Weiss Associates Environmental and Geologic Services

5500 Shellmound Street, Emeryville, CA 94608-2411 FAX: 510-547-5043 Phone: 510-450-6000

95 FEB -2 PM 4:

TRANSMITTAL

DATE:	February 1, 1995	**PROJECT #:**	81-0422
TO:	Scott Seery	**PHONE:**	(510) 567-6783
COMPANY:	Alameda County Health Care Services Environmental Protection Division 1131 Harbor Bay Parkway #250 Alameda, CA 94502-6577	**FAX:**	(510) 337-9335
FROM:	Faith Daverin, (510) 450-6161		
SUBJECT:	**Shell Station** **1784 - 150th Avenue, San Leandro, CA** **STID 768**		

VIA:	**FAX:**	**AS:**	**FOR:**
☐ Fax	# of pages: (including this cover)	☐ Per our phone call	☐ Your information
☑ 1st Class Mail	☐ Hard Copy to follow	☐ You requested	☐ Return to you
☐ Overnight Delivery		☐ Is required	☑ Your action
☐ UPS (Surface)		☑ We believe you may be interested	☐ Your review & comments
☐ Courier			

Please call (510) 450-6000 if there are any problems with transmission.

COMMENTS:

The hydropunch survey approved in your letter dated November 16, 1994 has been scheduled for Tuesday, February 14, 1995. On this date, we will used the Geoprobe techniques supplied by Vironex of Foster City, California to collect soil and ground water samples, thus determining the presence of any hydrocarbons in the subsurface. Based on our field observations and analytic results, a monitoring well may be installed in the location of one of the hydropunch locations. We have Gregg Drilling scheduled for Friday, February 17, 1995 for the monitoring well installation. If you have any questions or comments, please give Tom Howard a call at (510) 450-6118.

CC: Dan Kirk, Shell Oil Company, P.O. Box 4023, Concord, California 94524

Weiss Associates Environmental and Geologic Services

5500 Shellmound Street, Emeryville, CA 94608-2411 Fax: 510-547-5043 Phone: **510-450-6000**

June 13, 1995

Scott Seery
Alameda County Department
of Environmental Health
Hazardous Materials Division
1131 Harbor Bay Parkway
Suite 250
Alameda, California 94502-6577

BH-7 through BH-10 (mw-4)

Re: **Subsurface Investigation Report and First Quarter 1995 Monitoring Results**
Shell Service Station
WIC #204-6852-1404
1784 150th Avenue
San Leandro, California
WA Job #81-0422-41

Dear Mr. Seery:

This letter presents quarterly ground water monitoring data and results of Weiss Associates' (WA) subsurface investigation conducted at the Shell service station referenced above (Figure 1). As we informed you, WA held the quarterly monitoring results for inclusion with this report. This monitoring report satisfies the quarterly requirements prescribed by California Administrative Code Title 23 Waters, Chapter 3, Subchapter 16, Article 5, Section 2652.d. As outlined in WA's November 8, 1994[1] workplan, the subsurface investigation objective was to further characterize the extent of hydrocarbons in ground water downgradient of the Shell site. The scope of work was originally outlined in the workplan dated November 8, 1994, which is an extension of work outlined in WA's workplan dated December 6, 1993[2]. Included below are descriptions and results of monitoring activities performed in the first quarter 1995, proposed work for the second quarter 1995, the subsurface investigation scope of work, summary of previous investigations and results of this investigation.

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1 Weiss Associates, November 8, 1994, Consultant's letter-workplan regarding the proposed drilling of soil borings and water sampling via hydropunch at the Shell service station at 1784 150th Avenue, San Leandro, California, 2 pages and one attachment.

2 Weiss Associates, December 6, 1993, Consultant's letter-workplan regarding the proposed drilling of soil borings and water sampling via hydropunch at the Shell service station at 1784 150th Avenue, San Leandro, California, 4 pages and one attachment.

First Quarter 1995 Activities

- Blaine Tech Services, Inc. (BTS) of San Jose, California measured ground water depths and collected ground water samples from the site wells. The BTS report describing these activities and the analytic report for the ground water samples are included as Attachment A.

- Weiss Associates (WA) calculated ground water elevations and compiled the analytic data (Tables 1 and 2), prepared a ground water elevation contour map and plotted benzene and total petroleum hydrocarbons as gasoline (TPH-G) concentrations in ground water (Figures 2 and 3).

- WA conducted a subsurface investigation to assess the downgradient extent of hydrocarbons in ground water. The investigation results are presented below.

Discussion of Quarterly Monitoring Results

Ground water elevations in March 1995 rose about 2.5 ft in the onsite wells since the fourth quarter 1994. These increases are due to recharge from the increased precipitation during the winter. Hydrocarbon concentrations, however, declined in MW-1 and remained stable in wells MW-2 and MW-3 when compared to historical results. The ground water flow direction changed from southerly in the fourth quarter of 1994 to southeasterly in the first quarter of 1995. Historically, the ground water flow direction has been predominantly to the northwest. Furthermore, the distribution of dissolved hydrocarbons suggests that ground water flows northwestward, which is consistent with the topographic gradient.

Anticipated Second Quarter 1995 Activities

WA will submit a report presenting the results of the second quarter 1995 ground water monitoring results. The report will include tabulated chemical analytic results, ground water elevations, a ground water elevation contour map and plotted benzene and TPH-G concentrations in ground water.

Subsurface Investigation Scope Of Work

WA's scope of work to further characterize the extent of hydrocarbons in ground water downgradient from the Shell site was to:

- Obtain the necessary drilling and encroachment permits for the site;

- Prepare a site safety plan and locate underground and overhead utility lines;

- Drill temporary borings BH-7, BH-8, BH-9 and BH-10 downgradient from the Shell station along 150th Avenue and Portofino Drive and collect soil samples for lithologic description;
- Analyze selected soil samples from each boring for total petroleum hydrocarbons as gasoline (TPH-G) and benzene, toluene, ethylbenzene and xylenes (BETX);
- Analyze grab ground water samples from each boring, except BH-10, for TPH-G and BETX;
- Backfill borings BH-7, BH-8 and BH-9 with hydrated bentonite;
- Complete boring BH-10 as a two-inch diameter monitoring well (MW-4);
- Survey, develop, and arrange the sampling of well MW-4;
- Dispose of drill cuttings and purge water; and
- Report the results.

Site Summary

Site Setting: The site is an operating Shell service station located at the southern corner of the intersection of 150th and Freedom Avenues in San Leandro, California. The base of the San Leandro Hills is approximately 0.25 miles to the northeast. The site is about 50 ft above mean sea level and the local topography slopes westward toward San Francisco Bay, about 6 miles to the west.

Surroundings: Mixed commercial and residential.

Site Geology: Sediments beneath the site are Quaternary alluvial deposits derived from sedimentary and igneous rocks of the Diablo Range. The site is intersected by the Hayward Fault Zone.

Previous Investigations

1986 Waste Oil Tank Removal: In November 1986, Petroleum Engineering of Santa Rosa, California, removed a 550-gallon waste oil tank from the site. Immediately following the tank removal, Blaine Tech Services (BTS) of San Jose, California collected soil samples beneath the former tank at 8 ft and 11 ft depth. The soil samples contained petroleum oil and grease (POG) at 196 and 167 parts per million (ppm), respectively. The tank pit was over-excavated to a total

depth of 16 ft but soil samples were not collected. Ground water was not encountered in the tank excavation[3]. A new 550-gallon fiberglass waste oil tank was installed in the same location.

1990 Well Installation: In March 1990, WA installed ground water monitoring well MW-1 adjacent to the waste oil tank[4]. In a soil sample collected from 29 ft below ground surface (bgs), TPH-G and benzene were detected at 35 and 0.23 ppm, respectively. TPH-G and benzene were also detected in water samples at 510 and 1.5 parts per billion (ppb), respectively. Up to 12 ppb 1,2-DCA has been detected in ground water samples from MW-1 since that time.

1992 Well Installation: In February 1992, WA installed monitoring wells MW-2 and MW-3. A soil sample collected near the water table from the boring for well MW-2 contained up to 79 ppm TPH-G. Although well MW-3 is located over 100 ft upgradient of the tanks, up to 68 ppb TPH-G were detected in a soil sample from this boring. TPH-G and benzene were detected in ground water samples from MW-2 at 17,000 and 6,200 ppb, respectively, and from MW-3 at 4,500 and 97 ppb, respectively.

June 1994 Subsurface Investigation: In June 1994, WA drilled six small diameter soil borings in the site vicinity and collected soil and ground water samples for analysis. No hydrocarbons were detected in soil samples from any borings, except for 13 ppb benzene in boring BH-3 at 16 ft bgs. Also, no hydrocarbons were detected in ground water samples from borings BH-1, BH-4, BH-5 and BH-6. Ground water from borings BH-2 and BH-3 contained over 5,000 ppb TPH-G, indicating that hydrocarbons had migrated northwestward from the site. Analytic results for soil and ground water collected from BH-1 through BH-6 are included in Tables 3 and 4, respectively.

Quarterly Ground Water Monitoring: Quarterly ground water sampling has been conducted in monitoring well MW-1 since March 1990 and wells MW-2 and MW-3 since February 1992. Ground water samples from MW-2 have contained the highest TPH-G and benzene, up to 160,000 and 36,000 ppb, respectively. The ground water flow direction has a historical range from north-northwestward to eastward. On March 3, 1995, the ground water flow direction beneath the site was southeasterly as shown on Figure 2. Analytic results for all quarterly ground water monitoring are tabulated as Table 2. Figure 3 shows TPH-G and benzene concentrations in ground water.

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3 BTS, November 21, 1986, Sampling Report 86315-M2, Shell Service Station, 1784 150th Avenue, San Leandro, California, Consultant's letter-report prepared for Shell Oil Company, 3 pages and 2 attachments.

4 Weiss Associates, July 31, 1990, Consultant's letter-report prepared for the Alameda County Department of Environmental Health (ACDEH) regarding second quarter 1990 activities at the Shell service station located at 1784 150th Avenue in San Leandro, California, 10 pages and 2 attachments.

1995 Subsurface Investigation

Permits Obtained: Alameda County Flood Control and Water Conservation District, Zone 7 Permit No. 94811 and City of San Leandro Encroachment Permit No. 94380 (Attachment B).

Drilling Dates: February 14 and March 3, 1995.

Drilling Geologists: WA Geologists Thomas Howard and Faith Morris-Daverin under the supervision of Certified Engineering Geologist James W. Carmody.

Drilling Methods: Vironex of Redwood City, California drilled soil borings BH-7, BH-8 and BH-9 using a hydraulic powered Geoprobe to advance two-inch diameter continuos-core samplers. All soil samples were collected using a Bore Probe Drive Sampler. Gregg Drilling and Testing, Inc. of Martinez, California drilled boring BH-10 which was completed as a well using a Truck-mounted B-61 with 8-inch outside diameter hollow stem augers. WA's standard field procedures are presented in Attachment C.

Number of Borings: Four (BH-7 through BH-10; Figure 4). Boring BH-10 was completed as ground water monitoring well MW-4.

Boring Depths: 17 to 30.5 ft below ground surface.

Sediments Encountered: Sediments in borings BH-7 through BH-10 consist of inter-bedded low to moderate permeability silty to sandy gravel, clayey to gravelly silt, and silty sand from the ground surface to 30.5 ft bgs, the total depth explored. The boring logs are presented in Appendix D. A geologic cross-section is presented in Figure 5 based on the cross section location shown on Figure 4.

Depth to Ground Water: Ground water was encountered in borings BH-7, BH-9 and BH-10 between 17 and 22 ft bgs. No ground water was encountered in boring BH-8. The depth to water during drilling may not reflect the static water level because the boreholes were only open long enough to allow for the collection of ground water samples.

Soil Sampling Method:

Continuous coring was conducted from the surface to about 20 ft bgs in borings BH-7, BH-8 and BH-9. In boring BH-10, soil samples were collected every five ft using clean split-spoon drive samplers lined with brass tubes for field screening and lithologic description. Soil samples were collected from just above where ground water was encountered in each boring using brass tubes. All soil samples collected from just above where ground water was encountered were submitted for chemical analysis.

Water Sampling Method:

In borings BH-7 and BH-9, ground water samples were collected from within a sealed stainless steel screen encased in a perforated stainless steel sleeve. Using new, clean polyethylene 3/8-inch tubing, ground water was bailed from the rod bore directly into sample vials.

Soil and Water Analytical Methods:

All soil and ground water samples were analyzed for TPH-G by modified EPA Method 8015 and BTEX by EPA Method 8020. The analytic report and chain-of-custody forms are presented in Attachment E.

Analytical Laboratory:

National Environmental Testing, Inc. of Santa Rosa, California.

Soil Analytic Results:

No hydrocarbons were detected in any of the soil samples collected from borings BH-7 through BH-10. Analytic results for soil are tabulated on Table 3.

Grab Ground Water Analytic Results:

Up to 100 ppb TPH-G and 1.0 ppb benzene were detected in grab ground water samples from borings BH-7 and BH-9 (Table 4). No ground water was encountered in boring BH-8. No TPH-G or benzene was detected in well MW-4, constructed in boring BH-10 (Table 2).

Boring Backfill:

Borings BH-7 through BH-9 were backfilled from their total depth to ground surface with hydrated bentonite. A monitoring well was constructed in boring BH-10.

Cuttings Disposal:

No soil cuttings were produced by the Geoprobe from borings BH-7 through BH-9.

Monitoring Well MW-4 Construction

Well Placement Rationale: Because depth to ground water data have indicated a varying ground water flow direction the past three years, WA assumed the predominant flow direction based on the topography and the distribution of dissolved hydrocarbons.

Number of Wells: One. Boring BH-10 was completed as ground water monitoring well MW-4 (Figure 4).

Well Materials: Two-inch diameter schedule 40 PVC well casing with 0.010-inch slotted screen and Monterey #1/20 sand. A sanitary seal of cement grout and hydrated bentonite was placed above the sand pack around the well.

Depth to Ground Water: Ground water was first encountered at about 16 ft bgs during drilling and rose to about 9.5 ft bgs prior to well installation.

Screened Interval: Well MW-4 is screened from 5 to 27 ft depth. Well construction details are presented in Attachment D.

Well Development: On March 21, 1995, BTS developed well MW-4 using surge block agitation and bailer excavation. Well development data are presented in BTS report in Attachment A. Well MW-4 yielded about 0.9 gallons per minute (gpm) during development.

Well Survey: The top of casing and vault elevations of well MW-4 were surveyed by licensed land surveyor PLS Surveys, Incorporated of Alameda, California. The survey report is presented in Attachment F.

Ground Water Sampling and Analyses: On March 24, 1995, BTS collected a ground water sample from well MW-4 and analyzed it for TPH-G by modified EPA Method 8015, BTEX by EPA Method 8020 and VOCs by EPA Method 8010. Prior to sampling, three well casing volumes of ground water were removed from the well. A BTS dedicated PVC bailer was used to collect the water sample.

Ground Water Analytical Results: No TPH-G, BTEX or VOCs were detected in the sample from well MW-4. The analytic results are

tabulated in Table 2 and the analytic report and chain-of-custody are included as Attachment A.

Ground Water Flow Direction::

Historically, ground water gradient at this site has ranged from 0.0008 ft/ft to 0.017 ft/ft. In the first quarter, ground water flowed towards the south-southeast with a gradient from 0.0015 to 0.0021 ft/ft. **Ground water flow direction has ranged from east to northwest, and is typically northwest** (roughly two-thirds of the time). Changes in the ground water gradient and flow direction do not appear to correlate with seasonal changes.

Waste Disposal:

Purge water from well development and sampling was contained in 55-gallon drums and transported by Crosby and Overton, Inc. of Oakland to the Shell refinery in Martinez, California for recycling. About two cubic yards of soil were transported by Manley & Sons Trucking, Inc. of Sacramento, California to the Redwood Landfill in Novato, California for disposal. Soil disposal documents are presented as Attachment G.

Summary

The results of this and previous investigations indicate that:

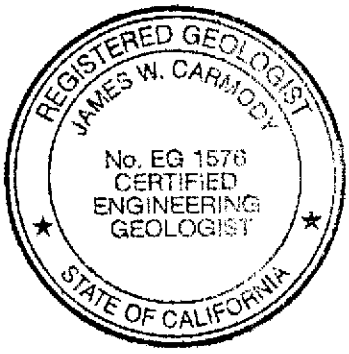
- The site is underlain primarily by low-estimated permeability sediments, with interspersed moderate-estimated permeability sediments. Furthermore, this site is located over and adjacent to the Hayward Fault.

- Historically, depths to water in the onsite wells have ranged from approximately 15 ft to 28 ft below ground surface. Although the ground water flow direction has varied, it has been predominantly northwestward.

- No hydrocarbons were detected in ground water from MW-4, located northwest (downgradient) from the Shell service station. Thus, the downgradient extent of hydrocarbons in ground water appears fully assessed. Hydrocarbons seem to be limited to beneath the site and a portion of 150th Avenue. Further migration may be limited by low to very low-estimated permeability soils downgradient of the site.

We trust that this submittal meets your needs. Please call Tom Howard at (510) 450-6118 if you have any questions or comments.

Sincerely,
Weiss Associates



Thomas M. Howard
Project Geologist

James W. Carmody, C.E.G.
Senior Project Hydrogeologist

Attachments: Figures
Tables
A - Blaine Tech Ground Water Monitoring Report
B - Drill Permits
C - Standard Field Procedures
D - Boring Logs
E - Subsurface Investigation Soil and Ground Water Analytic Reports and Chain-of-Custody Forms
F - Survey Report
G - Soil Disposal Confirmation

cc: Dan Kirk, Shell Oil Company, P.O. Box 4023, Concord, California 94524
Kevin Graves, Regional Water Quality Control Board - San Francisco Bay Region, 2101 Webster Street, Suite 500, Oakland, California 94612

TMH/JWC:eac
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Figure 1. Site Location Map - Shell Service Station WIC #204-6852-1404, 1784 150th Avenue, San Leandro, California

1/9/92

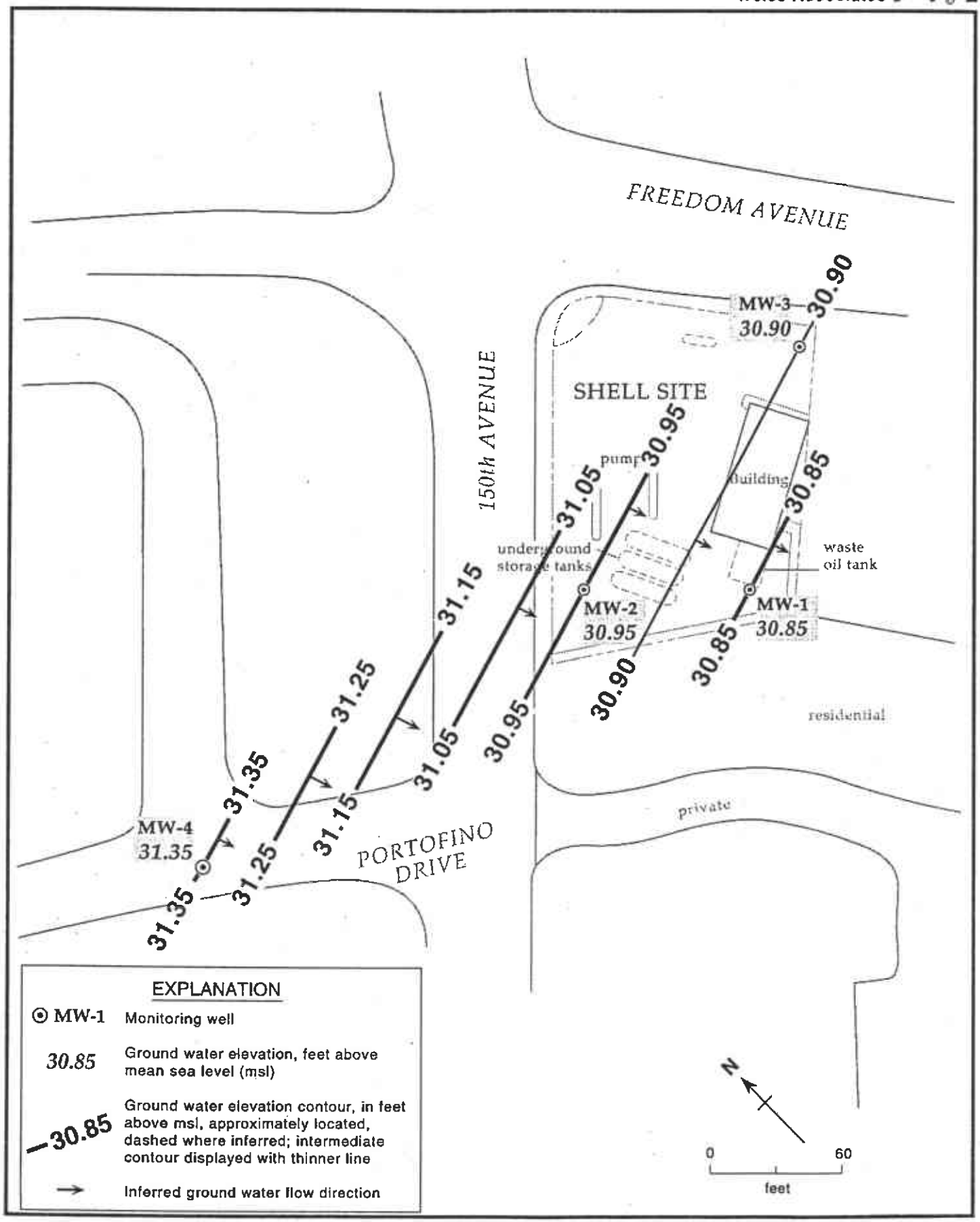

Figure 2. Monitoring Well Locations and Ground Water Elevation Contours - March 24, 1995 - Shell Service Station WIC #204-6852-1404, 1784 150th Avenue, San Leandro, California

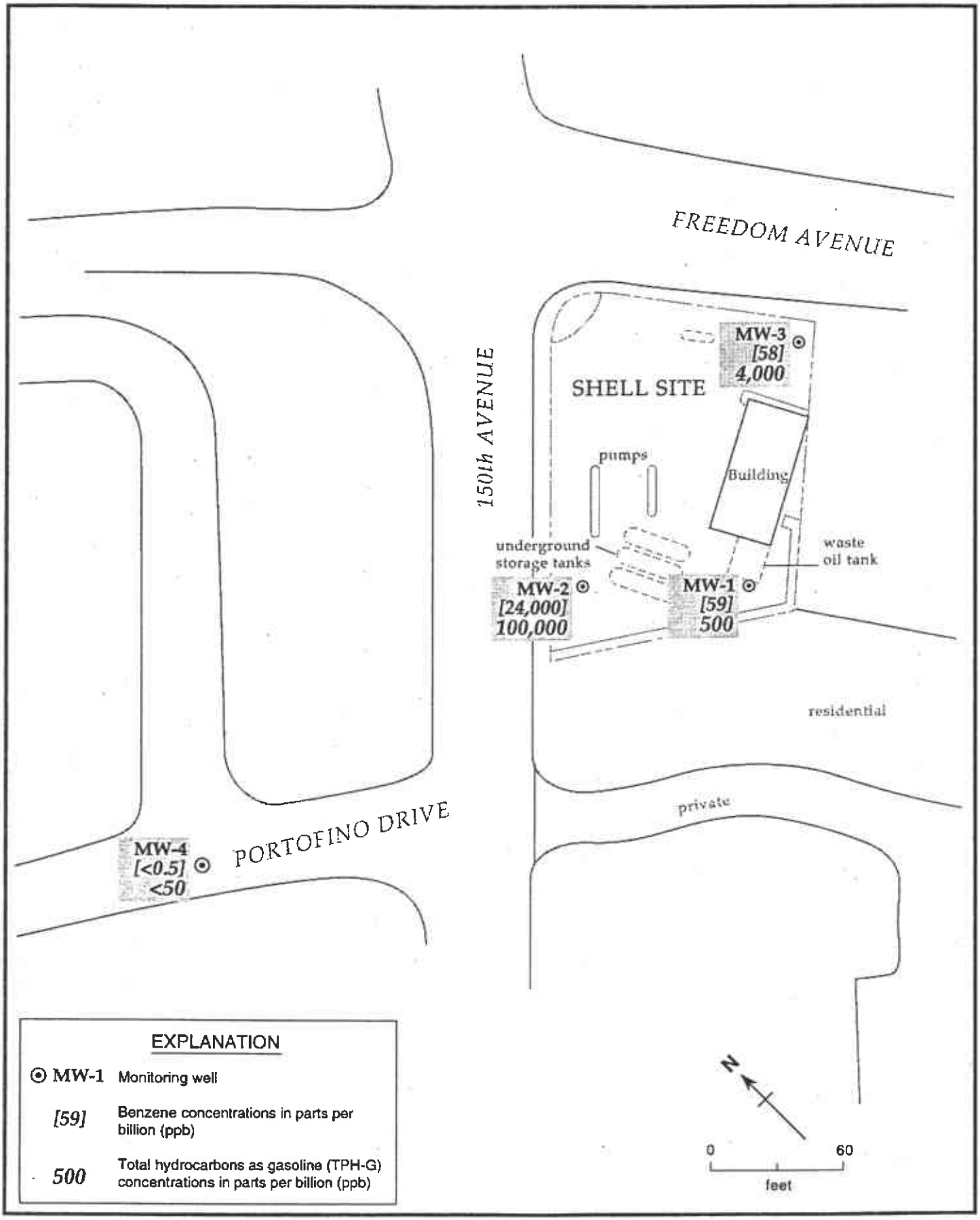

Figure 3. Benzene and TPH-G Concentrations in Ground Water - February 28, 1995 and March 24, 1995 - Shell Service Station WIC #204-6852-1404, 1784 150th Avenue, San Leandro, California

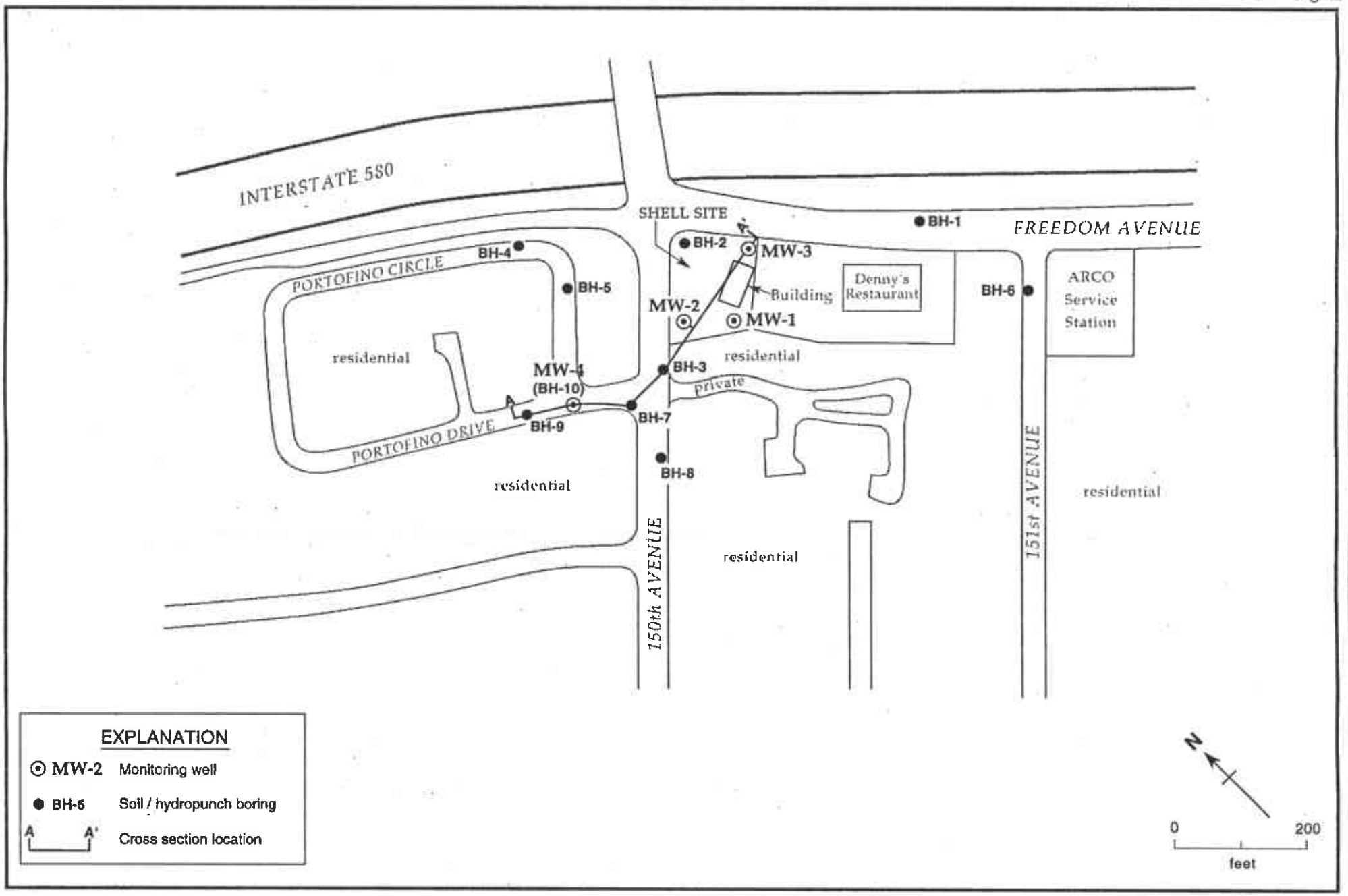

Figure 4. Monitoring Well and Boring Locations and Site Vicinity - Shell Service Station WIC #204-6852-1404, 1784 150th Avenue, San Leandro, California

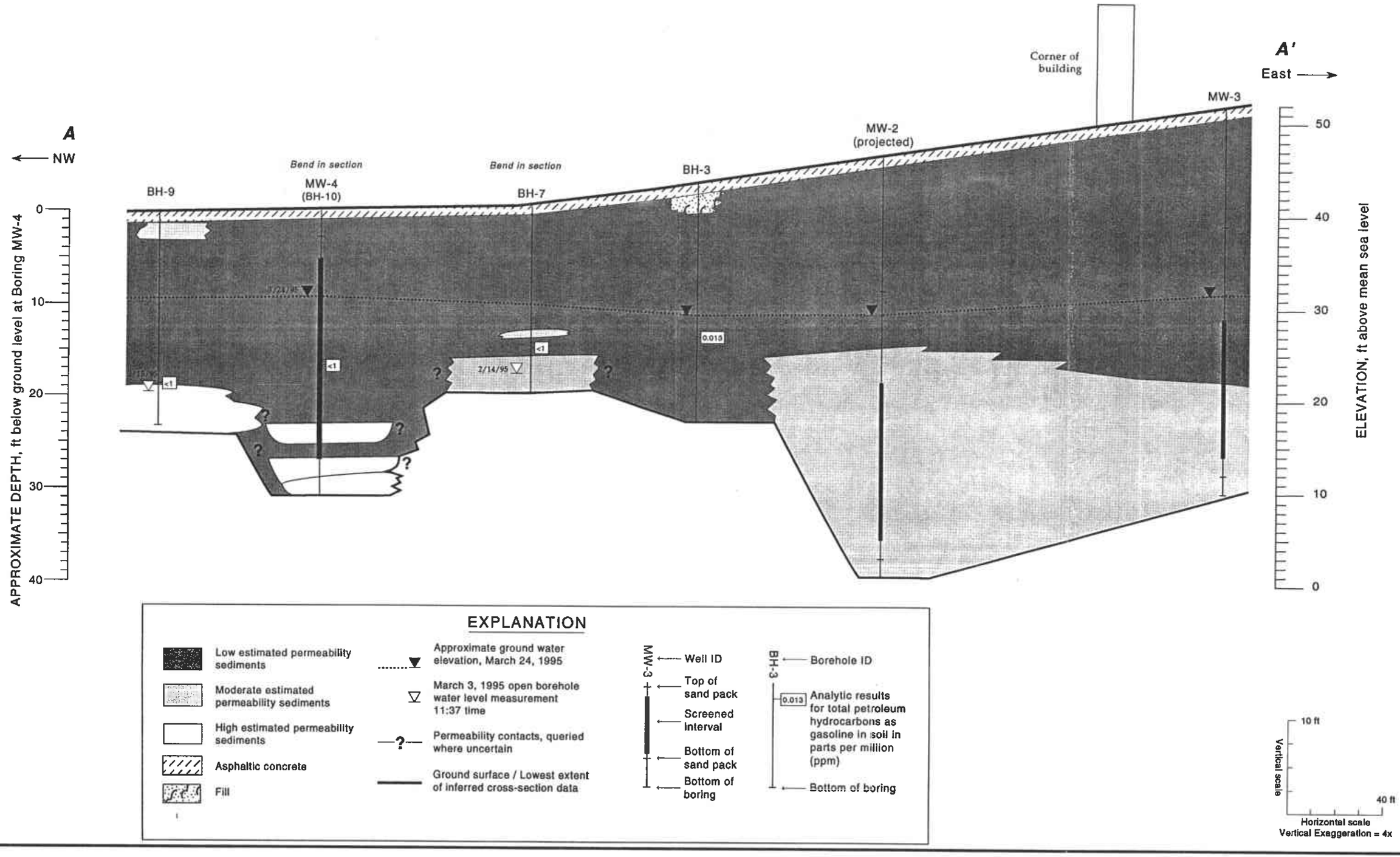

Figure 5. Geologic Cross Section A-A' - Shell Service Station, WIC #204-6852-1404, 1784 150th Avenue, San Leandro, California

S422-036.AI

Table 1. Ground Water Elevations - Shell Service Station WIC #204-6852-1404, 1784 150th Avenue, San Leandro, California

Well ID	Date	Top-of-Casing Elevation (ft above msl)	Depth to Water (ft)	Ground Water Elevation (ft above msl)
MW-1	03/08/90	49.13	25.29	23.84
	06/12/90		25.85	23.28
	09/13/90		27.49	21.64
	12/18/90		27.41	21.72
	03/07/91		25.79	23.34
	06/07/91		25.64	23.49
	09/17/91		27.54	21.59
	12/09/91		27.81	21.32
	02/13/92		25.57	23.56
	02/24/92		22.83	26.30
	02/27/92		23.09	26.04
	03/01/92		23.26	25.87
	06/03/92		24.64	24.49
	09/01/92		26.74	22.39
	10/06/92		27.18	21.95
	11/11/92		27.99	21.14
	12/04/92		27.14	21.99
	01/22/93		20.09	29.04
	02/10/93		24.26	24.87
	03/03/93		20.50	28.63
	05/11/93		21.70	27.43
	06/17/93		22.42	26.71
	09/10/93		24.11	25.02
	12/13/93		23.73	25.40
	03/03/94		22.08	27.05
	06/06/94		23.10	26.03
	09/12/94		25.19	23.94
	12/19/94		23.06	26.07
	02/28/95		**20.90**	**28.23**
	03/24/95		**18.28**	**30.85**
MW-2	02/13/92	45.83	22.22	23.61
	02/24/92		19.61	26.22
	02/27/92		19.92	25.91
	03/01/92		21.11	24.72
	06/03/92		21.58	24.25
	09/01/92		23.46	22.37
	10/06/92		23.99	21.84
	11/11/92		24.25	21.58
	12/04/92		23.89	21.94
	01/22/93		17.03	28.80
	02/10/93		18.08	27.75
	03/03/93		17.28	28.55

Table 1. Ground Water Elevations - Shell Service Station WIC #204-6852-1404, 1784 150th Avenue, San Leandro, California (continued)

Well ID	Date	Top-of-Casing Elevation (ft above msl)	Depth to Water (ft)	Ground Water Elevation (ft above msl)
	05/11/93		18.41	27.42
	06/17/93		19.06	26.77
	09/10/93		20.88	24.95
	12/13/93		20.42	25.41
	03/03/94		18.48	27.35
	06/06/94		20.26	25.57
	09/12/94		21.80	24.03
	12/19/94		19.66	26.17
	02/28/95		**17.51**	**28.32**
	03/24/95		**14.88**	**30.95**
MW-3	02/13/92	51.97	27.97	24.00
	02/24/92		25.60	26.37
	02/27/92		25.88	26.09
	03/01/92		26.00	25.97
	06/03/92		27.70	24.27
	09/01/92		29.46	22.51
	10/06/92		30.01	21.96
	11/11/92		30.26	21.71
	12/04/92		29.93	22.04
	01/22/93		22.76	29.21
	02/10/93		21.40	30.57
	03/03/93		23.08	28.89
	05/11/93		24.51	27.46
	06/17/93		25.21	26.76
	09/10/93		26.95	25.02
	12/13/93		26.52	25.45
	03/03/94		24.50	27.47
	06/06/94		26.33	25.64
	09/12/94		27.98	23.99
	12/19/94		25.63	26.34
	02/28/95		**23.45**	**28.52**
	03/24/95		**21.07**	**30.90**
MW-4	**03/24/95**	**40.51**	**9.16**	**31.35**

Table 2. Analytic Results for Ground Water - Shell Service Station WIC #204-6852-1404, 1784 150th Avenue, San Leandro, California

Well ID	Date Sampled	Depth to Water (ft)	TPH-G	TPH-D	POG	B	E	T	X	1,2-DCA
			← parts per billion (µg/l) →							
MW-1	03/08/90	25.29	510	120[a]	<10,000	1.	<0.5	0.8	5.4	12
	06/12/90	25.85	390	100[a]	<10,000	86	0.7	1.3	6.2	<0.4
	09/13/90	27.49	100	130[a]	<10,000	56	2.4	0.75	2.8	<0.4[b]
	12/18/90	27.41	480	<50[a]	<10,000	54	3.3	1.7	3.7	5.3
	03/07/91	25.79	80	<50[a]	---	266	1.2	<0.5	<1.5	6.7
	06/07/91	25.64	510	<50[a]	---	130	6.1	3.8	11	7.9
	09/17/91	27.54	330	120[ac]	---	67	3	<0.5	2.2	6
	12/09/91	27.81	140[d]	80	---	<0.	1.7	<0.5	4.7	5.4
	03/01/92	23.36	<50	<50	---	<0.	<0.5	<0.5	<0.5	3
	06/03/92	24.64	1,500	---	---	520	72	180	230	3
	09/01/92	26.74	130	---	---	16	1.8	1.4	3.4	1.3[e]
	12/04/92	27.14	150	---	---	360	1.8	0.7	2.1	3.3
	03/03/93	20.50	<50	---	---	1.	<0.5	<0.5	<0.5	0.76
	06/17/93	22.42	1,600	---	---	340	120	120	440	3
	09/10/93	24.11	2,600	---	---	670	310	340	730	2.3
	12/13/93	23.73	11,000	---	---	470	380	320	2,300	6.3
	03/03/94	22.08	16,000	---	---	700	480	690	3,200	---
	06/06/94	23.10	7,500	---	---	420	200	280	1,000	3.1
	09/12/94	25.19	1,200	---	---	110	3.3	21	420	2.6
	12/19/94	23.06	4,600	---	---	470	230	330	1,300	3.7
	02/28/95	**20.90**	**500**	**---**	**---**	**59**	**6.8**	**32**	**68**	**5.0**
MW-2	02/24/92	19.61	17,000	2,700[c]	---	6,200	550	1,600	1,900	200
	03/01/92	21.11	86,000	1,000[c]	---	30,000	2,300	34,000	16,000	82
	06/03/92	21.58	87,000	---	---	28,000	2,000	18,000	10,000	<50
	09/01/92	23.46	110,000	---	---	21,000	1,900	13,000	7,800	83[h]
	12/04/92	23.89	42,000	---	---	15,000	960	2,400	2,900	100
	03/03/93	17.28	160,000	---	---	36,000	32,000	3,800	21,000	7.7
	03/03/93[h]	---	150,000	---	---	31,000	20,000	3,100	14,000	16
	06/17/93	19.06	65,000	---	---	34,000	3,200	15,000	11,000	37

Table 2. Analytic Results for Ground Water - Shell Service Station WIC #204-6852-1404, 1784 150th Avenue, San Leandro, California (continued)

Well ID	Date Sampled	Depth to Water (ft)	TPH-G	TPH-D	POG	B	E	T	X	1,2-DCA
			← parts per billion (µg/l) →							
	06/17/93[h]	19.06	62,000	---	---	28,000	2,700	14,000	10,000	36
	09/10/93[f]	20.88	72,000	---	---	24,000	2,300	16,000	11,000	28.0
	09/10/93[dupf]	20.88	71,000	---	---	23,000	2,300	15,000	10,000	27.0
	12/13/93	20.42	19,000	---	---	5,400	680	4,900	3,100	<0.5
	12/13/93[dup]		17,000	---	---	6,200	720	5,500	3,500	3.4
	03/03/94	18.48	110,000	---	---	21,000	2000	24,000	13,000	---
	03/03/94[dup]	18.48	93,000	---	---	19,000	1,800	22,000	12,000	---
	06/06/94	20.26	10,000	---	---	1,900	2,500	3,300	13,000	5.8
	06/06/94[dup]	20.26	99,000	---	---	9,900	2,400	12,000	12,000	5.7
	09/12/94	21.80	160,000	---	---	22,000	3,400	33,000	23,000	<0.4
	09/12/94[dup]	21.80	150,000	---	---	23,000	3,500	34,000	23,000	<0.4
	12/19/94	19.66	80,000	---	---	17,000	2,300	16,000	14,000	<0.4
	12/19/94[dup]	19.66	100,000	---	---	28,000	3,400	26,000	20,000	<0.4
	02/28/95	**17.51**	**100,000**	**—**	**—**	**24,000**	**2,300**	**18,000**	**17,000**	**<0.4**
	02/28/95[dup]	**17.51**	**100,000**	**—**	**—**	**31,000**	**3,200**	**21,000**	**18,000**	**<0.4**
MW-3	02/24/92	25.60	4,500	1,300[c]	---	97	78	<5	18	9.1
	03/01/92	26.00	2,200	440	---	69	<0.5	<0.5	<0.5	13
	06/03/92	27.70	4,100	---	---	13	44	72	65	16
	09/01/92	29.46	1,900	---	---	20	5.5	6.8	<5	19
	09/01/92[dup]	29.46	1,900	---	---	21	3.4	6.6	<5	21
	12/04/92	29.93	2,400	---	---	8.	<5	<5	<5	16
	12/04/92[dup]	29.93	2,100	---	---	11	5.7	<0.5	<0.5	18
	03/03/93	23.08	5,100	---	---	63	75	61	150	3.3
	06/17/93	25.21	4,000	---	---	94	82	140	150	23
	09/10/93	26.95	3,200	---	---	140	12.5	12.5	12.5	20.0
	12/13/93	26.52	6,200	---	---	<12.	<12.5	<12.5	<12.5	13
	03/03/94	24.50	4,500	---	---	73	<5	<5	<5	---
	06/06/94	26.33	3,200	---	---	<0.	3.1	<0.5	<0.5	16
	09/12/94	27.98	3,900	---	---	<0.	9.6	<0.5	4.1	7.8

Table 2. Analytic Results for Ground Water - Shell Service Station WIC #204-6852-1404, 1784 150th Avenue, San Leandro, California (continued)

Well ID	Date Sampled	Depth to Water (ft)	TPH-G	TPH-D	POG	B	E	T	X	1,2-DCA
			← parts per billion (µg/l) →							
	12/19/94	25.63	2,400	---	---	21	4.2	22	2.6	25
	02/28/95	**23.45**	**4,000**	**—**	**—**	**58**	**7.1**	**<0.5**	**3.5**	**18**
MW-4	**03/24/95**	**9.16**	**<50**	**—**	**—**	**<0.**	**<0.5**	**<0.5**	**<0.5**	**<0.4**
Trip Blank	03/08/90		<50	---	---	<0.	<0.5	<0.5	<0.5	---
	06/12/90		<50	---	---	<0.	<0.5	<0.5	<0.5	---
	12/18/90		<50	---	---	<0.	<0.5	<0.5	<0.5	---
	03/07/91		<50	---	---	<0.	<0.5	<0.5	<0.5	---
	06/07/91		<50	---	---	<0.	<0.5	<0.5	<0.5	---
	09/17/91		<50	---	---	<0.	<0.5	<0.5	<0.5	---
	12/09/91		<50	---	---	<0.	<0.5	<0.5	<0.5	---
	02/24/92		<50	---	---	<0.	0.6	2.5	2.2	---
	03/01/92		<50	---	---	<0.	<0.5	<0.5	<0.5	---
	06/03/92		<50	---	---	<0.	<0.5	<0.5	<0.5	---
	09/01/92		<50	---	---	<0.	<0.5	<0.5	<0.5	<0.5
	12/04/92		<50	---	---	<0.	<0.5	<0.5	<0.5	<0.5[j]
	03/03/93		<50	---	---	<0.	<0.5	<0.5	<0.5	<0.5
	06/17/93		<50	---	---	<0.	<0.5	<0.5	<0.5	<0.5
	09/10/93		<50	---	---	<0.	<0.5	<0.5	<0.5	---
	12/13/93		<50	---	---	<0.	<0.5	<0.5	<0.5	<0.5[k]
	03/03/94		<50	---	---	<0.	<0.5	<0.5	<0.5	---
	06/06/94		<50	---	---	<0.	<0.5	<0.5	<0.5	---
	09/12/94		<50	---	---	<0.	<0.5	<0.5	<0.5	---
	12/19/94		<50	---	---	<0.	<0.5	<0.5	<0.5	---
	02/28/95		<50	---	---	<0.	<0.5	<0.5	<0.5	---
	03/24/95		**<50**	**—**	**—**	**<0.**	**<0.5**	**<0.5**	**<0.5**	**—**

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Table 2. Analytic Results for Ground Water - Shell Service Station WIC #204-6852-1404, 1784 150th Avenue, San Leandro, California (continued)

Well ID	Date Sampled	Depth to Water (ft)	TPH-G	TPH-D	POG	B	E	T	X	1,2-DCA
			← parts per billion (µg/l) →							
Bailer	03/08/90		<50	---	---	<0.	<0.5	<0.5	<0.5	---
Blank	09/01/92		<50	---		<0.	<0.5	0.7	<0.5	<0.5
	12/04/92		60	---		<0.	<0.5	<0.5	<0.5	<0.5[j]
DTSC MCLs			NE	NE	NE	1	680	100[l]	1,750	5.0

Abbreviations:

TPH-G = Total Petroleum Hydrocarbons as Gasoline by Modified EPA Method 8015
TPH-D = Total Petroleum Hydrocarbons as Diesel by Modified EPA Method 8015
POG = Petroleum oil and grease by American Public Health Association Standard Method 503E or 5520F
B = Benzene by EPA Method 8020
E = Ethylbenzene by EPA Method 8020
T = Toluene by EPA Method 8020
X = Xylenes by EPA Method 8020
1,2-DCA = 1,2-Dichloroethane by EPA Method 601
--- = Not analyzed
<n = Not detected above method detection limit of n ppb
DTSC MCLs = California Department of Toxic Substances Control maximum contaminant levels for drinking water
NE = Not established

Notes:

a = No total petroleum hydrocarbons as motor oil detected above modified EPA Method 8015 detection limit of 500 ppb
b = Tetrachloroethene (PCE) detected at 24 ppb by EPA Method 601; DTSC MCL for PCE = 5 ppb
c = Result is due to hydrocarbon compounds lighter than diesel
d = Result due to a non-gasoline hydrocarbon
e = In the matrix spike/matrix spike duplicate of sample MW-1, the RPD for Freon 113 and 1,3-dichlorobenzene was greater than 25%
f = The MW-2 and Dup samples each contained 1.6 ppb of methylene chloride which is within normal laboratory background levels.
h = Sample MW-2 was diluted 1:100 for EPA Method 8010 due to the interfering hydrocarbon peaks
j = The trip and field blank samples contained 14 and 10 mg/L 1,3-dichlorobenzene, respectively
k = 1.4 mg/L Chloroethene detected in equipment blank, trip blank not analyzed
l = DTSC recommended action level for drinking water; MCL not established

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Table 3. Hydrocarbons and Volatile Organic Compounds in Soil - Shell Service station WIC #204-6852-1404, 1784 150th Avenue, San Leandro, California

Borehole/ Sample ID	Date Sampled	TPH-G	B	T	E	X	VOCs
		← parts per million (mg/kg) →					
BH-1-21	06/06/94	<1.0	<0.0050	<0.0050	<0.0050	<0.0050	---
BH-2-20	06/06/94	<1.0	<0.0050	<0.0050	<0.0050	<0.0050	---
BH-3-16	06/06/94	<1.0	0.013	<0.0050	<0.0050	<0.0050	ND
BH-4-20.6	06/07/94	<1.0	<0.0050	<0.0050	<0.0050	<0.0050	---
BH-5-15.6	06/07/94	<1.0	<0.0050	<0.0050	<0.0050	<0.0050	---
BH-6-20.5	06/07/94	<1.0	<0.0050	<0.0050	<0.0050	<0.0050	---
BH-7-15.8	**02/14/95**	**<1.0**	**<0.0025**	**<0.0025**	**<0.0025**	**<0.0025**	**—**
BH-8-16.0	**02/14/95**	**<1.0**	**<0.0025**	**<0.0025**	**<0.0025**	**<0.0025**	**—**
BH-9-19.5	**02/14/95**	**<1.0**	**<0.0025**	**<0.0025**	**<0.0025**	**<0.0025**	**—**
BH-10-15.2	**03/03/95**	**<1.0**	**<0.0050**	**<0.0050**	**<0.0050**	**<0.0050**	**—**

Abbreviations:

TPH-G = Total petroleum hydrocarbons as gasoline by Modified EPA Method 8015B = Benzene by EPA Method 8020
T = Toluene by EPA Method 8020
E = Ethylbenzene by EPA Method 8020
X = Xylenes by EPA Method 8020
VOCs = Volatile organic compounds by EPA Method 8010
ND = Not detected between detection limits of 0.005 and 0.050 ppm
--- = Not analyzed

Analytical Laboratory:

Sequoia Analytical, Inc. of Redwood City, California

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Table 4. Hydrocarbon and Volatile Organic Compounds in Grab Ground Water Samples - Shell Service Station WIC #204-6852-1404, 1784 150th Avenue, San Leandro, California

Borehole/ Sample ID	Date Sampled	TPH-G	B	T	E	X	VOCs
		← parts per billion (µg/L) →					
BH-1	06/06/94	<50	<0.50	<0.50	<0.50	<0.50	---
BH-2	06/06/94	5,200[a]	8.8	<0.50	9.1	<0.50	---
BH-3	06/06/94	120,000[b]	25,000	14,000	3,100	13,000	ND
BH-4	06/07/94	<50	<0.50	<0.50	<0.50	<0.50	---
BH-5	06/07/94	<50	<0.50	<0.50	<0.50	<0.50	---
BH-6	06/07/94	<50	<0.50	<0.50	<0.50	<0.50	---
BH-7-17-W	**02/14/95**	**100**	**1.0**	**1.0**	**<0.5**	**<0.5**	**—**
BH-9-20-W	**02/14/95**	**90**	**0.9**	**0.9**	**<0.5**	**<0.5**	**—**

Abbreviations:

TPH-G = Total petroleum hydrocarbons as gasoline by Modified EPA Method 8015
B = Benzene by EPA Method 8020
T = Toluene by EPA Method 8020
E = Ethylbenzene by EPA Method 8020
X = Xylenes by EPA Method 8020
VOCs = Volatile organic compounds by EPA Method 8010
--- = Not analyzed
ND = Not detected between detection limits of 10 and 100 ppb.

Analytical Laboratory:

Sequoia Analytical, Inc. of Redwood City, California

Notes:

a = Chromatogram pattern as weathered gasoline.
b = Chromatogram pattern as gasoline.

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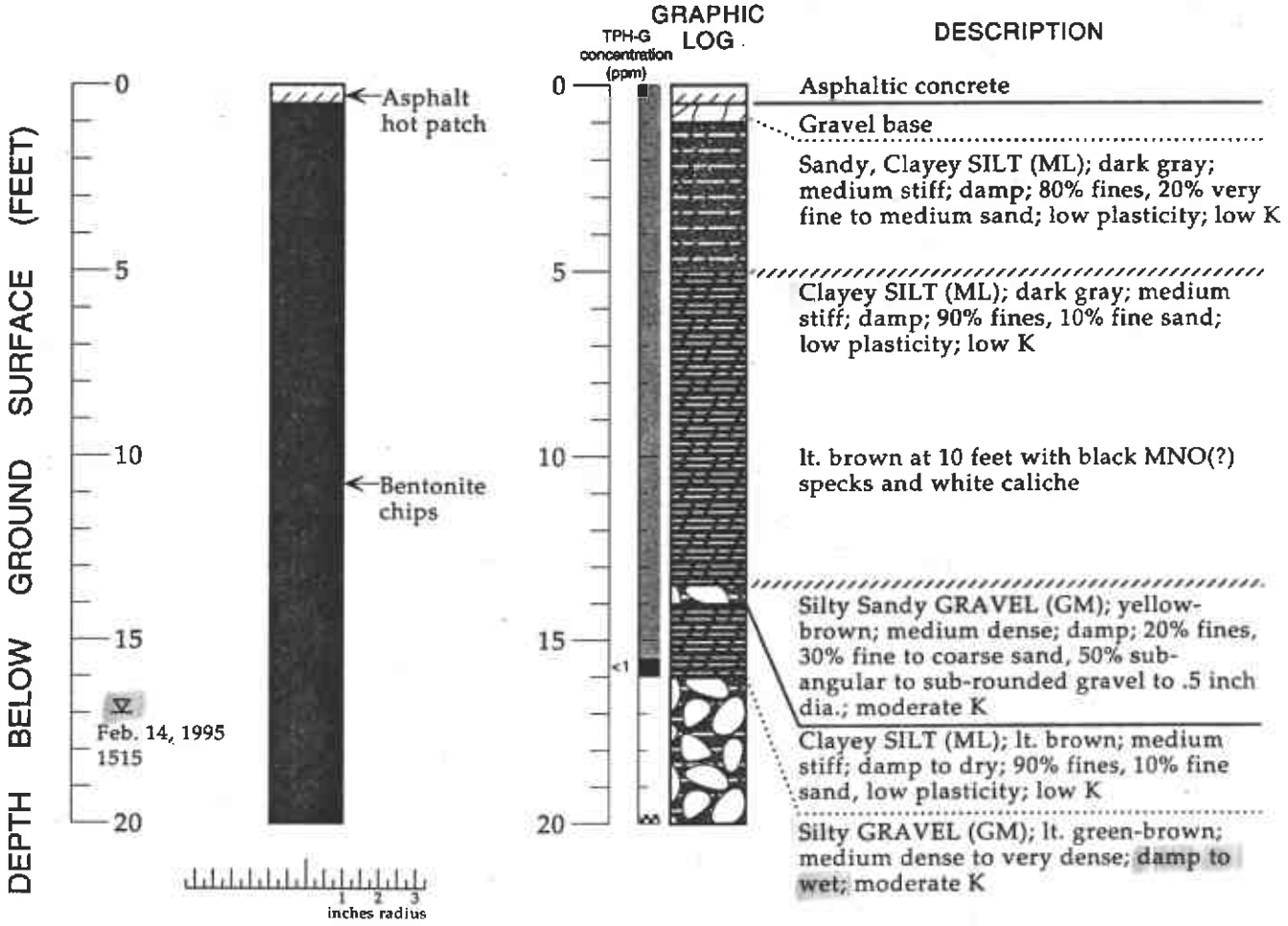
ATTACHMENT D

BORING LOGS

BH-7



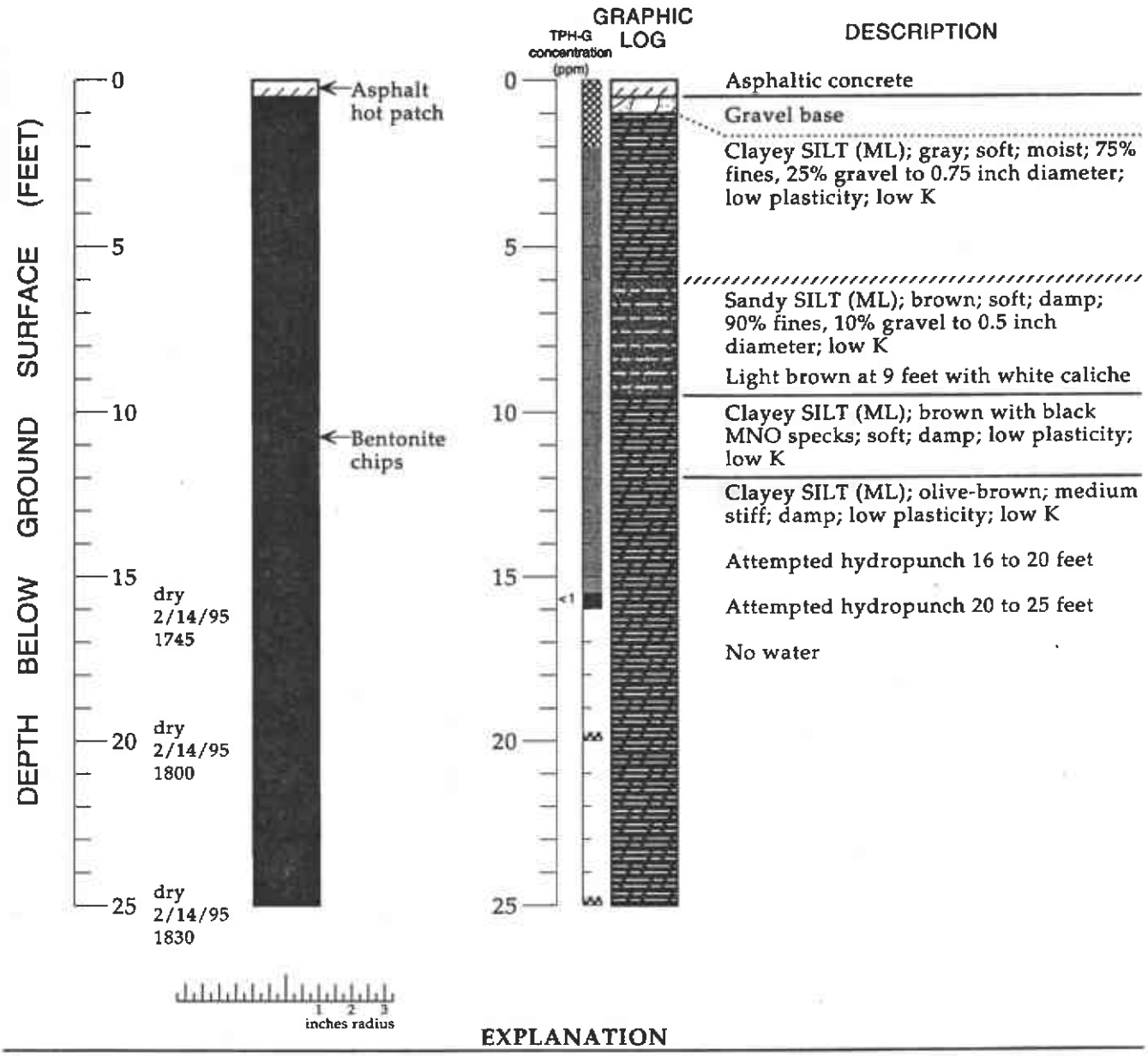
EXPLANATION

- ▼ 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: Thomas Howard
Supervisor: James W. Carmody; CEG 1576
Drilling Company: Vironix, Foster City, CA
License Number: C57-606481
Driller: Tom VanHuizen
Drilling Method: GeoProbe
Date Drilled: February 14, 1995
Well Head Completion: N/A
Type of Sampler: Californnia continous soil and ground water sampler
Ground Surface Elevation: ~40 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 - BH-7 - Shell Service Station WIC #204-6852-1404, 150th Avenue, San Leandro, California

BH-8



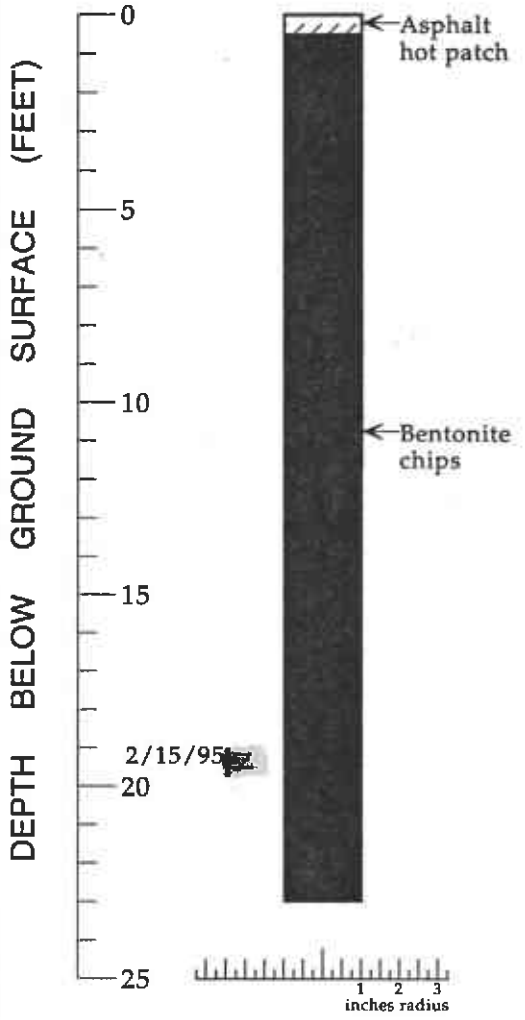
EXPLANATION

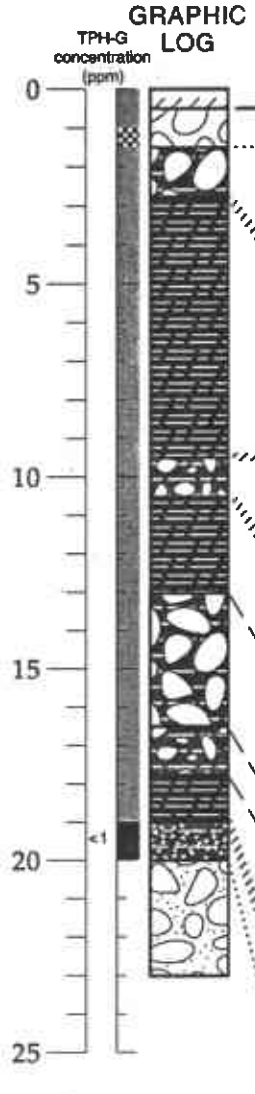
- ▼ Water level during drilling (date)
- ▽ Water level (date)
- ——..... Contact (dotted where approximate)
- —?—?— Uncertain contact
- //////// Gradational contact
- Location of recovered drive sample
- Location of drive sample sealed for chemical analysis
- Cutting sample
- K = Estimated hydraulic conductivity

Logged By: Faith M. Daverin
Supervisor: James W. Carmody; CEG 1576
Drilling Company: Vironix, Foster City, CA
License Number: C57-606481
Driller: Tom VanHuizen
Drilling Method: GeoProbe
Date Drilled: February 14, 1995
Well Head Completion: N/A
Type of Sampler: California continous soil and ground water sampler
Ground Surface Elevation: ~40 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 - BH-8 - Shell Service Station WIC #204-6852-1404, 150th Avenue, San Leandro, California

BH-9





DESCRIPTION

Asphaltic concrete

Gravel base

Silty GRAVEL (GM); very dark gray; medium dense; damp; 40% fines, 60% fine gravel to .60 inch dia.; medium plasticity; low K

Clayey SILT (ML); very dark gray; medium stiff; damp; 90% fines, 10% fine sand; medium plasticity; low K

medium stiff to soft from 4.5 ft. to 8 ft.

5% fine gravel to .30 inch dia. from 5 ft. to 8 ft.

Gravelly SILT (ML); olive-gray; medium stiff; damp; 80% fines, 20% fine gravel to .5 inch dia.; medium plasticity; low K

Clayey SILT (ML); olive-brown; medium stiff; damp; 90% fines, 10% fine sand; medium plasticity; low K

—?— —?— —?— —?— —?— —?—

Sandy SILT (ML); olive-brown, speckled black; medium stiff; damp; 80% fines, 20% fine to coarse sand; medium plasticity; low K

—?— —?— —?— —?— —?— —?—

Gravelly SILT (ML)

—?— —?— —?— —?— —?— —?—

Clayey SILT (ML); olive-brown, speckled black; medium stiff; damp; 90% fines, 10% fine sand; medium plasticity; low K

Silty SAND (SM); olive-brown; medium dense; moist; 20% fines, 80% fine to coarse sand; low plasticity; moderate to high K

Sandy GRAVEL (GM); medium dense; wet; high K

Attempt Hydropunch 20.0 to 23.0 ft. collect water sample

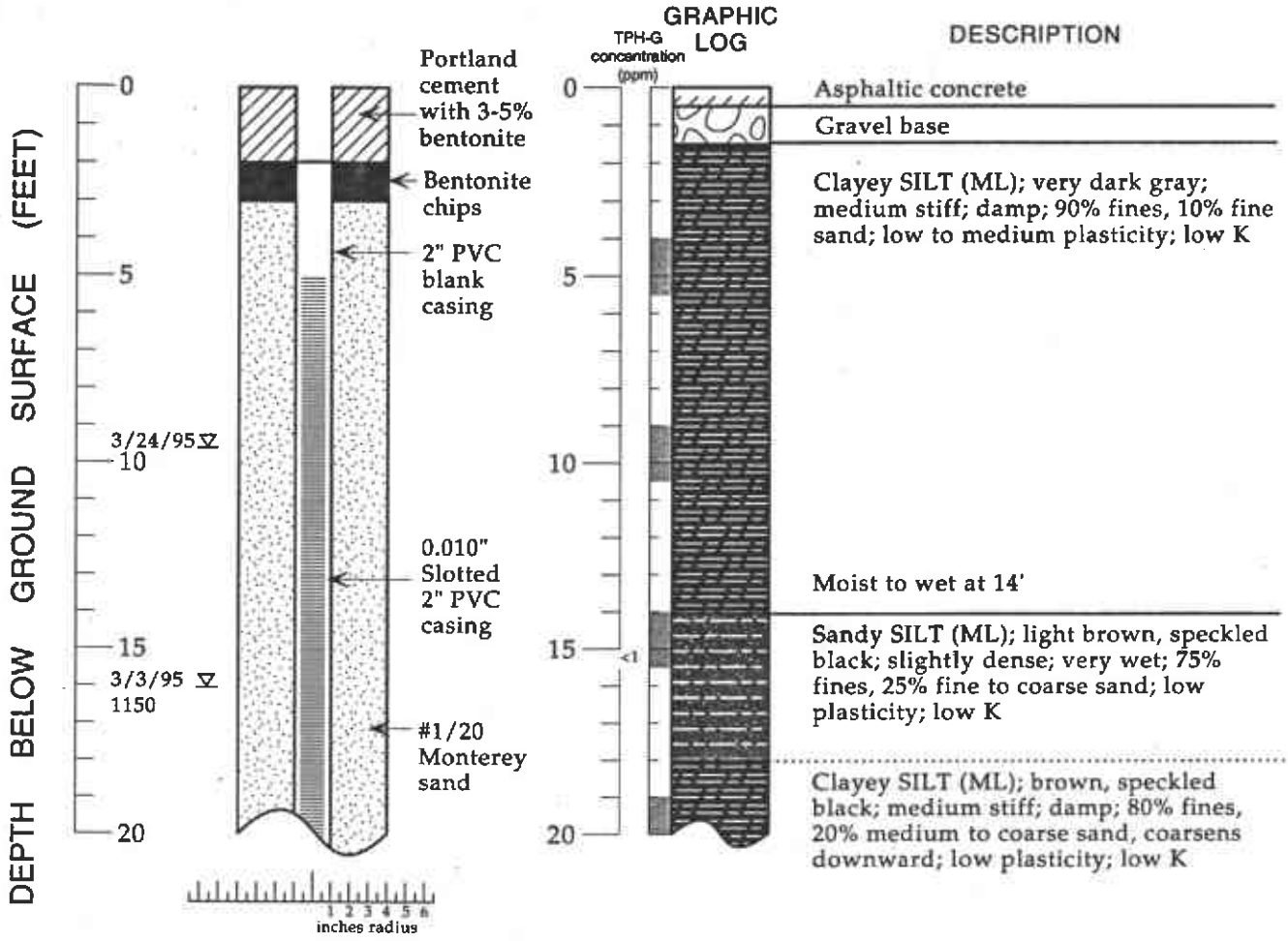
EXPLANATION

- ▼ 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: Thomas Howard
Supervisor: James W. Carmody; CEG 1576
Drilling Company: Vironix, Foster City, CA
License Number: C57-606481
Driller: Tom VanHuizen
Drilling Method: GeoProbe
Date Drilled: February 15, 1995
Well Head Completion: N/A
Type of Sampler: California continous soil and water sampler
Ground Surface Elevation: ~40 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 - BH-9 - Shell Service Station WIC #204-6852-1404, 150th Avenue, San Leandro, California

WELL MW-4 (BH-10)



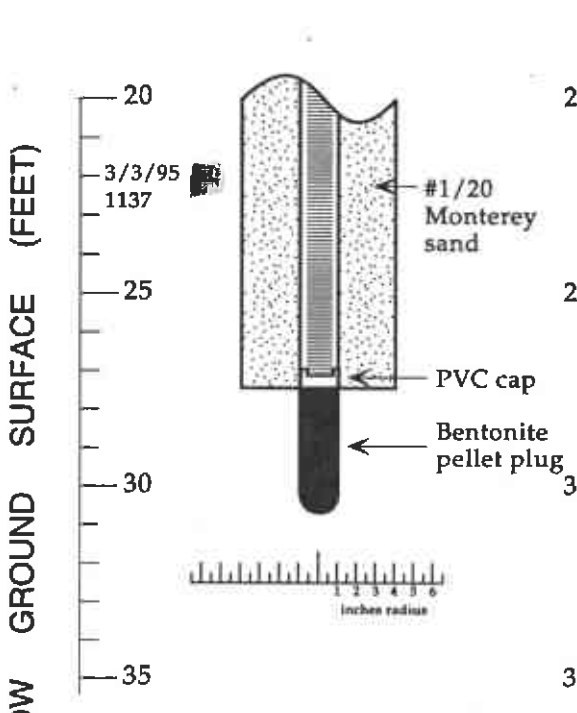
EXPLANATION

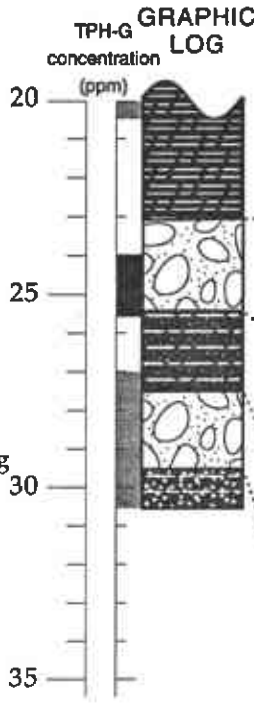
- ▼ Water level during drilling (date)
- ▽ Water level (date)
- ——····—— Contact (dotted where approximate)
- —?—?— Uncertain contact
- ////////. Gradational contact
- Location of recovered drive sample
- Location of drive sample sealed for chemical analysis
- Cutting sample
- K = Estimated hydraulic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

Logged By: Faith Daverin
Supervisor: James W. Carmody; CEG 1576
Drilling Company: Gregg Drilling, Martinez, CA
License Number: C57-485165
Driller: Marvin Hoover
Drilling Method: Hollow stem auger
Date Drilled: March 3, 1995
Well Head Completion: 2" locking well-plug, traffic-rated vault
Type of Sampler: Split barrel (2" ID)
Ground Surface Elevation: 40.08 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 - MW-4 (BH-10) - Shell Service Station WIC #204-6852-1404, 150th Avenue, San Leandro, California

WELL MW-4 (BH-10)(cont.)





DESCRIPTION

Clayey SILT (ML); brown, speckled black; medium stiff; damp; 80% fines, 20% medium to coarse sand, coarsens downward; low plasticity; low K

Sandy GRAVEL (GM); brown; medium dense; very moist; 25% fines, 25% medium to coarse sand, 50% gravel to 0.25" diameter; moderate to high K

Sandy SILT (ML); light brown, speckled black; slightly dense; damp to moist; 70% fines, 30% fine to medium sand; low plasticity; low K

Sandy GRAVEL (GM); brown; medium dense; very moist; 10% fines; 90% fine to very coarse sand; high K

Silty SAND (SM); light brown; loose; very wet; 30% silt, 70% very fine to fine sand; low plasticity; moderate K

Boring Log and Well Construction Details - MW-4 (BH-10) - Shell Service Station WIC #204-6852-1404, 150th Avenue, San Leandro, California