AEI CONSULTANTS
Environmental & Civil Engineering Services

3210 Old Tunnel Road, Suite B, Lafayette, CA 94549-4157
Phone: (925) 283-6000 Fax: (925) 283-6121

May 8, 2002

MAY 13 2002

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

Subject: 1450 Fruitvale Avenue
Oakland, California
AEI Project No. 4627

Dear Mr. Chan:

Enclosed is a workplan prepared by AEI to perform an appropriate groundwater investigation at the above referenced property. Thank you for meeting with John Jay and myself in March. After much discussion between Mr. Jay, Mr. Phua, and our staff, the scope of work was decided upon to provide sufficient and timely information to better define the extent of the plume.

AEI has been retained to perform this project, and we expect to begin the field work in the next few weeks. Although we are not anticipating any significant changes in the scope, we are requesting you input and comments and look forward to completing the project.

Thank you again for your time and please call me at (925) 283-6000 if you have any questions.

Sincerely,

Peter McIntyre
Project Geologist

May 8, 2002

WORKPLAN – FURTHER SITE INVESTIGATION

1450 Fruitvale Avenue
Oakland, California

AEI Project No. 5183

Prepared For

Alameda County Health Care Services Agency
1131 Harbor Bay Parkway, Suite 250
Alameda, CA 94501

Prepared By

AEI Consultants
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AEI

AEI CONSULTANTS
ENVIRONMENTAL & CIVIL ENGINEERING SERVICES

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May 8, 2002

Mr. Barney Chan
Alameda County Health Care Services Agency
1131 Harbor Bay Parkway, Suite 250
Alameda, CA 94501

Re: Workplan – Further Site Investigation
1450 Fruitvale Avenue
Oakland, California
AEI Project # 5183

Dear Mr. Chan:

The following workplan has been prepared on behalf of the Fruitvale-Farnam Associates, LLP (FFA) for the above referenced property. AEI Consultants (AEI) has been retained by FFA to provide environmental engineering and consulting services associated with the release of gasoline fuel hydrocarbons at the property. This workplan has been prepared in response to a request by the Alameda County Health Care Services Agency (ACHCSA) to further define the extent of hydrocarbon plume.

SITE DESCRIPTION AND BACKGROUND

The subject property (hereinafter referred to as the "site" or "property") is located on the eastern corner of Fruitvale Avenue and Farnam Street in a residential and commercial area of the City of Oakland. The property is approximately 11,000 square feet in size and is developed with a three-story building that occupies two-thirds of the parcel. The western corner of the parcel is improved with an asphalt parking lot. The property is currently vacant.

The site had reportedly been developed as a gas station in 1950 by Atlantic Richfield Oil Company (currently known as ARCO) and operated until at least 1983. There were four underground storage tanks located along the southern property boundary. The fuel dispenser island was located on the northeast corner of the current parking lot. The gas station was demolished and the existing warehouse was constructed after 1983.

Two soil-boring projects were performed between 1998 and 1999 to determine whether a fuel release had occurred and to what extent soil or groundwater had been impacted. Refer to Figure 2 and Tables 3 & 4 for the locations and results of these soil-boring projects. Three groundwater monitoring wells were then installed. Concentrations of TPH as gasoline and benzene have been found in the soil up to 360 mg/kg and 0.59 mg/kg respectively. Based on soil analytical data from the borings and the lack of hydrocarbons detected in sidewall samples from an exploratory

excavation dug in the former tank location, the release appears to have occurred along the product piping or in the former dispenser location. The most recent groundwater analytical data indicates that groundwater has been impacted with TPH as gasoline and benzene up to 29,000 µg/l and 2,100 µg/l, respectively. Refer to Figure 3 for the locations of the existing wells. Historical soil and groundwater data are presented in Tables 1 through 4.

GEOLOGIC CONDITIONS

According to logs of the borings completed by AEI, the near surface sediments generally consist of silty clays to approximately 10 to 12 feet below ground surface (bgs). The clays are underlain by sandy and clayey gravels. The water bearing deposits consist of gravel materials. During the advancement of temporary borings, the apparent depth to groundwater, as evidenced by wet or saturated deposits, ranged from 12 to 21 feet bgs. However static groundwater in the developed wells has ranged from 8 to 18 feet bgs.

The site is located at 42 feet above mean sea level (msl). The site is flat; however, the topography of the area slopes gently to the southwest. Average groundwater elevations for the three wells ranged from 25.36 feet above msl in October 2000 to 33.54 feet above msl in March 2002. Based on these measurements, groundwater beneath the site generally flows in a southwesterly direction, however during March 2002, a northwesterly flow direction was noted. Generally the hydraulic gradient has been on the order of 10^{-2} ft/ft. Historical groundwater level measurements are presented in Table 1. A rose diagram of groundwater flow directions is presented on Figure 4.

According to the USGS Oakland East topographic map, the nearest surface water body is the Brooklyn Basin Tidal Canal, located approximately 3,500 feet southwest of the site. Two small surface creeks, Sausal Creek and Peralta Creek, are located in the area; however, both are over 2,600 feet to the north of the site at their closest point.

SCOPE OF WORK

This scope of work has been primarily designed to further define the extent of impacted groundwater beneath the site. The goal of the work is to obtain sufficient data to appropriately locate [illegible]. This data should prove valuable during future human health risk and sensitive environmental receptor analyses.

AEI proposes to advance a total of eight (8) soil borings (labeled AEI-13 through AEI-20) in the locations shown on Figure 4. The borings will be advanced to approximately 20 feet bgs, or to first encountered groundwater. The borings will be continuously logged and soil samples will be collected for hydrocarbon analyses. Groundwater samples will also be collected from each boring.

FIELD PROCEDURES

Drilling
Borings will be advanced with a Geoprobe™ direct-push drilling rig to depths of approximately 20 feet in each boring. The selected drilling contractor will hold a California C57 driller's license. Following sample collection, each boring will be backfilled with cement grout.

Push rods and sampling equipment will be decontaminated between samples and between boreholes as appropriate to minimize the occurrence of cross-contamination.

Soil Sample Collection
Soil will be continuously collected in 4-foot acrylic liners within the sampling barrel. Samples will be selected and cut from the liners. The sample will be sealed with Teflon tape and plastic end caps. Soil samples will be screened in the field for the presence of hydrocarbons by visual observation and by use of a photo-ionization detector.

Groundwater Sample Collection
When groundwater is encountered, a Hydropunch™ screen sampler will be advanced within the water bearing deposits. The sample will be pulled back to expose a screened interval of the sampler. Groundwater will be collected through the rod with a drop tube. If groundwater cannot be sampled by this method, the rods will be removed and ¾" PVC casing will be temporarily inserted into the borehole to allow for groundwater collection. Groundwater samples will be collected into 40 ml VOA vials. The containers will be sealed so that no head-space or air bubbles are visible within the containers.

Sample Storage
All samples will be sealed and labeled immediately upon collection. Samples will be placed in a cooler with water ice, and maintained at a temperature of 3 to 4 degrees C. Chain of custody procedure will be initiated prior to leaving the site. All samples will be delivered to the selected laboratory on the day of collection.

Sample Analyses
It is anticipated that approximately 20 soil and groundwater samples will be analyzed during this project. The selected samples will be analyzed for TPH as gasoline (EPA method 8015M), and for BTEX with MTBE (EPA method 602/8020). Detections of MTBE by EPA method 8020 will be confirmed with reanalysis by EPA method 8260B.

Waste Storage
Drill cuttings will be stored in 55-gallon drums, pending the results of sample analyses. On-site treatment or off-site disposal of cuttings is not included in this scope of work. Equipment rinse water will be stored in 55-gallon drums.

REPORTING

Following receipt of all analytical data, a technical report will be prepared. The report will include figures, data tables, logs of borings, and interpretation of data. In addition, a discussion will be made for further investigation, if necessary. [redacted].

SITE SAFETY

Prior to commencement of field activities, a site safety meeting will be held at a designated command post near the working area. Emergency procedures will be outlined at this meeting, including an explanation of the hazards of the known or suspected chemicals of interest. All site personnel will be in Level D personal protection equipment, which is the anticipated maximum amount of protection needed. A working area will be established with barricades and warning tape to delineate the zone where hard hats and steel-toed shoes must be worn, and where unauthorized personnel will not be allowed. A site safety plan conforming to Part 1910.120 (i) (2) of 29 CFR will be on site at all times during the project.

ESTIMATED SCHEDULE

AEI has been retained to perform the scope of work outlined herein. City and County permits will be obtained within approximately one week of approval by ACHCSA. Field work will be scheduled upon approval of permits. The ACHCSA will be given adequate notification of the scheduled day of drilling to schedule a field inspection, if desired. The field work is expected to be completed in two days. Laboratory analytical results will be obtained within approximately one week of sample collection. A final report will be prepared and submitted to the client and ACHCSA within approximately 1 month of sample collection.

AEI requests your approval to proceed with this project. Please contact either of the undersigned at (925) 283-6000 if you have any questions or need any additional information.

Sincerely,
AEI Consultants

Peter McIntyre
Project Geologist

Joseph P. Derhake, PE
Principal

Figure 1 – Site location map
Figure 2 – Previous Soil Boring Locations
Figure 3 – Existing Well Locations
Figure 4 – Proposed Boring Locations

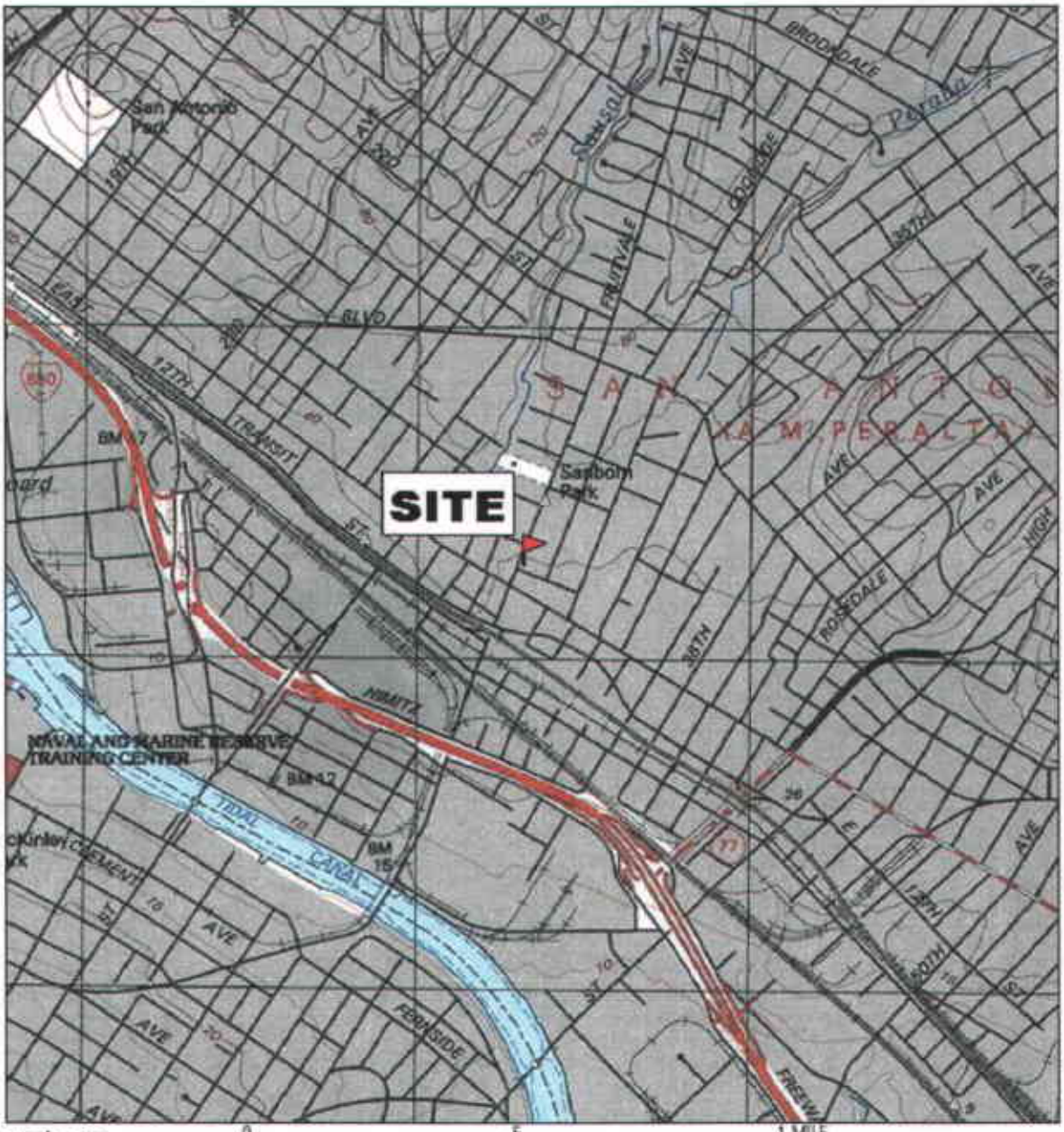
Table 1 – Water Table Data
Table 2 – Groundwater Sample Analytical Data
Table 3 – Previous Soil Sample Analytical Results
Table 4 – Previous Groundwater Sample Analytical Results

Distributions: Mr. John Jay
10700 MacArthur Boulevard, Suite 200
Oakland, CA 94506

Fruitvale-Farnam Associates, LLP
Mr. Bill Phua
141 Woodland Way
Piedmont, CA 94611

Mr. Barney Chan
Alameda County Health Care Services Agency
1131 Harbor Bay Parkway, Suite 250
Alameda, CA 94501

AEI Files (Project # 5183)



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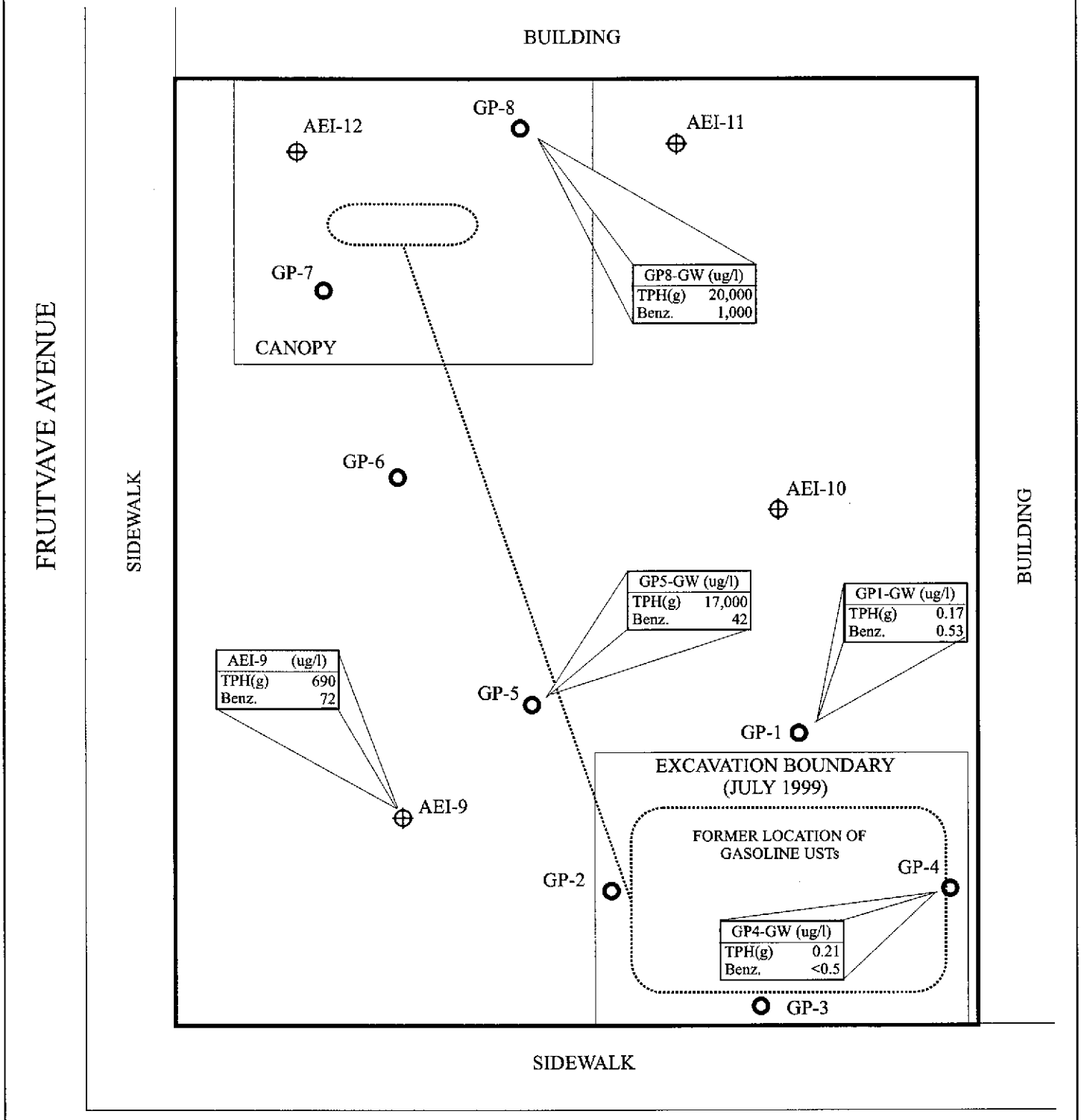
AEI CONSULTANTS 3210 OLD TUNNEL RD, STE B, LAFAYETTE, CA	
SITE LOCATION MAP	
1450 FRUITVALE AVENUE OAKLAND, CALIFORNIA	**FIGURE 1** AEI PROJECT NO. 5183



KEY

⊕ BORING LOCATIONS PERFORMED BY AEI AUGUST 24, 1999

O APPROXIMATE LOCATIONS OF SAMPLING PERFORMED BY *GLENFOS*; JULY, 1998

TPH(G) = Total Petroleum Hydrocarbons as gasoline
Benz. = Benzene

SCALE: 1" = 10'

N

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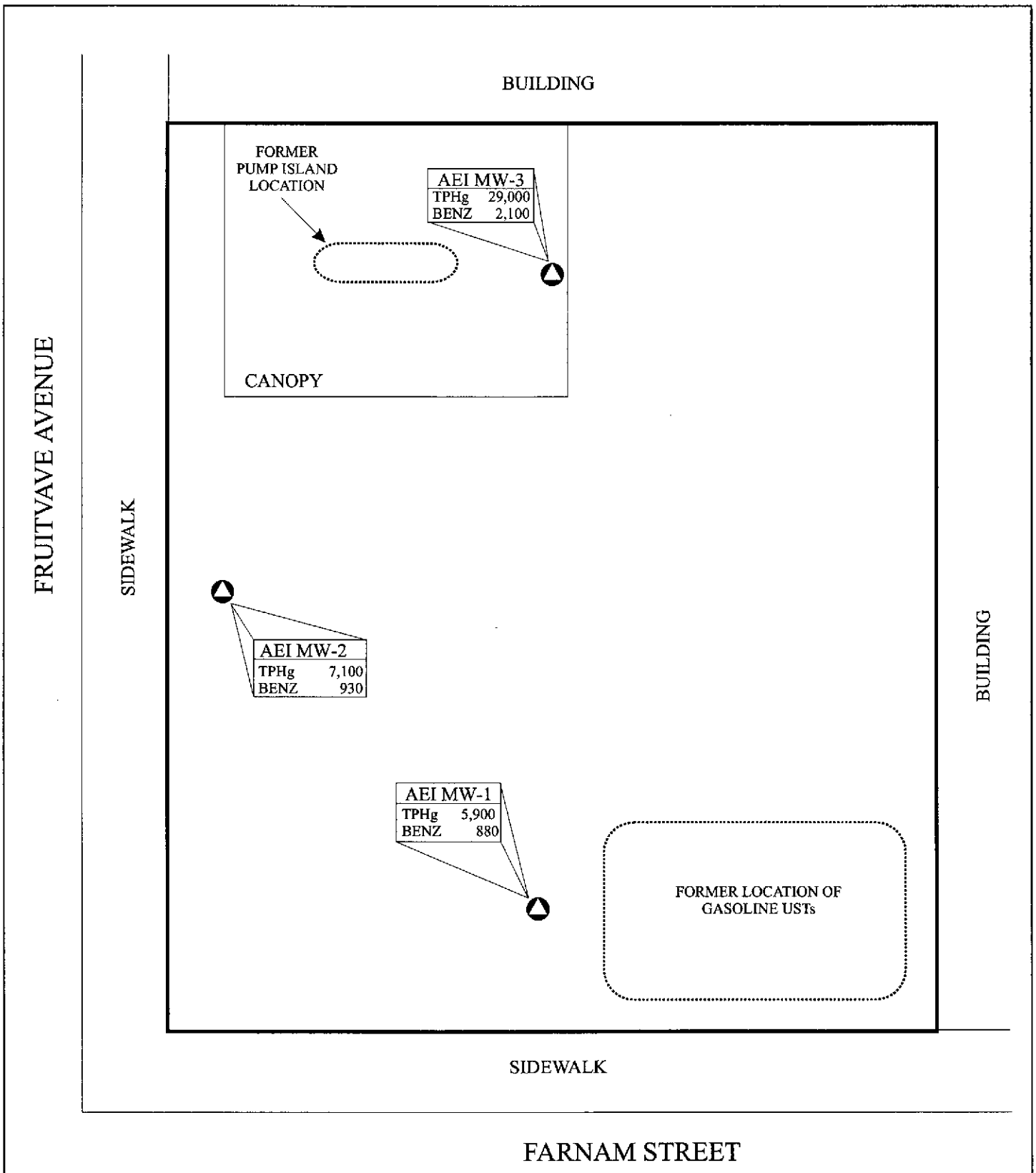
PREVIOUS SOIL BORING LOCATIONS

1450 FRUITVALE AVENUE
OAKLAND, CALIFORNIA

FIGURE 2
AEI PROJECT NO 5183



KEY

WELL LOCATIONS

TPHg = Total Petroleum Hydrocarbons as gasoline
Benz = Benzene
All samples measured in ug/L
(See Table 2 for all results)

SCALE: 1" = 10'

N

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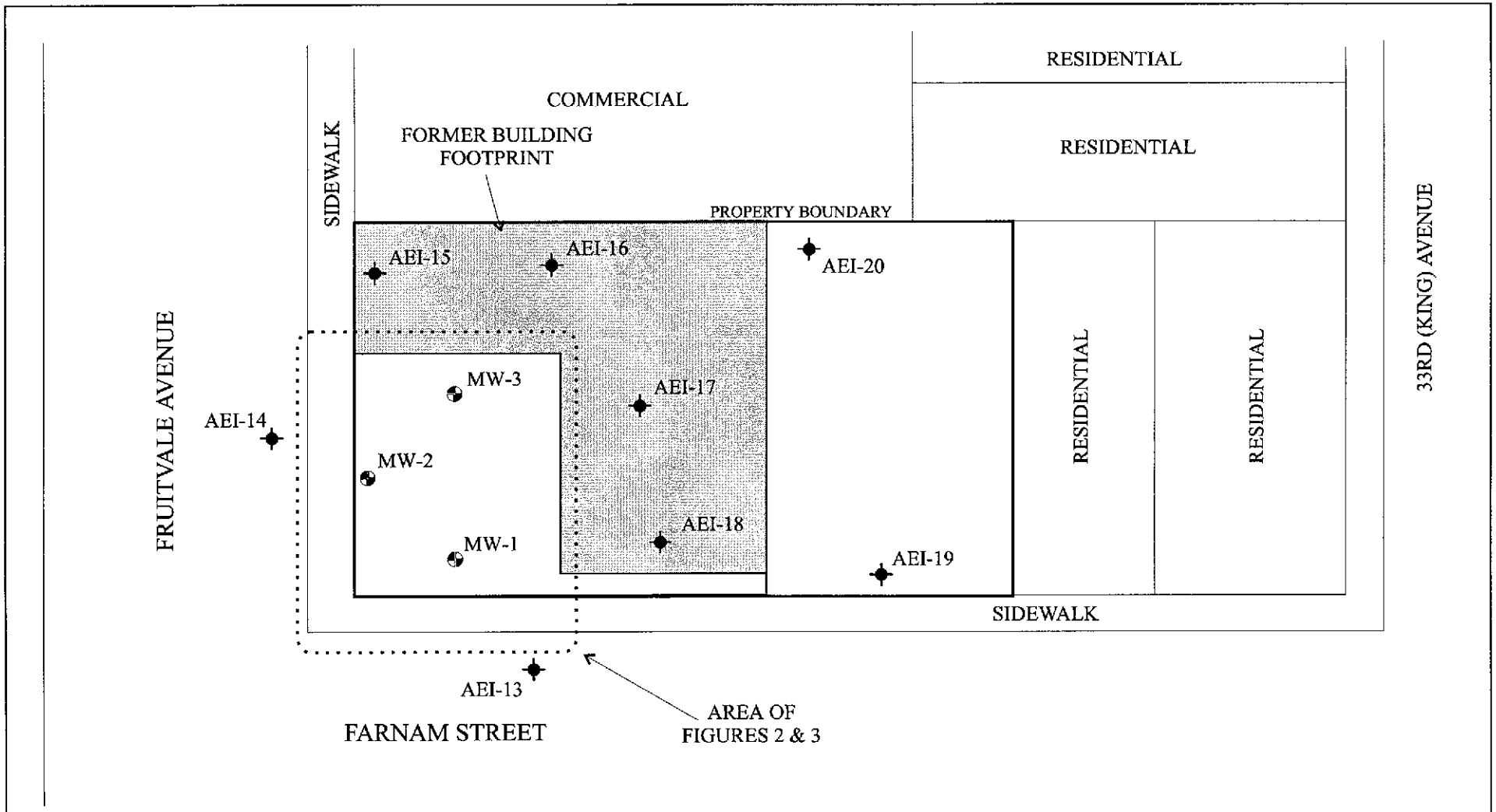
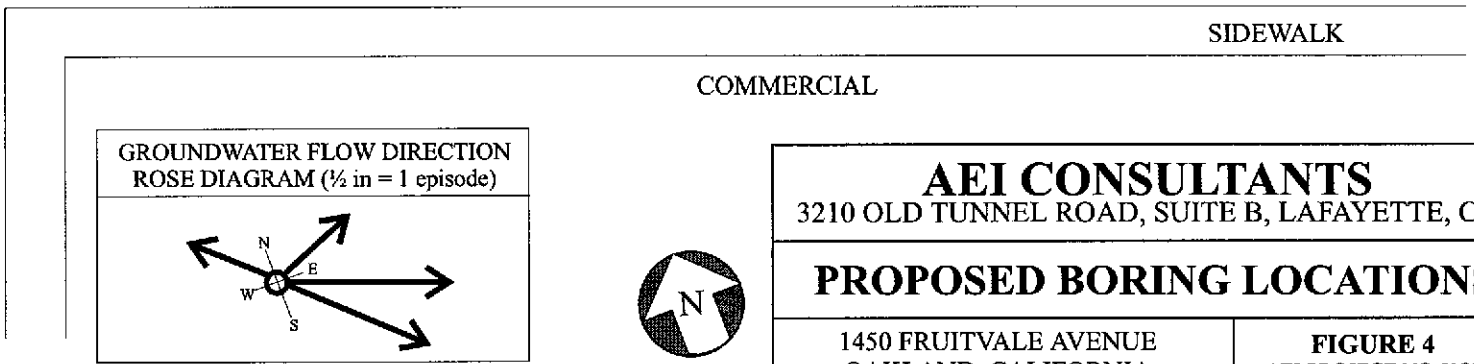
EXISTING WELLS: HYDROCARBONS 3/29/02

1450 FRUITVALE AVENUE
OAKLAND, CALIFORNIA

FIGURE 3
AEI PROJECT NO 5183





KEY

- EXISTING WELLS
- PROPOSED TEMPORARY BORING

SCALE: 1" = 40'
(Parcel Boundaries from County Assessor's Office)

GROUNDWATER FLOW DIRECTION ROSE DIAGRAM (½ in = 1 episode)

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PROPOSED BORING LOCATIONS

1450 FRUITVALE AVENUE
OAKLAND, CALIFORNIA

FIGURE 4
AEI PROJECT NO 5183

Table 1
Water Table Data

Well ID	Date	Well Elevation (ft msl)	Depth to Water (ft)	Groundwater Elevation (ft msl)
MW-1	10/16/00	42.13	17.72	24.41
	1/19/01	42.13	9.15	32.98
	4/26/01	42.13	9.40	32.73
	8/3/01	42.13	12.38	29.75
	11/5/01	42.13	16.22	25.91
	3/29/02	**42.13**	**7.96**	**34.17**
MW-2	10/16/00	42.08	14.98	27.10
	1/19/01	42.08	9.00	33.08
	4/26/01	42.08	8.34	33.74
	8/3/01	42.08	11.70	30.38
	11/5/01	42.08	15.08	27.00
	3/29/02	**42.08**	**8.96**	**33.12**
MW-3	10/16/00	42.55	17.98	24.57
	1/19/01	42.55	10.90	31.65
	4/26/01	42.55	9.21	33.34
	8/3/01	42.55	12.67	29.88
	11/5/01	42.55	15.90	26.65
	3/29/02	**42.55**	**9.20**	**33.35**

Episode #	Date	Average Water Table (ft msl)	Change from Previous Episode	Flow direction (gradient)
1	10/16/00	25.36	-	E/SE (0.116)
2	1/19/01	32.57	+7.21	E/NE (0.041)
3	4/26/01	33.27	+0.70	SE (0.034)
4	8/3/01	30.00	-3.27	E/SE (0.024)
5	11/5/01	26.52	-3.48	SE (0.033)
6	**3/29/02**	**33.54**	**+7.02**	**NW (0.032)**

Notes:
All well elevations are measured from the top of the casings
ft msl = feet above mean sea level

Table 2
Groundwater Sample Analytical Data

Well/Sample ID	Date Collected	Consultant/ Lab	TPHg µg/L	MTBE µg/L	Benzene µg/L	Toluene µg/L	Ethylbenzene µg/L	Xylenes µg/L
MW-1	10/16/00	AEI/MAI	4,500	<20	560	14	53	62
	01/19/01	AEI/MAI	13,000	<100	790	46	1,100	210
	04/26/01	AEI/MAI	7,500	<30	470	23	720	120
	08/03/01	AEI/MAI	4,500	<10	440	11	55	6.6
	11/05/01	AEI/MAI	1,700	<10	100	6.0	4.6	2.1
	03/29/02	**AEI/MAI**	**9,500**	**ND<100**	**880**	**32**	**400**	**59**
MW-2	10/16/00	AEI/MAI	4,600	<300	380	3.8	95	33
	01/19/01	AEI/MAI	4,200	<10	450	4.7	120	50
	04/26/01	AEI/MAI	5,600	<20	810	12	210	65
	08/03/01	AEI/MAI	2,900	<20	360	3	97	46
	11/05/01	AEI/MAI	2,400	<85	280	3.2	76	25
	03/29/02	**AEI/MAI**	**7,100**	**ND<100**	**930**	**11**	**220**	**39**
MW-3	10/16/00	AEI/MAI	12,000	<10	570	32	680	1,200
	01/19/01	AEI/MAI	27,000	<200	3,400	110	2,200	2,700
	04/26/01	AEI/MAI	33,000	<200	3,300	190	2,800	3,400
	08/03/01	AEI/MAI	23,000	<50	2,300	52	1,800	1,400
	11/05/01	AEI/MAI	30,000	<200	1,900	58	2,000	1,600
	03/29/02	**AEI/MAI**	**29,000**	**ND<100**	**2,100**	**57**	**2,500**	**1,700**
MRL			50.0	5.0	0.5	0.5	0.5	0.5

MRL = Method Reporting Limit, unless otherwise shown
µg/L = micrograms per liter
AEI = AEI Consultants
MAI = McCampbell Analytical, Inc.
TPHg = total petroleum hydrocarbons as gasoline
MTBE = methyl tertiary butyl ether

Table 3
Previous Soil Sample Analytical Results

Sample ID	Consul-tant	Sample Date	TPH-g mg/kg	MTBE mg/kg	Benzene mg/kg	Toluene mg/kg	Ethyl Benzene mg/kg	Xylenes mg/kg	Total Lead mg/kg
GP-1 10'	Glenfos	7/9/1998	10	-	<0.005	0.022	0.015	<0.01	-
GP-2 10'	Glenfos	7/9/1998	1.5	-	0.017	<0.005	<0.005	<0.01	-
GP-2 15'	Glenfos	7/9/1998	27	-	0.017	0.056	0.052	0.51	-
GP-2 30'	Glenfos	7/9/1998	2.5	-	<0.005	<0.005	<0.005	<0.01	-
GP-3 10'	Glenfos	7/9/1998	95	-	0.59	0.42	1.1	1.5	7.3
GP-3 15'	Glenfos	7/9/1998	2.5	-	0.055	0.018	0.055	0.26	-
GP-3 20'	Glenfos	7/9/1998	1.6	-	0.02	<0.005	0.02	0.032	-
GP-3 25'	Glenfos	7/9/1998	<1	-	<0.005	<0.005	<0.005	<0.01	-
GP-4 10'	Glenfos	7/9/1998	2.5	-	0.017	<0.005	0.003	0.021	4.1
GP-5 10'	Glenfos	7/9/1998	6.5	-	<0.005	0.022	0.018	0.041	-
GP-5 15'	Glenfos	7/9/1998	19	-	0.077	0.016	0.43	0.49	-
GP-5 20'	Glenfos	7/9/1998	<1	-	<0.005	<0.005	<0.005	<0.01	-
GP-6 5'	Glenfos	7/9/1998	<1	-	<0.005	<0.005	<0.005	<0.01	-
GP-6 10'	Glenfos	7/9/1998	7.7	-	0.008	0.015	0.012	0.047	6.2
GP-6 15'	Glenfos	7/9/1998	190	-	0.34	0.53	2.3	4.7	-
GP-6 20'	Glenfos	7/9/1998	28	-	0.083	0.081	0.052	0.19	-
GP-7 10'	Glenfos	7/9/1998	86	-	<0.005	0.088	0.09	0.5	-
GP-7 15'	Glenfos	7/9/1998	2.7	-	0.008	0.012	<0.005	0.031	-
GP-8 10'	Glenfos	7/9/1998	24	-	0.022	0.061	0.071	0.45	-
GP-8 15'	Glenfos	7/9/1998	5.8	-	0.021	0.014	0.022	0.06	-
GP-8 20'	Glenfos	8/23/1999	<1	-	<0.005	<0.005	<0.005	<0.01	-
AEI-9 10'	AEI	8/23/1999	<1	<0.05	<0.005	<0.005	<0.005	<0.005	-
AEI-9 20'	AEI	8/23/1999	<1	<0.05	<0.005	<0.005	<0.005	<0.005	-
AEI-10 10'	AEI	8/23/1999	77	<0.05	<0.005	<0.005	0.078	<0.005	-
AEI-10 15'	AEI	8/23/1999	69	0.071	0.1	0.21	0.23	<0.005	-
AEI-11 10'	AEI	8/23/1999	<1	<0.05	<0.005	<0.005	<0.005	<0.005	-
AEI-11 15'	AEI	8/23/1999	210	<0.40	<0.020	1.1	1.2	2.4	-
AEI-12 10'	AEI	8/23/1999	24	<0.05	<0.005	0.12	<0.005	<0.005	-
AEI-12 15'	AEI	8/23/1999	120	<0.40	<0.020	<0.020	1.6	1.6	-
MW-1 6.5'	AEI	9/25-26/00	<1.0	<.05	<.005	<.005	<.005	<.005	-
MW-1 11.5'	AEI	9/25-26/00	15.0	<.05	<.005	0.31	<.005	0.011	-
MW-2 6.5'	AEI	9/25-26/00	<1.0	<.05	<.005	<.005	<.005	<.005	-
MW-2 11'	AEI	9/25-26/00	73.0	<.05	<.005	0.044	0.0080	0.040	-
MW-3 6.5'	AEI	9/25-26/00	<1.0	<.05	<.005	<.005	<.005	<.005	-
MW-3 16'	AEI	9/25-26/00	360.0	<1.0	0.42	2.1	6.5	11.0	-
MDL			1.0	0.05	0.005	0.005	0.005	0.005	

MDL = Method Detection Limit

mg/kg = milligrams per kilogram (ppm)

- Sample not analyzed for this chemical

TPH-g = Total petroleum hydrocarbons as gasoline

Table 4
Previous Groundwater Sample Analytical Results

Sample ID	Consultant	Sample Date	TPH-g µg/L	MTBE µg/L	Benzene µg/L	Toluene µg/L	Ethyl-Benzene µg/L	Xylenes µg/L	Lead µg/L
GP 1	Glenfos	7/9/1998	170	-	0.53	<0.5	1.2	2.0	-
GP 4	Glenfos	7/9/1998	210	-	<0.5	<0.5	0.58	<1	11
GP 5	Glenfos	7/9/1998	17,000	-	42	24	820	110	-
GP 8	Glenfos	7/9/1998	20,000	<10	1,000	19	420	290	9.5
AEI-9W	AEI	8/23/1999	690	3.8	72	0.79	29	24	-
MDL			50	5.0	0.5	0.5		1.5	2.5

MDL = Method Detection Limit

ND = Not detected above the Method Detection Limit (unless otherwise noted)

µg/L = micrograms per liter (ppb)

- Sample not analyzed for this chemical

TPH-g = Total petroleum hydrocarbons as gasoline