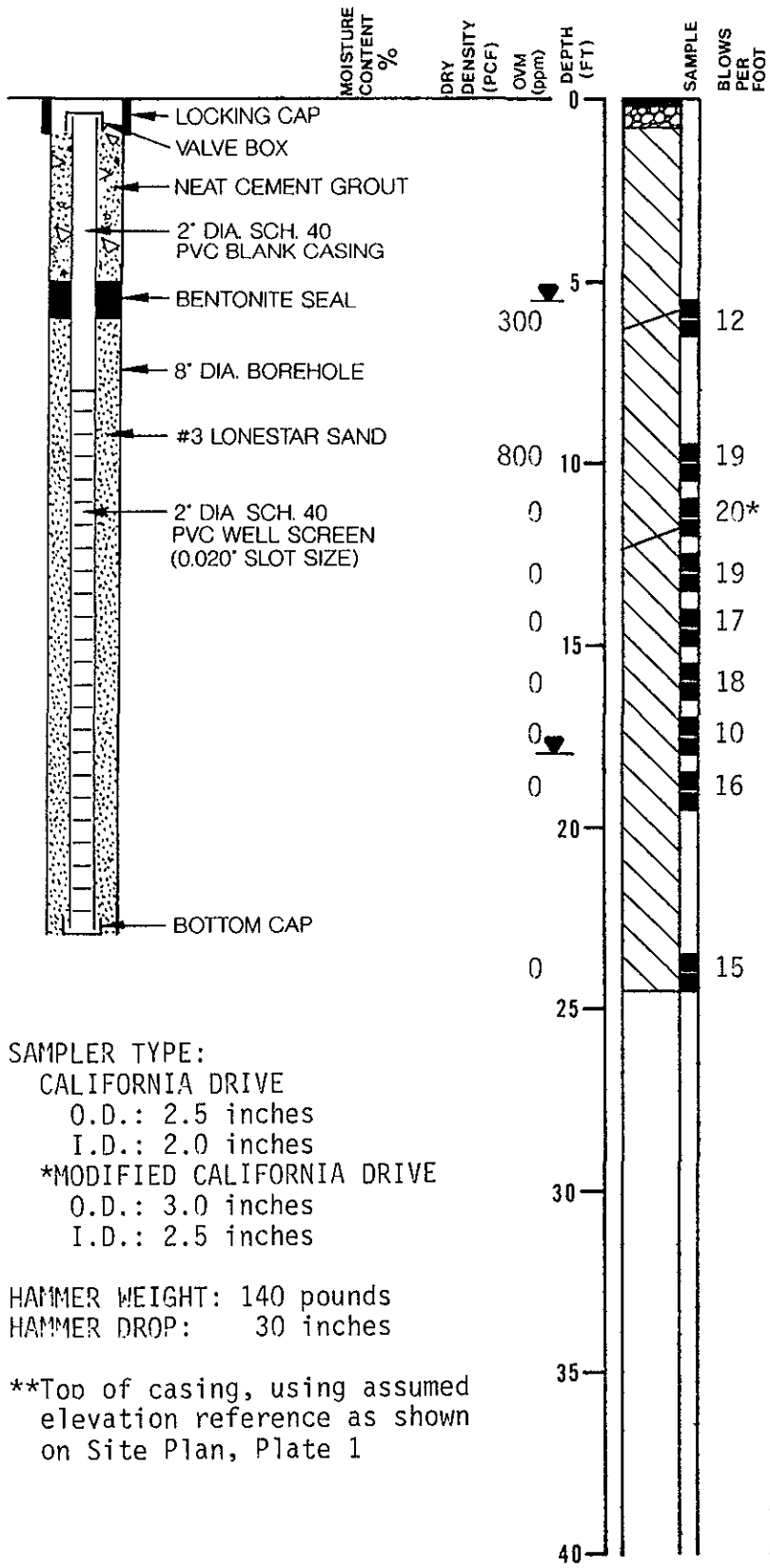
537.004

12/14/90

**3**

# LOG OF TEST BORING MW-1

EQUIPMENT 8" Hollow Stem Auger  
 DATE DRILLED 6/5/90  
 ELEVATION 101.13 feet\*\*



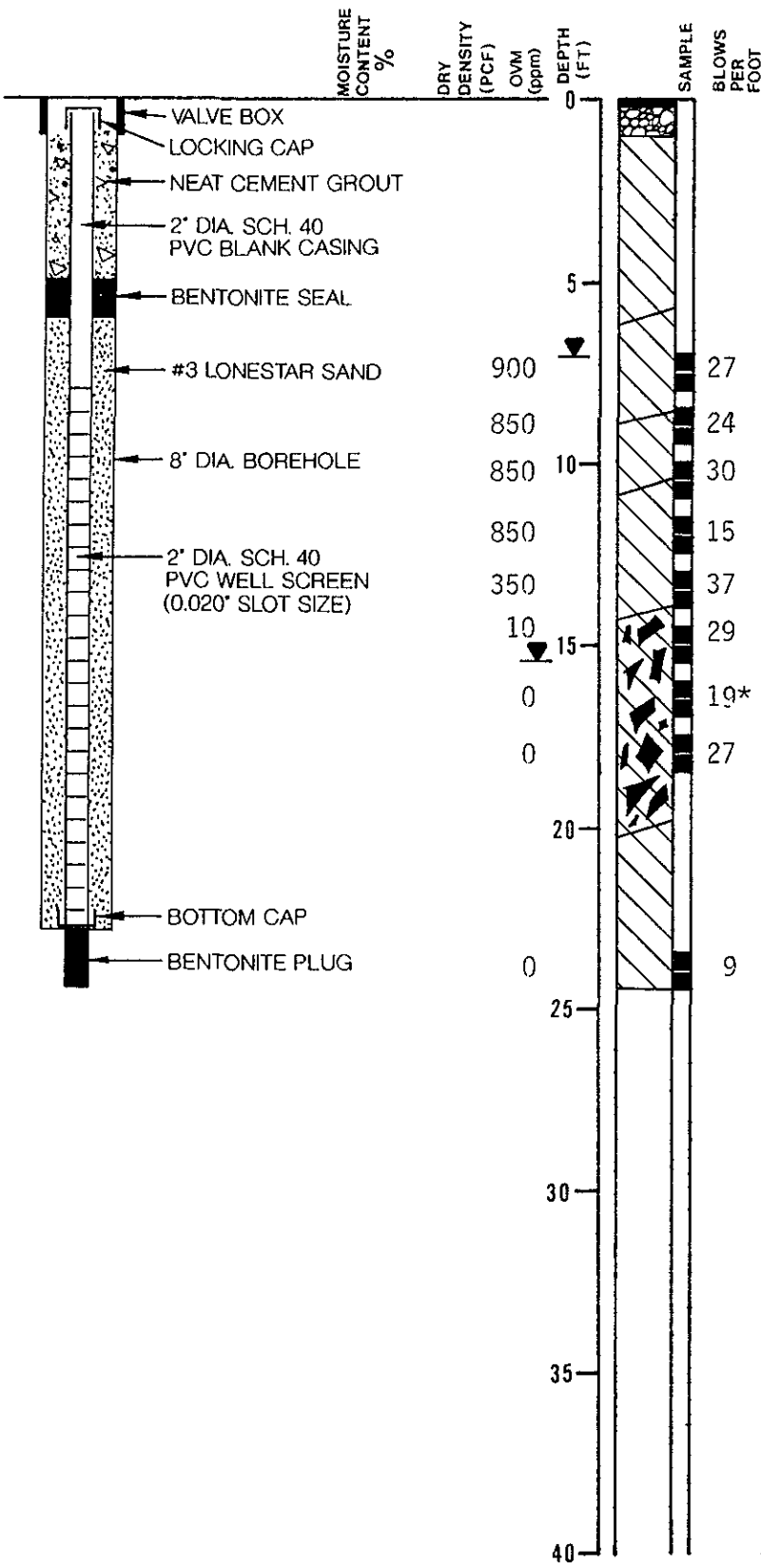
SAMPLER TYPE:  
 CALIFORNIA DRIVE  
 O.D.: 2.5 inches  
 I.D.: 2.0 inches  
 \*MODIFIED CALIFORNIA DRIVE  
 O.D.: 3.0 inches  
 I.D.: 2.5 inches

HAMMER WEIGHT: 140 pounds  
 HAMMER DROP: 30 inches

\*\*Top of casing, using assumed elevation reference as shown on Site Plan, Plate 1

# LOG OF TEST BORING MW-2

EQUIPMENT 3" Hollow Stem Auger  
 DATE DRILLED 6/5/90  
 ELEVATION 101.49 feet



Subsurface Consultants

EMERYVILLE SENIOR HOUSING

PLATE

JOB NUMBER  
537.003

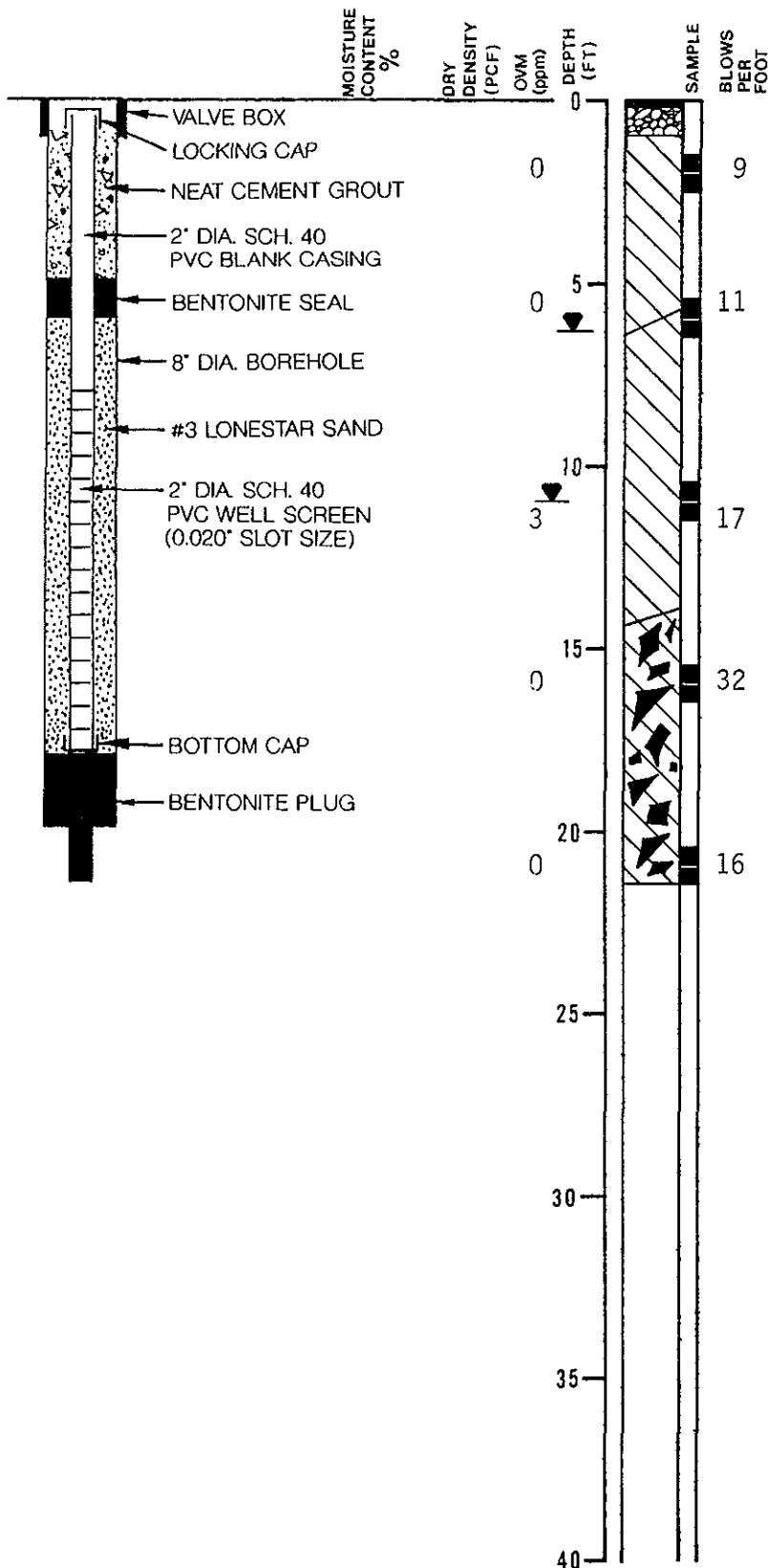
DATE  
6/13/90

APPROVED  
*[Signature]*

**5**

# LOG OF TEST BORING MW-3

EQUIPMENT 8" Hollow Stem Auger  
 DATE DRILLED 6/5/90  
 ELEVATION 100.20 feet



ASPHALTIC CONCRETE - 2" thick  
 BASE ROCK - 8" thick  
 DARK BROWN SILTY CLAY (CL)  
 medium stiff, moist

GROUNDWATER LEVEL 6/6/90  
 MOTTLED BROWN & DARK BROWN SANDY CLAY (CL)  
 medium stiff, moist, coarse grained sand

GROUNDWATER LEVEL DURING DRILLING

BROWN CLAYEY GRAVEL (GC)  
 dense, wet

Subsurface Consultants

EMERYVILLE SENIOR HOUSING

PLATE

JOB NUMBER  
537.003

DATE  
6/13/90

APPROVED  
*[Signature]*

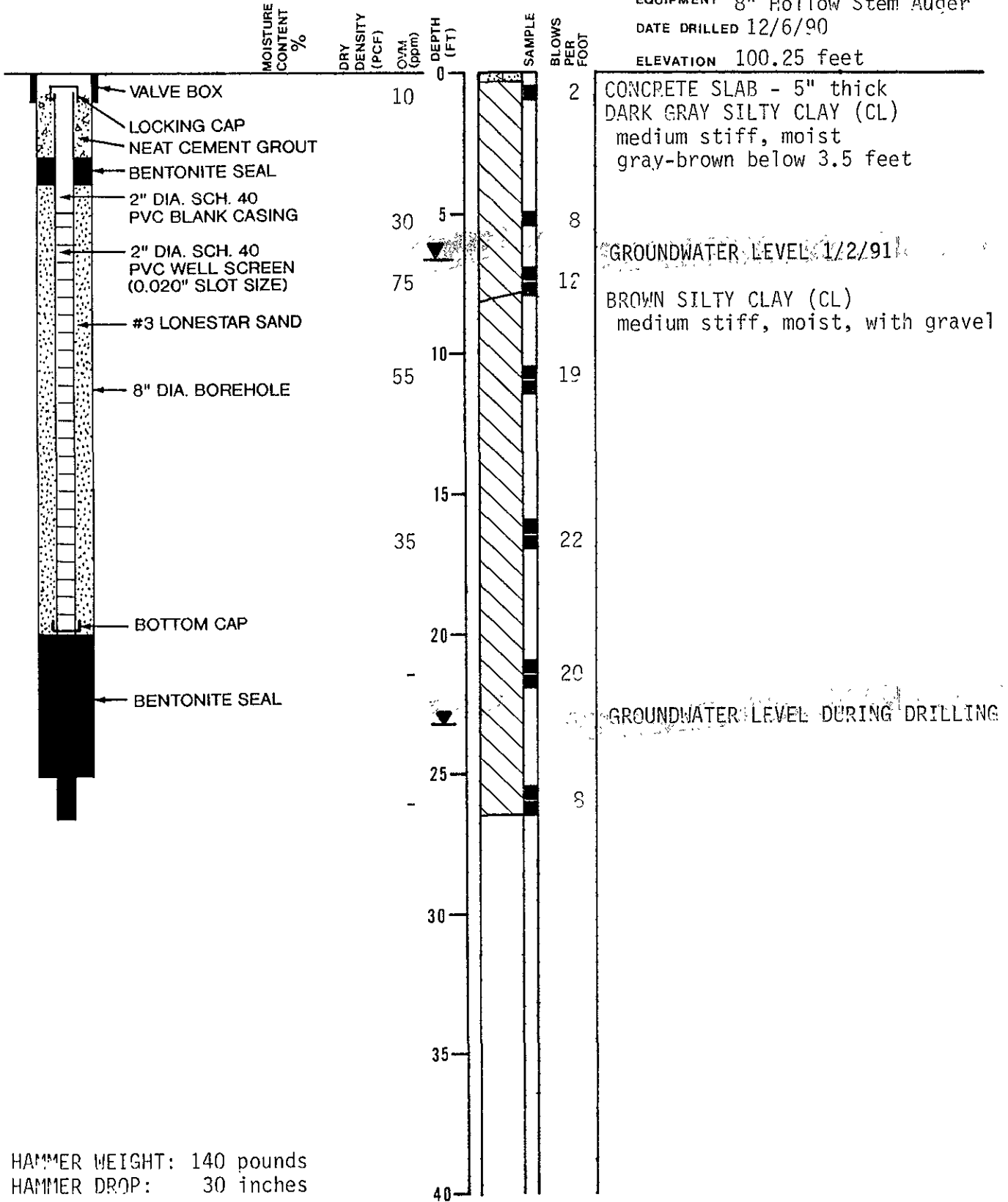
**6**

# LOG OF TEST BORING MW-4

EQUIPMENT 8" Hollow Stem Auger

DATE DRILLED 12/6/90

ELEVATION 100.25 feet



HAMMER WEIGHT: 140 pounds  
 HAMMER DROP: 30 inches

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EMERYVILLE SENIOR HOUSING

JOB NUMBER  
537.004

DATE  
12/14/90

APPROVED  
*[Signature]*

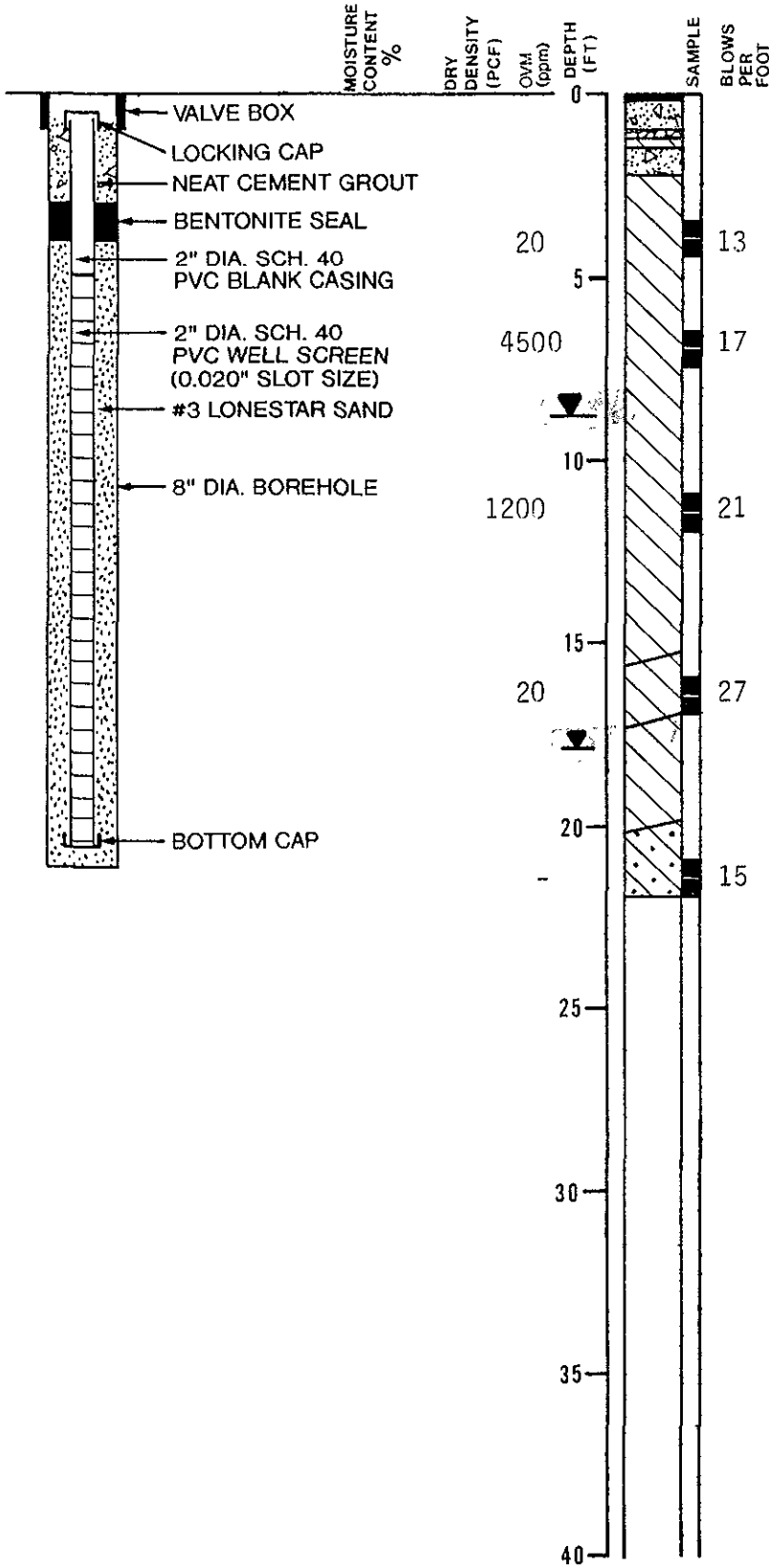
PLATE

7



# LOG OF TEST BORING MW-5

EQUIPMENT 8" Hollow Stem Auger  
 DATE DRILLED 12/7/90  
 ELEVATION 99.54 feet



ASPHALTIC CONCRETE - 3" thick  
 CONCRETE SLAB - 9" thick  
 BASE ROCK - 2" thick  
 GRAY CLAY (CL)  
 CONCRETE SLAB - 9" thick  
 DARK GRAY SILTY CLAY (CL)  
 medium stiff, moist, with gravel  
 mottled gray and green below  
 4 feet  
 GROUNDWATER LEVEL 1/2/91  
 GROUNDWATER LEVEL DURING DRILLING  
 BROWN GRAVELLY CLAY (CL)  
 medium stiff, moist  
 RED-BROWN SANDY CLAY (CL)  
 medium stiff, moist  
 BROWN CLAYEY SAND (SC)  
 medium dense, wet, with gravel,  
 fine grained sand

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EMERYVILLE SENIOR HOUSING

PLATE

JOB NUMBER  
537.004

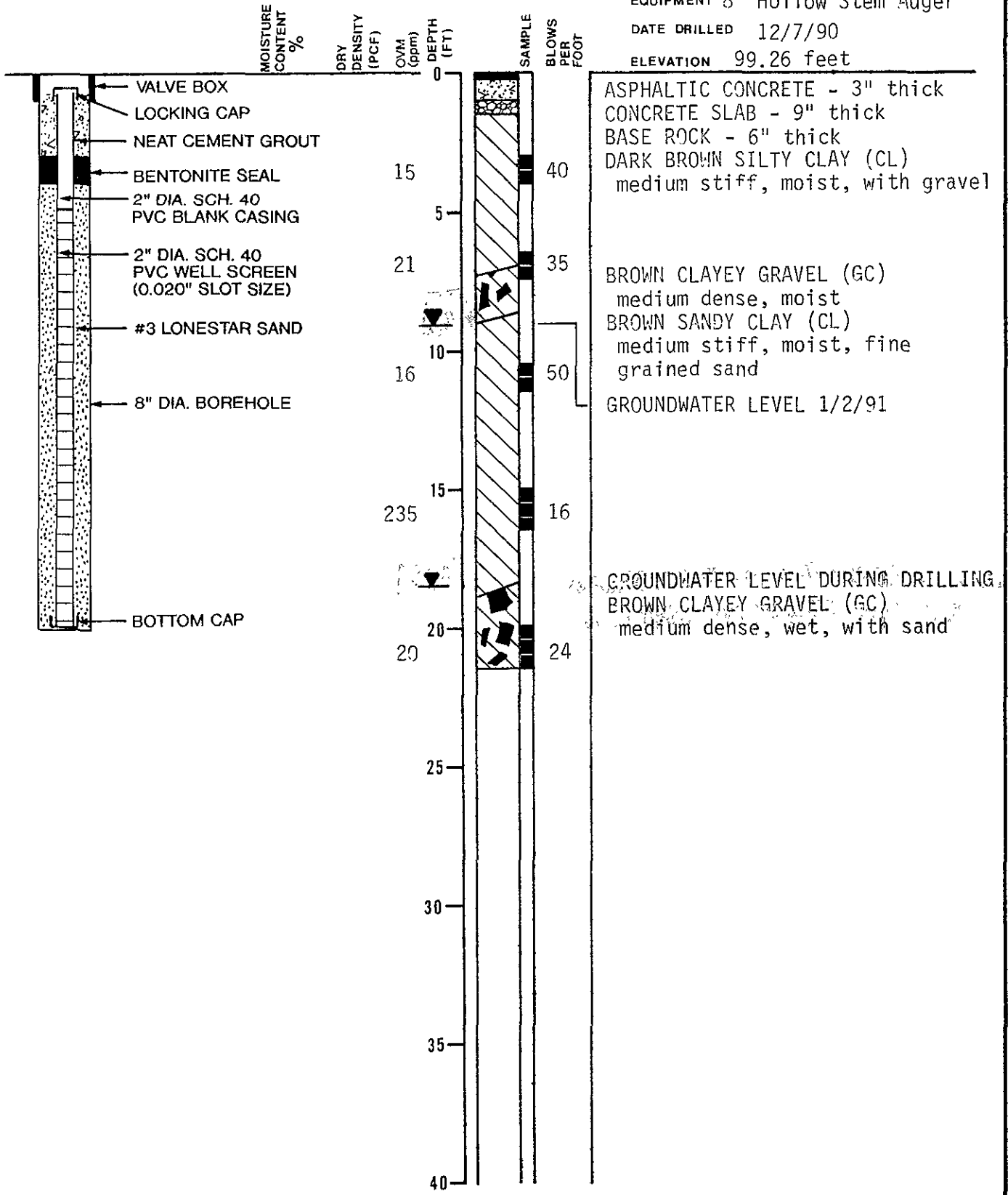
DATE  
12/14/90

APPROVED

8

# LOG OF TEST BORING MW-6

EQUIPMENT 8" Hollow Stem Auger  
 DATE DRILLED 12/7/90  
 ELEVATION 99.26 feet



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EMERYVILLE SENIOR HOUSING

PLATE

JOB NUMBER  
537.004

DATE  
12/14/90

APPROVED  
*[Signature]*

9

# LOG OF TEST BORING 1

EQUIPMENT 6" Solid Flight Auger

DATE DRILLED 1/4/90

ELEVATION --

LABORATORY TESTS	MOISTURE CONTENT (%)	DRY DENSITY (PCF)	DEPTH (FT)	SAMPLE	BLOWS PER FOOT	DESCRIPTION
PI = 28%	22.1	90	0			ASPHALTIC CONCRETE - 3" thick
LL = 50%					19	BASE ROCK - 4" thick
	22.0	102	5		25	BLACK SILTY CLAY (CL) stiff, moist, with trace of sand
	18.1	110	5		27	dark gray-brown below 5'
	19.2	106	10		22	MOTTLED GRAY AND GREEN SILTY CLAY (CL) medium stiff, moist, with fine grained sand
						orange-brown below 13'
	20.5	107	15		30*	
						GROUNDWATER LEVEL DURING DRILLING
	25.0	98	20		32*	BROWN SILTY SAND (SM) medium dense, wet, fine grained
	22.6	105	25		12*	MOTTLED BROWN AND GRAY-BROWN SILTY CLAY (CL) medium stiff, wet
	26.4	98	30		13*	ORANGE-BROWN SILTY SAND (S1) medium dense, wet, fine grained, with gravel
						borehole backfilled with cement grout
			35			
			40			

LL = LIQUID LIMIT(%)  
 PI = PLASTICITY INDEX(%)  
 UC = UNCONFINED COMPRESSIVE SHEAR STRENGTH

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

HAMMER WEIGHT: 140 pounds  
 HAMMER DROP: 30 inches

Subsurface Consultants

EMERYVILLE SENIOR HOUSING-EMERYVILLE

JOB NUMBER  
537.002

DATE  
1/15/90

APPROVED  
*[Signature]*

PLATE

10

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

UNIFIED SOIL CLASSIFICATION SYSTEM

Subsurface Consultants

EMERYVILLE SENIOR HOUSING

JOB NUMBER  
537.004

DATE  
12/14/90

APPROVED  


PLATE

11



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

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

RECEIVED

JAN - 2 1991

AM 7 8 9 10 11 12 1 2 3 4 5 6 PM



DATE RECEIVED: 12/12/90

DATE REPORTED: 12/27/90

LAB NUMBER: 102533

CLIENT: SUBSURFACE CONSULTANTS

REPORT ON: 6 WATER SAMPLES AND 12 SOIL SAMPLES

PROJECT #: 537.004

LOCATION: 4300 SAN PABLO

RESULTS: SEE ATTACHED

*Allen*

-----  
QA/QC Approval

*McPrin*

-----  
Final Approval

LABORATORY NUMBER: 102533  
 CLIENT: SUBSURFACE CONSULTANTS  
 PROJECT ID: 537.004  
 LOCATION: 4300 SAN PABLO

DATE RECEIVED: 12/12/90  
 DATE EXTRACTED: 12/14/90  
 DATE ANALYZED: 12/18/90  
 DATE REPORTED: 12/27/90

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

LAB ID	SAMPLE ID	GASOLINE RANGE (mg/Kg)	KEROSENE RANGE (mg/Kg)	DIESEL RANGE (mg/Kg)	REPORTING LIMIT* (mg/Kg)
102533-9	MW5 @ 7'	45	ND	ND	10

ND = Not Detected at or above reporting limit.

\*Reporting limit applies to all analytes.

QA/QC SUMMARY

RPD, % 1  
 RECOVERY, % 99

LABORATORY NUMBER: 102533  
 CLIENT: SUBSURFACE CONSULTANTS  
 PROJECT ID: 537.004  
 JOB LOCATION: 4300 SAN PABLO

DATE RECEIVED: 12/12/90  
 DATE ANALYZED: 12/14/90  
 DATE REPORTED: 12/27/90

Total Volatile Hydrocarbons with BTXE in Aqueous Solutions  
 TVH by California DOHS Method/LUFT Manual October 1989  
 BTXE by EPA 5030/8020

LAB ID	SAMPLE ID	TVH AS GASOLINE (ug/L)	BENZENE (ug/L)	TOLUENE (ug/L)	ETHYL BENZENE (ug/L)	TOTAL XYLENES (ug/L)
102533-1	MW1 (12/11/90)	260	0.5	0.8	ND(0.5)	0.7
102533-2	MW2 (12/11/90)	1,600	3.0	2.5	2.1	3.8
102533-3	MW3 (12/11/90)	ND(50)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)
102533-4	MW4 (12/10/90)	300	ND(0.5)	1.1	0.6	1.3
102533-5	MW5 (12/10/90)	420	ND(0.5)	ND(0.5)	1.5	2.8
102533-6	MW6 (12/11/90)	ND(50)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)

ND = Not detected at or above reporting limit; Reporting limit indicated in parentheses.

QA/QC SUMMARY

=====  
 RPD, % 1  
 RECOVERY, % 89  
 =====



LABORATORY NUMBER: 102533  
CLIENT: SUBSURFACE CONSULTANTS  
PROJECT ID: 537.004  
JOB LOCATION: 4300 SAN PABLO

DATE RECEIVED: 12/12/90  
DATE ANALYZED: 12/15/90  
DATE REPORTED: 12/27/90

Total Volatile Hydrocarbons with BTXE in Soils & Wastes  
TVH by California DOHS Method/LUFT Manual October 1989  
BTXE by EPA 5030/8020

LAB ID	SAMPLE ID	TVH AS GASOLINE (mg/Kg)	BENZENE (ug/Kg)	TOLUENE (ug/Kg)	ETHYL BENZENE (ug/Kg)	TOTAL XYLENES (ug/Kg)
102533-7	MW4 @ 5'	ND(1.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)
102533-8	MW4 @ 11'	ND(1.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)
102533-9	MW5 @ 7'	18	5.2	18	61	180
102533-10	MW5 @ 11.5'	52	ND(5.0)	39	160	390
102533-11	MW6 @ 7'	ND(1.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)
102533-12	MW6 @ 16'	ND(1.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)
102533-13	B1 @ 7'	490	ND(80)	280	810	2,200
102533-14	B1 @ 10'	ND(1.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)
102533-15	B2 @ 8'	21	ND(5.0)	15	68	260
102533-16	B2 @ 11'	ND(1.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)
102533-17	B3 @ 7'	ND(1.0)	ND(5.0)	16	ND(5.0)	28
102533-18	B3 @ 11'	57	14	86	370	1,100

ND = Not detected at or above reporting limit; Reporting limit indicated in parentheses.

QA/QC SUMMARY

RPD, %	7
RECOVERY, %	86



# Subsurface Consultants

CHAIN OF CUSTODY RECORD  
& ANALYTICAL TEST REQUEST

Project Name: 4300 SAN PABLO  
 SCI Job Number: 537.004  
 Project Contact at SCI: BILL WIKANDER  
 Sampled By: JOHN WOLFE  
 Analytical Laboratory: CUZETIS & TOMPKINS  
 Analytical Turnaround: STANDARD

Sample ID	Sample Type <sup>1</sup>	Container Type <sup>2</sup>	Sampling Date	Hold	Analysis	Analytical Method
B107'	SOIL	BRASS TUBE	12/6/90		TNH/BIXE	8015/8020
B1010'	↓	↓	↓		↓	↓
B200'	↓	↓	↓		↓	↓
B2011'	↓	↓	↓		↓	↓
B307'	↓	↓	↓		↓	↓
B3011'	↓	↓	↓		↓	↓

\* \* \* \* \*

Released by: *C. O'Neil* Date: 12/12/90

Released by Courier: \_\_\_\_\_ Date: \_\_\_\_\_

Received by Laboratory: *Mary Brutter* Date: 12/12/90 1:27p

Relinquished by Laboratory: \_\_\_\_\_ Date: \_\_\_\_\_

Received by: \_\_\_\_\_ Date: \_\_\_\_\_

<sup>1</sup> Sample Type: W = water, S = soil, O = other (specify)  
<sup>2</sup> 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: 4300 SAN PABLO  
 SCI Job Number: 537.004  
 Project Contact at SCI: BILL WILKANDER  
 Sampled By: JOHN WOLFE  
 Analytical Laboratory: CURTIS & TOMPKINS  
 Analytical Turnaround: STANDARD

Sample ID	Sample Type <sup>1</sup>	Container Type <sup>2</sup>	Sampling Date	Hold	Analysis	Analytical Method
MW4 @ 5'	SOIL	BRASS TUBE	12/6/90		TUH/BTXE	8015/8020
MW4 @ 11'			12/6/90		↓	
MW5 @ 7'			12/7/90		TUH/BTXE TEH (W/GAS)	8015/8020 8015/100. *
MW5 @ 11.5'					TUH/BTXE	8015/8020
MW6 @ 7'					↓	
MW6 @ 16'					↓	

\* \* \* \* \*

Released by: [Signature] Date: 12/12/90

Released by Courier: \_\_\_\_\_ Date: \_\_\_\_\_

Received by Laboratory: \_\_\_\_\_ Date: \_\_\_\_\_

~~Relinquished~~ by Laboratory: [Signature] Date: 12/12/90 1.27p.

Received by: \_\_\_\_\_ Date: \_\_\_\_\_

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

Notes to Laboratory:  
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 -Questions/clarifications...contact SCI at (415) 268-0461

# Subsurface Consultants

CHAIN OF CUSTODY RECORD  
& ANALYTICAL TEST REQUEST

Project Name: 4300 SAN PABLO  
 SCI Job Number: 537.004  
 Project Contact at SCI: BILL WIKANDER  
 Sampled By: JOSE BERMUDEZ  
 Analytical Laboratory: CURTIS & TOMPKINS  
 Analytical Turnaround: STANDARD

Sample ID	Sample Type <sup>1</sup>	Container Type <sup>2</sup>	Sampling Date	Hold	Analysis	Analytical Method
MW1(12/11/90)	WATER	Z VOA's	12/11/90		TNH/BTXE	8015/8020
MW2(12/11/90)			12/11/90			
MW3(12/11/90)			12/11/90			
MW4(12/10/90)			12/10/90			
MW5(12/10/90)			12/10/90			
MW6(12/11/90)	↓	↓	12/11/90		↓	↓
_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____

\* \* \* \* \*

Released by: *[Signature]* Date: 12/12/90

Released by Courier: \_\_\_\_\_ Date: \_\_\_\_\_

Received by Laboratory: *[Signature]* Date: 12/12/90 1:27p

Relinquished by Laboratory: *[Signature]* Date: \_\_\_\_\_

Received by: \_\_\_\_\_ Date: \_\_\_\_\_

<sup>1</sup> Sample Type: W = water, S = soil, O = other (specify)  
<sup>2</sup> 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