PES Environmental, Inc.
Engineering & Environmental Services

July 11, 1995

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Mr. Thomas Gram
Former Eastshore Partners
5800 Shellmound, Suite 210
Emeryville, California 94608

TRANSMITTAL
QUARTERLY MONITORING REPORT
POWELL STREET PLAZA AND
SHELLMOUND III PROPERTIES
EMERYVILLE, CALIFORNIA

Dear Tom:

Enclosed please find the Quarterly Monitoring Report for the Powell Street Plaza and Shellmound III Properties in Emeryville, California. Quarterly sampling was conducted on March 3, 1995. PES Environmental, Inc. (PES) has prepared this report on behalf of the former partners of Eastshore Partners.

I trust this is the information you require at this time.

Very truly yours,

PES ENVIRONMENTAL, INC.

Bryan J. Smith
Senior Staff Engineer

Enclosure

cc: David Cooke, Esq., Beveridge & Diamond

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PES Environmental, Inc.
Engineering & Environmental Services

A Report Prepared for:

Mr. Thomas Gram
5800 Shellmound, Suite 210
Emeryville, California 94608

QUARTERLY MONITORING REPORT
POWELL STREET PLAZA
AND SHELLMOUND III SITES
EMERYVILLE, CALIFORNIA

JULY 11, 1995

By:

Bryan J. Smith
Senior Staff Engineer

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DISTRIBUTION

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1.0 INTRODUCTION

This report presents data collected by PES Environmental, Inc. (PES) during the March 3, 1995 groundwater monitoring at Powell Street Plaza and the adjacent Shellmound III properties in Emeryville, California. This monitoring was conducted on behalf of the former partners of Eastshore Partners pursuant to a June 4, 1993 letter to Aetna Real Estate Associates, L.P. (the current Powell Street Plaza property owner) from the Alameda County Department of Environmental Health (ACDEH). The scope of monitoring activities was established in subsequent conversations with Ms. Susan Hugo of ACDEH and Mr. Rich Hiett of the California Regional Water Quality Control Board - San Francisco Bay Region (RWQCB). The purpose of the monitoring was to evaluate the degree and extent of petroleum hydrocarbons in groundwater at the subject sites.

2.0 QUARTERLY STATUS REPORT

The passive free-phase product recovery skimmers have been operating in Wells MW-13 and MW-15 at the Powell Street Plaza site during the quarter. The product collection canisters are emptied monthly. From January 12, 1995 to March 3, 1995, the product recovery systems removed approximately 0.04 gallons of product. The total volume of product recovered since system operation began on November 10, 1993 is 1.27 gallons. In addition to the monthly inspection and maintenance of the product recovery skimmers, a full round of water-level elevation measurements was made once per month.

Soils from the excavation of an East Bay Municipal Utilities District (EBMUD) sanitary sewer trench are being stored on the Shellmound III site. Monitoring well MG-7 has been covered by a soil stockpile and was inaccessible during sampling. The fence along the northern boundary of the Shellmound III property and the northeastern access gate from Shellmound Street have been removed. A ramp has been installed connecting the Shellmound III property with the Powell Street Plaza property at the northwest corner of the Shellmound III property.

3.0 QUARTERLY GROUNDWATER SAMPLING

Quarterly groundwater sampling was conducted by Blaine Tech Services, Inc. (Blaine Tech) under PES' observation on March 3, 1995. Groundwater samples were collected from Monitoring Wells MW-1, MW-2, MW-4, MW-5, MW-11, MW-12, MW-16, MW-19, MG-2, MG-4 and PZ-1 in accordance with the monitoring well sampling schedule approved by the ACDEH. Due to the inaccessibility of monitoring well MG-7, a groundwater sample was collected from monitoring well MW-16. Monitoring well identification and corresponding sample numbers are presented on Table 1. Locations of the monitoring wells are shown on Plate 1.

Groundwater samples were collected from each well after removing approximately three well volumes of water using a stainless steel bailer or an electric submersible pump. During purging, the discharge water was monitored for pH, temperature, electrical conductivity and turbidity. The samples were collected from the wells using a new disposable plastic (high-density polyethylene) bailer at each well and poured into the appropriate laboratory containers. The sample containers were then labeled and immediately placed in a chilled, thermally-insulated cooler for delivery under chain-of-custody protocol to American Environmental Network (AEN), a State-certified laboratory in Pleasant Hill, California. AEN received the samples on March 6, 1995.

AEN analyzed the samples using EPA Test Method 8015 (modified) for total petroleum hydrocarbons quantified as gasoline (TPHg), diesel (TPHd) and motor oil (TPHmo) and using EPA Test Method 8020 for benzene, toluene, ethylbenzene and total xylenes (BTEX). Laboratory chemical results for dissolved hydrocarbon compounds in groundwater, including results from previous sampling rounds, are listed in Table 2.

The laboratory reports and chain-of-custody records are included in Appendix A. Field methods and field parameter measurements are described in the Blaine Tech sampling report included in Appendix B.

4.0 WATER-LEVEL AND PRODUCT THICKNESS MEASUREMENTS

Water levels and product thickness (where present) in the monitoring wells were measured on March 3, 1995 by PES prior to well purging and sampling. Measurements were recorded to the nearest 0.01 foot using an electronic, dual-interface sounding probe. Depth-to-water measurements were converted to water-level elevations referenced to mean sea level (MSL) and corrected for displacement by free product. To prevent cross-contamination between wells, the portion of the sounding probe that was submerged in the well was cleaned with an alconox/deionized water solution and rinsed with deionized water between well measurements. Water-level elevations and product thicknesses are listed in Table 3 and illustrated on Plates 2 and 3, respectively.

5.0 SUMMARY OF RESULTS

This section presents a summary of groundwater chemistry and water-level elevation data collected during the March 3, 1995 sampling event.

5.1 Groundwater Chemistry

TPHd was detected in each of the eleven groundwater samples. Concentrations of TPHd ranged from 0.3 parts per million (ppm) to 11 ppm. TPHg was detected in samples collected from Wells MW-2, MW-4, MW-5, MW-11, MG-2, MG-4, and PZ-1 at concentrations ranging from 0.06 ppm to 3.1 ppm. TPHmo was detected in each groundwater sample except the samples from Wells MW-1, MW-12, MW-16, and MW-19. Concentrations of TPHmo ranged from 0.2 ppm to 0.9 ppm.

Benzene was detected in groundwater samples collected from Wells MW-2, MW-4, MW-11, MG-2, and PZ-1 at concentrations ranging from 0.0006 ppm to 0.610 ppm. Toluene, ethylbenzene, and total xylenes were detected in the sample collected from MW-4 at concentrations of 0.004 ppm, 0.001 ppm, and 0.004 ppm, respectively.

5.2 Water-Level and Product Thickness Measurements

The March 3, 1995 water-level elevations at the Powell Street Plaza property ranged from 2.07 feet higher (MW-15) to 0.03 feet lower (MW-3) than water-level elevations measured on November 29, 1994. The March 3, 1995 water-level elevations on the Shellmound III property ranged from 0.69 feet higher (MG-4) to 0.09 feet lower (MG-1) than the November 1994 water-level elevations. The generally higher water-level elevations observed at the Powell Street Plaza and Shellmound III properties on March 3, 1995 correlate with the wet winter season, which this year consisted of very heavy rains falling throughout the season.

Wells MW-8 and MW-10 continue to show a trend of uncharacteristically low water-level elevations with respect to surrounding wells. This may be due to their proximity to utility corridors with permeable backfill located within Shellmound Street. The groundwater mound in the vicinity of Wells MW-13 and MW-14 is slightly more pronounced in the March 3, 1995 water-level elevations than in the November 29, 1994 water-level elevations.

The primary direction of groundwater flow is southwest toward Temescal Creek at an approximate gradient range of 0.006 to 0.019 feet per foot. Free product was observed in trace amounts (thickness less than 0.01 feet) in Wells MW-7, MW-13, MW-14, MW-15, MG-1, and MG-3.

6.0 DISCUSSION OF GROUNDWATER CHEMISTRY RESULTS

At the request of ACDEH, the laboratory analytical program was modified beginning with the November 1994 sampling round to include EPA Test Method 8015 (modified) for TPHg, TPHd, and TPHmo and EPA Method 8020 for BTEX. These methods replaced EPA Method 8260, which was used for the previous four quarters of groundwater monitoring.

Results from two quarterly sampling events have now been obtained using this revised laboratory analytical program. The groundwater chemistry results from these quarters indicate that low concentrations of petroleum hydrocarbons were detected in samples from wells which had previously shown non-detectable concentrations. These detectable concentrations are primarily in the TPHd and TPHmo range, which are generally characterized as low solubility medium-to-heavy-fraction petroleum hydrocarbons. PES will continue to evaluate the laboratory results of future quarterly monitoring by comparison with the previous results.

7.0 QUALITY ASSURANCE/QUALITY CONTROL (QA/QC)

Chemical data obtained from water sample analyses were validated according to accuracy, precision, and completeness criteria. Three types of control samples: spikes, duplicates, and blanks, were used in the QA/QC program to evaluate the chemical data.

Data accuracy was assessed by evaluating results of analyses of a laboratory spike sample and a laboratory spike duplicate. The results of spike and spike duplicate analyses are presented in the laboratory report in Appendix A. The recoveries (the percentage difference between the spike concentration and the measured concentration) and differences (from duplicate analyses) were within project goals.

The evaluation procedure for blanks includes a qualitative review of the chemical analysis data reported by the laboratory. TPHg, TPHd, TPHmo and BTEX were not detected in the internal blanks prepared by the laboratory. One field blank (Sample Number 95090000) was submitted to AEN for analysis. TPHg, TPHd, TPHmo and BTEX were not detected in the field blank.

Internal laboratory blank, spike and duplicate data were within the laboratory QA/QC limits. No petroleum hydrocarbons or hydrocarbon constituents were detected in the field blank or in the internal blanks. The data from AEN are considered to be representative and acceptable.

TABLES

TABLE 1

Summary of Wells Sampled
March 3, 1995

Powell Street Plaza and Shellmound III Sites
Emeryville, California

Well ID	Sample Number
MW-1	95090001
MW-2	95090002
MW-3	NS
MW-4	95090004
MW-5	95090005
MW-6	NS
MW-7	NS
MW-8	NS
MW-9	NS
MW-10	NS
MW-11	95090011
MW-12	95090012
MW-13	NS
MW-14	NS
MW-15	NS
MW-16	95090016
MW-18	NS
MW-19	95090019
MG-1	NS
MG-2	95090102
MG-3	NS
MG-4	95090104
MG-7	NS
PZ-1	95090201
Field Blank	95090000

Note:

NS Not sampled

TABLE 2

Results of Chemical Analyses of Groundwater Samples

Powell Street Plaza and Shellmound III Sites
Emeryville, California

Well Number	Date Sampled	EPA Test Method	(concentrations expressed in parts per million) TPH as Gasoline	TPH as Diesel	TPH as Motor Oil	Benzene	Toluene	Ethyl-benzene	Total Xylenes	Comments
MW-1	3/14/88	8015	NT	<1	NT	NT	NT	NT	NT	
	3/25/91	8015/8020	<0.050	<0.050	NT	<0.0003	<0.0003	<0.0003	<0.0003	
	11/10/93	8260	<0.050	<0.050	NT	0.0013	0.0018	<0.0005	0.0020	
	2/23/94	8260	<0.050	<0.050	NT	<0.0005	<0.0005	<0.0005	<0.0005	
	6/2/94	8260	<0.050	<0.050	NT	<0.0005	<0.0005	<0.0005	<0.0005	
	11/29/94	8015/8020	<0.05	0.3	0.2	<0.0005	<0.0005	<0.0005	<0.002	
	3/3/95	**8015/8020**	**<0.05**	**0.69**	**<0.2**	**<0.0005**	**<0.0005**	**<0.0005**	**<0.002**	
MW-2	3/14/88	8015	NT	0.05	NT	NT	NT	NT	NT	
	3/25/91	8015/8020	0.053	<0.050	NT	0.0006	<0.0003	<0.0003	<0.0003	
	11/10/93	8260	<0.050	<0.050	NT	<0.0005	<0.0005	<0.0005	<0.0005	
	2/23/94	8260	<0.050	<0.050	NT	<0.0005	<0.0005	<0.0005	<0.0005	
	6/2/94	8260	<0.050	<0.050	NT	<0.0005	<0.0005	<0.0005	<0.0005	
	8/30/94	8260	<0.050	0.200	NT	0.0006	<0.0005	<0.0005	<0.0005	
	11/29/94	8015/8020	0.07	3.9	0.9	0.0009	<0.0005	<0.0005	<0.002	
	3/3/95	**8015/8020**	**0.08**	**3.9**	**0.2**	**0.0007**	**<0.0005**	**<0.0005**	**<0.002**	
MW-3	3/14/88	8015	NT	0.15	NT	NT	NT	NT	NT	
	3/25/91	NS	NS	NS	NT	NS	NS	NS	NS	Free product
	11/10/93	NS	NS	NS	NT	NS	NS	NS	NS	Free product (0.23 ft)
	2/23/94	8260	<0.050	11.000	NT	0.0007	<0.0005	<0.0005	<0.0005	
	6/2/94	8260	NS	NS	NS	NS	NS	NS	NS	Well cover jammed
	8/30/94	8260	<0.050	1.300	NT	0.0013	<0.0005	<0.0005	0.0006	
	11/29/94	NS	NS	NS	NS	NS	NS	NS	NS	
	3/3/95	**NS**	**NS**	**NS**	**NS**	**NS**	**NS**	**NS**	**NS**	
MW-4	3/14/88	8015	NT	1.2	NT	NT	NT	NT	NT	
	3/25/91	8015/8020	1.300	2.500	NT	0.7100	0.0030	0.0020	0.0060	

TABLE 2

Results of Chemical Analyses of Groundwater Samples

Powell Street Plaza and Shellmound III Sites
Emeryville, California

Well Number	Date Sampled	EPA Test Method	(concentrations expressed in parts per million) TPH as Gasoline	TPH as Diesel	TPH as Motor Oil	Benzene	Toluene	Ethyl-benzene	Total Xylenes	Comments
MW-4	11/10/93	8260	0.800	34.000	NT	0.4400	0.0030	<0.0020	<0.0020	Free product (0.02 ft)
(cont)	2/23/94	8260	0.560	18.000	NT	0.4500	0.0025	<0.0005	0.0020	
	6/2/94	8260	<0.500	13.000	NT	0.760	<0.005	<0.005	<0.005	
	8/30/94	8260	1.400	<0.050	NT	0.470	<0.0005	<0.0005	<0.0005	
	11/29/94	8015/8020	3.5	14	1.5	0.500	0.004	0.0007	0.003	
	3/3/95	**8015/8020**	**3.1**	**11**	**0.7**	**0.610**	**0.004**	**0.001**	**0.004**	
MW-5	3/14/88	8015	NT	<1	NT	NT	NT	NT	NT	
	11/10/93	8260	<0.050	6.800	NT	<0.0005	<0.0005	<0.0005	<0.0005	
	2/23/94	8260	<0.050	7.100	NT	<0.0005	<0.0005	<0.0005	<0.0005	
	6/2/94	8260	<0.500	8.100	NT	<0.005	<0.005	<0.005	<0.005	
	8/30/94	8260	<0.050	1.400	NT	<0.0005	<0.0005	<0.0005	<0.0005	0.0005 - 1,2-DCA
	11/29/94	8015/8020	2.1	4.3	1.1	0.0006	0.0006	<0.0005	<0.002	
	3/3/95	**8015/8020**	**0.6**	**5.3**	**0.2**	**<0.0005**	**<0.0005**	**<0.0005**	**<0.002**	
MW-6	3/14/88	8015	NT	<0.05	NT	NT	NT	NT	NT	
	11/10/93	8260	<0.050	<0.050	NT	<0.0005	<0.0005	<0.0005	<0.0005	
	2/23/94	8260	<0.050	<0.050	NT	<0.0005	<0.0005	<0.0005	<0.0005	
	6/2/94	8260	<0.050	<0.050	NT	<0.0005	<0.0005	<0.0005	<0.0005	
	11/29/94	NS	NS	NS	NS	NS	NS	NS	NS	
	3/3/95	**NS**	**NS**	**NS**	**NS**	**NS**	**NS**	**NS**	**NS**	
MW-7	3/10/88	NS	NS	NS	NS	NS	NS	NS	NS	Free product (1.32 ft)
	11/10/93	NS	NS	NS	NS	NS	NS	NS	NS	Free product (0.22 ft)
	2/23/94	NS	NS	NS	NS	NS	NS	NS	NS	Free product (0.02 ft)
	6/2/94	NS	NS	NS	NS	NS	NS	NS	NS	Free product (0.01 ft)
	11/29/94	NS	NS	NS	NS	NS	NS	NS	NS	Free product (Trace: <0.01 ft)
	3/3/95	**NS**	**NS**	**NS**	**NS**	**NS**	**NS**	**NS**	**NS**	Free product (Trace: <0 01 ft)

TABLE 2

Results of Chemical Analyses of Groundwater Samples

Powell Street Plaza and Shellmound III Sites
Emeryville, California

Well Number	Date Sampled	EPA Test Method	(concentrations expressed in parts per million) TPH as Gasoline	TPH as Diesel	TPH as Motor Oil	Benzene	Toluene	Ethyl-benzene	Total Xylenes	Comments
MW-8	3/14/88	8015	NT	<0.05	NT	NT	NT	NT	NT	
	11/10/93	8260	<0.050	<0.050	NT	<0.0005	<0.0005	<0.0005	<0.0005	
	2/23/94	8260	<0.050	<0.050	NT	<0.0005	<0.0005	<0.0005	<0.0005	
	6/2/94	8260	<0.050	0.190	NT	<0.0005	<0.0005	<0.0005	<0.0005	
	9/6/94	8260	<0.050	<0.050	NT	<0.0005	<0.0005	<0.0005	<0.0005	
	11/29/94	NS	NS	NS	NS	NS	NS	NS	NS	
	3/3/95	**NS**	**NS**	**NS**	**NS**	**NS**	**NS**	**NS**	**NS**	
MW-9	3/14/88	8015	NT	<1	NT	NT	NT	NT	NT	
	11/10/93	8260	<0.050	<0.050	NT	<0.0005	<0.0005	<0.0005	<0.0005	
	2/23/94	8260	<0.050	<0.050	NT	<0.0005	<0.0005	<0.0005	<0.0005	
	6/2/94	8260	<0.050	<0.050	NT	<0.0005	<0.0005	<0.0005	<0.0005	
	11/29/94	NS	NS	NS	NS	NS	NS	NS	NS	
	3/3/95	**NS**	**NS**	**NS**	**NS**	**NS**	**NS**	**NS**	**NS**	
MW-10	3/14/88	8015	NT	<1.0	NT	NT	NT	NT	NT	
	11/10/93	8260	<0.050	<0.050	NT	<0.0005	<0.0005	<0.0005	<0.0005	
	2/23/94	8260	<0.050	<0.050	NT	<0.0005	<0.0005	<0.0005	<0.0005	
	6/2/94	8260	<0.050	<0.050	NT	<0.0005	<0.0005	<0.0005	<0.0005	
	11/29/94	NS	NS	NS	NS	NS	NS	NS	NS	
	3/3/95	**NS**	**NS**	**NS**	**NS**	**NS**	**NS**	**NS**	**NS**	
MW-11	3/14/88	NS	NS	NS	NS	NS	NS	NS	NS	Well was dry
	11/10/93	8260	<0.050	<0.050	NT	0.0008	<0.0005	<0.0005	<0.0005	
	2/23/94	8260	<0.050	<0.050	NT	0.0008	<0.0005	<0.0005	<0.0005	
	6/2/94	8260	<0.050	<0.050	NT	0.0021	<0.0005	<0.0005	<0.0005	
	8/30/94	8260	<0.050	<0.050	NT	0.0028	<0.0005	<0.0005	<0.0005	

TABLE 2

Results of Chemical Analyses of Groundwater Samples

Powell Street Plaza and Shellmound III Sites
Emeryville, California

Well Number	Date Sampled	EPA Test Method	(concentrations expressed in parts per million) TPH as Gasoline	TPH as Diesel	TPH as Motor Oil	Benzene	Toluene	Ethyl-benzene	Total Xylenes	Comments
MW-11	11/29/94	8015/8020	0.07	2.0	0.8	0.002	<0.0005	<0.0005	<0.002	
(cont.)	3/3/95	**8015/8020**	**0.06**	**3.7**	**0.2**	**0.005**	**<0.0005**	**<0.0005**	**<0.002**	
MW-12	3/14/88	8015	NT	0.05	NT	NT	NT	NT	NT	
	11/10/93	8260	<0.050	<0.050	NT	<0.0005	<0.0005	<0.0005	<0.0005	
	2/23/94	8260	<0.050	<0.050	NT	<0.0005	<0.0005	<0.0005	<0.0005	
	6/2/94	8260	<0.050	<0.050	NT	<0.0005	<0.0005	<0.0005	<0.0005	
	9/6/94	8260	<0.050	<0.050	NT	<0.0005	<0.0005	<0.0005	<0.0005	
	11/29/94	8015/8020	<0.05	0.3	<0.2	<0.0005	<0.0005	<0.0005	<0.002	
	3/3/95	**8015/8020**	**<0.05**	**0.3**	**<0.2**	**<0.0005**	**<0.0005**	**<0.0005**	**<0.002**	
MW-13	3/14/88	8015/8020	NT	1.7	NT	<0.0005	<0.0005	<0.0005	<0.0005	
	11/10/93	NS	NS	NS	NS	NS	NS	NS	NS	Free product (1.06 ft)
	2/23/94	NS	NS	NS	NS	NS	NS	NS	NS	Free product (Trace: <0.01 ft)
	6/2/94	NS	NS	NS	NS	NS	NS	NS	NS	Free product (Trace: <0.01 ft)
	11/29/94	NS	NS	NS	NS	NS	NS	NS	NS	Free product (Trace: <0.01 ft)
	3/3/95	**NS**	**NS**	**NS**	**NS**	**NS**	**NS**	**NS**	**NS**	
MW-14	3/14/88	8015	NT	<1	NT	NT	NT	NT	NT	
	11/10/93	NS	NS	NS	NS	NS	NS	NS	NS	Free product (0.27 ft)
	2/23/94	NS	NS	NS	NS	NS	NS	NS	NS	Free product (Trace: <0.01 ft)
	6/2/94	NS	NS	NS	NS	NS	NS	NS	NS	Free product (Trace: <0.01 ft)
	11/29/94	NS	NS	NS	NS	NS	NS	NS	NS	Free product (Trace: <0.01 ft)
	3/3/95	**NS**	**NS**	**NS**	**NS**	**NS**	**NS**	**NS**	**NS**	Free product (Trace: <0.01 ft)
MW-15	3/14/88	8015/8020	NT	1.8	NT	<0.0005	<0.0005	<0.0005	<0.0005	
	11/10/93	NS	NS	NS	NS	NS	NS	NS	NS	Free product (0.15 ft)
	2/23/94	NS	NS	NS	NS	NS	NS	NS	NS	Free product (Trace: <0.01 ft)
	6/2/94	NS	NS	NS	NS	NS	NS	NS	NS	Free product (Trace: <0.01 ft)

TABLE 2

Results of Chemical Analyses of Groundwater Samples

Powell Street Plaza and Shellmound III Sites
Emeryville, California

Well Number	Date Sampled	EPA Test Method	(concentrations expressed in parts per million) TPH as Gasoline	TPH as Diesel	TPH as Motor Oil	Benzene	Toluene	Ethyl-benzene	Total Xylenes	Comments
MW-15	11/29/94	NS	NS	NS	NS	NS	NS	NS	NS	Free product (Trace: <0.01 ft)
(cont)	3/3/95	**NS**	**NS**	**NS**	**NS**	**NS**	**NS**	**NS**	**NS**	Free product (Trace: <0.01 ft)
MW-16	3/14/88	8015	NT	<0.05	NT	NT	NT	NT	NT	
	4/21/89	8015	NT	<1.0	NT	0.0009	0.0026	0.0004	0.0041	
	3/25/91	8015/8020	<0.050	<0.050	NT	<0.0003	<0.0003	<0.0003	0.0003	
	5/20/92	8015/8020	<0.050	0.140	NT	<0.0003	<0.0003	<0.0003	<0.0003	Non-standard diesel pattern
	11/10/93	8260	<0.050	<0.050	NT	<0.0005	<0.0005	<0.0005	<0.0005	
	2/23/94	8260	<0.050	<0.050	NT	<0.0005	<0.0005	<0.0005	<0.0005	
	6/2/94	8260	<0.050	<0.050	NT	<0.0005	<0.0005	<0.0005	<0.0005	
	11/29/94	NS	NS	NS	NS	NS	NS	NS	NS	
	3/3/95	**8015/8020**	**<0.05**	**0.5**	**<0.2**	**<0.0005**	**<0.0005**	**<0.0005**	**<0.002**	
MW-18	3/14/88	8015	NT	<0.05	NT	NT	NT	NT	NT	
	5/20/92	8015/8020	<0.050	<0.050	NT	<0.0003	<0.0003	<0.0003	<0.0003	
	11/10/93	8260	<0.050	<0.050	NT	<0.0005	<0.0005	<0.0005	<0.0005	
	2/23/94	NS	NS	NS	NS	NS	NS	NS	NS	Well area flooded
	6/2/94	8260	<0.050	<0.050	NT	<0.0005	<0.0005	<0.0005	<0.0005	
	11/29/94	NS	NS	NS	NS	NS	NS	NS	NS	Well area flooded, almost under water
	3/3/95	**NS**	**NS**	**NS**	**NS**	**NS**	**NS**	**NS**	**NS**	**Well area flooded**
MW-19	10/6/94	8015/8020	<0.05	<0.05	0.4	<0.0005	<0.0005	<0.0005	<0.002	
	10/31/94	8015/8020	<0.05	0.2	<0.2	<0.0005	<0.0005	<0.0005	<0.002	
	11/29/94	8015/8020	0.07	<0.05	0.5	0.002	0.005	0.0009	0.005	
	3/3/95	**8015/8020**	**<0.05**	**0.3**	**<0.2**	**<0.0005**	**<0.0005**	**<0.0005**	**<0.002**	
MG-1	4/21/89	NS	NS	NS	NS	NS	NS	NS	NS	Free product
	3/25/91	NS	NS	NS	NS	NS	NS	NS	NS	Free product
	5/21/92	NS	NS	NS	NS	NS	NS	NS	NS	Free product (0.03 ft)

TABLE 2

Results of Chemical Analyses of Groundwater Samples

Powell Street Plaza and Shellmound III Sites
Emeryville, California

Well Number	Date Sampled	EPA Test Method	(concentrations expressed in parts per million) TPH as Gasoline	TPH as Diesel	TPH as Motor Oil	Benzene	Toluene	Ethyl-benzene	Total Xylenes	Comments
MG-1	11/10/93	NS	NS	NS	NS	NS	NS	NS	NS	Free product (0.36 ft)
(cont)	2/23/94	NS	NS	NS	NS	NS	NS	NS	NS	Free product (Trace: <0.01 ft)
	6/2/94	NS	NS	NS	NS	NS	NS	NS	NS	Free product (0.09 ft)
	11/29/94	NS	NS	NS	NS	NS	NS	NS	NS	Free product (Trace: <0.01 ft)
	3/3/95	**NS**	**NS**	**NS**	**NS**	**NS**	**NS**	**NS**	**NS**	Free product (Trace: <0.01 ft)
MG-2	4/21/89	8015	NT	<1.0	NT	0.09	0.0027	<0.0003	0.0017	
	3/25/91	8015/8020	<0.050	<0.050	NT	0.0010	<0.0003	<0.0003	<0.0003	
	5/21/92	8015	0.210	1.400	NT	0.0820	0.0018	0.0006	0.0014	
	11/10/93	8260	0.050	0.540	NT	0.0160	0.0009	<0.0005	<0.0005	
	2/23/94	8260	<0.050	3.300	NT	0.0033	<0.0005	<0.0005	<0.0005	
	6/2/94	8260	0.490	<0.050	NT	0.016	0.0009	<0.0005	<0.0005	
	8/30/94	8260	<0.050	0.875	NT	0.0078	0.0006	<0.0005	0.0006	
	11/29/94	8015/8020	0.3	3.2	0.9	0.015	0.001	<0.0005	<0.002	
	3/3/95	**8015/8020**	**0.8**	**3.1**	**0.7**	**0.002**	**<0.0005**	**<0.0005**	**<0.002**	
MG-3	4/21/89	8015	NT	<1.0	NT	0.1	0.0023	<0.0003	0.0089	
	3/25/91	8015/8020	0.610	2.600	NT	0.0750	0.0008	0.0004	0.0020	
	5/21/92	NS	NS	NS	NS	NS	NS	NS	NS	Free product (0.85 ft)
	11/10/93	NS	NS	NS	NS	NS	NS	NS	NS	Free product (0.47 ft)
	2/23/94	8260	NS	NS	NS	NS	NS	NS	NS	Free product (0.02 ft)
	6/2/94	8260	NS	NS	NS	NS	NS	NS	NS	Free product (0.08 ft)
	11/29/94	NS	NS	NS	NS	NS	NS	NS	NS	Free product (Trace: <0 01 ft)
	3/3/95	**NS**	**NS**	**NS**	**NS**	**NS**	**NS**	**NS**	**NS**	Free product (Trace: <0.01 ft)
MG-4	4/21/89	8015	NT	<1.0	NT	0.0003	<0.0003	<0.0003	0.0013	
	3/25/91	8015/8020	<0.050	<0.050	NT	0.0004	<0.0003	<0.0003	0.0005	
	5/20/92	8015/8020	<0.050	<0.050	NT	<0.0003	<0.0003	<0.0003	<0.0003	
	11/10/93	8260	<0.050	<0.050	NT	<0.0005	<0.0005	<0.0005	<0.0005	

TABLE 2

Results of Chemical Analyses of Groundwater Samples

Powell Street Plaza and Shellmound III Sites
Emeryville, California

Well Number	Date Sampled	EPA Test Method	(concentrations expressed in parts per million) TPH as Gasoline	TPH as Diesel	TPH as Motor Oil	Benzene	Toluene	Ethyl-benzene	Total Xylenes	Comments
MG-4	2/23/94	8260	<0.050	<0.050	NT	<0.0005	<0.0005	<0.0005	<0.0005	
(cont)	6/2/94	8260	<0.050	<0.050	NT	<0.0005	<0.0005	<0.0005	<0.0005	
	9/6/94	8260	<0.050	<0.050	NT	<0.0005	<0.0005	<0.0005	<0.0005	0.0007 - 1,2-DCA
	11/29/94	8015/8020	<0.05	4.8	0.6	<0.0005	<0.0005	<0.0005	<0.002	
	3/3/95	**8015/8020**	**0.05**	**9.9**	**0.9**	**<0.0005**	**<0.0005**	**<0.0005**	**<0.002**	
MG-7	3/25/91	8015/8020	<0.050	<0.050	NT	0.0005	<0.0003	<0.0003	<0.0003	
	5/20/92	8015/8020	<0.050	0.060	NT	<0.0003	<0.0003	<0.0003	<0.0003	Non-standard diesel pattern
	11/10/93	8260	<0.050	<0.050	NT	<0.0005	<0.0005	<0.0005	<0.0005	
	2/23/94	8260	<0.050	<0.050	NT	<0.0005	<0.0005	<0.0005	<0.0005	
	6/2/94	8260	<0.050	<0.050	NT	<0.0005	<0.0005	<0.0005	<0.0005	
	8/30/94	8260	<0.050	<0.050	NT	<0.0005	<0.0005	<0.0005	<0.0005	0.0007 - 1,2-DCA
	11/29/94	8015/8020	<0.05	2.6	0.4	<0.0005	<0.0005	<0.0005	<0.002	
	3/3/95	**NS**	**NS**	**NS**	**NS**	**NS**	**NS**	**NS**	**NS**	**Well buried under soil stockpile**
PZ-1	3/25/91	8015/8020	0.320	0.340	NT	0.0004	<0.0003	<0.0003	0.0010	
	5/21/92	8015/8020	0.120	0.600	NT	0.0018	0.0003	0.0003	0.0012	
	11/10/93	8260	<0.050	<0.050	NT	0.0015	<0.0005	<0.0005	<0.0005	0.450 - TPH as light petroleum distillate
	2/23/94	8260	<0.050	<0.050	NT	0.0009	<0.0005	<0.0005	<0.0005	0.200 - TPH as stoddard solvent
	6/2/94	8260	<0.050	<0.050	NT	0.0016	<0.0005	<0.0005	<0.0005	2.400 - TPH as light petroleum distillate
	11/29/94	8015/8020	0.2	1.4	1.7	0.0007	<0.0005	<0.0005	<0.002	
	3/3/95	**8015/8020**	**2.0**	**3.7**	**0.8**	**0.0006**	**<0.0005**	**<0.0005**	**<0.002**	

Notes.

NT = Not tested for indicated test parameter

NS = Not sampled for indicated test parameter

TPH = Total petroleum hydrocarbons

1,2-DCA = 1,2-Dichloroethane

TABLE 3

Water-Level Elevations and Product Thickness Measurements

Powell Street Plaza and Shellmound III Sites
Emeryville, California

Well Number	Measurement Date	Top of Casing (feet MSL)	Depth to Product (feet)	Depth to Water (feet)	Product Thickness (feet)	Water-Level Elevation (feet MSL)	Corrected W-L Elevation (feet MSL)
MW-1	3/3/95	8.72	NP	4.75		3.97	
MW-2	3/3/95	9.83	NP	5.75		4.08	
MW-3	3/3/95	10.86	NP	6.58		4.28	
MW-4	3/3/95	11.58	NP	7.38		4.20	
MW-5	3/3/95	11.16	NP	6.55		4.61	
MW-6	3/3/95	11.42	NP	7.09		4.33	
MW-7	3/3/95	11.84	Trace	5.90	<0.01	5.94	5.94
MW-8	3/3/95	7.48	NP	5.30		2.18	
MW-9	3/3/95	7.50	NP	2.26		5.24	
MW-10	3/3/95	7.38	NP	5.06		2.32	
MW-11	3/3/95	11.89	NP	6.85		5.04	
MW-12	3/3/95	9.42	NP	5.00		4.42	
MW-13	3/3/95	10.83	Trace	5.11	<0.01	5.72	5.72
MW-14	3/3/95	11.74	Trace	4.41	<0.01	7.33	7.33
MW-15	3/3/95	11.86	Trace	6.88	<0.01	4.98	4.98
MW-16	3/3/95	10.82	NP	7.65		3.17	
MW-18	3/3/95	6.21	NM	NM		NM	
MW-19	3/3/95	9.94	NP	5.52		4.42	
MG-1	3/3/95	11.82	Trace	7.56	<0.01	4.26	4.26
MG-2	3/3/95	10.83	NP	6.40		4.43	
MG-3	3/3/95	9.76	Trace	5.39	<0.01	4.37	4.37
MG-4	3/3/95	7.38	NP	3.19		4.19	
MG-7	3/3/95	10.06	NM	NM		NM	
PZ-1	3/3/95	7.99	NP	3.52		4.47	

Notes:

Revised top of casing elevations based on December 27, 1994 and January 4, 1995 Kier & Wright surveying.

NP = No free product observed

Trace = Slight residue on interface probe or other indication of free-product. Product thickness is less than 0.01 f

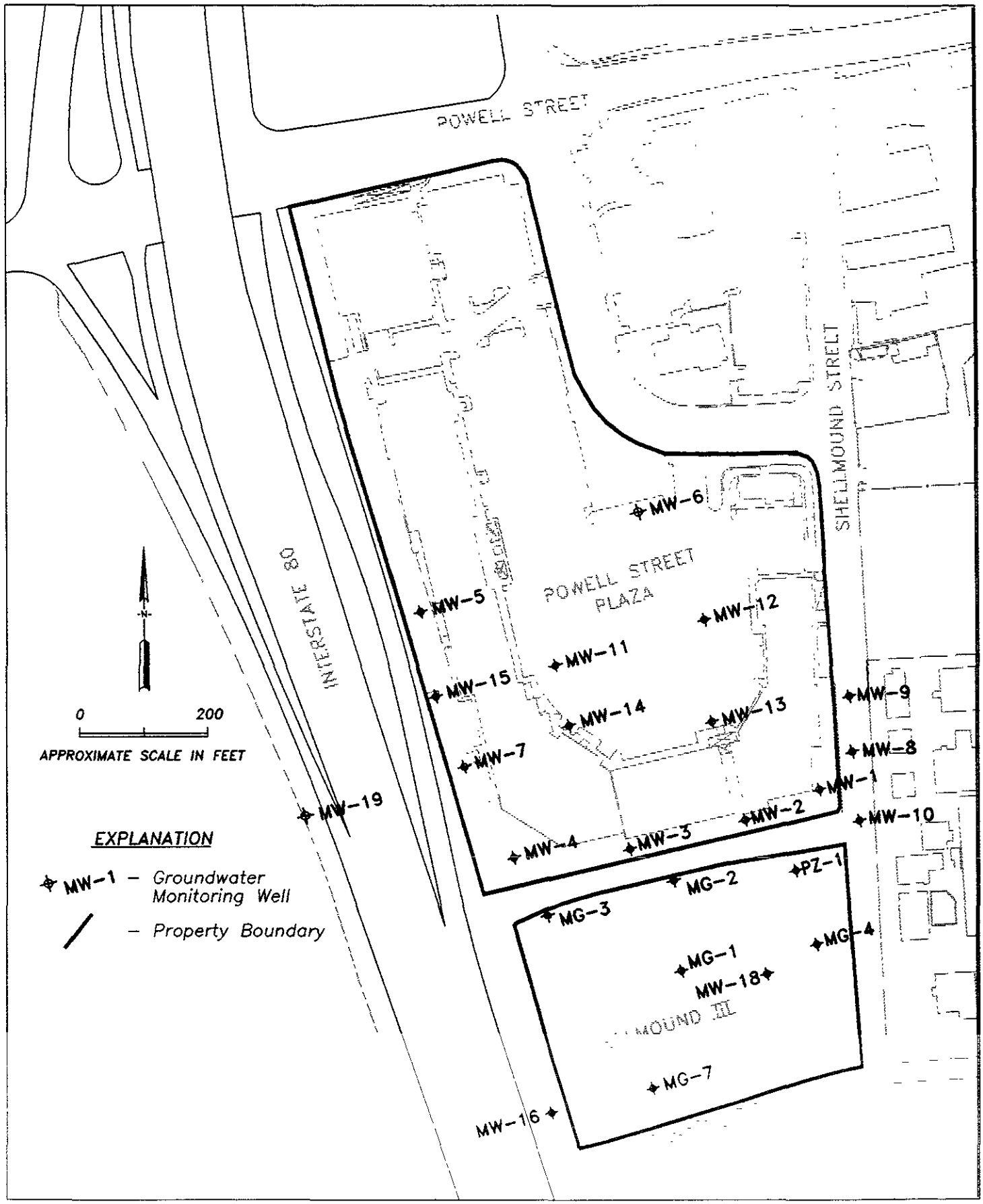
NM = Not measured

W-L = Water-Level

Corrected Water-Level Elevations were calculated as follows:

Water-Level Elevation = Top of Casing - Depth to Water + 0.85 x Product Thickness

ILLUSTRATIONS

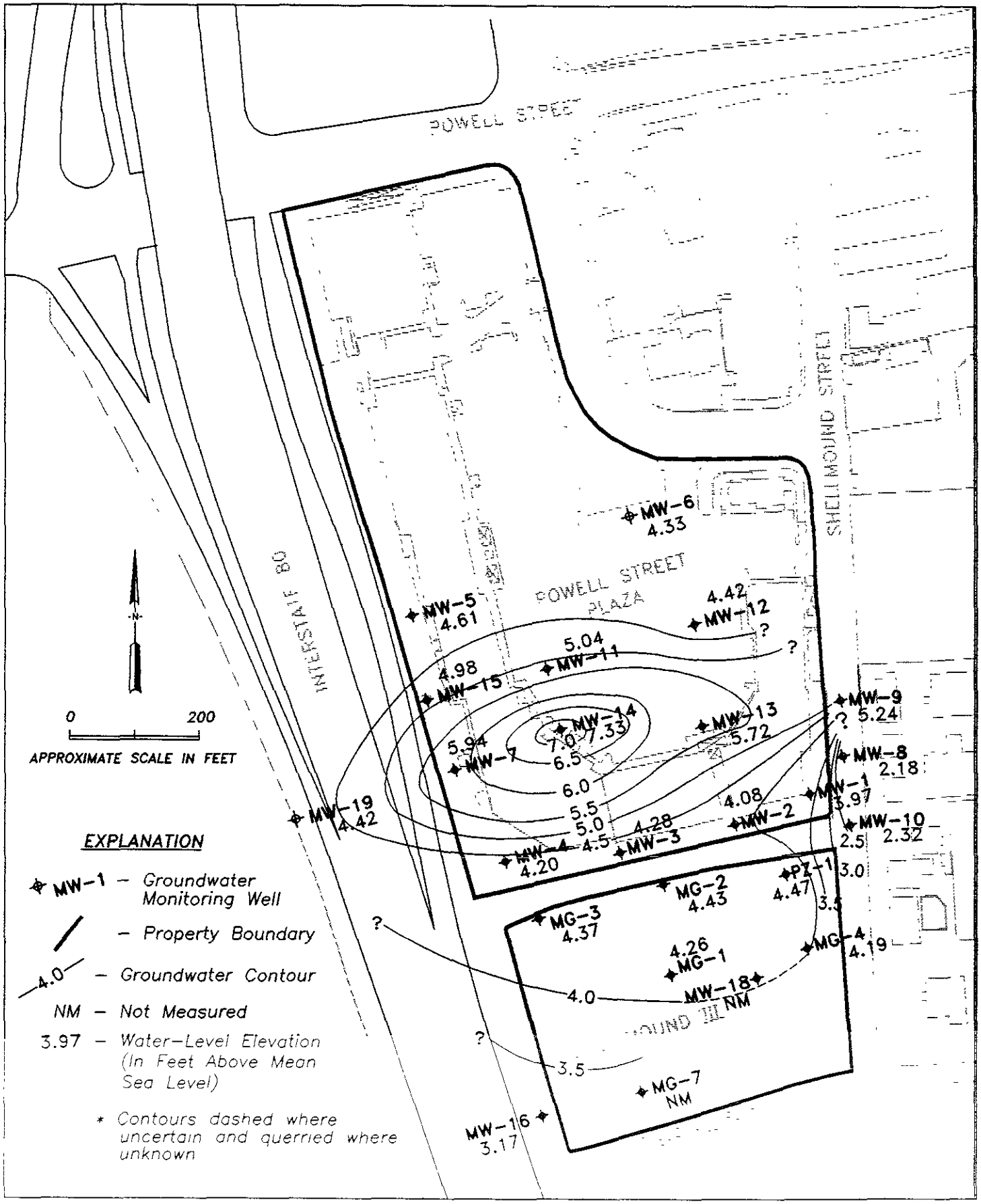


PES Environmental, Inc.
Engineering & Environmental Services

Site Plan
Powell Street Plaza and
Shellmound III Sites
Emeryville, California

PLATE
1

241.0102.008	020080P6		6/95
JOB NUMBER	DWG NUMBER		DATE



PES Environmental, Inc.
Engineering & Environmental Services

Water-Level Elevations on March 3, 1995
Powell Street Plaza and
Shellmound III Sites
Emeryville, California

PLATE
2

241.0102.005	020050P6		6/95
JOB NUMBER	DWG NUMBER		DATE

APPENDIX A

LABORATORY REPORT SHEETS
AND
CHAIN OF CUSTODY RECORDS
GROUNDWATER SAMPLES

American Environmental Network

Certificate of Analysis

OHS Certification: 1172 — AIHA Accreditation: 11134

PES ENVIRONMENTAL, INC.
1682 NOVATO BLVD.
SUITE 100
NOVATO, CA 94947

ATTN: JOHN SKALBECK
CLIENT PROJ. ID: 241-0102-005
CLIENT PROJ. NAME: POWELL ST.

REPORT DATE: 03/19/95

DATE(S) SAMPLED: 03/03/95

DATE RECEIVED: 03/06/95

AEN WORK ORDER: 9503096

PROJECT SUMMARY:

On March 6, 1995, this laboratory received 6 water sample(s).

Client requested sample(s) be analyzed for organic parameters. Results of analysis are summarized on the following page(s). Please see quality control report for a summary of QC data pertaining to this project.

Samples will be stored for 30 days after completion of analysis, then disposed of in accordance with State and Federal regulations. Samples may be archived by prior arrangement.

If you have any questions, please contact Client Services at (510) 930-9090.

Larry Klein
Laboratory Director

PES ENVIRONMENTAL, INC.

SAMPLE ID: 95090012
AEN LAB NO: 9503096-01
AEN WORK ORDER: 9503096
CLIENT PROJ. ID: 241-0102-005

MW-12

DATE SAMPLED: 03/03/95
DATE RECEIVED: 03/06/95
REPORT DATE: 03/19/95

ANALYTE	METHOD/ CAS#	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED
BTEX & Gasoline HCs	**EPA 8020**				
Benzene	71-43-2	ND	0.5	ug/L	03/13/95
Toluene	108-88-3	ND	0.5	ug/L	03/13/95
Ethylbenzene	100-41-4	ND	0.5	ug/L	03/13/95
Xylenes, Total	1330-20-7	ND	2	ug/L	03/13/95
Purgeable HCs as Gasoline	5030/GCFID	ND	0.05	mg/L	03/13/95
#Extraction for TPH	**EPA 3510**	-		Extrn Date	03/13/95
TPH as Diesel	**GC-FID**	0.3 *	0.05	mg/L	03/15/95
TPH as Oil	**GC-FID**	ND	0.2	mg/L	03/15/95

ND = Not detected at or above the reporting limit
* = Value at or above reporting limit

PES ENVIRONMENTAL, INC.

SAMPLE ID: 95090016
AEN LAB NO: 9503096-02
AEN WORK ORDER: 9503096
CLIENT PROJ. ID: 241-0102-005

MW-16

DATE SAMPLED: 03/03/95
DATE RECEIVED: 03/06/95
REPORT DATE: 03/19/95

ANALYTE	METHOD/ CAS#	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED
BTEX & Gasoline HCs	EPA 8020				
Benzene	71-43-2	ND	0.5	ug/L	03/13/95
Toluene	108-88-3	ND	0.5	ug/L	03/13/95
Ethylbenzene	100-41-4	ND	0.5	ug/L	03/13/95
Xylenes, Total	1330-20-7	ND	2	ug/L	03/13/95
Purgeable HCs as Gasoline	5030/GCFID	ND	0.05	mg/L	03/13/95
#Extraction for TPH	EPA 3510	-		Extrn Date	03/13/95
TPH as Diesel	GC-FID	0.5 *	0.05	mg/L	03/15/95
TPH as Oil	GC-FID	ND	0.2	mg/L	03/15/95

ND = Not detected at or above the reporting limit
* = Value at or above reporting limit

PES ENVIRONMENTAL, INC.

SAMPLE ID: 95090019
AEN LAB NO: 9503096-03
AEN WORK ORDER: 9503096
CLIENT PROJ. ID: 241-0102-005

mw-19

DATE SAMPLED: 03/03/95
DATE RECEIVED: 03/06/95
REPORT DATE: 03/19/95

ANALYTE	METHOD/ CAS#	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED
BTEX & Gasoline HCs	**EPA 8020**				
Benzene	71-43-2	ND	0.5	ug/L	03/13/95
Toluene	108-88-3	ND	0.5	ug/L	03/13/95
Ethylbenzene	100-41-4	ND	0.5	ug/L	03/13/95
Xylenes, Total	1330-20-7	ND	2	ug/L	03/13/95
Purgeable HCs as Gasoline	5030/GCFID	ND	0.05	mg/L	03/13/95
#Extraction for TPH	**EPA 3510**	-		Extrn Date	03/13/95
TPH as Diesel	**GC-FID**	0.3 *	0.05	mg/L	03/15/95
TPH as Oil	**GC-FID**	ND	0.2	mg/L	03/15/95

ND = Not detected at or above the reporting limit
* = Value at or above reporting limit

PES ENVIRONMENTAL, INC.

SAMPLE ID: 95090102
AEN LAB NO: 9503096-04
AEN WORK ORDER: 9503096
CLIENT PROJ. ID: 241-0102-005

DATE SAMPLED: 03/03/95
DATE RECEIVED: 03/06/95
REPORT DATE: 03/19/95

ANALYTE	METHOD/ CAS#	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED
BTEX & Gasoline HCs	EPA 8020				
Benzene	71-43-2	2 *	0.5	ug/L	03/14/95
Toluene	108-88-3	ND	0.5	ug/L	03/14/95
Ethylbenzene	100-41-4	ND	0.5	ug/L	03/14/95
Xylenes, Total	1330-20-7	ND	2	ug/L	03/14/95
Purgeable HCs as Gasoline	5030/GCFID	0.8 *	0.05	mg/L	03/14/95
#Extraction for TPH	EPA 3510	-		Extrn Date	03/14/95
TPH as Diesel	GC-FID	3.1 *	0.05	mg/L	03/15/95
TPH as Oil	GC-FID	0.7 *	0.2	mg/L	03/15/95

ND = Not detected at or above the reporting limit
* = Value at or above reporting limit

PES ENVIRONMENTAL, INC.

SAMPLE ID: 95090104
AEN LAB NO: 9503096-05
AEN WORK ORDER: 9503096
CLIENT PROJ. ID: 241-0102-005

DATE SAMPLED: 03/03/95
DATE RECEIVED: 03/06/95
REPORT DATE: 03/19/95

ANALYTE	METHOD/ CAS#	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED
BTEX & Gasoline HCs	EPA 8020				
Benzene	71-43-2	ND	0.5	ug/L	03/14/95
Toluene	108-88-3	ND	0.5	ug/L	03/14/95
Ethylbenzene	100-41-4	ND	0.5	ug/L	03/14/95
Xylenes, Total	1330-20-7	ND	2	ug/L	03/14/95
Purgeable HCs as Gasoline	5030/GCFID	0.05 *	0.05	mg/L	03/14/95
#Extraction for TPH	EPA 3510	-		Extrn Date	03/13/95
TPH as Diesel	GC-FID	9.9 *	0.05	mg/L	03/15/95
TPH as Oil	GC-FID	0.9 *	0.2	mg/L	03/15/95

ND = Not detected at or above the reporting limit
* = Value at or above reporting limit

PES ENVIRONMENTAL, INC.

SAMPLE ID: 95090201
AEN LAB NO: 9503096-06
AEN WORK ORDER: 9503096
CLIENT PROJ. ID: 241-0102-005

DATE SAMPLED: 03/03/95
DATE RECEIVED: 03/06/95
REPORT DATE: 03/19/95

ANALYTE	METHOD/ CAS#	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED
BTEX & Gasoline HCs	**EPA 8020**				
Benzene	71-43-2	0.6 *	0.5	ug/L	03/14/95
Toluene	108-88-3	ND	0.5	ug/L	03/14/95
Ethylbenzene	100-41-4	ND	0.5	ug/L	03/14/95
Xylenes, Total	1330-20-7	ND	2	ug/L	03/14/95
Purgeable HCs as Gasoline	5030/GCFID	2.0 *	0.05	mg/L	03/14/95
#Extraction for TPH	**EPA 3510**	-		Extrn Date	03/14/95
TPH as Diesel	**GC-FID**	3.7 *	0.05	mg/L	03/15/95
TPH as Oil	**GC-FID**	0.8 *	0.2	mg/L	03/15/95

ND = Not detected at or above the reporting limit
* = Value at or above reporting limit

AEN (CALIFORNIA)
QUALITY CONTROL REPORT

AEN JOB NUMBER: 9503096

CLIENT PROJECT ID: 241-0102-005

Quality Control and Project Summary

All laboratory quality control parameters were found to be within established limits.

Definitions

Laboratory Control Sample (LCS)/Method Spike(s): Control samples of known composition. LCS and Method Spike data are used to validate batch analytical results.

Matrix Spike(s): Aliquot of a sample (aqueous or solid) with added quantities of specific compounds and subjected to the entire analytical procedure. Matrix spike and matrix spike duplicate QC data are advisory.

Method Blank: An analytical control consisting of all reagents, internal standards, and surrogate standards carried through the entire analytical process. Used to monitor laboratory background and reagent contamination.

Not Detected (ND): Not detected at or above the reporting limit.

Relative Percent Difference (RPD): An indication of method precision based on duplicate analysis.

Reporting Limit (RL): The lowest concentration routinely determined during laboratory operations. The RL is generally 1 to 10 times the Method Detection Limit (MDL). Reporting limits are matrix, method, and analyte dependent and take into account any dilutions performed as part of the analysis.

Surrogates: Organic compounds which are similar to analytes of interest in chemical behavior, but are not found in environmental samples. Surrogates are added to all blanks, calibration and check standards, samples, and spiked samples. Surrogate recovery is monitored as an indication of acceptable sample preparation and instrumental performance.

D: Surrogates diluted out.

#: Indicates result outside of established laboratory QC limits.

QUALITY CONTROL DATA

METHOD: EPA 3510 GCFID

AEN JOB NO: 9503096
DATE EXTRACTED: 03/13/95: 03/14/95
INSTRUMENT: C
MATRIX: WATER

Surrogate Standard Recovery Summary

Date Analyzed	Client Id.	Lab Id.	Percent Recovery n-Pentacosane
03/15/95	95090012	01	85
03/15/95	95090016	02	90
03/15/95	95090019	03	82
03/15/95	95090102	04	101
03/15/95	95090104	05	82
03/15/95	95090201	06	93
QC Limits:			73-129

DATE EXTRACTED: 03/13/95
DATE ANALYZED: 03/14/95
SAMPLE SPIKED: DI WATER

Method Spike Recovery Summary

Analyte	Spike Added (mg/L)	Average Percent Recovery	RPD	QC Limits Percent Recovery	QC Limits RPD
Diesel	1 68	85	4	65-103	12

Daily method blanks for all associated analytical runs showed no contamination over the reporting limit.

QUALITY CONTROL DATA

METHOD: EPA 8020, 5030 GCFID

AEN JOB NO: 9503096
INSTRUMENT: H
MATRIX: WATER

Surrogate Standard Recovery Summary

Date Analyzed	Client Id.	Lab Id.	Percent Recovery Fluorobenzene
03/13/95	95090012	01	101
03/13/95	95090016	02	101
03/13/95	95090019	03	101
03/14/95	95090102	04	101
03/14/95	95090104	05	102
03/14/95	95090201	06	102
QC Limits:			92-109

DATE ANALYZED: 03/13/95
SAMPLE SPIKED: 9503095-01
INSTRUMENT: H

Matrix Spike Recovery Summary

Analyte	Spike Added (ug/L)	Average Percent Recovery	RPD	QC Limits Percent Recovery	QC Limits RPD
Benzene	18.2	93	5	85-109	17
Toluene	52.8	93	5	87-111	16
Hydrocarbons as Gasoline	500	92	3	66-117	19

Daily method blanks for all associated analytical runs showed no contamination over the reporting limit

*** END OF REPORT ***

[redacted] Engineering & Environmental Services

CHAIN OF CUSTODY RECORD

[redacted] NOVATO, CALIFORNIA 94947
(415) 899-1600 FAX (415) 899-1601

R-3,5-1

9503095 96

JOB NUMBER: 2411-0102-005
NAME/LOCATION: Powell Street Plaza
PROJECT MANAGER: John Skalbeck

SAMPLERS: Blaine Tech / Keith Brown
RECORDER: Jenny Han (Signature Required)

DATE YR	MO	DY	TIME	SAMPLE NUMBER/ DESIGNATION	SOURCE CODE	MATRIX: Water	Sediment	Soil	Oil	# CONTAINERS & PRESERV.: Unpres.	H_2SO_4	HNO_3	HCl	Filtered	DEPTH IN FEET	COL MTD CD	QA CODE	ANALYSIS REQUESTED: EPA 601/8010	EPA 602/8020 (BTEX)	EPA 624/8240	EPA 625/8270	TPHg by 5030/8015 (mod)	TPHd by 3550/8015 (mod)	TPH Heavy oil
95	03	03	15 15	95090000	10	✓							5			00	01	X				X	X	X
95	03	03	15 30	95090001	23	✓							5			27	10							
95	03	03	15 55	95090002	23	✓							5			27	10							
95	03	03	10 25	95090003	23	✓							5		95090095	27	10							
95	03	03	11 10	95090004	23	✓							5			27	10							
95	03	03	08 30	95090005	23	✓							5			27	10							
95	03	03	14 55	95090006	23	✓							5		01A-E	27	10							
95	03	03	15 55	95090007	23	✓							5		02A-E	27	10							
95	03	03	15 55	95090008	23	✓							5		03A-E	27	10							
95	03	03	15 55	95090009	23	✓							5		04A-E	27	10							
95	03	03	12 45	95090010	23	✓							5		05A-E	27	10							
95	03	03	14 05	95090011	23	✓							5		06A-E	27	10							
95	03	03	13 25	95090012	23	✓							6			27	10							

NOTES

* 95090001 gets analyzed only if 95090002 has a "hit"!

CHAIN OF CUSTODY RECORD

	RECEIVED BY: (Signature)	DATE	TIME
RELINQUISHED BY: (Signature)		3/7/95	4:05 PM
RELINQUISHED BY: (Signature)	RECEIVED BY: (Signature)	3/7/95	8:40 AM
RELINQUISHED BY: (Signature)	RECEIVED BY: (Signature)	3-7-95	10:55
RELINQUISHED BY: (Signature)	RECEIVED BY: (Signature)	3/8/95	12:10
DISPATCHED BY: (Signature)	RECEIVED FOR LAB BY: (Signature) Dana Gillespie	3/8/95	1210

METHOD OF SHIPMENT: Courier to AEN

Laboratory Copy White | Project Office Copy Yellow | Field or Office Copy Pink

PES ENVIRONMENTAL, INC.
1682 NOVATO BLVD.
SUITE 100
NOVATO, CA 94947

ATTN: JOHN SKALBECK
CLIENT PROJ. ID: 241-0102-005
CLIENT PROJ. NAME: POWELL ST.

REPORT DATE: 03/28/95

DATE(S) SAMPLED: 03/03/95

DATE RECEIVED: 03/06/95

AEN WORK ORDER: 9503095

PROJECT SUMMARY:

On March 6, 1995, this laboratory received 6 water sample(s).

Client requested five samples be analyzed for organic parameters; one sample was placed on hold. On March 15, 1995, sample was taken off hold for analysis. Results of analysis are summarized on the following page(s). Please see quality control report for a summary of QC data pertaining to this project.

Samples will be stored for 30 days after completion of analysis, then disposed of in accordance with State and Federal regulations. Samples may be archived by prior arrangement.

If you have any questions, please contact Client Services at (510) 930-9090.

Larry Klein
Laboratory Director

PES ENVIRONMENTAL, INC.

SAMPLE ID: 95090000
AEN LAB NO: 9503095-01
AEN WORK ORDER: 9503095
CLIENT PROJ. ID: 241-0102-005

DATE SAMPLED: 03/03/95
DATE RECEIVED: 03/06/95
REPORT DATE: 03/28/95

ANALYTE	METHOD/ CAS#	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED
BTEX & Gasoline HCs	EPA 8020				
Benzene	71-43-2	ND	0.5	ug/L	03/14/95
Toluene	108-88-3	ND	0.5	ug/L	03/14/95
Ethylbenzene	100-41-4	ND	0.5	ug/L	03/14/95
Xylenes, Total	1330-20-7	ND	2	ug/L	03/14/95
Purgeable HCs as Gasoline	5030/GCFID	ND	0.05	mg/L	03/14/95
#Extraction for TPH	EPA 3510	-		Extrn Date	03/13/95
TPH as Diesel	GC-FID	ND	0.05	mg/L	03/15/95
TPH as Oil	GC-FID	ND	0.2	mg/L	03/16/95

ND = Not detected at or above the reporting limit
* = Value at or above reporting limit

PES ENVIRONMENTAL, INC.

SAMPLE ID: 95090001
AEN LAB NO: 9503095-02
AEN WORK ORDER: 9503095
CLIENT PROJ. ID: 241-0102-005

MW-1

DATE SAMPLED: 03/03/95
DATE RECEIVED: 03/06/95
REPORT DATE: 03/28/95

ANALYTE	METHOD/ CAS#	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED
BTEX & Gasoline HCs	EPA 8020				
Benzene	71-43-2	ND	0.5	ug/L	03/15/95
Toluene	108-88-3	ND	0.5	ug/L	03/15/95
Ethylbenzene	100-41-4	ND	0.5	ug/L	03/15/95
Xylenes, Total	1330-20-7	ND	2	ug/L	03/15/95
Purgeable HCs as Gasoline	5030/GCFID	ND	0.05	mg/L	03/15/95
#Extraction for TPH	EPA 3510	-		Extrn Date	03/15/95
TPH as Diesel	GC-FID	0.69 *	0.05	mg/L	03/17/95
TPH as Oil	GC-FID	ND	0.2	mg/L	03/17/95

ND = Not detected at or above the reporting limit
* = Value at or above reporting limit

PES ENVIRONMENTAL, INC.

SAMPLE ID: 95090002
AEN LAB NO: 9503095-03
AEN WORK ORDER: 9503095
CLIENT PROJ. ID: 241-0102-005

MW-2

DATE SAMPLED: 03/03/95
DATE RECEIVED: 03/06/95
REPORT DATE: 03/28/95

ANALYTE	METHOD/ CAS#	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED
BTEX & Gasoline HCs	EPA 8020				
Benzene	71-43-2	0.7 *	0.5	ug/L	03/13/95
Toluene	108-88-3	ND	0.5	ug/L	03/13/95
Ethylbenzene	100-41-4	ND	0.5	ug/L	03/13/95
Xylenes, Total	1330-20-7	ND	2	ug/L	03/13/95
Purgeable HCs as Gasoline	5030/GCFID	0.08 *	0.05	mg/L	03/13/95
#Extraction for TPH	EPA 3510	-		Extrn Date	03/13/95
TPH as Diesel	GC-FID	3.9 *	0.05	mg/L	03/15/95
TPH as Oil	GC-FID	0.2 *	0.2	mg/L	03/16/95

ND = Not detected at or above the reporting limit
* = Value at or above reporting limit

PES ENVIRONMENTAL, INC.

SAMPLE ID: 95090004
AEN LAB NO: 9503095-04
AEN WORK ORDER: 9503095
CLIENT PROJ. ID: 241-0102-005

MW-4

DATE SAMPLED: 03/03/95
DATE RECEIVED: 03/06/95
REPORT DATE: 03/28/95

ANALYTE	METHOD/ CAS#	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED
BTEX & Gasoline HCs	EPA 8020				
Benzene	71-43-2	610 *	0.5	ug/L	03/13/95
Toluene	108-88-3	4 *	0.5	ug/L	03/14/95
Ethylbenzene	100-41-4	1 *	0.5	ug/L	03/14/95
Xylenes, Total	1330-20-7	4 *	2	ug/L	03/14/95
Purgeable HCs as Gasoline	5030/GCFID	3.1 *	0.05	mg/L	03/13/95
#Extraction for TPH	EPA 3510	-		Extrn Date	03/13/95
TPH as Diesel	GC-FID	11 *	0.05	mg/L	03/15/95
TPH as Oil	GC-FID	0.7 *	0.2	mg/L	03/16/95

ND = Not detected at or above the reporting limit
* = Value at or above reporting limit

PES ENVIRONMENTAL, INC.

SAMPLE ID: 95090005
AEN LAB NO: 9503095-05
AEN WORK ORDER: 9503095
CLIENT PROJ. ID: 241-0102-005

DATE SAMPLED: 03/03/95
DATE RECEIVED: 03/06/95
REPORT DATE: 03/28/95

ANALYTE	METHOD/ CAS#	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED
BTEX & Gasoline HCs	EPA 8020				
Benzene	71-43-2	ND	0.5	ug/L	03/13/95
Toluene	108-88-3	ND	0.5	ug/L	03/13/95
Ethylbenzene	100-41-4	ND	0.5	ug/L	03/13/95
Xylenes, Total	1330-20-7	ND	2	ug/L	03/13/95
Purgeable HCs as Gasoline	5030/GCFID	0.6 *	0.05	mg/L	03/13/95
#Extraction for TPH	EPA 3510	-		Extrn Date	03/13/95
TPH as Diesel	GC-FID	5.3 *	0.05	mg/L	03/15/95
TPH as Oil	GC-FID	0.2 *	0.2	mg/L	03/16/95

ND = Not detected at or above the reporting limit
* = Value at or above reporting limit

PES ENVIRONMENTAL, INC.

SAMPLE ID: 95090011
AEN LAB NO: 9503095-06
AEN WORK ORDER: 9503095
CLIENT PROJ. ID: 241-0102-005

DATE SAMPLED: 03/03/95
DATE RECEIVED: 03/06/95
REPORT DATE: 03/28/95

ANALYTE	METHOD/ CAS#	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED
BTEX & Gasoline HCs	EPA 8020				
Benzene	71-43-2	5 *	0.5	ug/L	03/13/95
Toluene	108-88-3	ND	0.5	ug/L	03/13/95
Ethylbenzene	100-41-4	ND	0.5	ug/L	03/13/95
Xylenes, Total	1330-20-7	ND	2	ug/L	03/13/95
Purgeable HCs as Gasoline	5030/GCFID	0.06 *	0.05	mg/L	03/13/95
#Extraction for TPH	EPA 3510	-		Extrn Date	03/13/95
TPH as Diesel	GC-FID	3.7 *	0.05	mg/L	03/15/95
TPH as Oil	GC-FID	0.2 *	0.2	mg/L	03/16/95

ND = Not detected at or above the reporting limit
* = Value at or above reporting limit

AEN (CALIFORNIA)
QUALITY CONTROL REPORT

AEN JOB NUMBER: 9503095

CLIENT PROJECT ID: 241-0102-005

Quality Control and Project Summary

All laboratory quality control parameters were found to be within established limits.

Definitions

Laboratory Control Sample (LCS)/Method Spike(s): Control samples of known composition. LCS and Method Spike data are used to validate batch analytical results.

Matrix Spike(s): Aliquot of a sample (aqueous or solid) with added quantities of specific compounds and subjected to the entire analytical procedure. Matrix spike and matrix spike duplicate QC data are advisory.

Method Blank: An analytical control consisting of all reagents, internal standards, and surrogate standards carried through the entire analytical process. Used to monitor laboratory background and reagent contamination.

Not Detected (ND): Not detected at or above the reporting limit.

Relative Percent Difference (RPD): An indication of method precision based on duplicate analysis.

Reporting Limit (RL): The lowest concentration routinely determined during laboratory operations. The RL is generally 1 to 10 times the Method Detection Limit (MDL). Reporting limits are matrix, method, and analyte dependent and take into account any dilutions performed as part of the analysis.

Surrogates: Organic compounds which are similar to analytes of interest in chemical behavior, but are not found in environmental samples. Surrogates are added to all blanks, calibration and check standards, samples, and spiked samples. Surrogate recovery is monitored as an indication of acceptable sample preparation and instrumental performance.

D: Surrogates diluted out.

#: Indicates result outside of established laboratory QC limits.

QUALITY CONTROL DATA

METHOD: EPA 3510 GCFID

AEN JOB NO: 9503095
DATE(S) EXTRACTED: 03/13; 15/95
INSTRUMENT: C
MATRIX: WATER

Surrogate Standard Recovery Summary

Date Analyzed	Client Id.	Lab Id.	Percent Recovery n-Pentacosane
03/15/95	95090000	01	82
03/17/95	95090001	02	85
03/15/95	95090002	03	83
03/15/95	95090004	04	91
03/15/95	95090005	05	80
03/15/95	95090011	06	83
QC Limits:			73-129

DATE EXTRACTED: 03/13/95
DATE ANALYZED: 03/14/95
SAMPLE SPIKED: DI WATER
INSTRUMENT: C

Method Spike Recovery Summary

Analyte	Spike Added (mg/L)	Average Percent Recovery	RPD	QC Limits Percent Recovery	QC Limits RPD
Diesel	1 68	85	4	65-103	12

Daily method blanks for all associated analytical runs showed no contamination over the reporting limit.

QUALITY CONTROL DATA

METHOD: EPA 8020, 5030 GCFID

AEN JOB NO: 9503095
INSTRUMENT: H
MATRIX: WATER

Surrogate Standard Recovery Summary

Date Analyzed	Client Id.	Lab Id.	Percent Recovery Fluorobenzene
03/14/95	95090000	01	100
03/15/95	95090001	02	100
03/13/95	95090002	03	100
03/14/95	95090004	04	102
03/13/95	95090005	05	100
03/13/95	95090011	06	102
QC Limits:			92-109

DATE ANALYZED: 03/14/95
SAMPLE SPIKED: 9503095-01
INSTRUMENT: H

Matrix Spike Recovery Summary

Analyte	Spike Added (ug/L)	Average Percent Recovery	RPD	QC Limits Percent Recovery	QC Limits RPD
Benzene	18.2	93	5	85-109	17
Toluene	52.8	93	5	87-111	16
Hydrocarbons as Gasoline	500	92	3	66-117	19

Daily method blanks for all associated analytical runs showed no contamination over the reporting limit

*** END OF REPORT ***

[redacted] Engineering & Environmental Services

CHAIN OF CUSTODY RECORD

[redacted] NOVA [redacted] ALIF[redacted] 949[redacted]
(415) 899-1600 FAX (415) 899-1601

9503095

JOB NUMBER 2411-0102-005
NAME/LOCATION Powell Street Plaza
PROJECT MANAGER John Skalbeck

SAMPLERS: Blaine Tech / Keith Brown
RECORDER: Jeany Han (Signature Required)

DATE YR	MO	DY	TIME	SAMPLE NUMBER/ DESIGNATION	SOURCE CODE	MATRIX: Water	Sedim't	Soil	Oil	# CONTAINERS & PRESERV.: Unpres.	H_2SO_4	HNO_3	HCl	Filtered	DEPTH IN FEET	COL MTD CD	QA CODE
95	03	03	1515	95090000	10	✓							5		DIA-E	27	01
95	03	03	1530	95090001	23	✓							5		02A-E	27	10
95	03	03	955	95090002	23	✓							5		03A-E	27	10
95	03	03	1025	95090004	23	✓							5		04A-E	27	10
95	03	03	1110	95090005	23	✓							5		05A-E	27	10
95	03	03	830	95090011	23	✓							5		06A-E	27	10
95	03	03	1453	95090012	23	✓							5			27	10
95	03	03	1555	95090014	23	✓							5			27	10
95	03	03	1555	95090019	23	✓							5			27	18
95	03	03	1245	95090102	23	✓							5		95030916	27	10
95	03	03	1405	95090104	23	✓							5			27	10
95	03	03	1325	95090201	23	✓							6			27	10

ANALYSIS REQUESTED

EPA 601/8010	EPA 602/8020 (BTEX)	EPA 624/8240	EPA 625/8270	TPHg by 5030/8015 (mod)	TPHd by 3550/8015 (mod)	TPH Separator oil
X				X	X	X

NOTES

* 95090001 gets analyzed only if 95090002 has a "hit".

3/15/95 1230 John Skalbeck informed that sample 95090001 will be analyzed due to "hits" found on the TPH-gas, BTEX, diesel & mo results from sample 95090002 kls

CHAIN OF CUSTODY RECORD

	RELINQUISHED BY: (Signature)	RECEIVED BY: (Signature)	DATE	TIME
			3/8/95	4:05 pm
	RELINQUISHED BY: (Signature)	RECEIVED BY: (Signature)	DATE	TIME
			3/7/95	8:40 AM
	RELINQUISHED BY: (Signature)	RECEIVED BY: (Signature)	DATE	TIME
			3-7-95	10:55
	RELINQUISHED BY: (Signature)	RECEIVED BY: (Signature)	DATE	TIME
			3/6/95	12:10
DISPATCHED BY: (Signature)	DATE	TIME	RECEIVED FOR LAB BY: (Signature)	DATE	TIME
			Anna Gallespie	3/6/95	1210

METHOD OF SHIPMENT: Courier to AEN

Laboratory Copy White — Project Office Copy Yellow — Field or Office Copy Pink

APPENDIX B

GROUNDWATER SAMPLING REPORT

BLAINE TECH SERVICES, INC.

BLAINE
TECH SERVICES INC.

985 TIMOTHY DRIVE
SAN JOSE, CA 95133
(408) 995-5535
FAX (408) 293-8773

March 27, 1995

PES Environmental, Inc.
1682 Novato Blvd.
Suite 100
Novato, CA 94947

Attn: Bryan Smith

SITE:
Shellmound 3
Powell Street Plaza
Shellmound & Christie
Emeryville, Califonia

DATE:
March 3, 1995

GROUNDWATER SAMPLING REPORT *950303-K-1*

Blaine Tech Services, Inc. perform specialized environmental sampling and documentation 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. does not participate in the interpretation of analytical results or become involved with the marketing or installation of remedial systems.

This report deals with the groundwater well sampling performed by our firm in response to your request. Data collected in the course of our work at the site are presented in the TABLE OF WELL MONITORING DATA. This information was collected during our inspection, well evacuation, and sample collection. Measurements include the total depth of the well and depth to water. Water surfaces were further inspected for the presence of immiscibles. A series of electrical conductivity, pH, and temperature readings were obtained durng well evacuation and at the time of sample collection.

TABLE OF WELL MONITORING DATA

Well I.D.	MG-2			MG-4			MW-1			MW-2		
Date Sampled	03/03/95			03/03/95			03/03/95			03/03/95		
Well Diameter (in.)	2			2			4			4		
Total Well Depth (ft.)	14.70			11.64			13.63			14.12		
Depth To Water (ft.)	6.48			3.13			4.82			5.76		
Free Product (ft.)	NONE			NONE			NONE			NONE		
Reason If Not Sampled	--			--			--			--		
1 Case Volume (gal.)	1.3			1.3			5.7			5.4		
Did Well Dewater?	NO			NO			YES @ 9.0 GALS.			NO		
Gallons Actually Evacuated	4.0			4.0			9.0			18.0		
Purging Device	BAILER			BAILER			ELECTRIC SUBMERSIBLE			ELECTRIC SUBMERSIBLE		
Sampling Device	BAILER			BAILER			BAILER			BAILER		
Time	12:32	12:36	12:38	13:51	13:54	13:56	09:21	15:25		09:34	09:44	09:47
Temperature (Fahrenheit)	60.8	61.2	61.0	60.4	61.0	60.8	61.8	64.2		63.6	64.8	65.0
pH	7.3	7.1	7.0	7.1	7.2	7.2	7.2	7.2		7.1	7.0	7.1
Conductivity (micromhos/cm)	680	820	800	1500	1600	1700	3600	4000		10,000	10,000	10,000
Nephelometric Turbidity (NTU)	21.8	10.4	6.0	41.8	19.8	15.5	43.6	188.1		9.6	4.8	3.6
BTS Chain of Custody	950303-K-1			950303-K-1			950303-K-1			950303-K-1		
BTS Sample I.D.	95090102			95090104			95090001			95090002		
DHS RMTL Laboratory	AEN			AEN			AEN			AEN		
Analysis	TPH (GAS), BTEX, TPH (DIESEL), MOTOR OIL			TPH (GAS), BTEX, TPH (DIESEL), MOTOR OIL			TPH (GAS), BTEX, TPH (DIESEL), MOTOR OIL			TPH (GAS), BTEX, TPH (DIESEL), MOTOR OIL		

TABLE OF WELL MONITORING DATA

Well I.D.	MW-4			MW-5			MW-11			MW-12		
Date Sampled	03/03/95			03/03/95			03/03/95			03/03/95		
Well Diameter (in.)	4			2			2			2		
Total Well Depth (ft.)	12.98			14.78			12.74			11.49		
Depth To Water (ft.)	7.38			6.56			6.91			5.05		
Free Product (ft.)	NONE			NONE			NONE			NONE		
Reason If Not Sampled	--			--			--			--		
1 Case Volume (gal.)	3.6			1.3			0.9			1.0		
Did Well Dewater?	NO			NO			NO			YES @ 2.2 GALS.		
Gallons Actually Evacuated	12.0			4.0			3.0			2.2		
Purging Device	ELECTRIC SUBMERSIBLE			BAILER			BAILER			BAILER		
Sampling Device	BAILER			BAILER			BAILER			BAILER		
Time	10:07	10:10	10:14	10.53	10:57	11:01	08:11	08:13	08:20	08:47	08:50	14:50
Temperature (Fahrenheit)	61.8	63.2	62.9	63.8	64.4	64.8	63.8	64.6	65.0	62.2	62.6	62.4
pH	7.2	7.1	7.2	7.5	7.1	7.1	7.2	7.2	7.2	7.5	7.2	7.3
Conductivity (micromhos/cm)	3,000	2,600	2,800	2400	2400	2400	2000	2000	2000	1400	1300	1400
Nephelometric Turbidity	16.2	31.1	38.5	>200	>200	>200	12.0	33.9	42.5	>200	>200	>200
BTS Chain of Custody	950303-K-1			950303-K-1			950303-K-1			950303-K-1		
BTS Sample I.D.	95090004			95090005			95090011			95090012		
DHS HMTL Laboratory	AEN			AEN			AEN			AEN		
Analysis	TPH (GAS), BTEX, TPH (DIESEL), MOTOR OIL			TPH (GAS), BTEX, TPH (DIESEL), MOTOR OIL			TPH (GAS), BTEX, TPH (DIESEL), MOTOR OIL			TPH (GAS), BTEX, TPH (DIESEL), MOTOR OIL		

TABLE OF WELL MONITORING DATA

Well I.D.	MW-16 *			MW-19			PZ-1		
Date Sampled	03/03/95			03/03/95			03/03/95		
Well Diameter (in.)	2			2			2		
Total Well Depth (ft.)	12.68			14.78			14.02		
Depth To Water (ft.)	7.65			5.56			3.61		
Free Product (ft.)	NONE			NONE			NONE		
Reason If Not Sampled	--			--			--		
1 Case Volume (gal.)	0.8			1.5			1.6		
Did Well Dewater?	NO			NO			NO		
Gallons Actually Evacuated	2.5			4.5			5.0		
Purging Device	BAILER			BAILER			BAILER		
Sampling Device	BAILER			BAILER			BAILER		
Time	15:43	15:46	15:48	11:40	11:43	11:45	13:12	13:15	13:18
Temperature (Fahrenheit)	60.0	61.0	60.6	61.4	62.6	61.6	59.8	59.6	60.1
pH	7.1	7.4	7.4	7.4	7.4	7.4	7.4	7.0	7.0
Conductivity (micromhos/cm)	8100	7600	7600	1200	820	860	2800	2800	2800
Nephelometric Turbidity	>200	>200	>200	>200	>200	>200	>200	>200	>200
BTS Chain of Custody	950303-K-1			950303-K-1			950303-K-1		
BTS Sample I.D.	95090016			95090019			95090201		
DHS HMTL Laboratory	AEN			AEN			AEN		
Analysis	TPH (GAS), BTEX, TPH (DIESEL), MOTOR OIL			TPH (GAS), BTEX, TPH (DIESEL), MOTOR OIL			TPH (GAS), BTEX, TPH (DIESEL), MOTOR OIL		

* Well MW-16 was sampled in replacement of MG-7 which was inaccessible per Brian Smith.

EQUIPMENT

Selection of Sampling Equipment

The determination of what apparatus is to be used on particular wells may be made by the property owner, but is usually made by the professional consultant directing the performance of the monitoring on the property owner's behalf. When no specific requirement is made, our personnel will select equipment that will accomplish the work in the most efficient manner. Our personnel are equipped with a variety of sampling devices that include USGS/Middleburg pumps, down hole electric submersible pumps, air lift pumps, suction pumps, and bailers made of both Teflon and stainless steel.

Bailers and electric submersible pumps were selected for the collection of samples at this site.

Bailers: A bailer, in its simplest form, is a hollow tube which has been fitted with a check valve at the lower end. The device can be lowered into a well by means of a cord. When the bailer enters the water, the check valve opens and liquid flows into the interior of the bailer. The bottom check valve prevents water from escaping when the bailer is drawn up out of the well.

Two types of bailers are used in groundwater wells at sites where fuel hydrocarbons are of concern. The first type of bailer is made of a clear material such as acrylic plastic and is used to obtain a sample of the surface and the near surface liquids in order to detect the presence of visible or measurable fuel hydrocarbon floating on the surface. The second type of bailer is made of Teflon or stainless steel and is used as an evacuation and/or sampling device.

Bailers are inexpensive and relatively easy to clean. Because they are manually operated, variations in operator technique may have a greater influence than would be found with more automated sampling equipment. Also where fuel hydrocarbons are involved, the bailer may include near surface contaminants that are not representative of water deeper in the well.

Electric Submersible Pumps: Electric submersible pumps are appropriate for the high volume evacuation of wells of any depth provided the well diameter is large enough to admit the pump. Four inch and three inch diameter wells will readily accept electric submersible pumps, while two inch wells do not. In operation, the pump is lowered into the well with a pipe train above it. A checkvalve immediately above the pump and below the first section of pipe prevents water that has entered the pipe from flowing back into the well. Electricity is provided to the pump via an electrical cable and the action of the pump is to push water up out of the well.

Electric submersible pumps are often used as well evacuation devices, which are then supplanted with a more specialized sample collection device (such as a bailer) at the time of sampling. An alternative is to use the pump for both evacuation and sampling. When a

bailer is used to collect the sample, interpretation of results by the consultant should allow for variations attributable to near surface contamination entering the bailer. When the electric submersible is, itself, used for sample collection it should be operated with the output restricted to a point where the loss of volatiles becomes indistinguishable from the level obtained with true sampling pumps.

It should be noted that when the pump is used for both evacuation and sample collection that it is possible to perform these operation as an uninterrupted continuum. This contrasts with the variations in elapsed time between evacuation and sample collection that occur when field personnel cease one mode of operation and must bring other apparatus into use.

STANDARD PRACTICES

Evacuation

Groundwater well sampling protocols call for the evacuation of a sufficient volume of water from the well to insure that the sample is collected from water than has been newly drawn into the well from the surrounding geologic formation. The protocol used on these wells called for a volumetric removal of three case volumes with stabilization of standard water parameters. There are situations where up to ten case volumes of evacuation may be removed, especially when attempting to stabilize turbidity in undeveloped wells. Different professional consultants may specify different levels of evacuation prior to sampling or may request that specific parameters be used to determine when to collect the sample. Our personnel use several standard instruments to record the changes in parameters as the well is evacuated. These instruments are used regardless of whether or not a specific volumetric standard has been called for. As a result, the consultant will always be provided with a record of the pH, EC, and temperature changes that occurred during the evacuation process. Additional information obtained with different types of instruments (such as dissolved oxygen and turbidity meters) can also be collected if requested in advance.

Effluent Materials

The evacuation of purge water creates a volume of effluent water which, in most cases, must be contained. Blaine Tech Services, Inc. will place this water in appropriate containers of the client's choice or bring new DOT 17 E drums to the site which are appropriate for the containment of the effluent materials. The determination of how to properly dispose of the effluent water must usually await the results of laboratory analyses of the sample collected from the groundwater well.

Observations and Measurements

Included in the scope of work are routine measurements and investigative procedures which are intended to determine if the wells are suitable for evacuation and sampling. These include measurement (from the top of the well case) of the total depth of the well; the depth to water, and the thickness of any free product zone (FPZ) encountered. The

presence of a significant free product zone may interfere with efforts to collect a water sample that accurately reflects the condition of groundwater lying below the FPZ. This interference is caused by adhesion of petroleum to any device being lowered through the FPZ and the likelihood that minute globules of petroleum may break free of the sampling device and be included in the sample. Accordingly, evaluation of analytical results from wells containing any amount of free petroleum should take into account the possibility that positive results have been skewed higher by such an inclusion. The decision to sample or not sample such wells is left to the discretion of our field personnel at the site and the consultant who establishes sampling guidelines based on the need for current information on groundwater conditions at the site.

Sampling Methodology

Samples were obtained by standardized sampling procedures that follow an evacuation and sample collection protocol. The sampling methodology conforms with State and Regional Water Quality Control Board standards and specifically adheres to EPA requirements for apparatus, sample containers and sample handling as specified in publication SW 846 and the T.E.G.D. which is published separately.

Sample Containers

Sample material is collected in specially prepared containers appropriate to the type of analyses intended. Our firm uses new sample containers of the type specified by either EPA or the RWQCB. Often times analytical laboratories wish to supply the sample containers because checks performed on these bottles are often part of a comprehensive laboratory QC program. In cases where the laboratory does not supply sample containers our personnel collect water samples in new containers that are appropriate to the type of analytical procedure that the sample is to receive. For example, 40 ml volatile organic analysis vials (VOAs) are used when analysis for gasoline and similar light volatile compounds is intended. These containers are prepared according to EPA SW 846 and will usually contain a small amount of preservative when the analysis is for TPH as gasoline or EPA 602. Vials intended for EPA 601 analysis and EPA 624 GCMS procedures are not preserved. The closure of volatile organic analysis water sample containers is accomplished with an open headed (syringe accessible) plastic screw cap brought down on top of a Teflon faced septum which is used to seal the sample without headspace.

Water samples intended for semivolatile and nonvolatile analysis such as total oil and grease (TOG) and diesel (TPH HBF) are collected and transported in properly prepared new glass liter bottles. Dark amber glass is used in the manufacture of these bottles to reduce any adverse effect on the sample by sunlight. Antimicrobial preservative may be added to the sample liquid if a prolonged holding time is expected prior to analysis. Closure is accomplished with a heavy plastic screw cap.

Groundwater well samples intended for metals analysis are transported in new plastic bottles and preserved with nitric acid. Our personnel can field filter the sample liquid prior to placing it in the sample container if instructed to perform this procedure.

Sample Handling Procedures

Water samples are collected in any of several appropriate devices such as bailers, Coliwasas, Middleburg sampling pumps etc. which are described in detail only as warranted by their employment at a given site. Sample liquid is decanted into new sample containers in a manner which reduces the loss of volatile constituents and follows the applicable EPA procedures for handling volatile organic and semi-volatile compounds.

Groundwater samples that are to receive metals analyses can be filtered prior to being placed in the plastic sample bottles that contain the nitric acid preservative. The filtration process employs new glass containers which are discarded and laboratory quality disposable filtering containers which are also discarded. A frequently used filtering procedure employs a vacuum pump to draw sample material through a 0.45 micron filter. The 0.45 micron pore size is standard, but the amount of filter available varies with the type of package selected. Filters are selected on the basis of the relative turbidity of the water sample. Samples which are relatively clean can be efficiently filtered with relatively inexpensive filters while very turbid water will require a very large filter with a high tolerance for sediments. One of several such filters our firm uses are the Nalgene Type A filters in which an upper and lower receptacle chamber are affixed to the filter. Sample material is poured into the upper chamber and a vacuum pump attached to the lower chamber. Simple actuation of the vacuum pump induces the flow of water through the filter and into the lower chamber. The sample is then decanted into the laboratory container and the filter assembly discarded. Cartridge type flow-through filters are more expensive but can be fitted directly to the discharge line of most sampling pumps (USGS/Middleburg pumps) and electric submersible pumps.

Following collection, samples are promptly placed in an ice chest containing prefrozen blocks of an inert ice substitute such as Blue Ice or Super Ice. The samples are maintained in either an ice chest or a refrigerator until delivered into the custody of the laboratory.

Sample Designations

All sample containers are identified with both a sampling event number and a discrete sample identification number. Please note that the sampling event number is the number that appears on our chain of custody. It is roughly equivalent to a job number, but applies only to work done on a particular day of the year rather than spanning several days as jobs and projects often do.

Chain of Custody

Samples are continuously maintained in an appropriate cooled container while in our custody and until delivered to the laboratory under our standard chain of custody. If the samples are taken charge of by a different party (such as another person from our office, a courier, etc.) prior to being delivered to the laboratory, appropriate release and acceptance records are made on the chain of custody (time, date, and signature of the person releasing the samples followed by the time, date and signature of the person accepting custody of the samples).

Hazardous Materials Testing Laboratory

The samples obtained at this site were delivered to American Environmental Network in Pleasant Hill, California. AEN is certified by the California Department of Health Services as a Hazardous Materials Testing Laboratory and is listed as DOHS HMTL #1172.

Personnel

All Blaine Tech Services, Inc. personnel receive 29 CFR 1910.120(e)(2) training as soon after being hired as is practical. In addition, many of our personnel have additional certifications that include specialized training in level B supplied air apparatus and the supervision of employees working on hazardous materials sites. Employees are not sent to a site unless we are confident they can adhere to any site safety provisions in force at the site and unless we know that they can follow the written provisions of an SSP and the verbal directions of an SSO.

In general, employees sent to a site to perform groundwater well sampling will assume an OSHA level D (wet) environment exists unless otherwise informed. The use of gloves and double glove protocols protects both our employees and the integrity of the samples being collected. Additional protective gear and procedures for higher OSHA levels of protection are available.

Decontamination

All apparatus is brought to the site in clean and serviceable condition. The equipment is decontaminated after each use and before leaving the site. Decontamination procedures include complete disassembly of the device to a point where a jet of steam cleaner water can be directed onto all the internal surfaces. Blaine Tech Services, Inc. frequently modifies apparatus to allow complete disassembly and proper cleaning.

Please call if we can be of any further assistance.

Richard C. Blaine

RCB/lp

attachments: chain of custody

[redacted] Engineering & Environmental Services

CHAIN OF CUSTODY RECORD

[redacted] (415) [redacted]-1600 FAX (415) [redacted]-1601

JOB NUMBER: 2411-0102-005

NAME/LOCATION: Powell Street Plaza

PROJECT MANAGER: John Skalbeck

SAMPLERS: Blaine Tech / Keith Brown

RECORDER: Jenny Han (Signature Required)

DATE YR	MO	DY	TIME	SAMPLE NUMBER/ DESIGNATION	SOURCE CODE	MATRIX: Water	Sediment	Soil	Oil	# CONTAINERS & PRESERV.: Unpres.	H_2SO_4	HNO_3	HCl	Filtered	DEPTH IN FEET	COL MTD CD	QA CODE	ANALYSIS REQUESTED: EPA 601/8010	EPA 8020/8020 (BTEX)	EPA 8240/8260	EPA 8015/8270	TPH-g by 8015M/8015 (mod)	TPH-d by 8015M/8015 (mod)	TPH-motor oil
95	03	03	15 15	95090000	10	✓							5		Field Blank		01						
95	03	03	12 20	95090001 *	23	✓							5		MW-1	2	7 10	X			X	X	X
95	03	03	13 55	95090002	23	✓							5		MW-2	2	7 10						
95	03	03	10 25	95090004	23	✓							5		MW-4	2	7 10						
95	03	03	11 10	95090005	23	✓							5		MW-5	2	7 10						
95	03	03	8 30	95090011	23	✓							5		MW-11	2	7 10						
95	03	03	14 55	95090012	23	✓							5		MW-12	2	7 10						
95	03	03	15 55	95090016	23	✓							5		MW-16	2	7 10						
95	03	03	11 55	95090019	23	✓							5		MW-19	2	7 10						
95	03	03	12 45	95090102	23	✓							5		MW-2	2	7 10						
95	03	03	10 05	95090104	23	✓							5		MW-4	2	7 10						
95	03	03	13 25	95090201	23	✓							5		P1-A	2	7 10						

* 95090001 gets analyzed only if 95090002 has a "hit".

CHAIN OF CUSTODY RECORD

		DATE	TIME
RELINQUISHED BY: (Signature)	RECEIVED BY: (Signature)	3/6/95	4:05 pm
RELINQUISHED BY: (Signature)	RECEIVED BY: (Signature)	3/7/95	8:40 am
RELINQUISHED BY: (Signature)	RECEIVED BY: (Signature)	3-7-95	10:55
RELINQUISHED BY: (Signature)	RECEIVED BY: (Signature)	DATE	TIME
DISPATCHED BY: (Signature) DATE TIME	RECEIVED FOR LAB BY: (Signature)	DATE	TIME

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QUALITY CONTROL REVIEWER

Robert S. Creps, P. E.
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