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

June 10, 2011

Charles Carmel (*Sent via E-mail to: charles.carmel@bp.com*)
Atlantic Richfield Corporation
P.O. Box 1257
San Ramon, CA 94583

Subject: Fuel Leak Case No. RO0000077 and GeoTracker Global ID T0600100103, ARCO #6148, 5131 Shattuck Avenue, Oakland, CA 94609

Dear Mr. Carmel:

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 hydrocarbons in soil at concentrations of 15 mg/kg TPH-g remain 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)
Hollis Phillips, ARCADIS s*ent via E-mail to: hollis.phillips@arcadis-us.com* (w/enc)

ALAMEDA COUNTY
HEALTH CARE SERVICES
AGENCY
ALEX BRISCOE, Agency Director

DEPARTMENT OF ENVIRONMENTAL HEALTH
OFFICE OF THE DIRECTOR
1131 HARBOR BAY PARKWAY
ALAMEDA, CA 94502
(510) 567-6777
FAX (510) 337-9135

June 10, 2011

Charles Carmel (*Sent via E-mail to: charles.carmel@bp.com*)
Atlantic Richfield Corporation
P.O. Box 1257
San Ramon, CA 94583

REMEDIAL ACTION COMPLETION CERTIFICATE

Subject: Fuel Leak Case No. RO0000077 and GeoTracker Global ID T0600100103, ARCO #6148, 5131 Shattuck Avenue, Oakland, CA 94609

Dear Mr. Carmel:

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 25296.10 of the Health and Safety Code and with corrective action regulations adopted pursuant to Section 25299.3 of the Health and Safety Code and that no further action related to the petroleum release(s) at the site is required.

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,

Ariu Levi
Director
Alameda County Environmental Health

Alameda County Environmental Health

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

I. AGENCY INFORMATION

Date: June 21, 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 #6148		
Site Facility Address: 5131 Shattuck Ave, Oakland, CA 94609		
RB Case No.: 01-0111	StID No.: 3626	LOP Case No.: RO0000077
URF Filing Date: Unknown	Geotracker ID: T0600100103	APN: 14-1216-31-2

Responsible Parties	Addresses	Phone Numbers
Paul Supple	PO Box 1257, San Ramon, CA, 94583	925-275-3801

Tank I.D. No	Size in Gallons	Contents	Closed In Place/Removed?	Date
1	Unknown	Waste Oil	Removed	06/1987
2	12,000	Gasoline	Removed & Replaced	11/14/2000
3	12,000	Gasoline	Removed & Replaced	11/14/2000
4	12,000	Gasoline	Removed & Replaced	11/14/2000
Piping			Removed & Replaced	11/14/2000

III. RELEASE AND SITE CHARACTERIZATION INFORMATION

Cause and Type of Release: Unknown, USTs appeared intact upon removal.		
Site characterization complete? Yes	Date Approved By Oversight Agency: ---	
Monitoring wells installed? Yes	Number: 7	Proper screened interval? No, MW screens were occasionally submerged.
Highest GW Depth Below Ground Surface: 11.79	Lowest Depth: 18.09	Flow Direction: Southwest
Most Sensitive Current Use: Potential drinking water source.		

Summary of Production Wells in Vicinity: Well search conducted identified 19 wells within a ½-mile radius of the site. Of the 19 identified wells, 6 cathodic protection wells (4 [D1, D2, L2, N2] belong to EBMUD and are approx 50 ft deep, 2 others [D3 & M2] belong to PG&E and are 120 ft deep. These wells are located ¼ to ½-mile northeast and southeast of the site. One industrial well (J1, approx 40 feet bgs) belongs to Marshall Steel Company and is located ¼-mile north of the site. The remaining identified wells are 1 geotechnical well, 1 abandoned well, and 1 domestic well. These wells do not appear to be receptors due to their distance from the site.	
Are drinking water wells affected? No	Aquifer Name: East Bay Plain
Is surface water affected? No	Nearest SW Name: San Francisco Bay, approx 1.5 mi west of site
Off-Site Beneficial Use Impacts (Addresses/Locations): None	
Reports on file? Yes	Where are reports filed? Alameda County Environmental Health (and Oakland Fire Department, Fire Prevention Bureau)

TREATMENT AND DISPOSAL OF AFFECTED MATERIAL

Material	Amount (Include Units)	Action (Treatment or Disposal w/Destination)	Date
Tank	1 unknown quantity UST 3 10,000-gallon tanks	Disposal, Unknown Location Disposal, Ecology Control Industries, Richmond, CA.	June, 1987 November 2000
Piping	Unknown quantity	Disposal, Ecology Control Industries, Richmond, CA.	November 2000
Free Product	Sheen	Bailed from MW	March, 1992
Soil	~370 cubic yards	Disposal, Forward Landfill	November 2000
Groundwater	Not Reported	--	--

MAXIMUM DOCUMENTED CONTAMINANT CONCENTRATIONS BEFORE AND AFTER CLEANUP
(Please see Attachments x – x for additional information on contaminant locations and concentrations)

Contaminant	Soil (ppm)		Water (ppb)	
	Before	After	Before	After[9]
TPH (Gas)	4,470 (T1-N, 16 ft, 11/14/00)	750 (CSB-3-17.5, 17.5 ft, 04/29/04)	Free Product[7] (MW-2, 06/12/92)	560 (MW-3, 08/20/08)
TPH (Diesel)	540 (S-17-B2, 17 ft, 12/1991)	540 (S-17-B2, 17 ft, 12/1991)	Free Product[7] (MW-2, 06/12/92)	Not analyzed
Oil and Grease	210 (S6/9 1400 SK, 20 ft, 06/1987)	210 (S6/9 1400 SK, 20 ft, 06/1987)	16,000[5] (MW-3, 3/18/92)	10,000 (MW-3, 2/27/96)
Benzene	5.9 (VW-6, 16 ft, 8/3/95)	0.007 (CSB-6-16, 16 ft, 04/29/04)	Free Product[7] (MW-2, 06/12/92)	<3.0 (MW-2, 08/20/08)
Toluene	105 (T1-N, 16 ft, 11/14/00)	0.74 (CSB-2-18, 18 ft, 04/29/04)	Free Product[7] (MW-2, 06/12/92)	<0.50 (08/15/07)
Ethylbenzene	73 (T1-N, 16 ft, 11/14/00)	13 (CSB-2-18, 18 ft, 04/29/04)	Free Product[7] (MW-2, 06/12/92)	<0.50 (08/15/07)
Xylenes	430 (VW-6, 6 ft, 8/1/95)	100 (CSB-2-18, 18 ft, 04/29/04)	27 (MW-3, 3/18/92)	<0.50 (08/15/07)
Heavy Metals (Cd, Cr, Pb, Ni, Zn)	8.3 (S-17.5-B1, 17.5 ft, 12/91)	8.3 (S-17.5-B1, 17.5 ft, 12/91)	67[6] (MW-3, 03/18/92)	67[8] (MW-3, 03/18/92)
MTBE	Not analyzed[4]	<0.5[3]	18,800[2]	0.56[1] (MW-3, 08/20/08)
Other (8240/8270)	Not analyzed	Not analyzed	19[6] (MW-2, 03/18/92)	19[6] (MW-2, 03/18/92)

[1] Other VOCs analyzed (groundwater µg/L after cleanup): 0.56 µg/L MtBE, <10 µg/L TBA, <0.50 µg/L DIPE, <0.50 µg/L ETBE, <0.50 µg/L TAME, <0.50 µg/L EDB, <0.50 µg/L 1.2-DCA, <300 µg/L EtOH
[2]Other VOCs not analyzed (groundwater ppb before cleanup): MtBE, TBA, DIPE, ETBE, TAME, EDB, 1.2-DCA, EtOH
[3]Other VOCs (Soil mg/kg after cleanup): <2.5 mg/kg TBA, <1.0 mg/kg DIPE, <0.5 mg/kg ETBE, <0.5 mg/kg TAME, NA EtOH, NA EDB, NA 1.2-DCA,
[4]Other VOCs (Soil mg/kg before cleanup): MtBE, TBA, TAME, DIPE, EtOH EDB, 1.2-DCA Not Analyzed
[5]The chromatogram does not match the typical diesel fingerprint, but appears to be weathered gasoline.
[6]Tetrachloroethene
[7]Free product = 0.05 inch in MW-2
[8]Confirmation Analysis not performed
[9]No Purge

Site History and Description of Corrective Actions:
The site is an operating ARCO gasoline station #6148 located at 5131 Shattuck Avenue in Oakland, California at the intersection of 52nd Street and Shattuck Avenue. The site is on a relatively flat lot at an elevation of approximately 110 feet above mean sea level. The site is located west of the East Bay Hills and lies within the Berkeley Alluvial Plain, which is a sub-area of the East Bay Alluvial Plain.

On June 1, 1987, Crosby, Overton and Erico Construction removed one waste oil UST was from the southwest portion of the site. Soil samples collected at 20 feet bgs detected TPH-mo at 210 mg/kg.

In December 1991, RESNA installed four borings (B-1 through B-4) at the site with groundwater monitoring wells (MW-1 through MW-3) installed in B-1 through B-3. The most elevated concentrations of hydrocarbons were detected in soil samples collected between 15 to 20 feet bgs, which detected TPH-g at 740 mg/kg, TPH-d at 540 mg/kg, and benzene at 4.3 mg/kg in soil sample S-17-B2. Groundwater sample analytical results detected TPH-g and benzene at concentrations of 46,000 µg/L and 3,400 µg/L, respectively in a groundwater sample collected from MW-2 on June 12, 1992, while free product was detected in MW-2.

On July 6, 1993, RESNA installed three sparge wells (B-9 through B-11), one combination air sparge/vapor extraction well (AS-2/VW-2) and two vapor extraction wells at the site. Air sparge pilot testing was performed and a 2 to 1 mixture of air to helium was injected to establish the minimum pressure required to evacuate the sparge well of water (determined to be 4 cu ft/min). Helium was detected in the vadose zone at AS-2 and MW-5 at levels ranging from 0.03% to 4.8%. The distribution of helium in the vadose zone was random and did not appear to increase or decrease significantly as a function of distance from AS-2 or time of sparging. Effective Sparge radius of 10-15 ft is estimated. Second part of test included AS/SVE. It was determined that a vapor extraction flowrate of approximately 30 cfm per was necessary to capture off-gas from the saturated zone.

From July 31 through August 3, 1995, EMCON installed four air sparge wells (AS-2 through AS-5) and 8 SVE wells (VW-2 and VW-4 through VW-10). AS-2/VW-2 was decommissioned. By September 1995, EMCON completed the SVE/AS system installation at the site. The SVE/AS system operated at the site from September 1995 through February 2000. Approximately 1,894 pounds of TPH-g and 0.0131 pounds of benzene were removed from the site using the remediation system.

Beginning in November, 2000, the USTs, product lines, and dispensers were removed and replaced. The work was completed in January 2001. The current UST complex consists of one 12,000-gallon UST and one 20,000-gallon UST. Approximately 370 cubic yards of soil were excavated and removed from areas surrounding the product lines and USTs in 2000.

In order to evaluate the effectiveness of the SVE/AS system that operated at the site, URS installed eight soil borings in locations of previously detected elevated concentrations of petroleum hydrocarbons and collected 15 confirmation soil samples on April 29, 2004. TPH-g ranged from 1 mg/kg (CSB-5-18.0) to 750 mg/kg (CSB-3-17.5), benzene was detected at 0.007 mg/kg (CSB-6-16.0), MTBE not detected above reporting limit, TBA ranged from 0.012 mg/kg (CSB-9-11.5) to 0.014 mg/kg (CSB-8-2). The results of the investigation confirm two apparently localized areas of hydrocarbon impacted soil located near the former waste oil UST and near the east end of the dispenser island closest to the station building. Contaminant leaching from soil to groundwater appears minimal based on the concentrations of gasoline range hydrocarbons in soil (CSB-1-17.5, CSB-2-18.0, and CSB-3-17.5) and the groundwater analytical data from proximal monitoring wells MW-1, MW-2, and MW-3.

Beginning in 2003, groundwater monitoring wells were not purged prior to sampling. Initially, concentrations of contaminants in purge and no purge samples were essentially the same order of magnitude. For example, the purged groundwater sample analytical results from groundwater samples collected from MW-2 collected on July 31, 2003 did not detect TPH-g or BTEX above the laboratory detection limit of <50 µg/L and <0.5 µg/L, respectively, but did detect MTBE at a concentration of 2.0 µg/L. The no purge groundwater samples collected from MW-2 collected on December 17, 2003 detected TPH-g at a concentration of 51 µg/L, benzene at 1.0 µg/L, and MTBE at 2.4 µg/L with TEX not detected above the laboratory detection limit.

Groundwater Monitoring continued until August 20, 2008. In this final groundwater monitoring event, no chemical constituent above the laboratory analytical detection limit in seven groundwater monitoring wells besides 560 µg/L TPH-g, 3.0 µg/L benzene, and 0.56 µg/L MTBE in MW-3 were detected.

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 risk to human health based upon current land use and conditions.		
Site Management Requirements: Case closure for this fuel leak site is granted for the current commercial land use only. If a modification to the existing structure, change in land use to any residential or other conservative land use scenario is proposed at this site, Alameda County Environmental Health (AECH) 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. 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. This site is to be entered into the City of Oakland Permit Tracking System due to the residual contamination on site.		
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.

Considerations and/or Variances:

In 2006 and in 2008, the purged groundwater concentrations of TPH-g, detected at 660 µg/L and 220 µg/L, respectively, were detected higher than the no purge samples collected in the previous no purge quarters, in which TPH-g was detected at <50 µg/L (below the detection limit). An explanation was not presented by consultant. However, it can be hypothesized that groundwater from the dissolved plume enters the well upon purging. Therefore, the no purge analytical results appear to be biased low and are not yielding results representative of the dissolved plume. However, considering the trends in contaminant concentrations over time, residual concentrations do not preclude closure for the existing commercial land-use.

Conclusion:

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.

VI. LOCAL AGENCY REPRESENTATIVE DATA

Prepared by: Paresh Khatri	Title: Hazardous Materials Specialist
Signature: Paresh Khatri	Date: June 21, 2010
Approved by: Donna L. Drogos, P.E.	Title: Division Chief
Signature:	Date: 06/23/10

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: 6/24/2010	

VIII. MONITORING WELL DECOMMISSIONING

Date Requested by ACEH:	Date of Well Decommissioning Report: 4/29/2011	
All Monitoring Wells Decommissioned: YES	Number Decommissioned: 7	Number Retained: 0
Reason Wells Retained: N/A		
Additional requirements for submittal of groundwater data from retained wells:		
ACEH Concurrence - Signature: Paresh Khatri		Date: 6/9/2011

Attachments:
1. Site Vicinity Map, Site Plans, and Cross Sections (13 pp)
2. Historic Soil Analytical Data (3 pp)
3. Confirmation Soil Sample Analytical Data (4 pp)
4. Groundwater Analytical Data (19 pp)
5. Well Survey Map & Data Table (6 pp)
6. Air Sparge/Vapor Extraction Pilot Test Data (6 pp)
7. Boring Logs (27 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: Thursday, June 24, 2010 11:35 AM
To: Khatri, Paresh, Env. Health
Cc: Drogos, Donna, Env. Health
Subject: Re: RO0000077; Closure Summary for ARCO #6148 (T0600100103)

Paresh - Thanks for the notification. We have no objection to ACEH's recommendation for case closure of Case #RO00077 (Arco Station #6148 in Oakland).

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> 6/24/2010 8:33 AM >>>
Hello Cherie,

Attached is a closure summary for RO0000077; ARCO #6148 located at 5131 Shattuck Avenue 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

ATTACHMENT 1

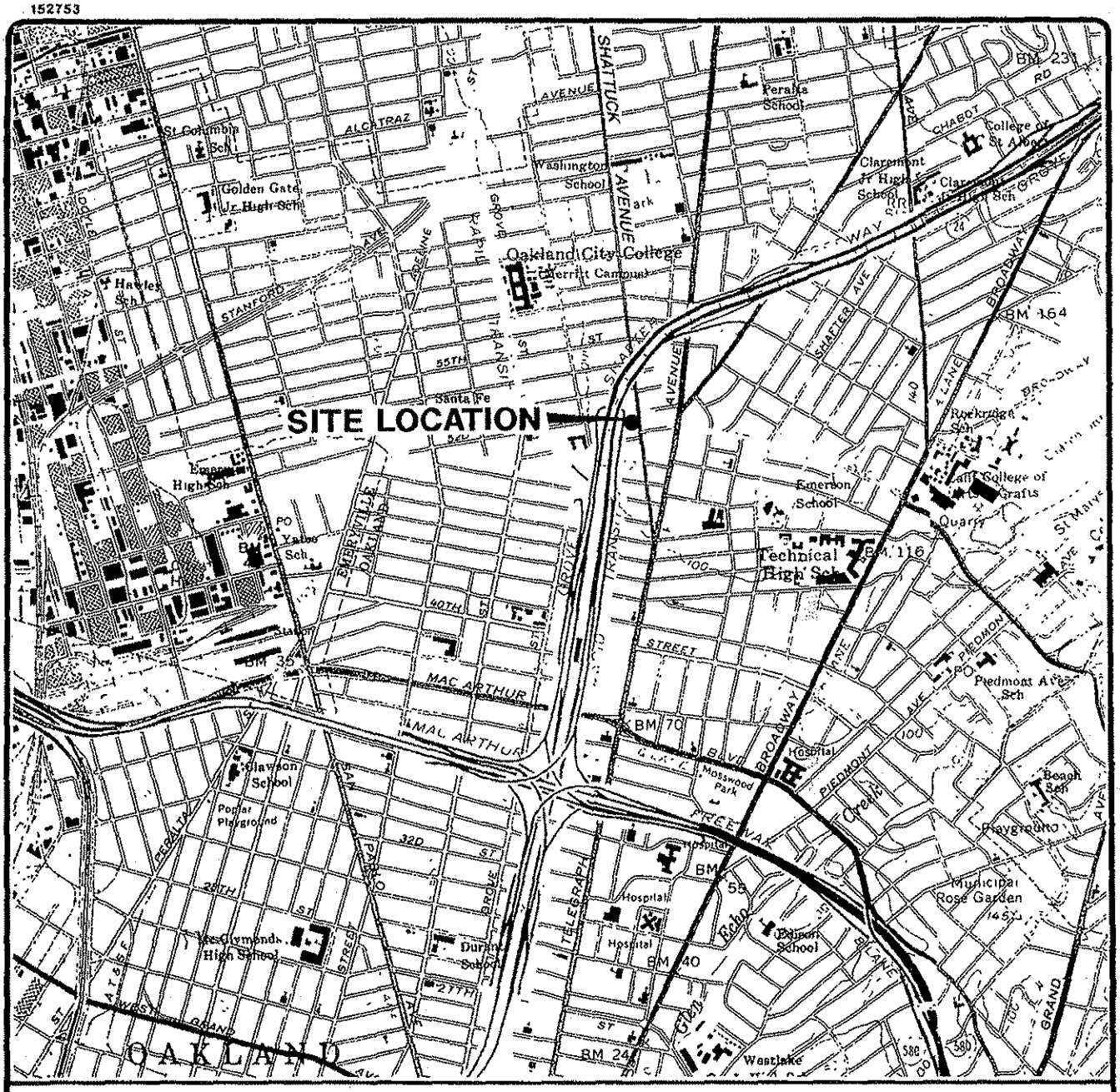
SITE VICINITY MAP

SITE PLANS

CROSS SECTIONS

(13 PAGES)

152753



Base map from USGS 7.5' Quad. Maps:
Oakland East and Oakland West, California
Photorevised 1980.

- N -

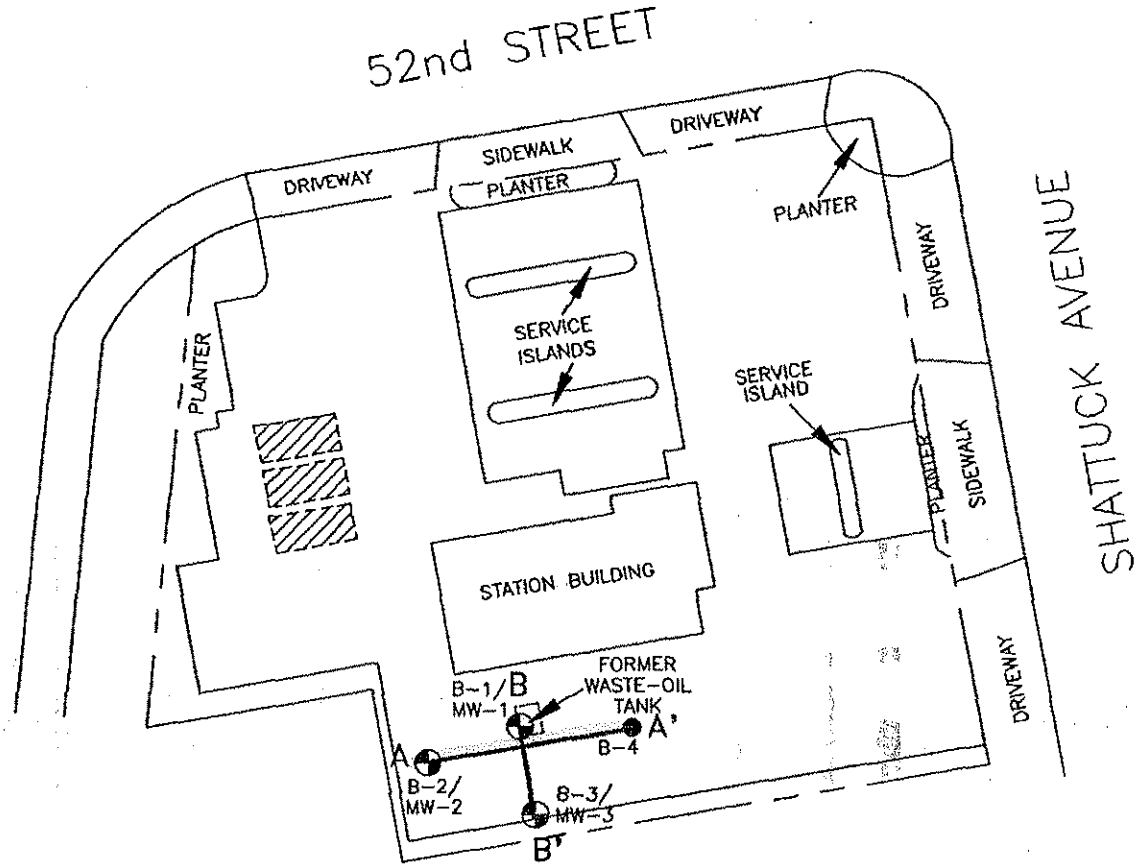
Scale 0 2000 4000 Feet

EMCON

ARCO PRODUCTS COMPANY
SERVICE STATION 6148, 5131 SHATTUCK AVENUE
QUARTERLY GROUNDWATER MONITORING
OAKLAND, CALIFORNIA

SITE LOCATION

FIGURE
1
PROJECT NO.
805-135.03



EXPLANATION

B-3/ MW-3 = Monitoring well (RESNA, December 1991)

B-4 = Soil boring (RESNA, December 1991)

= Underground storage tank

B — B' = Geologic cross section

N

Approximate Scale

40 20 0 40 80

feet

Source: Based on ARCO Site Plan dated 1980.

RESNA	**GENERALIZED SITE PLAN** **ARCO Station 6148** **5131 Shattuck Avenue** **Oakland, California**	**PLATE** **2**
PROJECT 61035.02		

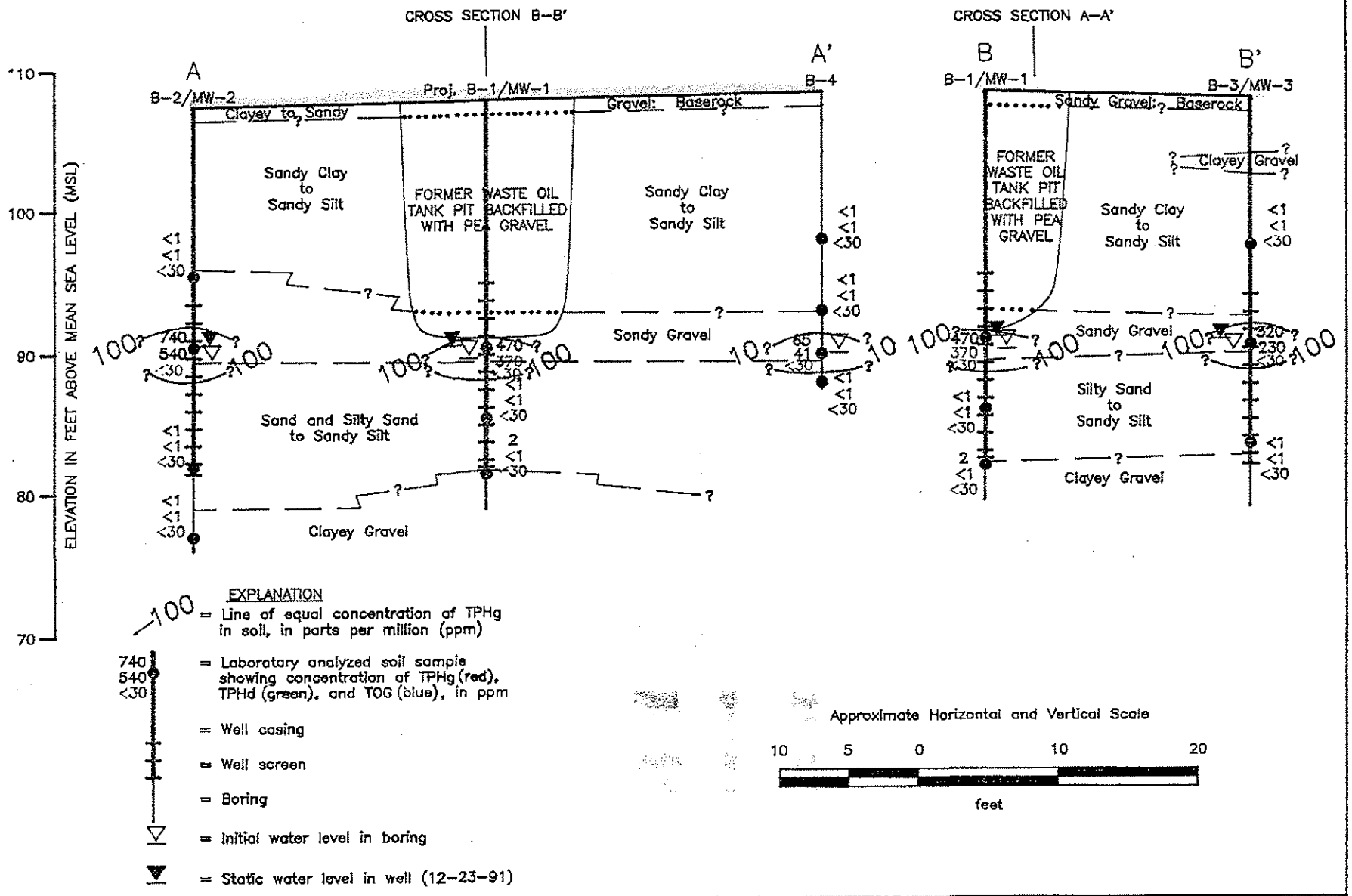
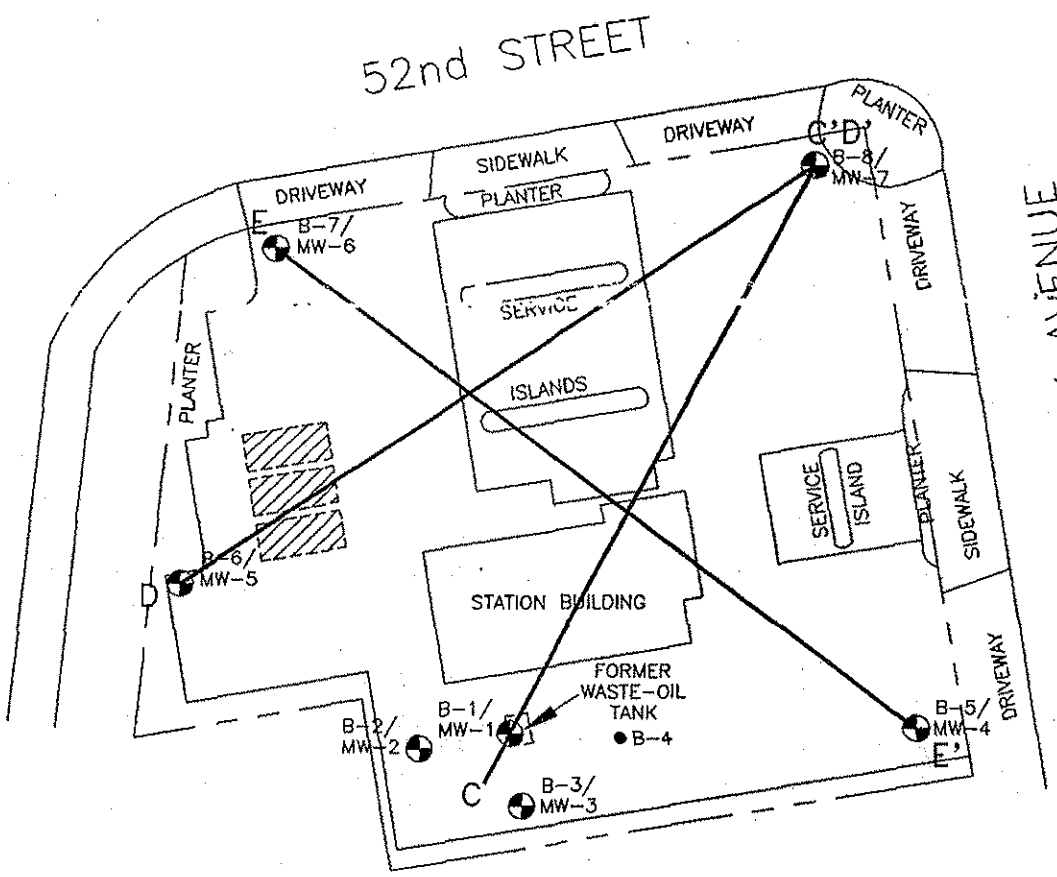


PLATE 11	GEOLOGIC CROSS SECTIONS A-A' AND B-B' ARCO Station 6148 5131 Shattuck Avenue Oakland, California	RESNA PROJECT 61035.02

January 21, 1993, ADDITIONAL SUBSURFACE INVESTIGATION - RESNA



EXPLANATION

= Existing underground storage tanks

B-4 ● = Soil boring (RESNA, December 1991)

B-8/MW-7 ⊕ = Monitoring well (RESNA, December 1991 and October 1992)

E — E' = Geologic cross section

N

Approximate Scale

40 20 0 40 80

feet

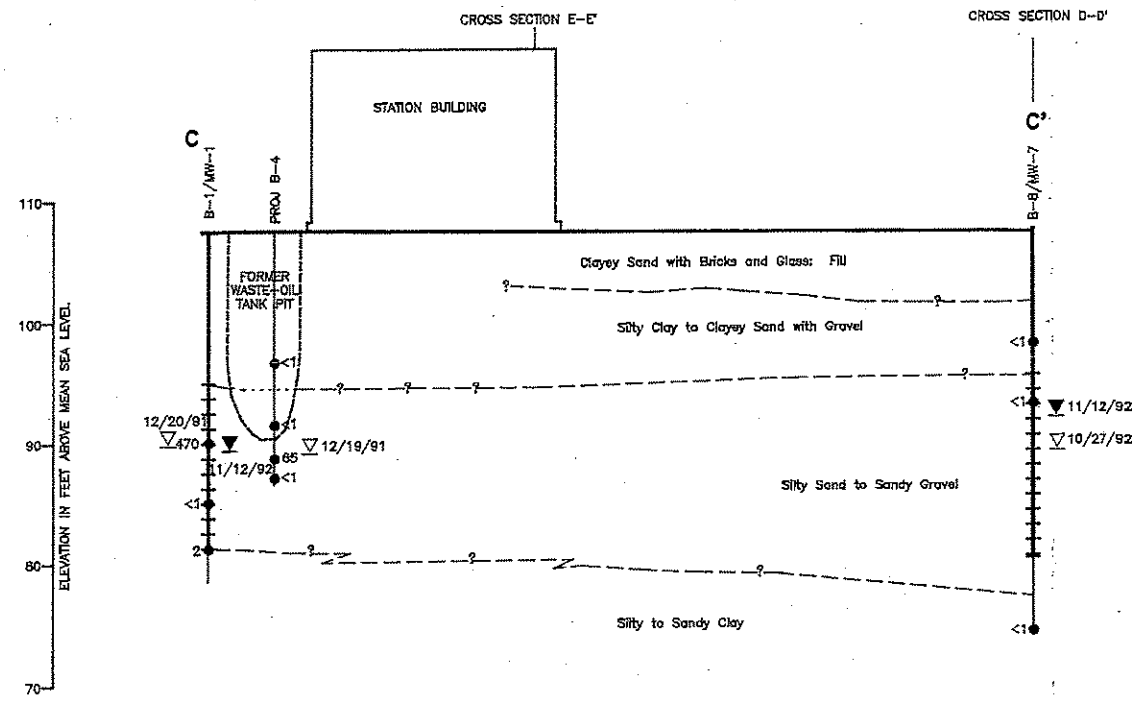
Source: Based on data supplied by John Koch, Surveyor, 11/09/92.

RESNA
Working to Restore Nature

PROJECT 61035.05

GENERALIZED SITE PLAN
ARCO Station 6148
5131 Shattuck Avenue
Oakland, California

PLATE
2



EXPLANATION

740 = Laboratory analyzed soil sample showing concentration of TPHg in parts per million

= Well casing

= Well screen

= Boring

▽ = Initial water level in boring

▼ = Static water level in well

Approximate Horizontal Scale

20 10 0 20 40

feet

Approximate Vertical Scale

10 5 0 10 20

feet

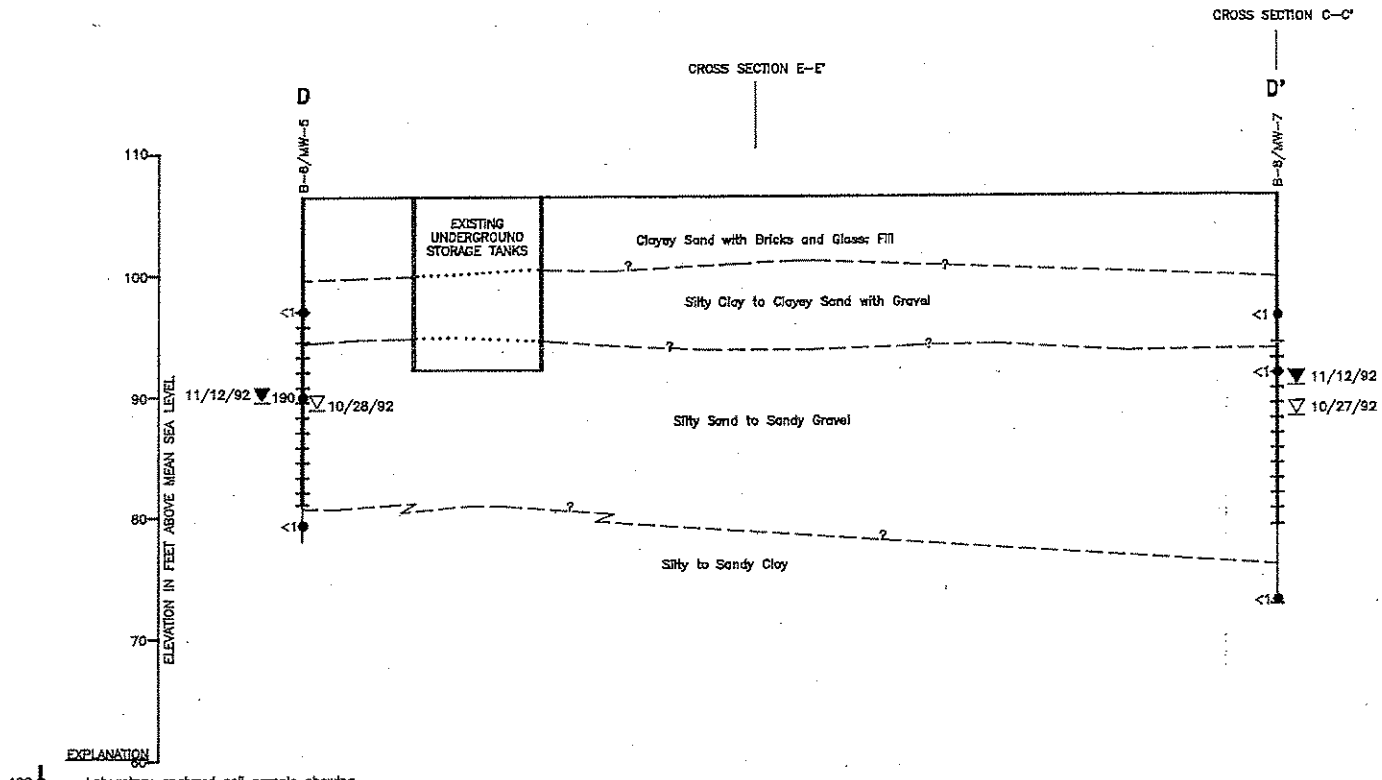
REGISTERED GEOLOGIST
JAMES LEWIS NELSON
No. 1463
CERTIFIED ENGINEERING GEOLOGIST
STATE OF CALIFORNIA

RESNA
Working to Restore Nature

PROJECT 61035.05 610355A

GEOLOGIC CROSS SECTION C-C'
ARCO Station 6148
5131 Shattuck Avenue
Oakland, California

PLATE
13



REGISTERED GEOLOGIST
JAMES LEWIS NELSON
No. 1483
CERTIFIED ENGINEERING GEOLOGIST
STATE OF CALIFORNIA

EXPLANATION

190 = Laboratory analyzed soil sample showing concentration of TPHg in parts per million

= Well casing

= Well screen

= Boring

= Initial water level in boring

= Static water level in well

Approximate Horizontal Scale

20 10 0 20 40

feet

Approximate Vertical Scale

10 5 0 10 20

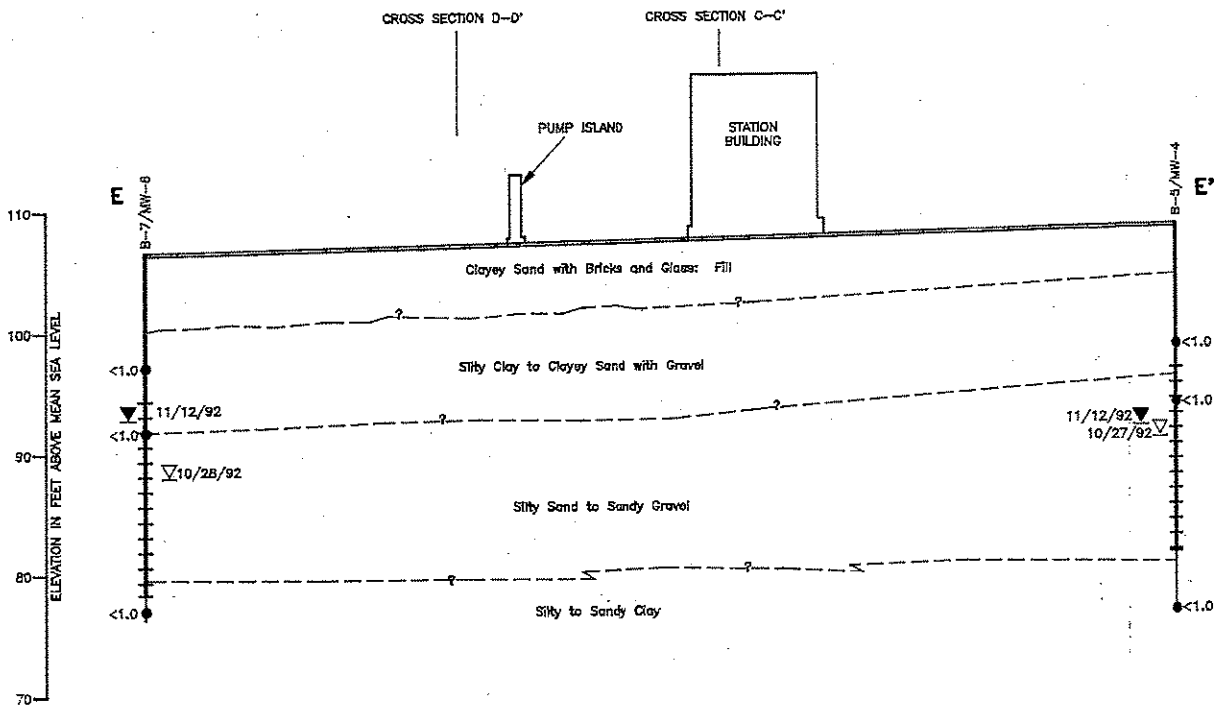
feet

RESNA
Working to Restore Nature

PROJECT 61035.05 61035D

GEOLOGIC CROSS SECTION D-D'
ARCO Station 6148
5131 Shattuck Avenue
Oakland, California

PLATE
14



EXPLANATION

<1.0 = Laboratory analyzed soil sample showing concentration of TPHg in parts per million

= Well casing

= Well screen

= Boring

▽ = Initial water level in boring

▼ = Static water level in well

Approximate Horizontal Scale

20 10 0 20 40

feet

Approximate Vertical Scale

10 5 0 10 20

feet

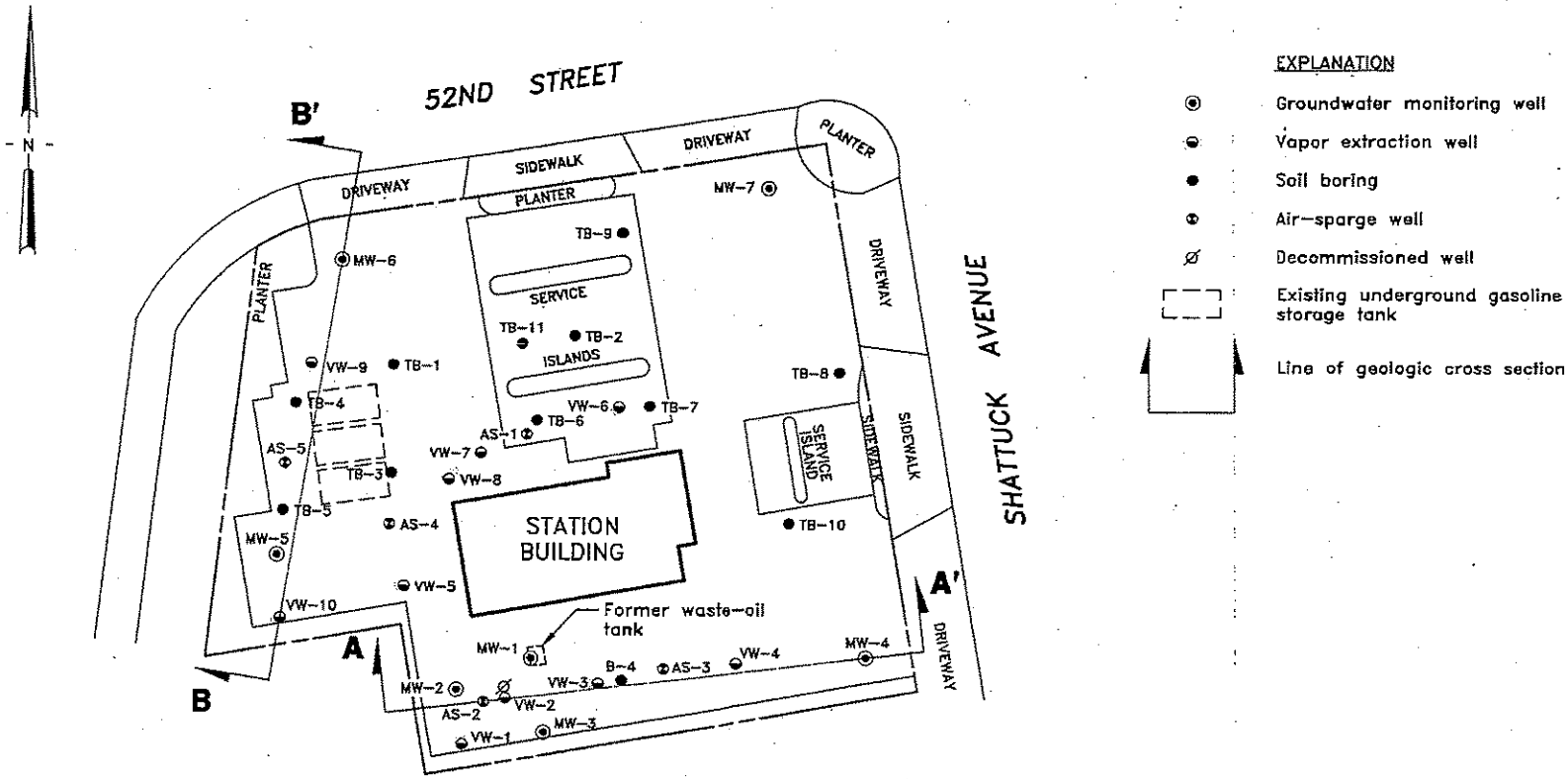
REGISTERED GEOLOGIST
JAMES LEWIS NELSON
No. 1463
CERTIFIED ENGINEERING GEOLOGIST
STATE OF CALIFORNIA

RESNA
Working to Restore Nature

PROJECT 61035.05 610355E

GEOLOGIC CROSS SECTION E-E'
ARCO Station 6148
5131 Shattuck Avenue
Oakland, California

PLATE
15



EMCON

SCALE: 0 30 60 FEET
(Approximate)

ARCO PRODUCTS COMPANY
SERVICE STATION 6148
5131 SHATTUCK AVENUE
OAKLAND, CALIFORNIA

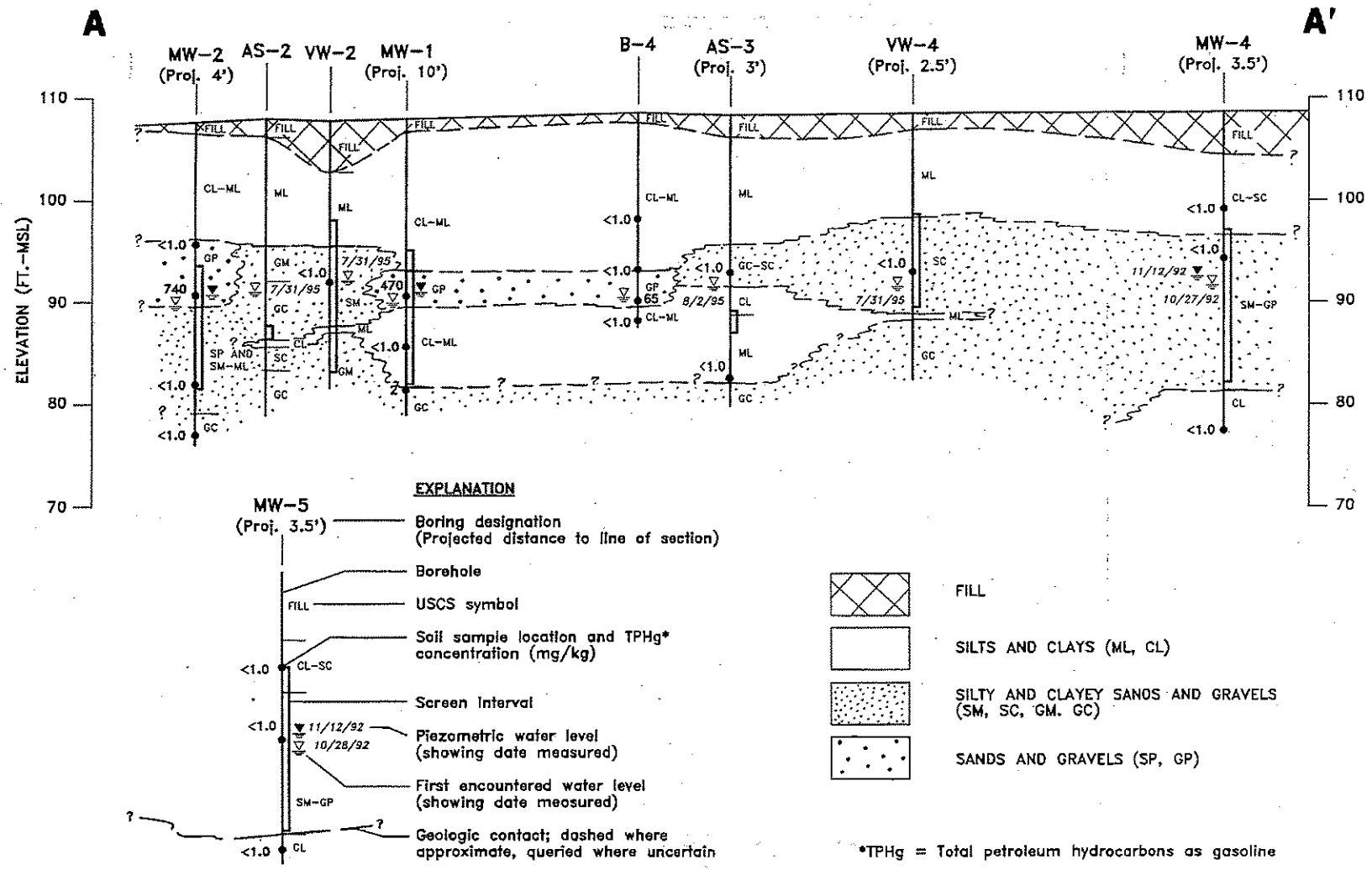
SITE PLAN

FIGURE NO. 2

PROJECT NO. 805-135.04

Feb 1, 1996 Remedial Well Installation Report - EMCON

G:\805-135\SITEPLAN REV 0 01/26/96 14:26:57 DD DJ



emcon

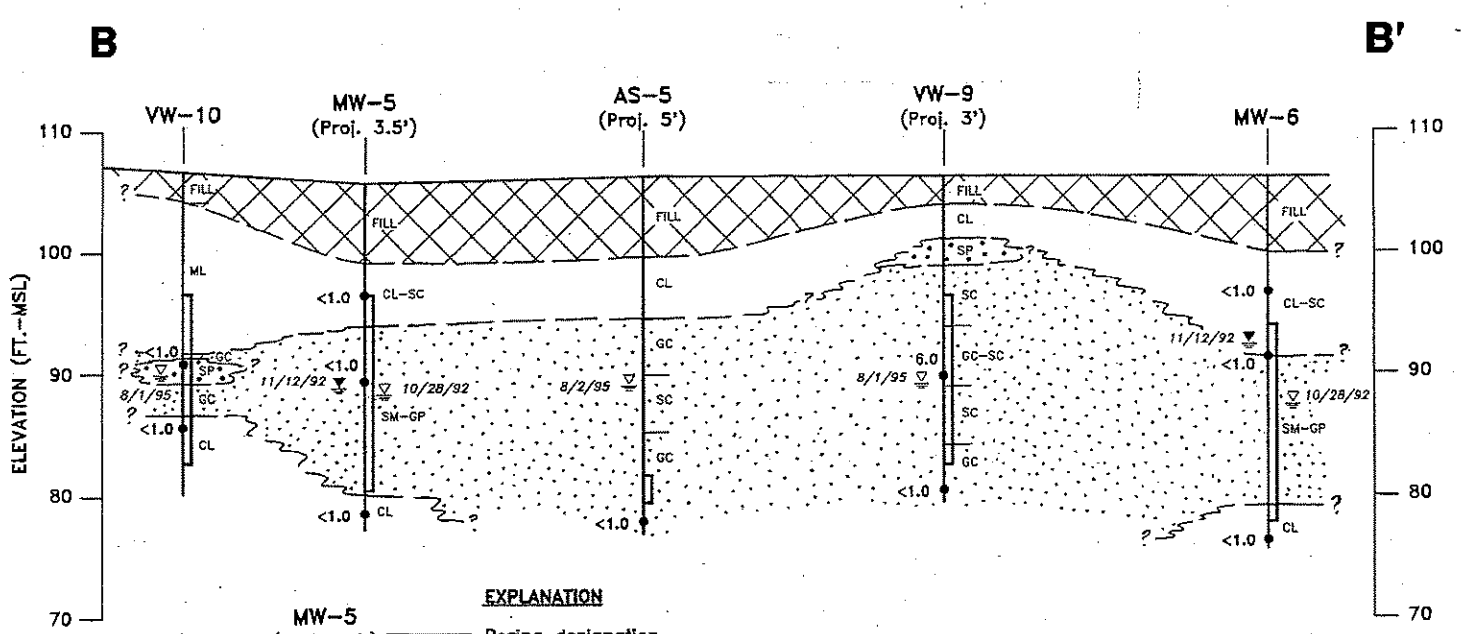
SCALE: 0 10 20 FEET
(Horizontal and Vertical)

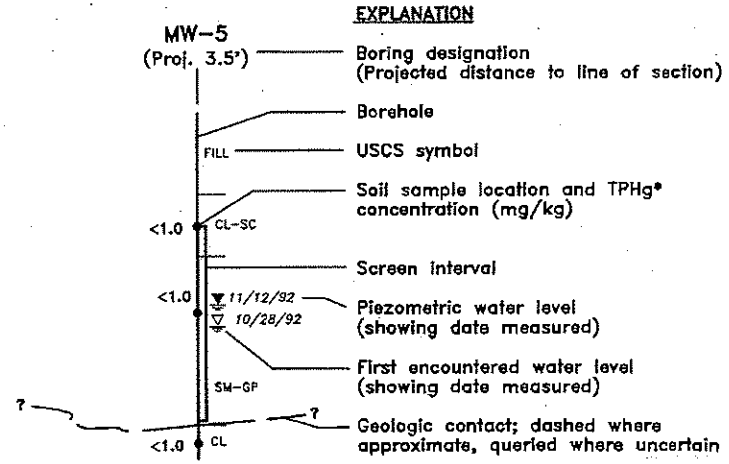
ARCO PRODUCTS COMPANY
SERVICE STATION 6148
5131 SHATTUCK AVENUE
OAKLAND, CALIFORNIA

GEOLOGIC CROSS SECTION A-A'

FIGURE NO. 3
PROJECT NO. 805-135.04

J:\1805135\SECAA REV 0 11/01/95 09:48:05 KMM DJ





EXPLANATION

- MW-5 (Proj. 3.5') — Boring designation (Projected distance to line of section)
- Borehole
- FILL — USCS symbol
- Soil sample location and TPHg* concentration (mg/kg)
- Screen interval
- 11/12/92 / 10/28/92 — Piezometric water level (showing date measured)
- First encountered water level (showing date measured)
- Geologic contact; dashed where approximate, queried where uncertain

- FILL
- SILTS AND CLAYS (ML, CL)
- SILTY AND CLAYEY SANDS AND GRAVELS (SM, SC, GM, GC)
- SANDS AND GRAVELS (SP, GP)

*TPHg = Total petroleum hydrocarbons as gasoline

EMCON

SCALE: 0 10 20 FEET
(Horizonatal and Vertical)

ARCO PRODUCTS COMPANY
SERVICE STATION 6148
5131 SHATTUCK AVENUE
OAKLAND, CALIFORNIA

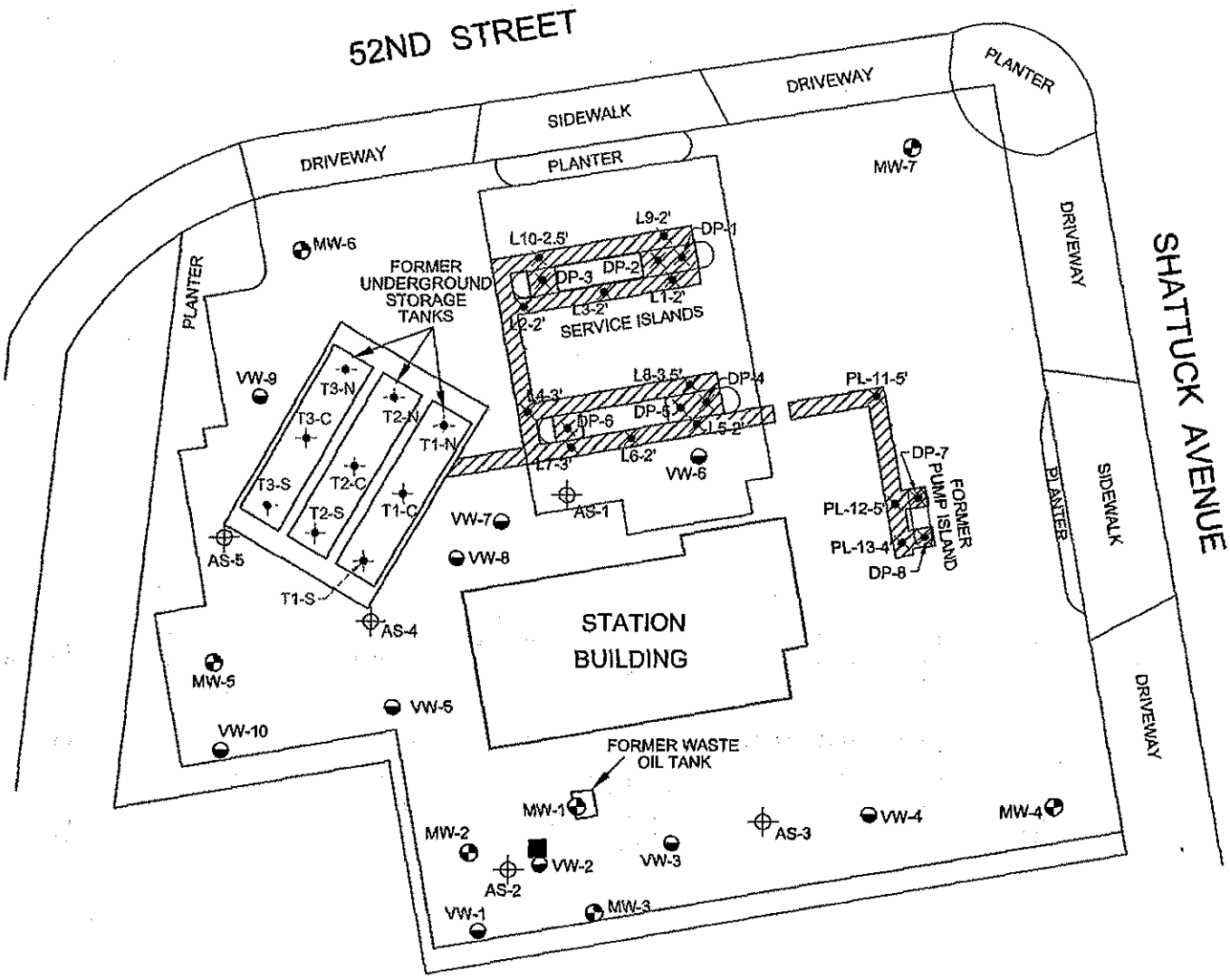
GEOLOGIC CROSS SECTION B-B'

FIGURE NO. 4

PROJECT NO. 805-135.04

J:\1\805135\SECBB REV 0 11/01/95 09:48:05 KMM DJ

June 1, 2004 - Soil investigation for Site closure Rpt.



LEGEND:

- MONITORING WELL
- AIR SPARGING WELL
- SOIL VAPOR EXTRACTION WELL
- DESTROYED WELL
- TANK BASIN SOIL SAMPLE LOCATIONS
- FORMER PRODUCT LINE/ DISPENSER PUMP SOIL SAMPLE LOCATIONS
- EXCAVATION AREA

NORTH

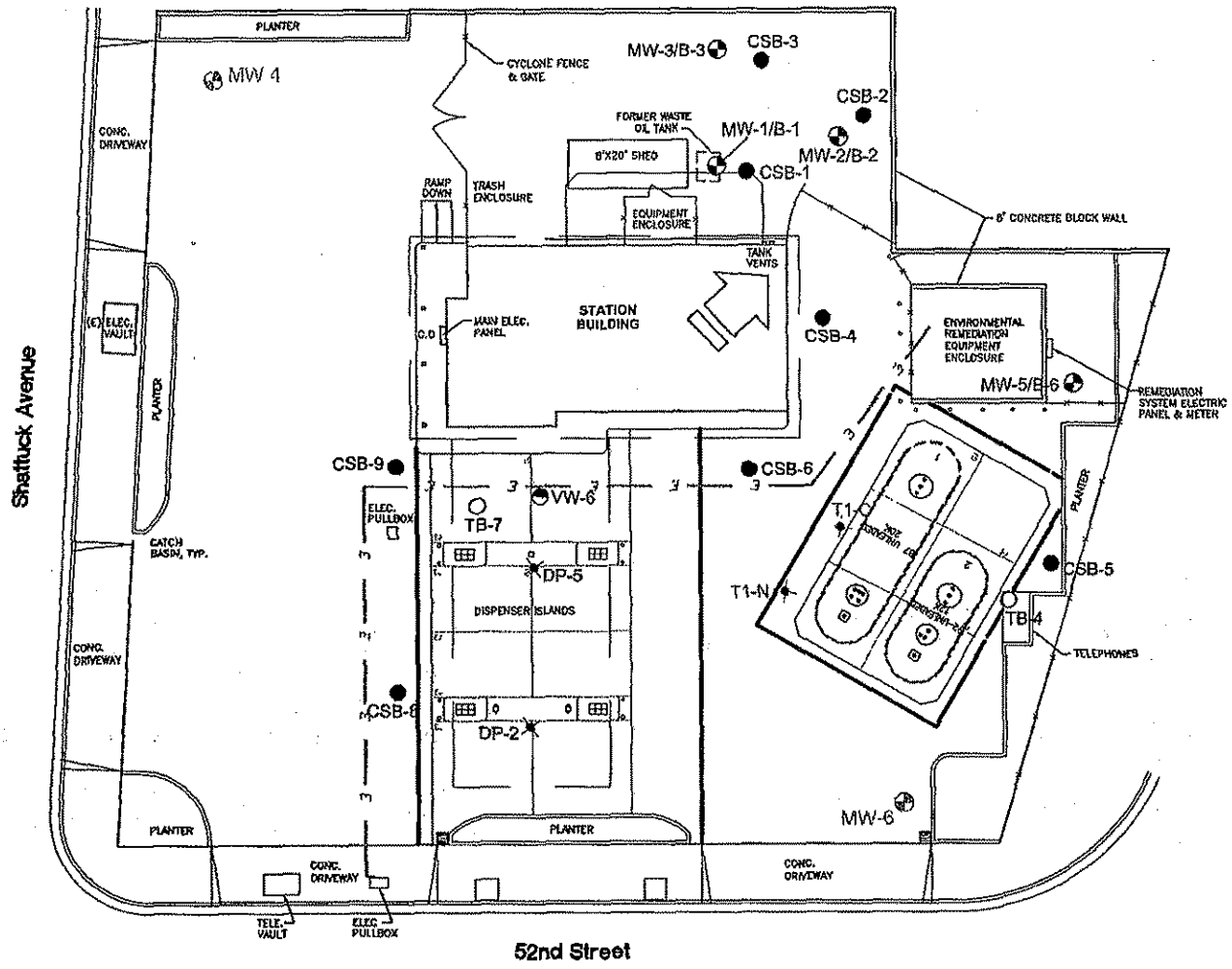
0 30 60

SCALE IN FEET

NOTE: SITE MAP ADAPTED FROM IT CORPORATION FIGURES. SITE DIMENSIONS AND FACILITY LOCATIONS NOT VERIFIED.

URS	Project No. 38486907 Arco Service Station 6148 5131 Shattuck Avenue Oakland, California	HISTORICAL SOIL SAMPLE LOCATIONS	FIGURE 2

Jun 01, 2004 - 3:53pm
X:\x_env_waste\BP CEM\Sites\Scott Robinson\Paul Supple\6148\Closure\2_HSSL.dwg



LEGEND:

- ● CONFIRMATION SOIL BORING
- ○ HISTORICAL SOIL BORING
- ◔ MONITORING WELL
- ◓ SOIL VAPOR EXTRACTION WELL
- ⊹ TANK BASIN SOIL SAMPLE
- ✕ FORMER PRODUCT LINE/ DISPENSER PUMP SOIL SAMPLE
- — E — ELECTRICAL LINE
- HISTORIC GROUNDWATER FLOW DIRECTION (APPROXIMATE)

NORTH

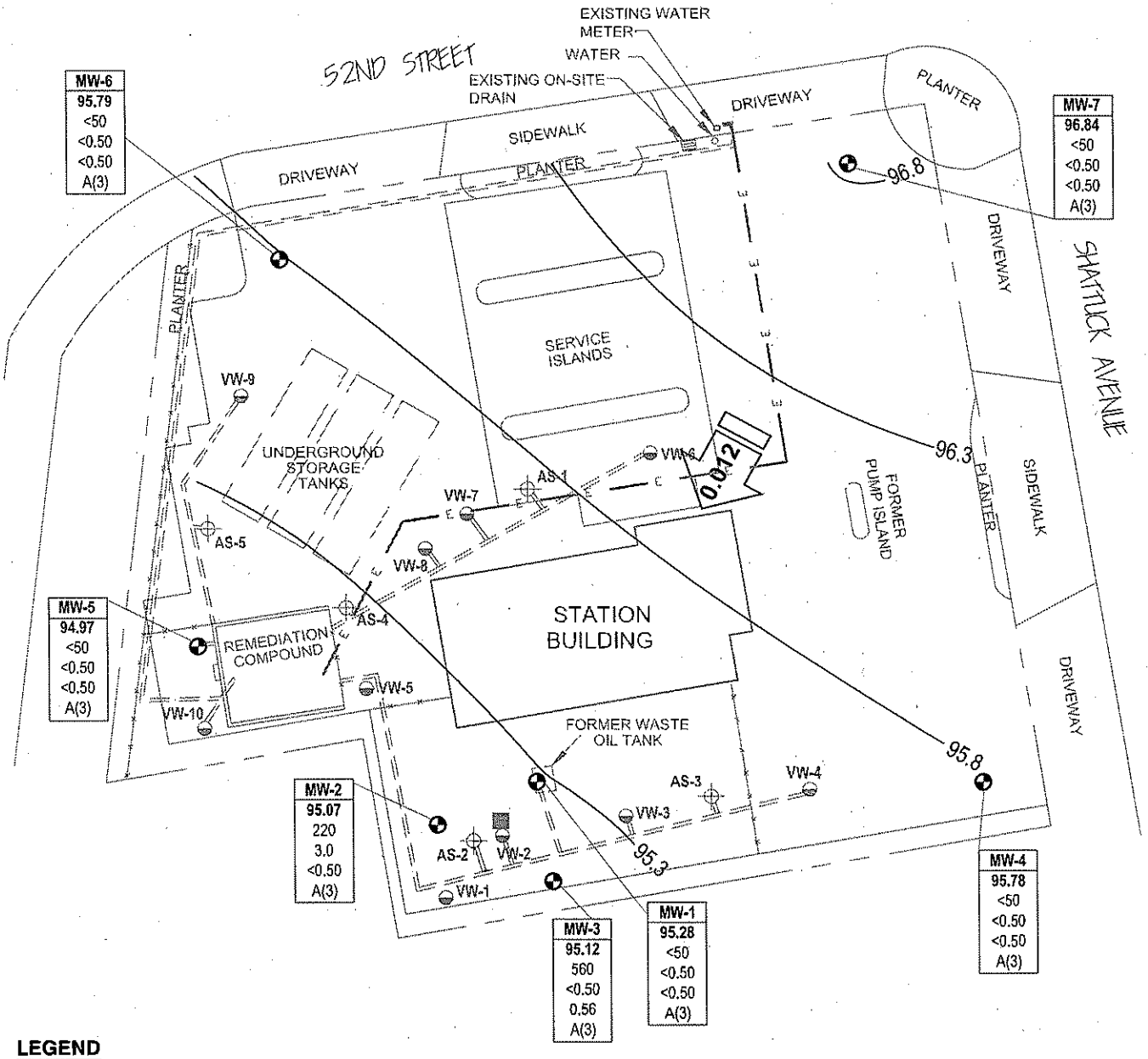
0 30 60

SCALE IN FEET

NOTE: SITE MAP ADAPTED FROM IT CORPORATION FIGURES. SITE DIMENSIONS AND FACILITY LOCATIONS NOT VERIFIED.

URS	Project No. 38486907 Arco Service Station 6148 5131 Shattuck Avenue Oakland, California	CONFIRMATION SOIL BORING LOCATIONS	FIGURE 3

Jun 01, 2004 - 3:48pm
X:\x_env_waste\BP GEM\Sites\Scott Robinson\Paul Supple\6148\Closure\3_CSB.dwg



LEGEND

- MONITORING WELL
- AIR SPARGING WELL
- SOIL VAPOR EXTRACTION WELL
- DESTROYED WELL
- Well / ELEV / GRO / Benzene / MTBE / A — WELL DESIGNATION; GROUND-WATER ELEVATION (FT ABOVE MSL); CONCENTRATION OF GRO, BENZENE AND MTBE IN GROUND WATER (µg/L); SAMPLING FREQUENCY
- A(3) — SAMPLED ANNUALLY, 3RD QUARTER
- < — NOT DETECTED AT OR ABOVE LABORATORY REPORTING LIMITS
- NS — NOT SAMPLED
- ORC — OXYGEN RELEASING COMPOUND SOCK
- — E — ELECTRICAL LINE
- FENCING
- REMEDIATION PIPING
- 0.012 — GROUND-WATER FLOW DIRECTION AND GRADIENT (FT/FT)
- 95.3 — GROUND-WATER ELEVATION CONTOUR (FT/MSL)

N

0 30 60

SCALE (ft)

NOTE: SITE MAP ADAPTED FROM IT CORPORATION FIGURES. SITE DIMENSIONS AND FACILITY LOCATIONS NOT VERIFIED.

BROADBENT & ASSOCIATES, INC.
ENGINEERING, WATER RESOURCES & ENVIRONMENTAL
1324 Mangrove Ave. Suite 212, Chico, California 95926
Project No.: 06-08-638 Date: 9/10/08

ARCO Service Station #6148
5131 Shattuck Avenue
Oakland, California

Ground-Water Elevation Contours and Analytical Summary Map
20 August 2008

Drawing 1

ATTACHMENT 2

HISTORIC SOIL ANALYTICAL DATA

(3 PAGES)

TABLE 3
RESULTS OF LABORATORY ANALYSES OF SOIL SAMPLES - VOCs and METALS
ARCO Station 6148
Oakland, California
December 19-20, 1991

Sample Identification	VOCs	Cd	Cr	Pb	Zn	Ni
S-17-1/2-B1	ND*	0.87	31	8.3	62	41
S-22-1/2-B1	ND	0.82	30	4.1	62	34
S-17-B2	ND*	0.87	24	6.7	68	46
S-25-1/2-B2	ND	<0.50	28	2.8	45	26
S-17-1/2-B3	NA	0.95	31	3.9	66	38
S-26-1/2-B3	ND	0.77	48	6.9	70	66
S-18-1/2-B4	ND*	<0.50	27	3.6	57	35
S-20-B4	ND	NA	NA	NA	NA	NA

All results shown in parts per million (ppm)
VOCs: Volatile Organic Compounds by EPA Method 8240.
Cd: Cadmium by EPA Method 6010.
Cr: Chromium by EPA Method 6010.
Pb: Lead by EPA Method 7421.
Zn: Zinc by EPA Method 6010.
Ni: Nickel by EPA Method 6010.
<: Results reported as less than the detection limit.
ND: All 37 compounds tested were not detected.
ND*: All compounds tested were not detected with the exception of BTEX.
NA: Not analyzed.

Sample Identification:

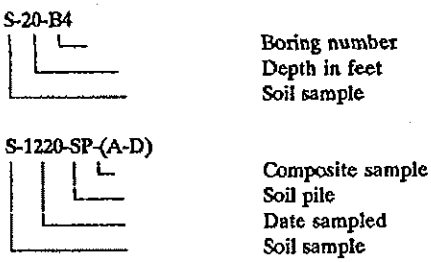


Table 2
Historical Soil Sample
Laboratory Analytical Results

Atlantic Richfield Company
Service Station #6148
5131 Shattuck Avenue
Oakland, California

Investigation Phase	Sample ID	Sample Date	Sample Depth (feet bgs)	TPH-g (mg/kg)	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Xylene (mg/kg)
1st Phase of Investigation	S-17.5-B1	1991	17.5	470	2.3	5.1	5.1	24
	S-22.5-B1	1991	22.5	<1.0	0.010	<0.0050	<0.0050	<0.0050
	S-26.5-B1	1991	26.5	2.0	0.026	0.014	0.011	0.049
	S-12-B2	1991	12	<1.0	<0.0050	<0.0050	<0.0050	<0.0050
	S-17-B2	1991	14	740	2.3	13	7.7	41
	S-25.5-B2	1991	25.5	<1.0	0.015	0.016	<0.0050	0.019
	S-30.5-B2	1991	30.5	<1.0	0.015	0.0080	<0.0050	<0.0050
	S-10.5-B3	1991	10.5	<1.0	<0.0050	0.0070	<0.0050	<0.0050
	S-17.5-B3	1991	17.5	320	0.65	0.65	2.3	5.0
	S-26.5-B3	1991	26.5	<1.0	<0.0050	<0.0050	<0.0050	<0.0050
	S-10.5-B4	1991	10.5	<1.0	<0.0050	<0.0050	<0.0050	<0.0050
	S-15.5-B4	1991	15.5	<1.0	0.010	<0.0050	<0.0050	<0.0050
	S-18.5-B4	1991	18.5	65	0.42	0.22	0.54	0.77
	S-20-B4	1991	20	<1.0	0.0070	<0.0050	<0.0050	<0.0050
2nd Phase of Investigation	S-9.5-B5	1992	9.5	<1.0	<0.0050	<0.0050	<0.0050	<0.0050
	S-14.5-B5	1992	14.5	<1.0	0.13	<0.0050	<0.0050	0.0050
	S-31.5-B5	1992	31.5	<1.0	<0.0050	<0.0050	<0.0050	<0.0050
	S-9.5-B6	1992	9.5	<1.0	<0.0050	<0.0050	<0.0050	<0.0050
	S-16.5-B6	1992	16.5	190	0.24	0.55	1.0	1.3
	S-27.5-B6	1992	27.5	<1.0	<0.0050	<0.0050	<0.0050	<0.0050
	S-10-B7	1992	10	<1.0	<0.0050	<0.0050	<0.0050	<0.0050
	S-15-B7	1992	15	<1.0	<0.0050	<0.0050	<0.0050	<0.0050
	S-29.5-B7	1992	29.5	<1.0	<0.0050	<0.0050	<0.0050	0.025
	S-9.5-B8	1992	9.5	<1.0	<0.0050	<0.0050	<0.0050	<0.0050
	S-14.5-B8	1992	14.5	<1.0	<0.0050	<0.0050	<0.0050	<0.0050
	S-33.5-B8	1992	33.5	<1.0	<0.0050	<0.0050	<0.0050	<0.0050
3rd Phase of Investigation	S-6-TB1	4/26/93	6	<1.0	<0.0050	0.014	<0.0050	0.018
	S-9.5-TB1	4/26/93	9.5	<1.0	<0.0050	0.011	<0.0050	0.029
	S-15-TB1	4/26/93	15	2.5	0.12	0.042	0.014	0.027
	S-5.5-TB2	4/26/93	5.5	<1.0	<0.0050	0.014	<0.0050	0.011
	S-9.5-TB2	4/26/93	9.5	<1.0	<0.0050	0.015	<0.0050	0.012
	S-15-TB2	4/26/93	15	5.3	0.84	0.062	0.13	0.21
	S-6.5-TB3	4/27/93	6.5	<1.0	<0.0050	<0.0050	<0.0050	<0.0050
	S-9.5-TB3	4/27/93	9.5	<1.0	<0.0050	<0.0050	<0.0050	0.013
	S-16-TB3	4/27/93	15	3.2	0.11	0.079	0.023	0.12
	S-6.5-TB4	4/27/93	6.5	<1.0	<0.0050	<0.0050	<0.0050	<0.0050
	S-9.5-TB4	4/27/93	9.5	<1.0	<0.0050	<0.0050	<0.0050	<0.0050
	S-15-TB4	4/27/93	15	470	0.76	0.17	4.7	15
	S-6.5-TB5	4/27/93	6.5	<1.0	<0.0050	<0.0050	<0.0050	<0.0050
	S-9.5-TB5	4/27/93	9.5	<1.0	<0.0050	<0.0050	<0.0050	<0.0050
	S-15-TB5	4/27/93	15	<1.0	<0.0050	<0.0050	<0.0050	<0.0050
	S-6.5-TB6	4/27/93	6.5	<1.0	<0.0050	<0.0050	<0.0050	<0.0050
	S-9.5-TB6	4/27/93	9.5	20	<0.0050	<0.0050	0.074	0.61
	S-15-TB6	4/27/93	15	25	0.30	2.4	1.0	6.3
	S-28-TB6	4/27/93	28	<1.0	0.0054	0.025	<0.0050	0.016
	S-5-TB7	4/26/93	5	<1.0	<0.0050	<0.0050	<0.0050	0.032
	S-12-TB7	4/26/93	12	3.9	0.23	0.35	0.054	0.50
	S-15-TB7	4/26/93	15	28	1.4	3.9	0.80	4.7
	S-16.5-TB7	4/26/93	16.5	610	4.1	36	15	91
	S-4.5-TB8	4/26/93	4.5	<1.0	0.014	0.036	<0.0050	0.019
	S-9.5-TB8	4/26/93	9.5	<1.0	<0.0050	<0.0050	<0.0050	<0.0050
	S-15-TB8	4/26/93	15	<1.0	0.009	0.034	0.0072	0.029
	S-18-TB8	4/26/93	18	<1.0	0.0095	0.020	<0.0050	0.015
	S-3.5-TB9	4/26/93	3.5	<1.0	<0.0050	0.0087	<0.0050	0.0089
	S-9.5-TB9	4/26/93	9.5	6.7	0.019	0.024	0.049	0.45
	S-15-TB9	4/26/93	15	3.9	0.092	0.020	0.014	0.51
	S-5-TB10	4/26/93	5	<1.0	<0.0050	<0.0050	<0.0050	0.0080
	S-9.5-TB10	4/26/93	9.5	<1.0	0.011	0.020	<0.0050	0.0071
	S-14.5-TB10	4/26/93	14.5	<1.0	0.011	0.016	<0.0050	0.0078
	S-6.5-TB11	4/27/93	6.5	<1.0	0.020	0.016	<0.0050	0.011
	S-9.5-TB11	4/27/93	9.5	<1.0	0.080	0.012	<0.0050	0.028
	S-15-TB11	4/27/93	15	19	1.9	0.080	0.51	0.83

Table 2
Historical Soil Sample
Laboratory Analytical Results

Atlantic Richfield Company
Service Station #6148
5131 Shattuck Avenue
Oakland, California

Investigation Phase	Sample ID	Sample Date	Sample Depth (feet bgs)	TPH-g (mg/kg)	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Xylene (mg/kg)
Additional Investigation	B9-1-5	7/1993	5	<1.0	<0.0050	<0.0050	<0.0050	<0.0050
	B9-2-9.5	7/1993	9.5	<1.0	<0.0050	<0.0050	<0.0050	<0.0050
	B9-3-14.5	7/1993	14.5	<1.0	<0.0050	<0.0050	<0.0050	<0.0050
	B9-5-25	7/1993	25	<1.0	0.0060	<0.0050	<0.0050	<0.0050
	B10-3-16	7/1993	16	<1.0	<0.0050	<0.0050	<0.0050	<0.0050
	B10-6-28	7/1993	28	<1.0	<0.0050	<0.0050	<0.0050	<0.0050
	B11-3-14.5	7/1993	14.5	<1.0	<0.0050	<0.0050	<0.0050	<0.0050
	B11-5-24.5	7/1993	24.5	4.1	0.20	0.52	0.13	0.66
AS/SVE Well Installations	AS-3	8/2/95	16	<1	0.35	<0.005	<0.005	<0.005
	AS-3	8/2/95	26.5	<1	<0.005	<0.005	<0.005	0.007
	AS-4	8/2/95	14	<1	0.009	<0.005	<0.005	0.0045
	AS-4	8/2/95	26.5	<1	<0.005	<0.005	<0.005	<0.005
	AS-5	8/2/95	28.5	<1	<0.005	<0.005	<0.005	<0.005
	VW-2	7/31/95	16.5	<1	<0.005	<0.005	<0.005	<0.005
	VW-4	7/31/95	16	<1	<0.005	<0.005	<0.005	<0.005
	VW-5	7/31/95	21.5	<1	<0.005	<0.005	<0.005	<0.005
	VW-5	8/1/95	16	74	0.7	<0.2	0.9	1.0
	VW-6	8/1/95	6	**3,100**	<5	86	63	430
	VW-6	8/3/95	8	**2,300**	<5	51	48	310
	VW-6	8/3/95	11.5	**2,100**	<2	7.3	16	110
	VW-6	8/3/95	16	**1,700**	5.9	94	44	240
	VW-7	8/3/95	17	30	0.3	0.5	0.6	2.8
	VW-8	8/1/95	26	<1	<0.005	<0.005	<0.005	<0.005
	VW-9	8/1/95	16.5	6	<0.025	<0.025	<0.025	<0.025
	VW-9	8/1/95	26	<1	<0.005	<0.005	<0.005	<0.005
	VW-10	8/1/95	16	<1	<0.005	<0.005	<0.005	<0.005
	VW-10	8/1/95	21	<1	<0.005	<0.005	<0.005	<0.005
Tank and Piping Removal and Replacement	DP-1	11/14/00	2.0	5.32	0.014	0.0638	0.011	0.318
	DP-2	11/14/00	2.0	**132**	<0.1	0.265	0.86	14.5
	DP-3	11/14/00	2.0	<1.0	<0.005	<0.005	<0.005	0.0203
	DP-4	11/14/00	2.0	5.16	0.0226	0.134	0.0584	0.7999
	DP-5	11/14/00	2.0	**2,390**	<1.0	1.18	8.86	140
	DP-6	11/14/00	2.0	<2.0	<0.01	<0.01	<0.01	0.0165
	DP-7	12/22/00	4.0	<1.0	<0.005	<0.005	<0.005	0.00581
	DP-8	12/22/00	4.0	<1.0	<0.005	<0.005	<0.005	0.00834
	L-1	11/14/00	2.0	3.55	<0.005	<0.005	<0.005	0.0135
	L-2	11/14/00	2.0	<2.0	<0.005	<0.005	<0.005	<0.005
	L-3	11/14/00	2.0	<2.0	<0.01	<0.01	<0.01	<0.01
	L-4	11/14/00	3.0	<2.0	<0.01	<0.01	<0.01	<0.01
	L-5	11/14/00	2.0	<1.0	<0.005	<0.005	<0.005	0.0102
	L-6	11/14/00	2.0	5.8	<0.005	0.0108	0.0184	0.0207
	L-7	11/14/00	3.0	<2.0	<0.01	<0.01	<0.01	0.0237
	L-8	11/14/00	3.5	<1.0	<0.005	<0.005	<0.005	<0.005
	L-9	11/14/00	2.0	13.2	<0.005	0.00757	0.118	0.123
	L-10	11/14/00	2.5	1.15	<0.005	<0.005	<0.005	<0.005
	PL-11	11/14/00	5.0	<1.0	<0.005	<0.005	<0.005	0.00667
	PL-12	12/22/00	4.0	<1.0	<0.005	<0.005	<0.005	0.0056
	PL-13	12/22/00	4.0	<1.0	<0.005	<0.005	<0.005	<0.005
	T1-N	11/14/00	16.0	**4,470**	<2.0	105	73	404
	T1-C	11/14/00	16.0	**961**	<1.0	<1.0	<1.0	<1.0
	T1-S	11/14/00	16.0	<200	<1.0	<1.0	<1.0	<1.0
	T2-N	11/14/00	16.0	14.8	0.0289	0.025	0.2	0.655
	T2-C	11/14/00	16.0	33.1	0.0175	<0.01	<0.01	2.1
	T2-S	11/14/00	16.0	<2.0	<0.01	<0.01	<0.01	0.0188
	T3-N	11/14/00	16.0	<2.0	<0.01	<0.01	<0.01	0.0264
	T3-C	11/14/00	16.0	<2.0	<0.01	<0.01	<0.01	0.0102
	T3-S	11/14/00	16.0	<2.0	<0.01	<0.01	<0.01	<0.01

Notes:
Results in **BOLD** exceed California RWQCB ESLs for TPH-g of 100 mg/kg during initial investigations
TPH-g total petroleum hydrocarbons as gasoline
bgs below ground surface
mg/kg milligrams per kilograms

ATTACHMENT 3

CONFIRMATION SOIL SAMPLE ANALYTICAL DATA

(4 PAGES)

Table 3
Confirmation Soil Samples and Rational

Atlantic Richfield Company
Service Station #6148
5131 Shattuck Boulevard
Oakland, California

Sample ID	Rational for Soil Boring Location
CSB-1-17.5	Approximate location of soil boring B1/MW-1 (TPH-g = 470 mg/kg at 17.5 feet bgs). Soil confirmation sample to evaluate effectiveness of site work.
CSB-2-14.0 CSB-2-18.0	Approximate location of soil boring B2/MW-2 (TPH-g = 740 mg/kg at 14 feet bgs). Soil confirmation sample to evaluate effectiveness of site work.
CSB-3-17.5	Approximate location of soil boring B3/MW-3 (TPH-g = 320 mg/kg at 17.5 feet bgs). Soil confirmation sample to evaluate effectiveness of site work.
CSB-4-16.5 CSB-4-19.0	Approximate location of soil boring B6/MW-5 (TPH-g = 190 mg/kg at 16.5 feet bgs). Soil confirmation sample to evaluate effectiveness of site work.
CSB-5-15.5 CSB-5-18.0	Approximate location of soil boring TB-4 (TPH-g = 470 mg/kg at 15 feet bgs). Soil confirmation sample to evaluate effectiveness of site work.
CSB-6-16.0	Approximate downgradient/cross-gradient location of soil borings TN-1 and T1-C (TPH-g = 4,470 mg/kg and 961mg/kg, respectively at 16 feet bgs). Soil confirmation sample to evaluate effectiveness of site work.
CSB-8-2.0	Approximate location of soil boring DP-2 (TPH-g = 132 mg/kg at 2 feet bgs). Soil confirmation sample to evaluate effectiveness of site work.
CSB-9-6.0 CSB-9-11.5 CSB-9-16.5 CSB-9-21.5 CSB-9-26.5	Approximate median location of soil borings TB-7, VW-6, and DP-5(TPH-g = 610 mg/kg at 16.5 feet bgs 3,100 mg/kg at 6 feet bgs, and TPH-g = 2,390 mg/kg at 2 feet bgs, respectively). Soil confirmation sample to evaluate effectiveness of site work and investigate vertical extent of soil contamination in VW-6 and DP-5.

Key:

XXX-X-17.5	= XXX-X is Sample Location
CSB-1-XX.X	= XX.X is Sample Depth in feet bgs
bgs	= below ground surface

Table 4
Soil Analytical Data
Atlantic Richfield Company Service Station #6148
5131 Shattuck Avenue
Oakland, California

Soil Sample ID	Date Sampled	Sample Depth (feet bgs)	GRO (mg/kg)	Benzene (mg/kg)	Toluene (mg/kg)	Ethyl-benzene (mg/kg)	Xylenes (mg/kg)	MTBE (mg/kg)
CSB-1-17.5	4/29/04	17.5	**590**	ND< 0.5	ND< 0.5	**2.9**	ND< 0.5	ND< 0.5
CSB-2-14.0	4/29/04	14.0	ND< 1.0	ND< 0.005	ND< 0.005	ND< 0.005	ND< 0.005	ND< 0.005
CSB-2-18.0	4/29/04	18.0	**730**	ND< 0.5	**0.74**	**13**	**100**	ND< 0.5
CSB-3-17.5	4/29/04	17.5	**750**	ND< 0.5	ND< 0.5	ND< 0.5	ND< 0.5	ND< 0.5
CSB-4-16.5	4/29/04	16.5	ND< 1.0	ND< 0.005	ND< 0.005	ND< 0.005	ND< 0.005	ND< 0.005
CSB-4-19.0	4/29/04	19.0	**8.8**	ND< 0.005	ND< 0.005	ND< 0.005	ND< 0.005	ND< 0.005
CSB-5-15.5	4/29/04	15.5	ND< 1.0	ND< 0.005	ND< 0.005	ND< 0.005	ND< 0.005	ND< 0.005
CSB-5-18.0	4/29/04	18.0	**1.0**	ND< 0.005	ND< 0.005	ND< 0.005	ND< 0.005	ND< 0.005
CSB-6-16.0	4/29/04	16.0	**9.4**	**0.007**	**0.0056**	**0.25**	**0.0099**	ND< 0.005
CSB-8-2	4/29/04	2.0	ND< 1.0	ND< 0.005	ND< 0.005	ND< 0.005	ND< 0.005	ND< 0.005
CSB-9-6.0	4/29/04	6.0	ND< 1.0	ND< 0.005	ND< 0.005	ND< 0.005	ND< 0.005	ND< 0.005
CSB-9-11.5	4/29/04	11.5	ND< 1.0	ND< 0.005	ND< 0.005	ND< 0.005	ND< 0.005	ND< 0.005
CSB-9-16.5	4/29/04	16.5	**170**	ND< 0.5	ND< 0.5	ND< 0.5	ND< 0.5	ND< 0.5
CSB-9-21.5	4/29/04	21.5	ND< 1.0	ND< 0.005	ND< 0.005	ND< 0.005	ND< 0.005	ND< 0.005
CSB-9-26.5	4/29/04	26.5	**2.2**	ND< 0.005	ND< 0.005	ND< 0.005	ND< 0.005	ND< 0.005

Notes:

* all detections above laboratory reporting limits are in **bold.**
* all fuel oxygenate compounds analyzed using EPA Method 8260B

mg/kg = milligrams per kilogram
bgs = below ground surface
GRO = Please note that beginning in the Fourth Quarter 2003, the laboratory modified the reported analyte list. Total Petroleum Hydrocarbons as Gasoline (TPH-g) has been changed to Gasoline Range Organics (GRO). The resulting data may be impacted by the potential inclusion of non-TPHg analytes within the requested fuel range resulting in a higher concentration being reported. The range for GRO is C4- C12.
MTBE = Methyl tert-butyl ether
ND< = Not detected at or above the laboratory reporting limit
TPH-g = Total Petroleum Hydrocarbons as Gasoline.

Table 5
Fuel Oxygenates

Atlantic Richfield Company
Service Station #6148
5131 Shattuck Ave.
Oakland, CA

Soil Sample ID	Date Sampled	Sample Depth (feet bgs)	TBA (mg/kg)	MTBE (mg/kg)	DIPE (mg/kg)	ETBE (mg/kg)	TAME (mg/kg)
CSB-1-17.5	4/29/04	17.5	ND< 2.5	ND< 0.5	ND<1.0	ND< 0.5	ND< 0.5
CSB-2-14.0	4/29/04	14.0	ND< 0.01	ND< 0.005	ND< 0.01	ND< 0.005	ND< 0.005
CSB-2-18.0	4/29/04	18.0	ND< 2.5	ND< 0.5	ND<1.0	ND< 0.5	ND< 0.5
CSB-3-17.5	4/29/04	17.5	ND< 2.5	ND< 0.5	ND<1.0	ND< 0.5	ND< 0.5
CSB-4-16.5	4/29/04	16.5	ND< 0.01	ND< 0.005	ND< 0.01	ND< 0.005	ND< 0.005
CSB-4-19.0	4/29/04	19.0	ND< 0.01	ND< 0.005	ND< 0.01	ND< 0.005	ND< 0.005
CSB-5-15.5	4/29/04	15.5	ND< 0.01	ND< 0.005	ND< 0.01	ND< 0.005	ND< 0.005
CSB-5-18.0	4/29/04	18.0	ND< 0.01	ND< 0.005	ND< 0.01	ND< 0.005	ND< 0.005
CSB-6-16.0	4/29/04	16.0	ND< 0.01	ND< 0.005	ND< 0.01	ND< 0.005	ND< 0.005
CSB-8-2	4/29/04	2.0	**0.014**	ND< 0.005	ND< 0.01	ND< 0.005	ND< 0.005
CSB-9-6	4/29/04	6.0	ND< 0.01	ND< 0.005	ND< 0.01	ND< 0.005	ND< 0.005
CSB-9-11.5	4/29/04	11.5	**0.012**	ND< 0.005	ND< 0.01	ND< 0.005	ND< 0.005
CSB-9-16.5	4/29/04	16.5	ND< 2.5	ND< 0.5	ND<1.0	ND< 0.5	ND< 0.5
CSB-9-21.5	4/29/04	21.5	ND< 0.01	ND< 0.005	ND< 0.01	ND< 0.005	ND< 0.005
CSB-9-26.5	4/29/04	26.5	ND< 0.01	ND< 0.005	ND< 0.01	ND< 0.005	ND< 0.005

Notes:

1) all detections above laboratory reporting limits are in **bold.**
2) historical soil data is italicized and grouped with the corresponding soil borings from this Soil Investigation (4/29/2004).

DIPE = Di-isopropyl ether
ETBE = Ethyl tert butyl ether
mg/kg = milligrams per kilogram
MTBE = Methyl tert-butyl ether
ND< = Not detected at or above the laboratory reporting limit
TAME = tert-Amyl methyl ether
TBA = tert-Butyl alcohol

Table 6

Comparison of Current Detections with Historical Soil Analytical Data and Selected ESL

Atlantic Richfield Company Service Station #6148

5131 Shattuck Avenue

Oakland, California

ESL protective of deep (> 3m) soil that is a potential drinking water source at a commercial/industrial site			TPH-g/ GRO (mg/kg)	Benzene (mg/kg)	Toluene (mg/kg)	Ethyl-benzene (mg/kg)	Xylenes (mg/kg)	MTBE (mg/kg)
			100	0.044	2.9	3.3	1.5	0.023
Soil Sample ID	Date Sampled	Sample Depth (feet bgs)	GRO/ TPH-g (mg/kg)	Benzene (mg/kg)	Toluene (mg/kg)	Ethyl-benzene (mg/kg)	Xylenes (mg/kg)	MTBE (mg/kg)
CSB-1-17.5	4/29/04	17.5	**590**	ND< 0.5	ND< 0.5	2.9	ND< 0.5	ND< 0.5
S-17.5-B1	*1991*	*17.5*	***470***	***2.3***	***5.1***	***5.1***	***24***	*NS*
CSB-2-18.0	4/29/04	18	**730**	ND< 0.5	0.74	**13**	**100**	ND< 0.5
S-17-B2	*1991*	*17*	***740***	***2.3***	***13***	***7.7***	***41***	*NS*
CSB-3-17.5	4/29/04	17.5	**750**	ND< 0.5	ND< 0.5	ND< 0.5	ND< 0.5	ND< 0.5
S-17.5-B3	*1991*	*17.5*	***320***	***0.65***	*0.65*	*2.3*	***5.9***	*NS*
CSB-4-16.5	4/29/04	16.5	ND< 1.0	ND< 0.005	ND< 0.005	ND< 0.005	ND< 0.005	ND< 0.005
S-16.5-B6	*1992*	*16.5*	***190***	***0.24***	*0.55*	*1*	*1.3*	*NS*
CSB-5-15.5	4/29/04	15.5	ND< 1.0	ND< 0.005	ND< 0.005	ND< 0.005	ND< 0.005	ND< 0.005
S-15-TB4	*34086*	*15*	***470***	***0.76***	*0.17*	***4.7***	***15***	*NS*
CSB-6-16.0	4/29/04	16	9.4	0.007	0.0056	0.25	0.0099	ND< 0.005
TN-1	*11/14/00*	*16*	***4470***	*ND<2.0*	***105***	***73***	***404***	*NS*
TC-1	*11/14/00*	*16*	***961***	*ND<1.0*	*ND<1.0*	*ND<1.0*	*ND<1.0*	*NS*
CSB-8-2	04/29/04	2	ND< 1.0	ND< 0.005	ND< 0.005	ND< 0.005	ND< 0.005	ND< 0.005
DP-2	*11/14/00*	*2*	***132***	*ND<0.1*	*0.265*	*0.86*	***14.5***	*NS*
CSB-9-6.0	04/29/04	6	ND< 1.0	ND< 0.005	ND< 0.005	ND< 0.005	ND< 0.005	ND< 0.005
VW-6	*11/14/00*	*6*	***3,100***	*ND< 5*	***86***	***63***	***430***	*NS*
CSB-9-11.5	04/29/04	11.5	ND< 1.0	ND< 0.005	ND< 0.005	ND< 0.005	ND< 0.005	ND< 0.005
VW-6	*11/14/00*	*11.5*	***2,100***	*ND< 2*	***7.3***	***16***	***110***	*NS*
CSB-9-16.5	04/29/04	16.5	**170**	ND< 0.5	ND< 0.5	ND< 0.5	ND< 0.5	ND< 0.5
VW-6	*11/14/00*	*16*	***1,700***	***5.9***	***94***	***44***	***240***	
S-16.5-TB7	*04/26/93*	*16.5*	***610***	***4.1***	***36***	***15***	***91***	*NS*
CSB-9-21.5	04/29/04	21.5	ND< 1.0	ND< 0.005	ND< 0.005	ND< 0.005	ND< 0.005	ND< 0.005
CSB-9-26.5	04/29/04	26.5	2	ND< 0.005	ND< 0.005	ND< 0.005	ND< 0.005	ND< 0.005

Notes:

1) All detections above laboratory reporting limits are in **bold**.
2) Historical soil data is italicized and grouped with the corresponding soil borings from this Soil Investigation (4/29/2004).

ESLs = Environmental Screening Level (RWQCB July 2003). Volume 2 Table C Deep Soil Screening Levels (>3 m bgs) where groundwater is a current or potential source of drinking water.

mg/kg = milligrams per kilogram

bgs = below ground surface

GRO = Please note that beginning in the Fourth Quarter 2003, the laboratory modified the reported analyte list. Total Petroleum Hydrocarbons as Gasoline (TPH-g) has been changed to Gasoline Range Organics (GRO). The resulting data may be impacted by the potential inclusion of non-TPHg analytes within the requested fuel range resulting in a higher concentration being reported. The carbon range for GRO is C4- C12.

MTBE = Methyl tert-butyl ether

ND< = Not detected at or above the laboratory reporting limit

TPH-g = Total Petroleum Hydrocarbons as Gasoline.

ATTACHMENT 4

GROUNDWATER ANALYTICAL DATA

(19 PAGES)

Table 1
Historical Groundwater Elevation and Analytical Data
Petroleum Hydrocarbons and Their Constituents
1995 - Present**

ARCO Service Station 6148
5131 Shattuck Avenue, Oakland, California

Well Designation	Water Level Field Date	Top of Casing Elevation	Depth to Water	Groundwater Elevation	Floating Product Thickness	Groundwater Flow Direction	Hydraulic Gradient	Water Sample Field Date	TPHG LUFT Method	Benzene EPA 8020	Toluene EPA 8020	Ethylbenzene EPA 8020	Total Xylenes EPA 8020	MTBE EPA 8020	MTBE EPA 8240	TRPH EPA 418.1
		ft-MSL	feet	ft-MSL	feet	MWN	ft/ft		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L
MW-1	03-20-95	108 03	15.75	92.28	ND	SW	0.02	03-20-95	830	140	5	41	110	--	--	--
MW-1	06-06-95	108.03	17.68	90.35	ND	SW	0.016	06-06-95	210	30	<0.5	7.3	16	--	--	--
MW-1	08-24-95	107.80	17.45	90.35	ND	SW	0.014	08-24-95	Not sampled: well was inaccessible due to construction							
MW-1	11-16-95	107.80	17 64	90.16	ND	SW	0 012	11-16-95	<50	5.6	<0.5	1 4	1.2	55	--	--
MW-1	02-27-96	107.80	15.21	92.59	ND	SW	0.016	02-27-96	1400	240	88	44	110	200	--	--
MW-1	05-15-96	107.80	17.53	90.27	ND	SW	0.015	05-15-96	Not sampled: well sampled semi-annually, during the first and third quarter							
MW-1	08-14-96	107.80	17.15	90.65	ND	SW	0.021	08-14-96	98	18	<0.5	1.9	1	45	--	--
MW-1	11-11-96	107.80	17.78	90.02	ND	SW	0 015	11-11-96	Not sampled: well sampled semi-annually, during the first and third quarter							
MW-1	03-25-97	107.80	17.68	90.12	ND	SSW	0 018	03-25-97	<50	<0 5	<0.5	<0.5	<0.5	<3	--	--
MW-1	05-15-97	107.80	17 91	89 89	ND	SSW	0.014	05-15-97	Not sampled: well sampled semi-annually, during the first and third quarter							
MW-1	10-26-97	107.80	18.85	88.95	ND	SW	0.009	10-26-97	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--
MW-1	11-10-97	107.80	18.10	89.70	ND	SSW	0.014	11-10-97	<50	<0.5	<0.5	<0.5	<0 5	4	--	--
MW-1	02-13-98	107.80	13.15	94.65	ND	SSW	0.012	02-13-98	<100	8.4	<1	<1	14	130	--	--
MW-1	05-12-98	107.80	12.30	95.50	ND	SW	0.02	05-12-98	<50	<0 5	<0.5	<0.5	<0.5	<3	--	--
MW-1	07-28-98	107.80	17.04	90 76	ND	SW	0.02	07-28-98	<50	<0 5	<0.5	<0.5	<0.5	<3	--	--
MW-1	10-28-98	107.80	18.10	89.70	ND	SW	0.01	10-28-98	<50	<0 5	<0 5	<0.5	<0.5	<3	--	--
MW-1	02-12-99	107.80	15.84	91.96	ND	SW	0.02	02-12-99	72	<0.5	<0 5	<0.5	<0.5	23	--	--
MW-2	03-20-95	107.43	15.50	91.93	ND#	SW	0.02	03-20-95	Not sampled: floating product entered well during purging							
MW-2	06-06-95	107.43	17.43	90 00	ND	SW	0 016	06-06-95	1200	60	21	35	140	--	--	--
MW-2	08-24-95	107.28	17.22	90 06	ND	SW	0.014	08-24-95	Not sampled: well was inaccessible due to construction							
MW-2	11-16-95	107.28	17.36	89.92	ND	SW	0.012	11-16-95	360	45	1.3	7.1	7.5	210	--	--
MW-2	02-27-96	107.28	14.82	92.46	ND	SW	0.016	02-27-96	8900	1400	980	150	550	940	--	--
MW-2	05-15-96	107 28	17.40	89.88	ND	SW	0.015	05-15-96	480	82	48	8	48	87	--	--
MW-2	08-14-96	107.28	17.00	90.28	ND	SW	0.021	08-14-96	130	22	4	2	9	120	--	--
MW-2	11-11-96	107.28	17.55	89.73	ND	SW	0 015	11-11-96	1200	150	120	21	160	110	--	--
MW-2	03-25-97	107.28	17.32	89.96	ND	SSW	0 018	03-25-97	670	23	58	13	120	28	--	--
MW-2	05-15-97	107.28	17.61	89.67	ND	SSW	0 014	05-15-97	<50	<0.5	<0.5	<0.5	<0.5	23	--	--
MW-2	10-26-97	107.28	18.43	88.85	ND	SW	0.009	10-26-97	<50	<0 5	<0.5	<0.5	<0.5	<3	--	--
MW-2	11-10-97	107.28	17.84	89 44	ND	SSW	0.014	11-10-97	<100	<1	<1	<1	1	74	--	--
MW-2	02-13-98	107.28	12.75	94.53	ND	SSW	0.012	02-13-98	220	9 5	3.9	3.7	48	84	--	--

Table 1
Historical Groundwater Elevation and Analytical Data
Petroleum Hydrocarbons and Their Constituents
1995 - Present**

ARCO Service Station 6148
5131 Shattuck Avenue, Oakland, California

Well Designation	Water Level Field Date	Top of Casing Elevation	Depth to Water	Groundwater Elevation	Floating Product Thickness	Groundwater Flow Direction	Hydraulic Gradient	Water Sample Field Date	TPHG LUFT Method	Benzene EPA 8020	Toluene EPA 8020	Ethylbenzene EPA 8020	Total Xylenes EPA 8020	MTBE EPA 8020	MTBE EPA 8240	TRPH EPA 418.1
		ft-MSL	feet	ft-MSL	feet	MWN	ft/ft		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L
MW-2	05-12-98	107.28	17.02	90.26	ND	SW	0 02	05-12-98	3900	210	280	86	910	35	--	--
MW-2	07-28-98	107.28	17.30	89.98	ND	SW	0.02	07-28-98	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--
MW-2	10-28-98	107.28	17 80	89.48	ND	SW	0 01	10-28-98	170	17	<0.5	1.7	5 0	24	--	--
MW-2	02-12-99	107.28	15.55	91.73	ND	SW	0.02	02-12-99	12000	620	95	490	2200	270	--	--
MW-3	03-20-95	107.77	15.60	92.17	ND	SW	0.02	03-20-95	29000	880	190	760	2000	--	--	16
MW-3	06-06-95	107 77	17.54	90.23	ND	SW	0.016	06-06-95	22000	450	54	380	1300	--	--	7.1
MW-3	08-24-95	107.61	17.42	90.19	ND	SW	0.014	08-24-95	Not sampled well was inaccessible due to construction							
MW-3	11-16-95	107.61	17.58	90 03	ND	SW	0.012	11-16-95	13000	210	<20	320	1000	790	--	8.3
MW-3	02-27-96	107.61	15.03	92.58	ND	SW	0.016	02-27-96	9700	94	15	290	720	430	--	10
MW-3	05-15-96	107.61	17.35	90.26	ND	SW	0 015	05-15-96	5600	66	12	37	67	230	--	--
MW-3	08-14-96	107.61	17.10	90 51	ND	SW	0.021	08-14-96	830	17	<1*	8	7	110	--	--
MW-3	11-11-96	107.61	17.73	89 88	ND	SW	0.015	11-11-96	500	28	3	12	13	150	--	--
MW-3	03-25-97	107.61	17.99	89.62	ND	SSW	0 018	03-25-97	<50	<0.5	<0 5	<0.5	<0.5	94	--	--
MW-3	05-15-97	107.61	17 84	89.77	ND	SSW	0.014	05-15-97	<50	<0.5	<0.5	<0.5	<0 5	65	--	--
MW-3	10-26-97	107.61	18.50	89.11	ND	SW	0.009	10-26-97	220	4	<1	<1	<1	160	--	--
MW-3	11-10-97	107.61	18.00	89.61	ND	SSW	0.014	11-10-97	350	8	<2	3	3	230	--	--
MW-3	02-13-98	107.61	13 00	94.61	ND	SSW	0.012	02-13-98	<50	1.3	<0.5	<0.5	1	21	--	--
MW-3	05-12-98	107.61	17.20	90.41	ND	SW	0.02	05-12-98	120	<0.5	<0.5	<0.5	<0.9	71	--	--
MW-3	07-28-98	107.61	17.46	90.15	ND	SW	0.02	07-28-98	<50	1.4	<0.5	<0.5	<0.5	52	--	--
MW-3	10-28-98	107.61	18.00	89.61	ND	SW	0.01	10-28-98	170	<0.5	<0.5	<0.5	0.7	35	--	--
MW-3	02-12-99	107.61	15.76	91.85	ND	SW	0 02	02-12-99	120	2.0	0.6	<0.5	1.3	37	--	--
MW-4	03-20-95	106.58	13.85	92.73	ND	SW	0.02	03-20-95	88	1	<0.5	<0.5	0.7	--	--	--
MW-4	06-06-95	106 58	15.70	90.88	ND	SW	0.016	06-06-95	<50	<0.5	<0 5	<0.5	<0.5	--	--	--
MW-4	08-24-95	106 71	15.86	90.85	ND	SW	0.014	08-24-95	Not sampled: well was inaccessible due to construction							
MW-4	11-16-95	106.71	16.10	90.61	ND	SW	0.012	11-16-95	<50	<0.5	<0.5	<0.5	<0.5	6	--	--
MW-4	02-27-96	106.71	13.72	92.99	ND	SW	0.016	02-27-96	<50	<0.5	<0 5	<0 5	<0 5	10	--	--
MW-4	05-15-96	106.71	15.90	90.81	ND	SW	0.015	05-15-96	Not sampled: well sampled semi-annually, during the first and third quarter							
MW-4	08-14-96	106.71	15.68	91.03	ND	SW	0.021	08-14-96	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--
MW-4	11-11-96	106.71	16.19	90.52	ND	SW	0.015	11-11-96	Not sampled: well sampled semi-annually, during the first and third quarter							

Table 1
Historical Groundwater Elevation and Analytical Data
Petroleum Hydrocarbons and Their Constituents
1995 - Present**

ARCO Service Station 6148
5131 Shattuck Avenue, Oakland, California

Well Designation	Water Level Field Date	Top of Casing Elevation	Depth to Water	Groundwater Elevation	Floating Product Thickness	Groundwater Flow Direction	Hydraulic Gradient	Water Sample Field Date	TPHG LUFT Method	Benzene EPA 8020	Toluene EPA 8020	Ethylbenzene EPA 8020	Total Xylenes EPA 8020	MTBE EPA 8020	MTBE EPA 8240	TRPH EPA 418 1
		ft-MSL	feet	ft-MSL	feet	MWN	ft/ft		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L
MW-4	03-25-97	106.71	16.10	90.61	ND	SSW	0 018	03-25-97	<50	<0.5	<0.5	<0 5	<0.5	<3	--	--
MW-4	05-15-97	106.71	16.38	90.33	ND	SSW	0.014	05-15-97	Not sampled; well sampled semi-annually, during the first and third quarter							
MW-4	10-26-97	106.71	17.78	88.93	ND	SW	0.009	10-26-97	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--
MW-4	11-10-97	106.71	16.43	90.28	ND	SSW	0.014	11-10-97	Not sampled; well sampled semi-annually, during the first and third quarter							
MW-4	02-13-98	106.71	13.05	93.66	ND	SSW	0.012	02-13-98	<50	1.3	0 7	<0.5	2.3	19	--	--
MW-4	05-12-98	106.71	15.69	91.02	ND	SW	0.02	05-12-98	Not sampled; well sampled semi-annually, during the first and third quarter							
MW-4	07-28-98	106.71	15.93	90.78	ND	SW	0.02	07-28-98	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--
MW-4	10-28-98	106.71	16.40	90.31	ND	SW	0.01	10-28-98	Not sampled, well sampled semi-annually, during the first and third quarter							
MW-4	02-12-99	106.71	14.13	92.58	ND	SW	0.02	02-12-99	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--
MW-5	03-20-95	106.68	14.92	91.76	ND	SW	0.02	03-20-95	21000	6900	450	800	1300	--	--	--
MW-5	06-06-95	106.68	16.61	90.07	ND	SW	0.016	06-06-95	6500	1700	<20	120	69	--	--	--
MW-5	08-24-95	106.60	16.47	90.13	ND	SW	0.014	08-24-95	Not sampled; well was inaccessible due to construction							
MW-5	11-16-95	106.60	16.69	89.91	ND	SW	0.012	11-16-95	1800	470	<5	17	5	1000	--	--
MW-5	02-27-96	106.60	14.35	92.25	ND	SW	0.016	02-27-96	10000	1000	71	690	1000	440	450	--
MW-5	05-15-96	106.60	16.58	90.02	ND	SW	0.015	05-15-96	3400	350	6	72	20	220	--	--
MW-5	08-14-96	106.60	17.26	89.34	ND	SW	0 021	08-14-96	2100	130	2.7	47	4.7	220	--	--
MW-5	11-11-96	106.60	16.62	89.98	ND	SW	0.015	11-11-96	1200	31	1	8	2	130	--	--
MW-5	03-25-97	106.60	16.38	90.22	ND	SSW	0.018	03-25-97	<50	<0 5	<0.5	<0.5	<0 5	5	--	--
MW-5	05-15-97	106.60	16.54	90.06	ND	SSW	0.014	05-15-97	<50	<0 5	<0.5	<0.5	<0.5	<3	--	--
MW-5	10-26-97	106.60	17.60	89 00	ND	SW	0.009	10-26-97	<50	<0.5	<0.5	<0 5	<0.5	7	--	--
MW-5	11-10-97	106.60	16.78	89 82	ND	SSW	0 014	11-10-97	<50	<0.5	<0.5	<0.5	<0.5	24	--	--
MW-5	02-13-98	106.60	12.21	94.39	ND	SSW	0 012	02-13-98	11200	51	<10	<10	<10	2000	--	--
MW-5	05-12-98	106.60	NR	NR	ND	SW	0.02	05-12-98	Not sampled; well inaccessible							
MW-5	07-28-98	106 60	16.47	90.13	ND	SW	0.02	07-28-98	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--
MW-5	10-28-98	106.60	16.80	89.80	ND	SW	0.01	10-28-98	<50	0.8	<0.5	<0.5	<0 5	99	--	--
MW-5	02-12-99	106.60	14.88	91.72	ND	SW	0 02	02-12-99	<1000	<10	<10	<10	<10	1100	--	--
MW-6	03-20-95	105.16	12 13	93 03	ND	SW	0 02	03-20-95	<50	<0 5	<0.5	<0 5	<0 5	--	--	--
MW-6	06-06-95	105.16	13.95	91.21	ND	SW	0 016	06-06-95	<50	<0 5	<0.5	<0 5	<0 5	--	--	--
MW-6	08-24-95	105.13	14.07	91 06	ND	SW	0 014	08-24-95	<50	<0 5	<0.5	<0 5	<0.5	<3	--	--

Table 1
Historical Groundwater Elevation and Analytical Data
Petroleum Hydrocarbons and Their Constituents
1995 - Present**

ARCO Service Station 6148
5131 Shattuck Avenue, Oakland, California

Well Designation	Water Level Field Date	Top of Casing Elevation	Depth to Water	Groundwater Elevation	Floating Product Thickness	Groundwater Flow Direction	Hydraulic Gradient	Water Sample Field Date	TPHG LUFT Method	Benzene EPA 8020	Toluene EPA 8020	Ethylbenzene EPA 8020	Total Xylenes EPA 8020	MTBE EPA 8020	MTBE EPA 8240	TRPH EPA 418.1
		ft-MSL	feet	ft-MSL	feet	MWN	ft/ft		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L
MW-6	11-16-95	105.13	14.34	90.79	ND	SW	0.012	11-16-95	<60	<0.5	<0.5	<0.5	<0.5	--	--	--
MW-6	02-27-96	105.13	12.00	93.13	ND	SW	0.016	02-27-96	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--
MW-6	05-15-96	105.13	14.10	91.03	ND	SW	0.015	05-15-96	Not sampled: well sampled annually, during the first quarter							
MW-6	08-14-96	105.13	13.70	91.43	ND	SW	0.021	08-14-96	Not sampled: well sampled annually, during the first quarter							
MW-6	11-11-96	105.13	14.11	91.02	ND	SW	0.015	11-11-96	Not sampled: well sampled annually, during the first quarter							
MW-6	03-25-97	105.13	14.15	90.98	ND	SSW	0.018	03-25-97	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--
MW-6	05-15-97	105.13	14.44	90.69	ND	SSW	0.014	05-15-97	Not sampled: well sampled annually, during the first quarter							
MW-6	10-26-97	105.13	16.02	89.11	ND	SW	0.009	10-26-97	Not sampled: well sampled annually, during the first quarter							
MW-6	11-10-97	105.13	14.52	90.61	ND	SSW	0.014	11-10-97	Not sampled: well sampled annually, during the first quarter							
MW-6	02-13-98	105.13	10.06	95.07	ND	SSW	0.012	02-13-98	<50	<0.5	<0.5	<0.5	<0.5	8	--	--
MW-6	05-12-98	105.13	13.75	91.38	ND	SW	0.02	05-12-98	Not sampled: well sampled annually, during the first quarter							
MW-6	07-28-98	105.13	14.06	91.07	ND	SW	0.02	07-28-98	Not sampled: well sampled annually, during the first quarter							
MW-6	10-28-98	105.13	14.71	90.42	ND	SW	0.01	10-28-98	Not sampled: well sampled annually, during the first quarter							
MW-6	02-12-99	105.13	12.22	92.91	ND	SW	0.02	02-12-99	<100	<1	<1	<1	<1	110	--	--
MW-7	03-20-95	107.08	12.32	94.76	ND	SW	0.02	03-20-95	<50	<0.5	<0.5	<0.5	<0.5	--	--	--
MW-7	06-06-95	107.08	14.59	92.49	ND	SW	0.016	06-06-95	Not sampled: well sampled semi-annually, during the first and third quarters							
MW-7	08-24-95	107.05	14.64	92.41	ND	SW	0.014	08-24-95	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--
MW-7	11-16-95	107.05	15.30	91.75	ND	SW	0.012	11-16-95	Not sampled: well sampled semi-annually, during the first and third quarters							
MW-7	02-27-96	107.05	12.24	94.81	ND	SW	0.016	02-27-96	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--
MW-7	05-15-96	107.05	14.65	92.40	ND	SW	0.015	05-15-96	Not sampled: well sampled annually, during the first quarter							
MW-7	08-14-96	107.05	14.35	92.70	ND	SW	0.021	08-14-96	Not sampled: well sampled annually, during the first quarter							
MW-7	11-11-96	107.05	14.92	92.13	ND	SW	0.015	11-11-96	Not sampled: well sampled annually, during the first quarter							
MW-7	03-25-97	107.05	14.80	92.25	ND	SSW	0.018	03-25-97	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--
MW-7	05-15-97	107.05	15.27	91.78	ND	SSW	0.014	05-15-97	Not sampled: well sampled annually, during the first quarter							
MW-7	10-26-97	107.05	16.68	90.37	ND	SW	0.009	10-26-97	Not sampled: well sampled annually, during the first quarter							
MW-7	11-10-97	107.05	15.37	91.68	ND	SSW	0.014	11-10-97	Not sampled: well sampled annually, during the first quarter							
MW-7	02-13-98	107.05	10.80	96.25	ND	SSW	0.012	02-13-98	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--
MW-7	05-12-98	107.05	14.32	92.73	ND	SW	0.02	05-12-98	Not sampled: well sampled annually, during the first quarter							
MW-7	07-28-98	107.05	14.79	92.26	ND	SW	0.02	07-28-98	Not sampled: well sampled annually, during the first quarter							
MW-7	10-28-98	107.05	15.57	91.48	ND	SW	0.01	10-28-98	Not sampled well sampled annually, during the first quarter							

Table 1
Historical Groundwater Elevation and Analytical Data
Petroleum Hydrocarbons and Their Constituents
1995 - Present**

ARCO Service Station 6148
5131 Shattuck Avenue, Oakland, California

Well Designation	Water Level Field Date	Top of Casing Elevation	Depth to Water	Groundwater Elevation	Floating Product Thickness	Groundwater Flow Direction	Hydraulic Gradient	Water Sample Field Date	TPHG LUFT Method	Benzene EPA 8020	Toluene EPA 8020	Ethylbenzene EPA 8020	Total Xylenes EPA 8020	MTBE EPA 8020	MTBE EPA 8240	TRPH EPA 418.1
		ft-MSL	feet	ft-MSL	feet	MWN	ft/ft		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L
MW-7	02-12-99	107.05	12.46	94.59	ND	SW	0.02	02-12-99	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--

ft-MSL: elevation in feet, relative to mean sea level
MWN: ground-water flow direction and gradient apply to the entire monitoring well network
ft/ft: foot per foot
TPHG: total petroleum hydrocarbons as gasoline, California DHS LUFT Method
µg/L: micrograms per liter
EPA: United States Environmental Protection Agency
MTBE: Methyl tert-butyl ether
mg/L milligrams per liter
TRPH: total recoverable petroleum hydrocarbons
NR: not reported; data not available
ND: none detected
SW: Southwest
#: floating product entered the well during purging
-- not analyzed or not applicable
**: For previous historical groundwater elevation and analytical data please refer to *Fourth Quarter 1995 Groundwater Monitoring Program Results and Remediation System Performance Evaluation Report, ARCO Service Station 6148, Oakland, California,* (EMCON, March 4, 1996).

Pinnacle

TABLE 5
CUMULATIVE RESULTS OF LABORATORY ANALYSES OF WATER SAMPLES-VOCs
ARCO Station 6148
Oakland, California

Date/Well	Compound	VOCs (ppb)
MW-1		
03/18/21	Tetrachloroethene	13
	Trichloroethene	1.2
06/12/92	Tetrachloroethene	18
	Trichloroethene	1.4
MW-2		
03/18/92	Tetrachloroethene	19
	Trichloroethene	2.2
	cis-1,2-Dichloroethene	0.5
06/12/92	Not sampled--floating product	
MW-3		
03/18/92	Tetrachloroethene	2.7
06/12/92	Tetrachloroethene	1.9

MCL:	PCE	TCE	cis-1,2-DCE
	5	5	6*

Results in parts per billion (ppb).
VOCs: Volatile Organic Compounds by EPA method 5030/8010. Compounds not shown were not detected.
Cd: Cadmium by EPA method 6010.
Cr: Chromium by EPA method 6010.
Pb: Lead by EPA method 7421.
Zn: Zinc by EPA method 6010.
Ni: Nickel by EPA method 6010.
MCLs: Maximum Contaminant Levels as reported by the California Department of Health Services 10/24/90.
*: Proposed MCL.

TABLE 4
CUMULATIVE RESULTS OF LABORATORY ANALYSES OF WATER SAMPLES-
TPHg, TPHd, BTEX, TOG, and Metals
ARCO Station 6148
Oakland, California

WELL DATE	TPHg	TPHd	B	T	E	X	Cd	Cr	Pb	Ni	Zn	TOG
MW-1												
03/18/92	790	<50	310	26	12	44	<3	5	3	<20	31	<0.5 (1.4)
06-12-92	1000	<50**	290	15	10	30	NA	NA	NA	NA	NA	<0.5
MW-2												
03/18/92	8,400	230*	1,400	1,000	220	870	<3	21	9	38	54	1.2 (3.0)
06/12/92	Not sampled-floating product											
MW-3												
03/18/92	20,000	2,800*	3,200	560	380	1,000	<3	67	27	113	156	7.8 (8.1)
06/12/92	46,000	1,600**	3,400	4,200	1,300	5,400	NA	NA	NA	NA	NA	16
MCL:	—	—	1	—	680	1,750	10	50	50	—	—	—
DWAL:	—	—	—	100	—	—	—	—	—	—	—	—

Results in parts per billion (ppb), except TOG which is in parts per million (ppm).
TPHg: Total petroleum hydrocarbons as gasoline by EPA method 5030/8015/8020.
TPHd: Total petroleum hydrocarbons as diesel by EPA method 3510.
B: benzene, T: toluene, E: ethylbenzene, X: total xylenes isomers
BTEX: Analyzed by EPA method 5030/8015/8020.
TOG: Total oil and grease by Standard method 5520F-IR.
( ): Concentrations in parentheses were results of Method 5520C.
*: Laboratory reported sample matrix contained high boiling point fuel mixture calculated as diesel, possibly weathered gasoline.
Metals: By EPA method 6010 and 7421.
<: Results reported below the laboratory detection limit.
**: Samples taken on July 2, 1992. Laboratory reported sample contains a lower boiling point hydrocarbon mixture quantified as diesel. The chromatogram does not match the typical diesel fingerprint, but appears to be weathered gasoline.

Table 1. Summary of Ground-Water Monitoring Data: Relative Water Elevations and Laboratory Analyses

Station #6148, 5131 Shattuck Ave., Oakland, CA

Well and Sample Date	P/NP	Comments	TOC (feet msl)	Top of Screen (ft bgs)	Bottom of Screen (ft bgs)	DTW (feet bgs)	Water Level Elevation (feet msl)	Concentrations in (µg/L)						DO (mg/L)	pH
								GRO/ TPHg	Benzene	Toluene	Ethyl-Benzene	Total Xylenes	MTBE		
MW-1															
6/21/2000	--		107.80	13.00	26.00	17.49	90.31	<50	<0.5	<0.5	<0.5	<1.0	<3.0	--	--
9/20/2000	--		107.80	13.00	26.00	17.64	90.16	<50	<0.5	0.677	<0.5	0.969	<2.5	--	--
12/22/2000	--		107.80	13.00	26.00	16.87	90.93	186	5.38	0.522	9.52	30.2	8.91	--	--
3/26/2001	--		107.80	13.00	26.00	16.60	91.20	<50	<0.5	<0.5	<0.5	<0.5	9.1	--	--
5/30/2001	--		107.80	13.00	26.00	17.10	90.70	<50	<0.5	<0.5	<0.5	<0.5	<2.5	--	--
9/23/2001	--		107.80	13.00	26.00	17.53	90.27	<50	<0.5	<0.5	<0.5	<0.5	6.7	--	--
12/28/2001	--		107.80	13.00	26.00	15.57	92.23	<50	2.7	<0.5	<0.5	<0.5	20	--	--
3/21/2002	--		107.80	13.00	26.00	15.57	92.23	--	--	--	--	--	--	--	--
4/17/2002	--		107.80	13.00	26.00	16.25	91.55	<50	<0.5	<0.5	<0.5	<0.5	<2.5	--	--
8/19/2002	--		107.80	13.00	26.00	17.69	90.11	<50	<0.5	<0.5	<0.5	<0.5	<2.5	2.0	7.1
11/27/2002	--		107.80	13.00	26.00	17.45	90.35	<50	<0.50	1.8	0.65	3.5	1.7	1.0	6.3
2/5/2003	--	d	107.80	13.00	26.00	16.93	90.87	<50	<0.50	<0.50	<0.50	<0.50	1.1	1.2	7.3
5/13/2003	--		107.80	13.00	26.00	16.95	90.85	<50	<0.50	<0.50	<0.50	<0.50	<0.50	1.0	6.5
7/31/2003	--		107.80	13.00	26.00	17.74	90.06	<50	<0.50	<0.50	<0.50	<0.50	0.55	1.2	6
12/17/2003	NP		107.80	13.00	26.00	17.03	90.77	<50	<0.50	<0.50	<0.50	<0.50	2.5	2.0	6.5
05/05/2004	NP		113.37	13.00	26.00	17.28	96.09	<50	<0.50	<0.50	<0.50	<0.50	0.60	2.6	6.4
08/25/2004	NP		113.37	13.00	26.00	17.72	95.65	<50	<0.50	<0.50	<0.50	<0.50	<0.50	1.2	6.9
11/29/2004	NP		113.37	13.00	26.00	17.45	95.92	<50	<0.50	<0.50	<0.50	<0.50	0.62	0.92	6.8
01/31/2005	NP		113.37	13.00	26.00	16.67	96.70	<50	<0.50	<0.50	<0.50	<0.50	0.59	1.63	6.1
05/09/2005	NP		113.37	13.00	26.00	16.77	96.60	<50	<0.50	<0.50	<0.50	<0.50	0.55	1.03	6.7
08/10/2005	NP		113.37	13.00	26.00	17.76	95.61	<50	<0.50	<0.50	<0.50	<0.50	0.62	0.9	7.0
8/29/2006	P		113.37	13.00	26.00	17.63	95.74	<50	<0.50	<0.50	<0.50	<0.50	<0.50	1.5	6.6
8/15/2007	NP		113.37	13.00	26.00	17.92	95.45	<50	<0.50	<0.50	<0.50	<0.50	<0.50	1.09	7.14
8/20/2008	**NP**		**113.37**	**13.00**	**26.00**	**18.09**	**95.28**	**<50**	**<0.50**	**<0.50**	**<0.50**	**<0.50**	**<0.50**	**1.03**	**6.47**
MW-2															
6/21/2000	--		107.28	14.00	26.00	17.19	90.09	69	<0.5	<0.5	<0.5	<1.0	12	--	--
9/20/2000	--		107.28	14.00	26.00	17.31	89.97	<50	0.964	<0.5	<0.5	<.05	5.05	--	--
12/22/2000	--		107.28	14.00	26.00	16.58	90.70	2,140	174	60.2	118	438	123	--	--
3/26/2001	--		107.28	14.00	26.00	16.45	90.83	8,490	333	148	495	1,660	<250	--	--
5/30/2001	--		107.28	14.00	26.00	16.83	90.45	4,700	200	71	260	780	43	--	--

Table 1. Summary of Ground-Water Monitoring Data: Relative Water Elevations and Laboratory Analyses

Station #6148, 5131 Shattuck Ave., Oakland, CA

Well and Sample Date	P/NP	Comments	TOC (feet msl)	Top of Screen (ft bgs)	Bottom of Screen (ft bgs)	DTW (feet bgs)	Water Level Elevation (feet msl)	Concentrations in (µg/L)						DO (mg/L)	pH
								GRO/ TPHg	Benzene	Toluene	Ethyl-Benzene	Total Xylenes	MTBE		
MW-2 Cont.															
9/23/2001	--		107.28	14.00	26.00	17.30	89.98	160	5.9	1.8	0.8	41	14	--	--
12/28/2001	--		107.28	14.00	26.00	15.38	91.90	1,800	54	<5.0	<5.0	240	30	--	--
3/21/2002	--		107.28	14.00	26.00	15.36	91.92	--	--	--	--	--	--	--	--
4/17/2002	--		107.28	14.00	26.00	16.01	91.27	<50	<0.5	<0.5	<0.5	<0.5	10	--	--
8/19/2002	--	a	107.28	14.00	26.00	17.53	89.75	170	22	0.92	14	26	<2.5	3.0	6.9
11/27/2002	--		107.28	14.00	26.00	17.21	90.07	340	22	0.68	13	26	<0.50	1.6	6.6
2/5/2003	--	d	107.28	14.00	26.00	16.72	90.56	83	2.7	<0.50	0.97	15	4.3	0.7	7.0
05/13/2003	NP	f	107.28	14.00	26.00	16.72	90.56	<50	0.91	<0.50	<0.50	0.6	2.8	0.7	6.5
7/31/2003	--		107.28	14.00	26.00	17.51	89.77	<50	<0.50	<0.50	<0.50	<0.50	2.0	7.1	6.7
12/17/2003	NP		107.28	14.00	26.00	16.78	90.50	51	1.0	<0.50	<0.50	<0.50	2.4	8.1	7.1
02/13/2004	NP	e	112.87	14.00	26.00	16.63	96.24	50	0.70	<0.50	0.54	0.90	1.6	5.6	6.7
05/05/2004	NP		112.87	14.00	26.00	17.04	95.83	<50	<0.50	<0.50	<0.50	<0.50	0.99	4.3	6.9
08/25/2004	NP		112.87	14.00	26.00	17.55	95.32	<50	<0.50	<0.50	<0.50	<0.50	0.63	7.5	6.6
11/29/2004	NP		112.87	14.00	26.00	17.24	95.63	85	10	<0.50	4.6	1.0	0.55	1.41	6.9
01/31/2005	NP		112.87	14.00	26.00	16.48	96.39	<50	<0.50	<0.50	<0.50	<0.50	1.2	0.76	6.1
05/09/2005	NP		112.87	14.00	26.00	16.52	96.35	<50	0.68	<0.50	<0.50	<0.50	1.8	0.7	6.6
08/10/2005	NP		112.87	14.00	26.00	17.48	95.39	<50	1.8	<0.50	<0.50	<0.50	1.5	0.62	6.7
8/29/2006	P		112.87	14.00	26.00	17.33	95.54	660	6.4	<0.50	1.5	2.5	<0.50	0.8	6.4
8/15/2007	NP		112.87	14.00	26.00	17.60	95.27	<50	<0.50	<0.50	<0.50	<0.50	<0.50	0.75	6.81
8/20/2008	**NP**		**112.87**	**14.00**	**26.00**	**17.80**	**95.07**	**220**	**3.0**	**<0.50**	**<0.50**	**<0.50**	**<0.50**	**0.96**	**6.38**
MW-3															
6/21/2000	--		107.61	14.00	26.00	17.52	90.09	200	<0.5	<0.5	<0.5	2.1	24	--	--
9/20/2000	--		107.61	14.00	26.00	17.61	90.00	<50	<0.5	<0.5	<0.5	<0.5	20	--	--
12/22/2000	--		107.61	14.00	26.00	16.85	90.76	227	4.73	1.06	2.58	5.22	27.3	--	--
3/26/2001	--		107.61	14.00	26.00	16.79	90.82	287	6.29	1.58	6.47	12.1	24.2	--	--
5/30/2001	--		107.61	14.00	26.00	17.11	90.50	500	10	<0.5	7.00	16	20	--	--
9/23/2001	--		107.61	14.00	26.00	17.57	90.04	400	6.4	0.74	<0.5	0.62	22	--	--
12/28/2001	--		107.61	14.00	26.00	15.41	92.20	270	2.5	2.4	<0.5	2.3	9.2	--	--
3/21/2002	--		107.61	14.00	26.00	15.58	92.03	--	--	--	--	--	--	--	--
4/17/2002	--		107.61	14.00	26.00	16.25	91.36	360	2.5	0.72	<0.5	<0.5	12	--	--

Table 1. Summary of Ground-Water Monitoring Data: Relative Water Elevations and Laboratory Analyses

Station #6148, 5131 Shattuck Ave., Oakland, CA

Well and Sample Date	P/NP	Comments	TOC (feet msl)	Top of Screen (ft bgs)	Bottom of Screen (ft bgs)	DTW (feet bgs)	Water Level Elevation (feet msl)	Concentrations in (µg/L)						DO (mg/L)	pH
								GRO/ TPHg	Benzene	Toluene	Ethyl-Benzene	Total Xylenes	MTBE		
MW-3 Cont.															
8/19/2002	--	b	107.61	14.00	26.00	17.66	89.95	750	11	2.1	<0.5	2.4	14	1.4	6.8
11/27/2002	--		107.61	14.00	26.00	17.69	89.92	470	<0.50	<0.50	<0.50	<0.50	<0.50	1.1	6.6
2/5/2003	--	d	107.61	14.00	26.00	16.82	90.79	<50	<0.50	<0.50	<0.50	<0.50	2.4	1.3	6.6
5/13/2003	--		107.61	14.00	26.00	17.12	90.49	300	<0.50	<0.50	<0.50	<0.50	2.2	1.4	6.7
7/31/2003	--		107.61	14.00	26.00	17.72	89.89	320	<0.50	<0.50	<0.50	<0.50	2.1	1.4	6.8
12/17/2003	NP		107.61	14.00	26.00	16.95	90.66	340	0.51	<0.50	<0.50	<0.50	4.8	1.3	6.7
02/13/2004	NP	e	113.05	14.00	26.00	16.77	96.28	<50	<0.50	<0.50	<0.50	<0.50	3.1	2.1	7.1
05/05/2004	NP		113.05	14.00	26.00	17.22	95.83	<50	<0.50	<0.50	<0.50	<0.50	1.3	1.2	6.9
08/25/2004	NP		113.05	14.00	26.00	17.66	95.39	<50	<0.50	<0.50	<0.50	<0.50	3.3	1.2	7.1
11/29/2004	NP		113.05	14.00	26.00	17.47	95.58	110	<0.50	<0.50	<0.50	<0.50	1.4	1.0	6.9
01/31/2005	NP		113.05	14.00	26.00	16.16	96.89	<50	<0.50	<0.50	<0.50	<0.50	2.0	0.87	6.2
05/09/2005	NP		113.05	14.00	26.00	16.64	96.41	50	<0.50	<0.50	<0.50	<0.50	0.80	0.83	6.7
08/10/2005	NP		113.05	14.00	26.00	17.59	95.46	65	<0.50	<0.50	<0.50	<0.50	<0.50	0.82	6.7
8/29/2006	P		113.05	14.00	26.00	17.60	95.45	<50	<0.50	<0.50	<0.50	0.74	0.51	1.0	6.4
8/15/2007	NP		113.05	14.00	26.00	17.88	95.17	<50	<0.50	<0.50	<0.50	<0.50	<0.50	0.74	6.67
8/20/2008	**NP**		**113.05**	**14.00**	**26.00**	**17.93**	**95.12**	**560**	**<0.50**	**<0.50**	**<0.50**	**<0.50**	**0.56**	**1.05**	**6.40**
MW-4															
6/21/2000	--		106.71	11.50	26.50	16.00	90.71	1,400	5.3	7.3	36	85	4	--	--
9/20/2000	--		106.71	11.50	26.50	16.03	90.68	<50	<0.5	<0.5	<0.5	<0.5	<2.5	--	--
12/22/2000	--		106.71	11.50	26.50	--	--	--	--	--	--	--	--	--	--
3/26/2001	--		106.71	11.50	26.50	15.05	91.66	<50	<0.5	<0.5	<0.5	<0.5	<2.5	--	--
5/30/2001	--		106.71	11.50	26.50	15.62	91.09	--	--	--	--	--	--	--	--
9/23/2001	--		106.71	11.50	26.50	16.07	90.64	<50	<0.5	<0.5	<0.5	<0.5	<2.5	--	--
12/28/2001	--		106.71	11.50	26.50	13.68	93.03	--	--	--	--	--	--	--	--
3/21/2002	--		106.71	11.50	26.50	14.04	92.67	<50	<0.5	<0.5	<0.5	<0.5	<2.5	--	--
4/17/2002	--		106.71	11.50	26.50	14.78	91.93	--	--	--	--	--	--	--	--
8/19/2002	--		106.71	11.50	26.50	16.18	90.53	<50	<0.5	<0.5	<0.5	<0.5	<2.5	1.4	6.8
11/27/2002	--		106.71	11.50	26.50	15.89	90.82	--	--	--	--	--	--	--	--
2/5/2003	--	d	106.71	11.50	26.50	15.40	91.31	<50	<0.50	<0.50	<0.50	<0.50	<0.50	1.1	6.6
5/13/2003	--		106.71	11.50	26.50	15.42	91.29	--	--	--	--	--	--	--	--

Table 1. Summary of Ground-Water Monitoring Data: Relative Water Elevations and Laboratory Analyses

Station #6148, 5131 Shattuck Ave., Oakland, CA

Well and Sample Date	P/NP	Comments	TOC (feet msl)	Top of Screen (ft bgs)	Bottom of Screen (ft bgs)	DTW (feet bgs)	Water Level Elevation (feet msl)	Concentrations in (µg/L)						DO (mg/L)	pH
								GRO/ TPHg	Benzene	Toluene	Ethyl-Benzene	Total Xylenes	MTBE		
MW-4 Cont.															
7/31/2003	--		106.71	11.50	26.50	16.23	90.48	<50	<0.50	<0.50	<0.50	<0.50	<0.50	1.4	6.4
12/17/2003	--		106.71	11.50	26.50	15.57	91.14	--	--	--	--	--	--	--	--
02/13/2004	P	c	112.15	11.50	26.50	15.30	96.85	<50	<0.50	<0.50	<0.50	<0.50	<0.50	1.1	6.3
05/05/2004	--		112.15	11.50	26.50	15.69	96.46	--	--	--	--	--	--	--	--
08/25/2004	P		112.15	11.50	26.50	16.07	96.08	<50	<0.50	<0.50	<0.50	0.51	<0.50	1.6	6.4
11/29/2004	--		112.15	11.50	26.50	15.86	96.29	--	--	--	--	--	--	--	--
01/31/2005	P		112.15	11.50	26.50	15.17	96.98	<50	<0.50	<0.50	<0.50	<0.50	<0.50	1.61	6.2
05/09/2005	--		112.15	11.50	26.50	15.25	96.90	--	--	--	--	--	--	--	--
08/10/2005	P		112.15	11.50	26.50	16.23	95.92	<50	<0.50	0.50	<0.50	1.1	<0.50	0.68	6.5
8/29/2006	P		112.15	11.50	26.50	16.04	96.11	<50	<0.50	<0.50	<0.50	0.53	<0.50	1.2	6.5
8/15/2007	NP		112.15	11.50	26.50	16.20	95.95	<50	<0.50	<0.50	<0.50	<0.50	<0.50	1.09	7.92
8/20/2008	**NP**		**112.15**	**11.50**	**26.50**	**16.37**	**95.78**	**<50**	**<0.50**	**<0.50**	**<0.50**	**<0.50**	**<0.50**	**0.99**	**6.56**
MW-5															
3/26/2000	--		106.60	10.00	25.00	15.45	91.15	767	12.4	<5.0	<5.0	<5.0	163	--	--
6/21/2000	--		106.60	10.00	25.00	16.52	90.08	67	<0.5	<0.5	<0.5	<1.0	10	--	--
9/20/2000	--		106.60	10.00	25.00	16.34	90.26	<50	<0.5	<0.5	<0.5	<0.5	3.48	--	--
12/22/2000	--		106.60	10.00	25.00	15.58	91.02	341	11.5	2.53	4.02	6.25	146	--	--
5/30/2001	--		106.60	10.00	25.00	15.77	90.83	110	2.3	<0.5	<0.5	0.81	72	--	--
9/23/2001	--		106.60	10.00	25.00	16.16	90.44	<50	<0.5	<0.5	<0.5	<0.5	<2.5	--	--
12/28/2001	--		106.60	10.00	25.00	14.09	92.51	240	2.8	1.9	<0.5	2.6	48	--	--
3/21/2002	--		106.60	10.00	25.00	14.43	92.17	--	<0.5	<0.5	<0.5	<0.5	--	--	--
4/17/2002	--		106.60	10.00	25.00	14.96	91.64	<50	<0.5	<0.5	<0.5	<0.5	<2.5	--	--
8/19/2002	--	c	106.60	10.00	25.00	16.34	90.26	--	--	--	--	--	--	--	--
11/27/2002	--	c	106.60	10.00	25.00	--	--	--	--	--	--	--	--	--	--
2/5/2003	--	c , d	106.60	10.00	25.00	--	--	--	--	--	--	--	--	--	--
5/13/2003	NP	f	106.60	10.00	25.00	15.43	91.17	<50	<0.50	<0.50	<0.50	<0.50	15	1.4	6.2
7/31/2003	--		106.60	10.00	25.00	16.47	90.13	<50	<0.50	<0.50	<0.50	<0.50	1.2	14.1	8.1
12/17/2003	NP		106.60	10.00	25.00	15.99	90.61	<50	<0.50	<0.50	<0.50	<0.50	1.8	15.4	8.5
02/13/2004	NP	e	112.04	10.00	25.00	15.90	96.14	<50	<0.50	<0.50	<0.50	<0.50	2.6	11.1	7.0
05/05/2004	NP		112.04	10.00	25.00	16.28	95.76	51	<0.50	<0.50	<0.50	<0.50	1.2	0.8	7.2

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Station #6148, 5131 Shattuck Ave., Oakland, CA

Well and Sample Date	P/NP	Comments	TOC (feet msl)	Top of Screen (ft bgs)	Bottom of Screen (ft bgs)	DTW (feet bgs)	Water Level Elevation (feet msl)	Concentrations in (µg/L)						DO (mg/L)	pH
								GRO/ TPHg	Benzene	Toluene	Ethyl-Benzene	Total Xylenes	MTBE		
MW-5 Cont.															
08/25/2004	NP		112.04	10.00	25.00	16.67	95.37	<50	<0.50	<0.50	<0.50	<0.50	1.1	10.5	--
11/29/2004	NP		112.04	10.00	25.00	16.37	95.67	<50	<0.50	<0.50	<0.50	<0.50	0.61	1.0	7.0
01/31/2005	NP		112.04	10.00	25.00	15.73	96.31	<50	<0.50	<0.50	<0.50	<0.50	0.86	1.63	6.3
05/09/2005	NP		112.04	10.00	25.00	15.90	96.14	<50	<0.50	<0.50	<0.50	<0.50	0.60	1.12	7.2
08/10/2005	NP		112.04	10.00	25.00	16.65	95.39	740	<0.50	<0.50	<0.50	<0.50	2.5	--	7.3
8/29/2006	P		112.04	10.00	25.00	16.60	95.44	230	<0.50	<0.50	<0.50	<0.50	1.1	--	6.4
8/20/2008	**NP**		**112.04**	**10.00**	**25.00**	**17.07**	**94.97**	**<50**	**<0.50**	**<0.50**	**<0.50**	**<0.50**	**<0.50**	**1.60**	**6.74**
MW-6															
6/21/2000	--		105.13	12.00	27.00	13.91	91.22	--	--	--	--	--	--	--	--
9/20/2000	--		105.13	12.00	27.00	14.03	91.10	--	--	--	--	--	--	--	--
12/22/2000	--		105.13	12.00	27.00	--	--	--	--	--	--	--	--	--	--
3/26/2001	--		105.13	12.00	27.00	12.59	92.54	<50	<0.5	<0.5	<0.5	<0.5	<2.5	--	--
5/30/2001	--		105.13	12.00	27.00	13.40	91.73	--	--	--	--	--	--	--	--
9/23/2001	--		105.13	12.00	27.00	13.49	91.64	--	--	--	--	--	--	--	--
12/28/2001	--		105.13	12.00	27.00	12.07	93.06	--	--	--	--	--	--	--	--
3/21/2002	--		105.13	12.00	27.00	11.79	93.34	<50	<0.5	<0.5	<0.5	<0.5	<2.5	--	--
4/17/2002	--		105.13	12.00	27.00	12.45	92.68	--	--	--	--	--	--	--	--
8/19/2002	--		105.13	12.00	27.00	13.96	91.17	<50	<0.5	<0.5	<0.5	<0.5	<2.5	2.8	6.9
11/27/2002	--		105.13	12.00	27.00	14.07	91.06	--	--	--	--	--	--	--	--
2/5/2003	--	d	105.13	12.00	27.00	13.55	91.58	--	--	--	--	--	--	--	--
5/13/2003	--		105.13	12.00	27.00	13.57	91.56	--	--	--	--	--	--	--	--
7/31/2003	--		105.13	12.00	27.00	14.18	90.95	67	<0.50	<0.50	<0.50	<0.50	<0.50	1.8	6.5
12/17/2003	--		105.13	12.00	27.00	14.12	91.01	--	--	--	--	--	--	--	--
02/13/2004	--	e	110.66	12.00	27.00	13.51	97.15	--	--	--	--	--	--	--	--
05/05/2004	--		110.66	12.00	27.00	13.95	96.71	--	--	--	--	--	--	--	--
08/25/2004	P		110.66	12.00	27.00	14.42	96.24	55	<0.50	0.98	<0.50	1.5	<0.50	3.6	6.7
11/29/2004	--		110.66	12.00	27.00	14.20	96.46	--	--	--	--	--	--	--	--
01/31/2005	--		110.66	12.00	27.00	13.33	97.33	--	--	--	--	--	--	--	--
05/09/2005	--		110.66	12.00	27.00	13.45	97.21	--	--	--	--	--	--	--	--
08/10/2005	P		110.66	12.00	27.00	14.29	96.37	53	<0.50	1.2	<0.50	2.6	<0.50	2.63	6.5

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Station #6148, 5131 Shattuck Ave., Oakland, CA

Well and Sample Date	P/NP	Comments	TOC (feet msl)	Top of Screen (ft bgs)	Bottom of Screen (ft bgs)	DTW (feet bgs)	Water Level Elevation (feet msl)	Concentrations in (µg/L)						DO (mg/L)	pH
								GRO/ TPHg	Benzene	Toluene	Ethyl-Benzene	Total Xylenes	MTBE		
MW-6 Cont.															
8/29/2006	P		110.66	12.00	27.00	14.29	96.37	<50	<0.50	<0.50	<0.50	<0.50	<0.50	--	6.5
8/15/2007	NP		110.66	12.00	27.00	14.47	96.19	<50	<0.50	<0.50	<0.50	<0.50	<0.50	2.19	6.81
8/20/2008	**NP**		**110.66**	**12.00**	**27.00**	**14.87**	**95.79**	**<50**	**<0.50**	**<0.50**	**<0.50**	**<0.50**	**<0.50**	**3.64**	**6.63**
MW-7															
6/21/2000	--		107.05	12.00	27.00	14.57	92.48	--	--	--	--	--	--	--	--
9/20/2000	--		107.05	12.00	27.00	14.58	92.47	--	--	--	--	--	--	--	--
12/22/2000	--		107.05	12.00	27.00	13.21	93.84	--	--	--	--	--	--	--	--
3/26/2001	--		107.05	12.00	27.00	13.18	93.87	71.4	<0.5	<0.5	<0.5	<0.5	<2.5	--	--
5/30/2001	--		107.05	12.00	27.00	13.80	93.25	--	--	--	--	--	--	--	--
9/23/2001	--		107.05	12.00	27.00	14.27	92.78	--	--	--	--	--	--	--	--
12/28/2001	--		107.05	12.00	27.00	12.24	94.81	--	--	--	--	--	--	--	--
3/21/2002	--		107.05	12.00	27.00	12.16	94.89	<50	<0.5	<0.5	<0.5	<0.5	<2.5	--	--
4/17/2002	--		107.05	12.00	27.00	13.08	93.97	--	--	--	--	--	--	--	--
8/19/2002	--		107.05	12.00	27.00	14.73	92.32	<50	<0.5	<0.5	<0.5	<0.5	<2.5	1.4	6.7
11/27/2002	--		107.05	12.00	27.00	14.76	92.29	--	--	--	--	--	--	--	--
2/5/2003	--	d	107.05	12.00	27.00	14.07	92.98	--	--	--	--	--	--	--	--
5/13/2003	--		107.05	12.00	27.00	14.00	93.05	--	--	--	--	--	--	--	--
7/31/2003	--		107.05	12.00	27.00	14.00	93.05	<50	<0.50	<0.50	<0.50	<0.50	<0.50	1.6	6.4
12/17/2003	--		107.05	12.00	27.00	14.10	92.95	--	--	--	--	--	--	--	--
02/13/2004	--	e	112.59	12.00	27.00	13.91	98.68	--	--	--	--	--	--	--	--
05/05/2004	--		112.59	12.00	27.00	14.60	97.99	--	--	--	--	--	--	--	--
08/25/2004	P		112.59	12.00	27.00	15.25	97.34	<50	<0.50	0.53	<0.50	0.91	<0.50	1.2	6.4
11/29/2004	--		112.59	12.00	27.00	15.00	97.59	--	--	--	--	--	--	--	--
01/31/2005	--		112.59	12.00	27.00	13.69	98.90	--	--	--	--	--	--	--	--
05/09/2005	--		112.59	12.00	27.00	13.79	98.80	--	--	--	--	--	--	--	--
08/10/2005	P		112.59	12.00	27.00	15.02	97.57	<50	<0.50	0.51	<0.50	<0.50	<0.50	1.45	6.4
8/29/2006	P		112.59	12.00	27.00	15.00	97.59	<50	<0.50	<0.50	<0.50	<0.50	<0.50	1.6	6.4
8/15/2007	NP		112.59	12.00	27.00	15.10	97.49	<50	<0.50	<0.50	<0.50	<0.50	<0.50	1.00	7.03
8/20/2008	**NP**		**112.59**	**12.00**	**27.00**	**15.75**	**96.84**	**<50**	**<0.50**	**<0.50**	**<0.50**	**<0.50**	**<0.50**	**1.17**	**6.56**

SYMBOLS AND ABBREVIATIONS:
-- = Not analyzed/applicable/measured/available
< = Not detected at or above specified laboratory reporting limit
DO = Dissolved Oxygen
DTW = Depth to water in feet below ground surface
ft bgs = feet below ground surface
GWE = Groundwater measured in feet above mean sea level
GRO = Gasoline Range Organics
mg/L = Milligrams per liter or parts per million (ppm)
MTBE = Methyl tertiary butyl ether analyzed by EPA Method 8021B unless otherwise noted (Prior to 2/5/03)
NP = Well not purged prior to sampling
P = Well purged prior to sampling
TOC = Top of casing measured in feet above mean sea level
TPH-g = Total Petroleum Hydrocarbons as Gasoline
ug/L = Micrograms per liter

FOOTNOTES:
a = Hydrocarbon pattern is present in the requested fuel quantitation range but does not resemble the pattern of the requested fuel (TPHg/GRO).
b = Chromatogram Pattern: Gasoline C6-C10 (TPHg/GRO).
c = Well MW-5 not sampled due to ORC sock wedged in well.
d = TPH-g, BTEX, and MTBE analyzed by EPA meathod 8260B beginning on 1st quarter sampling event (2/5/03).
e = Wells surveyed to NAVD'88 datum on January 29, 2004.
f = During this monitoring event, the oxygen releasing compounds (ORC) were replaced for this well.

NOTES:
Beginning in the fourth quarter 2003, the laboratory modified the reported analyte list. TPH-g was changed to GRO. The resulting data may be impacted by the potential inclusion of non-TPH-g analytes within the requested fuel range resulting in a higher concentration being reported. Beginning in the second quarter 2004, the carbon range for GRO was changed from C6-C10 to C4-C12.

The values for pH and DO were obtained from field measurements.

The top and bottom of screen depths for wells MW-1, MW-2 and MW-3 were obtained from EMCON O&M sampling sheets not from well logs.

Note: The data within this table collected prior to April 2006 was provided to Broadbent & Associates, Inc. by Atlantic Richfield Company and their previous consultants. Broadbent & Associates, Inc. has not verified the accuracy of this information.

Table 2. Summary of Fuel Additives Analytical Data

Station #6148, 5131 Shattuck Ave., Oakland, CA

Well and Sample Date	Concentrations in (µg/L)								Comments
	Ethanol	TBA	MTBE	DIPE	ETBE	TAME	1,2-DCA	EDB	
MW-1									
2/5/2003	<40	<20	1.1	<0.50	<0.50	<0.50	--	--	
5/13/2003	<100	<20	<0.50	<0.50	<0.50	<0.50	--	--	
7/31/2003	<100	<20	0.55	<0.50	<0.50	<0.50	<0.50	<0.50	
12/17/2003	<100	<20	2.5	<0.50	<0.50	<0.50	<0.50	<0.50	
05/05/2004	<100	<20	0.60	<0.50	<0.50	<0.50	<0.50	<0.50	
08/25/2004	<100	<20	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	a
11/29/2004	<100	<20	0.62	<0.50	<0.50	<0.50	<0.50	<0.50	
01/31/2005	<100	<20	0.59	<0.50	<0.50	<0.50	<0.50	<0.50	
05/09/2005	<100	<20	0.55	<0.50	<0.50	<0.50	<0.50	<0.50	
08/10/2005	<100	<20	0.62	<0.50	<0.50	<0.50	<0.50	<0.50	
8/29/2006	<300	<20	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
8/15/2007	<300	<20	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	b
8/20/2008	**<300**	**<10**	**<0.50**	**<0.50**	**<0.50**	**<0.50**	**<0.50**	**<0.50**	
MW-2									
2/5/2003	<40	<20	4.3	<0.50	<0.50	<0.50	--	--	
5/13/2003	<100	<20	2.8	<0.50	<0.50	<0.50	--	--	
7/31/2003	<100	<20	2.0	<0.50	<0.50	<0.50	<0.50	<0.50	
12/17/2003	<100	<20	2.4	<0.50	<0.50	<0.50	<0.50	<0.50	
02/13/2004	<100	<20	1.6	<0.50	<0.50	<0.50	<0.50	<0.50	
05/05/2004	<100	<20	0.99	<0.50	<0.50	<0.50	<0.50	<0.50	
08/25/2004	<100	<20	0.63	<0.50	<0.50	<0.50	<0.50	<0.50	
11/29/2004	<100	<20	0.55	<0.50	<0.50	<0.50	<0.50	<0.50	
01/31/2005	<100	<20	1.2	<0.50	<0.50	<0.50	<0.50	<0.50	
05/09/2005	<100	<20	1.8	<0.50	<0.50	<0.50	<0.50	<0.50	
08/10/2005	<100	<20	1.5	<0.50	<0.50	<0.50	<0.50	<0.50	
8/29/2006	<300	<20	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
8/15/2007	<300	<20	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	b
8/20/2008	**<300**	**<10**	**<0.50**	**<0.50**	**<0.50**	**<0.50**	**<0.50**	**<0.50**	
MW-3									
2/5/2003	<40	<20	2.4	<0.50	<0.50	<0.50	--	--	

Table 2. Summary of Fuel Additives Analytical Data

Station #6148, 5131 Shattuck Ave., Oakland, CA

Well and Sample Date	Concentrations in (µg/L)								Comments
	Ethanol	TBA	MTBE	DIPE	ETBE	TAME	1,2-DCA	EDB	
MW-3 Cont.									
5/13/2003	<100	<20	2.2	<0.50	<0.50	<0.50	--	--	
7/31/2003	<100	<20	2.1	<0.50	<0.50	<0.50	<0.50	<0.50	
12/17/2003	<100	<20	4.8	<0.50	<0.50	<0.50	<0.50	<0.50	
02/13/2004	<100	<20	3.1	<0.50	<0.50	<0.50	<0.50	<0.50	
05/05/2004	<100	<20	1.3	<0.50	<0.50	<0.50	<0.50	<0.50	
08/25/2004	<100	<20	3.3	<0.50	<0.50	<0.50	<0.50	<0.50	
11/29/2004	<100	<20	1.4	<0.50	<0.50	<0.50	<0.50	<0.50	
01/31/2005	<100	<20	2.0	<0.50	<0.50	<0.50	<0.50	<0.50	
05/09/2005	<100	<20	0.80	<0.50	<0.50	<0.50	<0.50	<0.50	
08/10/2005	<100	<20	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
8/29/2006	<300	<20	0.51	<0.50	<0.50	<0.50	<0.50	<0.50	
8/15/2007	<300	<20	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	b
8/20/2008	**<300**	**<10**	**0.56**	**<0.50**	**<0.50**	**<0.50**	**<0.50**	**<0.50**	
MW-4									
7/31/2003	<100	<20	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
02/13/2004	<100	<20	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
08/25/2004	<100	<20	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
01/31/2005	<100	<20	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
08/10/2005	<100	<20	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
8/29/2006	<300	<20	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
8/15/2007	<300	<20	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	b
8/20/2008	**<300**	**<10**	**<0.50**	**<0.50**	**<0.50**	**<0.50**	**<0.50**	**<0.50**	
MW-5									
5/13/2003	<100	<20	15	<0.50	<0.50	1.1	--	--	
7/31/2003	<100	<20	1.2	<0.50	<0.50	<0.50	<0.50	<0.50	
12/17/2003	<100	<20	1.8	<0.50	<0.50	<0.50	<0.50	<0.50	
02/13/2004	<100	<20	2.6	<0.50	<0.50	<0.50	<0.50	<0.50	
05/05/2004	<100	<20	1.2	<0.50	<0.50	<0.50	<0.50	<0.50	
08/25/2004	<100	<20	1.1	<0.50	<0.50	<0.50	<0.50	<0.50	
11/29/2004	<100	<20	0.61	<0.50	<0.50	<0.50	<0.50	<0.50	

Table 2. Summary of Fuel Additives Analytical Data

Station #6148, 5131 Shattuck Ave., Oakland, CA

Well and Sample Date	Concentrations in (µg/L)								Comments
	Ethanol	TBA	MTBE	DIPE	ETBE	TAME	1,2-DCA	EDB	
MW-5 Cont.									
01/31/2005	<100	<20	0.86	<0.50	<0.50	<0.50	<0.50	<0.50	
05/09/2005	<100	<20	0.60	<0.50	<0.50	<0.50	<0.50	<0.50	
08/10/2005	<100	<20	2.5	<0.50	<0.50	<0.50	<0.50	<0.50	
8/29/2006	<300	<20	1.1	<0.50	<0.50	<0.50	<0.50	<0.50	
8/20/2008	**<300**	**<10**	**<0.50**	**<0.50**	**<0.50**	**<0.50**	**<0.50**	**<0.50**	
MW-6									
7/31/2003	<100	<20	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
08/25/2004	<100	<20	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
08/10/2005	<100	<20	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
8/29/2006	<300	<20	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
8/15/2007	<300	<20	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	b
8/20/2008	**<300**	**<10**	**<0.50**	**<0.50**	**<0.50**	**<0.50**	**<0.50**	**<0.50**	
MW-7									
7/31/2003	<100	<20	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
08/25/2004	<100	<20	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
08/10/2005	<100	<20	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
8/29/2006	<300	<20	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
8/15/2007	<300	<20	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	b
8/20/2008	**<300**	**<10**	**<0.50**	**<0.50**	**<0.50**	**<0.50**	**<0.50**	**<0.50**	

SYMBOLS AND ABBREVIATIONS:
< = Not detected at or above the specified laboratory reporting limit
-- = Not available/analyzed/applicable
DIPE = Di-isopropyl ether
EDB = 1,2-Dibromoethane
ETBE = Ethyl tert butyl ether
MTBE = Methyl tert-butyl ether
1,2-DCA = 1,2-Dichloroethane
TAME = tert-Amyl methyl ether
TBA = tert-Butyl alcohol
ug/L = micrograms per liter

FOOTNOTES:
a = This sample was analyzed beyond the EPA recommended holding time. The results may still be useful for their intended purpose.
b = Calib. Verif. Is within method limits but outside contract limits for Ethanol.

Note: The data within this table collected prior to April 2006 was provided to Broadbent & Associates, Inc. by Atlantic Richfield Company and their previous consultants. Broadbent & Associates, Inc. has not verified the accuracy of this information.

Table 3. Historical Ground-Water Flow Direction and Gradient

Station #6148, 5131 Shattuck Ave., Oakland, CA

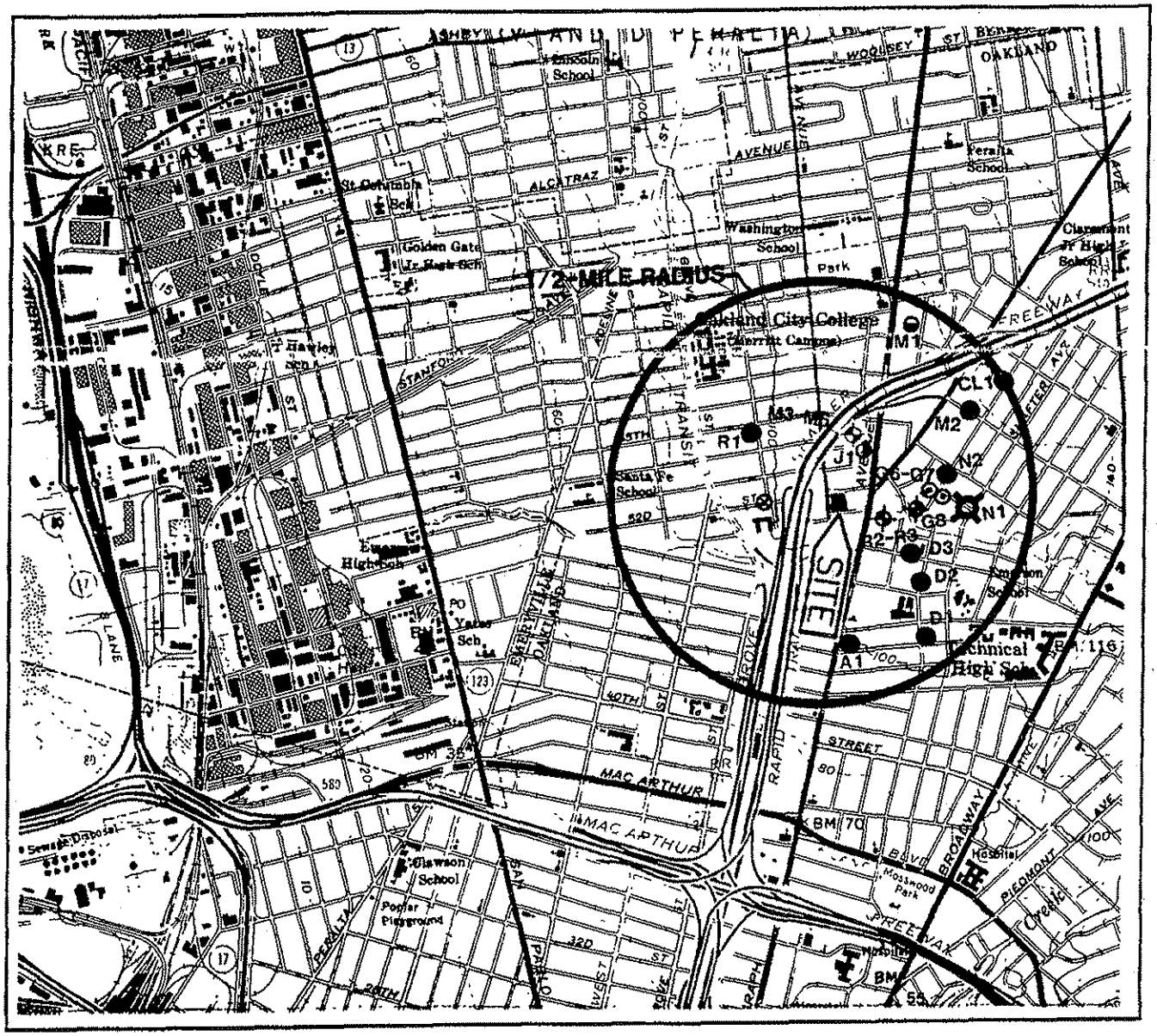
Date Sampled	Approximate Flow Direction	Approximate Hydraulic Gradient
6/21/2000	South-Southwest	0.016
9/20/2000	South-Southwest	0.017
12/22/2000	South-Southwest	0.022
3/26/2001	South-Southwest	0.02
5/30/2001	South-Southwest	0.02
9/23/2001	South-Southwest	0.019
12/28/2001	Southwest	0.019
3/21/2002	Southwest	0.019
4/17/2002	Southwest	0.017
8/19/2002	Southwest	0.016
11/27/2002	Southwest	0.015
2/5/2003	Southwest	0.017
5/13/2003	Southwest	0.013
7/31/2003	Southwest	0.014
2/13/2004	Southwest	0.016
5/5/2004	Southwest	0.016
8/25/2004	Southwest	0.013
11/29/2004	Southwest	0.013
1/31/2005	Southwest	0.02
5/9/2005	Southwest	0.02
8/10/2005	Southwest	0.02
8/29/2006	Southwest	0.014
8/15/2007	Southwest	0.015
8/20/2008	**Southwest**	**0.012**

Note: The data within this table collected prior to April 2006 was provided to Broadbent & Associates, Inc. by Atlantic Richfield Company and their previous consultants. Broadbent & Associates, Inc. has not verified the accuracy of this information.

ATTACHMENT 5

WELL SURVEY MAP AND DATA TABLE

(6 PAGES)



Source U S Geological Survey
7.5–Minute Quadrangle
Oakland West, California.
Photorevised 1980.

◑ = Industrial well
⊖ = Monitoring well
⊠ = Destroyed well
● = Cathodic well
◒ = Domestic well
⊙ = Piezometric well
⊗ = Geotechnical well

Approximate Scale

2000 1000 0 2000 4000

feet

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PROJECT 61035.05

WELL LOCATION MAP
ARCO Station 6148
5131 Shattuck Avenue
Oakland, California

PLATE
3

TABLE 1
WELL SURVEY DATA
ARCO Station 6148
Oakland, California
(Page 1 of 1)

Map Section Number	Well Number	Well Type	Well Owner	Well Depth (feet)	Depth to Water (feet)
13	L2	Cathodic Protection	EBMUD	50	NA
13	M2	Cathodic Protection	PG&E	120	NA
13	N2	Cathodic Protection	EBMUD	50	NA
24	D1	Cathodic Protection	EBMUD	53	25
24	D2	Cathodic Protection	EBMUD	53	NA
24	D3	Cathodic Protection	PG&E	120	NA
13	G8	Monitoring	City of Oakland	33	18
13	M3	Monitoring	Chevron USA Inc	30	13
13	M4	Monitoring	Chevron USA Inc	29	13
13	M5	Monitoring	Chevron USA Inc	29	13
14	R2	Monitoring	Pacific Rim Development	31	17
14	R3	Monitoring	Pacific Rim Development	36	16
23	A1	Monitoring	Wayne Kelly Auto Parts	35	14
13	G6	Piezometric	City of Oakland	28	18
13	G7	Piezometric	City of Oakland	28	23
14	J1	Industrial	Marshall Steel Company	40	NA
13	N1	Abandoned	Mrs H. Gotelli	85	9
14	R1	Geotechnical	Children's Hospital	150	NA
13	M1	Domestic	Angela Delucchi	75	5

EBMUD: East Bay Municipal Utility District.
PG&E: Pacific Gas and Electric.
NA: Not available.

Source: Andreas Godfry, County of Alameda Public Works Department.

ATTACHMENT 6

AIR SPARGE / VAPOR EXTRACTION PILOT TEST DATA

(6 PAGES)

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TABLE 2
SPARGE AND VAPOR EXTRACTION WELL DATA SUMMARY
ARCO Station 6148
Oakland, California

Well ID	Well Type	Depth-to-Water	Screened Interval	Depth of Well
AS-2	Sparge	17.04	24.5 to 26.5	26.5
VW-1	Vadose	16.64	14 to 24	24
VW-2	Vadose	16.64	15 to 20	20
VW-3	Vadose	16.96	14 to 24	24
MW-1	Monitoring	17.14	13 to 26	26
MW-2	Monitoring	16.82	14 to 26	26
MW-3	Monitoring	16.98	14 to 26	26

Notes:
Measurements in feet below ground surface.

TABLE 3
AIR SPARGE TEST FIELD MONITORING DATA
ARCO Station 6148
Oakland, California
(Page 1 of 2)

February 16, 1994

Time	AS-2	MW-2	MW-1	VW-1	MW-3	VW-3
Pre-Sparge	$TPHg_{GW}$ = 180	$TPHg_{GW}$ = 12,000 $TPHg_V$ = 4,900	$TPHg_{GW}$ = 150 $TPHg_V$ = <5.0	$TPHg_{GW}$ = FP $TPHg_V$ = 2,900	$TPHg_{GW}$ = 11,000 $TPHg_V$ = 620	$TPHg_{GW}$ = 70,000 $TPHg_V$ = 2,900
4:45 (start sparge)	Q_A = 2.0 Q_E = 1.0 P_i = 9.0	—	—	—	—	
4:45-5:00		H_V = 0.13 H_S = 0.40	H_V = 0.09 H_S = 0.07	H_V = 0.15 H_S = 0.43	H_V = 0.21 H_S = 0.37	H_V = 0.32 H_S = 0.03
5:00-5:15		H_V = 0.05 H_S = 0.16	H_V = 0.28 H_S = 0.40	H_V = 0.03 H_S = 0.11	H_V = 0.18 H_S = 0.39	H_V = 0.66 H_S = 0.38
5:15-5:30		H_V = 1.5 H_S = 0.37	H_V = 0.14 H_S = 0.26	H_V = 0.03 H_S = 0.52	H_V = 0.00 H_S = 0.49	H_V = 0.49 H_S = 0.26
5:30-5:45		H_V = 4.8 H_S = 0.25	H_V = 0.07 H_S = 0.22	H_V = 0.00 H_S = 0.21	H_V = 0.04 H_S = 0.34	H_V = 0.47 H_S = 0.22
5:45 (end sparge)	$TPHg_{GW}$ = 220	$TPHg_{GW}$ = 22,000 $TPHg_V$ = 4,600	$TPHg_{GW}$ = 140 $TPHg_V$ = 300	$TPHg_{GW}$ = FP $TPHg_V$ = 8,400	$TPHg_{GW}$ = 10,000 $TPHg_V$ = 1,400	$TPHg_{GW}$ = 61,000 $TPHg_V$ = 3,700
Distance from sparge well		10'6"	14'	14'2"	14'7"	26'6"

See notes on page 2 of 2

TABLE 3
AIR SPARGE TEST DATA
ARCO Station 6148
Oakland, California
(Page 2 of 2)

Notes:

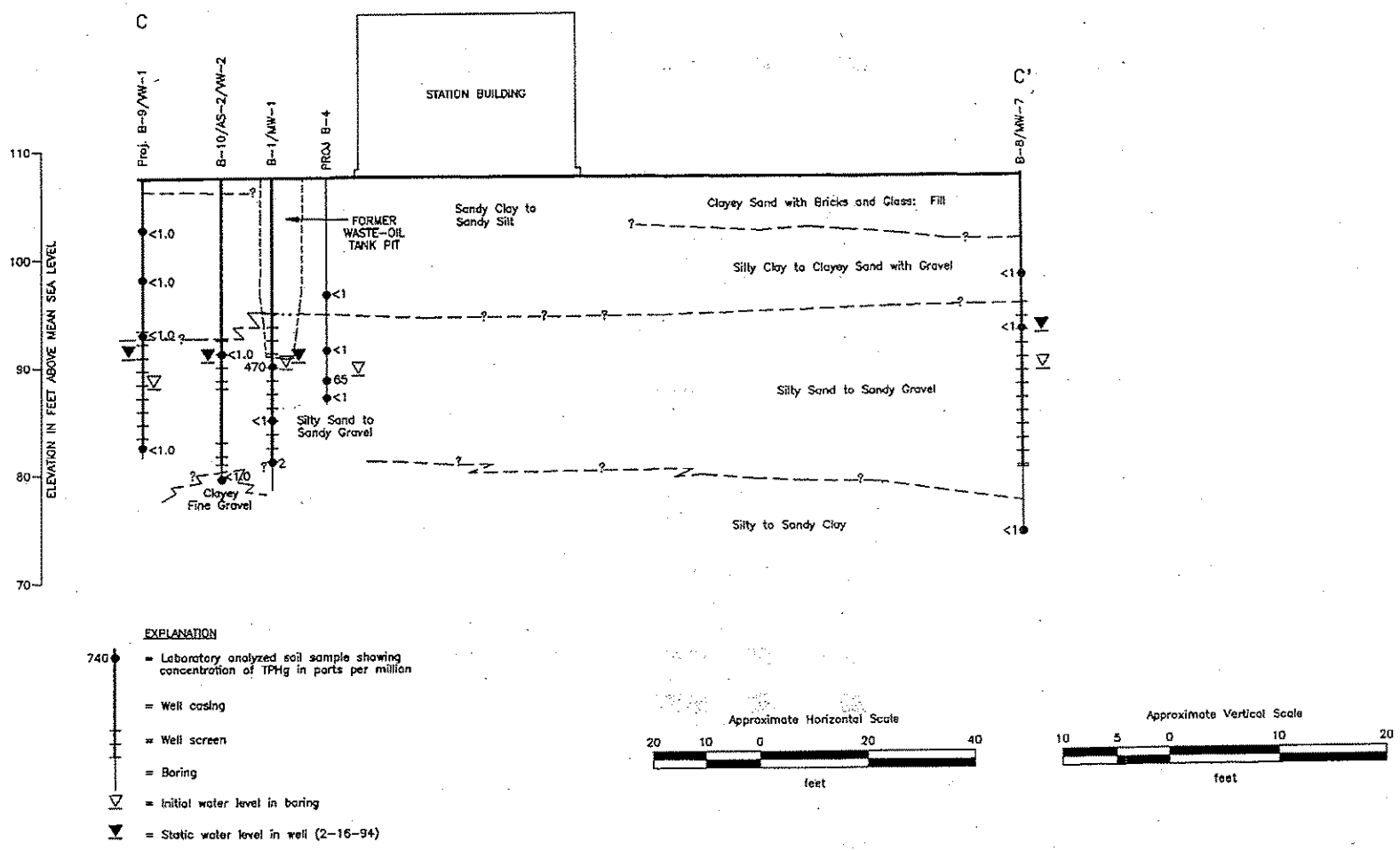
TPHg:	Total petroleum hydrocarbons as gasoline.
$TPHg_V$:	Concentrations of TPHg vapor in soil gas measured in mg/m^3.
$TPHg_{GW}$:	Concentrations of TPHg dissolved in groundwater measured in parts per billion.
Q_A:	Injection rate of sparge air measured in actual cubic feet per minute.
Q_H:	Injection rate of helium measured in actual cubic feet per minute.
P_I:	Combined air and helium injection pressure measured in pounds per square inch.
H_V:	Levels of helium in vadose zone measured in percent.
H_S:	Levels of helium in saturated zone measured in percent.
—:	Not applicable, not sampled, or not measured.

TABLE 4
COMBINATION VAPOR EXTRACTION/AIR SPARGE TEST FIELD MONITORING DATA
ARCO Station 6148
Oakland, California

February 17, 1994

Influent Air Stream from VW-1				Injection Well AS-2		Observation Wells			
						MW-2	MW-3	MW-1	VW-3
Elapsed Time (min)	Flow Rate (acfm)	Applied Vacuum ("H_2O)	OVM Readings (ppm)	Flow Rate (acfm)	Applied Pressure (psi)	Induced Vacuum ("H_2O)	Induced Vacuum ("H_2O)	Induced Vacuum ("H_2O)	Induced Vacuum ("H_2O)
0	25	28	5,700			0.07	0.06	0.04	0.02
15	25	38	5,800			0.07	0.06	0.02	0.03
30	25	40	4,900			0.07	0.05	0.01	0.02
45	25	39	8,750			0.06	0.05	0.01	0.03
60	25	38	5,110			0.06	0.05	0.01	0.03
		Begin Air Sparging							
75	25	38	6,400	2.5	9	0.03	0.03	0.00	0.01
90	25	36	6,120	2.5	9	0.03	0.03	0.00	0.01
105	25	35	6,500	2.5	9	0.03	0.03	0.00	0.02
120	25	35	5,470	2.5	9	0.03	0.03	0.00	0.01
Distance from extraction well VW-1 (feet):						14'3"	20'2"	28'	37'10"

Notes:
acfm = actual cubic feet per minute
" H_2O = inches of water column
ppm = parts per million
No detectable background fluctuations in atmospheric pressure.



EXPLANATION

740 = Laboratory analyzed soil sample showing concentration of TPHg in parts per million

= Well casing

= Well screen

= Boring

▽ = Initial water level in boring

▼ = Static water level in well (2-16-94)

Approximate Horizontal Scale

20 10 0 20 40

feet

Approximate Vertical Scale

10 5 0 10 20

feet

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PROJECT 61035.11 61035.11C

GEOLOGIC CROSS SECTION C-C'
ARCO Station 6148
5131 Shattuck Avenue
Oakland, California

PLATE 4

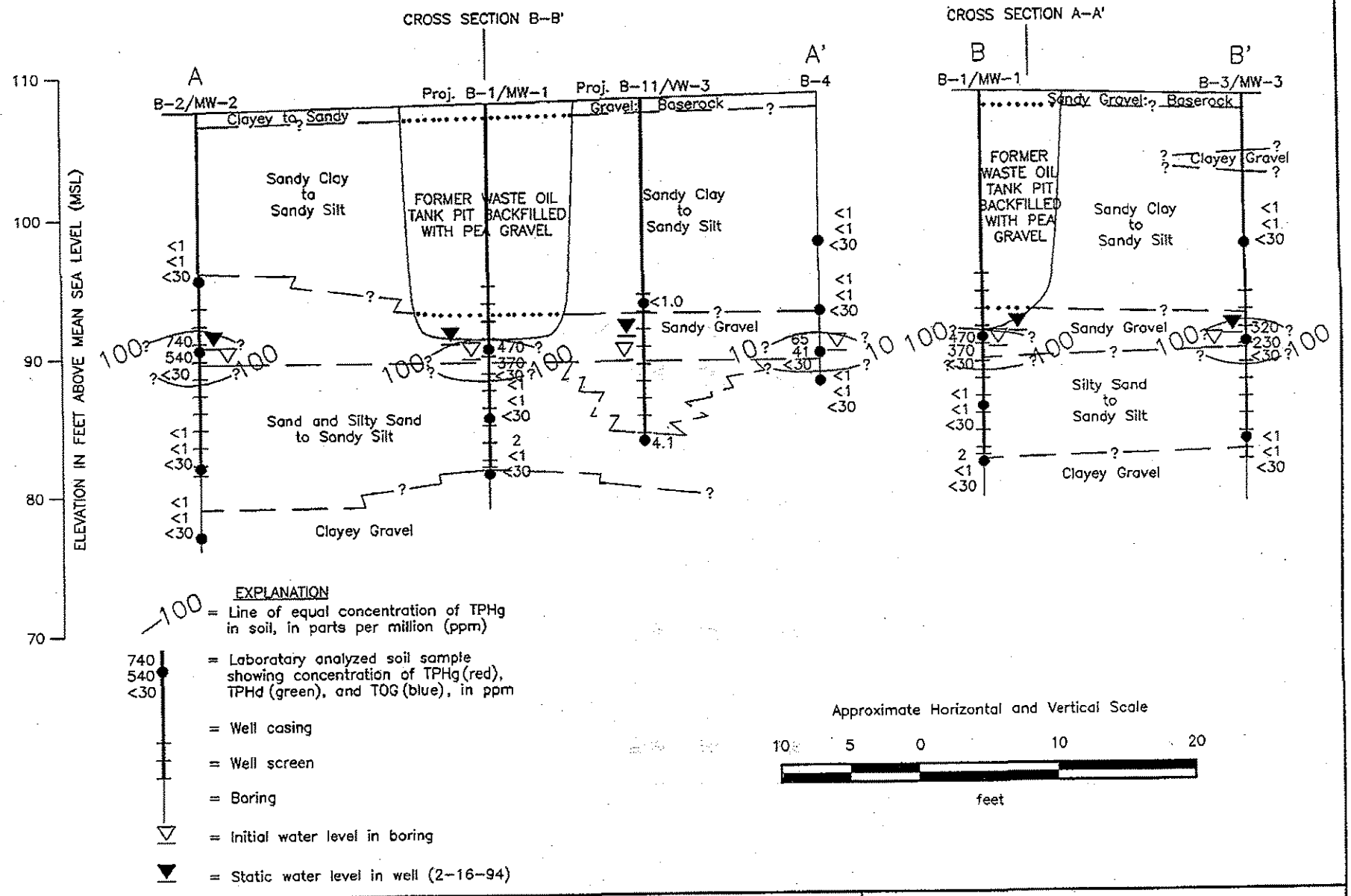

PLATE	GEOLOGIC CROSS SECTIONS A-A' AND B-B' ARCO Station 6148 5131 Shattuck Avenue Oakland, California	RESNA Working to Restore Nature
3		PROJECT 61035.11

ATTACHMENT 7

BORING LOGS

MONITORING WELL CONSTRUCTION DETAILS

(27 PAGES)

Depth of boring: 29 feet Diameter of boring: 10 inches Date drilled: 12/20/91

Well depth: 26 feet Material type: Sch 40 PVC Casing diameter: 4 inches

Screen interval: 13 to 26 feet Slot size: 0.020-inch

Drilling Company: HEW Drilling Driller: Jasper and Louie

Method Used: Hollow-Stem Auger Field Geologist: Barbara Sieminski

Signature of Registered Professional:

Registration No.: CEG 1463 State: CA

Depth	Sample No.	Blows	P.I.D.	USCS Code	Description	Well Const.
					Paved area – old tank pit.	
0					Asphalt (4 inches).	
				GP	Gravel, brown, damp, loose; subrounded to rounded, well-sorted: pea gravel backfill.	
2						
4						
6					Pea gravel.	
8						
10						
12					Pea gravel.	
14						
16						
	S-17.5	7 16 22		GP	Sandy gravel, with silt, green, moist, dense; obvious product odor	
18				SM	Silty sand, with gravel, light brown, wet, medium dense.	
20					(Section continues downward)	

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LOG OF BORING B-1/MW-1

ARCO Station 6148
5131 Shattuck Avenue
Oakland, California

PLATE 4

Depth	Sample No.	BLOWS	P.I.D.	USCS Code	Description	Well Const.
22	S-22.5	3 4 7	0	SM	Silty sand, with gravel, light brown, wet, medium dense More silt, no gravel.	
24						
26	S-26.5	7 2 7	0	GC	Clayey gravel, with sand, light brown, moist to wet, loose to medium dense.	
28		6 8 7				
30					Totol depth = 29 feet.	
32						
34						
36						
38						
40						
42						
44						
46						
48						
50						

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LOG OF BORING B-1/MW-1

ARCO Station 6148
5131 Shattuck Avenue
Oakland, California

PLATE 5

Depth of boring: 31-1/2 feet Diameter of boring: 10 inches Date drilled: 12/19/91

Well depth: 26 feet Material type: Sch 40 PVC Casing diameter: 4 inches

Screen interval: 14 to 26 feet Slot size: 0.020-inch

Drilling Company: HEW Drilling Driller: Jasper and Louie

Method Used: Hollow-Stem Auger Field Geologist: Lou Leet

Signature of Registered Professional:

Registration No.: CEG 1463 State: CA

Depth	Sample No.	Blows	P.I.D.	USCS Code	Description	Well Const.
					Paved area.	
0					Asphalt (4 inches).	
				GC	Clayey gravel, dark brown, damp, medium dense; baserock	
				CL	Sandy clay, dark brown, damp, medium plasticity, stiff.	
2						
4						
	S-5.5	5 6 8	0		Color change to brown.	
6						
8						
				ML	Sandy silt, with gravel, brown, damp, low plasticity, stiff; angular gravel.	
10	S-10.5	3 5 10	0			
	S-12	8 13 16	0	GP	Sandy gravel, light brown, damp, medium dense; angular gravel.	
14					Color change to brown, increasing silt, larger gravel.	
	S-15.5	2 10 16	20	GW	Sandy gravel, with silt, green, moist, medium dense; noticeable product odor, gravel to 1 inch diameter, subrounded.	
16	S-17	12 15 18	350		More sand, very moist, obvious product odor.	
18				SW	Sand, with gravel, light brown, wet, medium dense.	
20	S-20.5	5 6 10	2			

(Section continues downward)

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LOG OF BORING B-2/MW-2

ARCO Station 6148
5131 Shattuck Avenue
Oakland, California

PLATE 6

Depth	Sample No.	BLOWS	P.I.D.	USCS Code	Description	Well Const.
22				SW	Sand, with gravel, light brown, wet, medium dense.	
24						
26	S-25.5	3 3 3	0			
28				ML	Sandy silt, with clay, light brown, moist, medium plasticity, firm.	
30	S-30.5	19 12 20	0	GC	Clayey gravel, with sand, light brown, moist to damp, dense; gravel up to 1-1/2 inches diameter.	
32					Total depth = 31-1/2 feet.	
34						
36						
38						
40						
42						
44						
46						
48						
50						

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PROJECT 61035.02

LOG OF BORING B-2/MW-2

ARCO Station 6148
5131 Shattuck Avenue
Oakland, California

PLATE 7

Depth of boring: 29 feet Diameter of boring: 10 inches Date drilled: 12/20/91

Well depth: 26 feet Material type: Sch 40 PVC Casing diameter: 4 inches

Screen interval: 14 to 26 feet Slot size: 0.020-inch

Drilling Company: HEW Drilling Driller: Jasper and Louie

Method Used: Hollow-Stem Auger Field Geologist: Barbara Sieminski

Signature of Registered Professional:

Registration No.: CEG 1463 State: CA

Depth	Sample No.	Blows	P.I.D.	USCS Code	Description	Well Const.
					Paved area.	
0					Asphalt (4 inches).	
				SP	Sandy gravel, brown, damp, loose; baserock.	
2				CL	Sandy clay, dark brown, damp, medium plasticity, stiff.	
4				GC	Clayey gravel, with sand, dark brown, damp, medium dense; subangular gravel up to 1 inch diameter	
6	S-5.5	4 6 10	0	CL	Sandy clay, with small gravel, dark brown, damp, medium plasticity, stiff; with roots.	
8						
10	S-10.5	2 4 6	0		More gravel.	
				ML	Sandy silt, with gravel, brown, damp, low plasticity, stiff; subangular gravel.	
12						
14					Gravel up to 1 inch diameter.	
	S-15.5	4 8 10	25	GP	Sandy gravel, with silt, green, moist, medium dense; noticeable product odor.	
16		10				
	S-17.5	14	268		More sand; obvious product odor.	
18		24		SM	Silty sand, with gravel, green, wet, dense.	
	S-19	8 13 18	3		Color change to light brown, more gravel.	
20					(Section continues downward)	

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PROJECT: 61035.02

LOG OF BORING B-3/MW-3

ARCO Station 6148
5131 Shattuck Avenue
Oakland, California

PLATE 8

Depth	Sample No.	BLOWS	P.I.D.	USCS Code	Description	Well Const.
22				SM	Silty sand, with gravel, light brown, wet, dense.	
24	S-24.5	4 8 12	0		Less gravel.	
				ML	Sandy silt, light brown, wet, low plasticity, very stiff.	
26	S-26.5	10 15 20	0	GC	Clayey gravel, with sand, light brown, moist, dense.	
28		12 16 20	0			
					Total depth = 29 feet.	
30						
32						
34						
36						
38						
40						
42						
44						
46						
48						
50						

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LOG OF BORING B-3/MW-3

ARCO Station 6148
5131 Shattuck Avenue
Oakland, California

PLATE 9

Depth of boring: 32 feet Diameter of boring: 10.25 inches Date drilled: 10/27/92

Well depth: 26-1/2 feet Material type: Sch 40 PVC Casing diameter: 4 inches

Screen interval: 11-1/2 to 26-1/2 feet Filter pack: #3 Sand Slot size: 0.020-inch

Drilling Company: Exploration GeoServices Driller: Dave and Dennis

Method Used: Hollow-Stem Auger Field Geologist: Rob Campbell

Signature of Registered Professional:

Registration No.: CEG 1463 State: CA

Depth	Sample No.	Blows	P.I.D.	USCS Code	Description	Well Const.
					Asphalt-covered surface.	
0					Asphalt (4 inches).	
				SC	Clayey sand with silt, dark brown, damp, medium dense; brick fragments, glass: fill.	
2						
4		5		CL	Silty clay, dark brown, damp, low plasticity.	
	S-5	7	0			
		9		ML	Clayey silt, brown, damp, stiff, low plasticity.	
6						
8						
	S-9.5	6	0			
10		8				
		9	30		Product odor at 11 feet.	
12				GP-GM	Gravel with sand and silt, 1-2 inch gravel, olive-green, moist, medium dense; product odor.	
				SP-SM	Gravelly sand with silt, medium-grained sand and gravel, olive-green, moist, medium loose; product odor, root holes.	
14		10				
	S-14.5	14	210			
		12				
16			180			
			20 ▽	GP-GM	Sandy gravel with silt and clay, brown, wet, medium dense; no product odar.	
18						
		13				
20	S-20	15	0			
		14				

(Section continues downward)

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LOG OF BORING B-5/MW-4
ARCO Station 6148
5131 Shattuck Avenue
Oakland, California

PLATE 5

Depth	Sample No.	BLOWS	P.I.D.	USCS Code	Description	Well Const.
22				GP–GM	Sandy gravel with silt, brown, wet, dense; root holes.	
24	S–25	14 18 22	0			
26						
28				CL	Silty clay, brown, damp, low plasticity, hard.	
30	S–30	15 19 27	0			
		9				
	S–31.5	13 15	0			
32					Total depth = 32 feet.	
34						
36						
38						
40						
42						
44						
46						
48						
50						

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PROJECT 61035.05

LOG OF BORING B–5/MW–4
ARCO Station 6148
5131 Shattuck Avenue
Oakland, California

PLATE
6

Depth of boring: 28 feet Diameter of boring: 10.25 inches Date drilled: 10/28/92

Well depth: 25 feet Material type: Sch 40 PVC Casing diameter: 4 inches

Screen interval: 10 to 25 feet Filter pack: #3 Sand Slot size: 0.020-inch

Drilling Company: Exploration GeoServices Driller: Dave and Dennis

Method Used: Hollow-Stem Auger Field Geologist: Rob Campbell

Signature of Registered Professional:

Registration No.: CEG 1463 State: CA

Depth	Sample No.	Blows	P.I.D.	USCS Code	Description	Well Const.
					Asphalt-covered surface.	
0					Asphalt (4 inches).	
				SC	Clayey sand with silt, dark brown, damp, medium dense; brick fragments, glass fragments: fill.	
2						
4	S-4.5	11 12 13	0			
6						
8				GM	Silty gravel with sand, brown, damp, medium dense.	
10	S-9.5	10 12 14	50		Slight product odor at 10 feet.	
12				GP	Sandy gravel, olive-green, moist, loose; product odor.	
				GP-GC	Sandy gravel with clay, olive-green, moist, dense; product odor.	
14	S-14.5	12 18 19	36			
16	S-16	8	407			
	S-16.5	14				
	S-17.5	16				
18	S-18	7	210	▽		
	S-18.5	8				
	S-19	9		SP	Gravelly sand, light brown, wet, dense; slight product odor.	
	S-19.5	12				
20	S-20	18 19	10			
	S-20.5	7				
	S-21	10 13	0	GP	Sandy gravel, gray, wet, medium dense; no product odor.	
				SM	Silty sand, gray with brown mottling, wet, medium dense.	

(Section continues downward)

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LOG OF BORING B-6/MW-5
ARCO Station 6148
5131 Shattuck Avenue
Oakland, California

PLATE 7

Depth	Sample No.	BLOWS	P.I.D.	USCS Code	Description	Well Const.
	S-20.5	7		SP	Gravelly sand, light brown, wet, dense; no product odor.	
	S-21	10	0	GP	Sandy gravel, gray, wet, medium dense.	
22	S-22	13	0	SM	Silty sand, gray with brown mottling, wet, medium dense.	
	S-22.5	4 7	0			
	S-23.5	9				
24	S-24	13 20	0	GW-GC	Gravelly sand with clay, brown with black mottling, wet, dense.	
	S-25	12 12	0			
26	S-26	15 19	0	CL	Silty clay, brown with gray mottling, wet, hard.	
		14				
	S-27.5	21 25	0			
28					Total depth = 28 feet.	
30						
32						
34						
36						
38						
40						
42						
44						
46						
48						
50						

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LOG OF BORING B-6/MW-5
ARCO Station 6148
5131 Shattuck Avenue
Oakland, California

PLATE
8

Depth of boring: 30 feet Diameter of boring: 10.25 inches Date drilled: 10/28/92

Well depth: 27 feet Material type: Sch 40 PVC Casing diameter: 4 inches

Screen interval: 12 to 27 feet Filter pack: #3 Sand Slot size: 0.020-inch

Drilling Company: Exploration GeoServices Driller: Dave and Dennis

Method Used: Hollow-Stem Auger Field Geologist: Rob Campbell

Signature of Registered Professional:

Registration No.: CEG 1463 State: CA

Depth	Sample No.	Blows	P.I.D.	USCS Code	Description	Well Const.
					Asphalt-covered surface.	
0					Asphalt (4 inches).	
				SC	Clayey sand, dark brown, damp, medium dense; no product odor, brick fragments: fill.	
2						
4	S-4.5	4 7 7	0			
6				SC	Clayey sand with gravel, brown with greenish-gray ond black mottling, damp to moist, medium dense; root holes.	
8						
10	S-10	6 8 10	0			
12					Color change to olive-green at 12 feet, moist. Color change to brown at 13-1/2 feet.	
				SP	Gravelly sand, brown with orange and gray mottling, moist, medium dense; product odor, root holes.	
14		10				
	S-15	11 10	42			
16						
18				SM	Silty sand with gravel, gray with brown mottling, wet, medium dense; no product odor, cross-bedding lamination.	
	S-19	9	0			
20		10 12				

(Section continues downward)

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LOG OF BORING B-7/MW-6
ARCO Station 6148
5131 Shattuck Avenue
Oakland, California

PLATE 9

Depth	Sample No.	BLOWS	P.I.D.	USCS Code	Description	Well Const.
22				SM	Silty sand with gravel, gray with brown mottling, wet, medium dense; no product odor.	
24				GP	Sondy gravel, brown with orange mottling, wet, dense.	
	S-25	13 18 22	0			
26						
28	S-28	13 27 42	0	CL	Sandy clay, brown, damp, low plasticity, hard; root holes.	
	S-29.5	12 16 27	0			
30					Total depth = 30 feet.	
32						
34						
36						
38						
40						
42						
44						
46						
48						
50						

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LOG OF BORING B-7/MW-6
ARCO Station 6148
5131 Shattuck Avenue
Oakland, California

PLATE
10

Depth of boring: 34 feet Diameter of boring: 10.25 inches Date drilled: 10/27/92

Well depth: 27 feet Material type: Sch 40 PVC Casing diameter: 4 inches

Screen interval: 12 to 27 feet Filter pack: #3 Sand Slot size: 0.020-inch

Drilling Company: Exploration GeoServices Driller: Dave and Dennis

Method Used: Hollow-Stem Auger Field Geologist: Rob Campbell

Signature of Registered Professional:

Registration No.: CEG 1463 State: CA

Depth	Sample No.	Blows	P.I.D.	USCS Code	Description	Well Const.
					Asphalt-covered surface.	
0					Asphalt (4 inches).	
				SC	Clayey sand with silt, dark brown, damp, medium dense; no product odor, brick fragments, glass: fill.	
2						
4	S-4.5	5 8 13	0			
6				CL	Gravelly clay with sand, brown, damp, low plasticity, very stiff; root holes.	
8						
10	S-9.5	4 7 10	0			
12			40			
				GW-GM	Sandy gravel with silt, olive-green, moist, dense; product odor, green decreases with depth in sample taken.	
14	S-14.5	12 16 18	40		Grades to light brown at 14.9 feet.	
16						
18				SW	Sand with gravel, light brown, wet, medium dense; no product odor.	
20	S-19.5 S-20	5 8 13	0			
				GW-GM	Sandy gravel with silt, brown, wet, dense.	

(Section continues downward)

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LOG OF BORING B-8/MW-7
ARCO Station 6148
5131 Shattuck Avenue
Oakland, California

PLATE 11

Depth	Sample No.	BLOWS	P.I.D.	USCS Code	Description	Well Const.
22				SW	Sand with gravel, light brown, wet, medium dense; no product odor.	
				GW-GM	Sandy gravel with silt, brown, wet, dense.	
24	S-25	13 15 18	0			
26						
		12				
28	S-28	11 8	0			
		12				
30	S-30	11 22	0	CL	Silty clay, brown, damp, low plasticity, hard.	
32						
	S-33.5	12 16 27	0			
34					Total depth = 34 feet.	
36						
38						
40						
42						
44						
46						
48						
50						

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LOG OF BORING B-8/MW-7
ARCO Station 6148
5131 Shattuck Avenue
Oakland, California

PLATE
12

Depth of boring: 21 feet Diameter of boring: 6 inches Date drilled: 12/19/91

Well depth: N/A Material type: N/A Casing diameter: N/A

Screen interval: N/A Slot size: N/A

Drilling Company: HEW Drilling Driller: Jasper and Louie

Method Used: Hollow-Stem Auger Field Geologist: Barbara Sieminski

Signature of Registered Professional:

Registration No.: CEG 1463 State: CA

Depth	Sample No.	Blows	P.I.D.	USCS Code	Description	Well Const.
					Paved area.	
0					Asphalt (4 inches).	
				GP	Sandy gravel, brown, damp, loose; baserock.	
				CL	Sandy clay, with small gravel, dark brown, damp, medium plasticity, stiff.	
2						
4						
	S-5.5	4 5 6	0		With silt.	
6						
8						
10	S-10.5	2 5 9	0	ML	Sandy silt, with gravel, brown, damp, low plasticity, stiff.	
12						
14						
	S-15.5	7 17 16	13	GP	Sandy gravel, with silt, green, damp, dense; noticeable product odor.	
16						
18	S-18.5	4 6 9 8	76		More sand; obvious product odor.	
				SM	Silty sand, with gravel, mottled green-brown, wet, medium dense.	
20	S-20	10 11	9			
					Total depth = 21 feet.	

RESNA

PROJECT: 61035.02

LOG OF BORING B-4

ARCO Station 6148
5131 Shattuck Avenue
Oakland, California

PLATE 10

Total depth of boring: 25-1/2 feet
Diameter of boring: 12 inches
Date drilled: 7-6-93
Drilling Company: Exploration Geoservices
Driller: John
Drilling method: Hollow-Stem Auger

Casing diameter: 4 inches
Casing material: Sch 40 PVC
Slot size: 0.1-inch
Sand size: 3/8" pea gravel
Screen interval: 14 feet to 24 feet
Field Geologist: Zbig Ignatowicz

Signature of Registered Professional: Richard Watts
Registration No.: C043139 State: CA

Depth	Sample No.	Blows	P.I.D.	USCS Code	Description	Well Const.
					Asphalt over base course.	
2				ML	Sandy silt, dark brown, slightly damp, no to low plasticity, hard.	
4		23				
6	S-5	30 41				
8						
10	S-9.5	27 50/3				
12						
14		21				
16	S-14.5	50/6		GP	Sandy fine gravel, dark yellowish-brown, damp, very dense.	
18				▽		
20	S-19.5	23 50/5			Wet; odor.	
22						
24		16		SM	Silty sand, yellowish-brown, wet, very dense.	
	S-25	26 30				
26					Total Depth = 25-1/2 feet.	
28						
30						
32						
34						
36						
38						
40						

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PROJECT: 61035.11

LOG OF BORING B-9/VW-1
ARCO Station 6148
5131 Shattuck Avenue
Oakland, California

PLATE 2A

Total depth of boring: 28 feet
Diameter of boring: 12 inches
Date drilled: 7-6-93
Drilling Company: Exploration Geoservices
Driller: John
Drilling method: Hollow-Stem Auger

Casing diameter: 2 inches/4 inches
Casing material: Sch 40 PVC
Slot size: 0.020-inch
Sand size: 3/8" gravel/No. 3 Sand
Screen interval: 24.5 feet to 26.5/15 feet to 19.5 feet
Field Geologist: Zbig Ignatowicz

Signature of Registered Professional: Richard Wells
Registration No.: C045139 State: CA

Depth	Sample No.	Blows	P.I.D.	USCS Code	Description	Well Const.
					Asphalt over base course.	
2				CL/ML	Sandy clay to sandy silt, dark brown, slightly damp, low to medium plasticity, very stiff.	
4						
6	S-6	19 14 15				
8						
10		20 45		ML	Sandy silt, ~20% fine-grained sond, brown, slightly damp, no to low plasticity, hard.	
12	S-11	50/4				
14		14			More gravelly, gravel up to ~30%.	
16	S-15.5	20 26		GP	Sandy gravel, ~40% fine-grained sand, fine gravel, dark greenish-gray, damp, dense.	
18						
20	S-20.5	20 32 44			Wet	
22					Clayey gravel.	
24		13		SM	Silty sand, yellowish-brown, wet, dense.	
26	S-25.5	19 22				
		20		GC	Clayey fine gravel, yellowish-brown, wet, very dense.	
28	S-28	35 50/3			Total Depth = 28 feet.	
30						
32						
34						
36						
38						
40						

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PROJECT: 61035.11

LOG OF BORING B-10/AS-2/VW-2
ARCO Station 6148
5131 Shattuck Avenue
Oakland, California

PLATE 3A

Total depth of boring: 25 feet
Diameter of boring: 12 inches
Date drilled: 7-6-93
Drilling Company: Exploration Geoservices
Driller: John
Drilling method: Hollow-Stem Auger

Casing diameter: 4 inches
Casing material: Sch 40 PVC
Slot size: 0.10-inch
Sand size: 3/8" pea gravel
Screen interval: 14 feet to 24 feet
Field Geologist: Zbig Ignatowicz

Signature of Registered Professional: Richard Wells
Registration No.: C043139 State: CA

Depth	Sample No.	Blows	P.I.D.	USCS Code	Description	Well Const.
					Asphalt over base course.	
2				ML	Sandy silt, with some clay, dark brown, damp, low plasticity, very stiff.	
4	S-5	9 10 12				
6						
8						
10	S-10	17 25 45				
12						
14	S-14.5	20 50/6		GP	Sondy gravel, dark gray, moist, very dense; odor.	
16						
18				▽		
20	S-19.5	22 50/6			Wet.	
22						
24	S-24.5	22 50/3		SM	Silty sand, dark yellowish-brown, wet, very dense.	
					Totol Depth = 25 feet.	
26						
28						
30						
32						
34						
36						
38						
40						

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LOG OF BORING B-11/VW-3
ARCO Station 6148
5131 Shattuck Avenue
Oakland, California

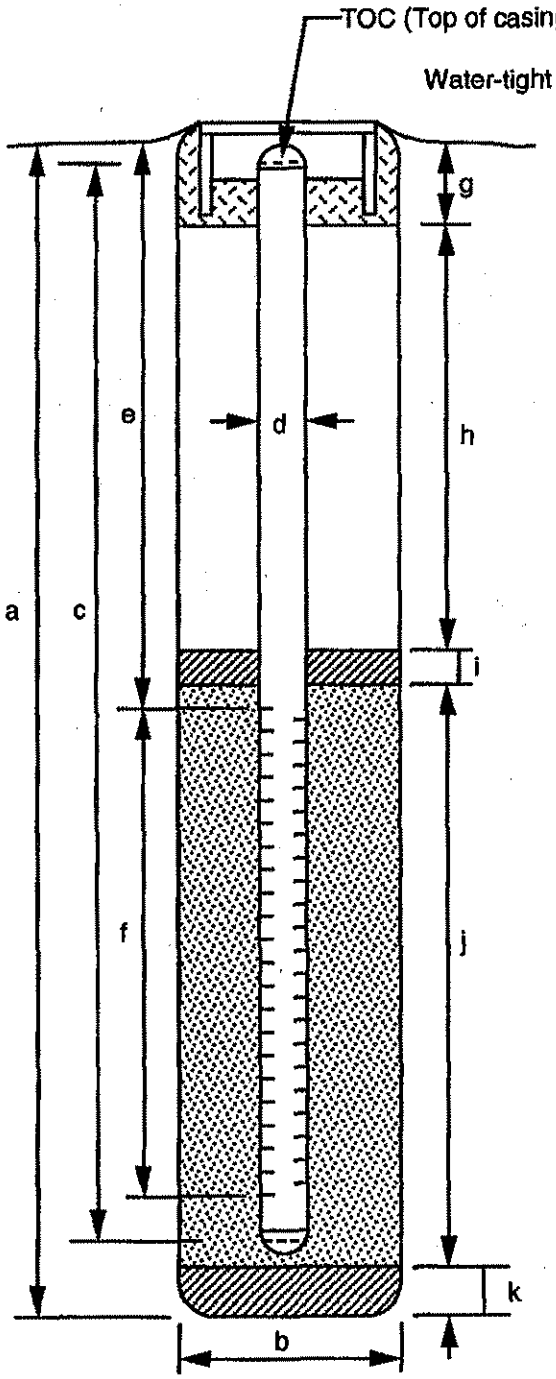
PLATE
4A

WELL DETAILS

EMCON ASSOCIATES

PROJECT NUMBER 0805-135.04
PROJECT NAME ARCO 6148
LOCATION 5131 Shattuck Ave., Oakland
WELL PERMIT NO. 95453

BORING / WELL NO. AS-2
TOP OF CASING ELEV. 107.38
GROUND SURFACE ELEV. 107.89
DATUM M.S.L.
INSTALLATION DATE 7/31/95



EXPLORATORY BORING

a. Total depth 30.0 ft.
b. Diameter 8.0 in.
Drilling method Hollow Stem Auger

WELL CONSTRUCTION

c. Total casing length 22.1 ft.
Material Schedule 40 PVC
d. Diameter 2.0 in.
e. Depth to top perforations 20.5 ft.
f. Perforated length 1.0 ft.
Perforated interval from 20.5 to 21.5 ft.
Perforation type Machine Slotted
Perforation size 0.020 inch
g. Surface seal 1.0 ft.
Material Concrete
h. Backfill 15.0 ft.
Material Cement
i. Seal 3.0 ft.
Material Bentonite
j. Gravel pack 2.5 ft.
Gravel pack interval from 19.5 to 22.0 ft.
Material #3 Sand
k. Bottom seal/fill 7.0 ft.
Material Bentonite

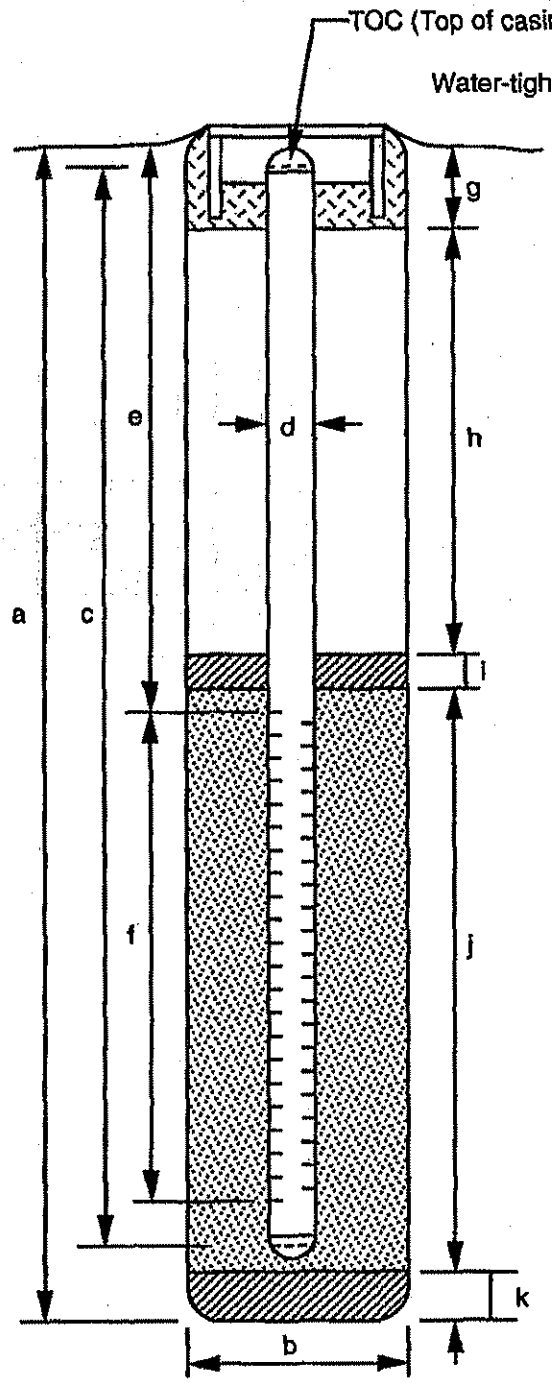
Form prepared by R. Davis

WELL DETAILS

EMCON ASSOCIATES

PROJECT NUMBER 0805-135.04
PROJECT NAME ARCO 6148
LOCATION 5131 Shattuck Ave., Oakland
WELL PERMIT NO. 95453

BORING / WELL NO. AS-3
TOP OF CASING ELEV. 107.89
GROUND SURFACE ELEV. 108.34
DATUM M.S.L.
INSTALLATION DATE 8/2/95



EXPLORATORY BORING

a. Total depth 29.0 ft.
b. Diameter 8.0 in.
Drilling method Hollow Stem Auger

WELL CONSTRUCTION

c. Total casing length 22.0 ft.
Material Schedule 40 PVC
d. Diameter 2.0 in.
e. Depth to top perforations 19.6 ft.
f. Perforated length 2.0 ft.
Perforated interval from 19.6 to 21.6 ft.
Perforation type Machine Slotted
Perforation size 0.020 inch
g. Surface seal 1.0 ft.
Material Concrete
h. Backfill 16.0 ft.
Material Cement
i. Seal 2.0 ft.
Material Bentonite
j. Gravel pack 3.5 ft.
Gravel pack interval from 19.0 to 22.5 ft.
Material #3 Sand
k. Bottom seal/fill 6.5 ft.
Material Bentonite

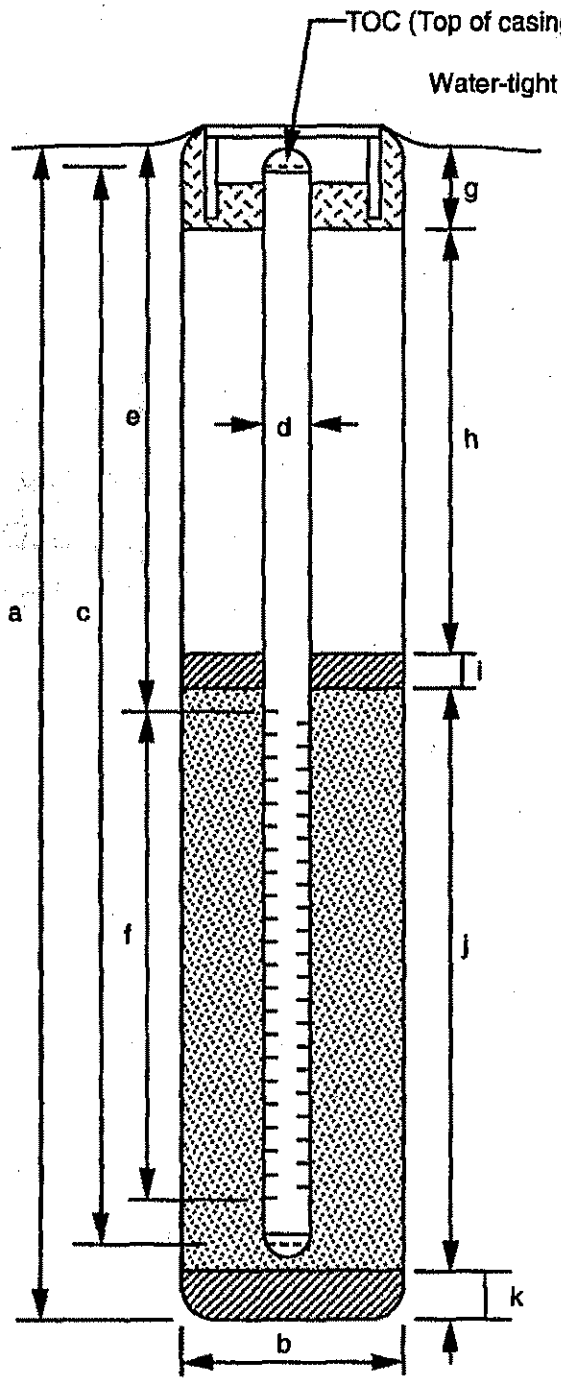
Form prepared by R. Davis

WELL DETAILS

EMCON ASSOCIATES

PROJECT NUMBER 0805-135.04
PROJECT NAME ARCO 6148
LOCATION 5131 Shattuck Ave., Oakland
WELL PERMIT NO. 95453

BORING / WELL NO. AS-4
TOP OF CASING ELEV. 106.81
GROUND SURFACE ELEV. 107.26
DATUM M.S.L.
INSTALLATION DATE 8/2/95



EXPLORATORY BORING

a. Total depth 29.0 ft.
b. Diameter 8.0 in.
Drilling method Hollow Stem Auger

WELL CONSTRUCTION

c. Total casing length 28.2 ft.
Material Schedule 40 PVC
d. Diameter 2.0 in.
e. Depth to top perforations 25.6 ft.
f. Perforated length 2.0 ft.
Perforated interval from 25.6 to 27.6 ft.
Perforation type Machine Slotted
Perforation size 0.020 inch
g. Surface seal 1.0 ft.
Material Concrete
h. Backfill 22.0 ft.
Material Cement
i. Seal 2.0 ft.
Material Bentonite
j. Gravel pack 4.0 ft.
Gravel pack interval from 25.0 to 29.0 ft.
Material #3 Sand
k. Bottom seal/fill na ft.
Material

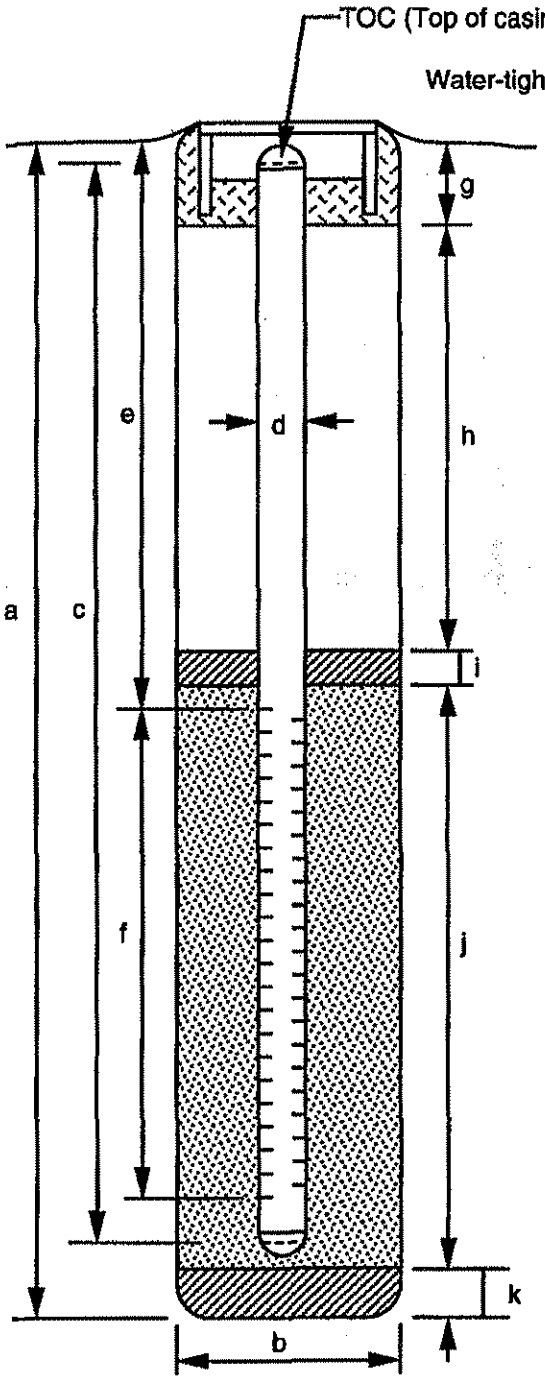
Form prepared by R. Davis

WELL DETAILS

EMCON ASSOCIATES

PROJECT NUMBER 0805-135.04
PROJECT NAME ARCO 6148
LOCATION 5131 Shattuck Ave., Oakland
WELL PERMIT NO. 95453

BORING / WELL NO. AS-5
TOP OF CASING ELEV. 106.24
GROUND SURFACE ELEV. 106.69
DATUM M.S.L.
INSTALLATION DATE 8/2/95



EXPLORATORY BORING

a. Total depth 29.0 ft.
b. Diameter 8.0 in.
Drilling method Hollow Stem Auger

WELL CONSTRUCTION

c. Total casing length 27.0 ft.
Material Schedule 40 PVC
d. Diameter 2.0 in.
e. Depth to top perforations 24.6 ft.
f. Perforated length 2.0 ft.
Perforated interval from 24.6 to 26.6 ft.
Perforation type Machine Slotted
Perforation size 0.020 inch
g. Surface seal 1.0 ft.
Material Concrete
h. Backfill 21.0 ft.
Material Cement
i. Seal 2.0 ft.
Material Bentonite
j. Gravel pack 4.0 ft.
Gravel pack interval from 24.0 to 28.0 ft.
Material #3 Sand
k. Bottom seal/fill 1.0 ft.
Material Native Slough

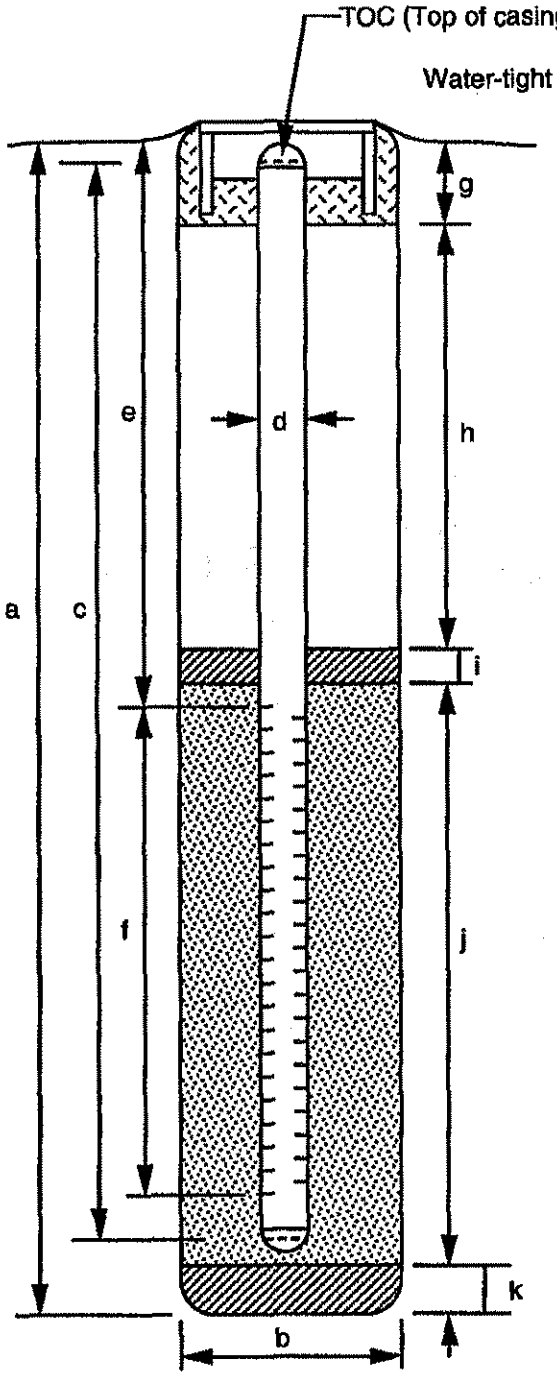
Form prepared by R. Davis

WELL DETAILS

EMCON ASSOCIATES

PROJECT NUMBER 0805-135.04
PROJECT NAME ARCO 6148
LOCATION 5131 Shattuck Ave., Oakland
WELL PERMIT NO. 95453

BORING / WELL NO. VW-2
TOP OF CASING ELEV. na
GROUND SURFACE ELEV. na
DATUM M.S.L.
INSTALLATION DATE 7/31/95



EXPLORATORY BORING

a. Total depth 26.5 ft.
b. Diameter 10.0 in.
Drilling method Hollow Stem Auger

WELL CONSTRUCTION

c. Total casing length 24.8 ft.
Material Schedule 40 PVC
d. Diameter 4.0 in.
e. Depth to top perforations 9.8 ft.
f. Perforated length 14.0 ft.
Perforated interval from 9.8 to 23.8 ft.
Perforation type Machine Slotted
Perforation size 0.020 inch
g. Surface seal 1.0 ft.
Material Concrete
h. Backfill 4.0 ft.
Material Cement
i. Seal 2.0 ft.
Material Bentonite
j. Gravel pack 17.0 ft.
Gravel pack interval from 8.0 to 25.0 ft.
Material #3 Sand
k. Bottom seal/fill 1.5 ft.
Material Native Slough

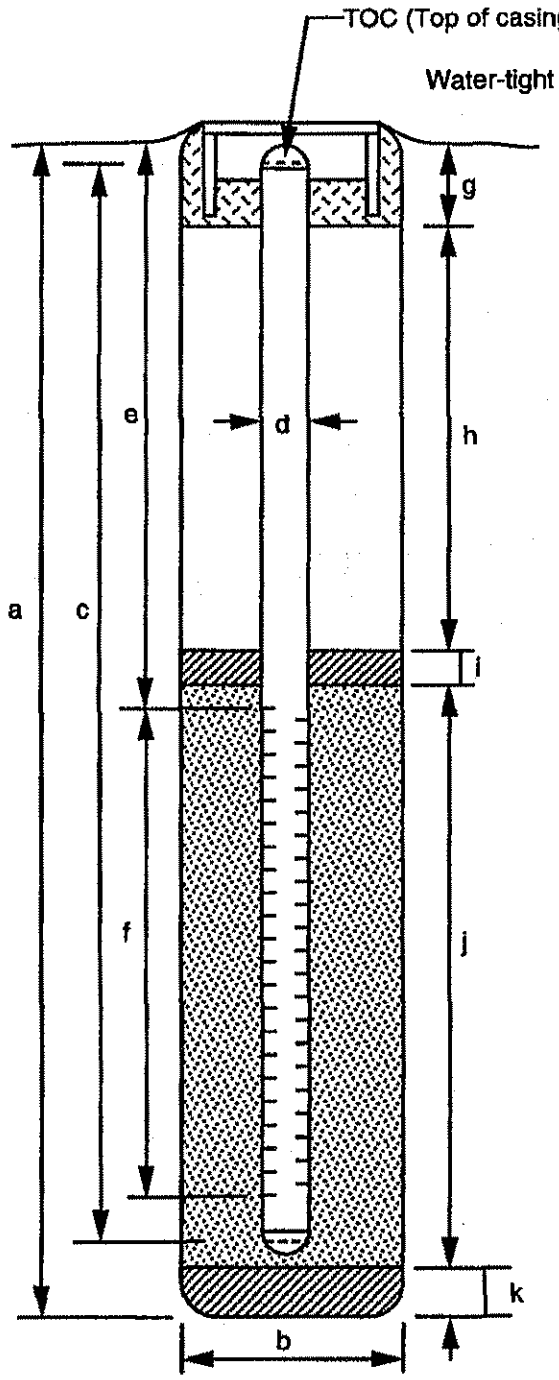
Form prepared by R. Davis

WELL DETAILS

EMCON ASSOCIATES

PROJECT NUMBER 0805-135.04
PROJECT NAME ARCO 6148
LOCATION 5131 Shattuck Ave., Oakland
WELL PERMIT NO. 95453

BORING / WELL NO. VW-4
TOP OF CASING ELEV. na
GROUND SURFACE ELEV. na
DATUM M.S.L.
INSTALLATION DATE 8/1/95



EXPLORATORY BORING

a. Total depth 26.5 ft.
b. Diameter 10.0 in.
Drilling method Hollow Stem Auger

WELL CONSTRUCTION

c. Total casing length 20.2 ft.
Material Schedule 40 PVC
d. Diameter 4.0 in.
e. Depth to top perforations 10.0 ft.
f. Perforated length 9.2 ft.
Perforated interval from 10.0 to 19.2 ft.
Perforation type Machine Slotted
Perforation size 0.020 inch
g. Surface seal 1.0 ft.
Material Concrete
h. Backfill 5.5 ft.
Material Cement
i. Seal 2.0 ft.
Material Bentonite
j. Gravel pack 12.5 ft.
Gravel pack interval from 9.0 to 21.5 ft.
Material #3 Sand
k. Bottom seal/fill 5.0 ft.
Material Native Slough

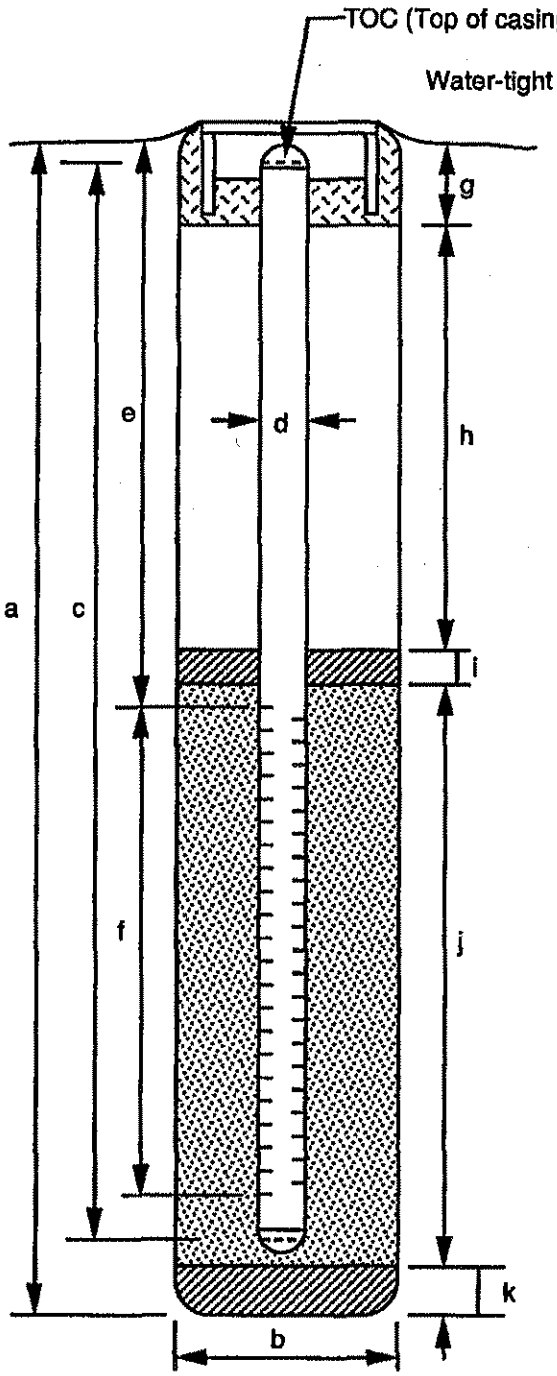
Form prepared by R. Davis

WELL DETAILS

EMCON ASSOCIATES

PROJECT NUMBER 0805-135.04
PROJECT NAME ARCO 6148
LOCATION 5131 Shattuck Ave., Oakland
WELL PERMIT NO. 95453

BORING / WELL NO. VW-5
TOP OF CASING ELEV. na
GROUND SURFACE ELEV. na
DATUM M.S.L.
INSTALLATION DATE 8/1/95



EXPLORATORY BORING

a. Total depth 26.5 ft.
b. Diameter 10.0 in.
Drilling method Hollow Stem Auger

WELL CONSTRUCTION

c. Total casing length 24.5 ft.
Material Schedule 40 PVC
d. Diameter 4.0 in.
e. Depth to top perforations 10.0 ft.
f. Perforated length 14.0 ft.
Perforated interval from 10.0 to 24.0 ft.
Perforation type Machine Slotted
Perforation size 0.020 inch
g. Surface seal 1.0 ft.
Material Concrete
h. Backfill 5.5 ft.
Material Cement
i. Seal 2.0 ft.
Material Bentonite
j. Gravel pack 16.5 ft.
Gravel pack interval from 8.5 to 25.0 ft.
Material #3 Sand
k. Bottom seal/fill 1.5 ft.
Material Native Slough

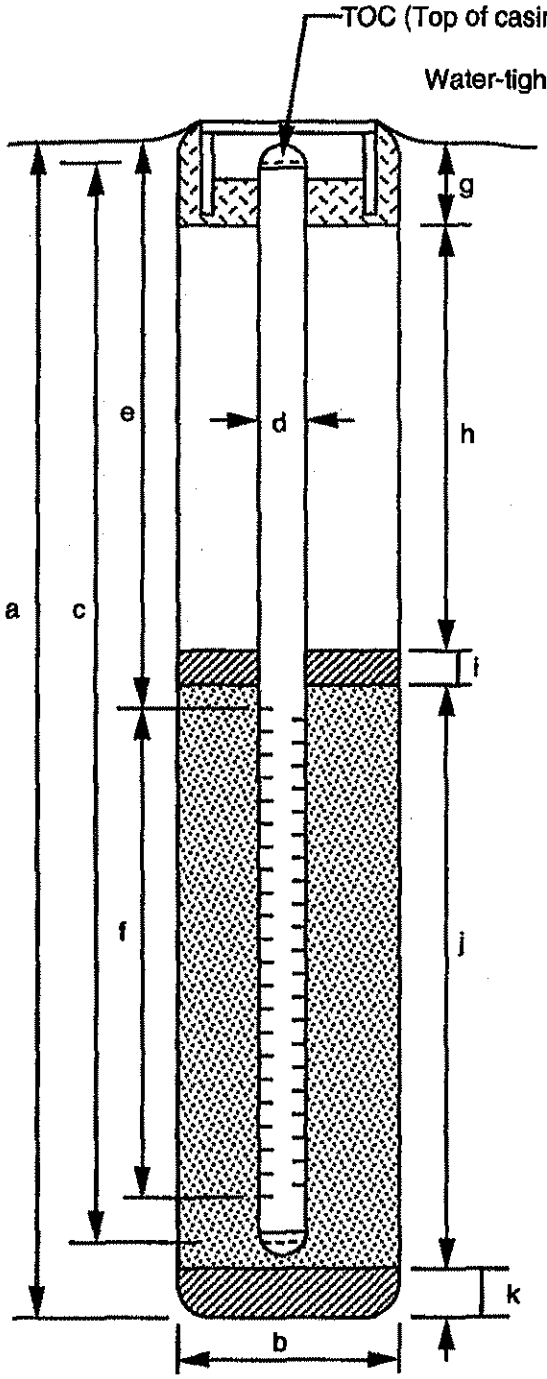
Form prepared by R. Davis

WELL DETAILS

EMCON ASSOCIATES

PROJECT NUMBER 0805-135.04
PROJECT NAME ARCO 6148
LOCATION 5131 Shattuck Ave., Oakland
WELL PERMIT NO. 95453

BORING / WELL NO. VW-6
TOP OF CASING ELEV. 107.76
GROUND SURFACE ELEV. 108.16
DATUM M.S.L.
INSTALLATION DATE 8/3/95



EXPLORATORY BORING

a. Total depth 20.0 ft.
b. Diameter 10.0 in.
Drilling method Hollow Stem Auger

WELL CONSTRUCTION

c. Total casing length 19.5 ft.
Material Schedule 40 PVC
d. Diameter 4.0 in.
e. Depth to top perforations 5.1 ft.
f. Perforated length 14.0 ft.
Perforated interval from 5.1 to 19.1 ft.
Perforation type Machine Slotted
Perforation size 0.020 inch
g. Surface seal 0.5 ft.
Material Concrete
h. Backfill 2.0 ft.
Material Cement
i. Seal 2.0 ft.
Material Bentonite
j. Gravel pack 4.5 ft.
Gravel pack interval from 4.5 to 20.0 ft.
Material #3 Sand
k. Bottom seal/fill na ft.
Material

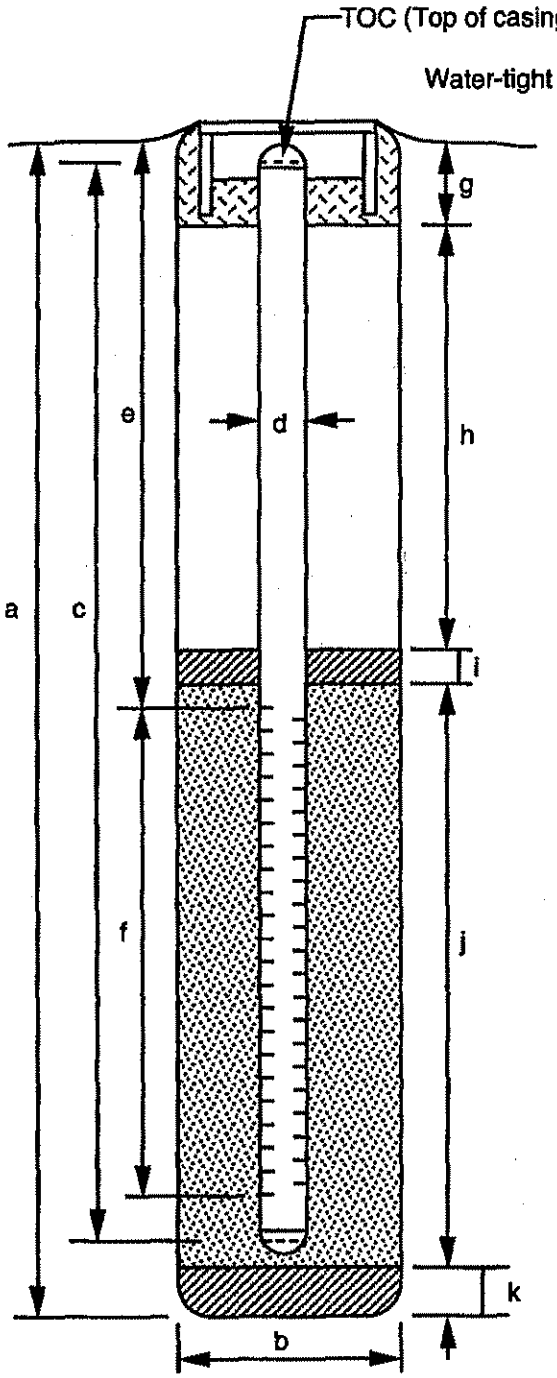
Form prepared by R. Davis

WELL DETAILS

EMCON ASSOCIATES

PROJECT NUMBER 0805-135.04
PROJECT NAME ARCO 6148
LOCATION 5131 Shattuck Ave., Oakland
WELL PERMIT NO. 95453

BORING / WELL NO. VW-7
TOP OF CASING ELEV. 107.52
GROUND SURFACE ELEV. 107.96
DATUM M.S.L.
INSTALLATION DATE 8/3/95



EXPLORATORY BORING

a. Total depth 25.0 ft.
b. Diameter 10.0 in.
Drilling method Hollow Stem Auger

WELL CONSTRUCTION

c. Total casing length 23.9 ft.
Material Schedule 40 PVC
d. Diameter 4.0 in.
e. Depth to top perforations 9.1 ft.
f. Perforated length 14.0 ft.
Perforated interval from 9.1 to 23.1 ft.
Perforation type Machine Slotted
Perforation size 0.020 inch
g. Surface seal 1.0 ft.
Material Concrete
h. Backfill 4.5 ft.
Material Cement
i. Seal 2.0 ft.
Material Bentonite
j. Gravel pack 17.5 ft.
Gravel pack interval from 7.5 to 25.0 ft.
Material #3 Sand
k. Bottom seal/fill 1.5 ft.
Material Native Slough

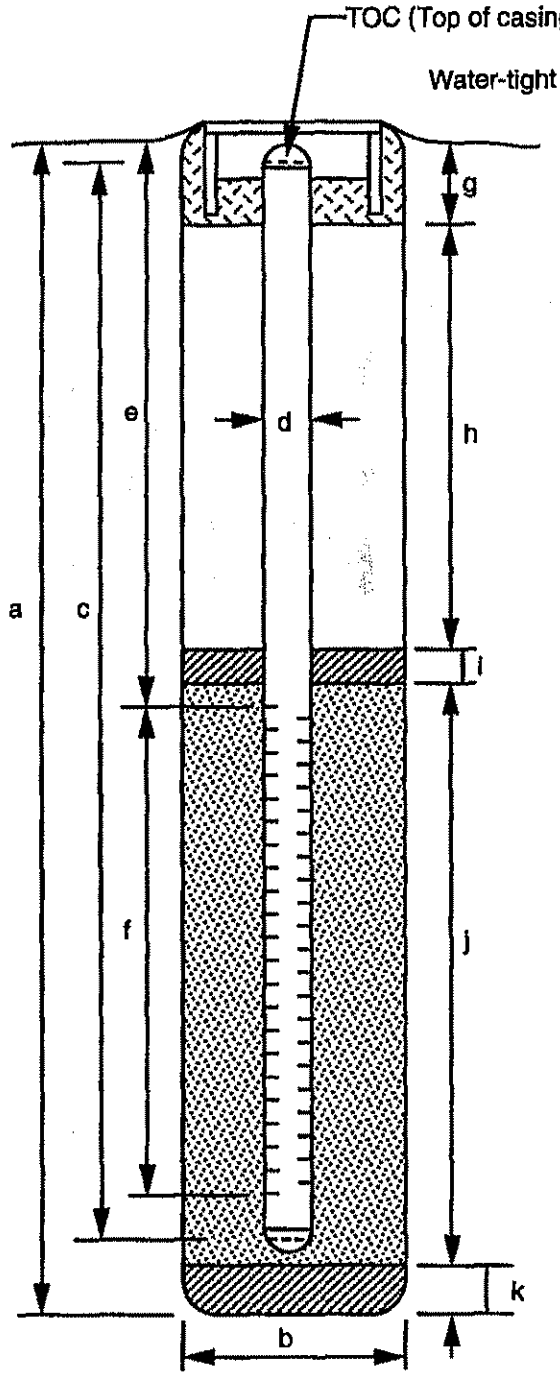
Form prepared by R. Davis

WELL DETAILS

EMCON ASSOCIATES

PROJECT NUMBER 0805-135.04
PROJECT NAME ARCO 6148
LOCATION 5131 Shattuck Ave., Oakland
WELL PERMIT NO. 95453

BORING / WELL NO. VW-8
TOP OF CASING ELEV. 107.43
GROUND SURFACE ELEV. 107.91
DATUM M.S.L.
INSTALLATION DATE 8/3/95



EXPLORATORY BORING

a. Total depth 25.0 ft.
b. Diameter 10.0 in.
Drilling method Hollow Stem Auger

WELL CONSTRUCTION

c. Total casing length 24.7 ft.
Material Schedule 40 PVC
d. Diameter 4.0 in.
e. Depth to top perforations 9.8 ft.
f. Perforated length 14.0 ft.
Perforated interval from 9.8 to 23.8 ft.
Perforation type Machine Slotted
Perforation size 0.020 inch
g. Surface seal 1.0 ft.
Material Concrete
h. Backfill 6.0 ft.
Material Cement
i. Seal 2.0 ft.
Material Bentonite
j. Gravel pack 14.0 ft.
Gravel pack interval from 9.0 to 25.0 ft.
Material #3 Sand
k. Bottom seal/fill 1.5 ft.
Material Native Slough

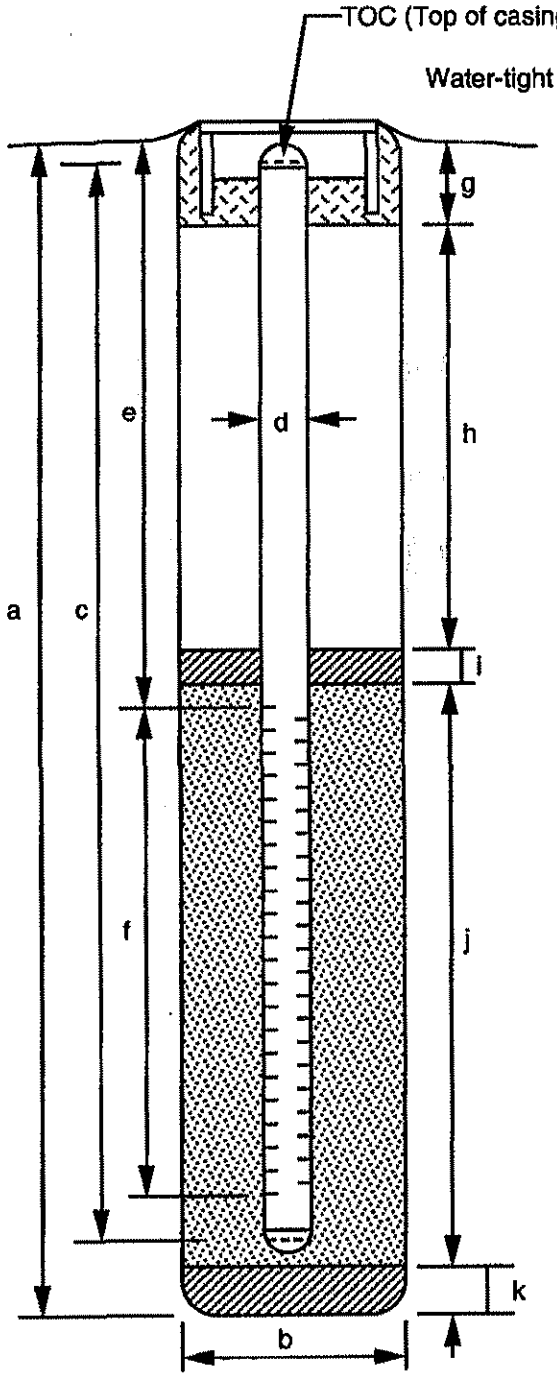
Form prepared by R. Davis

WELL DETAILS

EMCON ASSOCIATES

PROJECT NUMBER 0805-135.04
PROJECT NAME ARCO 6148
LOCATION 5131 Shattuck Ave., Oakland
WELL PERMIT NO. 95453

BORING / WELL NO. VW-9
TOP OF CASING ELEV. 106.18
GROUND SURFACE ELEV. 106.54
DATUM M.S.L.
INSTALLATION DATE 8/1/95



EXPLORATORY BORING

a. Total depth 25.0 ft.
b. Diameter 10.0 in.
Drilling method Hollow Stem Auger

WELL CONSTRUCTION

c. Total casing length 24.4 ft.
Material Schedule 40 PVC
d. Diameter 4.0 in.
e. Depth to top perforations 9.9 ft.
f. Perforated length 14.0 ft.
Perforated interval from 9.9 to 23.9 ft.
Perforation type Machine Slotted
Perforation size 0.020 inch
g. Surface seal 1.0 ft.
Material Concrete
h. Backfill 5.5 ft.
Material Cement
i. Seal 2.0 ft.
Material Bentonite
j. Gravel pack 17.0 ft.
Gravel pack interval from 8.0 to 25.0 ft.
Material #3 Sand
k. Bottom seal/fill 1.5 ft.
Material Native Slough

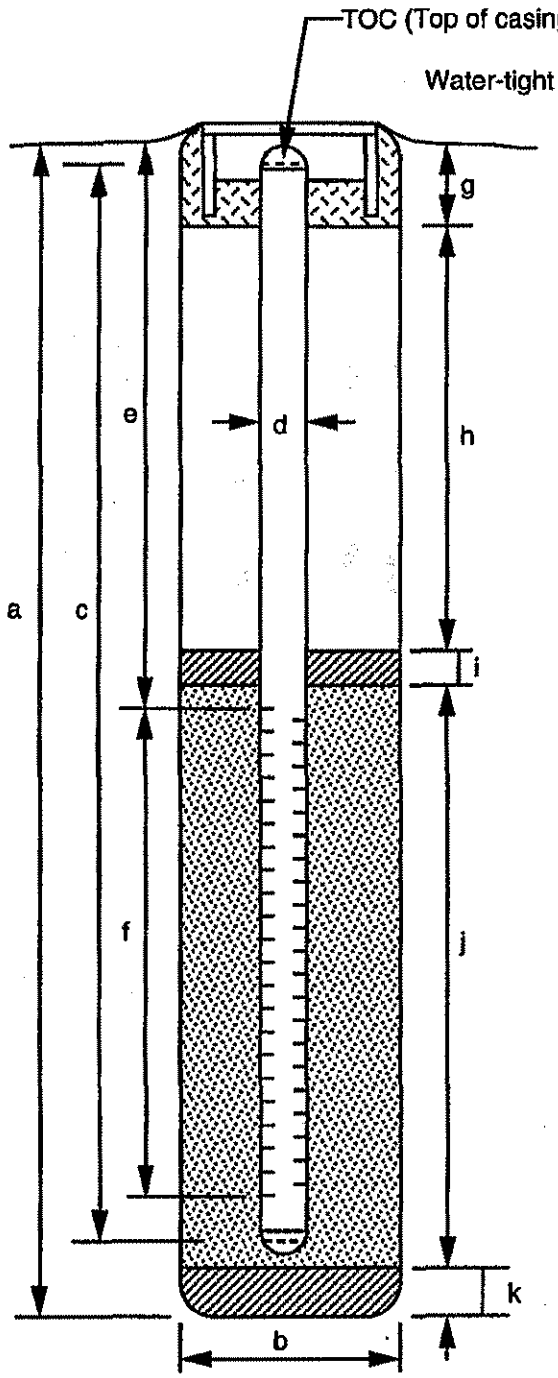
Form prepared by R. Davis

WELL DETAILS

EMCON ASSOCIATES

PROJECT NUMBER 0805-135.04
PROJECT NAME ARCO 6148
LOCATION 5131 Shattuck Ave., Oakland
WELL PERMIT NO. 95453

BORING / WELL NO. VW-10
TOP OF CASING ELEV. 106.73
GROUND SURFACE ELEV. 107.18
DATUM M.S.L.
INSTALLATION DATE 8/1/95



EXPLORATORY BORING

a. Total depth 25.0 ft.
b. Diameter 10.0 in.
Drilling method Hollow Stem Auger

WELL CONSTRUCTION

c. Total casing length 24.6 ft.
Material Schedule 40 PVC
d. Diameter 4.0 in.
e. Depth to top perforations 10.2 ft.
f. Perforated length 14.0 ft.
Perforated interval from 10.2 to 24.2 ft.
Perforation type Machine Slotted
Perforation size 0.020 inch
g. Surface seal 1.0 ft.
Material Concrete
h. Backfill 6.0 ft.
Material Cement
i. Seal 2.0 ft.
Material Bentonite
j. Gravel pack 16.0 ft.
Gravel pack interval from 9.0 to 25.0 ft.
Material #3 Sand
k. Bottom seal/fill 1.5 ft.
Material Native Slough

Form prepared by R. Davis

LOG OF EXPLORATORY BORING

PROJECT NUMBER 0805-135.04 BORING NO. AS-2

PROJECT NAME Arco Station #6148 PAGE 1 OF 2

BY R.K.D. DATE 7/31/95 SURFACE ELEV. 107.89 ft.

PID Reading (ppm)	Sample Recovery (in./in.)	Penetration (Blows per 6")	GROUND WATER LEVELS	DEPTH IN FT.	SAMPLES	LITHOGRAPHIC COLUMN	DESCRIPTION	WELL DETAIL
							ASPHALT.	
							SANDY GRAVEL (GP), Aggregate roadbase.	
0.0	9/18	16 23 29		5			SANDY SILT (ML), mottled light olive brown (2.5Y, 5/4) and dark grayish brown (2.5Y, 3/2); 80-85% low-plasticity fines; 15-20% fine-grained sand; hard; damp; no hydrocarbon odor.	
0.0	14/18	21 27 33		10			@10 to 11.5': As above; 65% low-plasticity fines; 20-25% fine-grained sand; 10-15% fine to coarse gravel.	
12.0	16/18	16 16 19	7/31/95 ▽	15			SILTY GRAVEL (GM), dark brown (10YR, 3/3); 30% low-plasticity fines; 50% fine to coarse-grained sand; 20% fine to coarse gravel (to 2" dia.); dense; moist (wet in fractures); hydrocarbon odor.	
45.0	16/18	26 30 40					CLAYEY GRAVEL (GC), as above; 30-35% medium-plasticity fines; hydrocarbon odor.	
				20				

EMCON

REMARKS

Boring drilled to a depth of 29 feet below grade surface (bgs) by West Hazmat using 8" dia. hollow-stem augers. Samples collected using a 2" dia. modified- California split-spoon sampler. Boring completed as a 2" dia. PVC air sparge well screened from 20.5 to 21.5 feet bgs. Groundwater was encountered at 17 feet bgs. See explanation sheet for definition of symbols used in well detail and sample columns of this log.

LOG OF EXPLORATORY BORING

PROJECT NUMBER 0805-135.04 BORING NO. AS-2

PROJECT NAME Arco Station #6148 PAGE 2 OF 2

BY R.K.D. DATE 7/31/95 SURFACE ELEV. 107.89 ft.

PID Reading (ppm)	Sample Recovery (in./in.)	Penetration (Blows per 6")	GROUND WATER LEVELS	DEPTH IN FT.	SAMPLES	LITHOGRAPHIC COLUMN	DESCRIPTION	WELL DETAIL
--	0/18	23 27 33 18					CLAYEY GRAVEL (GC), continued.	
--	18/18	14 20 30					SILTY CLAY (CL), yellowish brown (10YR, 5/4); 90-95% low to medium-plasticity fines; 5-10% fine to coarse-grained sand; trace fine gravel; stiff; moist; no hydrocarbon odor.	
--	14/18	35 50/5"		25			CLAYEY SAND (SC), light olive brown (2.5Y, 5/4); 30% medium-plasticity fines; 40% fine to coarse-grained sand; 30% fine to coarse gravel (to 1" dia.); coarse sand and gravel clasts are subangular to angular; medium dense; wet; no hydrocarbon odor.	
--	10/18	6 20 20					CLAYEY GRAVEL (GC), light olive brown (2.5Y, 5/4); 10-30% medium-plasticity fines; 30% fine to coarse-grained sand; 40% fine to coarse gravel; dense; wet; no hydrocarbon odor.	
				30			BORING TERMINATED AT 29 FEET BGS.	
				35				
				40				

EMCON

REMARKS

Boring drilled to a depth of 29 feet below grade surface (bgs) by West Hazmat using 8" dia. hollow-stem augers. Samples collected using a 2" dia. modified- California split-spoon sampler. Boring completed as a 2" dia. PVC air sparge well screened from 20.5 to 21.5 feet bgs. Groundwater was encountered at 17 feet bgs. See explanation sheet for definition of symbols used in well detail and sample columns of this log.

LOG OF EXPLORATORY BORING

PROJECT NUMBER **0805-135.04** BORING NO. **AS-3**

PROJECT NAME **Arco Station #6148** PAGE **1 OF 2**

BY **R.K.D.** DATE **8/2/95** SURFACE ELEV. **108.34 ft.**

PID Reading (ppm)	Sample Recovery (in./in.)	Penetration (Blows per 6")	GROUND WATER LEVELS	DEPTH IN FT.	SAMPLES	LITHOGRAPHIC COLUMN	DESCRIPTION	WELL DETAIL
							ASPHALT.	
							SANDY GRAVEL (GP), Aggregate roadbase.	
0.0	18/18	7 10 13		5			CLAYEY SILT (ML), very dark grayish brown (10YR, 3/2); 85-90% low to medium-plasticity fines; 10-15% fine to coarse-grained sand; very stiff; damp; no hydrocarbon odor.	
0.0	17/18	7 9 14		10			@10': As above.	
53.0	18/18	11 23 27	8/2/95 ▽	15			CLAYEY GRAVEL to CLAYEY SAND (GC-SC), 30% medium-plasticity fines; 30-40% fine to coarse-grained sand; 30-40% fine to coarse gravel (to 1.5" dia.); very dense; damp; hydrocarbon odor.	
65.0	18/18	6 10 10					SILTY CLAY (CL), mottled dark gray (2.5Y, 4/0) and light olive brown (2.5Y, 5/0); 90-95% low to medium-plasticity fines; 5-10% fine-grained sand; very stiff; moist (wet at 18'); hydrocarbon odor.	
71.0	18/18	6 6		20				

EMCON

REMARKS

Boring drilled to a depth of 29 feet below grade surface (bgs) by West Hazmat using 8" dia. hollow-stem augers. Samples collected using a 2" dia. modified- California split-spoon sampler. Boring completed as a 2" dia. PVC air sparge well screened from 19.6 to 21.6 feet bgs. Groundwater was encountered at 17 feet bgs. See explanation sheet for definition of symbols used in well detail and sample columns of this log.

LOG OF EXPLORATORY BORING

PROJECT NUMBER 0805-135.04 BORING NO. AS-3

PROJECT NAME Arco Station #6148 PAGE 2 OF 2

BY R.K.D. DATE 8/2/95 SURFACE ELEV. 108.34 ft.

PID Reading (ppm)	Sample Recovery (in./in.)	Penetration (Blows per 6")	GROUND WATER LEVELS	DEPTH IN FT.	SAMPLES	LITHOGRAPHIC COLUMN	DESCRIPTION	WELL DETAIL
--	18/18	5 10 11 12					CLAYEY SAND (SC), yellowish brown (10YR, 5/4); 30% medium-plasticity fines; 70% fine to coarse-grained sand; medium dense; wet; no hydrocarbon odor.	
--	24/24	4 4 9 6					SANDY CLAY (CL), yellowish brown (10YR, 5/4); 65% low to medium-plasticity fines; 35% fine to coarse-grained sand; medium dense; moist to wet; no hydrocarbon odor.	
0.0	18/18	8 13 17		25			SILT to SANDY SILT (ML), light yellowish brown (10YR, 5/4); 80-90% low to medium-plasticity fines; 10-20% fine to coarse-grained sand; very stiff; moist; no hydrocarbon odor.	
--	18/18	12 12 23					CLAYEY GRAVEL (GC), yellowish brown (10YR, 5/4); 20-30% medium-plasticity fines; 20-30% fine to coarse-grained sand; 50% fine to coarse gravel (to 2" dia.), subangular; dense; wet; no hydrocarbon odor.	
				30			BORING TERMINATED AT 29 FEET BGS.	
				35				
				40				

EMCON

REMARKS

Boring drilled to a depth of 29 feet below grade surface (bgs) by West Hazmat using 8" dia. hollow-stem augers. Samples collected using a 2" dia. modified- California split-spoon sampler. Boring completed as a 2" dia. PVC air sparge well screened from 19.6 to 21.6 feet bgs. Groundwater was encountered at 17 feet bgs. See explanation sheet for definition of symbols used in well detail and sample columns of this log.

LOG OF EXPLORATORY BORING

PROJECT NUMBER	0805-135.04	BORING NO.	AS-4
PROJECT NAME	Arco Station #6148	PAGE	1 OF 2
BY R.K.D.	DATE 8/2/95	SURFACE ELEV.	107.26 ft.

PID Reading (ppm)	Sample Recovery (in./in.)	Penetration (Blows per 6")	GROUND WATER LEVELS	DEPTH IN FT.	SAMPLES	LITHOGRAPHIC COLUMN	DESCRIPTION	WELL DETAIL
0.0	13/18	5 6 7		5			**SANDY CLAY (CL)**, dark grayish brown (10YR, 3/2); 60% medium-plasticity fines; 15-30% fine to coarse-grained sand.	
							SILTY SAND (SM), dark brown (10YR, 3/3); 20-25% low-plasticity fines; 75-80% fine to coarse-grained sand; medium dense; damp; no hydrocarbon odor.	
							@10 to 10.8': As above; 10% fine to coarse gravel.	
0.0	13/18	5 4 7		10			**CLAYEY SAND (SC)**, dark brown (10YR, 3/3); 30-40% medium-plasticity fines; 55-60% fine to coarse-grained sand; 5% fine gravel; firm; damp; no hydrocarbon odor.	
85.0	16/18	12 14 19					@12.5': mottled dark gray (2.5Y, 4/0) and light olive brown (2.5Y, 5/4); 25-30% medium-plasticity fines; 50% fine to coarse-grained sand; 20-25% fine to coarse gravel, subangular to angular; medium dense to dense; moist; no hydrocarbon odor.	
56.0	5/18	7 9 13		15			**CLAYEY SAND to CLAYEY GRAVEL (SC-GC)**, light olive brown (2.5Y, 5/4) to dark grayish brown (10YR, 3/2); 25% medium-plasticity fines; 35-40% fine to coarse-grained sand; 35-40% fine to coarse gravel; dense; moist to wet (water visible in pockets and fractures beginning at 16.5'); hydrocarbon odor.	
			8/2/95 ▽					
11.0	8/18	10 20 20		20				

EMCON

REMARKS

Boring drilled to a depth of 29 feet below grade surface (bgs) by West Hazmat using 8" dia. hollow-stem augers. Samples collected using a 2" dia. modified- California split-spoon sampler. Boring completed as a 2" dia. PVC air sparge well screened from 25.6 to 27.6 feet bgs. Groundwater was encountered at 17.5 feet bgs. See explanation sheet for definition of symbols used in well detail and sample columns of this log.

LOG OF EXPLORATORY BORING

PROJECT NUMBER 0805-135.04 | BORING NO. AS-4

PROJECT NAME Arco Station #6148 | PAGE 2 OF 2

BY R.K.D. | DATE 8/2/95 | SURFACE ELEV. 107.26 ft.

PID Reading (ppm)	Sample Recovery (in./in.)	Penetration (Blows per 6")	GROUND WATER LEVELS	DEPTH IN FT.	SAMPLES	LITHOGRAPHIC COLUMN	DESCRIPTION	WELL DETAIL
0.0	17/18	11 13 17					From 20 to 23.5': Interbedded, 30% SANDY SILT (ML) and 70% SILTY SAND (SM). SANDY SILT (ML), light yellowish brown (10YR, 5/4); 75-85% low to medium-plasticity fines; 15-25% fine-grained sand; trace fine gravel; stiff; wet; no hydrocarbon odor.	
0.0	16/18	7 7 9					SILTY SAND (SM), yellowish brown (10YR, 5/4); 15-30% low-plasticity fines; 70-80% fine to coarse-grained sand; medium dense to dense; wet; no hydrocarbon odor.	
--	14/18	9 11 12		25			CLAYEY SAND (SC), light olive brown (2.5Y, 5/4); 30% medium-plasticity fines; 40% fine to coarse-grained sand; 30% fine to coarse gravel (to 1" dia.), subangular to angular clasts; medium dense; wet; no hydrocarbon odor.	
--	12/18	12 14 18					CLAYEY GRAVEL (GC), light olive brown (2.5Y, 5/4); 30% medium-plasticity fines; 30% fine to coarse-grained sand; 40% fine to coarse gravel; dense; wet; no hydrocarbon odor.	
				30			BORING TERMINATED AT 29 FEET BGS.	
				35				
				40				

EMCON

REMARKS

Boring drilled to a depth of 29 feet below grade surface (bgs) by West Hazmat using 8" dia. hollow-stem augers. Samples collected using a 2" dia. modified- California split-spoon sampler. Boring completed as a 2" dia. PVC air sparge well screened from 25.6 to 27.6 feet bgs. Groundwater was encountered at 17.5 feet bgs. See explanation sheet for definition of symbols used in well detail and sample columns of this log.

LOG OF EXPLORATORY BORING

PROJECT NUMBER 0805-135.04 BORING NO. AS-5

PROJECT NAME Arco Station #6148 PAGE 1 OF 2

BY R.K.D. DATE 8/2/95 SURFACE ELEV. 106.69 ft.

PID Reading (ppm)	Sample Recovery (in./in.)	Penetration (Blows per 6")	DEPTH IN FT.	DESCRIPTION
				ASPHALT.
				SANDY GRAVEL (GP), Aggregate roadbase.
0.0	8/18	13 6 8	5	FILL: Wood, brick and concrete fragments.
				SANDY CLAY (CL), dark brown (10YR, 3/3); 60% medium-plasticity fines; 30-35% fine to coarse-grained sand; 5-10% fine to coarse gravel (to 1.5" dia.); very stiff; damp; no hydrocarbon odor.
0.0	15/18	8 8 15	10	
125.0	5/18	10 20 22		CLAYEY GRAVEL (GC), dark olive gray (5Y, 3/2); 25% medium-plasticity fines; 35-40% fine to coarse-grained sand; 35-40% fine to coarse gravel; medium dense; moist; hydrocarbon odor.
58.0	6/18	12 15 15	15	@15': As above.
			8/2/95 ▽	@17': Wet.
0.0	14/18	6 9 13		CLAYEY SAND (SC), yellowish brown (10YR, 5/4); 15-25% medium-plasticity fines; 60% fine to coarse-grained sand; 15-25% fine to coarse gravel; medium dense; moist; no hydrocarbon odor.
			20	

EMCON

REMARKS

Boring drilled to a depth of 29 feet below grade surface (bgs) by West Hazmat using 8" dia. hollow-stem augers. Samples collected using a 2" dia. modified- California split-spoon sampler. Boring completed as a 2" dia. PVC air sparge well screened from 24.6 to 26.6 feet bgs. Groundwater was encountered at 17 feet bgs. See explanation sheet for definition of symbols used in well detail and sample columns of this log.

LOG OF EXPLORATORY BORING

PROJECT NUMBER	0805-135.04	BORING NO.	AS-5
PROJECT NAME	Arco Station #6148	PAGE	2 OF 2
BY R.K.D.	DATE 8/2/95	SURFACE ELEV.	106.69 ft.

PID Reading (ppm)	Sample Recovery (in./in.)	Penetration (Blows per 6")	GROUND WATER LEVELS	DEPTH IN FT.	SAMPLES	LITHOGRAPHIC COLUMN	DESCRIPTION	WELL DETAIL
0.0	12/18	6 11					CLAYEY SAND (SC), continued.	
--	18/18	7 12 11					CLAYEY GRAVEL (GC), yellowish brown (10YR, 5/4); 20-30% medium-plasticity fines; 20-30% fine to coarse-grained sand; 50% fine to coarse gravel; dense; wet; no hydrocarbon odor.	
--	18/18	20 20 23		25			@25': As above.	
--	18/18	6 12 21					@28': As above.	
				30			BORING TERMINATED AT 29 FEET BGS.	
				35				
				40				

EMCON

REMARKS

Boring drilled to a depth of 29 feet below grade surface (bgs) by West Hazmat using 8" dia. hollow-stem augers. Samples collected using a 2" dia. modified- California split-spoon sampler. Boring completed as a 2" dia. PVC air sparge well screened from 24.6 to 26.6 feet bgs. Groundwater was encountered at 17 feet bgs. See explanation sheet for definition of symbols used in well detail and sample columns of this log.

LOG OF EXPLORATORY BORING

PROJECT NUMBER	0805-135.04	BORING NO.	AS/VW-2
PROJECT NAME	Arco Station #6148	PAGE	1 OF 2
BY R.DAVIS	DATE 7/31/95	SURFACE ELEV.	NA ft.

PID Reading (ppm)	Sample Recovery (in./in.)	Penetration (Blows per 6")	GROUND WATER LEVELS	DEPTH IN FT.	SAMPLES	LITHOGRAPHIC COLUMN	DESCRIPTION	WELL DETAIL
				5			Well(s) drilled out to 28 fbg using a 12" dia. hollow-stem auger drill rig. The boring was backfilled with neat cement through augers, and capped at the surface with concrete.	
				10				
				15				
				20				

EMCON

REMARKS

Boring/well drilled out to 28 feet below grade surface (bgs) by West Hazmat using 12" dia. hollow-stem augers. No samples were collected for this boring. Backfilled to surface with neat cement through augers and capped with concrete. No groundwater was encountered. See explanation sheet for definition of symbols used in well detail and sample columns of this log.

LOG OF EXPLORATORY BORING

PROJECT NUMBER	0805-135.04	BORING NO.	AS/VW-2
PROJECT NAME	Arco Station #6148	PAGE	2 OF 2
BY R.DAVIS	DATE 7/31/95	SURFACE ELEV.	NA ft.

PID Reading (ppm)	Sample Recovery (in./in.)	Penetration (Blows per 6")	GROUND WATER LEVELS	DEPTH IN FT.	SAMPLES	LITHOGRAPHIC COLUMN	DESCRIPTION	WELL DETAIL
				25				
				30			BORING TERMINATED AT 28 FEET BGS.	
				35				
				40				

EMCON

REMARKS

Boring/well drilled out to 28 feet below grade surface (bgs) by West Hazmat using 12" dia. hollow-stem augers. No samples were collected for this boring. Backfilled to surface with neat cement through augers and capped with concrete. No groundwater was encountered. See explanation sheet for definition of symbols used in well detail and sample columns of this log.

LOG OF EXPLORATORY BORING

PROJECT NUMBER **0805-135.04** BORING NO. **VW-2**

PROJECT NAME **Arco Station #6148** PAGE **1 OF 2**

BY **R.K.D.** DATE **7/31/95** SURFACE ELEV. **NA ft.**

PID Reading (ppm)	Sample Recovery (in./in.)	Penetration (Blows per 6")	GROUND WATER LEVELS	DEPTH IN FT.	SAMPLES	LITHOGRAPHIC COLUMN	DESCRIPTION	WELL DETAIL
							ASPHALT.	
							FILL: SANDY GRAVEL (GP) to SANDY SILT (ML), occassional brick fragments; damp; no hydrocarbon odor.	
0.0	14/18	7 11 29		5			**SANDY SILT (ML)**, dark olive gray (5Y, 3/2); 50% non to low-plasticity fines; 30% fine to coarse-grained sand; 20% fine to coarse gravel (to 1" dia.); damp; no hydrocarbon odor.	
0.0	16/18	15 20 27		10			@10': As above.	
21.0	17/18	18 20 25	7/31/95 ▽	15			**SILTY SAND (SM)**, dark brown (10YR, 3/3); 30% low-plasticity fines; 50% fine to coarse-grained sand; 20% fine to coarse gravel (to 2" dia.); dense; moist (wet in fractures); hydrocarbon odor. @15.5 to 16.5': mottled dark gray (2.5Y, 4/0) and light olive brown (2.5Y, 5/4).	
				20				

EMCON

REMARKS

Boring drilled to 26.5 feet below grade surface (bgs) by West Hazmat using 10" dia. hollow-stem augers. Samples were collected using a 2" dia. modified- California split-spoon sampler. Boring completed as a 4" dia. PVC vapor extraction well screened from 9.8 to 23.8 feet bgs. Groundwater was encountered at 16 feet bgs. See explanation sheet for definition of symbols used in well detail and sample columns of this log.

LOG OF EXPLORATORY BORING

PROJECT NUMBER 0805-135.04 BORING NO. VW-2

PROJECT NAME Arco Station #6148 PAGE 2 OF 2

BY R.K.D. DATE 7/31/95 SURFACE ELEV. NA ft.

PID Reading (ppm)	Sample Recovery (in./in.)	Penetration (Blows per 6")	GROUND WATER LEVELS	DEPTH IN FT.	SAMPLES	LITHOGRAPHIC COLUMN	DESCRIPTION	WELL DETAIL
0.0 35.0	17/18	12 23 32					SILTY SAND (SM), continued. SILT (ML), light yellowish brown (10YR, 6/4); non to low-plasticity fines; trace fine-grained sand; very stiff; wet; no hydrocarbon odor. SILTY GRAVEL (GM), yellowish brown (10YR, 5/4); 25-30% low-plasticity fines; 20% fine to coarse-grained sand; 50-55% fine to coarse gravel (to 1.5" dia.); very dense; wet; hydrocarbon odor.	
--	16/18	7 11 15		25			@25': As above; medium dense; hydrocarbon odor.	
							BORING TERMINATED AT 26.5 FEET BGS.	
				30				
				35				
				40				

EMCON

REMARKS

Boring drilled to 26.5 feet below grade surface (bgs) by West Hazmat using 10" dia. hollow-stem augers. Samples were collected using a 2" dia. modified- California split-spoon sampler. Boring completed as a 4" dia. PVC vapor extraction well screened from 9.8 to 23.8 feet bgs. Groundwater was encountered at 16 feet bgs. See explanation sheet for definition of symbols used in well detail and sample columns of this log.

LOG OF EXPLORATORY BORING

PROJECT NUMBER	0805-135.04	BORING NO.	VW-4
PROJECT NAME	Arco Station #6148	PAGE	1 OF 2
BY R.K.D.	DATE 7/31/95	SURFACE ELEV.	NA ft.

PID Reading (ppm)	Sample Recovery (in./in.)	Penetration (Blows per 6")	GROUND WATER LEVELS	DEPTH IN FT.	SAMPLES	LITHOGRAPHIC COLUMN	DESCRIPTION	WELL DETAIL
							ASPHALT.	
							FILL: Aggregate roadbase.	
0.0	18/18	17 19 24		5			CLAYEY SILT (ML), very dark grayish brown (10YR, 3/2); 85-90% low to medium-plasticity fines; very stiff; damp; no hydrocarbon odor.	
							@10': As above.	
0.0	17/18	12 15 23		10			CLAYEY SAND (SC), yellowish brown (10YR, 5/6); 20-30% low to medium-plasticity fines; 60-70% fine to coarse-grained sand; 10% fine gravel; dense; damp; no hydrocarbon odor.	
0.0	10/12	26 50/4"	7/31/95 ▽	15			@15': As above; mottled dark gray (2.5Y, 4/0) and light olive brown (2.5Y, 5/4); moist; no hydrocarbon odor. @17': Wet.	
0.0	14/18	21 19 25						
				20				

EMCON

REMARKS

Boring drilled to 26.5 feet below grade surface (bgs) by West Hazmat using 10" dia. hollow-stem augers. Samples collected using a 2" dia. modified-California split-spoon sampler. Boring completed as a 4" dia. PVC vapor extraction well screened from 10 to 19.2 feet bgs. Groundwater was encountered at 17 feet bgs. See explanation sheet for definition of symbols used in well detail and sample columns of this log.

LOG OF EXPLORATORY BORING

PROJECT NUMBER 0805-135.04 BORING NO. VW-4

PROJECT NAME Arco Station #6148 PAGE 2 OF 2

BY R.K.D. DATE 7/31/95 SURFACE ELEV. NA ft.

PID Reading (ppm)	Sample Recovery (in./in.)	Penetration (Blows per 6")	GROUND WATER LEVELS	DEPTH IN FT.	SAMPLES	LITHOGRAPHIC COLUMN	DESCRIPTION	WELL DETAIL
0.0	16/18	10 15 15					CLAYEY SAND (SC), continued.	
							CLAYEY SILT (ML), light yellowish brown (10YR, 6/4); 90-95% low to medium-plasticity fines; 5-10% fine-grained sand; stiff; wet; no hydrocarbon odor.	
							CLAYEY GRAVEL (GC), yellowish brown (10YR, 5/4); 20-30% medium-plasticity fines; 30-35% fine to coarse-grained sand; 35-40% fine to coarse gravel; medium dense; wet; no hydrocarbon odor.	
--	12/18	12 21 25		25			@25': As above.	
							BORING TERMINATED AT 26.5 FEET BGS.	
				30				
				35				
				40				

EMCON

REMARKS

Boring drilled to 26.5 feet below grade surface (bgs) by West Hazmat using 10" dia. hollow-stem augers. Samples collected using a 2" dia. modified-California split-spoon sampler. Boring completed as a 4" dia. PVC vapor extraction well screened from 10 to 19.2 feet bgs. Groundwater was encountered at 17 feet bgs. See explanation sheet for definition of symbols used in well detail and sample columns of this log.

LOG OF EXPLORATORY BORING

PROJECT NUMBER 0805-135.04 BORING NO. VW-5

PROJECT NAME Arco Station #6148 PAGE 1 OF 2

BY R.K.D. DATE 8/1/95 SURFACE ELEV. NA ft.

PID Reading (ppm)	Sample Recovery (in./in.)	Penetration (Blows per 6")	GROUND WATER LEVELS	DEPTH IN FT.	SAMPLES	LITHOGRAPHIC COLUMN	DESCRIPTION	WELL DETAIL
							ASPHALT.	
							FILL: SILTY to SANDY GRAVEL (GM), dark brown; aggregate base material.	
0.5	16/18	10 21 24		5				
							SANDY SILT (ML), dark brown (7.5YR, 3/2); 60-65% low to medium-plasticity fines; 30% fine to coarse-grained sand; 5-10% fine to coarse gravel; very stiff; damp; no hydrocarbon odor.	
0.8	14/18	7 11 12		10			@10': As above.	
							SANDY CLAY (CL), dark olive gray (5Y, 3/2); 60-65% medium-plasticity fines; 25% fine to coarse-grained sand; 10-15% fine to coarse gravel (to 1" dia.); very stiff; moist; hydrocarbon odor.	
91.0	18/18	15 16		15				
54.0		21	8/1/95 ▽				CLAYEY SAND (SC), yellowish brown (10YR, 5/4); 20-30% medium-plasticity fines; 60% fine to coarse-grained sand; 10-20% fine gravel; dense; moist; hydrocarbon odor.	
				20				

EMCON

REMARKS

Boring drilled to 26.5 feet below grade surface (bgs) by West Hazmat using 10" dia. hollow-stem augers. Samples were collected using a 2" dia. modified- California split-spoon sampler. Boring completed as a 4" dia. PVC vapor extraction well screened from 10 to 24 feet gbs. Groundwater was encountered at 16.9 feet bgs. See explanation sheet for definition of symbols used in well detail and sample columns of this log.

LOG OF EXPLORATORY BORING

PROJECT NUMBER 0805-135.04 BORING NO. VW-5

PROJECT NAME Arco Station #6148 PAGE 2 OF 2

BY R.K.D. DATE 8/1/95 SURFACE ELEV. NA ft.

PID Reading (ppm)	Sample Recovery (in./in.)	Penetration (Blows per 6")	DEPTH IN FT.	LITHOGRAPHIC COLUMN	DESCRIPTION
38.0		7			**SANDY CLAY (CL)**, dark olive gray (5Y, 3/2); 60-70% medium-plasticity fines; 30-40% fine to coarse-grained sand; stiff; wet; hydrocarbon odor.
		11			
2.1	17/18	11			**CLAYEY GRAVEL (GC)**, yellowish brown (10YR, 5/4); 20% medium-plasticity fines; 30% fine to coarse-grained sand; 50% fine to coarse gravel (to 1.5" dia.); medium dense; wet; no hydrocarbon odor.
			25		**CLAYEY SAND (SC)**, yellowish brown (10YR, 5/4); 20-30% medium-plasticity fines; 60% fine to coarse-grained sand; 10-20% fine gravel; dense; moist; no hydrocarbon odor.
3.2	9/18	6			**SANDY SILT (ML)**, yellowish brown (10YR, 5/4); 85% low-plasticity fines; 15% fine-grained sand; very stiff; wet; no hydrocarbon odor.
		12			
		18			**CLAYEY GRAVEL (GC)**, yellowish brown (10YR, 5/4); 20% medium-plasticity fines; 30% fine to coarse-grained sand; 50% fine to coarse gravel (to 1.5: dia.); medium dense; wet; no hydrocarbon odor.
			30		**BORING TERMINATED AT 26.5 FEET BGS.**
			35		
			40		

WELL DETAIL

EMCON

REMARKS

Boring drilled to 26.5 feet below grade surface (bgs) by West Hazmat using 10" dia. hollow-stem augers. Samples were collected using a 2" dia. modified- California split-spoon sampler. Boring completed as a 4" dia. PVC vapor extraction well screened from 10 to 24 feet gbs. Groundwater was encountered at 16.9 feet bgs. See explanation sheet for definition of symbols used in well detail and sample columns of this log.

LOG OF EXPLORATORY BORING

PROJECT NUMBER 0805-135.04 BORING NO. VW-6

PROJECT NAME Arco Station #6148 PAGE 1 OF 1

BY R.K.D. DATE 8/3/95 SURFACE ELEV. 108.16 ft.

PID Reading (ppm)	Sample Recovery (in./in.)	Penetration (Blows per 6")	GROUND WATER LEVELS	DEPTH IN FT.	SAMPLES	LITHOGRAPHIC COLUMN	DESCRIPTION	WELL DETAIL
							CONCRETE.	
							SANDY GRAVEL (GP), aggregate roadbase; very dense.	
							@4.5': Hydrocarbon odors observed during hand augering.	
540	16/18	7 13 18		5			SILTY SAND (SM), olive gray (5Y, 4/2); 30-40% low-plasticity fines; 60-70% fine to medium-grained sand; dense; moist; hydrocarbon odor.	
825	14/18	5 8 12					@7.5': As above; trace fine gravel; medium dense; moist; hydrocarbon odor.	
145	10/18	10 12 18		10			GRAVEL (GP), mottled olive gray (5Y, 4/2) and light olive brown (2.5Y, 5/4); 10% low to medium-plasticity fines; 30% fine to coarse-grained sand; 60% fine to coarse gravel, subangular, weathered, fractured; medium dense; damp; hydrocarbon odor.	
300	9/12	29 50/5"		15			CLAYEY GRAVEL (GC), mottled olive brown (5Y, 4/4); and light olive brown (2.5Y, 5/4); 20-25% medium-plasticity fines; 30-35% fine to coarse-grained sand; 45% fine to coarse gravel (to 2" dia.); very dense; moist; hydrocarbon odor.	
150	5/18	21 25 33					@19': As above.	
				20			BORING TERMINATED AT 20 FEET BGS.	

EMCON

REMARKS

Boring drilled to 20 feet below grade surface (bgs) by West Hazmat using 10" dia. hollow-stem augers. Samples collected using a 2" dia. modified-California split-spoon sampler. Boring completed as a 4" dia. PVC vapor extraction well screened from 5.1 to 19.1 feet bgs. No groundwater was encountered. See explanation sheet for definition of symbols used in well detail and sample columns of this log.

LOG OF EXPLORATORY BORING

PROJECT NUMBER	0805-135.04	BORING NO.	VW-7
PROJECT NAME	Arco Station #6148	PAGE	1 OF 2
BY R.K.D.	DATE 8/3/95	SURFACE ELEV.	107.96 ft.

PID Reading (ppm)	Sample Recovery (in./in.)	Penetration (Blows per 6")	GROUND WATER LEVELS	DEPTH IN FT.	SAMPLES	LITHOGRAPHIC COLUMN	DESCRIPTION	WELL DETAIL
							ASPHALT.	
							FILL: SANDY GRAVEL (GP).	
0.0	17/18	5 13 14		5			SANDY SILT (ML), dark yellowish brown (10YR, 4/4); 60-70% low-plasticity fines; 30-40% fine-grained sand; stiff; damp; no hydrocarbon odor.	
							SILTY SAND (SM), dark yellowish brown (10YR, 4/4); 30-35% low-plasticity fines; 65-70% fine-grained sand; medium dense; damp; no hydrocarbon odor.	
0.0	16/18	13 15 17		10			CLAYEY GRAVEL (GC), dark brown (10YR, 3/3); 15% medium-plasticity fines; 30% fine to coarse-grained sand; 55% fine to coarse gravel (to 2" dia.); dense; damp; no hydrocarbon odor.	
21	16/18	6 10 10					@12.5': As above; mottled dark grayish brown and light olive brown; 25% medium-plasticity fines; 35% fine to coarse-grained sand; 40% fine to coarse gravel; medium dense; moist; hydrocarbon odor.	
15	11/18	7 19 11		15				
37	11/18	11 16 21						
125	13/18	6 7 13	8/3/95 ▽				@17.5': Wet in voids and fractures. @18': No hydrocarbon odor.	
				20			CLAYEY SAND (SC), described on next page.	

EMCON

REMARKS

Boring drilled to 25 feet below grade surface (bgs) by West Hazmat using 10" dia. hollow-stem augers. Samples collected using a 2" dia. modified-California split-spoon sampler. Boring completed as a 4" dia. PVC vapor extraction well screened from 9.1 to 23.1 feet bgs. Groundwater was encountered at 19 feet bgs. See explanation sheet for definition of symbols used in well detail and sample columns of this log.

LOG OF EXPLORATORY BORING

PROJECT NUMBER	0805-135.04	BORING NO.	VW-7
PROJECT NAME	Arco Station #6148	PAGE	2 OF 2
BY R.K.D.	DATE 8/3/95	SURFACE ELEV.	107.96 ft.

PID Reading (ppm)	Sample Recovery (in./in.)	Penetration (Blows per 6")	GROUND WATER LEVELS	DEPTH IN FT.	SAMPLES	LITHOGRAPHIC COLUMN	DESCRIPTION	WELL DETAIL
0.0	17/18	5 11 7					CLAYEY SAND (SC), dark yellowish brown (10YR, 4/4); 30-40% low to medium-plasticity fines; 60-70% fine to medium-grained sand; trace coarse sand; trace fine gravel; iron oxide staining; medium dense; wet; no hydrocarbon odor.	
0.0	18/18	5 9 11		25			CLAYEY GRAVEL (GC), dark brown (10YR, 3/3); 15% medium-plasticity fines; 40% fine to coarse-grained sand; 45% fine to coarse gravel; medium dense; wet; no hydrocarbon odor.	
							BORING TERMINATED AT 25 FBG. SAMPLED TO A DEPTH OF 26.5 FEET BGS.	
				30				
				35				
				40				

EMCON

REMARKS

Boring drilled to 25 feet below grade surface (bgs) by West Hazmat using 10" dia. hollow-stem augers. Samples collected using a 2" dia. modified-California split-spoon sampler. Boring completed as a 4" dia. PVC vapor extraction well screened from 9.1 to 23.1 feet bgs. Groundwater was encountered at 19 feet bgs. See explanation sheet for definition of symbols used in well detail and sample columns of this log.

LOG OF EXPLORATORY BORING

PROJECT NUMBER **0805-135.04** BORING NO. **VW-8**

PROJECT NAME **Arco Station #6148** PAGE **1 OF 2**

BY **R.K.D.** DATE **8/1/95** SURFACE ELEV. **107.91 ft.**

PID Reading (ppm)	Sample Recovery (in./in.)	Penetration (Blows per 6")	GROUND WATER LEVELS	DEPTH IN FT.	SAMPLES	LITHOGRAPHIC COLUMN	DESCRIPTION	WELL DETAIL
							ASPHALT.	
							FILL: SANDY GRAVEL (GP), aggregate roadbase.	
							CLAYEY SILT (ML), very dark grayish brown (10YR, 3/2); 85% low to medium-plasticity fines; 10% fine to coarse-grained sand; 5% fine gravel; very stiff; damp; no hydrocarbon odor.	
0.0	15/18	7 11 18		5			**SILTY SAND (SM)**, dark yellowish brown (10YR, 3/4); 35% nonplastic fines; 65% fine-grained sand; medium dense; damp; no hydrocarbon odor.	
0.0	16/18	9 12 17		10			**CLAYEY GRAVEL (GC)**, dark brown (10YR, 3/3); 20-30% medium-plasticity fines; 20% fine to coarse-grained sand; 50-60% fine to coarse gravel, subangular; occasionally well weathered; medium dense; moist; no hydrocarbon odor.	
33	15/18	13 17 19	8/1/95 ▽	15			**CLAYEY SAND to CLAYEY GRAVEL (SC-GC)**, mottled light olive brown (2.5Y, 5/4) and dark olive gray (5Y, 3/2); 20-30% medium-plasticity fines; 30-40% fine to coarse-grained sand; 30-40% fine to coarse gravel, subangular to angular; fractured; dense; wet; hydrocarbon odor.	
				20			**CLAYEY SAND (SC)**, described on next page.	

EMCON

REMARKS

Boring drilled to 25 feet below grade surface (bgs) by West Hazmat using 10" dia. hollow-stem augers. Samples collected using a 2" dia. modified-California split-spoon sampler. Boring completed as a 4" dia. PVC vapor extraction well screened from 9.8 to 23.8 feet bgs. Groundwater was encountered at 16.5 feet bgs. See explanation sheet for definition of symbols used in well detail and sample columns of this log.

LOG OF EXPLORATORY BORING

PROJECT NUMBER 0805-135.04 BORING NO. VW-8

PROJECT NAME Arco Station #6148 PAGE 2 OF 2

BY R.K.D. DATE 8/1/95 SURFACE ELEV. 107.91 ft.

PID Reading (ppm)	Sample Recovery (in./in.)	Penetration (Blows per 6")	GROUND WATER LEVELS	DEPTH IN FT.	SAMPLES	LITHOGRAPHIC COLUMN	DESCRIPTION	WELL DETAIL
--	14/18	7 6 7					CLAYEY SAND (SC), light olive brown (2.5Y, 5/4); 20-25% medium-plasticity fines; 45-50% fine to coarse-grained sand; 25-30% fine to coarse gravel; medium dense; wet; no hydrocarbon odor.	
--	11/18	7 7 7		25			CLAYEY GRAVEL (GC), light olive brown (2.5Y, 5/4); 20% medium-plasticity fines; 25-30% fine to coarse-grained sand; 50-55% fine to coarse gravel; medium dense; wet; no hydrocarbon odor.	
							BORING TERMINATED AT 25 FBG. SAMPLED TO A DEPTH OF 26.5 FEET BGS.	
				30				
				35				
				40				

EMCON

REMARKS

Boring drilled to 25 feet below grade surface (bgs) by West Hazmat using 10" dia. hollow-stem augers. Samples collected using a 2" dia. modified-California split-spoon sampler. Boring completed as a 4" dia. PVC vapor extraction well screened from 9.8 to 23.8 feet bgs. Groundwater was encountered at 16.5 feet bgs. See explanation sheet for definition of symbols used in well detail and sample columns of this log.

LOG OF EXPLORATORY BORING

PROJECT NUMBER 0805-135.04 BORING NO. VW-9

PROJECT NAME Arco Station #6148 PAGE 1 OF 2

BY R.K.D. DATE 8/1/95 SURFACE ELEV. 106.54 ft.

PID Reading (ppm)	Sample Recovery (in./in.)	Penetration (Blows per 6")	GROUND WATER LEVELS	DEPTH IN FT.	SAMPLES	LITHOGRAPHIC COLUMN	DESCRIPTION	WELL DETAIL
							ASPHALT.	
							FILL: SANDY GRAVEL (GP), aggregate roadbase.	
							SANDY CLAY (CL), dark yellowish brown (10YR, 4/4); 60% medium-plasticity fines; 30-35% fine to coarse-grained sand; 5-10% fine to coarse gravel (to 1.5" dia.); very stiff; damp; no hydrocarbon odor.	
2.8	14/18	6 11 14		5			SAND (SP), dark yellowish brown (10YR, 4/4); 5-10% medium-plasticity fines; 90-95% fine to coarse-grained sand; trace fine gravel (to 1" dia.); medium dense; damp; no hydrocarbon odor.	
2.6	16/18	9 9 9		10			CLAYEY SAND (SC), yellowish brown (10YR, 5/4); 15-25% medium-plasticity fines; 60% fine to coarse-grained sand; 15-25% fine to coarse gravel (to 1" dia.); medium dense; moist; no hydrocarbon odor.	
301	12/18	10 12 14	8/1/95 ▽	15			CLAYEY GRAVEL to CLAYEY SAND (GC-SC), dark olive gray (5Y, 3/2); 25% medium-plasticity fines; 35-40% fine to coarse-grained sand; 35-40% fine to coarse gravel; medium dense; very moist; hydrocarbon odor.	
				20			CLAYEY SAND (SC), described on next page.	

EMCON

REMARKS

Boring drilled to 25 feet below grade surface (bgs) by West Hazmat using 10" dia. hollow-stem augers. Samples collected using a 2" dia. modified-California split-spoon sampler. Boring completed as a 4" dia. PVC vapor extraction well screened from 9.9 to 23.9 feet bgs. Groundwater was encountered at 17 feet bgs. See explanation sheet for definition of symbols used in well detail and sample columns of this log.

LOG OF EXPLORATORY BORING

PROJECT NUMBER **0805-135.04** BORING NO. **VW-9**

PROJECT NAME **Arco Station #6148** PAGE **2 OF 2**

BY **R.K.D.** DATE **8/1/95** SURFACE ELEV. **106.54 ft.**

PID Reading (ppm)	Sample Recovery (in./in.)	Penetration (Blows per 6")	GROUND WATER LEVELS	DEPTH IN FT.	SAMPLES	LITHOGRAPHIC COLUMN	DESCRIPTION	WELL DETAIL
2.0	18/18	15 15 21					**CLAYEY SAND (SC)**, yellowish brown (10YR, 5/4); 20-30% medium-plasticity fines; 60% fine to coarse-grained sand; 10-20% fine gravel; dense; wet; hydrocarbon odor.	
2.1	18/18	14 18 23		25			**CLAYEY GRAVEL (GC)**, yellowish brown (10YR, 5/4); 20-30% medium-plasticity fines; 20-30% fine to coarse-grained sand; 50% fine to coarse gravel (to 1.5" dia.); dense; wet; no hydrocarbon odor.	
							BORING TERMINATED AT 25 FBG. SAMPLED TO A DEPTH OF 26.5 FEET BGS.	
				30				
				35				
				40				

EMCON

REMARKS

Boring drilled to 25 feet below grade surface (bgs) by West Hazmat using 10" dia. hollow-stem augers. Samples collected using a 2" dia. modified-California split-spoon sampler. Boring completed as a 4" dia. PVC vapor extraction well screened from 9.9 to 23.9 feet bgs. Groundwater was encountered at 17 feet bgs. See explanation sheet for definition of symbols used in well detail and sample columns of this log.

LOG OF EXPLORATORY BORING

PROJECT NUMBER	0805-135.04	BORING NO.	VW-10
PROJECT NAME	Arco Station #6148	PAGE	1 OF 2
BY R.K.D.	DATE 8/1/95	SURFACE ELEV.	107.18 ft.

PID Reading (ppm)	Sample Recovery (in./in.)	Penetration (Blows per 6")	GROUND WATER LEVELS	DEPTH IN FT.	SAMPLES	LITHOGRAPHIC COLUMN	DESCRIPTION	WELL DETAIL
							ASPHALT.	
							FILL: SANDY GRAVEL (GP), aggregate roadbase.	
0.0	10/18	7 7 11		5			SANDY SILT (ML), dark yellowish brown (10YR, 4/4); 60-65% non to low-plasticity fines; 35-40% fine-grained sand; stiff; damp; no hydrocarbon odor.	
0.0	12/18	8 10 21		10			@10': yellowish brown (10YR, 5/4); hard; slightly damp; no hydrocarbon odor.	
85	14/18	12 14 18	8/1/95 ▽	15			@15': As above. CLAYEY GRAVEL (GC), 15% low-plasticity fines; 30% fine to coarse-grained sand; 55% fine gravel; damp; no hydrocarbon odor. SAND (SP), very dark gray (10YR, 3/1); 5-10% nonplastic fines; 90-95% fine to coarse-grained sand; dense; wet; hydrocarbon odor.	
				20			CLAYEY GRAVEL (GC), described on next page.	

EMCON

REMARKS

Boring drilled to 25 feet below grade surface (bgs) by West Hazmat using 10" dia. hollow-stem augers. Samples collected using a 2" dia. modified-California split-spoon sampler. Boring completed as a 4" dia. PVC vapor extraction well screened from 10.2 to 24.2 feet bgs. Groundwater was encountered at 17 feet bgs. See explanation sheet for definition of symbols used in well detail and sample columns of this log.

LOG OF EXPLORATORY BORING

PROJECT NUMBER 0805-135.04 BORING NO. VW-10

PROJECT NAME Arco Station #6148 PAGE 2 OF 2

BY R.K.D. DATE 8/1/95 SURFACE ELEV. 107.18 ft.

PID Reading (ppm)	Sample Recovery (in./in.)	Penetration (Blows per 6")	GROUND WATER LEVELS	DEPTH IN FT.	SAMPLES	LITHOGRAPHIC COLUMN	DESCRIPTION	WELL DETAIL
0.0	14/18	6 9 11					CLAYEY GRAVEL (GC), 20-25% low-plasticity fines; 20% fine to coarse-grained sand; 55-60% fine to coarse gravel (to 2" dia.); medium dense; wet; no hydrocarbon odor.	
							SANDY CLAY (CL).	
--	14/18	7 8 10		25			@25': As above.	
							BORING TERINATED AT 25 FBG. SAMPLED TO A DEPTH OF 26.5 FEET BGS.	
				30				
				35				
				40				

EMCON

REMARKS

Boring drilled to 25 feet below grade surface (bgs) by West Hazmat using 10" dia. hollow-stem augers. Samples collected using a 2" dia. modified-California split-spoon sampler. Boring completed as a 4" dia. PVC vapor extraction well screened from 10.2 to 24.2 feet bgs. Groundwater was encountered at 17 feet bgs. See explanation sheet for definition of symbols used in well detail and sample columns of this log.

URS

1333 Broadway, Suite 800
Oakland, California 94612

LOG OF BORING

Borehole ID: CSB-1

Total Depth: 20.0 ft. bgs

PROJECT INFORMATION	DRILLING INFORMATION
Project: Site 6148: Soil Investigation	**Drilling Company:** Vironex
Site Location: 5131 Shattuck Ave., Oakland, CA	**Driller:** Mike
Project Manager: Scott Robinson	**Type of Drilling Rig:** Geoprobe
RG: William Frohlich	**Drilling Method:** 2" Direct Push
Geologist: Kevin Uno	**Sampling Method:** California Modified
Job Number: 384869078.0013601	**Date(s) Drilled:** 4/29/04

BORING INFORMATION	
Groundwater Depth: 16 ft. bgs	**Boring Location:** Behind station building, north of MW-1
Air Knife or Hand Auger Depth: Airknife to 5' bgs	**Boring Diameter:** 2"
Coordinates: X Y	**Boring Type:** Exploratory

Depth (ft bgs)	Symbol	Lithologic Description	USCS	PID (ppm)	Recovery	Sample ID / Comments
0		ASPHALT: 3"				
		NO RECOVERY: Airknifed to 5' bgs.	NR	no odor		
2						
4		SANDY SILT: dark brown, 10% clay, 60% silt, 30% sand, trace gravel. Moderately stiff, moist; low plasticity.	ML	no odor		
6						
8						
		SANDY GRAVELLY SILT: dark brown, 10% clay, 50% silt, 20% sand, 20% gravel. Moderately stiff, moist; low plasticity.				
10				no odor		
		SILTY GRAVELLY SAND: light brown, 5% clay, 25% silt, 40% sand, 30% gravel. Fine to coarse sand, angular gravel, up to 1 inch, moderately loose, moist to wet; no plasticity.	SM			

URS

LOG OF BORING

Borehole ID: CSB-1

Depth (ft bgs)	Symbol	Lithologic Description	USCS	PID (ppm)	Recovery	Sample ID / Comments
12						
14				HC odor		
16						
		Color change to grey green. Strong hydrocarbon odor.		HC odor		CSB-1-17.5 (17.5- 18.0' bgs)
18						
		EOB: 20.0 ft bgs.				
20						

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LOG OF BORING

Borehole ID: CSB-2
Total Depth: 20.0 ft. bgs

PROJECT INFORMATION	DRILLING INFORMATION
Project: Site 6148: Soil Investigation	**Drilling Company:** Vironex
Site Location: 5131 Shattuck Ave., Oakland, CA	**Driller:** Mike
Project Manager: Scott Robinson	**Type of Drilling Rig:** Geoprobe
RG: William Frohlich	**Drilling Method:** 2" Direct Push
Geologist: Kevin Uno	**Sampling Method:** California Modified
Job Number: 384869078.0013601	**Date(s) Drilled:** 4/29/04

BORING INFORMATION	
Groundwater Depth: 16 ft. bgs	**Boring Location:** Behind station building, 3 ft. south of MW-2
Air Knife or Hand Auger Depth: Airknife to 5' bgs	**Boring Diameter:** 2"
Coordinates: X Y	**Boring Type:** Exploratory

Depth (ft bgs)	Symbol	Lithologic Description	USCS	PID (ppm)	Recovery	Sample ID / Comments
0		ASPHALT: 3"				
		NO RECOVERY: Airknifed to 5' bgs.	NR	no odor		
2						
		SANDY SILT: dark brown, 10% clay, 50% silt, 30% sand, trace gravel. Moderately stiff, moist; low plasticity.	ML			
4						
				no odor		
6						
8						
		SANDY GRAVELLY SILT: brown, 10% clay, 40% silt, 30% sand, 20% gravel. Moderately stiff, moist; no to low plasticity.				
		SILTY GRAVELLY SAND: light brown, 5% clay, 25% silt, 40% sand, 30% gravel. Fine to coarse sand, angular gravel, up to 1 inch, moderately loose, moist to wet; no plasticity.	SM			
10				no odor		

URS

LOG OF BORING

Borehole ID: CSB-2

Depth (ft bgs)	Symbol	Lithologic Description	USCS	PID (ppm)	Recovery	Sample ID / Comments
12						
14				no odor		CSB-2-14.0 (14.0- 14.5' bgs)
16		Color change to grey green. Strong hydrocarbon odor.				
18				HC odor		CSB-2-18.0 (18.0- 18.5' bgs)
20		EOB: 20.0 ft bgs.				

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LOG OF BORING

Borehole ID: CSB-3

Total Depth: 20.0 ft. bgs

PROJECT INFORMATION	DRILLING INFORMATION
Project: Site 6148: Soil Investigation	**Drilling Company:** Vironex
Site Location: 5131 Shattuck Ave., Oakland, CA	**Driller:** Mike
Project Manager: Scott Robinson	**Type of Drilling Rig:** Geoprobe
RG: William Frohlich	**Drilling Method:** 2" Direct Push
Geologist: Kevin Uno	**Sampling Method:** California Modified
Job Number: 384869078.0013601	**Date(s) Drilled:** 4/29/04

BORING INFORMATION

Groundwater Depth: 16 ft. bgs	**Boring Location:** Behind station building, 15 ft. east of CSB-2
Air Knife or Hand Auger Depth: Airknife to 5' bgs	**Boring Diameter:** 2"
Coordinates: X Y	**Boring Type:** Exploratory

Depth (ft bgs)	Symbol	Lithologic Description	USCS	PID (ppm)	Recovery	Sample ID / Comments
0		ASPHALT: 3"				
		NO RECOVERY: Airknifed to 5' bgs.	NR	no odor		
2						
4		SANDY SILT: dark brown, 10% clay, 50% silt, 35% sand, 5% gravel. Stiff, moist; low plasticity.	ML	no odor		
6		No Recovery 5.0- 10.0 ft. bgs				
8						
10		SILTY GRAVELLY SAND: brown, 5% clay, 20% silt, 45% sand, 30% gravel. Fine to coarse sand, angular gravel, up to 1 inch; Moderately dense, moist; no to low plasticity.	SM	no odor		

URS

LOG OF BORING

Borehole ID: CSB-3

Depth (ft bgs)	Symbol	Lithologic Description	USCS	PID (ppm)	Recovery	Sample ID / Comments
12						
		SILTY SANDY GRAVEL: light brown, 5% clay, 20% silt, 30% sand, 45% gravel. Fine to coarse sand, angular gravel, up to 1 inch; moderately loose, moist to wet; low plasticity.	GM			
14				no odor		
16						
		Color change to grey green. Strong hydrocarbon odor.		HC odor		CSB-3-17.5 (17.5- 18.0' bgs)
18						
		EOB: 20.0 ft bgs.				
20						

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LOG OF BORING

Borehole ID: CSB-4

Total Depth: 20.0 ft. bgs

PROJECT INFORMATION	DRILLING INFORMATION
Project: Site 6148: Soil Investigation	**Drilling Company:** Vironex
Site Location: 5131 Shattuck Ave., Oakland, CA	**Driller:** Mike
Project Manager: Scott Robinson	**Type of Drilling Rig:** Geoprobe
RG: William Frohlich	**Drilling Method:** 2" Direct Push
Geologist: Kevin Uno	**Sampling Method:** California Modified
Job Number: 384869078.0013601	**Date(s) Drilled:** 4/29/04

BORING INFORMATION	
Groundwater Depth: 16 ft. bgs	**Boring Location:** W side of station building, 5 ft. E of VW-5
Air Knife or Hand Auger Depth: Airknife to 5' bgs	**Boring Diameter:** 2"
Coordinates: X Y	**Boring Type:** Exploratory

Depth (ft bgs)	Symbol	Lithologic Description	USCS	PID (ppm)	Recovery	Sample ID / Comments
0		ASPHALT: 3"				
		FILL: Airknifed to 5' bgs. FILL: 10% silt, 80% sand, 5% gravel. Fine sand, moderately dense, trace gravel.		no odor		
2						
4		CLAYEY SANDY SILT: dark brown, 25% clay, 50% silt, 25% sand, trace angular gravel. Stiff, moist; low to medium plasticity.	ML			
				no odor		
6		Increase in fines: 35% clay, 55% silt, 10% sand, trace angular gravel. Stiff, moist; medium plasticity.				
8						
10				no odor		
		GRAVELLY SILTY SAND: light brown, trace clay, 20% silt, 50% sand,	SM			

Depth (ft bgs)	Symbol	Lithologic Description	USCS	PID (ppm)	Recovery	Sample ID / Comments
12		30% gravel. Fine to coarse sand, angular gravel, up to 0.75 inches, moderately loose, moist to wet; low plasticity.				
		Gravely, silty sand grades to sandy gravel.				
		SILTY SANDY GRAVEL; light brown, 15% silt, 40% sand, 45% angular gravel. Moderately dense, moist; no plasticity.	GM			
14				no odor		
16						CSB-4-16.5 (16.5- 17.0' bgs)
		Color change to grey green. Strong hydrocarbon odor.				
18				HC odor		CSB-4-18.5 (18.5- 19.0' bgs)
		EOB: 20.0 ft bgs.				
20						

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LOG OF BORING

Borehole ID: CSB-5

Total Depth: 20.0 ft. bgs

PROJECT INFORMATION	DRILLING INFORMATION
Project: Site 6148: Soil Investigation	**Drilling Company:** Vironex
Site Location: 5131 Shattuck Ave., Oakland, CA	**Driller:** Mike
Project Manager: Scott Robinson	**Type of Drilling Rig:** Geoprobe
RG: William Frohlich	**Drilling Method:** 2" Direct Push
Geologist: Kevin Uno	**Sampling Method:** California Modified
Job Number: 384869078.0013601	**Date(s) Drilled:** 4/29/04

BORING INFORMATION	
Groundwater Depth: 16 ft. bgs	**Boring Location:** W side of station building in handicap parking stall
Air Knife or Hand Auger Depth: Airknife to 6.5 ft. bgs	**Boring Diameter:** 2"
Coordinates: X Y	**Boring Type:** Exploratory

Depth (ft bgs)	Symbol	Lithologic Description	USCS	PID (ppm)	Recovery	Sample ID / Comments
0		ASPHALT: 3"				
		FILL: Airknifed to 6.5 ft. bgs. FILL: 10% silt, 80% sand, 5% gravel. Fine sand, moderately dense, trace gravel.		no odor		
2						
4				no odor		
6		CLAYEY SILT: dark brown, 20% clay, 70% silt, 10% sand. Occasional cemented, sand nodules up 0.25 inches. Stiff, moist; low to medium plasticity.	ML			
8						
10				no odor		
		CLAYEY SAND: red, 30% clay, 10% silt, 60% sand. Loose, moist; low	SM			

Depth (ft bgs)	Symbol	Lithologic Description	USCS	PID (ppm)	Recovery	Sample ID / Comments
12		to medium plasticity.				
		CLAYEY SILT: dark brown, 20% clay, 70% silt, 10% sand. Moderately stiff, moist; low to medium plasticity.	ML			
		SANDY GRAVEL: brown, trace silt, 25% sand, 70% angular gravel. Loose, moist; no plasticity.	GP			
14		CLAYEY SILT: dark brown, 20% clay, 70% silt, 10% sand. Stiff, moist; low to medium plasticity.	ML			
		SANDY GRAVEL: brown, trace silt, 25% sand, 70% angular gravel. loose, moist; no plasticity.	GP	no odor		CSB-5-15.5 (15.5- 16.0' bgs)
16						
		Color change to grey green. Strong hydrocarbon odor.				
18				HC odor		CSB-5-18.0 (18.0- 18.5' bgs)
		SILTY SAND: red brown, 5% clay, 25% silt, 70% sand. Moderately dense, moist; low plasticity. EOB: 20.0 ft bgs.	SM			
20						

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LOG OF BORING

Borehole ID: CSB-6
Total Depth: 20.0 ft. bgs

PROJECT INFORMATION	DRILLING INFORMATION
Project: Site 6148: Soil Investigation	**Drilling Company:** Vironex
Site Location: 5131 Shattuck Ave., Oakland, CA	**Driller:** Mike
Project Manager: Scott Robinson	**Type of Drilling Rig:** Geoprobe
RG: William Frohlich	**Drilling Method:** 2" Direct Push
Geologist: Kevin Uno	**Sampling Method:** California Modified
Job Number: 384869078.0013601	**Date(s) Drilled:** 4/29/04

BORING INFORMATION

Groundwater Depth: 16 ft. bgs	**Boring Location:** Between VW-8 and VW-7 at W corner of station bldg.
Air Knife or Hand Auger Depth: Airknife to 5.0 ft. bgs	**Boring Diameter:** 2"
Coordinates: X Y	**Boring Type:** Exploratory

Depth (ft bgs)	Symbol	Lithologic Description	USCS	PID (ppm)	Recovery	Sample ID / Comments
0		ASPHALT: 3"				
		FILL: Airknifed to 5.0 ft. bgs.		no odor		
2						
4						
		NO RECOVERY		no odor		
6						
8		GRAVELLY SAND: light brown, 10% silt, 60% sand, 30% gravel. Stiff, damp; no plasticity.	SM			
10				no odor		

Depth (ft bgs)	Symbol	Lithologic Description	USCS	PID (ppm)	Recovery	Sample ID / Comments
12		SANDY GRAVEL: brown to grey, 10% silt, 20% sand, 70% gravel. Moderately loose, damp; no plasticity.	GM			
		GRAVELLY SAND: light brown, 5% silt, 60% sand, 35% gravel. Angular, poorly sorted gravel. Moderately dense, moist; no plasticity.	GM			
14						
16				422		CSB-6-16.0 (16.0- 16.5' bgs)
		Color change to grey green. Strong hydrocarbon odor.				
18		SANDY GRAVEL: green to brown, 20% sand, 80% gravel. Angular, loose, moist; no plasticity.				
		GRAVELLY SAND: green to brown, 5% silt, 60% sand, 35% gravel. Angular, poorly sorted gravel. Moderately dense, moist; no plasticity.		HC odor		
		EOB: 20.0 ft bgs.				
20						

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LOG OF BORING

Borehole ID: CSB-8
Total Depth: 2.5 ft. bgs

PROJECT INFORMATION	DRILLING INFORMATION
Project: Site 6148: Soil Investigation	**Drilling Company:** Vironex
Site Location: 5131 Shattuck Ave., Oakland, CA	**Driller:** Mike
Project Manager: Scott Robinson	**Type of Drilling Rig:** Geoprobe
RG: William Frohlich	**Drilling Method:** Hand Auger
Geologist: Kevin Uno	**Sampling Method:** California Modified
Job Number: 384869078.0013601	**Date(s) Drilled:** 4/29/04

BORING INFORMATION	
Groundwater Depth: NA	**Boring Location:** Approx. 5 ft. off of NE corner of canopy
Air Knife or Hand Auger Depth: 2.5 ft.	**Boring Diameter:** 2"
Coordinates: X Y	**Boring Type:** Exploratory

Depth (ft bgs)	Symbol	Lithologic Description	USCS	PID (ppm)	Recovery	Sample ID / Comments
0		ASPHALT: 3"				
		SILTY SAND: FILL, dark brown, 20% silt, 80% sand. Damp, low to no plasticity.		0		
2						CSB-8-2.5 (2.0- 2.5' bgs)

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LOG OF BORING

Borehole ID: CSB-9

Total Depth: 30.0 ft. bgs

PROJECT INFORMATION	DRILLING INFORMATION
Project: Site 6148: Soil Investigation	**Drilling Company:** Vironex
Site Location: 5131 Shattuck Ave., Oakland, CA	**Driller:** Mike
Project Manager: Scott Robinson	**Type of Drilling Rig:** Geoprobe
RG: William Frohlich	**Drilling Method:** 2" Direct Push
Geologist: Kevin Uno	**Sampling Method:** California Modified
Job Number: 384869078.0013601	**Date(s) Drilled:** 4/29/04

BORING INFORMATION	
Groundwater Depth: 16 ft. bgs	**Boring Location:** Approx. 10 ft. off of NE corner of station building
Air Knife or Hand Auger Depth: Airknife to 5 ft. bgs	**Boring Diameter:** 2"
Coordinates: X Y	**Boring Type:** Exploratory

Depth (ft bgs)	Symbol	Lithologic Description	USCS	PID (ppm)	Recovery	Sample ID / Comments
0		ASPHALT: 3"				
		FILL: Airknifed to 5' bgs. FILL: 10% silt, 80% sand, 5% gravel. Fine sand, moderately dense, trace gravel.		0		
2						
4						
		SANDY SILT: dark brown, trace clay, 60% silt, 40% sand, trace gravel. Fine to coarse sand, angular gravel up to 1 inch. Stiff, damp; no to low plasticity.	ML	0		
6						CSB-9-6.0 (6.0- 6.5' bgs)
8						
10				0		CSB-9-11.5 (11.5- 12.0'

Depth (ft bgs)	Symbol	Lithologic Description	USCS	PID (ppm)	Recovery	Sample ID / Comments
12						bgs)
14						
16		SILTY SANDY GRAVEL: grey green, trace clay, 15% silt, 20% sand, 65% gravel. Poorly sorted angular to sub-angular gravel. Green staining and hydrocarbon odor. Moderately loose, moist; no plasticity.	GM	408		CSB-9-16.5 (16.5- 17.0' bgs)
18						▽
20						
22		GRAVELLY SAND: brown, 10% silt, 70% sand, 20% gravel. Fine to coarse sand , poorly sorted angular to sub-angular gravel. Moderately loose, wet; no plasticity.	SM	0		CSB-9-21.5 (21.5- 22.0' bgs)
24						
26				0		CSB-9-26.5 (26.5- 27.0' bgs)
28						

Depth (ft bgs)	Symbol	Lithologic Description	USCS	PID (ppm)	Recovery	Sample ID / Comments
30		SANDY GRAVEL: brown, 10% silt, 20% sand, 70% gravel. Angular, poorly sorted gravel. Red staining, loose, wet to saturated; no plasticity. EOB: Refusal at 30.0ft. bgs	GM			