

# P & D ENVIRONMENTAL

A Division of Paul H. King, Inc.  
4020 Panama Court  
Oakland, CA 94611  
(510) 658-6916

1204/19

March 25, 1998  
Report 0101.R6

Rec'd

6/7/98

Mr. Michael Liu  
Former Merritt Environmental Corporation Facility  
1044 5th Avenue  
Oakland, CA 94606

SUBJECT: GROUNDWATER MONITORING AND SAMPLING REPORT  
Former Merritt Environmental Corporation Facility  
1044 5th Avenue  
Oakland, CA

Dear Mr. Liu:

P&D Environmental, a division of Paul H. King, Inc. (P&D), is pleased to present this report documenting the sampling of one groundwater monitoring well at the subject site. This work was performed in accordance with P&D's proposal 061197.P1 dated June 11, 1997. The well was monitored and sampled on February 27, 1998. The reporting period is for December, 1997 through February, 1998. A Site Location Map is attached with this report as Figure 1, and a Site Vicinity Map is attached as Figure 2.

All work was performed under the direct supervision of an appropriately registered professional. This report is prepared in accordance with guidelines set forth in the document "Tri-Regional Board Staff Recommendations for Preliminary Evaluation and Investigation of Underground Tank Sites" dated August 10, 1990 and "Appendix A - Workplan for Initial Subsurface Investigation" dated August 20, 1991.

## BACKGROUND

The subject site is located in a developed portion of the City of Oakland approximately 3,000 feet to the south of Lake Merritt. The site and surrounding topography are relatively flat.

It is P&D's understanding that the subject facility was previously used by Merritt Environmental Corporation as a storage yard for equipment and materials. Based upon discussions with Mr. Jeff Hammond of Merritt Environmental Corporation, the underground storage tank was installed some time in the 1950's. The underground storage tank was reported to always have contained gasoline. It is P&D's understanding that the tank was most recently pressure tested in October, 1994 and was reported to have passed the pressure test with no indication of leaks.

Use of the tank was reported to have been discontinued at the end of 1994, at which time the tank was reported to have been emptied of its contents. The tank capacity was 1,000 gallons. The fill port for the gasoline tank was located directly above the tank, at the west end of the tank. One vent line was reported to have been connected to the tank, with one dispenser located adjacent and to the south of the tank. The dispenser line and vent line were also reported to have been connected to the tank at the west end of the tank. The tank was located beneath the sidewalk at the facility on 5th Avenue. The former location of the tank pit at the facility is shown in Figure 2.

On September 14, 1995 Merritt Environmental Corporation uncovered one 1,000 gallon capacity gasoline underground storage tank and prepared the tank for removal. However, because of scheduling difficulties, it was necessary to postpone the removal of the tank from the site.

On October 18, 1995 Merritt Environmental Corporation removed the 1,000-gallon capacity gasoline fuel tank from the tank pit at the subject site. The tank was constructed of single wall steel. Groundwater was not encountered in

the tank pit. Two soil samples were collected from beneath the ends of the tank from the bottom of the tank pit. The bottom of the tank was at a depth of approximately eight feet below grade. The samples, designated as T1-10 and T2-10, were collected at a depth of approximately ten feet below grade, approximately two feet into the native material beneath the former ends of the tank. Sample T1-10 was collected from the end of the pit closest to East 11th Street. Groundwater was not encountered in the tank pit.

The laboratory analytical results of soil samples T1-10 and T2-10 showed that TPH-G was detected at concentrations of 130 and 64 parts per millions (ppm), respectively, and that lead was detected at concentrations of 4.4 and 5.5 ppm, respectively. Benzene was only detected in sample T1-10.0 at a concentration of 0.059 ppm. Review of the laboratory analytical reports indicates that the TPH-G results are aged gasoline. Documentation of the sample collection and laboratory reports are presented in P&D's Underground Storage Tank Removal Report 0101.R1 dated January 22, 1996.

In response to a letter from Mr. Barney Chan dated January 4, 1996, P&D prepared a work plan (Work Plan 0101.W1) dated February 5, 1996 for soil and groundwater investigation. The work plan was subsequently approved by Mr. Chan in a letter dated February 5, 1996.

On February 8, 1996, P&D personnel oversaw the drilling of boreholes B1, B2, and B3 by Vironex of Foster City, California. The locations of boreholes B1, B2, and B3 are shown in Figure 2.

Groundwater was initially encountered in boreholes B1, B2, and B3 during drilling at depths of approximately 13, 16, and 16.5 feet, below the ground surface, respectively. Approximately 10 to 15 minutes after completion of borehole drilling in each borehole, and immediately prior to groundwater grab sample collection, groundwater levels were subsequently recorded to have stabilized in boreholes B1, B2, and B3 at depths of 7.5, 7.7, and 8.6 feet below the ground surface, respectively.

The laboratory analytical results of the soil sample collected from borehole B2 show that TPH-G and BTEX were not detected. In boreholes B1, and B3, TPH-G was detected at concentrations of 2,300, and 12 ppm, respectively, and benzene was detected at concentrations of 7.1, and 0.036 ppm, respectively. Review of the laboratory analytical report indicates that the TPH-G results are aged gasoline.

The laboratory analytical results of the groundwater grab sample collected from borehole B2 show that TPH-G and BTEX were not detected. In boreholes B1, and B3, TPH-G was detected at concentrations of 63, and 60 ppm, respectively; and benzene was detected at concentrations of 1.7, and 1.8 ppm, respectively.

Documentation of the sample collection procedures and laboratory analytical results for boreholes B1 through B3 are presented in P&D's Subsurface Investigation Report 0101.R2 dated February 21, 1996. Based upon the sample results, P&D recommended that groundwater grab samples be collected from four boreholes designated as B4 through B7 located to the south and northwest of the subject site to define the extent of petroleum hydrocarbons detected in borings B1 and B3. Provisions were presented to expand the extent of the investigation in the event that petroleum hydrocarbons were encountered in these proposed boreholes. The recommendations were subsequently approved by Mr. Barney Chan of the ACDEH in a letter dated February 22, 1996.

On February 27, 1996, P&D personnel oversaw the drilling of boreholes B4, through B9 by Vironex of Foster City, California. The locations of boreholes B4 through B9 are shown in Figure 2.

Groundwater was initially encountered during drilling in boreholes B5 through B8 at a depth of approximately 15 feet below grade, groundwater levels had risen to approximately 8 to 9 feet below grade within 5 to 15 minutes of borehole drilling completion (with the exception of borehole B7, where groundwater was measured at a depth of approximately 3.3 feet below grade). Similar conditions were observed during the previous investigation in boreholes B1 through B3. In borehole B4, groundwater was not initially encountered during drilling, but was measured at a depth of approximately 7.7 feet below grade approximately 10 to 15 minutes after completion of drilling. In borehole B9, groundwater was initially encountered during drilling at a depth of approximately 12 feet below grade, and was measured at a depth of approximately 11.0 feet below grade approximately 10 to 15 minutes after completion of drilling.

The laboratory analytical results of the soil samples collected from the boreholes show that TPH-G and BTEX were not detected, with the exception of borehole B5 at a depth of 10 feet, where TPH-G was detected at a concentration of 27 ppm, and toluene, ethylbenzene and xylenes were detected at concentrations of 0.035, 0.22 and 0.60 ppm, respectively. Review of the laboratory analytical report indicates that the TPH-G results are interpreted as aged gasoline.

The laboratory analytical results of the groundwater grab samples collected from boreholes B6 through B8 show that TPH-G and BTEX were not detected. In boreholes B4, B5 and B9, TPH-G was detected at concentrations of 1.9, 1.3 and 1.8 ppm, respectively; and benzene was detected at concentrations of 0.62, 1.3 and 0.84 ppm, respectively. Review of the laboratory analytical report indicates that the TPH-G results are interpreted as aged gasoline.

Documentation of the sample collection procedures and laboratory analytical results for boreholes B4 through B9 are presented in P&D's Subsurface Investigation Report 0101.R3 dated March 13, 1996. Based upon the sample results and discussions with Mr. Barney Chan, P&D recommended in the March 13, 1996 report that one groundwater monitoring well be installed adjacent to the office building at the subject site between the office building and the former tank pit to evaluate potential risk to sensitive receptors. The recommendations were subsequently approved by Mr. Barney Chan of the ACDEH in a letter dated July 3, 1997.

On July 21, 1997 P&D personnel oversaw the installation of one groundwater monitoring well, designated as MW1 at the subject site. The location of the monitoring well is shown on the attached Site Vicinity Map, Figure 2. Documentation of the well installation is provided in P&D's Monitoring Well Installation Report 0101.R4 dated July 30, 1997.

#### FIELD ACTIVITIES

On February 27, 1998 well MW1 was monitored for depth to water and the presence of free product and sheen by P&D personnel. The depth to water was measured to the nearest 0.01 foot using an electric water level indicator. The presence of free product and sheen was evaluated using a transparent bailer. No free product or sheen were observed in the well. The depth to water level measurement is summarized in Table 1.

After the well had been monitored, the well was purged of a minimum of three casing volumes of water. During purging operations, the field parameters of pH, electrical conductivity and temperature were monitored. Once the field parameters had been observed to stabilize and a minimum of three casing volumes had been purged, a groundwater sample was collected from the well using a Teflon bailer. The bailer was cleaned using an Alconox solution and clean water rinse prior to use. A copy of the data sheet used to record the field parameters during well purging is attached with this report.

The groundwater sample was transferred from the bailer to 40 milliliter Volatile Organic Analysis (VOA) vials which were sealed with Teflon-lined screw caps. The VOA vials were overturned and tapped to assure that no air bubbles were present. The sample bottles were then labeled and placed into a cooler with ice pending delivery to McCampbell Analytical, Inc. in Pacheco, California. McCampbell Analytical, Inc. is a State-certified hazardous waste testing laboratory. Chain of custody procedures were observed for all sample handling.

#### HYDROGEOLOGY

Water levels were measured in the monitoring well once during the quarter. The measured depth to water at the site in well MW1 on February 27, 1998 was 8.23 feet. The groundwater level in well MW1 has increased by 3.82 feet since the previous monitoring on November 6, 1997.

The site groundwater flow direction is unknown. However, based upon site vicinity topography, the groundwater flow direction has been inferred to be southerly or westerly, towards the channel separating Oakland from Alameda. The channel is connected to San Francisco Bay, and is tidally influenced. The groundwater flow direction and gradient at the site may be tidally influenced.

Groundwater monitoring data collected on February 27, 1998 are presented in Table 1.

#### LABORATORY ANALYTICAL RESULTS

The groundwater sample collected from groundwater monitoring well MW1 was analyzed for TPH-G using EPA Method 5030 in conjunction with Modified EPA Method 8015 (GC/FID), and for BTEX and MTBE using EPA Method 8020.

The laboratory analytical results of the groundwater sample collected from well MW1 show that TPH-G, and benzene were detected at concentrations of 0.094, and 0.00057, ppm, respectively. MTBE was not detected.

Since the previous quarter, TPH-G and benzene concentrations have decreased in well MW1. The laboratory analytical results of the groundwater sample are summarized in Table 2. Copies of the laboratory analytical report and chain of custody documentation are attached with this report.

#### DISCUSSION AND RECOMMENDATIONS

Based upon the sample results, P&D recommends that the monitoring program be continued for one additional quarter.

#### DISTRIBUTION

Copies of this report should be sent to Mr. Barney Chan at the ACDEH and to Mr. Kevin Graves at the San Francisco Bay Regional Water Quality Control Board.

#### LIMITATIONS

This report was prepared solely for the use of Mr. Michael Liu. The content and conclusions provided by P&D in this assessment are based on information collected during our investigation, which may include, but not be limited to, visual site inspections; interviews with site owner, regulatory agencies and other pertinent individuals; review of available public documents; subsurface exploration and our professional judgement based on said information at the time of preparation of this document. Any subsurface sample results and observations presented herein are considered to be representative of the area of investigation; however, geological conditions may vary between borings and may

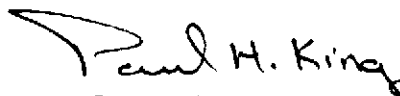
not necessarily apply to the general site as a whole. If future subsurface or other conditions are revealed which vary from these findings, the newly-revealed conditions must be evaluated and may invalidate the findings of this report.

This report is issued with the understanding that it is the responsibility of the owner, or his representative, to ensure that the information contained herein is brought to the attention of the appropriate regulatory agencies, where required by law. Additionally, it is the sole responsibility of the owner to properly dispose of any hazardous materials or hazardous wastes left onsite, in accordance with existing laws and regulations.

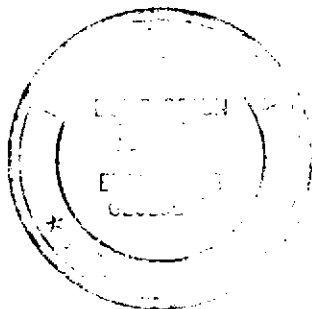
This report has been prepared in accordance with generally accepted practices using standards of care and diligence normally practiced by recognized consulting firms performing services of a similar nature. P&D is not responsible for the accuracy or completeness of information provided by other individuals or entities which is used in this report. This report presents our professional judgement based upon data and findings identified in this report and interpretation of such data based upon our experience and background, and no warranty, either express or implied, is made. The conclusions presented are based upon the current regulatory climate and may require revision if future regulatory changes occur.

Should you have any questions, please do not hesitate to contact us at (510) 658-6916.

Sincerely,  
P&D Environmental



Paul H. King  
Hydrogeologist



Don R. Braun  
Certified Engineering Geologist  
Registration No.: 1310  
Expires: 6/30/90

Attachments: Tables 1 & 2  
Site Location Map - Figure 1  
Site Vicinity Map - Figure 2  
Well Sampling Purge Data Sheet  
Laboratory Analytical Report  
Chain of Custody Documentation

TABLE 1  
WELL MONITORING DATA

Well No.	Date Monitored	Top of Casing Elev. (ft.)	Depth to Water (ft.)	Water Table Elev. (ft.)
MW1	02/27/98	Not Surveyed	8.23	Not Calculated
	11/06/97		12.05	
	07/24/97		11.55	
	07/23/97*		11.54	

NOTES:

Elev. = Elevation.

ft. = Feet.

\* = Indicates prior to well development.

TABLE 2  
GROUNDWATER  
LABORATORY ANALYTICAL RESULTS

Sample Location	TPH-G	MTBE	Benzene	Toluene	Ethyl-benzene	Total Xylenes
Sample Collected on February 27, 1998						
MW1	0.094	ND	0.00057	ND	0.0045	0.0036
Sample Collected on November 6, 1997						
MW1	0.14	ND	0.0011	ND	0.0045	0.0025
Sample Collected on February 27, 1998						
MW1	0.50	ND	0.0037	ND	0.0031	0.023

NOTES:

TPH-G = Total Petroleum Hydrocarbons as Gasoline.

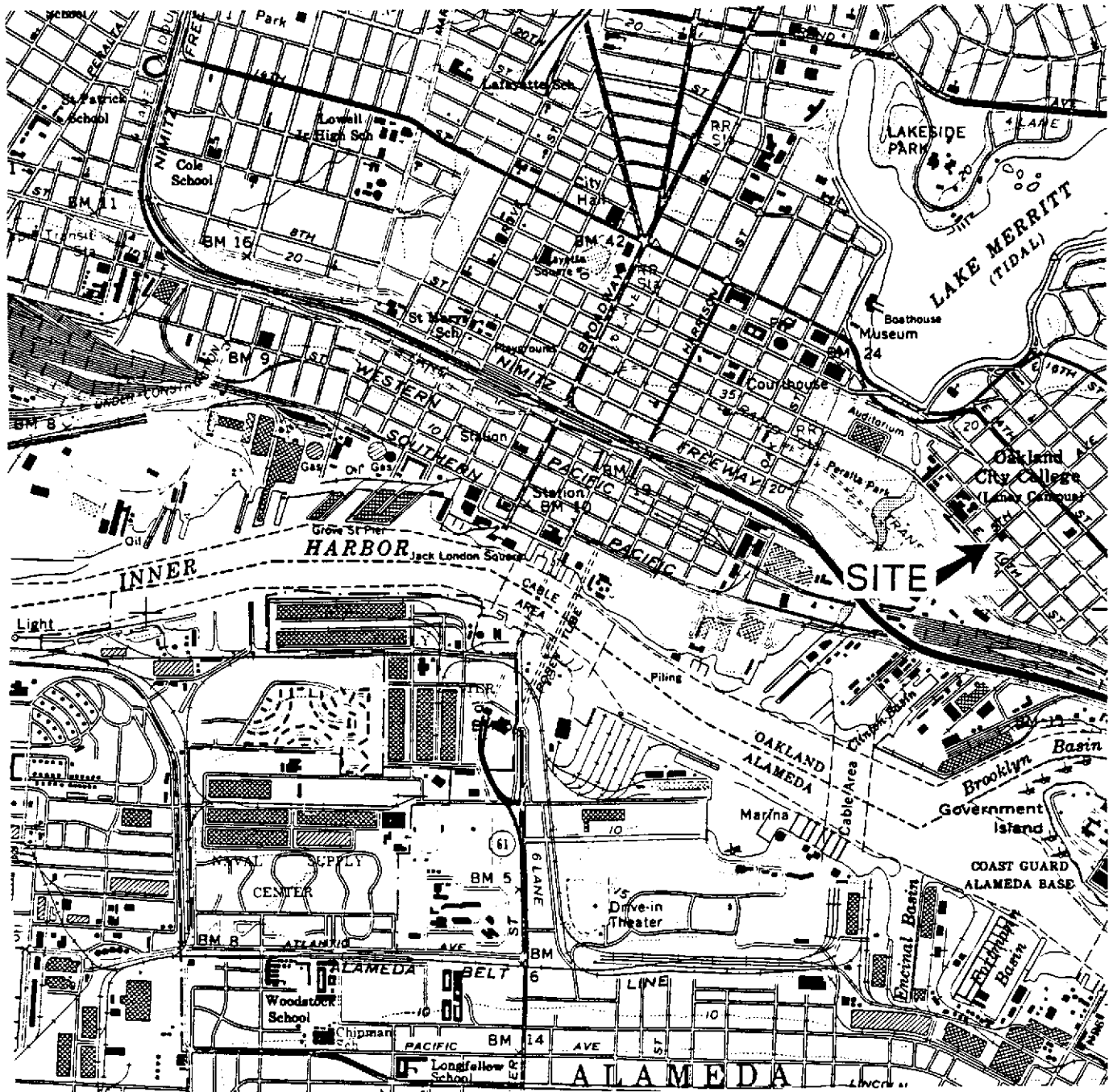
MTBE = Methyl tert-Butyl Ether.

ND = Not Detected.

Results are in parts per million (ppm), unless otherwise specified.

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Base Map From:  
 U.S. Geological Survey  
 Oakland West, Calif.  
 7.5 Minute Quadrangle  
 Photorevised, 1980

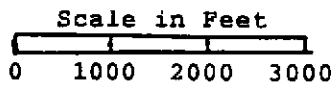
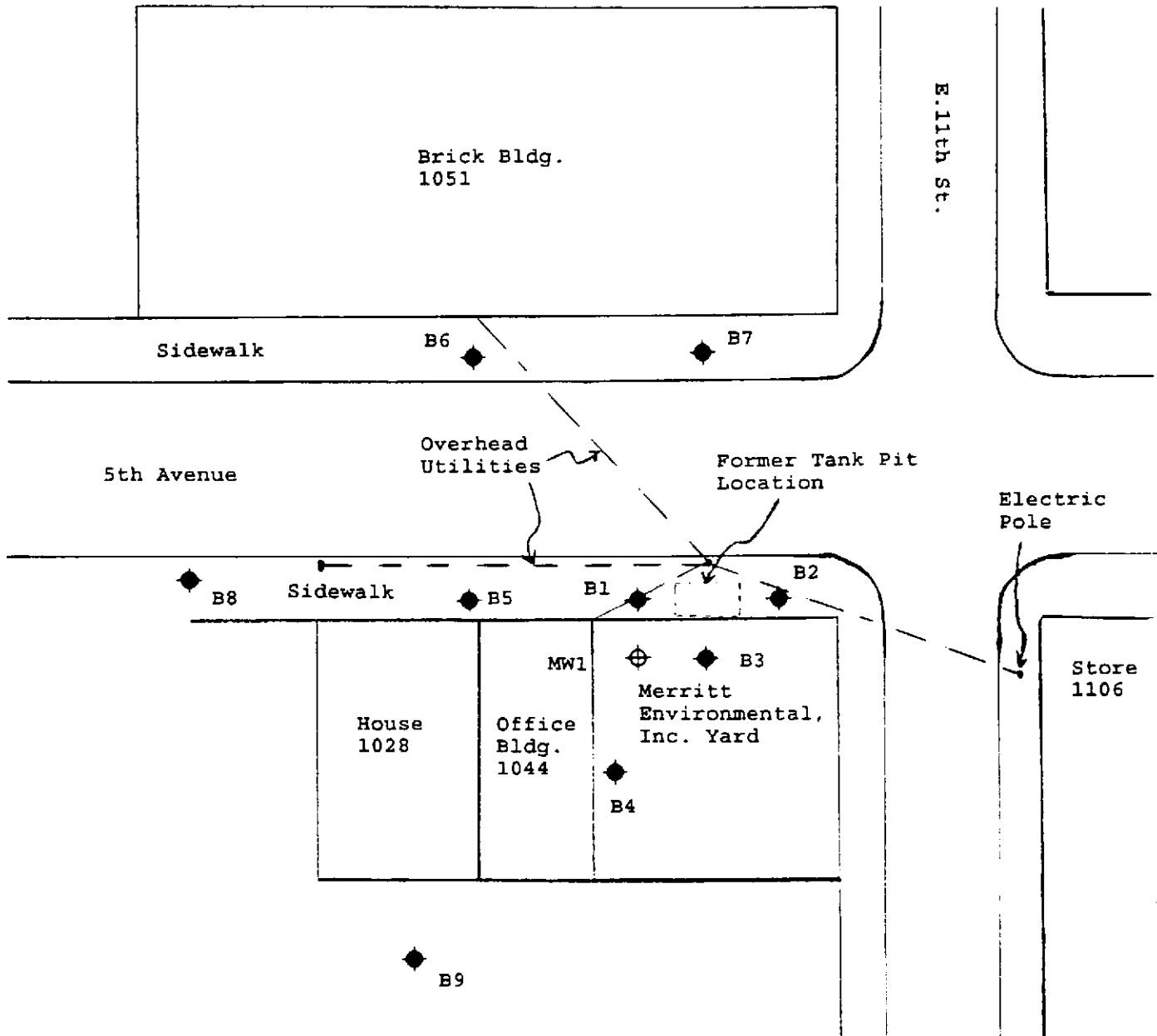


Figure 1  
**SITE LOCATION MAP**  
 Merritt Environmental, Inc.  
 1044 5th Avenue  
 Oakland, California



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### LEGEND

- ◆ Existing Soil Boring Location
- ⊕ Existing Groundwater Monitoring Well Location

North



0 40  
Scale in Feet

Base Map From  
P&D Environmental  
October, 1995

Figure 2  
**SITE VICINITY MAP**  
Merritt Environmental  
Corporation Facility  
1044 5th Avenue  
Oakland, California





McCAMPBELL ANALYTICAL INC.

110 Second Avenue South, #D7, Pacheco, CA 94553  
 Telephone : 510-798-1620 Fax : 510-798-1622  
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P&D Environmental 4020 Panama Court Oakland, CA 94611	Client Project ID: #0101; Michael Lin Site	Date Sampled: 02/27/98
	Client Contact: Paul King	Date Received: 02/27/98
	Client P.O:	Date Extracted: 02/27/98
		Date Analyzed: 02/27/98

**Gasoline Range (C6-C12) Volatile Hydrocarbons as Gasoline\*, with Methyl tert-Butyl Ether\* & BTEX\***

EPA methods 5030, modified 8015, and 8020 or 602; California RWQCB (SF Bay Region) method GC/FID(5030)

Lab ID	Client ID	Matrix	TPH(g) <sup>+</sup>	MTBE	Benzene	Toluene	Ethylbenzene	Xylenes	% Recovery Surrogate
86235	MW1	W	94,a	ND	0.57	ND	4.5	3.6	105
Reporting Limit unless otherwise stated; ND means not detected above the reporting limit	W		50 ug/L	5.0	0.5	0.5	0.5	0.5	
	S		1.0 mg/kg	0.05	0.005	0.005	0.005	0.005	

\* water and vapor samples are reported in ug/L, wipe samples in ug/wipe, soil and sludge samples in mg/kg, and all TCLP and SPLP extracts in ug/L

\* cluttered chromatogram; sample peak coelutes with surrogate peak

The following descriptions of the TPH chromatogram are cursory in nature and McCampbell Analytical is not responsible for their interpretation: a) unmodified or weakly modified gasoline is significant; b) heavier gasoline range compounds are significant(aged gasoline?); c) lighter gasoline range compounds (the most mobile fraction) are significant; d) gasoline range compounds having broad chromatographic peaks are significant; biologically altered gasoline?; e) TPH pattern that does not appear to be derived from gasoline (?); f) one to a few isolated peaks present; g) strongly aged gasoline or diesel range compounds are significant; h) lighter than water immiscible sheen is present; i) liquid sample that contains greater than ~5 vol. % sediment; j) no recognizable pattern.

## QC REPORT FOR HYDROCARBON ANALYSES

Date: 02/27/98

Matrix: WATER

Analyte	Concentration (mg/L)			Amount Spiked	% Recovery		
	Sample (#86133)	MS	MSD		MS	MSD	RPD
TPH (gas)	0.0	100.6	98.4	100.0	100.6	98.4	2.2
Benzene	0.0	10.1	9.7	10.0	101.0	97.0	4.0
Toluene	0.0	10.5	10.1	10.0	105.0	101.0	3.9
Ethyl Benzene	0.0	10.3	10.0	10.0	103.0	100.0	3.0
Xylenes	0.0	32.1	30.5	30.0	107.0	101.7	5.1
TPH(diesel)	0	136	142	150	90	95	4.5
TRPH (oil & grease)	0	20800	20800	23700	88	88	0.0

$$\% \text{ Rec.} = (\text{MS} - \text{Sample}) / \text{amount spiked} \times 100$$

$$\text{RPD} = (\text{MS} - \text{MSD}) / (\text{MS} + \text{MSD}) \times 2 \times 100$$

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10584xpd255.doc

## CHAIN OF CUSTODY RECORD

PROJECT NUMBER: 0101		PROJECT NAME: Michael Liu Site			NUMBER OF CONTAINERS 2	ANALYSIS(ES): PPH-Cu, Pb, STEV, MTR, E	PRESERVATIVE ICE	REMARKS Normal Turn Around  86235
SAMPLED BY: (PRINTED AND SIGNATURE) Paul W. King Paul W. King								
SAMPLE NUMBER	DATE	TIME	TYPE	SAMPLE LOCATION				
MW1	2/27/88		water					
ICE <input checked="" type="checkbox"/> PRESERVATION <input checked="" type="checkbox"/> GOOD CONDITION <input checked="" type="checkbox"/> APPROPRIATE <input checked="" type="checkbox"/> HEAD SPACE ABSENT <input checked="" type="checkbox"/> CONTAINERS <input checked="" type="checkbox"/>					VOAS <input checked="" type="checkbox"/> O&G METALS <input checked="" type="checkbox"/> OTHER <input type="checkbox"/>			
RELINQUISHED BY: (SIGNATURE) Paul W. King		DATE 2-27	TIME 3:25	RECEIVED BY: (SIGNATURE) Butts		TOTAL NO. OF SAMPLES (THIS SHIPMENT) 1	LABORATORY: Mc Campbell Analytical	
RELINQUISHED BY: (SIGNATURE) Butts 819		DATE 2-27	TIME 4:20	RECEIVED BY: (SIGNATURE) Nina Pina		TOTAL NO. OF CONTAINERS (THIS SHIPMENT) 2	LABORATORY CONTACT: Ed Hamilton	
RELINQUISHED BY: (SIGNATURE)		DATE	TIME	RECEIVED FOR LABORATORY BY: (SIGNATURE)		LABORATORY PHONE NUMBER: (510) 798-1620		
					SAMPLE ANALYSIS REQUEST SHEET ATTACHED: ( ) YES (X) NO			
REMARKS: VOAs preserved with HCl								

H