



ENVIRONMENTAL  
PROTECTION

A Report Prepared For:

97 OCT 27 PM 6:20

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**

**OCTOBER 24, 1997**

By:

William W. Mast, R.G.  
Senior Engineer

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 third 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). A copy of the ACEHS letter is attached as Appendix A.

## 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 in June 1997 to evaluate groundwater conditions in the vicinity of the former UST. 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 September 29, 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 September 29, 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 using either a positive displacement pump or disposable bailers. 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 the 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 B.

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 C.

## **5.0 DISCUSSION OF MONITORING RESULTS**

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

### **5.1 Water-Level Measurements**

Depth-to-water measurements for September 1997, ranged from 6.05 feet (MW-2) to 6.45 feet (MW-1) below the TOC. Groundwater water-level elevations ranged from 93.77 feet (MW-3) to 94.22 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 September 29, 1997. The contoured water-level elevations indicate that groundwater flow is generally to the southwest. This flow direction is consistent with previous water-level elevation results. The groundwater gradient is approximately 0.003 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 B). The analytical laboratory reports and chain-of-custody forms are presented in Appendix C.

Petroleum hydrocarbon compounds were detected in the groundwater sample from Well MW-1. Although TPH-g, benzene, and ethylbenzene were detected at slightly higher concentrations than during the June 1997 groundwater monitoring event, concentrations are within the same order of magnitude. Variations in chemical concentrations are likely a result of seasonal fluctuations in the position of the water table with regard to residual petroleum hydrocarbons in soil. No petroleum hydrocarbon compounds were detected in the groundwater samples from Wells MW-2 and MW-3; the absence of petroleum hydrocarbons in these wells is consistent with previous results.

The results of the inorganic analyses indicate that intrinsic (naturally occurring) biodegradation appears to be occurring in the vicinity of the former UST. The low concentrations of sulfate and nitrate in the sample from Well MW-1 (relative to Wells MW-2 and MW-3) suggest ongoing sulfate reduction and denitrification, respectively, that indicate petroleum hydrocarbon degradation from microbial activity. As a consequence of this biodegradation, oxygen appears to be consumed, resulting in a reduced environment (low oxidation-reduction potential and the presence of ferrous [reduced] iron). Additional data collected during future quarterly groundwater monitoring events will assist in evaluating possible trends in microbial activity and associated declines 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
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
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

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
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
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

Notes:

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

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

µg/L = Micrograms per liter.

&lt; = 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**

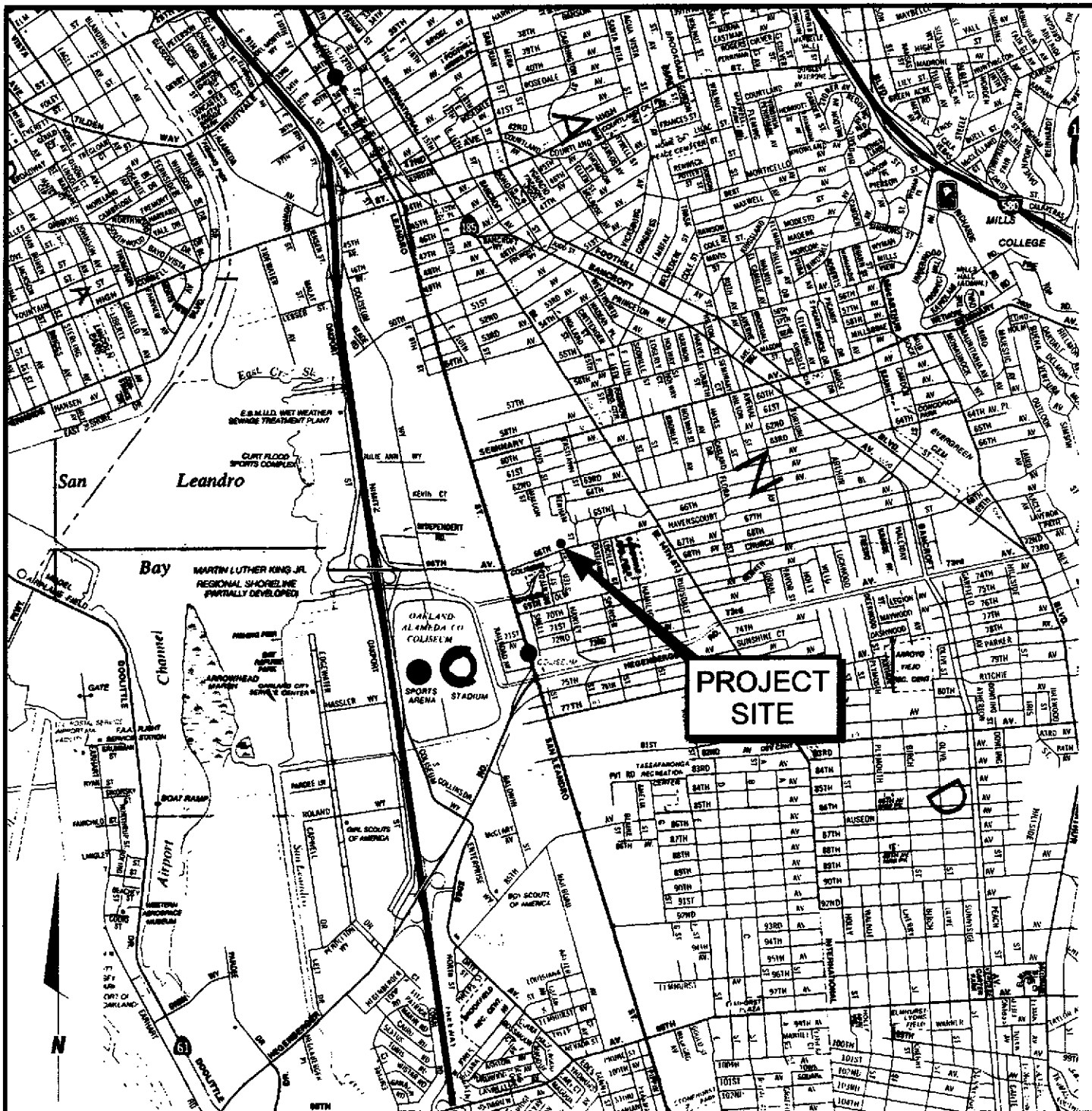
Sample Location	Date Sampled	Sampled By	Dissolved Oxygen (mg/L)	Ox-Redux Potential (mV)	Sulfate (mg/L)	Nitrate (mg/L)	Ferrous Iron (mg/L)
MW-1	9/29/97	PES	0.4	-86	12	0.15	3.61
MW-2	9/29/97	PES	0.5	68	100	0.22	0.20
MW-3	9/29/97	PES	0.4	73	290	2.9	0.14

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

10/97

JOB NUMBER

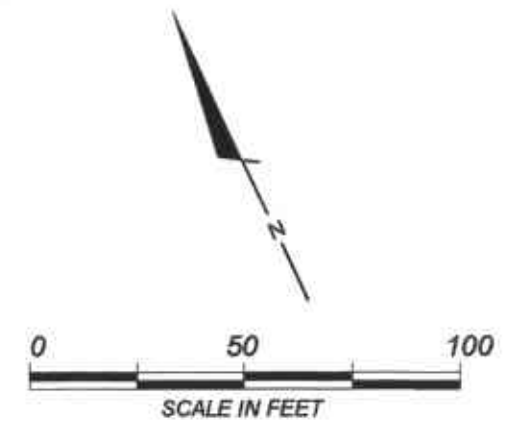
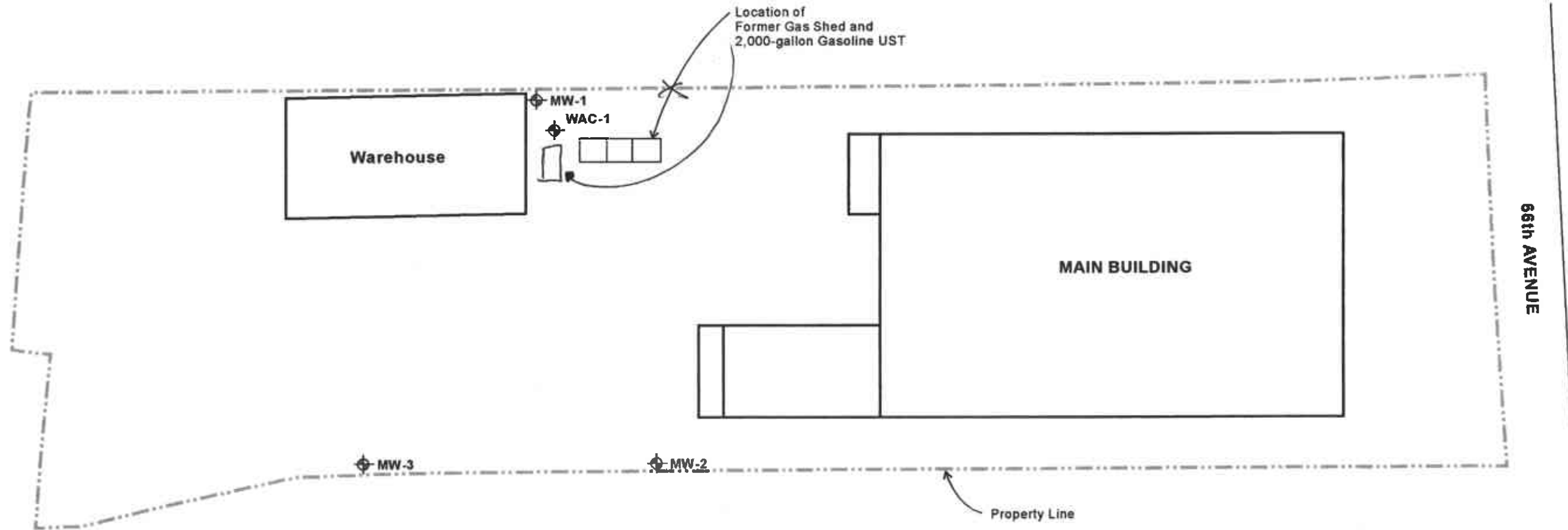
DRAWING NUMBER

REVIEWED BY

DATE



**Explanation**

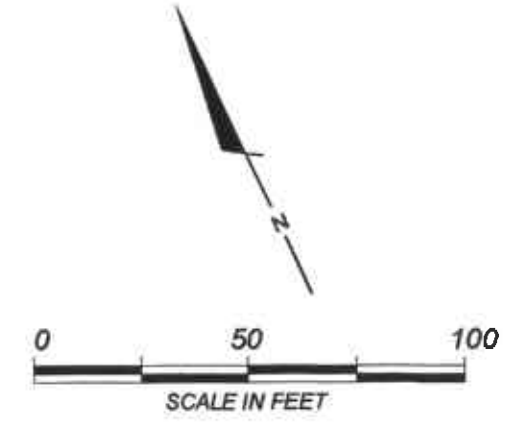
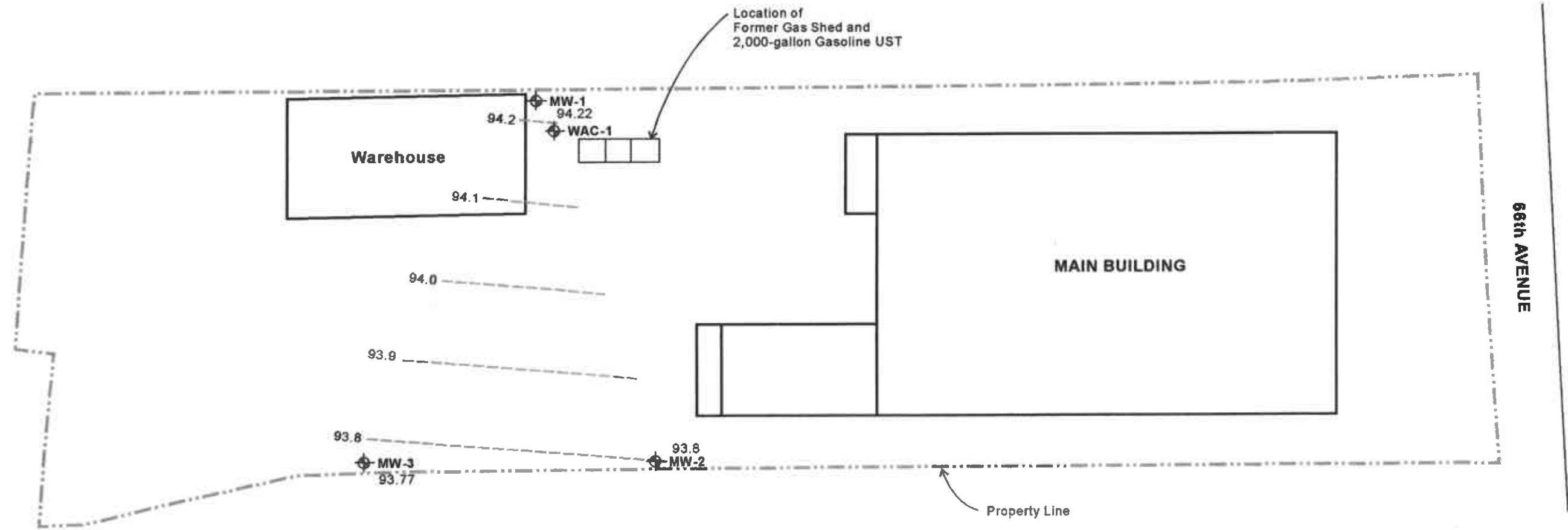
⊕ Monitoring Well Location



Drawing modified from ENVIRON, 1997

**Explanation**

-  Monitoring Well Location
- 94.22 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

ALAMEDA COUNTY  
HEALTH CARE SERVICES



AGENCY  
DAVID J. KEARS, Agency Director

August 19, 1997  
StID # 565

Mr. Rand Perry  
Pacific Electric Motor Co.  
1009 66th Ave.  
Oakland CA 94601

ENVIRONMENTAL HEALTH SERVICES  
ENVIRONMENTAL PROTECTION (LOP)  
1131 Harbor Bay Parkway, Suite 250  
Alameda, CA 94502-6577  
(510) 567-6700  
FAX (510) 337-9335

Re: Soil and Groundwater Investigation for Pacific  
Electric Motor Co., 1009-66th Ave., Oakland, CA 94601

Dear Mr. Perry:

This letter serves to summarize the 7/31/97 meeting at the County's office with yourself, Mr. John Schroeter, Mr. Gary Norton and myself in regards to the on-going subsurface investigation at the above site. This meeting addressed the items in my July 28, 1997 letter and attempted to clarify the requirements for eventual site closure.

At this meeting, I was given the July 17, 1997 Environ report which had been revised, stamped and signed. I was also given a summary table accounting for the removal of 2087 cubic yards of soil to BFI Landfill. No further information regarding soils disposal is required.

Offsite characterization was not required based upon a southwesterly groundwater gradient. It was assumed that offsite residential exposure could be conservatively estimated by using existing soil and groundwater data closer to the former tank pit. It was agreed that a human health risk assessment would be submitted after sufficient groundwater monitoring had occurred. Three additional monitoring events were requested to determine if groundwater concentrations have stabilized.

In regards to monitoring well WAC-1, installed by W.A. Craig, because of its uncertain construction, no additional monitoring will be required from this well, however, TPHg, BTEX and MTBE must be analyzed in the other three wells.

In order to verify that natural bioremediation is occurring in these wells, at least two wells, one within the plume and one downgradient, should be tested for the following indicator parameters:

- \*dissolved oxygen
- \*oxygen-reduction potential
- \*nitrates, sulfates
- \*iron +2

Mr. Rand Perry  
Pacific Electric Motor Co., 1009 66th Ave.  
StID # 565  
August 19, 1997  
Page 2.

You may contact me at (510) 567-6765 if you have any questions.

Sincerely,

*Barney M Chan*

Barney M. Chan  
Hazardous Materials Specialist

c: Mr. Gary Norton, Serrano & Cone Inc., 2092 Omega Rd., Suite F  
San Ramon, CA 94583

Mr. John Schroeter, Environ, 5820 Shellmound St., Suite 700,  
Emeryville, CA 94608

B. Chan, files  
2mon1009



**APPENDIX B**

**GROUNDWATER SAMPLING REPORT**

**BLAINE**  
TECH SERVICES INC.



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

RECEIVED OCT 15 1997

October 9, 1997

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:  
September 29, 1997

## GROUNDWATER SAMPLING REPORT 970929-L-2

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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

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### 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.

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	09/29/97			09/29/97			09/29/97		
Well Diameter (in.)	2			2			2		
Total Well Depth (ft.)	25.06			25.15			25.00		
Depth To Water (ft.)	6.45			6.05			6.16		
Free Product (in.)	NONE			NONE			NONE		
Reason If Not Sampled	--			--			--		
1 Case Volume (gal.)	3.0			3.1			3.0		
Did Well Dewater?	NO			NO			NO		
Gallons Actually Evacuated	9.0			10.0			9.0		
Purging Device	MIDDLEBURG			MIDDLEBURG			MIDDLEBURG		
Sampling Device	BAILER			BAILER			BAILER		
Time	14:54	14:58	15:02	14:25	14:28	14:42	14:05	14:09	14:14
Temperature (Fahrenheit)	62.8	65.0	63.8	62.2	62.4	61.8	62.2	62.4	61.8
pH	7.0	6.8	6.8	7.4	7.2	7.1	6.7	6.7	6.6
Conductivity (micromhos/cm)	2600	2100	2200	1750	1450	1300	7000	7500	7900
Nephelometric Turbidity Units	>200	>200	>200	>200	>200	>200	>200	>200	>200
Dissolved Oxygen (D.O) (mg/L)	0.4			0.5			0.4		
Oxidation Reduction Potential (mV)	-86			68			73		
BTS Chain of Custody	970929-L2			970929-L2			970929-L2		
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 TECH SERVICES INC.

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

## CONDUCT ANALYSIS TO DETECT

LAB SUPERIOR DHS # \_\_\_\_\_  
ALL ANALYSES MUST MEET SPECIFICATIONS AND DETECTION LIMITS  
SET BY CALIFORNIA DHS AND  
 EPA  RWQCB REGION \_\_\_\_\_  
 LIA  
 OTHER

CHAIN OF CUSTODY  
970129-L2  
CLIENT PES  
SITE PACIFIC ELEC. MOTOR CO  
1099 66<sup>TH</sup> AVE  
OAKLAND CA

C = COMPOSITE ALL CONTAINERS

TPH-G EPA 8015 MOD.  
BTX/MIBE EPA 8020  
SULFATE BY EPA 300.0  
NITRATE BY EPA 353.3/300

SPECIAL INSTRUCTIONS  
INVOICE & REPORT TO  
PES ENVIRONMENTAL  
ATTN: WILL MART

SAMPLE I.D.	DATE/TIME		MATRIX S = SOIL W = H2O	TOTAL	CONTAINERS	C = COMPOSITE ALL CONTAINERS				ADD'L INFORMATION	STATUS	CONDITION	LAB SAMPLE #
						TPH-G	BTX/MIBE	SULFATE	NITRATE				
MW-1	9/19	1506	W	4	1 LTR / 40 ml	X	X	X	X				
MW-2		1446	W	4	1 LTR / 40 ml	X	X	X	X				
MW-3		1416	W	4		X	X	X	X				

SAMPLING COMPLETED	DATE	TIME	SAMPLING PERFORMED BY	RESULTS NEEDED NO LATER THAN	
			<u>LAD GILCHRIST</u>	<u>AS CONTRACTED</u>	
RELEASED BY	DATE	TIME	RECEIVED BY	DATE	TIME
<u>[Signature]</u>	<u>9/30/97</u>	<u>4:33 pm</u>	<u>[Signature]</u>	<u>9/30/97</u>	<u>4:33 p.m.</u>
RELEASED BY	DATE	TIME	RECEIVED BY	DATE	TIME
RELEASED BY	DATE	TIME	RECEIVED BY	DATE	TIME
SHIPPED VIA	DATE SENT	TIME SENT	COOLER #		



# BLAINE TECH SERVICES INC.

1680 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
- LIA
- OTHER

RWQCB REGION \_\_\_\_\_

SPECIAL INSTRUCTIONS

### CHAIN OF CUSTODY

970929-L2

CLIENT **PES**

SITE **PACIFIC ELEC. MOTOR CO.**

**1099 66<sup>TH</sup> AVE**

**OAKLAND CA**

C = COMPOSITE ALL CONTAINERS

IRON BY SM 3500D

SAMPLE I.D.	DATE/TIME	MATRIX S = SOIL W = H2O	CONTAINERS		C	1	2	3	4	5	6	7	8	9	10	ADD'L INFORMATION	STATUS	CONDITION	LAB SAMPLE #		
			TOTAL																		
MW-1	9/29 1506	W	3	40ml	X																
MW-2	1446	W	3	VDA'S	X																
MW-3	1416	W	3	NO PRES	X																

SAMPLING COMPLETED	DATE	TIME	SAMPLING PERFORMED BY	RESULTS NEEDED NO LATER THAN	
	9-29-97	1506	LAD GILCHRIST	AS CONTRACTED	
RELEASED BY	DATE	TIME	RECEIVED BY	DATE	TIME
[Signature]	9-29-97	1513	[Signature]	9-29-97	1513
RELEASED BY	DATE	TIME	RECEIVED BY	DATE	TIME
RELEASED BY	DATE	TIME	RECEIVED BY	DATE	TIME
SHIPPED VIA	DATE SENT	TIME SENT	COOLER #		

**APPENDIX C**

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



Superior

Analytical Laboratory

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

Date: October 8, 1997

Attn: WILL MAST

Laboratory Number : 23278

Project Number/Name : 970929-L2

Facility/Site : PACIFIC ELEC MOTOR CO  
1099 66th AVE  
OAKLAND, CA

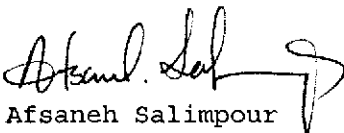
Dear WILL MAST:


Attached is Superior Analytical Laboratory report for the samples received on September 30, 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 October 30, 1997, 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

  
Sanjay Panda  
QA/QC Manager



**Superior**

**Analytical Laboratory**

CASE NARRATIVE

PES Environmental, Inc.  
Project Number/Name: 970929-L2  
Laboratory Number: 23278

Sample Receipt

Three water samples were received by  
Superior Analytical Laboratory on September 30, 1997.

Cooler temperature was 4°C

No abnormalities were noted with sample receiving.

Sample Analysis

The samples were analyzed for methods 8015M, 8020 .

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



Superior

Analytical Laboratory

PES Environmental, Inc.  
Attn: WILL MAST

Project 970929-L2  
Reported on October 6, 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 23278

Sample ID	Sampled	Received	Extract.	Analyzed	QC Batch	LAB #
MW-1	09/29/97	09/30/97	10/03/97	10/03/97	DJ032.37	01
MW-2	09/29/97	09/30/97	10/03/97	10/03/97	DJ032.37	02
MW-3	09/29/97	09/30/97	10/03/97	10/03/97	DJ032.37	03

QC Samples

QC Batch #	QC Sample ID	TypeRef.	Matrix	Extract.	Analyzed
DJ032.37-01	Method Blank	MB	Water	10/03/97	10/03/97
DJ032.37-02	Laboratory Spike	LS	Water	10/03/97	10/03/97
DJ032.37-03	97093003 MW-6	MS 23281-03	Water	10/03/97	10/03/97
DJ032.37-04	97093003 MW-6	MSD 23281-03	Water	10/03/97	10/03/97



Superior

Analytical Laboratory

PES Environmental, Inc.
Attn: WILL MAST

Project 970929-L2
Reported on October 6, 1997

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

Table with 5 columns: LAB ID, Sample ID, Matrix, Dil.Factor, Moisture. Rows include 23278-01, 23278-02, 23278-03.

RESULTS OF ANALYSIS

Table with 8 columns: Compound, 23278-01 Conc. RL ug/L, 23278-02 Conc. RL ug/L, 23278-03 Conc. RL ug/L. Rows include Gasoline Range, Benzene, Toluene, Ethyl Benzene, Total Xylenes, Methyl-t-butyl-ether, and Surrogate Recoveries (%).



# Superior

## 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: 23278  
Method Blank(s)

DJ032.37-01  
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) 101



# Superior

## 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: 23278

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

For Water Matrix (ug/L)

DJ032.37 02 / - Laboratory Control Spikes

Gasoline Range		2000	1700	85	65-135	
Benzene		20	20	100	65-135	
Toluene		20	21	105	65-135	
Ethyl Benzene		20	21	105	65-135	
Total Xylenes		60	62	103	65-135	

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

108 50-150

For Water Matrix (ug/L)

DJ032.37 03 / 04 - Sample Spiked: 23281 - 03

Gasoline Range	ND	2000	1900/1900	95/95	65-135	0
Benzene	ND	20	22/22	110/110	65-135	0
Toluene	ND	20	23/22	115/110	65-135	5
Ethyl Benzene	ND	20	22/22	110/110	65-135	0
Total Xylenes	ND	60	68/66	113/110	65-135	3

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

108/105 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)

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Page 4 of 4



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

**Client Project #:**  
**Project: 970929-L2**  
 SAL Job #: 23278

**Ref.** R3230Wet  
**Unit** mg/L  
**Matrix** Waste Water  
**Sampled** 9/29/97  
**Received** 10/1/97  
**Analyst** MCL  
**Reported** 10/8/97

**Attention: Afsaneh Salimpour**


**QC Batch #: 3230**

**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	0.15	0.22	2.9	10/1/97	SM 4500 NO <sub>3</sub> <sup>-</sup> D
Sulfate	5.0 mg/L	12	100	290	10/8/97	SM 4500 SO <sub>4</sub> <sup>-2</sup> E

ND: Not Detected

\*NOTE: Received out of hold; Ran several hours out of hold.

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

**Quality Control Report**

Client Proj. #:  
 Project: 970929-L2  
 SAL Job #: 23278

Ref. Q3230Wet

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

**QC Batch : 3230**


Rep. Unit mg/L  
 Matrix Water

Analyzed 10/1, 8/97  
 Reported 10/8/97

**Attention: Afsaneh Salimpour**

**Sample ID: matrix or Blank spiked samples**

Analyte	Nitrate	Sulfate
Method	SM 4500 NO <sub>3</sub> <sup>-</sup> D	SM 4500 SO <sub>4</sub> <sup>-2</sup> E
Concentration spiked	10.0 mg/L	20.0 mg/L
Spike % recovery	89.0%	90.6%
Spiked % rec. dup	89.3%	93.7%
RPD	0.3	3.4

  
 H. Khosh Khoo, PhD.,  
 Laboratory Director/President

# CHAIN OF CUSTODY AND ANALYSIS REQUEST

SALs Job Number: 23278

3230

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: 970929-L2  
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 15:06	WG 09/29/97	1		10/08/97	NITRATE 10/08/97 SULFATE
02	MW-2 14:40	WG 09/29/97	1		10/08/97	NITRATE 10/08/97 SULFATE
03	MW-3 14:16	WG 09/29/97	1*		10/08/97	NITRATE 10/08/97 SULFATE

Use client sample ID on C.O.A !

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

Comments:  
SULFATE BY EPA 300.0  
NITRATE BY EPA 353.3/300.0

Ran just out of hold for  
NO3: 16:30

Samples stored in ice : \_\_\_\_\_ Appropriate Containers : \_\_\_\_\_ Samples preserved : \_\_\_\_\_ VOAs without headspace : \_\_\_\_\_  
Relinquished By: Zali Date: 10/1/97 Time: 3:15 Received By: ERC Date: 10/1/97 Time: 3:15  
Relinquished By: 829 Date: 1/1 Time: 3:40 Received By: R Johnson Date: 10/1/97 Time: 18:40

# BLAINE TECH SERVICES INC.

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

## CONDUCT ANALYSIS TO DETECT

LAB

**SUPERIOR**

DHS #

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

- EPA  
 LIA  
 OTHER

RWQCB REGION

**23278**

### SPECIAL INSTRUCTIONS

INVOICE & REPORT TO  
PES ENVIRONMENTAL  
ATTN: WILL MART

### CHAIN OF CUSTODY

**970929-L2**

CLIENT  
**PES**

SITE  
**PACIFIC ELEC MOTOR CO  
1099 66<sup>th</sup> AVE  
OAKLAND CA**

SAMPLE I.D.	DATE/TIME	MATRIX S = SOIL W = H <sub>2</sub> O	CONTAINERS TOTAL	C = COMPOSITE ALL CONTAINERS	CONDUCT ANALYSIS TO DETECT			
					TPH-G EPA 8015 MOD.	BTEX/MTBE EPA 8020	SULFATE BY EPA 300.0	NITRATE BY EPA 353.3/300
MW-1	9/29 1506	W	4		X	X	X	X
MW-2	1446	W	4		X	X	X	X
MW-3	1416	W	4		X	X	X	X

ADD'L INFORMATION      STATUS      CONDITION      LAB SAMPLE #

ET  
Samples Stored in ice. YES  
Appropriate containers YES  
Samples preserved YES  
VGA's without headspace YES  
Comments: 4.0°C

SAMPLING COMPLETED      DATE      TIME      SAMPLING PERFORMED BY      RESULTS NEEDED NO LATER THAN

**LAD GILCHRIST**      **AS CONTRACTED**

RELEASED BY      DATE      TIME      RECEIVED BY      DATE      TIME

**[Signature]**      9/30/97      4:33pm      **[Signature]**      9/30/97      4:53 p.m.

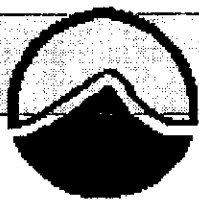
RELEASED BY      DATE      TIME      RECEIVED BY      DATE      TIME

**[Signature]**      9/30/97      6:15p.m.      **[Signature]**      9/30/97      1830

RELEASED BY      DATE      TIME      RECEIVED BY      DATE      TIME

SHIPPED VIA      DATE SENT      TIME SENT      COOLER #

**X**                     **X**



**ETS**

RECEIVED OCT - 8 1997

1343 Redwood Way  
Petaluma, CA 94954  
(707) 795-9605/FAX 795-9384

Environmental  
Technical  
Services

Soil, Water & Air  
Testing & Monitoring  
Analytical Labs  
Technical Support

*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: October 7, 1997  
Lab #: 97-09-0427 thru -07-0429  
Received: September 30, 1997  
Tech(s): C. Lawrence  
Lab Supervisor: D. Jacobson  
Lab Director: G.S. Conrad, Ph.D.  
Sample ID(s): MW-1, MW-2, MW-3

Sample of: monitor well water  
Project #: unknown

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

### RESULTS

SAMPLE ID	FERROUS IRON
MW-1	3.61 mg/l
MW-2	0.20 mg/l
MW-3	0.14 mg/l

### COMMENTS

There is great variability in ferrous iron levels with two samples showing only low levels of ferrous iron, and the third sample being at a relatively high level (18-26 times higher than the other two). The two low samples suggest low iron and/or only mild reduction of the environment, while the high sample suggests a much higher total iron and a much more reduced environment.

#### QC DATA - Ferrous & Redox Tests 10/7/97

Test	Lab Standard	Result	Percent Recovery
Ferrous Iron*	1.000 mg/l	0.900 mg/l	90.0%
Redox Test $\square$	474.0 mV	450.3 mV	95.0%

\* Ferrous Ammonium Sulfate -  $(\text{Fe}(\text{NH}_4)_2(\text{SO}_4)_2 \cdot 6\text{H}_2\text{O})$ ;  $\square$  SMEWW 2580

#### 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.,  $\copyright$  1992: Ferrous Iron ( $\text{Fe}^{2+}$ ) - Phenanthroline Method (modified SMEWW 3500-Fe D); Redox - ASTM D 1498.

# BLAINE

TECH SERVICES INC.

1680 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  
970929-L2  
 CLIENT PES  
 SITE PACIFIC ELEC. MOTOR CO.  
1099 66<sup>TH</sup> AVE  
OAKLAND CA

C = COMPOSITE ALL CONTAINERS

IRON BY SM 350D  
 Cooperate Fe<sup>2+</sup> + ~~Fe~~ Ni/Mn

SPECIAL INSTRUCTIONS

SAMPLE I.D.	DATE/TIME	MATRIX S = SOIL W = H2O	CONTAINERS TOTAL	C = COMPOSITE ALL CONTAINERS	IRON BY SM 350D Cooperate Fe <sup>2+</sup> + <del>Fe</del> Ni/Mn											ADD'L INFORMATION	STATUS	CONDITION	LAB SAMPLE #	
MW-1	9/29 1506	W	3 40ml		X															
MW-2	1446	W	3 VOAS		X															
MW-3	1416	W	3 NOPRES		X															

SAMPLING COMPLETED 9-29-97 1506 DATE 9-29-97 TIME 1506 SAMPLING PERFORMED BY LAD GILCHRIST RESULTS NEEDED NO LATER THAN AS CONTRACTED

RELEASED BY [Signature] DATE 9-29-97 TIME 1513 RECEIVED BY William Most DATE 9-29-97 TIME 1513

RELEASED BY William Most DATE 9/30/97 TIME 11:29 RECEIVED BY David R. Jacobson DATE 9-30-97 TIME 11:28

RELEASED BY \_\_\_\_\_ DATE \_\_\_\_\_ TIME \_\_\_\_\_ RECEIVED BY \_\_\_\_\_ DATE \_\_\_\_\_ TIME \_\_\_\_\_

SHIPPED VIA \_\_\_\_\_ DATE SENT \_\_\_\_\_ TIME SENT \_\_\_\_\_ COOLER # \_\_\_\_\_

**DISTRIBUTION**

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

**OCTOBER 24, 1997**

**COPY NO. 2**

		<u>Copy No.</u>
1 Copy	Pacific Electric Motor Company 1009 66th Avenue Oakland, California 94601  Attention: Mr. Rand Perry	1
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	2 - 3
3 Copies	PES Job File	4 - 6
1 Copy	Unbound Original	7