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# Treadwell & Rollo

26 May 2006  
Project 3494.01

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Alameda County  
JUN 01 2006  
Environmental Health

Subject: Response to Request for Site Conceptual Model  
for Former Peterson Manufacturing Company Facility  
1600 63<sup>rd</sup> Street  
Emeryville, California

Dear Mr. Gholami:

This letter is in response to the Alameda County Department of Environmental Health Services (ACDEHS) request for a Site Conceptual Model (SCM) of the property located at 1600 63<sup>rd</sup> Street in Emeryville, California (Site). Treadwell and Rollo Inc. (T&R) has compiled the attached SCM from available references provided by the Site owner.

## SITE DESCRIPTION AND BACKGROUND

The Site is located at 1600 63<sup>rd</sup> Street in Emeryville, California (Figure 1). The Site occupies 2.75 acres bounded by 63<sup>rd</sup> Street to the south, Overland Avenue to the west, 64<sup>th</sup> Street to the north, and the City of Emeryville Fire Station Number 2 to the east (Figure 2). The surrounding land use is primarily commercial and light industrial.

The property was originally developed as a tallow manufacturing plant by Peterson Manufacturing Company in 1914 (ES, 1988). Historical records indicate six underground storage tanks (USTs) were previously located at the Site (Figure 3).

The current tenant has operated a FedEx shipping facility at the Site since 1989, when the Site was redeveloped and construction of the FedEx building was completed. FedEx currently operates one 10,000-gallon gasoline UST at the Site (SOMA, 2000).

## ENVIRONMENTAL INVESTIGATIONS

Since 1987, numerous environmental investigations and remediation activities have been conducted at the Site. They are summarized below beginning with the most recent.

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A soil and groundwater investigation was conducted by SOMA Corporation (SOMA) of Emeryville, California in May, August, and October of 1999. Shallow groundwater samples were collected from monitoring wells onsite in May 1999 and from five borings advanced in the northwestern portion of the Site in August 1999. Soil samples were also collected from the five borings. The shallow groundwater investigation indicates only petroleum hydrocarbons, primarily Total Petroleum Hydrocarbons as gasoline and diesel (TPH-g and TPH-d, respectively), were detected (SOMA, 2000). The groundwater elevation was not measured in well MW-2 due to the presence of approximately three feet of floating product in the well.

SOMA also conducted a deep groundwater investigation in October 1999. Using cone penetrometer testing (CPT) technology, deep groundwater samples were collected from two separate intervals determined at the time of the test that correlated with a former deep industrial well. Sampling results indicate that residual chemicals were not detected at concentrations that were expected to impact the beneficial uses of deep groundwater (SOMA, 2000).

A limited soil and groundwater assessment of the area surrounding groundwater monitoring well MW-2 was completed in 1994 (Certified, 1994). The results of soil analyses indicated that TPH-g and TPH-d concentrations were less than 2 milligrams per kilogram (mg/kg, or parts per million [ppm]), and that other petroleum constituents were present at concentrations below 0.3 mg/kg. The results of groundwater analyses indicated that TPH-g and TPH-d concentrations were 0.59 and 22 milligrams per liter (mg/L), respectively.

Harding-Lawson Associates (HLA) conducted a soil and groundwater quality investigation between April and June, 1989. HLA drilled 6 soil borings and completed five as groundwater monitoring wells. Soil analyses were limited to those collected from MW-2, as other borings reportedly did not exhibit obvious signs of contamination. Soil from MW-2 contained TPH-g and TPH-d at 15 and 212 mg/kg, respectively. The only compound detected in groundwater was TPH-g at 0.3 mg/L in MW-2 (HLA, 1989).

A Site Characterization Report was prepared by Engineering-Science (ES) in 1987 and 1988 (ES, 1988). ES drilled and sampled 12 soil borings; sampled an unknown, tarry material found on the Site surface; collected and composited samples of surface soils; sampled the contents of six USTs, seven ASTs, and five sumps; and, drilled and installed three groundwater monitoring wells. ES also investigated the deep groundwater supply well that was present on the Site. The analytical results for samples collected by ES are included in Tables 2 through 4.

The above-referenced report by HLA noted that previous investigations were conducted at the Site by Peter Kaldveer and Associates between 1986 and 1987; however, these references were not made available to Treadwell & Rollo so that information is not presented in this SCM.

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## REMEDIAL ACTIONS

Remedial actions completed at the Site to date include: removing old, leaking USTs, and relining another UST; excavating, remediating and replacing petroleum hydrocarbon-affected soil; and closing the deep industrial water well located at the Site. These activities have been conducted by several different consulting firms in conjunction with the site owner and the cleanup guidelines established by the ACEH.

Six USTs, six sumps, seven aboveground storage tanks (AST), a deep water-supply well and other appurtenances related to Peterson's manufacturing operations were removed prior to and during redevelopment activities in 1988 (ES, 1988). The FedEx gasoline UST was reportedly relined in 1998. FedEx also reportedly stopped using a waste oil UST located in the general area of the gasoline UST in 1998 (SOMA, 2000).

Landfarming with biodegradation was used by ES to remediate the hydrocarbon-contaminated soils removed from the UST excavations. The landfarming operation was reviewed and approved by the ACDEHS. Thin layers of excavated soil were placed along the boundaries of the Site and aerated according to the approved ES work plan from April 1988 until July 1988. The process was continued until the results of laboratory analyses of confirmation soil samples showed concentrations of TPH-g, TPH-d, and BTEX were below the California Regional Water Quality Control Board guidelines that were in effect at the time. Upon completion, the soil was placed back into the UST excavations beneath the proposed asphalt parking area (ES, 1988).

## SITE CONCEPTUAL MODEL

All documented sampling locations, former UST locations, and soil excavations are presented in Figures 2 and 3. Analytical results from soil samples collected at each location are presented in Table 1. Analytical results from groundwater samples and the historical groundwater elevations are presented in Tables 2 and 4, respectively. Conditions at the Site are summarized below.

**Groundwater Flow:** Based on the most recent sampling event, the shallow groundwater flow was determined to be in northwesterly direction at a gradient of 0.02 (Figure 4).

**Contaminant Distribution:** Isoconcentration maps for soil were not prepared, due to the long time period over which soil samples were collected. Isoconcentration maps of TPH-g and TPH-d in groundwater are presented as Figures 5 and 6, respectively. These maps are based on data collected in 1999, the last year of regular groundwater monitoring at the Site. The results of the most recent groundwater analyses indicate that TPH-g and TPH-d are present in shallow groundwater in the northwest portion of the Site. The maximum concentration of TPH-g was

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210 mg/L in well MW-2. The maximum concentration of TPH-d was 5,800 mg/L in a grab sample collected from boring HP-5, located along the northwest property boundary.

**Subsurface Conditions:** Geologic cross sections of the Site were created using the historical data and the boring logs from the past investigations (Figures 7 and 8). The cross-sections do not indicate the presence of buried alluvial channels in the subsurface or potential pathways for chemical migration in shallow groundwater. Boring logs from past soil and groundwater investigations are presented in Appendix A. Boring logs were not available for the Kaldveer borings (EB-1 through EB-6) advanced in March 1987.

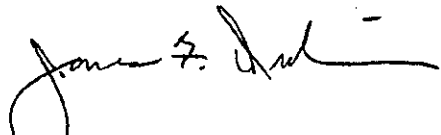
**Current Potential Sources:** There is currently one 10,000-gallon gasoline UST being used by FedEx at the Site. This UST was relined in 1998. The product samples that have been collected in the northeast corner of the Site do not indicate characteristics of gasoline and are therefore associated with historical operations other than FedEx's use of the UST (SOMA, 2000).


## SUMMARY AND CONCLUSIONS

Based on the past investigations, the soil and shallow groundwater at the Site has been affected by the former manufacturing processes that took place at the Site. The sump and tank removals, landfarming, and other past remediation activities appear to have been successful in removing the sources of contaminant releases to soil and groundwater.

If you have any questions, please call Glenn Leong at (510) 874-4500 at extension 554.

Sincerely yours,  
TREADWELL & ROLLO, INC.

  
James Durkin, PG, CHG  
Senior Geologist

  
Glenn M. Leong, REA  
Senior Associate

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Attachments: References

Figure 1 - Site Location Map

Figure 2 - Site Plan

Figure 3 - Site Plan Showing Soil Excavation Areas

Figure 4 - Shallow Groundwater Elevation Contours – 14 May 1999

Figure 5 - Isoconcentration map of TPH-g Detected in Groundwater –  
May-August 1999

Figure 6 - Isoconcentration map of TPH-d Detected in Groundwater –  
May-August 1999

Figure 7 - Geologic Cross-Section A-A'

Figure 8 - Geologic Cross-Section B-B'

Table 1 – Summary of Historical Soil Sample Results

Table 2 – Summary of Historical Groundwater Sampling Results

Table 3 – Summary of Historical Soil Excavation Confirmation Sampling

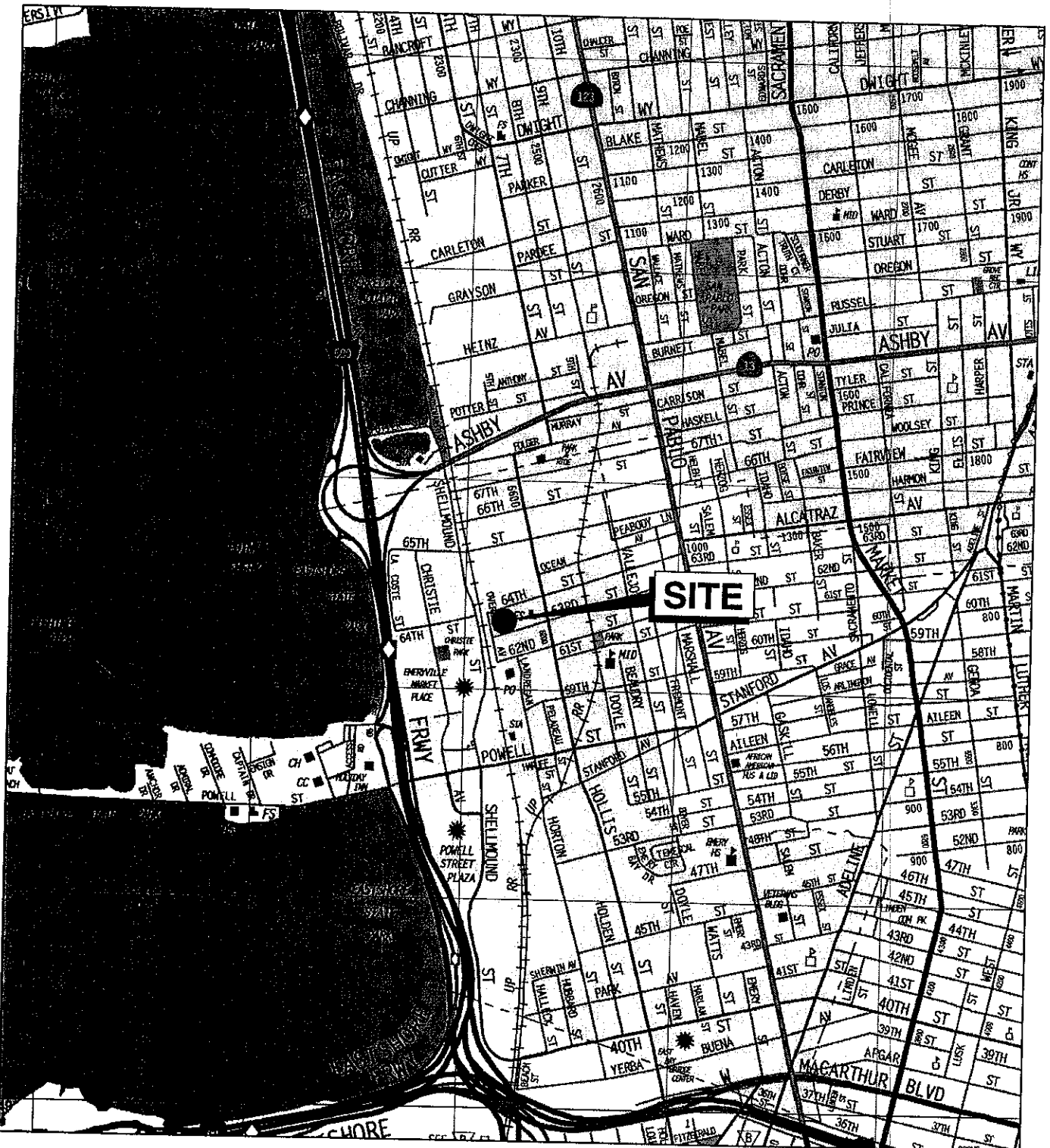
Table 4 – Summary of Historical Groundwater Elevation Data

Appendix A – Historical Boring Logs

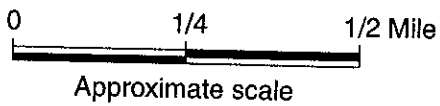
**REFERENCES**

- Certified Engineering and Testing Company (Certified). 1994. *Subsurface Investigation, 1600 63<sup>rd</sup> Street, Emeryville*. November 22.
- Engineering-Science (ES). 1988. *Site Characterization Report for Soil and Groundwater Contamination at 1600 63<sup>rd</sup> Street Site, Emeryville*. December 22.
- Harding Lawson Associates (HLA). 1989. *Groundwater Quality Investigation, 1600 63<sup>rd</sup> Street Emeryville*. October 2.
- Harding Lawson Associates. 1991. *Quarterly Groundwater Monitoring, 1600 63<sup>rd</sup> Street Emeryville*. November 21.
- Kaldveer Associates (Kaldveer). 1988. *Foundation Investigation for Federal Express Building at Peterson Manufacturing Site, Emeryville*. April 11.
- SOMA Corporation. 1998. *Summary of Remedial Activities and Recommended Site Closure Measures, 1600 63<sup>rd</sup> Street, Emeryville*. July 30.
- SOMA Corporation. 1999a. *Additional Groundwater Investigation Workplan, 1600 63<sup>rd</sup> Street, Emeryville*. February 23.
- SOMA Corporation. 1999b. *Shallow Groundwater Sampling Results and Addendum to Additional Groundwater Investigation Workplan, 1600 63<sup>rd</sup> Street, Emeryville*. July 7.
- SOMA Corporation. 1999c. *Shallow Groundwater Investigation Results, 1600 63<sup>rd</sup> Street, Emeryville*. September 2.
- SOMA Corporation. 2000. *Groundwater Investigation Report and Workplan for Additional Investigations, 1600 63<sup>rd</sup> Street, Emeryville*. January 10.

**FIGURES**



Base map: The Thomas Guide  
Alameda County  
1999



1600 63RD STREET  
Emeryville, California

**SITE LOCATION MAP**

**Treadwell&Rollo**

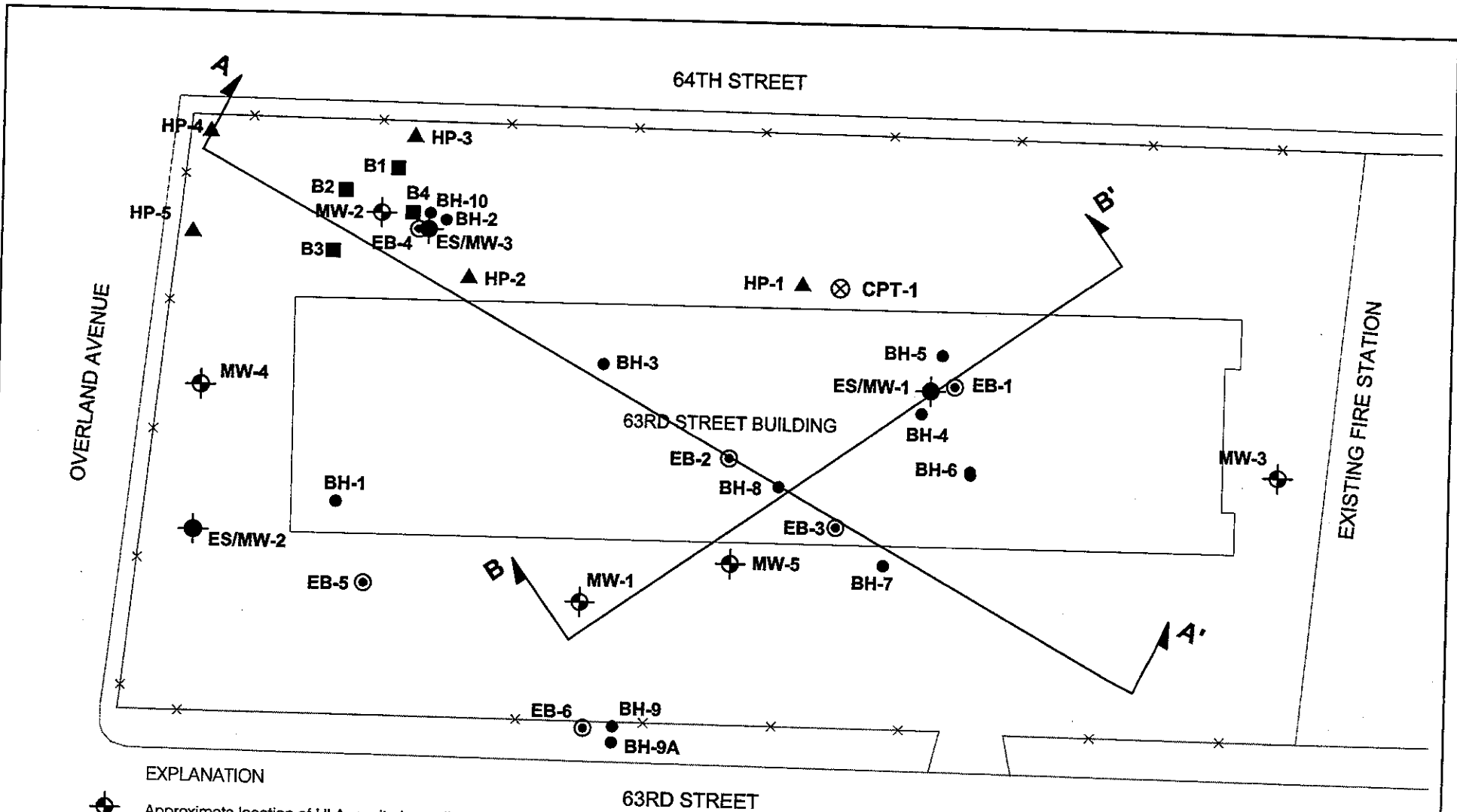
Date 04/21/06

Project No. 3494.01









Figure 1



S:\Trgraphics-Oak\3400's\3494.01\3494.01 site plan FIGURE 2.DWG 4/19/06



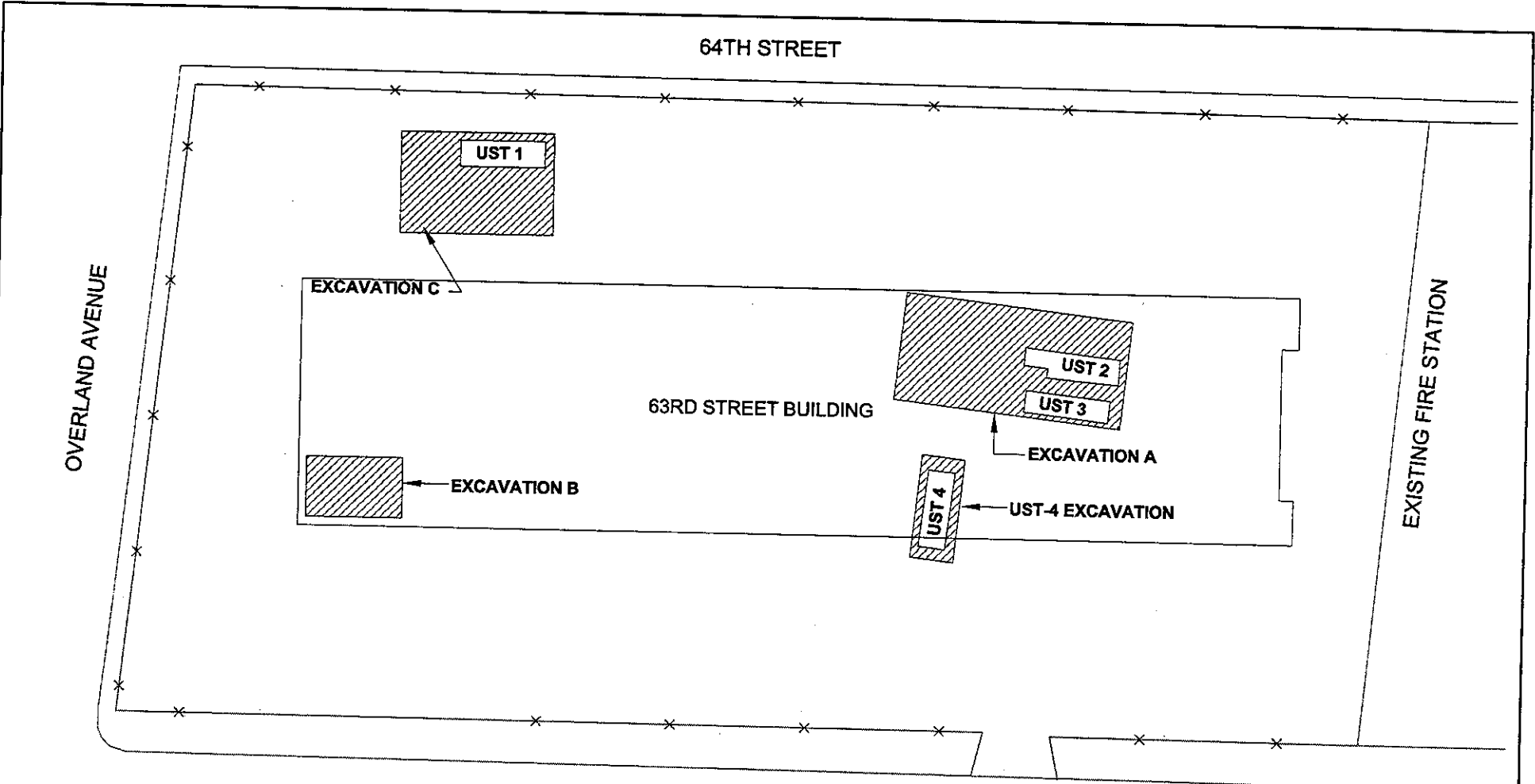
**EXPLANATION**

-  Approximate location of HLA monitoring well
-  Approximate location of grab groundwater sample, August 1999
-  Approximate location of borehole sampled by Kaldveer, March 1987
-  Approximate location of Engineering Science monitoring well
-  Approximate location of borehole sampled by Engineering Science, September 1987
-  Approximate location of borehole sampled by Certified, July 1994
-  Approximate CPT sampling location
-  Alignment of Geologic cross section




<b>1600 63RD STREET</b> Emeryville, California		
<b>SITE PLAN</b>		
Date 04/21/06	Project No. 3494.01	Figure 2
<b>Treadwell&amp;Rollo</b>		

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**EXPLANATION**

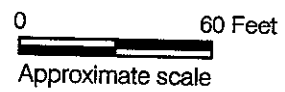
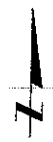
-  Soil and Tank excavation areas
- UST 1** Underground storage tank location

Excavation A - Soil and UST excavation on 9 April 1988 (ES 1988)

Excavation B - Soil excavation on 9 May 1988 (ES 1988)

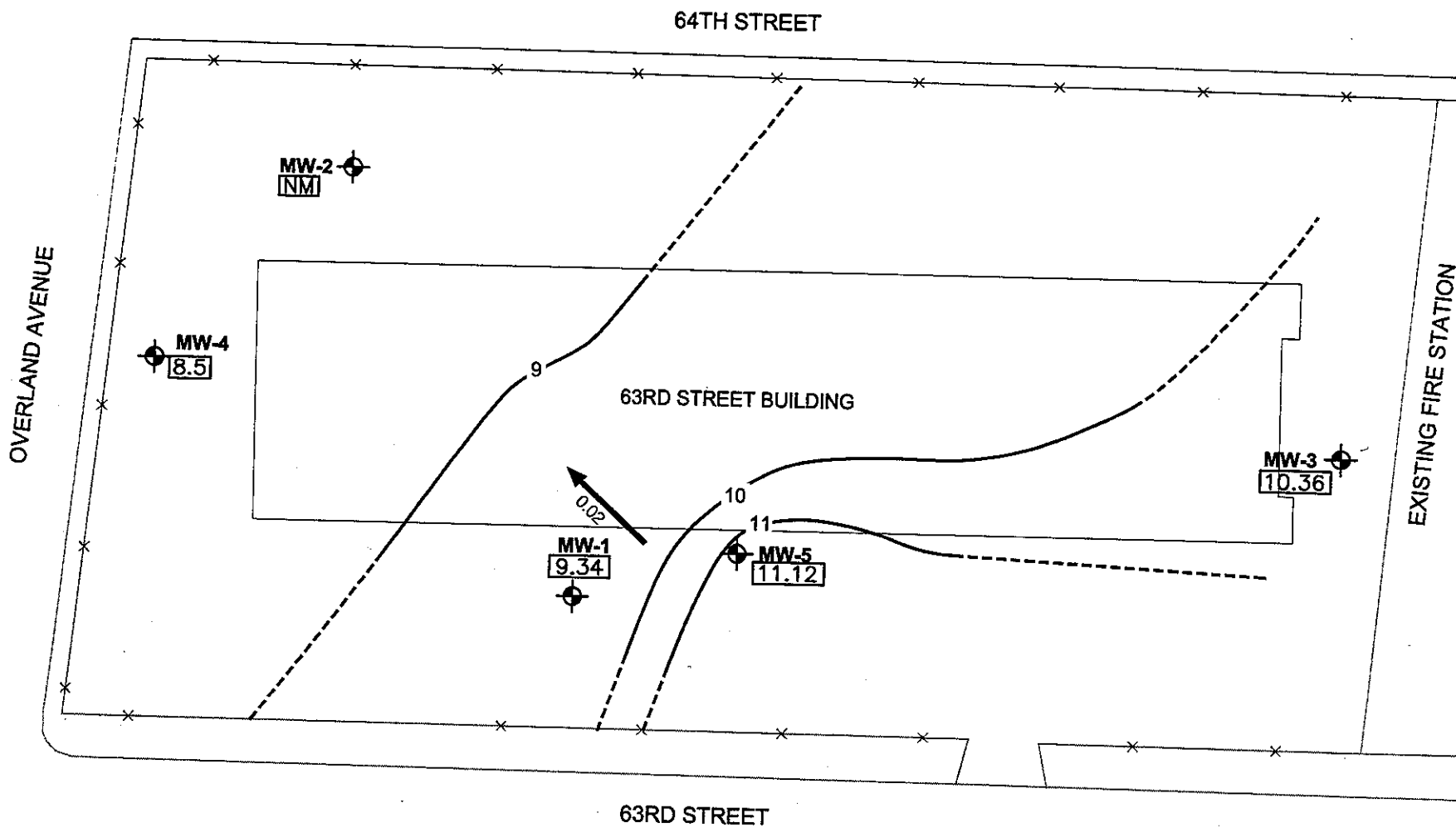
Excavation C - Soil and UST excavation on 9 April 1988 (ES 1988)

UST -4 Excavation - UST excavation on 12 April 1988 (ES 1988)







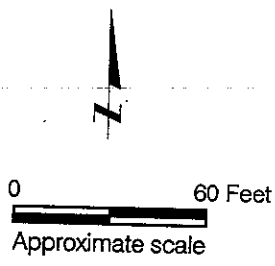
<b>1600 63RD STREET</b> Emeryville, California		
<b>SITE PLAN</b> <b>SHOWING SOIL EXCAVATION AREAS</b>		
Date 04/21/06	Project No. 3494.01	Figure 3
<b>Treadwell&amp;Rollo</b>		

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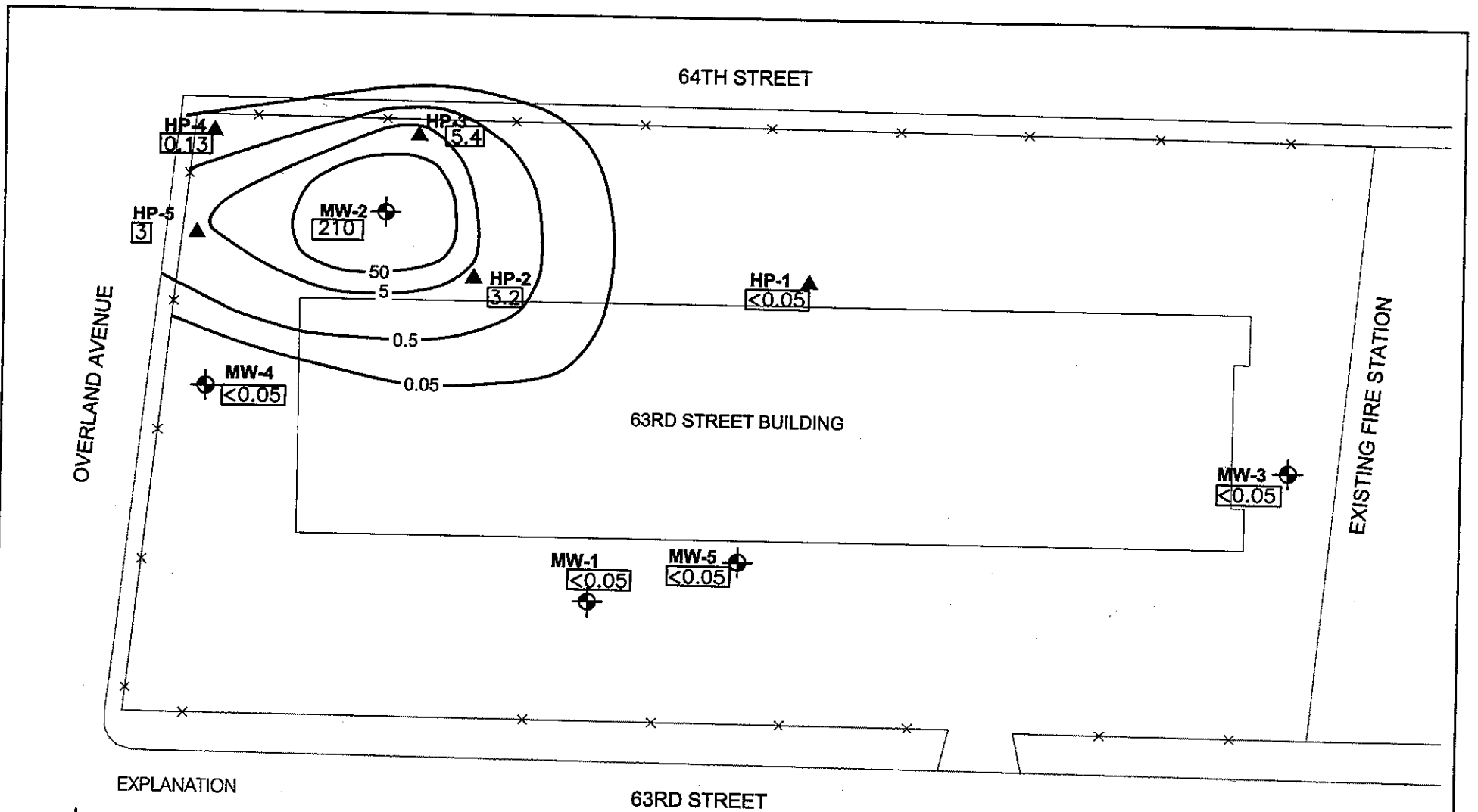
EXPLANATION

-  Approximate location of HLA monitoring well
-  Approximate groundwater contour, dashed where inferred
-  Groundwater elevation measured 14 May 1999 (SOMA, 200)
-  Inferred groundwater flow direction and gradient







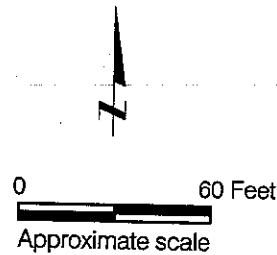
<b>1600 63RD STREET</b> Emeryville, California		
<b>SHALLOW GROUNDWATER</b> <b>ELEVATION CONTOURS - 14 MAY 1999</b>		
Date 04/21/06	Project No. 3494.01	Figure 4
<b>Treadwell &amp; Rollo</b>		

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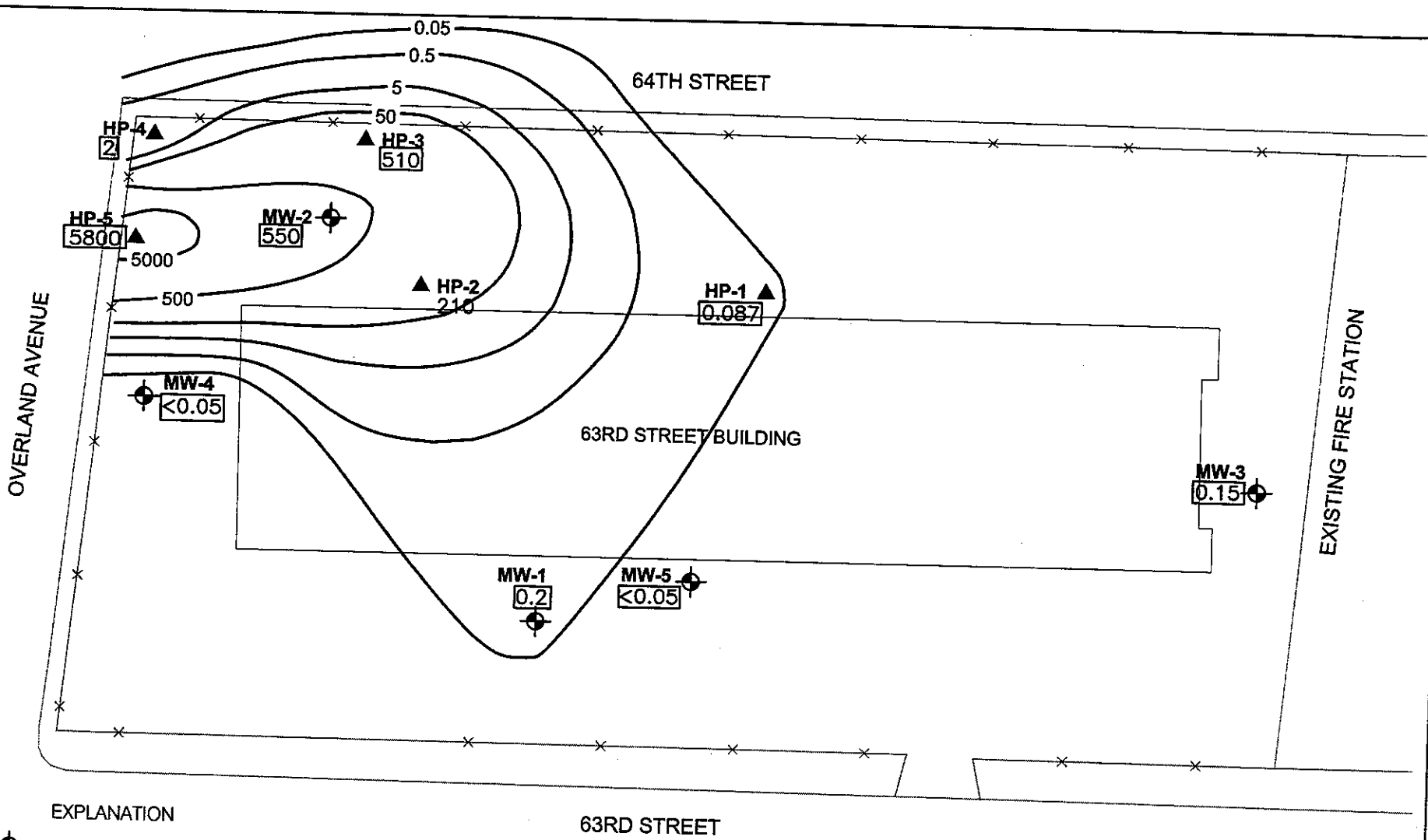
EXPLANATION

-  Approximate location of HLA monitoring well
-  Approximate location of grab groundwater sample, August 1999
-  Approximate TPH-d concentration contour
-  TPH-g concentration (mg/L) (SOMA, 2000)







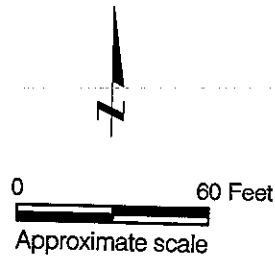
<b>1600 63RD STREET</b> Emeryville, California		
<b>ISOCONCENTRATION - MAP OF TPH-g</b> <b>DETECTED IN GROUNDWATER - MAY-AUGUST 1999</b>		
Date 04/21/06	Project No. 3494.01	Figure 5
<b>Treadwell&amp;Rollo</b>		

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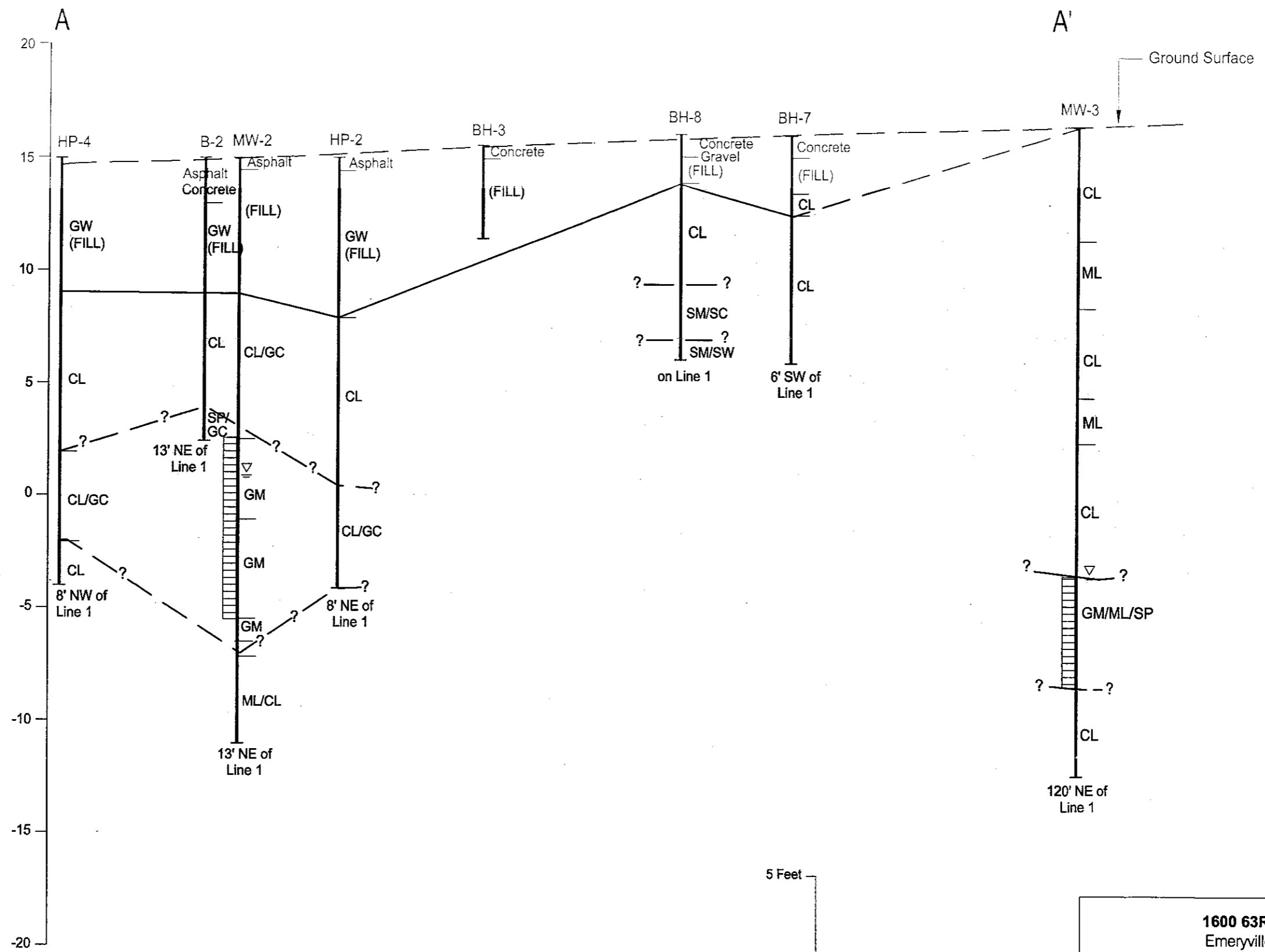


EXPLANATION

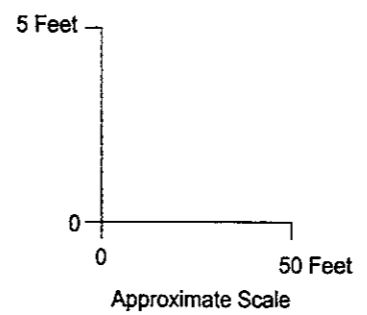
-  Approximate location of HLA monitoring well
-  Approximate location of grab groundwater sample, August 1999
-  Approximate TPH-d concentration contour
-  TPH-d concentration (mg/L)



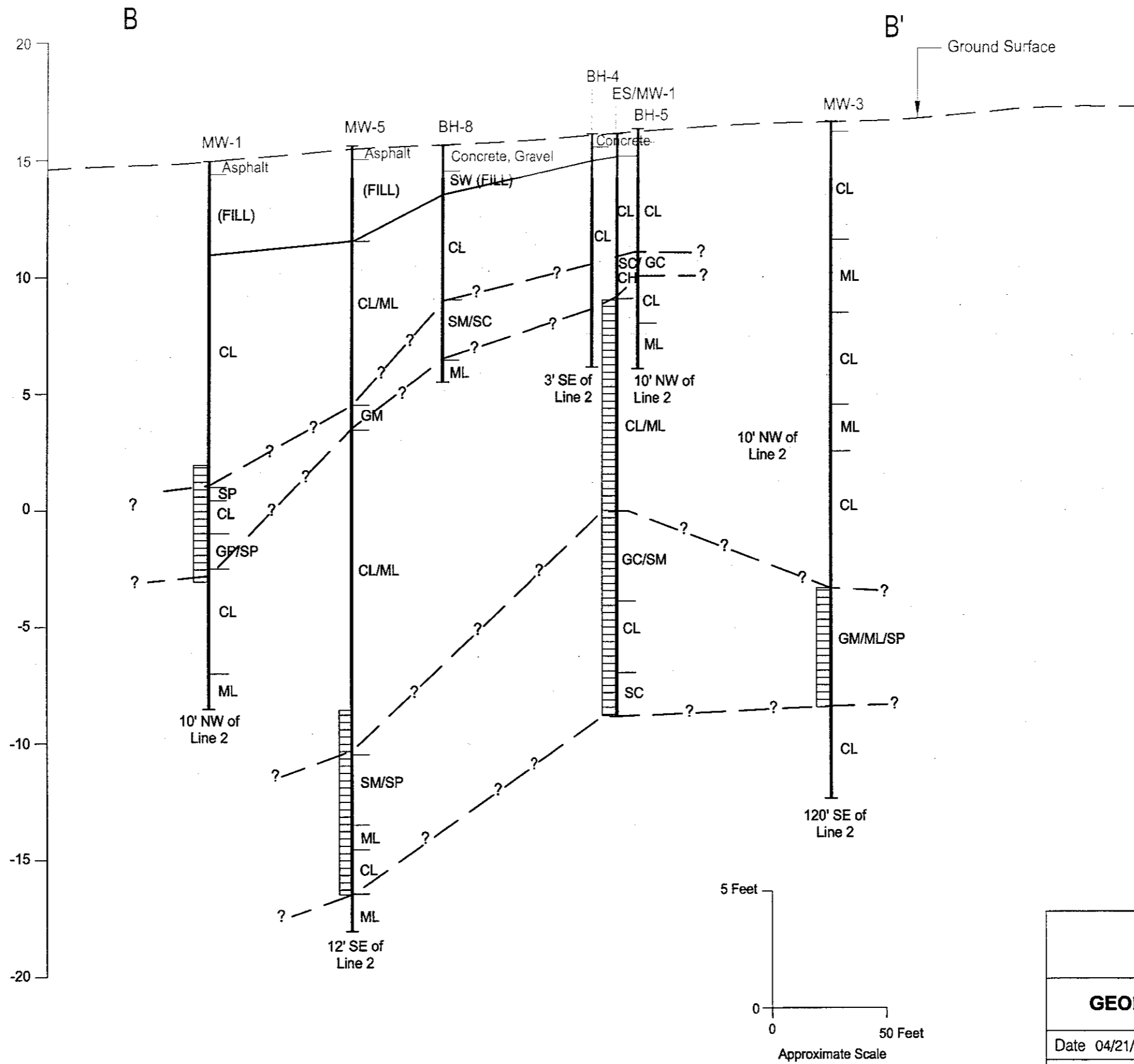
<b>1600 63RD STREET</b> Emeryville, California		
<b>ISOCONCENTRATION MAP OF TPH-d DETECTED IN GROUNDWATER - MAY-AUGUST 1999</b>		
Date 04/21/06	Project No. 3494.01	Figure 6
<b>Treadwell&amp;Rollo</b>		



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1600 63RD STREET Emeryville, California		
<b>GEOLOGIC CROSS-SECTION A-A'</b>		
Date 04/21/06	Project No. 3494.01	Figure 7
<b>Treadwell&amp;Rollo</b>		



349401\_X-SECTIONS

1600 63RD STREET Emeryville, California		
<b>GEOLOGIC CROSS-SECTION B-B'</b>		
Date 04/21/06	Project No. 3494.01	Figure 8
<b>Treadwell &amp; Rollo</b>		

TABLES



TABLE 1  
SUMMARY OF HISTORICAL SOIL SAMPLE RESULTS  
1600 63rd Street, Emeryville, CA

Sample ID	Date Sampled	Depth (ft) (ft)	Notes	Chemical Concentrations Detected (ppm)									
				TOG	TPHg	TPHd	TPH	Benzene	Toluene	Ethylbenzene	Total Xylenes	PCBs	TPH (Modified 8015)
<b>Kaldveer</b>													
EB-1	3/30/1987	3.0		--	1600	380	--	--	--	--	--	--	--
EB-2	3/30/1987	2.5		ND (1)	--	--	--	--	--	--	--	--	--
EB-3	3/30/1987	3.0		120 (1)	--	--	--	--	--	--	--	--	--
EB-4	3/30/1987	4.5	(2)	--	--	--	--	0.006	0.011	ND	ND	--	ND
EB-5	3/30/1987	6.0		1300	--	--	--	--	--	--	--	--	ND
EB-6	3/30/1987	7.5		190 (1)	ND	--	--	--	--	--	--	--	--
<b>Engineering Science</b>													
BH-1	9/2/1987	2.5, 6.5 Composite		4800	--	--	1900	--	--	--	--	--	--
BH-3	9/8/1987	1.0		100	--	--	<100	--	--	--	--	--	--
BH-4	9/2/1987	2.5, 4.5 Composite		--	1300	--	--	--	--	--	--	--	--
BH-5	9/2/1987	2.5, 6.0 Composite		--	1300	ND	--	--	--	--	--	--	--
BH-6	9/2/1987	1.0, 3.5 Composite		--	17	--	--	--	--	--	--	--	--
BH-7	9/8/1987	3.5, 9.5 Composite		--	--	20	--	--	--	--	--	ND	--
BH-8	9/8/1987	2.5, 6.0, 9.0 Composite		<100	--	--	<100	--	--	--	--	ND	--
BH-9A	9/9/1987	5.5, 10.0 Composite		--	--	16	--	--	--	--	--	ND	--
BH-10	9/9/1987	2.5		<100	--	--	<100	--	--	--	--	--	--
ES/MW-1	11/5/1987	5.0	(5)	--	360	(6)	--	0.7	0.8	--	1.2	--	--
ES/MW-2	11/6/1987	5.0		<250	--	--	<250	--	--	--	--	--	<10
ES/MW-3	1/6/1988	4.5	(2)	--	--	--	1100	ND	0.6	ND	ND	<0.3	--
Peterson-ASP	5/6/1988	2.0	(2) (4)	--	--	--	43000	--	--	--	0.71	ND	--
WPRS-C	5/11/1988	0.5 Composite 100-ft grid	(2) (3)	--	--	--	--	ND	ND	ND	ND	0.042	--
<b>Harding Lawson</b>													
MW-2	5/1/1989	5.0	(7)	--	15	212	--	<0.005	<0.005	<0.005	<0.005	ND	--
		9.5	(7)	--	<10	<10	--	<0.005	<0.005	<0.005	<0.005	ND	--
<b>Certified</b>													
B1	7/13/1994	12.0		--	<2	<2	--	0.011	0.1	0.14	0.26	--	--
B2	7/13/1994	12.0		--	<2	<2	--	0.013	0.038	0.04	0.12	--	--
B3	7/13/1994	12.0		--	<2	<2	--	0.01	0.1	0.14	0.47	--	--
B4	7/13/1994	12.0		--	<2	<2	--	<0.005	0.018	0.017	0.1	--	--
ESL					100	500	100	0.18	9.3	32	11	0.22	

NOTES:

- ppm = parts per million
- TOG = Total Petroleum Hydrocarbons as Oil and Grease
- TPHg = Total Petroleum Hydrocarbons as Gasoline.
- TPHd = Total Petroleum Hydrocarbons as Diesel.
- TPH = Total Petroleum Hydrocarbons
- PCBs = Polychlorinated Biphenyls
- MTBE = Methyl-tert-butyl ether
- = Not Analyzed.
- ND = Not Detected.
- < = Below Specified Reporting Limits.
- ESL = Environmental Screening Level (Shallow Soils-SFBRWQCB 2005)

- (1) GC/FID Waste Oil Standard
- (2) Other EPA 8240 analytes not detected
- (3) Composite soil sample collected at roughly a 100 foot grid across the site from approximately 3 to 6 inches below the surface.
- (4) 440 ppm lead, 6.1 ppm flourene, 19 ppm phenanthrene, 7.7 ppm flouranthene, 16 ppm pyrene, 23 ppm chrysene, 9.6 ppm benzo(a)anthracene detected.
- (5) 4.9 ppm lead detected.
- (6) Result reported as gasoline and diesel.
- (7) Other EPA 8010, 8020, 8270 and 8080 analytes not detected.

TABLE 2  
SUMMARY OF HISTORICAL GROUNDWATER SAMPLING RESULTS  
1600 63rd Street, Emeryville, CA

Sample No.	Date Sampled	Notes	Chemical Concentrations Detected (ppm)												
			TPHd	TPHg	Benzene	Toluene	Ethyl-benzene	Total Xylenes	PCBs	EPA 8080 Analytes	EPA 8270 Analytes	EPA 8240 Analytes	EPA 8010 Analytes	MTBE	Motor Oil
<b>Engineering Science</b>															
ES/MW-1	11/12/1987	(1)	--	--	1.7	2.6	--	4.2	--	--	--	--	--	--	--
ES/MW-2	11/12/1987	(2)	--	--	--	--	--	--	--	--	--	--	--	--	--
ES/MW-3	1/13/1988	(3)	--	--	--	--	--	--	<0.0003	--	--	0.002 (12)	--	--	--
<b>HLA</b>															
MW-1	6/18/1989		<0.5	<0.5	<0.001	<0.001	<0.001	<0.001	--	--	ND	<0.01	--	--	--
	9/21/1989		<0.5	<0.5	<0.005	<0.005	<0.005	<0.005	0.0005	(4)	ND	<0.01	--	--	--
	12/20/1989		<0.5	<0.05	<0.005	<0.005	<0.005	<0.005	<0.0005	ND	ND	<0.01	--	--	--
	3/20/1990		<0.5	<0.05	<0.005	<0.005	<0.005	<0.005	<0.0005	ND	ND	<0.01	--	--	--
	7/20/1990		0.17	<0.05	<0.005	<0.0005	<0.0005	<0.005	--	ND	--	--	--	--	--
	11/12/1990		0.16	<0.05	<0.005	<0.0005	<0.0005	<0.005	<0.0005	ND	--	--	--	--	--
	2/7/1991		0.2	<0.05	<0.005	<0.0005	<0.0005	<0.005	<0.0005	ND	--	--	--	--	--
	5/8/1991		0.7	<0.05	<0.005	<0.0005	<0.0005	<0.005	<0.0005	ND	--	--	--	--	--
MW-2	6/25/1989		<0.5	0.3	<0.005	<0.005	<0.005	<0.005	<0.0005	--	(7)	<0.01	--	--	--
	9/21/1989		1	<0.5	<0.005	<0.005	<0.005	<0.005	<0.0005	(5)	(8)	<0.01	--	--	--
	12/20/1989		<0.5	0.53	<0.005	<0.005	<0.005	<0.005	<0.0005	ND	(9)	<0.01	--	--	--
	2/20/1990		49	0.42	<0.005	<0.005	<0.005	<0.005	<0.0005	(6)	(10)	0.044 (13)	--	--	--
	5/11/1990		8.4	1.2	<0.005	<0.005	<0.005	<0.005	--	--	--	<0.01	--	--	--
	5/11/1990		<2.5	<0.5	<0.01	<0.01	<0.01	<0.01	--	--	--	<0.02	--	--	--
	7/20/1990		27	3.9	<0.005	<0.005	<0.005	0.011	--	ND	--	--	--	--	--
	7/20/1990		30	2.3	<0.005	<0.0025	<0.0025	0.0033	--	ND	--	--	--	--	--
	11/12/1990		61	380	<0.005	<0.0005	<0.0005	0.0005	<0.0005	ND	--	--	--	--	--
	11/12/1990		35	7	<0.005	0.0009	0.0001	0.0079	<0.0005	ND	--	--	--	--	--
	2/7/1991		41	11	<0.005	<0.0005	<0.0005	<0.0005	<0.0005	ND	--	--	--	--	--
	2/7/1991		27	13	<0.005	<0.0005	<0.0005	0.043	<0.0005	ND	--	--	--	--	--
	5/8/1991		43	88	<0.005	<0.0005	<0.0005	<0.005	<0.0005	ND	--	--	--	--	--
5/8/1991		26	150	<0.005	<0.0005	<0.0005	<0.005	<0.0005	ND	--	--	--	--	--	
MW-3	7/18/1989		<0.5	<0.5	<0.001	<0.001	<0.001	<0.001	--	--	ND	<0.01	--	--	--
	9/21/1989		<0.5	<0.5	<0.005	<0.005	<0.005	<0.005	<0.0005	ND	ND	<0.01	--	--	--
	12/20/1989		<0.5	<0.05	<0.005	<0.005	<0.005	<0.005	<0.0005	ND	ND	<0.01	--	--	--
	3/20/1990		<0.5	<0.05	<0.005	<0.005	<0.005	<0.005	<0.0005	ND	ND	<0.01	--	--	--
	7/20/1990		<0.05	0.11	<0.005	<0.0005	<0.0005	<0.005	--	ND	--	--	--	--	--
	11/12/1990		<0.05	<0.05	<0.005	<0.0005	<0.0005	<0.005	<0.0005	ND	--	--	--	--	--
	2/7/1991		0.12	<0.05	<0.005	<0.0005	<0.0005	<0.005	<0.0005	ND	--	--	--	--	--
	5/8/1991		<0.05	<0.05	<0.005	<0.0005	<0.0005	<0.005	<0.0005	ND	--	--	--	--	--

TABLE 2  
SUMMARY OF HISTORICAL GROUNDWATER SAMPLING RESULTS  
1600 63rd Street, Emeryville, CA

Sample No.	Date Sampled	Notes	Chemical Concentrations Detected (ppm)													
			TPHd	TPHg	Benzene	Toluene	Ethyl-benzene	Total Xylenes	PCBs	EPA 8080 Analytes	EPA 8270 Analytes	EPA 8240 Analytes	EPA 8010 Analytes	MTBE	Motor Oil	
MW-4	6/25/1989		<0.5	<0.05	<0.005	<0.005	<0.005	<0.005	<0.005	<0.0005	--	ND	<0.01	--	--	--
	9/21/1989		<0.5	<0.5	<0.005	<0.005	<0.005	<0.005	<0.005	<0.0005	ND	ND	<0.01	--	--	--
	12/20/1989		<0.5	<0.05	<0.005	<0.005	<0.005	<0.005	<0.005	<0.0005	ND	ND	<0.01	--	--	--
	12/20/1989		--	--	<0.005	<0.005	<0.005	<0.005	<0.005	--	--	--	<0.01	--	--	--
	3/20/1990		<0.5	<0.05	<0.005	<0.005	<0.005	<0.005	<0.005	<0.0005	ND	ND	<0.01	--	--	--
	7/20/1990		<0.05	<b>0.12</b>	<0.005	<0.0005	<0.0005	<0.005	<0.005	--	ND	--	--	--	--	--
	11/12/1990		<0.05	<0.05	<0.005	<0.0005	<0.0005	<0.005	<0.005	<0.0005	ND	--	--	--	--	--
	2/7/1991		<0.05	<0.05	<0.005	<0.0005	<0.0005	<0.005	<0.005	<0.0005	ND	--	--	--	--	--
	5/8/1991		<0.05	<0.05	<0.005	<0.0005	<0.0005	<0.005	<0.005	<0.0005	ND	--	--	--	--	--
MW-5	6/30/1989		<0.5	<0.05	<0.005	<0.005	<0.005	<0.005	<0.005	--	--	ND	<0.01	--	--	--
	9/21/1989		<0.5	<0.5	<0.005	<0.005	<0.005	<0.005	<0.005	<b>0.0009</b>	(11)	ND	<0.01	--	--	--
	12/20/1989		<0.5	<0.05	<0.005	<0.005	<0.005	<0.005	<0.005	<0.0005	ND	ND	<0.01	--	--	--
	3/20/1990		<0.5	<0.05	<0.005	<0.005	<0.005	<0.005	<0.005	<0.0005	ND	ND	<0.01	--	--	--
	7/20/1990		<0.05	<0.05	<0.005	<0.0005	<0.0005	<0.005	<0.005	--	ND	--	--	--	--	--
	11/12/1990		<0.05	<0.05	<0.005	<0.0005	<0.0005	<0.005	<0.005	<0.0005	ND	--	--	--	--	--
	2/7/1991		<0.05	<0.05	<0.005	<0.0005	<0.0005	<0.005	<0.005	<0.0005	ND	--	--	--	--	--
	5/8/1991		<0.05	<0.05	<0.005	<0.0005	<0.0005	<0.005	<0.005	<0.0005	ND	--	--	--	--	--
<b>Certified</b>																
MW-2	11/19/1992		<b>22</b>	<b>0.59</b>	<0.0003	<b>0.0014</b>	<0.0003	<b>0.0015</b>	--	--	--	--	--	--	--	--
	7/13/1994		<b>6</b>	<2	<0.001	<0.001	<0.001	<0.001	--	--	--	--	--	--	--	--
<b>SOMA Corporation- Monitoring Wells</b>																
MW-1	5/14/1999		<b>0.2</b>	<0.05	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	ND	ND	--	ND	<0.005	<0.5	
MW-2	5/14/1999	(14)	<b>550</b>	<b>210</b>	<2.5	<2.5	<2.5	<b>4.9</b>	<0.5	--	--	--	--	--	<3,500	
MW-3	5/14/1999		<b>0.15</b>	<0.05	<0.0005	<0.0005	<0.0005	<0.0005	<0.00052	ND	ND	--	ND	<0.005	<0.5	
MW-4	5/14/1999		<0.051	<0.05	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	ND	ND	--	ND	<0.005	<0.51	
MW-5	5/14/1999		<0.05	<0.05	<0.0005	<0.0005	<0.0005	<0.0005	<0.00052	ND	ND	--	ND	<0.005	<0.5	
<b>SOMA Corporation- Groundwater Grab Samples</b>																
HP-1-W	8/5/1999		<b>0.087</b>	<0.05	<0.0005	<0.0005	<0.0005	<0.0005	--	--	--	--	--	<0.005	--	
HP-2-W	8/5/1999		<b>210</b>	<b>3.2</b>	<0.001	<0.001	<0.001	<0.001	--	--	--	--	--	<0.01	--	
HP-3-W	8/5/1999		<b>150</b>	<b>5.4</b>	<0.005	<0.005	<0.005	<0.005	--	--	--	--	--	<0.05	--	
HP-4-W	8/5/1999		<b>2</b>	<b>0.13</b>	<0.0005	<b>0.001</b>	<b>0.00082</b>	<b>0.002</b>	--	--	--	--	--	<0.005	--	
HP-5-W	8/5/1999	(14)	<b>5,800</b>	<b>3</b>	<0.005	<0.005	<0.005	<0.005	--	--	--	--	--	<0.05	--	

TABLE 2  
SUMMARY OF HISTORICAL GROUNDWATER SAMPLING RESULTS  
1600 63rd Street, Emeryville, CA

Sample No.	Date Sampled	Notes	Chemical Concentrations Detected (ppm)												
			TPHd	TPHg	Benzene	Toluene	Ethyl-benzene	Total Xylenes	PCBs	EPA 8080 Analytes	EPA 8270 Analytes	EPA 8240 Analytes	EPA 8010 Analytes	MTBE	Motor Oil
<b>CPT Groundwater Grab Samples</b>															
CPT-1-1W	10/21/1999	Depth= 78' - 103'	<0.05	<0.05	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.005	ND	ND	ND	--	--
CPT-1-2W	10/21/1999	Depth= 135' - 160'	<b>0.1 (15)</b>	<0.05	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.013	ND	ND	ND	--	--
ESL			640	500	46	130	290	100	0.014					1.8	

NOTES:

- ppm = parts per million
- TPHd = Total Petroleum Hydrocarbons as Diesel
- TPHg = Total Petroleum Hydrocarbons as Gasoline
- PCBs = Polychlorinated biphenols
- < = Below Specified Reporting Limits.
- = Not Analyzed.
- ND = Not Detected.
- ESL = Environmental Screening Level (Shallow GW-SFBRWQCB 2005)
- TOG = Total Oil and Grease

- (1) 0.031 ppm lead and 21 ppm total fuel hydrocarbons detected.
- (2) 200 ppm TOG detected.
- (3) 2.7 ppm total fuel hydrocarbons detected.
- (4) 0.0001 ppm endrin aldehyde detected.
- (5) 0.00016 ppm heptachlor and 0.00015 ppm 4,4'-DDD detected.
- (6) 0.00035 ppm Gamma-BHC detected.
- (7) Trace fluorene detected.
- (8) 0.006 ppm fluorene, 0.005 ppm bis(2-ethyl-hexyl) phthalate and 0.0061 ppm 2-methyl-naphthalene detected.
- (9) 0.012 ppm 2-methyl-naphthalene detected.
- (10) 0.0061 ppm fluorene, 0.018 ppm 2-methyl-naphthalene and 0.0055 phenanthrene detected.
- (11) 0.00015 ppm endrin aldehyde detected.
- (12) 0.002 ppm unknown EPA 8240 analyte detected.
- (13) 0.044 ppm acetone detected.
- (14) Product samples collected from well MW-2 and boring HP-5; Chromalab results indicate hydrocarbon reported does not match diesel standard. Friedman & Bruya results indicate "patterns displayed by these peaks are indicative of degraded Bunker C or crude oil"
- (15) Chromalab analytical results state "Compounds reported are in the diesel range. They do not exhibit pattern characteristic of hydrocarbon."

TABLE 3  
SUMMARY OF HISTORICAL SOIL EXCAVATION CONFIRMATION SAMPLING  
1600 63rd Street, Emeryville, CA

Sample No.	Date Sampled	Depth (below ground surface)	Description	Chemical Concentrations Detected (ppm)												
				TPHg	TPHd	TPH	Benzene	Toluene	Ethylbenzene	Total Xylenes	PCB's	EPA 8270 Analytes	Other Analyses			
<b>Excavation A</b>																
UST-2SA	4/12/1988		Soil sample from west end of excavation	350	--	--	150 (ppb)	--	--	--	--	ND	--	--	--	--
UST-2SB	4/12/1988		Soil sample from east end of excavation	ND	ND	--	ND	ND	--	ND	ND	ND	--	--	--	--
UST-3SA	4/12/1988		Soil sample from west end of excavation	--	170	--	ND	ND	--	ND	--	--	--	--	--	--
UST-3SB	4/12/1988		Soil sample from east end of excavation	ND	ND	--	ND	ND	--	ND	--	--	--	--	--	--
PP-1	5/17/1988	variable	Sides and bottom of excavation A	--	300	1600	--	--	--	--	--	--	--	--	--	--
PP-2	5/17/1988	variable	Sides and bottom of excavation A	--	ND	ND	--	--	--	--	--	--	--	--	--	--
PP-3	5/17/1988	variable	Sides and bottom of excavation A	--	200	200	--	--	--	--	--	--	--	--	--	--
PP-4	5/17/1988	variable	Sides and bottom of excavation A	--	91	91	--	--	--	--	--	--	--	--	--	--
PP-5	5/17/1988	variable	Sides and bottom of excavation A	--	48	48	--	--	--	--	--	--	--	--	--	--
PP-6	5/17/1988	variable	Sides and bottom of excavation A	--	2000	2000	--	--	--	--	--	--	--	--	--	--
PP-7	5/17/1988	variable	Sides and bottom of excavation A	--	ND	ND	--	--	--	--	--	--	--	--	--	--
PP-8	5/17/1988	variable	Sides and bottom of excavation A	--	200	200	--	--	--	--	--	--	--	--	--	--
PP-9	5/17/1988	variable	Sides and bottom of excavation A	--	78	78	--	--	--	--	--	--	--	--	--	--
PP-10	5/20/1988	variable	Sides and bottom of excavation A	ND	ND	--	--	--	--	--	--	--	--	--	--	--
PP-11	5/20/1988	variable	Sides and bottom of excavation A	ND	83	--	--	--	--	--	--	--	--	--	--	--
PP-12	5/20/1988	variable	Sides and bottom of excavation A	ND	92	--	--	--	--	--	--	--	--	--	--	--
PP-14-15	5/23/1988	variable	Sides and bottom of excavation A	790	ND	--	--	--	--	--	--	--	--	--	--	--
PP-15	5/25/1988	variable	Sides and bottom of excavation A	490	ND	--	--	--	--	--	--	--	--	--	--	--
<b>Excavation B</b>																
EXNBH-1	5/9/1988	variable	Composite sample around BH-1	ND	ND	--	--	--	--	--	--	--	--	--	--	--
<b>Excavation C</b>																
HT-1	4/7/1988		Soil sample from beneath west end of tank	--	35	--	--	--	--	--	78 (ppb)	--	--	--	--	(2)
HT-2	4/7/1988		Soil sample from beneath east end of tank	--	26	--	--	--	--	6 (ppb)	43 (ppb)	--	--	--	--	(3)
HT-3	4/7/1988	near surface	Soil sample from east edge of pit	--	--	2600	--	--	--	112 (ppb)	ND	--	--	--	--	(4)
UST-1SA	4/15/1988		Soil sample from west end of pit	--	--	--	--	--	--	--	ND	--	--	--	--	(5)
EXNUST-1	5/9/1988	variable	Composite near UST	--	--	--	--	--	--	--	--	(1)	--	--	--	--
PNA-S	5/23/1988		Soil from Burn-Pit area	--	--	--	--	--	--	--	--	--	--	--	--	--
<b>UST-4</b>																
UST-4SA	4/12/1988		Soil sample from north end of excavation	ND	ND	--	--	--	--	--	--	--	--	--	--	--
UST-4SB	4/12/1988		Soil sample from south end of excavation	ND	ND	--	--	--	--	--	--	--	--	--	--	--
<b>ESL (ppm)</b>				100	500	100	0.18	9.3	32	11	0.22					

Notes:

- ppm = parts per million
- TPHd = Total Petroleum Hydrocarbons as Diesel
- TPHg = Total Petroleum Hydrocarbons as Gasoline
- PCBs = Polychlorinated biphenols
- < = Below Specified Reporting Limits.
- = Not Analyzed.
- ND = Not Detected.
- ESL = Environmental Screening Level (Shallow Soils-SFBRWQCB 2005)

- (1) 1.2 ppm Pyrene
- (2) 21 ppb C6 Hydrocarbons
- (3) 500 ppb Hexane
- (4) 2100 ppb Hexane
- (5) 170 ppb C6 Hydrocarbons

**TABLE 4**  
**SUMMARY OF HISTORICAL GROUNDWATER ELEVATION DATA**  
**1600 63rd Street, Emeryville, CA**

Well Number	Top of Casing Elevation	Depth of Well Screen Interval	Date Measured	Depth to Water	Water Elevation	Change in Elevation
	(feet)	(feet)		(feet)	(feet)	(feet)
MW-1	15.12	13-18	8/3/1989	5.99	9.13	
			9/21/1989	5.81	9.31	0.18
			10/20/1989	6.24	8.88	-0.43
			12/20/1989	6.09	9.03	0.15
			3/20/1990	5.87	9.25	0.22
			7/20/1990	5.75	9.37	0.12
			11/12/1990	6.04	9.08	-0.29
			2/7/1991	6.65	8.47	-0.61
			5/8/1991	6.17	8.95	0.48
			5/14/1999	5.78	9.34	0.39
MW-2	14.43	12.5-20.5	8/3/1989	6.66	7.77	
			9/21/1989	6.32	8.11	0.34
			10/20/1989	6.78	7.65	-0.46
			12/20/1989	7.32	7.11	-0.54
			3/20/1990	6.76	7.67	0.56
			5/11/1990	6.66*	--	--
			7/20/1990	6.74*	--	--
			11/12/1990	6.75*	--	--
			11/21/1990	7.00*	--	--
			2/7/1991	6.88*	--	--
5/8/1991	6.92*	--	--			
5/14/1999	NM*	--	--			
MW-3	15.90	20-25	8/3/1989	4.06	11.84	
			9/21/1989	3.77	12.13	0.29
			10/20/1989	4.49	11.41	-0.72
			12/20/1989	4.32	11.58	0.17
			3/20/1990	3.78	12.12	0.54
			7/20/1990	3.73	12.17	0.05
			11/12/1990	3.89	12.01	-0.16
			2/7/1991	3.92	11.98	-0.03
			5/8/1991	3.96	11.94	-0.04
			5/14/1999	5.54	10.36	-1.58
MW-4	14.04	22-29	8/3/1989	7.10	6.94	
			9/21/1989	6.90	7.14	0.20
			10/20/1989	6.95	7.09	-0.05
			12/20/1989	7.24	6.80	-0.29
			3/20/1990	6.94	7.10	0.30
			7/20/1990	6.94	7.10	0.00
			11/12/1990	7.13	6.91	-0.19
			2/7/1991	6.94	7.10	0.19
			5/8/1991	7.15	6.89	-0.21
			5/14/1999	5.54	8.50	1.61

**TABLE 4**  
**SUMMARY OF HISTORICAL GROUNDWATER ELEVATION DATA**  
**1600 63rd Street, Emeryville, CA**

Well Number	Top of Casing Elevation	Depth of Well Screen Interval	Date Measured	Depth to Water	Water Elevation	Change in Elevation
	(feet)	(feet)		(feet)	(feet)	(feet)
MW-5	15.21	24-32	8/3/1989	4.35	10.86	
			9/21/1989	4.38	10.83	-0.03
			10/20/1989	4.37	10.84	0.01
			12/20/1989	4.48	10.73	-0.11
			3/20/1990	4.07	11.14	0.41
			7/20/1990	4.12	11.09	-0.05
			11/12/1990	4.36	10.85	-0.24
			2/7/1991	4.44	10.77	-0.08
			5/8/1991	3.90	11.31	0.54
			5/14/1999	4.09	11.12	-0.19

**NOTES:**

\* - Petroleum product measured in well (0.01- to 3-feet thick)

**APPENDIX A  
Historical Boring Logs**



CLIENT Wareham Development  
Peterson Manufacturing Co.

LOCATION 63rd St., Emeryville, CA

DATE 5 November 1987

GEOLOGIST K. Chesick

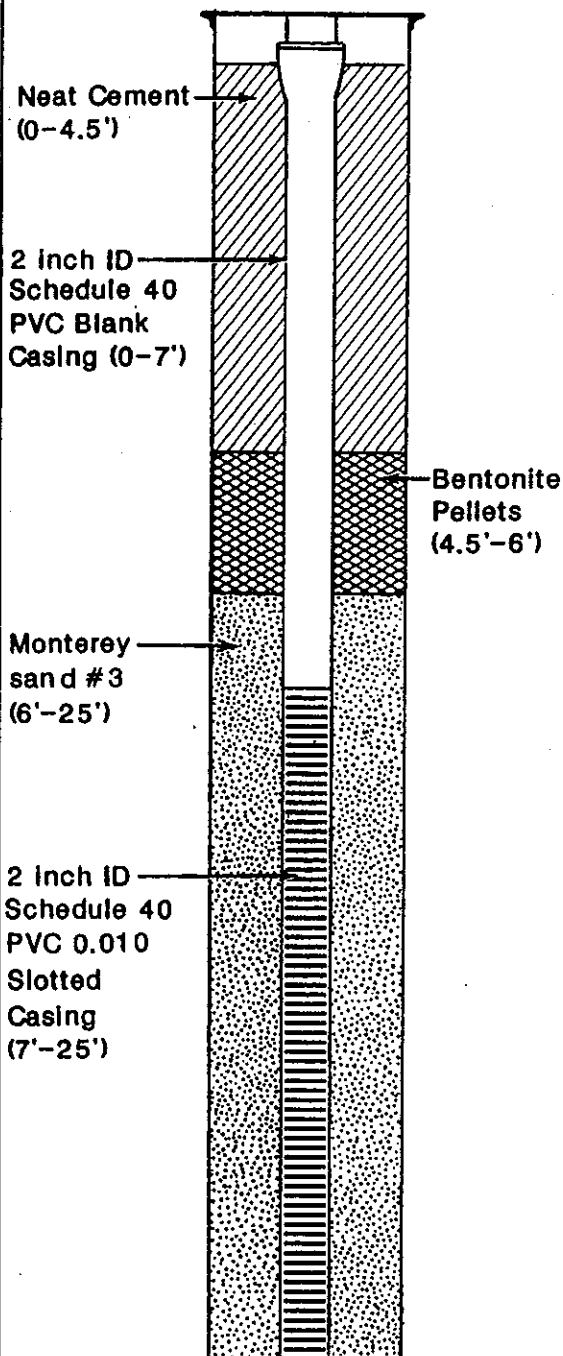
TEST HOLE NUMBER MW-1  
Chris St. Pierre

DRILLER Aqua Science Engineers

DRILLING METHOD Hollow Stem Auger

HOLE DIAMETER 8"

WELL CONSTRUCTION



LITHOLOGY

DESCRIPTION

DEPTH (FEET)	DESCRIPTION
0	CEMENT with rebar
	COARSE GRAVEL FILL, sub rounded
	GRAY CLAYEY FINE SANDY FILL
2	BLACK FINE GRAVELLY SANDY SILTY CLAY (CL), soft, moist, w/ beef jerky or smokey odor
4	BLACK SILTY CLAY (CL), soft, wet, w/minor coarse sand and pea gravel (<5%). Strong hydrocarbon (gas) odor
6	BLACK SANDY SILTY CLAY (CL), medium stiff, moist, w/glass and brick debris and balls of green gray sandy clay. Hydrocarbon odor
6	SILTY CLAYEY VERY FINE SAND (SC) w/green sandstone clasts. Hydrocarbon odor
8	GRAY BROWN COARSE SANDY FINE GRAVELLY CLAY (CH), stiff, moist (20% sand and gravel) w/glass debris. Strong Hydrocarbon odor
8	SILTY CLAYEY VERY FINE SAND (SC) W/green sandstone clasts. Hydrocarbon odor.
10	GREEN GRAY SANDY SILTY CLAY (CL), medium stiff, moist, mild Hydrocarbon odor.
10	LT GRAY CLAY (CH), soft, moist (<5% sand and fine gravel) (Faster drilling)
12	LT GRAY SILTY FINE SANDY CLAY (CL), stiff, dry, bioturbated, w/orange streaks, occasional flat 5mm chips (man made) (20% fine sand.) Slight hydrocarbon odor
14	ORANGE GRAY FINE SANDY SILTY CLAY (CL), very stiff w/ minor pea gravel (20% sand) (Stiff drilling)

EXPLANATION

▼ Water level during drilling

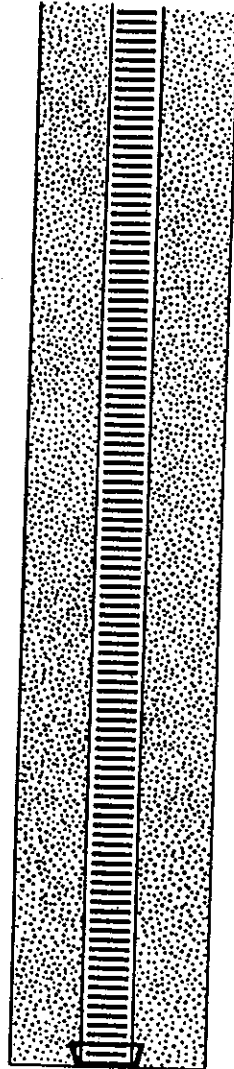
— Contact (dashed where approximate)

■ Location of sample

Wareham Development  
 CLIENT Peterson Manufacturing Co.  
 LOCATION 63rd St., Emeryville, CA  
 DATE 5 November 1987  
 GEOLOGIST K. Chesick

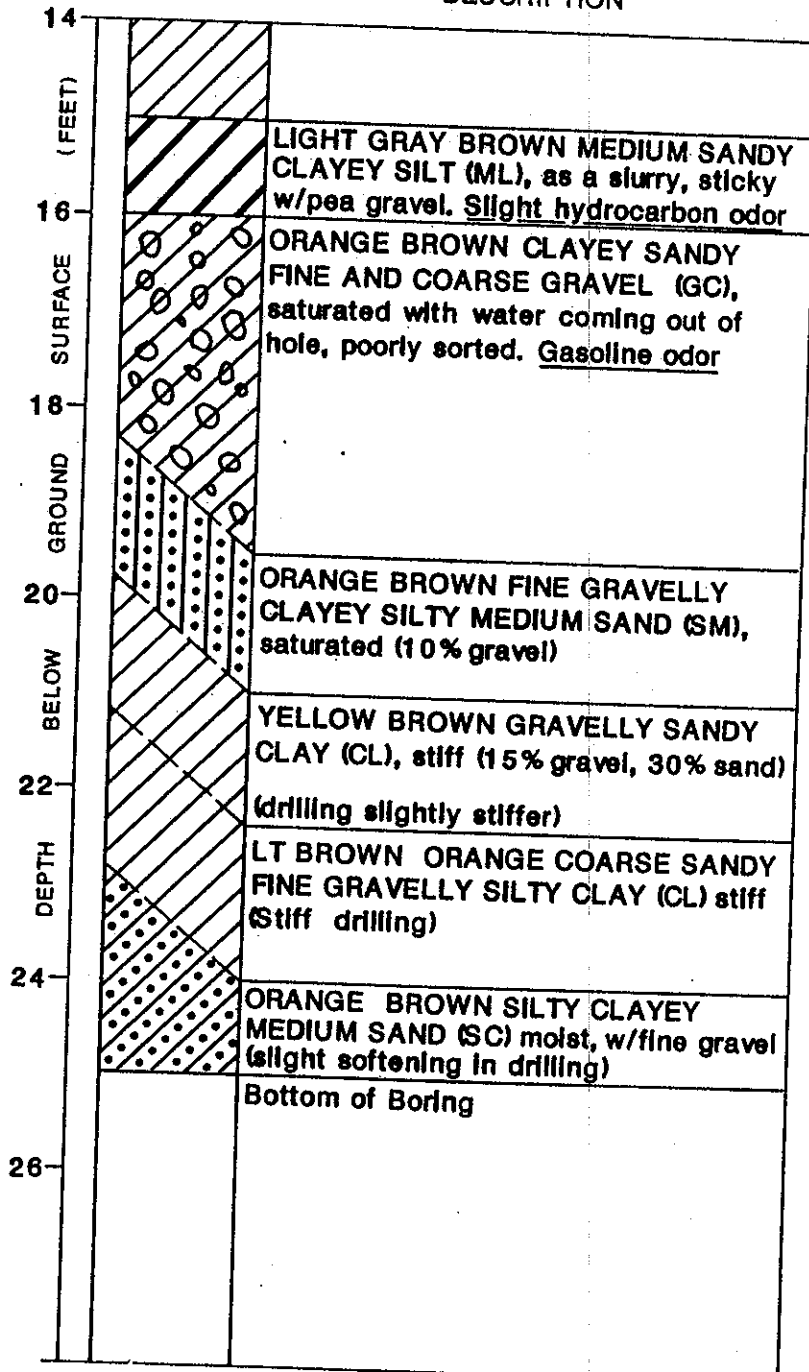
TEST HOLE NUMBER MW-1  
 Chris St. Pierre  
 DRILLER Aqua Science Engineers  
 DRILLING METHOD Hollow Stem Auger  
 HOLE DIAMETER 8"

WELL CONSTRUCTION



LITHOLOGY

DESCRIPTION



EXPLANATION

▽ Water level during drilling

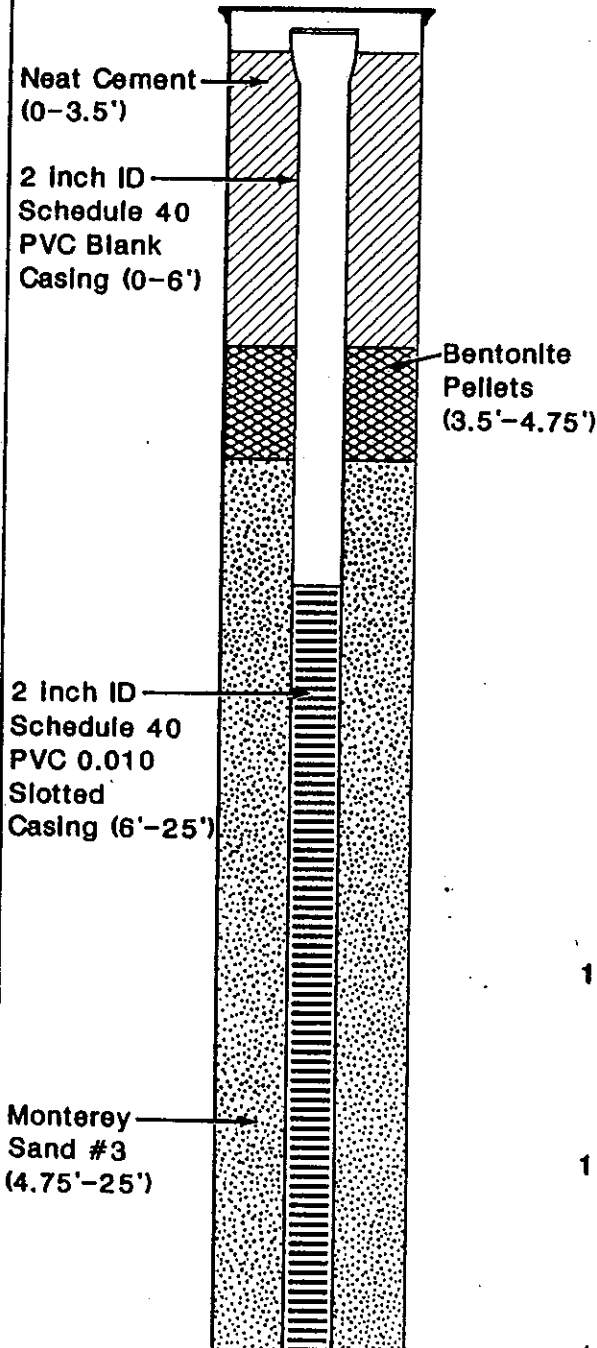
— Contact (dashed where approximate)

■ Location of sample

Wareham Development  
 CLIENT Peterson Manufacturing Co.  
 LOCATION 63rd St, Emeryville, CA  
 DATE 6 November 1987  
 GEOLOGIST K. Chesick

TEST HOLE NUMBER MW-2  
 Chris St. Pierre  
 DRILLER Aqua Science Engineers  
 DRILLING METHOD Hollow Stem Auger  
 HOLE DIAMETER 8"

WELL CONSTRUCTION



LITHOLOGY

DESCRIPTION

DEPTH (FEET)	DESCRIPTION
0	CEMENT with rebar
0-3.5	BROWN BLACK COARSE SANDY SILTY CLAY (CL), soft, moist (15% sand)
3.5-4.75	BRICK LAYER
4.75-6	BROWN CLAY (CH), wet, w/brown slurry coating having faint solvent/hydrocarbon odor
6-8	BLACK COARSE SANDY FINE GRAVELLY SILTY CLAY (CL) soft, wet (10% sand and gravel); cuttings coated w/brown sludge having faint solvent/hydrocarbon odor
8-10	BLACK COARSE SANDY FINE GRAVELLY CLAYEY SILT (ML), w/black sludge coating (15% sand and gravel) Slight hydrocarbon odor
10-11	BLACK AND GRAY GREEN SANDY CLAY (CL), (15-20% sand) (Sticky drilling)
11-12	GREEN BROWN SANDY CLAY (CL), coated with saturated lumpy brown-grey sludge. Hydrocarbon odor
12-13	BROWN GREEN SANDY SILTY CLAY (CL), stiff, moist, sticky (15% sand) Slight hydrocarbon odor
13-14	GREEN GRAY, BLACK AND GRAY SANDY SILTY CLAY (CL), medium stiff, moist w/brick fragments (10% sand)
14-15	GREEN GRAY, LT BROWN AND ORANGE SANDY SILTY CLAY (CL), dry, stiff w/sandstone clasts up to 3.5 cm, bloturbated (25% sand)
15-25	YELLOW BROWN SANDY CLAY (CL), soft, moist, (30% sand)

EXPLANATION

▼ Water level during drilling

— Contact (dashed where approximate)

■ Location of sample

CLIENT Wareham Development  
Peterson Manufacturing Co.

LOCATION 63rd St., Emeryville, CA

DATE 6 November 1987

GEOLOGIST K. Chesick

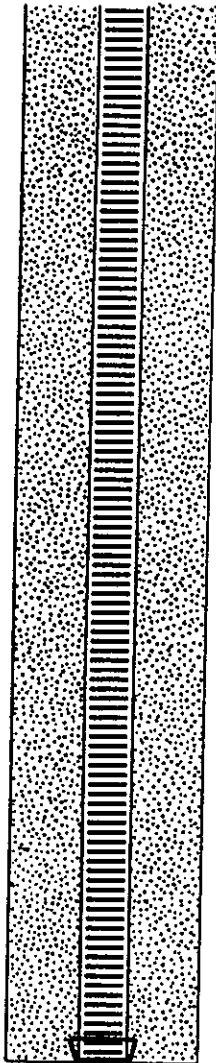
TEST HOLE NUMBER MW-2  
Chris Pierre

DRILLER Aqua Science Engineers

DRILLING METHOD Hollow Stem Auger

HOLE DIAMETER 8"

WELL CONSTRUCTION



LITHOLOGY

DESCRIPTION

DEPTH (FEET)	LITHOLOGY	DESCRIPTION
14		
16		
18		
20		
22		
24		
26		

SURFACE  
 GROUND  
 BELOW  
 DEPTH

DARKER YELLOW BROWN SANDY CLAY (CL), soft, moist, sticky (40% sand) becomes grayer, stiffer with depth.

MEDIUM GRAY SANDY CLAY (CL), soft, moist (25% sand) w/black and medium brown streaks and brick fragments.

LT BROWN CLAYEY SILTY MEDIUM SAND (SM), comes out of hole as a very watery slurry. Slurry becomes thicker with increasing depth. Sand increases, becomes coarser. Angular fine gravel appears in cuttings.

Bottom of boring.

EXPLANATION

▼ Water level during drilling

— Contact (dashed where approximate)

■ Location of sample

CLIENT WAREHAM DEVELOPMENT

TEST HOLE NUMBER MW-3

LOCATION PETERSON MANUFACTURING CO.  
63rd ST., EMERYVILLE, CA

DRILLER CHRIS ST. PIERRE  
AQUA SCIENCE ENGINEERS

DATE 6 JANUARY 1988

DRILLING METHOD HOLLOW STEM AUGER

GEOLOGIST K. CHESICK

HOLE DIAMETER 8-inch

WELL CONSTRUCTION

LITHOLOGY

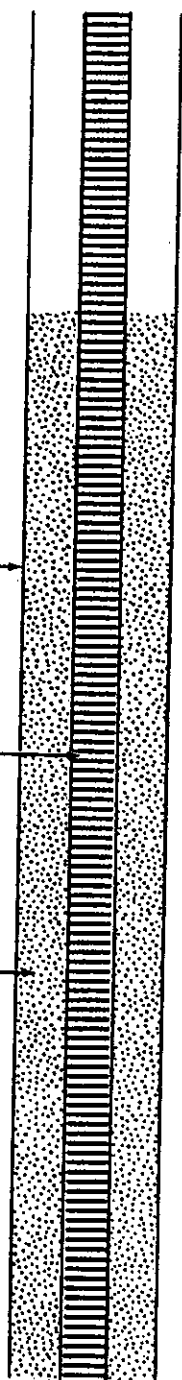
DESCRIPTION

(WELL LEFT UNCOMPLETED TO CHECK FOR FREE PRODUCT ON HIGH WATER TABLE)

8 inch DIAMETER BOREHOLE (0 - 20 feet)

0.010 SLOTTED 2 Inch ID SCHEDULE 40 PVC CASING (0 TO 20 feet)

#3 MONTEREY SAND (3 - 20 feet)



DEPTH (FEET)	LITHOLOGY	DESCRIPTION
0		CONCRETE W/WIRE
0 - 1		BRICK
1 - 2	•••••	DK BROWN SILTY SAND (SM), SOFT, SATURATED, W/SMALL BRICK FRAGMENTS
2 - 3	Diagonal lines	GRAY GREEN FINE SANDY CLAY (CL), SOFT, MOIST, W/CHINA FRAGMENTS
3 - 4	Diagonal lines	BLACK SANDY CLAY (CL), VERY SOFT, MOIST. HYDROCARBON ODOR
4 - 5	Diagonal lines	BLACK SILTY CLAY (CL), SOFT, WET W/MINOR SAND, INTERVALS OF BROWN GREEN CLAY WITH BRICK FRAGMENTS. STRONG DIESEL ODOR
5 - 6	Diagonal lines	GREEN GRAY FINE SANDY SILTY CLAY (CL), STIFF, DRY, BIOTURBATED W/SOME BROWN BLACK CLAY. DIESEL ODOR
6 - 7	Diagonal lines	OIL SHEEN VISIBLE ON SURFACE OF 6.5' SAMPLE.
7 - 8	Diagonal lines	GREEN GRAY FINE GRAVELLY SILTY CLAY (CL), STIFF, DRY, W/ANGULAR GRAVEL. STRONG DIESEL ODOR; BROWN OILY SPOTS VISIBLE WHERE SAMPLE IS BROKEN OPEN. OIL SHEEN VISIBLE ON SAMPLE SURFACE.
8 - 10	N.R.	NOTE: AT 11 feet, WATER FLOWS UP AUGER; WATER HAS DARK BROWN OILY SUBSTANCE FLOATING ON IT, AND A DIESEL ODOR
10 - 12	Diagonal lines with circles	MED. GRAY GREEN CLAYEY V. COARSE SAND FINE GRAVEL (GC), POORLY SORTED, W/LIMONITIC STREAKS. STRONG DIESEL ODOR. OUTSIDE OF SAMPLER COATED WITH BROWN OILY SUBSTANCE.
12 - 14	Diagonal lines with circles	(CUTTINGS ARE MOSTLY GRAY SILTY SLURRY)

EXPLANATION

▽ Water level during drilling

— Contact (dashed where approximate)

■ Location of sample

CLIENT WAREHAM DEVELOPMENT

TEST HOLE NUMBER MW-3

LOCATION PETERSON MANUFACTURING CO.  
63rd ST., EMERYVILLE, CA

DRILLER CHRIS ST. PIERRE  
AQUA SCIENCE ENGINEERS

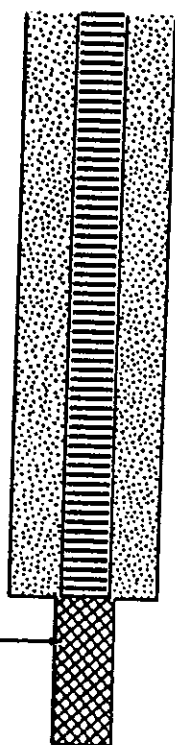
DATE 6 JANUARY 1988

DRILLING METHOD HOLLOW STEM AUGER

GEOLOGIST K. CHESICK

HOLE DIAMETER 8-inch

WELL CONSTRUCTION



BENTONITE PELLETS (20 - 21.5 feet)

LITHOLOGY

DESCRIPTION

DEPTH (FEET)	LITHOLOGY	DESCRIPTION
14	(19-20-23)	GREEN GRAY MED. TO COARSE SAND (SP), OIL SHEEN. <u>STRONG DIESEL ODOR</u>
16	(19-20-23)	GREEN GRAY COARSE SAND AND FINE GRAVEL (GP), GENERALLY BIMODAL, OIL SHEEN. <u>STRONG DIESEL ODOR</u>  (CUTTINGS COME UP AS A GRAY SLURRY WHICH BECOMES THICKER WITH DEPTH AND HAS INCREASED SAND AND GRAVEL CONTENT)
18		
20	(5-5-9)	LT GRAY BROWN FINE SANDY CLAY (CL), STIFF, MOIST (40% SAND)
22		BOTTOM OF BORING

EXPLANATION

∇ Water level during drilling

— Contact (dashed where approximate)

■ Location of sample

Top of PVC Casing  
Elevation 15.12 ft MSL

Equipment 10" HSA

Elevation 15.1 ft Date 4/30/89

GROUND SURFACE

See below for  
Well Top Detail

TOP OF CASING 0.5 ft below  
ground level

10 IN. DIAMETER BOREHOLE  
0 to 23.5 ft

4 IN. DIAMETER SCH. 40 PVC  
BLANK CASING 0.5 to 13 ft

BENTONITE/CEMENT SEAL  
1 to 8.5 ft

BENTONITE PELLET SEAL  
8.5 to 10.5 ft

SANDPACK (Monterey 2/16)  
10.5 to 22 ft

4 IN. DIAMETER SCH. 40 PVC  
SLOTTED SCREEN  
(0.010" slot size)  
13 to 18 ft

SILT TRAP 18 to 18.5 ft  
BOTTOM WELL CAP at 18.5 ft

SILT TRAP 18 to 18.5 ft  
SLOUGH 22.0 to 23.5 ft

BOTTOM OF BOREHOLE 23.5 ft

Blows/foot  
OVA Readings  
(ppm)  
Depth (ft)  
Sample

3 IN. ASPHALT  
FILL - gravel and sand, hard, dry

VERY DARK GRAY SILTY SANDY CLAY (CL) medium  
stiff, moist

GRAY-GREEN SILTY GRAVELLY CLAY (CL) stiff,  
moist

color change to gray-brown

▽ water level on 4/30/89  
color change to light olive-brown

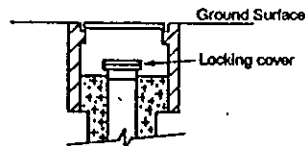
GRAY-BROWN SAND (SP) loose, saturated  
LIGHT OLIVE-BROWN SILTY CLAY (CL) medium  
stiff, saturated

GRAY-BROWN SANDY GRAVEL (GP) loose,  
saturated

GRAY-BROWN SAND (SP) medium dense, saturated  
DARK BROWN SILTY CLAY (CL) soft, saturated  
GRAY-BROWN CLAY (CL) soft, moist

YELLOW-BROWN CLAYEY SILT (ML) medium stiff,  
wet  
bottom of boring at 23.5 ft

WELL TOP DETAIL



NOT TO SCALE



Harding Lawson Associates  
Engineers and Geoscientists

Log of Boring and Well Completion Detail MW-1  
1600-63rd Street Associates, Inc.  
Emeryville, California

PLATE

A-3

DRAWN

JOB NUMBER

18, 452, 016.02

APPROVED

DATE

9/89

REVISED

DATE

Top of PVC Casing  
Elevation 14.43 ft MSL

Equipment 10" HSA

Elevation 15.0 ft Date 6/18/89

GROUND SURFACE

See below for  
Well Top Detail

Blows/foot

OVA Readings  
(ppm)

Depth (ft)

Sample

TOP OF CASING 0.5 ft below  
ground level

10 IN. DIAMETER BOREHOLE  
0 to 26 ft

4 IN. DIAMETER SCH. 40 PVC  
BLANK CASING 0.5 to 12.5 ft

BENTONITE/CEMENT SEAL  
1 to 8.5 ft

BENTONITE PELLET SEAL  
8.5 to 10.5 ft

SANDPACK (Lonestar 2/16)  
10.5 to 23 ft

4 IN. DIAMETER SCH. 40 PVC  
SLOTTED SCREEN  
(0.010" slot size)  
12.5 to 20.5 ft

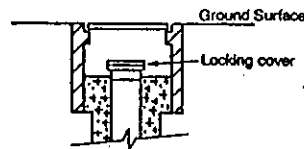
SILT TRAP 20.5 to 20.9 ft

BOTTOM WELL CAP at 20.9 ft

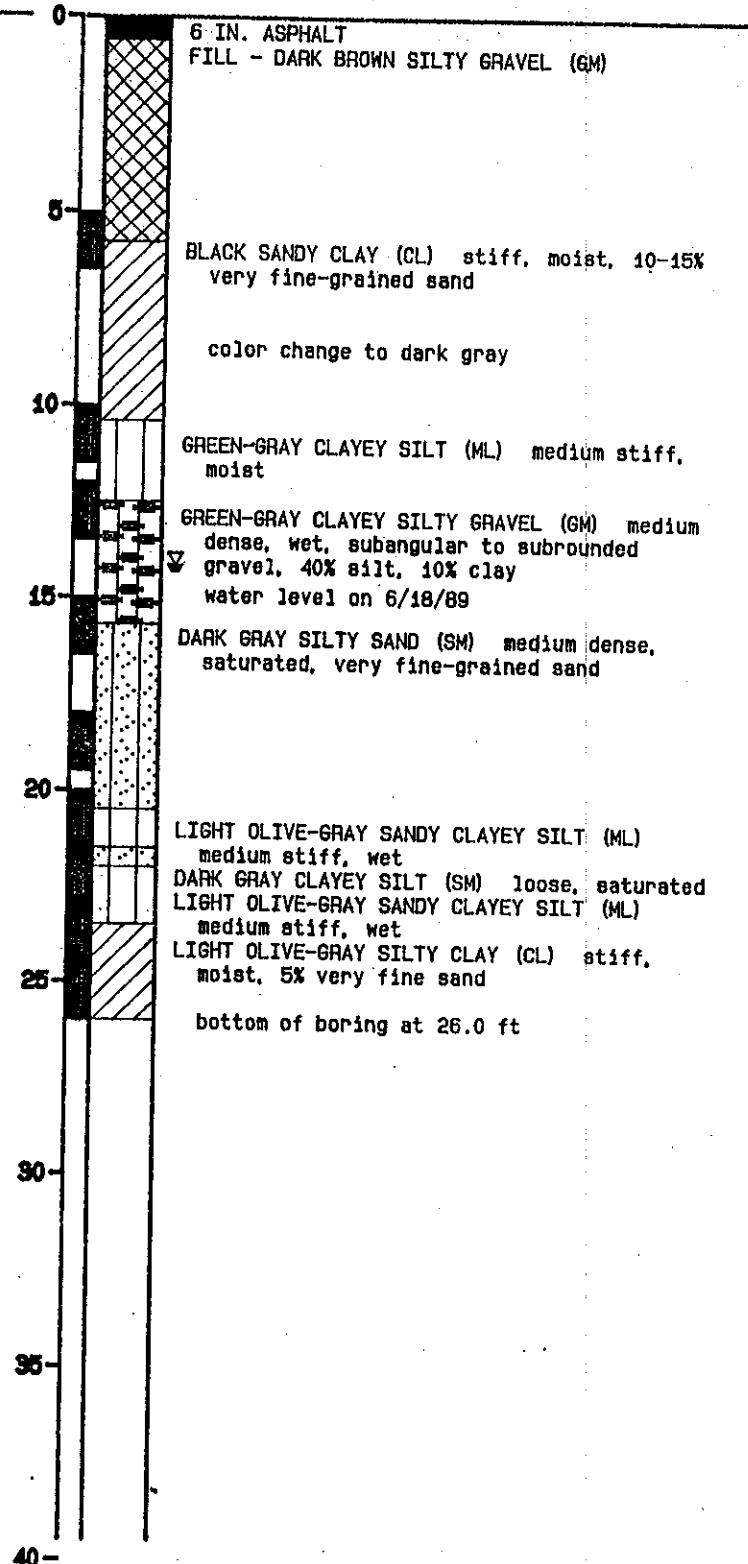
HOLE CLEANED OUT TO 24.5 ft  
BENTONITE PELLETS  
23.0 to 24.5 ft

SLOUGH 24.5 to 26.0 ft

WELL TOP DETAIL



NOT TO SCALE



Harding Lawson Associates  
Engineers and Geoscientists

Log of Boring and Well Completion Detail MW-2  
1600-63rd Street Associates, Inc.  
Emeryville, California

PLATE

A-4

DRAWN

JOB NUMBER

18, 452, 016.02

APPROVED

DATE

9/89

REVISED

DATE



Top of PVC Casing  
Elevation 15.90 ft MSL

Equipment 10" HSA

Elevation 16.5 ft Date 5/1/89

GROUND SURFACE

See below for  
Well Top Detail

TOP OF CASING 0.5 ft below  
ground level

10 IN. DIAMETER BOREHOLE  
0 to 29 ft

4 IN. DIAMETER SCH. 40 PVC  
BLANK CASING 0.5 to 20 ft

BENTONITE/CEMENT SEAL  
1 to 15 ft

BENTONITE PELLET SEAL  
15 to 18 ft

SANDPACK (Lonestar 2/16)  
18 to 27 ft

4 IN. DIAMETER SCH. 40 PVC  
SLOTTED SCREEN  
(0.010" slot size) 20 to 25

SILT TRAP 25 to 25.5 ft

BOTTOM WELL CAP at 25 ft

HOLE CLEANED OUT TO 27 ft

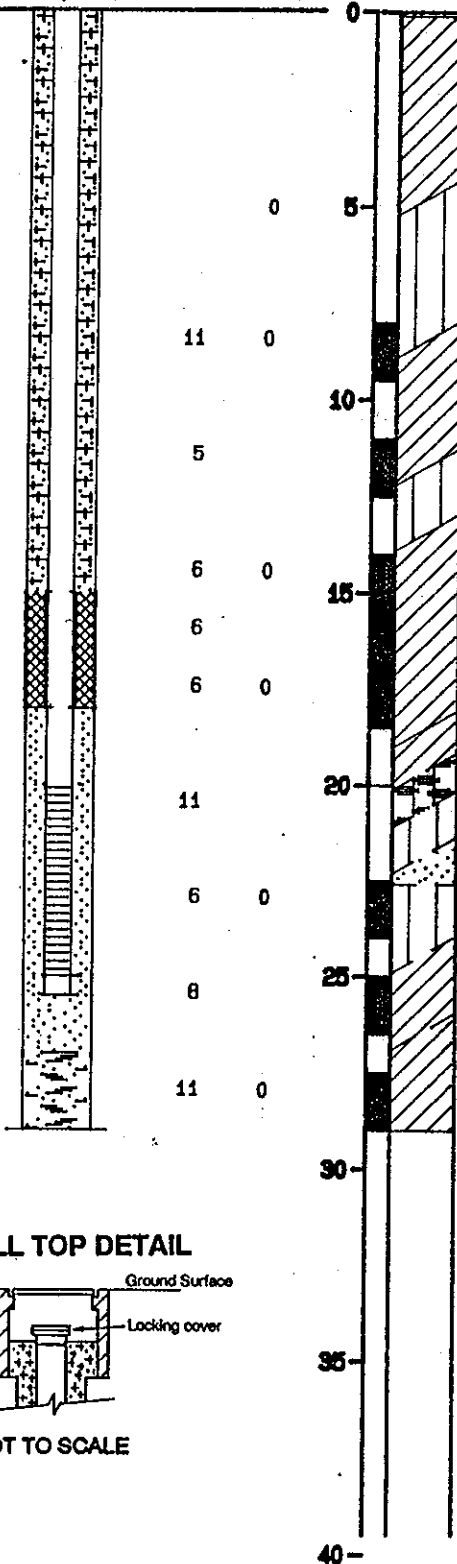
SLOUGH 27.0-29.0 ft

Blows/foot

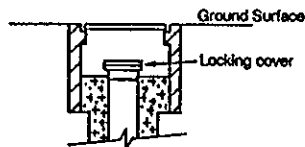
OVA Readings  
(gpm)

Depth (ft)

Sample



WELL TOP DETAIL



NOT TO SCALE



Harding Lawson Associates  
Engineers and Geoscientists

Log of Boring and Well Completion Detail MW-3

PLATE

1600-63rd Street Associates, Inc.  
Emeryville, California

A-5

DRAWN

JOB NUMBER

18, 452, 016.02

APPROVED

DATE

9/89

REVISED

DATE

Top of PVC Casing  
Elevation 14.04 ft MSL

Equipment 10" HSA

Elevation 14.5 ft Date 6/18/89

GROUND SURFACE

See below for  
Well Top Detail

TOP OF CASING 0.5 ft below  
ground level

10 IN. DIAMETER BOREHOLE  
0 to 31 ft

4 IN. DIAMETER SCH. 40 PVC  
BLANK CASING 0.5 to 22 ft

BENTONITE/CEMENT SEAL  
1 to 18 ft

BENTONITE PELLET SEAL  
18 to 20 ft

SANDPACK (Monterey 2/16)  
20 to 30 ft

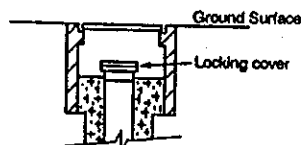
4 IN. DIAMETER SCH. 40 PVC  
SLOTTED SCREEN  
(0.010" slot size)  
22 to 29 ft

SILT TRAP 29 to 29.5 ft  
BOTTOM WELL CAP at 29.5 ft.

BENTONITE PELLETS 30 to  
31 ft

HOLE CLEANED OUT TO 31 ft

WELL TOP DETAIL



NOT TO SCALE

Blows/foot  
OVA Readings  
(ppm)  
Depth (ft)  
Sample

6 IN. ASPHALT  
FILL - MEDIUM DARK BROWN SILTY GRAVEL (GM)

BLACK SILTY CLAY WITH SAND (CL) soft, moist,  
with very fine sand

color change to dark gray  
DARK GRAY CLAYEY SILT (ML)

DARK GRAY-BROWN SILTY SAND (SM) medium  
dense, moist, with gravel

DARK GRAY-BROWN CLAYEY SAND (SC) loose, wet  
water level on 6/18/89

OLIVE-GRAY SANDY CLAYEY SILT (ML) soft,  
saturated, 10% very fine to fine sand

OLIVE-BROWN SILTY CLAY (CL) stiff, wet

OLIVE-BROWN SILTY SAND (SM) medium dense,  
saturated

OLIVE-BROWN SANDY SILT (ML) medium stiff,  
saturated

trace gravel from 20-20.2 ft

OLIVE-GRAY SILTY SAND (SM) loose, saturated,  
very fine sand

OLIVE-GRAY SILTY CLAY (CL) stiff, moist

DARK YELLOW-BROWN SILTY SAND (SM) medium  
dense, saturated

DARK YELLOW-BROWN SANDY GRAVEL (GM) medium  
dense, saturated

OLIVE-BROWN CLAYEY SILT (ML) stiff, wet,  
with 5% fine gravel

DARK YELLOW-BROWN SILTY SANDY GRAVEL (GM)  
medium dense, saturated, 40% coarse sand,  
10% silt

OLIVE-BROWN CLAYEY SILT (ML) medium stiff,  
moist  
bottom of boring at 31 ft

40-



Harding Lawson Associates  
Engineers and Geoscientists

Log of Boring and Well Completion Detail MW-4  
1600-63rd Street Associates, Inc.  
Emeryville, California

PLATE

A-6

Top of PVC Casing  
Elevation 15.21 ft MSL

Equipment 10" HSA

GROUND SURFACE

See below for  
Well Top Detail

Elevation 15.7 ft Date 6/25/89

TOP OF CASING 0.5 ft below  
ground level

10 IN. DIAMETER BOREHOLE  
0 to 33.5 ft

4 IN. DIAMETER SCH. 40 PVC  
BLANK CASING 0.5 to 24 ft

BENTONITE/CEMENT SEAL  
1 to 20 ft

BENTONITE PELLET SEAL  
20 to 22 ft

SANDPACK (Monterey 2/16)  
22 to 33.5 ft

4 IN. DIAMETER SCH. 40 PVC  
SLOTTED SCREEN  
(0.010" slot size)  
24 to 32 ft

BOTTOM WELL CAP at 32 ft

HOLE CLEANED OUT TO 33.5 ft

Blows/foot  
OVA Readings  
(ppm)  
Depth (ft)  
Sample

2 IN. ASPHALT  
FILL - MEDIUM DARK BROWN SILTY GRAVEL (GP)  
dry

VERY DARK GRAY SILTY CLAY (CL) soft, dry,  
10% fine sand

DARK BROWN CLAYEY SILT (ML) stiff, dry, with  
5% fine gravel  
color change to olive-brown at 10.4 ft

VERY DARK GRAY SILTY GRAVEL (GM) loose, moist  
LIGHT OLIVE-BROWN SILTY CLAY (CL) medium  
stiff, moist  
color change between 13.5 and 15.0 ft to  
brown

DARK GRAY-BROWN CLAYEY SILT (ML) medium  
stiff, moist

BROWN SILTY CLAY (CL) soft, moist  
DARK GRAY-BROWN SANDY CLAYEY SILT (ML)  
stiff, moist, 10% very fine to fine sand  
color change to gray-brown, with 40% very  
fine to fine sand

water level on 6/25/89

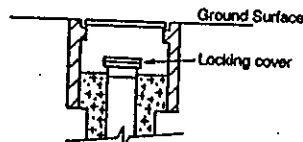
GRAY-BROWN SILTY SAND (SM) medium dense,  
saturated, 30-35% silt  
YELLOW-BROWN SAND (SP) 10YR 5/4 medium dense,  
saturated

DARK GRAY-BROWN SANDY CLAYEY SILT (ML)  
stiff, wet, 10% very fine sand

DARK YELLOW-BROWN GRAVEL (GM) 10YR 3/4 medum  
dense, saturated, 15-25% fine to medium  
sand, 15% silt

DARK GRAY-BROWN SANDY CLAYEY SILT (ML) stiff,  
moist  
bottom of boring at 33.5 ft

WELL TOP DETAIL



NOT TO SCALE



Harding Lawson Associates  
Engineers and Geoscientists

Log of Boring and Well Completion Detail MW-5  
1600-63rd Street Associates, Inc.  
Emeryville, California

PLATE

A-7

DRAWN

JOB NUMBER

18, 452, 016.02

APPROVED

DATE

9/89

REVISED

DATE

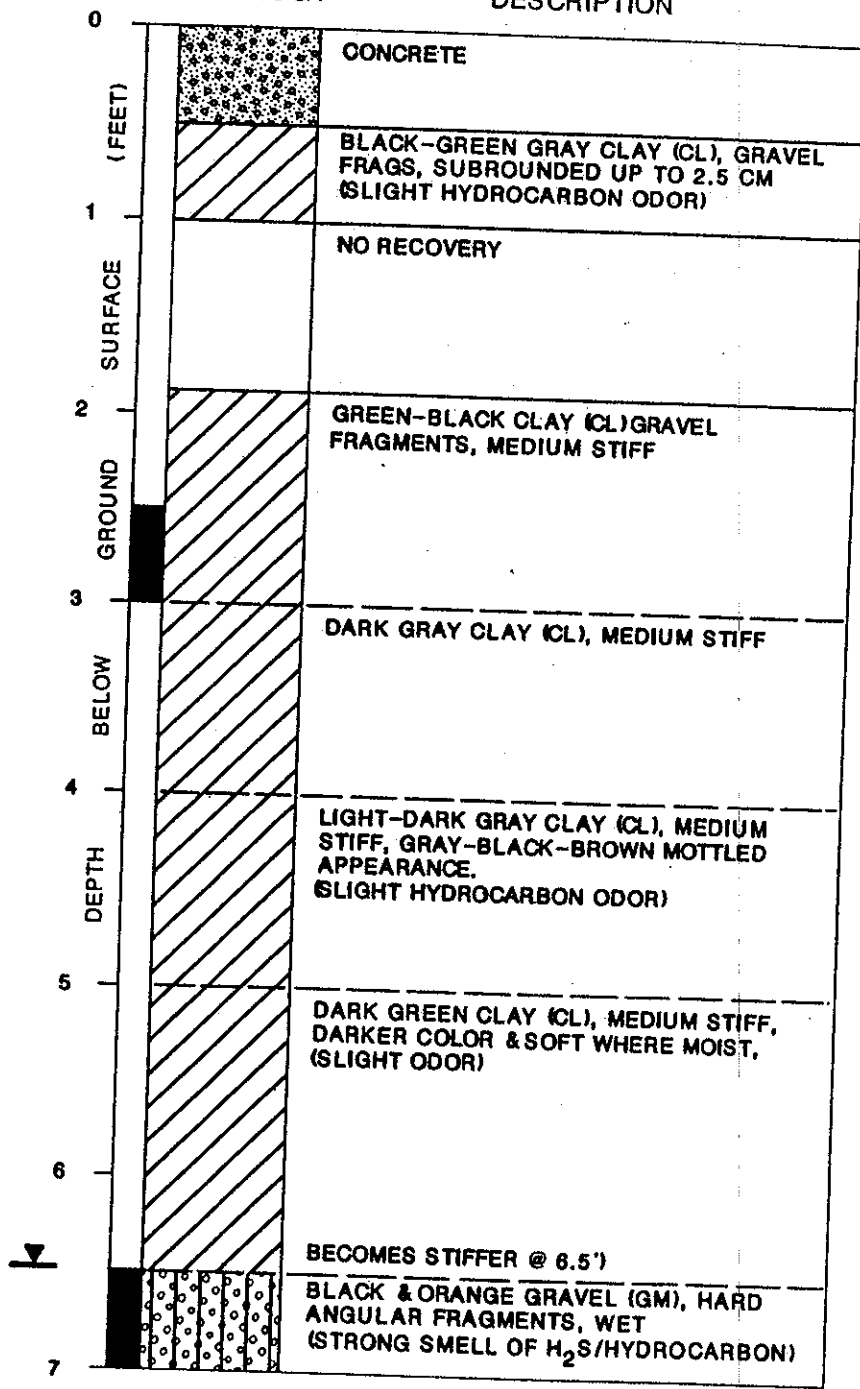
CLIENT WAREHAM DEVELOPMENT  
 LOCATION PETERSON MANUFACTURING CO.  
 63rd ST. EMERYVILLE, CA.  
 DATE 2 SEPTEMBER 1987  
 GEOLOGIST W. HAUCK

TEST HOLE NUMBER BH-1  
 DRILLER HANDDRIVEN SAMPLING CO.  
 DRILLING METHOD HANDHELD SAMPLER  
 HOLE DIAMETER 1.25'

WELL CONSTRUCTION

LITHOLOGY

DESCRIPTION



EXPLANATION

▽ Water level during drilling

— Contact (dashed where approximate)

■ Location of sample

CLIENT WAREHAM DEVELOPMENT

TEST HOLE NUMBER BH-3

LOCATION PETERSON MANUFACTURING CO.  
63rd ST., EMERYVILLE CA.

DRILLER HANDDRIVEN SAMPLING CO.

DATE 8, 9 SEPTEMBER 1987

DRILLING METHOD HANDHELD SAMPLER

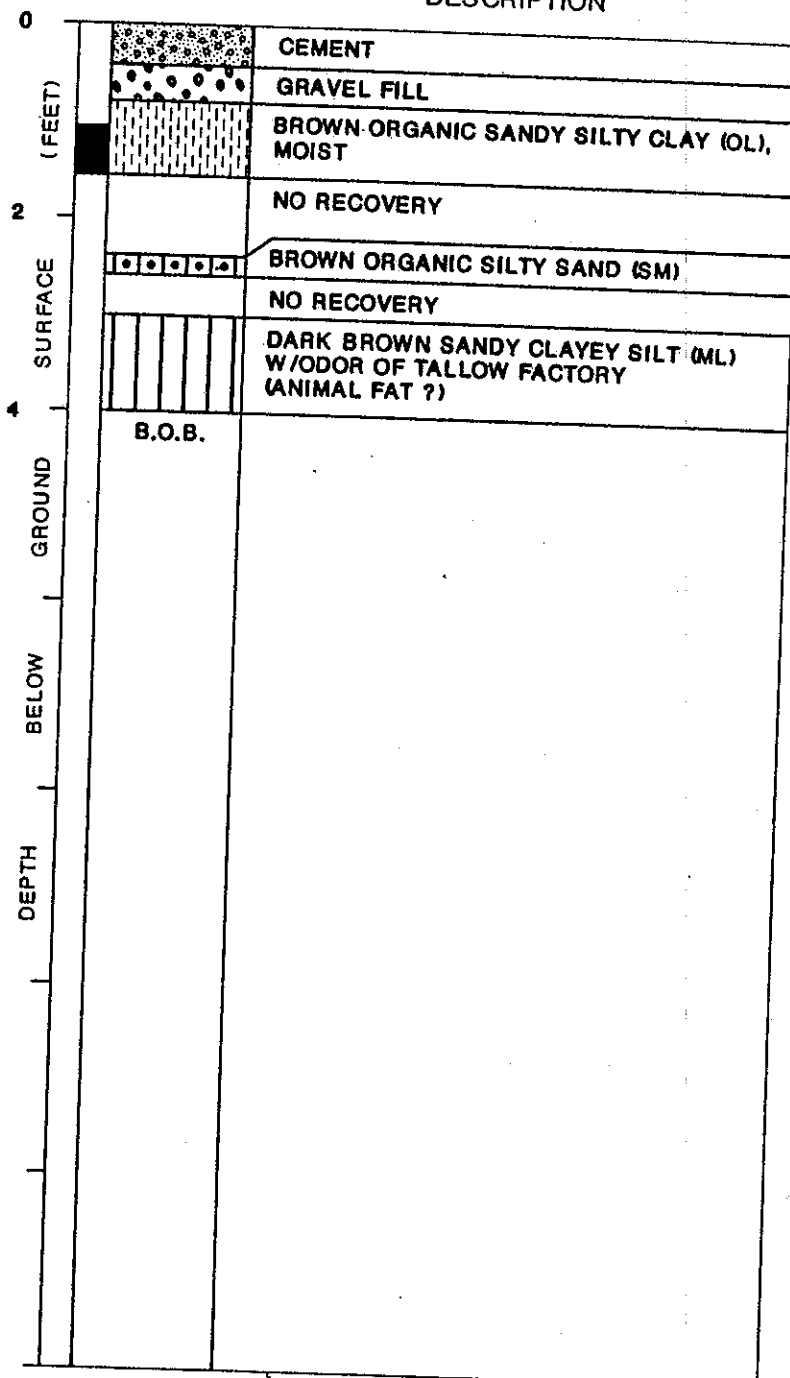
GEOLOGIST K. CHESICK

HOLE DIAMETER 1.25"

WELL CONSTRUCTION

LITHOLOGY

DESCRIPTION



EXPLANATION

▼ Water level during drilling

— Contact (dashed where approximate)

■ Location of sample

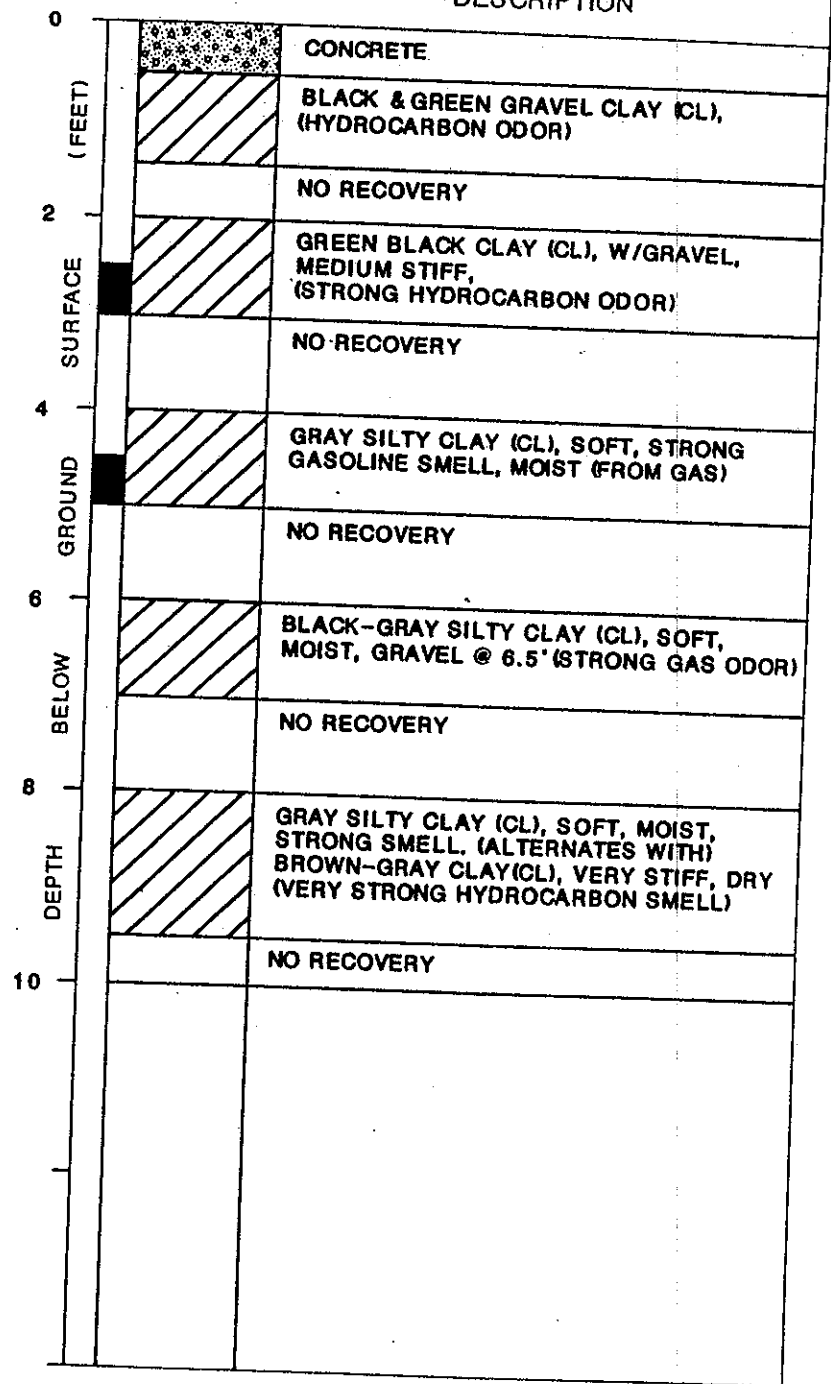
CLIENT WAREHAM DEVELOPMENT  
 LOCATION PETERSON MANUFACTURING CO.  
 83 rd ST., EMERYVILLE, CA.  
 DATE 2 SEPTEMBER 1987  
 GEOLOGIST W. HAUCK

TEST HOLE NUMBER BH-4  
 DRILLER HANDRIVEN SAMPLING CO.  
 DRILLING METHOD HAND HELD SAMPLER  
 HOLE DIAMETER 1.26'

WELL CONSTRUCTION

LITHOLOGY

DESCRIPTION



EXPLANATION

▼ Water level during drilling

— Contact (dashed where approximate)  
 ■ Location of sample

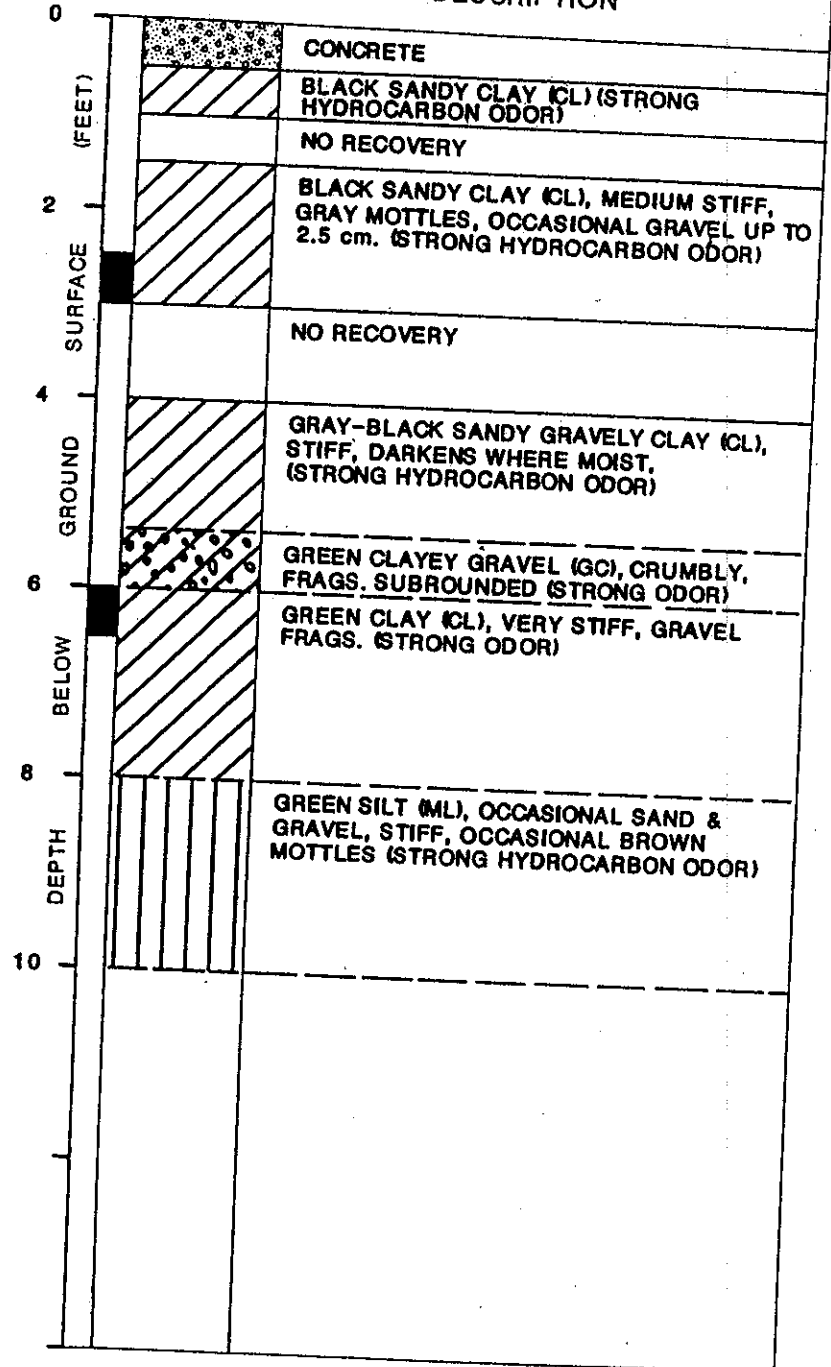
CLIENT WAREHAM DEVELOPMENT  
 LOCATION PETERSON MANUFACTURING CO.  
 63rd ST. EMERYVILLE, CA.  
 DATE 2 SEPTEMBER 1987  
 GEOLOGIST W. HAUCK

TEST HOLE NUMBER BH-5  
 DRILLER HANDRIVEN SAMPLING CO.  
 DRILLING METHOD HANDHELD SAMPLER  
 HOLE DIAMETER 1.25"

WELL CONSTRUCTION

LITHOLOGY

DESCRIPTION



EXPLANATION

▼ Water level during drilling

— Contact (dashed where approximate)

■ Location of sample

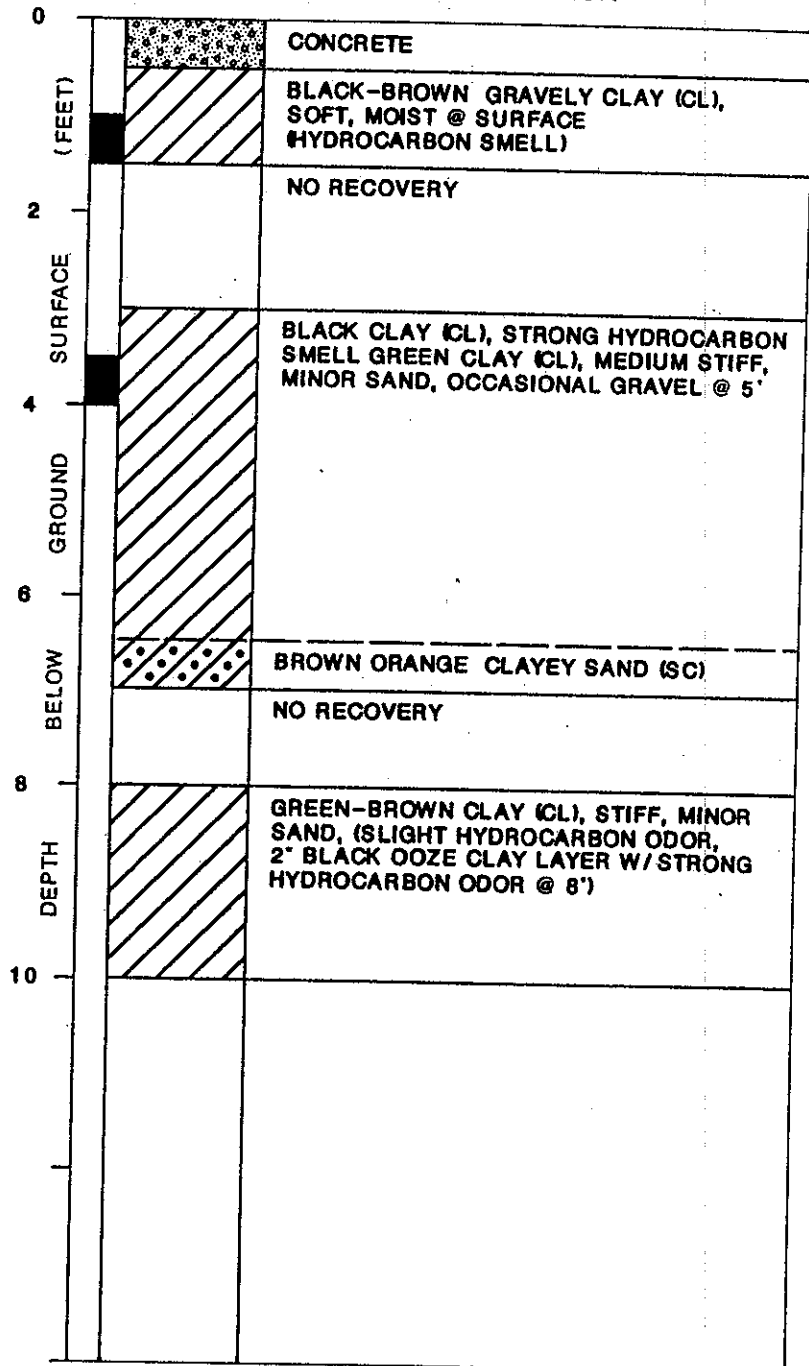
CLIENT WAREHAM DEVELOPMENT  
 LOCATION PETERSON MANUFACTURING CO.  
63rd ST., EMERYVILLE, CA.  
 DATE 2 SEPTEMBER 1987  
 GEOLOGIST W. HAUCK

TEST HOLE NUMBER BH-6  
 DRILLER HANDRIVEN SAMPLING CO.  
 DRILLING METHOD HANDHELD SAMPLER  
 HOLE DIAMETER 1.25"

WELL CONSTRUCTION

LITHOLOGY

DESCRIPTION



EXPLANATION

▼ Water level during drilling

— Contact (dashed where approximate)

■ Location of sample



CLIENT WAREHAM DEVELOPMENT

TEST HOLE NUMBER BH-7

LOCATION PETERSON MANUFACTURING CO.  
63rd ST., EMERYVILLE CA.

DRILLER HANDRIVEN SAMPLING CO.

DATE 8 SEPTEMBER 1987

DRILLING METHOD HANDHELD SAMPLER

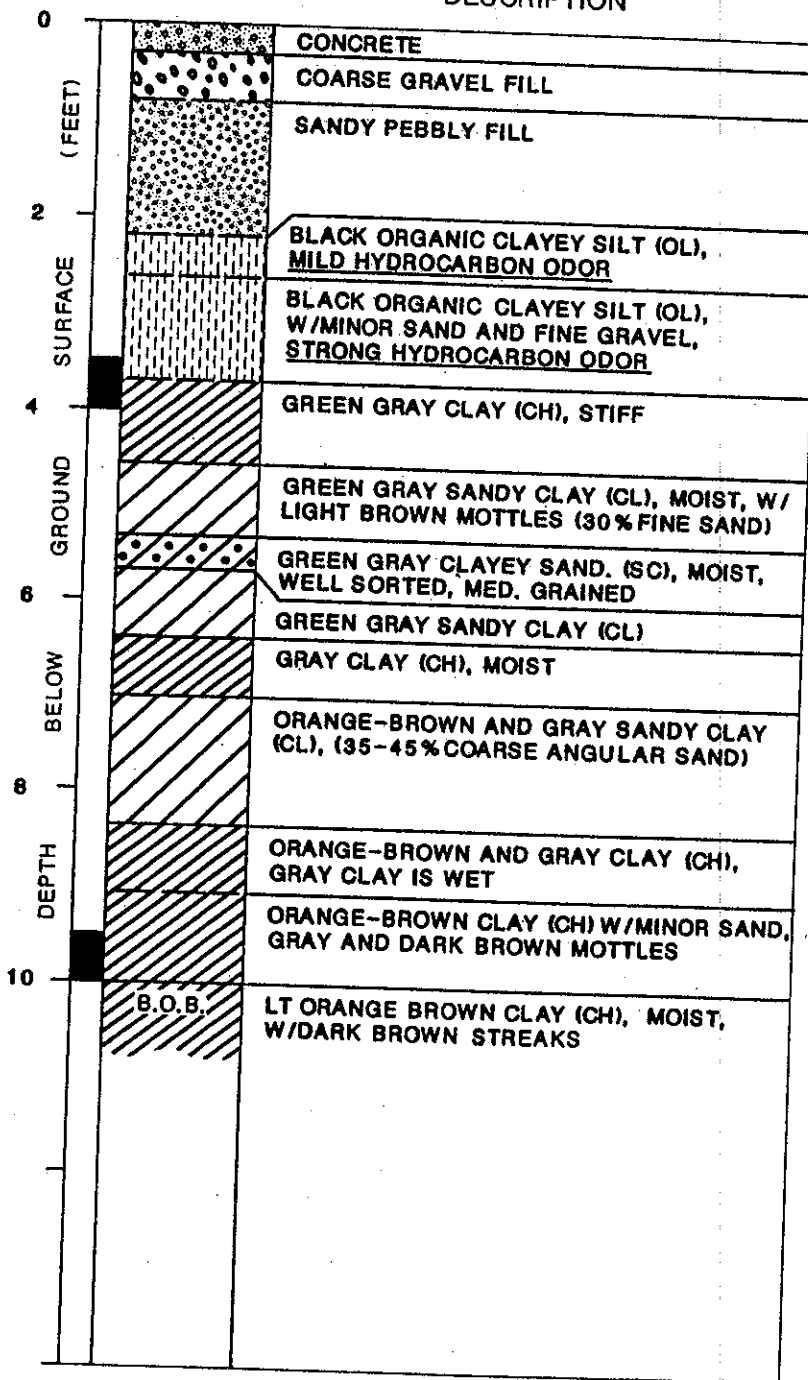
GEOLOGIST K. CHESICK

HOLE DIAMETER 1.25"

WELL CONSTRUCTION

LITHOLOGY

DESCRIPTION



EXPLANATION

Water level during drilling

Contact (dashed where approximate)

Location of sample

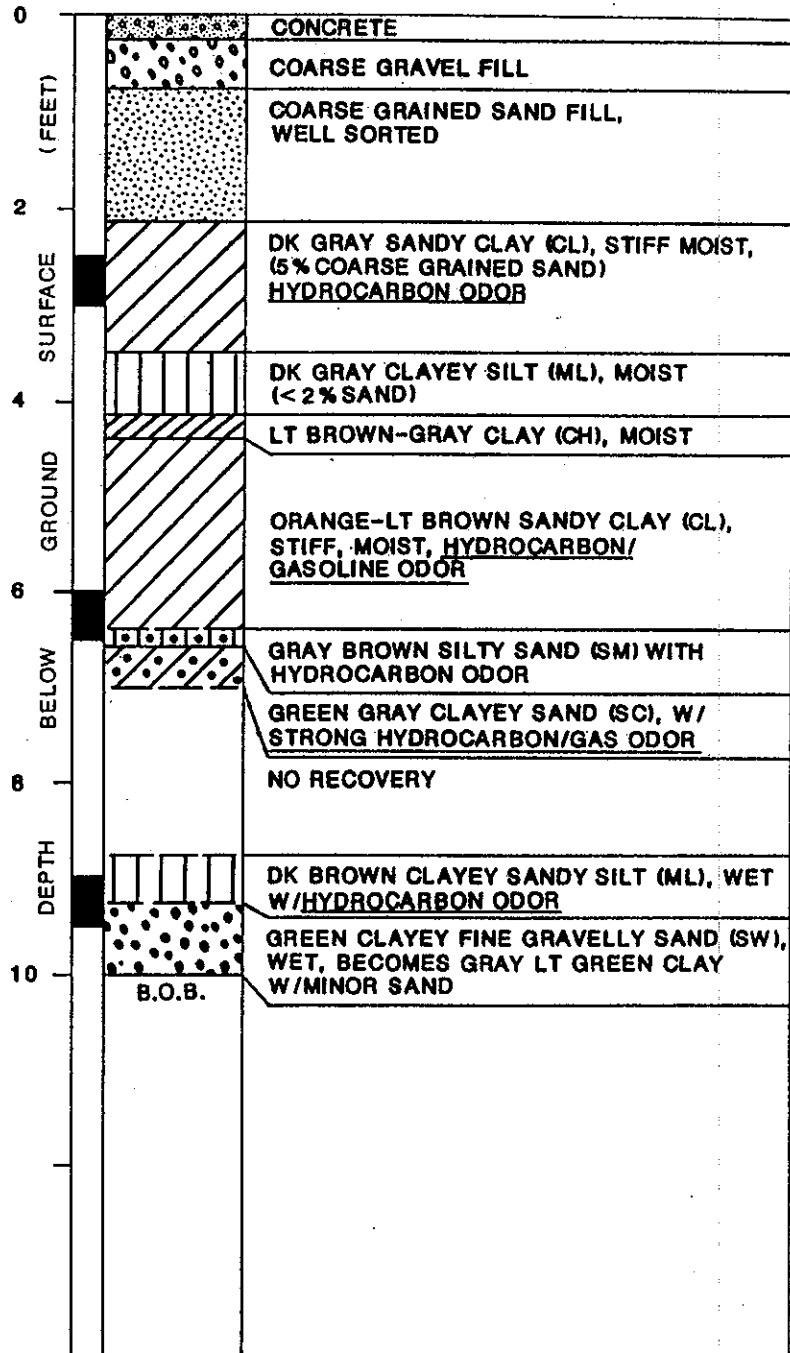
CLIENT WAREHAM DEVELOPMENT  
 LOCATION PETERSON MANUFACTURING CO.  
 83rd ST., EMERYVILLE CA.  
 DATE 8 SEPTEMBER 1987  
 GEOLOGIST K. GHESICK

TEST HOLE NUMBER BH-8  
 DRILLER HANDRIVEN SAMPLING CO.  
 DRILLING METHOD HANDHELD SAMPLER  
 HOLE DIAMETER 1.25"

WELL CONSTRUCTION

LITHOLOGY

DESCRIPTION



EXPLANATION

∇ Water level during drilling

— Contact (dashed where approximate)

■ Location of sample

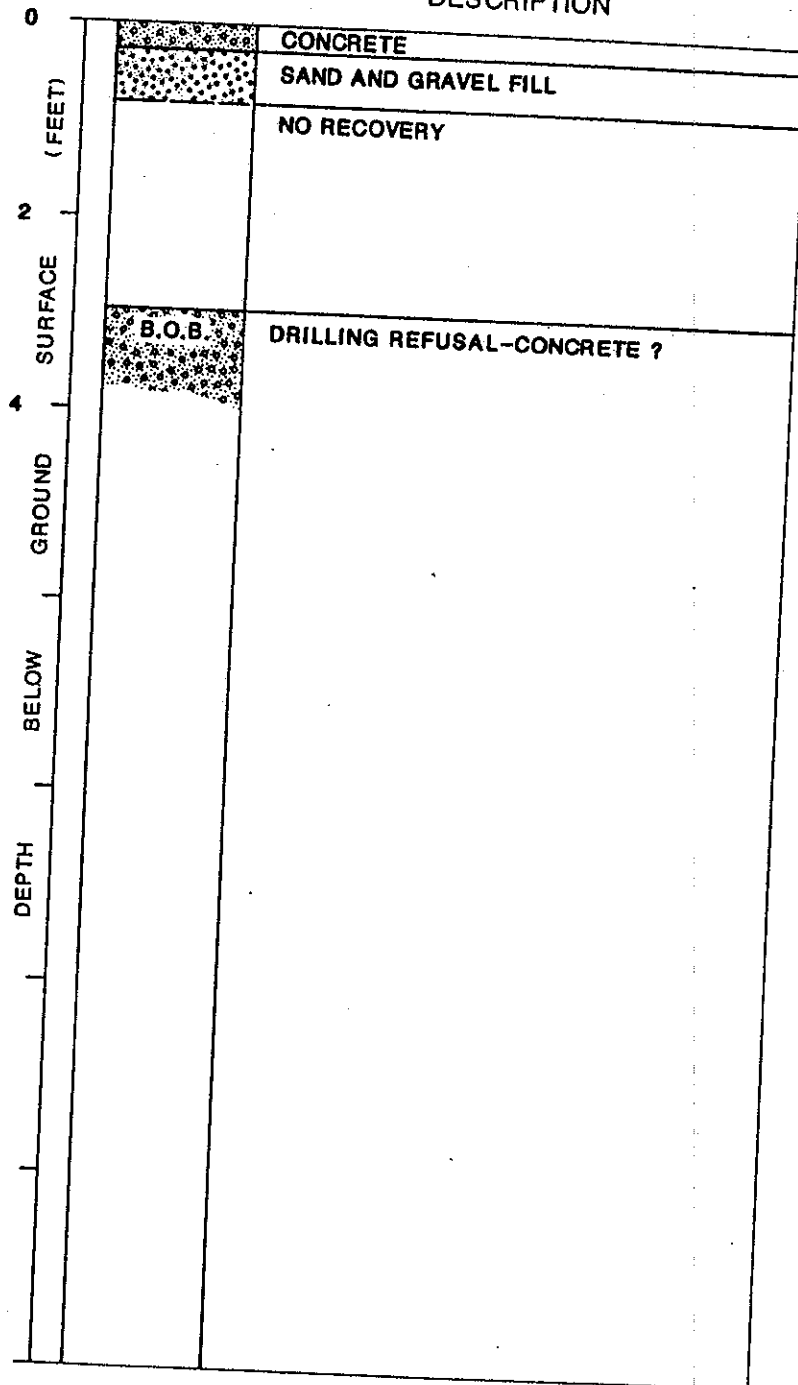
CLIENT WAREHAM DEVELOPMENT  
 LOCATION PETERSON MANUFACTURING CO.  
63rd ST., EMERYVILLE CA.  
 DATE 9 SEPTEMBER 1987  
 GEOLOGIST K. CHESICK

TEST HOLE NUMBER BH-9  
 DRILLER HANDDRIVEN SAMPLING CO.  
 DRILLING METHOD HANDHELD SAMPLER  
 HOLE DIAMETER 1.25'

WELL CONSTRUCTION

LITHOLOGY

DESCRIPTION



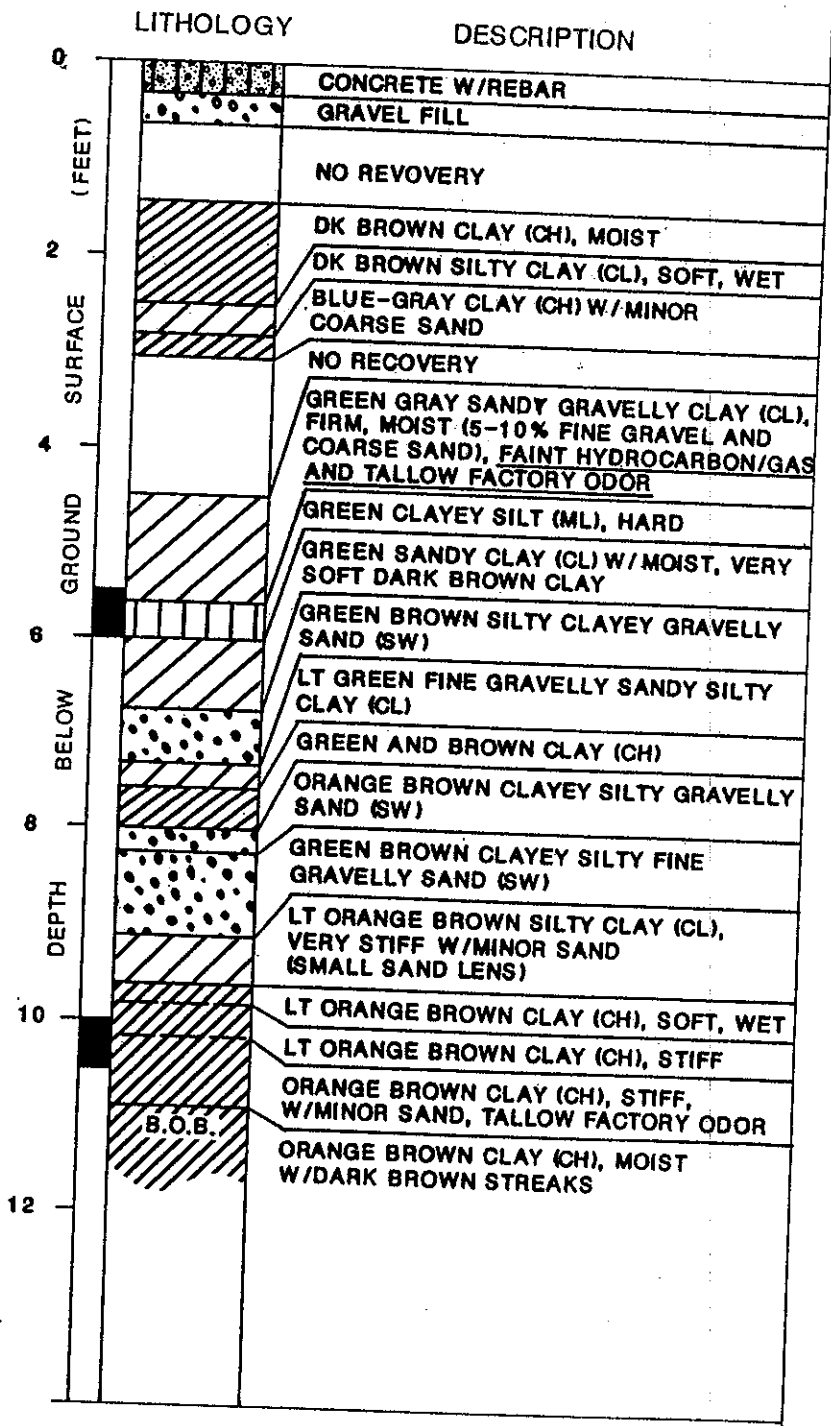
during drilling

— Contact (dashed where approximate)  
 ■ Location of sample

CLIENT WAREHAM DEVELOPMENT  
 LOCATION PETERSON MANUFACTURING CO.  
 63rd ST, EMERYVILLE CA.  
 DATE 9 SEPTEMBER 1987  
 GEOLOGIST K. CHESICK

TEST HOLE NUMBER BH-9A  
 DRILLER HANDDRIVEN SAMPLING CO.  
 DRILLING METHOD HANDHELD SAMPLER  
 HOLE DIAMETER 1.25"

WELL CONSTRUCTION



EXPLANATION

▼ Water level during drilling

— Contact (dashed where approximate)

■ Location of sample

CLIENT WAREHAM DEVELOPMENT

TEST HOLE NUMBER BH-10

LOCATION PETERSON MANUFACTURING CO.  
63rd ST., EMERYVILLE CA.

DRILLER HANDDRIVEN SAMPLING CO.

DATE 9 SEPTEMBER 1987

DRILLING METHOD HANDHELD SAMPLER

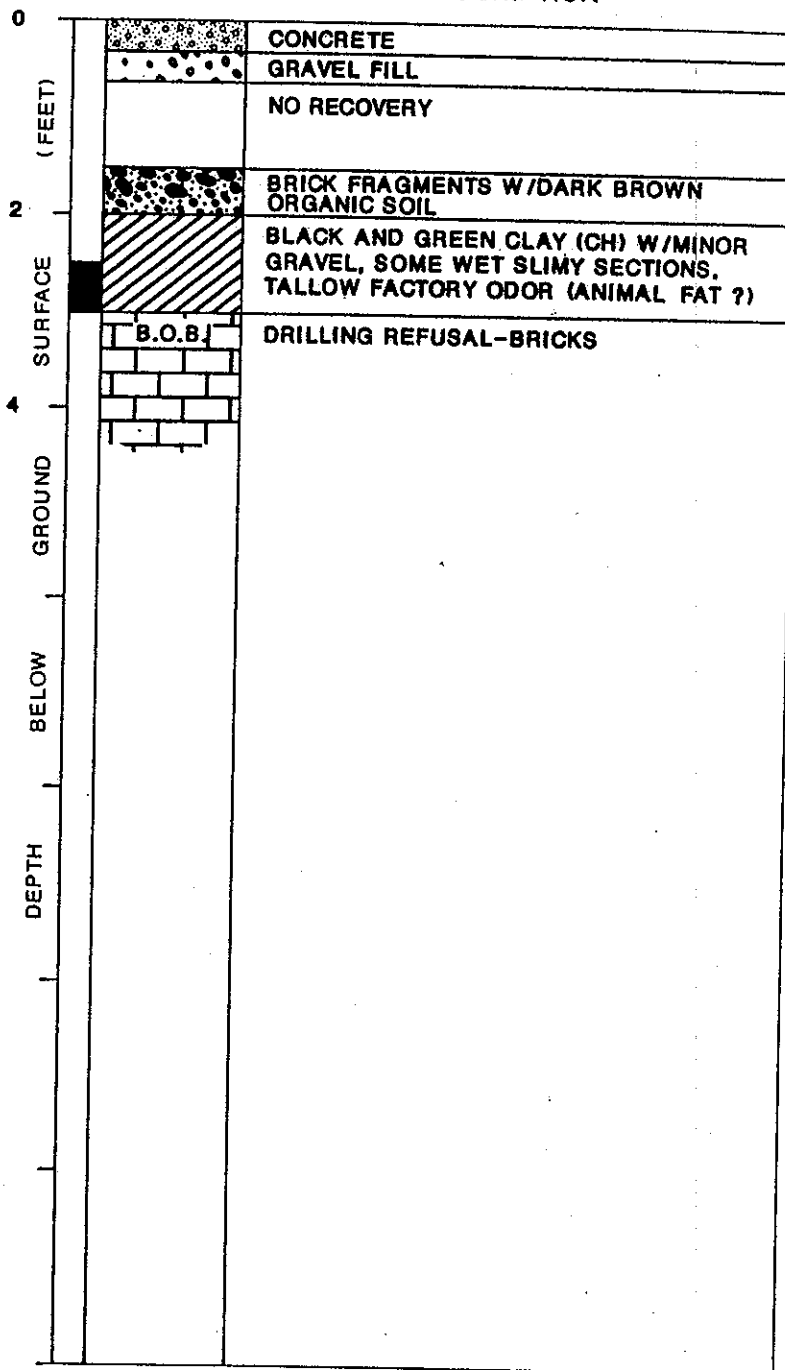
GEOLOGIST K. CHESICK

HOLE DIAMETER 1.25"

WELL CONSTRUCTION

LITHOLOGY

DESCRIPTION



EXPLANATION

▼ Water level during drilling

— Contact (dashed where approximate)

■ Location of sample



**Recon**  
Environmental Corp.

Legend

-  GW
-  GP
-  GM
-  GC
-  ML
-  CL
-  OL
-  SW
-  SP
-  SM
-  SC
-  MH
-  CH
-  OH
-  Pt

Job No.: S40120	Location: 1600 63rd Street Emeryville, CA
Drilling Method: Hydraulic Hammer	Boring # B2
Drilling Company: Precision	Sheet # 1
Drilling Crew: Michael & Jose	Drilling Time: 8:30 AM
Geologist: Fred Hayden	
Sampling Method: Brass Sleeves	Date 7/13/94
Casing/Sand/Seal Depth: N/A N/A N/A	
Depth to Water/Time: N/A	

Elevation:

Recovery	Sample Type	Sample No.	Blows/6 in.	PID	Sample No.	Depth in Feet	USGS Code	Soil Description:
						1		ASPHALT with base Gravel.
						2		
						3	GP	Brownish green, ashy green and reddish brown, slightly moist, Sandy GRAVEL.  Becomes mottled black a green with Clay at 5 feet.
					4			
					5			
				0.0	6			
					7			
					B2-7	8	CL	Greenish slightly moist Sandy CLAY.  Becomes whitish green with Clay and some coarse Sand (old product odor)
					9			
				20	10			
					11			
						12	SC/GC	Greenish Sandy slightly moist CLAY changing to Clayey SAND and GRAVEL, old product odor.
						13		TD @ 12' No groundwater encountered.
						14		
						15		
						16		
						17		
						18		
						19		
						20		

**Recon**  
Environmental Corp.

Legend

	GW		ML
	GP		CL
	GM		OL
	GC		MH
	SW		CH
	SP		OH
	SM		Pt
	SC		

Job No.: S40120	Location: 1600 63rd Street Emeryville, CA		
Drilling Method: Hydraulic Hammer	Drilling Company: Precision		Boring # B3
Drilling Crew: Michael & Jose	Geologist: Fred Hayden		Sheet # 1
Sampling Method: Brass Sleeves	Casing/Sand/Seal Depth: N/A N/A N/A		Drilling Time: 8:30 AM
Depth to Water/Time: N/A	Date 7/13/94		

Elevation:

Recovery	Sample Type	Sample No.	Blows/6 in.	PID	Sample No.	Depth in Feet	USGS Code	Soil Description:
						1		ASPHALT with base Gravels
						2		
						3	GP	Grayish brown slightly moist Sandy GRAVEL.
						4		
						5		
				0.0	B3-7	6		
						7	CL	Reddish brown slightly moist Sandy CLAY.
						8		
						9		
				0.0		10		
						11	SC	Greenish gray Clayey moist SAND with Gravel.
						12		
			70		B3-12	13		TD @ 12' No groundwater encountered.
						14		
						15		
						16		
						17		
						18		
						19		
						20		





# LITHOLOGY

Depth (feet)	Graphic Log	Description	OVA (ppm)
..... ..... ..... ..... <u>5</u>		<b>ASPHALT</b> FILL - SANDY GRAVEL (GW), gray (10YR 6/1), moist to dry, loose, poorly sorted, angular gravels (up to 1/2" diameter), no odor, brick and glass fragments.  — Grades to clayey gravel.	..... ..... ..... ..... <u>5</u>
..... ..... ..... ..... <u>10</u>		SILTY CLAY (CL), dark green-gray (5G 4/1), stiff, moist, lowplasticity, abundant gravel and medium sand, no odor.  — Color change to light brown (7.5YR 6/3), trace sand.  — Increased amount of fine sand, iron oxide stain.	..... ..... ..... ..... <u>10</u> 0
..... ..... ..... ..... <u>15</u>		GRAVELLY CLAY (CL) to CLAYEY GRAVEL (GC), light brown (7.5YR 6/3), wet, loose, angular gravel, abundant medium grain sand, no odor.	..... ..... ..... ..... <u>15</u> 0
..... ..... ..... ..... <u>20</u>		SANDY CLAY (CL) to CLAYEY SAND (SC), dark green-gray (5G 4/1), soft, wet, low plasticity, very fine sand, massive, no odor. BOTTOM OF HOLE AT 19 FEET.	..... ..... ..... ..... <u>20</u> 0
..... ..... ..... ..... <u>25</u>			..... ..... ..... ..... <u>25</u>
..... ..... ..... ..... <u>30</u>			..... ..... ..... ..... <u>30</u>
..... ..... ..... ..... <u>35</u>			..... ..... ..... ..... <u>35</u>

<table style="width: 100%;"> <tr> <td style="text-align: center;"> SAND</td> <td style="text-align: center;"> SILT</td> </tr> <tr> <td style="text-align: center;"> CLAY</td> <td style="text-align: center;"> GRAVEL</td> </tr> </table>	SAND	SILT	CLAY	GRAVEL	Drilling Method: Direct Push Sampling method: Envirocore Drilling company: Precision Drillers: Sergio/Jesus
SAND	SILT				
CLAY	GRAVEL				

Date: 8-5-99  
 Permit No.: 99WR479  
 Geologist: JH/ BW



**Lithology for Soil Boring HP-1**  
 1600 63rd Street, Emeryville, California

November 1999

152-002

# LITHOLOGY

Depth (feet)	Graphic Log	Description	OVA (ppm)
.....		<b>ASPHALT</b>	
.....		<b>FILL - SANDY GRAVEL (GW)</b> , gray (10YR 6/1), moist to dry, loose, poorly sorted, angular gravels (up to 1/2" diameter), no odor, brick and glass fragments.	0
.....		— Grades to clayey gravel.	
5			5
.....		<b>SILTY CLAY (CL)</b> , dark black (10YR 2/1), medium stiff, moist, low plasticity, medium sand, no odor.	0
.....		— Medium odor.	0
.....		— Color change to black to dark green-gray (5G 4/1)	80
.....		— Strong odor.	800
15			15
.....		<b>GRAVELLY CLAY (CL)</b> , dark green-gray (5G 4/1), moist, loose, angular gravel, abundant, medium grain sand, hydrocarbon odor.	450
.....			400
20		<b>BOTTOM OF HOLE AT 19 FEET.</b>	20
.....			
25			25
.....			
30			30
.....			
35			35

	SAND		SILT
	CLAY		GRAVEL

Drilling Method: Direct Push  
 Sampling method: Envirocore  
 Drilling company: Precision  
 Drillers: Sergio/Jesus

Date: 8-5-99  
 Permit No.: 99WR479  
 Geologist: JH/BW

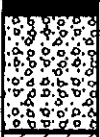
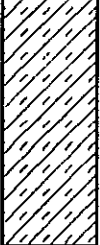
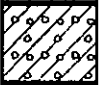
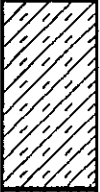






**Lithology for Soil Boring HP-2**  
 1600 63rd Street, Emeryville, California

November 1999

152-002

# LITHOLOGY

Depth (feet)	Graphic Log	Description	OVA (ppm)
.....		<b>ASPHALT FILL - SANDY GRAVEL (GW)</b> , gray (10YR 6/1), moist to dry, loose, poorly sorted, angular gravels (up to 1/2" diameter), no odor, brick and glass fragments.	0
.....		<b>SILTY CLAY (CL)</b> , black (10YR 2/1), medium stiff, moist, lowplasticity, medium sands, medium hydrocarbon odor.	200
5		— Color change to black to dark green-gray (5G 1/4)	200
.....		<b>GRAVELLY CLAY (CL)</b> , dark green-gray (5G 4/1), moist, loose, angular gravel, abundant, medium grain.	200
10		<b>SILTY CLAY (CL)</b> , black (10YR 2/1), medium stiff, moist, lowplasticity, medium sands, medium hydrocarbon odor.	800
.....		<b>SANDY CLAY (CL)</b> , dark green-gray (5G 4/1), soft, moist, low plasticity, well sorted, fine sand, strong hydrocarbon odor.	700
15		<b>BOTTOM OF HOLE AT 19 FEET.</b>	20
.....			
20			
.....			
25			
.....			
30			
.....			
35			

- |  |  |
|--|--|
|  SAND |  SILT   |
|  CLAY |  GRAVEL |

Drilling Method: Direct Push  
 Sampling method: Envirocore  
 Drilling company: Precision  
 Drillers: Sergio/Jesus

Date: 8-5-99  
 Permit No.: 99WR479  
 Geologist: JH/ BW



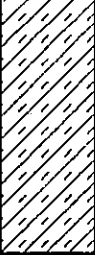




**Lithology for Soil Boring HP-3**  
 1600 63rd Street, Emeryville, California

November 1999

152-002

# LITHOLOGY

Depth (feet)	Graphic Log	Description	OVA (ppm)
		<b>ASPHALT</b>	
		<b>FILL - SANDY GRAVEL (GW)</b> , gray (10YR 6/1), moist to dry, loose, poorly sorted, angular gravels (up to 1/2" diameter), no odor, brick and glass fragments.	0
5			5
		<b>SILTY CLAY (CL)</b> , dark green-gray (5G 4/1), slightly moist, bw plasticity, stiff, minor amount of imbedded gravel, mottled, hydrocarbon odor.	0
10		— Increased amount of fine sand.	150
		<b>GRAVELLY CLAY (CL) to CLAYEY SANDY GRAVEL (GC)</b> , dark green-gray (5G 4/1), moist, loose, interbedded CL and GC with abundant medium grain sand, hydrocarbon odor.	600
15			450
		<b>SILTY CLAY (CL)</b> , light brown (7.5YR 6/3), moist, stiff, massive, no odor.	50
20		<b>BOTTOM OF HOLE AT 19 FEET.</b>	20
25			25
30			30
35			35

 SAND	 SILT
 CLAY	 GRAVEL

Drilling Method: Direct Push  
 Sampling method: Envirocore  
 Drilling company: Precision  
 Drillers: Sergio/Jesus

Date: 8-5-99  
 Permit No.: 99WR479  
 Geologist: JH/ BW

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**Lithology for Soil Boring HP-4**  
 1600 63rd Street, Emeryville, California

November 1999  
 152-002

LITHOLOGY

Depth (feet)	Graphic Log	Description	OVA (ppm)
.....		ASPHALT	.....
.....		FILL - SANDY GRAVEL (GW), gray (10YR 6/1), moist to dry, loose, poorly sorted, angular gravels (up to 1/2" diameter), no odor, brick and glass fragments.	..... 0
.....		— Grades to clayey gravel.	.....
5			5
.....			..... 0
.....		SANDY SILTY CLAY (CL), dark greenish gray (5G 4/1), wet, stiff, medium plasticity, abundant medium sand, minor fine gravel, strong hydrocarbon odor.	..... 240
.....			.....
10			10
.....			.....
.....		— Grades to SANDY CLAY (CL), medium sand, wet, strong hydrocarbon odor.	..... 140
.....			.....
15			15
.....		— Hydrocarbon product stain at 15.5 to 16 feet.	.....
.....		GRAVELLY CLAY (CL) to CLAYEY SANDY GRAVEL(GC), dark green-gray (5G 4/1), wet, loose, interbedded CL and GC with abundant sand, strong hydrocarbon odor.	..... 100
.....		BOTTOM OF HOLE AT 19 FEET.	.....
20			20
.....			.....
25			25
.....			.....
30		30	
.....		.....	
35		35	

SAND  
 CLAY

SILT  
 GRAVEL

Drilling Method: Direct Push  
Sampling method: Envirocore  
Drilling company: Precision  
Drillers: Sergio/Jesus

Date: 8-5-99  
Permit No.: 99WR479  
Geologist: JH/ BW



Lithology for Soil Boring HP-5  
1600 63rd Street, Emeryville, California

November 1999

152-002

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