CAMBRIA

3769

JUN 0 4 2001

May 31, 2001

JUN 4 0 2001

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

Re: **First Quarter 2001 Monitoring Report, Sensitive Receptor Survey and Site Conceptual Model**
Shell-branded Service Station
4255 MacArthur Boulevard
Oakland, California
Incident #98995758
Cambria Project #243-0524-002

Dear Mr. Chan:

On behalf of Equiva Services LLC, Cambria Environmental Technology, Inc. (Cambria) is submitting this groundwater monitoring report in accordance with the reporting requirements of 23 CCR 2652d.

FIRST QUARTER 2001 ACTIVITIES

Groundwater Monitoring: Blaine Tech Services, Inc. (Blaine) of San Jose, gauged and sampled the site wells, calculated groundwater elevations and compiled the gasoline constituents analytical data. No SPH was detected this quarter. Cambria prepared a groundwater elevation contour map (Figure 1). Bioattentionation parameters, monitored annually in the third quarter, are presented in Table 1. Blaine's report, presenting the laboratory report and supporting field documents, is included as Attachment A.

Dual-Phase Vacuum Extraction (DVE): On February 23 and March 14, 2001 Advanced Cleanup Technologies Inc. of Benicia, California conducted eight-hour mobile DVE at the site using a vacuum truck. DVE is the process of applying high vacuum through an airtight well seal to simultaneously extract soil vapors from the vadose zone and enhance groundwater extraction from the saturated zone. A vacuum truck was used to create the vacuum and contain extracted fluids.

The DVE was performed on monitoring well MW-2 and tank backfill well TB-2. After extracting groundwater and vapors from MW-2 for nearly eight hours, the truck extracted

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Cambria Environmental Technology, Inc.

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groundwater from well TB-2 until the tank was filled. Approximately 1.26 pounds of aqueous-phase hydrocarbons and 0.06 pounds of vapor-phase hydrocarbons have been removed from the subsurface using DVE during the last quarter. Mass removal data for DVE operations are summarized in Tables 2 and 3. Analytical results for the current DVE events are included as Attachment B.

Site Conceptual Model: As recommended in our third quarter 2000 groundwater monitoring report, Cambria has completed a site conceptual model that is included as Attachment C.

Well Receptor Survey: Cambria reviewed Department of Water Resources (DWR) files to locate records of municipal and private wells within a half-mile radius of the site. A total of thirty wells, including twenty-five monitoring wells, one domestic well, and four cathodic protection wells, were identified within the half-mile radius. These wells are listed in Table 4. The domestic well is located approximately 2,500 feet southeast (upgradient) of the subject site as shown on Figure 2. Cathodic protection and monitoring wells are not shown on the figure. Copies of the DWR well completion reports are included as Attachment D.

Five elementary schools and one church are located within one-half mile of the site and are identified on Figure 2. The closest of these is St. Lawrence O'Toole Church and Elementary School, situated 0.14 miles northeast (upgradient) of the site.

Conduit Study: A conduit study was performed to identify potential vertical and horizontal migration pathways that may exist in the vicinity of the site. The conduit study included identification of underground utilities in the site vicinity. Cambria obtained sanitary sewer and storm drain maps from the City of Oakland Engineering Department. Water main maps were obtained from East Bay Municipal Utility District (EBMUD). Utility locations are mapped on Figure 3.

Two sanitary sewer conduits run northeast along High Street. City of Oakland engineering maps indicate that the sewer lines are typically buried at a depth of approximately 13 feet below ground to the top of the pipe. Two water main lines flow northeast along High Street and three water mains flow northwest on the northern portion of MacArthur Boulevard. Along the southern portion of MacArthur, the three water main lines branch off into two lines. Based on discussions with Debra Braxton of EBMUD, the water main pipes are typically buried at a depth of approximately eight feet below ground to the top of the pipe. A storm drain conduit flows northeast along MacArthur Boulevard with a branch off of the line to the southeast across the intersection of High Street and MacArthur Boulevard. The storm drain conduit curves to the northwest along Mac Arthur Boulevard. City of Oakland engineering maps indicate that the storm

drain conduits are typically buried at a depth of approximately 13 feet below ground to the top of the pipe.

Groundwater depth at the site has ranged from approximately 7 to 17 feet below grade (fbg). Thus, there is a possibility that the conduit trenches for sewer, storm drain, and water lines located approximately 8 to 13 fbg may serve as preferential pathways for the migration of petroleum hydrocarbons and methyl tert-butyl ether (MTBE). However, the typical groundwater flow direction is toward the southwest to west. No known conduits are located in the nearby downgradient direction.

ANTICIPATED SECOND QUARTER 2001 ACTIVITIES

Groundwater Monitoring: Blaine will gauge and sample all wells and tabulate the data. Cambria will prepare a monitoring report.

DVE: Cambria will continue to perform monthly site visits to oversee DVE from wells MW-2 and TB-2. Wells TB-1 and MW-3 will be added to the groundwater extraction schedule. At this time, groundwater extraction only will be performed on tank backfill wells due to the potential adverse affect high vacuum may have on the underground storage tanks and equipment in the tank pit.

CLOSING

We appreciate the opportunity to work with you on this project. Please call Melody Munz at (510) 420-3324 if you have any questions or comments.

Sincerely,
Cambria Environmental Technology, Inc

Melody Munz
Project Engineer

Stephan A. Bork, C.E.G., C.H.G.
Associate Hydrogeologist

REGISTERED GEOLOGIST
STEPHAN A. BORK
No. EG 2058
CERTIFIED ENGINEERING GEOLOGIST
STATE OF CALIFORNIA

Figures:
1 - Groundwater Elevation Contour Map
2 - Area Well Survey
3 - Underground Utility Locations

Tables:
1 - Groundwater Analytical Data - Bioattenuation Parameters
2 - Groundwater Extraction - Mass Removal Data
3 - Vapor Extraction - Mass Removal Data
4 - Well Survey Results

Attachments:
A - Blaine Groundwater Monitoring Report and Field Notes
B - Analytical Results for Dual-Phase Vacuum Extraction Events
C - Site Conceptual Model
D - Department of Water Resources Well Completion Reports

cc: Karen Petryna, Equiva Services LLC, P.O. Box 7869, Burbank, California 91510-7869

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BLAINE
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February 5, 2001

Karen Petryna
Equiva Services LLC
P.O. Box 7869
Burbank, CA 91510-7869

First Quarter 2001 Groundwater Monitoring at
Shell-branded Service Station
4255 MacArthur Boulevard
Oakland, CA

Monitoring performed on January 15, 2001

Groundwater Monitoring Report **010115-X-3**

This report covers the routine monitoring of groundwater wells at this Shell-branded facility. In accordance with standard procedures that conform to Regional Water Quality Control Board requirements, routine field data collection includes depth to water, total well depth, thickness of any separate immiscible layer, water column volume, calculated purge volume (if applicable), elapsed evacuation time (if applicable), total volume of water removed (if applicable), and standard water parameter instrument readings. Sample material is collected, contained, stored, and transported to the laboratory in conformance with EPA standards. Purgewater (if applicable) is, likewise, collected and transported to the Martinez Refining Company.

Basic field information is presented alongside analytical values excerpted from the laboratory report in the cumulative table of **WELL CONCENTRATIONS**. The full analytical report for the most recent samples and the field data sheets are attached to this report.

At a minimum, Blaine Tech Services, Inc. field personnel are certified on completion of a forty hour Hazardous Materials and Emergency Response training course per 29 CFR 1910.120. Field personnel are also enrolled in annual eight hour refresher courses.

Blaine Tech Services, Inc. conducts sampling and documentation assignments of this type as an independent third party. In order to avoid compromising the objectivity necessary for the proper and disinterested performance of this work, Blaine Tech Services, Inc. concentrates on objective data collection and does not participate in the interpretation of analytical results, the definition of geological or hydrological conditions, the formulation of recommendations, or the marketing of remedial systems.

Please call if you have any questions.

Yours truly,

Deidre Kerwin
Operations Manager

DK/jt

attachments: Cumulative Table of WELL CONCENTRATIONS
Certified Analytical Report
Field Data Sheets

cc: Anni Kreml
Cambria Environmental Technology, Inc.
1144 65th Street, Suite C
Oakland, CA 94608-2411

02/22/01

Groundwater Elevation Contour Map
January 15, 2001

EXPLANATION

- MW-1 — Monitoring and tank backfill well locations
- SB-1 — Cambria soil boring location (12/98)
- XXX — Groundwater elevation contour, in feet above mean sea level (msl), approximately located; dashed where inferred
- Inferred groundwater flow direction
- * Data anomalous, not used for contouring
- Boring ID / Benz. - Date / MTBE - Date — Boring designation; Benzene and MTBE concentrations are measured in parts per billion (ppb). Date is most recent sampling
- Well / ELEV / Benzene / MTBE — Well designation; Groundwater elevation, in feet above msl; Benzene and MTBE concentrations are in ppb and are analyzed by EPA Method 8020; MTBE results in parentheses are analyzed by EPA Method 8260.

0 20 40 80 160
SCALE : 1" = 40'

FIGURE 1

CAMBRIA

Shell-branded Service Station
4255 MacArthur Boulevard
Oakland, California
Incident #98995758

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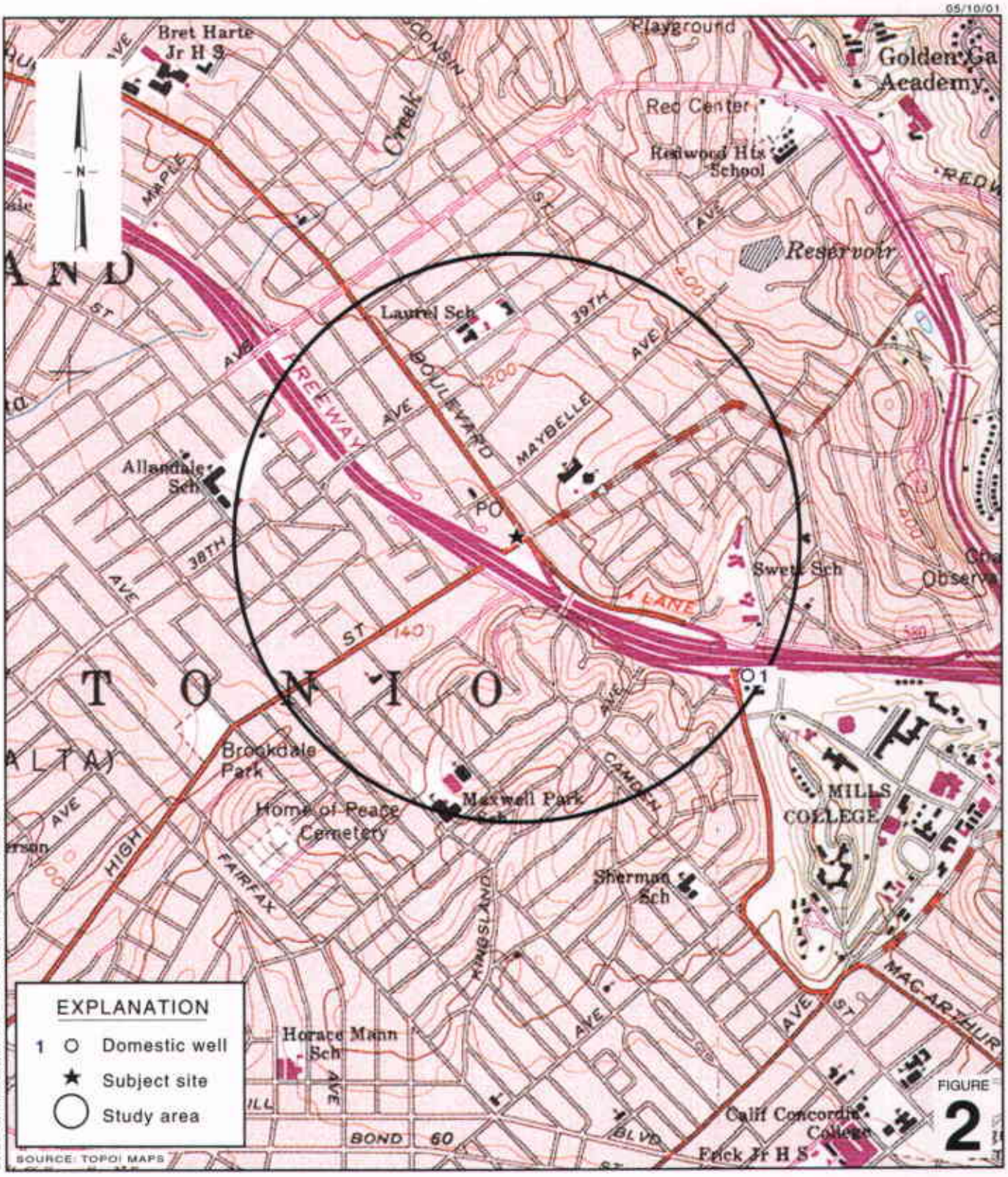

Shell-branded Service Station
4255 MacArthur Boulevard
Oakland, California
Incident #98995758

CAMBRIA

Area Well Survey

(1/2 Mile Radius)

05/16/01

Underground Utility Locations

CAMBRIA

restaurant
foot clinic
trailer park
church structures
sidewalk
SB-1
MW-3
Shell-branded Service Station
storage building
EBMUD
driveway
MACARTHUR BOULEVARD
Water Main (8")
Water Main (8")
Water Main (8")
parking
pharmacy
TB-1
SB-2
underground storage tanks
planter
MW-2
pump island
UNOCAL 76
steep embankment
ramp
580 onramp
MW-4
TB-2
MW-1
storm drain
planter
EBMUD
sidewalk
driveway
traffic signal
City of Oakland Electric
F.L. 166.84
HIGHWAY 580
Sanitary Sewer Line (8")
Storm Drain (5' circular concrete culvert)
Water Main (8")
Water Main (8")
HIGH STREET
(15")
(15")
Water Main (8")
Water Main (8")
Sanitary Sewer (8")
F.L. 166.5
vacant lot
parking
liquor deli
parking
Robert's Tires
parking
former Chevron service station
residential/ offices
cleaners
yogurt
video
canopy
Water Main (8")
Water Main (8")
Alameda Co. building

EXPLANATION

- MW-1 — Monitoring and tank backfill well locations
- SB-1 — Cambria soil boring location (12/98)
- Sanitary Sewer line
- Water Main line
- Storm Drain line
- Flow direction

0 20 40 80
SCALE : 1" = 40'

FIGURE
3

Shell-branded Service Station
4255 MacArthur Boulevard
Oakland, California
Incident #98995758

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Table 1. **Groundwater Analytical Data - Bioattenuation Parameters** - Shell-branded Service Station, Incident #98995758, 4255 MacArthur Boulevard, Oakland, California

Well ID	Date	ORP (mV)	DO	Total Alkalinity	Ferrous Iron	Nitrate as Nitrate	Sulfate	Notes
			← (Concentrations in mg/L) →					
MW-1	07/17/98	---	0.8	460	1.6	<1.0	12	
	07/23/99	---	1.0	480	0.790	7.49	28.6	
	07/26/00	-140	13.2	92.9	<0.0100	7.80	387	
MW-2	07/17/98	---	---	---	---	---	---	SPH
	07/23/99	---	1.4	440	26.0	<1.00	3.24	
	07/26/00	113	2.2	26.5	3.74	7.59	399	
MW-3	07/17/98	---	1.3	860	5.3	<1.0	6.5	
	07/17/98	---	1.3	860	5.4	<1.0	5.8	duplicate
	07/23/99	---	1.3	920	76.0	<1.00	4.23	
	07/26/00	-70	0.9	440	4.04	<1.00	355	
MW-4	07/17/98	---	1.4	630	2.8	<1.0	13	
	07/23/99	---	0.9	620	46.0	7.41	6.03	
	07/26/00	-137	1.4	228	0.223	6.30	372	

Abbreviations &Notes:

ORP = Oxidation reduction potential, measured pre-purge
mV = Millivolts
DO = Dissolved oxygen, measured pre-purge
mg/L = Milligrams per liter
SPH = Separate-phase hydrocarbons in well; not sampled
--- = Not analyzed / Not available
<n = Below detection limit of n mg/L
Total alkalinity by EPA Method 310.2, concentrations in mg CaCO3/L
Ferrous iron by EPA Method 200.7
Nitrate as nitrate and sulfate by EPA Method 300.0

Table 2: Groundwater Extraction - Mass Removal Data - Shell-branded Service Station, Incident #98995758, 4255 MacArthur Boulevard, Oakland, CA

					TPPH			Benzene			MTBE		
Date Purged	Well ID	Volume Pumped (gal)	Cumulative Volume Pumped (gal)	Date Sampled	TPPH Concentration (ppb)	TPPH Removed (lb)	TPPH Removed To Date (lb)	Benzene Concentration (ppb)	Benzene Removed (lb)	Benzene Removed to Date (lb)	MTBE Concentration (ppb)	MTBE Removed (lb)	MTBE Removed To Date (lb)
04/23/99	MW-2	200	200	04/13/98	180,000	0.30040	0.30040	2,800	0.00467	0.00467	71,000	0.11849	0.11849
05/24/99	MW-2	200	400	04/13/98	180,000	0.30040	0.60079	2,800	0.00467	0.00935	71,000	0.11849	0.23698
06/28/99	MW-2	200	600	04/13/98	180,000	0.30040	0.90119	2,800	0.00467	0.01402	71,000	0.11849	0.35547
07/30/99	MW-2	200	800	07/23/99	65,800	0.10981	1.01100	6,500	0.01085	0.02487	46,600	0.07777	0.43324
08/24/99	MW-2	100	900	07/23/99	65,800	0.05491	1.06591	6,500	0.00542	0.03029	46,600	0.03888	0.47212
10/29/99	MW-2	100	1,000	07/23/99	65,800	0.05491	1.12081	6,500	0.00542	0.03571	46,600	0.03888	0.51101
11/30/99	MW-2	100	1,100	07/23/99	65,800	0.05491	1.17572	6,500	0.00542	0.04114	46,600	0.03888	0.54989
02/02/00	MW-2	200	1,300	01/17/00	46,000	0.07677	1.25249	6,000	0.01001	0.05115	31,000	0.05174	0.60163
11/16/00	MW-2	150	1,450	10/12/00	63,200	0.07910	1.33159	5,840	0.00731	0.05846	66,600	0.08336	0.68499
02/23/01	MW-2	200	1,650	01/15/01	59,700	0.09963	1.43122	2,630	0.00439	0.06285	5,080	0.00848	0.69347
03/14/01	MW-2	300	1,950	01/15/01	59,700	0.14945	1.58067	2,630	0.00658	0.06943	5,080	0.01272	0.70618
04/23/99	TB-2	4,800	4,800	08/24/99	6,240	0.24993	0.01602	400	0.01602	0.01602	86,100	3.44856	3.44856
05/24/99	TB-2	4,800	9,600	08/24/99	6,240	0.24993	0.26595	400	0.01602	0.03204	86,100	3.44856	6.89711
06/28/99	TB-2	4,800	14,400	08/24/99	6,240	0.24993	0.51588	400	0.01602	0.04806	86,100	3.44856	10.34567
07/30/99	TB-2	4,800	19,200	08/24/99	6,240	0.24993	0.76581	400	0.01602	0.06408	86,100	3.44856	13.79422
08/24/99	TB-2	2,400	21,600	08/24/99	6,240	0.12497	0.89078	400	0.00801	0.07210	86,100	1.72428	15.51850
10/29/99	TB-2	2,255	23,855	10/29/99	7,460	0.14037	1.03115	656	0.01234	0.08444	442	0.00832	15.52682
11/30/99	TB-2	3,800	27,655	10/29/99	7,460	0.23655	1.26769	656	0.02080	0.10524	442	0.01402	15.54083
02/02/00	TB-2	4,500	32,155	01/31/00	2,070	0.07773	1.34542	108	0.00406	0.10930	6,550	0.24595	15.78678
11/16/00	TB-2	974	33,129	11/16/00	107,000	0.86963	2.21505	3,390	0.02755	0.13685	16,800	0.13654	15.92332
02/23/01	TB-2	2,506	35,635	02/23/01	80,600	1.68542	3.90048	2,410	0.05040	0.18724	38,100	0.79671	16.72003
03/14/01	TB-2	1,075	36,710	02/23/01	80,600	0.72300	4.62347	2,410	0.02162	0.20886	38,100	0.34176	17.06179
Total Gallons Extracted:			**38,660**		**Total Pounds Removed:**		**6.43805**			**0.27829**			**17.76798**
					Total Gallons Removed:		**1.05542**			**0.03812**			**2.86580**

Table 2: Groundwater Extraction - Mass Removal Data - Shell-branded Service Station, Incident #98995758, 4255 MacArthur Boulevard, Oakland, CA

Abbreviations & Notes:

TPPH = Total purgeable hydrocarbons as gasoline, analyzed by EPA Method 8015
MtBE = Methyl tert-butyl ether by EPA Method 8020; MTBE results in bold are analyzed by EPA Method 8260
µg/L = Micrograms per liter
ppb = Parts per billion, equivalent to µg/L
lb = Pound
L = Liter
gal = Gallon
g = Gram
Mass removed based on the formula: volume extracted (gal) x Concentration (µg/L) x (g/10^6µg) x (pound/453.6g) x (3.785 L/gal)
Volume removal data based on the formula: density (in gms/cc) x 9.339 (ccxlbs/gmsxgals)
Benzene analyzed by EPA Method 8020

Table 3: Vapor Extraction - Mass Removal Data - Shell-branded Service Station, Incident #98995758, 4255 MacArthur Boulevard, Oakland, CA

							TPHg		Benzene		MTBE	
		Interval	System				TPHg	Cumulative	Benzene	Cumulative	MTBE	Cumulative
		Hours of	Flow	Hydrocarbon Concentrations			Removal	TPHg	Removal	Benzene	Removal	MTBE
	Well	Operation	Rate	TPHg	Benzene	MTBE	Rate	Removed	Rate	Removed	Rate	Removed
Date	ID	(hours)	(CFM)	(Concentrations in ppmv)			(#/hour)	(#)	(#/hour)	(#)	(#/hour)	(#)
11/16/00	MW-2	0.67	0.5	663.0	7.00	42.0	0.004	0.003	0.000	0.000	0.000	0.000
02/23/01	MW-2	7.00	3.2	24.1	0.93	11.9	0.001	0.010	0.000	0.000	0.001	0.004
03/14/01	MW-2	6.00	4.0	203	4.13	51.9	0.011	0.075	0.000	0.001	0.003	0.021
Total Pounds Removed:							**TPHg =**	**0.075**	**Benzene =**	**0.001**	**MTBE =**	**0.021**

Abbreviations and Notes:

CFM = Cubic feet per minute

TPHg = Total petroleum hydrocarbons as gasoline (C6-C12) by modified EPA Method 8015 in 1 liter tedlar bag samples

ppmv = Parts per million by volume

= Pounds

TPHG, Benzene, and MTBE analyzed by EPA Method 8015/8020 in 1 liter tedlar bag samples

TPHg / Benzene / MTBE removal rate = Rate based on Bay Area Air Quality Management District's Manual of Procedures for Soil Vapor Extraction dated July 17, 1991.

(Rate = Concentration (ppmv) x system flow rate (cfm) x (1lb-mole/386ft3) x molecular weight (86 lb/lb-mole for TPHg, 78 lb/lb-mole for benzene, 88 lb/lb-mole for MTBE) x 60 min/hour x 1/1,000,000)

Cumulative TPHg / Benzene / MTBE removal = Previous removal rate multiplied by the hour-interval of operation plus the previous total

Table 4. Well Survey Results - Shell-branded Service Station, 4255 MacArthur Boulevard, Oakland, California. Incident #

LOCATION	Well ID	Installation Date	Owner	Use	Depth (ft bgs)	Screened Interval (ft bgs)	Sealed Interval (ft bgs)
1	UNK	April 11, 1930	Mills College	DOM	354	UNK	UNK

Well Locations provided by the State of California Department of Water Resources

Notes and Abbreviations:

Location = Column number refers to map location on Figure 2.
Well ID = California State well identification number as recorded by the Department of Water Resources in Sacramento, California.
UNK = Unknown.
DOM= Domestic

ATTACHMENT A

Blaine Groundwater Monitoring Report
and Field Notes

WELL CONCENTRATIONS
Shell-branded Service Station
4255 MacArthur Boulevard
Oakland, CA
Wic #204-5510-0600

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)	TOC (MSL)	Depth to Water (ft.)	Depth to SPH (ft.)	GW Elevation (MSL)	SPH Thickness (ft.)	DO Reading (ppm)	ORP Reading (mV)
MW-1	11/17/1993	410	21	11	7.9	47	NA	NA	175.79	8.59	NA	167.20	NA	NA	NA
MW-1	01/20/1994	1,200	180	19	48	47	NA	NA	175.79	8.22	NA	167.57	NA	NA	NA
MW-1	04/25/1994	3,100	610	<10	130	27	NA	NA	175.79	7.63	NA	168.16	NA	NA	NA
MW-1	07/07/1994	2,400	1,000	10	250	20	NA	NA	175.79	8.31	NA	167.48	NA	NA	NA
MW-1	10/27/1994	2,200	500	3.1	72	1.8	NA	NA	175.79	8.84	NA	166.95	NA	NA	NA
MW-1	11/17/1994	NA	NA	NA	NA	NA	NA	NA	175.79	7.60	NA	168.19	NA	NA	NA
MW-1	11/28/1994	NA	NA	NA	NA	NA	NA	NA	175.79	7.56	NA	168.23	NA	NA	NA
MW-1	01/13/1995	570	75	2.5	6.7	11	NA	NA	175.79	7.11	NA	168.68	NA	NA	NA
MW-1	04/12/1995	1,800	480	<5.0	79	<5.0	NA	NA	175.79	7.08	NA	168.71	NA	NA	NA
MW-1	07/25/1995	120	15	1.1	2.1	2.9	NA	NA	175.79	7.73	NA	168.06	NA	NA	NA
MW-1 (D)	07/25/1995	300	88	2.4	11	6.5	NA	NA	175.79	7.73	NA	168.06	NA	NA	NA
MW-1	10/18/1995	130	9.5	0.8	1.3	1.7	NA	NA	175.79	8.42	NA	167.37	NA	NA	NA
MW-1 (D)	10/18/1995	120	11	0.8	1.4	1.8	NA	NA	175.79	8.42	NA	167.37	NA	NA	NA
MW-1	01/17/1996	250	22	0.9	1.6	2.3	NA	NA	175.79	7.83	NA	167.96	NA	NA	NA
MW-1	04/25/1996	<50	4.6	<0.5	<0.5	0.6	500b	NA	175.79	7.35	NA	168.44	NA	NA	NA
MW-1	07/17/1996	<250	15	<2.5	<2.5	<2.5	540	NA	175.79	7.70	NA	168.09	NA	NA	NA
MW-1	10/01/1996	1,200	500	12	57	82	1,900	NA	175.79	8.07	NA	167.72	NA	NA	NA
MW-1	01/22/1997	640	170	4.3	33	33	1,200	NA	175.79	7.21	NA	168.58	NA	NA	NA
MW-1	04/08/1997	<200	34	<2.0	3.3	4.3	950	NA	175.79	7.75	NA	168.04	NA	NA	NA
MW-1 (D)	04/08/1997	<200	66	<2.0	6.4	8	740	NA	175.79	7.75	NA	168.04	NA	NA	NA
MW-1	07/08/1997	190	49	1.2	5.8	8.6	560	NA	175.79	8.01	NA	167.78	NA	NA	NA
MW-1	10/08/1997	<100	7	<1.0	<1.0	<1.0	620	NA	175.79	8.10	NA	167.69	NA	NA	NA
MW-1	01/09/1998	970	390	12	48	71	1,200	NA	175.79	7.14	NA	168.65	NA	NA	NA
MW-1	04/13/1998	<50	136	<0.50	1.5	1.8	170	NA	175.79	6.78	NA	169.01	NA	NA	NA
MW-1	07/17/1998	2,500	750	11	88	67	150	NA	175.79	7.28	NA	168.51	NA	NA	NA
MW-1	10/02/1998	8,000	970	36	270	440	35	NA	175.79	7.77	NA	168.02	NA	NA	NA

WELL CONCENTRATIONS
Shell-branded Service Station
4255 MacArthur Boulevard
Oakland, CA
Wic #204-5510-0600

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)	TOC (MSL)	Depth to Water (ft.)	Depth to SPH (ft.)	GW Elevation (MSL)	SPH Thickness (ft.)	DO Reading (ppm)	ORP Reading (mV)
MW-1	02/03/1999	210	56	0.82	<0.50	3.2	220	NA	175.79	7.45	NA	168.34	NA	1.4	NA
MW-1	04/29/1999	<50	4.5	<0.50	0.56	<0.50	140	196	175.79	7.58	NA	168.21	NA	1.2	140
MW-1	07/23/1999	<50.0	<0.500	<0.500	<0.500	<0.500	120	111*	175.79	8.51	NA	167.28	NA	1.0	NA
MW-1	11/01/1999	<50.0	<0.500	<0.500	<0.500	<0.500	2.90	NA	175.79	8.30	NA	167.49	NA	1.4	-71
MW-1	01/17/2000	<50	<0.50	<0.50	<0.50	<0.50	3.30	NA	175.79	8.04	NA	167.75	NA	16.9	64
MW-1	04/17/2000	<50.0	1.08	<0.500	<0.500	<0.500	<2.50	NA	175.79	8.00	NA	167.79	NA	1.8	112
MW-1	07/26/2000	125	54.3	2.16	5.45	9.86	33.1	NA	175.79	7.52	NA	168.27	NA	13.2	-140
MW-1	10/12/2000	101	40.7	2.68	3.00	5.18	25.0	NA	175.79	7.71	NA	168.08	NA	>20	534
MW-1	**01/15/2001**	**<50.0**	**0.633**	**<0.500**	**0.505**	**1.74**	**<2.50**	**NA**	**175.79**	**7.33**	**NA**	**168.46**	**NA**	**16.9**	**-127**
MW-2	11/17/1993	31,000	9,400	4,600	1,000	3,900	NA	NA	170.91	12.31	NA	158.60	NA	NA	NA
MW-2	01/20/1994	40,000	6,900	5,600	780	4,100	NA	NA	170.91	11.48	NA	159.43	NA	NA	NA
MW-2 (D)	01/20/1994	41,000	7,200	6,200	900	4,800	NA	NA	170.91	11.48	NA	159.43	NA	NA	NA
MW-2	04/25/1994	60,000	9,300	6,100	1,400	6,200	NA	NA	170.91	10.84	NA	160.07	NA	NA	NA
MW-2	07/07/1994	280,000a	40,000	26,000	8,100	32,000	NA	NA	170.91	11.89	NA	159.02	NA	NA	NA
MW-2 (D)	07/07/1994	53,000	13,000	6,600	2,000	8,400	NA	NA	170.91	11.89	NA	159.02	NA	NA	NA
MW-2	10/27/1994	130,000	14,000	12,000	2,400	13,000	NA	NA	170.91	12.89	NA	158.02	NA	NA	NA
MW-2 (D)	10/27/1994	390,000	8,800	7,000	1,700	11,000	NA	NA	170.91	12.89	NA	158.02	NA	NA	NA
MW-2	11/17/1994	NA	NA	NA	NA	NA	NA	NA	170.91	9.11	NA	161.80	NA	NA	NA
MW-2	11/28/1994	NA	NA	NA	NA	NA	NA	NA	170.91	9.22	NA	161.69	NA	NA	NA
MW-2	01/13/1995	75,000	5,900	12,000	3,100	17,000	NA	NA	170.91	8.10	NA	162.81	NA	NA	NA
MW-2	04/12/1995	100,000	8,500	11,000	2,400	12,000	NA	NA	170.91	10.12	NA	160.79	NA	NA	NA
MW-2 (D)	04/12/1995	80,000	4,200	9,300	2,500	12,000	NA	NA	170.91	10.12	NA	160.79	NA	NA	NA
MW-2	07/25/1995	NA	NA	NA	NA	NA	NA	NA	170.91	11.53	NA	159.80	0.52	NA	NA
MW-2	10/18/1995	NA	NA	NA	NA	NA	NA	NA	170.91	14.02	NA	156.99	0.13	NA	NA
MW-2	01/17/1996	NA	NA	NA	NA	NA	NA	NA	170.91	10.27	NA	160.78	0.17	NA	NA

WELL CONCENTRATIONS
Shell-branded Service Station
4255 MacArthur Boulevard
Oakland, CA
Wic #204-5510-0600

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)	TOC (MSL)	Depth to Water (ft.)	Depth to SPH (ft.)	GW Elevation (MSL)	SPH Thickness (ft.)	DO Reading (ppm)	ORP Reading (mV)
MW-2	04/25/1996	NA	NA	NA	NA	NA	NA	NA	170.91	11.68	NA	159.25	0.03	NA	NA
MW-2	07/17/1996	NA	NA	NA	NA	NA	NA	NA	170.91	12.78	NA	158.81	0.48	NA	NA
MW-2	10/01/1996	NA	NA	NA	NA	NA	NA	NA	170.91	14.21	NA	156.70	0.28	NA	NA
MW-2	01/22/1997	NA	NA	NA	NA	NA	NA	NA	170.91	10.92	NA	160.08	0.11	NA	NA
MW-2	04/08/1997	NA	NA	NA	NA	NA	NA	NA	170.91	14.12	NA	156.95	0.20	NA	NA
MW-2	07/08/1997	NA	NA	NA	NA	NA	NA	NA	170.91	14.98	NA	156.08	0.19	NA	NA
MW-2	10/08/1997	NA	NA	NA	NA	NA	NA	NA	170.91	12.97	NA	157.98	0.05	NA	NA
MW-2	01/08/1998	NA	NA	NA	NA	NA	NA	NA	170.91	12.54	NA	158.43	0.08	NA	NA
MW-2	04/13/1998	180,000	2,800	5,200	2,400	13,000	71,000	NA	170.91	10.05	NA	160.86	NA	NA	NA
MW-2	07/17/1998	NA	NA	NA	NA	NA	NA	NA	170.91	11.75	NA	159.24	0.10	NA	NA
MW-2	10/02/1998	NA	NA	NA	NA	NA	NA	NA	170.91	16.78	NA	154.22	0.11	NA	NA
MW-2	02/03/1999	NA	NA	NA	NA	NA	NA	NA	170.91	9.90	9.82	161.07	0.08	NA	NA
MW-2	04/29/1999	NA	NA	NA	NA	NA	NA	NA	170.91	9.86	9.81	161.09	0.05	NA	NA
MW-2	07/23/1999	65,800	6,500	4,480	1,960	8,960	46,600	58,500*	170.91	14.45	NA	156.46	NA	1.4	NA
MW-2	11/01/1999	NA	NA	NA	NA	NA	NA	NA	170.91	11.84	11.81	159.09	0.03	NA	NA
MW-2	01/17/2000	46,000	6,000	2,400	1,500	5,500	50,000	31,000	170.91	11.00	NA	159.91	NA	1.3	-54
MW-2	04/17/2000	96,300	8,150	10,200	2,820	14,900	112,000	108,000	170.91	11.06	NA	159.85	NA	2.6	125
MW-2	07/26/2000	72,400	8,680	5,620	2,810	13,400	66,200	46,300	170.91	12.82	NA	158.09	NA	2.2	113
MW-2	10/12/2000	63,200	5,840	4,180	2,310	11,100	61,200	66,600	170.91	11.32	NA	159.59	NA	0.4	55
MW-2	**01/15/2001**	**59,700**	**2,630**	**4,800**	**2,050**	**11,500**	[redacted]		**170.91**	**10.19**	**NA**	**160.72**	**NA**	**1.1**	**-22**
MW-3	11/17/1993	18,000	5,400	660	720	2,200	NA	NA	174.61	15.40	NA	159.21	NA	NA	NA
MW-3	01/20/1994	55,000	13,000	2,600	2,200	6,500	NA	NA	174.61	14.61	NA	160.00	NA	NA	NA
MW-3	04/25/1994	96,000	11,000	1,600	3,100	9,900	NA	NA	174.61	13.12	NA	161.49	NA	NA	NA
MW-3 (D)	04/25/1994	78,000	12,000	1,900	2,600	7,300	NA	NA	174.61	13.12	NA	161.49	NA	NA	NA
MW-3	07/07/1994	NA	NA	NA	NA	NA	NA	NA	174.61	14.54	NA	160.07	0.02	NA	NA

WELL CONCENTRATIONS
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Oakland, CA
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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)	TOC (MSL)	Depth to Water (ft.)	Depth to SPH (ft.)	GW Elevation (MSL)	SPH Thickness (ft.)	DO Reading (ppm)	ORP Reading (mV)
MW-3	10/27/1994	NA	NA	NA	NA	NA	NA	NA	174.61	15.62	NA	159.03	0.05	NA	NA
MW-3	11/17/1994	NA	NA	NA	NA	NA	NA	NA	174.61	13.83	NA	160.78	NA	NA	NA
MW-3	11/28/1994	NA	NA	NA	NA	NA	NA	NA	174.61	14.02	NA	160.59	NA	NA	NA
MW-3	01/13/1995	180,000	3,200	2,700	1,700	5,200	NA	NA	174.61	12.13	NA	162.48	NA	NA	NA
MW-3 (D)	01/13/1995	23,000	4,000	690	960	3,000	NA	NA	174.61	12.13	NA	162.48	NA	NA	NA
MW-3	04/12/1995	56,000	8,700	1,500	2,100	6,300	NA	NA	174.61	12.96	NA	161.65	NA	NA	NA
MW-3	07/25/1995	NA	NA	NA	NA	NA	NA	NA	174.61	14.28	NA	160.38	0.06	NA	NA
MW-3	10/18/1995	NA	NA	NA	NA	NA	NA	NA	174.61	15.88	NA	158.77	0.05	NA	NA
MW-3	01/17/1996	NA	NA	NA	NA	NA	NA	NA	174.61	13.86	NA	160.94	0.24	NA	NA
MW-3	04/25/1996	NA	NA	NA	NA	NA	NA	NA	174.61	13.82	NA	160.81	0.02	NA	NA
MW-3	07/17/1996	NA	NA	NA	NA	NA	NA	NA	174.61	16.11	NA	158.52	0.03	NA	NA
MW-3	10/01/1996	46,000	7,300	530	1,700	3,900	3,200	NA	174.61	16.56	NA	158.05	NA	NA	NA
MW-3 (D)	10/01/1996	47,000	7,100	530	1,700	4,000	2,900	NA	174.61	16.56	NA	158.05	NA	NA	NA
MW-3	01/22/1997	82,000	5,200	1,300	2,800	8,900	1,100	NA	174.61	13.07	NA	161.54	NA	NA	NA
MW-3 (D)	01/22/1997	61,000	8,400	1,100	2,300	7,000	2,700	NA	174.61	13.07	NA	161.54	NA	NA	NA
MW-3	04/08/1997	NA	NA	NA	NA	NA	NA	NA	174.61	17.09	NA	157.54	0.03	NA	NA
MW-3	07/08/1997	56,000	8,800	580	2,000	4,900	2,800	NA	174.61	15.85	NA	158.76	NA	NA	NA
MW-3	10/08/1997	48,000	8,000	590	1,700	3,400	5,100	NA	174.61	16.22	NA	158.39	NA	NA	NA
MW-3	01/08/1998	47,000	9,400	810	2,300	4,700	6,300	NA	174.61	13.80	NA	160.81	NA	NA	NA
MW-3 (D)	01/08/1998	48,000	8,100	750	2,000	4,100	5,800	NA	174.61	13.80	NA	160.81	NA	NA	NA
MW-3	04/13/1998	32,000	6,800	540	1,400	3,400	4,000	NA	174.61	12.97	NA	161.64	NA	NA	NA
MW-3 (D)	04/13/1998	36,000	7,300	660	1,600	3,700	4,000	NA	174.61	12.97	NA	161.64	NA	NA	NA
MW-3	07/17/1998	71,000	11,000	590	2,200	6,900	3,900	NA	174.61	11.51	NA	163.10	NA	NA	NA
MW-3 (D)	07/17/1998	76,000	12,000	700	2,600	8,000	3,000	NA	174.61	11.51	NA	163.10	NA	NA	NA
MW-3	10/02/1998	66,000	8,900	510	2,000	4,900	4,600	NA	174.61	16.50	NA	158.11	NA	NA	NA
MW-3 (D)	10/02/1998	59,000	9,400	460	2,000	4,900	4,700	NA	174.61	16.50	NA	158.11	NA	NA	NA

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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)	TOC (MSL)	Depth to Water (ft.)	Depth to SPH (ft.)	GW Elevation (MSL)	SPH Thickness (ft.)	DO Reading (ppm)	ORP Reading (mV)
MW-3	02/03/1999	36,000	6,800	300	1,600	2,900	18,000	NA	174.61	15.21	NA	159.40	NA	1.3	NA
MW-3	04/29/1999	45,000	8,100	580	2,200	5,800	4,700	5,150	174.61	15.43	NA	159.18	NA	1.5	-68
MW-3	07/23/1999	29,400	3,540	215	810	3,800	4,720	6,950*	174.61	14.95	NA	159.66	NA	1.3	NA
MW-3	11/01/1999	20,000	4,190	294	1,060	1,740	5,540	8,590	174.61	14.66	NA	159.95	NA	0.6	-110
MW-3	01/17/2000	17,000	3,900	89	1,100	1,200	7,900	NA	174.61	13.94	NA	160.67	NA	1.3	-40
MW-3	04/17/2000	28,100	5,240	247	1,540	2,750	16,600	NA	174.61	14.00	NA	160.61	NA	1.1	-86
MW-3	07/26/2000	24,300	6,680	159	1,610	1,640	17,100	NA	174.61	13.72	NA	160.89	NA	0.9	-70
MW-3	10/12/2000	14,300	2,630	86.7	241	1,360	16,300	NA	174.61	14.15	NA	160.46	NA	0.9	50
MW-3	**01/15/2001**	**22,100**	**4,400**	**266**	**977**	**2,990**	**13,200**	**NA**	**174.61**	**13.05**	**NA**	**161.56**	**NA**	**1.3**	**-40**
MW-4	11/17/1994	NA	NA	NA	NA	NA	NA	NA	164.06	6.62	NA	157.44	NA	NA	NA
MW-4	11/28/1994	2,900	200	17	76	260	NA	NA	164.06	6.11	NA	157.95	NA	NA	NA
MW-4	01/13/1995	1,900	130	5.6	13	40	NA	NA	164.06	6.05	NA	158.01	NA	NA	NA
MW-4	04/12/1995	680	150	<2.0	10	13	NA	NA	164.06	6.31	NA	157.75	NA	NA	NA
MW-4	07/25/1995	340	100	0.8	8.8	3	NA	NA	164.06	7.36	NA	156.70	NA	NA	NA
MW-4	10/18/1995	150	31	<0.5	3.5	0.8	NA	NA	164.06	8.54	NA	155.52	NA	NA	NA
MW-4	01/17/1996	290	14	<0.5	1.8	0.8	NA	NA	164.06	8.48	NA	155.58	NA	NA	NA
MW-4	04/25/1996	<500	65	<5	<5	<5	1,700	NA	164.06	7.40	NA	156.66	NA	NA	NA
MW-4 (D)	04/25/1996	<500	66	<5	8.7	<5	1,500	NA	164.06	7.40	NA	156.66	NA	NA	NA
MW-4	07/17/1996	<500	84	<5.0	6.5	<5.0	1,500	NA	164.06	7.75	NA	156.31	NA	NA	NA
MW-4 (D)	07/17/1996	<500	54	<5.0	<5.0	<5.0	1,700	2,100	164.06	7.75	NA	156.31	NA	NA	NA
MW-4	10/01/1996	<500	1.9	<5.0	<5.0	<5.0	3,000	NA	164.06	8.82	NA	155.24	NA	NA	NA
MW-4	01/22/1997	580	130	<2.5	18	5.2	1,200	NA	164.06	7.51	NA	156.55	NA	NA	NA
MW-4	04/08/1997	770	200	7	26	55	1,500	8	164.06	7.18	NA	156.88	NA	NA	NA
MW-4	07/08/1997	570	78	<5.0	14	11	1,200	NA	164.06	9.00	NA	155.06	NA	NA	NA
MW-4 (D)	07/08/1997	640	81	<5.0	16	19	1,600	NA	164.06	9.00	NA	155.06	NA	NA	NA

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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)	TOC (MSL)	Depth to Water (ft.)	Depth to SPH (ft.)	GW Elevation (MSL)	SPH Thickness (ft.)	DO Reading (ppm)	ORP Reading (mV)
MW-4	10/08/1997	<500	40	<5.0	7.4	5.4	1,400	NA	164.06	8.97	NA	155.09	NA	NA	NA
MW-4 (D)	10/08/1997	<500	36	<5.0	5.9	<5.0	1,400	NA	164.06	8.97	NA	155.09	NA	NA	NA
MW-4	01/08/1998	<1,000	55	<10	13	<10	2,000	NA	164.06	7.90	NA	156.16	NA	NA	NA
MW-4	04/13/1998	350	110	2.4	20	26	<2.5	NA	164.06	7.35	NA	156.71	NA	NA	NA
MW-4	07/17/1998	210	66	0.78	5.4	9.8	1,700	NA	164.06	6.95	NA	157.11	NA	NA	NA
MW-4	10/02/1998	<50	0.69	<0.50	<0.50	<0.50	2,900	NA	164.06	7.35	NA	156.71	NA	NA	NA
MW-4	02/03/1999	560	120	2.5	29	34	6,800	NA	164.06	7.71	NA	156.35	NA	0.9	NA
MW-4	04/29/1999	390	80	1.9	13	19	7,000	8,360	164.06	7.83	NA	156.23	NA	1.1	-125
MW-4	07/23/1999	460	93.6	8.40	25.2	28.8	3,760	6,000*	164.06	11.33	NA	152.73	NA	0.9	NA
MW-4	11/01/1999	77.3	0.520	<0.500	<0.500	<0.500	539	NA	164.06	10.66	NA	153.40	NA	2.8	3
MW-4	01/17/2000	160	27	<0.50	12	6.3	12,000	NA	164.06	10.15	NA	153.91	NA	3.9	-17
MW-4	04/17/2000	<500	26	6.38	9.35	10.4	9,070	NA	164.06	10.10	NA	153.96	NA	1.7	-129
MW-4	07/26/2000	<500	22.7	<5.00	7.59	6.96	7,660	NA	164.06	10.09	NA	153.97	NA	1.4	-137
MW-4	10/12/2000	172	19.8	<0.500	7.47	4.50	8,290	NA	164.06	9.35	NA	154.71	NA	3.5	529
MW-4	**01/15/2001**	**53.6**	**1.50**	**<0.500**	**2.45**	**1.80**	**9,260**	**NA**	**164.06**	**8.77**	**NA**	**155.29**	**NA**	**2.3**	**53**
TB-1	04/29/1999	NA	NA	NA	NA	NA	NA	NA	NA	6.00	NA	NA	NA	3.8	-132
TB-1	11/01/1999	NA	NA	NA	NA	NA	NA	NA	NA	12.65	NA	NA	NA	0.2	-165
TB-1	01/17/2000	NA	NA	NA	NA	NA	NA	NA	NA	7.72	NA	NA	NA	0.8	-178
TB-1	04/17/2000	NA	NA	NA	NA	NA	NA	NA	NA	7.65	NA	NA	NA	0.5	-152
TB-1	07/26/2000	NA	NA	NA	NA	NA	NA	NA	NA	5.13	NA	NA	NA	1.0	-124
TB-1	10/12/2000	NA	NA	NA	NA	NA	NA	NA	NA	5.20	NA	NA	NA	0.7	-73
TB-1	**01/15/2001**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**5.09**	**NA**	**NA**	**NA**	**1.2**	**-118**
TB-2	04/29/1999	NA	NA	NA	NA	NA	NA	NA	NA	4.76	NA	NA	NA	4.2	-108
TB-2	11/01/1999	NA	NA	NA	NA	NA	NA	NA	NA	11.33	NA	NA	NA	0.5	-148

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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)	TOC (MSL)	Depth to Water (ft.)	Depth to SPH (ft.)	GW Elevation (MSL)	SPH Thickness (ft.)	DO Reading (ppm)	ORP Reading (mV)
TB-2	01/17/2000	NA	NA	NA	NA	NA	NA	NA	NA	9.79	NA	NA	NA	0.7	-162
TB-2	04/17/2000	NA	NA	NA	NA	NA	NA	NA	NA	9.75	NA	NA	NA	0.9	-121
TB-2	07/26/2000	NA	NA	NA	NA	NA	NA	NA	NA	4.73	NA	NA	NA	0.9	-85
TB-2	10/12/2000	NA	NA	NA	NA	NA	NA	NA	NA	4.05	NA	NA	NA	0.6	-47
TB-2	**01/15/2001**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**3.87**	**NA**	**NA**	**NA**	**0.7**	**-91**

Abbreviations:
TPPH= Total petroleum hydrocarbons as gasoline by modified EPA Method 8015
BTEX = benzene, toluene, ethylbenzene, xylenes by EPA Method 8020
MTBE = methyl-tertiary-butyl ether
TOC = Top of Casing Elevation
SPH = Separate-Phase Hydrocarbons
GW = Groundwater
ug/L = parts per billion
msl = Mean sea level
ft = Feet
<n = Below detection limit
D = Duplicate sample
NA = Not applicable
DO = Dissolved Oxygens
ppm = parts per million
ORP = Oxidation Reduction Potential
mV = millivolts

Shouldn't sample TB-1 & 2 to identify source of problem

WELL CONCENTRATIONS
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4255 MacArthur Boulevard
Oakland, CA
Wic #204-5510-0600

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)	TOC (MSL)	Depth to Water (ft.)	Depth to SPH (ft.)	GW Elevation (MSL)	SPH Thickness (ft.)	DO Reading (ppm)	ORP Reading (mV)

Notes:

* = Sample analyzed outside the EPA recommended holding time.

a = Ground water surface had a sheen when sampled

b = MTBE value is estimated by Sequoia Analytical of Redwood City, California

When separate-phase hydrocarbons are present, ground water elevation is adjusted using the relation:

Corrected ground water elevation = Top-of-casing elevation - depth to water + (0.8 x hydrocarbon thickness).

Sequoia
Analytical

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FAX (408) 782-6308
www.sequoialabs.com

30 January, 2001

Nick Sudano
Blaine Tech Services (Shell)
1680 Rogers Avenue
San Jose, CA 95112

RE: 4255 McArthur Blvd.
Sequoia Report: MKA0387

Enclosed are the results of analyses for samples received by the laboratory on 01/16/01 12:46. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Wayne Stevenson
Client Services Manager

CA ELAP Certificate #1210

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Blaine Tech Services (Shell)	Project: 4255 McArthur Blvd.	
1680 Rogers Avenue	Project Number: 4255 McArthur Blvd./ Oakland	**Reported:**
San Jose CA, 95112	Project Manager: Nick Sudano	01/30/01 11:46

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
MW-1	MKA0387-01	Water	01/15/01 13:34	01/16/01 12:46
MW-2	MKA0387-02	Water	01/15/01 15:11	01/16/01 12:46
MW-3	MKA0387-03	Water	01/15/01 15:39	01/16/01 12:46
MW-4	MKA0387-04	Water	01/15/01 14:25	01/16/01 12:46

Wayne Stevenson, Client Services Manager

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Blaine Tech Services (Shell)	Project: 4255 McArthur Blvd.	
1680 Rogers Avenue	Project Number: 4255 McArthur Blvd./ Oakland	**Reported:**
San Jose CA, 95112	Project Manager: Nick Sudano	01/30/01 11:46

Total Purgeable Hydrocarbons (C6-C12), BTEX and MTBE by DHS LUFT

Sequoia Analytical - Morgan Hill

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
MW-1 (MKA0387-01) Water Sampled: 01/15/01 13:34 Received: 01/16/01 12:46									
Purgeable Hydrocarbons	ND	50.0	ug/l	1	1A23004	01/23/01	01/23/01	DHS LUFT	
Benzene	**0.633**	0.500	"	"	"	"	"	"	
Toluene	ND	0.500	"	"	"	"	"	"	
Ethylbenzene	**0.505**	0.500	"	"	"	"	"	"	
Xylenes (total)	**1.74**	0.500	"	"	"	"	"	"	
Methyl tert-butyl ether	ND	2.50	"	"	"	"	"	"	
Surrogate: a,a,a-Trifluorotoluene		*103 %*		*70-130*		"	"	"	
MW-2 (MKA0387-02) Water Sampled: 01/15/01 15:11 Received: 01/16/01 12:46									
Purgeable Hydrocarbons	**59700**	20000	ug/l	400	1A19004	01/19/01	01/19/01	DHS LUFT	P-01
Benzene	**2630**	200	"	"	"	"	"	"	
Toluene	**4800**	200	"	"	"	"	"	"	
Ethylbenzene	**2050**	200	"	"	"	"	"	"	
Xylenes (total)	**11500**	200	"	"	"	"	"	"	
Methyl tert-butyl ether	**[illegible]**	**1000**	"	"	"	"	"	"	
Surrogate: a,a,a-Trifluorotoluene		*101 %*		*70-130*		"	"	"	
MW-3 (MKA0387-03) Water Sampled: 01/15/01 15:39 Received: 01/16/01 12:46									
Purgeable Hydrocarbons	**22100**	5000	ug/l	100	1A19004	01/19/01	01/19/01	DHS LUFT	P-01
Benzene	**4400**	50.0	"	"	"	"	"	"	
Toluene	**266**	50.0	"	"	"	"	"	"	
Ethylbenzene	**977**	50.0	"	"	"	"	"	"	
Xylenes (total)	**2990**	50.0	"	"	"	"	"	"	
Methyl tert-butyl ether	**13200**	250	"	"	"	"	"	"	
Surrogate: a,a,a-Trifluorotoluene		*98.8 %*		*70-130*		"	"	"	

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Blaine Tech Services (Shell)	Project: 4255 McArthur Blvd.	
1680 Rogers Avenue	Project Number: 4255 McArthur Blvd./ Oakland	**Reported:**
San Jose CA, 95112	Project Manager: Nick Sudano	01/30/01 11:46

Total Purgeable Hydrocarbons (C6-C12), BTEX and MTBE by DHS LUFT

Sequoia Analytical - Morgan Hill

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
MW-4 (MKA0387-04) Water Sampled: 01/15/01 14:25 Received: 01/16/01 12:46									
Purgeable Hydrocarbons	**53.6**	50.0	ug/l	1	1A19004	01/19/01	01/19/01	DHS LUFT	P-01
Benzene	**1.50**	0.500	"	"	"	"	"	"	
Toluene	ND	0.500	"	"	"	"	"	"	
Ethylbenzene	**2.45**	0.500	"	"	"	"	"	"	
Xylenes (total)	**1.80**	0.500	"	"	"	"	"	"	
Methyl tert-butyl ether	**9260**	500	"	200	"	"	01/23/01	"	M-03
Surrogate: a,a,a-Trifluorotoluene		*96.4 %*	*70-130*		"	"	*01/19/01*	"	

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Blaine Tech Services (Shell)	Project: 4255 McArthur Blvd.	
1680 Rogers Avenue	Project Number: 4255 McArthur Blvd./ Oakland	**Reported:**
San Jose CA, 95112	Project Manager: Nick Sudano	01/30/01 11:46

MTBE Confirmation by EPA Method 8260A

Sequoia Analytical - Morgan Hill

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
MW-2 (MKA0387-02) Water Sampled: 01/15/01 15:11 Received: 01/16/01 12:46									
Methyl tert-butyl ether	[illegible]	4000	ug/l	4000	1A26018	01/26/01	01/26/01	EPA 8260A	
Surrogate: 1,2-Dichloroethane-d4		*113 %*	*70-130*		"	"	"	"	

don't need spectra for results

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1680 Rogers Avenue	Project Number: 4255 McArthur Blvd./ Oakland	**Reported:**
San Jose CA, 95112	Project Manager: Nick Sudano	01/30/01 11:46

Total Purgeable Hydrocarbons (C6-C12), BTEX and MTBE by DHS LUFT - Quality Control

Sequoia Analytical - Morgan Hill

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1A19004 - EPA 5030B [P/T]										
Blank (1A19004-BLK1)				Prepared & Analyzed: 01/19/01						
Purgeable Hydrocarbons	ND	50.0	ug/l							
Benzene	ND	0.500	"							
Toluene	ND	0.500	"							
Ethylbenzene	ND	0.500	"							
Xylenes (total)	ND	0.500	"							
Methyl tert-butyl ether	ND	2.50	"							
Surrogate: a,a,a-Trifluorotoluene	*9.99*		"	*10.0*		*99.9*	*70-130*			
LCS (1A19004-BS1)				Prepared & Analyzed: 01/19/01						
Purgeable Hydrocarbons	232	50.0	ug/l	250		92.8	70-130			
Surrogate: a,a,a-Trifluorotoluene	*9.13*		"	*10.0*		*91.3*	*70-130*			
Matrix Spike (1A19004-MS1)		**Source: MKA0251-01**		Prepared & Analyzed: 01/19/01						
Purgeable Hydrocarbons	252	50.0	ug/l	250	ND	101	60-140			
Surrogate: a,a,a-Trifluorotoluene	*9.35*		"	*10.0*		*93.5*	*70-130*			
Matrix Spike Dup (1A19004-MSD1)		**Source: MKA0251-01**		Prepared & Analyzed: 01/19/01						
Purgeable Hydrocarbons	231	50.0	ug/l	250	ND	92.4	60-140	8.70	25	
Surrogate: a,a,a-Trifluorotoluene	*9.43*		"	*10.0*		*94.3*	*70-130*			
Batch 1A23004 - EPA 5030B [P/T]										
Blank (1A23004-BLK1)				Prepared & Analyzed: 01/23/01						
Purgeable Hydrocarbons	ND	50.0	ug/l							
Benzene	ND	0.500	"							
Toluene	ND	0.500	"							
Ethylbenzene	ND	0.500	"							
Xylenes (total)	ND	0.500	"							
Methyl tert-butyl ether	ND	2.50	"							
Surrogate: a,a,a-Trifluorotoluene	*10.2*		"	*10.0*		*102*	*70-130*			

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1680 Rogers Avenue	Project Number: 4255 McArthur Blvd./ Oakland	**Reported:**
San Jose CA, 95112	Project Manager: Nick Sudano	01/30/01 11:46

Total Purgeable Hydrocarbons (C6-C12), BTEX and MTBE by DHS LUFT - Quality Control

Sequoia Analytical - Morgan Hill

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1A23004 - EPA 5030B [P/T]										
LCS (1A23004-BS1)				Prepared & Analyzed: 01/23/01						
Purgeable Hydrocarbons	271	50.0	ug/l	250		108	70-130			
Surrogate: a,a,a-Trifluorotoluene	*10.0*		"	*10.0*		*100*	*70-130*			
Matrix Spike (1A23004-MS1)		**Source: MKA0381-04**		Prepared & Analyzed: 01/23/01						
Purgeable Hydrocarbons	289	50.0	ug/l	250	ND	116	60-140			
Surrogate: a,a,a-Trifluorotoluene	*9.87*		"	*10.0*		*98.7*	*70-130*			
Matrix Spike Dup (1A23004-MSD1)		**Source: MKA0381-04**		Prepared & Analyzed: 01/23/01						
Purgeable Hydrocarbons	260	50.0	ug/l	250	ND	104	60-140	10.6	25	
Surrogate: a,a,a-Trifluorotoluene	*9.78*		"	*10.0*		*97.8*	*70-130*			

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1680 Rogers Avenue	Project Number: 4255 McArthur Blvd./ Oakland	**Reported:**
San Jose CA, 95112	Project Manager: Nick Sudano	01/30/01 11:46

MTBE Confirmation by EPA Method 8260A - Quality Control
Sequoia Analytical - Morgan Hill

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1A26018 - EPA 5030B [P/T]										
Blank (1A26018-BLK1)				Prepared & Analyzed: 01/26/01						
Methyl tert-butyl ether	ND	1.00	ug/l							
Surrogate: 1,2-Dichloroethane-d4	*10.5*		"	*10.0*		*105*	*70-130*			
LCS (1A26018-BS1)				Prepared & Analyzed: 01/26/01						
Methyl tert-butyl ether	10.4	1.00	ug/l	10.0		104	70-130			
Surrogate: 1,2-Dichloroethane-d4	*9.46*		"	*10.0*		*94.6*	*70-130*			
Matrix Spike (1A26018-MS1)			**Source: MKA0538-02**	Prepared & Analyzed: 01/26/01						
Methyl tert-butyl ether	10.8	1.00	ug/l	10.0	ND	108	70-130			
Surrogate: 1,2-Dichloroethane-d4	*11.5*		"	*10.0*		*115*	*70-130*			
Matrix Spike Dup (1A26018-MSD1)			**Source: MKA0538-02**	Prepared & Analyzed: 01/26/01						
Methyl tert-butyl ether	10.2	1.00	ug/l	10.0	ND	102	70-130	5.71	25	
Surrogate: 1,2-Dichloroethane-d4	*11.0*		"	*10.0*		*110*	*70-130*			

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1680 Rogers Avenue	Project Number: 4255 McArthur Blvd./ Oakland	**Reported:**
San Jose CA, 95112	Project Manager: Nick Sudano	01/30/01 11:46

Notes and Definitions

M-03	Sample was analyzed at a second dilution.
P-01	Chromatogram Pattern: Gasoline C6-C12
DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference

LAB: Sequoia

Lab Identification (if necessary):

Address:

City, State, Zip:

EQUIVA Services LLC Chain Of Custody Record

Equiva Project Manager to be Invoiced:

- [x] SCIENCE & ENGINEERING
- [ ] TECHNICAL SERVICES
- [ ] CRMT HOUSTON

Karen Petryna

INCIDENT NUMBER (S&E ONLY): 9 8 9 9 5 7 5 8

SAP or CRMT NUMBER (TS/CRMT):

PAGE: 1 of 1

CONSULTANT COMPANY: Blaine Tech Services

ADDRESS: 1680 Rogers Avenue

CITY: San Jose, CA 95112

TELEPHONE: 408-573-0555 FAX: 408-573-7771 E-MAIL: nsudano@blainetech.com

SITE ADDRESS (Street and City): 4255 MacArthur Blvd., Oakland

PROJECT CONTACT (Report to): Nick Sudano

CONSULTANT PROJECT NO.: BTS # 010115-X3

SAMPLER NAME(S) (Print): HOYT RYALES

LAB USE ONLY

TURNAROUND TIME (BUSINESS DAYS): [x] 10 DAYS [ ] 5 DAYS [ ] 72 HOURS [ ] 48 HOURS [ ] 24 HOURS [ ] LESS THAN 24 HOURS

[ ] LA - RWQCB REPORT FORMAT [ ] UST AGENCY: ____

GC/MS MTBE CONFIRMATION: HIGHEST X HIGHEST per BORING ____ ALL ____

SPECIAL INSTRUCTIONS OR NOTES: TEMPERATURE ON RECEIPT C°

REQUESTED ANALYSIS MKA0387

LAB USE ONLY	Field Sample Identification	SAMPLING DATE	SAMPLING TIME	MATRIX	NO. OF CONT.	TPH - Gas, Purgeable (8015m)	BTEX (8021B)	MTBE (8021B)	MTBE (8260B)	TPH - Diesel, Extractable (8015m)	Oxygenates (5) by 8260	Ethanol, Methanol (8015B)	1,2-DCA & EDB by 8010	MTBE (8260B) Confirmation, See Note	FIELD NOTES: Container/Preservative or PID Readings or Laboratory Notes
	MW-1	1/15/01	1334	W	3	X	X	X						X	01
	MW-2	↓	1511	↓	↓	X	X	X						X	02
	MW-3	↓	1539	↓	↓	X	X	X						X	03
	MW-4	↓	1425	↓	↓	X	X	X						X	04

Relinquished by: (Signature)	Received by: (Signature)	Date:	Time:
[signature]	[signature]	1/16/01	9:23
[signature]	Heather Shelley	1/16	12:46

Distribution: White with final report, Green to File, Yellow and Pink to Client.

10/16/00 Revision

Q&Q Graphic (714) 898-9702

WELL GAUGING DATA

Project # 01611$-X3 Date 1/15/01 Client EQUIVA

Site 4255 MacArthur Blvd OAKLAND CAL

	Well ID	Well Size (in.)	Sheen / Odor	Depth to Immiscible Liquid (ft.)	Thickness of Immiscible Liquid (ft.)	Volume of Immiscibles Removed (ml)	Depth to water (ft.)	Depth to well bottom (ft.)	Survey Point: TOB or (TOC)	PRE-PURGE DO/ORP
	mw-1	4					7.33	23.21	↓	16.9/-127
FP	MW-2	4					10.19	19.40		1.1/-22
FP	mw-3	4					13.05	21.55		1.3/-40
	Mw-4	2					8.77	30.11		2.3/53
	TB-1	4					5.09	13.29		1.2/-118
	TB-2	4					3.87	12.92	↓	0.7/-91

wells purged w/ mc's in place except for mw-4

EQUIVA WELL MONITORING DATA SHEET

BTS #: 010116-X3	Site: 204-5510-0600
Sampler: HOYT	Date: 1/16/01
Well I.D.: MW-1	Well Diameter: 2 3 (4) 6 8 ____
Total Well Depth: 23.21	Depth to Water: 7.33
Depth to Free Product:	Thickness of Free Product (feet):
Referenced to: (PVC) Grade	D.O. Meter (if req'd): (YSI) HACH

Purge Method:
- Bailer
- Disposable Bailer
- Middleburg
- (Electric Submersible)
- Waterra
- Peristaltic
- Extraction Pump
- Other ____

Sampling Method: (Bailer)
- Disposable Bailer
- Extraction Port
- Dedicated Tubing
- Other: ____

10.3 (Gals.) X 3 = 30.9 Gals.
1 Case Volume | Specified Volumes | Calculated Volume

Well Diameter	Multiplier	Well Diameter	Multiplier
1"	0.04	4"	0.65
2"	0.16	6"	1.47
3"	0.37	Other	radius² * 0.163

Time	Temp (°F)	pH	Cond.	Turbidity	Gals. Removed	Observations
1327	64.8	9.46	1037	68.4	10.5	
1329	65.7	9.09	1072	7200	21	
1331	66.5	8.47	1114	126.6	31	

Did well dewater? Yes (No) Gallons actually evacuated: 31

Sampling Time: 1334 Sampling Date: 1/16/01

Sample I.D.: MW-1 Laboratory: (Sequoia) Columbia Other ____

Analyzed for: (TPH-G BTEX MTBE) TPH-D Other:

EB I.D. (if applicable): @ Time Duplicate I.D. (if applicable):

Analyzed for: TPH-G BTEX MTBE TPH-D Other:

D.O. (if req'd):	(Pre-purge):	16.9 mg/L	Post-purge:	mg/L
O.R.P. (if req'd):	(Pre-purge):	-127 mV	Post-purge:	mV

EQUIVA WELL MONITORING DATA SHEET

BTS #: 010115-X3	Site: 204-5510-0600
Sampler: HOYT	Date: 1/15/01
Well I.D.: MW-2	Well Diameter: 2 3 (4) 6 8 ____
Total Well Depth: 19.40	Depth to Water: 10.19
Depth to Free Product:	Thickness of Free Product (feet):
Referenced to: (PVC) Grade	D.O. Meter (if req'd): (YSI) HACH

Purge Method:
- Bailer
- Disposable Bailer
- Middleburg
- (Electric Submersible)
- Waterra
- Peristaltic
- Extraction Pump
- Other_____

Sampling Method: (Bailer)
- Disposable Bailer
- Extraction Port
- Dedicated Tubing
- Other: _____

5.9 (Gals.) X 3 = 17.9 Gals.
1 Case Volume | Specified Volumes | Calculated Volume

Well Diameter	Multiplier	Well Diameter	Multiplier
1"	0.04	4"	0.65
2"	0.16	6"	1.47
3"	0.37	Other	radius² * 0.163

Time	Temp (°F)	pH	Cond.	Turbidity	Gals. Removed	Observations
1505	66.4	6.75	875	>200	6	odor
1506	66.8	6.73	861	>200	12	↓
1507	67.4	6.73	858	>200	18	↓
	Emptied Skimmer					
	NO SPH DETECTED IN SKIMMER OR WELL					

Did well dewater? Yes (No)		Gallons actually evacuated: 18	
Sampling Time: 1511		Sampling Date: 1/15/01	
Sample I.D.: MW-2		Laboratory: (Sequoia) Columbia Other_____	
Analyzed for: (TPH-G BTEX MTBE) TPH-D		Other:	
EB I.D. (if applicable): @ Time		Duplicate I.D. (if applicable):	
Analyzed for: TPH-G BTEX MTBE TPH-D		Other:	
D.O. (if req'd): (Pre-purge)	1.1 mg/L	Post-purge:	mg/L
O.R.P. (if req'd): (Pre-purge)	-22 mV	Post-purge:	mV

EQUIVA WELL MONITORING DATA SHEET

BTS #: 010115-X3	Site: 204-5510-0600
Sampler: HOYT	Date: 1/16/01
Well I.D.: MW-3	Well Diameter: 2 3 (4) 6 8 ___
Total Well Depth: 21.55	Depth to Water: 13.05
Depth to Free Product:	Thickness of Free Product (feet):
Referenced to: (PVC) Grade	D.O. Meter (if req'd): (YSI) HACH

Purge Method:
- Bailer
- Disposable Bailer
- Middleburg
- (Electric Submersible)
- Waterra
- Peristaltic
- Extraction Pump
- Other_____

Sampling Method: (Bailer)
- Disposable Bailer
- Extraction Port
- Dedicated Tubing
- Other: _____

5.5 (Gals.) X 3 = 16.5 Gals.
1 Case Volume | Specified Volumes | Calculated Volume

Well Diameter	Multiplier	Well Diameter	Multiplier
1"	0.04	4"	0.65
2"	0.16	6"	1.47
3"	0.37	Other	radius^2 * 0.163

Time	Temp (°F)	pH	Cond.	Turbidity	Gals. Removed	Observations
1533	67.8	6.75	1445	78.9	5.5	Heavy sheen odor
1534	68.0	6.74	1456	79.8	11	↓
1535	67.9	6.78	1508	92.6	17	↓
		NO	SPH	DETECTED		

Did well dewater? Yes (No) Gallons actually evacuated: 17

Sampling Time: 1539 Sampling Date: 1/16/01

Sample I.D.: MW-3 Laboratory: (Sequoia) Columbia Other_____

Analyzed for: (TPH-G BTEX MTBE) TPH-D Other:

EB I.D. (if applicable): @ Time Duplicate I.D. (if applicable):

Analyzed for: TPH-G BTEX MTBE TPH-D Other:

D.O. (if req'd):	(Pre-purge):	1.3 mg/L	Post-purge:	mg/L
O.R.P. (if req'd):	(Pre-purge):	-40 mV	Post-purge:	mV

EQUIVA WELL MONITORING DATA SHEET

BTS #: 010115-X3	Site: 204-5510-0600
Sampler: HOYT	Date: 1/15/01
Well I.D.: MW-4	Well Diameter: (2) 3 4 6 8 ____
Total Well Depth: 30.11	Depth to Water: 8.77
Depth to Free Product:	Thickness of Free Product (feet):
Referenced to: (PVC) Grade	D.O. Meter (if req'd): (YSI) HACH

Purge Method:
- Bailer
- Disposable Bailer
- (Middleburg)
- Electric Submersible
- Waterra
- Peristaltic
- Extraction Pump
- Other_____

Sampling Method: (Bailer)
- Disposable Bailer
- Extraction Port
- Dedicated Tubing
- Other: _____

1 Case Volume		Specified Volumes		Calculated Volume
3.4	(Gals.) X	3	=	10.2 Gals.

Well Diameter	Multiplier	Well Diameter	Multiplier
1"	0.04	4"	0.65
2"	0.16	6"	1.47
3"	0.37	Other	radius² * 0.163

Time	Temp (°F)	pH	Cond.	Turbidity	Gals. Removed	Observations
1415	63.5	7.01	1216	>200	3.5	
1418	63.6	6.96	1163	192.7	7	
1421	64.0	7.60	1159	118.2	11	

Did well dewater? Yes (No)		Gallons actually evacuated: 11	
Sampling Time: 1425		Sampling Date: 1/15/01	
Sample I.D.: MW-4		Laboratory: (Sequoia) Columbia Other_____	
Analyzed for: (TPH-G BTEX MTBE) TPH-D		Other:	
EB I.D. (if applicable):	@ Time	Duplicate I.D. (if applicable):	
Analyzed for: TPH-G BTEX MTBE TPH-D		Other:	
D.O. (if req'd): (Pre-purge:)	2.3 mg/L	Post-purge:	mg/L
O.R.P. (if req'd): (Pre-purge:)	53 mV	Post-purge:	mV

ATTACHMENT B

Analytical Results for Dual Phase Vacuum Extraction Events

Sequoia Analytical

1455 McDowell Blvd. North, Ste. D
Petaluma, CA 94954
(707) 792-1865
FAX (707) 792-0342
www.sequoialabs.com

February 27 , 2001

Troy Buggle
Cambria Environmental - Oakland
1144 65th St., Suite C
Oakland, CA 94608
RE: Equiva / P102581

Enclosed are the results of analyses for samples received by the laboratory on 02/23/01. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Angelee Cari
Client Services Representative

CA ELAP Certificate Number 2374

Sequoia Analytical

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Petaluma, CA 94954
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FAX (707) 792-0342
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Cambria Environmental - Oakland	Project: Equiva	
1144 65th St., Suite C	Project Number: 4255 MacArthur Blvd., Oakland	**Reported:**
Oakland CA, 94608	Project Manager: Troy Buggle	02/27/01 16:40

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
MW-2	P102581-01	Air	02/23/01 12:21	02/23/01 12:30
TB-2	P102581-02	Water	02/23/01 12:15	02/23/01 12:30

Sequoia Analytical

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Cambria Environmental - Oakland	Project: Equiva	
1144 65th St., Suite C	Project Number: 4255 MacArthur Blvd., Oakland	**Reported:**
Oakland CA, 94608	Project Manager: Troy Buggle	02/27/01 16:40

Total Petroleum Hydrocarbons as Gasoline and BTEX by EPA 8015M/8020M

Sequoia Analytical - Petaluma

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
MW-2 (P102581-01) Air Sampled: 02/23/01 12:21 Received: 02/23/01 12:30									
Gasoline	**84.8**	10.0	ug/l	0.2	1020586	02/23/01	02/23/01	EPA 8015M/8020M	
Benzene	**2.97**	0.100	"	"	"	"	"	"	
Toluene	**0.645**	0.100	"	"	"	"	"	"	QR-04
Ethylbenzene	ND	0.100	"	"	"	"	"	"	
Xylenes (total)	**0.455**	0.100	"	"	"	"	"	"	QR-04
Methyl tert-butyl ether	**42.7**	0.500	"	"	"	"	"	"	
Surrogate: a,a,a-Trifluorotoluene		*107 %*	*65-135*		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		*96.7 %*	*65-135*		"	"	"	"	
TB-2 (P102581-02) Water Sampled: 02/23/01 12:15 Received: 02/23/01 12:30									
Gasoline	**80600**	10000	ug/l	200	1020645	02/26/01	02/26/01	EPA 8015M/8020M	
Benzene	**2410**	100	"	"	"	"	"	"	
Toluene	**20300**	100	"	"	"	"	"	"	
Ethylbenzene	**1060**	100	"	"	"	"	"	"	
Xylenes (total)	**16400**	100	"	"	"	"	"	"	
Methyl tert-butyl ether	**38100**	500	"	"	"	"	"	"	
Surrogate: a,a,a-Trifluorotoluene		*106 %*	*65-135*		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		*98.0 %*	*65-135*		"	"	"	"	

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Cambria Environmental - Oakland	Project: Equiva	
1144 65th St., Suite C	Project Number: 4255 MacArthur Blvd., Oakland	**Reported:**
Oakland CA, 94608	Project Manager: Troy Buggle	02/27/01 16:40

Total Petroleum Hydrocarbons as Gasoline and BTEX by EPA 8015M/8020M - Quality Control

Sequoia Analytical - Petaluma

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1020586 - EPA 5030, waters										
Blank (1020586-BLK1)				Prepared & Analyzed: 02/23/01						
Gasoline	ND	50.0	ug/l							
Benzene	ND	0.500	"							
Toluene	ND	0.500	"							
Ethylbenzene	ND	0.500	"							
Xylenes (total)	ND	0.500	"							
Methyl tert-butyl ether	ND	2.50	"							
Surrogate: a,a,a-Trifluorotoluene	*318*		"	*300*		*106*	*65-135*			
Surrogate: 4-Bromofluorobenzene	*294*		"	*300*		*98.0*	*65-135*			
LCS (1020586-BS1)				Prepared & Analyzed: 02/23/01						
Gasoline	2230	50.0	ug/l	2750		81.1	65-135			
Benzene	35.5	0.500	"	32.0		111	65-135			
Toluene	182	0.500	"	193		94.3	65-135			
Ethylbenzene	44.0	0.500	"	46.0		95.7	65-135			
Xylenes (total)	224	0.500	"	231		97.0	65-135			
Methyl tert-butyl ether	69.9	2.50	"	52.0		134	65-135			
Surrogate: a,a,a-Trifluorotoluene	*353*		"	*300*		*118*	*65-135*			
Surrogate: 4-Bromofluorobenzene	*305*		"	*300*		*102*	*65-135*			
Matrix Spike (1020586-MS1)	**Source: P102528-03**			Prepared & Analyzed: 02/23/01						
Gasoline	2440	50.0	ug/l	2750	66.1	86.3	65-135			
Benzene	36.3	0.500	"	32.0	ND	113	65-135			
Toluene	184	0.500	"	193	0.671	95.0	65-135			
Ethylbenzene	47.2	0.500	"	46.0	ND	103	65-135			
Xylenes (total)	232	0.500	"	231	1.07	100	65-135			
Methyl tert-butyl ether	69.1	2.50	"	52.0	ND	132	65-135			
Surrogate: a,a,a-Trifluorotoluene	*350*		"	*300*		*117*	*65-135*			
Surrogate: 4-Bromofluorobenzene	*312*		"	*300*		*104*	*65-135*			

Sequoia Analytical

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Cambria Environmental - Oakland	Project: Equiva	
1144 65th St., Suite C	Project Number: 4255 MacArthur Blvd., Oakland	**Reported:**
Oakland CA, 94608	Project Manager: Troy Buggle	02/27/01 16:40

Total Petroleum Hydrocarbons as Gasoline and BTEX by EPA 8015M/8020M - Quality Control

Sequoia Analytical - Petaluma

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1020586 - EPA 5030, waters										
Matrix Spike Dup (1020586-MSD1)	**Source: P102528-03**			Prepared & Analyzed: 02/23/01						
Gasoline	2310	50.0	ug/l	2750	66.1	81.6	65-135	5.47	20	
Benzene	36.0	0.500	"	32.0	ND	112	65-135	0.830	20	
Toluene	185	0.500	"	193	0.671	95.5	65-135	0.542	20	
Ethylbenzene	46.6	0.500	"	46.0	ND	101	65-135	1.28	20	
Xylenes (total)	230	0.500	"	231	1.07	99.1	65-135	0.866	20	
Methyl tert-butyl ether	67.0	2.50	"	52.0	ND	128	65-135	3.09	20	
Surrogate: a,a,a-Trifluorotoluene	*355*		"	*300*		*118*	*65-135*			
Surrogate: 4-Bromofluorobenzene	*311*		"	*300*		*104*	*65-135*			
Batch 1020645 - EPA 5030, waters										
Blank (1020645-BLK1)				Prepared & Analyzed: 02/26/01						
Gasoline	ND	50.0	ug/l							
Benzene	ND	0.500	"							
Toluene	ND	0.500	"							
Ethylbenzene	ND	0.500	"							
Xylenes (total)	ND	0.500	"							
Methyl tert-butyl ether	ND	2.50	"							
Surrogate: a,a,a-Trifluorotoluene	*311*		"	*300*		*104*	*65-135*			
Surrogate: 4-Bromofluorobenzene	*293*		"	*300*		*97.7*	*65-135*			
LCS (1020645-BS1)				Prepared & Analyzed: 02/26/01						
Gasoline	2210	50.0	ug/l	2750		80.4	65-135			
Benzene	34.3	0.500	"	32.0		107	65-135			
Toluene	178	0.500	"	193		92.2	65-135			
Ethylbenzene	42.9	0.500	"	46.0		93.3	65-135			
Xylenes (total)	220	0.500	"	231		95.2	65-135			
Methyl tert-butyl ether	67.5	2.50	"	52.0		130	65-135			
Surrogate: a,a,a-Trifluorotoluene	*347*		"	*300*		*116*	*65-135*			
Surrogate: 4-Bromofluorobenzene	*306*		"	*300*		*102*	*65-135*			

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Cambria Environmental - Oakland	Project: Equiva	
1144 65th St., Suite C	Project Number: 4255 MacArthur Blvd., Oakland	**Reported:**
Oakland CA, 94608	Project Manager: Troy Buggle	02/27/01 16:40

Total Petroleum Hydrocarbons as Gasoline and BTEX by EPA 8015M/8020M - Quality Control

Sequoia Analytical - Petaluma

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1020645 - EPA 5030, waters										
Matrix Spike (1020645-MS1)	**Source: P102514-01**			Prepared & Analyzed: 02/26/01						
Gasoline	2320	50.0	ug/l	2750	ND	84.4	65-135			
Benzene	35.6	0.500	"	32.0	ND	111	65-135			
Toluene	183	0.500	"	193	ND	94.7	65-135			
Ethylbenzene	45.9	0.500	"	46.0	ND	99.8	65-135			
Xylenes (total)	224	0.500	"	231	ND	97.0	65-135			
Methyl tert-butyl ether	97.2	2.50	"	52.0	29.8	130	65-135			
Surrogate: a,a,a-Trifluorotoluene	*354*		"	*300*		*118*	*65-135*			
Surrogate: 4-Bromofluorobenzene	*303*		"	*300*		*101*	*65-135*			
Matrix Spike Dup (1020645-MSD1)	**Source: P102514-01**			Prepared & Analyzed: 02/26/01						
Gasoline	2270	50.0	ug/l	2750	ND	82.5	65-135	2.18	20	
Benzene	34.3	0.500	"	32.0	ND	107	65-135	3.72	20	
Toluene	177	0.500	"	193	ND	91.6	65-135	3.33	20	
Ethylbenzene	44.6	0.500	"	46.0	ND	97.0	65-135	2.87	20	
Xylenes (total)	217	0.500	"	231	ND	93.9	65-135	3.17	20	
Methyl tert-butyl ether	94.8	2.50	"	52.0	29.8	125	65-135	2.50	20	
Surrogate: a,a,a-Trifluorotoluene	*348*		"	*300*		*116*	*65-135*			
Surrogate: 4-Bromofluorobenzene	*306*		"	*300*		*102*	*65-135*			

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Cambria Environmental - Oakland	Project: Equiva	
1144 65th St., Suite C	Project Number: 4255 MacArthur Blvd., Oakland	**Reported:**
Oakland CA, 94608	Project Manager: Troy Buggle	02/27/01 16:40

Notes and Definitions

QR-04	Results between the primary and confirmation columns varied by greater than 40% RPD.
DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference

SEQUOIA LA__ IATORIES

EQUIVA Service .LC Chain Of Custody Record

Equiva Project Manager (To be Invoiced):	
Science & Engineering (S&E)	✓
Technical Services (TS)	
CRMT Houston	

K. PETRYNA

INCIDENT NUMBER (S&E): 9 8 9 9 5 7 5 8

SAP or CRMT NUMBER (TS/CRMT): 1 3 5 7 0 1

DATE: 2-23-01

PAGE: 1 OF 1

ONSULTANT COMPANY: CAMBRIA ENV. TECH.

DDRESS: 1144 65th ST., SUITE B

ITY: OAKLAND, CA 94608

EL: 510 420 3333 FAX: 510 420 9170 E-MAIL

SITE ADDRESS (Street and City): 4255 MACARTHUR BLVD., OAKLAND

PROJECT CONTACT (Report to): TROY BUGGLE

CONSULTANT PROJECT NO.: 243-0524

SAMPLER NAME(s) (Print): Sanjiv Gill

LAB USE ONLY

TURNAROUND TIME (BUSINESS DAYS)

☐ 10 DAYS ☐ 5 DAYS ☒ 72 HR ☐ 48 HR ☐ 24 HR ☐ <24 HR

☐ LA-RWQCB REPORT FORMAT ✓ UST AGENCY:

IC/MS MTBE CONFIRMATION: HIGHEST ____ HIGHEST per BORING ____ ALL ____

PECIAL INSTRUCTIONS OR NOTES: TEMPERATURE ON RECEIPT (C)

REQUESTED ANALYSIS

AB/ISE/NLY	Field Sample Identification	SAMPLING DATE	SAMPLING TIME	MAT-RIX	NO. OF CONT.	TPH - Purgeable (8015m)	TPH - Extractable (8015m)	BTEX / MTBE (8021B)	BTEX / MTBE + Oxygenates (8260B)	VOCs Full List + Oxygenates (8260B)	MTBE (8260B) Confirmation, See Note	EPA 5035 Extraction for Volatiles	VOCs Halogenated/Aromatic (8021B)	Ethanol, Methanol (8015B)	Metals (Specify) ____	TRPH (418.1)	Vapor VOCs BTEX / MTBE (TO-15)	Vapor VOCs Full List (TO-15)	Vapor TPH (ASTM 3416m)	Vapor Fixed Gases (ASTM D1946)	Test for Disposal (48-____)					Field Notes: Container/Preservative or PID Readings or Laboratory Notes
	MW2	2-23-01	12:21	AIR	1	✓		✓				P10258					1									72-HOUR HOLD TIME
	TB2	2-23-01	12:15	H2O	4	✓		✓						↓			-2									VOA's W/ HCL

COOLER CUSTODY SEALS INTACT ☐

NOT INTACT ☐

COOLER TEMPERATURE 2.6

Relinquished by: (Signature)	Received by: (Signature)	Date: 2/23/01	Time: 1230
Relinquished by: (Signature)	Received by: (Signature)	Date:	Time:
Relinquished by: (Signature)	Received by: (Signature)	Date:	Time:

STRIBUTION: White with final report, Green to File, Yellow and Pink to Client.

10/15/00 Revision

Sequoia Analytical

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March 19 , 2001

Dan Lescure
Cambria Environmental - Emeryville
6262 Hollis Street
Emeryville, CA 94608
RE: Equiva / P103382

Enclosed are the results of analyses for samples received by the laboratory on 03/15/01. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Angelee Cari

Angelee Cari
Client Services Representative

CA ELAP Certificate Number 2374

Sequoia Analytical

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Petaluma, CA 94954
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Cambria Environmental - Emeryville	Project: Equiva	
6262 Hollis Street	Project Number: 4255 MacArthur Blvd., Oakland, CA.	**Reported:**
Emeryville CA, 94608	Project Manager: Dan Lescure	03/19/01 14:21

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
MW-2	P103382-01	Air	03/14/01 11:35	03/15/01 13:30

Sequoia Analytical

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Cambria Environmental - Emeryville	Project: Equiva	
6262 Hollis Street	Project Number: 4255 MacArthur Blvd., Oakland, CA.	**Reported:**
Emeryville CA, 94608	Project Manager: Dan Lescure	03/19/01 14:21

Total Petroleum Hydrocarbons as Gasoline and BTEX by EPA 8015M/8020M

Sequoia Analytical - Petaluma

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
MW-2 (P103382-01) Air Sampled: 03/14/01 11:35 Received: 03/15/01 13:30									
Gasoline	**203**	14.2	ppmv	1	1030407	03/16/01	03/16/01	EPA 8015M/8020M	
Benzene	**4.13**	0.157	"	"	"	"	"	"	
Toluene	**2.70**	0.133	"	"	"	"	"	"	
Ethylbenzene	**1.23**	0.115	"	"	"	"	"	"	
Xylenes (total)	**4.40**	0.115	"	"	"	"	"	"	
Methyl tert-butyl ether	**51.9**	0.556	"	"	"	"	"	"	
Surrogate: a,a,a-Trifluorotoluene		*104 %*	*65-135*		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		*99.3 %*	*65-135*		"	"	"	"	

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Cambria Environmental - Emeryville	Project: Equiva	
6262 Hollis Street	Project Number: 4255 MacArthur Blvd., Oakland, CA.	**Reported:**
Emeryville CA, 94608	Project Manager: Dan Lescure	03/19/01 14:21

Total Petroleum Hydrocarbons as Gasoline and BTEX by EPA 8015M/8020M - Quality Control
Sequoia Analytical - Petaluma

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1030407 - EPA 5030, waters										
Blank (1030407-BLK1)				Prepared & Analyzed: 03/16/01						
Gasoline	ND	14.2	ppmv							
Benzene	ND	0.157	"							
Toluene	ND	0.133	"							
Ethylbenzene	ND	0.115	"							
Xylenes (total)	ND	0.115	"							
Methyl tert-butyl ether	ND	0.556	"							
Surrogate: a,a,a-Trifluorotoluene	*50.6*		"	*50.3*		*101*	*65-135*			
Surrogate: 4-Bromofluorobenzene	*41.0*		"	*41.9*		*97.9*	*65-135*			
LCS (1030407-BS1)				Prepared & Analyzed: 03/16/01						
Gasoline	651	14.2	ppmv	780		83.5	65-135			
Benzene	10.9	0.157	"	10.0		109	65-135			
Toluene	49.7	0.133	"	51.3		96.9	65-135			
Ethylbenzene	9.54	0.115	"	10.6		90.0	65-135			
Xylenes (total)	48.4	0.115	"	53.3		90.8	65-135			
Methyl tert-butyl ether	16.2	0.556	"	14.5		112	65-135			
Surrogate: a,a,a-Trifluorotoluene	*57.1*		"	*50.3*		*114*	*65-135*			
Surrogate: 4-Bromofluorobenzene	*43.3*		"	*41.9*		*103*	*65-135*			
Matrix Spike (1030407-MS1)		**Source: P103340-02**		Prepared & Analyzed: 03/16/01						
Gasoline	635	14.2	ppmv	780	ND	81.4	65-135			
Benzene	9.47	0.157	"	10.0	ND	94.7	65-135			
Toluene	50.6	0.133	"	51.3	ND	98.6	65-135			
Ethylbenzene	9.96	0.115	"	10.6	ND	94.0	65-135			
Xylenes (total)	50.6	0.115	"	53.3	ND	94.9	65-135			
Methyl tert-butyl ether	17.9	0.556	"	14.5	0.576	119	65-135			
Surrogate: a,a,a-Trifluorotoluene	*52.1*		"	*50.3*		*104*	*65-135*			
Surrogate: 4-Bromofluorobenzene	*43.0*		"	*41.9*		*103*	*65-135*			

Sequoia Analytical

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Cambria Environmental - Emeryville	Project: Equiva	
6262 Hollis Street	Project Number: 4255 MacArthur Blvd., Oakland, CA.	**Reported:**
Emeryville CA, 94608	Project Manager: Dan Lescure	03/19/01 14:21

Total Petroleum Hydrocarbons as Gasoline and BTEX by EPA 8015M/8020M - Quality Control

Sequoia Analytical - Petaluma

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1030407 - EPA 5030, waters										
Matrix Spike Dup (1030407-MSD1)	**Source: P103340-02**			Prepared & Analyzed: 03/16/01						
Gasoline	630	14.2	ppmv	780	ND	80.8	65-135	0.791	20	
Benzene	9.45	0.157	"	10.0	ND	94.5	65-135	0.211	20	
Toluene	50.7	0.133	"	51.3	ND	98.8	65-135	0.197	20	
Ethylbenzene	9.92	0.115	"	10.6	ND	93.6	65-135	0.402	20	
Xylenes (total)	50.6	0.115	"	53.3	ND	94.9	65-135	0	20	
Methyl tert-butyl ether	18.0	0.556	"	14.5	0.576	120	65-135	0.557	20	
Surrogate: a,a,a-Trifluorotoluene	*53.1*		"	*50.3*		*106*	*65-135*			
Surrogate: 4-Bromofluorobenzene	*43.5*		"	*41.9*		*104*	*65-135*			

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Petaluma, CA 94954
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Cambria Environmental - Emeryville	Project: Equiva	
6262 Hollis Street	Project Number: 4255 MacArthur Blvd., Oakland, CA.	**Reported:**
Emeryville CA, 94608	Project Manager: Dan Lescure	03/19/01 14:21

Notes and Definitions

DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference

EQUIVA Services LLC Chain Of Custody Record

Equiva Project Manager (To be invoiced):		
Science & Engineering (S&E)	X	Karen Petryna
Technical Services (TS)		
CRMT Houston		

INCIDENT NUMBER (S&E): 98995758

SAP or CRMT NUMBER (TS/CRMT): 135701

DATE: 3-14-01

PAGE: 1 OF 1

CONSULTANT COMPANY: Cambria Env. Tech

ADDRESS: 6262 Hollis St.

CITY: Emeryville Ca

TEL: 510-420-1988 FAX: 510-450-8295 E-MAIL:

SITE ADDRESS (Street and City): 4255 MacArthur Blvd Oakland, Ca

PROJECT CONTACT (Report to): Dan Lescure

CONSULTANT PROJECT NO.: 243-0524-006

SAMPLER NAME(s) (Print): Sanjiv Gill

LAB USE ONLY

TURNAROUND TIME (BUSINESS DAYS)

☐ 10 DAYS ☐ 5 DAYS ☐ 72 HR ☒ 48 HR ☐ 24 HR ☐ <24 HR

☐ LA-RWQCB REPORT FORMAT UST AGENCY:

GC/MS MTBE CONFIRMATION: HIGHEST ____ HIGHEST per BORING ____ ALL ____

SPECIAL INSTRUCTIONS OR NOTES: TEMPERATURE ON RECEIPT (C)

Please report all results in PPMV

REQUESTED ANALYSIS

LAB USE ONLY	Field Sample Identification	SAMPLING DATE	SAMPLING TIME	MATRIX	No. OF CONT.	TPH - Purgeable (8015m)	TPH - Extractable (8015m)	BTEX / MTBE (8021B)	BTEX / MTBE + Oxygenates (8260B)	VOCs Full List + Oxygenates (8260B)	MTBE (8260B) Confirmation, See Note	EPA 5035 Extraction for Voletiles	VOCs Halogenated/Aromatic (8021B)	Ethanol, Methanol (8015B)	Metals (Specify) ____	TRPH (418.1)	Vapor VOCs BTEX / MTBE (TO-15)	Vapor VOCs Full List (TO-15)	Vapor TPH (ASTM 3416m)	Vapor Fixed Gases (ASTM D1946)	Test for Disposal (4B-____)				Field Notes: Container/Preservative or PID Readings or Laboratory Notes
	MW-2	3-14-01	11:35	air	2	X		X																	P103382-01

Relinquished by: (Signature)	Received by: (Signature)	Date: 3-15-01	Time: 1330
Relinquished by: (Signature)	Received by: (Signature)	Date:	Time:
Relinquished by: (Signature)	Received by: (Signature)	Date:	Time:

DISTRIBUTION: White with final report, Green to File, Yellow and Pink to Client.

10/15/00 Revision

ATTACHMENT C

Site Conceptual Model

SITE CONCEPTUAL MODEL

Date May 9, 2001

Cambria Environmental Technology, Inc.

Site Address:	4255 MacArthur	**Incident Number:**	98995758
City:	Oakland	**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)	Soil and groundwater investigation was conducted adjacent to subsurface product storage tanks in 1985. MW-1 installed. According to a 1998 report, petroleum hydrocarbons in soil appear to be limited to the vicinity of the current UST complex and dispenser island areas.
	1.2	Discuss Steps Taken to Stop Release	USTs replaced in 1985. 810 cubic yards of hydrocarbon bearing soil excavated and disposed.
2		**Site Characterization**	
	2.1	Current Site Use/Status	The site is an active Shell-branded service station located at the intersection of MacArthur Boulevard and High St. in a mixed commercial and residential area of Oakland. An active Unocal service station and a former Chevron service station are located east (upgradient) and west of the site. A trailer park and adjacent Caltrans access to Interstate 580 are located immediately southwest (downgradient) of the site. There are three underground storage tanks (USTs) on site. Topography slopes toward the west.
	2.2	Soil Definition Status	In a 1998 investigation, no TPHg or benzene was detected in two soil borings (SB-1 and SB-2) on the trailer park parcel. MTBE was detected at 1.4 mg/kg in SB-2 at 7 fbg. A 1995 investigation reported that hydrocarbon in soil is limited to 4-18 fbg.
	2.3	Separate-Phase Hydrocarbon Definition Status	SPH was initially detected at MW-3 in 7/94 and MW-2 in 7/95. SPH skimmers were installed in MW-3 and MW-4, and 21.80 lbs of SPH have been removed by manual bailing (17.26 lbs from MW-2 and 4.54 lbs from MW-3). No SPH has been detected in MW-3 since 4/97 and in MW-2 since 11/99.
	2.4	Groundwater Definition Status (BTEX)	The downgradient extent of the BTEX plume in groundwater has been essentially defined given the significant attenuation in concentrations from MW-2 to MW-4 and borings SB-1 and SB-2. Highest concentrations of BTEX compounds have consistently been detected at MW-2 (immediately downgradient of UST complex on the trailer park property) and (immediately crossgradient of UST complex). BTEX concentrations in upgradient well MW-1 suggest some impact by an offsite source. Cambria is seeking access to install wells on offsite property to comply with an agency request for additional investigation.

Item	Evaluation Criteria	Comments/Discussion
2.5	BTEX Plume Stability and Concentration Trends	Based on quarterly groundwater monitoring data, BTEX concentrations appear to be stable to decreasing in all wells. The steadily decreasing concentrations in downgradient well MW-4, suggest that the BTEX plume is shrinking back towards the Shell site.
2.6	Groundwater Definition Status (MTBE) not yet done	The extent of the MTBE plume in groundwater has been adequately defined in the upgradient direction by detection of low and decreasing concentrations in MW-1. Planned downgradient investigation and well installation is expected to enhance downgradient definition. Highest concentrations of MTBE have consistently been detected at MW-2. Lower concentrations have been detected at MW-3 and MW-4. Definition of the vertical extent of MTBE is not warranted given the apparent lack of wells or other mechanism to induce downward
2.7	MTBE Plume Stability and Concentration Trends No	Based on quarterly groundwater monitoring data, MTBE concentrations appear to be stable and the MTBE plume appears to be stable.
2.8	Groundwater Flow Direction, Depth Trends and Gradient Trends	Groundwater flow direction ranges from west-southwest to west at approximately 0.1 ft/ft. Depth to groundwater on the site has ranged from 7 to 17 fbg.
2.9	Stratigraphy and Hydrogeology	The 1992 subsurface investigation indicated predominantly silty clay and clayey silt with low estimated hydraulic conductivity (K) from ground surface to about 12 feet below grade (fbg), and clayey sand, silty sand, and sand between about 12 to 22 fbg with moderate to high estimated K.
2.10	Preferential Pathways Analysis	According to Cambria's 2001 report, nearby utility trenches could influence groundwater flow. However, this is unlikely given the typical gradient direction away from known subsurface utilities. Sewer, storm drain, and water lines run approximately 8 - 13 fbg and groundwater depth ranges from 7 - 17 fbg.
2.11	Other Pertinent Issues	
3	**Remediation Status**	
3.1	Remedial Actions Taken	USTs were replaced in December 1985 and approximately 810 cubic yards of hydrocarbon-bearing soil were transported to a disposal facility. Dispensers and piping were replaced in 1995. During the dispenser replacements, horizontal wells HW-1 through HW-4 were installed in the vadose zone about 5 ft bgs to facilitate future removal of hydrocarbons from soil. In August 1997, Cambria performed short-term SVE testing but did not recommend further use of SVE due to high cost and ineffectiveness. Monthly DVE on MW-2 and groundwater extraction TB-2 were performed from 4/99 to 11/99, and reinitiated in 11/00. MW-3 and TB-1 will be added to the extraction schedule. Approximately 21.8* of PH has been bailed from the wells.
3.2	Area Remediated	Remediation has focused on soil and groundwater around the UST complex.

Item	Evaluation Criteria	Comments/Discussion
3.3	Remediation Effectiveness	Contaminated soil (up to 22,000 mg/kg total volatile hydrocarbons and 500 mg/kg benzene) was removed from the site during 1985 excavation. So far, ongoing groundwater extraction activities have removed a total 5.57 lbs TPPH, .25 lbs benzene, and 17.4 lbs MTBE from MW-2 and TB-2. Vapor extraction activities have removed a total of 0.030 lbs TPHg, 0.001 lb benzene, and .006 lb MTBE from MW-2. Ultimate remediation effectiveness is yet to be determined.
4	**Well and Sensitive Receptor Survey**	
4.1	Designated Beneficial Groundwater Use	Municipal and domestic water supply, industrial process water supply, industrial service water supply, and agricultural water supply (RWQCB basin plan)
4.2	Shallow Groundwater Use	Unknown
4.3	Deep Groundwater Use	Unknown
4.4	Well Survey Results	A 2001 well survey identified 25 monitoring wells, one domestic well, and 4 cathodic protection wells within one-half mile of the site.
4.5	Likelihood of Impact to Wells	Unlikely, given that the closest potential receptor (domestic well) is located approximately 2500 feet southeast (upgradient) of the site.
4.6	Likelihood of Impact to Surface Water	Unlikely, given that there are no surface water bodies within one-half mile of the site.
5	**Risk Assessment**	
5.1	Site Conceptual Exposure Model (current and future uses)	The site is an active Shell-branded service station located at the intersection of MacArthur Boulevard and High St. in a mixed commercial and residential area of Oakland. The soil and groundwater contamination plume extends beneath a trailer park located on the parcel immediately southwest of the site. The groundwater plume also likely extends beneath a church building located on the parcel immediately northwest of the site. A freeway exists downgradient of the trailer park.
5.2	Exposure Pathways	Volatilization from soil and groundwater to indoor and outdoor air. Dermal exposure, ingestion and particulate inhalation by construction workers.
5.3	Risk Assessment Status	No formal risk assessment has been performed.
5.4	Identified Human Exceedances	No exceedances have been identified or evaluated.
5.5	Identified Ecological Exceedances	No exceedances have been identified or evaluated.

Item	Evaluation Criteria	Comments/Discussion
6	Additional Recommended Data or Tasks	
6.1		
6.2		
6.3		
6.4		

Known Environmental Documents for the Site

Additional Investigation Workplan, Cambria, June 29, 1998
Remedial Action Plan, Cambria, April 15, 1998
Subsurface Investigation, Cambria, March 19, 1998
Soil Vapor Extraction Report, Cambria, February 23, 1998
Additional Offsite Subsurface Investigation Workplan, Cambria, July 22, 1997
SVE Test Workplan, June 21, 1996, Weiss
Subsurface Investigation, Weiss, January 26, 1995
Subsurface Investigation, Weiss, March 15, 1994
Workplan, Geostrategies, September 30, 1992
Soil and Groundwater Investigation, Emcon, July 25, 1985

Attached:

Site Location Map
Groundwater elevation map (1/01) See monitoring report
Groundwater analytical tables (1/01) See monitoring report
Groundwater extraction data (1/01) See monitoring report
Soil analytical tables (1998, 1995) See monitoring report
Conduit study map (5/01) See monitoring report
Well survey map and table (5/01) See monitoring report
Well and boring logs (1998, 1995, 1994, 1985)
Cross-section (1998)

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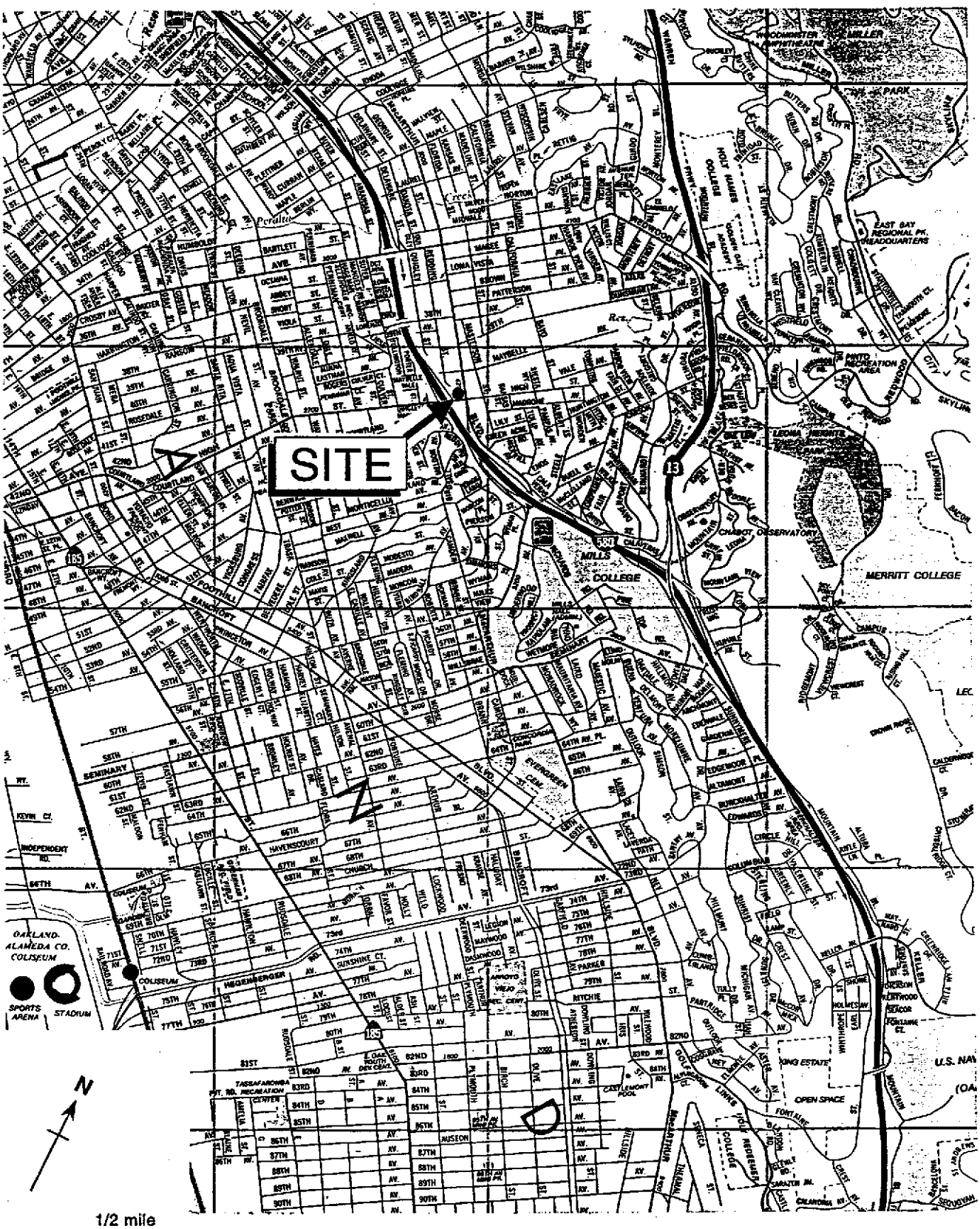
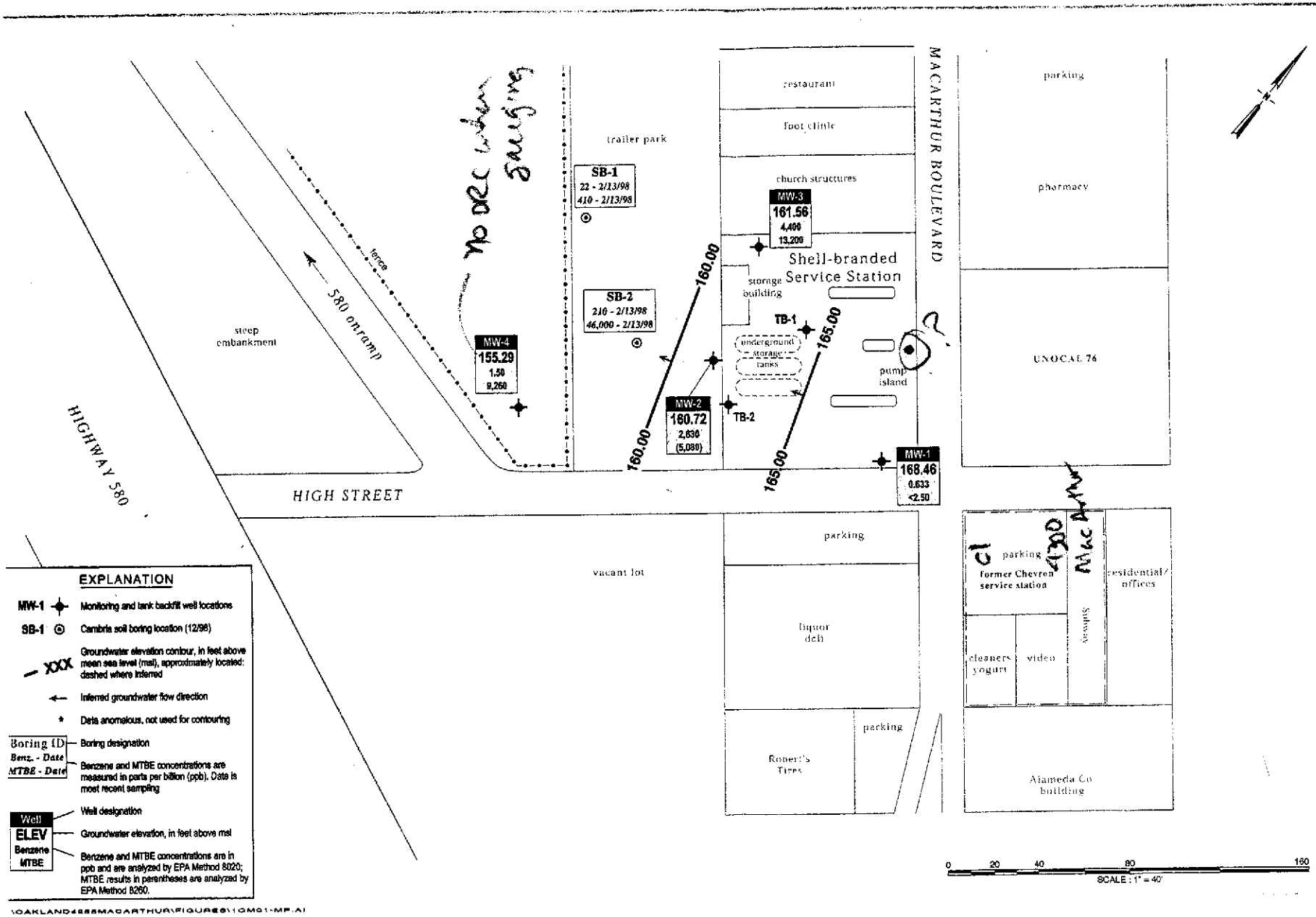


Figure 1. Site Location Map - Shell Service Station WIC# 204-5510-0600, 4255 MacArthur Boulevard, Oakland, California



EXPLANATION

- MW-1 ✦ Monitoring and tank backfill well locations
- SB-1 ⊙ Cambria soil boring location (12/98)
- XXX Groundwater elevation contour, in feet above mean sea level (msl), approximately located; dashed where inferred
- ← Inferred groundwater flow direction
- * Data anomalous, not used for contouring
- Boring ID / Benz. - Date / MTBE - Date — Boring designation; Benzene and MTBE concentrations are measured in parts per billion (ppb). Date is most recent sampling
- Well / ELEV / Benzene / MTBE — Well designation; Groundwater elevation, in feet above msl; Benzene and MTBE concentrations are in ppb and are analyzed by EPA Method 8020; MTBE results in parentheses are analyzed by EPA Method 8260.

\OAKLAND4255MACARTHUR\FIGURES\1QM01-MF.AI

Groundwater Elevation Contour Map
January 15, 2001

CAMBRIA

Shell-branded Service Station
4255 MacArthur Boulevard
Oakland, California
Incident #98995758

FIGURE **1**

CAMBRIA

Table 1. Soil Analytical Data - Shell Service Station, WIC # 204-5510-0600, 4255 MacArthur Boulevard, Oakland, California

Sample ID	Date Sampled	TPHg	Benzene	Toluene	Ethylbenzene	Xylenes	MTBE	MTBE[a]
		←			(concentrations in mg/Kg)		→	
SB-1 - 5.0	2/13/98	<1.0	<0.0050	<0.0050	<0.0050	<0.0050	<0.025	<0.10
SB-1 - 7.0	2/13/98	<1.0	<0.0050	<0.0050	<0.0050	<0.0050	<0.025	<0.10
SB-2 - 5.0	2/13/98	<1.0	<0.0050	<0.0050	<0.0050	<0.0050	<0.025	<0.10
SB-2 - 7.0	2/13/98	<1.0	<0.0050	<0.0050	<0.0050	<0.0050	1.4	0.88

Abbreviations and Notes:

mg/Kg = Milligrams per kilogram

TPHg = Total petroleum hydrocarbons as gasoline by modified EPA Method 8015

Benzene, toluene, ethylbenzene, and xylenes by EPA Method 8020

MTBE = Methyl tert-butyl ether by EPA Method 8020

<n = Not detected at n mg/Kg

a = MTBE results quantified by EPA Method 8260. Results reported after sample hold time had expired.

Table 1. Analytic Results for Soil - Shell Service Station WIC #204-5510-0600, 4255 MacArthur Boulevard, Oakland, California

Boring ID (Well ID)	Sample Depth (ft)	Date Sampled	Ground Water Depth (ft)	TPH-G	B	E	T	X
				← parts per million (mg/kg) →				
BH-A (MW-1)	6.0	11/03/93	8.56	<1	<0.0025	<0.0025	<0.0025	<0.0025
	10.5	11/03/93		26	0.4	0.12	0.028	0.62
	14.0	11/03/93		24	0.028	0.062	0.02	0.32
	18.0	11/03/93		<1	<0.0025	<0.0025	<0.0025	<0.0025
	22.0	11/03/93		<1	0.0063	0.0097	0.0094	0.057
BH-B (MW-2)	6.0	11/03/93	12.07	<1	<0.0025	<0.0025	<0.0025	<0.0025
	9.0	11/03/93		7.6	0.069	0.044	<0.0025	0.11
	14.0	11/03/93		66	0.07	0.53	0.44	2.6
	18.5	11/03/93		<1	0.032	0.0042	0.012	0.02
	24.0	11/03/93		<1	0.021	0.0037	0.023	0.021
BH-C (MW-3)	6.5	11/04/93	15.27	<1	<0.0025	<0.0025	<0.0025	<0.0025
	11.3	11/04/93		1,700	1.1	33	2.5	44
	16.0	11/04/93		610	3.3	6.9	5.7	33
	22.5	11/04/93		<1	<0.0025	<0.0025	<0.0025	<0.0025
BH-D	5.0	11/03/94	NE	<1	<0.0025	<0.0025	<0.0025	<0.0025
	10.0	11/03/94		<1	0.13	0.011	<0.0025	0.01
	15.0	11/03/94		<1	<0.0025	<0.0025	<0.0025	<0.0025
	20.0	11/03/94		<1	<0.0025	<0.0025	<0.0025	0.015
BH-E	5.0	11/03/94	NE	5,900	23	120	160	430
	10.0	11/03/94		<1	0.031	<0.0025	<0.0025	<0.0025
	15.0	11/03/94		<1	0.0053	<0.0025	0.0033	0.007
	20.0	11/03/94		<1	<0.0025	<0.0025	0.0077	0.015

— Table 1 continues on next page —

Table 1. Analytic Results for Soil - Shell Service Station WIC #204-5510-0600, 4255 MacArthur Boulevard, Oakland, California (continued)

Boring ID (Well ID)	Sample Depth (ft)	Date Sampled	Ground Water Depth (ft)	TPH-G	B	E	T	X
				← parts per million (mg/kg) →				
BH-F (MW-4)	5.0	11/03/94	NE	<1	<0.0025	<0.0025	<0.0025	<0.0025
	10.0	11/03/94		13	0.29	0.17	0.14	0.54
	15.0	11/03/94		<1	0.044	0.017	0.0033	0.032
	20.0	11/03/94		<1	<0.0025	<0.0025	<0.0025	<0.0025

Abbreviations:

TPH-G = Total petroleum hydrocarbons as gasoline by modified EPA Method 8015
B = Benzene by EPA Method 8020
E = Ethylbenzene by EPA Method 8020
T = Toluene by EPA Method 8020
X = Xylenes by EPA Method 8020
<n = Not detected above method detection limit of n ppm
NE = Not encountered

Analytical Laboratory:

National Environmental Testing (NET) Pacific, Inc., Santa Rosa, California

WELL CONCENTRATIONS
Shell-branded Service Station
4255 MacArthur Boulevard
Oakland, CA
Wic #204-5510-0600

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)	TOC (MSL)	Depth to Water (ft.)	Depth to SPH (ft.)	GW Elevation (MSL)	SPH Thickness (ft.)	DO Reading (ppm)	ORP Reading (mV)
MW-1	11/17/1993	410	21	11	7.9	47	NA	NA	175.79	8.59	NA	167.20	NA	NA	NA
MW-1	01/20/1994	1,200	180	19	48	47	NA	NA	175.79	8.22	NA	167.57	NA	NA	NA
MW-1	04/25/1994	3,100	610	<10	130	27	NA	NA	175.79	7.63	NA	168.16	NA	NA	NA
MW-1	07/07/1994	2,400	1,000	10	250	20	NA	NA	175.79	8.31	NA	167.48	NA	NA	NA
MW-1	10/27/1994	2,200	500	3.1	72	1.8	NA	NA	175.79	8.84	NA	166.95	NA	NA	NA
MW-1	11/17/1994	NA	NA	NA	NA	NA	NA	NA	175.79	7.60	NA	168.19	NA	NA	NA
MW-1	11/28/1994	NA	NA	NA	NA	NA	NA	NA	175.79	7.56	NA	168.23	NA	NA	NA
MW-1	01/13/1995	570	75	2.5	6.7	11	NA	NA	175.79	7.11	NA	168.68	NA	NA	NA
MW-1	04/12/1995	1,800	480	<5.0	79	<5.0	NA	NA	175.79	7.08	NA	168.71	NA	NA	NA
MW-1	07/25/1995	120	15	1.1	2.1	2.9	NA	NA	175.79	7.73	NA	168.06	NA	NA	NA
MW-1 (D)	07/25/1995	300	88	2.4	11	6.5	NA	NA	175.79	7.73	NA	168.06	NA	NA	NA
MW-1	10/18/1995	130	9.5	0.8	1.3	1.7	NA	NA	175.79	8.42	NA	167.37	NA	NA	NA
MW-1 (D)	10/18/1995	120	11	0.8	1.4	1.8	NA	NA	175.79	8.42	NA	167.37	NA	NA	NA
MW-1	01/17/1996	250	22	0.9	1.6	2.3	NA	NA	175.79	7.83	NA	167.96	NA	NA	NA
MW-1	04/25/1996	<50	4.6	<0.5	<0.5	0.6	500b	NA	175.79	7.35	NA	168.44	NA	NA	NA
MW-1	07/17/1996	<250	15	<2.5	<2.5	<2.5	540	NA	175.79	7.70	NA	168.09	NA	NA	NA
MW-1	10/01/1996	1,200	500	12	57	82	1,900	NA	175.79	8.07	NA	167.72	NA	NA	NA
MW-1	01/22/1997	640	170	4.3	33	33	1,200	NA	175.79	7.21	NA	168.58	NA	NA	NA
MW-1	04/08/1997	<200	34	<2.0	3.3	4.3	950	NA	175.79	7.75	NA	168.04	NA	NA	NA
MW-1 (D)	04/08/1997	<200	66	<2.0	6.4	8	740	NA	175.79	7.75	NA	168.04	NA	NA	NA
MW-1	07/08/1997	190	49	1.2	5.8	8.6	560	NA	175.79	8.01	NA	167.78	NA	NA	NA
MW-1	10/08/1997	<100	7	<1.0	<1.0	<1.0	620	NA	175.79	8.10	NA	167.69	NA	NA	NA
MW-1	01/09/1998	970	390	12	48	71	1,200	NA	175.79	7.14	NA	168.65	NA	NA	NA
MW-1	04/13/1998	<50	136	<0.50	1.5	1.8	170	NA	175.79	6.78	NA	169.01	NA	NA	NA
MW-1	07/17/1998	2,500	750	11	88	67	150	NA	175.79	7.28	NA	168.51	NA	NA	NA
MW-1	10/02/1998	8,000	970	36	270	440	35	NA	175.79	7.77	NA	168.02	NA	NA	NA

WELL CONCENTRATIONS
Shell-branded Service Station
4255 MacArthur Boulevard
Oakland, CA
Wic #204-5510-0600

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)	TOC (MSL)	Depth to Water (ft.)	Depth to SPH (ft.)	GW Elevation (MSL)	SPH Thickness (ft.)	DO Reading (ppm)	ORP Reading (mV)
MW-1	02/03/1999	210	56	0.82	<0.50	3.2	220	NA	175.79	7.45	NA	168.34	NA	1.4	NA
MW-1	04/29/1999	<50	4.5	<0.50	0.56	<0.50	140	196	175.79	7.58	NA	168.21	NA	1.2	140
MW-1	07/23/1999	<50.0	<0.500	<0.500	<0.500	<0.500	120	111*	175.79	8.51	NA	167.28	NA	1.0	NA
MW-1	11/01/1999	<50.0	<0.500	<0.500	<0.500	<0.500	2.90	NA	175.79	8.30	NA	167.49	NA	1.4	-71
MW-1	01/17/2000	<50	<0.50	<0.50	<0.50	<0.50	3.30	NA	175.79	8.04	NA	167.75	NA	16.9	64
MW-1	04/17/2000	<50.0	1.08	<0.500	<0.500	<0.500	<2.50	NA	175.79	8.00	NA	167.79	NA	1.8	112
MW-1	07/26/2000	125	54.3	2.16	5.45	9.86	33.1	NA	175.79	7.52	NA	168.27	NA	13.2	-140
MW-1	10/12/2000	101	40.7	2.68	3.00	5.18	25.0	NA	175.79	7.71	NA	168.08	NA	>20	534
MW-1	**01/15/2001**	**<50.0**	**0.633**	**<0.500**	**0.505**	**1.74**	**<2.50**	**NA**	**175.79**	**7.33**	**NA**	**168.46**	**NA**	**16.9**	**-127**
MW-2	11/17/1993	31,000	9,400	4,600	1,000	3,900	NA	NA	170.91	12.31	NA	158.60	NA	NA	NA
MW-2	01/20/1994	40,000	6,900	5,600	780	4,100	NA	NA	170.91	11.48	NA	159.43	NA	NA	NA
MW-2 (D)	01/20/1994	41,000	7,200	6,200	900	4,800	NA	NA	170.91	11.48	NA	159.43	NA	NA	NA
MW-2	04/25/1994	60,000	9,300	6,100	1,400	6,200	NA	NA	170.91	10.84	NA	160.07	NA	NA	NA
MW-2	07/07/1994	280,000a	40,000	26,000	8,100	32,000	NA	NA	170.91	11.89	NA	159.02	NA	NA	NA
MW-2 (D)	07/07/1994	53,000	13,000	6,600	2,000	8,400	NA	NA	170.91	11.89	NA	159.02	NA	NA	NA
MW-2	10/27/1994	130,000	14,000	12,000	2,400	13,000	NA	NA	170.91	12.89	NA	158.02	NA	NA	NA
MW-2 (D)	10/27/1994	390,000	8,800	7,000	1,700	11,000	NA	NA	170.91	12.89	NA	158.02	NA	NA	NA
MW-2	11/17/1994	NA	NA	NA	NA	NA	NA	NA	170.91	9.11	NA	161.80	NA	NA	NA
MW-2	11/28/1994	NA	NA	NA	NA	NA	NA	NA	170.91	9.22	NA	161.69	NA	NA	NA
MW-2	01/13/1995	75,000	5,900	12,000	3,100	17,000	NA	NA	170.91	8.10	NA	162.81	NA	NA	NA
MW-2	04/12/1995	100,000	8,500	11,000	2,400	12,000	NA	NA	170.91	10.12	NA	160.79	NA	NA	NA
MW-2 (D)	04/12/1995	80,000	4,200	9,300	2,500	12,000	NA	NA	170.91	10.12	NA	160.79	NA	NA	NA
MW-2	07/25/1995	NA	NA	NA	NA	NA	NA	NA	170.91	11.53	NA	159.80	0.52	NA	NA
MW-2	10/18/1995	NA	NA	NA	NA	NA	NA	NA	170.91	14.02	NA	156.99	0.13	NA	NA
MW-2	01/17/1996	NA	NA	NA	NA	NA	NA	NA	170.91	10.27	NA	160.78	0.17	NA	NA

WELL CONCENTRATIONS
Shell-branded Service Station
4255 MacArthur Boulevard
Oakland, CA
Wic #204-5510-0600

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)	TOC (MSL)	Depth to Water (ft.)	Depth to SPH (ft.)	GW Elevation (MSL)	SPH Thickness (ft.)	DO Reading (ppm)	ORP Reading (mV)
MW-2	04/25/1996	NA	NA	NA	NA	NA	NA	NA	170.91	11.68	NA	159.25	0.03	NA	NA
MW-2	07/17/1996	NA	NA	NA	NA	NA	NA	NA	170.91	12.78	NA	158.81	0.48	NA	NA
MW-2	10/01/1996	NA	NA	NA	NA	NA	NA	NA	170.91	14.21	NA	156.70	0.28	NA	NA
MW-2	01/22/1997	NA	NA	NA	NA	NA	NA	NA	170.91	10.92	NA	160.08	0.11	NA	NA
MW-2	04/08/1997	NA	NA	NA	NA	NA	NA	NA	170.91	14.12	NA	156.95	0.20	NA	NA
MW-2	07/08/1997	NA	NA	NA	NA	NA	NA	NA	170.91	14.98	NA	156.08	0.19	NA	NA
MW-2	10/08/1997	NA	NA	NA	NA	NA	NA	NA	170.91	12.97	NA	157.98	0.05	NA	NA
MW-2	01/08/1998	NA	NA	NA	NA	NA	NA	NA	170.91	12.54	NA	158.43	0.08	NA	NA
MW-2	04/13/1998	180,000	2,800	5,200	2,400	13,000	71,000	NA	170.91	10.05	NA	160.86	NA	NA	NA
MW-2	07/17/1998	NA	NA	NA	NA	NA	NA	NA	170.91	11.75	NA	159.24	0.10	NA	NA
MW-2	10/02/1998	NA	NA	NA	NA	NA	NA	NA	170.91	16.78	NA	154.22	0.11	NA	NA
MW-2	02/03/1999	NA	NA	NA	NA	NA	NA	NA	170.91	9.90	9.82	161.07	0.08	NA	NA
MW-2	04/29/1999	NA	NA	NA	NA	NA	NA	NA	170.91	9.86	9.81	161.09	0.05	NA	NA
MW-2	07/23/1999	65,800	6,500	4,480	1,960	8,960	46,600	58,500*	170.91	14.45	NA	156.46	NA	1.4	NA
MW-2	11/01/1999	NA	NA	NA	NA	NA	NA	NA	170.91	11.84	11.81	159.09	0.03	NA	NA
MW-2	01/17/2000	46,000	6,000	2,400	1,500	5,500	50,000	31,000	170.91	11.00	NA	159.91	NA	1.3	-54
MW-2	04/17/2000	96,300	8,150	10,200	2,820	14,900	112,000	108,000	170.91	11.06	NA	159.85	NA	2.6	125
MW-2	07/26/2000	72,400	8,680	5,620	2,810	13,400	66,200	46,300	170.91	12.82	NA	158.09	NA	2.2	113
MW-2	10/12/2000	63,200	5,840	4,180	2,310	11,100	61,200	66,600	170.91	11.32	NA	159.59	NA	0.4	55
MW-2	**01/15/2001**	**59,700**	**2,630**	**4,800**	**2,050**	**11,500**	**44,400**	**5,080**	**170.91**	**10.19**	**NA**	**160.72**	**NA**	**1.1**	**-22**
MW-3	11/17/1993	18,000	5,400	660	720	2,200	NA	NA	174.61	15.40	NA	159.21	NA	NA	NA
MW-3	01/20/1994	55,000	13,000	2,600	2,200	6,500	NA	NA	174.61	14.61	NA	160.00	NA	NA	NA
MW-3	04/25/1994	96,000	11,000	1,600	3,100	9,900	NA	NA	174.61	13.12	NA	161.49	NA	NA	NA
MW-3 (D)	04/25/1994	78,000	12,000	1,900	2,600	7,300	NA	NA	174.61	13.12	NA	161.49	NA	NA	NA
MW-3	07/07/1994	NA	NA	NA	NA	NA	NA	NA	174.61	14.54	NA	160.07	0.02	NA	NA

WELL CONCENTRATIONS
Shell-branded Service Station
4255 MacArthur Boulevard
Oakland, CA
Wic #204-5510-0600

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)	TOC (MSL)	Depth to Water (ft.)	Depth to SPH (ft.)	GW Elevation (MSL)	SPH Thickness (ft.)	DO Reading (ppm)	ORP Reading (mV)
MW-3	10/27/1994	NA	NA	NA	NA	NA	NA	NA	174.61	15.62	NA	159.03	0.05	NA	NA
MW-3	11/17/1994	NA	NA	NA	NA	NA	NA	NA	174.61	13.83	NA	160.78	NA	NA	NA
MW-3	11/28/1994	NA	NA	NA	NA	NA	NA	NA	174.61	14.02	NA	160.59	NA	NA	NA
MW-3	01/13/1995	180,000	3,200	2,700	1,700	5,200	NA	NA	174.61	12.13	NA	162.48	NA	NA	NA
MW-3 (D)	01/13/1995	23,000	4,000	690	960	3,000	NA	NA	174.61	12.13	NA	162.48	NA	NA	NA
MW-3	04/12/1995	56,000	8,700	1,500	2,100	6,300	NA	NA	174.61	12.96	NA	161.65	NA	NA	NA
MW-3	07/25/1995	NA	NA	NA	NA	NA	NA	NA	174.61	14.28	NA	160.38	0.06	NA	NA
MW-3	10/18/1995	NA	NA	NA	NA	NA	NA	NA	174.61	15.88	NA	158.77	0.05	NA	NA
MW-3	01/17/1996	NA	NA	NA	NA	NA	NA	NA	174.61	13.86	NA	160.94	0.24	NA	NA
MW-3	04/25/1996	NA	NA	NA	NA	NA	NA	NA	174.61	13.82	NA	160.81	0.02	NA	NA
MW-3	07/17/1996	NA	NA	NA	NA	NA	NA	NA	174.61	16.11	NA	158.52	0.03	NA	NA
MW-3	10/01/1996	46,000	7,300	530	1,700	3,900	3,200	NA	174.61	16.56	NA	158.05	NA	NA	NA
MW-3 (D)	10/01/1996	47,000	7,100	530	1,700	4,000	2,900	NA	174.61	16.56	NA	158.05	NA	NA	NA
MW-3	01/22/1997	82,000	5,200	1,300	2,800	8,900	1,100	NA	174.61	13.07	NA	161.54	NA	NA	NA
MW-3 (D)	01/22/1997	61,000	8,400	1,100	2,300	7,000	2,700	NA	174.61	13.07	NA	161.54	NA	NA	NA
MW-3	04/08/1997	NA	NA	NA	NA	NA	NA	NA	174.61	17.09	NA	157.54	0.03	NA	NA
MW-3	07/08/1997	56,000	8,800	580	2,000	4,900	2,800	NA	174.61	15.85	NA	158.76	NA	NA	NA
MW-3	10/08/1997	48,000	8,000	590	1,700	3,400	5,100	NA	174.61	16.22	NA	158.39	NA	NA	NA
MW-3	01/08/1998	47,000	9,400	810	2,300	4,700	6,300	NA	174.61	13.80	NA	160.81	NA	NA	NA
MW-3 (D)	01/08/1998	48,000	8,100	750	2,000	4,100	5,800	NA	174.61	13.80	NA	160.81	NA	NA	NA
MW-3	04/13/1998	32,000	6,800	540	1,400	3,400	4,000	NA	174.61	12.97	NA	161.64	NA	NA	NA
MW-3 (D)	04/13/1998	36,000	7,300	660	1,600	3,700	4,000	NA	174.61	12.97	NA	161.64	NA	NA	NA
MW-3	07/17/1998	71,000	11,000	590	2,200	6,900	3,900	NA	174.61	11.51	NA	163.10	NA	NA	NA
MW-3 (D)	07/17/1998	76,000	12,000	700	2,600	8,000	3,000	NA	174.61	11.51	NA	163.10	NA	NA	NA
MW-3	10/02/1998	66,000	8,900	510	2,000	4,900	4,600	NA	174.61	16.50	NA	158.11	NA	NA	NA
MW-3 (D)	10/02/1998	59,000	9,400	460	2,000	4,900	4,700	NA	174.61	16.50	NA	158.11	NA	NA	NA

WELL CONCENTRATIONS
Shell-branded Service Station
4255 MacArthur Boulevard
Oakland, CA
Wic #204-5510-0600

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)	TOC (MSL)	Depth to Water (ft.)	Depth to SPH (ft.)	GW Elevation (MSL)	SPH Thickness (ft.)	DO Reading (ppm)	ORP Reading (mV)
MW-3	02/03/1999	36,000	6,800	300	1,600	2,900	18,000	NA	174.61	15.21	NA	159.40	NA	1.3	NA
MW-3	04/29/1999	45,000	8,100	580	2,200	5,800	4,700	5,150	174.61	15.43	NA	159.18	NA	1.5	-68
MW-3	07/23/1999	29,400	3,540	215	810	3,800	4,720	6,950*	174.61	14.95	NA	159.66	NA	1.3	NA
MW-3	11/01/1999	20,000	4,190	294	1,060	1,740	5,540	8,590	174.61	14.66	NA	159.95	NA	0.6	-110
MW-3	01/17/2000	17,000	3,900	89	1,100	1,200	7,900	NA	174.61	13.94	NA	160.67	NA	1.3	-40
MW-3	04/17/2000	28,100	5,240	247	1,540	2,750	16,600	NA	174.61	14.00	NA	160.61	NA	1.1	-86
MW-3	07/26/2000	24,300	6,680	159	1,610	1,640	17,100	NA	174.61	13.72	NA	160.89	NA	0.9	-70
MW-3	10/12/2000	14,300	2,630	86.7	241	1,360	16,300	NA	174.61	14.15	NA	160.46	NA	0.9	50
MW-3	**01/15/2001**	**22,100**	**4,400**	**266**	**977**	**2,990**	**13,200**	**NA**	**174.61**	**13.05**	**NA**	**161.56**	**NA**	**1.3**	**-40**
MW-4	11/17/1994	NA	NA	NA	NA	NA	NA	NA	164.06	6.62	NA	157.44	NA	NA	NA
MW-4	11/28/1994	2,900	200	17	76	260	NA	NA	164.06	6.11	NA	157.95	NA	NA	NA
MW-4	01/13/1995	1,900	130	5.6	13	40	NA	NA	164.06	6.05	NA	158.01	NA	NA	NA
MW-4	04/12/1995	680	150	<2.0	10	13	NA	NA	164.06	6.31	NA	157.75	NA	NA	NA
MW-4	07/25/1995	340	100	0.8	8.8	3	NA	NA	164.06	7.36	NA	156.70	NA	NA	NA
MW-4	10/18/1995	150	31	<0.5	3.5	0.8	NA	NA	164.06	8.54	NA	155.52	NA	NA	NA
MW-4	01/17/1996	290	14	<0.5	1.8	0.8	NA	NA	164.06	8.48	NA	155.58	NA	NA	NA
MW-4	04/25/1996	<500	65	<5	<5	<5	1,700	NA	164.06	7.40	NA	156.66	NA	NA	NA
MW-4 (D)	04/25/1996	<500	66	<5	8.7	<5	1,500	NA	164.06	7.40	NA	156.66	NA	NA	NA
MW-4	07/17/1996	<500	84	<5.0	6.5	<5.0	1,500	NA	164.06	7.75	NA	156.31	NA	NA	NA
MW-4 (D)	07/17/1996	<500	54	<5.0	<5.0	<5.0	1,700	2,100	164.06	7.75	NA	156.31	NA	NA	NA
MW-4	10/01/1996	<500	1.9	<5.0	<5.0	<5.0	3,000	NA	164.06	8.82	NA	155.24	NA	NA	NA
MW-4	01/22/1997	580	130	<2.5	18	5.2	1,200	NA	164.06	7.51	NA	156.55	NA	NA	NA
MW-4	04/08/1997	770	200	7	26	55	1,500	8	164.06	7.18	NA	156.88	NA	NA	NA
MW-4	07/08/1997	570	78	<5.0	14	11	1,200	NA	164.06	9.00	NA	155.06	NA	NA	NA
MW-4 (D)	07/08/1997	640	81	<5.0	16	19	1,600	NA	164.06	9.00	NA	155.06	NA	NA	NA

WELL CONCENTRATIONS
Shell-branded Service Station
4255 MacArthur Boulevard
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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)	TOC (MSL)	Depth to Water (ft.)	Depth to SPH (ft.)	GW Elevation (MSL)	SPH Thickness (ft.)	DO Reading (ppm)	ORP Reading (mV)
MW-4	10/08/1997	<500	40	<5.0	7.4	5.4	1,400	NA	164.06	8.97	NA	155.09	NA	NA	NA
MW-4 (D)	10/08/1997	<500	36	<5.0	5.9	<5.0	1,400	NA	164.06	8.97	NA	155.09	NA	NA	NA
MW-4	01/08/1998	<1,000	55	<10	13	<10	2,000	NA	164.06	7.90	NA	156.16	NA	NA	NA
MW-4	04/13/1998	350	110	2.4	20	26	<2.5	NA	164.06	7.35	NA	156.71	NA	NA	NA
MW-4	07/17/1998	210	66	0.78	5.4	9.8	1,700	NA	164.06	6.95	NA	157.11	NA	NA	NA
MW-4	10/02/1998	<50	0.69	<0.50	<0.50	<0.50	2,900	NA	164.06	7.35	NA	156.71	NA	NA	NA
MW-4	02/03/1999	560	120	2.5	29	34	6,800	NA	164.06	7.71	NA	156.35	NA	0.9	NA
MW-4	04/29/1999	390	80	1.9	13	19	7,000	8,360	164.06	7.83	NA	156.23	NA	1.1	-125
MW-4	07/23/1999	460	93.6	8.40	25.2	28.8	3,760	6,000*	164.06	11.33	NA	152.73	NA	0.9	NA
MW-4	11/01/1999	77.3	0.520	<0.500	<0.500	<0.500	539	NA	164.06	10.66	NA	153.40	NA	2.8	3
MW-4	01/17/2000	160	27	<0.50	12	6.3	12,000	NA	164.06	10.15	NA	153.91	NA	3.9	-17
MW-4	04/17/2000	<500	26	6.38	9.35	10.4	9,070	NA	164.06	10.10	NA	153.96	NA	1.7	-129
MW-4	07/26/2000	<500	22.7	<5.00	7.59	6.96	7,660	NA	164.06	10.09	NA	153.97	NA	1.4	-137
MW-4	10/12/2000	172	19.8	<0.500	7.47	4.50	8,290	NA	164.06	9.35	NA	154.71	NA	3.5	529
MW-4	**01/15/2001**	**53.6**	**1.50**	**<0.500**	**2.45**	**1.80**	**9,260**	**NA**	**164.06**	**8.77**	**NA**	**155.29**	**NA**	**2.3**	**53**
TB-1	04/29/1999	NA	NA	NA	NA	NA	NA	NA	NA	6.00	NA	NA	NA	3.8	-132
TB-1	11/01/1999	NA	NA	NA	NA	NA	NA	NA	NA	12.65	NA	NA	NA	0.2	-165
TB-1	01/17/2000	NA	NA	NA	NA	NA	NA	NA	NA	7.72	NA	NA	NA	0.8	-178
TB-1	04/17/2000	NA	NA	NA	NA	NA	NA	NA	NA	7.65	NA	NA	NA	0.5	-152
TB-1	07/26/2000	NA	NA	NA	NA	NA	NA	NA	NA	5.13	NA	NA	NA	1.0	-124
TB-1	10/12/2000	NA	NA	NA	NA	NA	NA	NA	NA	5.20	NA	NA	NA	0.7	-73
TB-1	**01/15/2001**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**5.09**	**NA**	**NA**	**NA**	**1.2**	**-118**
TB-2	04/29/1999	NA	NA	NA	NA	NA	NA	NA	NA	4.76	NA	NA	NA	4.2	-108
TB-2	11/01/1999	NA	NA	NA	NA	NA	NA	NA	NA	11.33	NA	NA	NA	0.5	-148

WELL CONCENTRATIONS
Shell-branded Service Station
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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)	TOC (MSL)	Depth to Water (ft.)	Depth to SPH (ft.)	GW Elevation (MSL)	SPH Thickness (ft.)	DO Reading (ppm)	ORP Reading (mV)
TB-2	01/17/2000	NA	NA	NA	NA	NA	NA	NA	NA	9.79	NA	NA	NA	0.7	-162
TB-2	04/17/2000	NA	NA	NA	NA	NA	NA	NA	NA	9.75	NA	NA	NA	0.9	-121
TB-2	07/26/2000	NA	NA	NA	NA	NA	NA	NA	NA	4.73	NA	NA	NA	0.9	-85
TB-2	10/12/2000	NA	NA	NA	NA	NA	NA	NA	NA	4.05	NA	NA	NA	0.6	-47
TB-2	**01/15/2001**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**3.87**	**NA**	**NA**	**NA**	**0.7**	**-91**

Abbreviations:
TPPH= Total petroleum hydrocarbons as gasoline by modified EPA Method 8015
BTEX = benzene, toluene, ethylbenzene, xylenes by EPA Method 8020
MTBE = methyl-tertiary-butyl ether
TOC = Top of Casing Elevation
SPH = Separate-Phase Hydrocarbons
GW = Groundwater
ug/L = parts per billion
msl = Mean sea level
ft = Feet
<n = Below detection limit
D = Duplicate sample
NA = Not applicable
DO = Dissolved Oxygens
ppm = parts per million
ORP = Oxidation Reduction Potential
mV = millivolts

WELL CONCENTRATIONS
Shell-branded Service Station
4255 MacArthur Boulevard
Oakland, CA
Wic #204-5510-0600

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)	TOC (MSL)	Depth to Water (ft.)	Depth to SPH (ft.)	GW Elevation (MSL)	SPH Thickness (ft.)	DO Reading (ppm)	ORP Reading (mV)

Notes:

* = Sample analyzed outside the EPA recommended holding time.

a = Ground water surface had a sheen when sampled

b = MTBE value is estimated by Sequoia Analytical of Redwood City, California

When separate-phase hydrocarbons are present, ground water elevation is adjusted using the relation:

Corrected ground water elevation = Top-of-casing elevation - depth to water + (0.8 x hydrocarbon thickness).

Table 2: Groundwater Extraction - Mass Removal Data - Shell-branded Service Station, Incident #98995758, 4255 MacArthur Boulevard, Oakland, CA

Date Purged	Well ID	Volume Pumped (gal)	Cumulative Volume Pumped (gal)	Date Sampled	TPPH			Benzene			MTBE		
					TPPH Concentration (ppb)	TPPH Removed (lb)	TPPH Removed To Date (lb)	Benzene Concentration (ppb)	Benzene Removed (lb)	Benzene Removed to Date (lb)	MTBE Concentration (ppb)	MTBE Removed (lb)	MTBE Removed To Date (lb)
04/23/99	MW-2	200	200	04/13/98	180,000	0.30040	0.30040	2,800	0.00467	0.00467	71,000	0.11849	0.11849
05/24/99	MW-2	200	400	04/13/98	180,000	0.30040	0.60079	2,800	0.00467	0.00935	71,000	0.11849	0.23698
06/28/99	MW-2	200	600	04/13/98	180,000	0.30040	0.90119	2,800	0.00467	0.01402	71,000	0.11849	0.35547
07/30/99	MW-2	200	800	07/23/99	65,800	0.10981	1.01100	6,500	0.01085	0.02487	46,600	0.07777	0.43324
08/24/99	MW-2	100	900	07/23/99	65,800	0.05491	1.06591	6,500	0.00542	0.03029	46,600	0.03888	0.47212
10/29/99	MW-2	100	1,000	07/23/99	65,800	0.05491	1.12081	6,500	0.00542	0.03571	46,600	0.03888	0.51101
11/30/99	MW-2	100	1,100	07/23/99	65,800	0.05491	1.17572	6,500	0.00542	0.04114	46,600	0.03888	0.54989
02/02/00	MW-2	200	1,300	01/17/00	46,000	0.07677	1.25249	6,000	0.01001	0.05115	**31,000**	0.05174	0.60163
11/16/00	MW-2	150	1,450	10/12/00	63,200	0.07910	1.33159	5,840	0.00731	0.05846	**66,600**	0.08336	0.68499
02/23/01	MW-2	200	1,650	01/15/01	59,700	0.09963	1.43122	2,630	0.00439	0.06285	**5,080**	0.00848	0.69347
04/23/99	TB-2	4,800	4,800	08/24/99	6,240	0.24993	0.01602	400	0.01602	0.01602	86,100	3.44856	3.44856
05/24/99	TB-2	4,800	9,600	08/24/99	6,240	0.24993	0.26595	400	0.01602	0.03204	86,100	3.44856	6.89711
06/28/99	TB-2	4,800	14,400	08/24/99	6,240	0.24993	0.51588	400	0.01602	0.04806	86,100	3.44856	10.34567
07/30/99	TB-2	4,800	19,200	08/24/99	6,240	0.24993	0.76581	400	0.01602	0.06408	86,100	3.44856	13.79422
08/24/99	TB-2	2,400	21,600	08/24/99	6,240	0.12497	0.89078	400	0.00801	0.07210	86,100	1.72428	15.51850
10/29/99	TB-2	2,255	23,855	10/29/99	7,460	0.14037	1.03115	656	0.01234	0.08444	442	0.00832	15.52682
11/30/99	TB-2	3,800	27,655	10/29/99	7,460	0.23655	1.26769	656	0.02080	0.10524	442	0.01402	15.54083
02/02/00	TB-2	4,500	32,155	01/31/00	2,070	0.07773	1.34542	108	0.00406	0.10930	6,550	0.24595	15.78678
11/16/00	TB-2	974	33,129	11/16/00	107,000	0.86963	2.21505	3,390	0.02755	0.13685	16,800	0.13654	15.92332
02/23/01	TB-2	2,506	35,635	02/23/01	80,600	1.68542	3.90048	2,410	0.05040	0.18724	38,100	0.79671	16.72003
Total Gallons Extracted:			**37,285**		**Total Pounds Removed:**		**5.56561**			**0.25009**			**17.41350**
					Total Gallons Removed:		**0.91240**			**0.03426**			**2.80865**

Table 2: Groundwater Extraction - Mass Removal Data - Shell-branded Service Station, Incident #98995758, 4255 MacArthur Boulevard, Oakland, CA

Abbreviations & Notes:

TPPH = Total purgeable hydrocarbons as gasoline, analyzed by EPA Method 8015
MtBE = Methyl tert-butyl ether by EPA Method 8020; MTBE results in bold are analyzed by EPA Method 8260
µg/L = Micrograms per liter
ppb = Parts per billion, equivalent to µg/L
lb = Pound
L = Liter
gal = Gallon
g = Gram
Mass removed based on the formula: volume extracted (gal) x Concentration (µg/L) x (g/10^6µg) x (pound/453.6g) x (3.785 L/gal)
Volume removal data based on the formula: density (in gms/cc) x 9.339 (ccxlbs/gmsxgals)
Benzene analyzed by EPA Method 8020

Table 3: Vapor Extraction - Mass Removal Data - Shell-branded Service Station, Incident #98995758, 4255 MacArthur Boulevard, Oakland, CA

							TPHg		Benzene		MTBE	
		Interval	System				TPHg	Cumulative	Benzene	Cumulative	MTBE	Cumulative
		Hours of	Flow	Hydrocarbon Concentrations			Removal	TPHg	Removal	Benzene	Removal	MTBE
	Well	Operation	Rate	TPHg	Benzene	MTBE	Rate	Removed	Rate	Removed	Rate	Removed
Date	ID	(hours)	(CFM)	(Concentrations in ppmv)			(#/hour)	(#)	(#/hour)	(#)	(#/hour)	(#)
11/16/00	MW-2	5.00	0.5	663.0	7.00	42.0	0.004	0.022	0.000	0.000	0.000	0.001
02/23/01	MW-2	8.00	3.2	24.1	0.93	11.9	0.001	0.030	0.000	0.001	0.001	0.006
Total Pounds Removed:							**TPHg =**	**0.030 #**	**Benzene =**	**0.001 #**	**MTBE =**	**0.006 #**

Abbreviations and Notes:

CFM = Cubic feet per minute

TPHg = Total petroleum hydrocarbons as gasoline (C6-C12) by modified EPA Method 8015 in 1 liter tedlar bag samples

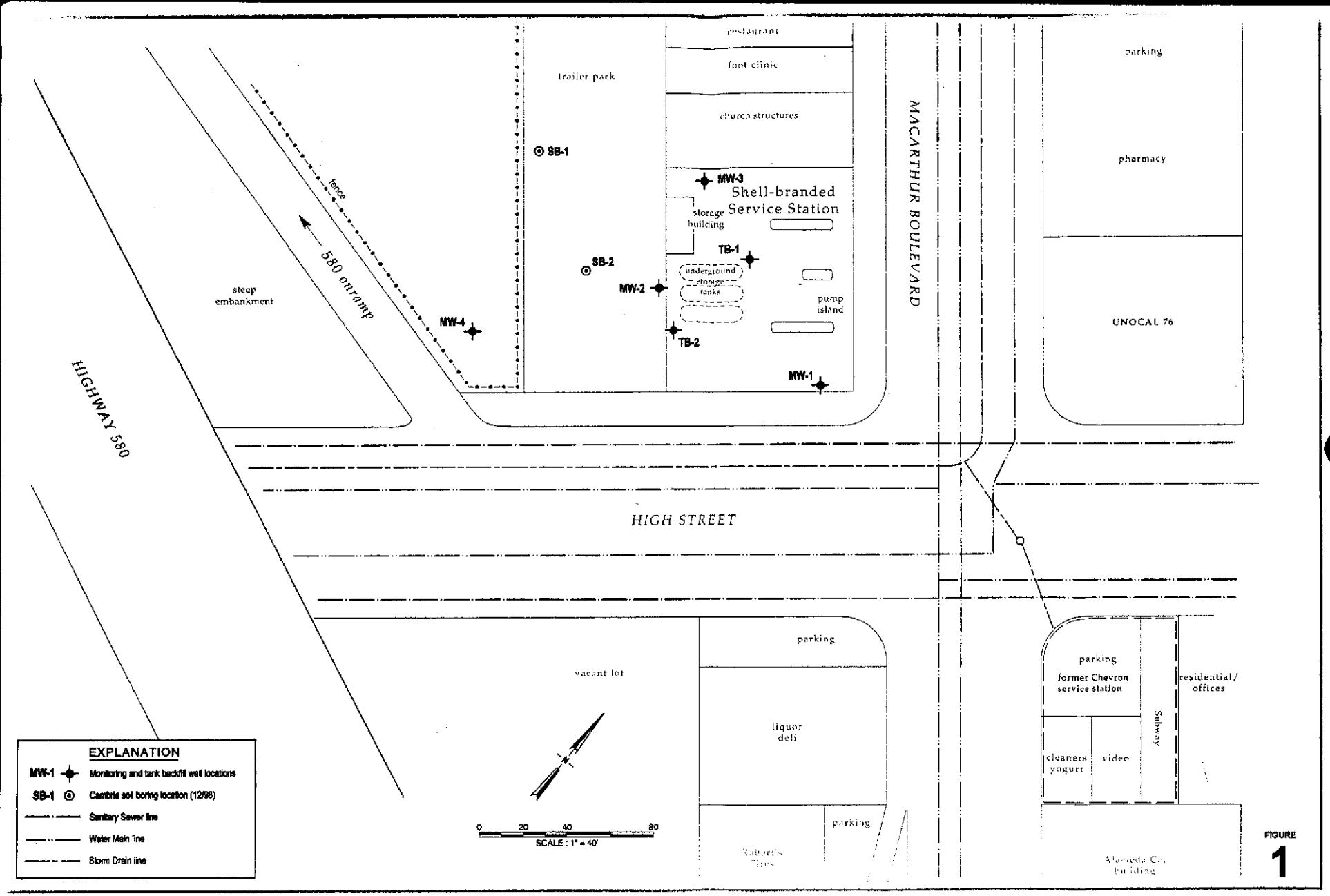
ppmv = Parts per million by volume

= Pounds

TPHG, Benzene, and MTBE analyzed by EPA Method 8015/8020 in 1 liter tedlar bag samples

TPHg / Benzene / MTBE removal rate = Rate based on Bay Area Air Quality Management District's Manual of Procedures for Soil Vapor Extraction dated July 17, 1991.
(Rate = Concentration (ppmv) x system flow rate (cfm) x (1lb-mole/386ft3) x molecular weight (86 lb/lb-mole for TPHg, 78 lb/lb-mole for benzene, 88 lb/lb-mole for MTBE) x 60 min/hour x 1/1,000,000)

Cumulative TPHg / Benzene / MTBE removal = Previous removal rate multiplied by the hour-interval of operation plus the previous total



Underground Utility Location

CAMBRIA

Shell-branded Service Station
4255 MacArthur Boulevard
Oakland, California
Incident #98995758

FIGURE
1

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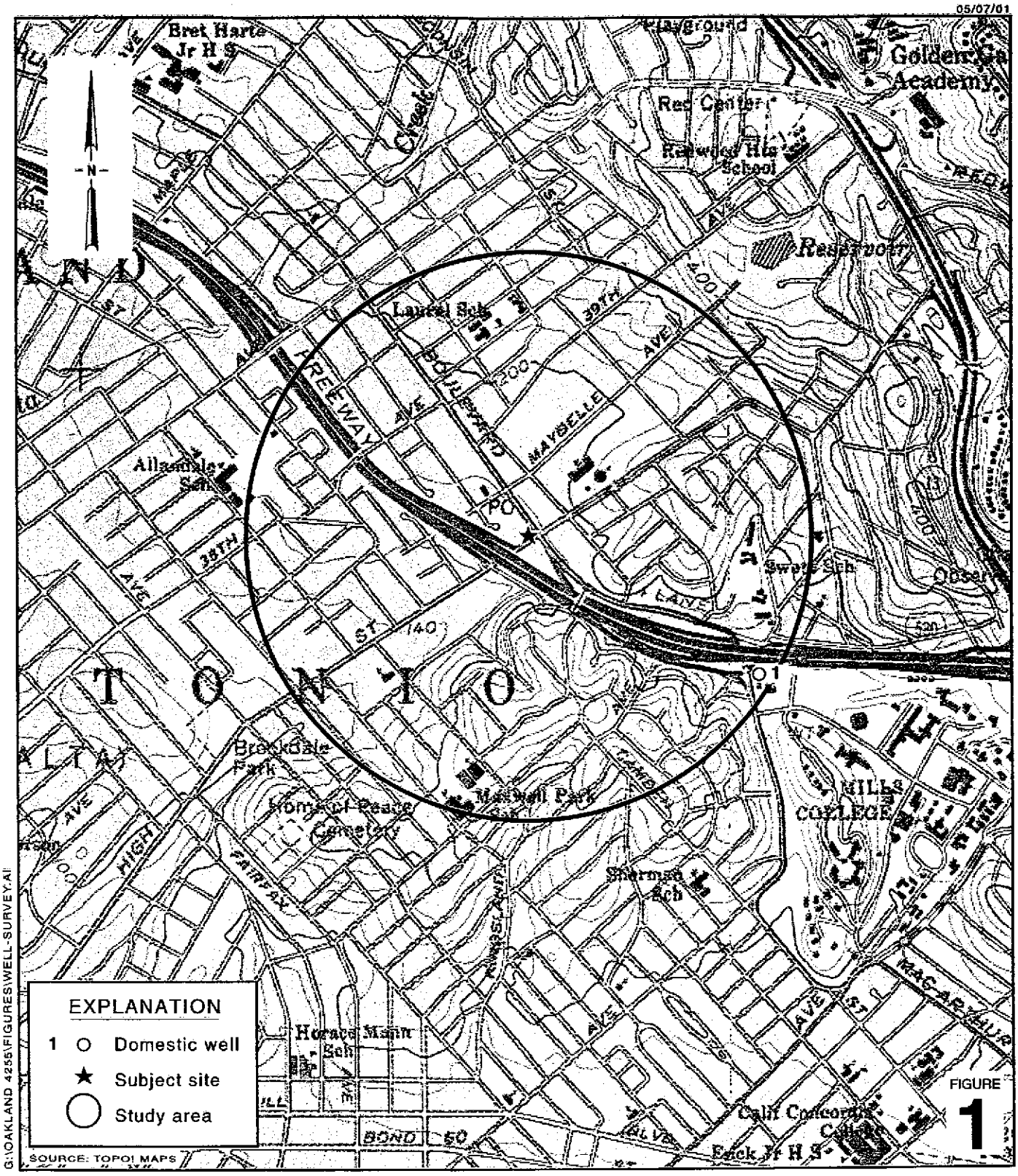
05/07/01



G:\OAKLAND 4255\FIGURES\WELL-SURVEY.AI

FIGURE **1**

Shell-branded Service Station
4255 MacArthur Boulevard
Oakland, California
Incident #98995758

CAMBRIA

Area Well Survey

(1/2 Mile Radius)

Table 3. Well Survey Results - Shell-branded Service Station, 4255 MacArthur Boulevard, Oakland, California. Incident #

LOCATION	Well ID	Installation Date	Owner	Use	Depth (ft bgs)	Screened Interval (ft bgs)	Sealed Interval (ft bgs)
1	UNK	April 11, 1930	Mills College	DOM	354	UNK	UNK

Well Locations provided by the State of California Department of Water Resources

Notes and Abbreviations:

Location = Column number refers to map location on Figure 2.
Well ID = California State well identification number as recorded by the Department of Water Resources in Sacramento, California.
UNK = Unknown.
DOM= Domestic

BORING LOG

Client: **Shell Oil Products Company**

Project No: **240-0524** Phase Task

Boring ID **SB-1**

Location **4255 MacArthur Blvd., Oakland**

Surface Elev. **NA ft,**

Depth (feet)	Blow Count	Sample	Interval	Lithologic Description
0	Ground Surface			**Asphalt**
				SILT; (ML); brown; soft; damp; 10% clay, 80% silt, 10% gravel to 0.25 inch diameter; low plasticity; low estimated permeability.
5				**Clayey SILT**; (ML); brown; soft; damp; 15% clay, 80% silt, 5% gravel to 0.5 inch diameter; low plasticity; low estimated permeability.
				wet.
				SILT; (ML); dark brown; medium stiff; damp; 5% clay, 80% silt, 10% fine sand, 5% gravel to 0.5 inch diameter; low plasticity; low estimated permeability.
10				black; 10% clay, 85% silt, 5% gravel to 0.5 inch diameter.

TPHg (ppm)	Graphic Log	Boring Completion Graphics	Depth (feet)	Additional Comments
			0	
			5	Water encountered @ 7 ft.
			10	Bottom of boring @ 12 ft.

Driller **Gregg**

Logged By **Brian Busch**

Water-Bearing Zones **NA**

Drilling Started **2/13/98**

Drilling Completed **2/13/98**

Grout Type **Portland Type I/II**

Notes: **See site map.**

Cambria Environmental Technology, Inc.

BORING LOG

Client: **Shell Oil Products Company**

Project No: **240-0524** Phase Task

Boring ID **SB-2**

Location **4255 MacArthur Blvd., Oakland**

Surface Elev. **NA ft.**

Page **1** of **1**

Depth (feet)	Blow Count	Sample	Interval	Lithologic Description
0	Ground Surface			**Asphalt**
				Gravelly SAND; (SPG); brown; soft; damp; 10% silt, 70% sand, 20% gravel to 1 inch diameter with concrete and wood; no plasticity; moderate estimated permeability.
5				**SILT**; (ML); brown; medium stiff; damp; 10% clay, 85% silt, 5% gravel to 0.25 inch diameter with wood; low plasticity; low estimated permeability.
				dark brown; soft; 5% clay, 95% silt; no plasticity.
				moist; low plasticity.
				wet; 10% clay, 80% silt, 10% gravel to 0.125 inch diameter.
10				

TPHg (ppm) | Graphic Log | Boring Completion Graphics

Depth (feet)	Additional Comments
0	
5	Static water level @ 5 ft.
10	Water encountered @ 8 ft.
	Bottom of boring @ 12 ft.

Driller **Gregg**

Logged By **Brian Busch**

Water-Bearing Zones **NA**

Drilling Started **2/13/98**

Drilling Completed **2/13/98**

Grout Type **Portland Type I/II**

Notes: **See site map.**

BOR 24524 2/13/98

Cambria Environmental Technology, Inc.

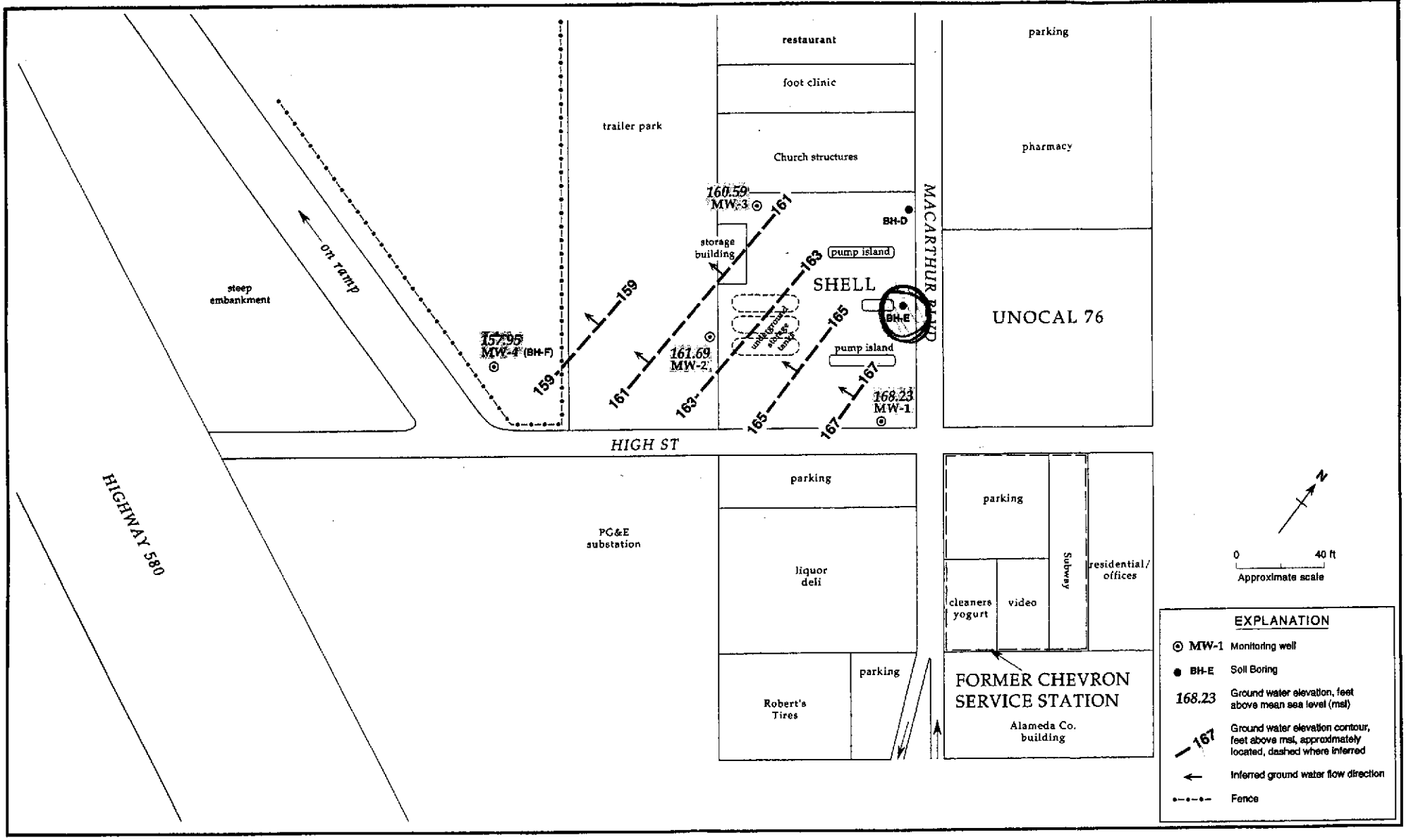


Figure 2. Montoring Well and Soil Boring Locations and Ground Water Elevation Contours - November 28, 1994 - Shell Service Station WIC #204-5510-0600, 4255 MacArthur Boulevard, Oakland, California

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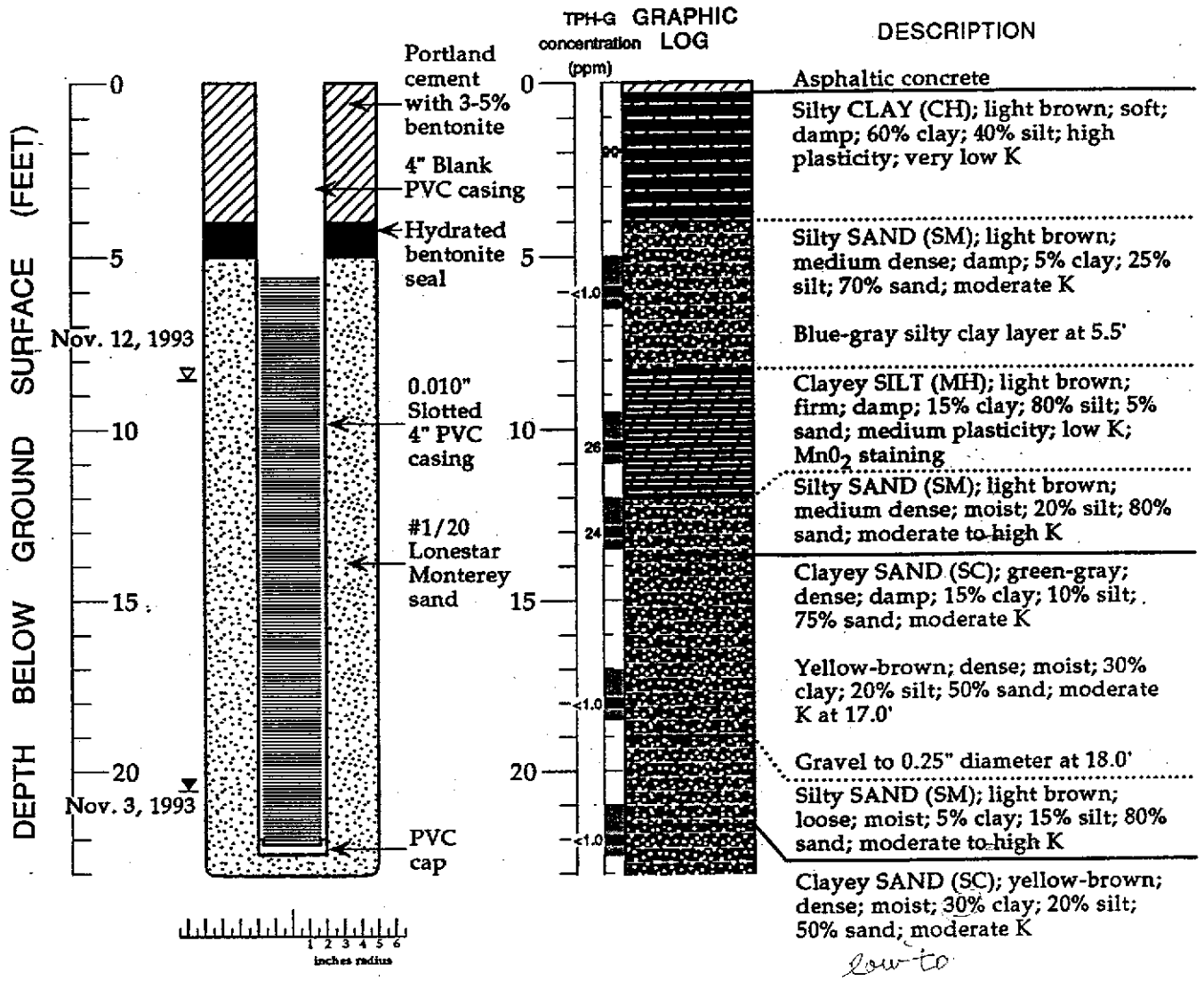
1/17/95

MONITORING WELL MW-1 (BH-A)



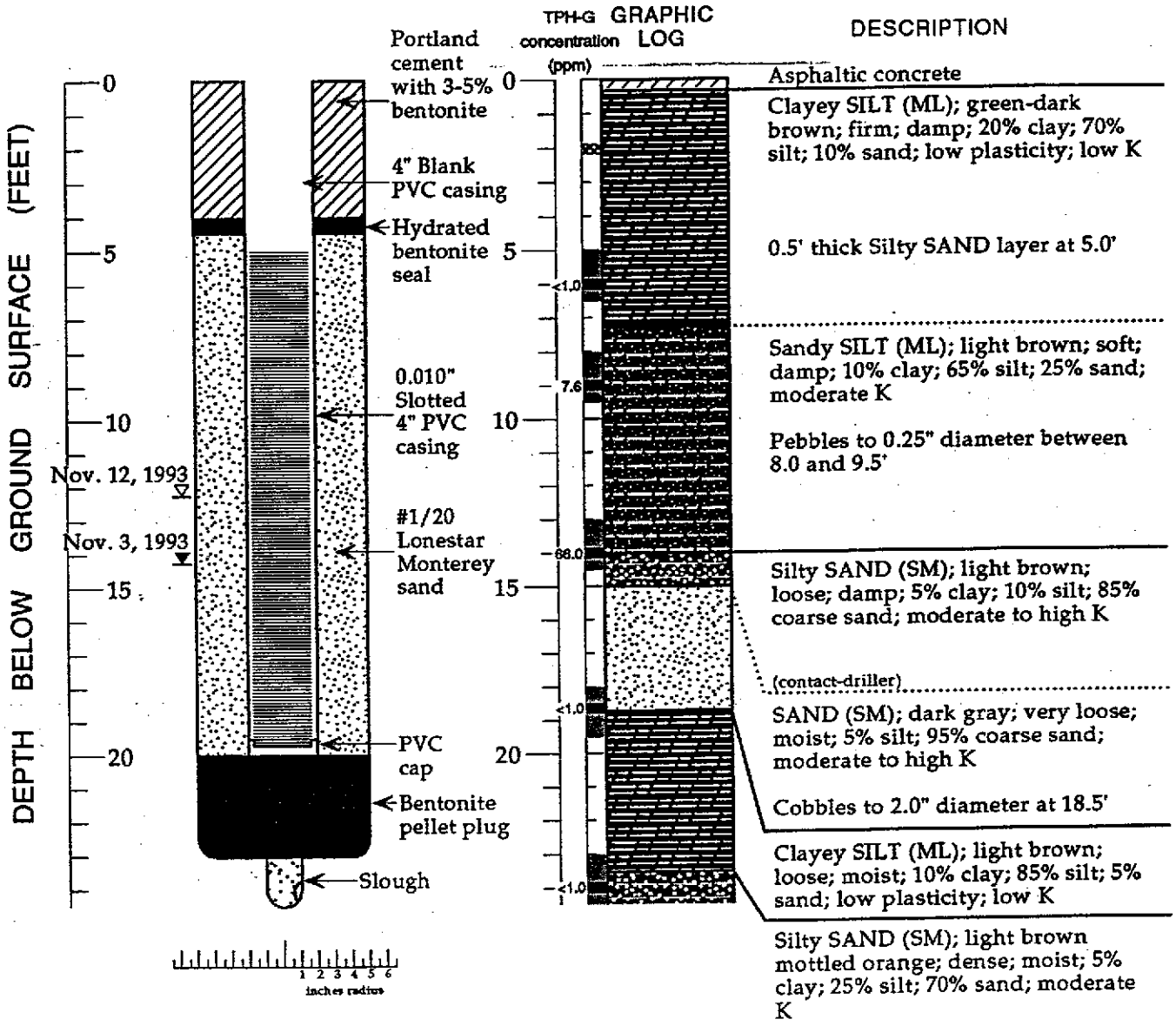
EXPLANATION

- ▼ Water level during drilling (date)
- ▽ Water level (date)
- ———— Contact (dotted where approximate)
- —?—?— Uncertain contact
- ////////// Gradational contact
- Location of recovered drive sample
- Location of drive sample sealed for chemical analysis
- Cutting sample
- K = Estimated hydraulic conductivity

Logged By: Janet K. Macdonald
Supervisor: N. Scott MacLeod; RG 5747
Drilling Company: Soils Exploration Services, Vacaville, CA
License Number: C57-582696
Driller: Morris Petersen
Drilling Method: Hollow-stem auger
Date Drilled: November 3, 1993
Well Head Completion: 4" locking well-plug, traffic-rated vault
Type of Sampler: Split barrel (2" ID)
Ground Surface Elevation: 175.79 feet above mean sea level
TPH-G: Total petroleum hydrocarbon as gasoline in soil by modified EPA Method 8015

Boring Log and Well Construction Details - Well MW-1 (BH-A) - Shell Service Station WIC #204-5510-0600, 4255 MacArthur Boulevard, Oakland, California

MONITORING WELL MW-2 (BH-B)



EXPLANATION

- ▼ Water level during drilling (date)
- ▽ Water level (date)
- ——— Contact (dotted where approximate)
- —?—?— Uncertain contact
- ////////// Gradational contact
- Location of recovered drive sample
- Location of drive sample sealed for chemical analysis
- Cutting sample
- K = Estimated hydraulic conductivity

Logged By: Janet K. Macdonald
Supervisor: N. Scott MacLeod; RG 5747
Drilling Company: Soils Exploration Services, Vacaville,CA
License Number: C57-582696
Driller: Morris Peterson
Drilling Method: Hollow-stem auger
Date Drilled: November 3, 1993
Well Head Completion: 4" locking well-plug, traffic-rated vault
Type of Sampler: Split barrel (2" ID)
Ground Surface Elevation: 170.91 feet above mean sea level
TPH-G: Total petroleum hydrocarbon as gasoline in soil by modified EPA Method 8015

Boring Log and Well Construction Details - Well MW-2 (BH-B) - Shell Service Station WIC #204-5510-0600, 4255 MacArthur Boulevard, Oakland, California

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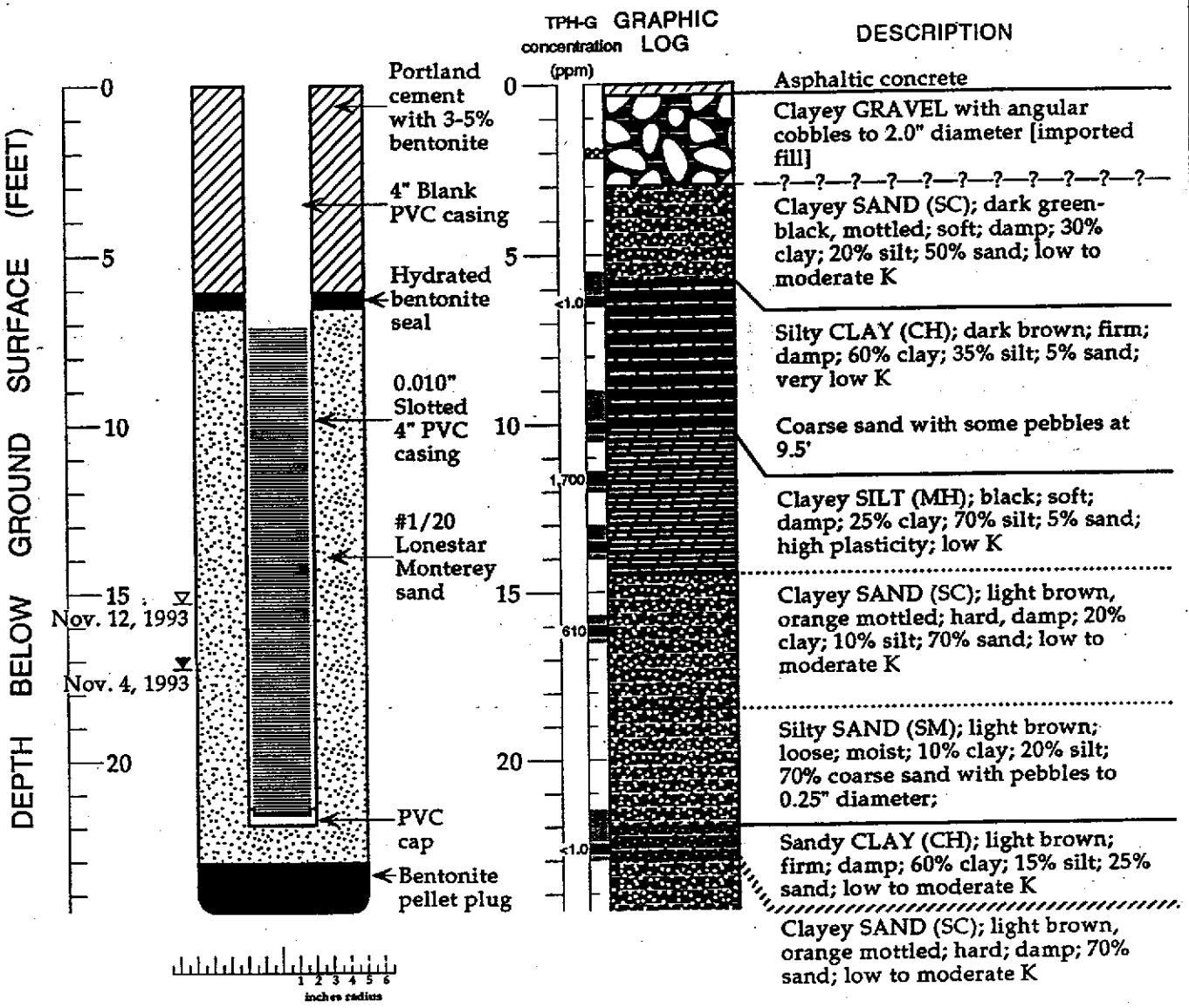
3/11/94

MONITORING WELL MW-3 (BH-C)



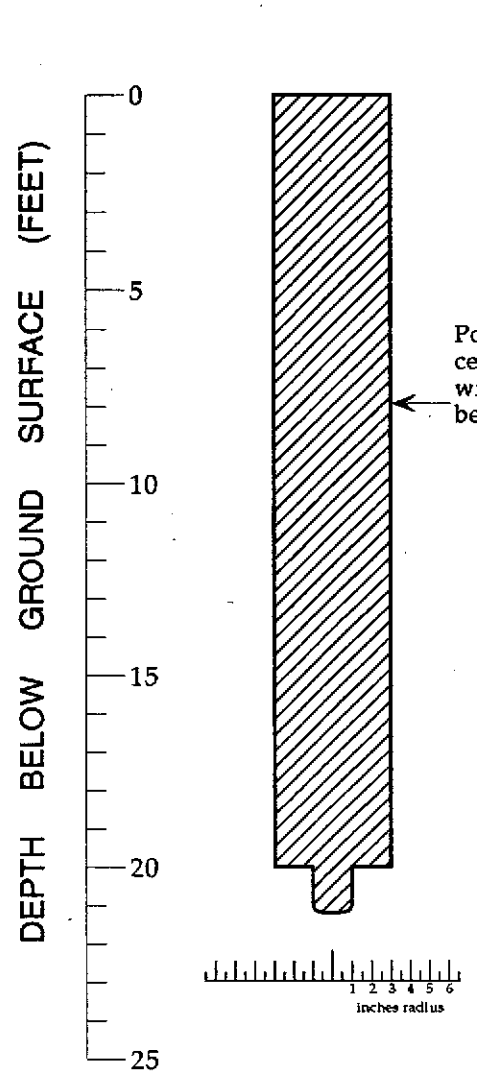
EXPLANATION

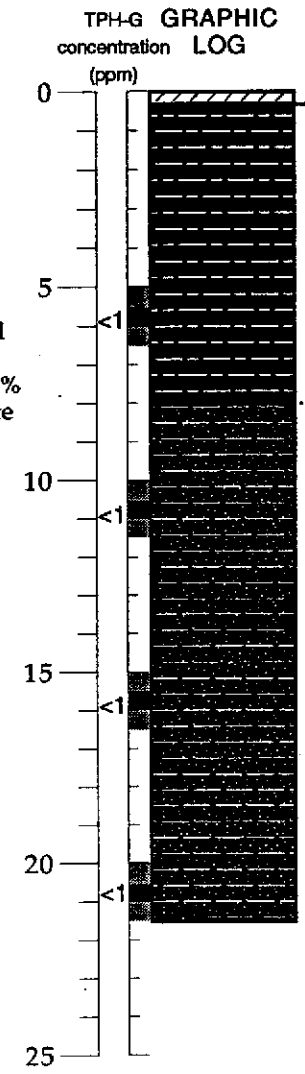
- ▼ Water level during drilling (date)
- ⧖ Water level (date)
- ——····—— Contact (dotted where approximate)
- —?—?— Uncertain contact
- ////////// Gradational contact
- Location of recovered drive sample
- Location of drive sample sealed for chemical analysis
- Cutting sample
- K = Estimated hydraulic conductivity

Logged By: Janet K. Macdonald
Supervisor: N. Scott MacLeod; RG 5747
Drilling Company: Soils Exploration Services, Vacaville, CA
License Number: C57-582696
Driller: Morris Peterson
Drilling Method: Hollow-stem auger
Date Drilled: November 4, 1993
Well Head Completion: 4" locking well-plug, traffic-rated vault
Type of Sampler: Split barrel (2" ID)
Ground Surface Elevation: 174.61 feet above mean sea level
TPH-G: Total petroleum hydrocarbon as gasoline in soil by modified EPA Method 8015

Boring Log and Well Construction Details - Well MW-3 (BH-C) - Shell Service Station WIC #204-5510-0600, 4255 MacArthur Boulevard, Oakland, California

BORING BH-D





DESCRIPTION

Asphalt

Silty CLAY (CH); olive-gray; very firm to stiff; damp; 90% clay; 10% silt; low K

Sandy CLAY (ML); brown; stiff; damp; 60% clay, 10% silt, 30% fine to medium angular sand; low K

Green-brown; stiff; 80% clay, 20% medium angular sand; organic material; calcifications; mottled brown

Light brown; 55% clay, 45% medium to coarse angular sand; organic material; oxidation; sand coarsens downward

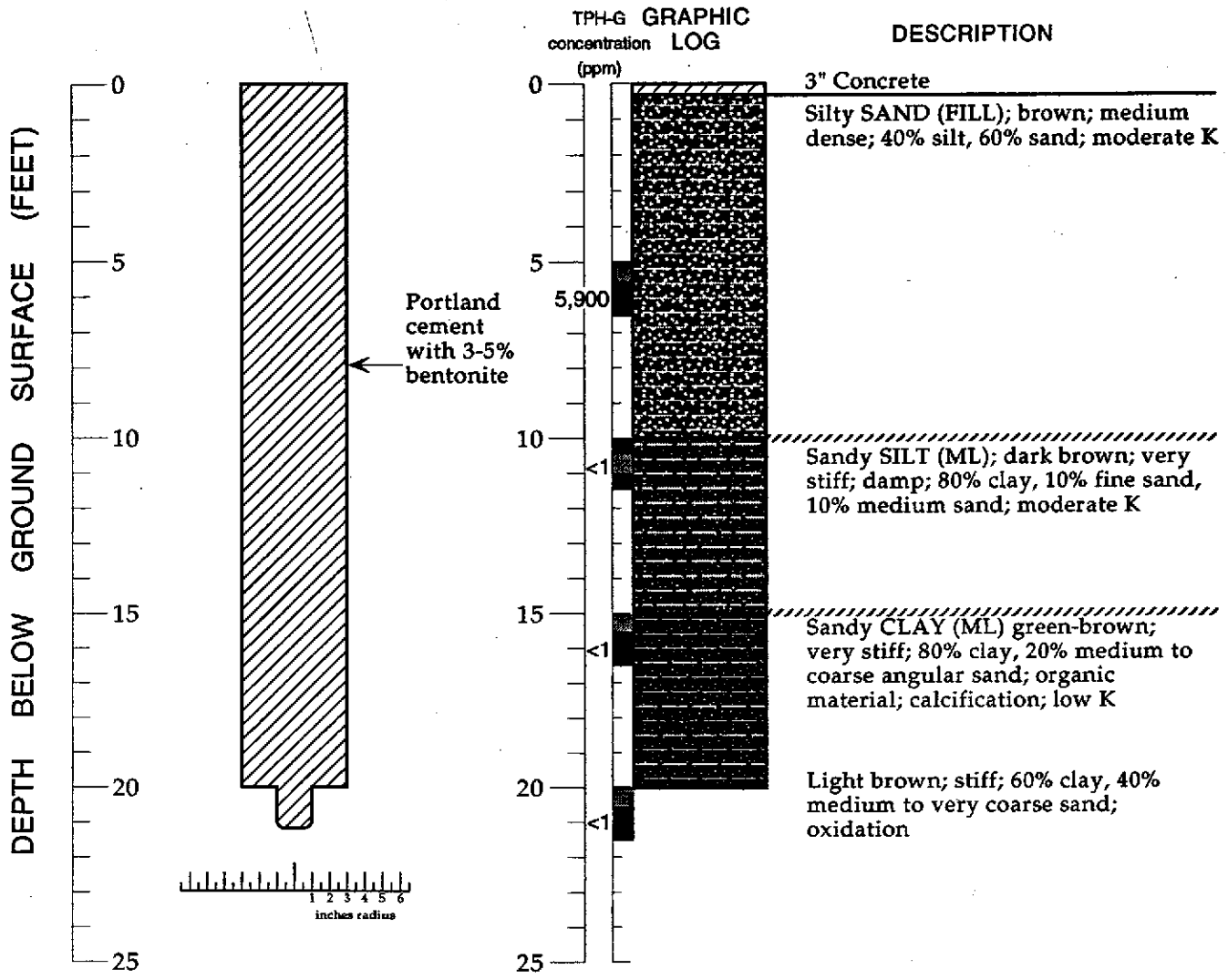
EXPLANATION

—····— Contact (dotted where approximate)
—?—?— Uncertain contact
////////. Gradational contact
Location of recovered drive sample
Location of drive sample sealed for chemical analysis
Cutting sample
K = Estimated hydraulic conductivity

Logged By: Faith Daverin
Supervisor: Jim Carmody; CEG 1576
Drilling Company: Gregg Drilling, San Rafael,CA
License Number: C57-485165
Driller: Chris St. Pierre
Drilling Method: Hollow-stem auger
Date Drilled: November 3, 1994
Type of Sampler: Split spoon (2" ID)
TPH-G: Total petroleum hydrocarbons as gasoline in soil by modified EPA Method 8015

Boring Log - Boring BH-D - Shell Service Station WIC #204-5510-0600, 4255 MacArthur Boulevard, Oakland, California

BORING BH-E



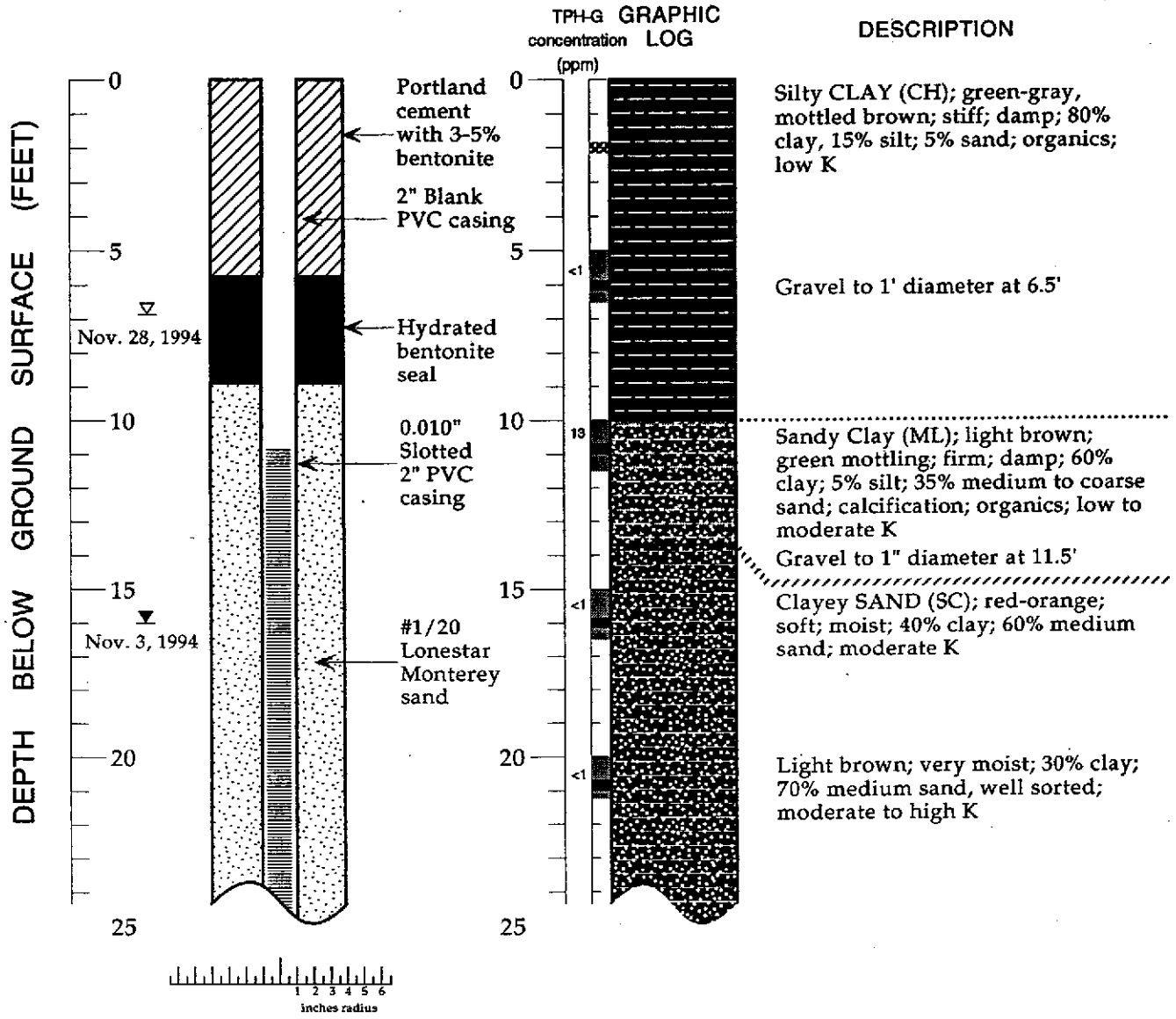
EXPLANATION

- Contact (dotted where approximate)
- Uncertain contact
- Gradational contact
- Location of recovered drive sample
- Location of drive sample sealed for chemical analysis
- Cutting sample
- K = Estimated hydraulic conductivity

Logged By: Faith Daverin
Supervisor: Jim Carmody; CEG 1576
Drilling Company: Gregg Drilling, Pacheco, CA
License Number: C57-485165
Driller: Chris St. Pierre
Drilling Method: Hollow-stem auger
Date Drilled: November 3, 1994
Type of Sampler: Split spoon (2" ID)
TPH-G: Total petroleum hydrocarbons as gasoline in soil by modified EPA Method 8015

Boring Log - Boring BH-E - Shell Service Station WIC #204-5510-0600, 4255 MacArthur Boulevard, Oakland, California

MONITORING WELL MW-4 (BH-F)



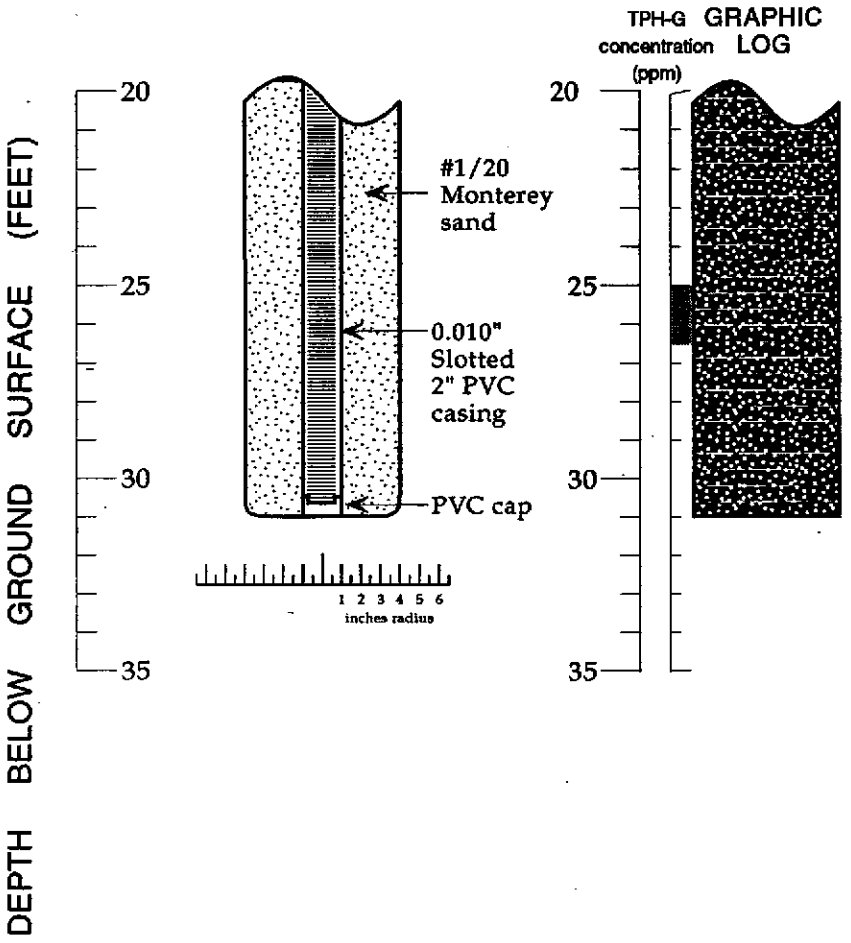
EXPLANATION

- ▼ Water level during drilling (date)
- ▽ Water level (date)
- ——— Contact (dotted where approximate)
- —?—?— Uncertain contact
- //////// Gradational contact
- Location of recovered drive sample
- Location of drive sample sealed for chemical analysis
- Cutting sample
- K = Estimated hydraulic conductivity

Logged By: Faith Daverin
Supervisor: Jim Carmody; CEG 1576
Drilling Company: Gregg Drilling, Pacheco, CA
License Number: C57-485165
Driller: Chris St. Pierre
Drilling Method: Hollow-stem auger - 8" diameter
Date Drilled: November 3, 1994
Well Head Completion: 2" locking well-plug, traffic-rated vault
Type of Sampler: Split spoon (2" ID)
Ground Surface Elevation: feet above mean sea level
TPH-G: Total petroleum hydrocarbons as gasoline in soil by modified EPA Method 8015

Boring Log and Well Construction Details - Well MW-4 (BH-F) - Shell Service Station WIC #204-5510-0600, 4255 MacArthur Boulevard, Oakland, California

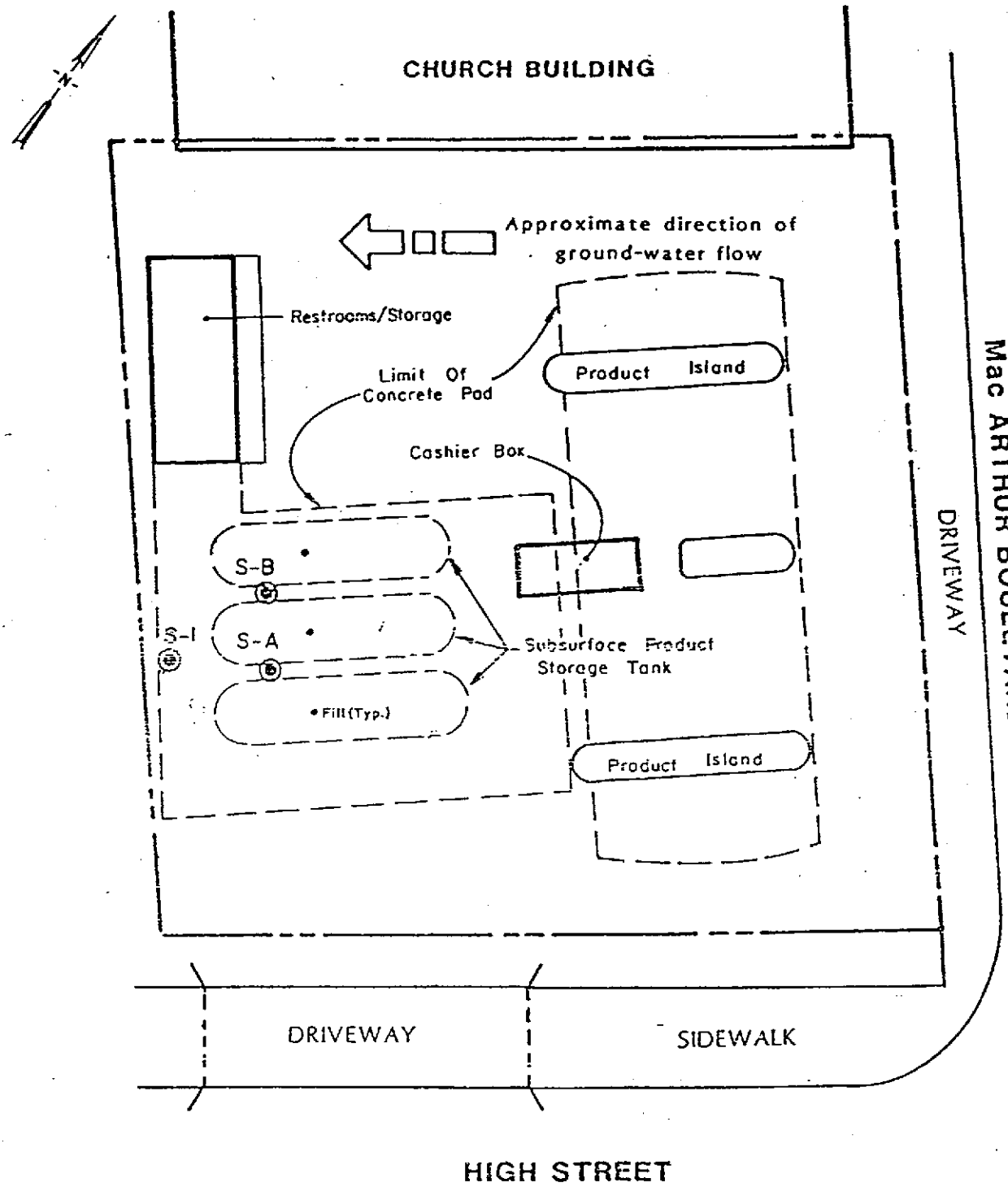
WELL MW-4 (BH-F) (cont.)



DESCRIPTION

30% clay; 70% medium to very coarse sand, saturated

Boring Log and Well Construction Details - Well MW-4 (BH-F) - Shell Service Station WIC #204-5510-0600, 4255 MacArthur Boulevard, Oakland, California



Approximate Scale: 1" = 20'

LEGEND

◉ Monitoring well location

EMCON Associates
San Jose, California

GETTLER-RYAN, INC.
SUBSURFACE HYDROGEOLOGIC INVESTIGATION
SHELL STATION, MacARTHUR & HIGH STREET
OAKLAND, CALIFORNIA

MONITORING WELL LOCATION MAP

FIGURE 1

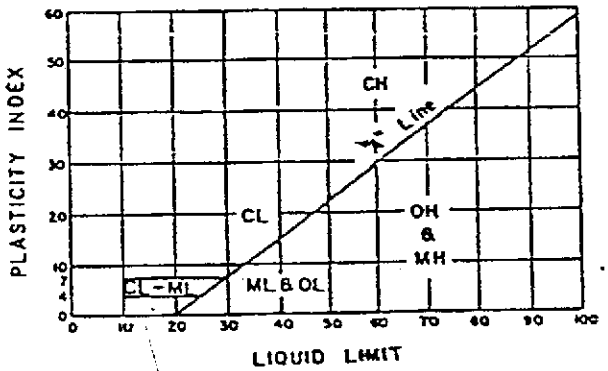
PROJECT NO. 738-02.01

MAJOR DIVISIONS		SYMBOLS	TYPICAL SOIL DESCRIPTIONS
COARSE GRAINED SOILS (More than 1/2 of soil) no. 200 sieve size)	GRAVELS (More than 1/2 of coarse fraction) no. 4 sieve size)	GW	Well graded gravels or gravel-sand mixtures, little or no fines
		GP	Poorly graded gravels or gravel-sand mixtures, little or no fines
		GM	Silty gravels, gravel-sand-silt mixtures
		GC	Clayey gravels, gravel-sand-clay mixtures
	SANDS (More than 1/2 of coarse fraction < no. 4 sieve size)	SW	Well graded sands or gravelly sands, little or no fines
		SP	Poorly graded sands or gravelly sands, little or no fines
		SM	Silty sands, sand-silt mixtures
		SC	Clayey sands, sand-clay mixtures
FINE GRAINED SOILS (More than 1/2 of soil < no. 200 sieve size)	SILTS & CLAYS LL < 50	ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity
		CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays
		OL	Organic silts and organic silty clays of low plasticity
	SILTS & CLAYS LL > 50	MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts
		CH	Inorganic clays of high plasticity, fat clays
		OH	Organic clays of medium to high plasticity, organic silty clays, organic silts
HIGHLY ORGANIC SOILS		Pt	Peat and other highly organic soils

CLASSIFICATION CHART
(Unified Soil Classification System)

CLASSIFICATION	RANGE OF GRAIN SIZES	
	U.S. Standard Sieve Size	Grain Size in Millimeters
BOULDERS	Above 12"	Above 305
COBBLES	12" to 3"	305 to 76.2
GRAVEL	3" to No. 4	76.2 to 4.76
coarse	3" to 3/4"	76.2 to 19.1
fine	3/4" to No. 4	19.1 to 4.76
SAND	No. 4 to No. 200	4.76 to 0.074
coarse	No. 4 to No. 10	4.76 to 2.00
medium	No. 10 to No. 40	2.00 to 0.420
fine	No. 40 to No. 200	0.420 to 0.074
SILT & CLAY	Below No. 200	Below 0.074

GRAIN SIZE CHART



PLASTICITY CHART

METHOD OF SOIL CLASSIFICATION

9-711

NOTES: Logs of Exploratory Borings

2.5 YR 6/2 — Denotes color as field checked to Munsell Soil Color Charts (1975 Edition)

 Denotes undisturbed sample taken in 2-inch split-spoon sampler.

 Denotes disturbed sample (bag sample).

 Denotes first observation of ground water.

 Denotes static ground-water level.

Penetration — Sample drive hammer weight - 140 pounds, drop - 30 inches. Blows required to drive sampler 1 foot are indicated on the logs.

LOG OF EXPLORATORY BORING

PROJECT NUMBER 738-02.01 BORING NO. S-A

PROJECT NAME Gettler-Ryan, Shell, High and MacArthur PAGE 1 OF 1

BY JB DATE 6/10/85 SURFACE ELEV.

TORVANE (TSF)	POCKET PENETROMETER (TSF)	PENETRATION (Blows/Ft.)	GROUND WATER LEVELS	DEPTH IN FT.	SAMPLES	LITHOGRAPHIC COLUMN	DESCRIPTION
				0		GW FILL	CONCRETE GRAVEL; Fill; brown (10YR, 5/3); coarse gravel, 10-20% sand; strong product odor
				5	1	SW FILL	SAND; Fill; brown (10YR, 5/3); fine to coarse sand; loose; moist; strong product odor.
						CL FILL	CLAY; Fill; yellowish brown (10YR, 5/4); 30-40% fine to medium sand; moist; strong product odor.
	2.25	29		10	2		
	3.25	35			3	CL	CLAY; yellowish brown (10YR, 5/4); trace sand; very stiff; no product odor.
					4		@14': yellowish brown (10YR, 5/6); interbedded clay and sandy clay
	2.5	63		15			
							@19': blue-green; 5-10% fine to coarse gravel; trace fine sand; hard; moist; no product odor
	2.5	60	▽	20			HOLE TERMINATED at 20 feet SUFFICIENT INFORMATION OBTAINED.

REMARKS Drilled by 8-inch continuous flight hollow stem auger

Backfilled with soil cuttings to 0.5 feet, cement to 0 feet.

emcon ASSOCIATES

PLATE A

LOG OF EXPLORATORY BORING

PROJECT NUMBER 738-02.01 BORING NO. S-B

PROJECT NAME Gettler-Ryan, Shell, High and MacArthur PAGE 1 OF 1

BY JB DATE 6/10/85 SURFACE ELEV.

TORVANE (TSF)	POCKET PENETROMETER (TSF)	PENETRATION (Blows/Ft.)	GROUND WATER LEVELS	DEPTH IN FT.	SAMPLES	LITHOGRAPHIC COLUMN	DESCRIPTION
				0		CL FILL	CONCRETE CLAY; Fill; dark grayish brown (2.5Y, 4/2); 10-20% fine to coarse gravel; trace fine sand; strong product odor.
				5			
				10		CL	@10': olive (5Y, 5/3); trace fine to medium sand; firm; moist; slight product odor. CLAY; light olive brown (2.5Y, 5/4); 10-15% fine to medium sand; 15% fine gravel; silty; hard; moist; no product odor.
	5	43			1		
				15			
	2.5	56	▽		2		@18.5': blue-green; very silty; 5-10% fine gravel; trace fine sand; hard; moist no product odor.
				20			HOLE TERMINATED at 30 feet; SUFFICIENT INFORMATION OBTAINED

REMARKS

Drilled by 8-inch continuous flight hollow-stem auger.
Backfilled with soil cuttings to 0.5 feet, cement to 0 feet.

emkon ASSOCIATES

LOG OF EXPLORATORY BORING

PROJECT NUMBER 738-02.01 BORING NO. S-1

PROJECT NAME Gettler-Ryan, Shell, High and MacArthur PAGE 1 OF 1

BY JB DATE 6/10/85 SURFACE ELEV.

TORVANE (TSF)	POCKET PENETROMETER (TSF)	PENETRATION (Blows/Ft.)	GROUND WATER LEVELS	DEPTH IN FT.	SAMPLES	LITHOGRAPHIC COLUMN	DESCRIPTION
				0			ASPHALT CLAY; Fill; slight product odor
				5		CL	CLAY; yellowish brown (10YR, 5/4); 10-20% fine to coarse gravel; trace fine sand strong product odor.
				10			
	5	34		15	1		@15': 20-25% fine to coarse sand; silty; 10-20% fine to medium gravel; hard; moist; slight product odor.
	5	38	▽	20	2		@18.5-20': greenish blue to light olive brown (2.5Y, 5/6); 10-20% fine to coarse gravel; trace fine sand; hard; moist moderate product odor.
	3.75	32		25	3		@24': grayish brown (2.5Y, 5/2); 5-10% coarse gravel; trace fine sand; very stiff; no product odor.
	4.5	30		30	4		@29': yellowish brown (10YR, 5/4) silty; 10-15% fine to medium sand; very stiff; moist; no product odor.
				35			HOLE TERMINATED at 30 feet: SUFFICIENT INFORMATION OBTAINED.
				40			

REMARKS Drilled by 8-inch continuous flight hollow stem auger
Converted to 3-inch monitoring well, detailed on Plate D.

emcon ASSOCIATES

PLATE C

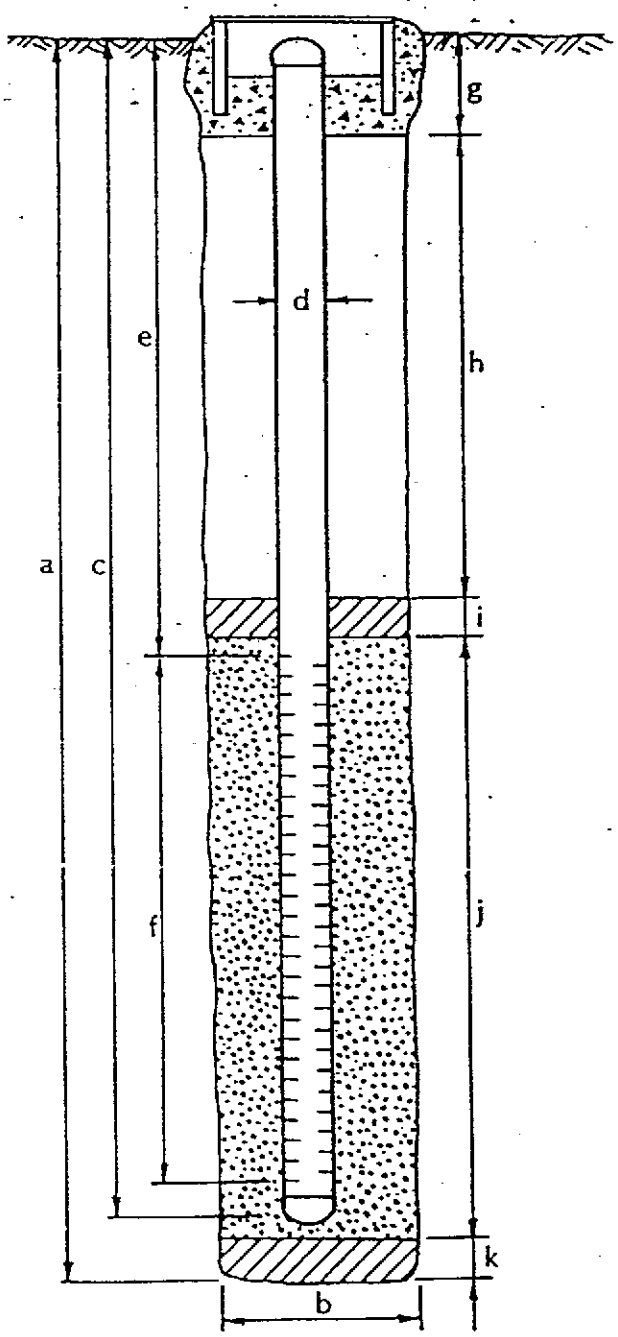
WELL DETAILS

EMCON ASSOCIATES

PROJECT NUMBER 738-02.01
PROJECT NAME Gettler-Ryan, Shell
COUNTY Alameda
WELL PERMIT NO.

BORING / WELL NO. S-1
TOP OF CASING ELEV.
GROUND SURFACE ELEV.
DATUM

G-5 vault box (Std.)



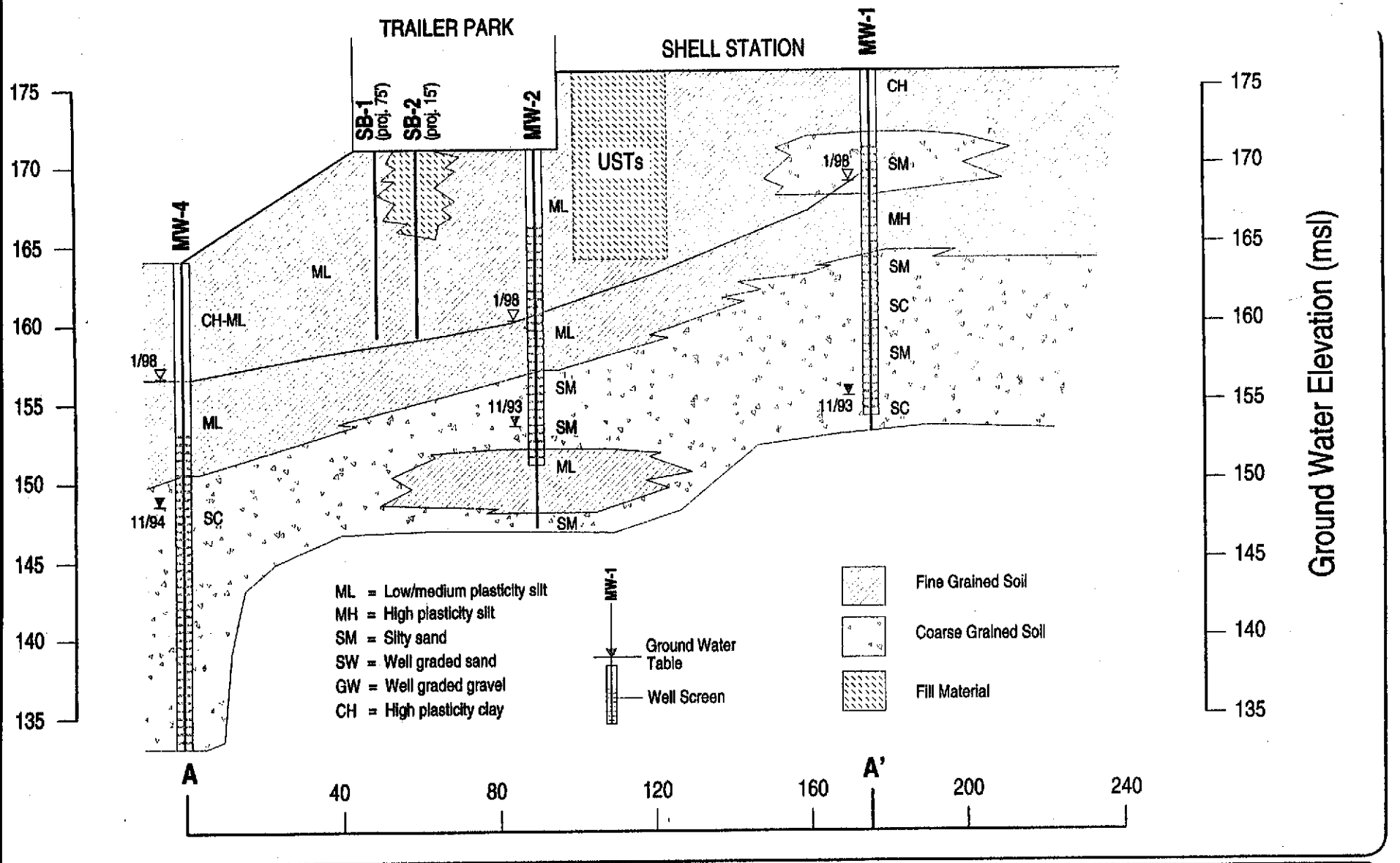
EXPLORATORY BORING

a. Total depth 30 ft.
b. Diameter 8 in.
Drilling method Hollow-Stem Auger

WELL CONSTRUCTION

c. Casing length 29 ft.
Material Schedule 40 PVC
d. Diameter 3 in.
e. Depth to top perforations 18 ft.
f. Perforated length 11 ft.
Perforated interval from 18 to 29 ft.
Perforation type Slotted Screen
Perforation size 0.020 inch
g. Surface seal 4.5 ft.
Seal material Cement
h. Backfill - ft.
Backfill material Included in g.
i. Seal 0.5 ft.
Seal material Bentonite
j. Gravel pack (5 to 29 ft.) 24 ft.
Pack material 6 x 12 Monterey Sand
k. Bottom seal 1 ft.
Seal material Compacted Clay

PLATE



CAMBRIA
Environmental Technology, Inc.

Shell Service Station
4255 MacArthur Boulevard
Oakland, California

G:\OAK4255\FIGURES\CRSS-SEC.DWG

Cross Section A - A'

FIGURE
2

1/09/98

ATTACHMENT D

Department of Water Resources Well Completion Reports

01-1292 134-B

Job #1607. Mills College, Oakland.
Well

LOG OF WELL.

Yellow cementy clay			20	feet
Loose gravel, some water	20	to	24	"
Yellow cementy gravel	24	"	36	"
Blue cementy gravel	36	"	44	"
Yellow cementy gravel	44	"	52	"
Yellow gravel	52	"	72	"
Cementy gravel, yellow	72	"	84	"
Yellow clay with gravel	84	"	120	"
Blue clay	120	"	138	"
Yellow clay with gravel	138	"	140	"
Sticky yellow clay	140	"	180	"
Red clay with gravel, (Dry)	180	"	188	"
Yellow sandy clay	188	"	213	"
Yellow cement gravel	213	"	224	"
Hard cement gravel, dry	224	"	232	"
Yellow sandy clay	232	"	288	"
Yellow sandy clay with gravel, dry	288	"	330	"
Brown sticky clay	330	"	347	"
Brown cement gravel	347	"	352	"

352 feet of 12" No. 12 Red Hard Double Steel Casing including Starter 20 feet long with No. 10 Shoe. 30 feet of machine perforations.

Extra perforations	24'	to	42'
" "	42	"	70
" "	70	"	100

Final cleaning of well to 338 ft

01-1291 2-1314-3

Kiva Well, Mills College.
Bored by H. W. Norman,
Foreman, John Reiber.

LOG OF WELL.

Dark soil			8 feet
Cement gravel	8	to 25	"
Loose rock & gravel	25	" 50	"
Yellow clay	50	" 80	"
Gray clay	80	" 98	"
Cement gravel	98	"115	"
Yellow clay	115	"125	"
Cement gravel	125	"135	"
Water gravel	135	"145	"
Red cement gravel	145	"165	"
Yellow clay	165	"175	"
Cement gravel	175	"200	"
Yellow clay	200	"214	"
Water gravel	214	"220	"
Sandy clay	220	"240	"
Fine sand	240	"250	"
Yellow sandy clay	250	"280	"
Cement gravel	280	"306	"
Fine sand & water gravel	306	"319	"
Yellow clay	319	"338	"
Sand & gravel	338	"351	"
Yellow clay	351	"354	"—

237 ft. 12" No. 12 R. H. Double casing, including starter and shoe. 126 ft. 10" No. 14 R. H. Dbl. Casing inc. Shoe
42 feet of machine perforations, 10" Casing.
Perforated 25' to 51' - 12" Casing.
" 80' " 90' - 12" "
" 125' " 145' - 12" "
" 197' " 237' - 12" "

Work done by H. W. Norman, Cut-Rate Well Borer,
I WILL SAVE YOU MONEY.

Job #1218. Mills College.

01-1290

25/3W-3

LOG OF WELL.

Soil & a little rock			10 feet
Brown clay	10	to 19	"
Yellow clay	19	" 32	"
Hard cement gravel	32	" 39	"
Hard yellow clay	39	" 48	"
Hard yellow clay & rock	48	" 61	"
Hard yellow clay & grit (Small layer of gravel at 95')	61	" 95	"
Hard yellow clay & grit	95	" 127	"
Cement gravel	127	" 128	"
Hard yellow clay & grit	128	" 200	"
Sandy formation	200	" 202	"
Hard yellow clay	202	" 206	"
Hard sandy formation	206	" 218	"
Sand	218	" 242	"
Yellow clay, rock & gravel	242	" 255	"
Gravel	255	" 261	"
Hard yellow clay	261	" 262	"
Gravel	262	" 266	"
Hard yellow clay	266	" 279	"
Sandy clay	279	" 288	"
Sand	288	" 293	"
Gravel	293	" 303	"
Yellow clay	303	" 324	"

CASING IN WELL.

258 feet 16" No. 12 Red Hard Double Steel casing, including 30 feet of machine perforations (Chisel between 1/16" & 1/8") and 5/8" x 6" Steel Shoe.

324 feet 12" No. 12 Red Hard Double Steel Casing, including 30 feet of machine perforations (Chisel between 1/16" & 1/8") and 5/8" x 6" Steel Shoe.

Work done by J. M. Ough,
1201 - East Twelfth Street,
Oakland, California.

Foreman, William Kessler.

Well finished April 11 - 1930.

324' - 12" No 12 Double Casing

258' - 16" No 12 Double Casing

1 inch = 27' Approx.

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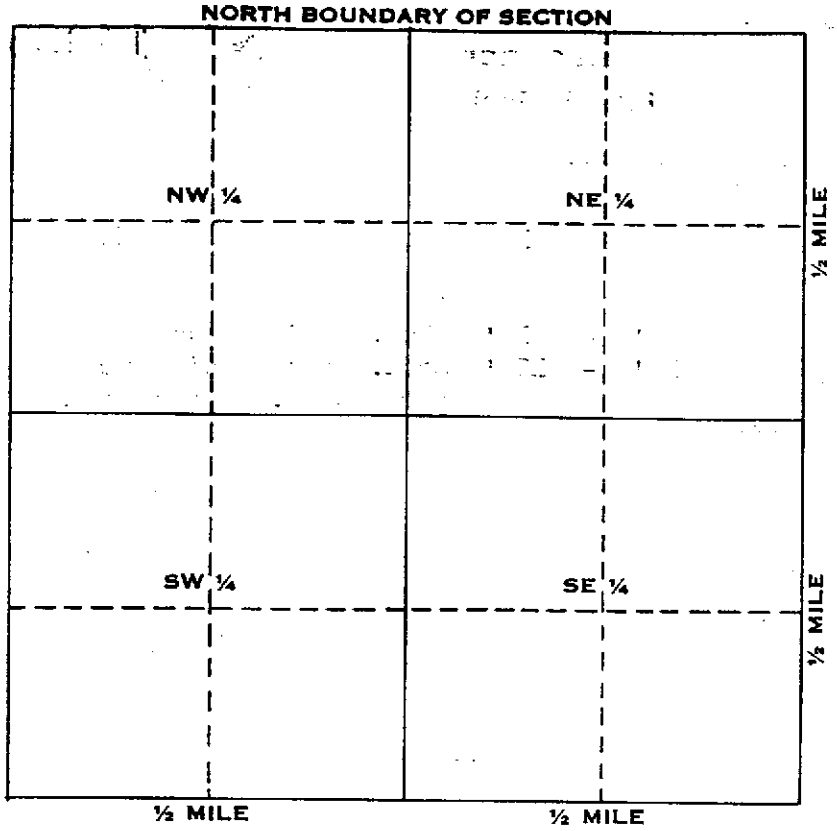
STATE OF CALIFORNIA DWR
WELL COMPLETION REPORT
(WELL LOGS)

REMOVED

WELL LOCATION SKETCH

140357

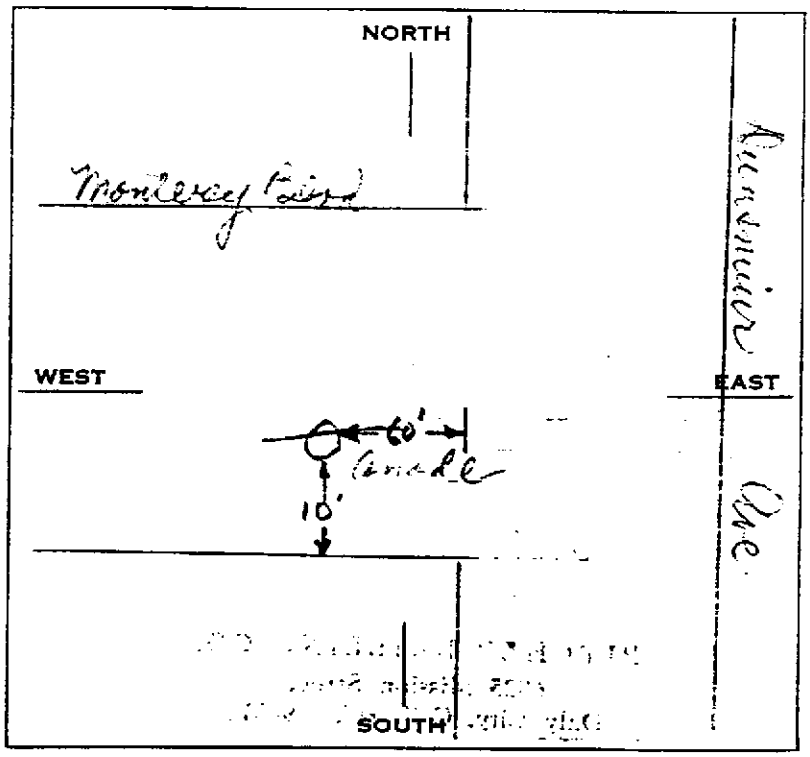


Township 1 N/S

Range 3 E/W

Section No. 33R

A. Location of well in sectionized areas.
Sketch roads, railroads, streams, or other features as necessary.



B. Location of well in areas not sectionized.
Sketch roads, railroads, streams, or other features as necessary.
Indicate distances.

DEPT. OF WATER RESOURCES
1976 SEP 2 PM 1 31

RECEIVED
JUL 15 1976
COUNTY OF ALAMEDA
PUBLIC WORKS
DEPARTMENT

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STATE OF CALIFORNIA DWR
WELL COMPLETION REPORT
(WELL LOGS)

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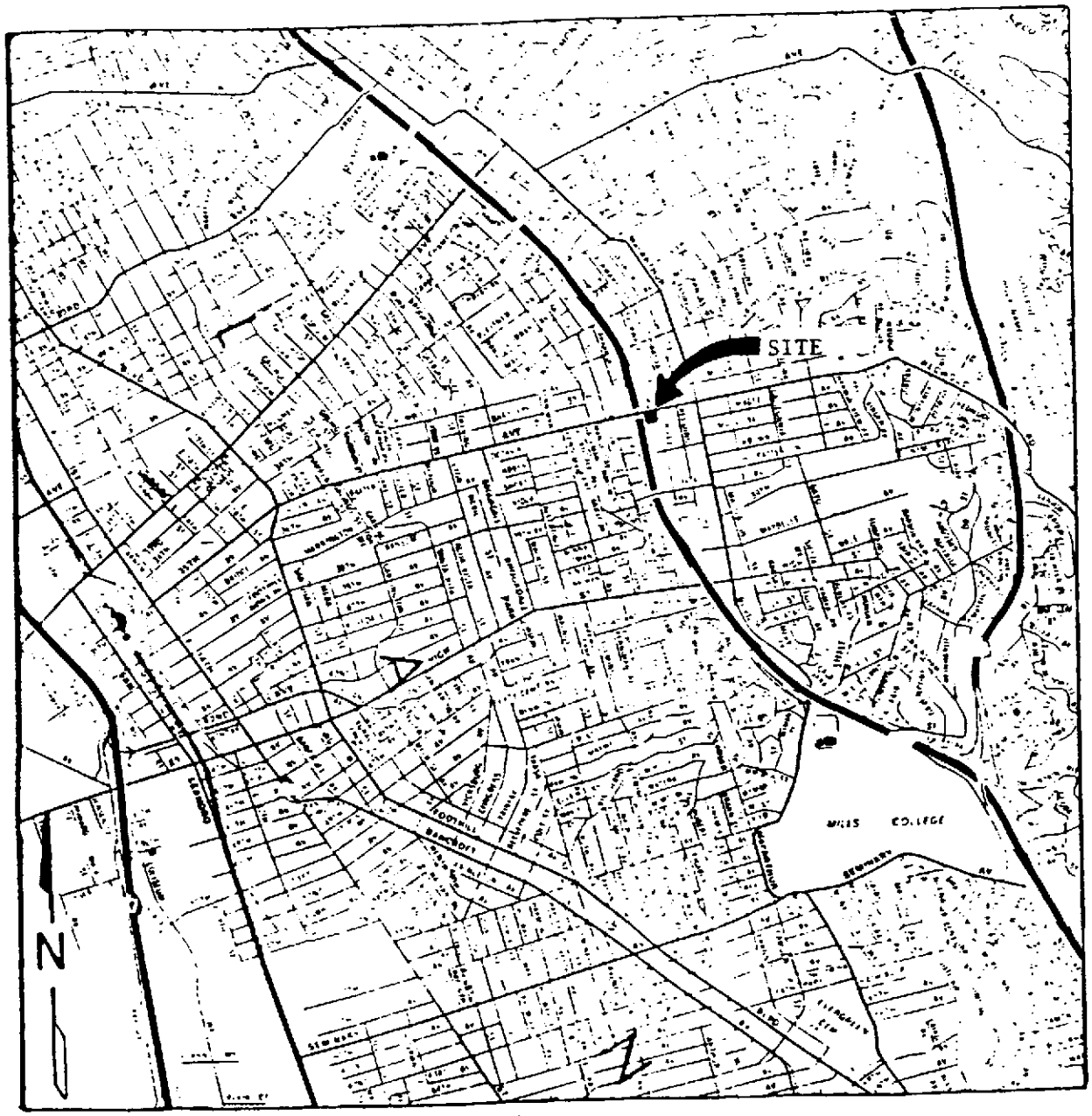
308373A-C

KAPREALIAN ENGINEERING, INC.

Consulting Engineers

P.O. BOX 996 • BENICIA, CA 94510

(707) 746-6915 • (707) 746-6916 • FAX: (707) 746-5581



LOCATION MAP

Unocal Service Station #6129
3420 - 35th Avenue
Oakland, California

2S/3W4C4

308373A

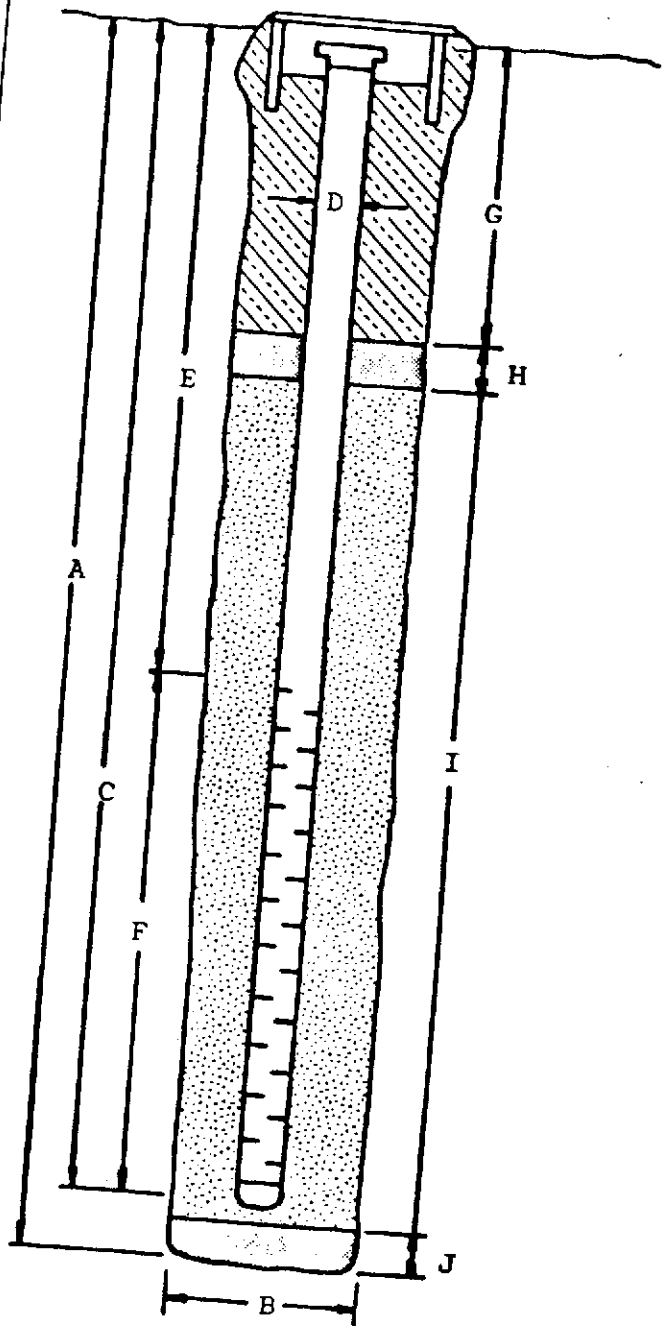
WELL COMPLETION DIAGRAM

PROJECT NAME: Unocal - Oakland - 35th Avenue BORING/WELL NO. MW1

PROJECT NUMBER: KEI-P89-0902

WELL PERMIT NO.: 89689

Flush-mounted Well Cover



A. Total Depth: 44'

B. Boring Diameter*: 9"

Drilling Method: Hollow Stem Auger

C. Casing Length: 44'

Material: Schedule 40 PVC

D. Casing Diameter: OD = 2.375"

ID = 2.067"

E. Depth to Perforations: 24'

F. Perforated Length: 20'

Perforation Type: Machined Slot

Perforation Size: 0.020"

G. Surface Seal: 20'

Seal Material: Concrete

H. Seal: 2'

Seal Material: Bentonite

I. Gravel Pack: 22'

Pack Material: RMC Lonestar Sand

Size: #3

J. Bottom Seal: None

Seal Material: N/A

*Boring diameter can vary from 8-1/4" to 9" depending on bit ...

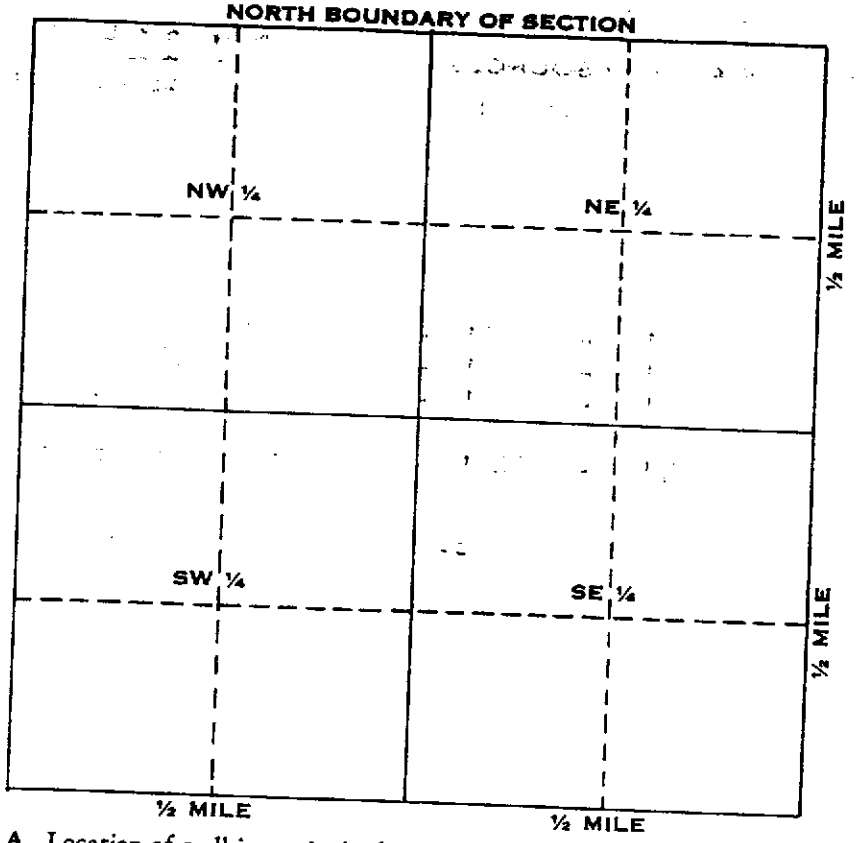
CONFIDENTIAL

STATE OF CALIFORNIA DWR
WELL COMPLETION REPORT
(WELL LOGS)

REMOVED

WELL LOCATION SKETCH

115706

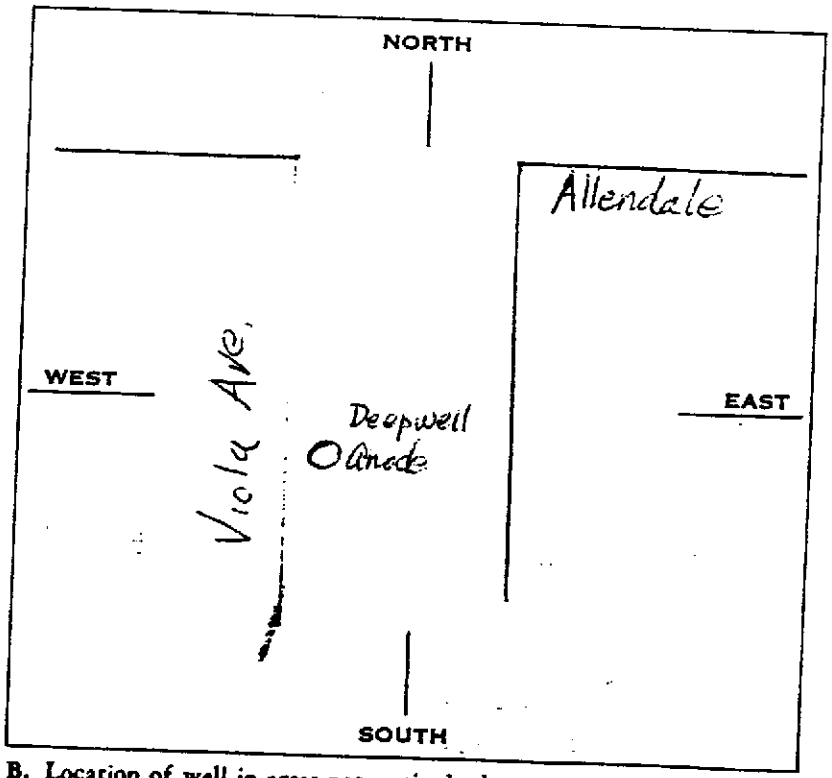


Township _____ N/S

Range _____ E/W

Section No. _____

A. Location of well in sectionized areas.
Sketch roads, railroads, streams, or other features as necessary.



B. Location of well in areas not sectionized.
Sketch roads, railroads, streams, or other features as necessary.
Indicate distances.

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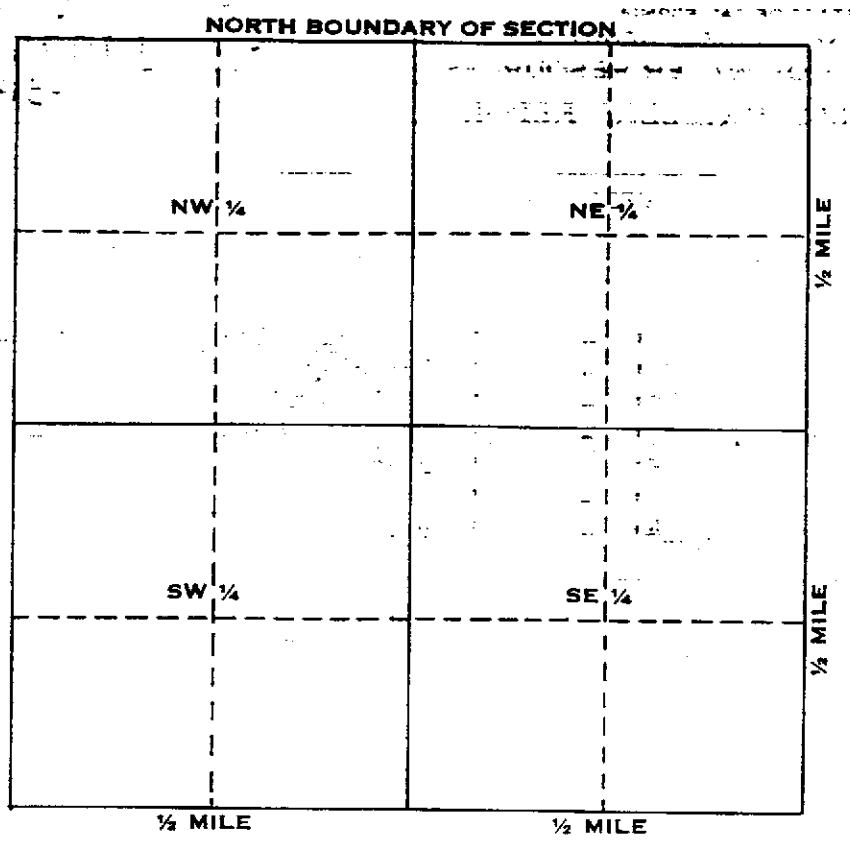
STATE OF CALIFORNIA DWR
WELL COMPLETION REPORT
(WELL LOGS)

REMOVED

WELL LOCATION SKETCH

1403564

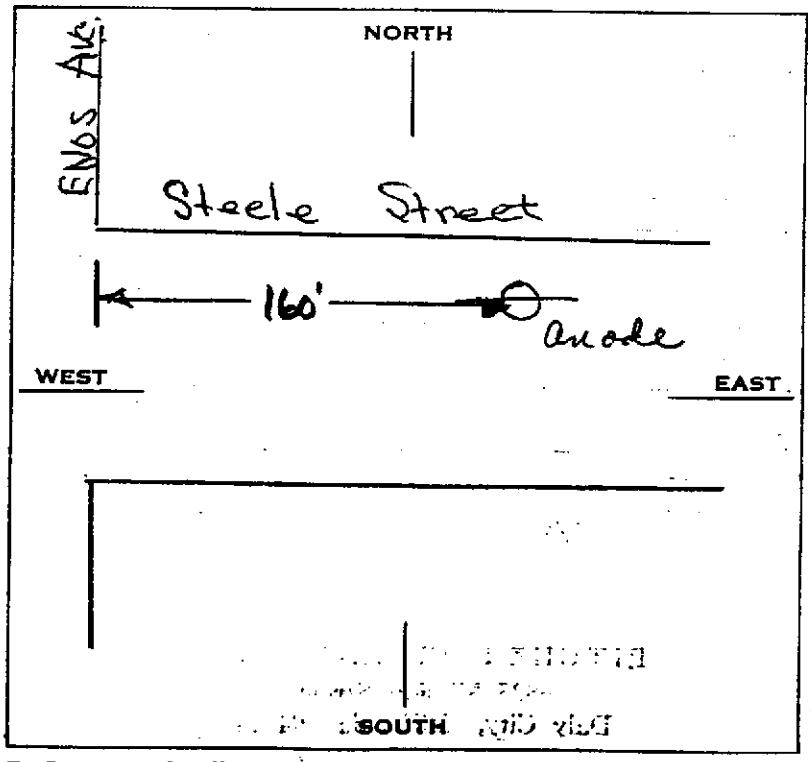


Township 2 N/S

Range 3 E/W

Section No. 3E

A. Location of well in sectionized areas.
Sketch roads, railroads, streams, or other features as necessary.



B. Location of well in areas not sectionized.
Sketch roads, railroads, streams, or other features as necessary.
Indicate distances.

1976 SEP 2 PM 1 28

DEPT OF WATER RESOURCES

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DEPARTMENT

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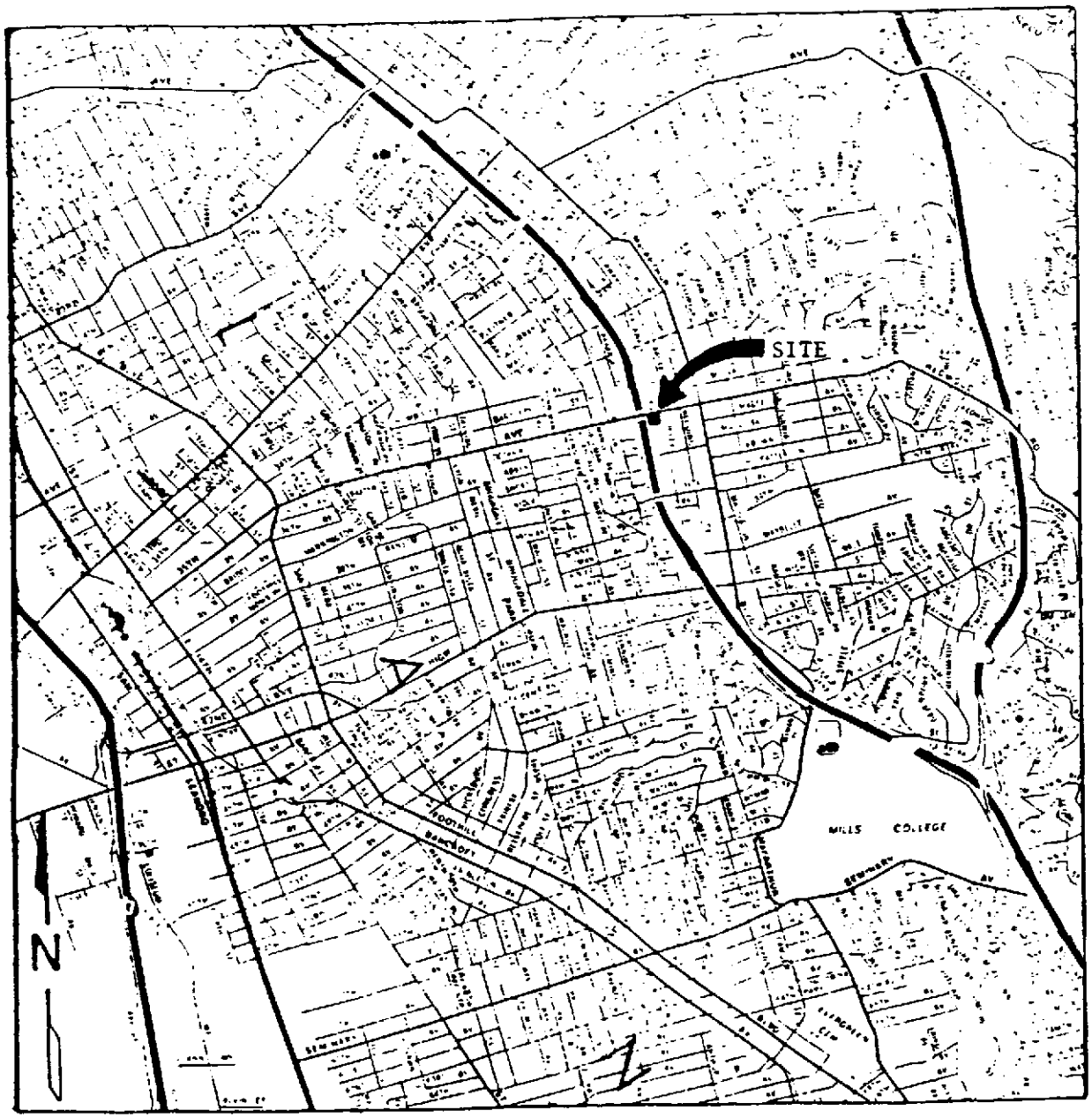

LOCATION MAP

Unocal Service Station #6129
3420 - 35th Avenue
Oakland, California

308373A-

KAPREALIAN ENGINEERING, INC.

Consulting Engineers

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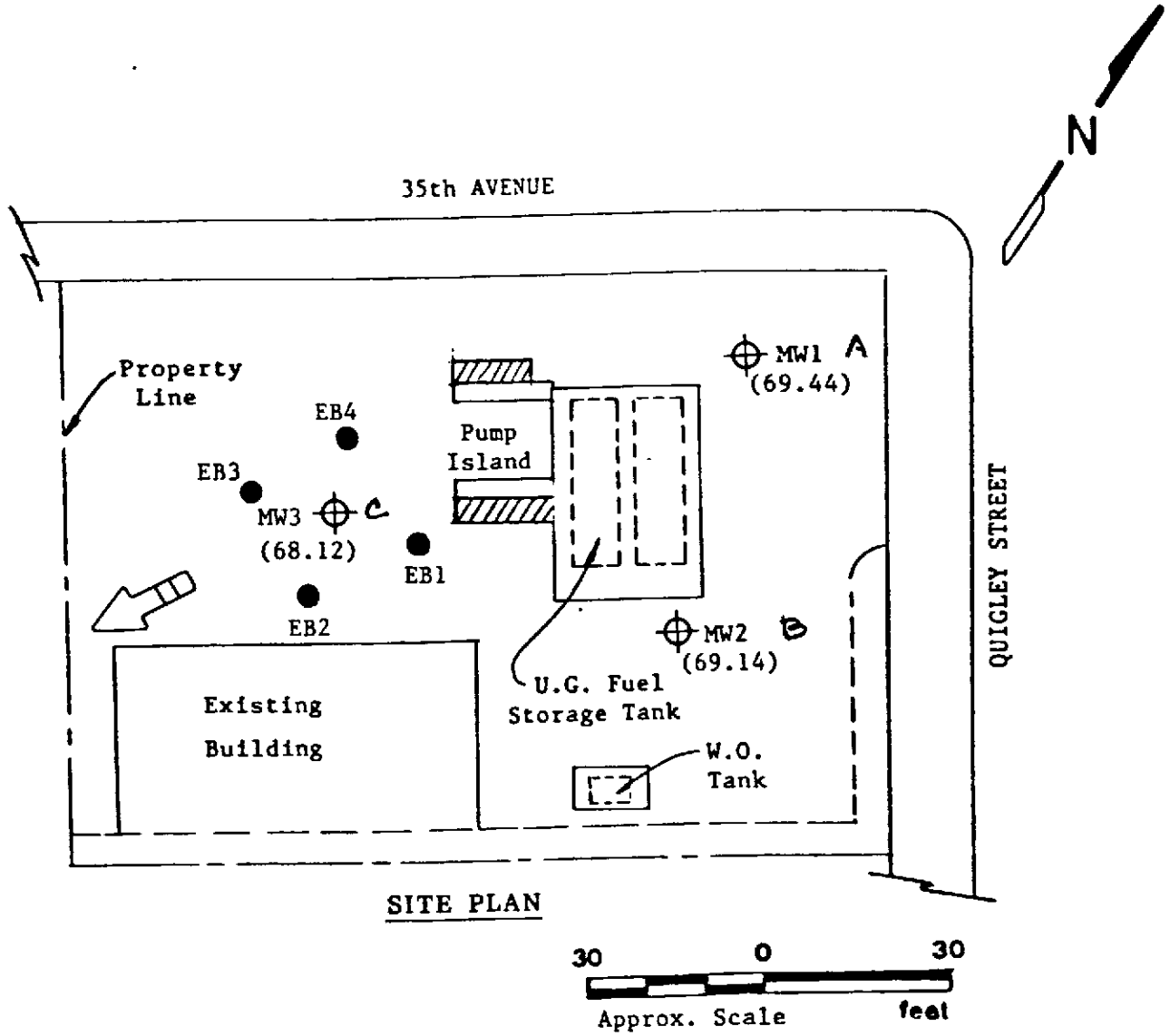

SITE PLAN

LEGEND

- ● Exploratory Boring (Proposed)
- ⊕ Monitoring Well
- ( ) Water table elevation in feet on 1/5/90. Top of MW3 well cover assumed 100.00 feet as datum.
- ⇨ Direction of ground water flow.

Unocal Service Station #6129
3420 - 35th Avenue
Oakland, California

25/3W-4C4

BORING LOG

308373A

Project No. KEI-P89-0902	Boring & Casing Diameter 9" 2"	Logged By D.L.
Project Name Unocal Oakland - 35th Ave.	Well Head Elevation N/A	Date Drilled 12/12/89
Boring No. MW1	Drilling Method Hollow-stem Auger	Drilling Company EGI

Penetration blows/6"	G. W. level	Depth (ft) Samples	Stratigraphy USCS	Description
		0		A.C. Pavement Clay, sand and gravel: fill; large chert boulder at 6", dark yellowish brown.
5/7/11		5	CH	Clay, high plasticity, with gravel, 5% sand, stiff, moist, dark yellowish brown.
11/15/30		10	GC/ CH	Clayey gravel, 5-10% sand, dense, moist, dark yellowish brown, lensed with gravelly clay and clay, high plasticity, very stiff, moist, dark yellowish brown, gravel to 3/4".
18/30/48		15	GC	Clayey gravel with sand, 15-35% clay, very dense, slightly moist to wet, dark yellowish brown, gravel to 1".
18/29		20		Color change at 20 feet to dark brown.

25/3N 4E4

BORING LOG

308373A

Project No. KEI-P89-0902	**Boring & Casing Diameter** 9" 2"	**Logged By** D.L.
Project Name Unocal Oakland - 35th Ave.	**Well Head Elevation** N/A	**Date Drilled** 12/12/89
Boring No. MW1	**Drilling Method** Hollow-stem Auger	**Drilling Company** EGI

Penetration blows/6"	G. W. level	Depth (ft) Samples	Stratigraphy USCS	Description
			GC	Clayey gravel with sand, as above.
16/33		25	CH	Gravelly clay, high plasticity, 10 - 15% sand, gravel to 3/4", very stiff, moist, dark yellowish brown and dark brown, mottled.
19/40		30	GC	Clayey gravel with sand, 15-30% coarse sand, very dense, moist, dark brown, gravel to 1".
26/50-5 1/2	▼	35		Clayey gravel with sand, 15-20% clay, gravel to 1 1/2", very dense, moist to wet, dark brown.
12/22		40		Clayey gravel, as above, strong brown.

25/3M 4C4

BORING LOG

308373A

Project No. KEI-P89-0902	**Boring & Casing Diameter** 9" 2"	**Logged By** D.L.
Project Name Unocal Oakland - 35th Ave.	**Well Head Elevation** N/A	**Date Drilled** 12/12/89
Boring No. MW1	**Drilling Method** Hollow-stem Auger	**Drilling Company** EGI

Penetration blows/6"	G. W. level	Depth (ft) Samples	Stratigraphy USCS	Description
			GC	Clayey gravel, as above.
		45		
		50		
		55		
		60		TOTAL DEPTH 44'

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STATE OF CALIFORNIA DWR
WELL COMPLETION REPORT
(WELL LOGS)

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2S/3W4C4

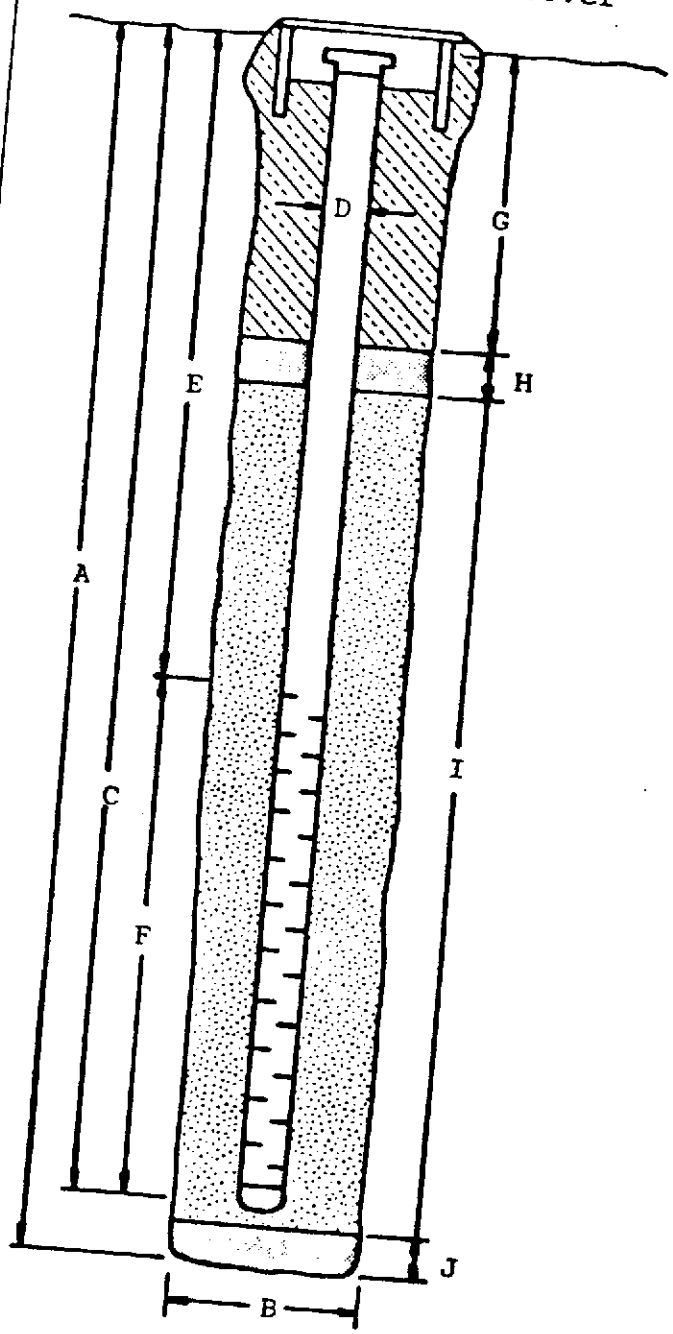
308373A

WELL COMPLETION DIAGRAM

PROJECT NAME: Unocal - Oakland - 35th Avenue BORING/WELL NO. MW1

PROJECT NUMBER: KEI-P89-0902

WELL PERMIT NO.: 89689



A. Total Depth: 44'

B. Boring Diameter*: 9"

Drilling Method: Hollow Stem Auger

C. Casing Length: 44'

Material: Schedule 40 PVC

D. Casing Diameter: OD = 2.375"

ID = 2.067"

E. Depth to Perforations: 24'

F. Perforated Length: 20'

Perforation Type: Machined Slot

Perforation Size: 0.020"

G. Surface Seal: 20'

Seal Material: Concrete

H. Seal: 2'

Seal Material: Bentonite

I. Gravel Pack: 22'

Pack Material: RMC Lonestar Sand

Size: #3

J. Bottom Seal: None

Seal Material: N/A

*Boring diameter can vary from 8-1/4" to 9" depending on bit ...

308373A-C

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Consulting Engineers
P.O. BOX 996 • BENICIA, CA 94510
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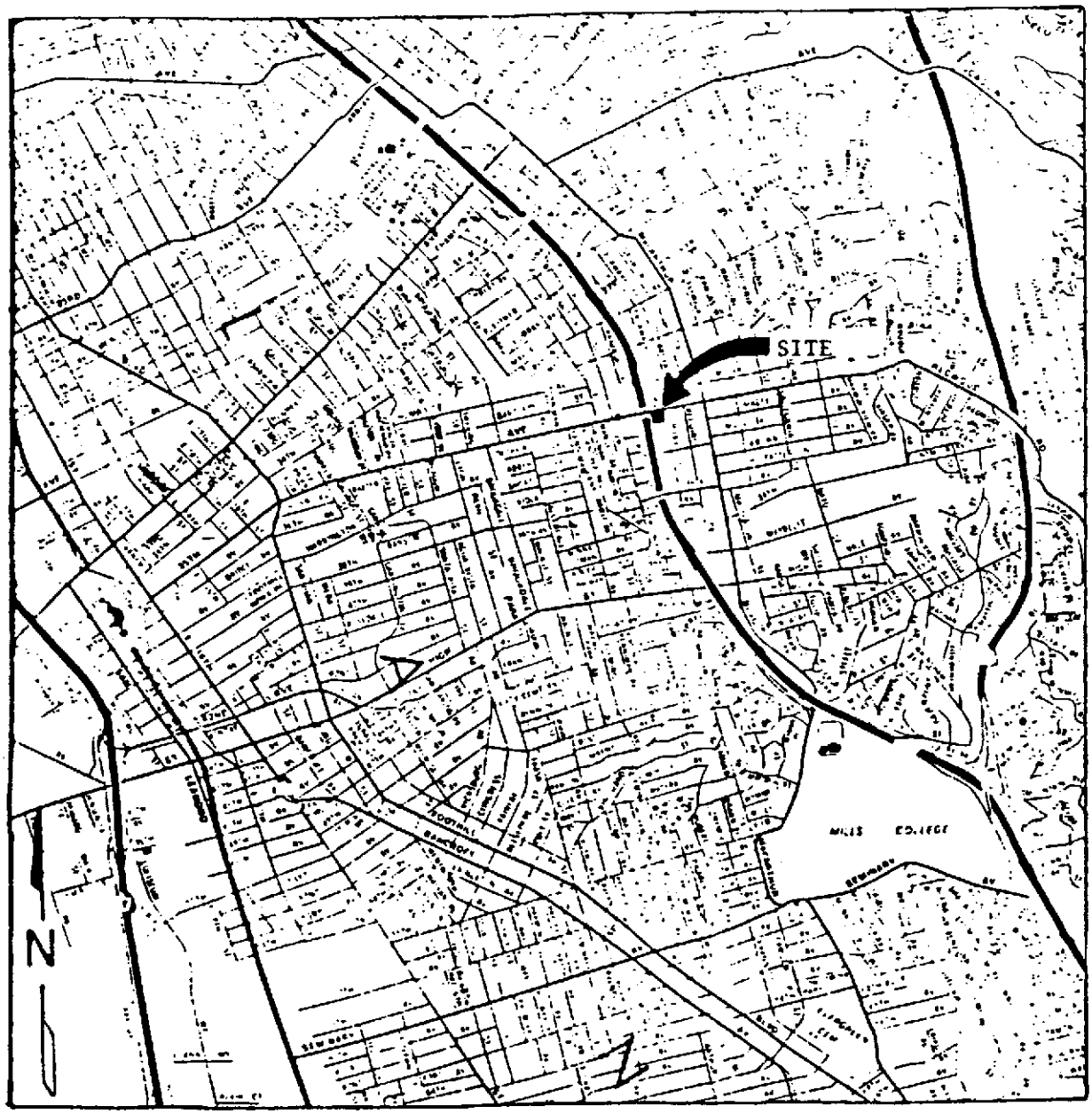

LOCATION MAP

Unocal Service Station #6129
3420 - 35th Avenue
Oakland, California

308373A-

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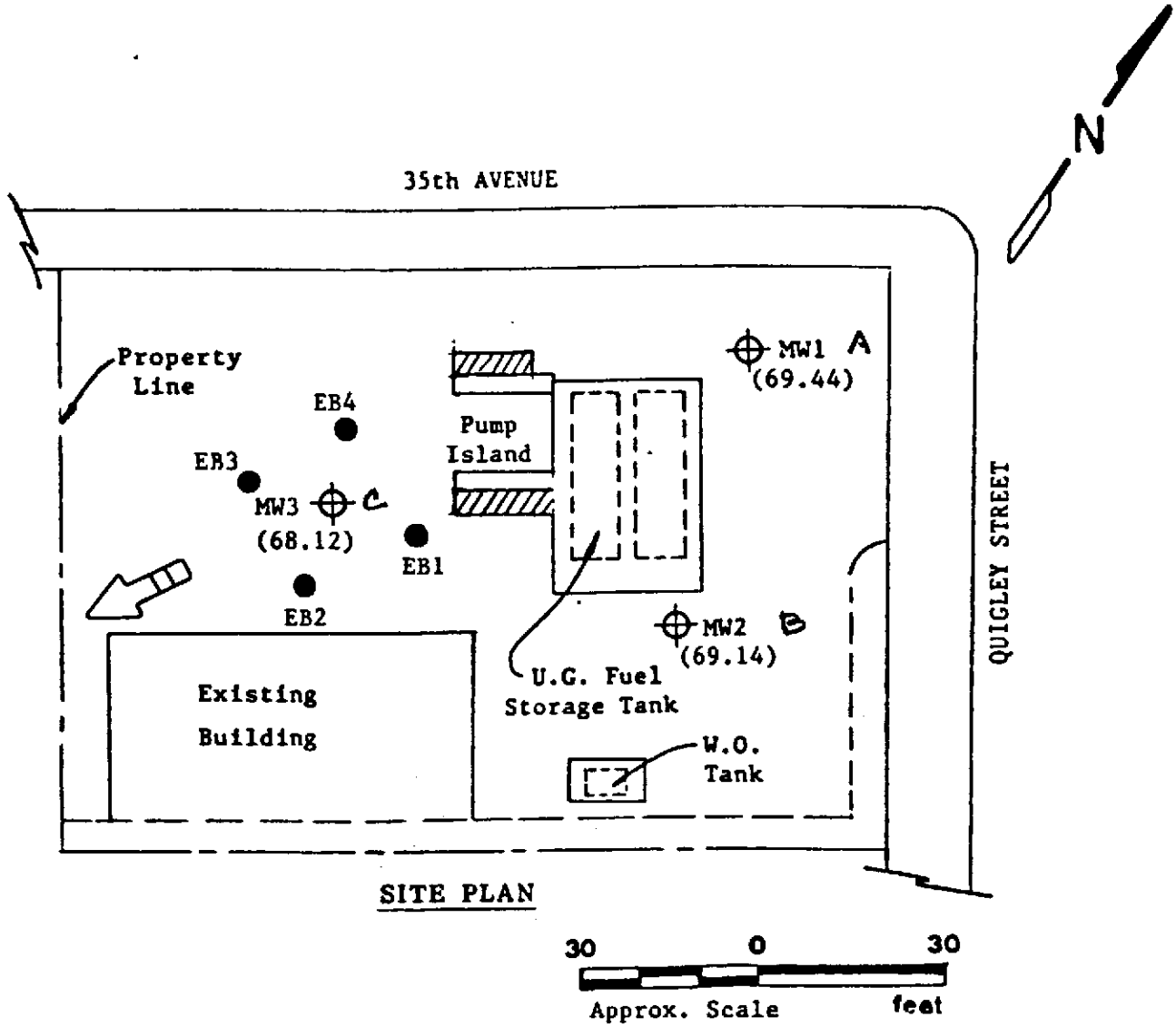


SITE PLAN

LEGEND

- ● Exploratory Boring (Proposed)
- ⊕ Monitoring Well
- ( ) Water table elevation in feet on 1/5/90. Top of MW3 well cover assumed 100.00 feet as datum.
- ⇨ Direction of ground water flow.

Unocal Service Station #6129
3420 - 35th Avenue
Oakland, California

2:3M-405

368373B

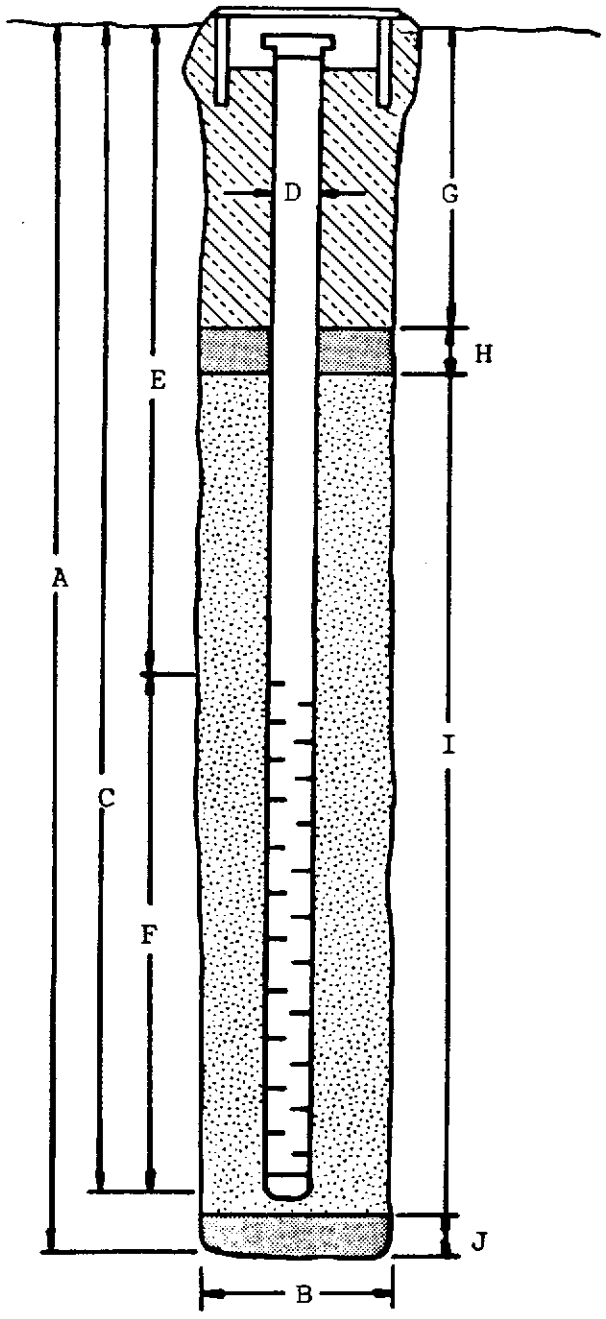
WELL COMPLETION DIAGRAM

PROJECT NAME: Unocal - Oakland - 35th Avenue BORING/WELL NO. MW2

PROJECT NUMBER: KEI-P89-0902

WELL PERMIT NO.: 89689

Flush-mounted Well Cover



A. Total Depth: 44'

B. Boring Diameter*: 9"

Drilling Method: Hollow Stem Auger

C. Casing Length: 44'

Material: Schedule 40 PVC

D. Casing Diameter: OD = 2.375"

ID = 2.067"

E. Depth to Perforations: 24'

F. Perforated Length: 20'

Perforation Type: Machined Slot

Perforation Size: 0.020"

G. Surface Seal: 20'

Seal Material: Concrete

H. Seal: 2'

Seal Material: Bentonite

I. Gravel Pack: 22'

Pack Material: RMC Lonestar Sand

Size: #3

J. Bottom Seal: None

Seal Material: N/A

*Boring diameter can vary from 8-1/4" to 9" depending on bit wear.

2S/3W-16C5

BORING LOG

308373B

Project No. KEI-P89-0902	**Boring & Casing Diameter** 9" 2"	**Logged By** D.L. Dan Bauer CEG 1310
Project Name Unocal Oakland - 35th Ave.	**Well Head Elevation** N/A	**Date Drilled** 12/12/89
Boring No. MW2	**Drilling Method** Hollow-stem Auger	**Drilling Company** EGI

Penetration blows/6"	G. W. level	Depth (ft) Samples	Stratigraphy USCS	Description
		0	GC	A.C. Pavement Well graded gravel with clay, 10-15% sand, very dense, moist, yellowish brown to dark yellowish brown, gravel to 5", sand content decreases with depth.
10/15/16		5		Clayey gravel, 25-45% clay, 10-15% sand, very dense, very moist, dark yellowish brown, gravel to 1".
13/36/ 50-5"				
29/39/40		10	GC/ CH	Clayey gravel, as above, lensed with gravelly clay, same.
27/38/ 50-5"			GC	Color change at 12 feet, dark yellowish brown and strong brown, mottled.
37/50- 5 1/2		15		Color change at 14 feet to dark yellowish brown.
27/37/47				Clayey gravel with sand, very dense, slightly moist to moist, dark yellowish brown, gravel to 1 1/2".
16/30/39		20		Clayey gravel, very dense, moist, dark brown.

2S/3W-4C5

BORING LOG

308373B

Project No. KEI-P89-0902	Boring & Casing Diameter 9" 2"	Logged By D.L.
Project Name Unocal Oakland - 35th Ave.	Well Head Elevation N/A	Date Drilled 12/12/89
Boring No. MW2	Drilling Method Hollow-stem Auger	Drilling Company EGI

Penetration blows/6"	G. W. level	Depth (ft) Samples	Stratigraphy USCS	Description
30/50			GC	Clayey gravel to gravelly clay, very dense, moist, dark brown, clay is high plasticity, very stiff.
25/34/50-6"		25	GW-GC	Well graded gravel with clay and sand, 25-35% coarse sand, very dense, moist, dark brown.
15/20/33			CH	Sandy clay, high plasticity, 5-10% sand, very stiff, moist, dark brown to dark reddish brown.
16/22/35		30	GC	Clayey gravel with sand, gravel to 1", 15-30% sand, very dense, moist, dark brown.
13/24/48				
27/37/40			GW-GC	Well graded gravel with clay and sand, gravel to 2".
40/25/34	▼	35		
			CH	Sandy clay, high plasticity, with gravel, very stiff, moist, dark brown 15-30% gravel to 5/8".
19/22/32		40		

2S/3W 4C5

BORING LOG

3083738

Project No. KEI-P89-0902	Boring & Casing Diameter 9" 2"	Logged By D.L.
Project Name Unocal Oakland - 35th Ave.	Well Head Elevation N/A	Date Drilled 12/12/89
Boring No. MW2	Drilling Method Hollow-stem Auger	Drilling Company EGI

Penetration blows/6"	G. W. level	Depth (ft) Samples	Stratigraphy USCS	Description
17/24/25		45 50 55 60	CH	Sandy clay as above.
				Gravelly clay, high plasticity, with sand, very stiff, moist, dark brown, gravel to 5/8".
				TOTAL DEPTH 44'

CONFIDENTIAL

STATE OF CALIFORNIA DWR
WELL COMPLETION REPORT
(WELL LOGS)

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KAPREALIAN ENGINEERING, INC.

Consulting Engineers

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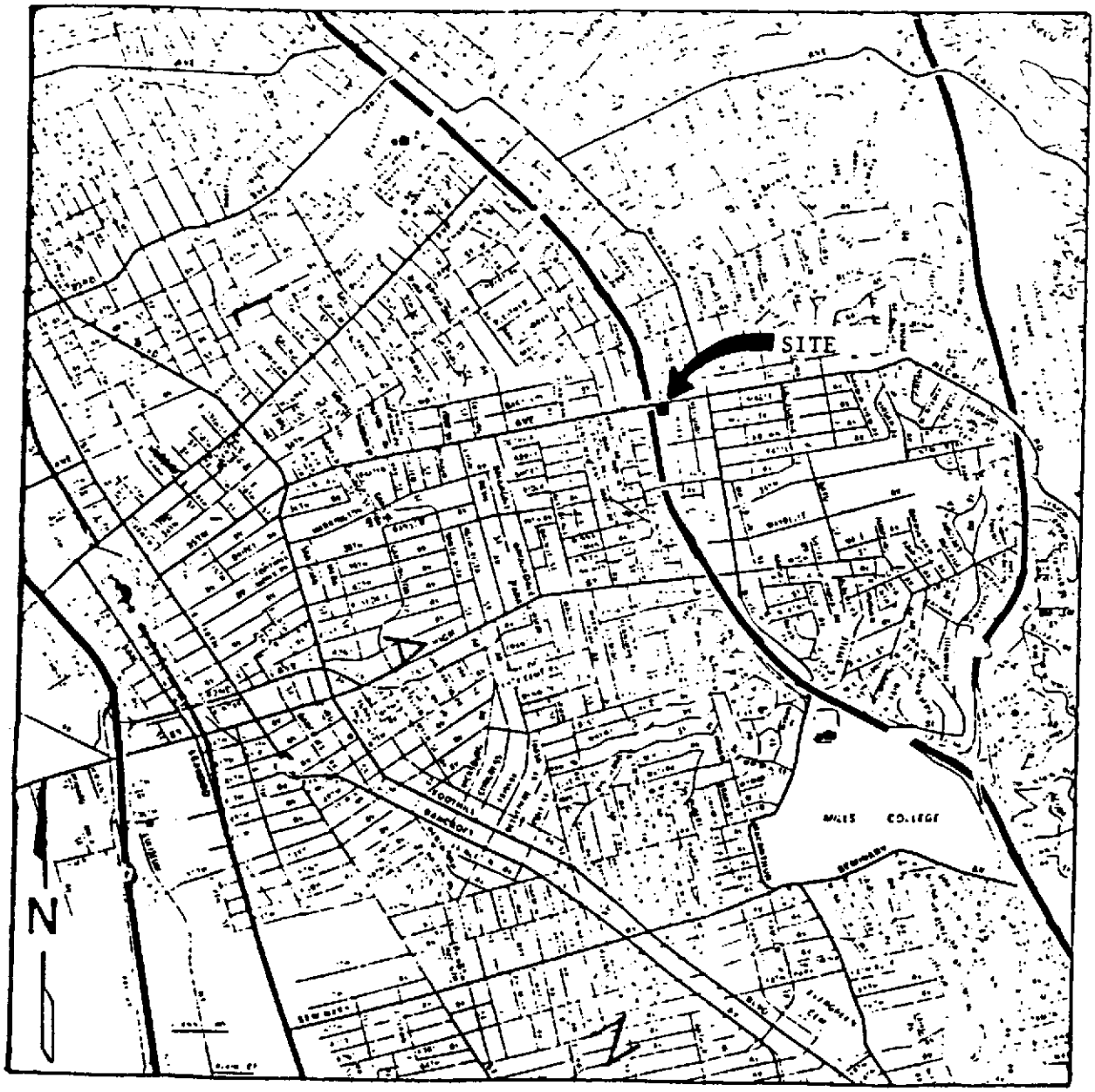

LOCATION MAP

Unocal Service Station #6129
3420 - 35th Avenue
Oakland, California

308373A-

KAPREALIAN ENGINEERING, INC.

Consulting Engineers

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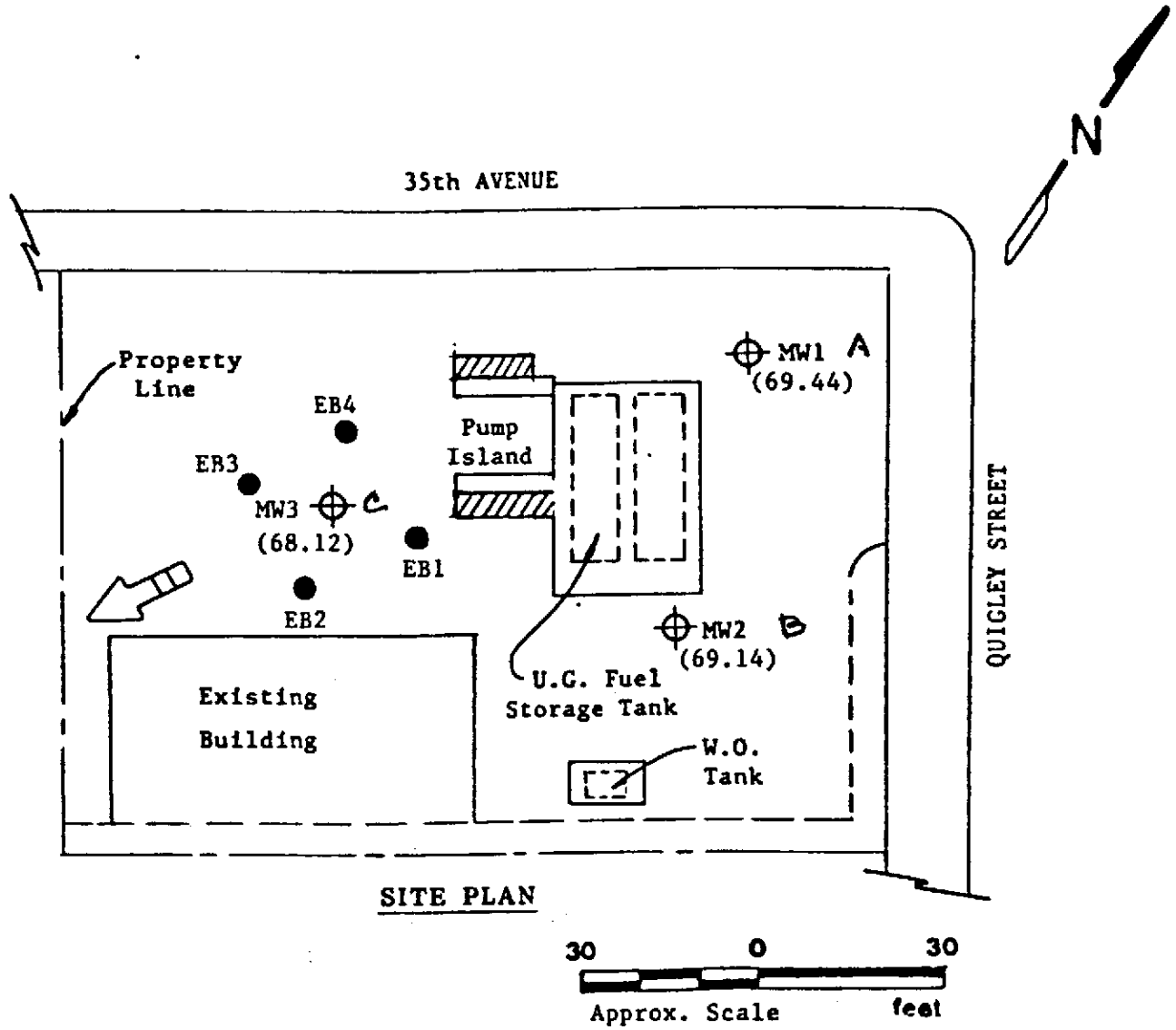


SITE PLAN

LEGEND

- ● Exploratory Boring (Proposed)
- ⊕ Monitoring Well
- ( ) Water table elevation in feet on 1/5/90. Top of MW3 well cover assumed 100.00 feet as datum.
- ⇨ Direction of ground water flow.

Unocal Service Station #6129
3420 - 35th Avenue
Oakland, California

2S/3W-4C6

308373C

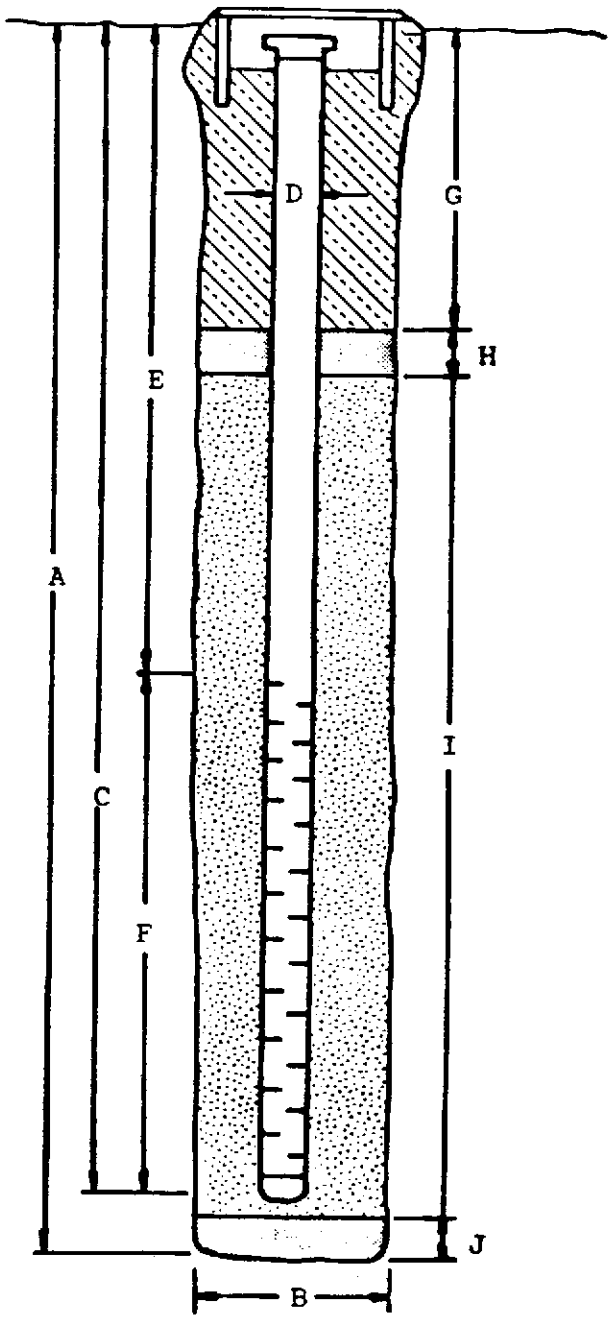
WELL COMPLETION DIAGRAM

PROJECT NAME: Unocal - Oakland - 35th Avenue BORING/WELL NO. MW3

PROJECT NUMBER: KEI-P89-0902

WELL PERMIT NO.: 89689

Flush-mounted Well Cover



A. Total Depth: 44'

B. Boring Diameter*: 9"

Drilling Method: Hollow Stem Auger

C. Casing Length: 43'

Material: Schedule 40 PVC

D. Casing Diameter: OD = 2.375" ID = 2.067"

E. Depth to Perforations: 23'

F. Perforated Length: 20'

Perforation Type: Machined Slot

Perforation Size: 0.020"

G. Surface Seal: 19'

Seal Material: Concrete

H. Seal: 2'

Seal Material: Bentonite

I. Gravel Pack: 22'

Pack Material: RMC Lonestar Sand

Size: #3

J. Bottom Seal: None

Seal Material: N/A

*Boring diameter can vary from 8-1/4" to 9" depending on bit wear.

25/3 N-4166

BORING LOG 308373C

Project No. KEI-P89-0902	**Boring & Casing Diameter** 9" 2"	**Logged By** D.L. JRB CEG 1310
Project Name Unocal Oakland - 35th Ave.	**Well Head Elevation** N/A	**Date Drilled** 12/13/89
Boring No. MW3	**Drilling Method** Hollow-stem Auger	**Drilling Company** EGI

Penetration blows/6"	G. W. level	Depth (ft) Samples	Stratigraphy USCS	Description
		0		A.C. Pavement Gravel, sand and clay: fill and disturbed native soil, dark yellowish brown.
11/12 8/21/36		5	GC	No sample recovery first attempt. Clayey gravel with sand, very dense, very moist to wet, olive, dark yellowish brown below 6 feet.
13/29		10		Clayey gravel with sand, 25-35% clay, gravel to 1 1/2", very dense, moist, dark yellowish brown, clay is high plasticity.
16/30/ 50-5 1/2		15	CH	Gravelly clay, high plasticity, with sand, very stiff to hard, moist, dark brown and dark yellowish brown, mottled.
26/34		20	GC	Clayey gravel with sand, lensed with with clay sand with gravel to 3/8", very dense, moist, dark brown, 15% clay throughout, gravel to 1".

25/4N-4C6

BORING LOG

308373C

Project No. KEI-P89-0902	Boring & Casing Diameter 9" 2"	Logged By D.L.
Project Name Unocal Oakland - 35th Ave.	Well Head Elevation N/A	Date Drilled 12/13/89
Boring No. MW3	Drilling Method Hollow-stem Auger	Drilling Company EGI

Penetration blows/6"	G. W. level	Depth (ft) Samples	Stratigraphy USCS	Description
19/33		25	GC	Clayey gravel with sand, 15-25% sand, very dense, moist, dark brown.
8/8/12		30	CH	Sandy clay, high plasticity, firm to stiff, moist, strong brown.
				Gravelly clay, high plasticity with sand, dense, moist to very moist, strong brown to dark brown.
40/50/50			GW-GC	Well graded gravel with clay and sand, very dense, moist to wet, dark brown, gravel to >2".
		35		
43/50-5"	▼			
			GC/CH	Undifferentiated clayey gravel and gravelly clay, very dense, very stiff, dark brown.
		40		

2S/3W-4C6

BORING LOG

308373C

Project No. KEI-P89-0902	**Boring & Casing Diameter** 9" 2"	**Logged By** D.L.
Project Name Unocal Oakland - 35th Ave.	**Well Head Elevation** N/A	**Date Drilled** 12/13/89
Boring No. MW3	**Drilling Method** Hollow-stem Auger	**Drilling Company** EGI

Penetration blows/6"	G. W. level	Depth (ft) Samples	Stratigraphy USCS	Description
			GC/ CH	Undifferentiated clayey gravel and gravelly clay, as above.
		45		
		50		
		55		
		60		TOTAL DEPTH 44'

025103W 4
308373D-

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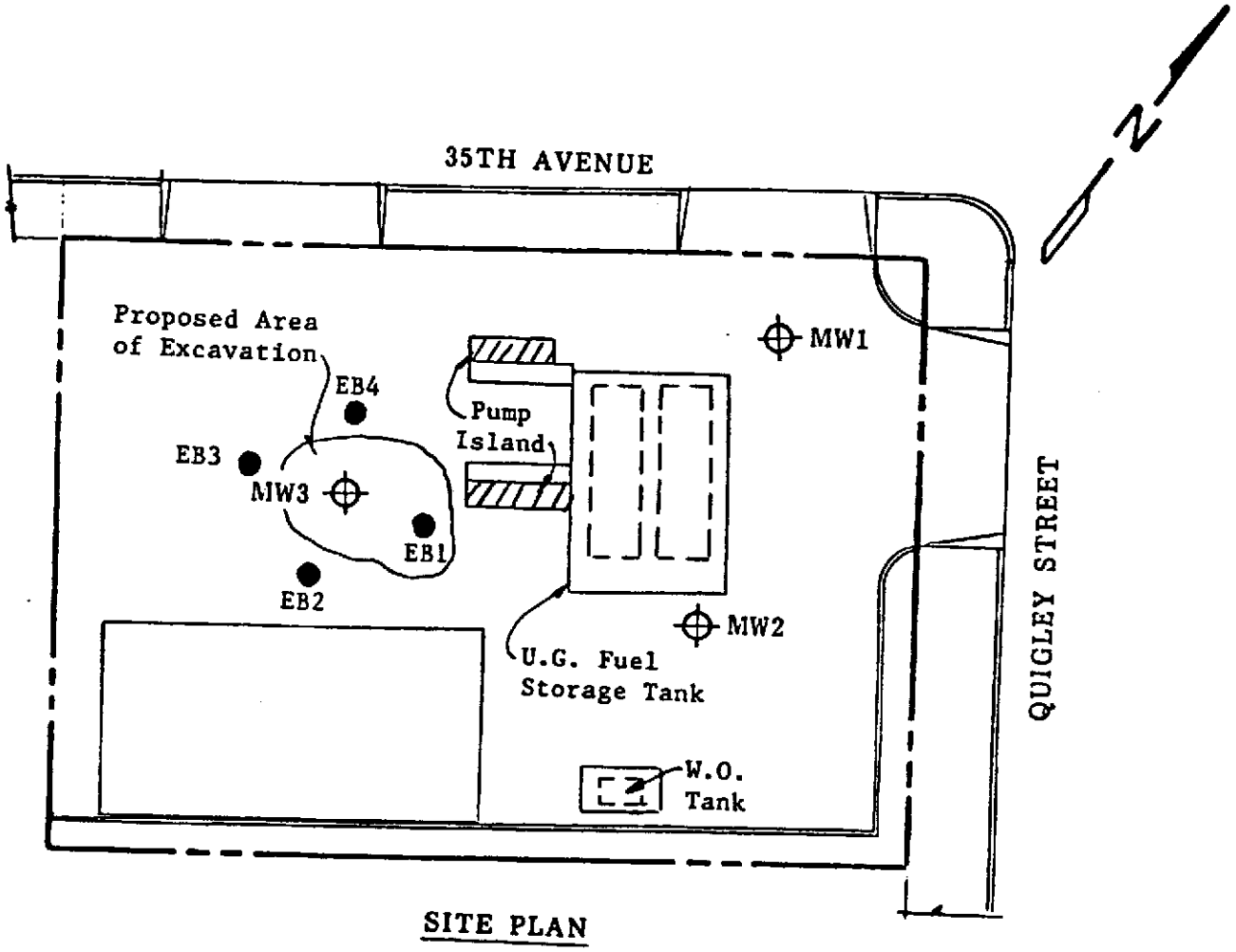

SITE PLAN

0 30 60
Approx. Scale feet

LEGEND

- Exploratory Boring
- Monitoring Well

Unocal Service Station #6129
3420 - 35th Avenue
Oakland, California

2S/3W 4C

308373 D-G

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LOCATION MAP

Unocal Service Station #6129
3420 - 35th Avenue
Oakland, California

25/3W 4C

308373 D

BORING LOG

Project No. KEI-P89-0902	Boring & Casing Diameter 9" 2"	Logged By D.L. Dn R Brow
Project Name Unocal Oakland - 35th Ave.	Well Head Elevation N/A	Date Drilled 3-14-90
Boring No. EB1	Drilling Method Hollow-stem Auger	Drilling Company EGI

Penetration blows/6"	G. W. level	Depth (ft) Samples	Stratigraphy USCS	Description
		0		Concrete Pavement Clay, sand and gravel: imported fill and disturbed native material, gravel to 4" diameter, dark yellowish brown, dark olive gray below 2 feet.
8/14/10		5	CL/ CH	Clay, with sand, trace silt, stiff, moist, olive brown.
8/27/28		10	GC	Clayey gravel with sand, gravel to >2" diameter, very dense, moist, dark yellowish brown.
		15		
		20		TOTAL DEPTH DRILLED: 9' TOTAL DEPTH SAMPLED: 10.5'

025/03W 4C
3083730-F

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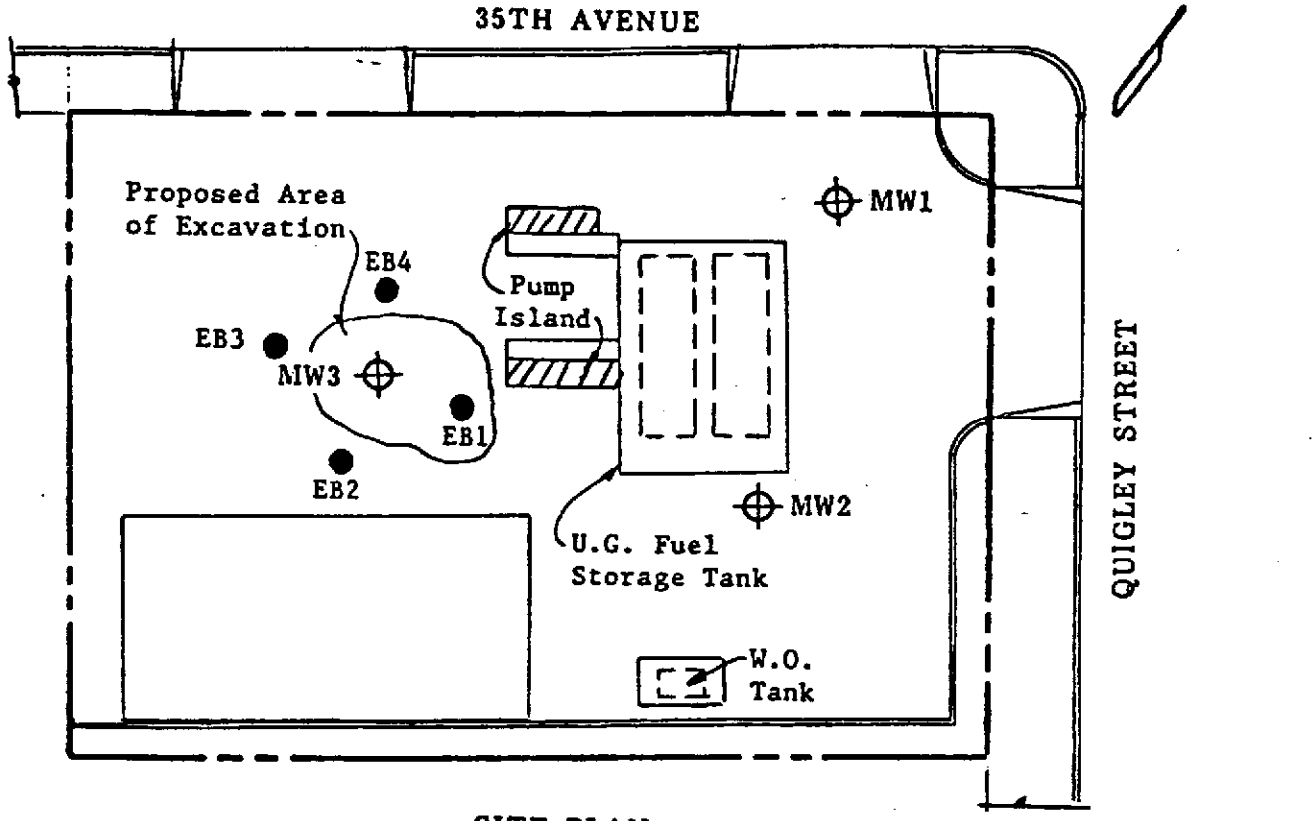

SITE PLAN

LEGEND

- ● Exploratory Boring
- ⊕ Monitoring Well

Unocal Service Station #6129
3420 - 35th Avenue
Oakland, California

2S/3W 4C

308373 D-G

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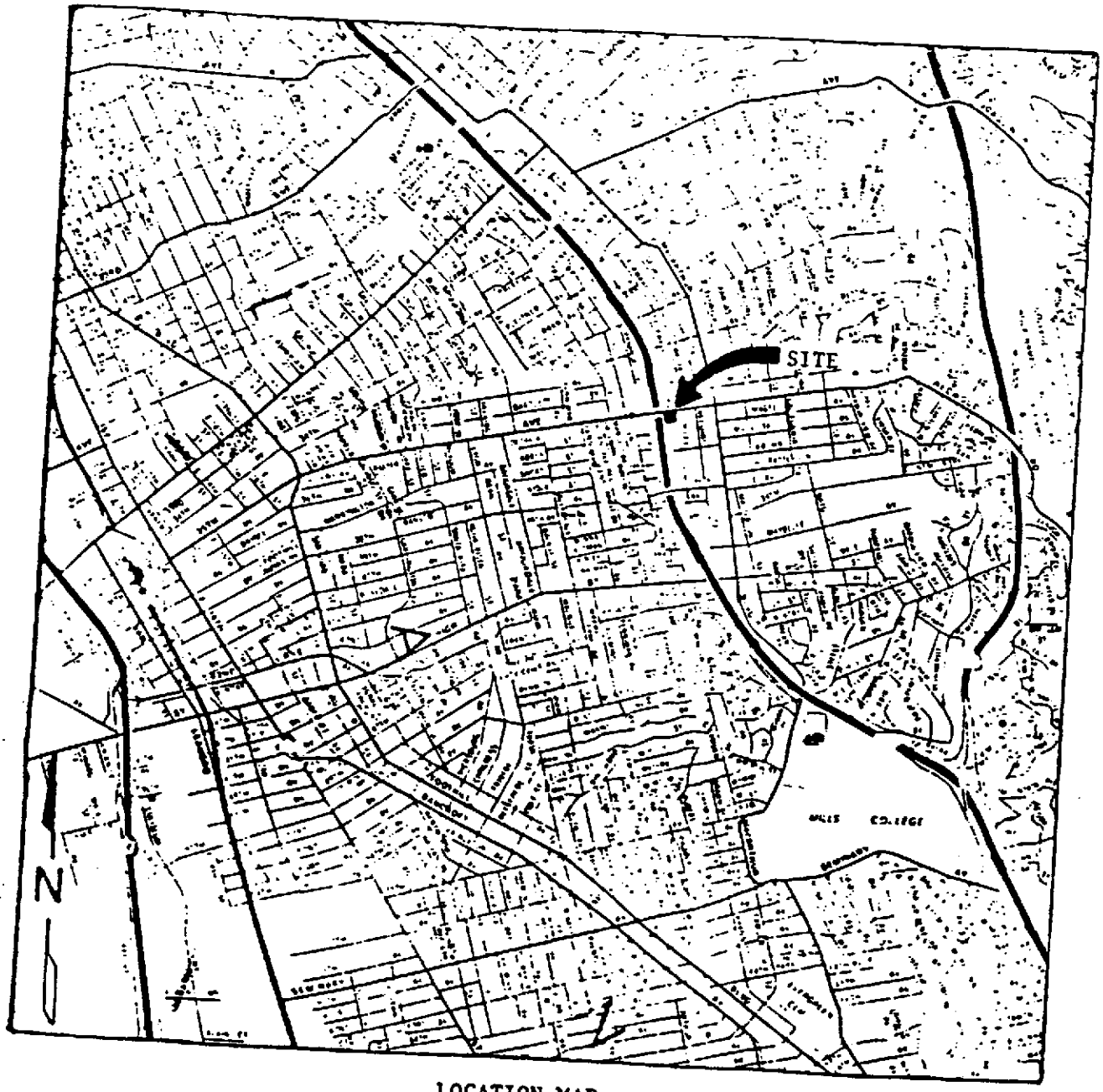

LOCATION MAP

Unocal Service Station #6129
3420 - 35th Avenue
Oakland, California

BORING LOG

308373F

Project No. KEI-P89-0902	**Boring & Casing Diameter** 9" 2"	**Logged By** D.L.
Project Name Unocal Oakland - 35th Ave.	**Well Head Elevation** N/A	**Date Drilled** 3-14-90
Boring No. EB3	**Drilling Method** Hollow-stem Auger	**Drilling Company** EGI

Penetration blows/6"	G. W. level	Depth (ft) Samples	Stratigraphy USCS	Description
		0		A. C. Pavement
				Clay, sand, and gravel: imported fill and disturbed native material, dark yellowish brown grading to olive brown.
7/10/19		5		Poor sample recovery at 5 feet. Perched water, discoloration.
				Approximate base of fill.
			GC	Clayey gravel with sand, gravel to 1" diameter, very dense, moist, dark yellowish brown.
17/26/23		10		
		15		
		20		

TOTAL DEPTH DRILLED: 9'
TOTAL DEPTH SAMPLED: 10.5'

025/03W 4C
308373 D-1

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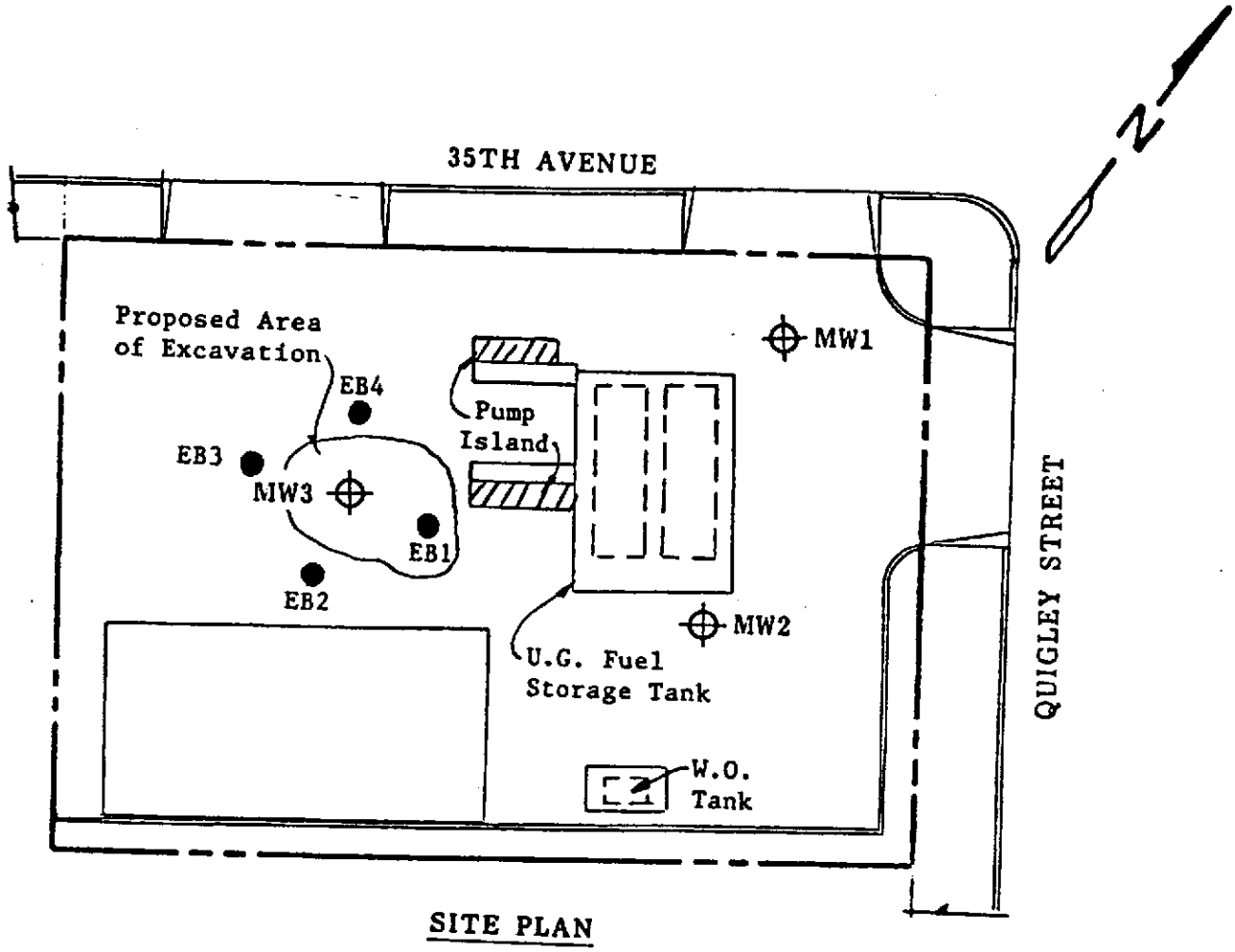

SITE PLAN

LEGEND

- ● Exploratory Boring
- ⊕ Monitoring Well

Unocal Service Station #6129
3420 - 35th Avenue
Oakland, California

2S/3W 4C

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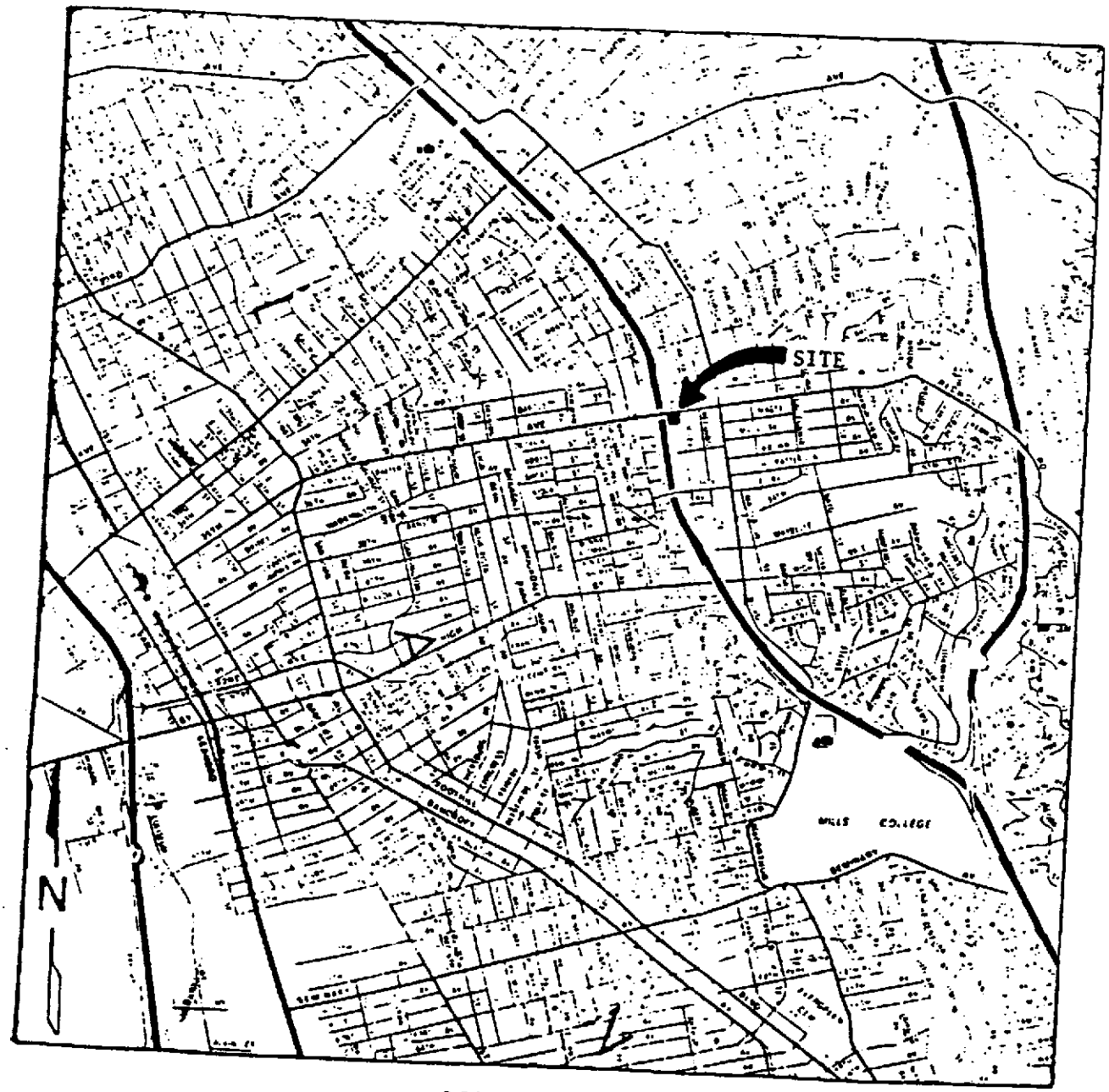

LOCATION MAP

Unocal Service Station #6129
3420 - 35th Avenue
Oakland, California

25/3W 4C

3083736

BORING LOG

Project No. KEI-P89-0902	Boring & Casing Diameter 9" 2"	Logged By D.L.
Project Name Unocal Oakland - 35th Ave.	Well Head Elevation N/A	Date Drilled 3-14-90
Boring No. EB4	Drilling Method Hollow-stem Auger	Drilling Company EGI

Penetration blows/6"	G. W. level	Depth (ft) Samples	Stratigraphy USCS	Description
		0		A. C. Pavement Clay, sand and gravel: fill and disturbed native material, dark yellowish brown.
9/14/22		5	GC	Clayey gravel with sand, gravel to >2" diameter, very dense, moist, dark yellowish brown.
12/28/30		10		
		15		
		20		

TOTAL DEPTH DRILLED: 9'
TOTAL DEPTH SAMPLED: 10.5'

025/03W 4C
3083730-C

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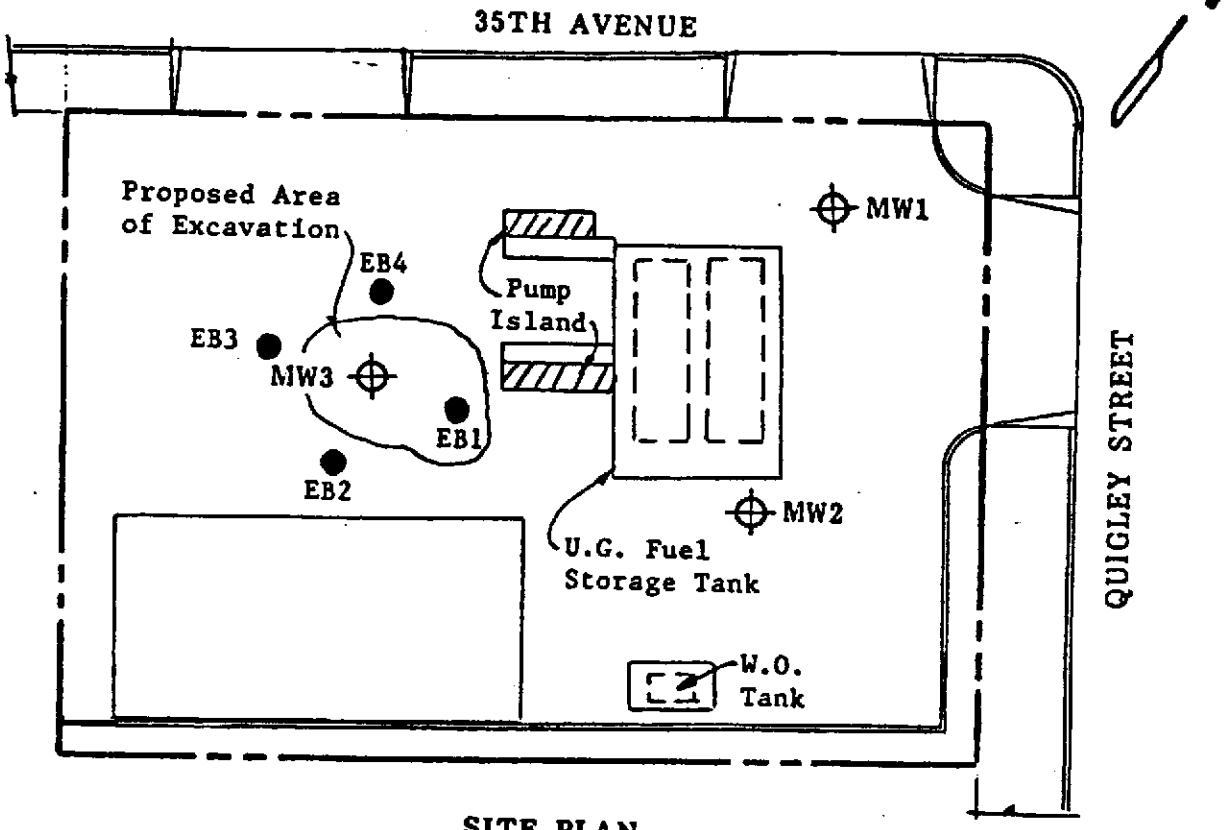

SITE PLAN

LEGEND

- Exploratory Boring
- Monitoring Well

Unocal Service Station #6129
3420 - 35th Avenue
Oakland, California

25/3W 4C

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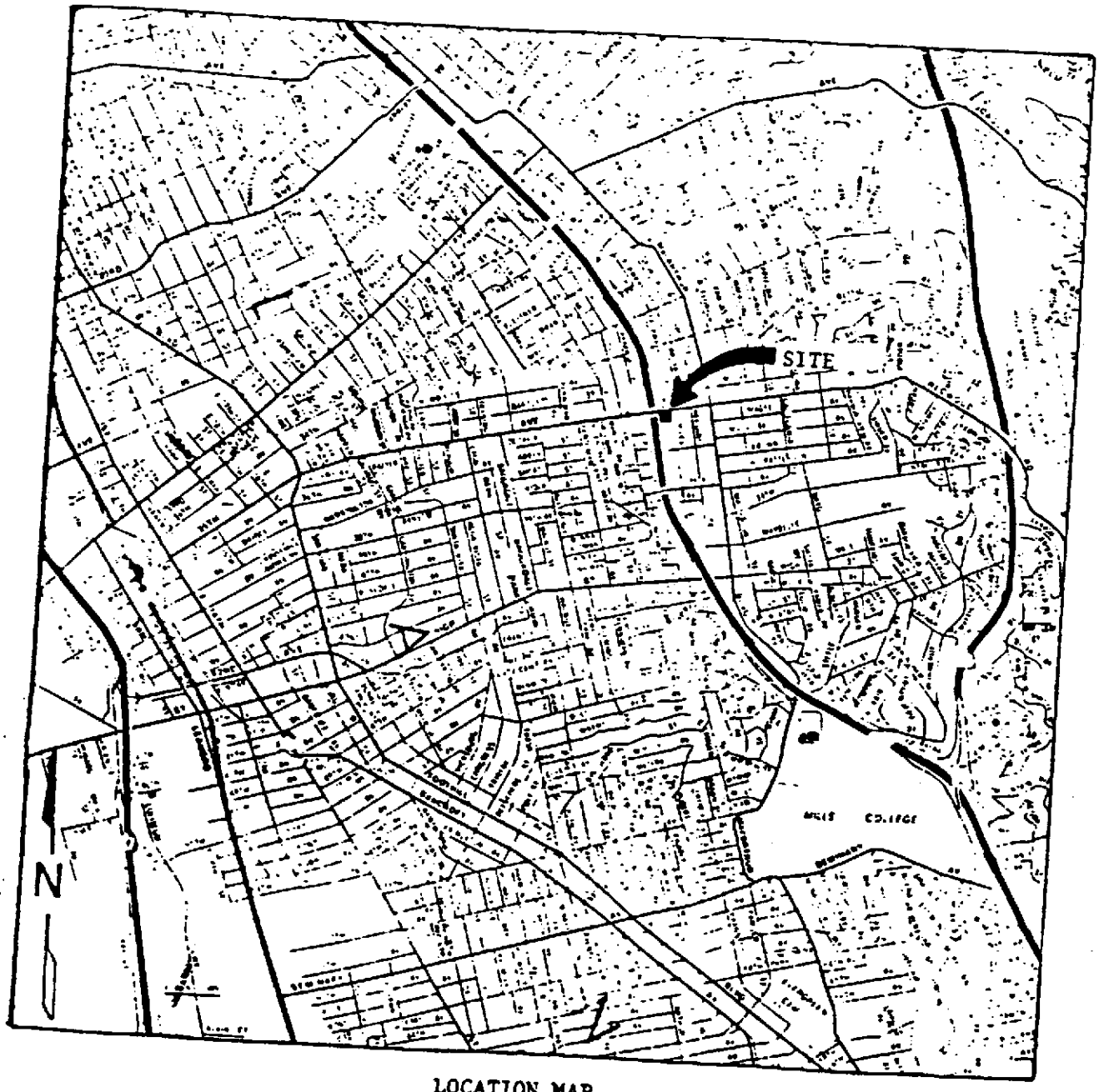

LOCATION MAP

Unocal Service Station #6129
3420 - 35th Avenue
Oakland, California

25/3W 4C

BORING LOG

308373E

Project No. KEI-P89-0902	Boring & Casing Diameter 9" 2"	Logged By D.L.
Project Name Unocal Oakland - 35th Ave.	Well Head Elevation N/A	Date Drilled 3-14-90
Boring No. EB2	Drilling Method Hollow-stem Auger	Drilling Company EGI

Penetration blows/6"	G. W. level	Depth (ft) Samples	Stratigraphy USCS	Description
		0		Concrete Pavement Sand: fill.
				Clay, sand and gravel: imported fill and disturbed native material, olive brown and olive gray.
4/12/7		5		Very poor recovery Fill: clay, sand and gravel, olive, wet (perched water?).
			GC	Clayey gravel with sand, gravel to 1" diameter, dense, moist, dark yellowish brown.
'20/26				
/19/25		10		
		15		
		20		

TOTAL DEPTH DRILLED: 9.5'
TOTAL DEPTH SAMPLED: 11'