**PES Environmental, Inc.**
**Engineering & Environmental Services**

July 3, 1996

**131.0100.003**

Alameda County Environmental Health Services
Hazardous Materials Division
1131 Harbor Bay Parkway
Alameda, California 94502

Attention: Ms. Susan Hugo



**QUARTERLY GROUNDWATER MONITORING**
**MAY 1996 SAMPLING EVENT**
**EMERY BAY PLAZA**
**1650 65TH STREET**
**EMERYVILLE, CALIFORNIA**

Dear Ms. Hugo:

This letter presents data collected by PES Environmental, Inc. (PES) during the May 1996 quarterly groundwater monitoring. PES has been retained by Emery Bay Plaza to conduct groundwater remediation and monitoring at the subject site.

The objective of the groundwater monitoring program at this site is to: (1) evaluate the presence of hydrocarbons in groundwater; (2) provide data to assess the performance and effectiveness of the groundwater remedial program; and (3) monitor seasonal water level variations at the site. The monitoring is performed in accordance with California Regional Water Quality Control Board (RWQCB) guidelines and the approved remedial plan for this site.

In December 1995, the groundwater monitoring program and the one-year bioremediation pilot study were evaluated. The result of the evaluation was presented in PES' *Year End Summary Report, Bioremediation Pilot Study and Quarterly Groundwater Monitoring, November 1995 Sampling Event, Emery Bay Plaza, 1650 65th Street, Emeryville, California,* dated December 29, 1995. The year-end report recommended that the groundwater monitoring program be revised to focus on monitoring of wells EW-1, MW-2, MW-4, and MW-8, located in the vicinity of the former underground storage tank (UST). Data collected from these four wells will continue to provide information on groundwater quality and the progress of the bioremediation program. The revised quarterly groundwater monitoring program was verbally approved by you during a phone conversation with Andrew Briefer of PES on February 13, 1996.

## BACKGROUND INFORMATION

Six monitoring wells and one extraction well were installed at the site (Plate 2) following removal of an onsite UST in July 1987 and several offsite USTs in September and October 1989. Groundwater monitoring has been conducted at this facility since November 1989. An activated carbon groundwater treatment system was installed and operated under the authority of an East Bay Municipal Utility District wastewater discharge permit (Permit #502-45131) from December 1990 until it was discontinued on October 25, 1993, pending start of the in-situ bioremediation pilot program in December 1994. The pilot study is described in PES' March 16, 1994 letter to you titled *Proposed Monitoring Revisions, Passive In-Situ Bioremediation Pilot Study, Emery Bay Plaza, 1650 65th Street Property, Emeryville, California* and a December 21, 1993 PES document titled *Workplan, Passive In-Situ Bioremediation Pilot Study, Emery Bay Plaza, 1650 65th Street Property, Emeryville, California.* Bioremediation activities have been ongoing and monitoring results are presented in this monitoring report. The present sampling is the twenty-sixth consecutive sampling event since groundwater monitoring was initiated, and the nineteenth to be conducted by PES.

On September 22, 1994, PES installed an additional monitoring well, MW-8, near the eastern boundary of the subject property. The purpose of this well is to evaluate water quality upgradient of the former onsite UST and to provide an additional upgradient point of introduction of oxygen and nutrients for the in-situ bioremediation program.

## GROUNDWATER MEASUREMENTS

### Water-Level Measurement Procedures

Groundwater levels in the monitoring wells were measured by Blaine Tech Services (Blaine Tech) of San Jose, California, on May 9, 1996. The groundwater level in each of the monitoring wells was measured to a precision of 0.01 feet using an electronic water-level indicator. Prior to each measurement, the portion of the water-level indicator that was submerged in the well was cleaned with a mild detergent solution and rinsed with de-ionized water.

## Water-Level Measurement Results

Water-level data were converted to water-level elevations referenced to mean sea level (MSL). A groundwater elevation map constructed from the data is presented on Plate 3. An historical summary of groundwater elevations for wells at the site is presented in Table 1.

Groundwater elevations on May 9, 1996 have generally varied in the onsite monitoring wells compared with the prior quarterly monitoring event. Elevations decreased in four of the onsite wells and increased in the remaining three. The water-level measured in MW-8 was not used in determining groundwater contours during this sampling event because the data was not consistent with nearby water-levels in MW-2, MW-6, and MW-7. Based on measured water levels on May 9, 1996, groundwater flow direction at the site was calculated to be toward the southwest, with an approximate gradient of 0.01 foot per foot. This is consistent with historical groundwater flow direction and gradient.

## Dissolved Oxygen Measurement Procedures

As part of the in-situ bioremediation program at the subject property, dissolved oxygen measurements were collected prior to and following each oxygen and nutrient addition and during the quarterly monitoring events. Prior to purging and sampling, the total dissolved oxygen in each of the seven monitoring wells and the extraction well was measured in-situ using a YSI, Inc., Model 51B Dissolved Oxygen Meter. The equipment was calibrated according to the manufacturer's specifications before use. Prior to each measurement, the portion of the equipment submerged in the well was cleaned with a mild detergent solution and rinsed with de-ionized water. The measurements were collected from each well within the middle portion of the water column.

## Oxygen Enhancement

As part of the bioremediation program, an oxygen source, in the form of a solution of hydrogen peroxide ($H_2O_2$), and nutrients (nitrogen and phosphorous), was periodically introduced into wells EW-1, MW-2 and MW-8. The nutrient solution contained approximately 10,000 milligrams per liter (mg/L) $H_2O_2$, 20 mg/L nitrogen as nitrate, and 37 mg/L phosphate. On April 11, 1996, the sixth quarterly application of approximately 500 gallons of nutrient solution was introduced into the wells. During the addition, water levels and flow rates were monitored to allow an evaluation of permeability and hydraulic effects of the nutrient addition. Dissolved oxygen measurements were made prior to and following the introduction. The data generated during the nutrient addition and dissolved oxygen measurements are summarized in Tables 3 and 4.

## Dissolved Oxygen Measurement Results

Dissolved oxygen measurements are used as an indication of the effectiveness of the oxygenation achieved during bioremediation. Total dissolved oxygen concentrations measured in onsite wells during the May 1996 monitoring event ranged from 0.5 to 0.7 mg/L. Dissolved oxygen concentrations have varied in all wells since the previous measurements. Dissolved oxygen concentrations for the May 1996 monitoring event are provided in the groundwater sampling report in Appendix A. An historical summary of dissolved oxygen measurements is presented in Table 3. Concentrations of dissolved oxygen in wells MW-2 and EW-1 declined to concentrations comparable to non-amended wells since the April 1996 nutrient addition.

# GROUNDWATER SAMPLING AND ANALYTICAL TESTING

## Sampling Protocol

Groundwater samples were collected by Blaine Tech on May 9, 1996. Prior to sampling, the groundwater was visually inspected to assess the presence of floating product. A minimum of three well volumes was evacuated prior to sampling using a teflon bladder pump. During pumping the discharge water was measured for pH, temperature, electrical conductivity, and turbidity. Groundwater samples were collected with a clean teflon bailer and decanted into clean 40-milliliter glass vials with teflon lined caps.

Samples were immediately labeled to designate sample number, time and date collected, and analysis requested, then stored in a chilled, thermally-insulated cooler for transport to the analytical laboratory. The information collected during the groundwater sampling and the chain of custody records are presented in a groundwater sampling report prepared by Blaine Tech, provided in Appendix A.

## Analytical Program

Groundwater samples from all wells including the extraction well, were analyzed by American Environmental Network (AEN), a state-certified laboratory located in Pleasant Hill, California. Samples were analyzed for total petroleum hydrocarbons quantified as gasoline (TPH-gas), benzene, toluene, ethylbenzene, and total xylenes (BTEX) by EPA Test Method 8015M/8020.

If you have any questions or comments, please do not hesitate to call either of the undersigned.

Yours very truly,

**PES ENVIRONMENTAL, INC.**

Jenny F. Han
Senior Staff Geologist

Andrew A. Briefer, P. E.
Associate Engineer


Attachments:

| | | |
|---|---|---|
| | Table 1 | Summary of Groundwater Elevations Through May 1996 |
| | Table 2 | Summary of Analytical Results for Groundwater Samples Through May 1996 |
| | Table 3 | Summary of Total Dissolved Oxygen Through May 1996 |
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| | Plate 1 | Site Location Map |
| | Plate 2 | Well Location Map |
| | Plate 3 | Groundwater Elevation Contours on May 9, 1996 |
| | Plate 4 | Dissolved Hydrocarbons in Groundwater on May 9, 1996 |
| | Appendix A | Groundwater Sampling Report |
| | Appendix B | Analytical Laboratory Reports |

pc: Mr. Thomas Gram - P. O. Partners
Ms. Lynn Tolin - Emery Bay Plaza

**QUALITY CONTROL REVIEWER**

Robert S. Creps, P.E.
Principal Engineer

Table 1. **Summary of Groundwater Elevations Through May 1996**
Emery Bay Plaza
1650 65th Street, Emeryville, California

| Well Number | Date | Measured by | Top of Casing (feet MSL) | Depth to Water (feet) | Groundwater Elevations (feet MSL) |
|---|---|---|---|---|---|
| **MW-2** | 21-Feb-90 | ES | 15.75 | 11.72 | 4.03 |
| | 25-May-90 | ES | 15.75 | 11.83 | 3.92 |
| | 29-Aug-90 | ES | 15.75 | 11.72 | 4.03 |
| | 29-Nov-90 | ES | 15.75 | 11.99 | 3.76 |
| | 1-Mar-91 | ES | 15.79 | 12.87 | 2.92 |
| | 28-May-91 | ES | 15.79 | 12.21 | 3.58 |
| | 1-Aug-91 | ES | 15.79 | NA | NA |
| | 27-Jan-92 | PES | 15.79 | 11.78 | 4.01 |
| | 28-Feb-92 | PES | 15.79 | 11.70 | 4.09 |
| | 28-May-92 | PES | 15.79 | 11.83 | 3.96 |
| | 27-Aug-92 | PES | 15.79 | 12.28 | 3.51 |
| | 10-Nov-92 | PES | 15.79 | 12.40 | 3.39 |
| | 18-Feb-93 | PES | 15.79 | 12.00 | 3.79 |
| | 20-May-93 | PES | 15.79 | 12.00 | 3.79 |
| | 19-Aug-93 | PES | 15.79 | 12.11 | 3.68 |
| | 15-Nov-93 | PES | 15.79 | 11.64 | 4.15 |
| | 14-Feb-94 | PES | 15.79 | 11.45 | 4.34 |
| | 16-May-94 | PES | 15.79 | 11.25 | 4.54 |
| | 10-Aug-94 | PES | 15.79 | 11.22 | 4.57 |
| | 3-Nov-94 | PES | 15.79 | 11.32 | 4.47 |
| | 9-Feb-95 | PES | 15.79 | 10.64 | 5.15 |
| | 9-May-95 | PES | 15.79 | 10.60 | 5.19 |
| | 10-Aug-95 | PES | 15.79 | 10.98 | 4.81 |
| | 13-Nov-95 | PES | 15.79 | 11.18 | 4.61 |
| | 2-Mar-96 | PES | 15.79 | 10.42 | 5.37 |
| | **9-May-96** | **PES** | **15.79** | **10.78** | **5.01** |
| **MW-3** | 21-Feb-90 | ES | 12.45 | 9.18 | 3.27 |
| | 25-May-90 | ES | 12.45 | 9.25 | 3.20 |
| | 29-Aug-90 | ES | 12.45 | 9.50 | 2.95 |
| | 29-Nov-90 | ES | 12.45 | 9.80 | 2.65 |
| | 1-Mar-91 | ES | 12.43 | 9.51 | 2.92 |
| | 28-May-91 | ES | 12.43 | 9.03 | 3.40 |
| | 1-Aug-91 | ES | 12.43 | NA | NA |
| | 27-Jan-92 | PES | 12.43 | 9.44 | 2.99 |
| | 28-Feb-92 | PES | 12.43 | 8.80 | 3.63 |
| | 28-May-92 | PES | 12.43 | 8.80 | 3.63 |
| | 27-Aug-92 | PES | 12.43 | 9.18 | 3.25 |
| | 10-Nov-92 | PES | 12.43 | 9.44 | 2.99 |
| | 18-Feb-93 | PES | 12.43 | 7.59 | 4.84 |
| | 20-May-93 | PES | 12.43 | 8.21 | 4.22 |
| | 19-Aug-93 | PES | 12.43 | 8.71 | 3.72 |

Table 1. **Summary of Groundwater Elevations Through May 1996**
Emery Bay Plaza
1650 65th Street, Emeryville, California

| Well Number | Date | Measured by | Top of Casing (feet MSL) | Depth to Water (feet) | Groundwater Elevations (feet MSL) |
|---|---|---|---|---|---|
| **MW-3 Cont.** | 15-Nov-93 | PES | 12.43 | 9.09 | 3.34 |
| | 14-Feb-94 | PES | 12.43 | 8.84 | 3.59 |
| | 16-May-94 | PES | 12.43 | 8.18 | 4.25 |
| | 10-Aug-94 | PES | 12.43 | 8.72 | 3.71 |
| | 3-Nov-94 | PES | 12.43 | 8.13 | 4.30 |
| | 9-Feb-95 | PES | 12.43 | 6.86 | 5.57 |
| | 9-May-95 | PES | 12.43 | 7.16 | 5.27 |
| | 10-Aug-95 | PES | 12.43 | 8.00 | 4.43 |
| | 13-Nov-95 | PES | 12.43 | 8.44 | 3.99 |
| | 2-Mar-96 | PES | 12.43 | 7.31 | 5.12 |
| | **9-May-96** | **PES** | **12.43** | **7.72** | **4.71** |
| **MW-4** | 21-Feb-90 | ES | 12.24 | 8.63 | 3.61 |
| | 25-May-90 | ES | 12.24 | 8.58 | 3.66 |
| | 29-Aug-90 | ES | 12.24 | 8.50 | 3.74 |
| | 29-Nov-90 | ES | 12.24 | 8.74 | 3.50 |
| | 1-Mar-91 | ES | 12.24 | 8.65 | 3.59 |
| | 28-May-91 | ES | 12.24 | 8.57 | 3.67 |
| | 1-Aug-91 | ES | 12.24 | NA | NA |
| | 27-Jan-92 | PES | 12.24 | 8.62 | 3.62 |
| | 28-Feb-92 | PES | 12.24 | 8.52 | 3.72 |
| | 28-May-92 | PES | 12.94 | 8.35 | 3.89 |
| | 27-Aug-92 | PES | 12.24 | 9.00 | 3.24 |
| | 10-Nov-92 | PES | 12.24 | 8.85 | 3.39 |
| | 18-Feb-93 | PES | 12.24 | 8.17 | 4.07 |
| | 20-May-93 | PES | 12.24 | 8.21 | 4.03 |
| | 19-Aug-93 | PES | 12.24 | 8.20 | 4.04 |
| | 15-Nov-93 | PES | 12.24 | 8.33 | 3.91 |
| | 14-Feb-94 | PES | 12.24 | 8.30 | 3.94 |
| | 16-May-94 | PES | 12.24 | 8.20 | 4.04 |
| | 10-Aug-94 | PES | 12.24 | 8.14 | 4.10 |
| | 3-Nov-94 | PES | 12.24 | 8.30 | 3.94 |
| | 9-Feb-95 | PES | 12.24 | 8.11 | 4.13 |
| | 9-May-95 | PES | 12.24 | 7.76 | 4.48 |
| | 10-Aug-95 | PES | 12.24 | 7.91 | 4.33 |
| | 13-Nov-95 | PES | 12.24 | 7.95 | 4.29 |
| | 2-Mar-96 | PES | 12.24 | 7.89 | 4.35 |
| | **9-May-96** | **PES** | **12.24** | **7.64** | **4.60** |
| **MW-5** | 21-Feb-90 | ES | 12.81 | 6.91 | 5.90 |
| | 25-May-90 | ES | 12.81 | 7.58 | 5.23 |
| | 29-Aug-90 | ES | 12.81 | 7.75 | 5.06 |
| | 29-Nov-90 | ES | 12.81 | 8.17 | 4.64 |

Table 1. **Summary of Groundwater Elevations Through May 1996**
Emery Bay Plaza
1650 65th Street, Emeryville, California

| Well Number | Date | Measured by | Top of Casing (feet MSL) | Depth to Water (feet) | Groundwater Elevations (feet MSL) |
|---|---|---|---|---|---|
| MW-5 Cont. | 1-Mar-91 | ES | 12.82 | 8.11 | 4.71 |
| | 28-May-91 | ES | 12.82 | 7.39 | 5.43 |
| | 1-Aug-91 | ES | 12.82 | NA | NA |
| | 27-Jan-92 | PES | 12.82 | 7.90 | 4.92 |
| | 28-Feb-92 | PES | 12.82 | 7.73 | 5.09 |
| | 28-May-92 | PES | 12.82 | 7.18 | 5.64 |
| | 27-Aug-92 | PES | 12.82 | 7.54 | 5.28 |
| | 10-Nov-92 | PES | 12.82 | 7.90 | 4.92 |
| | 18-Feb-93 | PES | 12.82 | 6.58 | 6.24 |
| | 20-May-93 | PES | 12.82 | 6.29 | 6.53 |
| | 19-Aug-93 | PES | 12.82 | 6.89 | 5.93 |
| | 15-Nov-93 | PES | 12.82 | 7.43 | 5.39 |
| | 14-Feb-94 | PES | 12.82 | 7.16 | 5.66 |
| | 16-May-94 | PES | 12.82 | 6.50 | 6.32 |
| | 10-Aug-94 | PES | 12.82 | 6.98 | 5.84 |
| | 3-Nov-94 | PES | 12.82 | 7.36 | 5.46 |
| | 9-Feb-95 | PES | 12.82 | 5.68 | 7.14 |
| | 9-May-95 | PES | 12.82 | 5.36 | 7.46 |
| | 10-Aug-95 | PES | 12.82 | 6.29 | 6.53 |
| | 13-Nov-95 | PES | 12.82 | 6.89 | 5.93 |
| | 2-Mar-96 | PES | 12.82 | 7.26 | 5.56 |
| | **9-May-96** | **PES** | **12.82** | **6.00** | **6.82** |
| MW-6 | 1-Mar-91 | ES | 12.03 | 8.59 | 3.44 |
| | 28-May-91 | ES | 12.03 | 8.35 | 3.68 |
| | 1-Aug-91 | ES | 12.03 | NA | NA |
| | 27-Jan-92 | PES | 12.03 | 8.32 | 3.71 |
| | 28-Feb-92 | PES | 12.03 | 8.08 | 3.95 |
| | 28-May-92 | PES | 12.03 | 8.04 | 3.99 |
| | 27-Aug-92 | PES | 12.03 | 8.48 | 3.55 |
| | 10-Nov-92 | PES | 12.03 | 8.52 | 3.51 |
| | 18-Feb-93 | PES | 12.03 | 8.14 | 3.89 |
| | 20-May-93 | PES | 12.03 | 8.46 | 3.57 |
| | 19-Aug-93 | PES | 12.03 | 8.61 | 3.42 |
| | 15-Nov-93 | PES | 12.03 | 8.30 | 3.73 |
| | 14-Feb-94 | PES | 12.03 | 8.09 | 3.94 |
| | 16-May-94 | PES | 12.03 | 7.82 | 4.21 |
| | 10-Aug-94 | PES | 12.03 | 8.46 | 3.57 |
| | 3-Nov-94 | PES | 12.03 | 8.16 | 3.87 |
| | 9-Feb-95 | PES | 12.03 | 7.66 | 4.37 |
| | 9-May-95 | PES | 12.03 | 8.57 | 3.46 |
| | 10-Aug-95 | PES | 12.03 | 7.72 | 4.31 |

**Table 2. Summary of Analytical Results for Groundwater Samples Through May 1996**
Emery Bay Plaza
1650 65th Street, Emeryville, California

Concentrations expressed in milligrams per liter (mg/l) - equivalent to parts per million (ppm)

| Well Number | Sample Date | Sampled by | TPH as Gasoline | TPH as Diesel | Benzene MCL = 0.001 | Toluene DAL = 0.1 | Ethyl-Benzene MCL = 0.68 | Total Xylenes MCL = 1.75 | Purgeable Halocarbons | Lead MCL = 0.005 |
|---|---|---|---|---|---|---|---|---|---|---|
| MW-2 | Nov-89 | ES | 100 | NA | 8.4 | 7.4 | 2.4 | 13 | 0.015 * | 0.05 |
| | Feb-90 | ES | 54 | NA | 7.8 | 5.6 | 1.6 | 8.4 | 0.032 * | 0.021 |
| | May-90 | ES | 40 | NA | 7.8 | 7.5 | 1.6 | 7.6 | 0.076 * | 0.025 |
| | Aug-90 | ES | 49 | 4.6 | 9 | 8 | ND | 8.9 | 0.040 * | 0.0059 |
| | Nov-90 | ES | 73 | 3.5 | 6.9 | 5.9 | 1.4 | 7.4 | NA | NA |
| | Mar-91 | ES | 72 | 1.8 | 5.5 | 6.6 | 1 | 7.7 | NA | NA |
| | May-91 | ES | 31 | ND | 8.4 | 4.7 | 1.7 | 6.3 | NA | NA |
| | Aug-91 | ES | 47 | ND | 7.6 | 1.6 | 7.3 | 7.8 | NA | NA |
| | 29-Jan-92 | PES | 77.000 | NA | 10.000 | 8.700 | 2.000 | 7.600 | NA | NA |
| | 28-Feb-92 | PES | 70.000 | NA | 9.100 | 6.400 | 0.530 | 7.400 | NA | NA |
| | 28-May-92 | PES | 54.000 | NA | 8.000 | 4.800 | 2.400 | 6.200 | NA | NA |
| | 27-Aug-92 | PES | 47.000 | NA | 2.700 | 2.900 | 3.400 | 9.200 | NA | NA |
| | 10-Nov-92 | PES | 45.000 | <20 | 6.600 | 4.000 | 2.000 | 5.800 | <0.050 | NA |
| | 18-Feb-93 | PES | 14.000 | NA | 2.300 | 0.810 | 0.670 | 1.400 | NA | NA |
| | 20-May-93 | PES | 43.000 | NA | 7.300 | 5.200 | 1.500 | 5.500 | NA | NA |
| | 19-Aug-93 | PES | 45.000 | NA | 4.900 | 3.700 | 1.300 | 3.400 | NA | NA |
| | 15-Nov-93 | PES | 97.000 | NA | 6.100 | 1.700 | 1.700 | 4.100 | NA | NA |
| | 14-Feb-94 | PES | 27.000 | NA | 5.000 | 0.830 | 1.200 | 3.100 | NA | NA |
| | 16-May-94 | PES | 77.000 | NA | 6.800 | 1.100 | 1.400 | 3.300 | NA | NA |
| | 10-Aug-94 | PES | 25 | NA | 5.600 | 0.750 | 1.400 | 1.700 | NA | NA |
| | 3-Nov-94 | PES | 24 | NA | 7.200 | 0.500 | 1.500 | 1.600 | NA | NA |
| | 9-Feb-95 | PES | 12 | NA | 2.200 | 0.100 | 0.480 | 0.940 | NA | NA |
| | 9-May-95 | PES | 7.8 | NA | 1.300 | 0.078 | 0.340 | 0.480 | NA | NA |
| | 10-Aug-95 | PES | 5.3 | NA | 1.300 | 0.150 | 0.240 | 0.270 | NA | NA |
| | 13-Nov-95 | PES | 8.5 | NA | 2.100 | 0.250 | 0.430 | 0.440 | NA | NA |
| | 13-Feb-96 | PES | 5.2 | NA | 1.500 | 0.190 | 0.210 | 0.290 | NA | NA |
| | **9-May-96** | **PES** | **1.7** | **NA** | **0.370** | **0.130** | **0.060** | **0.090** | **NA** | **NA** |

**Table 2. Summary of Analytical Results for Groundwater Samples Through May 1996**
Emery Bay Plaza
1650 65th Street, Emeryville, California

Concentrations expressed in milligrams per liter (mg/l) - equivalent to parts per million (ppm)

| Well Number | Sample Date | Sampled by | TPH as Gasoline | TPH as Diesel | Benzene | Toluene | Ethyl-Benzene | Total Xylenes | Purgeable Halocarbons | Lead |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | MCL = 0.001 | DAL = 0.1 | MCL = 0.68 | MCL = 1.75 | | MCL = 0.005 |
| MW-3 | Nov-89 | ES | 0.13 | NA | 0.0022 | ND | ND | 0.003 | ND | ND |
| | Feb-90 | ES | ND | NA | 0.0025 | ND | ND | ND | NA | 0.011 |
| | May-90 | ES | ND | ND | 0.002 | ND | ND | ND | ND | NA |
| | Aug-90 | ES | ND | 0.8 | 0.0044 | 0.0029 | ND | 0.0054 | NA | NA |
| | Nov-90 | ES | 0.9 | 0.8 | 0.0034 | ND | ND | ND | NA | NA |
| | Mar-91 | ES | ND | ND | 0.025 | 0.025 | 0.0053 | 0.32 | NA | NA |
| | May-91 | ES | ND | ND | 0.0026 | ND | ND | ND | NA | NA |
| | Aug-91 | ES | ND | ND | 0.0019 | ND | ND | ND | NA | NA |
| | 29-Jan-92 | PES | 0.092 | NA | 0.0024 | <0.0003 | 0.0006 | <0.0003 | NA | NA |
| | 28-Feb-92 | PES | 0.160*** | NA | 0.0028 | <0.0003 | 0.0007 | 0.0005 | NA | NA |
| | 28-May-92 | PES | <0.050 | NA | 0.0025 | <0.0005 | <0.0005 | <0.0005 | NA | NA |
| | 27-Aug-92 | PES | 0.370 | NA | 0.0040 | <0.001 | <0.0005 | <0.0005 | NA | NA |
| | 10-Nov-92 | PES | 0.240 | <0.100 | 0.0042 | <0.0003 | <0.0003 | <0.0006 | <0.0003 | NA |
| | 18-Feb-93 | PES | 0.140 | NA | 0.0018 | <0.0005 | <0.0005 | <0.0005 | NA | NA |
| | 20-May-93 | PES | 0.072 | NA | 0.0031 | <0.0005 | <0.0005 | <0.0005 | NA | NA |
| | 19-Aug-93 | PES | <0.050 | NA | 0.0032 | <0.0005 | <0.0005 | 0.0007 | NA | NA |
| | 15-Nov-93 | PES | 0.070 | NA | 0.0023 | 0.0007 | <0.0005 | 0.0015 | NA | NA |
| | 14-Feb-94 | PES | 0.120 | NA | 0.0053 | 0.0023 | 0.0012 | 0.0042 | NA | NA |
| | 16-May-94 | PES | 0.120 | NA | 0.0031 | <0.0005 | <0.0005 | 0.0017 | NA | NA |
| | 10-Aug-94 | PES | 0.1 | NA | 0.003 | < 0.0005 | 0.0005 | <0.002 | NA | NA |
| | 3-Nov-94 | PES | 0.1 | NA | 0.003 | < 0.0005 | <0.0005 | <0.002 | NA | NA |
| | 9-Feb-95 | PES | 0.1 | NA | 0.002 | <0.0005 | <0.0005 | <0.002 | NA | NA |
| | 9-May-95 | PES | 0.1 | NA | 0.003 | <0.0005 | 0.0005 | <0.002 | NA | NA |
| | 10-Aug-95 | PES | 0.1 | NA | 0.003 | <0.0005 | <0.0005 | <0.002 | NA | NA |
| | 13-Nov-95 | PES | <0.05 | NA | 0.003 | <0.0005 | <0.0005 | <0.002 | NA | NA |

**Table 2. Summary of Analytical Results for Groundwater Samples Through May 1996**
Emery Bay Plaza
1650 65th Street, Emeryville, California

Concentrations expressed in milligrams per liter (mg/l) - equivalent to parts per million (ppm)

| Well Number | Sample Date | Sampled by | TPH as Gasoline | TPH as Diesel | Benzene | Toluene | Ethyl-Benzene | Total Xylenes | Purgeable Halocarbons | Lead |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | MCL = 0.001 | DAL = 0.1 | MCL = 0.68 | MCL = 1.75 | | MCL = 0.005 |
| MW-4 | Nov-89 | ES | 0.2 | NA | 0.0023 | ND | ND | ND | ND | ND |
| | Feb-90 | ES | ND | NA | ND | ND | ND | ND | NA | 0.006 |
| | May-90 | ES | ND | ND | 0.001 | ND | ND | ND | ND | NA |
| | Aug-90 | ES | ND | 0.8 | 0.0089 | 0.0071 | ND | 0.0094 | NA | NA |
| | Nov-90 | ES | ND | 0.7 | 0.0027 | ND | ND | ND | NA | NA |
| | Mar-91 | ES | NA | ND | 0.003 | ND | ND | ND | NA | NA |
| | May-91 | ES | NA | ND | 0.0024 | ND | ND | ND | NA | NA |
| | Aug-91 | ES | NA | ND | 0.0015 | ND | ND | ND | NA | NA |
| | 29-Jan-92 | PES | <0.050 | NA | 0.0022 | 0.0004 | <0.0003 | 0.0007 | NA | NA |
| | 28-Feb-92 | PES | <0.050 | NA | 0.0016 | <0.0003 | <0.0003 | 0.0003 | NA | NA |
| | 28-May-92 | PES | <0.050 | NA | 0.0015 | <0.0005 | <0.0005 | <0.0005 | NA | NA |
| | 27-Aug-92 | PES | 0.080 | NA | 0.003 | <0.001 | <0.0005 | 0.0005 | NA | NA |
| | 10-Nov-92 | PES | 0.180 | <0.100 | 0.060 | 0.0009 | <0.0003 | <0.0006 | <0.0003 | NA |
| | 18-Feb-93 | PES | 0.060 | NA | 0.0017 | <0.0005 | <0.0005 | <0.0005 | NA | NA |
| | 20-May-93 | PES | <0.050 | NA | 0.0022 | <0.0005 | <0.0005 | <0.0005 | NA | NA |
| | 19-Aug-93 | PES | <0.050 | NA | 0.0020 | 0.0006 | <0.0005 | 0.0005 | NA | NA |
| | 15-Nov-93 | PES | <0.050 | NA | 0.0020 | 0.0005 | <0.0005 | 0.0009 | NA | NA |
| | 14-Feb-94 | PES | <0.050 | NA | <0.0005 | <0.0005 | <0.0005 | <0.0005 | NA | NA |
| | 16-May-94 | PES | <0.050 | NA | 0.0017 | 0.0009 | <0.0005 | 0.0011 | NA | NA |
| | 10-Aug-94 | PES | <0.05 | NA | 0.002 | <0.0005 | <0.0005 | <0.002 | NA | NA |
| | 3-Nov-94 | PES | 0.06 | NA | 0.002 | <0.0005 | <0.0005 | <0.002 | NA | NA |
| | 9-Feb-95 | PES | 0.06 | NA | 0.002 | 0.0006 | <0.0005 | <0.002 | NA | NA |
| | 9-May-95 | PES | 0.07 | NA | 0.001 | <0.0005 | <0.0005 | <0.002 | NA | NA |
| | 10-Aug-95 | PES | <0.05 | NA | 0.001 | <0.0005 | <0.0005 | <0.002 | NA | NA |
| | 13-Nov-95 | PES | <0.05 | NA | 0.003 | <0.0005 | <0.0005 | <0.002 | NA | NA |
| | 13-Feb-96 | PES | <0.05 | NA | 0.0013 | <0.0005 | <0.0005 | <0.002 | NA | NA |
| | **9-May-96** | **PES** | **<0.05** | **NA** | **0.0009** | **<0.0005** | **<0.0005** | **<0.002** | **NA** | **NA** |

**Table 2. Summary of Analytical Results for Groundwater Samples Through May 1996**
Emery Bay Plaza
1650 65th Street, Emeryville, California

Concentrations expressed in milligrams per liter (mg/l) - equivalent to parts per million (ppm)

| Well Number | Sample Date | Sampled by | TPH as Gasoline | TPH as Diesel | Benzene | Toluene | Ethyl-Benzene | Total Xylenes | Purgeable Halocarbons | Lead |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | MCL = 0.001 | DAL = 0.1 | MCL = 0.68 | MCL = 1.75 | | MCL = 0.005 |
| MW-5 | Nov-89 | ES | ND | NA | 0.074 | ND | ND | 0.0042 | ND | ND |
| | Feb-90 | ES | ND | NA | 0.2 | ND | ND | ND | NA | 0.012 |
| | May-90 | ES | ND | ND | 0.11 | ND | ND | ND | ND | NA |
| | Aug-90 | ES | ND | 0.7 | 0.066 | 0.0022 | ND | 0.0038 | NA | NA |
| | Nov-90 | ES | 0.6 | 0.9 | 0.069 | ND | ND | ND | NA | NA |
| | Mar-91 | ES | ND | 1.1 | 0.066 | 0.0023 | ND | ND | NA | NA |
| | May-91 | ES | ND | ND | 0.11 | ND | ND | ND | NA | NA |
| | Aug-91 | ES | ND | ND | 0.078 | 0.0021 | ND | ND | NA | NA |
| | 29-Jan-92 | PES | 0.190 | NA | 0.090 | 0.0005 | <0.0003 | 0.0006 | NA | NA |
| | 28-Feb-92 | PES | 0.230*** | NA | 0.110 | 0.0009 | <0.0003 | 0.0005 | NA | NA |
| | 28-May-92 | PES | 0.130 | NA | 0.100 | <0.0005 | <0.0005 | <0.0005 | NA | NA |
| | 27-Aug-92 | PES | 0.520 | NA | 0.083 | 0.002 | <0.0005 | <0.0005 | NA | NA |
| | 10-Nov-92 | PES | 0.240 | <0.100 | 0.074 | 0.0010 | <0.0003 | <0.0006 | <0.0003 | NA |
| | 18-Feb-93 | PES | 0.190 | NA | 0.056 | 0.0006 | <0.0005 | <0.0005 | NA | NA |
| | 20-May-93 | PES | <0.200 | NA | 0.056 | <0.002 | <0.002 | <0.002 | NA | NA |
| | 19-Aug-93 | PES | 0.170 | NA | 0.050 | 0.0007 | <0.0005 | <0.0005 | NA | NA |
| | 15-Nov-93 | PES | 0.220 | NA | 0.049 | 0.001 | <0.001 | <0.001 | NA | NA |
| | 14-Feb-94 | PES | 0.140 | NA | 0.062 | <0.0005 | <0.0005 | <0.0005 | NA | NA |
| | 16-May-94 | PES | 0.310 | NA | 0.140 | 0.003 | <0.003 | <0.003 | NA | NA |
| | 12-Aug-94 | PES | 0.5 | NA | 0.095 | 0.034 | 0.004 | 0.014 | NA | NA |
| | 3-Nov-94 | PES | 0.4 | NA | 0.079 | 0.0006 | <0.0005 | <0.002 | NA | NA |
| | 9-Feb-95 | PES | 0.3 | NA | 0.074 | 0.0008 | <0.0005 | <0.0002 | NA | NA |
| | 9-May-95 | PES | 0.2 | NA | 0.047 | 0.0005 | <0.0005 | <0.002 | NA | NA |
| | 10-Aug-95 | PES | 0.2 | NA | 0.046 | 0.0005 | <0.0005 | <0.002 | NA | NA |
| | 13-Nov-95 | PES | 0.3 | NA | 0.048 | 0.0007 | <0.0005 | <0.002 | NA | NA |

**Table 2. Summary of Analytical Results for Groundwater Samples Through May 1996**
Emery Bay Plaza
1650 65th Street, Emeryville, California

Concentrations expressed in milligrams per liter (mg/l) - equivalent to parts per million (ppm)

| Well Number | Sample Date | Sampled by | TPH as Gasoline | TPH as Diesel | Benzene | Toluene | Ethyl-Benzene | Total Xylenes | Purgeable Halocarbons | Lead |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | MCL = 0.001 | DAL = 0.1 | MCL = 0.68 | MCL = 1.75 | | MCL = 0.005 |
| MW-6 | May-90 | ES | NA | ND | ND | ND | ND | ND | ND | ND** |
| | Aug-90 | ES | NA | ND | NA | NA | NA | NA | NA | ND** |
| | Nov-90 | ES | 1.2 | 1.4 | 0.0012 | ND | ND | ND | 0.0012 | NA |
| | Mar-91 | ES | ND | ND | ND | ND | ND | ND | NA | NA |
| | May-91 | ES | ND | ND | ND | ND | ND | ND | NA | NA |
| | Aug-91 | ES | ND | ND | ND | ND | ND | ND | NA | NA |
| | 29-Jan-92 | PES | <0.050 | NA | <0.0003 | <0.0003 | <0.0003 | <0.0003 | NA | NA |
| | 28-Feb-92 | PES | <0.050 | NA | <0.0003 | <0.0003 | <0.0003 | <0.0003 | NA | NA |
| | 28-May-92 | PES | <0.050 | NA | <0.0005 | <0.0005 | <0.0005 | <0.0005 | NA | NA |
| | 27-Aug-92 | PES | <0.050*** | NA | <0.0005 | <0.001 | <0.0005 | <0.0005 | NA | NA |
| | 10-Nov-92 | PES | <0.050 | <0.100 | <0.0003 | <0.0003 | <0.0003 | <0.0006 | <0.0003 | NA |
| | 18-Feb-93 | PES | <0.050 | NA | <0.0005 | <0.0005 | <0.0005 | <0.0005 | NA | NA |
| | 20-May-93 | PES | <0.050 | NA | <0.0005 | <0.0005 | <0.0005 | <0.0005 | NA | NA |
| | 19-Aug-93 | PES | <0.050 | NA | <0.0005 | <0.0005 | <0.0005 | <0.0005 | NA | NA |
| | 15-Nov-93 | PES | <0.050 | NA | <0.0005 | <0.0005 | <0.0005 | <0.0005 | NA | NA |
| | 14-Feb-94 | PES | <0.050 | NA | <0.0005 | <0.0005 | <0.0005 | <0.0005 | NA | NA |
| | 16-May-94 | PES | <0.050 | NA | <0.0005 | <0.0005 | <0.0005 | <0.0005 | NA | NA |
| | 10-Aug-94 | PES | <0.05 | NA | <0.0005 | <0.0005 | <0.0005 | <0.002 | NA | NA |
| | 3-Nov-94 | PES | <0.05 | NA | <0.0005 | <0.0005 | <0.0005 | <0.002 | NA | NA |
| | 9-Feb-95 | PES | <0.05 | NA | <0.0005 | <0.0005 | <0.0005 | <0.002 | NA | NA |
| | 9-May-95 | PES | <0.05 | NA | <0.0005 | <0.0005 | <0.0005 | <0.002 | NA | NA |
| | 10-Aug-95 | PES | <0.05 | NA | <0.0005 | <0.0005 | <0.0005 | <0.002 | NA | NA |
| | 13-Nov-95 | PES | <0.05 | NA | <0.0005 | <0.0005 | <0.0005 | <0.002 | NA | NA |
| MW-7 | May-90 | ES | NA | 0.6 | 0.24 | ND | ND | ND | 0.24 | ND** |
| | Aug-90 | ES | ND | ND | 0.081 | 0.0018 | ND | ND | 0.0844 | ND** |
| | Nov-90 | ES | ND | 0.8 | 0.054 | ND | ND | ND | 0.054 | NA |

**Table 2. Summary of Analytical Results for Groundwater Samples Through May 1996**
Emery Bay Plaza
1650 65th Street, Emeryville, California

Concentrations expressed in milligrams per liter (mg/l) - equivalent to parts per million (ppm)

| Well Number | Sample Date | Sampled by | TPH as Gasoline | TPH as Diesel | Benzene | Toluene | Ethyl-Benzene | Total Xylenes | Purgeable Halocarbons | Lead |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | MCL = 0.001 | DAL = 0.1 | MCL = 0.68 | MCL = 1.75 | | MCL = 0.005 |
| MW-7 | Mar-91 | ES | ND | ND | 0.1 | 0.0036 | ND | ND | NA | NA |
| Cont. | May-91 | ES | ND | ND | 0.12 | 0.0027 | ND | ND | NA | NA |
| | Aug-91 | ES | ND | ND | 0.074 | 0.0033 | ND | ND | NA | NA |
| | 29-Jan-92 | PES | 0.270 | NA | 0.025 | 0.0005 | <0.0003 | 0.0008 | NA | NA |
| | 28-Feb-92 | PES | 0.100*** | NA | 0.033 | 0.0007 | <0.0003 | 0.0007 | NA | NA |
| | 28-May-92 | PES | 0.150 | NA | 0.021 | <0.0005 | <0.0005 | <0.0005 | NA | NA |
| | 27-Aug-92 | PES | 0.440 | NA | 0.011 | 0.001 | <0.0005 | <0.0005 | NA | NA |
| | 10-Nov-92 | PES | 0.370 | <0.100 | 0.031 | 0.0012 | <0.0003 | 0.0012 | <0.0003 | NA |
| | 18-Feb-93 | PES | 0.270 | NA | 0.077 | 0.0013 | <0.0005 | 0.0014 | NA | NA |
| | 20-May-93 | PES | 0.300 | NA | 0.150 | 0.003 | <0.002 | 0.003 | NA | NA |
| | 19-Aug-93 | PES | 0.110 | NA | 0.040 | 0.0010 | <0.0005 | 0.0011 | NA | NA |
| | 15-Nov-93 | PES | 0.120 | NA | 0.015 | 0.0006 | <0.0005 | 0.0023 | NA | NA |
| | 14-Feb-94 | PES | 0.120 | NA | 0.038 | <0.0005 | <0.0005 | <0.0005 | NA | NA |
| | 17-May-94 | PES | <0.300 | NA | 0.061 | <0.003 | <0.003 | <0.003 | NA | NA |
| | 10-Aug-94 | PES | 0.1 | NA | 0.009 | <0.0005 | <0.0005 | <0.002 | NA | NA |
| | 3-Nov-94 | PES | 0.1 | NA | 0.003 | <0.0005 | <0.0005 | <0.002 | NA | NA |
| | 9-Feb-95 | PES | 0.2 | NA | 0.050 | 0.0006 | <0.0005 | <0.002 | NA | NA |
| | 9-May-95 | PES | 0.3 | NA | 0.120 | 0.001 | <0.0005 | <0.002 | NA | NA |
| | 10-Aug-95 | PES | <0.05 | NA | 0.007 | <0.0005 | <0.0005 | <0.002 | NA | NA |
| | 13-Nov-95 | PES | 0.09 | NA | 0.003 | <0.0005 | <0.0005 | <0.002 | NA | NA |
| MW-8 | 3-Nov-94 | PES | <0.05 | NA | 0.001 | <0.0005 | <0.0005 | <0.002 | NA | NA |
| | 9-Feb-95 | PES | <0.05 | NA | <0.0005 | <0.0005 | <0.0005 | <0.002 | NA | NA |
| | 9-May-95 | PES | <0.05 | NA | <0.0005 | <0.0005 | <0.0005 | <0.002 | NA | NA |
| | 10-Aug-95 | PES | <0.05 | NA | <0.0005 | <0.0005 | <0.0005 | <0.002 | NA | NA |
| | 13-Nov-95 | PES | <0.05 | NA | <0.0005 | <0.0005 | <0.0005 | <0.002 | NA | NA |
| | 13-Feb-96 | PES | <0.05 | NA | <0.0005 | <0.0005 | <0.0005 | <0.002 | NA | NA |
| | **9-May-96** | **PES** | **<0.05** | **NA** | **<0.0005** | **<0.0005** | **<0.0005** | **<0.002** | **NA** | **NA** |

**Table 2. Summary of Analytical Results for Groundwater Samples Through May 1996**
Emery Bay Plaza
1650 65th Street, Emeryville, California

Concentrations expressed in milligrams per liter (mg/l) - equivalent to parts per million (ppm)

| Well Number | Sample Date | Sampled by | TPH as Gasoline | TPH as Diesel | Benzene | Toluene | Ethyl-Benzene | Total Xylenes | Purgeable Halocarbons | Lead |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | MCL = 0.001 | DAL = 0.1 | MCL = 0.68 | MCL = 1.75 | | MCL = 0.005 |
| EW-1 | May-90 | ES | 20 | ND | 7.5 | 4.5 | 1 | 6.3 | 0.068 | ND** |
| | Aug-90 | ES | NA | 3.5 | 6 | 4.2 | ND | 4.6 | 0.016 * | ND** |
| | Nov-90 | ES | 47 | 3.1 | 6 | 3.4 | 1 | 4.7 | NA | NA |
| | 17-Dec-90 | ES | NA | NA | 11 | 7.9 | 2.2 | 10 | NA | NA |
| | 19-Dec-90 | ES | NA | NA | 3.7 | 2.5 | ND | 2.3 | NA | NA |
| | 21-Dec-90 | ES | NA | NA | 3.2 | 2.2 | ND | 1.7 | NA | NA |
| | 27-Dec-90 | ES | NA | NA | 2.9 | 2.1 | 0.16 | 1.5 | NA | NA |
| | 4-Jan-91 | ES | NA | NA | 3.2 | 2.8 | ND | ND | NA | NA |
| | 11-Jan-91 | ES | NA | NA | 3 | 2.4 | 0.2 | 1.8 | NA | NA |
| | 6-Feb-91 | ES | NA | NA | 0.47 | 0.23 | 0.011 | 0.39 | NA | NA |
| | 13-Feb-91 | ES | NA | NA | 1.2 | 0.28 | ND | 0.36 | NA | NA |
| | 15-Mar-91 | ES | NA | NA | 0.13 | 0.085 | 0.006 | 0.17 | NA | NA |
| | 3-Jul-91 | ES | NA | NA | 1.3 | 0.95 | 0.22 | 1.4 | NA | NA |
| | 1-Aug-91 | ES | NA | NA | 0.22 | 0.19 | 0.013 | 0.27 | NA | NA |
| | 16-Aug-91 | ES | NA | NA | 0.17 | 0.16 | 0.013 | 0.19 | NA | NA |
| | 13-Nov-91 | ES | NA | NA | 3.1 | 0.27 | 0.04 | 0.22 | NA | NA |
| | 29-Jan-92 | PES | 2.700 | NA | 0.570 | 0.150 | 0.0070 | 0.260 | NA | NA |
| | 26-Mar-92 | PES | 25.000 | NA | 3.600 | 2.600 | 0.530 | 2.600 | NA | NA |
| | 28-May-92 | PES | 16.000 | NA | 3.300 | 3.200 | 0.750 | 2.600 | NA | NA |
| | 29-Jun-92 | PES | 7.000 | NA | 2.200 | 3.100 | 0.270 | 1.400 | NA | NA |
| | 21-Jul-92 | PES | 1.600 | NA | 0.220 | 0.017 | <0.0005 | 0.100 | NA | NA |
| | 27-Aug-92 | PES | NS | NS | NS | NS | NS | NS | NS | NS |
| | 23-Sep-92 | PES | 5.200 | NA | 1.100 | 0.590 | 0.100 | 1.000 | NA | NA |
| | 27-Oct-92 | PES | 1.300 | NA | 0.220 | 0.061 | 0.0053 | 0.110 | NA | NA |
| | 24-Nov-92 | PES | 7.100 | NA | 1.400 | 1.100 | 0.120 | 0.890 | NA | NA |
| | 18-Feb-93 | PES | 7.200 | NA | 1.400 | 0.930 | 0.210 | 1.000 | NA | NA |
| | 09-Mar-93 | PES | 4.600 | NA | 0.990 | 0.750 | 0.062 | 0.840 | NA | NA |

Table 2. **Summary of Analytical Results for Groundwater Samples Through May 1996**
Emery Bay Plaza
1650 65th Street, Emeryville, California

Concentrations expressed in milligrams per liter (mg/l) - equivalent to parts per million (ppm)

| Well Number | Sample Date | Sampled by | TPH as Gasoline | TPH as Diesel | Benzene | Toluene | Ethyl-Benzene | Total Xylenes | Purgeable Halocarbons | Lead |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | MCL = 0.001 | DAL = 0.1 | MCL = 0.68 | MCL = 1.75 | | MCL = 0.005 |
| EW-1 | 21-Apr-93 | PES | 4.900 | NA | 0.270 | 0.180 | 0.020 | 0.190 | NA | NA |
| Cont. | 13-May-93 | PES | 2.600 | NA | 0.520 | 0.110 | 0.023 | 0.330 | NA | NA |
| | 28-Jun-93 | PES | 9.500 | NA | 1.900 | 0.460 | 0.230 | 1.000 | NA | NA |
| | 11-Aug-93 | PES | 1.300 | NA | <0.002 | <0.002 | <0.002 | 0.400 | NA | NA |
| | 15-Nov-93 | PES | 46.000 | NA | 2.900 | 0.380 | 0.500 | 1.700 | NA | NA |
| | 14-Feb-94 | PES | 21.000 | NA | 4.500 | 0.860 | 1.000 | 2.800 | NA | NA |
| | 16-May-94 | PES | 19.000 | NA | 7.300 | 0.930 | 1.300 | 3.300 | NA | NA |
| | 10-Aug-94 | PES | 19 | NA | 4.200 | 0.490 | 1.100 | 1.500 | NA | NA |
| | 3-Nov-94 | PES | 20 | NA | 6.000 | 0.230 | 1.400 | 1.400 | NA | NA |
| | 9-Feb-95 | PES | 8.7 | NA | 1.800 | 0.110 | 0.380 | 0.740 | NA | NA |
| | 9-May-95 | PES | 6.6 | NA | 1.100 | 0.051 | 0.270 | 0.380 | NA | NA |
| | 10-Aug-95 | PES | 2.6 | NA | 0.410 | 0.016 | 0.110 | 0.097 | NA | NA |
| | 13-Nov-95 | PES | 14 | NA | 2.900 | 0.110 | 0.550 | 0.440 | NA | NA |
| | 13-Feb-96 | PES | 3.7 | NA | 1.000 | 0.220 | 0.170 | 0.280 | NA | NA |
| | **9-May-96** | **PES** | **0.97** | **NA** | **0.230** | **0.050** | **0.039** | **0.047** | **NA** | **NA** |

NOTES:

* = 1,2-Dichlorethane concentration (only 1,2-Dichloroethane detected).
** = Organic Lead
*** = TPH quantified as gasoline but chromatogram pattern was not typical of gasoline.
ES = Engineering-Science, Inc.
PES = PES Environmental, Inc.
NA = Not analyzed
ND = Not detected above method detection limit.
NS = Not sampled.
<0.0005 = Not detected above indicated laboratory reporting limit.
MCL = California Maximum Contaminant level, current as of January 1991.
DAL = Department of Health Services Action Levels, current as of January 1991.
TPH = Total Petroleum Hydrocarbons

Table 3. **Summary of Total Dissolved Oxygen Through May 1996**
Emery Bay Plaza
1650 65th Street, Emeryville, California

| Well Number | Date | Time of Day | Measured by | Total Dissolved Oxygen (mg/L) | Notes |
|---|---|---|---|---|---|
| MW-2 | 10-Aug-94 | 10:52 | PES | <0.1 | |
| | 3-Nov-94 | 12:03 | Blaine | 0.2 | |
| | 29-Dec-94 | 9:56 | PES | 1.9 | (1) |
| | 29-Dec-94 | 17:05 | PES | >20 | (2) |
| | 9-Feb-95 | 14:31 | Blaine | 0.9 | |
| | 16-Mar-95 | 9:45 | PES | 0.07 | (1) |
| | 16-Mar-95 | 16:05 | PES | >20 | (2) |
| | 21-Mar-95 | 9:35 | PES | 0.025 | |
| | 23-Mar-95 | 9:45 | PES | 0.14 | |
| | 28-Mar-95 | 9:50 | PES | 0.12 | |
| | 6-Apr-95 | 11:12 | Blaine | 0.1 | |
| | 9-May-95 | 11:25 | Blaine | 1.3 | |
| | 20-Jun-95 | 10:35 | PES | 0 | (1) |
| | 20-Jun-95 | 15:23 | PES | >20 | (2) |
| | 26-Jun-95 | 19:50 | PES | 0.12 | |
| | 28-Jun-95 | 19:47 | PES | 0.12 | |
| | 1-Jul-95 | 19:45 | PES | 0.45 | |
| | 3-Jul-95 | 19:35 | PES | 0.06 | |
| | 10-Aug-95 | 13:11 | Blaine | 0.7 | |
| | 20-Sep-95 | 9:55 | PES | 0.8 | (1) |
| | 23-Sep-95 | 13:25 | PES | 1.6 | |
| | 25-Sep-95 | 8:20 | PES | 2.0 | |
| | 28-Sep-95 | 9:51 | PES | 1.1 | |
| | 13-Nov-95 | 11:10 | Blaine | 0.4 | |
| | 11-Jan-96 | 10:47 | PES | 1.4 | (1) |
| | 14-Jan-96 | 17:27 | PES | >15 | |
| | 17-Jan-96 | 8:03 | PES | 8.2 | |
| | 19-Jan-96 | 9:31 | PES | 4.8 | |
| | 21-Jan-96 | 18:10 | PES | 2.6 | |
| | 25-Jan-96 | 20:13 | PES | 1.8 | |
| | 13-Feb-96 | 11:43 | Blaine | 0.4 | |
| | 11-Apr-96 | 10:12 | PES | 0.1 | (1) |
| | 15-Apr-96 | 8:48 | PES | >15 | |
| | **9-May-96** | **11:22** | **Blaine** | **0.6** | |
| MW-3 | 10-Aug-94 | 10:14 | PES | <0.1 | |
| | 3-Nov-94 | 10:03 | Blaine | 0.2 | |
| | 29-Dec-94 | 9:09 | PES | 2.1 | (1) |
| | 9-Feb-95 | 12:05 | Blaine | 0.8 | |
| | 16-Mar-95 | 15:45 | PES | 0.06 | (1) |
| | 21-Mar-95 | 10:05 | PES | 0.11 | |
| | 23-Mar-95 | 10:04 | PES | 0.14 | |
| | 28-Mar-95 | 10:05 | PES | * | |
| | 6-Apr-95 | 11:30 | Blaine | 0.05 | |
| | 9-May-95 | 9:48 | Blaine | 0.9 | |

Table 3. Summary of Total Dissolved Oxygen Through May 1996
Emery Bay Plaza
1650 65th Street, Emeryville, California

| Well Number | Date | Time of Day | Measured by | Total Dissolved Oxygen (mg/L) | Notes |
|---|---|---|---|---|---|
| MW-3 | 20-Jun-95 | 10:12 | PES | 0.01 | (1) |
| Cont. | 20-Jun-95 | 14:53 | PES | 0.01 | (2) |
| | 26-Jun-95 | 20:34 | PES | 0 | |
| | 10-Aug-95 | 11:19 | Blaine | 1.1 | |
| | 20-Sep-95 | 14:41 | PES | 0.6 | (1) |
| | 13-Nov-95 | 9:54 | Blaine | 0.4 | |
| | 11-Jan-96 | 13:12 | PES | 1.6 | (1) |
| | 13-Feb-96 | NM | NM | NM | |
| | 11-Apr-96 | PES | 15:00 | 0.2 | (1) |
| | **9-May-96** | **NM** | **NM** | **NM** | |
| MW-4 | 10-Aug-94 | 10:08 | PES | 0.1 | |
| | 3-Nov-94 | 9:24 | Blaine | 0.1 | |
| | 29-Dec-94 | 10:06 | PES | 2 | (1) |
| | 9-Feb-95 | 11:41 | Blaine | 0.6 | |
| | 16-Mar-95 | 15:30 | PES | 0.07 | (1) |
| | 9-May-95 | 9:37 | Blaine | 1.7 | |
| | 20-Jun-95 | 10:20 | PES | 0 | (1) |
| | 20-Jun-95 | 15:01 | PES | 0 | (2) |
| | 3-Jul-95 | 19:40 | PES | 0.07 | |
| | 10-Aug-95 | 11:00 | Blaine | 0.7 | |
| | 20-Sep-95 | 14:20 | PES | 0.6 | (1) |
| | 13-Nov-95 | 9:37 | Blaine | 0.6 | |
| | 11-Jan-96 | 13:25 | PES | 1.0 | (1) |
| | 13-Feb-96 | 10:47 | Blaine | 0.4 | |
| | 11-Apr-96 | 10:35 | PES | 0.1 | (1) |
| | **9-May-96** | **10:55** | **Blaine** | **0.7** | |
| MW-5 | 10-Aug-94 | 10:32 | PES | 0.1-0.2 | |
| | 3-Nov-94 | 10:47 | Blaine | 0.4 | |
| | 29-Dec-94 | 9:18 | PES | 2.1 | (1) |
| | 9-Feb-95 | 12:48 | Blaine | 1.0 | |
| | 9-May-95 | 10:25 | Blaine | 1.8 | |
| | 20-Jun-95 | 10:05 | PES | 0 | (1) |
| | 20-Jun-95 | 14:43 | PES | 0.03 | (2) |
| | 28-Jun-95 | 20:10 | PES | 0.02 | |
| | 10-Aug-95 | 12:10 | Blaine | 0.8 | |
| | 20-Sep-95 | 14:55 | PES | 0.7 | (1) |
| | 13-Nov-95 | 10:28 | Blaine | 0.5 | |
| | 11-Jan-96 | 11:29 | PES | 1.5 | (1) |
| | 13-Feb-96 | NM | NM | NM | |
| | 11-Apr-96 | 10:50 | PES | 0.15 | (1) |
| | **9-May-96** | **NM** | **NM** | **NM** | |

Table 3. **Summary of Total Dissolved Oxygen Through May 1996**
Emery Bay Plaza
1650 65th Street, Emeryville, California

| Well Number | Date | Time of Day | Measured by | Total Dissolved Oxygen (mg/L) | Notes |
|---|---|---|---|---|---|
| **MW-6** | 10-Aug-94 | 10:03 | PES | <0.1 | |
| | 3-Nov-94 | 9:42 | Blaine | 0.4 | |
| | 29-Dec-94 | 9:03 | PES | 2.2 | (1) |
| | 9-Feb-95 | 11:18 | Blaine | 1.0 | |
| | 16-Mar-95 | 15:15 | PES | 0.1 | (1) |
| | 21-Mar-95 | 9:50 | PES | 0.1 | |
| | 9-May-95 | 9:17 | Blaine | 1.2 | |
| | 20-Jun-95 | 10:23 | PES | 0.01 | (1) |
| | 20-Jun-95 | 15:10 | PES | 0 | (2) |
| | 26-Jun-95 | 19:40 | PES | 0.20 | |
| | 28-Jun-95 | 19:33 | PES | 0.22 | |
| | 1-Jul-95 | 19:40 | PES | 0.81 | |
| | 3-Jul-95 | 19:10 | PES | 0.56 | |
| | 10-Aug-95 | 10:40 | Blaine | 1.2 | |
| | 20-Sep-95 | 14:30 | PES | 0.8 | (1) |
| | 23-Sep-95 | 13:30 | PES | 1.2 | |
| | 25-Sep-95 | 8:30 | PES | 0.9 | |
| | 28-Sep-95 | 10:10 | PES | 1.0 | |
| | 13-Nov-95 | 9:13 | Blaine | 0.8 | |
| | 11-Jan-96 | 10:12 | PES | 2.4 | (1) |
| | 14-Jan-96 | 17:40 | PES | 2.4 | |
| | 17-Jan-96 | 8:25 | PES | 2.2 | |
| | 19-Jan-96 | 9:40 | PES | 2.2 | |
| | 21-Jan-96 | 18:32 | PES | 2.0 | |
| | 25-Jan-96 | 20:28 | PES | 1.8 | |
| | 13-Feb-96 | NM | NM | NM | |
| | 11-Apr-96 | 10:25 | PES | 0.1 | (1) |
| | **9-May-96** | **NM** | **NM** | **NM** | |
| **MW-7** | 10-Aug-94 | 10:37 | PES | <0.1 | |
| | 3-Nov-94 | 10:25 | Blaine | 0.3 | |
| | 29-Dec-94 | 9:33 | PES | 2.2 | (1) |
| | 9-Feb-95 | 12:26 | Blaine | 0.8 | |
| | 16-Mar-95 | 16:00 | PES | 0.06 | (1) |
| | 9-May-95 | 10:08 | Blaine | 1.1 | |
| | 3-Jul-95 | 19:30 | PES | 0.19 | |
| | 10-Aug-95 | 11:47 | Blaine | 0.9 | |
| | 20-Sep-95 | 10:45 | PES | 1.0 | (1) |
| | 11-Jan-96 | 11:18 | PES | 1.4 | (1) |
| | 13-Nov-95 | 10:13 | Blaine | 0.6 | |
| | 13-Feb-96 | NM | NM | NM | |
| | **9-May-96** | **NM** | **NM** | **NM** | |

Table 3. Summary of Total Dissolved Oxygen Through May 1996
Emery Bay Plaza
1650 65th Street, Emeryville, California

| Well Number | Date | Time of Day | Measured by | Total Dissolved Oxygen (mg/L) | Notes |
|---|---|---|---|---|---|
| MW-8 | 10-Aug-94 | NM | PES | NM | |
| | 3-Nov-94 | 11:20 | Blaine | 0.3 | |
| | 29-Dec-94 | 9:40 | PES | 2.1 | (1) |
| | 29-Dec-94 | 17:10 | PES | >20 | (2) |
| | 9-Feb-95 | 13:40 | Blaine | 0.8 | |
| | 16-Mar-95 | 9:20 | PES | 0.5 | (1) |
| | 16-Mar-95 | 16:10 | PES | >20 | (2) |
| | 21-Mar-95 | 9:00 | PES | >20 | |
| | 23-Mar-95 | 9:05 | PES | 4.1 | |
| | 28-Mar-95 | 9:10 | PES | >20 | |
| | 6-Apr-95 | 10:45 | Blaine | >15 | |
| | 9-May-95 | 10:52 | Blaine | 6 | |
| | 20-Jun-95 | 10:00 | PES | 0.32 | (1) |
| | 20-Jun-95 | 14:33 | PES | >20 | (2) |
| | 26-Jun-95 | 20:15 | PES | >20 | |
| | 28-Jun-95 | 19:59 | PES | >20 | |
| | 1-Jul-95 | 20:05 | PES | >20 | |
| | 3-Jul-95 | 19:20 | PES | >20 | |
| | 10-Aug-95 | 12:32 | Blaine | 1.0 | |
| | 20-Sep-95 | 10:30 | PES | 1.0 | (1) |
| | 23-Sep-95 | 13:10 | PES | >15 | |
| | 25-Sep-95 | 8:01 | PES | >15 | |
| | 28-Sep-95 | 9:30 | PES | >15 | |
| | 13-Nov-95 | 10:49 | Blaine | 0.4 | |
| | 11-Jan-96 | 9:56 | PES | 5.0 | (1) |
| | 14-Jan-96 | 17:03 | PES | >15 | |
| | 17-Jan-96 | 7:43 | PES | >15 | |
| | 19-Jan-96 | 9:12 | PES | >15 | |
| | 21-Jan-96 | 17:58 | PES | >15 | |
| | 25-Jan-96 | 20:03 | PES | 4.0 | |
| | 13-Feb-96 | 11:17 | Blaine | >15 | |
| | 11-Apr-96 | 9:10 | PES | 6.2 | (1) |
| | 15-Apr-96 | 8:35 | PES | >15 | |
| | **9-May-96** | **12:51** | **Blaine** | **0.5** | |
| EW-1 | 10-Aug-94 | 10:57 | PES | <0.1 | |
| | 3-Nov-94 | 11:50 | Blaine | 0.3 | |
| | 29-Dec-94 | 9:52 | PES | 2 | (1) |
| | 29-Dec-94 | 17:00 | PES | >20 | (2) |
| | 9-Feb-95 | 14:11 | Blaine | 1.0 | |
| | 16-Mar-95 | 10:00 | PES | 0.1 | (1) |
| | 16-Mar-95 | 16:00 | PES | >20 | (2) |
| | 21-Mar-95 | 9:20 | PES | >20 | |
| | 23-Mar-95 | 9:30 | PES | >20 | |
| | 28-Mar-95 | 9:40 | PES | 0.2 | |

**Table 3. Summary of Total Dissolved Oxygen Through May 1996**
Emery Bay Plaza
1650 65th Street, Emeryville, California

| Well Number | Date | Time of Day | Measured by | Total Dissolved Oxygen (mg/L) | Notes |
|---|---|---|---|---|---|
| EW-1 | 6-Apr-95 | 11:05 | Blaine | 0.18 | |
| Cont. | 9-May-95 | 11:19 | Blaine | 1.6 | |
| | 20-Jun-95 | 10:30 | PES | 0.01 | (1) |
| | 20-Jun-95 | 15:17 | PES | >20 | (2) |
| | 26-Jun-95 | 20:00 | PES | >20 | |
| | 28-Jun-95 | 19:40 | PES | >20 | |
| | 1-Jul-95 | 19:50 | PES | 5.68 | |
| | 3-Jul-95 | 19:38 | PES | 0.26 | |
| | 10-Aug-95 | 12:50 | Blaine | 0.6 | |
| | 20-Sep-95 | 9:45 | PES | 1.1 | (1) |
| | 23-Sep-95 | 13:20 | PES | >15 | |
| | 25-Sep-95 | 8:15 | PES | >15 | |
| | 28-Sep-95 | 9:43 | PES | >15 | |
| | 13-Nov-95 | 11:26 | Blaine | 0.5 | |
| | 11-Jan-96 | 10:25 | PES | 1.8 | (1) |
| | 14-Jan-96 | 17:21 | PES | >15 | |
| | 17-Jan-96 | 8:10 | PES | 14.2 | |
| | 19-Jan-96 | 9:25 | PES | 8.2 | |
| | 21-Jan-96 | 18:18 | PES | 4.0 | |
| | 25-Jan-96 | 20:17 | PES | 2.0 | |
| | 13-Feb-96 | 12:04 | Blaine | 0.3 | |
| | 11-Apr-96 | 10:00 | PES | 0.2 | (1) |
| | 15-Apr-96 | 8:44 | PES | >15 | |
| | **9-May-96** | **11:41** | **Blaine** | **0.5** | |

**NOTES:**

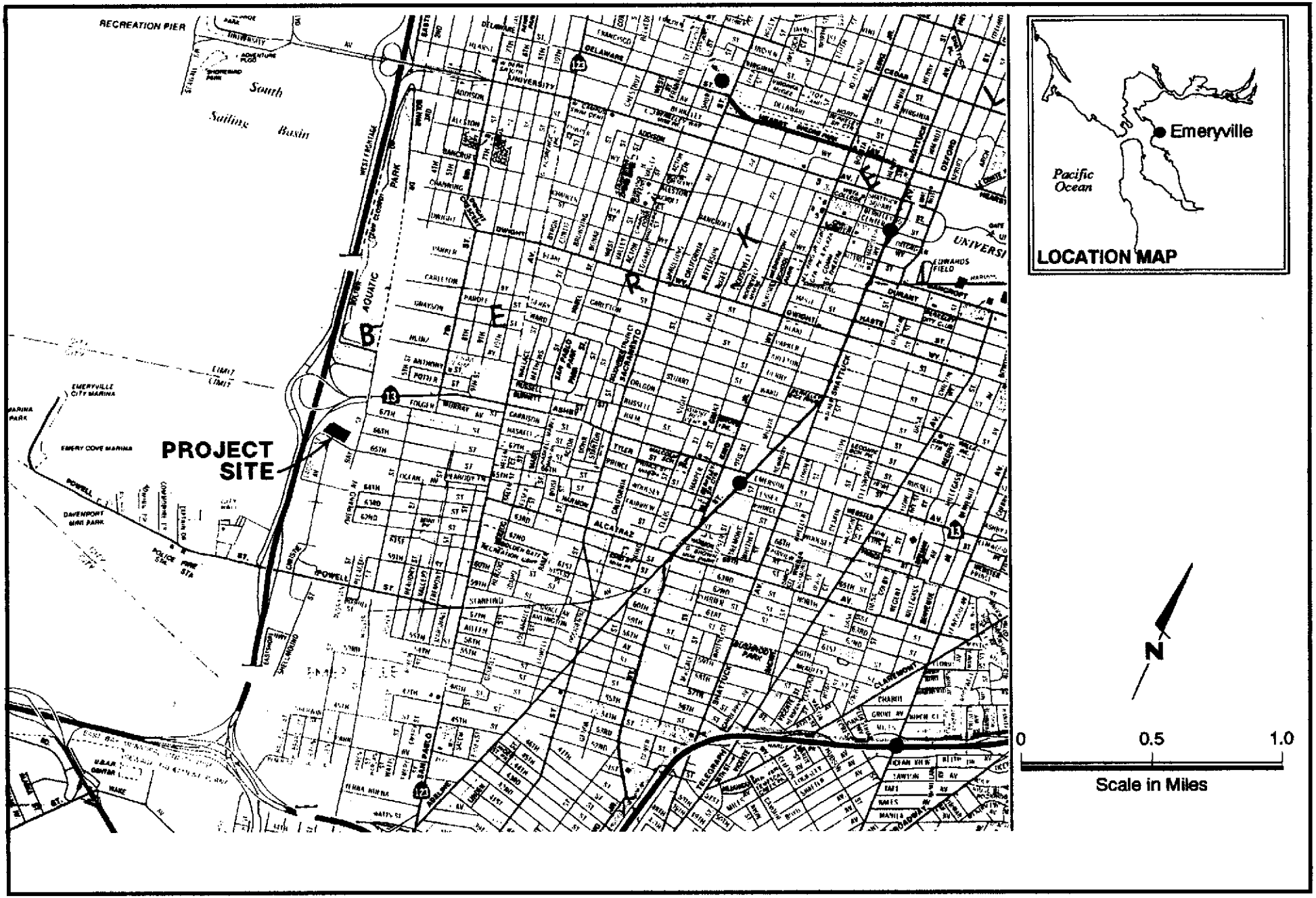
PES = PES Environmental, Inc.
Blaine = Blaine Technical Services
>20 = Above indicated equipment quantification maximum.
<0.1 = Below indicated equipment quantification minimum.
*YSI probe malfunctions
(1) = Measurement taken prior to nutrient introduction
(2) = Measurement taken after nutrient introduction

NM = Not measured.
mg/L = milligrams per liter

Table 4. Summary of Nutrient Introduction Through April 1996
Emery Bay Plaza
1650 65th Street, Emeryville, California

| Well Name | Date Introduced | Flow Rate (gpm) | Volume of Enriched Water Introduced (gallons) | Concentration of $H_2O_2$ (ppm) | Amount of $O_2$ Introduced (pounds) |
|---|---|---|---|---|---|
| EW-1 | 12/29/94 | 1.2 to 1.4 | 265 | 10,000 | 10.39 |
| | 3/16/95 | 3.9 to 4.1 | 249.5 | 10,000 | 9.78 |
| | 6/21/95 | 4.4 to 4.6 | 250 | 10,000 | 9.80 |
| | 9/20/95 | 4.1 to 4.3 | 250 | 10,000 | 9.80 |
| | 1/11/96 | 3.2 to 4.0 | 250 | 10,000 | 9.80 |
| | 4/11/96 | 3.5 to 3.8 | 250 | 10,000 | 9.80 |
| MW-2 | 12/29/94 | 2.8 to 4.3 | 201 | 10,000 | 7.88 |
| | 3/16/95 | 3.9 | 165.5 | 10,000 | 6.49 |
| | 6/21/95 | 1.3 to 4.6 | 158.4 | 10,000 | 6.21 |
| | 9/20/95 | 4.2 to 4.3 | 178.7 | 10,000 | 7.00 |
| | 1/11/96 | 4.1 to 4.5 | 226.6 | 10,000 | 8.88 |
| | 4/11/96 | 3.9 to 4.2 | 214 | 10,000 | 8.39 |
| MW-8 | 12/29/94 | 0.5 to 0.6 | 35 | 10,000 | 1.37 |
| | 3/16/95 | 0.21 to 0.67 | 80 | 10,000 | 3.14 |
| | 6/21/95 | 0.2 to 0.6 | 96 | 10,000 | 3.76 |
| | 9/20/95 | 0.3 to 1.7 | 81.3 | 10,000 | 3.19 |
| | 1/11/96 | 0.3 to 1.1 | 33.4 | 10,000 | 1.31 |
| | 4/11/96 | 0.2 to 0.5 | 36 | 10,000 | 1.41 |
| | | TOTAL | 3020.4 | TOTAL | 118.37 |

**Notes:**
gpm = gallons per minute
ppm = parts per million
Approximately 20 ppm of nitrogen as nitrate and 37 ppm of phosphate was present in solution.

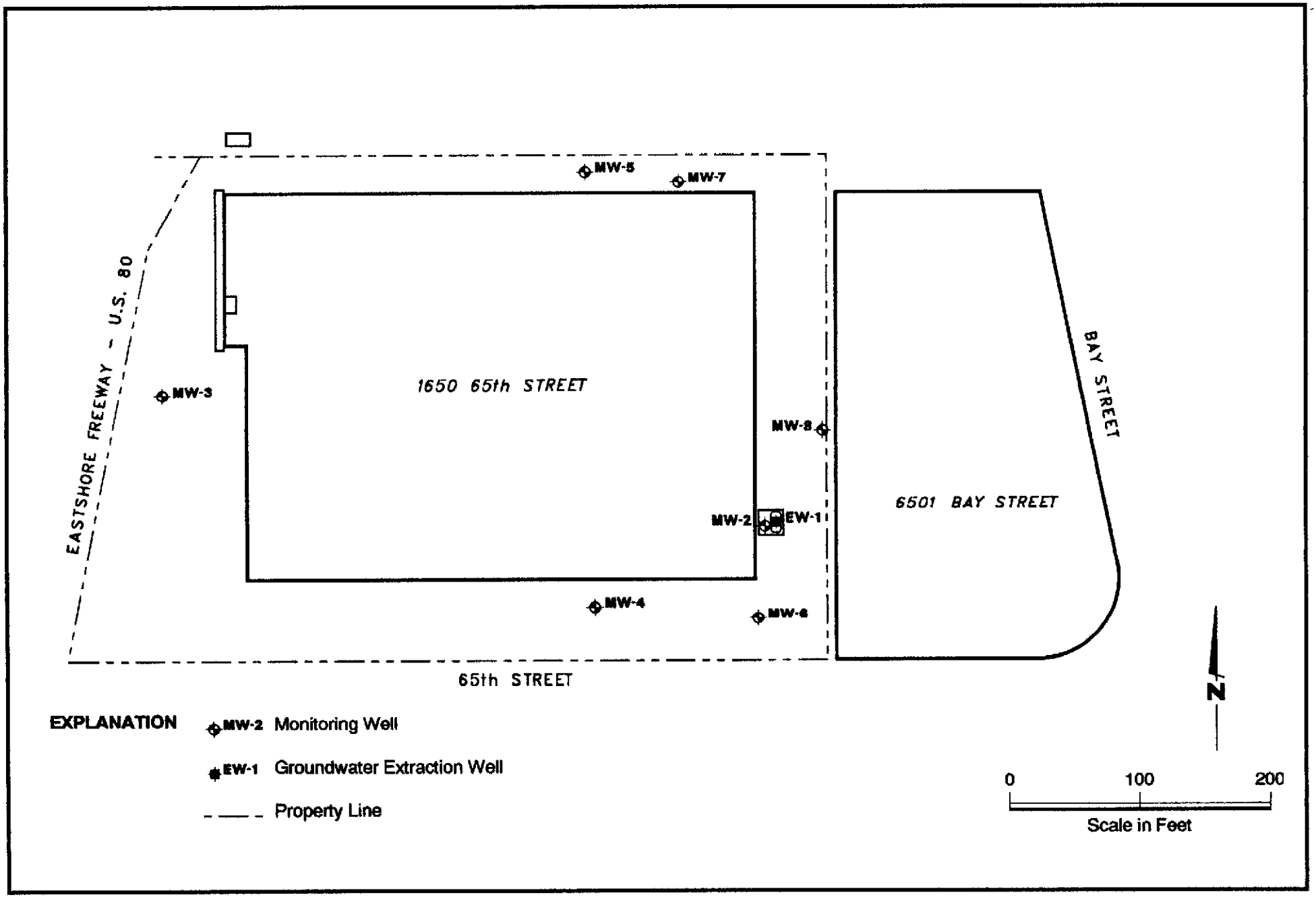



**PES Environmental, Inc.**
Engineering & Environmental Services

**Site Location Map**
1650 65th Street
Emeryville, California

PLATE
**1**

| 131.0100.003 | 131010V1.CDR | | 6/96 |
|---|---|---|---|
| JOB NUMBER | DRAWING NUMBER | REVIEWED BY | DATE |

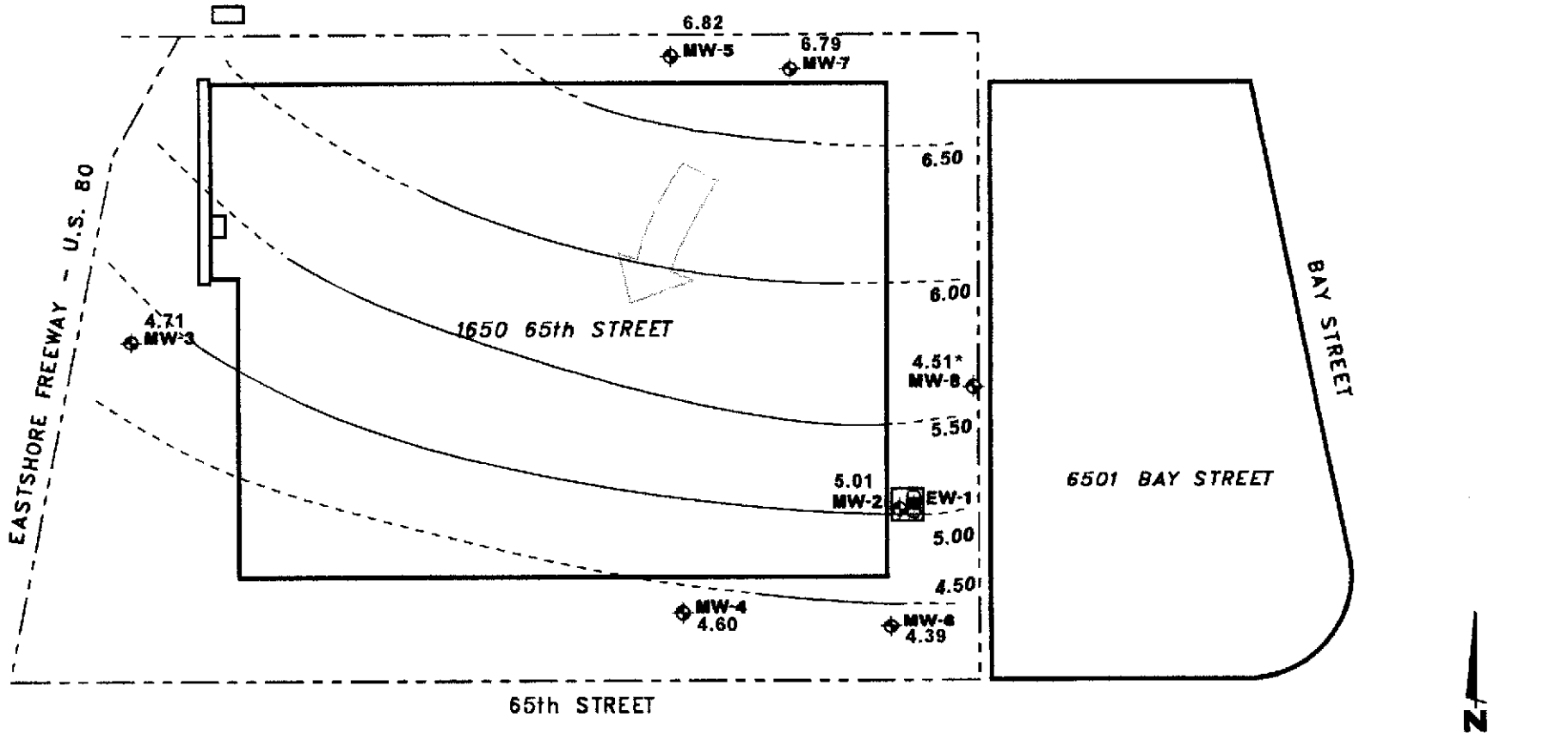



**PES Environmental, Inc.**
Engineering & Environmental Services

**Well Location Map**
1650 65th Street
Emeryville, California

PLATE
2

| 131.0100.003 | 131010S1.CDR | | 6/96 |
|---|---|---|---|
| JOB NUMBER | DRAWING NUMBER | REVIEWED BY | DATE |




**EXPLANATION**

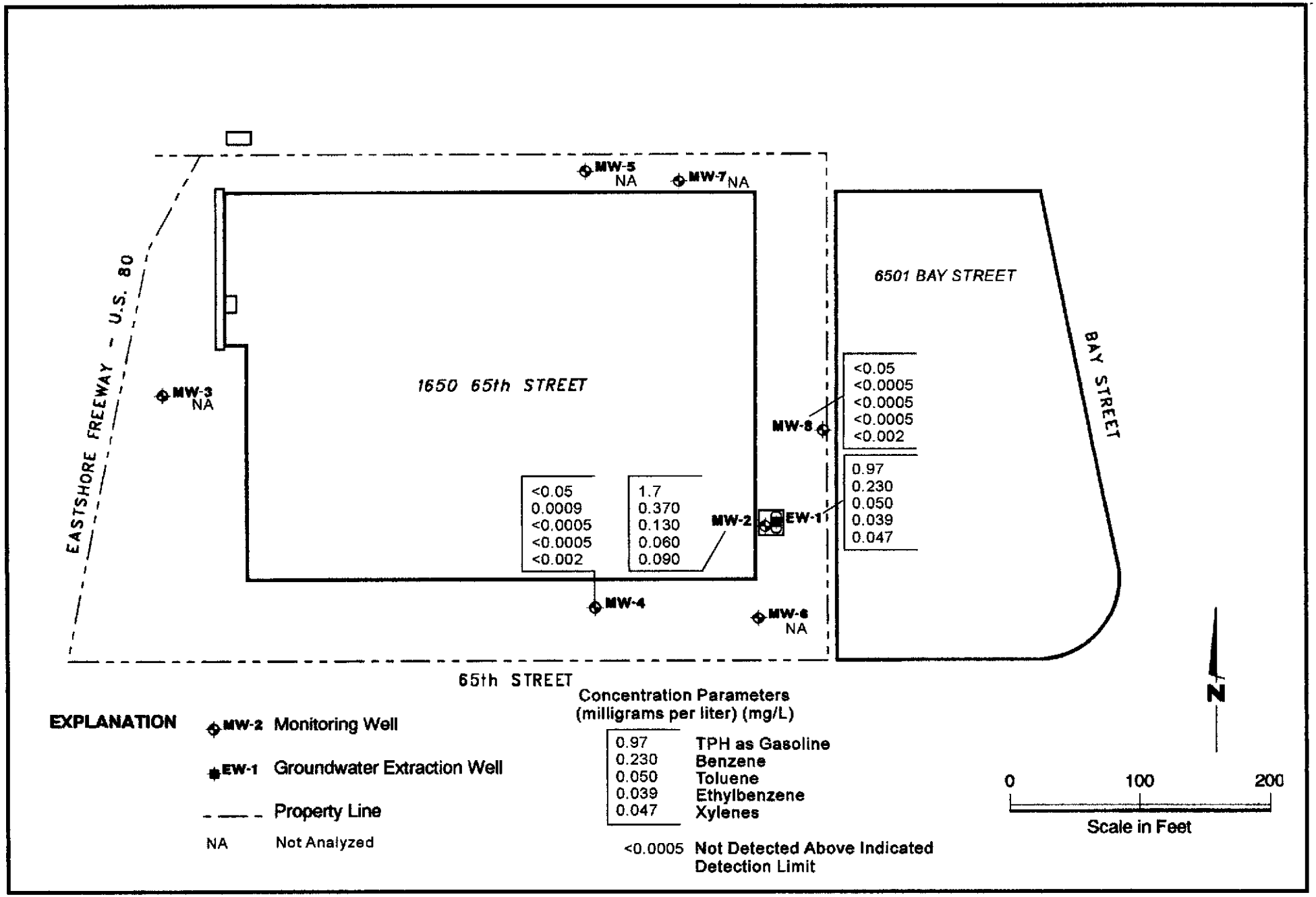
- MW-2 Monitoring Well
- EW-1 Groundwater Extraction Well
- Property Line
- * Well not used in determining contours
- Direction of Groundwater Gradient
- 5.01 Groundwater Elevation on May 9, 1996
- 5.0 Groundwater Elevation Contour (dashed where uncertain)

**PES Environmental, Inc.**
Engineering & Environmental Services

**Groundwater Elevation Contours on May 9, 1996**
1650 65th Street
Emeryville, California

PLATE 3

| 131.0100.003 | 131010S2.CDR | | 6/96 |
|---|---|---|---|
| JOB NUMBER | DRAWING NUMBER | REVIEWED BY | DATE |




**PES Environmental, Inc.**
Engineering & Environmental Services

**Dissolved Hydrocarbons in Groundwater on May 9, 1996**
1650 65th Street
Emeryville, California

PLATE
**4**

| 131.0100.003 | 131010S3.CDR | | 6/96 |
|---|---|---|---|
| JOB NUMBER | DRAWING NUMBER | REVIEWED BY | DATE |

BLAINE
TECH SERVICES INC.

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

May 22, 1996

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

ATTN: Jenny Han

RECEIVED MAY 24 1996

Site:
Emery Bay Plaza
1650 65th Street
Emeryville, California

Date:
May 9, 1996

## GROUNDWATER SAMPLING REPORT 960509-T-1

Blaine Tech Services, Inc. performs 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 the depth to water. Water surfaces were further inspected for the presence of immiscibles. A series of electrical conductivity, pH, and temperature readings were obtained during well evacuation and at the time of sample collection.

## Evacuation and Sampling Equipment

As shown in the TABLE OF MONITORING DATA, the wells at this site were evacuated according to a protocol requirement for the three case volumes. The wells were evacuated using bailers and electric submersible pumps.

Samples were collected using bailers.

**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 and 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 operations 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

## 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.

## Effluent Materials

The evacuation process creates a volume of effluent water which must be contained. Blaine Tech Services, Inc. will place this water in appropriate containers of the client's choice or bring new 55 gallon 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. If that sample does not establish whether or not the effluent water is contaminated, or if effluent from more than one source has been combined in the same container, it may be necessary to conduct additional analyses on the effluent material.

## Sampling Methodology

Samples were obtained by standardized sampling procedures that follow an evacuation and sample collection protocol. The sampling methodology conforms to both 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 T.E.G.D. which is published separately.

## Sample Containers

Sample containers are supplied by the laboratory performing the analyses.

## Sample Handling Procedures

Following collection, samples are promptly placed in an ice chest containing deionized ice or 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 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.

Please call if we can be of any further assistance.

Richard C. Blaine

RCB/mc

attachments: table of well monitoring data
chain of custody

# TABLE OF WELL MONITORING DATA

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Well I.D. | EW-1 | | | MW-2 | | | MW-3 | MW-4 | | |
| Date Sampled | 05/09/96 | | | 05/09/96 | | | 05/09/96 | 05/09/96 | | |
| Well Diameter (in.) | 4 | | | 2 | | | 4 | 4 | | |
| Total Well Depth (ft.) | 28.00 | | | 24.48 | | | 18.30 | 15.83 | | |
| Depth To Water (ft.) | 10.60 | | | 10.78 | | | 7.72 | 7.64 | | |
| Free Product (in.) | NONE | | | NONE | | | -- | NONE | | |
| Reason If Not Sampled | -- | | | -- | | | GAUGE ONLY | -- | | |
| 1 Case Volume (gal.) | 11.3 | | | 2.2 | | | | 5.3 | | |
| Did Well Dewater? | NO | | | NO | | | | NO | | |
| Gallons Actually Evacuated | 34.0 | | | 7.0 | | | | 16.0 | | |
| Purging Device | ELECTRIC SUBMERSIBLE | | | BAILER | | | | ELECTRIC SUBMERSIBLE | | |
| Sampling Device | BAILER | | | BAILER | | | | BAILER | | |
| Time | 11:41 | 11:43 | 11:45 | 11:22 | 11:25 | 11:28 | | 10:55 | 10:56 | 10:57 |
| Temperature (Fahrenheit) | 65.4 | 66 | 65.4 | 70.8 | 69.9 | 69.8 | | 70.8 | 69.8 | 71.7 |
| pH | 7.6 | 6.7 | 6.6 | 7.5 | 7.4 | 7.3 | | 7.8 | 8.2 | 8.3 |
| Conductivity (micromhos/cm) | 3000 | 2200 | 2200 | 6500 | 6400 | 6500 | | 9200 | 10000 | 10000 |
| Nephelometric Turbidity Units | 27.1 | 28.0 | 20.7 | >200 | >200 | >200 | | >200 | >200 | >200 |
| Dissolved Oxygen (mg/L) | 0.5 | | | 0.6 | | | | 0.7 | | |
| BTS Chain of Custody | 960509-T-1 | | | 960509-T-1 | | | | 960509-T-1 | | |
| BTS Sample I.D. | EW-1 | | | MW-2 | | | | MW-4 | | |
| DOHS HMTL Laboratory | AEN | | | AEN | | | | AEN | | |
| Analysis | TPH-GAS, BTEX | | | TPH-GAS, BTEX | | | | TPH-GAS, BTEX | | |

# TABLE OF WELL MONITORING DATA

| | | | | |
|---|---|---|---|---|
| Well I.D. | MW-5 | MW-6 | MW-7 | MW-8 |
| Date Sampled | 05/09/96 | 05/09/96 | 05/09/96 | 05/09/96 |
| Well Diameter (in.) | 4 | 4 | 4 | 2 |
| Total Well Depth (ft.) | 17.95 | 18.76 | 18.71 | 24.41 |
| Depth To Water (ft.) | 6.00 | 7.64 | 6.11 | 10.50 |
| Free Product (in.) | -- | -- | -- | NONE |
| Reason If Not Sampled | GAUGE ONLY | GAUGE ONLY | GAUGE ONLY | -- |
| 1 Case Volume (gal.) | | | | 2.2 |
| Did Well Dewater? | | | | NO |
| Gallons Actually Evacuated | | | | 6.75 |
| Purging Device | | | | BAILER |
| Sampling Device | | | | BAILER |
| Time | | | | 12:51 12:54 12:58 |
| Temperature (Fahrenheit) | | | | 68.1 67.2 67.7 |
| pH | | | | 7.3 7.4 7.3 |
| Conductivity (micromhos/cm) | | | | >15000 >15000 >15000 |
| Nephelometric Turbidity Units | | | | >200 >200 >200 |
| Dissolved Oxygen (mg/L) | | | | 0.5 |
| BTS Chain of Custody | | | | 960509-T-1 |
| BTS Sample I.D. | | | | MW-8 |
| DOHS HMTL Laboratory | | | | AEN |
| Analysis | | | | TPH-GAS, BTEX |

**BLAINE TECH SERVICES INC.**

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

CHAIN OF CUSTODY 960509--77

CLIENT PES

SITE EMERY BAY PLAZA
1650 65th Street
Emeryville

LAB AEN

DHS #

ALL ANALYSES MUST MEET SPECIFICATIONS AND DETECTION LIMITS SET BY CALIFORNIA DHS AND

☐ EPA ☐ RWQCB REGION ____
☐ LIA
☐ OTHER

SPECIAL INSTRUCTIONS Invoice & Report to PES.
Attn: Jenny Han
PES Proj # 131.0100.003

| SAMPLE I.D. | | | MATRIX S = SOIL W = H2O | CONTAINERS TOTAL | C = COMPOSITE ALL CONTAINERS | CONDUCT ANALYSIS TO DETECT: TPH-GAS 8015 | BTEX 8020 | | | | | | | ADD'L INFORMATION | STATUS | CONDITION | LAB SAMPLE # |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EW1 | 5/9 | 11:50 | W | 3 | | X | X | | | | | | | | | | |
| MW2 | 5/9 | 11:35 | W | 3 | | X | X | | | | | | | | | | |
| MW4 | 5/9 | 1105 | W | 3 | | X | X | | | | | | | | | | |
| MW8 | 5/9 | 13:05 | W | 3 | | X | X | | | | | | | | | | |

SAMPLING COMPLETED DATE 5/9 TIME 13:05

SAMPLING PERFORMED BY M.K. Toll

RESULTS NEEDED NO LATER THAN AS Contracted

| RELEASED BY | DATE | TIME | RECEIVED BY | DATE | TIME |
|---|---|---|---|---|---|
| M. Kolodall | 5-10-96 | 3:45 | | 5-10-96 | 3:45 |
| RELEASED BY | DATE | TIME | RECEIVED BY | DATE | TIME |
| RELEASED BY | DATE | TIME | RECEIVED BY | DATE | TIME |

| SHIPPED VIA | DATE SENT | TIME SENT | COOLER # |
|---|---|---|---|
| | | | |

# American Environmental Network

## Certificate of Analysis

DOHS Certification: 1172 AIHA Accreditation: 11134



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

ATTN: JENNY HAN
CLIENT PROJ. ID: 131.0100.003

C.O.C. NUMBER: 960509-T1

REPORT DATE: 05/23/96

DATE(S) SAMPLED: 05/09/96

DATE RECEIVED: 05/10/96

**AEN WORK ORDER: 9605163**

PROJECT SUMMARY:

On May 10, 1996, this laboratory received 4 water sample(s).

Client requested sample(s) be analyzed for chemical 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: EW1
AEN LAB NO: 9605163-01
AEN WORK ORDER: 9605163
CLIENT PROJ. ID: 131.0100.003

DATE SAMPLED: 05/09/96
DATE RECEIVED: 05/10/96
REPORT DATE: 05/23/96

| ANALYTE | METHOD/ CAS# | RESULT | REPORTING LIMIT | UNITS | DATE ANALYZED |
|---|---|---|---|---|---|
| **BTEX & Gasoline HCs** | **EPA 8020** | | | | |
| Benzene | 71-43-2 | 230 * | 0.5 | ug/L | 05/17/96 |
| Toluene | 108-88-3 | 50 * | 0.5 | ug/L | 05/17/96 |
| Ethylbenzene | 100-41-4 | 39 * | 0.5 | ug/L | 05/17/96 |
| Xylenes, Total | 1330-20-7 | 47 * | 2 | ug/L | 05/17/96 |
| Purgeable HCs as Gasoline | 5030/GCFID | 0.97 * | 0.05 | mg/L | 05/17/96 |

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

PES ENVIRONMENTAL, INC.

SAMPLE ID: MW2
AEN LAB NO: 9605163-02
AEN WORK ORDER: 9605163
CLIENT PROJ. ID: 131.0100.003

DATE SAMPLED: 05/09/96
DATE RECEIVED: 05/10/96
REPORT DATE: 05/23/96

| ANALYTE | METHOD/ CAS# | RESULT | REPORTING LIMIT | UNITS | DATE ANALYZED |
|---|---|---|---|---|---|
| **BTEX & Gasoline HCs** | **EPA 8020** | | | | |
| Benzene | 71-43-2 | 370 * | 0.5 | ug/L | 05/17/96 |
| Toluene | 108-88-3 | 130 * | 0.5 | ug/L | 05/17/96 |
| Ethylbenzene | 100-41-4 | 60 * | 0.5 | ug/L | 05/17/96 |
| Xylenes, Total | 1330-20-7 | 90 * | 2 | ug/L | 05/17/96 |
| Purgeable HCs as Gasoline | 5030/GCFID | 1.7 * | 0.05 | mg/L | 05/17/96 |

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

PES ENVIRONMENTAL, INC.

SAMPLE ID: MW4
AEN LAB NO: 9605163-03
AEN WORK ORDER: 9605163
CLIENT PROJ. ID: 131.0100.003

DATE SAMPLED: 05/09/96
DATE RECEIVED: 05/10/96
REPORT DATE: 05/23/96

| ANALYTE | METHOD/ CAS# | RESULT | REPORTING LIMIT | UNITS | DATE ANALYZED |
|---|---|---|---|---|---|
| **BTEX & Gasoline HCs** | **EPA 8020** | | | | |
| Benzene | 71-43-2 | 0.9 * | 0.5 | ug/L | 05/17/96 |
| Toluene | 108-88-3 | ND | 0.5 | ug/L | 05/17/96 |
| Ethylbenzene | 100-41-4 | ND | 0.5 | ug/L | 05/17/96 |
| Xylenes, Total | 1330-20-7 | ND | 2 | ug/L | 05/17/96 |
| Purgeable HCs as Gasoline | 5030/GCFID | ND | 0.05 | mg/L | 05/17/96 |

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

PES ENVIRONMENTAL, INC.

SAMPLE ID: MW8
AEN LAB NO: 9605163-04
AEN WORK ORDER: 9605163
CLIENT PROJ. ID: 131.0100.003

DATE SAMPLED: 05/09/96
DATE RECEIVED: 05/10/96
REPORT DATE: 05/23/96

| ANALYTE | METHOD/ CAS# | RESULT | REPORTING LIMIT | UNITS | DATE ANALYZED |
|---|---|---|---|---|---|
| **BTEX & Gasoline HCs** | **EPA 8020** | | | | |
| Benzene | 71-43-2 | ND | 0.5 | ug/L | 05/17/96 |
| Toluene | 108-88-3 | ND | 0.5 | ug/L | 05/17/96 |
| Ethylbenzene | 100-41-4 | ND | 0.5 | ug/L | 05/17/96 |
| Xylenes, Total | 1330-20-7 | ND | 2 | ug/L | 05/17/96 |
| Purgeable HCs as Gasoline | 5030/GCFID | ND | 0.05 | mg/L | 05/17/96 |

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

# AEN (CALIFORNIA)
# QUALITY CONTROL REPORT

AEN JOB NUMBER: 9605163

CLIENT PROJECT ID: 131.0100.003

## 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 8020, 5030 GCFID

AEN JOB NO: 9605163
INSTRUMENT: H
MATRIX: WATER

Surrogate Standard Recovery Summary

| Date Analyzed | Client Id. | Lab Id. | Percent Recovery Fluorobenzene |
|---|---|---|---|
| 05/17/96 | EW1 | 01 | 117 |
| 05/17/96 | MW2 | 02 | 104 |
| 05/17/96 | MW4 | 03 | 100 |
| 05/17/96 | MW8 | 04 | 101 |
| QC Limits: | | | 70-130 |

DATE ANALYZED: 05/16/96
SAMPLE SPIKED: 9605159-05
INSTRUMENT: H

Matrix Spike Recovery Summary

| Analyte | Spike Added (ug/L) | Average Percent Recovery | RPD | QC Limits Percent Recovery | QC Limits RPD |
|---|---|---|---|---|---|
| Benzene | 22.2 | 100 | <1 | 85-109 | 17 |
| Toluene | 73.9 | 92 | <1 | 87-111 | 16 |
| Hydrocarbons as Gasoloine | 500 | 113 | 3 | 66-117 | 19 |

Daily method blanks for all associated analytical runs showed no contamination at or above the reporting limit.

***END OF REPORT***

**BLAINE TECH SERVICES INC.**

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

CHAIN OF CUSTODY 960509-T1

CLIENT PES

SITE Emery Bay Plaza
1650 65th Street
Emeryville

CONDUCT ANALYSIS TO DETECT

LAB AEN 960509

DHS #

ALL ANALYSES MUST MEET SPECIFICATIONS AND DETECTION LIMITS SET BY CALIFORNIA DHS AND

- ☐ EPA
- ☐ LIA
- ☐ OTHER
- ☐ RWQCB REGION _____

SPECIAL INSTRUCTIONS Invoice & Report to PES
ATTN: Jenny Han
PES Proj # 131.0100.003

| SAMPLE I.D. | | | MATRIX S = SOIL W = H2O | CONTAINERS TOTAL | | C = COMPOSITE ALL CONTAINERS | TPH-Gas 8015 | BTEX 8020 | ADD'L INFORMATION | STATUS | CONDITION | LAB SAMPLE # |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EW1 | 5/9 | 11:50 | W | 3 | 01A-C | | X | X | | | | |
| MW2 | 5/9 | 11:35 | W | 3 | 02A-C | | X | X | | | | |
| MW4 | 5/9 | 11:05 | W | 3 | 03A-C | | X | X | | | | |
| MW8 | 5/9 | 13:05 | W | 3 | 04A-C | | X | X | | | | |

| SAMPLING COMPLETED | DATE | TIME |
|---|---|---|
| | 5/9 | 13:05 |

SAMPLING PERFORMED BY M. A. Toll

RESULTS NEEDED NO LATER THAN AS Contracted

| RELEASED BY | DATE | TIME | RECEIVED BY | DATE | TIME |
|---|---|---|---|---|---|
| M. A. Toll | 5-10-96 | 345 | [signature] | 5-10-96 | 345 |
| [signature] | 5-10-96 | 1210 | [signature] | 5/10/96 | 1710 |
| RELEASED BY | DATE | TIME | RECEIVED BY | DATE | TIME |

| SHIPPED VIA | DATE SENT | TIME SENT | COOLER # | |
|---|---|---|---|---|
| | | | | |