



A Report Prepared For:

Pacific Electric Motor Company
1009 66th Avenue
Oakland, California 94601

Attention: Mr. Rand Perry

**QUARTERLY MONITORING REPORT
PACIFIC ELECTRIC MOTOR COMPANY
1009 66TH AVENUE
OAKLAND, CALIFORNIA**

JANUARY 13, 1998

By:

A handwritten signature in cursive script that reads "William W. Mast".

William W. Mast, R.G.
Senior Engineer

A handwritten signature in cursive script that reads "William F. Frizzell".

William F. Frizzell, P.E.
Principal Engineer

618.0101.001

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1.0 INTRODUCTION

This report presents the results of quarterly groundwater monitoring performed by PES Environmental, Inc. (PES) during the fourth quarter of 1997 at Pacific Electric Motor Company (Site) in Oakland, California (Plate 1). The current groundwater monitoring program consists of measuring the depth to groundwater in three onsite monitoring wells, and purging and sampling the monitoring wells (Wells MW-1, MW-2, and MW-3) on a quarterly basis.

The purpose of the groundwater monitoring program is to: (1) evaluate the presence of petroleum hydrocarbons in groundwater; and (2) monitor water-level variations at the site. The quarterly monitoring program was performed in accordance with the sampling program specified in the Alameda County Environmental Health Services (ACEHS) letter *Soil and Groundwater Investigation for Pacific Electric Motor Co., 1009-66th Ave., Oakland, CA 94601*, dated August 19, 1997 and the procedures outlined in the *Proposal, Groundwater Sampling and Risk Evaluation, Pacific Electric Motor Company, Oakland, California* dated September 8, 1996 prepared by PES (PES, 1997).

2.0 BACKGROUND INFORMATION

The site is located in a residential and light industrial area in Oakland, California and is presently used to repair large electric motors. PEM formerly operated a 2,000-gallon steel gasoline underground storage tank (UST) on the east side of the warehouse building (Plate 2). The tank was reportedly installed in approximately 1975 (ENVIRON, 1997). In February 1995, the UST was removed by W.A. Craig, Inc. (WAC). Observations at the time of removal indicated that the tank was in good condition and no holes were evident. However, free-phase gasoline product was observed on the water surface in the tank excavation. Soil samples collected from the UST excavation and associated piping trenches detected total petroleum hydrocarbons as gasoline (TPH-g) at concentrations up to 10,000 milligrams per kilogram.

In April 1995, WAC performed a soil investigation consisting of nine soil borings to delineate the lateral and vertical extent of the petroleum hydrocarbons in soil. On the basis of the results of the soil investigation, WAC prepared and implemented a remediation program to remove soil affected by petroleum hydrocarbons. Approximately 1,500 cubic yards of soil were excavated and stockpiled onsite, and 116,000 gallons of petroleum hydrocarbon-affected water were pumped from the excavation and disposed. A dewatering sump installed by WAC during soil excavation was later converted to groundwater monitoring well WAC-1 (Plate 2). WAC summarized the results of their remediation program in a report entitled *Excavation and Sampling Report*, dated May 12, 1997.

ENVIRON, Inc. (ENVIRON) installed and sampled three shallow monitoring wells (MW-1, MW-2, MW-3) in June 1997 to evaluate groundwater conditions in the vicinity of the former UST. Well completion details are summarized in Table 1. The well installation program and associated soil and groundwater sampling program was summarized in the ENVIRON report *Soil and Ground Water Investigation, Summary Report, Pacific Electric Motor Co., 1009-66th Avenue, Oakland, California*, dated July 17, 1997. ENVIRON concluded that the remediation performed had successfully removed the source of the petroleum hydrocarbons (i.e., the former UST), and that residual concentrations of petroleum hydrocarbons in soil and groundwater were present only in the immediate vicinity of the former UST.

3.0 WATER-LEVEL MEASUREMENTS

Water levels in three onsite groundwater monitoring wells (Wells MW-1, MW-2, and MW-3) were measured by Blaine Tech Services, Inc. (Blaine Tech) of San Jose, California, under the direct supervision of PES, prior to sampling on December 16, 1997. Because of its uncertain construction, ACEHS stated that no further monitoring of Well WAC-1 is required (ACEHS, 1997). Depth-to-water in the monitoring wells was measured from the top-of-casing (TOC) reference benchmark to a precision of 0.01-feet using an electronic water-level indicator/interface probe. Depth-to-water measurements were converted to water-level elevations by subtracting the depth to water from the TOC elevation referenced to a site datum established by ENVIRON (ENVIRON, 1997). Free product was not observed in any of the monitoring wells.

To prevent cross-contamination between wells, the portion of the water-level indicator that was submerged in the well was cleaned between well measurements using a phosphate-free detergent/deionized water solution and double rinsed with deionized water.

4.0 GROUNDWATER SAMPLING

Groundwater samples were collected from Wells MW-1, MW-2, and MW-3 on December 16, 1997, by Blaine Tech under the direct supervision of PES. For the reasons described above, no samples were collected from Well WAC-1. Prior to well purging and groundwater sampling, Blaine Tech personnel measured dissolved oxygen in water in the well casing. This method of measurement disturbs the groundwater in the well casing minimally and provides the closest approximation to dissolved oxygen content in the adjacent aquifer. Groundwater samples were collected from each well after removing approximately three well volumes of water. At Wells MW-1 and MW-2, a positive displacement pump was used to purge the wells. Because of equipment difficulties, a disposable bailer was used to purge water from Well MW-3. During well purging, the discharged water was monitored for pH, temperature, electrical conductivity, turbidity, and oxidation-reduction potential.

Following purging, samples were collected from the wells using a stainless steel or teflon disposable bailer and transferred to the appropriate laboratory sample containers. The sample containers were filled slowly to minimize sample volatilization and to ensure that the sample was free of air bubbles. The samples were labeled to designate sample number, time and date collected, and analysis required. The samples were immediately placed in a chilled, thermally-insulated cooler. To prevent cross-contamination between wells, the pump and stainless steel bailer were decontaminated using a high pressure steam cleaner prior to initial use and after sampling at each well. Sampling procedures are documented in the groundwater sampling report prepared by Blaine Tech and included in Appendix A.

Groundwater samples were transported under chain-of-custody protocol to state-certified laboratories. Superior Analytical Laboratory analyzed samples for: total petroleum hydrocarbons as gasoline (TPH-g) using EPA Test Method 8015 modified; benzene, toluene, ethylbenzene, and total xylenes (BTEX) using EPA Test Method 8020, and; nitrate as nitrogen and sulfate using SM 4500. Environmental Technical Services of Petaluma, California analyzed the samples for ferrous iron using SMEWW 3500-Fe D. As noted above, dissolved oxygen and oxidation reduction potential were measured by Blaine Tech in the field. The laboratory reports and chain-of-custody records are included in Appendix B.

5.0 DISCUSSION OF MONITORING RESULTS

This section presents a summary of water-level measurements and groundwater analyses results from the December 1997 sampling event.

5.1 Water-Level Measurements

Depth-to-water measurements for December 1997, ranged from 3.42 feet (MW-1) to 5.52 feet (MW-3) below the TOC. Groundwater water-level elevations ranged from 94.41 feet (MW-3) to 97.25 feet (MW-1) referenced to site datum established by ENVIRON (ENVIRON, 1997). Depth-to-water measurements and calculated water-level elevations since installation of the monitoring wells in June 1997 and for the current period are presented in Table 2.

Plate 3 presents water-level elevation contours developed from water levels measured on December 16, 1997. The contoured water-level elevations indicate that groundwater flow is generally to the west. This flow direction has shifted slightly from previous water-level elevation results that indicated a southwest flow direction. The groundwater gradient is approximately 0.018 foot per foot (ft/ft).

5.2 Groundwater Chemistry

A summary of laboratory chemical analyses for petroleum hydrocarbons since well installation in June 1997 and for the current period is presented in Table 3. The results of field and laboratory chemical analysis of the inorganic constituents are presented in Table 4. Field

analytical results of dissolved oxygen and oxidation-reduction potential are presented in the Blaine Tech report (Appendix A). The analytical laboratory reports and chain-of-custody forms are presented in Appendix B.

Several petroleum hydrocarbon compounds were detected at low concentrations in the groundwater sample from Well MW-1, although TPH-g was not detected. Benzene, ethylbenzene, and xylenes were detected at concentrations of 1.3, 0.6, and 0.7 micrograms per liter ($\mu\text{g/L}$). These concentrations are significantly lower than concentrations observed during the June and September 1997 groundwater monitoring events and may possibly be explained by the variations of water-level elevations and flow direction since the last monitoring period.

Data collected during the next groundwater sampling event, scheduled for March 1998, will allow further evaluation of groundwater conditions at Well MW-1. No petroleum hydrocarbon compounds were detected in the groundwater samples from Wells MW-2 and MW-3; the absence of petroleum hydrocarbon compounds in these wells is consistent with results for June and September 1997.

The results of the inorganic analyses indicate that intrinsic (naturally occurring) biodegradation may have declined slightly in the vicinity of the former UST. Higher water levels across the site and increased dissolved oxygen levels indicate infiltration of rainwater containing elevated concentrations of dissolved oxygen. In general, these changes are greater at Well MW-1 than at Wells MW-2 and MW-3. Additional data collected during future quarterly groundwater monitoring events will likely show that as water levels decline after the rainy season, microbial activity and intrinsic biodegradation, as seen in the sulfate reduction and denitrification, will increase resulting in continued decreases in concentrations of petroleum hydrocarbons.

6.0 REFERENCES

- Alameda County Environmental Health Services (ACEHS), 1997. *Soil and Groundwater Investigation for Pacific Electric Motor Co., 1009-66th Ave., Oakland, CA 94601*. August 19.
- ENVIRON Corporation, 1997. *Soil and Groundwater Investigation, Summary Report, Pacific Electric Motor Co., 1009-66th avenue, Oakland, California*. July 17.
- PES Environmental, Inc. (PES), 1997. *Proposal, Quarterly Groundwater Sampling and Risk Evaluation, Pacific Electric Motor Company, Oakland, California*. September 8.

**Table 1. Monitoring Well Completion Details
Pacific Electric Motor Company
1009 66th Avenue
Oakland, California**

Well Number	Date Installed	Installed By	TOC Elevation (feet*)	Boring Diameter (inches)	Casing Diameter (inches)	Total Depth Boring (feet bgs)	Total Depth of Casing (feet bgs)	Screened Interval Depth (feet bgs)	
								Top	Bottom
MW-1	6/10/97	ENVIRON	101.04	8	2	26.5	25.5	5	25
MW-2	6/10/97	ENVIRON	100.12	8	2	25.5	25.5	5	25
MW-3	6/10/97	ENVIRON	100.23	8	2	25.5	25.5	5	25

Notes:

* = Site datum.

bgs = Below ground surface.

Reference: ENVIRON, 1997.

**Table 2. Water-Level Elevation Data
Quarterly Monitoring Program
Pacific Electric Motor Company
1009 66th Avenue, Oakland, California**

Well Number	Date	Measured By	Top of Casing Elevation (feet above assumed datum)	Depth to Water (feet BTOC)	Water-level Elevation (feet above assumed datum)
MW-1	6/19/97	ENVIRON	100.67	5.87	94.80
	7/1/97	ENVIRON	100.67	5.88	94.79
	9/29/97	PES	100.67	6.45	94.22
	12/16/97	PES	100.67	3.42	97.25
MW-2	6/19/97	ENVIRON	99.85	5.30	94.55
	7/1/97	ENVIRON	99.85	5.37	94.48
	9/29/97	PES	99.85	6.05	93.80
	12/16/97	PES	99.85	3.81	96.04
MW-3	6/19/97	ENVIRON	99.93	5.50	94.43
	7/1/97	ENVIRON	99.93	5.52	94.41
	9/29/97	PES	99.93	6.16	93.77
	12/16/97	PES	99.93	5.52	94.41

Notes:

Site datum established by ENVIRON (1997).

BTOC = Below top of casing.

**Table 3. Analytical Results for Groundwater Samples - Organics
 Quarterly Monitoring Program
 Pacific Electric Motor Company
 1009 66th Avenue, Oakland, California**

Sample Location	Date Sampled	Sampled By	TPH-g (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethyl-benzene (µg/L)	Xylenes (µg/L)	MTBE (µg/L)
MW-1	6/19/97	ENVIRON	18,000	3,300	200	1,100	4,900	<250
	9/29/97	PES	29,000	4,800	<25	2,000	3,500	<250
	12/16/97	PES	<50	1.3	<0.5	0.6	0.7	<5
MW-2	6/19/97	ENVIRON	<50	<0.5	<0.5	<0.5	<0.5	<5.0
	9/29/97	PES	<50	<0.5	<0.5	<0.5	<0.5	<5
	12/16/97	PES	<50	<0.5	<0.5	<0.5	<0.5	<5
MW-3	6/19/97	ENVIRON	<50	<0.5	<0.5	<0.5	<0.5	<5.0
	9/29/97	PES	<50	<0.5	<0.5	<0.5	<0.5	<5
	12/16/97	PES	<50	<0.5	<0.5	<0.5	<0.5	<5

Notes:

TPH-g = Total petroleum hydrocarbons as gasoline (EPA 8015M).

MTBE = Methyl tert-butyl ether (EPA 8021).

µg/L = Micrograms per liter.

< = Not detected at or above the laboratory reporting limit indicated.

Table 4. Analytical Results for Groundwater Samples - Inorganics
Quarterly Monitoring Program
Pacific Electric Motor Company
1009 66th Avenue, Oakland, California

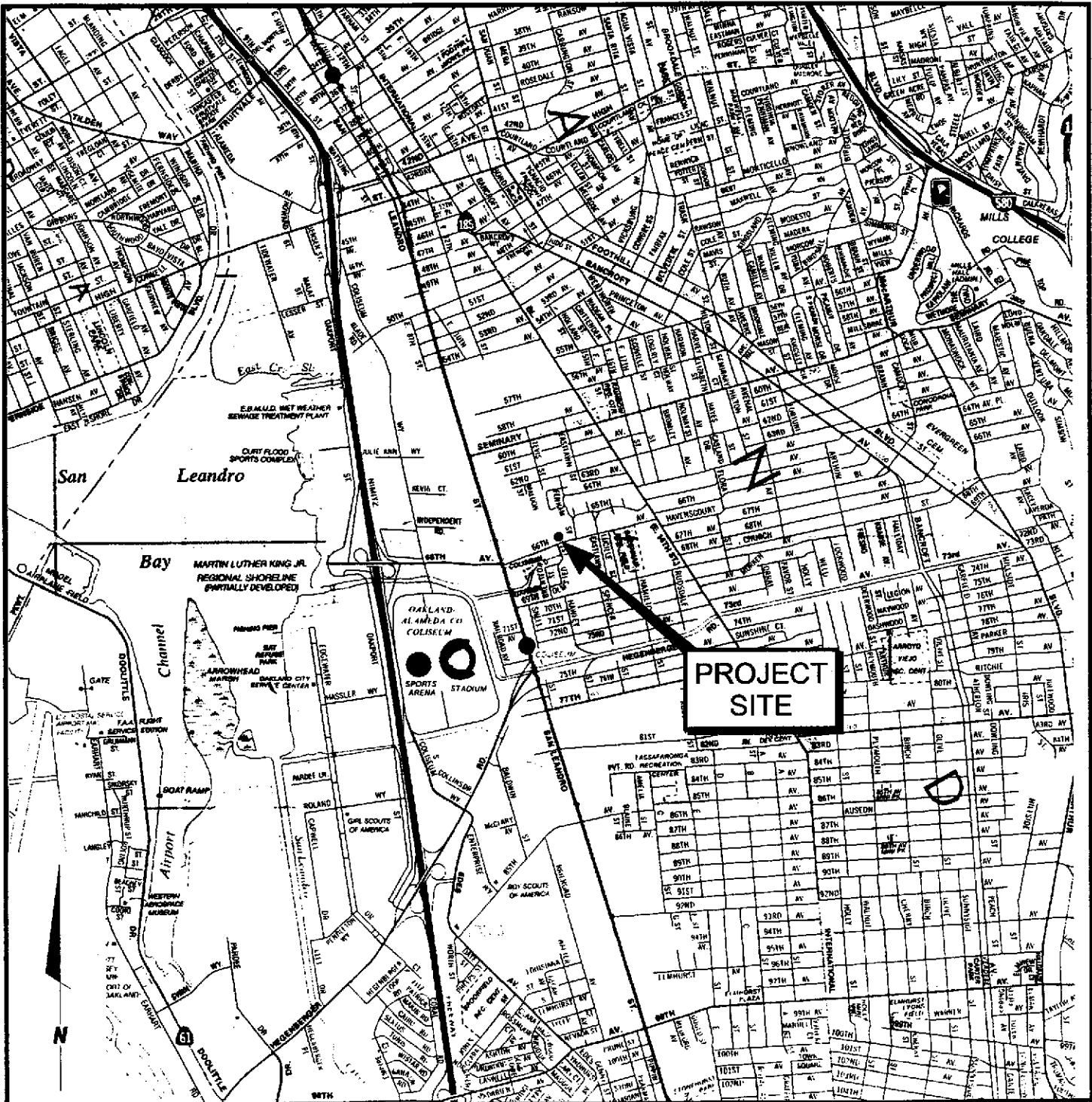
Sample Location	Date Sampled	Sampled By	Dissolved Oxygen (mg/L)	Ox-Redux Potential (mV)	Sulfate (mg/L)	Nitrate (mg/L)	Ferrous Iron (mg/L)
MW-1	9/29/97	PES	0.4	-86	12	0.15	3.61
	12/16/97	PES	1.8	75	35	1.85	0.53
MW-2	9/29/97	PES	0.5	68	100	0.22	0.20
	12/16/97	PES	1.45	121	86.5	0.2	0.16
MW-3	9/29/97	PES	0.4	73	290	2.9	0.14
	12/16/97	PES	0.7	131	274	3.75	0.24

Notes:

mg/L = Milligrams per liter.

mV = Millivolts.

Ox-Redux = Oxydation-reduction potential.



Scale in Feet

Oakland Map, California State Automobile Association, 1997.



PES Environmental, Inc.
Engineering & Environmental Services

Site Location Map
Pacific Electric Motor Company
1009 66th Avenue
Oakland, California

PLATE

1

618.0101.001

61801_V1.CDR

WWM

1/98

JOB NUMBER

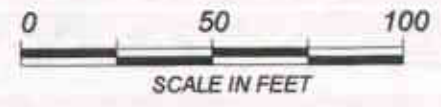
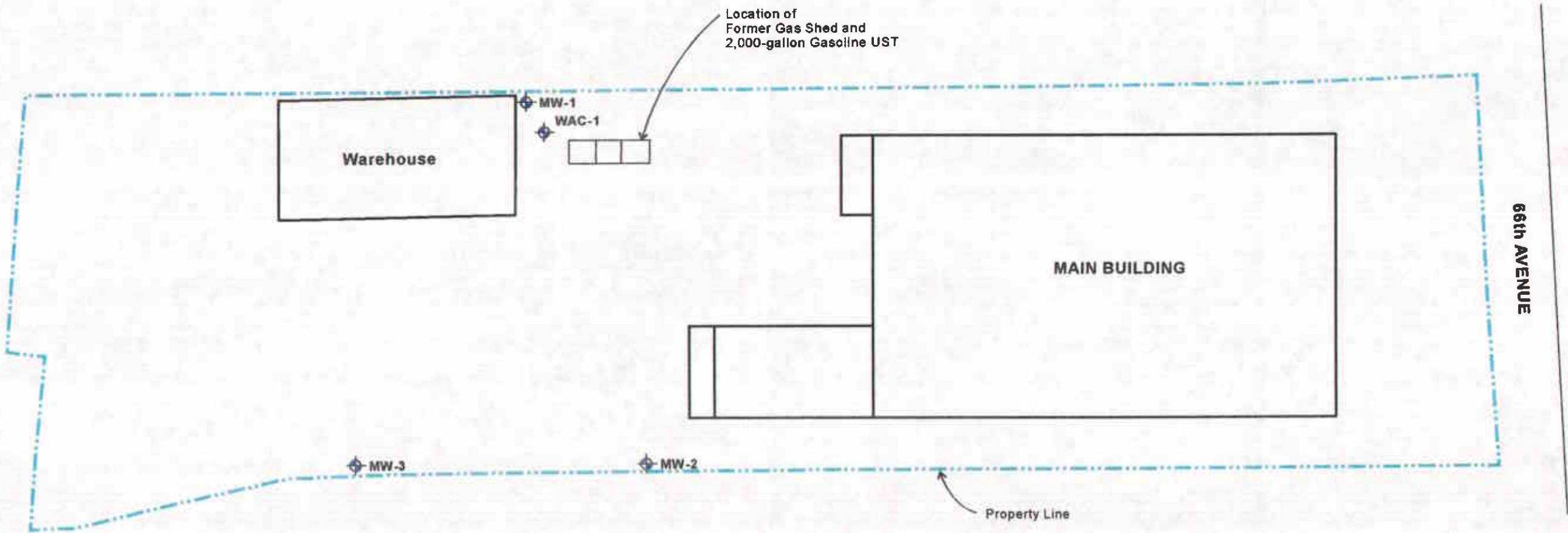
DRAWING NUMBER

REVIEWED BY

DATE



Explanation

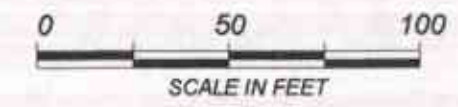
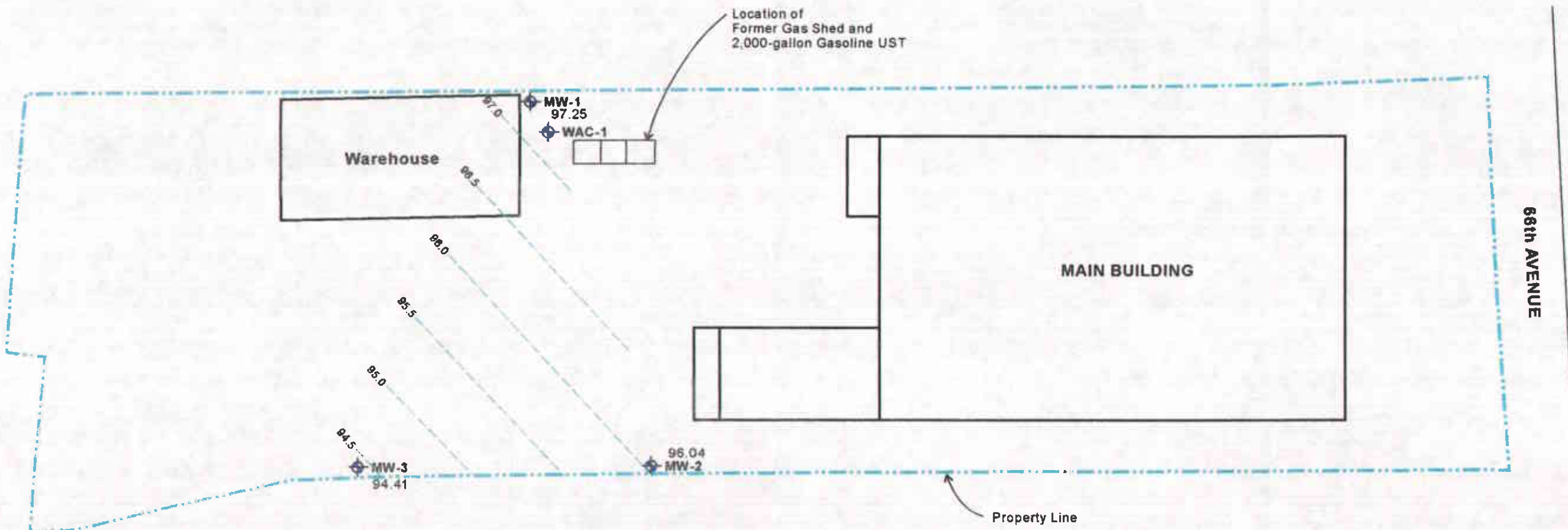
◆ Monitoring Well Location



Drawing modified from ENVIRON, 1997

Explanation

-  Monitoring Well Location
- 97.25 Water-Level Elevation (in feet, referenced to site datum)
-  Groundwater Contour (in feet, referenced to site datum; dashed where inferred)



Drawing modified from ENVIRON, 1997

APPENDIX A

GROUNDWATER SAMPLING REPORT

BLAINE
TECH SERVICES INC.

1680 ROGERS AVENUE
SAN JOSE, CALIFORNIA 95112
(408) 573-7771 FAX
(408) 573-0555 PHONE



January 13, 1998

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

ATTN: Will Mast

Site:
Pacific Electric Motor Company
1099 66th Ave.
Oakland, California

Date:
December 16, 1997

GROUNDWATER SAMPLING REPORT 971216-H-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, turbidity, dissolved oxygen, oxidation reduction potential, and temperature readings were obtained during well evacuation and at the time of sample collection.

STANDARD PRACTICES

Evacuation and Sampling Equipment

As shown in the TABLE OF WELL MONITORING DATA, the wells at this site were evacuated according to a protocol requirement for the removal of three case volumes of water, before sampling. The wells were evacuated using middleburg pumps and bailers.

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.

USGS/Middleburg Positive Displacement Sampling Pumps: USGS/Middleburg positive displacement sampling pumps are EPA approved pumps appropriate for use in wells down to two inches in diameter and depths up to several hundred feet. Actuation of the pump is accomplished with compressed air supplied by a single hose. Water is pushed out of the pump and up a Teflon conductor pipe to the surface. Evacuation and sampling are accomplished as a continuum. The rate of water removal is relatively slow and loss of volatiles almost non-existent. There is only positive pressure on the water being sampled and there is no impeller cavitation or suction. The pumps can be placed at any location within the well, can draw water from the very bottom of the well case, and are virtually immune to the erosive effects of silt or lack of water which destroy other types of pumps.

Disadvantages associated with Middleburg pumps include their high cost, low flow rate, temperamental operation, and cleaning requirements which are both elaborate and time consuming.

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 Superior Analytical Laboratory in San Francisco, California and Environmental Testing Services in Petaluma, California. Superior Analytical Laboratory is certified by the California Department of Health Services as a Hazardous Materials Testing Laboratory, and is listed as DOHS HMTL #1332.

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.

Reportage

Submission to the Regional Water Quality Control Board and the local implementing agency should include copies of the sampling report, the chain of custody and the certified analytical report issued by the Hazardous Materials Testing Laboratory.

Please call if we can be of any further assistance.



Kent Brown

KEB/aa

attachments: table of well monitoring data
chain of custody

TABLE OF WELL MONITORING DATA

Well I.D.	MW-1	MW-2	MW-3						
Date Sampled	12/16/97	12/16/97	12/16/97						
Well Diameter (in.)	2	2	2						
Total Well Depth (ft.)	25.10	25.09	25.01						
Depth To Water (ft.)	3.42	3.81	5.52						
Free Product (in.)	NONE	NONE	NONE						
Reason If Not Sampled	--	--	--						
1 Case Volume (gal.)	3.5	3.4	3.1						
Did Well Dewater?	NO	NO	NO						
Gallons Actually Evacuated	10.5	10.5	12.0						
Purging Device	BAILER	MIDDLEBURG	MIDDLEBURG						
Sampling Device	BAILER	BAILER	BAILER						
Time	14:44	14:51	14:57	13:59	14:03	14:06	13:20	13:24	13:28
Temperature (Fahrenheit)	60.0	61.2	62.2	62.6	62.4	62.8	63.0	63.4	63.8
pH	7.8	7.8	7.7	7.8	7.8	7.7	7.3	7.2	7.3
Conductivity (micromhos/cm)	390	450	460	900	800	800	5700	6600	6600
Nephelometric Turbidity Units	>200	>200	>200	>200	>200	>200	>200	>200	>200
Dissolved Oxygen (D.O) (mg/L)	1.8			1.45			0.7		
Oxidation Reduction Potential (mV)	75			121			131		
BTS Chain of Custody	971216-H1			971216-H1			971216-H1		
BTS Sample I.D.	MW-1			MW-2			MW-3		
DOHS HMTL Laboratory	SUPERIOR/ETS			SUPERIOR/ETS			SUPERIOR/ETS		
Analysis	TPH-G, BTEX, MTBE, SULFATE, NITRATE, & FERROUS IRON			TPH-G, BTEX, MTBE, SULFATE, NITRATE, & FERROUS IRON			TPH-G, BTEX, MTBE, SULFATE, NITRATE, & FERROUS IRON		

**BLAINE
BLAINE
TECH SERVICES INC**

1880 ROGERS AVENUE
SAN JOSE, CALIFORNIA 95112
FAX (408) 573-7771
PHONE (408) 573-0555

CHAIN OF CUSTODY
971216-H1
CLIENT: *PES Environmental*
SITE: *Pacific Electric Motor
1099 66th Ave
Oakland*

SAMPLE I.D.	MATRIX S - SOIL W - H2O	CONTAINERS	
		TOTAL	
MW-1	W	4	
MW-2	W	↓	
MW-3	W	↓	

C = COMPOSITE ALL CONTAINERS

CONDUCT ANALYSIS TO DETECT			
TPH-LEAD	BTEX, MIBK	SULPHATE	NITRATE * GROUND
X	X	X	X
↓	↓	↓	↓

LAB *Superior Lab.* DMS #
ALL ANALYSES MUST MEET SPECIFICATIONS AND DETECTION LIMITS SET BY CALIFORNIA DMS AND
 EPA RWOCB REGION
 LIA *23667*
 OTHER

SPECIAL INSTRUCTIONS *Invoice & Report
to PES Environmental
Add bill ~~to~~ MAST
* Note: Nitrate has a 48 hr hold
time*

ADD'L INFORMATION	STATUS	CONDITION	LAB SAMPLE #
<i>J. H.</i>			

SAMPLING COMPLETED DATE *12/16/97* TIME *1500* SAMPLING PERFORMED BY *Morgan Hogue* RESULTS NEEDED NO LATER THAN *Per client*

RELEASED BY *[Signature]* DATE *12/16/97* TIME *1506* RECEIVED BY *William Mast*

RELEASED BY *William Mast* DATE *12/16/97* TIME *1520* RECEIVED BY *[Signature]*

RELEASED BY *[Signature]* DATE *12/16/97* TIME *4:22P* RECEIVED BY *[Signature]*

SHIPPED VIA DATE SENT TIME SENT COOLER #

APPENDIX B

**LABORATORY REPORT
AND
CHAIN-OF-CUSTODY RECORDS**



Superior

RECEIVED JAN 07 1998

Analytical Laboratory

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

Date: December 24, 1997

Attn: WILL MAST

Laboratory Number : 23667

Project Number/Name : N/A

Dear WILL MAST:

Attached is Superior Analytical Laboratory report for the samples received on December 16, 1997. This report has been reviewed and approved for release. Reproduction of this report is permitted only in its entirety. Following the cover letter is the Case Narrative detailing sample receipt and analysis. Also enclosed is a copy of the original Chain-of-Custody record confirming receipt of samples.

Please note that any unused portion of the sample will be discarded after January 15, 1998, unless you have requested otherwise.

We appreciate the opportunity to be of service to you. If you have any questions, please contact our Laboratory at (510) 313-0850.

Sincerely,


Afsaneh Salimpour
Project Manager


QA/QC
Approval



Superior

Analytical Laboratory

CASE NARRATIVE

PES Environmental, Inc.
Project Number/Name: N/A
Laboratory Number: 23667

Sample Receipt

Three water samples were received by
Superior Analytical Laboratory on December 16, 1997.

Cooler temperature was 4.9°C

No abnormalities were noted with sample receiving.

Sample Analysis

The samples were analyzed for methods 8015M, 8020 and 9040.

NOTE: Reproduction of this report is permitted only in its entirety.



Superior

Analytical Laboratory

PES Environmental, Inc.
Attn: WILL MAST

Project
Reported on December 19, 1997

Gasoline Range Petroleum Hydrocarbons and BTXE
by EPA SW-846 5030/8015M/8020
Gasoline Range quantitated as all compounds from C6-C10

Chronology

Laboratory Number 23667

Sample ID	Sampled	Received	Extract.	Analyzed	QC Batch	LAB #
MW-1	12/16/97	12/16/97	12/17/97	12/17/97	DL172.37	01
MW-2	12/16/97	12/16/97	12/17/97	12/17/97	DL172.37	02
MW-3	12/16/97	12/16/97	12/17/97	12/17/97	DL172.37	03

QC Samples

QC Batch #	QC Sample ID	TypeRef.	Matrix	Extract.	Analyzed
DL172.37-01	Method Blank	MB	Water	12/17/97	12/17/97
DL172.37-02	Laboratory Spike	LS	Water	12/17/97	12/17/97
DL172.37-03	MONTHLY DEC	MS 23663-01	Water	12/17/97	12/17/97
DL172.37-04	MONTHLY DEC	MSD 23663-01	Water	12/17/97	12/17/97



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Gasoline Range quantitated as all compounds from C6-C10

LAB ID	Sample ID	Matrix	Dil.Factor	Moisture
23667-01	MW-1	Water	1.0	-
23667-02	MW-2	Water	1.0	-
23667-03	MW-3	Water	1.0	-

RESULTS OF ANALYSIS

Compound	23667-01		23667-02		23667-03	
	Conc.	RL	Conc.	RL	Conc.	RL
	ug/L		ug/L		ug/L	
Gasoline Range	ND	50	ND	50	ND	50
Benzene	1.3	0.5	ND	0.5	ND	0.5
Toluene	ND	0.5	ND	0.5	ND	0.5
Ethyl Benzene	0.6	0.5	ND	0.5	ND	0.5
Total Xylenes	0.7	0.5	ND	0.5	ND	0.5
Methyl-t-butyl-ether	ND	5	ND	5	ND	5
>> Surrogate Recoveries (%) <<						
Trifluorotoluene (SS)	107		100		99	



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Gasoline Range Petroleum Hydrocarbons and BTXE
 by EPA SW-846 5030/8015M/8020
 Gasoline Range quantitated as all compounds from C6-C10

Quality Assurance and Control Data

Laboratory Number: 23667
 Method Blank(s)

DL172.37-01
 Conc. RL
 ug/L

Gasoline Range	ND	50
Benzene	ND	0.5
Toluene	ND	0.5
Ethyl Benzene	ND	0.5
Total Xylenes	ND	0.5
Methyl-t-butyl-ether	ND	5

>> Surrogate Recoveries (%) <<
 Trifluorotoluene (SS) 98



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Analytical Laboratory

Gasoline Range Petroleum Hydrocarbons and BTXE
 by EPA SW-846 5030/8015M/8020
 Gasoline Range quantitated as all compounds from C6-C10

Quality Assurance and Control Data

Laboratory Number: 23667

Compound	Sample conc.	SPK Level	SPK Result	Recovery %	Limits %	RPD %
----------	--------------	-----------	------------	------------	----------	-------

For Water Matrix (ug/L)

DL172.37 02 / - Laboratory Control Spikes

Gasoline Range		2000	1900	95	65-135	
Benzene		20	21	105	65-135	
Toluene		20	22	110	65-135	
Ethyl Benzene		20	21	105	65-135	
Total Xylenes		60	64	107	65-135	

>> Surrogate Recoveries (%) <<
 Trifluorotoluene (SS)

99 50-150

For Water Matrix (ug/L)

DL172.37 03 / 04 - Sample Spiked: 23663 - 01

Gasoline Range	ND	2000	2000/1900	100/95	65-135	5
Benzene	ND	20	20/20	100/100	65-135	0
Toluene	ND	20	21/21	105/105	65-135	0
Ethyl Benzene	ND	20	21/20	105/100	65-135	5
Total Xylenes	ND	60	63/61	105/102	65-135	3

>> Surrogate Recoveries (%) <<
 Trifluorotoluene (SS)

102/100 50-150

Definitions:

ND = Not Detected

RL = Reporting Limit

NA = Not Analysed

RPD = Relative Percent Difference

ug/L = parts per billion (ppb)

mg/L = parts per million (ppm)

ug/kg = parts per billion (ppb)

mg/kg = parts per million (ppm)

Client:
 Superior Analytical Laboratory
 825 Arnold Dr. Suite 114
 Martinez, CA 94553

Client Project #:
 SAL Job #: 23667

Ref. R3383Wet
Unit mg/L
Matrix Waste Water
Sampled 12/16/97
Received 12/17/97
Analyst MCL
Reported 12/24/97

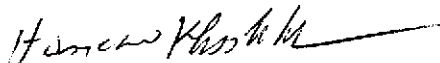
QC Batch #: 3383

Attention: Afsaneh Salimpour

Analytical Results
Sample ID:

Analyte	Detection Limit	01	02	03	Date Tested	Method
		MW - 1	MW - 2	MW - 3		
Nitrate as N	0.1 mg/L	1.85	0.20	3.75	12/18/97	SM 4500 NO ₃ ⁻ D
Sulfate	2.0 mg/L	34.9	86.5	274	12/24/97	SM 4500 SO ₄ ⁻² E

ND: Not Detected




H. Khosh Khoo, Ph.D.
 Laboratory Director/President

Quality Control Report**Client:**Superior Analytical Laboratory
825 Arnold Dr. Suite 114
Martinez, CA 94553**Client Project #:**
SAL Job #: 23667**QC Batch #: 3383****Ref. Q3383Wet****Matrix Water**
Analyzed: 12/18, 24/97
Reported: 12/24/97
Unit mg/L**Attention: Afsaneh Salimpour****Sample ID: matrix or Blank spiked samples**

Analyte	Detection Limit mg/L	Method	Spike Added mg/L	MS Spike Recovery	MSD Spike Recovery	Relative Percent Difference
Nitrate as N	0.1 mg/L	SM 4500 NO ₃ ⁻ D	5.00	95.5%	95.3%	0.2
Sulfate	2.0 mg/L	SM 4500 SO ₄ ⁻² E	20.0	105%	104%	1.0

ND: Not Detected


H. Khosh Khoo, Ph.D.
Laboratory Director/President

CHAIN OF CUSTODY AND ANALYSIS REQUEST

SALs Job Number: 23667

3383

Superior Analytical Laboratory
825 Arnold Dr. Suite 114
Martinez, CA 94553
Fax/Tel.: 510-229-1526/510-313-0850
Contact: Afsaneh Salimpour

Bill to: Superior Analytical Laboratory
P.O. Box. 2648
Martinez, California 94553

Project:
PO#:

Work Subcontracted to : Delta Env, Dr. Hossein Khoshkhoo
685 Stone Rd, Ste 12
Benecia, CA 94510
Phone 707-747-6081 Fax 707-747-6082

Lab#	Client ID	Sampled	#Con	Pres.	Due	Analysis	
01	MW-1	WG 12/16/97	1		12/24/97	NITRATE 12/24/97 SULFATE	20 \$ 20 \$
02	MW-2	WG 12/16/97	1		12/24/97	NITRATE 12/24/97 SULFATE	
03	MW-3	WG 12/16/97	1		12/24/97	NITRATE 12/24/97 SULFATE	

Use client sample ID on C.O.A !

- Fax invoice or quote ASAP Fax results to SAL-Martinez
 Fax results to our client

5 day TAT

HOLDING TIME : NITRATE

Samples stored in ice : _____ Appropriate Containers : _____ Samples preserved : _____ VOAs without headspace : _____

Relinquished By: R.B.S. Date: 12/17/97 Time: 2:21
Relinquished By: QJL Date: 12/17/97 Time: 6:23P
Received By: QJL Date: 12/17/97 Time: 2:21P
Received By: MJG Date: 12/17/97 Time: 2:21P

BLAINE TECH SERVICES INC.

1880 ROGERS AVENUE
SAN JOSE, CALIFORNIA 95112
FAX (408) 573-7771
PHONE (408) 573-0555

CONDUCT ANALYSIS TO DETECT

LAB ETS DHS # _____
 ALL ANALYSES MUST MEET SPECIFICATIONS AND DETECTION LIMITS
 SET BY CALIFORNIA DHS AND

EPA RWQCB REGION _____
 LIA
 OTHER

CHAIN OF CUSTODY
971216-H1
 CLIENT PES ENVIRONMENTAL
 SITE PACIFIC ELECTRIC MOTOR
1699 66th Ave
Oakland CA

C = COMPOSITE ALL CONTAINERS

FEROUS IRON

SPECIAL INSTRUCTIONS Invoice & Report
to PES ENVIRONMENTAL
ATTN: WILL MAST

SAMPLE ID.	DATE	TIME	MATERIAL		CONTAINERS						ADDITIONAL INFORMATION	STATUS	CONDITION	LAB SAMPLE #	
			W	H ₂ O											
MW-1	12/16/97	1505	W	51											
MW-2	12/16/97	1411	W	↓											
MW-3	12/16/97	1335	W	↓											

SAMPLING COMPLETED DATE 12/16/97 TIME 1500 SAMPLING PERFORMED BY Morgan Hargrave RESULTS NEEDED NO LATER THAN PER client

RELEASED BY [Signature] DATE 12/16/97 TIME 1500 RECEIVED BY Will Mast DATE 12-16-97 TIME 1500

RELEASED BY [Signature] DATE 12/16/97 TIME 1720 RECEIVED BY [Signature] DATE 12/16/97 TIME 5:20pm

RELEASED BY _____ DATE _____ TIME _____ RECEIVED BY _____ DATE _____ TIME _____

SHIPPED VIA _____ DATE SENT _____ TIME SENT _____ COLLECTION # _____

#003 P01
 TEL NO:
 DEC-17-'97 WED 17:13 ID:

DEC. 17 '97 (WED) 17:14 COMMUNICATION No. 29 PAGE 1

BLAINE

TECH SERVICES INC.

1880 ROGERS AVENUE
SAN JOSE, CALIFORNIA 95112
FAX (408) 573-7771
PHONE (408) 573-0555

CHAIN OF CUSTODY

CLIENT *PES Environmental*

SITE *Pacific Electric Motor*

1099 66th Ave

Oakland

SAMPLE I.D.	MATRIX S = SOIL W = H ₂ O	CONTAINERS	
		TOTAL	

MW-1 *W* *84*

MW-2 *W* *↓*

MW-3 *W* *↓*

C = COMPOSITE ALL CONTAINERS

CONDUCT ANALYSIS TO DETECT

TPH-LABS	BTEX, MIBE	Sulphate	Nitrate * see note
<i>x</i>	<i>x</i>	<i>x</i>	<i>x</i>
<i>↓</i>	<i>↓</i>	<i>↓</i>	<i>↓</i>

LAB *Superior Labs* DHS # _____
ALL ANALYSES MUST MEET SPECIFICATIONS AND DETECTION LIMITS SET BY CALIFORNIA DHS AND
 EPA RWQCB REGION _____
 LIA *23667*
 OTHER

SPECIAL INSTRUCTIONS *Invoice & Report to PES Environmental*
ATTN will ~~not~~ MUST
** Note: Nitrate has a 48 hr hold time*

ADD'L INFORMATION	STATUS	CONDITION	LAB SAMPLE #
-------------------	--------	-----------	--------------

Please initial:
 Samples stored in ice.
 Samples in appropriate containers.
 Samples preserved.
 Vials without headspace.
 Other: _____

SAMPLING COMPLETED *12/16/97* | DATE | TIME *1500* | SAMPLING PERFORMED BY *Morgan Hargreaves* | RESULTS NEEDED NO LATER THAN *Per client*

RELEASED BY *[Signature]* | DATE *12/16/97* | TIME *1506* | RECEIVED BY *William Mast* | DATE *12-16-97* | TIME *1506*

RELEASED BY *William Mast* | DATE *12/16/97* | TIME *1520* | RECEIVED BY *[Signature]* | DATE *12/16/97* | TIME *1520*

RELEASED BY *929* | DATE *12/16/97* | TIME *4:22P* | RECEIVED BY _____ | DATE _____ | TIME _____

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



ETS

1343 Redwood Way
Petaluma, CA 94954

(707) 795-9605/FAX 795-9384

Environmental
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Serving people and the environment so that both benefit.

WATER ANALYSIS REPORT

To: William Mast
PES Environmental, Inc.
1682 Novato Blvd. Suite 100
Novato, CA 94947

Date: December 23, 1997
Lab #: 97-12-0217, -12-0218, -12-0219
Received: December 16, 1997
Tech(s): C. Lawrence

Sample of: monitor well water
Project ID: PEM

Lab Supervisor: D. Jacobson
Lab Director: G.S. Conrad, Ph.D.
Sample ID(s): MW-1, MW-2 & MW-3

Site Location: Pacific Electric Motor, 1099 66th Avenue, Oakland, California.

RESULTS

SAMPLE ID	FERROUS IRON
MW-1	0.53 mg/l
MW-2	0.16 mg/l
MW-3	0.24 mg/l

COMMENTS

These three samples are more or less in the generally moderate range for ferrous iron suggesting modest total iron, although total iron could be anything depending on oxidations levels. In any event, notice there appears to be something of a gradient with values going from relatively low to relatively high. If total iron was the same in all three areas then it could be concluded that oxidation levels are the inverse of the ferrous iron levels; and/or iron bacterial activity would be the inverse of the ferrous gradient.

QC DATA - Ferrous Tests 11/10/97

Test	Lab Standard	Result	Percent Recovery
Ferrous Iron*	1.000 mg/l	0.882 mg/l	88.2%

*Ferrous Ammonium Sulfate - $(\text{Fe}(\text{NH}_4)_2(\text{SO}_4)_2 \cdot 6\text{H}_2\text{O})$.

NOTES:

These tests were done according to the Association for Testing Materials (ASTM), and/or conform to standard and accepted protocols as described in Standard Methods for the Examination of Water and Wastewater, 18th ed., c 1992: Ferrous Iron (Fe^{2+}) - Phenanthroline Method (modified SMEWW 3500-Fe D); Redox - ASTM D.1498.

DISTRIBUTION

**QUARTERLY MONITORING REPORT
PACIFIC ELECTRIC MOTOR COMPANY
1009 66TH AVENUE
OAKLAND, CALIFORNIA**

JANUARY 13, 1998

COPY NO. 3

		<u>Copy No.</u>
2 Copies	Pacific Electric Motor Company 1009 66th Avenue Oakland, California 94601 Attention: Mr. Rand Perry	1 - 2
2 Copies	Alameda County Health Care Service Agency Department of Environmental Health 1131 Harbor Bay Parkway, Suite 250 Alameda, California 94502-6577 Attention: Mr. Barney Chan	3 - 4
3 Copies	PES Job File	5 - 7
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