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CAMBRIA

September 23, 2005

Jerry Wickham
Alameda County Health Care Services Agency
1131 Harbor Bay Parkway, Suite 250
Alameda, California 94502-6577

Alameda County
OCT 03 2005
Environmental Health

Re: **Site Conceptual Model**
Shell-branded Service Station
230 West MacArthur Boulevard
Oakland, California
Incident # 98995741
Cambria Project # 247-0902-007
ACHCSA Case #3673

Dear Mr. Wickham:

Cambria Environmental Technology, Inc. (Cambria) prepared this site conceptual model (SCM) at the request of Equilon Enterprises LLC dba Shell Oil Products US (Shell).

SITE BACKGROUND

Site Location

This Shell service station is located on the northwest corner of West MacArthur Boulevard and Piedmont Avenue in Oakland, California (Figure 1). The site has been a retail fueling and auto service center since at least 1952. Three underground storage tanks (USTs), two dispenser islands, and a kiosk are currently on site. The site is surrounded by commercial properties and Kaiser Hospital. A former Gulf service station, now the Oakland Auto Works auto repair shop, is located northwest and adjacent to the site (Figure 2).

Site Investigations and Activities

Summaries of historical investigations and activities at the site are provided below:

1986 Site Investigation: In April 1986, Emcon Associates of San Jose, California drilled four exploratory borings (S-A through S-D) within the tank complex to total depths of 20.5 feet below grade (fbg). Groundwater was encountered at approximately 13 fbg. Soil samples were collected and analyzed for total hydrocarbons and benzene, toluene, ethylbenzene, and xylenes (BTEX). Total hydrocarbon concentrations ranging from 1,200 to 5,700 parts per million (ppm) were detected in samples collected at depths of 8 to 15 fbg. The report for this investigation could not be located at the time of this writing. Cumulative soil sampling results are included in this report as Table 1.

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1986 Additional Site Assessment: In December 1986, W.W. Irwin, Inc. analyzed soil gas vapors from 38 probe holes located throughout the entire site. The highest hydrocarbon concentrations were reportedly discovered in the area of the tank complex and dispenser islands. The report for this investigation could not be located at the time of this writing.

1987 Recovery Well Installation: In March 1987, Wayne Perry Construction, Inc. (Wayne Perry) installed three 4-inch-diameter, 13-feet-deep, soil-vapor recovery wells (VR-1, VR-2, and VR-3). A soil venting system utilizing an activated carbon scrubber operated between April and November 1987. On August 28, 1987, soil borings B-1 and B-2 were installed to determine the degree of contamination remaining in the soil. The maximum total hydrocarbon concentration, 1,870 ppm, was detected in boring B-1 at a depth of 8 fbg. Wayne Perry concluded that the venting operation had significantly decreased the contamination levels. Wayne Perry's January 26, 1988 *Review of Venting Operations* documents these activities.

1987 UST Removal: On November 2, 1987, the USTs were removed and soil samples (A1, A-2, B-1, B-2, C-1, C-2, D-1, and D-2) were collected in native soil from the bottom of the 15-foot-deep UST excavation and soil stockpile. Hydrocarbon concentrations ranged from 8.6 to 480 ppm, as documented in Kaprealian Associates December 1, 1987 *Soil Sampling Investigation* report. New USTs were installed in the same excavation.

1988 Soil and Groundwater Investigation: On July 11 and 12, 1988, Ensco Environmental Services Inc. (Ensco) of Fremont, California drilled three exploratory borings at the site and converted them to monitoring wells MW-1 through MW-3. MW-1 was completed to 31.5 fbg, and MW-2 and MW-3 were completed to 30 fbg. Total petroleum hydrocarbons as gasoline (TPHg) were detected in soil collected at 20.5 fbg from the boring for MW-3 at a concentration of 278 ppm. Benzene was not detected in any soil samples collected during this investigation. Ensco's September 30, 1988, *Soil and Groundwater Investigation* report documents this investigation's results.

1989 Phase II Supplemental Soil Investigation: On August 16, 1989, Ensco advanced three soil borings (SB-1, SB-2, and SB-3) to investigate possible hydrocarbon impacts to soil adjacent to the pump islands. The maximum TPHg concentration detected was 490 ppm in boring SB-3 at a depth of 15.5 fbg. Benzene was not detected in any soil samples collected during this investigation. Investigation results were documented in Ensco's October 9, 1989 *September Quarterly Report.*

1989 Phase II Shallow Groundwater Survey: On October 10, 1989, Ensco subcontractor NET Pacific of Santa Rosa, California advanced three probes (GS-1, GS-2, and GS-3) to sample the shallow groundwater adjacent to the pump islands. TPHg was detected in samples GS-2 and GS-3 at concentrations of 5,600 parts per billion (ppb) and 8,800 ppb, respectively. Benzene was detected in samples GS-2 and GS-3 at concentrations of 340 ppb and 380 ppb, respectively. Neither TPHg nor BTEX was detected in sample GS-1. Ensco's January 19, 1990, *December*

Quarterly Report documents investigation results. Cumulative grab groundwater sampling results are included in this report as Table 2.

1990 Well Installation: On January 9, 1990, Ensco drilled one exploratory boring at the site and converted it to monitoring well MW-4. Well MW-4 was screened from 15 to 25 fbg. Ensco's March 29, 1990 *March Quarterly Report* documented the well installation.

1990 Shallow Groundwater Investigation: On May 19, 1990, Exceltech subcontractor CHIPS Environmental Consulting, Inc. advanced six probes (Probe 1 through Probe 6) in the sidewalk along MacArthur Boulevard and collected shallow groundwater samples. TPHg was detected in Probe 2 and Probe 6 at concentrations of 25,000 ppb and 31,000 ppb, respectively. Benzene was detected in the sample collected from Probe 6 at a concentration of 430 ppb. Investigation results were documented in Exceltech's July 3, 1990 *June Quarterly Report.*

1998 Dispenser and Turbine Sump Upgrades: In February 1998, Paradiso Mechanical of San Leandro, California upgraded fuel-related equipment at the service station. Secondary containment was added to the existing dispensers and to the turbine sumps above the USTs. Cambria inspected the dispenser and tank pit areas. The City of Oakland did not require sampling at dispensers during 1998 upgrade projects unless there was evidence of hydrocarbons. No field indications of hydrocarbons, such as staining or odor, were observed during the site visit; therefore, no sampling was required. Details are included in Cambria's March 10, 1998 *1998 Upgrade Site Inspection Report.*

2002 Sensitive Receptor Survey (SRS), Conduit Study Report, and Subsurface Investigation Work Plan: The October 31, 2002 *Sensitive Receptor Survey, Conduit Study Report, and Subsurface Investigation Work Plan* included a joint conduit study and SRS which Cambria completed for the site. The conduit study showed that a storm drain located just west of the site, along West MacArthur Boulevard, might intersect groundwater and that the conduit backfill material may act as a preferential pathway for contaminant migration. The SRS showed two wells of unknown use located approximately ½ mile downgradient of the site, and one well of unknown use located approximately 1,500 feet upgradient of the site (Attachment A). Neither of the downgradient wells is likely to be impacted by petroleum hydrocarbons or fuel oxygenates originating from the subject site. Additionally, Cambria found that the nearest surface water body is Glen Echo Creek, located approximately 600 feet south of the site. Since calculated groundwater flow direction at the site has been to the west-southwest, petroleum hydrocarbons and fuel oxygenates from the site are not expected to impact Glen Echo Creek. The October 31, 2002 report also included an investigation work plan to advance two soil borings adjacent to the storm drain to evaluate the migration of any contaminates off site.

2003 SRS: In October 2003, Cambria completed an SRS for the site at Shell's request. The SRS targeted the following as potential sensitive receptors: basements within 200 feet, surface water and sensitive habitats within 500 feet, hospitals, residential care and childcare facilities within

1,000 feet, and water wells within ½ mile. No basements were observed within 200 feet, nor were any surface water or sensitive habitats observed within 500 feet. Hospitals and educational, childcare and residential care facilities were identified at approximately 150, 450, and 825 feet from the site. Snow White Day Care (214 West MacArthur Boulevard) is located approximately 150 feet from the site. Kaiser Permanente Hospital (280 West MacArthur Boulevard) is located approximately 450 feet from the site. National Hispanic University (262 Grand Avenue) is located approximately 825 feet from the site. No water wells in addition to those mentioned above were identified within ½ mile of the site.

2004 Subsurface Investigation: In March 2004, Cambria completed the soil and groundwater investigation proposed in the October 31, 2002 *Sensitive Receptor Survey, Conduit Study Report, and Subsurface Investigation Work Plan.* Two soil borings were advanced to 20 fbg adjacent to the storm drain located just west of the site. Due to the presence of subsurface utilities, the borings could not be advanced in the locations in the street as proposed in the work plan, but were advanced in the sidewalk instead. The logs of these borings are included in Attachment B. Soil samples were collected for chemical analysis at 5-foot intervals and at the depth of first-encountered groundwater. Additionally, one grab groundwater sample was collected from each boring for laboratory analysis.

TPHg was detected in only three soil samples (SB-1-17', SB-1-19.5', and SB-2-19.5') at concentrations of 12 ppm, 43 ppm, and 10 ppm, respectively. BTEX was not detected in any soil sample collected during this investigation. MTBE was detected in only two soil samples (SB-1-15'and SB-2-17') at concentrations of 0.0078 ppm and 0.0099 ppm, respectively. All soil samples with detectable TPHg and/or MTBE concentrations were from saturated soils or from within the capillary fringe.

TPHg was detected in both grab groundwater samples SB-1-W, and SB-2-W at concentrations of 10,000 ppb and 520 ppb, respectively. Benzene was detected in both grab groundwater samples SB-1-W, and SB-2-W at concentrations of 430 ppb and 4.9 ppb, respectively. Toluene, ethylbenzene, and total xylenes were detected only in grab groundwater sample SB-1-W at concentrations of 75 ppb, 98 ppb, and 44 ppb, respectively. MTBE was detected in both grab groundwater samples SB-1-W, and SB-2-W at concentrations of 110 ppb and 320 ppb, respectively. Cambria concluded that the investigation results indicate that the highest TPHg and MTBE concentrations in groundwater are localized near the western corner of the Shell site and that MTBE concentrations in groundwater appear to be decreasing with distance from the Shell site. Details of the investigation are contained in Cambria's July 2, 2004 *Subsurface Investigation Report.*

2005 Fueling System Upgrade: In April 2005, Cambria collected soil samples from beneath the site's dispensers and at selected piping locations following an upgrade of the site's fueling system. Five dispenser soil samples were collected at depths of between 1.5 and 4 fbg and into

native soil, and five piping trench soil samples were collected at depths of between 2 and 4.5 fbg and into native soil. Field indications of hydrocarbons, including staining and odor, were observed in the vicinity of the sample locations in the western portion of the site.

Based on the field observations and results of laboratory data, Cambria directed over-excavation to a maximum depth of 6 fbg. Due to the Oakland Fire Department's concern over encountering shallow groundwater, the vertical extent of over-excavation was limited to 6 fbg. The lateral extent of over-excavation was limited by the proximity of the site's canopy supports. Cambria collected eight additional over-excavation bottom and side-wall samples. Staining and odors were observed in all over-excavation sample locations.

Sampling results are included in Table 1. TPHg was detected in three of five dispenser samples, with a maximum concentration of 1,700 ppm in D-2-1.5. However, this sample location was removed during over-excavation activities. Benzene was detected in only one sample at a concentration of 0.060 ppm. MTBE was detected in only one sample at a concentration of 0.0050 ppm.

TPHg was detected in three of five piping samples, with a maximum concentration of 2,700 ppm. Benzene was detected in two of five piping samples, with a maximum concentration of 4.2 ppm. MTBE was detected in two of five samples, with a maximum concentration of 0.30 ppm.

TPHg was detected in six of eight over-excavation samples, with a maximum concentration of 830 ppm. Benzene, MTBE, ethyl tert butyl ether, and tert-amyl methyl ether concentrations in soil were below the laboratory detection limits in all eight over-excavation samples.

Details of the sampling are included in Cambria's June 23, 2005 *Dispenser and Piping Upgrade and Limited Over-Excavation Soil Sampling Report.*

Groundwater Monitoring: Quarterly groundwater monitoring has been performed at the site since July 1988. Depth to water has ranged historically between 11.31 and 16.76 fbg. During the second quarter 2005 monitoring and sampling event, the depth to water in the wells ranged from 11.87 to 13.95 fbg,. The groundwater flow direction, as calculated from depth to water measurements in on-site monitoring wells, is typically toward the west to southwest, but has occasionally ranged to the northwest. Historical groundwater sampling results and groundwater elevations are included in Attachment C.

Since the fourth quarter of 2003, coordinated monitoring and sampling has been conducted with the adjacent former gas station (currently Oakland Auto Works) at 240 West MacArthur Boulevard.

SCM

Attachment D presents an SCM summarized in table format.

CONCLUSIONS AND RECOMMENDATIONS

Current groundwater conditions appear to be low-risk for all identified potential receptors. Current soil conditions in previously impacted and remediated areas are not known. Based on the site's history and current conditions, Cambria recommends the following actions:

- Additional soil sampling at impacted 2005 upgrade piping sample locations;
- Groundwater monitoring and sampling on a semi-annual schedule for all wells;
- Continue coordinated monitoring with 240 W. MacArthur Blvd.;
- Collect soil samples for sieve analysis to use in City of Oakland risk-based screening levels (RBSLs) evaluation; and
- Following collection of current soil data, evaluate site soil and groundwater conditions versus San Francisco Regional Water Quality Control Board environmental screening levels and City of Oakland RBSLs

CLOSING

If you have any questions regarding the contents of this document, please call David Gibbs at (510) 420-3363.

Sincerely,
Cambria Environmental Technology, Inc.

David M. Gibbs, P.G.
Project Geologist

Matthew W. Derby, P.E.
Senior Project Engineer

Figures: 1 - Vicinity/Area Well Survey Map
2 - Soil Sample and Over-Excavation Location Map

Tables: 1 - Cumulative Soil Analytical Data
2 - Cumulative Grab Groundwater Analytical Data

Attachments: A - Well Survey Results
B - On-Site Well Boring Logs
C - Quarterly Groundwater Monitoring Data
D - Site Conceptual Model

cc: Denis Brown, Shell Oil Products US, 20945 S. Wilmington Ave., Carson, CA 90810

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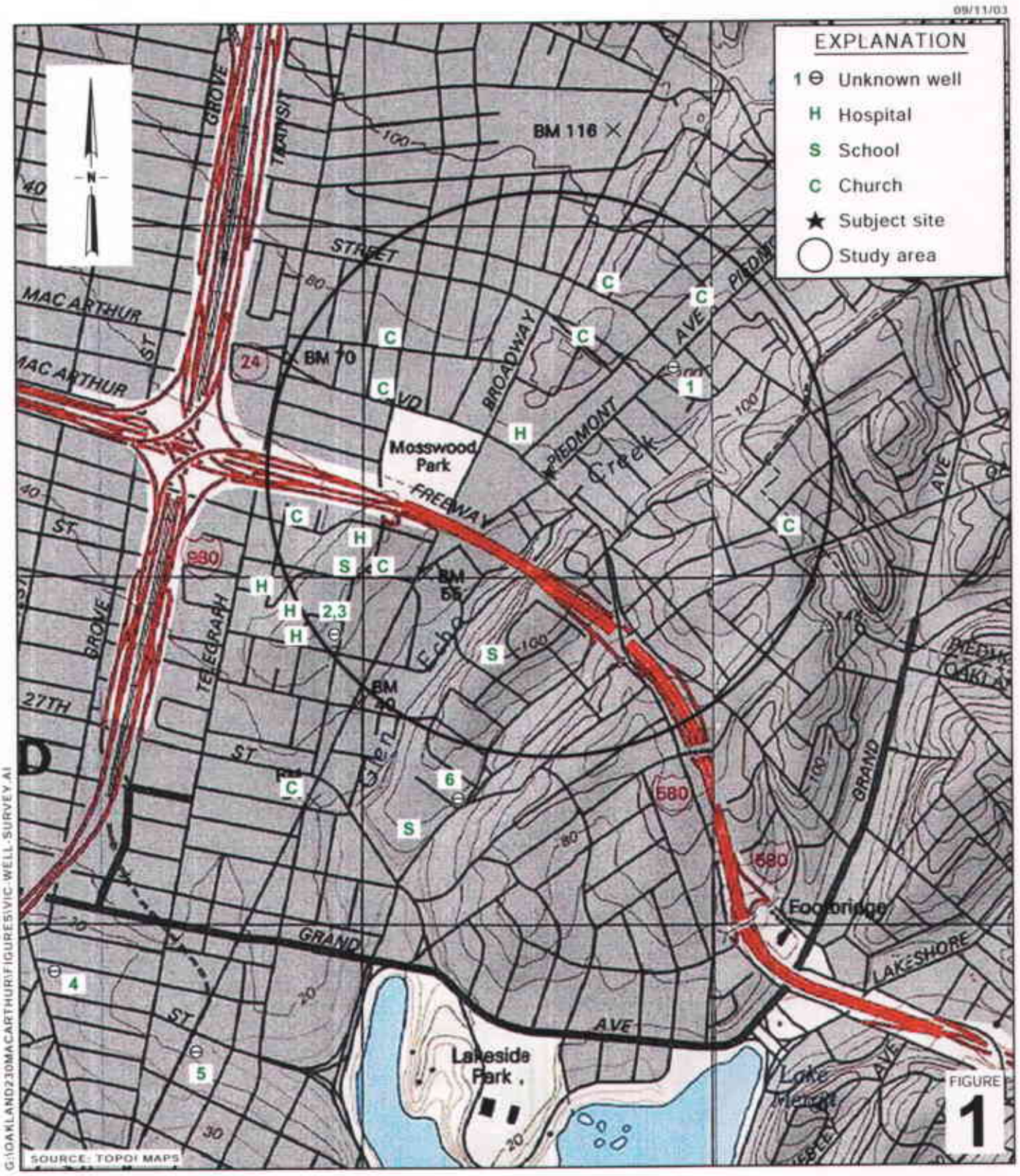

Shell-branded Service Station
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Vicinity/Area Well Survey Map
(1/2-Mile Radius)

06/17/05

Soil Sample and Over-Excavation Location Map

EXPLANATION

EX-1-6	▲	Over-excavation soil sample location (4/27/05)
D-1-4.0	⊛	Soil sample location (4/18/05)
MW-1	✦	Monitoring well location (Shell, 7/11-12/88)
MW-1	⊹	Monitoring well location (240 W. MacArthur)
SB-1	⊙	Soil boring location (3/24/04)
Probe 1	▲	Grab groundwater sample location (05/19/90)
GS-1	■	Grab groundwater sample location (10/17/89)
SB-1	⊙	Soil boring location (8/16/89)
A1	*	Soil sample location (11/05/87)
B-1	⊙	Soil boring location (8/27/87)
VR-1	⊕	Soil venting well location (3/12/87)
S-A	•	Soil boring location (4/14/86)

Storm drain line (SD)

Sanitary sewer line (SS)

Water line (W)

Gas line (G)

Electrical line (E)

Flow direction

Storm drain inlet

FL — Flow line elevation, in feet above mean sea level

fbg — Feet below grade

❶ — Product dispenser number

Groundwater Flow Direction
(Shell, 4Q96 through 1Q04)

Oakland Auto Works
240 W. MacArthur

Shell-branded
Service Station
230 W. MacArthur

Over-excavation areas

HOWE STREET

PIEDMONT AVENUE

WEST MACARTHUR BOULEVARD

Kaiser MB Center
235 W. MacArthur

0 15 30 60
SCALE 1:30 FEET

Site features for 240 W. MacArthur based on figure provided by Stellar Environmental Solutions, Inc.

G:\OAKLAND 230 MACARTHUR\FIGURES\SITE PLAN 6-05 AI

FIGURE
2

Shell-branded Service Station
230 West MacArthur Boulevard
Oakland, California
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Table 1. Cumulative Soil Analytical Data - TPHg, BTEX, MTBE, Oxygenates, and Lead - Shell-branded Service Station - Incident # 98995741, 230 W. MacArthur Boulevard, Oakland, California

Sample ID	Date	Depth (feet)	TPHg	Benzene	Toluene	Ethyl-benzene	Total Xylenes	TBA	MTBE	DIPE	ETBE	TAME	Total Lead	Organic Lead
			← parts per million →											
1986 Site Investigation														
S-A	4/14/1986	4 - 5.5	**17**[a]	--	--	--	--	--	--	--	--	--	--	--
S-A	4/14/1986	8.5 - 10	**1,200**[a]	--	--	--	--	--	--	--	--	--	--	--
S-A	4/14/1986	11 - 12.5	**4,300**[a]	--	--	--	--	--	--	--	--	--	--	--
S-A	4/14/1986	13.5 - 15	ND[a]	--	--	--	--	--	--	--	--	--	--	--
S-B	4/14/1986	5 - 6.5	**36**[a]	--	--	--	--	--	--	--	--	--	--	--
S-B	4/14/1986	8 - 9.5	**78**[a]	--	--	--	--	--	--	--	--	--	--	--
S-B	4/14/1986	12 - 13	**6.4**[a]	--	--	--	--	--	--	--	--	--	**11.0**[b]	--
S-C	4/14/1986	4 - 5.5	ND[a]	--	--	--	--	--	--	--	--	--	---	---
S-C	4/14/1986	7 - 8.5	ND[a]	--	--	--	--	--	--	--	--	--	---	---
S-C	4/14/1986	11 - 12.5	ND[a]	--	--	--	--	--	--	--	--	--	---	---
S-C	4/14/1986	13.5 - 15	**5700**[a]	--	--	--	--	--	--	--	--	--	---	---
S-D	4/14/1986	Composite	**571**[a]	--	--	--	--	--	--	--	--	--	--	--
1987 Soil Borings (associated with Recovery Well Installation)														
B-1 @ 4'	8/28/1987	4	**412**	<0.05	<0.05	<0.1	**5.4**	--	--	--	--	--	**65.9**[d]	--
B-1 @ 6'	8/28/1987	6	**1,440**	<0.05	<0.05	<0.1	**130**	--	--	--	--	--	**26.4**[d]	--
B-1 @ 8'	8/28/1987	8	**1,870**	<0.05	**4.3**	**14**	**325**	--	--	--	--	--	**14.3**[d]	--
B-1 @ 10'	8/28/1987	10	<10	<0.05	<0.05	<0.1	<0.1	--	--	--	--	--	<5[d]	--
B-1 @ 12'	8/28/1987	12	**122**	**0.60**	**0.36**	**0.38**	**0.33**	--	--	--	--	--	<5[d]	--
B-1 @ 14'	8/28/1987	14	**52**	<0.05	<0.05	<0.1	<0.1	--	--	--	--	--	<5[d]	--

Table 1. Cumulative Soil Analytical Data - TPHg, BTEX, MTBE, Oxygenates, and Lead - Shell-branded Service Station - Incident # 98995741, 230 W. MacArthur Boulevard, Oakland, California

Sample ID	Date	Depth (feet)	TPHg	Benzene	Toluene	Ethyl-benzene	Total Xylenes	TBA	MTBE	DIPE	ETBE	TAME	Total Lead	Organic Lead
			← parts per million →											
B-2 @ 5'	8/28/1987	5	<10	<0.05	**1.5**	**5.7**	<0.1	--	--	--	--	--	<5[d]	--
B-2 @ 6-7'	8/28/1987	6 - 7	<10	<0.05	**0.37**	**0.55**	<0.1	--	--	--	--	--	<5[d]	--
B-2 @ 8-9'	8/28/1987	8 - 9	<10	0.5	**0.4**	**0.3**	<0.1	--	--	--	--	--	<5[d]	--
B-2 @ 10'	8/28/1987	10	<10	<0.05	<0.05	<0.1	<0.1	--	--	--	--	--	<5[d]	--
B-2 @ 12'	8/28/1987	12	<10	<0.05	<0.05	<0.1	<0.1	--	--	--	--	--	<5[d]	--
1987 UST Removal and Soil Sampling														
A1	11/2/1987	15.0	**380**	**1.6**	**2.2**	--	**55**	--	--	--	--	--	---	--
A2	11/2/1987	15.0	**310**	**1.3**	**1.3**	--	**33**	--	--	--	--	--	---	--
B1	11/2/1987	15.0	**480**	**4.3**	**0.5**	--	**22**	--	--	--	--	--	---	--
B2	11/2/1987	15.0	**9.1**	**1.6**	**0.3**	--	**0.1**	--	--	--	--	--	---	--
C1	11/2/1987	15.0	**12**	**1.5**	<0.1	--	**1.1**	--	--	--	--	--	---	--
C2	11/2/1987	15.0	**170**	**4.1**	<0.1	--	**2.4**	--	--	--	--	--	---	--
D1	11/2/1987	15.0	**8.6**	<0.1	<0.1	--	<0.1	--	--	--	--	--	---	--
D2	11/2/1987	15.0	**44**	<0.1	<0.1	--	**5.3**	--	--	--	--	--	---	--
1988 Monitoring Well Installation														
MW1-2	7/11/1988	10	<10	<0.003	**0.0116**	<0.003	<0.003	--	--	--	--	--	---	--
MW1-3	7/11/1988	15	<10	<0.003	**0.0129**	<0.003	**0.0051**	--	--	--	--	--	---	--
MW1-4	7/11/1988	20	<10	<0.003	**0.023**	<0.003	<0.003	--	--	--	--	--	---	--
MW2-1	7/11/1988	5	<10	<0.003	**0.0161**	<0.003	<0.003	--	--	--	--	--	---	--
MW2-2	7/11/1988	10	<10	<0.003	**0.0093**	<0.003	<0.003	--	--	--	--	--	---	--
MW2-3	7/11/1988	15	<10	<0.003	**0.01**	<0.003	<0.003	--	--	--	--	--	---	--
MW3-1	7/12/1988	10	**278**	<0.05	**0.388**	<0.003	**0.411**	--	--	--	--	--	**11**[e]	--
MW3-2	7/12/1988	15	<10	<0.003	**0.0367**	<0.003	<0.003	--	--	--	--	--	**8.3**[e]	--
MW3-3	7/12/1988	20	<10	<0.003	**0.0304**	**0.0076**	<0.003	--	--	--	--	--	---	--

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Sample ID	Date	Depth (feet)	TPHg	Benzene	Toluene	Ethyl-benzene	Total Xylenes	TBA	MTBE	DIPE	ETBE	TAME	Total Lead	Organic Lead
			← parts per million →											
1989 Phase II Supplemental Soil Investigation														
SB1-1	8/16/1989	5	<1.0	<0.05	<0.1	<0.1	<0.1	--	--	--	--	--	---	--
SB1-2	8/16/1989	10	<1.0	<0.05	<0.1	<0.1	<0.1	--	--	--	--	--	---	--
SB1-3	8/16/1989	15	<1.0	<0.05	<0.1	<0.1	<0.1	--	--	--	--	--	---	--
SB1 (composite)	8/16/1989	Composite	--	--	--	--	--		--	--	--	--	**4.5**[a]	<0.05
SB2-1	8/16/1989	5.5	<1.0	<0.05	<0.1	<0.1	<0.1	--	--	--	--	--	--	--
SB2-2	8/16/1989	10.5	<1.0	<0.05	<0.1	<0.1	<0.1	--	--	--	--	--	--	--
SB2-3	8/16/1989	15.5	**490**	<0.05	**0.28**	**1.3**	**1.0**	--	--	--	--	--	--	--
SB2 (composite)	8/16/1989	Composite	--	--	--	--	--	--	--	--	--	--	**2.5**[a]	<0.05
SB3-1	8/16/1989	4.5	**6.6**	<0.05	**0.26**	**0.14**	**0.63**	--	--	--	--	--	--	--
SB3-2	8/16/1989	9.5	<1.0	<0.05	<0.1	<0.1	<0.1	--	--	--	--	--	--	--
SB3-3	8/16/1989	15.5	<1.0	<0.05	<0.1	<0.1	<0.1	--	--	--	--	--	--	--
SB3 (composite)	8/16/1989	Composite	--	--	--	--	--	--	--	--	--	--	**5.5**[a]	<0.05
SB-1-5'	3/24/2004	5	<1.0	<0.0050	<0.0050	<0.0050	<0.0050	--	<0.0050	--	--	--	--	--
SB-1-10'	3/24/2004	10	<1.0	<0.0050	<0.0050	<0.0050	<0.0050	--	<0.0050	--	--	--	--	--
SB-1-15'	3/24/2004	15	<1.0	<0.0050	<0.0050	<0.0050	<0.0050	--	**0.0078**	--	--	--	--	--
SB-1-17'	3/24/2004	17	**12**	<0.025	<0.025	<0.025	<0.025	--	<0.025	--	--	--	--	--
SB-1-19.5'	3/24/2004	19.5	**43**	<0.024	<0.024	<0.024	<0.024	--	<0.024	--	--	--	--	--
SB-2-5'	3/24/2004	5	<1.0	<0.0050	<0.0050	<0.0050	<0.0050	--	<0.0050	--	--	--	--	--
SB-2-10'	3/24/2004	10	<1.0	<0.0050	<0.0050	<0.0050	<0.0050	--	<0.0050	--	--	--	--	--
SB-2-15'	3/24/2004	15	<1.0	<0.0050	<0.0050	<0.0050	<0.0050	--	<0.0050	--	--	--	--	--
SB-2-17'	3/24/2004	17	<1.0	<0.0050	<0.0050	<0.0050	<0.0050	--	**0.0099**	--	--	--	--	--
SB-2-19.5'	3/24/2004	19.5	**10**	<0.025	<0.025	<0.025	<0.025	--	<0.025	--	--	--	--	--

Table 1. Cumulative Soil Analytical Data - TPHg, BTEX, MTBE, Oxygenates, and Lead - Shell-branded Service Station - Incident # 98995741, 230 W. MacArthur Boulevard, Oakland, California

Sample ID	Date	Depth (feet)	TPHg	Benzene	Toluene	Ethyl-benzene	Total Xylenes	TBA	MTBE	DIPE	ETBE	TAME	Total Lead	Organic Lead
			← parts per million →											
2005 Dispenser, Piping, and Limited Over-Excavation Soil Sampling														
D-1-4.0	4/18/2005	4.0	<1.0	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	**6.2**	--
D-2-1.5	4/18/2005	1.5	**1,700**	<0.40	**2.4**	**3.8**	**5.4**	<2.0	<0.40	<0.40	<0.40	<0.40	**130**	--
D-2-3.5	4/18/2005	3.5	**940**	**0.060**	**6.6**	**9.5**	**85**	<0.15	<0.025	<0.025	<0.025	<0.025	**8.0**	--
D-3-3.0	4/18/2005	3.0	**2.5**	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	**6.5**	--
D-4-4.0	4/18/2005	4.0	<1.0	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	**0.0050**	<0.0050	<0.0050	<0.0050	**8.1**	--
P-1-2.0	4/18/2005	2.0	<1.0	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	**4.2**	--
P-2-4.5	4/18/2005	4.5	<1.0	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	**9.7**	--
P-3-3.5	4/18/2005	3.5	**620**	<0.025	**0.20**	**1.6**	**6.1**	**0.18**	**0.066**	<0.025	<0.025	<0.025	**22**	--
P-4-4.0	4/18/2005	4.0	**2,700**	**4.2**	**1.6**	**39**	**78**	<1.5	**0.30**	<0.25	<0.25	<0.25	**140**	--
P-5-4.0	4/18/2005	4.0	**1,600**	**0.98**	**0.28**	**7.4**	**13**	<1.5	<0.25	<0.25	<0.25	<0.25	**11**	--
EX-1-6	4/28/2005	6.0	**830**	<0.50	**1.4**	**4.1**	<0.50	<2.5	<0.50	<1.0	<0.50	<0.50	**7.2**	--
EX-2-6	4/28/2005	6.0	**200**	<0.50	<0.50	<0.50	<0.50	<2.5	<0.50	<1.0	<0.50	<0.50	**7.1**	--
EX-3-6	4/28/2005	6.0	**7.3**	<0.0050	<0.0050	<0.0050	<0.0050	**0.015**	<0.0050	<0.010	<0.0050	<0.0050	**4.1**	--
EX-4-6	4/28/2005	6.0	**21**	<0.023	<0.023	<0.023	<0.023	<0.046	<0.023	<0.023	<0.023	<0.023	**12**	--
EX-B-6.5	4/28/2005	6.5	<1.0	<0.0050	<0.0050	<0.0050	<0.0050	**0.017**	<0.0050	<0.010	<0.0050	<0.0050	**3.6**	--
EX-5-6	4/28/2005	6.0	**7.6**	<0.019	<0.019	<0.019	**0.10**	<0.038	<0.019	<0.038	<0.019	<0.019	**4.1**	--
EX-6-6	4/28/2005	6.0	<1.0	<0.0050	<0.0050	<0.0050	<0.0050	**0.013**	<0.0050	<0.010	<0.0050	<0.0050	**7.3**	--
EX-B2-6.5	4/28/2005	6.5	**260**	<0.50	<0.50	**1.6**	**1.5**	<2.5	<0.50	**3.3**	<0.50	<0.50	**4.0**	--

Table 1. Cumulative Soil Analytical Data - TPHg, BTEX, MTBE, Oxygenates, and Lead - Shell-branded Service Station - Incident # 98995741, 230 W. MacArthur Boulevard, Oakland, California

Sample ID	Date	Depth (feet)	TPHg	Benzene	Toluene	Ethyl-benzene	Total Xylenes	TBA	MTBE	DIPE	ETBE	TAME	Total Lead	Organic Lead
			← parts per million →											

Abbreviations and Notes:

TPHg = Total petroleum hydrocarbons as gasoline analyzed by EPA Method 8260B (before 2004, analyzed by EPA method 8015).

Benzene, ethylbenzene, toluene, total xylenes by EPA method 8260B (before 2004, analyzed by EPA Method 8020).

MTBE = Methyl tert-butyl ether by EPA Method 8260B.

TBA = Tert-butyl alcohol analyzed by EPA Method 8260B.

MTBE = Methyl tertiary-butyl ether, analyzed by EPA Methods 8260B.

DIPE = Di-isopropyl ether, analyzed by EPA Method 8260B.

ETBE = Ethyl tert butyl ether, analyzed by modified EPA Method 8260B.

TAME = Tert-amyl methyl ether, analyzed by EPA Method 8260B.

Organic lead analyzed by Cal LUFT Manual, 12/87

Lead by EPA Method 6010

ND = Below detection limit

<n = Below detection limit of x ppm

-- = Not analyzed

Shading identifies pre-excavation sample locations that were subsequently removed

a = Analytical method is unknown

b = Total lead analyzed by unknown method

c = Composite of four samples taken from depths of 4 - 5 fbg, 7 - 8.5 fbg, 11 - 12.5 fbg, and 13.5 - 15 fbg

d = Lead analyzed by EPA method 7421

e = Total lead analyzed by EPA method 7240

Table 2. Historical Grab Groundwater Analytical Data - Shell-branded Service Station - 230 W. MacArthur Boulevard, Oakland, California - Incident # 98995741

Sample ID	Date	TPHg	Benzene	Toluene	Ethylbenzene	Total Xylenes	MTBE
		← (ppb) →					
GS-1[a]	10/17/1989	<50[b]	<0.5[b]	<0.5[b]	<0.6[b]	<1.5[b]	---
GS-2[a]	10/17/1989	**5,600[b]**	**340[b]**	**27[b]**	**1,200[b]**	**62[b]**	---
GS-3[a]	10/17/1989	**8,800[b]**	**380[b]**	**6[b]**	**580[b]**	**42[b]**	---
Probe 1	5/19/1990	<50	<0.5	<0.5	<0.5	<0.5	---
Probe 2	5/19/1990	**25,000**	**280**	**290**	**160**	**470**	---
Probe 3	5/19/1990	<50	<0.5	<0.5	<0.5	<0.5	---
Probe 4	5/19/1990	<50	**5**	<0.5	**2**	<0.5	---
Probe 5	5/19/1990	<50	**1**	**2**	**1**	**4**	---
Probe 6	5/19/1990	**31,000**	**430**	**600**	**240**	**1,400**	---
SB-1-W	3/24/2004	**10,000**	**430**	**75**	**98**	**44**	**110**
SB-2-W	3/24/2004	**520**	**4.9**	<1.0	<1.0	<2.0	**320**

Abbreviations and Notes:

TPHg = Total petroleum hydrocarbons as gasoline analyzed by EPA method 8260B; before 2004, analyzed by EPA method 8015 .

Benzene, ethylbenzene, toluene, total xylenes analyzed by EPA method 8260B; before 2004, analyzed by EPA method 8020.

MTBE = Methyl tert-butyl ether analyzed by EPA method 8260B.

ppb = Parts per billion

<x = Below detection limit of x ppm

--- = Not analyzed

a = Sample taken from temporary well

b = Analyzed by unknown method

ATTACHMENT A

Well Survey Results

Well Survey Results - Shell-branded Service Station, 230 West MacArthur Blvd. Oakland California - Incident # 98995741

Location	DWR Well ID	Owner's Well ID	Well Address	Installation Date	Owner	Use	Well Status	Depth (fbg)	Screened Interval (fbg)
1	01S/4W-24L1	Unk	4082 Piedmont Ave.	July 29, 1979	John Bond	Unk	Active	198	132-189
2	01S/4W-26A	1	30th St. and Webster St.	Unk	Providence Hospital	Unk	Active	150	120-150
3	01S/4W-26G	2	30th St. and Webster St.	Unk	Providence Hospital	Unk	Active	366	Unk
4	01S/4W-28L	649/733	20th St. and San Pablo Ave.	Unk	Great Western Power Co.	Unk	Active	556	Unk
5	01S/4W-26	715	SE corner of 20th St. and Broadway	Unk	Oakland Lodge #171, B.P.O.E.	Unk	Active	153	Unk
6	01S/4W-25E	946	Harrison St. and Hamilton Pl.	April 30, 1927	City of Paris Laundry	Unk	Active	295	125-240

Well Locations Provided by the Department of Water Resources

Notes and Abbreviations:

Location = Number refers to well label on Figure 1.

DWR Well ID = California State well identification number as recorded by the Department of Water Resources in Sacramento, California.

Unk= Unknown

fbg = feet below grade

ATTACHMENT B

On-Site Well Boring Logs

ensco environmental services, Inc.

230 MacArthur Blvd.
Oakland, California

DATE DRILLED: 7-11-88
PROJECT No.: 1847 G
LOGGED BY: SC

EXPLORATORY BORING LOG

DEPTH (ft.)	SAMPLE No	BLOWS/FOOT 140 ft/lbs.	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION	WATER LEVEL	OVA READING ppm
				8" concrete over 6" pea gravel		
1-5			SP	CLAYEY SAND, greenish gray, predominantly fine sand 20% fine gravel, damp		
5-6			SP	SAND, greenish gray, predominantly fine to medium sand, 5-10% coarse sand, 10-15% fine gravel, <5% fines, very dense, damp		
6	1-1	72	SP	SAND, olive brown, fine to medium grained trace silt, very dense, damp		0
7-9			SP			
9-10			SC	CLAYEY SAND, orangish brown, fine to medium grained organic staining, 4" lens of fine to medium sand (poorly sorted, greenish gray), dense, damp		
11	1-2	30	SC			1
12-14			SC			
14-15			SW		▽	
15-16			SW	SAND, bluish gray, fine to coarse grained <5% fines, color to brown at 15.5 feet, wet, dense		
16	1-3	37	CL	SANDY CLAY, yellowish brown, 30% fine sand, very moist		2
17			SC	CLAYEY SAND, tannish brown, predominantly fine sand, trace medium sand, 15-20% fines, rare rootholes, moist, dense		
18-19			SP	SAND, brown, predominantly fine sand, becomes silty at 20.5', dense, very moist to wet		
20						

REVIEWED BY R.G./C.E.G.

ensco
environmental
services, inc.

250 MacArthur Blvd.
Oakland, California

DATE DRILLED: 7-11-88
PROJECT No.: 1847 G
LOGGED BY: SC

MW-1

EXPLORATORY BORING LOG

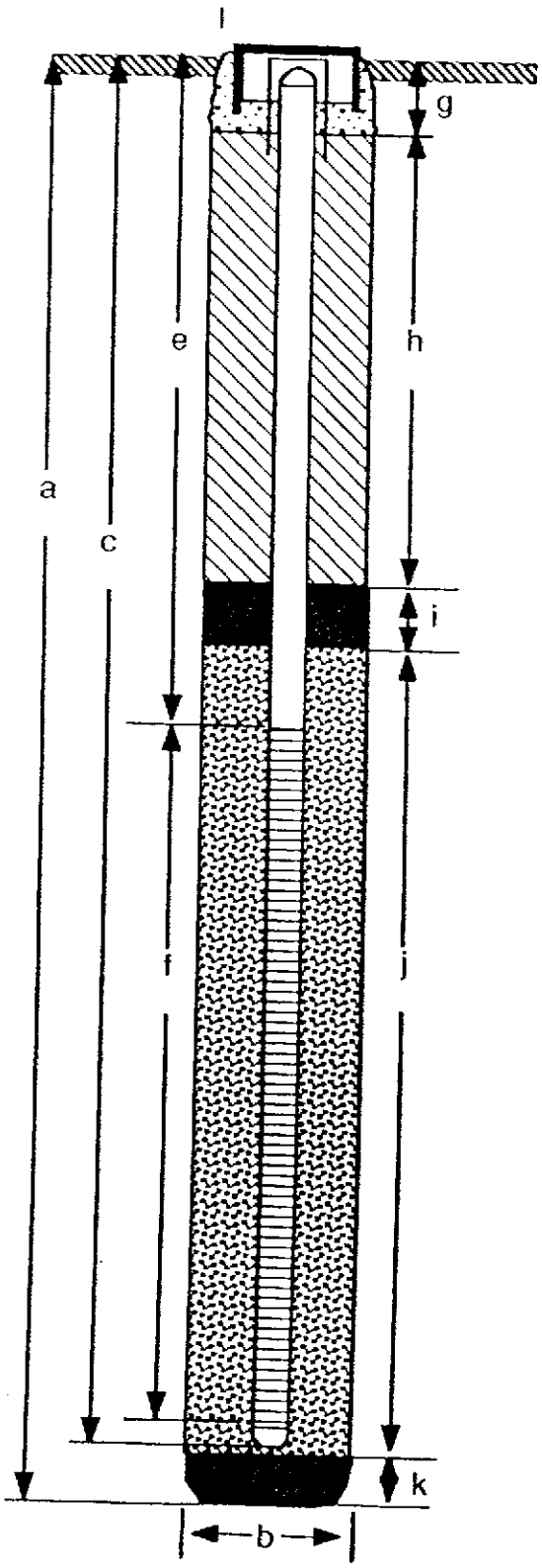
DEPTH (ft.)	SAMPLE No	BLOWS/FOOT 140 ft/lbs.	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION	WATER LEVEL	OVA READING ppm
20			SP	SAND cont.		
21	1-4	30	CL	SILTY CLAY, brown, 5-10% fine sand locally to 20% disseminated, hard, very moist		0
22						
23						
24			SP-SC	SAND, light olive, fine to medium grained <10% clay fines, rare oxidation stains, dense, very moist to wet		
25						
26	1-5	48	SC	CLAYEY SAND, light olive, predominantly fine to medium sand, 40% clay, rare organics, dense, very moist to wet		1
27						
28						
29						
30			SP-SC	SAND, light olive, predominantly fine to medium grained, 15% coarse sand, <10% clay fines, dense, saturated		
31	1-6	36				
32				BOTTOM OF BORING 31.5'		
33						
34						
35						
36						
37						
38						
39						
40						

REVIEWED BY R.G./C.E.G.

Monitoring Well Detail

PROJECT NUMBER 1847 G Shell Oil Co.
PROJECT NAME 230 MacArthur Blvd.
COUNTY Oakland, Alameda Co.
WELL PERMIT NO. 88305

BORING / WELL NO. MW-1
TOP OF CASING ELEV. 73.89'
GROUND SURFACE ELEV. 74.34'
DATUM 72.96' City of Oakland



EXPLORATORY BORING

a. Total Depth 31.5 ft.
b. Diameter 10 in.
Drilling method Hollowstem Auger

WELL CONSTRUCTION

c. Casing length 30 ft.
Material Schedule 40 PVC
d. Diameter 4 in.
e. Depth to top perforations 10 ft.
f. Perforated length 20 ft.
Perforated interval from 30 to 10 ft.
Perforation type machine slot
Perforation size 0.020 in.
g. Surface seal 1 ft.
Seal Material Concrete
h. Backfill 5 ft.
Backfill material Cement Grout
i. Seal 2 ft.
Seal Material Bentonite Pellets
j. Gravel pack 22 ft.
Pack material #2/12 Aqua Sand
k. Bottom seal -- ft.
Seal material NA
l. F-8 vault box, locking cover and lock

ensco environmental services, inc.

ensco
environmental
services, Inc.

230 MacArthur Blvd.
Oakland, California

DATE DRILLED: 7-11-88 MW-2
PROJECT No.: 1847 G
LOGGED BY: SC

EXPLORATORY BORING LOG

DEPTH (ft.)	SAMPLE No	BLOWS/FOOT 140 ft/lbs.	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION	WATER LEVEL	OVA READING ppm
1				4" Asphalt pavement over 9" baserock		
2			SC	CLAYEY SAND, orangish brown, fine to medium sand, 20% fines, damp		
3						
4				-as above; color to dark olive gray, locally 40% fine to coarse gravel composed of angular chert fragments, rare coarse sand, dense, damp		
5						
6	2-1	44	SC			2
7						
8						
9				-as above, color to yellowish brown with minor olive gray staining, ~40% fines, trace organic black staining, rare rootholes, dense, damp		
10			SC			
11	2-2	34				1
12			CL	SANDY TO SILTY CLAY, olive beige with slight orange staining, 10 to 20% fine sand, orange staining low plasticity, hard, damp		
13						
14						
15					▽	
16	2-3	34	SP-SM	SAND, brown, predominantly fine sand, 5 to 10% silt, trace organic staining, dense, wet, fine to medium sand		0.5
17						
18						
19						
20						

REVIEWED BY R.G./C.E.G.

ensco
environmental
services, Inc.

230 MacArthur Blvd.
Oakland, California

DATE DRILLED: 7-11-88
PROJECT No.: 1847 G
LOGGED BY: SC

MW-2

EXPLORATORY BORING LOG

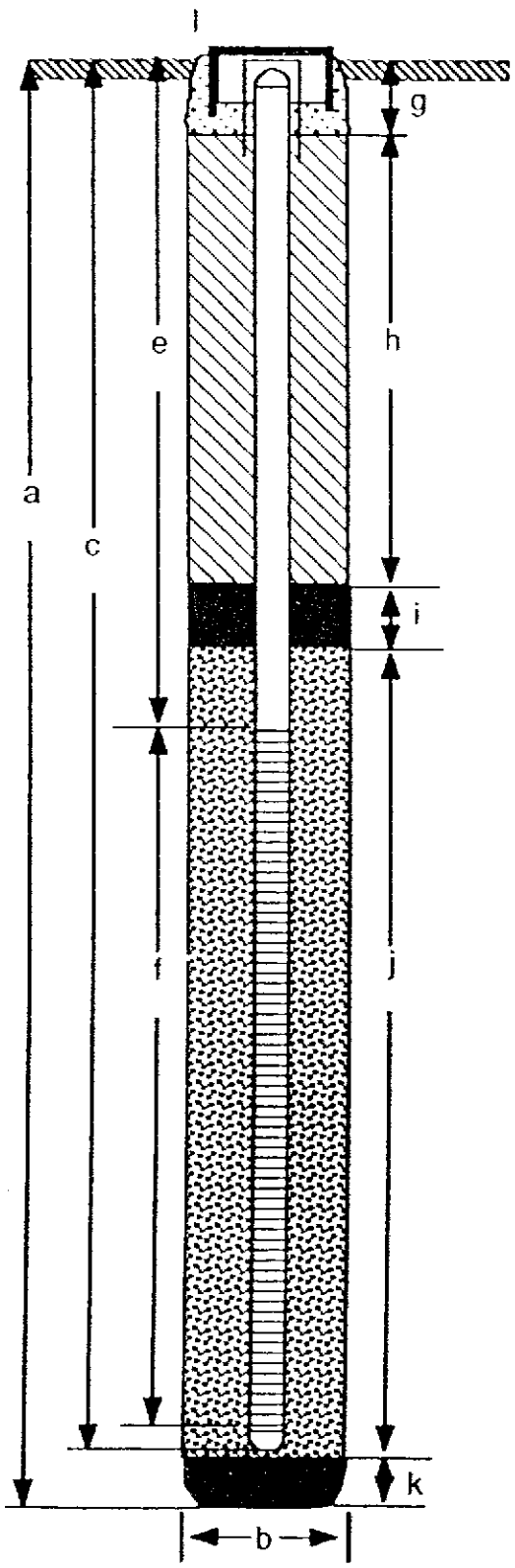
DEPTH (ft.)	SAMPLE No	BLOWS/FOOT 140 ft/lbs.	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION	WATER LEVEL	OVA READING ppm	
20							
21	2-4	28	CL	SILTY CLAY, tannish brown, trace of organic staining, 10% very fine sand, low plasticity, very stiff, wet, color changes to tan in shoe		0	
22							
23							
24							
25				SILTY CLAY, light olive gray and orangish brown, organic staining common, low to moderate plasticity, hard, moist, (4" lens of sandy silt with clay, damp to moist)			
26	2-5	64				0	
27							
28							
29				-- as above: becomes sandy and orangish brown, 30% fine sand, abundant silt, very stiff			
30	2-6	26				0	
				BOTTOM OF BORING 30.0'			
31							
32							
33							
34							
35							
36							
37							
38							
39							
40							

REVIEWED BY R.G./C.E.G.

Monitoring Well Detail

PROJECT NUMBER 1847 G Shell Oil Co.
PROJECT NAME 230 MacArthur Blvd.
COUNTY Oakland, Alameda Co.
WELL PERMIT NO. 88305

BORING / WELL NO. MW-2
TOP OF CASING ELEV. 75.24'
GROUND SURFACE ELEV. 75.96'
DATUM 72.96' City of Oakland



EXPLORATORY BORING

a. Total Depth 30 ft.
b. Diameter 10 in.
Drilling method Hollowstem Auger

WELL CONSTRUCTION

c. Casing length 28 ft.
Material Schedule 40 PVC
d. Diameter 4 in.
e. Depth to top perforations 10 ft.
f. Perforated length 18 ft.
Perforated interval from 28 to 10 ft.
Perforation type machine slot
Perforation size 0.020 in.
g. Surface seal 1 ft.
Seal Material Concrete
h. Backfill 5 ft.
Backfill material Cement Grout
i. Seal 2 ft.
Seal Material Bentonite Pellets
j. Gravel pack 20 ft.
Pack material #2/12 Aqua Sand
k. Bottom seal -- ft.
Seal material NA
l. F-8 vault box, locking cover and lock

ensco environmental services, inc.

ensco environmental services, Inc.

2350 MacArthur Blvd.
Oakland, California

DATE DRILLED: 7-12-88
PROJECT No.: 1847 G
LOGGED BY: SC

MW-3

EXPLORATORY BORING LOG

DEPTH (ft.)	SAMPLE No	BLOWS/FOOT 140 ft/lbs.	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION	WATER LEVEL	OVA READING ppm
1				8" concrete		
2				FILL, pea gravel		
3						
4						
5						
6						
7						0
8						
9						
10			SC	CLAYEY SAND, olive grey mottled with orangish brown, 50 to 60% fine sand, trace medium to coarse sand, slight petroleum odor, medium dense, damp		
11	3-1	12				
12			SW	SAND, orangish brown, fine to coarse grained with fine angular chert gravels, medium dense, damp		120
13						
14						
15				SAND, greenish gray, well graded, fine to coarse grained 10 to 15% fine gravels (angular to subangular white, yellow, and red cherts, graywacke), very faint petroleum odor, medium dense, saturated	▽	
16	3-2	13				
17			CL	SILTY CLAY, tannish brown, trace organic staining, 10% fine sand, rare root holes, low plasticity, stiff, moist		2
18						
19			SC			
20						

REVIEWED BY R.G./C.E.G.

ensco environmental services, inc.

230 MacArthur Blvd.
Oakland, CA

DATE DRILLED: 7-12-88
PROJECT No.: 1847 G
LOGGED BY: SC MW-3

EXPLORATORY BORING LOG

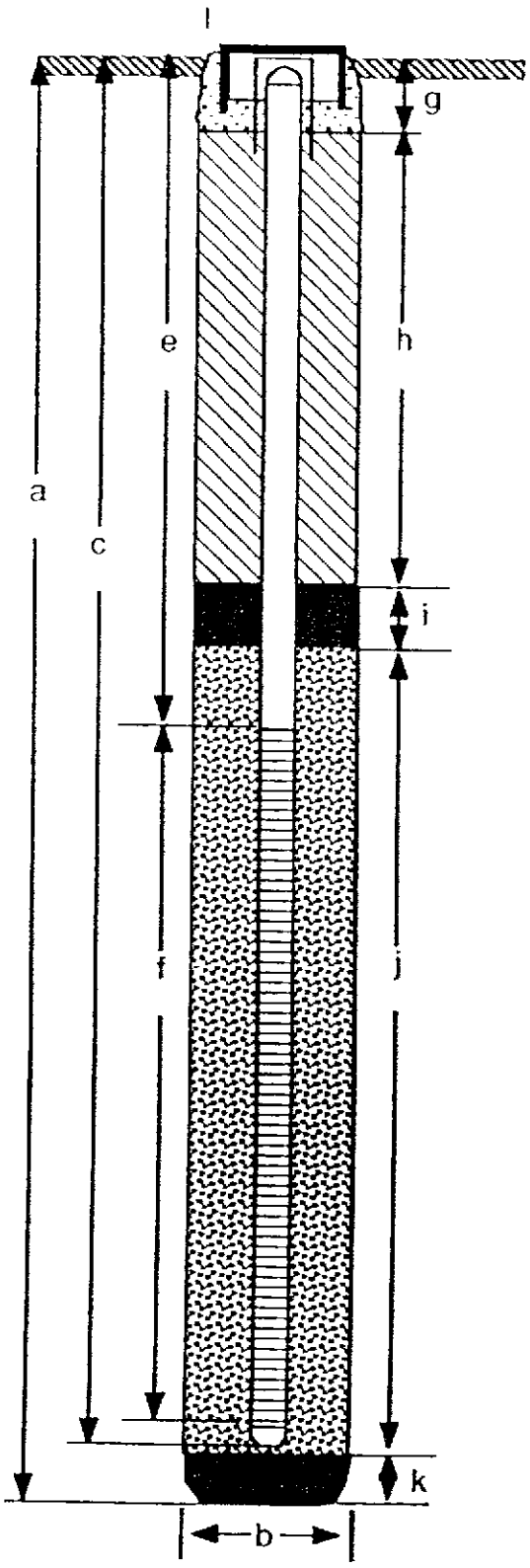
DEPTH (ft.)	SAMPLE No	BLOWS/FOOT 140 ft/lbs.	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION	WATER LEVEL	OVA READING ppm
20			SC	CLAYEY SAND, brown, 70% fine sand, medium dense, moist to wet		
21	3-3	31	CL	SILTY CLAY, tannish brown, 10% fine sand, trace organic staining, no rootholes, low plasticity, very stiff, wet		0
22						
23						
24			SC	CLAYEY SAND, olive with minor orange staining, 60% fine sand, 10% medium to coarse sand, shell fragment, very dense, moist to wet		
25						
26	3-4	72	CL	SANDY CLAY to SILTY CLAY, olive, 25% fine sand (locally sand <10%), low plasticity, hard, moist		0
27						
28			SP	CLAYEY SAND, olive with minor orange oxide staining, 60 to 70% fine sand, locally clay to 50%, (becomes very sandy at 30', olive to bluish gray), dense, moist		
29	3-5	44				
30				BOTTOM OF BORING 30'		0
31						
32						
33						
34						
35						
36						
37						
38						
39						
40						

REVIEWED BY R.G./C.E.G.

Monitoring Well Detail

PROJECT NUMBER 1847 G Shell Oil Co.
PROJECT NAME 230 MacArthur Blvd
COUNTY Oakland, Alameda Co.
WELL PERMIT NO. 88305

BORING / WELL NO. MW-3
TOP OF CASING ELEV. 74.68'
GROUND SURFACE ELEV. 75.05'
DATUM 72.96' City of Oakland



EXPLORATORY BORING

a. Total Depth 30 ft.
b. Diameter 10 in.
Drilling method Hollowstem Auger

WELL CONSTRUCTION

c. Casing length 28.5 ft.
Material Schedule 40 PVC
d. Diameter 4 in.
e. Depth to top perforations 11.5 ft.
f. Perforated length 17 ft.
Perforated interval from 28.5 to 11.5 ft.
Perforation type machine slot
Perforation size 0.020 in.
g. Surface seal 1 ft.
Seal Material Concrete
h. Backfill 7.5 ft.
Backfill material Cement Grout
i. Seal 1.5 ft.
Seal Material Bentonite Pellets
j. Gravel pack 18.5 ft.
Pack material #2/12 Aqua Sand
k. Bottom seal -- ft.
Seal material NA
l. F-8 vault box, locking cover and lock

ensco environmental services, inc.

ensco environmental services, inc.

PROJECT NAME: Shell Oil Company
230 MacArthur Blvd.
Oakland, CA

BORING NO. MW-4

DATE DRILLED: 1/9/90

PROJECT NUMBER: 1847-2G

LOGGED BY: J.M.

DEPTH (ft.)	SAMPLE No	BLOWS/FOOT	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION	WATER LEVEL	OVA READING ppm
1-5			CL	SANDY CLAY, light olive brown (2.5Y 5/6), 30-40% rounded to subangular fine to medium grained sand, ≈ 10% coarse gravel to 2", iron stain, black mottling, hard, very low plasticity, dry to damp		
6	MW-4-1	64				0
7-8			SW	SAND, light olive brown (2.5Y 5/6), fine to medium grained sand, 30% clay, rounded to subangular, poorly sorted, medium dense		
9-10			CL	SANDY CLAY, light olive brown (2.5Y 5/6), 35-45% sand, rounded to subangular, fine to medium grained, iron stain, very stiff, low plasticity, damp		
10	MW-4-2	40				0
11-13				Silty lenses		
14-15	MW-4-3	27	SP	SAND, olive gray (5Y 4/2), fine to medium grained sand, well sorted, rounded to subrounded, some iron stain, clay 10-20%, silt 10-20%, loose, moist		0
16-17			CL	SILTY CLAY, brown (10YR 5/3), silt ≈ 40%, black and gray mottling, iron stain, root holes and organic matter, very stiff, low plasticity, moist to damp		
18-19						
20	MW-4-4	33				0
21						

REVIEWED BY R.G./C.E.G.

ensco environmental services, inc.

PROJECT NAME: Shell Oil Company
230 MacArthur Blvd.
Oakland, CA

BORING NO. MW-4

DATE DRILLED: 1/9/90

PROJECT NUMBER: 1847-2G

LOGGED BY: J.M.

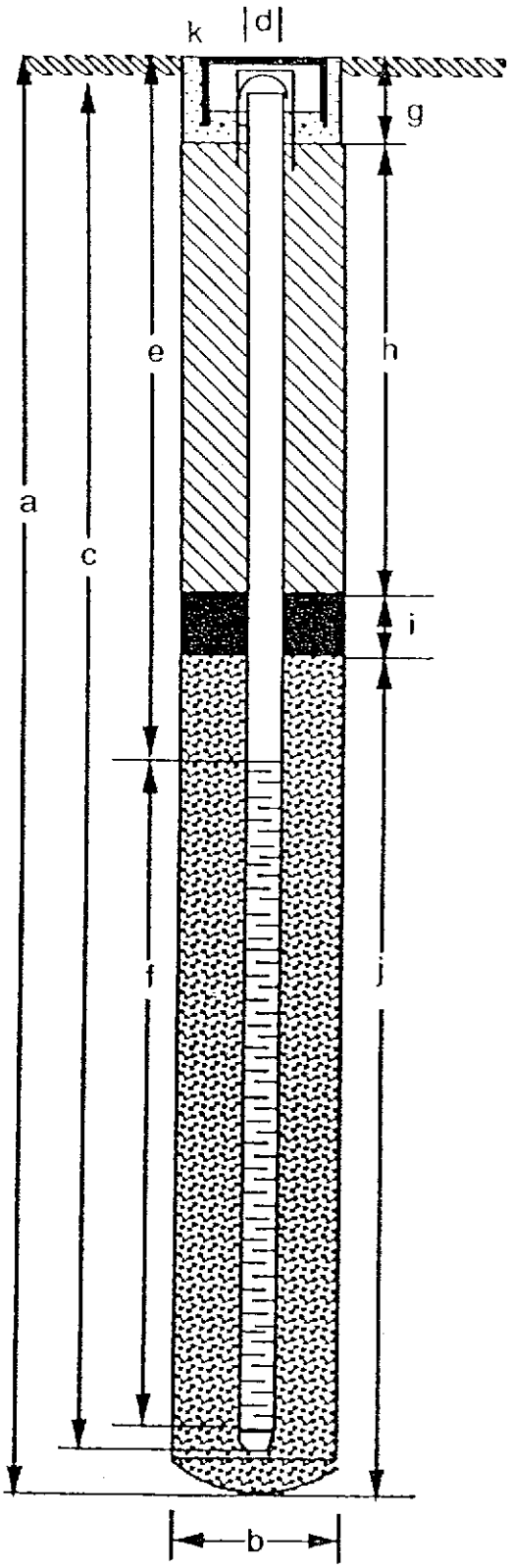
DEPTH (ft.)	SAMPLE No	BLOWS/FOOT	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION	WATER LEVEL	OVM READING ppm
22						
23						
24			CL	same as above		
25	MW-4-5	33				0
26				Bottom of Boring = 25.5 feet		
27						
28						
29						
30						
31						
32						
33						
34						
35						
36						
37						
38						
39						
40						
41						
42						

REVIEWED BY R.G./C.E.G.

Monitoring Well Detail

PROJECT NUMBER 1847-2G
PROJECT NAME Shell -Oakland
COUNTY Alameda
WELL PERMIT NO. 90116

BORING / WELL NO. MW-4
TOP OF CASING ELEV. 73.83
GROUND SURFACE ELEV. 74.46
DATUM 72.96



EXPLORATORY BORING

a. Total depth 25.5 ft.
b. Diameter 12 in.
Drilling method Hollow stem auger

WELL CONSTRUCTION

c. Casing length 25 ft.
Material schedule 40 PVC
d. Diameter 4 in.
e. Depth to top perforations 15 ft.
f. Perforated length 10 ft.
Perforated interval from 15 to 25 ft.
Perforation type slotted screen
Perforation size 0.020 in.
g. Surface seal 1 ft.
Seal material concrete
h. Backfill 12 ft.
Backfill material neat cement grout
i. Seal 1 ft.
Seal material bentonite
j. Gravel pack 11 ft.
Pack material clean sand
k.

ensco environmental services, inc.

ATTACHMENT C

Quarterly Groundwater Monitoring Data

WELL CONCENTRATIONS
Shell-branded Service Station
230 West MacArthur Boulevard
Oakland, CA

Well ID	Date	TPPH (ug/L)	B (ug/L)	T (ug/L)	E (ug/L)	X (ug/L)	MTBE 8020 (ug/L)	MTBE 8260 (ug/L)	DIPE (ug/L)	ETBE (ug/L)	TAME (ug/L)	TBA (ug/L)	TOC (MSL)	Depth to Water (ft.)	GW Elevation (MSL)
MW-1	7/14/1988	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	73.89	13.30	60.59
MW-1	10/4/1988	ND	8	4.3	ND	9	NA	NA	NA	NA	NA	NA	73.89	13.65	60.24
MW-1	11/10/1988	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	73.89	13.55	60.34
MW-1	12/9/1988	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	73.89	13.22	60.67
MW-1	1/10/1989	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	73.89	12.86	61.03
MW-1	1/20/1989	ND	ND	NA	NA	ND	NA	NA	NA	NA	NA	NA	73.89	12.91	60.98
MW-1	2/6/1989	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	73.89	12.94	60.95
MW-1	3/10/1989	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	73.89	12.59	61.30
MW-1	6/6/1989	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	73.89	14.05	59.84
MW-1	9/7/1989	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	73.89	14.92	58.97
MW-1	12/18/1989	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	73.89	14.88	59.01
MW-1	3/8/1990	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	73.89	14.08	59.81
MW-1	6/7/1990	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	73.89	13.89	60.00
MW-1	9/5/1990	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	73.89	14.83	59.06
MW-1	12/3/1990	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	73.89	15.05	58.84
MW-1	3/1/1991	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	73.89	14.34	59.55
MW-1	6/3/1991	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	73.89	14.16	59.73
MW-1	9/4/1991	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	73.89	14.60	59.29
MW-1	3/13/1992	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	73.89	13.40	60.49
MW-1	6/3/1992	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	73.89	13.76	60.13
MW-1	8/19/1992	87	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	73.89	14.57	59.32
MW-1	11/16/1992	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	73.89	14.78	59.11
MW-1	2/18/1993	59a	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	73.89	12.14	61.75
MW-1	6/1/1993	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	73.89	13.30	60.59
MW-1	8/30/1993	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	73.89	14.32	59.57
MW-1	12/13/1993	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	73.89	14.06	59.83
MW-1	3/3/1994	100	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	73.89	13.12	60.77

WELL CONCENTRATIONS
Shell-branded Service Station
230 West MacArthur Boulevard
Oakland, CA

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MW-1	6/6/1994	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	73.89	14.20	59.69
MW-1	9/12/1994	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	73.89	15.72	58.17
MW-1	12/15/1994	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	73.89	12.98	60.91
MW-1	3/13/1995 b	60	4.7	9.8	ND	2.9	NA	NA	NA	NA	NA	NA	73.89	11.74	62.15
MW-1	4/21/1995	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	73.89	NA	NA
MW-1	6/26/1995	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	73.89	13.00	60.89
MW-1	9/12/1995	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	73.89	14.14	59.75
MW-1	3/21/1996	<50	<0.5	<0.5	<0.5	<0.5	ND	NA	NA	NA	NA	NA	73.89	11.03	62.86
MW-1	6/28/1996	<50	<0.5	<0.5	<0.5	<0.5	<2.5	NA	NA	NA	NA	NA	73.89	13.53	60.36
MW-1	9/19/1996	<50	<0.5	<0.5	<0.5	<0.5	<2.5	NA	NA	NA	NA	NA	73.89	14.33	59.56
MW-1	12/19/1996	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	73.89	13.20	60.69
MW-1	12/5/1997	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	73.89	12.39	61.50
MW-1	12/24/1998	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	73.89	13.59	60.30
MW-1	12/23/1999	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	73.89	15.63	58.26
MW-1	12/11/2000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	73.89	15.36	58.53
MW-1	12/27/2001	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	73.89	12.09	61.80
MW-1	3/12/2002	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	73.89	12.33	61.56
MW-1	3/14/2002	<50	<0.50	<0.50	<0.50	<0.50	NA	<5.0	NA	NA	NA	NA	73.89	12.08	61.81
MW-1	6/13/2002	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	73.89	13.47	60.42
MW-1	9/9/2002	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	76.92	14.30	62.62
MW-1	12/12/2002	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	76.92	14.48	62.44
MW-1	3/10/2003	<50	<0.50	<0.50	<0.50	<0.50	NA	<5.0	NA	NA	NA	NA	76.92	12.76	64.16
MW-1	6/10/2003	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	76.92	13.17	63.75
MW-1	9/16/2003	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	76.92	14.10	62.82
MW-1	12/3/2003	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	76.92	13.93	62.99
MW-1	3/11/2004	<50	<0.50	<0.50	<0.50	<1.0	NA	<0.50	NA	NA	NA	NA	76.92	12.04	64.88
MW-1	6/17/2004	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	76.92	13.75	63.17
MW-1	9/13/2004	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	76.92	14.47	62.45

WELL CONCENTRATIONS
Shell-branded Service Station
230 West MacArthur Boulevard
Oakland, CA

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MW-1	12/7/2004	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	76.92	13.04	63.88
MW-1	3/3/2005	<50	<0.50	<0.50	<0.50	<1.0	NA	<0.50	<2.0	<2.0	<2.0	<5.0	76.92	11.31	65.61
MW-1	**6/14/2005**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**76.92**	**11.87**	**65.05**
MW-2	7/14/1988	ND	7.9	2.6	1.1	4	NA	NA	NA	NA	NA	NA	75.24	15.18	60.06
MW-2	10/4/1988	90	ND	1.3	2.3	12	NA	NA	NA	NA	NA	NA	75.24	15.30	59.94
MW-2	11/10/1988	ND	ND	ND	ND	2	NA	NA	NA	NA	NA	NA	75.24	15.17	60.07
MW-2	12/9/1988	ND	ND	0.6	ND	3	NA	NA	NA	NA	NA	NA	75.24	14.82	60.42
MW-2	1/20/1989	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	75.24	14.54	60.70
MW-2	2/6/1989	NA	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	75.24	14.59	60.65
MW-2	3/10/1989	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	75.24	14.88	60.36
MW-2	6/6/1989	ND	ND	0.5	ND	ND	NA	NA	NA	NA	NA	NA	75.24	15.30	59.94
MW-2	9/7/1989	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	75.24	16.76	58.48
MW-2	12/18/1989	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	75.24	16.65	58.59
MW-2	3/8/1990	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	75.24	15.92	59.32
MW-2	6/7/1990	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	75.24	16.10	59.14
MW-2	9/5/1990	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	75.24	16.61	58.63
MW-2	12/3/1990	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	75.24	17.06	58.18
MW-2	3/1/1991	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	75.24	16.62	58.62
MW-2	6/3/1991	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	75.24	16.65	58.59
MW-2	9/4/1991	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	75.24	16.57	58.67
MW-2	3/13/1992	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	75.24	14.66	60.58
MW-2	6/3/1992	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	75.24	15.90	59.34
MW-2	8/19/1992	67	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	75.24	16.72	58.52
MW-2	11/16/1992	50	ND	ND	ND	1.2	NA	NA	NA	NA	NA	NA	75.24	16.66	58.58
MW-2	2/18/1993	52a	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	75.24	13.88	61.36
MW-2 (D)	2/18/1993	52a	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	75.24	13.88	61.36
MW-2	6/1/1993	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	75.24	14.74	60.50

WELL CONCENTRATIONS
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Oakland, CA

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MW-2	8/30/1993	70a	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	75.24	15.85	59.39
MW-2	12/13/1993	68a	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	75.24	15.83	59.41
MW-2	3/3/1994	280a	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	75.24	14.80	60.44
MW-2	6/6/1994	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	75.24	16.65	58.59
MW-2	9/12/1994	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	75.24	16.72	58.52
MW-2	12/15/1994	230a	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	75.24	15.25	59.99
MW-2	3/13/1995	ND	2.9	6.3	ND	2.7	NA	NA	NA	NA	NA	NA	75.24	15.32	59.92
MW-2	4/21/1995	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	75.24	NA	NA
MW-2	6/26/1995	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	75.24	14.65	60.59
MW-2	9/12/1995	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	75.24	15.78	59.46
MW-2	3/21/1996	<50	<0.5	<0.5	<0.5	<0.5	ND	NA	NA	NA	NA	NA	75.24	12.72	62.52
MW-2	6/28/1996	<50	<0.5	<0.5	<0.5	<0.5	160	NA	NA	NA	NA	NA	75.24	14.95	60.29
MW-2	9/19/1996	<50	<0.5	<0.5	<0.5	<0.5	27	NA	NA	NA	NA	NA	75.24	15.64	59.60
MW-2	12/19/1996	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	75.24	14.47	60.77
MW-2	12/5/1997	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	75.24	14.22	61.02
MW-2	12/24/1998	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	75.24	14.97	60.27
MW-2	12/23/1999	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	75.24	16.07	59.17
MW-2	12/11/2000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	75.24	15.78	59.46
MW-2	12/27/2001	NA	NA	NA	NA	NA	NA	95	NA	NA	NA	NA	75.24	14.25	60.99
MW-2	3/14/2002	120	<0.50	<0.50	<0.50	<0.50	NA	31	NA	NA	NA	NA	75.24	14.59	60.65
MW-2	6/13/2002	100	<0.50	<0.50	<0.50	<0.50	NA	32	NA	NA	NA	NA	75.24	14.58	60.66
MW-2	9/9/2002	90	<0.50	<0.50	<0.50	<0.50	NA	54	NA	NA	NA	NA	78.25	15.49	62.76
MW-2	12/12/2002	92	<0.50	<0.50	<0.50	<0.50	NA	21	NA	NA	NA	NA	78.25	16.21	62.04
MW-2	3/10/2003	110	<0.50	<0.50	<0.50	<0.50	NA	33	NA	NA	NA	NA	78.25	14.33	63.92
MW-2	6/10/2003	<50	<0.50	<0.50	<0.50	<1.0	NA	49	NA	NA	NA	NA	78.25	14.48	63.77
MW-2	9/16/2003	<50	<0.50	<0.50	<0.50	<1.0	NA	39	NA	NA	NA	NA	78.25	15.45	62.80
MW-2	12/3/2003	56 a	<0.50	<0.50	<0.50	<1.0	NA	3.6	NA	NA	NA	NA	78.25	15.60	62.65
MW-2	3/11/2004	58 a	<0.50	<0.50	<0.50	<1.0	NA	67	NA	NA	NA	NA	78.25	13.78	64.47

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Shell-branded Service Station
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MW-2	6/17/2004	<50	<0.50	<0.50	<0.50	<1.0	NA	40	NA	NA	NA	NA	78.25	14.87	63.38
MW-2	9/13/2004	68 d	<0.50	<0.50	<0.50	<1.0	NA	44	<2.0	<2.0	<2.0	<5.0	78.25	15.85	62.40
MW-2	12/7/2004	<50 e	<0.50	<0.50	<0.50	<1.0	NA	54	NA	NA	NA	NA	78.25	15.17	63.08
MW-2	3/3/2005	110 e	<0.50	<0.50	<0.50	<1.0	NA	82	NA	NA	NA	NA	78.25	13.38	64.87
MW-2	**6/14/2005**	**<50 e**	**<0.50**	**<0.50**	**<0.50**	**<1.0**	**NA**	**29**	**NA**	**NA**	**NA**	**NA**	**78.25**	**13.95**	**64.30**
MW-3	7/14/1988	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	74.68	14.05	60.63
MW-3	10/4/1988	ND	ND	ND	ND	5	NA	NA	NA	NA	NA	NA	74.68	14.60	60.08
MW-3	11/10/1988	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	74.68	14.35	60.33
MW-3	12/9/1988	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	74.68	14.04	60.64
MW-3	1/10/1989	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	74.68	13.70	60.98
MW-3	1/20/1989	NA	NA	ND	ND	ND	NA	NA	NA	NA	NA	NA	74.68	13.72	60.96
MW-3	2/6/1989	70	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	74.68	13.75	60.93
MW-3	3/10/1989	150	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	74.68	13.42	61.26
MW-3	6/6/1989	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	74.68	14.52	60.16
MW-3	9/7/1989	ND	0.65	ND	ND	ND	NA	NA	NA	NA	NA	NA	74.68	15.52	59.16
MW-3	12/18/1989	46	1.3	ND	0.44	0.66	NA	NA	NA	NA	NA	NA	74.68	19.59	55.09
MW-3	3/8/1990	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	74.68	14.72	59.96
MW-3	6/7/1990	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	74.68	14.65	60.03
MW-3	9/5/1990	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	74.68	15.51	59.17
MW-3	12/3/1990	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	74.68	14.85	59.83
MW-3	3/1/1991	1.9	59	ND	22	ND	NA	NA	NA	NA	NA	NA	74.68	14.92	59.76
MW-3	6/3/1991	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	74.68	14.75	59.93
MW-3	9/4/1991	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	74.68	15.14	59.54
MW-3	3/13/1992	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	74.68	13.50	61.18
MW-3	6/3/1992	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	74.68	14.39	60.29
MW-3	8/19/1992	92	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	74.68	15.08	59.60
MW-3 (D)	8/19/1992	76	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	74.68	15.08	59.60

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MW-3	11/16/1992	200a	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	74.68	15.43	59.25
MW-3 (D)	11/16/1992	140a	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	74.68	15.43	59.25
MW-3	2/18/1993	680a	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	74.68	12.96	61.72
MW-3	6/1/1993	160a	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	74.68	13.98	60.70
MW-3 (D)	6/1/1993	150a	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	74.68	13.98	60.70
MW-3	8/30/1993	110a	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	74.68	14.82	59.86
MW-3	12/13/1993	140a	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	74.68	14.70	59.98
MW-3 (D)	12/13/1993	110a	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	74.68	14.70	59.98
MW-3	3/3/1994	61a	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	74.68	13.92	60.76
MW-3	6/6/1994	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	74.68	14.73	59.95
MW-3	9/12/1994	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	74.68	15.42	59.26
MW-3	12/15/1994	ND	ND	0.9	ND	0.6	NA	NA	NA	NA	NA	NA	74.68	13.80	60.88
MW-3	3/13/1995	100a	7.9	17	0.7	6.1	NA	NA	NA	NA	NA	NA	74.68	12.41	62.27
MW-3	4/21/1995	60	0.9	1.1	ND	1	NA	NA	NA	NA	NA	NA	74.68	NA	NA
MW-3	6/26/1995	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	74.68	13.79	60.89
MW-3	09/12/1995 b	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	74.68	14.77	59.91
MW-3	3/21/1996	<50	<0.5	<0.5	<0.5	<0.5	17	NA	NA	NA	NA	NA	74.68	11.80	62.88
MW-3	6/28/1996	<50	<0.5	<0.5	<0.5	<0.5	<0.5	NA	NA	NA	NA	NA	74.68	14.19	60.49
MW-3	9/19/1996	<50	<0.5	<0.5	<0.5	<0.5	<2.5	NA	NA	NA	NA	NA	74.68	14.85	59.83
MW-3	12/19/1996	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	74.68	13.61	61.07
MW-3	12/5/1997	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	74.68	13.16	61.52
MW-3	12/24/1998	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	74.68	14.08	60.60
MW-3	12/23/1999	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	74.68	15.92	58.76
MW-3	12/11/2000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	74.68	15.31	59.37
MW-3	12/27/2001	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	74.68	12.84	61.84
MW-3	3/12/2002	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	74.68	12.54	62.14
MW-3	3/14/2002	<50	<0.50	<0.50	<0.50	<0.50	NA	40	NA	NA	NA	NA	74.68	12.78	61.90
MW-3	6/13/2002	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	74.68	14.06	60.62

WELL CONCENTRATIONS
Shell-branded Service Station
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MW-3	9/9/2002	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	77.69	14.77	62.92
MW-3	12/12/2002	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	77.69	15.11	62.58
MW-3	3/10/2003	<50	<0.50	<0.50	<0.50	<0.50	NA	5.4	NA	NA	NA	NA	77.69	13.52	64.17
MW-3	6/10/2003	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	77.69	13.82	63.87
MW-3	9/16/2003	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	77.69	14.60	63.09
MW-3	12/3/2003	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	77.69	14.53	63.16
MW-3	3/11/2004	<50	<0.50	<0.50	<0.50	<1.0	NA	3.5	NA	NA	NA	NA	77.69	12.38	65.31
MW-3	6/17/2004	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	77.69	14.28	63.41
MW-3	9/13/2004	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	77.69	14.78	62.91
MW-3	12/7/2004	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	77.69	13.77	63.92
MW-3	3/3/2005	120	1.3	<0.50	<0.50	2.7	NA	2.3	<2.0	<2.0	<2.0	37	77.69	11.84	65.85
MW-3	**6/14/2005**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**77.69**	**12.29**	**65.40**
MW-4	1/23/1990	1,600	100	10	30	20	NA	NA	NA	NA	NA	NA	73.83	14.68	59.15
MW-4	3/8/1990	4,200	260	18	88	39	NA	NA	NA	NA	NA	NA	73.83	14.38	59.45
MW-4	6/7/1990	2,000	150	6.9	14	17	NA	NA	NA	NA	NA	NA	73.83	14.27	59.56
MW-4	9/5/1990	1,700	130	10	7.2	19	NA	NA	NA	NA	NA	NA	73.83	15.40	58.43
MW-4	12/3/1990	2,600	108	41	17	59	NA	NA	NA	NA	NA	NA	73.83	15.90	57.93
MW-4	6/3/1991	2,800	160	15	8.8	32	NA	NA	NA	NA	NA	NA	73.83	14.60	59.23
MW-4	9/4/1991	Sheen	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	73.83	15.25	58.58
MW-4	3/13/1992	2,700	180	70	5.9	29	NA	NA	NA	NA	NA	NA	73.83	12.72	61.11
MW-4	6/3/1992	1,700	190	ND	30	23	NA	NA	NA	NA	NA	NA	73.83	14.33	59.50
MW-4	8/19/1992	170	4.2	ND	0.6	1	NA	NA	NA	NA	NA	NA	73.83	15.18	58.65
MW-4	11/16/1992	2,600	92	49	50	81	NA	NA	NA	NA	NA	NA	73.83	15.39	58.44
MW-4	2/18/1993	7,400	120	38	51	87	NA	NA	NA	NA	NA	NA	73.83	12.62	61.21
MW-4	6/1/1993	7,000	1,800	1,700	1,600	1,700	NA	NA	NA	NA	NA	NA	73.83	13.68	60.15
MW-4	8/30/1993	2,100	80	11	ND	11	NA	NA	NA	NA	NA	NA	73.83	14.83	59.00
MW-4 (D)	8/30/1993	2,100	77	5.6	ND	5.5	NA	NA	NA	NA	NA	NA	73.83	14.83	59.00

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Shell-branded Service Station
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Oakland, CA

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MW-4	12/13/1993	2,000a	20	ND	21	52	NA	NA	NA	NA	NA	NA	73.83	14.50	59.33
MW-4	3/3/1994	3,500	150	86	85	90	NA	NA	NA	NA	NA	NA	73.83	13.48	60.35
MW-4 (D)	3/3/1994	3,200	130	73	74	76	NA	NA	NA	NA	NA	NA	73.83	13.48	60.35
MW-4	6/6/1994	590	25	ND	ND	ND	NA	NA	NA	NA	NA	NA	73.83	14.26	59.57
MW-4 (D)	6/6/1994	400	16	ND	ND	ND	NA	NA	NA	NA	NA	NA	73.83	14.26	59.57
MW-4	9/12/1994	1,800	42	ND	3.7	4.7	NA	NA	NA	NA	NA	NA	73.83	15.42	58.41
MW-4 (D)	9/12/1994	2,000	40	ND	5.7	8	NA	NA	NA	NA	NA	NA	73.83	15.42	58.41
MW-4	12/15/1994	2,900	78	14	94	17	NA	NA	NA	NA	NA	NA	73.83	13.43	60.40
MW-4 (D)	12/15/1994	2,900	90	7	96	18	NA	NA	NA	NA	NA	NA	73.83	13.43	60.40
MW-4	3/13/1995	2,700	240	24	99	34	NA	NA	NA	NA	NA	NA	73.83	12.13	61.70
MW-4 (D)	3/13/1995	2,500	300	24	140	28	NA	NA	NA	NA	NA	NA	73.83	12.13	61.70
MW-4	6/25/1995	2,100	87	10	67	25	NA	NA	NA	NA	NA	NA	73.83	13.26	60.57
MW-4 (D)	6/25/1995	2,300	92	12	74	26	NA	NA	NA	NA	NA	NA	73.83	13.26	60.57
MW-4	09/12/1995 b	1,300	33	13	9.3	15	NA	NA	NA	NA	NA	NA	73.83	14.64	59.19
MW-4 (D)	09/12/1995 b	1,500	2.1	16	11	17	NA	NA	NA	NA	NA	NA	73.83	14.64	59.19
MW-4	3/21/1996	2,100	50	3.2	40	5.4	ND	NA	NA	NA	NA	NA	73.83	11.55	62.28
MW-4 (D)	3/21/1996	1,700	24	<0.5	39	7.2	740	NA	NA	NA	NA	NA	73.83	11.55	62.28
MW-4	6/28/1996	1,300	61	6.2	53	11	1,000	NA	NA	NA	NA	NA	73.83	13.86	59.97
MW-4 (D)	6/28/1996	1,200	29	6.2	50	8.3	1,000	NA	NA	NA	NA	NA	73.83	13.86	59.97
MW-4	9/19/1996	820	12	<2.5	2.8	4.3	720	NA	NA	NA	NA	NA	73.83	14.72	59.11
MW-4 (D)	9/19/1996	580	9.6	<2.5	<2.5	<2.5	760	1,200	NA	NA	NA	NA	73.83	14.72	59.11
MW-4	12/19/1996	1,200	28	<5.0	<5.0	<5.0	<25	NA	NA	NA	NA	NA	73.83	13.06	60.77
MW-4	12/5/1997	1,900	36	9	16	18	630	NA	NA	NA	NA	NA	73.83	12.89	60.94
MW-4	12/24/1998	1,100	23	5.3	38	7.9	1,100	NA	NA	NA	NA	NA	73.83	13.92	59.91
MW-4	12/17/1999	1,100	22	21	13	11	3,800	3,200	NA	NA	NA	NA	73.83	14.28	59.55
MW-4	12/23/1999	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	73.83	16.24	57.59
MW-4	12/11/2000	975	25.0	11.3	<5.00	<5.00	1960	1730c	NA	NA	NA	NA	73.83	14.15	59.68
MW-4	12/27/2001	2,000	9.9	<5.0	18	<5.0	NA	1,400	NA	NA	NA	NA	73.83	12.61	61.22

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MW-4	3/14/2002	1,700	6.6	<2.0	2.1	2.1	NA	1,100	NA	NA	NA	NA	73.83	12.35	61.48
MW-4	6/13/2002	1,200	4.7	<2.0	<2.0	<2.0	NA	1,100	NA	NA	NA	NA	73.83	13.72	60.11
MW-4	9/9/2002	620	3.7	<2.0	<2.0	<2.0	NA	760	NA	NA	NA	NA	76.82	14.56	62.26
MW-4	12/12/2002	1,500	3.9	<2.0	<2.0	<2.0	NA	880	NA	NA	NA	NA	76.82	14.82	62.00
MW-4	3/10/2003	2,300	5.7	0.95	3.8	0.63	NA	1,200	NA	NA	NA	NA	76.82	13.63	63.19
MW-4	6/10/2003	2,200	5.3	<5.0	<5.0	<10	NA	880	NA	NA	NA	NA	76.82	13.68	63.14
MW-4	9/16/2003	1,400	<5.0	<5.0	<5.0	<10	NA	420	NA	NA	NA	NA	76.82	14.35	62.47
MW-4	12/3/2003	2,600	5.0	<5.0	<5.0	<10	NA	840	NA	NA	NA	NA	76.82	14.27	62.55
MW-4	3/11/2004	1900 a	6.3	<5.0	<5.0	<10	NA	800	NA	NA	NA	NA	76.82	12.62	64.20
MW-4	6/17/2004	1,000	7.4	<2.5	<2.5	<5.0	NA	460	NA	NA	NA	NA	76.82	13.90	62.92
MW-4	9/13/2004	1,100	4.6	<2.5	<2.5	<5.0	NA	300	<10	<10	<10	160	76.82	14.67	62.15
MW-4	12/7/2004	2,200	4.6	<2.5	<2.5	<5.0	NA	430	NA	NA	NA	NA	76.82	13.92	62.90
MW-4	3/3/2005	2,500	5.3	<2.5	<2.5	<5.0	NA	620	NA	NA	NA	NA	76.82	11.75	65.07
MW-4	**6/14/2005**	**<50**	**<0.50**	**<0.50**	**<0.50**	**<1.0**	**NA**	**51**	**NA**	**NA**	**NA**	**NA**	**76.82**	**12.20**	**64.62**

WELL CONCENTRATIONS
Shell-branded Service Station
230 West MacArthur Boulevard
Oakland, CA

Well ID	Date	TPPH (ug/L)	B (ug/L)	T (ug/L)	E (ug/L)	X (ug/L)	MTBE 8020 (ug/L)	MTBE 8260 (ug/L)	DIPE (ug/L)	ETBE (ug/L)	TAME (ug/L)	TBA (ug/L)	TOC (MSL)	Depth to Water (ft.)	GW Elevation (MSL)

Abbreviations:

TPPH = Total petroleum hydrocarbons as gasoline by EPA Method 8260B; prior to December 27, 2001, by EPA Method 8015.

BTEX = Benzene, toluene, ethylbenzene, xylenes by EPA Method 8260B; prior to December 27, 2001, by EPA Method 8020.

MTBE = Methyl tertiary butyl ether

DIPE = Di-isopropyl ether, analyzed by EPA Method 8260B

ETBE = Ethyl tertiary butyl ether, analyzed by EPA Method 8260B

TAME = Tertiary amyl methyl ether, analyzed by EPA Method 8260B

TBA = Tertiary butyl alcohol, analyzed by EPA Method 8260B

TOC = Top of Casing Elevation

GW = Groundwater

ug/L = Parts per billion

MSL = Mean sea level

ft. = Feet

<n = Below detection limit

(D) = Duplicate sample

ND = Not detected at or above the quantitative limit.

NA = Not applicable

Notes:

a = Chromatogram pattern indicates the presence of an unidentified hydrocarbon/Hydrocarbon does not match pattern of laboratory's standard.

b = The laboratory noted the sample was analyzed after the method specified holding time.

c = This sample was analyzed outside of EPA recommended hold time.

d = Sample contains discrete peak in gasoline range.

e = The concentration reported reflects individual or discrete unidentified peaks not matching a typical fuel pattern.

Site surveyed January 30, 2002 by Virgil Chavez Land Surveying of Vallejo, CA.

ATTACHMENT D

Site Conceptual Model Table

Site Conceptual Model Table

Site Address:	230 W. MacArthur Blvd	**Incident Number:**	98995741
City:	Oakland, CA	**Regulator:**	Alameda County Health Care Services Agency

Item	Evaluation Criteria	Comments/Discussion
1	**Hydrocarbon Source**	
1.1	Identify/Describe Release Source and Volume (if known)	The initial investigation at the site occurred in April 1986 when Emcon advanced exploratory borings in the vicinity of the UST complex. The impetus for this investigation is unknown. The investigation found total hydrocarbon concentrations of up to 5,700 ppm in soil collected at between 8 and 15 fbg. The source or volume of the release is not known.
1.2	Discuss Steps Taken to Stop Release	USTs were removed and replaced on November 2, 1987. Soil sampling completed during the 2005 station upgrade activities identified detectable concentrations of fuel hydrocarbons, MTBE, and fuel oxygenates. As a result, Shell submitted an April 26, 2005 *Underground Storage Tank Unauthorized Release (Leak)/Contaminant Site Report* to the Oakland Fire Department. Cambria directed soil excavation to the extents feasible to remove the highest concentrations of impacted soils. Post-excavation sampling results indicated that over-excavation achieved significant reductions in the final concentrations in remaining soils.
2	**Site Characterization**	
2.1	Current Site Use/Status	The site is an operating Shell-branded service station located on the northwest corner of West MacArthur Boulevard and Piedmont Avenue in Oakland, California (Figure 1). Three underground storage tanks (USTs), two dispenser islands, and a kiosk are currently on site. The site is surrounded by commercial properties and Kaiser Hospital. A former Gulf service station, now the Oakland Auto Works auto repair shop, is located northwest and adjacent to the site.

Site Address:	230 W. MacArthur Blvd	Incident Number:	98995741
City:	Oakland, CA	Regulator:	Alameda County Health Care Services Agency

Item	Evaluation Criteria	Comments/Discussion
2.2	Soil Definition Status	TPHg at concentrations of up to 5,700 ppm (April, 1986) has been detected in soil samples collected within the tank complex. In 1988, TPHg was detected at a concentration of 278 ppm during the installation of well MW-3 adjacent to the tank complex and in 1989, TPHg was detected at a concentration of 278 ppm in a boring (S-3) near the dispenser island. All these detections occurred at depths where groundwater contamination is a likely contributor. During the 2005 fueling system upgrade, field indications of hydrocarbons, including staining and odor, were observed in the vicinity of the sample locations in the western portion of the site and TPHg was detected in three of five dispenser samples at a maximum concentration of 1,700 ppm. These locations were removed during excavation activities. TPHg was detected in three of five piping samples at a maximum concentration of 2,700 ppm in P-4-4.0 at 4 fbg. Benzene was detected in two of five samples at a maximum concentration of 4.2 ppm in P-4-4.0 at 4 fbg. Due to concerns over canopy stability, this location was not excavated. Historically, impacted soil has been limited to the vicinity of the tank complex and dispenser islands.
2.3	Separate-Phase Hydrocarbon Definition Status	No separate-phase hydrocarbons have been reported at the site.
2.4	Groundwater Definition Status (BTEX)	On-site BTEX detections (primarily benzene) in groundwater appear to be confined to MW-3, adjacent to the USTs, and MW-4, the farthest downgradient on-site well. In addition, there was no detection of benzene in MW-4 during the 2Q05 sampling event and MW-3 has had only one detection (1.3 ppb 1Q05) since April 1995. Off site, on the 240 MacArthur property, benzene concentrations are currently greatest in wells adjacent to the former USTs with lower concentrations detected at locations downgradient.

Site Address:	230 W. MacArthur Blvd	Incident Number:	98995741
City:	Oakland, CA	Regulator:	Alameda County Health Care Services Agency

Item	Evaluation Criteria	Comments/Discussion
2.5	BTEX Plume Stability and Concentration Trends	BTEX compounds were detected in grab groundwater samples collected at the site in October 1989, May 1990, and March 2004. The maximum detected concentrations detected were 430 ppb of benzene at both Probe 6 in 1990 and SB-1 in 2004, 600 ppb of toluene at Probe 6 in 1990, 1,200 ppb of ethylbenzene at GS-2 in 1989, and 1,400 ppb of xylenes at Probe 6 in 1990. Probe 6 and SB-1 are located approximately 45-feet apart, just west and downgradient of the site, along W. MacArthur Boulevard. The fact that these two sites had exactly the same concentration of benzene in samples collected 14-years apart would indicate that the BTEX plume is stable in the downgradient direction. With the exception of MW-4, BTEX concentrations have been non-detectable in on-site wells since quarterly monitoring began in July 1988. Benzene concentrations at MW-4 have declined from a high of 1,800 ppb in June 1993 to 5.3 ppb in March 2005 and non-detectable in June 2005. BTEX concentrations (primarily benzene) have also declined in the off-site wells at the Oakland Auto Works site.
2.6	Groundwater Definition Status (MTBE)	Based on historic quarterly monitoring data, on-site MTBE contamination in groundwater is most pronounced at MW-4, the farthest downgradient on-site well. Lower concentrations have been detected at MW-2 and MW-3. Off site, at the Oakland Auto Works site, MTBE has been detected primarily in wells downgradient of the former Gulf Station USTs.
2.7	MTBE Plume Stability and Concentration Trends	Among the on-site wells, MTBE concentrations have declined over time. At MW-2 the concentration has declined from 160 ppb in June 1996 to 29 ppb in June 2005. At MW-3 the concentration has declined from 40 ppb in March 2002 to 2.3 ppb in March 2005. At MW-4 the concentration has varied but has declined from 3,200 ppb in December 1999 to 51 ppb in June 2005. Off site, at the Oakland Auto Works site, MTBE concentrations have shown an overall decrease since March 2004.
2.8	Groundwater Flow Direction, Depth Trends and Gradient Trends	Groundwater depths at the site ranged from 11.87 to 13.95 fbg in June 2005. The shallowest recorded depth to water was 11.31 fbg at MW-1 in March 1996; the deepest was 16.76 fbg at MW-2 in September 1989. The prevailing groundwater flow direction is to the west to west-southwest. The shallow-zone hydraulic gradient was approximately 0.0067 ft/ft in June 2005. The groundwater flow direction was to the west.

Site Address:	230 W. MacArthur Blvd	**Incident Number:**	98995741
City:	Oakland, CA	**Regulator:**	Alameda County Health Care Services Agency

Item	Evaluation Criteria	Comments/Discussion
2.9a	Regional Geology	The site is located near Oakland east of the San Francisco Bay. The surficial deposits are Holocene age alluvial fan and fluvial deposits which are typically medium dense to dense gravely sand or sandy gravels that grade upward to sandy or silty clay. A splay of the Hayward Fault lies approximately 3,500 feet northeast of the site.
2.9b	Topography	The site lies at an elevation of approximately 60-feet above mean sea level and the area slopes gradually to the southwest toward the Oakland Harbor and the San Francisco Bay. Glen Echo Creek is diverted into a culvert under Richmond Blvd. approximately 400-feet southeast of the site and surfaces approximately 600-feet south-southwest of the site.
2.9c	Stratigraphy and Hydrogeology	Sediments encountered during previous subsurface investigations at the site consisted primarily of clayey sand alternating with sand to approximately 31 fbg. At the location of MW-1, two thin clay units were encountered: a sandy clay between 15.5 and 16 fbg and a silty clay between 21 and 23 fbg. Groundwater was first encountered at approximately 15 fbg during the installation of wells MW-1 through MW-3. The historic static water level has ranged from 11.31 fbg to 16.76 fbg. The aquifer beneath the site is assumed to be unconfined.
2.10	Preferential Pathways Analysis	In October 2002, Cambria prepared a *Sensitive Receptor Survey, Conduit Study Report, and Subsurface Investigation Work Plan* for this site. The study indicated that a 24-inch diameter sanitary sewer line adjacent to the site, running along the median of MacArthur Boulevard, was installed between 5 and 10 feet below the water table and, therefore, could act as a preferential pathway for groundwater flow and contaminant migration. Cambria further concluded, however, that its distance from the site may preclude any contaminants reaching the sanitary sewer. As proposed in this report, two soil borings were advanced to 20 fbg, adjacent to the storm drain located just west of the site and soil and groundwater samples were collected. The purpose of the investigation was to assess whether hydrocarbons and MTBE in groundwater had impacted off-site soil and groundwater. Cambria concluded that the highest TPHg and MTBE concentrations in groundwater are localized near the western corner of the Shell site and that groundwater concentrations of MTBE appear to be decreasing with distance from the Shell site.
2.11	Other Pertinent Issues	The adjacent former Gulf Station site (now Oakland Auto Works) at 240 W. MacArthur formerly contained fuel and waste oil USTs and a waste oil sump. These locations are downgradient of the Shell site.
3	**Remediation Status**	
3.1	Remedial Actions Taken	In March 1987, Wayne Perry Construction, Inc. installed three 4-inch diameter, 13 feet deep, soil-vapor recovery wells. The soil venting system utilized an activated carbon scrubber that operated between April and November 1987. Wayne Perry concluded that prolonged venting reduced hydrocarbon concentrations.

Site Address:	230 W. MacArthur Blvd	Incident Number:	98995741
City:	Oakland, CA	Regulator:	Alameda County Health Care Services Agency

Item	Evaluation Criteria	Comments/Discussion
3.2	Area Remediated	The soil venting addressed hydrocarbon contamination in the vicinity of the UST complex.
3.3	Remediation Effectiveness	In 1987, Wayne Perry concluded that though soil sampling and analyses before, during, and after the soil venting was not extensive enough to quantify the effect of the remediation, samples collected prior to soil venting showed localized hydrocarbon concentrations up to 5,700 ppm. During the tank removal in November 1987, after the completion of the soil venting, the maximum hydrocarbon concentration detected in soil was 480 ppm.
4	**Well and Sensitive Receptor Survey**	
4.1	Designated Beneficial Water Use	Groundwater from the East Bay Plain groundwater basin is designated as a municipal, industrial process, industrial service, and agricultural water supply.
4.2	Shallow Groundwater Use	Shallow wells within a half-mile of the site are associated with groundwater monitoring. No shallow water producing wells were identified.
4.3	Deep Groundwater Use	There are six deep wells within a half-mile of the site. In 2002, their status and uses were unknown.
4.4	Well Survey Results	Two wells of unknown use are located approximately ½-mile downgradient of the site, and one well of unknown status and use is located approximately 1,500 feet upgradient of the site.
4.5	Likelihood of Impact to Wells	Due to either distance or location up- or cross-gradient of the site, it is unlikely that chemicals originating from the site will impact any identified wells.
4.6	Likelihood of Impact to Surface Water	Given that the nearest surface water body is Glen Echo Creek, located approximately 600 feet east and southeast of the site and that groundwater flow direction at the site has been to the west-southwest, petroleum hydrocarbons and fuel oxygenates from the site are not expected to impact surface water near the site.
5	**Risk Assessment**	
5.1	Site Conceptual Exposure Model (current and future uses)	The site is an operating Shell-branded service station located in a commercial business district The site land use is expected to remain commercial.
5.2	Exposure Pathways	Potential exposure pathways include inhalation of petroleum hydrocarbons and MTBE volatilized to indoor and outdoor air from impacted groundwater and soil by the commercial occupants of the site.
5.3	Risk Assessment Status	No risk assessment has been completed for this site.

Site Address:	230 W. MacArthur Blvd	**Incident Number:**	98995741
City:	Oakland, CA	**Regulator:**	Alameda County Health Care Services Agency

Item	Evaluation Criteria	Comments/Discussion
5.4	Identified Human Exceedances	No exceedances have been identified
5.5	Identified Ecological Exceedances	No exceedances have been identified.
6	**Additional Recommended Data or Tasks**	
6.1	Additional soil sampling at impacted 2005 upgrade piping sample location and at previously impacted areas to determine magnitude and extent of impact above risk based screening criteria.	
6.2	Semi-annual groundwater monitoring and sampling schedule for all wells.	
6.3	Continue coordinated monitoring with 240 W. MacArthur Blvd.	
6.4	Collect soil samples for sieve analysis for use in City of Oakland RBSLs evaluation.	
6.5	Current groundwater conditions appear to be low-risk for all identified potential receptors. Current soil conditions in previously impacted and remediated areas are not known. Following collection of current soil data, evaluate site soil and groundwater conditions versus San Francisco Regional Water Quality Control Board ESLs and City of Oakland RBSLs	

Known environmental documents for site:
1986 –*Investigation Report*, Emcon (unavailable)
1986 –*Site Assessment*, W.W. Irvin (unavailable)
December 1, 1987 – *Soil Sampling Investigation Report*, Kaprealian
January 26, 1988 – *Review of Venting Operations*, Wayne Perry
September 30, 1988 – *Soil and Groundwater Investigation*, Ensco
October 9, 1989 – *September Quarterly Report*, Ensco
January 19, 1990 – *December Quarterly Report*, Ensco
March 29, 1990 – *March Quarterly Report*, Ensco
July 3, 1990 – *June Quarterly Report*, Exceltech
March 10, 1998 – *1998 Upgrade Site Inspection Report*, Cambria
October 31, 2002 – *Sensitive receptor Survey, Conduit Study, and Subsurface Investigation Work Plan*, Cambria
July 2, 2004 –*Subsurface Investigation Report*, Cambria
June 23, 2005– *Dispenser and Piping Upgrade and Limited Over-Excavation Soil Sampling Report*, Cambria