PES Environmental, Inc.
Engineering & Environmental Services

September 7, 1993

93 SEP 10 AM 10: 39

131.0200.001

Alameda County Department of Environmental Health
Hazardous Materials Division
80 Swan Way, Room 200
Oakland, California 94621

Attention: Mr. Brian Oliva

TRANSMITTAL LETTER
QUARTERLY GROUNDWATER MONITORING REPORT
EMERY BAY MARKETPLACE
EMERYVILLE, CALIFORNIA

Dear Mr. Oliva:

Transmitted herewith is the July 1993 Quarterly Groundwater Monitoring Report for the Emery Bay Marketplace Site, located in Emeryville, California. PES Environmental, Inc. has recently been retained by Christie Avenue Partners to conduct quarterly groundwater monitoring activities at this site.

We trust this is the information you require at this time. Please contact either of the undersigned if you have any questions or comments.

Very truly yours,

PES ENVIRONMENTAL, INC.

Mary E. Williams
Senior Staff Environmental Scientist

Robert S. Creps, P.E.
Associate Engineer

cc: Ms. Lynn Tolin

Enclosure

1310200T.002

23

PES Environmental, Inc.
Engineering & Environmental Services

August 31, 1993

131.0200.001

Ms. Lynn Tolin
Christie Avenue Partners - J.S.
5800 Shellmound, Suite 210
Emeryville, California 94608

QUARTERLY GROUNDWATER MONITORING REPORT
JULY 1993 SAMPLING EVENT
EMERY BAY MARKETPLACE
EMERYVILLE, CALIFORNIA

Dear Ms. Tolin:

This letter report presents data collected by PES Environmental, Inc. (PES) during the July 22, 1993 quarterly groundwater monitoring conducted at Emery Bay Marketplace site, located in Emeryville, California (Plate 1). PES has been retained by Christie Avenue Partners - J.S. to perform ongoing quarterly groundwater monitoring at the subject site. The current groundwater monitoring program consists of measuring product thickness, if any, and depth to groundwater in seventeen onsite and off-site monitoring wells on a quarterly basis, and purging and sampling six of the monitoring wells (Wells W-7, W-13, W-14, W-19, W-20 and W-24). Plate 2 shows the location of monitoring wells at the site.

The purpose of the groundwater monitoring program at this site is to: (1) evaluate the presence of hydrocarbons in groundwater; (2) monitor potential migration of dissolved-phase hydrocarbons; and (3) monitor seasonal water level variations at the subject property. The monitoring is performed in accordance with Alameda County Department of Environmental Health (ACDEH) requirements and the approved workplan for this site entitled *Work Plan for Groundwater Monitoring and Free Product Removal at the Emery Bay Marketplace, Emeryville, California*, dated July 6, 1990.

BACKGROUND

Numerous environmental investigations have been performed at the subject site since redevelopment began in the early 1980's. Among them are the following:

- An environmental assessment of the Marketplace site conducted by Woodward Clyde Consultants (WCC) in 1981-82 included soil boring activities and the installation of four monitoring wells (Wells W-4, W-5, W-10, and W-12). Wells W-10 and W-12 are now abandoned.

- A 1987 subsurface investigation of the Marketplace site performed by WCC during which the presence of free-phase product was found on the groundwater in Well W-5.

- An environmental assessment of the northern area of the site (referred to as the Nielson property) was conducted by WCC in 1987. Activities performed during this assessment included excavating underground fuel storage tanks (USTs) and hydrocarbon-contaminated soils, and installing eight monitoring wells (Wells W-1 through W-4, W-5A, W-6A, W-7 and W-8). Wells W-2, W-3, W-4, W-5A and W-6A are now abandoned.

- Two separate 1988 investigations at the Marketplace site performed by Earth Metrics and Aqua Terra Technologies found an asphalt-like or tar-like substance floating on groundwater at the site.

- In 1989, McLaren Hart conducted a hydrogeologic investigation and a free product subsurface investigation at the Marketplace and Nielson sites which included the installation of six monitoring wells (Wells W-13 through W-18). Results from these investigations revealed the presence of floating product in several wells. The source of fuel oil found in onsite soils and groundwater was attributed to leaking USTs and/or piping associated with an asphalt refinery formerly located at the Nielson site.

- Activities performed by McLaren Hart during April and June 1990 included the installation of six additional monitoring wells (Wells W-19 through W-24).

In July 1990, McLaren Hart began quarterly groundwater monitoring activities at the subject site. PES began quarterly groundwater monitoring in July 1993.

GROUNDWATER ELEVATIONS

Water-level Measurement Procedures

Prior to sampling on July 22, 1993, groundwater levels in fifteen monitoring wells were measured to a precision of 0.01 foot using an electronic water-level indicator/interface probe. 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. The presence of free-phase product was evaluated and, if present, was measured to a precision of 0.01 foot using the interface probe.

Results

Two of the 17 wells scheduled for water level measurements were inaccessible during quarterly monitoring activities and therefore measurements were not obtained for these wells; W-16 was buried beneath a soil pile from a nearby construction project and W-17 was covered by a parked car. Water levels for the remaining 15 wells 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 and product levels for wells at the site is presented in Table 1. Appendix A contains a report summarizing the water level measurements.

Water levels have fluctuated since the April 29, 1993 sampling event. Water levels in Wells W-19, W-20, and W-21 have increased slightly, while water levels in all others have decreased. Based on measured water levels on July 22, 1993, groundwater at the site flows in a southerly to southwesterly direction, with an approximate gradient of 0.005 to 0.02 feet. These measurements show no significant changes from historical groundwater flow direction and gradient. Also consistent with historical data, free-phase product floating on groundwater was found to be present in Well W-5 (2.18 feet thick). A very thin layer was also found in Well W-19 at 0.01 feet thick.

GROUNDWATER SAMPLING AND ANALYTICAL TESTING

Sampling Protocol

Groundwater samples were collected on July 22, 1993 by Blaine Tech Services, Inc. (Blaine Tech) from Wells W-7, W-13, W-14, W-19, W-20, and W-24. A minimum of three well volumes were purged prior to sampling using a clean teflon bailer. Purge water was contained and collected in 55-gallon drums to be stored onsite prior to obtaining analytical results and subsequent disposal. During purging activities, 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, and stored in a chilled, thermally insulated cooler for transport to the analytical laboratory for chemical analysis. The information collected during the groundwater sampling and the chain of custody records is included in a groundwater sampling report prepared by Blaine Tech and presented in Appendix A.

Analytical Program

All groundwater samples collected during this quarterly monitoring event were analyzed by Coast-to-Coast Analytical Services, Inc. (Coast to Coast) in Benicia, California, a State-certified laboratory. Samples were analyzed for total petroleum hydrocarbons quantified as diesel (TPH-diesel) and as motor oil (TPH-oil) by EPA Test Method 8015 (modified).

Analytical Results

All six of the sampled wells were found to contain detectable concentrations of TPH-oil. Detectable concentrations of TPH-diesel were found only in Well W-7 (at 1.5 milligrams per liter [mg/ℓ]). Consistent with historical sampling results, Well W-19 contained the highest levels of TPH-Oil (20 mg/ℓ) and Well W-7 exhibited the next-highest level of TPH-Oil (3.2 mg/ℓ) and the only detectable concentration of TPH-diesel.

Analytical results, including historical monitoring data for the previous sampling events are presented in Table 2. The laboratory report and chain of custody records are provided in Appendix B. The distribution of hydrocarbons in groundwater at the site on July 22, 1993 is graphically presented on Plate 4.

SUMMARY

Groundwater elevations have fluctuated slightly since the previous April 29, 1993 sampling event. Generally consistent with historical data, the groundwater flow direction is toward the south to southwest. Concentrations of TPH-oil have not changed significantly in the six wells sampled during this monitoring event. Concentrations of TPH-diesel found in groundwater samples are similar to that found during the previous monitoring event. Free product was found on the groundwater in Wells W-5 and W-19.

We trust this information meets your needs at this time. If you have any questions or comments, please call either of the undersigned.

Yours very truly,

PES ENVIRONMENTAL, INC.

Mary E. Williams
Senior Staff Environmental Scientist

Robert S. Creps, P. E.
Associate Engineer

REGISTERED PROFESSIONAL ENGINEER
ROBERT S. CREPS
No. 45153
EXP. 10/30/94
CIVIL
STATE OF CALIFORNIA

Attachments:

Table 1	Summary of Groundwater Elevations
Table 2	Summary of Petroleum Hydrocarbon Analytical Results for Groundwater Samples
Plate 1	Site Location Map
Plate 2	Well Location Map
Plate 3	Groundwater Elevation Contours on July 22, 1993
Plate 4	Dissolved Hydrocarbons in Groundwater on July 22, 1993
Appendix A	Water Level and Groundwater Sampling Reports
Appendix B	Analytical Laboratory Reports

cc: Brian Oliva, Alameda County Department of Environmental Health/Hazardous Materials Division

Table 1. Summary of Groundwater Elevations Through July 1993

Emery Bay Marketplace
Emeryville, California

Well Number	Date	Measured by	Top of Casing (feet MSL)	Depth to Water (feet)	Potentiometric Surface Elevations (feet MSL)	Product Thickness (feet)
W-1	7-Aug-81	WCC	11.47	4.30	6.20 (2)	
	10-Sep-81	WCC		4.40	6.10 (2)	
	6-May-87	WCC		6.00	6.08 (2)	
	20-Aug-89	MH		5.60	5.87	
	11-Oct-89	MH		5.63	5.84	
	22-Feb-90	MH		4.92	6.55	
	28-Feb-90	MH		5.02	6.45	
	9-Apr-90	MH		5.44	6.03	
	7-Jun-90	MH		5.37	6.10	
	25-Jul-90	MH		5.26	6.21	
	3-Oct-90	MH		5.43	6.04	
	3-Jan-91	MH		5.69	5.78	
	3-Apr-91	MH		4.74	6.73	
	25-Oct-91	MH		5.22	6.25	
	15-Jan-92	MH		4.88	6.59	
	23-Apr-92	MH		4.98	6.49	
	21-Jul-92	MH		5.16	6.31	
	22-Oct-92	MH		5.79	5.68	
	26-Jan-93	MH		4.82	6.65	
	29-Apr-93	MH		6.01	5.46	
	22-Jul-93	**PES**		**6.05**	**5.42**	
W-4	7-Aug-81	WCC	9.96	4.30	6.20 (2)	
	10-Sep-81	WCC		4.40	6.10 (2)	
	18-Jan-82	WCC		2.50	8.00 (2)	
	27-Mar-85	WCC		NA	8.65	
	20-Aug-89	MH		3.95	6.01	
	11-Oct-89	MH		3.87	6.09	
	22-Feb-90	MH		2.00	7.96	
	28-Feb-90	MH		2.39	7.57	
	9-Apr-90	MH		3.17	6.79	
	7-Jun-90	MH		2.73	7.23	
	25-Jul-90	MH		3.71	6.25	
	3-Oct-90	MH		4.18	5.78	
	3-Jan-91	MH		3.64	6.32	
	3-Apr-91	MH		1.45	8.51	
	25-Oct-91	MH		4.29	5.67	
	15-Jan-92	MH		2.56	7.40	
	23-Apr-92	MH		2.80	7.16	
	21-Jul-92	MH		4.03	5.93	
	22-Oct-92	MH		4.50	5.46	
	26-Jan-93	MH		1.52	8.44	

Table 1. Summary of Groundwater Elevations Through July 1993

Emery Bay Marketplace
Emeryville, California

Well Number	Date	Measured by	Top of Casing (feet MSL)	Depth to Water (feet)	Potentiometric Surface Elevations (feet MSL)	Product Thickness (feet)
W-4	29-Apr-93	MH		3.02	6.94	
	22-Jul-93	**PES**		**3.86**	**6.10**	
W-5	7-Aug-81	WCC	11.41	4.70	7.50 (2)	NA
	10-Sep-81	WCC		4.90	7.30 (2)	NA
	18-Jan-82	WCC		2.50	9.60 (2)	NA
	27-Mar-85	WCC		NA	9.28	NA
	11-Oct-89	MH		4.43	7.58	0.71
	22-Feb-90	MH		3.80	8.36	0.88
	28-Feb-90	MH		4.43	8.38	1.65
	9-Apr-90	MH		4.73	8.23	1.82
	7-Jun-90	MH		4.30	8.64	1.80
	25-Jul-90	MH		5.10	8.11	2.12
	3-Oct-90	MH		4.90	7.45	1.11
	3-Jan-91	MH		4.77	7.36	0.85
	3-Apr-91	MH		2.42	9.02	0.03
	25-Oct-91	MH		5.47	6.94	1.18
	15-Jan-92	MH		3.21	8.88	0.80
	23-Apr-92	MH		3.13	8.28	1.41
	21-Jul-92	MH		3.55	9.14	1.50
	22-Oct-92	MH		4.28	8.36	1.45
	26-Jan-93	MH		3.28	9.18	1.24
	29-Apr-93	MH		2.60	8.81	NP
	22-Jul-93	**PES**		**5.78**	**7.48**	**2.18**
W-7	6-May-87	WCC	9.05	3.00	6.88 (2)	
	20-Aug-89	MH		3.59	5.46	
	11-Oct-89	MH		3.08	5.97	
	22-Feb-90	MH		1.75	7.30	
	28-Feb-90	MH		1.31	7.74	
	9-Apr-90	MH		2.42	6.63	
	7-Jun-90	MH		1.21	7.84	
	25-Jul-90	MH		2.76	6.29	
	3-Oct-90	MH		3.22	5.83	
	3-Jan-91	MH		3.17	5.88	
	3-Apr-91	MH		1.18	7.87	
	25-Oct-91	MH		3.47	5.59	
	15-Jan-92	MH		3.88	5.17	
	23-Apr-92	MH		3.20	5.85	
	21-Jul-92	MH		3.65	5.40	
	22-Oct-92	MH		4.58	4.77	

Table 1. Summary of Groundwater Elevations Through July 1993

Emery Bay Marketplace
Emeryville, California

Well Number	Date	Measured by	Top of Casing (feet MSL)	Depth to Water (feet)	Potentiometric Surface Elevations (feet MSL)	Product Thickness (feet)
W-7	26-Jan-93	MH		1.12	7.93	
	29-Apr-93	MH		2.90	6.15	
	22-Jul-93	**PES**		**4.26**	**4.79**	
W-8	6-May-87	WCC	10.43	5.50	6.88 (2)	
	20-Aug-89	MH		3.59	6.84	
	22-Feb-90	MH		1.50	8.93	
	28-Feb-90	MH		1.78	8.65	
	9-Apr-90	MH		3.12	7.31	
	7-Jun-90	MH		2.90	7.53	
	27-Jul-90	MH		3.33	7.10	
	3-Oct-90	MH		3.65	6.78	
	3-Jan-91	MH		3.46	6.97	
	3-Apr-91	MH		1.47	8.96	
	25-Oct-91	MH		3.54	6.89	
	15-Jan-92	MH		2.98	7.45	
	24-Apr-92	MH		3.01	7.42	
	21-Jul-92	MH		3.41	7.02	
	22-Oct-92	MH		4.23	6.20	
	26-Jan-93	MH		NM	NM	
	29-Apr-93	MH		2.29	8.14	
	22-Jul-93	**PES**		**3.17**	**7.26**	
W-13	20-Aug-89	MH	8.15	4.64	3.51	
	11-Oct-89	MH		4.60	3.55	
	22-Feb-90	MH		3.85	4.30	
	28-Feb-90	MH		4.18	3.97	
	9-Apr-90	MH		4.31	3.84	
	7-Jun-90	MH		3.93	4.22	
	25-Jul-90	MH		4.40	3.75	
	3-Oct-90	MH		4.67	3.48	
	3-Jan-91	MH		4.43	3.72	
	3-Apr-91	MH		3.64	4.51	
	25-Oct-91	MH		4.54	3.72	
	15-Jan-92	MH		3.82	4.33	
	23-Apr-92	MH		4.12	4.03	
	21-Jul-92	MH		4.44	3.71	
	22-Oct-92	MH		4.42	3.73	
	26-Jan-93	MH		3.10	5.05	
	29-Apr-93	MH		4.04	4.11	
	22-Jul-93	**PES**		**4.30**	**3.85**	

Table 1. Summary of Groundwater Elevations Through July 1993

Emery Bay Marketplace
Emeryville, California

Well Number	Date	Measured by	Top of Casing (feet MSL)	Depth to Water (feet)	Potentiometric Surface Elevations (feet MSL)	Product Thickness (feet)
W-14	20-Aug-89	MH	7.97	5.02	2.95	
	22-Feb-90	MH		4.19	3.78	
	28-Feb-90	MH		4.46	3.51	
	9-Apr-90	MH		4.36	3.61	
	7-Jun-90	MH		5.29	2.68	
	25-Jul-90	MH		4.83	3.14	
	3-Oct-90	MH		5.09	2.88	
	3-Jan-91	MH		4.32	3.65	
	3-Apr-91	MH		4.31	3.66	
	25-Oct-91	MH		4.41	3.56	
	15-Jan-92	MH		4.18	3.79	
	23-Apr-92	MH		4.93	3.04	
	21-Jul-92	MH		4.57	3.40	
	22-Oct-92	MH		5.28	2.69	
	26-Jan-93	MH		3.94	4.03	
	29-Apr-93	MH		4.59	3.38	
	22-Jul-93	**PES**		**5.30**	**2.67**	
W-15	20-Aug-89	MH	11.53	3.43	8.10	
	11-Oct-89	MH		4.26	7.27	
	22-Feb-90	MH		2.58	8.95	
	28-Feb-90	MH		2.53	9.00	
	9-Apr-90	MH		2.48	9.05	
	7-Jun-90	MH		4.54	6.99	
	25-Jul-90	MH		4.00	7.53	
	3-Oct-90	MH		3.46	8.07	
	3-Jan-91	MH		2.97	8.56	
	3-Apr-91	MH		3.05	8.48	
	25-Oct-91	MH		2.88	8.65	
	15-Jan-92	MH		3.54	7.99	
	23-Apr-92	MH		2.78	8.75	
	21-Jul-92	MH		2.67	8.86	
	22-Oct-92	MH		2.65	8.88	
	26-Jan-93	MH		2.47	9.06	
	29-Apr-93	MH		2.56	8.97	
	29-Apr-93	**PES**		**3.38**	**8.15**	
W-16	11-Oct-89	MH	10.94	4.81	6.19	0.07
	22-Feb-90	MH		3.92	7.02	NP
	28-Feb-90	MH		3.88	7.06	NP
	9-Apr-90	MH		7.81	3.13	NP

Table 1. Summary of Groundwater Elevations Through July 1993

Emery Bay Marketplace
Emeryville, California

Well Number	Date	Measured by	Top of Casing (feet MSL)	Depth to Water (feet)	Potentiometric Surface Elevations (feet MSL)	Product Thickness (feet)
W-16	7-Jun-90	MH		6.19	4.75	NP
	27-Jul-90	MH		4.44	6.50	NP
	3-Oct-90	MH		4.38	6.58	0.02
	3-Jan-91	MH		4.67	6.29	0.02
	3-Apr-91	MH		3.50	7.46	0.02
	25-Oct-91	MH		4.64	6.30	NP
	15-Jan-92	MH		4.11	6.83	NP
	23-Apr-92	MH		3.89	7.05	NP
	21-Jul-92	MH		4.28	6.66	NP
	22-Oct-92	MH		NM	NM	NM
	26-Jan-93	MH		2.47	8.47	NP
	22-Jul-93	**PES**		**NM**	**NM**	**NM**
W-17	11-Oct-89	MH	12.14	9.12	3.02	
	22-Feb-90	MH		5.42	6.72	
	28-Feb-90	MH		5.35	6.79	
	9-Apr-90	MH		5.72	6.42	
	7-Jun-90	MH		NM	NM	
	26-Jul-90	MH		5.59	6.55	
	3-Oct-90	MH		5.72	6.42	
	3-Jan-91	MH		6.28	5.86	
	3-Apr-91	MH		4.69	7.45	
	25-Oct-91	MH		6.00	6.14	
	15-Jan-92	MH		5.57	6.57	
	23-Apr-92	MH		5.17	6.97	
	21-Jul-92	MH		5.54	6.60	
	22-Oct-92	MH		6.10	6.04	
	26-Jan-93	MH		4.45	7.69	
	29-Apr-93	MH		5.25	6.89	
	22-Jul-93	**PES**		**NM**	**NM**	
W-18	11-Oct-89	MH	11.34	5.52	5.82	
	22-Feb-90	MH		4.42	6.92	
	28-Feb-90	MH		4.77	6.57	
	9-Apr-90	MH		5.24	6.10	
	7-Jun-90	MH		4.28	7.06	
	25-Jul-90	MH		4.98	6.36	
	3-Oct-90	MH		5.44	5.90	
	3-Jan-91	MH		5.84	5.50	
	3-Apr-91	MH		4.94	6.40	

Table 1. Summary of Groundwater Elevations Through July 1993

Emery Bay Marketplace
Emeryville, California

Well Number	Date	Measured by	Top of Casing (feet MSL)	Depth to Water (feet)	Potentiometric Surface Elevations (feet MSL)	Product Thickness (feet)
W-18	25-Oct-91	MH		5.55	5.79	
	15-Jan-92	MH		5.24	6.10	
	23-Apr-92	MH		4.81	6.53	
	21-Jul-92	MH		5.01	6.33	
	22-Oct-92	MH		5.55	5.79	
	26-Jan-93	MH		4.72	6.62	
	29-Apr-93	MH		4.68	6.66	
	22-Jul-93	**PES**		**5.07**	**6.27**	
W-19	9-Apr-90	MH	10.27	5.11	5.16	
	7-Jun-90	MH		4.77	5.50	
	25-Jul-90	MH		4.93	5.34	
	3-Oct-90	MH		4.95	5.32	
	3-Jan-91	MH		5.95	4.32	
	3-Apr-91	MH		5.39	4.88	
	25-Oct-91	MH		5.47	4.80	
	15-Jan-92	MH		5.18	5.09	
	23-Apr-92	MH		5.34	4.93	
	21-Jul-92	MH		5.08	5.19	
	22-Oct-92	MH		5.31	4.96	
	26-Jan-93	MH		4.82	5.45	
	29-Apr-93	MH		5.09	5.18	
	22-Jul-93	**PES**		**5.04**	**5.24**	**0.01**
W-20	9-Apr-90	MH	6.82	4.08	2.74	
	7-Jun-90	MH		3.79	3.03	
	25-Jul-90	MH		4.00	2.82	
	3-Oct-90	MH		4.03	2.79	
	3-Jan-91	MH		4.12	2.70	
	3-Apr-91	MH		3.84	2.98	
	25-Oct-91	MH		4.07	2.75	
	15-Jan-92	MH		3.75	3.07	
	23-Apr-92	MH		4.08	2.74	
	21-Jul-92	MH		4.02	2.80	
	22-Oct-92	MH		4.07	2.75	
	26-Jan-93	MH		3.30	3.52	
	29-Apr-93	MH		4.00	2.82	
	22-Jul-93	**PES**		**3.84**	**2.98**	

Table 1. Summary of Groundwater Elevations Through July 1993

Emery Bay Marketplace
Emeryville, California

Well Number	Date	Measured by	Top of Casing (feet MSL)	Depth to Water (feet)	Potentiometric Surface Elevations (feet MSL)	Product Thickness (feet)
W-21	9-Apr-90	MH	9.48	5.21	4.27	
	7-Jun-90	MH		4.84	4.64	
	25-Jul-90	MH		5.05	4.43	
	3-Oct-90	MH		5.18	4.30	
	3-Jan-91	MH		5.47	4.01	
	3-Apr-91	MH		4.80	4.68	
	25-Oct-91	MH		5.04	4.44	
	15-Jan-92	MH		4.95	4.53	
	23-Apr-92	MH		5.17	4.31	
	21-Jul-92	MH		5.07	4.41	
	22-Oct-92	MH		5.28	4.20	
	26-Jan-93	MH		4.46	5.02	
	29-Apr-93	MH		5.39	4.09	
	22-Jul-93	**PES**		**5.32**	**4.16**	
W-22	9-Apr-90	MH	11.67	7.50	4.17	
	7-Jun-90	MH		7.36	4.31	
	25-Jul-90	MH		7.49	4.18	
	3-Oct-90	MH		7.68	3.99	
	3-Jan-91	MH		7.88	3.79	
	3-Apr-91	MH		7.64	4.03	
	25-Oct-91	MH		6.69	4.98	
	15-Jan-92	MH		7.61	4.06	
	23-Apr-92	MH		7.21	4.46	
	21-Jul-92	MH		7.69	3.98	
	22-Oct-92	MH		7.82	3.85	
	26-Jan-93	MH		7.40	4.27	
	29-Apr-93	MH		7.71	3.96	
	22-Jul-93	**PES**		**7.76**	**3.91**	
W-23	9-Apr-90	MH	9.16	1.51	7.65	
	7-Jun-90	MH		1.78	7.38	
	27-Jul-90	MH		2.63	6.53	
	3-Oct-90	MH		3.20	5.96	
	3-Jan-91	MH		2.36	6.80	
	3-Apr-91	MH		0.60	8.56	
	25-Oct-91	MH		2.36	6.80	
	15-Jan-92	MH		1.62	7.54	
	23-Apr-92	MH		1.18	7.98	
	21-Jul-92	MH		2.17	6.99	
	22-Oct-92	MH		2.76	6.40	

Table 1. Summary of Groundwater Elevations Through July 1993

Emery Bay Marketplace
Emeryville, California

Well Number	Date	Measured by	Top of Casing (feet MSL)	Depth to Water (feet)	Potentiometric Surface Elevations (feet MSL)	Product Thickness (feet)
W-23	26-Jan-93	MH		0.39	8.77	
	29-Apr-93	MH		0.97	8.19	
	22-Jul-93	**PES**		**1.87**	**7.29**	
W-24	7-Jun-90	MH	8.72	4.75	3.97	
	25-Jul-90	MH		5.02	3.70	
	3-Oct-90	MH		5.00	3.72	
	3-Jan-91	MH		5.25	3.47	
	3-Apr-91	MH		4.56	4.16	
	25-Oct-91	MH		5.09	3.63	
	15-Jan-92	MH		4.82	3.90	
	23-Apr-92	MH		4.94	3.78	
	21-Jul-92	MH		5.00	3.72	
	22-Oct-92	MH		5.13	3.59	
	26-Jan-93	MH		3.38	5.34	
	29-Apr-93	MH		4.98	3.74	
	22-Jul-93	**PES**		**5.02**	**3.70**	

NOTES:

(1) Well W-1 is located on the Nielson property.
(2) Groundwater elevation taken from earlier reports does not agree with calculated elevation using current top of casing elevation.

feet MSL = Feet above mean sea level.
NA = Data not available.
NM = Not measured.
NP = Product not present or insufficient amount present to perform measurements.
WCC = Woodward Clyde Consultants
MH = McLaren Hart
PES = PES Environmental, Inc.

Table 2. Summary of Petroleum Hydrocarbon Analytical Results for Groundwater Samples Through July 1993

Emery Bay Marketplace
Emeryville, California

Concentrations expressed in milligrams per liter [mg/L] - equivalent to parts per million [ppm]

Well Number	Sample Date	Sampled by	TPH as Diesel	TPH as Motor Oil
W-1	14-Apr-87	WCC	NA	<5
	28-Feb-90	MH	<0.5	NA
	11-Apr-90	MH	<0.1	0.57
W-4	01-Mar-90	MH	<0.5	NA
	10-Apr-90	MH	<0.1	<0.25
W-5	27-Sep-89	MH	20	NA
	25-Oct-91	MH	NA	NA
W-7	26-Sep-89	MH	1.1	NA
	28-Feb-90	MH	<0.5	NA
	11-Apr-90	MH	5.6	7.5
	30-Jul-90	MH	2.6	2.0
	04-Oct-90	MH	5.0	6.0
	04-Jan-91	MH	4.0	12
	03-Apr-91	MH	<1.0	3.2
	25-Oct-91	MH	1.4 (3)	2.3
	16-Jan-92	MH	1.6	3.6
	24-Apr-92	MH	3.3	4.9
	23-Jul-92	MH	2.6	4.0
	23-Oct-92	MH	3.8	4.2
	27-Jan-93	MH	<0.5	8.0 (1)
	29-Apr-93	MH	1.6	1.7(1)
	22-Jul-93	**PES**	**1.5**	**3.2**
W-8	17-Apr-87	WCC	10(2)	NA
	26-Sep-89	MH	7.1	NA
	01-Mar-90	MH	4.5	NA
	18-Apr-90	MH	5.3	NA
W-13	28-Feb-90	MH	<0.5	NA
	12-Apr-90	MH	<0.5	NA
	27-Jul-90	MH	<0.5	<1
	04-Oct-90	MH	<0.5	<1
	03-Jan-91	MH	<0.5	<1
	04-Apr-91	MH	<0.5	<1

Table 2. Summary of Petroleum Hydrocarbon Analytical Results for Groundwater Samples Through July 1993

Emery Bay Marketplace
Emeryville, California

Concentrations expressed in milligrams per liter [mg/L] - equivalent to parts per million [ppm]

Well Number	Sample Date	Sampled by	TPH as Diesel	TPH as Motor Oil
W-13	25-Oct-91	MH	<0.5	<1
	16-Jan-92	MH	<0.5	<0.5
	24-Apr-92	MH	<0.5	<0.5
	22-Jul-92	MH	<0.5	<0.5
	23-Oct-92	MH	<0.5	<0.5
	27-Jan-93	MH	<0.05	0.11(1)
	29-Apr-93	MH	<0.5	0.12(1)
	22-Jul-93	**PES**	**<0.05**	**0.25**
W-14	28-Feb-90	MH	<0.5	NA
	11-Apr-90	MH	<0.1	<0.25
	30-Jul-90	MH	<0.6	<1
	04-Oct-90	MH	<0.5	<1
	04-Jan-91	MH	<0.5	<1
	04-Apr-91	MH	<0.5	<1
	25-Oct-91	MH	<0.5	<1
	16-Jan-92	MH	<0.5	<0.5
	24-Apr-92	MH	<0.5	<0.5
	22-Jul-92	MH	<0.5	<0.5
	23-Oct-92	MH	<0.5	<0.5
	27-Jan-93	MH	<0.05	0.13
	29-Apr-93	MH	<0.05	0.15
	22-Jul-93	**PES**	**<0.05**	**0.16**
W-15	25-Sep-89	MH	1.2	NA
	13-Apr-90	MH	1.5	NA
W-16	27-Sep-89	MH	4.7	NA
	28-Feb-90	MH	22	NA
	13-Apr-90	MH	9.0	NA
W-17	25-Sep-89	MH	0.7	NA
	13-Apr-90	MH	1.6	NA
W-18	26-Sep-89	MH	3.1	NA
	13-Apr-90	MH	5.1	NA

Table 2. Summary of Petroleum Hydrocarbon Analytical Results for Groundwater Samples Through July 1993

Emery Bay Marketplace
Emeryville, California

Concentrations expressed in milligrams per liter [mg/L] - equivalent to parts per million [ppm]

Well Number	Sample Date	Sampled by	TPH as Diesel	TPH as Motor Oil
W-19	12-Apr-90	MH	1.1	NA
	16-Apr-90	MH	<0.5	NA
	27-Jul-90	MH	<1	8.0
	03-Oct-90	MH	<0.5	3.0
	03-Jan-91	MH	<0.5	<1
	03-Apr-91	MH	<2.5	8.4
	25-Oct-91	MH	<0.5	34
	17-Jan-92	MH	<10.0	29
	23-Apr-92	MH	<2.0	7.1
	23-Jul-92	MH	<0.1	7.3
	22-Oct-92	MH	<10	28
	26-Jan-93	MH	0.79	35
	29-Apr-93	MH	<0.05	8.2
	22-Jul-93	**PES**	**<0.5**	**20**
W-20	12-Apr-90	MH	<0.5	NA
	16-Apr-90	MH	<0.5	NA
	30-Jul-90	MH	<0.5	<1
	03-Oct-90	MH	<0.5	<1
	04-Jan-91	MH	<0.5	<1
	04-Apr-91	MH	<0.5	2.3
	25-Oct-91	MH	<0.5	<1
	17-Jan-92	MH	<0.5	<0.5
	24-Apr-92	MH	<0.5	<0.5
	22-Jul-92	MH	<0.5	<0.5
	22-Oct-92	MH	<0.5	<0.5
	27-Jan-93	MH	<0.10	0.42 (1)
	29-Apr-93	MH	<0.05	0.38(1)
	22-Jul-93	**PES**	**<0.05**	**1.9**
W-21	12-Apr-90	MH	1.4	NA
	18-Apr-90	MH	1.7	NA
W-22	12-Apr-90	MH	<0.5	NA
	18-Apr-90	MH	<0.5	NA

Table 2. Summary of Petroleum Hydrocarbon Analytical Results for Groundwater Samples Through July 1993

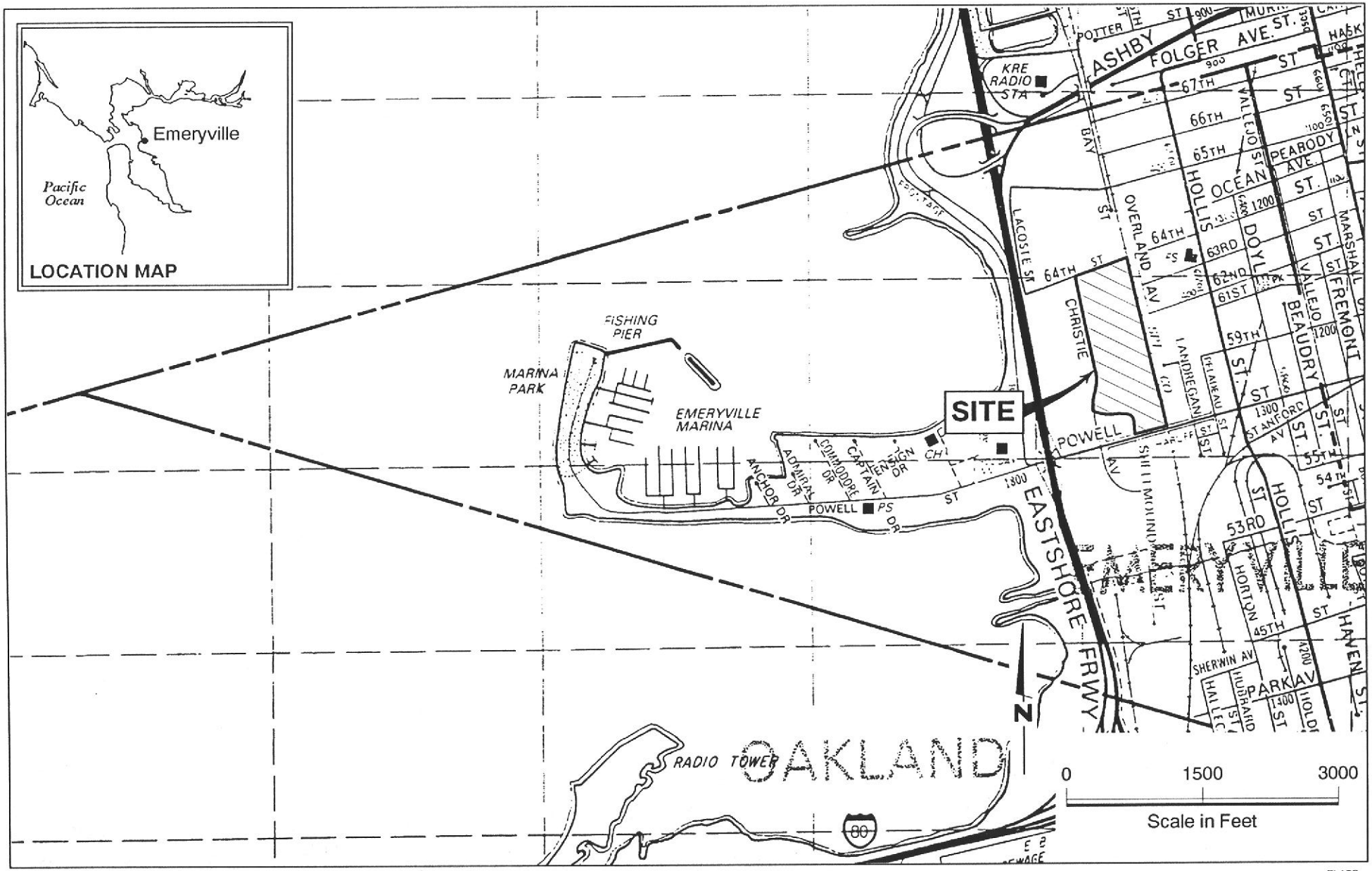
Emery Bay Marketplace
Emeryville, California

Concentrations expressed in milligrams per liter [mg/L] - equivalent to parts per million [ppm]

Well Number	Sample Date	Sampled by	TPH as Diesel	TPH as Motor Oil
W-23	12-Apr-90	MH	2.9	NA
	18-Apr-90	MH	3.6	NA
W-24	07-Jun-90	MH	<0.5	NA
	27-Jul-90	MH	<0.5	<1
	03-Oct-90	MH	<0.5	<1
	03-Jan-91	MH	<0.5	<1
	03-Apr-91	MH	<0.5	1.1
	25-Oct-91	MH	<0.5	<1
	17-Jan-92	MH	<0.5	<0.5
	24-Apr-92	MH	<0.5	<0.5
	23-Jul-92	MH	<0.5	<0.5
	22-Oct-92	MH	<0.5	<0.5
	26-Jan-93	MH	<0.05	0.20 (1)
	29-Apr-93	MH	<0.05	0.14 (1)
	22-Jul-93	**PES**	**<0.05**	**0.42**

Notes:

(1) = TPH quantified as motor oil although chromatogram pattern not typical of motor oil.
(2) = Semiquantified results include gasoline, diesel, and some oil and grease in Well W-8.
(3) = TPH quantified as diesel although chromatograph pattern not typical of diesel.
< 0.5 = Not detected above indicated detection limit.
TPH = Total petroleum hydrocarbons
NA = Not Analyzed
WCC = Woodward Clyde Consultants
MH = McLaren Hart
PES = PES Environmental, Inc.



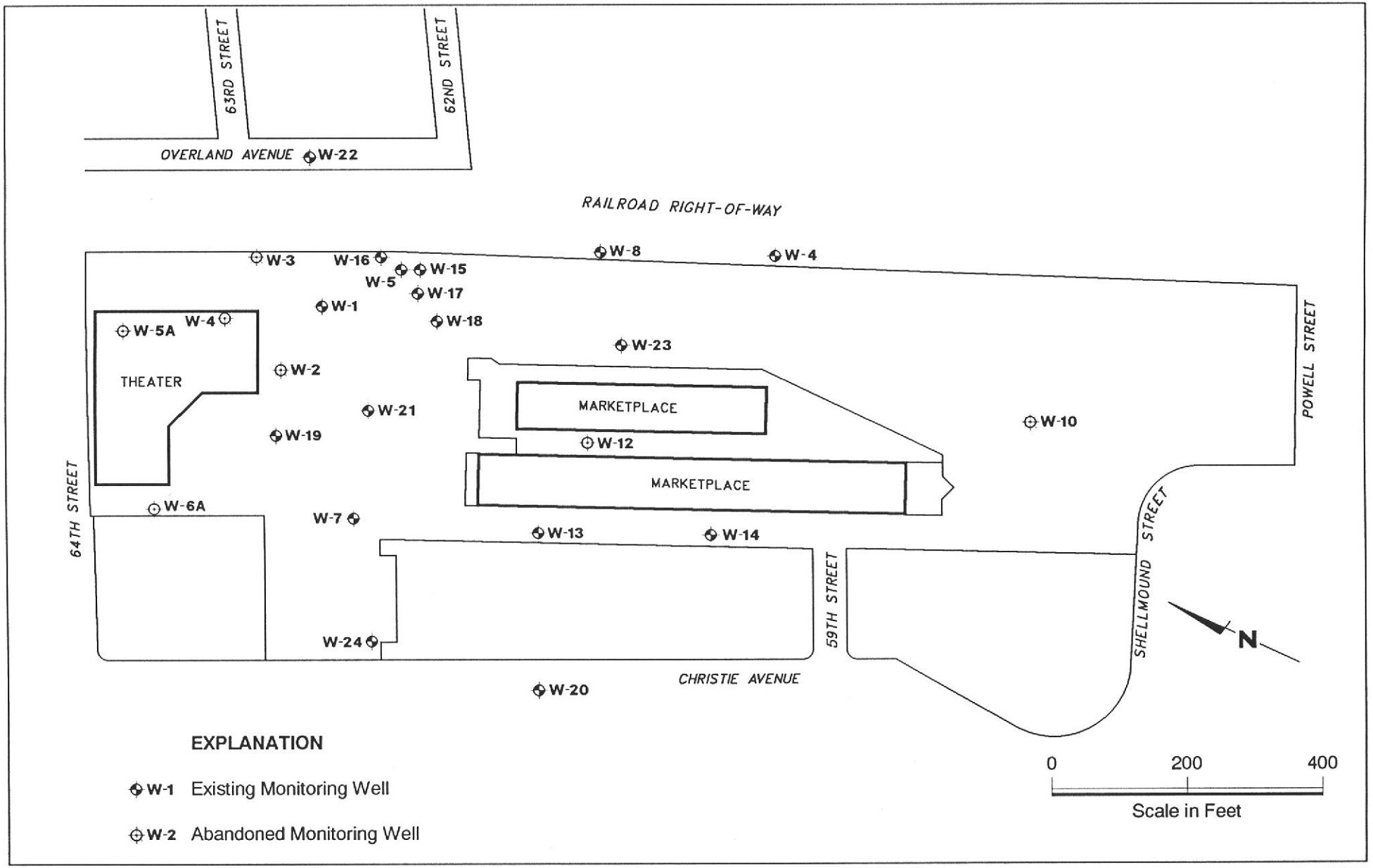
PLATE

1

PES Environmental, Inc.
Engineering & Environmental Services

Site Location Map
Emery Bay Marketplace Site
Emeryville, California

JOB NUMBER	REVIEWED BY	DATE	REVISED DATE	REVISED DATE
131.0200.001	MW	8/93		

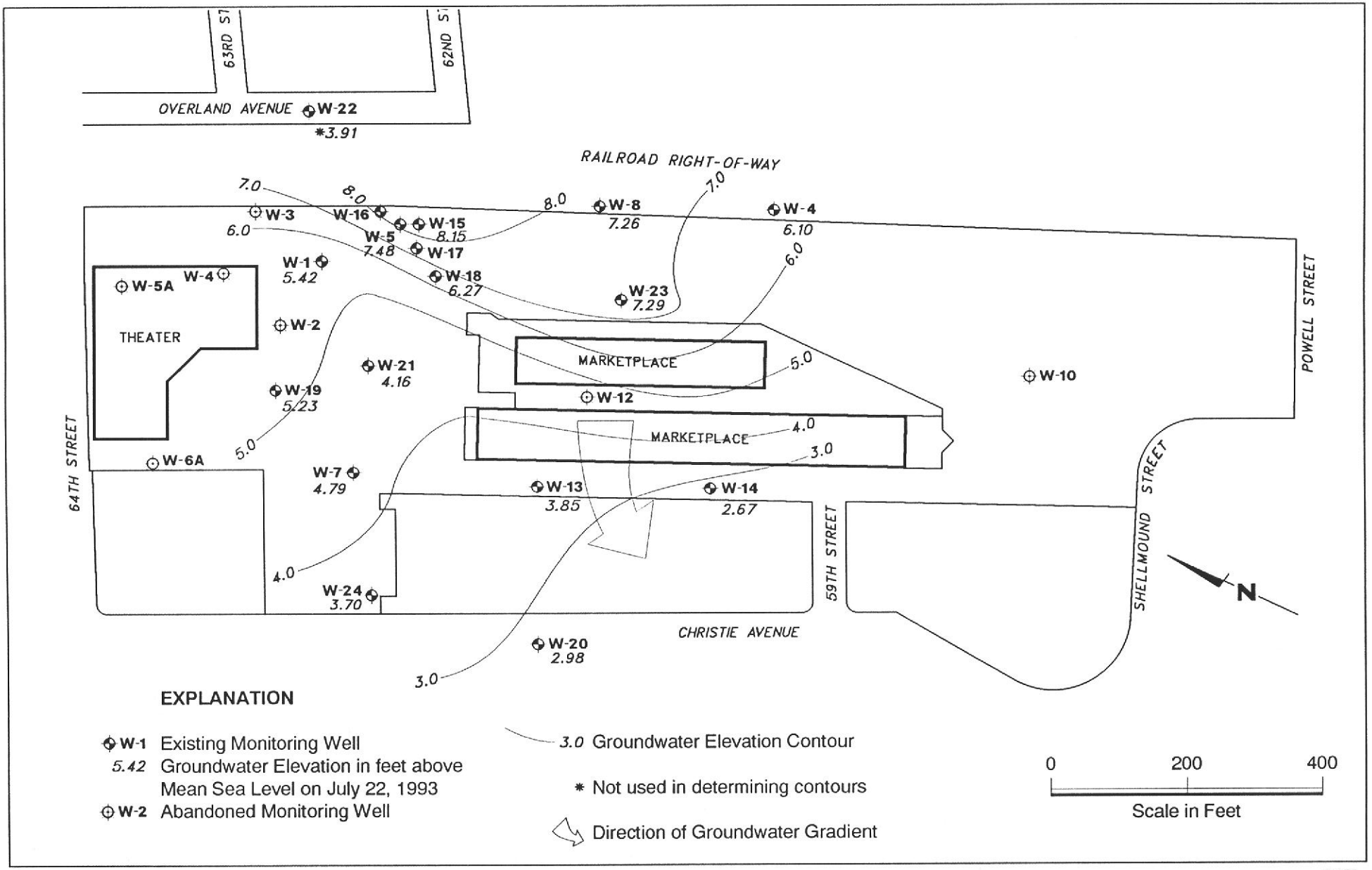


PES Environmental, Inc.
Engineering & Environmental Services

Well Location Map
Emery Bay Marketplace
Emeryville, California

PLATE
2

JOB NUMBER	REVIEWED BY	DATE	REVISED DATE	REVISED DATE
131.0200.001	MW	8/93		

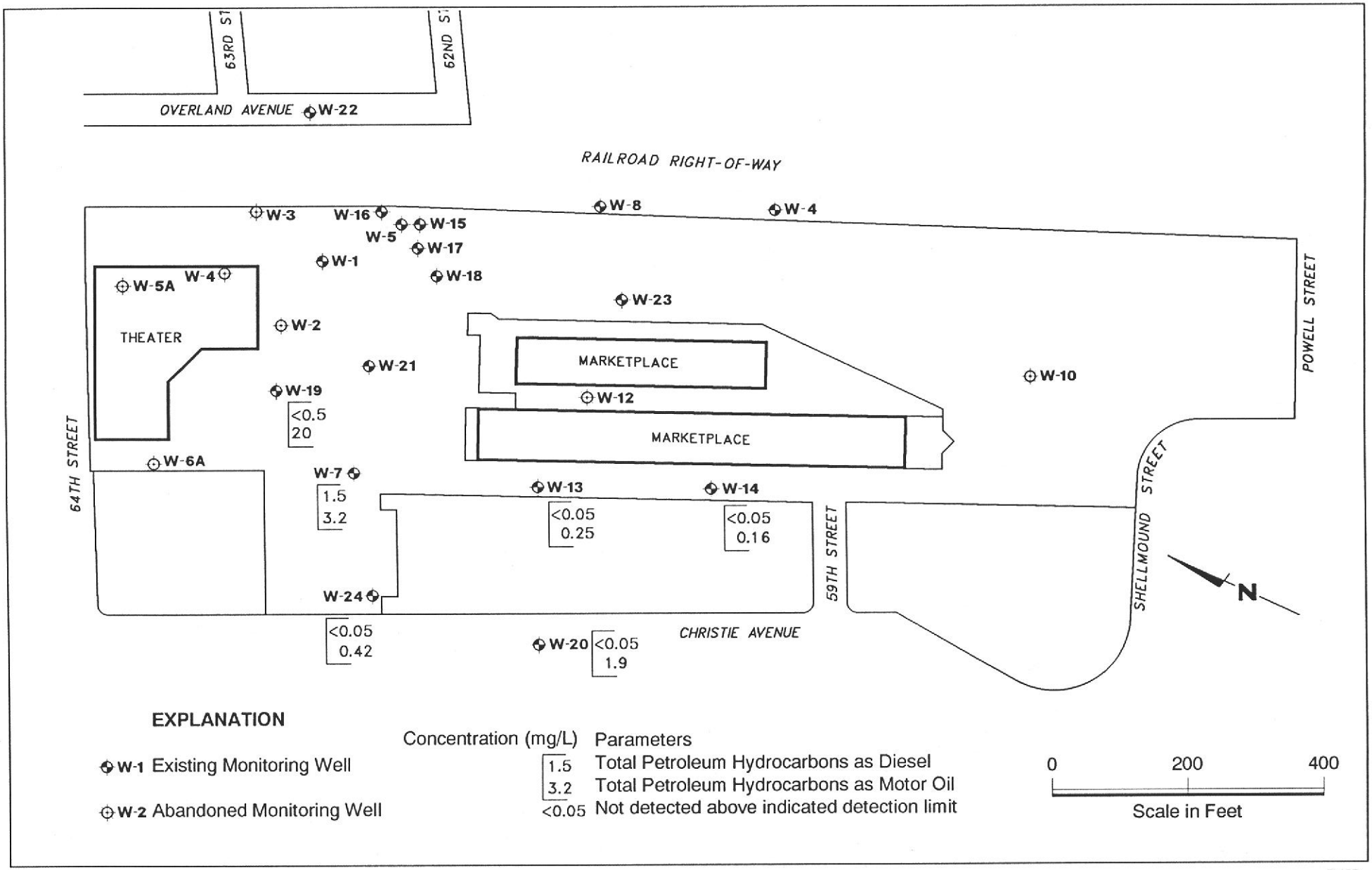


PES Environmental, Inc.
Engineering & Environmental Services

Groundwater Elevation Contours on July 22, 1993
Emery Bay Marketplace
Emeryville, California

PLATE
3

JOB NUMBER	REVIEWED BY	DATE	REVISED DATE	REVISED DATE
131.0200.001	MW	8/93		



PES Environmental, Inc.
Engineering & Environmental Services

Dissolved Hydrocarbons in Groundwater on July 22, 1993
Emery Bay Marketplace
Emeryville, California

PLATE
4

JOB NUMBER	REVIEWED BY	DATE	REVISED DATE	REVISED DATE
131.0200.001	MW	8/93		

APPENDIX A

WATER LEVEL AND GROUNDWATER SAMPLING REPORTS

BLAINE
TECH SERVICES INC.

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

August 12, 1993

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

Attention: Andrew Briefer

SITE:
Emery Bay Market Place
Christie Street
Emeryville, California

PROJECT:
Water Level Measurements

DATE:
July 22, 1993

Monthly Water Levels Report 930722-A-1.WL

Personnel from our office was present at the site on Thursday, July 22, 1993 to obtain water levels and conduct a sheen and odor check. Please note that we are reporting only the water levels, not elevations.

Well designation	Well diameter	Depth to water	Well depth	Sheen/Odor	Survey Point: Top of Case or Top of Box
W-1	2"	6.05'	10.64'	None	TOC
W-4	2"	3.86'	11.20'	None	TOC
W-5	2"	5.78'	9.26'	FPZ *	TOC
W-7	2"	4.26'	12.45'	None	TOC
W-8	2"	3.17'	11.78'	None	TOC
W-13	2"	4.30'	10.04'	None	TOC
W-14	2"	5.30'	9.89'	None	TOC
W-15	2"	3.38'	20.64'	None	TOC
W-16	--	Inaccessible--burried.			
W-17	--	Inaccessible--car parked over wellhead.			
W-18	2"	5.07'	20.05'	None	TOC

* A free product zone measuring 2.18' stood on water column.
Depth to immicsible liquid from the top of well case measured 3.60'.

Well designation	Well diameter	Depth to water	Well depth	Sheen/Odor	Survey Point: Top of Case or Top of Box
W-19	2"	5.04′	13.60′	FPZ **	TOC
W-20	2"	3.84′	16.90′	None	TOC
W-21	2"	5.32′	12.40′	None	TOC
W-22	2"	7.76′	15.07′	None	TOC
W-23	2"	1.87′	8.92′	None	TOC
W-24	2"	5.02′	13.36′	None	TOC

**A free product zone measuring 0.01′ (approximately one tenth of an inch stood) stood on water column.

Richard C. Blaine

RCB/jmb

BLAINE
TECH SERVICES INC.

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

August 12, 1993

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

Attn: Andrew Briefer

SITE:
Emery Bay Market Place
Emeryville, California

SAMPLING EVENT:
Evacuate and sample six wells

DATE:
July 22, 1993

GROUNDWATER SAMPLING REPORT 930722-A-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 is presented in the TABLE OF WELL MONITORING DATA. This data 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 during well evacuation and at the time of sample collection. Recharge performance can be evaluated by comparing the anticipated three, four, or five case volume evacuation gallonage with the volume which could actually be purged.

TABLE OF WELL MONITORING DATA

Well I.D.	W-7	W-13	W-14
Date Sampled	07/22/93	07/22/93	07/22/93
Well Diameter (in.)	2	2	2
Total Well Depth (ft.)	12.45	10.04	9.89
Depth To Water (ft.)	4.26	4.30	5.30
Free Product (ft.)	NONE	NONE	NONE
Reason If Not Sampled	--	--	--
1 Case Volume (gal.)	1.33	0.75	0.93
Did Well Dewater?	NO	NO	YES @ 1.25 gals.
Gallons Actually Evacuated	4.0	3.0	1.5
Purging Device	BAILER	BAILER	BAILER
Sampling Device	BAILER	BAILER	BAILER
Time	13:53 14:00 14:06	14:22 14:26 14:29	14:46 15:30
Temperature (Fahrenheit)	75.6 75.2 74.7	69.9 69.7 69.7	71.8 71.4
pH	8.2 7.8 7.5	8.8 8.7 8.4	8.3 8.4
Conductivity (micromhos/cm)	5000 6400 6800	1300 900 800	1800 2000
Nephelometric Turbidity Units	>200 >200 >200	>200 >200 >200	>200 >200
BTS Chain of Custody	930722-A-1	930722-A-1	930722-A-1
BTS Sample I.D.	W-7	W-13	W-14
DHS HMTL Laboratory	COAST TO COAST	COAST TO COAST	COAST TO COAST
Analysis	EPA 8015 (DIESEL & MOTOR OIL)	EPA 8015 (DIESEL & MOTOR OIL)	EPA 8015 (DIESEL & MOTOR OIL)

TABLE OF WELL MONITORING DATA

Well I.D.	W-19			W-20			W-24	
Date Sampled	07/22/93			07/22/93			07/22/93	
Well Diameter (in.)	2			2			2	
Total Well Depth (ft.)	13.60			16.90			13.36	
Depth To Water (ft.)	5.04			3.84			5.02	
Free Product (ft.)	0.01			NONE			NONE	
Reason If Not Sampled	--			--			--	
1 Case Volume (gal.)	1.39			2.12			1.35	
Did Well Dewater?	NO			NO			NO	
Gallons Actually Evacuated	4.5			6.5			4.25	
Purging Device	BAILER			BAILER			BAILER	
Sampling Device	BAILER			BAILER			BAILER	
Time	15:00	15:05	15:09	13:10	13:13	13:18	12:48	12:51	12:55
Temperature (Fahrenheit)	72.3	72.2	72.2	65.2	66.4	65.8	74.1	74.7	74.1
pH	7.7	7.5	7.5	7.5	7.5	7.5	7.4	7.6	7.4
Conductivity (micromhos/cm)	3500	3000	2700	9000	8600	8400	5500	3700	3200
Nephelometric Turbidity Units	132.8	>200	>200	>200	>200	>200	>200	>200	>200
BTS Chain of Custody	930722-A-1			930722-A-1			930722-A-1		
BTS Sample I.D.	W-19 *			W-20			W-24		
DHS HMTL Laboratory	COAST TO COAST			COAST TO COAST			COAST TO COAST		
Analysis	EPA 8015 (DIESEL & MOTOR OIL)			EPA 8015 (DIESEL & MOTOR OIL)			EPA 8015 (DIESEL & MOTOR OIL)		

* The laboratory was instructed to archive sample W-19 pending further instructions from Andrew Briefer of PES.

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 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.

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 contain

er 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 Coast to Coast Analytical Laboratory.

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.

BLAINE
TECH SERVICES INC

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

CHAIN OF CUSTODY 9307ZEA1

CLIENT PES

SITE EMERY Bay Market Place
Christie St
Emeryville

LAB Coast to Coast DHS #

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

☐ EPA ☐ RWQCB REGION ____
☐ LIA
☐ OTHER

SPECIAL INSTRUCTIONS
* ARCHIVE W19 Sample pending instructions from Andrew Briefer

C = COMPOSITE ALL CONTAINERS

SAMPLE I.D.	MATRIX S = SOIL W = H2O	CONTAINERS TOTAL		CONDUCT ANALYSIS TO DETECT: 8015 Diesel & motor oil	ADD'L INFORMATION	STATUS	CONDITION	LAB SAMPLE #
W7	W	1	Amber Litre	/				
W13		1		/				
W14		1		/				
* W19		1		/				
W20		1		/				
W24	↓	1	↓	/				

SAMPLING COMPLETED DATE 7/22/93 TIME 1600

SAMPLING PERFORMED BY Jeff Curtis

RESULTS NEEDED NO LATER THAN

RELEASED BY	DATE	TIME	RECEIVED BY	DATE	TIME
Jeff Curtis	7/23/93	0930	T. PA	7/23	930

SHIPPED VIA	DATE SENT	TIME SENT	COOLER #	

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/jmb

attachments: chain of custody

APPENDIX B

ANALYTICAL LABORATORY REPORTS

COAST-TO-COAST ANALYTICAL SERVICES

Air, Water & Hazardous Waste Sampling, Analysis & Consultation
Certified Hazardous Waste, Chemistry, Bacteriology & Bioassay Laboratories

San Luis Obispo, CA • Benicia, CA • Camarillo, CA • San Jose, CA • Goleta, CA
Anaheim, CA • Tempe, AZ • Valparaiso, IN • Westbrook, ME • Indianapolis, IN

NorCal Division (San Jose Laboratory)
2059 Junction Ave.
San Jose, CA 95131
(408) 955-9077

CLIENT: PES Environmental Inc
1682 Novato Boulevard, Suite 100
Novato, CA 94947

Lab Number : JJ-1181-1
Project : Emery Bay Market Place

Analyzed : 07/29/93
Analyzed by: TN
Method : EPA 8015M

REPORT OF ANALYTICAL RESULTS

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED	DATE RECEIVED
W7	Groundwater	Jeff Curtis of Blaine Tech	07/22/93	07/23/93

CONSTITUENT	(CAS RN)	*PQL µg/L	RESULT µg/L	NOTE
TOTAL PETROLEUM HYDROCARBONS				1
Total Petroleum Hydrocarbons (Diesel)		500.	1500.	
Total Petroleum Hydrocarbons (Motor Oil)		500.	3200.	

San Jose Lab Certifications: CAELAP #1204
*RESULTS listed as 'ND' were not detected at or above the listed PQL (Practical Quantitation Limit)
(1) Sample Preparation on 07/28/93 by LLB

08/02/93
ECD2-729C011
MC/mcc/ttn
OIL072893B

Respectfully submitted,
COAST-TO-COAST ANALYTICAL SERVICES, INC.

Marissa Coronel
Laboratory Director

COAST-TO-COAST ANALYTICAL SERVICES

Air, Water & Hazardous Waste Sampling, Analysis & Consultation
Certified Hazardous Waste, Chemistry, Bacteriology & Bioassay Laboratories

San Luis Obispo, CA • Benicia, CA • Camarillo, CA • San Jose, CA • Goleta, CA
Anaheim, CA • Tempe, AZ • Valparaiso, IN • Westbrook, ME • Indianapolis, IN

NorCal Division (San Jose Laboratory)
2059 Junction Ave.
San Jose, CA 95131
(408) 955-9077

CLIENT: PES Environmental Inc
1682 Novato Boulevard, Suite 100
Novato, CA 94947

Lab Number : JJ-1181-2
Project : Emery Bay Market Place

Analyzed : 07/29/93
Analyzed by: TN
Method : EPA 8015M

REPORT OF ANALYTICAL RESULTS

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED	DATE RECEIVED
W13	Groundwater	Jeff Curtis of Blaine Tech	07/22/93	07/23/93

CONSTITUENT	(CAS RN)	*PQL µg/L	RESULT µg/L	NOTE
TOTAL PETROLEUM HYDROCARBONS				1
Total Petroleum Hydrocarbons (Diesel)		50.	ND	
Total Petroleum Hydrocarbons (Motor Oil)		50.	250.	

San Jose Lab Certifications: CAELAP #1204
*RESULTS listed as 'ND' were not detected at or above the listed PQL (Practical Quantitation Limit)
(1) Sample Preparation on 07/28/93 by LLB

08/02/93
ECD2-729C010
MC/mcc/ttn
OIL072893B

Respectfully submitted,
COAST-TO-COAST ANALYTICAL SERVICES, INC.

Marissa Coronel
Laboratory Director

COAST-TO-COAST ANALYTICAL SERVICES

Air, Water & Hazardous Waste Sampling, Analysis & Consultation
Certified Hazardous Waste, Chemistry, Bacteriology & Bioassay Laboratories

San Luis Obispo, CA • Benicia, CA • Camarillo, CA • San Jose, CA • Goleta, CA
Anaheim, CA • Tempe, AZ • Valparaiso, IN • Westbrook, ME • Indianapolis, IN

NorCal Division (San Jose Laboratory)
2059 Junction Ave.
San Jose, CA 95131
(408) 955-9077

CLIENT: PES Environmental Inc
1682 Novato Boulevard, Suite 100
Novato, CA 94947

Lab Number : JJ-1181-3
Project : Emery Bay Market Place

Analyzed : 07/29/93
Analyzed by: TN
Method : EPA 8015M

REPORT OF ANALYTICAL RESULTS

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED	DATE RECEIVED
W14	Groundwater	Jeff Curtis of Blaine Tech	07/22/93	07/23/93

CONSTITUENT	(CAS RN)	*PQL µg/L	RESULT µg/L	NOTE
TOTAL PETROLEUM HYDROCARBONS				1
Total Petroleum Hydrocarbons (Diesel)		50.	ND	
Total Petroleum Hydrocarbons (Motor Oil)		50.	160.	

San Jose Lab Certifications: CAELAP #1204
*RESULTS listed as 'ND' were not detected at or above the listed PQL (Practical Quantitation Limit)
(1) Sample Preparation on 07/28/93 by LLB

08/02/93
ECD2-729C009
MC/mcc/ttn
OIL072893B

Respectfully submitted,
COAST-TO-COAST ANALYTICAL SERVICES, INC.

Marissa Coronel
Laboratory Director

COAST-TO-COAST ANALYTICAL SERVICES

Air, Water & Hazardous Waste Sampling, Analysis & Consultation
Certified Hazardous Waste, Chemistry, Bacteriology & Bioassay Laboratories

San Luis Obispo, CA • Benicia, CA • Camarillo, CA • San Jose, CA • Goleta, CA
Anaheim, CA • Tempe, AZ • Valparaiso, IN • Westbrook, ME • Indianapolis, IN

NorCal Division (San Jose Laboratory)
2059 Junction Ave.
San Jose, CA 95131
(408) 955-9077

Lab Number : JJ-1292-1
Project : Emery Bay Market Place

CLIENT: Paul Lohman
PES Environmental Inc
1682 Novato Boulevard, Suite 100
Novato, CA 94947

Analyzed : 08/13/93
Analyzed by: TN
Method : EPA 8015M

REPORT OF ANALYTICAL RESULTS

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED	DATE RECEIVED
W19 (JJ1181-6)	Aqueous	Jeff Curtis	07/22/93	08/04/93

CONSTITUENT	(CAS RN)	*PQL µg/L	RESULT µg/L	NOTE
TOTAL PETROLEUM HYDROCARBONS				1
Total Petroleum Hydrocarbons (Diesel)		500.	ND	
Total Petroleum Hydrocarbons (Motor Oil)		500.	20000.	

San Jose Lab Certifications: CAELAP #1204
*RESULTS listed as 'ND' were not detected at or above the listed PQL (Practical Quantitation Limit)
(1) Sample Preparation on 08/11/93 by LLB

08/15/93
ECD2-812C048
MC/mcc/ttn
DSL081193A

Respectfully submitted,
COAST-TO-COAST ANALYTICAL SERVICES, INC.

Marissa Coronel
Laboratory Director

COAST-TO-COAST ANALYTICAL SERVICES

Air, Water & Hazardous Waste Sampling, Analysis & Consultation
Certified Hazardous Waste, Chemistry, Bacteriology & Bioassay Laboratories

San Luis Obispo, CA • Benicia, CA • Camarillo, CA • San Jose, CA • Goleta, CA
Anaheim, CA • Tempe, AZ • Valparaiso, IN • Westbrook, ME • Indianapolis, IN

NorCal Division (San Jose Laboratory)
2059 Junction Ave.
San Jose, CA 95131
(408) 955-9077

CLIENT: PES Environmental Inc
1682 Novato Boulevard, Suite 100
Novato, CA 94947

Lab Number : JJ-1181-4
Project : Emery Bay Market Place

Analyzed : 07/31/93
Analyzed by: TN
Method : EPA 8015M

REPORT OF ANALYTICAL RESULTS

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED	DATE RECEIVED
W20	Groundwater	Jeff Curtis of Blaine Tech	07/22/93	07/23/93

CONSTITUENT	(CAS RN)	*PQL µg/L	RESULT µg/L	NOTE
TOTAL PETROLEUM HYDROCARBONS				1
Total Petroleum Hydrocarbons (Diesel)		50.	ND	
Total Petroleum Hydrocarbons (Motor Oil)		50.	1900.	

San Jose Lab Certifications: CAELAP #1204
*RESULTS listed as 'ND' were not detected at or above the listed PQL (Practical Quantitation Limit)
(1) Sample Preparation on 07/28/93 by LLB

08/02/93
ECD2-730C027
MC/mcc/ttn
OIL072893B

Respectfully submitted,
COAST-TO-COAST ANALYTICAL SERVICES, INC.

Marissa Coronel
Laboratory Director

COAST-TO-COAST ANALYTICAL SERVICES

Air, Water & Hazardous Waste Sampling, Analysis & Consultation
Certified Hazardous Waste, Chemistry, Bacteriology & Bioassay Laboratories

San Luis Obispo, CA • Benicia, CA • Camarillo, CA • San Jose, CA • Goleta, CA
Anaheim, CA • Tempe, AZ • Valparaiso, IN • Westbrook, ME • Indianapolis, IN

NorCal Division (San Jose Laboratory)
2059 Junction Ave.
San Jose, CA 95131
(408) 955-9077

CLIENT: PES Environmental Inc
1682 Novato Boulevard, Suite 100
Novato, CA 94947

Lab Number : JJ-1181-5
Project : Emery Bay Market Place

Analyzed : 07/29/93
Analyzed by: TN
Method : EPA 8015M

REPORT OF ANALYTICAL RESULTS

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED	DATE RECEIVED
W24	Groundwater	Jeff Curtis of Blaine Tech	07/22/93	07/23/93

CONSTITUENT	(CAS RN)	*PQL µg/L	RESULT µg/L	NOTE
TOTAL PETROLEUM HYDROCARBONS				1
Total Petroleum Hydrocarbons (Diesel)		50.	ND	
Total Petroleum Hydrocarbons (Motor Oil)		50.	420.	

San Jose Lab Certifications: CAELAP #1204
*RESULTS listed as 'ND' were not detected at or above the listed PQL (Practical Quantitation Limit)
(1) Sample Preparation on 07/28/93 by LLB

08/02/93
ECD2-729C016
MC/mcc/ttn
OIL072893B

Respectfully submitted,
COAST-TO-COAST ANALYTICAL SERVICES, INC.

Marissa Coronel
Laboratory Director

COAST-TO-COAST ANALYTICAL SERVICES

Air, Water & Hazardous Waste Sampling, Analysis & Consultation
Certified Hazardous Waste, Chemistry, Bacteriology & Bioassay Laboratories

San Luis Obispo, CA • Benicia, CA • Camarillo, CA • San Jose, CA • Goleta, CA
Anaheim, CA • Tempe, AZ • Valparaiso, IN • Westbrook, ME • Indianapolis, IN

NorCal Division (San Jose Laboratory)
2059 Junction Ave.
San Jose, CA 95131
(408) 955-9077

QC Batch ID: OIL072893B

CLIENT: Coast-to-Coast Analytical Services, Inc.

Analyzed : 07/29/93
Analyzed by: TN
Method : EPA 8015M

METHOD BLANK
REPORT OF ANALYTICAL RESULTS

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED	DATE RECEIVED
METHOD BLANK	Aqueous			

CONSTITUENT	(CAS RN)	*PQL µg/L	RESULT µg/L	NOTE
TOTAL PETROLEUM HYDROCARBONS				1
Total Petroleum Hydrocarbons (Diesel)		50.	ND	
Total Petroleum Hydrocarbons (Motor Oil)		50.	ND	

San Jose Lab Certifications: CAELAP #1204
*RESULTS listed as 'ND' were not detected at or above the listed PQL (Practical Quantitation Limit)
(1) Sample Preparation on 07/28/93 by LLB

08/02/93
ECD2-729C006
MC/mcc/ttn
JJ1181-1

Respectfully submitted,
COAST-TO-COAST ANALYTICAL SERVICES, INC.

Marissa Coronel
Laboratory Director

COAST-TO-COAST ANALYTICAL SERVICES

Air, Water & Hazardous Waste Sampling, Analysis & Consultation
Certified Hazardous Waste, Chemistry, Bacteriology & Bioassay Laboratories

San Luis Obispo, CA • Benicia, CA • Camarillo, CA • San Jose, CA • Goleta, CA
Anaheim, CA • Tempe, AZ • Valparaiso, IN • Westbrook, ME • Indianapolis, IN

NorCal Division (San Jose Laboratory)
2059 Junction Ave.

San Jose, CA 95131
(408) 955-9077

QC Batch ID: OIL072893B

CLIENT: Coast-to-Coast Analytical Services, Inc.

Analyzed : 07/29/93
Analyzed by: TN
Method : EPA 8015M

QC SPIKE
REPORT OF ANALYTICAL RESULTS

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED	DATE RECEIVED
QC SPIKE DUPLICATE	Aqueous			

CONSTITUENT	*PQL µg/L	SPIKE AMOUNT	RESULT µg/L	%REC	%DIFF	NOTE
TOTAL PETROLEUM HYDROCARBONS						1
Total Petroleum Hydrocarbons (Diesel)	50.	500.	460.	92.	4.4	

San Jose Lab Certifications: CAELAP #1204
*RESULTS listed as 'ND' were not detected at or above the listed PQL (Practical Quantitation Limit)
(1) Sample Preparation on 07/28/93 by LLB

08/02/93
ECD2-729C008
MC/mcc/ttn
JJ1181-1

Respectfully submitted,
COAST-TO-COAST ANALYTICAL SERVICES, INC.

Marissa Coronel
Laboratory Director

COAST-TO-COAST ANALYTICAL SERVICES

Air, Water & Hazardous Waste Sampling, Analysis & Consultation
Certified Hazardous Waste, Chemistry, Bacteriology & Bioassay Laboratories

San Luis Obispo, CA • Benicia, CA • Camarillo, CA • San Jose, CA • Goleta, CA
Anaheim, CA • Tempe, AZ • Valparaiso, IN • Westbrook, ME • Indianapolis, IN

NorCal Division (San Jose Laboratory)
2059 Junction Ave.

San Jose, CA 95131
(408) 955-9077

QC Batch ID: OIL072893B

CLIENT: Coast-to-Coast Analytical Services, Inc.

Analyzed : 07/29/93
Analyzed by: TN
Method : EPA 8015M

QC SPIKE
REPORT OF ANALYTICAL RESULTS

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED	DATE RECEIVED
QC SPIKE	Aqueous			

CONSTITUENT	*PQL µg/L	SPIKE AMOUNT	RESULT µg/L	%REC	NOTE
TOTAL PETROLEUM HYDROCARBONS					1
Total Petroleum Hydrocarbons (Diesel)	50.	500.	440.	88.	

San Jose Lab Certifications: CAELAP #1204
*RESULTS listed as 'ND' were not detected at or above the listed PQL (Practical Quantitation Limit)
(1) Sample Preparation on 07/28/93 by LLB

08/02/93
ECD2-729C007
MC/mcc/ttn
JJ1181-1

Respectfully submitted,
COAST-TO-COAST ANALYTICAL SERVICES, INC.

Marissa Coronel
Laboratory Director

BLAINE TECH SERVICES INC.

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

CHAIN OF CUSTODY 930722-41

CLIENT PES

SITE Emery Bay Market Place
Christie St
Emeryville

CONDUCT ANALYSIS TO DETECT

C = COMPOSITE ALL CONTAINERS

8015 Diesel & motor oil

LAB Coast to Coast DHS #

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

☐ EPA ☐ RWQCB REGION _____
☐ LIA
☐ OTHER

SPECIAL INSTRUCTIONS
ARCHIVE W19 Sample
pending instructions from
Andrew Briefer

SAMPLE I.D.			MATRIX S = SOIL W = H2O	CONTAINERS TOTAL		hold	ADD'L INFORMATION	STATUS	CONDITION	LAB SAMPLE #
W7	7-22-93	1410	W	1	AMBER LITRE					JJ1181-1
W13		1435		1						2
W14		1530		1						3
A W19		1515		1						6
W20		1320		1						4
W24		1300	W	1						5

SAMPLING COMPLETED — DATE 7/22/93 TIME 1600

SAMPLING PERFORMED BY Jeff Curtis

RESULTS NEEDED NO LATER THAN

RELEASED BY Jeff Curtis	DATE 7/22/93	TIME 0930	RECEIVED BY T. Pitt	DATE 7/23	TIME 930
RELEASED BY T. Pitt	DATE 7/23/93	TIME 11:03	RECEIVED BY Shelli Hoyt	DATE 7-23-93	TIME 1103
RELEASED BY	DATE	TIME	RECEIVED BY	DATE	TIME

SHIPPED VIA	DATE SENT	TIME SENT	COOLER #
			rec'd cold & intact