

ALAMEDA COUNTY
HEALTH CARE SERVICES
AGENCY
ALEX BRISCOE, Director



ENVIRONMENTAL HEALTH DEPARTMENT
ENVIRONMENTAL PROTECTION
1131 Harbor Bay Parkway, Suite 250
Alameda, CA 94502-6577
(510) 567-6700
FAX (510) 337-9335

March 29, 2012

Casimiro Damele
3750 Victor Avenue
Oakland, CA 94619

Subject: Fuel Leak Case No. RO0000132 and GeoTracker Global ID T0600100430, ARCO, 4401
Market Street, Oakland, CA 94608

Dear Mr. Damele:

This letter transmits the enclosed underground storage tank (UST) case closure letter in accordance with Chapter 6.75 (Article 4, Section 25299.37[h]). The State Water Resources Control Board adopted this letter on February 20, 1997. As of March 1, 1997, the Alameda County Environmental Health (ACEH) is required to use this case closure letter for all UST leak sites. We are also transmitting to you the enclosed case closure summary. These documents confirm the completion of the investigation and cleanup of the reported release at the subject site. The subject fuel leak case is closed.

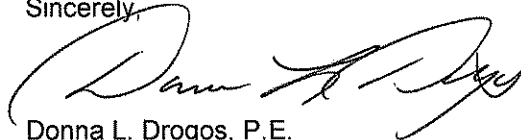
SITE INVESTIGATION AND CLEANUP SUMMARY

Please be advised that the following conditions exist at the site:

- Residual soil contamination consisting of 1,300 mg/kg TPH-g and 12 mg/kg benzene remains at the site.

If you have any questions, please call Paresh Khatri at (510) 777-2478. Thank you.

Sincerely,



Donna L. Drogos, P.E.
Division Chief

Enclosures: 1. Remedial Action Completion Certificate
2. Case Closure Summary

cc:

Ms. Cherie McCaulou (w/enc)
SF- Regional Water Quality Control Board
1515 Clay Street, Suite 1400
Oakland, CA 94612
(Sent via E-mail to:
CMcCaulou@waterboards.ca.gov)

Closure Unit (w/enc)
State Water Resources Control Board
UST Cleanup Fund
P.O. Box 944212
Sacramento, CA 94244-2120
(Sent via E-mail)

Paresh Khatri (w/orig enc), D. Drogos (w/enc), T. Le-Khan (w/enc)



REMEDIAL ACTION COMPLETION CERTIFICATION

March 29, 2012

Casimiro Damele
3750 Victor Avenue
Oakland, CA 94619

Subject: Case Closure for Fuel Leak Case No. RO0000132 and GeoTracker Global ID T0600100430, ARCO,
4401 Market Street, Oakland, CA 94608

Dear Mr. Damele:

This letter confirms the completion of a site investigation and remedial action for the underground storage tanks formerly located at the above-described location. Thank you for your cooperation throughout this investigation. Your willingness and promptness in responding to our inquiries concerning the former underground storage tank(s) are greatly appreciated.

Based on information in the above-referenced file and with the provision that the information provided to this agency was accurate and representative of site conditions, this agency finds that the site investigation and corrective action carried out at your underground storage tank(s) site is in compliance with the requirements of subdivisions (a) and (b) of Section 25299.37 of the Health and Safety Code and with corrective action regulations adopted pursuant to Section 25299.77 of the Health and Safety Code and that no further action related to the petroleum release(s) at the site is required.

Claims for reimbursement of corrective action costs submitted to the Underground Storage Tank Cleanup Fund more than 365 days after the date of this letter or issuance or activation of the Fund's Letter of Commitment, whichever occurs later, will not be reimbursed unless one of the following exceptions applies:

- Claims are submitted pursuant to Section 25299.57, subdivision (k) (reopened UST case); or
- Submission within the timeframe was beyond the claimant's reasonable control, ongoing work is required for closure that will result in the submission of claims beyond that time period, or that under the circumstances of the case, it would be unreasonable or inequitable to impose the 365-day time period.

This notice is issued pursuant to subdivision (h) of Section 25299.37 of the Health and Safety Code. Please contact our office if you have any questions regarding this matter.

Sincerely,

A handwritten signature in black ink, appearing to read 'Ariu Levi', written over a white background.

Ariu Levi
Director

**CASE CLOSURE SUMMARY
LEAKING UNDERGROUND FUEL STORAGE TANK - LOCAL OVERSIGHT PROGRAM**

I. AGENCY INFORMATION

Date: July 26, 2010

Agency Name: Alameda County Environmental Health	Address: 1131 Harbor Bay Parkway
City/State/Zip: Alameda, CA 94502-6577	Phone: (510) 777-2478
Responsible Staff Person: Paresh Khatri	Title: Hazardous Materials Specialist

II. CASE INFORMATION

Site Facility Name: ARCO		
Site Facility Address: 4401 Market Street, Oakland, California 94608		
RB Case No.: 01-0474	StID No.: 812	LOP Case No.: RO0000132
URF Filing Date: --	Global ID No.: T0600100430	APN: 13-1087-4
Responsible Parties	Addresses	Phone Numbers
Casimiro Damele	3750 Victor Avenue Oakland, CA 94619	

Tank I.D. No	Size in Gallons	Contents	Closed In Place/Removed?	Date
1	1,000-gallon	Gasoline	Removed	6/22/1990
2	500-gallon	Gasoline	Removed	6/22/1990
3	500-gallon	Gasoline	Removed	6/22/1990
4	500-gallon	Diesel	Removed	6/22/1990
Piping			Removed	6/22/1990

III. RELEASE AND SITE CHARACTERIZATION INFORMATION

Cause and Type of Release: USTs were covered in rust and exhibited holes up to an inch in diameter.		
Site characterization complete? Yes	Date Approved By Oversight Agency: ---	
Monitoring wells installed? Yes	Number: 7	Proper screened interval? Yes
Highest GW Depth Below Ground Surface: 11.05 ft bgs	Lowest Depth: 16.19 ft bgs	Flow Direction: Gradient is flat, but predominantly northwesterly
Most Sensitive Current Use: Potential drinking water source.		

Summary of Production Wells in Vicinity: Streamborn conducted a sensitive receptor survey in 2001. No water wells were identified at the property or in the vicinity of the site. Also, no surface water features are located within 500 feet of the site.

Are drinking water wells affected? No	Aquifer Name: East Bay Plain Groundwater Basin
Is surface water affected? No	Nearest SW Name: San Francisco Bay, located 1 mi east of site
Off-Site Beneficial Use Impacts (Addresses/Locations): None	
Reports on file? Yes	Where are reports filed? Alameda County Environmental Health & Oakland Fire Prevention Bureau

TREATMENT AND DISPOSAL OF AFFECTED MATERIAL

Material	Amount (Include Units)	Action (Treatment or Disposal w/Destination)	Date
Tank	One 1,000-gallon Three 500-gallon	H&H Ship Service Company, San Francisco H&H Ship Service Company, San Francisco	6/22/1990 6/22/1990
Piping	Unknown	---	6/22/1990
Free Product	---	---	---
Soil	---	---	---
Groundwater	---	---	---

MAXIMUM DOCUMENTED CONTAMINANT CONCENTRATIONS BEFORE AND AFTER CLEANUP

(Please see Attachments for additional information on contaminant locations and concentrations)

Contaminant	Soil (ppm)		Water (ppb)	
	Before	After	Before	After
TPH (Gas)	1,300 (B10, 4/8/1999)	1,300 (B10, 4/8/1999)	Free Product (B10, 4/8/1999)	1,400 (MW-2, 4/14/2009)
TPH (Diesel)	NA	NA	NA	NA
TPH (Motor Oil)	NA	NA	NA	NA
Benzene	12 (B10, 4/8/1999)	12 (B10, 4/8/1999)	Free Product (B10, 4/8/1999)	37 (MW-2, 4/14/2009)
Toluene	24 (S6, 6/22/1990)	24 (S6, 6/22/1990)	Free Product (B10, 4/8/1999)	<0.5 (all MWs, 4/14/2009)
Ethylbenzene	26 (S6, 6/22/1990)	26 (S6, 6/22/1990)	Free Product (B10, 4/8/1999)	30 (MW-2, 4/14/2009)
Xylenes	140 (S6, 6/22/1990)	140 (S6, 6/22/1990)	Free Product (B10, 4/8/1999)	120 (MW-2, 4/14/2009)
MTBE	<3.1 ⁴ (B10, 4/8/1999)	<3.1 ³ (B10, 4/8/1999)	Free Product ² (B10, 4/8/1999)	<0.5 ¹ (all MWs, 4/14/2009)
Heavy Metals (Cd, Cr, Pb, Ni, Zn)	NA	NA	NA	NA
Other 8240/8260	NA	NA	100 (MW-1, 8/22/2001)	<5.0 (all MWs, 4/14/2009)

¹ Other VOCs analyzed (groundwater µg/L after cleanup): <5.0 µg/L MtBE, <5.0 µg/L TBA, <1.0 µg/L DIPE, <0.5 µg/L ETBE, <0.5 µg/L TAME, <0.5 µg/L EDB, <0.5 µg/L 1.2-DCA, <250 µg/L EtOH

² Other VOCs analyzed (groundwater ppb before cleanup): 84 µg/L MtBE, 100 µg/L TBA, 1.3 µg/L DIPE, <0.5 µg/L ETBE, <0.5 µg/L TAME, <0.5 µg/L EDB, <0.5 µg/L 1.2-DCA, <250 µg/L EtOH.

³ Other VOCs (Soil mg/kg after cleanup): <0.023 mg/kg TBA, <0.046 mg/kg DIPE, <0.023 mg/kg ETBE, <0.023 mg/kg TAME; EDB & 1.2-DCA not analyzed.

⁴ Other VOCs (Soil mg/kg before cleanup): <0.023 mg/kg TBA, <0.046 mg/kg DIPE, <0.023 mg/kg ETBE, <0.023 mg/kg TAME; EDB & 1.2-DCA not analyzed.

NA - Not Analyzed

Site History and Description of Corrective Actions:

The site is located at 4401 Market Street in Oakland, California (**Figure 1**), approximately three miles north of downtown Oakland. The surrounding land use is primarily residential with some commercial land use.

The structure at 4401 Market Street was reportedly constructed in 1943 and used as a gasoline station until the 1970s. The exact installation date of the four underground gasoline storage tanks is unknown.

In June 1990, Environmental Bio-Systems removed one 1,000-gallon underground gasoline tank and three 500-gallon underground gasoline tanks from the southeast portion of 4401 Market Street. During tank removal, soil samples were collected from beneath the tanks and associated piping. Former UST locations are illustrated on **Figure 3** and soil sample analytical results are summarized on **Table 9**.

In October 1994, seven soil borings were drilled and three of the borings were completed as 2-inch diameter monitoring wells (MW1, MW2, and MW3) to delineate the extent of contamination. Soil samples were collected from each of the borings and groundwater samples were collected from the monitoring wells. Groundwater monitoring was conducted periodically between November 1994 and June 1997. Soil sample analytical results are summarized on **Table 10** and groundwater sample analytical results are summarized on **Table 5**.

In April and July 1999, nine soil borings were drilled. Soil and grab groundwater samples were collected from each of the borings. The investigation encountered free product, presumably gasoline, in boring SB2 at the southeast corner of the 4401 Market Street. Soil and groundwater sample analytical results are summarized on **Tables 10** and **11**.

In January 2001, four 2-inch diameter monitoring wells (MW4, MW5, MW6, and MW7) were installed. Soil samples were collected during drilling. Soil and groundwater sample analytical results are summarized on **Tables 5, 10, and 11**.

From February to November 2001, free product monitoring was conducted monthly for monitoring wells MW4, MW5, and MW6; free product was not detected (see **Table 6**).

On June 29, 2009, soil vapor sampling was conducted to determine whether residual contamination in soil and groundwater posed a potential contaminant volatilization to indoor air threat. Soil vapor sample analytical results for benzene were not detected above the laboratory detection limit. Soil vapor sampling locations are illustrated on **Figure 4** and analytical results are summarized on **Table 7**.

Groundwater monitoring was conducted periodically between February 2001 and April 2009 for all seven monitoring wells (**Table 5**).

Based on groundwater sample analytical results, the groundwater contaminant plume appears to extend off-site and impact neighboring properties. As part of the closure process, public notification for case closure was performed in the form of mailing a fact sheet to nearby properties. No comments opposing case closure were received during the comment period.

Geology & Hydrogeology:

The site is located within the East Bay Plain Groundwater Basin in Alameda County, at an elevation of approximately 75 feet msl. The San Francisco Bay is located approximately 1 mile to the west of the site.

According to Streamborn, the subsurface materials encountered in the onsite borings consisted predominantly of layers of silt and clay with varying amounts of sand, starting from the groundwater surface and extending to a depth of approximately 17 to 20 feet. Layers of sand containing varying amounts of gravel, clay, and silt beginning at an approximate depth of 17 to 20 feet bgs and extending to 25 ft bgs, the maximum depth drilled.

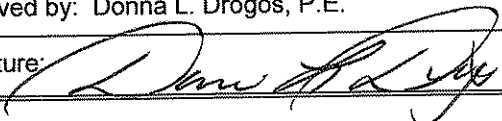
IV. CLOSURE

Does completed corrective action protect existing beneficial uses per the Regional Board Basin Plan? Yes		
Does completed corrective action protect potential beneficial uses per the Regional Board Basin Plan? Yes		
Does corrective action protect public health for current land use? Alameda County Environmental Health staff does not make specific determinations concerning public health risk. However, based upon the information available in our files to date, it does not appear that the release would present a significant risk to human health based upon current land use and conditions.		
<p>Site Management Requirements: Case closure for this fuel leak site is granted for the current commercial land use only. If a change in land use to any residential or other conservative land use scenario is proposed at this site, Alameda County Environmental Health (ACEH) must be notified as required by Government Code Section 65850.2.2. ACEH will re-evaluate the case upon receipt of approved development/construction plans.</p> <p>Excavation or construction activities in areas of residual contamination require planning and implementation of appropriate health and safety procedures by the responsible party (or current property owner/developer) prior to and during excavation and construction activities.</p> <p>This site is to be entered into the City of Oakland Permit Tracking System due to the residual contamination on site.</p>		
Should corrective action be reviewed if land use changes? Yes.		
Was a deed restriction or deed notification filed? No		Date Recorded: --
Monitoring Wells Decommissioned: No	Number Decommissioned: 0	Number Retained: 7
List Enforcement Actions Taken: None		
List Enforcement Actions Rescinded: --		

V. ADDITIONAL COMMENTS, DATA, ETC.

<p>Considerations and/or Variances:</p> <ul style="list-style-type: none"> Residual hydrocarbons in soil at concentrations of 1,300 mg/kg TPH-g and 12 mg/kg benzene remains at the site. <p>Conclusion:</p> <p>Alameda County Environmental Health staff believe that the levels of residual contamination do not pose a significantly threat to water resources, public health and safety, and the environment under the current commercial land use based upon the information available in our files to date. No further investigation or cleanup for the fuel leak case is necessary unless a change in land use to any residential or other conservative land use scenario occurs at the site. ACEH staff recommend closure for the site.</p>
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VI. LOCAL AGENCY REPRESENTATIVE DATA

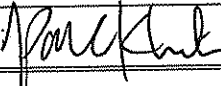
Prepared by: Paresh Khatri	Title: Hazardous Materials Specialist
Signature:	Date: July 26, 2010
Approved by: Donna L. Drogos, P.E.	Title: Division Chief
Signature: 	Date: 08/31/10

This closure approval is based upon the available information and with the provision that the information provided to this agency was accurate and representative of site conditions.

VII. REGIONAL BOARD NOTIFICATION

Regional Board Staff Name: Cherie McCaulou	Title: Engineering Geologist
Notification Date: SEPTEMBER 3, 2010	

VIII. MONITORING WELL DECOMMISSIONING

Date Requested by ACEH: 9/3/2010	Date of Well Decommissioning Report: 3/9/2012	
All Monitoring Wells Decommissioned: YES	Number Decommissioned: 7	Number Retained: 0
Reason Wells Retained: None Retained		
Additional requirements for submittal of groundwater data from retained wells: None		
ACEH Concurrence - Signature: 		Date: 3/29/2012

Attachments:

1. Site Figures 1 through 10
2. Analytical Tables 1 through 12
3. Boring Logs (15 pp)

This document and the related CASE CLOSURE LETTER & REMEDIAL ACTION COMPLETION CERTIFICATE shall be retained by the lead agency as part of the official site file.

Khatri, Paresh, Env. Health

From: Cherie McCaulou [CMccaulou@waterboards.ca.gov]
Sent: Friday, September 03, 2010 1:15 PM
To: Khatri, Paresh, Env. Health
Subject: Re: FW: RO0000132; Closure Summary for ARCO (T0600100430)

The Regional Water Board has no objection to ACEH recommendation for closing the case located at 4401 Market Street, Oakland. Thank you.

Sincerely,

Cherie McCaulou
Engineering Geologist
San Francisco Bay Regional Water Quality Control Board
cmccaulou@waterboards.ca.gov
510-622-2342

>>> "Khatri, Paresh, Env. Health" <paresh.khatri@acgov.org> 9/3/2010 11:24 AM >>>
Sorry I forgot the attachment.

Paresh C. Khatri
Hazardous Materials Specialist
Alameda County Environmental Health
Local Oversight Program
1131 Harbor Bay Parkway
Alameda, CA 94502-6577

Phone: (510) 777-2478
Fax: (510) 337-9335

E-mail: Paresh.Khatri@acgov.org

<http://www.acgov.org/aceh/lop/lop.htm>

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From: Khatri, Paresh, Env. Health
Sent: Friday, September 03, 2010 11:23 AM
To: 'Cherie McCaulou'
Cc: Drogos, Donna, Env. Health
Subject: RO0000132; Closure Summary for ARCO (T0600100430)

Hello Cherie,

Attached is a closure summary for RO0000132; ARCO located at 4401 Market Street in Oakland to comply with the RWQCB's 30-day review period. If no comments from the RWQCB are received within the 30-day review period, ACEH's will proceed with case closure.

Please contact me should you have any comments or questions regarding the subject site.

Sincerely,

Paresh C. Khatri
Hazardous Materials Specialist
Alameda County Environmental Health
Local Oversight Program
1131 Harbor Bay Parkway
Alameda, CA 94502-6577

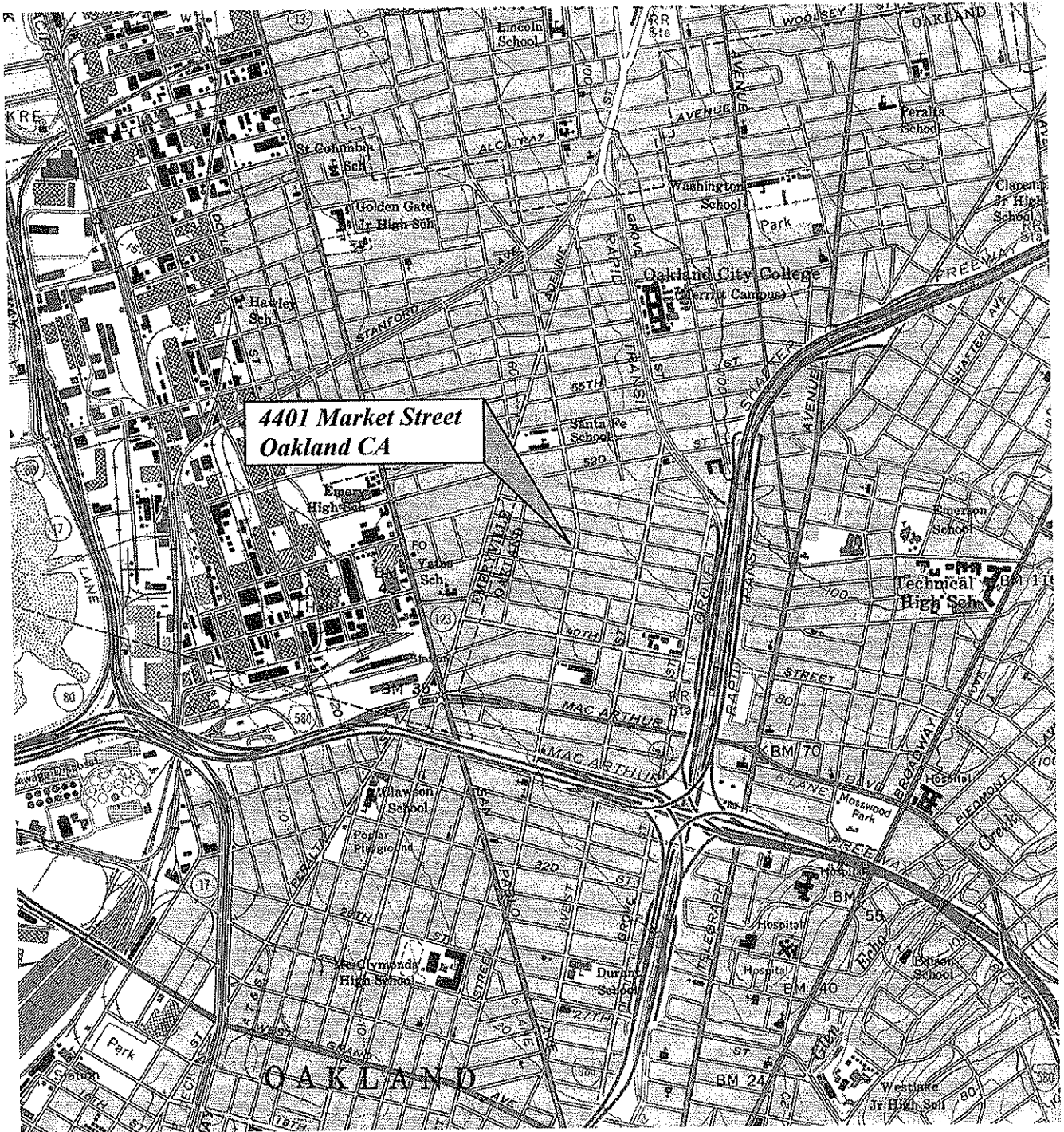
Phone: (510) 777-2478

Fax: (510) 337-9335

E-mail: Paresh.Khatri@acgov.org

<http://www.acgov.org/aceh/lop/lop.htm>

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Basemap: U.S. Geological Survey, 7.5 Minute Quadrangle, Oakland West CA, 1959 (Photorevised 1980).

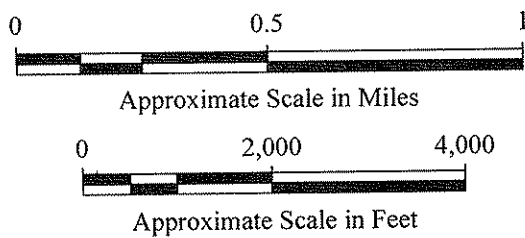


Figure 1
Location Map (USGS)
4401 Market Street
Oakland CA



Basemap: Google Earth, downloaded Nov 2009. Imagery dated Jun 2007.

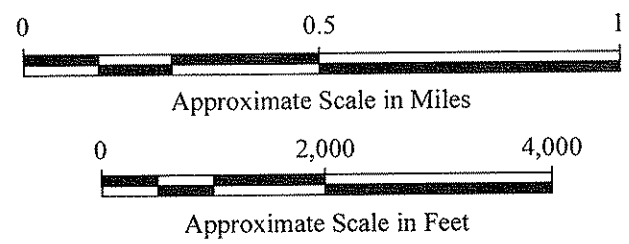


Figure 2
Location Map (Google Earth)
4401 Market Street
Oakland CA



Approximate Scale in Feet

Basemap: Google Earth, downloaded Nov 2009.
Google Earth imagery dated Jun 2007. Locations
of former underground tanks and pump island from
W.A. Craig report dated 1994.

George's Auto Repair
4401 Market Street



Former pump island

44th Street

903 44th Street
(residential)

Market Street

Legend

-  Former underground tank
-  Approximate limits of soil excavation during tank removal

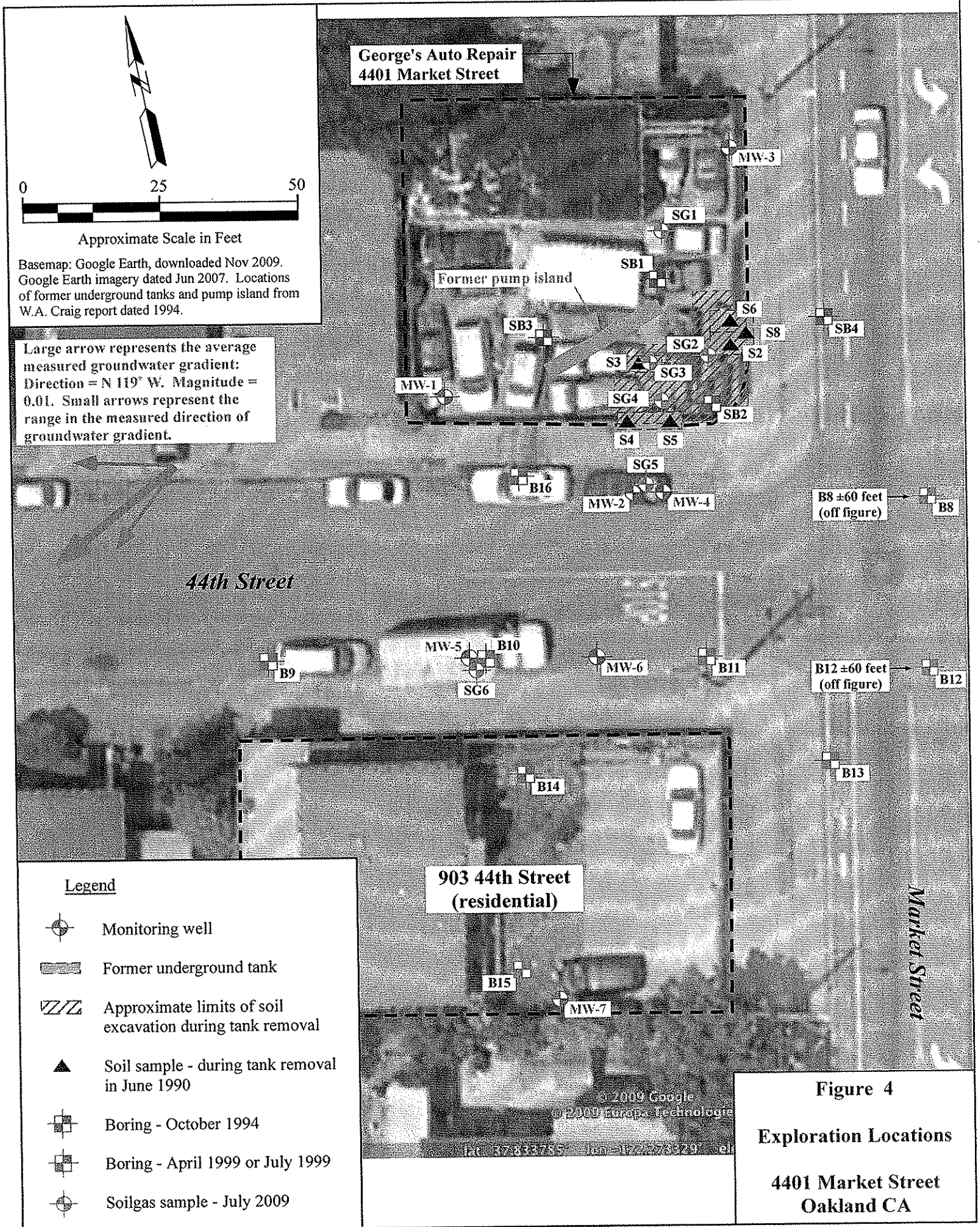
© 2009 Google
© 2009 Europa Technologies

lat: 37.833765 lon: -122.273329 elev:

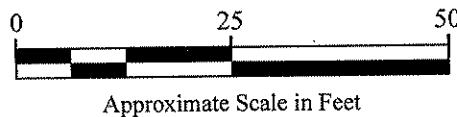
Figure 3

Site Map

4401 Market Street
Oakland CA



George's Auto Repair
4401 Market Street



Basemap: Google Earth, downloaded Nov 2009.
Google Earth imagery dated Jun 2007. Locations of former underground tanks and pump island from W.A. Craig report dated 1994.

Large arrow represents the average measured groundwater gradient: Direction = N 119° W. Magnitude = 0.01. Small arrows represent the range in the measured direction of groundwater gradient.

44th Street

903 44th Street
(residential)

Market Street

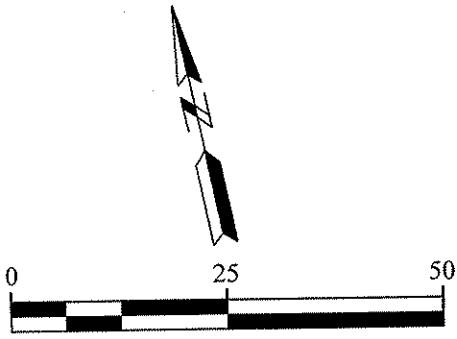
Legend

- Monitoring well
- Former underground tank
- Approximate limits of soil excavation during tank removal
- Soil sample - during tank removal in June 1990
- Boring - October 1994
- Boring - April 1999 or July 1999
- Soilgas sample - July 2009

Figure 4

Exploration Locations

4401 Market Street
Oakland CA



Basemap: Google Earth, downloaded Nov 2009. Google Earth imagery dated Jun 2007. Locations of former underground tanks and pump island from W.A. Craig report dated 1994.

Note: The gradient interpretation was primarily based on wells MW-1, MW-2, MW-4, and MW-5.

Measured groundwater gradient
 Direction = N 97° W
 Magnitude = 0.01

Large arrow represents the average measured groundwater gradient:
 Direction = N 119° W. Magnitude = 0.01. Small arrows represent the range in the measured direction of groundwater gradient.

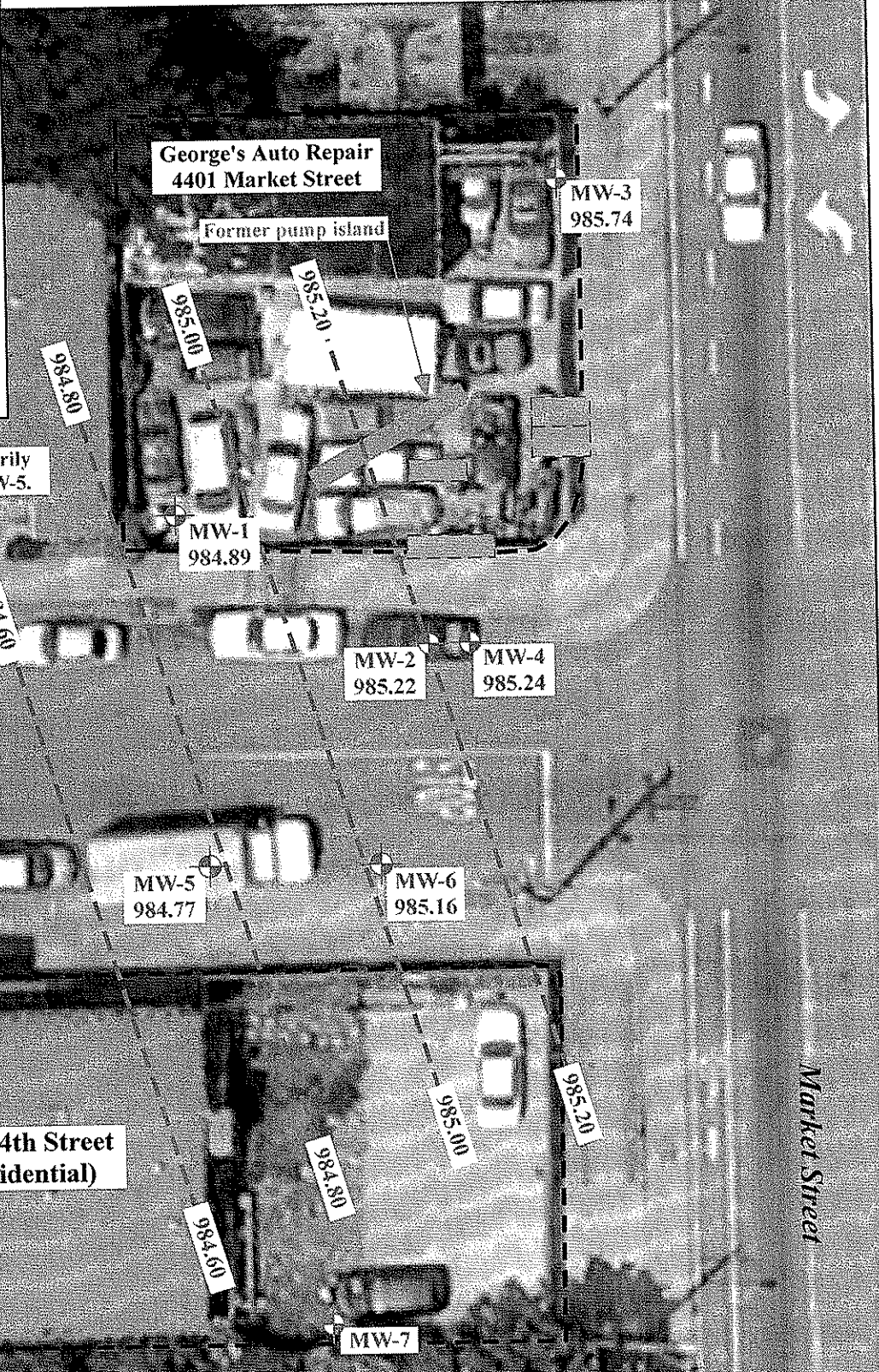


Figure 5
 Groundwater Levels and Gradient (14 April 2009)
 4401 Market Street
 Oakland CA

Legend

- Monitoring well
- Former underground tank

Groundwater elevations cited in units of feet, referenced to a site-specific datum (NOT Mean Sea Level)

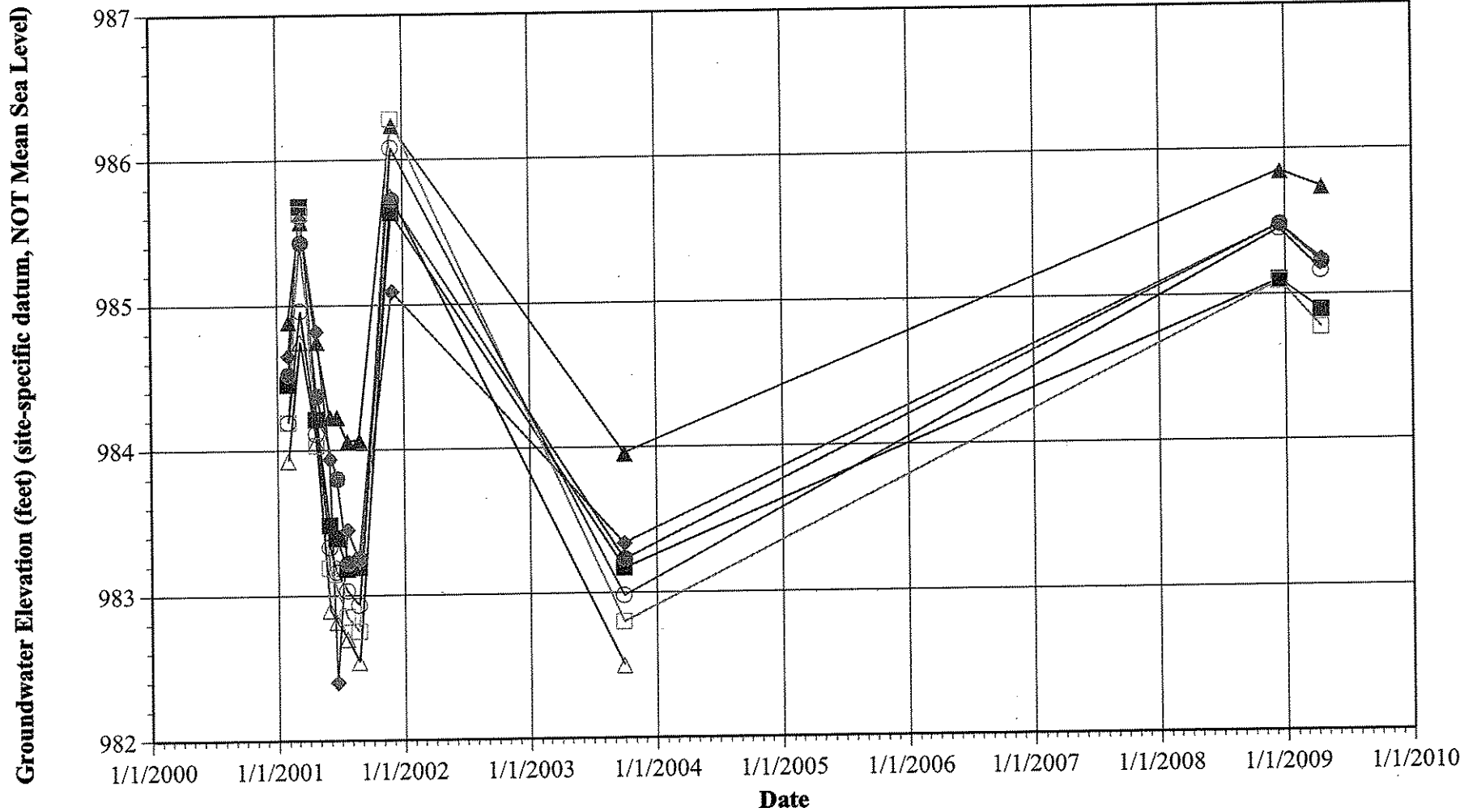


Figure 6
Hydrographs for the
Monitoring Wells Since 2001
4401 Market Street
Oakland CA

Groundwater elevations cited in units of feet, referenced to a site-specific datum (NOT Mean Sea Level)

**George's Auto Repair
4401 Market Street**

Former pump island

MW-3	Date	TPH-G
	Feb 01	<50
	May 01	<50
	Aug 01	<50
	Nov 01	<50
	Sep 03	<50
	Dec 08	<50
	Apr 09	<50

Date	TPH-G
Feb 01	<50
May 01	<50
Aug 01	<50
Nov 01	<50
Sep 03	<50
Dec 08	<50
Apr 09	<50

Date	TPH-G	MW-2
Sep 03	220	
Dec 08	1,600	
Apr 09	1,400	

MW-4	Date	TPH-G
	Feb 01	1,500
	May 01	1,000
	Aug 01	220
	Nov 01	3,100
	Sep 03	140
	Dec 08	70
	Apr 09	110

Date	TPH-G	MW-5
Feb 01	1,200	
May 01	570	
Aug 01	380	
Nov 01	1,600	
Sep 03	460	
Dec 08	3,300	
Apr 09	1,100	

MW-6	Date	TPH-G
	Feb 01	260
	May 01	53
	Aug 01	<50
	Nov 01	130
	Sep 03	<50
	Dec 08	78
	Apr 09	380

**903 44th Street
(residential)**

Date	TPH-G
Feb 01	<50
May 01	<50
Aug 01	<50
Nov 01	<50
Sep 03	<50

MW-7

Large arrow represents the average measured groundwater gradient: Direction = N 119° W. Magnitude = 0.01. Small arrows represent the range in the measured direction of groundwater gradient.

Approximate extent of groundwater with detectable TPH-Gasoline concentrations (greater than 50 µg/L) - April 2009

Groundwater with TPH-Gasoline concentrations exceeding 50 µg/L

- Surface area = 5,600 square feet
- Depth to groundwater table = 14 feet
- Maximum depth of contaminated groundwater = 25 feet
- Assumed porosity = 0.3
- Volume of contaminated groundwater = 18,500 cubic feet (139,000 gallons) (524,000 L)
- Average concentration of TPH-g = 400 µg/L
- Mass of TPH-Gasoline = 0.2 kg (0.4 pounds)
- Estimate corresponds to April 2009 data

Legend



Monitoring well



Former underground tank

TPH-G = TPH-Gasoline. Concentrations cited in units of µg/L.

Figure 7

Extent of TPH-Gasoline in Groundwater (April 2009)

**4401 Market Street
Oakland CA**



Approximate Scale in Feet

Basemap: Google Earth, downloaded Nov 2009.
 Google Earth imagery dated Jun 2007. Locations
 of former underground tanks and pump island from
 W.A. Craig report dated 1994.

Large arrow represents the average
 measured groundwater gradient:
 Direction = N 119° W. Magnitude =
 0.01. Small arrows represent the
 range in the measured direction of
 groundwater gradient.

**George's Auto Repair
 4401 Market Street**

Former pump island

Date	Ben
Feb 01	<0.5
May 01	<0.5
Aug 01	<0.5
Nov 01	<0.5
Sep 03	<0.5
Dec 08	<0.5
Apr 09	<0.5
MW-1	

MW-3	Date	Ben
	Feb 01	<0.5
	May 01	<0.5
	Aug 01	<0.5
	Nov 01	<0.5
	Sep 03	<0.5
	Dec 08	<0.5
	Apr 09	<0.5

44th Street

Date	Ben	MW-2
Sep 03	5.5	
Dec 08	43	
Apr 09	37	

MW-4	Date	Ben
	Feb 01	58
	May 01	19
	Aug 01	<0.5
	Nov 01	110
	Sep 03	<0.5
	Dec 08	1.1
	Apr 09	2.5

Approximate extent of ground-
 water with detectable Benzene
 concentrations (greater than 0.5
 µg/L) - April 2009

Date	Ben	MW-5
Feb 01	57	
May 01	20	
Aug 01	19	
Nov 01	73	
Sep 03	2.6	
Dec 08	53	
Apr 09	32	

MW-6	Date	Ben
	Feb 01	8.0
	May 01	<0.5
	Aug 01	<0.5
	Nov 01	5.7
	Sep 03	<0.5
	Dec 08	<0.5
	Apr 09	1.8

903 44th Street
 (residential)

Groundwater with Benzene concentrations exceeding 0.5 µg/L

- Surface area = 3,000 square feet
- Depth to groundwater table = 14 feet
- Maximum depth of contaminated groundwater = 25 feet
- Assumed porosity = 0.3
- Volume of contaminated groundwater = 9,900 cubic feet (74,000 gallons) (280,000 L)
- Average concentration of Benzene = 10 µg/L
- Mass of Benzene = 0.003 kg (0.006 pounds)
- Estimate corresponds to April 2009 data

Date	Ben	MW-7
Feb 01	<0.5	
May 01	<0.5	
Aug 01	<0.5	
Nov 01	<0.5	
Sep 03	<0.5	

Legend



Monitoring well



Former underground tank

Ben = Benzene. Concentrations
 cited in units of µg/L.

Figure 8
 Extent of Benzene in
 Groundwater (April 2009)

4401 Market Street
 Oakland CA

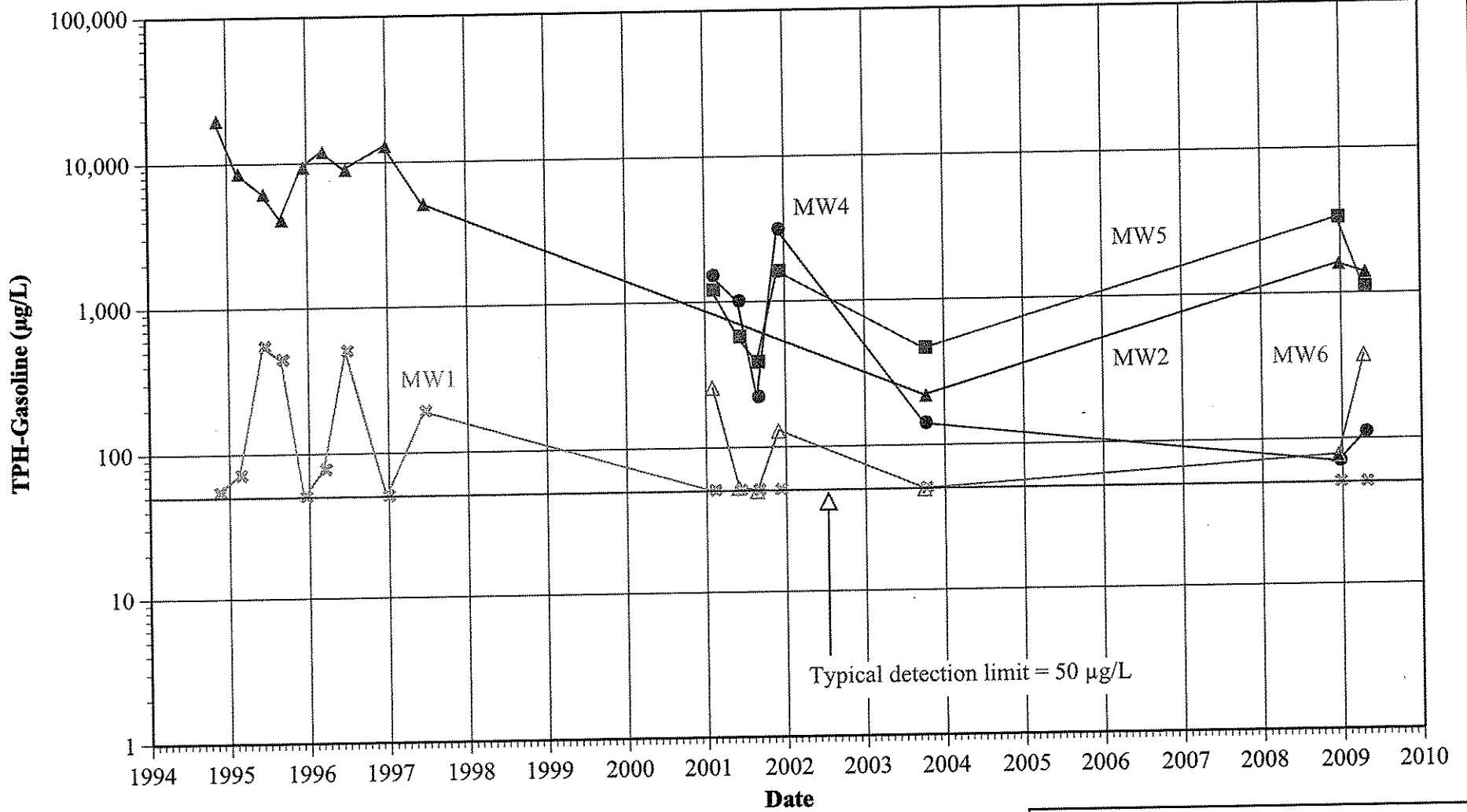


Figure 9

**TPH-Gasoline Versus Time in Wells
MW1, MW2, MW4, MW5, and MW6**

**4401 Market Street
Oakland CA**

Nondetectable concentrations have been plotted at the detection limit of 50 µg/L. Wells MW3 and MW7 are not shown because they have historically had nondetectable TPH-gasoline concentrations.

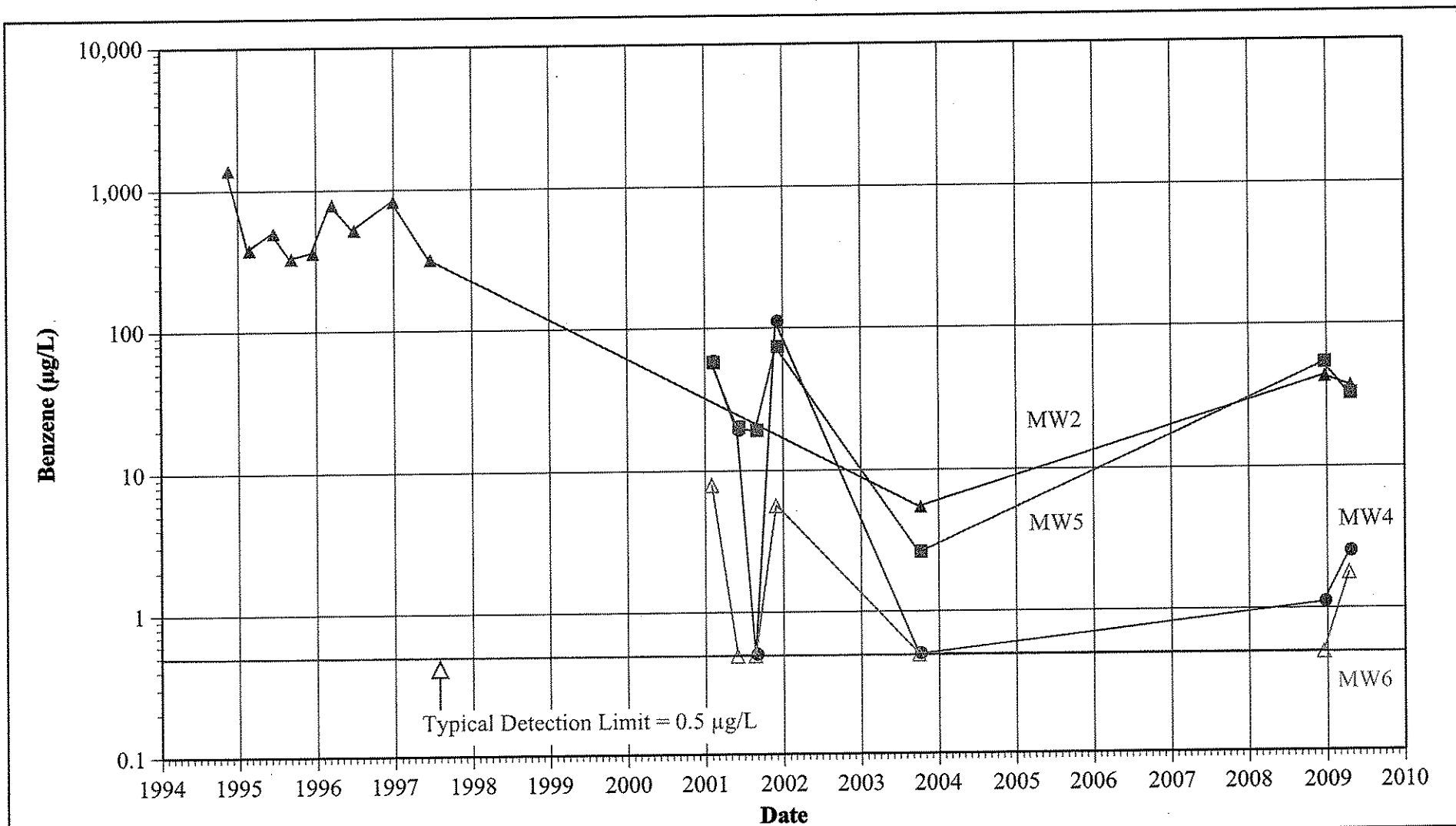


Figure 10

**Benzene Versus Time in Wells
MW2, MW4, MW5, and MW6**

**4401 Market Street
Oakland CA**

Nondetectable concentrations have been plotted at the detection limit of 0.5 µg/L. Wells MW1, MW3, and MW7 are not shown because they have historically had nondetectable benzene concentrations.

Table 1 (Page 1 of 3)
Environmental Chronology
4401 Market Street, Oakland CA

Date	Activities Performed By	Description
Unknown	Unknown	<ul style="list-style-type: none"> Four underground gasoline tanks (one 1,000-gallon and three 500-gallon tanks) were installed. W.A. Craig reported that the structure at 4401 Market Street was constructed in 1943 and used as a gasoline station until the 1970s.
22 June 1990	Environmental Bio-Systems	<ul style="list-style-type: none"> The 4 underground gasoline tanks were removed. Removal of the fuel dispensers, product piping, and pump island was not documented. Soil excavated during tank removal was reused to backfill the excavations. Soil samples were collected from below the tanks. Samples of the excavated soil were also collected. Soil samples were analyzed for TPH-gasoline and BTEX. Soil sampling indicated a release of gasoline.
6 September 1990	W.A. Craig	<ul style="list-style-type: none"> Two trenches were excavated to depths of approximately 5 feet in the vicinity of the former dispenser island. Contaminated soil was observed during excavation but no laboratory analyses were performed. The excavated soil was reused to backfill the trenches.
27 and 28 October 1994	W.A. Craig	<ul style="list-style-type: none"> Seven borings were drilled to depths of approximately 25 feet at and near 4401 Market Street (SB1, SB2, SB3, SB4, MW1, MW2, and MW3); three of the borings were completed as monitoring wells (MW1, MW2, and MW3). Soil samples were collected during drilling. Free product, presumably gasoline, was observed in boring SB2, located near the southwest corner of 4401 Market Street. Soil samples were analyzed for TPH-gasoline and BTEX.
8 November 1994	W.A. Craig	<ul style="list-style-type: none"> Groundwater monitoring was conducted for wells MW1, MW2, and MW3. Samples were analyzed for TPH-gasoline and BTEX.
14 February 1995	W.A. Craig	<ul style="list-style-type: none"> Groundwater monitoring was conducted for wells MW1, MW2, and MW3. Samples were analyzed for TPH-gasoline and BTEX.
7 June 1995	W.A. Craig	<ul style="list-style-type: none"> Groundwater monitoring was conducted for wells MW1, MW2, and MW3. Samples were analyzed for TPH-gasoline and BTEX.
29 August 1995	W.A. Craig	<ul style="list-style-type: none"> Groundwater monitoring was conducted for wells MW1, MW2, and MW3. Samples were analyzed for TPH-gasoline and BTEX.
8 December 1995	W.A. Craig	<ul style="list-style-type: none"> Groundwater monitoring was conducted for wells MW1, MW2, and MW3. Samples were analyzed for TPH-gasoline and BTEX.
7 March 1996	W.A. Craig	<ul style="list-style-type: none"> Groundwater monitoring was conducted for wells MW1, MW2, and MW3. Samples were analyzed for TPH-gasoline, BTEX, and MtBE.
19 June 1996	W.A. Craig	<ul style="list-style-type: none"> Groundwater monitoring was conducted for wells MW1, MW2, and MW3. Samples were analyzed for TPH-gasoline, BTEX, and MtBE.
20 December 1996	W.A. Craig	<ul style="list-style-type: none"> Groundwater monitoring was conducted for wells MW1, MW2, and MW3. Samples were analyzed for TPH-gasoline, BTEX, and MtBE.
12 June 1997	W.A. Craig	<ul style="list-style-type: none"> Groundwater monitoring was conducted for wells MW1, MW2, and MW3. Samples were analyzed for TPH-gasoline, BTEX, and MtBE.
31 March 1999	Streamborn	<ul style="list-style-type: none"> Groundwater levels measured in wells MW1, MW2, and MW3.
April and July 1999	Streamborn	<ul style="list-style-type: none"> Nine borings were drilled to depths of approximately 20 feet near 4401 Market Street (B8 through B16). Free product, presumably gasoline, was observed in boring B10, located on the south side of 44th Street, adjacent to 903 44th Street. Soil samples were collected during drilling. Groundwater samples were collected from temporary casings installed in the borings. The borings were grouted upon completion of groundwater sampling. Soil samples and groundwater samples were analyzed for TPH-gasoline, BTEX, and fuel oxygenates.
4-5 January 2001	Streamborn	<ul style="list-style-type: none"> Four monitoring wells (MW4, MW5, MW6, and MW7) were installed to depths of approximately 25 feet near 4401 Market Street. Soil samples were collected during drilling. Soil samples were analyzed for TPH-Gasoline, BTEX, and fuel oxygenates. An elevation survey was performed for the newly-installed monitoring wells.

Table 1 (Page 2 of 3)
Environmental Chronology
4401 Market Street, Oakland CA

Date	Activities Performed By	Description
1 February 2001	Streamborn	<ul style="list-style-type: none"> • Wells MW4, MW5, MW6, and MW7 were developed. • Groundwater samples were collected from wells MW1, MW3, MW4, MW5, MW6, and MW7. Samples were analyzed for TPH-Gasoline, BTEX, and fuel oxygenates. • Water levels were measured in wells MW1, MW2, MW3, MW4, MW5, MW6, and MW7. • Wells MW4, MW5, and MW6 were monitored for free product; no free product was detected.
9 March 2001	Streamborn	<ul style="list-style-type: none"> • Water levels were measured in wells MW1, MW2, MW3, MW4, MW5, MW6, and MW7. • Wells MW4, MW5, and MW6 were monitored for free product; no free product was detected.
23 April 2001	Streamborn	<ul style="list-style-type: none"> • Water levels were measured in MW1, MW2, MW3, MW4, MW5, MW6, and MW7. • Wells MW4, MW5, and MW6 were monitored for free product; no free product was detected.
30 May 2001	Streamborn	<ul style="list-style-type: none"> • Groundwater samples were collected from wells MW1, MW3, MW4, MW5, MW6 and MW7. Samples were analyzed for TPH-Gasoline, BTEX, and fuel oxygenates. • Water levels were measured in wells MW1, MW2, MW3, MW4, MW5, MW6, and MW7. • Wells MW4, MW5, and MW6 were monitored for free product; no free product was detected.
19 June 2001	Streamborn	<ul style="list-style-type: none"> • Water levels were measured in MW1, MW2, MW3, MW4, MW5, MW6, and MW7. • Wells MW4, MW5, and MW6 were monitored for free product; no free product was detected.
19 July 2001	Streamborn	<ul style="list-style-type: none"> • Water levels were measured in MW1, MW2, MW3, MW4, MW5, MW6, and MW7. • Wells MW4, MW5, and MW6 were monitored for free product; no free product was detected.
22 August 2001	Streamborn	<ul style="list-style-type: none"> • Groundwater samples were collected from wells MW1, MW3, MW4, MW5, MW6 and MW7. Samples were analyzed for TPH-Gasoline, BTEX, and fuel oxygenates. • Water levels were measured in wells MW1, MW2, MW3, MW4, MW5, MW6, and MW7. • Wells MW4, MW5, and MW6 were monitored for free product; no free product was detected.
29 November 2001	Streamborn	<ul style="list-style-type: none"> • Groundwater samples were collected from wells MW1, MW3, MW4, MW5, MW6 and MW7. Samples were analyzed for TPH-Gasoline, BTEX, and fuel oxygenates. • Water levels were measured in wells MW1, MW2, MW3, MW4, MW5, MW6, and MW7.
29 September 2003	Streamborn	<ul style="list-style-type: none"> • Groundwater samples were collected from wells MW1, MW3, MW4, MW5, MW6 and MW7. Samples were analyzed for TPH-Gasoline, BTEX, and fuel oxygenates. • Water levels were measured in wells MW1, MW2, MW3, MW4, MW5, MW6, and MW7. • Wells MW4, MW5, and MW6 were monitored for free product; no free product was detected.
21 November 2008	Streamborn	<ul style="list-style-type: none"> • Wells MW1, MW2, MW3, MW4, MW5, and MW6 were redeveloped by surging with a surge block and pumping with a submersible pump. • We could not contact the property owner of 903 44th Street and obtain permission to access well MW7.
15 December 2008	Streamborn	<ul style="list-style-type: none"> • Water levels were measured in wells MW1, MW2, MW3, MW4, MW5, and MW6. • Groundwater samples were collected from wells MW1, MW2, MW3, MW4, MW5, and MW6. Samples were analyzed for TPH-Gasoline/BTEX/fuel oxygenates (EPA Method 8260). • We could not contact the property owner of 903 44th Street and obtain permission to access well MW7.
14 April 2009	Streamborn	<ul style="list-style-type: none"> • Water levels were measured in wells MW1, MW2, MW3, MW4, MW5, and MW6. • Groundwater samples were collected from wells MW1, MW2, MW3, MW4, MW5, and MW6. Samples were analyzed for TPH-Gasoline/BTEX/fuel oxygenates (EPA Method 8260). • Streamborn repeatedly attempted to contact the property owner of 903 44th Street where well MW7 is located. The property owner did not respond to our inquiries.

Table 1 (Page 3 of 3)
Environmental Chronology
4401 Market Street, Oakland CA

Date	Activities Performed By	Description
29 June 2009	Streamborn	<ul style="list-style-type: none"> • Six borings (SG1 through SG6) were drilled to depths of approximately 6.5 feet at/near 4401 Market Street. • Soilgas implants were installed in each borehole at a depth of approximately 5.7 feet. Teflon tubing (3/16" ID, 1/4" OD) lead from the implant to the ground surface. The boreholes were backfilled with sand, dry bentonite, and hydrated bentonite and allowed to equilibrate for at least two hours prior to collecting soilgas samples. • A soilgas purge test was conducted in one of the boreholes (SG3) to determine the purge volume appropriate for sampling. The results of the purge test indicated that approximately two sand-pack volumes (sand-pack volume = volume of the voids in the interval of the sand pack) should be purged prior to sampling. This corresponded to a purge time of approximately 4.2 minutes at the purge flowrate = 0.167 liters/minute. • Soilgas samples were collected from each of the six implants. The samples were collected after purging two sand-pack volumes. The samples were collected using 1-liter summa canisters at the sampling flowrate = 0.167 liters/minute. Air Toxics (Folsom CA) analyzed the soilgas samples for volatile organic compounds (EPA Method Modified TO-15). • During soilgas sampling, a shroud was placed on the ground surface, over each borehole. A tracer gas (2-propanol or isopropyl alcohol also known as "rubbing alcohol") was introduced inside the shroud prior to and during purging and sampling. This activity was performed to determine whether soilgas samples contained atmospheric air (for example, due to short-circuiting or leakage along the outside of the implant tubing). Very low concentrations of the tracer gas were detected in each of the six soilgas samples; probably as a result of cross-contamination that occurred when the sample tubing was threaded through the shroud. • After each soilgas sample was collected; a vacuum leak check was performed on the sample train, including the implant tubing connection. The leak check consisted of applying a vacuum of approximately 27 inches Hg for a period of approximately five minutes. No leaks were detected. • The implant tubing was pulled and the borings were grouted. The asphalt concrete pavement was patched at the two sampling locations within the street.

General Note

(a) TPH = total petroleum hydrocarbons. BTEX = benzene, toluene, ethylbenzene, and xylenes. MtBE = methyl tert-butyl ether.

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Table 3
Groundwater Level and Gradient Data Since 2001
4401 Market Street, Oakland CA

Location	MW1		MW2		MW3		MW4		MW5		MW6		MW7		Groundwater Gradient	
Casing Diameter (inches)	2		2		2		2		2		2		2			
Ground Surface	Elev = 998.74		Elev = 998.07		Elev = 999.64		Elev = 998.18		Elev = 997.78		Elev = 998.02		Elev = 999.12			
Measuring Point	TOC N Side, Elev = 998.22		TOC N Side, Elev = 997.73		TOC N Side, Elev = 998.90		TOC N Side, Elev = 997.87		TOC N Side, Elev = 997.33		TOC N Side, Elev = 997.50		TOC N Side, Elev = 998.69			
Intercepted Interval	Depth	Elev	Depth	Elev	Depth	Elev	Depth	Elev	Depth	Elev	Depth	Elev	Depth	Elev	Direction	Magnitude
	19 to 25.5	972.9 to 979.7	19 to 27.5	970.6 to 979.1	19 to 27.5	972.1 to 980.6	9 to 25	973.2 to 989.2	9 to 25	972.8 to 988.8	9 to 25	973.0 to 989.0	9 to 25	974.1 to 990.1		
1 February 2001	13.77	984.45	13.21	984.52	14.01	984.89	13.22	984.65	13.14	984.19	13.31	984.19	14.76	983.93		
9 March 2001	12.54	985.68	12.30	985.43	13.32	985.58	12.28	985.59	11.70	985.63	12.54	984.96	13.94	984.75		
23 April 2001	14.01	984.21	13.36	984.37	14.15	984.75	13.05	984.82	13.30	984.03	13.39	984.11	14.63	984.06		
30 May 2001	14.74	983.48	NM	NM	14.67	984.23	13.93	983.94	14.14	983.19	14.17	983.33	15.79	982.90	N 138° W	0.01
19 June 2001	14.83	983.39	13.93	983.80	14.67	984.23	15.47	982.40	14.29	983.04	14.34	983.16	15.87	982.82		
19 July 2001	15.04	983.18	14.51	983.22	14.84	984.06	14.73	983.45	14.48	982.85	14.47	983.03	15.99	982.70		
22 August 2001	15.03	983.19	14.48	983.25	14.83	984.07	14.63	983.24	14.58	982.75	14.57	982.93	16.15	982.54	N 143° W	0.01
29 November 2001	12.59	985.63	12.01	985.72	12.66	986.24	12.78	985.09	11.05	986.28	11.42	986.08	12.94	985.75		
29 September 2003	15.05	983.17	14.50	983.23	14.94	983.96	14.53	983.34	14.53	982.80	14.52	982.98	16.19	982.50	N 131° W	0.01
15 December 2008	13.12	985.10	12.25	985.48	13.05	985.85	12.39	985.48	12.24	985.09	12.05	985.45	NM	NM	N 88° W	0.01
14 April 2009	13.33	984.89	12.51	985.22	13.16	985.74	12.63	985.24	12.56	984.77	12.34	985.16	NM	NM	N 97° W	0.01
Total Depth (last measurement)	24.6		24.6		24.6		24.5		24.9		24.8		24.6		Ave = N 119° W	Ave = 0.01

General Notes

- (a) Measurements are cited in units of feet, referenced to a site-specific datum (NOT Mean Sea Level).
- (b) TOC = top of PVC casing. N = north. Measuring points are the top of PVC casing, north side.
- (c) The depth to water and total depth were measured relative to the top of PVC casing.
- (d) The depth of the intercepted interval was measured relative to the ground surface and corresponds to the sand pack interval.

Table 4
Groundwater Purging and Sampling Information Since 2001
4401 Market Street, Oakland CA

Location	Sample Date	Sample Type	Dissolved Oxygen (mg/L)	pH	Specific Conductance (µS/cm)	Temperature (°C)	ORP (mV)	Turbidity and Color	Purge Method	Purge Duration (minutes)	Volume Purged (gallons)	Purged Dry ?	Standing Water Casing Volumes Removed
MW1	1 Feb 2001	GB	3.1	6.7	530	18.3	-210	Clear, none	SP	9	±5	Yes	±3
	30 May 2001	GB	1.0	6.8	560	24.2	30	Clear, none	SP	40	±5	Yes	±3
	22 Aug 2001	GB	3.0	6.9	510	20.4	50	Clear, none	SP	8	±5	Yes	±3
	29 Nov 2001	GB	NM	6.7	480	20.9	-170	Clear, none	SP	15	±4	Yes	±2
	29 Sep 2003	GB	1.6	6.3	520	21.5	130	Clear, none	SP	15	±5	Yes	±3
	15 Dec 2008	GB	1.0	6.6	410	18.0	80	Clear, none	SP	9	±6	no	±3
	14 Apr 2009	GB	1.1	6.5	400	17.5	180	Clear, none	SP	18	±7	no	±4
MW2	29 Sep 2003	GB	1.6	6.6	560	21.9	-80	Clear, none	SP	20	±5	no	±3
	15 Dec 2008	GB	1.1	6.6	590	18.5	-60	Clear, none	SP	11	±6	no	3
	14 Apr 2009	GB	1.1	6.1	610	19.5	-80	Clear, none	SP	27	±7	no	±4
MW3	1 Feb 2001	GB	5.0	6.7	370	17.4	-230	Clear, none	SP	4	±5	no	±3
	30 May 2001	GB	5.8	7.0	390	23.6	60	Clear, none	SP	26	±5	Yes	±3
	22 Aug 2001	GB	4.5	7.1	370	21.5	90	Cloudy, brown	SP	6	±5	Yes	±3
	29 Nov 2001	GB	NM	6.8	330	19.3	20	Clear, none	SP	10	±6	Yes	±3
	29 Sep 2003	GB	4.5	6.6	370	19.6	190	Clear, none	SP	10	±5	Yes	±3
	15 Dec 2008	GB	3.0	6.6	390	17.6	100	Clear, none	SP	9	±6	no	±3
	14 Apr 2009	GB	4.6	6.1	400	19.4	220	Clear, none	SP	28	±7	no	±4
MW4	1 Feb 2001	GB	5.2	6.8	580	18.2	-210	Cloudy, gray	SP	47	±15	Yes	±9
	30 May 2001	GB	1.5	6.8	700	22.8	20	Clear, none	SP	23	±6	Yes	±3
	22 Aug 2001	GB	2.1	6.9	540	21.2	-20	Clear, none	SP	5	±5	no	±3
	29 Nov 2001	GB	NM	6.7	550	19.5	-170	Clear, none	SP	16	±5	Yes	±3
	29 Sep 2003	GB	1.5	6.5	560	22.4	30	Clear, none	SP	10	±5	no	±3
	15 Dec 2008	GB	1.0	6.6	500	18.8	-20	Clear, none	SP	9	±6	no	±3
	14 Apr 2009	GB	0.9	6.0	510	20.7	-20	Clear, none	SP	22	±6	no	±3
MW5	1 Feb 2001	GB	0.8	6.7	640	18.1	-250	Turbid, brown	SP	18	±20	no	±10
	30 May 2001	GB	1.2	7.0	630	19.6	20	Clear, none	SP	4	±6	no	±3
	22 Aug 2001	GB	2.2	7.0	600	20.0	-40	Clear, none	SP	5	±5	no	±3
	29 Nov 2001	GB	NM	6.9	610	19.6	-170	Clear, none	SP	8	±7	no	±3
	29 Sep 2003	GB	1.6	6.7	560	21.9	-60	Clear, none	SP	10	±5	no	±3
	15 Dec 2008	GB	0.8	6.7	690	18.5	-50	Translucent, gray	SP	6	±6	no	±3
	14 Apr 2009	GB	0.9	6.5	680	17.8	10	Clear, none	SP	23	±6	no	±3
MW6	1 Feb 2001	GB	2.8	6.7	510	18.7	-360	Opaque, brown	SP	23	±20	no	±11
	30 May 2001	GB	2.9	6.8	470	24.2	80	Turbid, brown	SP	5	±6	no	±3
	22 Aug 2001	GB	2.6	6.9	400	21.0	30	Turbid, green	SP	5	±5	no	±3
	29 Nov 2001	GB	NM	6.8	390	19.5	-160	Clear, none	SP	8	±7	no	±3
	29 Sep 2003	GB	2.1	6.6	470	25.5	180	Clear, none	SP	10	±5	no	±3
	15 Dec 2008	GB	2.0	6.6	440	18.9	140	Translucent, brown	SP	6	±6	no	±3
	14 Apr 2009	GB	2.3	7.1	450	16.8	130	Clear, none	SP	14	±6	no	±3
MW7	1 Feb 2001	GB	3.0	6.8	430	16.1	-200	Cloudy, brown	SP	25	±17	no	±11
	30 May 2001	GB	3.1	6.8	500	23.6	60	Clear, none	SP	5	±5	no	±3
	22 Aug 2001	GB	4.6	6.9	420	19.3	20	Turbid, gray	SP	5	±5	no	±3
	29 Nov 2001	GB	NM	6.7	400	19.2	0	Clear, none	SP	6	±6	no	±3
	29 Sep 2003	GB	2.4	6.3	410	19.0	180	Clear, none	SP	10	±4	no	±3

General Notes

- (a) ORP = oxidation/reduction potential.
- (b) NM = not measured.
- (c) Entries in this table correspond to the end of purging (time of sampling).
- (d) SP = submersible purge pump.
- (e) GB = grab sample collected using a Teflon bailer fitted with a bottom-emptying device.

Table 5 (Page 1 of 2)
Groundwater Analytical Data from Monitoring Wells
4401 Market Street, Oakland CA

Location	Sample Date	Sampled By	TPH-Gasoline (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)	Methyl Tert-Butyl Ether (µg/L)	Tert-Butyl Alcohol (µg/L)	Other Fuel Oxygenates (µg/L)	
MW1	8 Nov 1994	W.A. Craig	54	<0.5	<0.5	<0.5	1.2	NA	NA	NA	
	14 Feb 1995	W.A. Craig	71	<0.5	<0.5	<0.5	0.97	NA	NA	NA	
	7 Jun 1995	W.A. Craig	540	0.6	<0.5	1.7	1.3	NA	NA	NA	
	29 Aug 1995	W.A. Craig	440	<0.5	<0.5	1.3	1.1	NA	NA	NA	
	8 Dec 1995	W.A. Craig	<50	<0.5	<0.5	<0.5	<0.5	NA	NA	NA	
	7 Mar 1996	W.A. Craig	77	<0.5	<0.5	<0.5	<0.5	44	NA	NA	
	19 Jun 1996	W.A. Craig	500	<0.5	<0.5	0.85	0.36	84	NA	NA	
	20 Dec 1996	W.A. Craig	<50	<0.5	<0.5	<0.5	<0.5	28	NA	NA	
	12 Jun 1997	W.A. Craig	190	<0.5	<0.5	<0.5	<0.5	12	NA	NA	
	1 Feb 2001	Streamborn	<50	<0.5	<0.5	<0.5	1.1	<5.0	<5.0	<5.0 to <10	
	30 May 2001	Streamborn	<50	<0.5	<0.5	<0.5	<0.5	<5.0	<5.0	<5.0	
	22 Aug 2001	Streamborn	<50	<0.5	<0.5	<0.5	<0.5	<5.0	100	<5.0 to <10	
	29 Nov 2001	Streamborn	<50	<0.5	<0.5	<0.5	<0.5	<5.0	<5.0	<5.0 to <10	
	29 Sep 2003	Streamborn	<50	<0.5	<0.5	<0.5	<1.0	<0.5	<5.0	<0.5 to <1.0	
15 Dec 2008	Streamborn	<50	<0.5	<0.5	<0.5	<1.0	<0.5	<20	<0.5 to <100		
14 Apr 2009	Streamborn	<50	<0.5	<0.5	<0.5	<1.0	<0.5	<5	<0.5 to <250		
MW2	8 Nov 1994	W.A. Craig	20,000	1,400	960	980	4,600	NA	NA	NA	
	14 Feb 1995	W.A. Craig	8,600	380	210	410	2,000	NA	NA	NA	
	7 Jun 1995	W.A. Craig	6,200	500	78	270	1,200	NA	NA	NA	
	29 Aug 1995	W.A. Craig	4,100	330	61	210	980	NA	NA	NA	
	8 Dec 1995	W.A. Craig	9,400	360	190	440	2,000	NA	NA	NA	
	7 Mar 1996	W.A. Craig	12,000	790	170	440	2,000	18	NA	NA	
	19 Jun 1996	W.A. Craig	9,000	520	82	350	1,500	<5.0	NA	NA	
	20 Dec 1996	W.A. Craig	13,000	830	180	410	2,200	<16	NA	NA	
	12 Jun 1997	W.A. Craig	5,100	320	32	190	880	<36	NA	NA	
	29 Sep 2003	Streamborn	220	5.5	<0.5	2.1	9.1	<0.5	24	DIPE = 1.3 Others = <0.5	
	15 Dec 2008	Streamborn	1,600	43	<0.5	53	150	<0.5	<20	<0.5 to <100	
	14 Apr 2009	Streamborn	1,400	37	<0.5	30	120	<0.5	10	<0.5 to <250	
	MW3	8 Nov 1994	W.A. Craig	<50	0.71	0.84	1.2	5.8	NA	NA	NA
		14 Feb 1995	W.A. Craig	<50	<0.5	<0.5	<0.5	<0.5	NA	NA	NA
7 Jun 1995		W.A. Craig	<50	<0.5	<0.5	<0.5	1.6	NA	NA	NA	
29 Aug 1995		W.A. Craig	<50	<0.5	<0.5	<0.5	<0.5	NA	NA	NA	
8 Dec 1995		W.A. Craig	<50	<0.5	<0.5	<0.5	<0.5	NA	NA	NA	
7 Mar 1996		W.A. Craig	<50	<0.5	<0.5	<0.5	<0.5	<5.0	NA	NA	
19 Jun 1996		W.A. Craig	<50	<0.5	<0.5	<0.5	<0.5	<5.0	NA	NA	
20 Dec 1996		W.A. Craig	<50	<0.5	<0.5	<0.5	<0.5	<5.0	NA	NA	
12 Jun 1997		W.A. Craig	<50	<0.5	<0.5	<0.5	<0.5	<5.0	NA	NA	
1 Feb 2001		Streamborn	<50	<0.5	<0.5	<0.5	<0.5	<5.0	<5.0	<5.0 to <10	
30 May 2001		Streamborn	<50	<0.5	<0.5	<0.5	<0.5	<5.0	<5.0	<5.0 to <10	
22 Aug 2001		Streamborn	<50	<0.5	<0.5	<0.5	<0.5	<5.0	14	<5.0 to <10	
29 Nov 2001		Streamborn	<50	<0.5	<0.5	<0.5	<0.5	<5.0	<5.0	<5.0 to <10	
29 Sep 2003		Streamborn	<50	<0.5	<0.5	<0.5	<1.0	<0.5	<5.0	<0.5 to <1.0	
15 Dec 2008	Streamborn	<50	<0.5	<0.5	<0.5	<1.0	<0.5	<20	<0.5 to <100		
14 Apr 2009	Streamborn	<50	<0.5	<0.5	<0.5	<1.0	<0.5	<5.0	<0.5 to <250		
MW4	1 Feb 2001	Streamborn	1,500	58	1.3	83	320	<5.0	16	<5.0 to <10	
	30 May 2001	Streamborn	1,000	19	<0.5	50	3.4	<5.0	23	<5.0 to <10	
	22 Aug 2001	Streamborn	220	<0.5	<0.5	3.2	2.7	<5.0	8.8	<5.0 to <10	
	29 Nov 2001	Streamborn	3,100	110	<5.0	120	410	<5.0	<5.0	<5.0 to <10	
	29 Sep 2003	Streamborn	140	<0.5	<0.5	<0.5	<1.0	<0.5	<5.0	<0.5 to <1.0	
	15 Dec 2008	Streamborn	70	1.1	<0.5	2.8	4.4	<0.5	<20	<0.5 to <100	
14 Apr 2009	Streamborn	110	2.5	<0.5	3.2	8.1	<0.5	<5.0	<0.5 to <250		

Table 5 (Page 2 of 2)
Groundwater Analytical Data from Monitoring Wells
4401 Market Street, Oakland CA

Location	Sample Date	Sampled By	TPH-Gasoline (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)	Methyl Tert-Butyl Ether (µg/L)	Tert-Butyl Alcohol (µg/L)	Other Fuel Oxygenates (µg/L)
MW5	1 Feb 2001	Streamborn	1,200	57	1.8	45	160	<5.0	<5.0	<5.0 to <10
	30 May 2001	Streamborn	570	20	<0.5	26	22	<5.0	<5.0	<5.0 to <10
	22 Aug 2001	Streamborn	380	19	0.67	31	17	<5.0	<5.0	<5.0 to <10
	29 Nov 2001	Streamborn	1,600	73	2.1	78	180	<5.0	<5.0	<5.0 to <10
	29 Sep 2003	Streamborn	460	2.6	<0.5	0.69	<1.0	<0.5	<5.0	<0.5 to <1.0
	15 Dec 2008	Streamborn	3,300	53	1.1	58	110	<0.5	<20	<0.5 to <100
MW6	14 Apr 2009	Streamborn	1,100	32	<0.5	24	23	<0.5	<5.0	<0.5 to <250
	1 Feb 2001	Streamborn	260	8.0	<0.5	22	23	<5.0	<5.0	<5.0 to <10
	30 May 2001	Streamborn	53	<0.5	<0.5	<0.5	<0.5	<5.0	<5.0	<5.0 to <10
	22 Aug 2001	Streamborn	<50	<0.5	<0.5	<0.5	<0.5	<5.0	<5.0	<5.0 to <10
	29 Nov 2001	Streamborn	130	5.7	<0.5	1.6	5.0	<5.0	<5.0	<5.0 to <10
	29 Sep 2003	Streamborn	<50	<0.5	<0.5	<0.5	<1.0	<0.5	<5.0	<0.5 to <1.0
MW7	15 Dec 2008	Streamborn	78	<0.5	<0.5	<0.5	<1.0	<0.5	<20	<0.5 to <100
	14 Apr 2009	Streamborn	380	1.8	<0.5	<0.5	<1.0	<0.5	<5.0	<0.5 to <250
	1 Feb 2001	Streamborn	<50	<0.5	<0.5	<0.5	<0.5	<5.0	<5.0	<5.0 to <10
	30 May 2001	Streamborn	<50	<0.5	<0.5	<0.5	<0.5	<5.0	<5.0	<5.0 to <10
	22 Aug 2001	Streamborn	<50	<0.5	<0.5	<0.5	<0.5	<5.0	<5.0	<5.0 to <10
	29 Nov 2001	Streamborn	<50	<0.5	<0.5	<0.5	<0.5	<5.0	<5.0	<5.0 to <10
29 Sep 2003	Streamborn	<50	<0.5	<0.5	<0.5	<1.0	<0.5	<5.0	<0.5 to <1.0	

Environmental Screening Level (ESL) - Groundwater IS a potential source of drinking water.

California Maximum Contaminant Levels (MCL)		1.0	150	300	1,750	13		
Risk-Based Goal for Carcinogenic Effects (10 ⁻⁶ excess lifetime cancer risk)		0.35		3.2		38		
California Office of Environmental Health Hazard Assessment - Public Health Goals (PHG)		0.15	150	300	1,800	13		
Taste and Odor Thresholds	100	170	40	30	20	5		
California Department of Health Services Notification Level							12	

Environmental Screening Level (ESL) - Groundwater IS NOT a potential source of drinking water.

Volatilization from Groundwater and Subsequent Vapor Intrusion, Residential Scenario	Directly Measure Soilgas	540	380,000	170,000	160,000	24,000	Directly Measure Soilgas	
Estuarine Surface Water - Gross Contamination Ceiling Value (Odors, etc.)	5,000	2,000	40	30	530	180	50,000	
Environmental Screening Level - Estuarine Surface Water - Chronic Habitat Aquatic Toxicity	210	46	130	43	100	8,000	18,000	
Environmental Screening Level - Estuarine Surface Water - Bioaccumulation/Human Consumption		71	200,000	29,000				

General Notes

- (a) TPH = total petroleum hydrocarbons. MtBE = methyl tert-butyl ether. DIPE = di-isopropyl ether.
- (b) NA = not analyzed.
- (c) Environmental Screening Levels from: *Screening For Environmental Concerns at Sites With Contaminated Soil and Groundwater (Interim Final - November 2007, Revised May 2008)*. Prepared by San Francisco Bay Regional Water Quality Control Board, Oakland CA. 27 May 2008. <http://www.waterboards.ca.gov/sanfranciscobay/esl.shtml>

Table 6
Free Product Thickness in Monitoring Wells MW4, MW5, and MW6
4401 Market Street, Oakland CA

Date	MW4 (feet)	MW5 (feet)	MW6 (feet)
1 February 2001	<0.005	<0.005	<0.005
9 March 2001	<0.005	<0.005	<0.005
23 April 2001	<0.005	<0.005	<0.005
30 May 2001	<0.005	<0.005	<0.005
19 June 2001	<0.005	<0.005	<0.005
19 July 2001	<0.005	<0.005	<0.005
22 August 2001	<0.005	<0.005	<0.005
29 November 2001	<0.005	<0.005	<0.005

General Note

(a) Free product monitoring was performed using a Water Mark Interface meter: Model H.OIL.

Table 7
Analytical Results from Soils Sampling
4401 Market Street, Oakland CA

Location	Sample Date	Sample Interval (feet)	Purge Flowrate (liter/min)	Purge Volume (liter)	Purge Volume (sand-pack volumes)	Sample Flowrate (liter/min)	Sample Volume (liter)	Approximate Depth to Groundwater (feet)	2-Propanol ($\mu\text{g}/\text{m}^3$)	Benzene ($\mu\text{g}/\text{m}^3$)	Toluene ($\mu\text{g}/\text{m}^3$)	Ethylbenzene ($\mu\text{g}/\text{m}^3$)	Total Xylenes ($\mu\text{g}/\text{m}^3$)	PCE ($\mu\text{g}/\text{m}^3$)	Acetone ($\mu\text{g}/\text{m}^3$)	2-Butanone ($\mu\text{g}/\text{m}^3$)	Carbon Disulfide ($\mu\text{g}/\text{m}^3$)	1,2,4-Trimethylbenzene ($\mu\text{g}/\text{m}^3$)	1,3,5-Trimethylbenzene ($\mu\text{g}/\text{m}^3$)	Other Volatile Organic Compounds (EPA Method TO-15) ($\mu\text{g}/\text{m}^3$)		
SG1	29 June 2009	4.3-6.0	0.167	0.704	2	0.167	1	13.7	100	5.6	16	8.8	44	170	80	11	<3.8	13	<6.8	Tetrahydrofuran = 7.2 Chloroform = 34 4-Methyl-2-pentanone = 8.7 Others <3.0 to <59		
SG2	29 June 2009	5.1-6.6	0.167	0.704	2	0.167	1	13.7	44	11	83	75	254	120	89	16	12	16	7.0	Carbon Disulfide = 12 Hexane = 32 Tetrahydrofuran = 6.4 Cyclohexane = 6.3 2,2,4-Trimethylpentane = 23 Heptane = 23 Others <3.0 to <59		
SG2 Laboratory Duplicate	29 June 2009	5.1-6.6	0.167	0.704	2	0.167	1	13.7	47	11	85	83	267	130	93	14	13	17	<14	Carbon Disulfide = 13 Hexane = 30 2,2,4-Trimethylpentane = 22 Heptane = 22 Others <6.4 to <120		
SG3	29 June 2009	4.8-6.4	0.167	0.704	2	0.167	1	13.7	190	5.1	29	6.2	29.7	29	72	13	4.6	16	<6.1	Carbon Disulfide = 4.6 Ethanol = 17 Hexane = 7.8 Tetrahydrofuran = 18 Heptane = 6.6 4-Methyl-2-pentanone = 7.6 Others <2.7 to <53		
SG4	29 June 2009	5.1-6.7	0.167	0.704	2	0.167	1	13.7	95	15	130	26	128	<9.1	110	31	10	40	17	Carbon Disulfide = 10 Hexane = 36 Cyclohexane = 6.6 2,2,4-Trimethylpentane = 38 Heptane = 38 4-Methyl-2-pentanone = 17 Propylbenzene = 8.6 Others <3.0 to <57		
SG5	29 June 2009	5.0-6.6	0.167	0.704	2	0.167	1	13.7	87	16	90	19	86	<12	70	15	34	40	11	Carbon Disulfide = 34 1,3-Butadiene = 4.4 Hexane = 48 Tetrahydrofuran = 9.5 Chloroform = 22 Heptane = 27 4-Methyl-2-pentanone = 22 Others <3.8 to <74		
SG6	29 June 2009	5.0-6.5	0.167	0.704	2	0.167	1	13.7	2,400 ⁽¹⁾	5.9	21	6.8	37.7	<8.2	32	7.4	40	10	<5.9	Carbon Disulfide = 40 Hexane = 66 Cyclohexane = 16 Heptane = 22 4-Methyl-2-pentanone = 10 Others <2.7 to <52 Chloroform = 460		
Environmental Screening Level - Shallow Soils (vapor intrusion), Residential Exposure										84	63,000	980	21,000	410								
California Human Health Screening Level (CHHSL) - Shallow Soils (vapor intrusion), Residential Land Use										36.2	135,000		315,000	180								

General Notes

- (a) 2-Propanol = Isopropyl alcohol or "rubbing alcohol". 2-Propanol was used as the tracer gas during purging and sampling.
 (b) PCE = Tetrachloroethene, 2-Butanone = Methyl ethyl ketone.
 (c) Environmental Screening Levels from: *Screening For Environmental Concerns at Sites With Contaminated Soil and Groundwater (Interim Final - November 2007, Revised May 2008)*. Prepared by San Francisco Bay Regional Water Quality Control Board, Oakland CA. 27 May 2008. www.waterboards.ca.gov/sanfranciscobay/esl.shtml
 (d) California Human Health Screening Level (CHHSL) from: *Use of California Human Health Screening Levels (CHHSL) in Evaluation of Contaminated Properties*. Prepared by California Environmental Protection Agency. January 2005.

Footnote

- (1) Result exceeded the instrument calibration range.

Table 8
Theoretical Proportion of the Shroud Atmosphere that was Measured in Each Soilgas
4401 Market Street, Oakland CA

Location	Sample Date	2-Propanol Concentration Measured Inside the Shroud		2-Propanol Concentrations Measured in the Soilgas Sample		Theoretical Proportion of Shroud Atmosphere that was Measured in Soilgas Sample
		ppbv	$\mu\text{g}/\text{m}^3$	ppbv	$\mu\text{g}/\text{m}^3$	Proportion
SG1	29 June 2009	350,000	860,000	42	100	1×10^{-4}
SG2	29 June 2009	360,000	882,000	18	44	5×10^{-5}
SG3	29 June 2009	340,000	833,000	78	190	2×10^{-4}
SG4	29 June 2009	305,000	747,000	39	95	1×10^{-4}
SG5	29 June 2009	70,000	172,000	36	87	5×10^{-4}
SG6	29 June 2009	245,000	600,000	960 ⁽¹⁾	2,400 ⁽¹⁾	4×10^{-3}

General Notes

- (a) 2-Propanol = Isopropyl alcohol or “rubbing alcohol”.
- (b) 2-Propanol was used as the tracer gas during soilgas purging and sampling. A cloth was soaked in 2-Propanol and the cloth was placed inside a metal liner. The liner had been previously drilled with multiple holes. The liner (containing the soaked cloth) was then placed inside the shroud. The atmosphere inside the shroud was monitored in the field using an organic vapor meter.
- (c) Organic vapor meter = Mini Rae 2000 organic vapor monitor fitted with a 10.6 eV photoionization detector, calibrated to 100 ppm v/v isobutylene.
- (d) The shroud consisted of a clear rectangular plastic storage container (12” x 9” x 6”). The lip of the storage container, where the container contacted the ground surface, was fitted with weather stripping. Two bulkhead fittings were installed in the side of the container. Teflon tubing (3/16” ID x 1/4” OD) was threaded through the bulkhead fittings. One tube consisted of the sample tube (leading from the implant). The other tube was used to monitor the shroud environment. A plug (nail) was inserted inside the tubing when the tubing was not in use.
- (e) During purging and sampling, multiple measurements of the atmosphere inside the shroud were made - the concentration cited in this table represents the average. In general, the measurements were consistent and did not vary significantly.
- (d) Theoretical Proportion of Shroud Atmosphere that was Measured in Soilgas Sample = (2-Propanol Concentration Measured in the Soilgas Sample) ÷ (2-Propanol Concentration Measured Inside the Shroud).

Footnote

- (1) Result exceeded the instrument calibration range.

Table 9
Soil Analytical Data Collected During Tank Removal - Representing Soil That Was Not Overexcavated (not removed)
4401 Market Street, Oakland CA

Location	Sample Depth (feet)	Location Description	Sample Date	Sample Type	TPH-Gasoline (mg/kg)	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Total Xylenes (mg/kg)
S2	±8.5	±2-feet below invert of middle 500-gallon gasoline tank	22 June 1990	Grab (liner)	360	0.99	12	9.5	53
S3	±7.5	±2-feet below invert of southern 500-gallon gasoline tank	22 June 1990	Grab (liner)	160	1.2	2.5	2.8	13
S4	±8	±2-feet below invert at non-fill end of 1,000-gallon gasoline tank	22 June 1990	Grab (liner)	210	3.3	9.4	7.6	32
S5	±8	±2-feet below invert at fill end of 1,000-gallon gasoline tank	22 June 1990	Grab (liner)	870	3.2	24	20	110
S6	±8.5	±2-feet below invert of northern 500-gallon gasoline tank	22 June 1990	Grab (liner)	730	5	24	26	140
S8	±15	±8.5-feet below inverts and midway between the two northern 500-gallon gasoline tanks	22 June 1990	Grab (liner)	260	3.7	14	7.1	33

General Note

(a) TPH = total petroleum hydrocarbons.

Table 10
Soil Analytical Data from Borings and Monitoring Wells
4401 Market Street, Oakland CA

Location	Sample Depth (feet)	Sample Date	TPH-Gasoline (mg/kg)	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Total Xylenes (mg/kg)	MtBE (mg/kg)	Other Fuel Oxygenates (mg/kg)
SB1	10 to 10.5	27 October 1994	<1	<0.005	<0.005	<0.005	<0.005	NM	NM
	15 to 15.5	27 October 1994	72	<0.01	0.13	0.21	0.18	NM	NM
	20 to 20.5	27 October 1994	<1	<0.005	<0.005	<0.005	<0.005	NM	NM
SB2	10 to 10.5	27 October 1994	40	0.079	0.034	0.43	4.7	NM	NM
	15 to 15.5	27 October 1994	19	0.46	0.041	0.31	4.2	NM	NM
	20 to 20.5	27 October 1994	5.7	0.006	<0.005	0.010	0.079	NM	NM
SB3	10 to 10.5	27 October 1994	<1	<0.005	<0.005	<0.005	<0.005	NM	NM
	15 to 15.5	27 October 1994	<1	<0.005	<0.005	<0.005	<0.005	NM	NM
	19.5 to 20	27 October 1994	<1	<0.005	<0.005	<0.005	<0.005	NM	NM
SB4	10 to 10.5	28 October 1994	<1	<0.005	0.005	0.006	0.016	NM	NM
	15 to 15.5	28 October 1994	220	<0.01	0.60	0.46	0.93	NM	NM
	19.5 to 20	28 October 1994	<1	<0.005	<0.005	<0.005	<0.005	NM	NM
MW1	10 to 10.5	27 October 1994	<1	<0.005	<0.005	<0.005	<0.005	NM	NM
	15 to 15.5	27 October 1994	<1	<0.005	<0.005	0.005	<0.005	NM	NM
	20 to 20.5	27 October 1994	<1	<0.005	<0.005	<0.005	<0.005	NM	NM
MW2	10 to 10.5	28 October 1994	<1	<0.005	<0.005	<0.005	<0.005	NM	NM
	15 to 15.5	28 October 1994	97	1.5	1.4	2.3	12	NM	NM
	20 to 20.5	28 October 1994	2.0	<0.005	0.009	0.016	0.062	NM	NM
MW3	10 to 10.5	28 October 1994	1.1	<0.005	0.006	<0.005	0.010	NM	NM
	15 to 15.5	28 October 1994	<1	<0.005	<0.005	<0.005	<0.005	NM	NM
	20 to 20.5	28 October 1994	<1	<0.005	<0.005	<0.005	<0.005	NM	NM
B8	11.5 to 12	8 April 1999	<1.0	<0.005	<0.005	<0.005	<0.005	<0.005	NM
	15 to 15.5	8 April 1999	<1.0	<0.005	<0.005	<0.005	<0.005	<0.005	NM
B9	11.5 to 12	8 April 1999	<1.0	<0.005	<0.005	<0.005	<0.005	<0.005	NM
	15 to 15.5	8 April 1999	110	<0.62	<0.62	<0.62	<0.62	<0.62	NM
B10	11.5 to 12	8 April 1999	<1.0	<0.005	<0.005	<0.005	<0.005	<0.005	NM
	15 to 15.5	8 April 1999	1,300	12	22	25	100	<3.1	NM
B11	11.5 to 12	8 April 1999	<1.0	<0.005	<0.005	<0.005	<0.005	<0.005	NM
	15 to 15.5	8 April 1999	140	<0.62	<0.62	1.8	8.9	<0.62	NM
B12	11.5 to 12	8 April 1999	<1.0	<0.005	<0.005	<0.005	<0.005	<0.005	NM
	15 to 15.5	8 April 1999	<1.0	<0.005	<0.005	<0.005	<0.005	<0.005	NM
B13	11.5 to 12	9 July 1999	<1.0	<0.005	<0.005	<0.005	<0.005	<0.005	NM
	15 to 15.5	9 July 1999	<1.0	<0.005	<0.005	<0.005	<0.005	<0.005	NM
B14	11.5 to 12	9 July 1999	<1.0	<0.005	<0.005	<0.005	<0.005	<0.005	NM
	15 to 15.5	9 July 1999	3.6	<0.005	<0.005	<0.005	0.036	<0.005	NM
	21 to 21.5	9 July 1999	2.1	<0.005	<0.005	0.059	0.32	<0.005	NM
B15	11.5 to 12	9 July 1999	<1.0	<0.005	<0.005	<0.005	<0.005	<0.005	NM
	15 to 15.5	9 July 1999	<1.0	<0.005	<0.005	<0.005	<0.005	<0.005	NM
	17.5 to 18	9 July 1999	<1.0	<0.005	<0.005	<0.005	<0.005	<0.005	NM
B16	11.5 to 12	9 July 1999	<1.0	<0.005	<0.005	<0.005	<0.005	<0.005	NM
	15 to 15.5	9 July 1999	<1.0	<0.005	<0.005	<0.005	<0.005	<0.005	NM
	19.5 to 20	9 July 1999	<1.0	<0.005	<0.005	<0.005	<0.005	<0.005	NM
MW4	12.5 to 13	5 January 2001	25	<0.62	<0.62	<0.62	<0.62	<0.005	<0.005 to <0.010
	14 to 14.5	5 January 2001	29	<0.62	<0.62	<0.62	<0.62	<0.023	<0.023 to <0.046
	15.5 to 16	5 January 2001	140	<3.1	<3.1	<3.1	5.3	<0.023	<0.023 to <0.046
MW5	12.5 to 13	4 January 2001	120	<3.1	<3.1	<3.1	9.2	<0.019	<0.019 to <0.038
	14 to 14.5	4 January 2001	560	<1.2	<1.2	8.5	43	<0.023	<0.023 to <0.045
	15.5 to 16	4 January 2001	93	<0.62	0.79	1.3	7.6	<0.022	<0.022 to <0.043
MW6	12.5 to 13	4 January 2001	91	<0.62	<0.62	1.0	1.3	<0.016	<0.016 to <0.038
	14 to 14.5	4 January 2001	200	<3.1	<3.1	<3.1	<3.1	<0.020	<0.020 to <0.040
MW7	10 to 10.5	5 January 2001	<1.0	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005 to <0.010
	15 to 15.5	5 January 2001	<1.0	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005 to <0.010
Environmental Screening Level - Direct Exposure to Soil, Residential Scenario (including child pica behavior)			110	0.12	63	2.3	31	30	
Environmental Screening Level - Direct Exposure to Soil, Construction Worker Scenario			4,200	12	650	210	420	2,000	

General Notes

(a) TPH = total petroleum hydrocarbons. MtBE = methyl tert-butyl ether. NM = not measured.

(b) Environmental Screening Levels from: *Screening For Environmental Concerns at Sites With Contaminated Soil and Groundwater (Interim Final - November 2007, Revised May 2008)*. Prepared by San Francisco Bay Regional Water Quality Control Board, Oakland CA. 27 May 2008. <http://www.waterboards.ca.gov/sanfranciscobay/esl.shtml>

Table 11
Groundwater Analytical Data from Temporarily-Screened Boreholes
4401 Market Street, Oakland CA

Boring Number	Depth to Water (feet)	Sample Date	Purged?	TPH-Gasoline (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethyl-benzene (µg/L)	Xylenes (µg/L)	MtBE (µg/L)
B8	±13	8 April 1999	No	<50	<0.5	<0.5	<0.5	<0.5	<5
B9	±14	8 April 1999	No	850	9.5	2.4	3.5	48	<5
B10	±13	8 April 1999	No	Free product observed floating on groundwater. No sample collected.					
B11	±18	8 April 1999	No	2,600	34	4.6	92	440	<10
B12	±13	8 April 1999	No	<50	<0.5	<0.5	<0.5	<0.5	<5
B13	±15	9 July 1999	No	<50	<0.5	<0.5	<0.5	<0.5	<5
B15	±15	9 July 1999	No	5,100 ⁽¹⁾	<5	<5	<5	<5	<50
B16	±21	9 July 1999	No	<50	<0.5	<0.5	<0.5	<0.5	6.5

General Note

- (a) TPH = total petroleum hydrocarbons. MtBE = Methyl tertiary Butyl Ether.
 (b) Depths measured from the adjacent ground surface.

Footnote

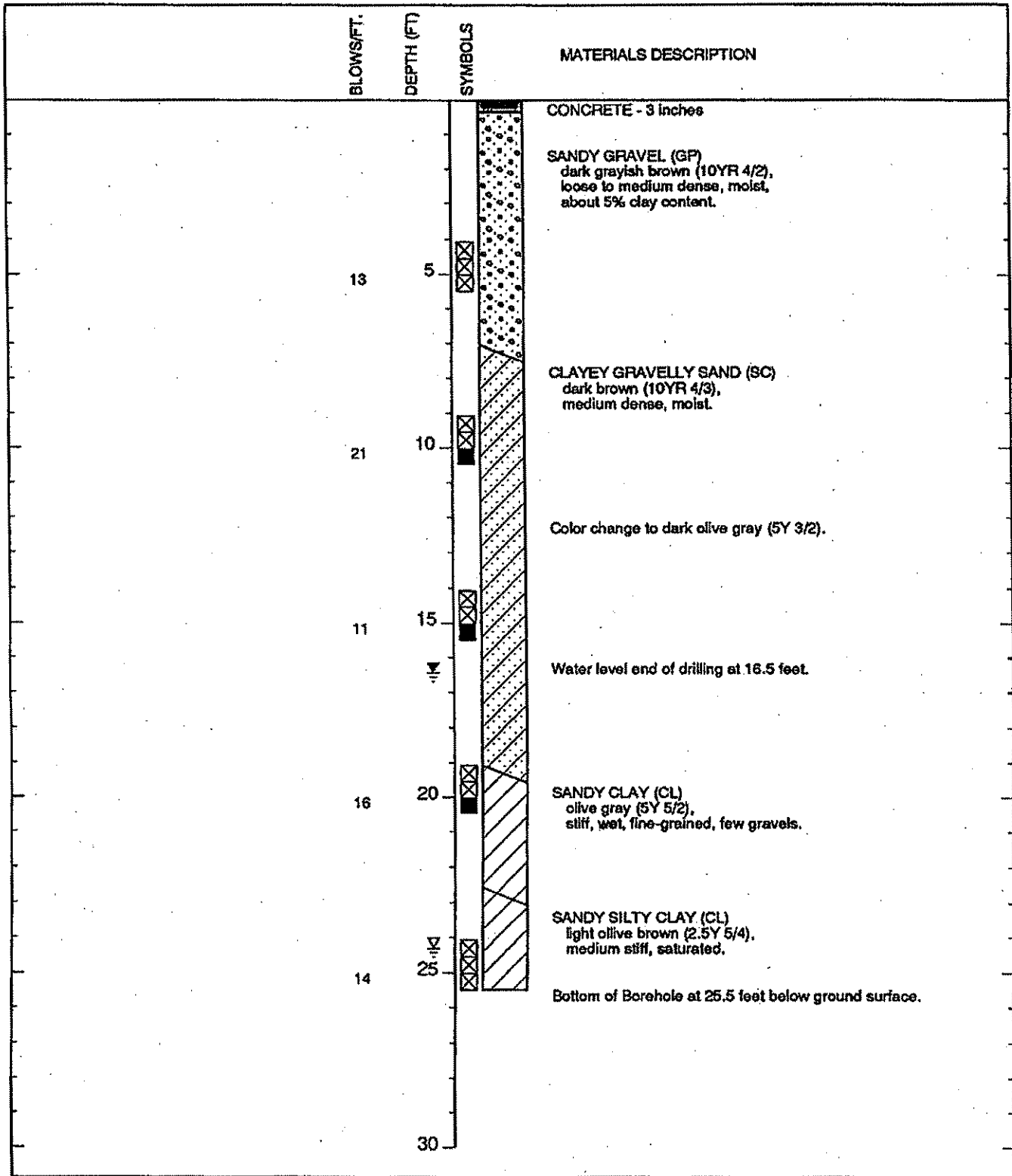
- (1) Laboratory reported that hydrocarbon found in gasoline range does not match their gasoline standard.

Table 12
Field Observations from Borings
4401 Market Street, Oakland CA

Boring Number	Date Performed	Total Depth (feet)	Depth to Water (feet)	Lithology	Depth Interval (feet), Organic Vapor Meter Measurement (OVM) (ppm v/v), Observations of Chemical Odor and Chemical Staining in Soil	Observations of Chemical Odor and Sheen in Groundwater
B8	8 April 1999	±16	±13	±1' to ±5': Lean Clay (CL) ±5' to ±7': Silt (ML) ±7' to ±16+': Fat Clay (CH)	±1' to 16': OVM <5, no odor or staining	No odor, no sheen
B9	8 April 1999	±16	±14	±1' to ±5': Lean Clay (CL) ±5' to ±7': Silt (ML) ±7' to ±16+': Fat Clay (CH)	±1' to 14': OVM <5, no odor or staining ±14.5': OVM = 5, slight gasoline odor, no staining	Slight gasoline odor, no sheen
B10	8 April 1999	±16	±13	±1' to ±5': Lean Clay (CL) ±5' to ±7': Silt (ML) ±7' to ±16+': Fat Clay (CH)	±1' to 13': OVM <5, no odor or staining ±13': OVM = 580, strong gasoline odor, no staining ±15': OVM = 850, strong gasoline odor, no staining	±1 inch of gasoline floating on groundwater (as observed in a 1/2-inch diameter bailer.)
B11	8 April 1999	±19	±18	±1' to ±5': Lean Clay (CL) ±5' to ±7': Silt (ML) ±7' to ±18': Fat Clay (CH) ±18' to ±19+': Lean Clay (CL)	±1' to 15': OVM <5, no odor or staining ±15': OVM = 520, strong gasoline odor, no staining ±18': OVM = 180, strong gasoline odor, no staining	Strong gasoline odor, no sheen
B12	8 April 1999	±16	±13	±1' to ±5': Lean Clay (CL) ±5' to ±7': Silt (ML) ±7' to ±16+': Fat Clay (CH)	±1' to 16': OVM <5, no odor or staining	No odor, no sheen
B13	9 July 1999	±20	±15	±1' to ±8': Lean Clay (CL) ±8' to ±19.5': Fat Clay (CH) ±19.5' to ±20+': Clayey Sand (SC)	±1' to 2±1': OVM <5, no odor or staining	No odor, no sheen
B14	9 July 1999	±24	Dry	0' to ±8': Lean Clay (CL) ±8' to ±20.5': Fat Clay (CH) ±20.5' to ±24+': Clayey Sand (SC)	0' to 19': OVM <5, no odor or staining ±19.5': OVM = 230, moderate gasoline odor, no staining ±20.5': OVM = 80, moderate gasoline odor, no staining ±21.5': OVM = 30, moderate gasoline odor, no staining	Dry hole. No groundwater sample collected.
B15	9 July 1999	±20	±15	0' to ±8': Lean Clay (CL) ±8' to ±17': Fat Clay (CH) ±17' to ±20+': Clayey Sand (SC)	0' to 18': OVM <5, no odor or staining ±18': OVM = 140, strong gasoline odor, no staining ±19.5': OVM = 250, strong gasoline odor, no staining	Strong petroleum odor, no sheen
B16	9 July 1999	±24	±21	±1' to ±9.5': Lean Clay (CL) ±9.5' to ±13': Clayey Sand (SC) ±13' to ±19': Lean Clay (CL) ±19' to ±21': Clayey Sand (SC) ±21' to ±23': Clayey Gravel (GC) ±23' to ±24+': Clayey Sand (SC)	±1' to 24': OVM <5, no odor or staining	No odor, no sheen

General Notes

- (a) All depths measured from the adjacent ground or pavement surface.
- (b) Organic vapor meter screening performed by placing the suction inlet of the organic vapor meter next to freshly exposed soil. Organic vapor meter = Thermo Environmental Instruments, Model 580B, equipped with 10.2 eV photoionization detector, calibrated to 100 ppm v/v isobutylene.
- (c) The depth to groundwater was measured in each temporarily-cased boring approximately 10 minutes following the conclusion of soil sampling. Reliable (stabilized) measurements of the depth to groundwater were not obtained and the stabilized depth to groundwater is likely shallower than our measurements indicate.



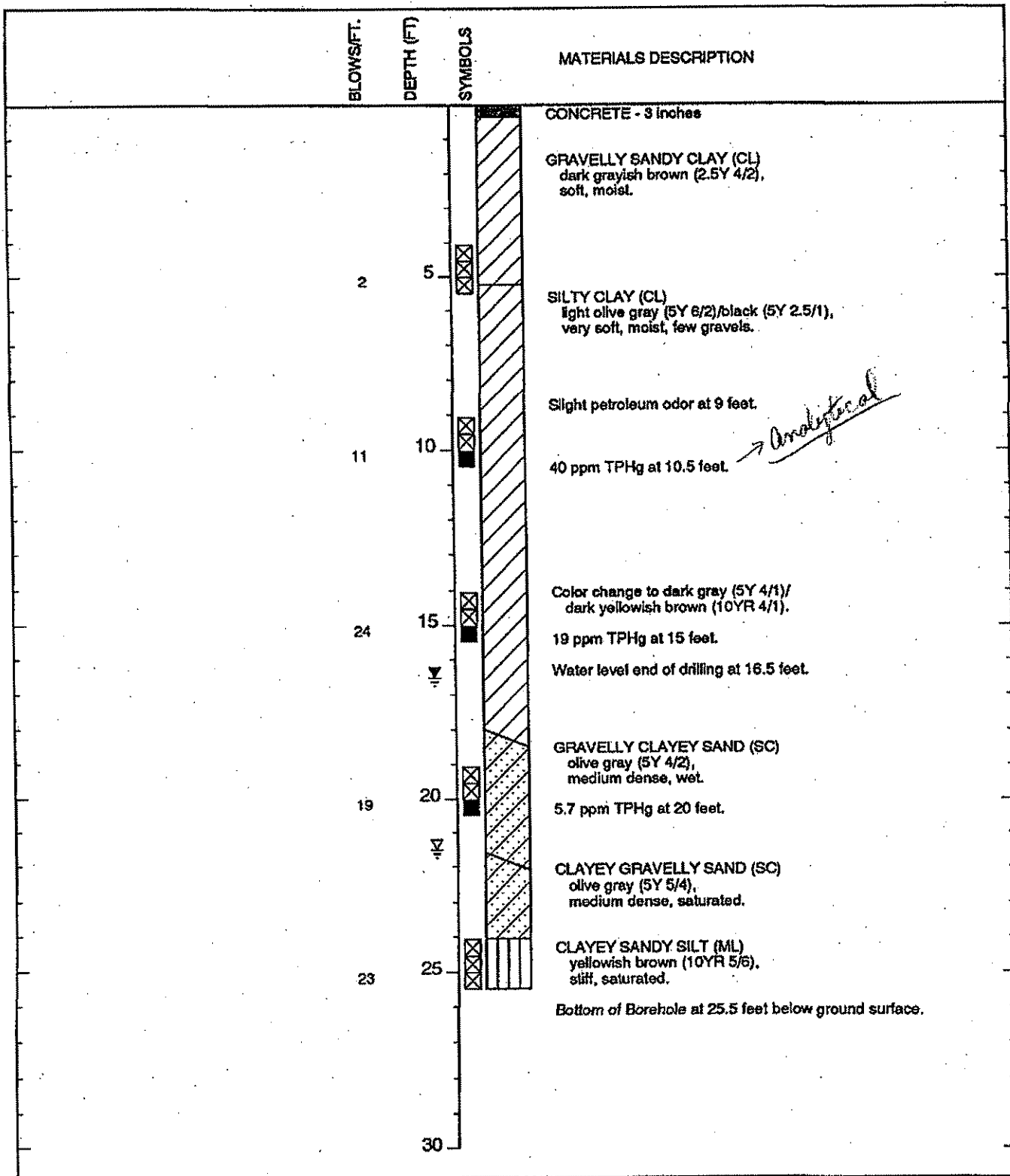
DRILL RIG	4" Continuous Flight Auger	DIAMETER OF HOLE	4 inches
DATE STARTED	10/27/94	TOTAL DEPTH OF HOLE	25.5 feet
DATE COMPLETED	10/27/94	TOP OF CASING ELEVATION	72.5 feet MSL

W. A. CRAIG, INC.
INDUSTRIAL AND ENVIRONMENTAL CONTRACTOR

Log of Boring SB-1
4401 Market Street
Oakland, California

PLATE
4A

JOB NUMBER	REVIEWED BY	DATE	REVISED DATE
3365	<i>[Signature]</i>	1/95	

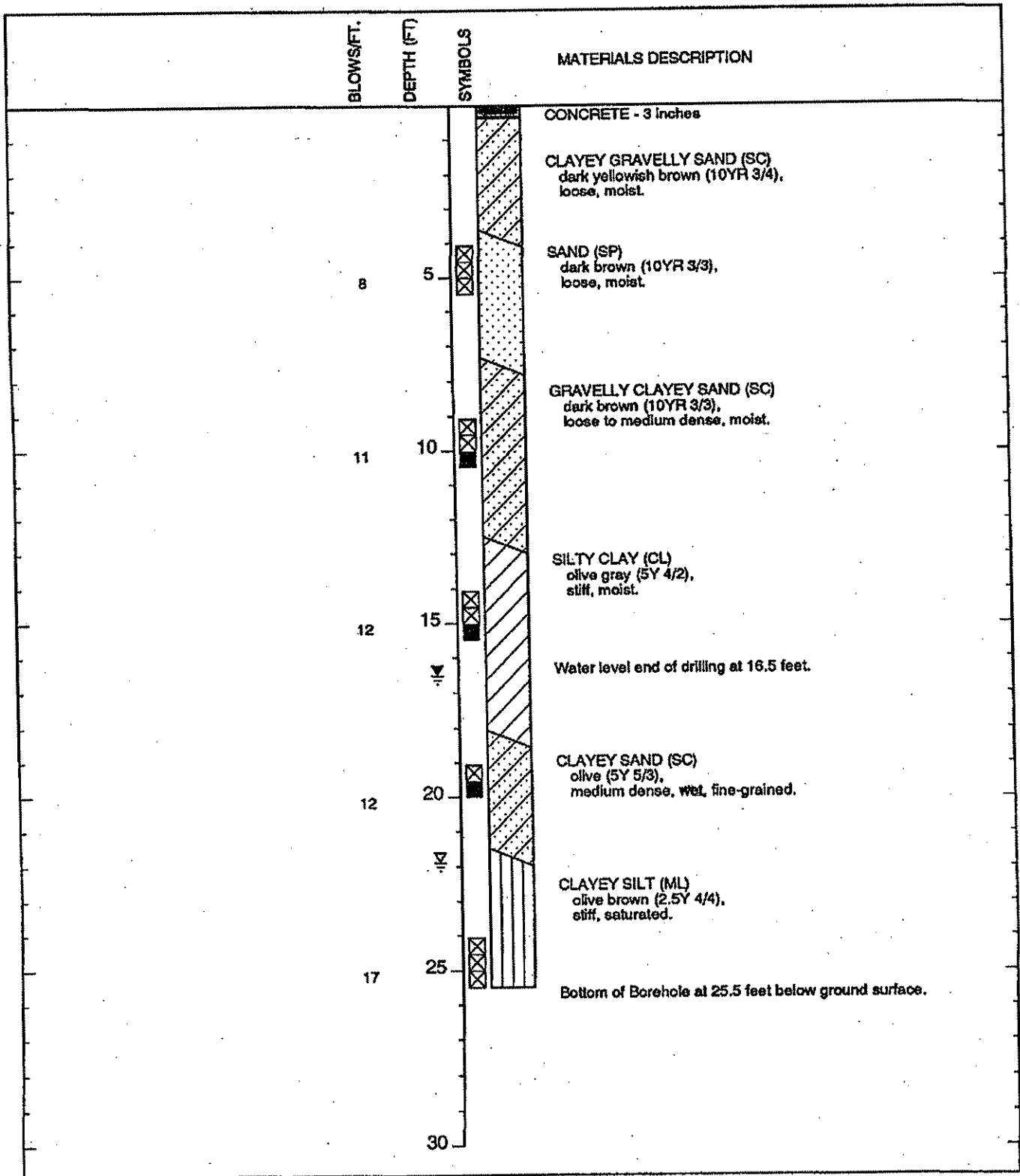


DRILL RIG	4" Continuous Flight Auger	DIAMETER OF HOLE	4 inches
DATE STARTED	10/27/94	TOTAL DEPTH OF HOLE	25.5 feet
DATE COMPLETED	10/27/94	TOP OF CASING ELEVATION	72.0 feet MSL

W. A. CRAIG, INC.
INDUSTRIAL AND ENVIRONMENTAL CONTRACTOR

Log of Boring SB-2
4401 Market Street
Oakland, California

PLATE
4B



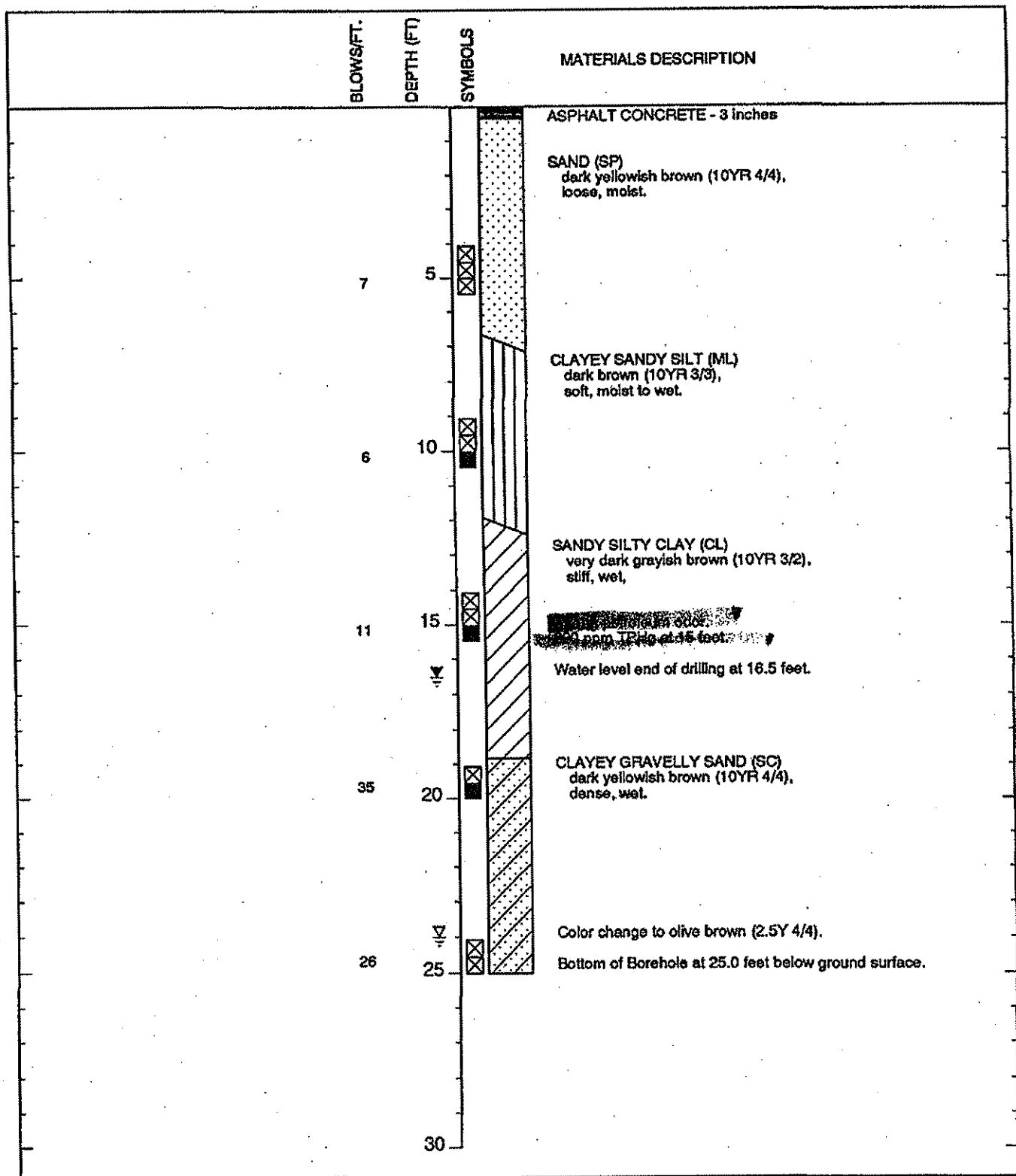
DRILL RIG	4" Continuous Flight Auger	DIAMETER OF HOLE	4 inches
DATE STARTED	10/27/94	TOTAL DEPTH OF HOLE	25.5 feet
DATE COMPLETED	10/27/94	TOP OF CASING ELEVATION	72.3 feet MSL

W. A. CRAIG, INC.
INDUSTRIAL AND ENVIRONMENTAL CONTRACTOR

Log of Boring SB-3
4401 Market Street
Oakland, California

PLATE
4C

JOB NUMBER	REVIEWER BY	DATE	REVISED DATE
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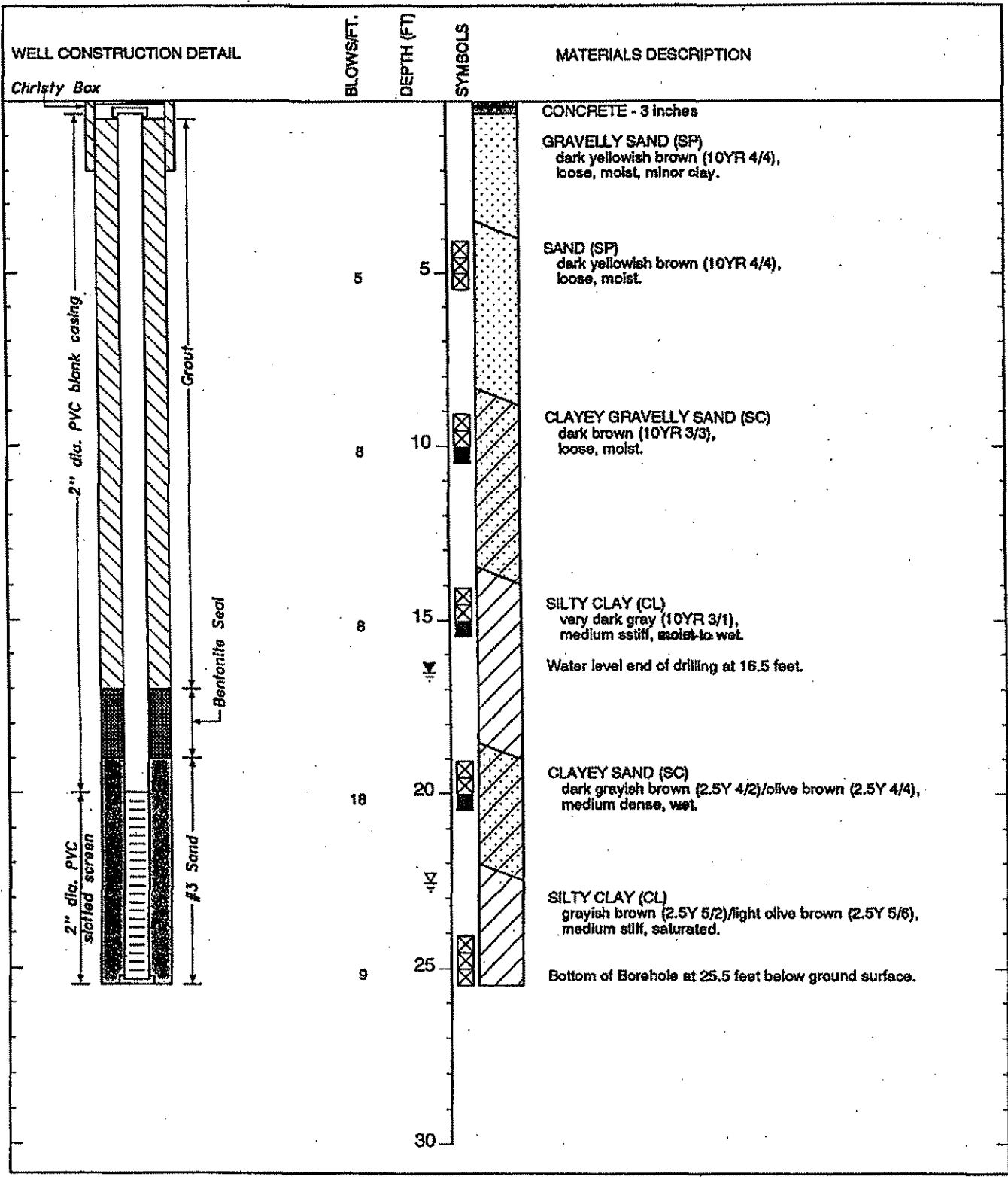
DRILL RIG	4' Continuous Flight Auger	DIAMETER OF HOLE	4 inches
DATE STARTED	10/28/94	TOTAL DEPTH OF HOLE	25.0 feet
DATE COMPLETED	10/28/94	TOP OF CASING ELEVATION	71.9 feet MSL

W. A. CRAIG, INC.
INDUSTRIAL AND ENVIRONMENTAL CONTRACTOR

Log of Boring SB-4
4401 Market Street
Oakland, California

PLATE
4D

JOB NUMBER	REVIEWED BY	DATE	REVISED DATE
3365	<i>[Signature]</i>	1/95	



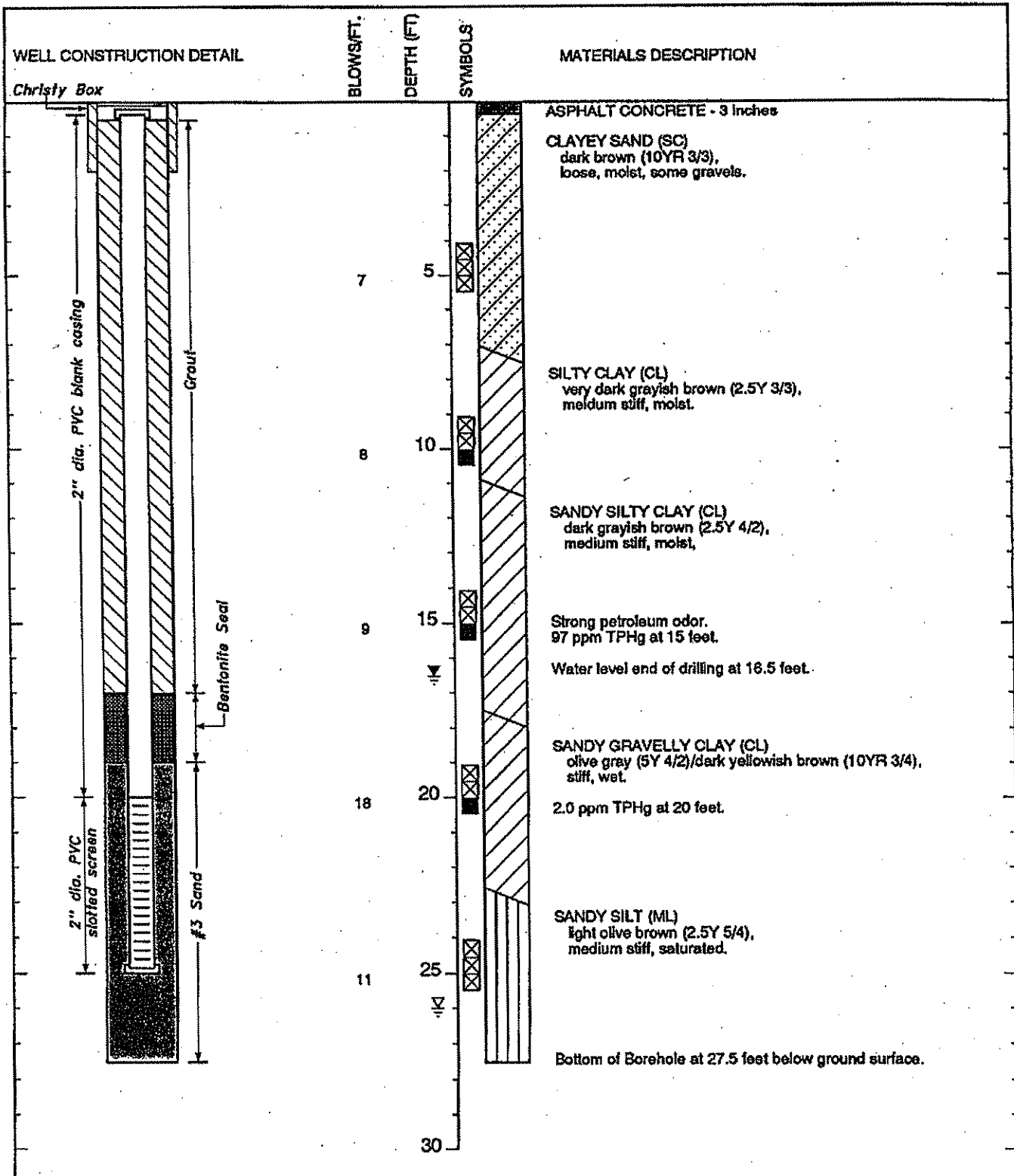
DRILL RIG	8" Hollow Stem Auger	DIAMETER OF HOLE	8 inches
DATE STARTED	10/27/94	TOTAL DEPTH OF HOLE	25.5 feet
DATE COMPLETED	10/27/94	TOP OF CASING ELEVATION	71.12 feet MSL

W. A. CRAIG, INC.
INDUSTRIAL AND ENVIRONMENTAL CONTRACTOR

Log of Boring MW-1 and
Well Completion Detail
4401 Market Street
Oakland, California

PLATE
4E

JOB NUMBER	REVIEWED BY	DATE	REVISED DATE
3365		1/95	

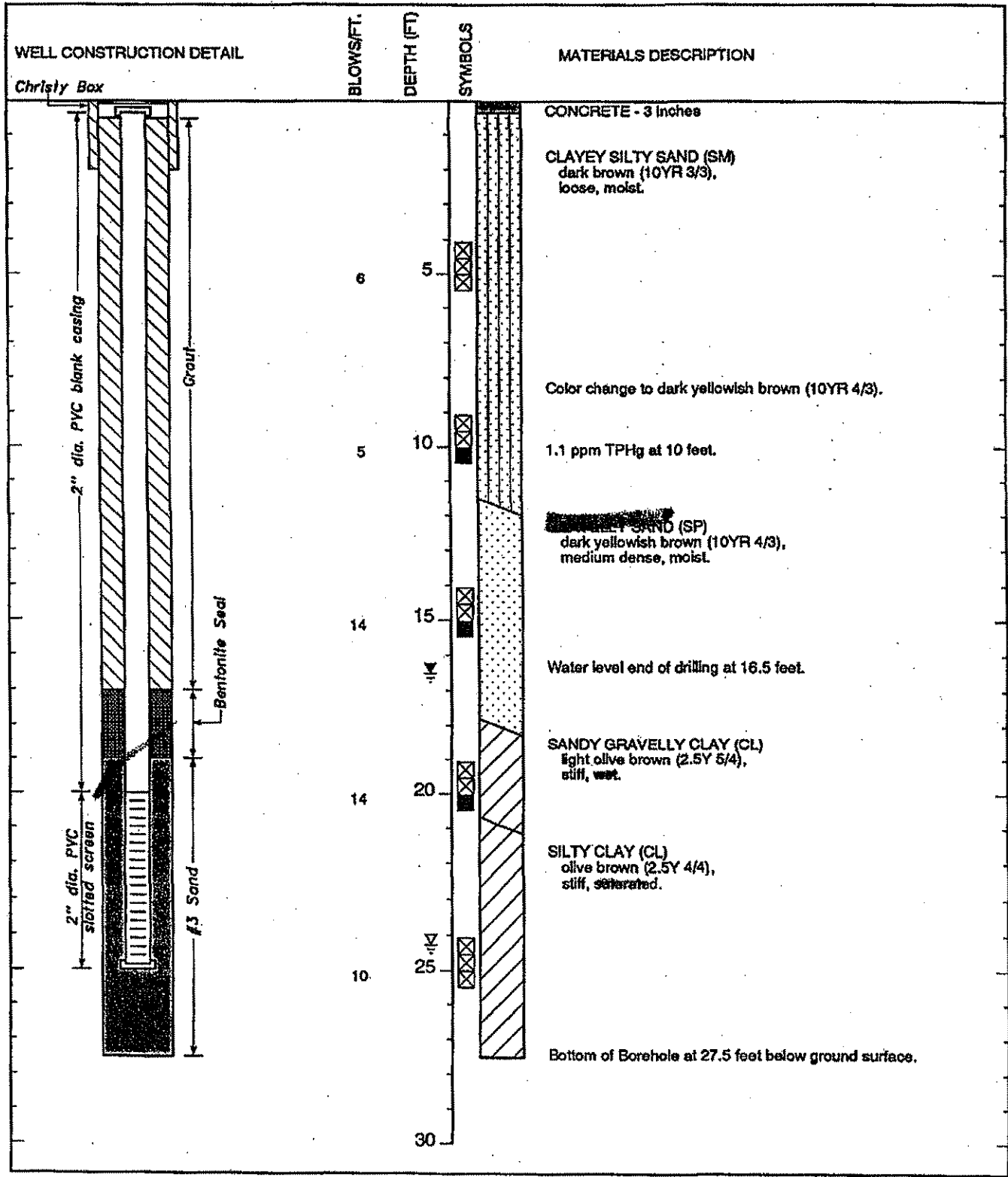


DRILL RIG	8" Hollow Stem Auger	DIAMETER OF HOLE	8 inches
DATE STARTED	10/28/94	TOTAL DEPTH OF HOLE	27.5 feet
DATE COMPLETED	10/28/94	TOP OF CASING ELEVATION	70.62 feet MSL

W. A. CRAIG, INC.
INDUSTRIAL AND ENVIRONMENTAL CONTRACTOR

Log of Boring MW-2 and Well Completion Detail
4401 Market Street
Oakland, California

PLATE
4F



DRILL RIG	8" Hollow Stem Auger	DIAMETER OF HOLE	8 inches
DATE STARTED	10/28/94	TOTAL DEPTH OF HOLE	27.5 feet
DATE COMPLETED	10/28/94	TOP OF CASING ELEVATION	71.79 feet MSL



W. A. CRAIG, INC.
INDUSTRIAL AND ENVIRONMENTAL CONTRACTOR

Log of Boring MW-3 and Well Completion Detail
4401 Market Street
Oakland, California

PLATE
4G

Boring No. MW4 (page 1 of 2)

<p>Project 4401 Market Street, Oakland CA</p> <p>Location North side of 44th Street, west of Market Street</p> <p>Elevation Top of casing, North side = 997.87 feet (site-specific datum) Ground surface = 998.18 feet (site-specific datum)</p> <p>Drill Method ±4.25-inch ID by ±8-inch OD hollow-stem auger</p> <p>Drill Rig B-61, Rig #D9</p> <p>Completion 2-inch PVC well with traffic rated vault</p> <p>Sampling ±2-inch ID by ±2.5-inch OD driven split spoon fitted with ±2-inch diameter by ±6-inch long brass liners. Samples collected by driving spoon ahead of auger bit.</p>	<p>Address 4401 Market Street, Oakland CA</p> <p>Logged By Matthew B. Hall STREAMBORN (Berkeley CA)</p> <p>Project No. P257</p> <p>Start 10:30 am, 5 January 2001 Finish 12:30 am, 5 January 2001</p> <p>Driller Gregg Drilling and Testing/Tony</p> <p>Drilled Depth ±25-feet</p> <p>Groundwater ±13-feet (during drilling)</p> <p>Groundwater ±13.2-feet (1 February 2001) (stabilized)</p>
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Depth (feet)	Graphic Log	USCS	Sample Interval	Blows per 6 inches	Recovery (inches)	Soil Description, Observations, Comments	OVM (ppm v/v)
0.0						Asphalt overlying aggregate base. No staining, no odor.	
-1.0							
-2.0							
-3.0							
-4.0							
-5.0			2		Fat clay (CH). Dark brown, moist, moderate to high plasticity, stiff. No staining, no odor.		
-6.0			3	18			
-6.5			3				
-7.0							
-8.0							
-9.0							
-10.0							

Boring No. MW4 (page 2 of 2)

Depth (feet)	Graphic Log	USCS	Sample Interval	Blows per 6 inches	Recovery (inches)	Soil Description, Observations, Comments	OVM (ppm v/v)	
10.0	[Hatched Pattern]							
11.0								
12.0								
				X	7		Same as above except very stiff. No staining, petroleum odor.	
				X	11	18		
13.0								
				X	16			
				X	7		Same as above except very stiff to hard. No staining, petroleum odor.	
14.0			CH					
				X	13	18		
				X	17			
15.0								
				X	6		Same as above except very stiff. No staining, petroleum odor found only in top 1-foot of sample.	
				X	7	18		
16.0								
				X	9			
17.0								
18.0								
19.0	[Dotted Pattern]							
				X	11		Poorly graded sand with clay and gravel (SP). Greyish brown, wet, fine to coarse sand, subrounded sand, <15% gravel, <15% fat clay, very dense. No staining, no odor.	
				X	23	18		
20.0								
			X	25				
21.0								
22.0		SP						
23.0								
24.0								
			X	5		Same as above except medium dense. No staining, no odor.		
			X	6	18			
25.0								
			X	12		Total drilled depth = 25 feet. Boring completed as well. See completion diagram.		

Boring No. MW5 (page 1 of 2)

<p>Project 4401 Market Street, Oakland CA</p> <p>Location South side of 44th Street, west of Market Street</p> <p>Elevation Top of casing, North side = 997.33 feet (site-specific datum) Ground surface = 997.78 feet (site-specific datum)</p> <p>Drill Method ±4.25-inch ID by ±8-inch OD hollow-stem auger</p> <p>Drill Rig D-14, "Rhino"</p> <p>Completion 2-inch PVC well with traffic rated vault</p> <p>Sampling ±1.5-inch ID by ±2-inch OD driven split spoon fitted with ±1.5-inch diameter by ±6-inch long brass liners. Samples collected by driving spoon ahead of auger bit.</p>	<p>Address 4401 Market Street, Oakland CA</p> <p>Logged By Matthew B. Hall STREAMBORN (Berkeley CA)</p> <p>Project No. P257</p> <p>Start 11:09 am, 4 January 2001 Finish 1:30 pm, 4 January 2001</p> <p>Driller Gregg Drilling and Testing/Bob</p> <p>Drilled Depth ±25-feet</p> <p>Groundwater ±13-feet (during drilling)</p> <p>Groundwater ±13.1-feet (1 February 2001) (stabilized)</p>
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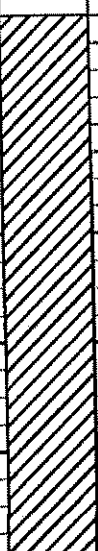
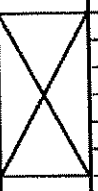
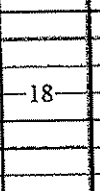
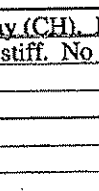

Depth (feet)	Graphic Log	USCS	Sample Interval	Blows per 6 inches	Recovery (inches)	Soil Description, Observations, Comments	OVM (ppm v/v)
0.0						Asphalt overlying aggregate base. No staining, no odor.	
-1.0							
-2.0							
-3.0							
-4.0							
-5.0						Fat clay (CH). Dark brown, moist, moderate to high plasticity, stiff. No staining, no odor.	
-6.0							
-7.0		CH					
-8.0							
-9.0							
-10.0							

Boring No. MW5 (page 2 of 2)

Depth (feet)	Graphic Log	USCS	Sample Interval	Blows per 6 inches	Recovery (inches)	Soil Description, Observations, Comments	OVM (ppm v/v)
10.0							
11.0							
12.0		CH	X			Same as above. No staining, petroleum odor.	
13.0				18			
14.0			X			Fat clay with gravel (CH). Dark greyish brown, wet, high plasticity, <10% subangular gravel. No staining, petroleum odor.	
15.0				18			
16.0			X			Sandy silt (ML). Dark brown, wet, moderate plasticity, <10% fine sand. No staining, petroleum odor found only in top 1.5-feet of sample.	
17.0				24			
18.0		ML	X				
19.0							
20.0			X			Poorly graded sand with clay and gravel (SP). Greyish brown, wet, fine to coarse sand, subrounded sand, <15% gravel, <25% fines. No staining, no odor.	
21.0				18			
22.0		SP	X				
23.0							
24.0			X			Same as above. No staining, no odor.	
25.0				18			
Total drilled depth = 25 feet. Boring completed as well. See completion diagram.							

Boring No. MW6 (page 1 of 2)

<p>Project 4401 Market Street, Oakland CA</p> <p>Location South side of 44th Street, west of Market Street</p> <p>Elevation Top of casing, North side = 997.50 feet (site-specific datum) Ground surface = 998.02 feet (site-specific datum)</p> <p>Drill Method ±4.25-inch ID by ±8-inch OD hollow-stem auger</p> <p>Drill Rig D-14, "Rhino"</p> <p>Completion 2-inch PVC well with traffic rated vault</p> <p>Sampling ±1.5-inch ID by ±2-inch OD driven split spoon fitted with ±1.5-inch diameter by ±6-inch long brass liners. Samples collected by driving spoon ahead of auger bit.</p>	<p>Address 4401 Market Street, Oakland CA</p> <p>Logged By Matthew B. Hall STREAMBORN (Berkeley CA)</p> <p>Project No. P257</p> <p>Start 8:50 am, 4 January 2001 Finish 10:45 am, 4 January 2001</p> <p>Driller Gregg Drilling and Testing/Bob</p> <p>Drilled Depth ±25-feet</p> <p>Groundwater ±13-feet (during drilling)</p> <p>Groundwater ±13.3-feet (1 February 2001) (stabilized)</p>
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Depth (feet)	Graphic Log	USCS	Sample Interval	Blows per 6 inches	Recovery (inches)	Soil Description, Observations, Comments	OVM (ppm v/v)
0.0						Asphalt overlying aggregate base. No staining, no odor.	
1.0							
2.0							
3.0							
4.0							
5.0						Fat clay (CH). Dark greyish brown, moist, moderate to high plasticity, stiff. No staining, no odor.	
6.0							
7.0		CH					
8.0							
9.0							
10.0							





Boring No. MW6 (page 2 of 2)

Depth (feet)	Graphic Log	USCS	Sample Interval	Blows per 6 inches	Recovery (inches)	Soil Description, Observations, Comments	OVM (ppm v/v)
10.0	[Diagonal Hatching]	CH	X				
11.0							
12.0							
13.0	[Vertical Lines]	ML	X				
14.0							
15.0							
16.0	[Diagonal Hatching]	CL	X				
17.0							
18.0	[Cross-hatching]	SM	X				
19.0							
20.0	[Vertical Lines]	ML	X				
21.0							
22.0							
23.0	[Diagonal Hatching]	SP	X				
24.0							
25.0							

Total drilled depth = 25 feet. Boring completed as well. See completion diagram.

Boring No. MW7 (page 1 of 2)

<p>Project 4401 Market Street, Oakland CA</p> <p>Location Back yard of 903 44th Street</p> <p>Elevation Top of casing, North side = 998.69 feet (site-specific datum) Ground surface = 999.12 feet (site-specific datum)</p> <p>Drill Method ±4.25-inch ID by ±8-inch OD hollow-stem auger</p> <p>Drill Rig B-61, Rig #D9</p> <p>Completion 2-inch PVC well with traffic rated vault</p> <p>Sampling ±2-inch ID by ±2.5-inch OD driven split spoon fitted with ±2-inch diameter by ±6-inch long brass liners. Samples collected by driving spoon ahead of auger bit.</p>	<p>Address 4401 Market Street, Oakland CA</p> <p>Logged By Matthew B. Hall STREAMBORN (Berkeley CA)</p> <p>Project No. P257</p> <p>Start 8:15 am, 5 January 2001 Finish 10:20 am, 5 January 2001</p> <p>Driller Gregg Drilling and Testing/Tony</p> <p>Drilled Depth ±25-feet</p> <p>Groundwater ±43-feet (during drilling)</p> <p>Groundwater ±14.8-feet (1 February 2001) (stabilized)</p>
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Depth (feet)	Graphic Log	USCS	Sample Interval	Blows per 6 inches	Recovery (inches)	Soil Description, Observations, Comments	OVM (ppm v/v)
0.0						Topsoil. No staining, no odor.	
1.0							
2.0							
3.0							
4.0							
5.0				2		Sandy silt (ML). Dark brown, moist, low to moderate plasticity, <30% fine sand, medium stiff to stiff. No staining, no odor.	
6.0				3	18		
7.0				5			
8.0		ML					
9.0							
10.0		CL		5	18	Lean clay (CL). Dark brown, moist, low to moderate plasticity, <5% fine sand, very stiff. No staining, no odor.	

Boring No. MW7 (page 2 of 2)

Depth (feet)	Graphic Log	USCS	Sample Interval	Blows per 6 inches	Recovery (inches)	Soil Description, Observations, Comments	OVM (ppm v/v)
10.0			X	10	18	See description previous page.	
				13			
11.0							
12.0							
13.0							
14.0							
15.0		CH	X	8	18	Fat clay (CH). Dark brownish grey, moist to wet, moderate plasticity, <15% fine sand, very stiff. No staining, no odor.	
				9			
				9			
16.0							
17.0							
18.0							
19.0							
20.0			X	8	18	Silty sand (SM). Brown, wet, fine to medium sand, subrounded sand, <30% silt, dense. No staining, no odor.	
				10			
					13		
21.0		SM					
22.0							
23.0							
24.0		SC	X	5	18	Clayey sand (SC). Brown, wet, coarse to fine sand, subrounded sand, <25% fines, medium dense. No staining, no odor.	
				7			
				8			
25.0						Total drilled depth = 25 feet. Boring completed as well. See completion diagram.	