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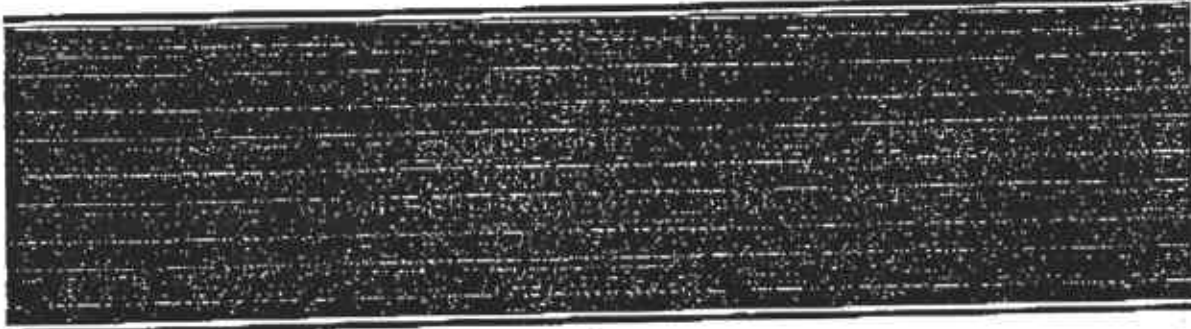
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**EXCAVATION AND SAMPLING
REPORT**

**PACIFIC ELECTRIC MOTOR
1009 66th Avenue
Oakland, California**

**W.A. CRAIG, INC
Project No. 3471.3
February 19, 1997**

DRAFT

PROFESSIONAL CERTIFICATION

***Excavation and Sampling
Report***

**Pacific Electric Motor
1009 66th Avenue
Oakland, California**

**W.A. Craig, Inc., Project No. 3471.3
February 19, 1997**

This report has been prepared by the staff of W.A. Craig, Inc., under the professional supervision of the persons whose seals and signatures appear hereon. No warranty, either expressed or implied, is made as to the professional advice presented herein. The analysis, conclusions and recommendations contained in this report are based upon the review of existing subsurface investigation reports, review of daily field-work reports, laboratory analytical reports, and discussions with W.A. Craig, Inc., personnel. This information has been reviewed and summarized in this report. The information from these sources has been used to develop a representation of the site conditions as they existed at the time of the corrective actions and they are subject to change.

The conclusions presented in this report are professional opinions based solely upon visual observations of the site and vicinity, and interpretation of available information as described in this report. W.A. Craig, Inc., recognizes that the limited scope of services performed in execution of this investigation may not be appropriate to satisfy the needs, or requirements of other state agencies, or of other users. Any use or reuse of this document or its findings, conclusions or recommendations presented herein is at the sole risk of the user.

**Geoffery A. Fiedler, R.G.
Geologist**

**W.A. Craig, II, R.E.A.
Owner**

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EXECUTIVE SUMMARY

Soil and groundwater were remediated by W.A. Craig, Inc. (WAC), at the Pacific Electric Motor site located at 1009 66th Avenue in Oakland, California. The remedial activities were performed in accordance with WAC's "Workplan for Additional Remediation of Soil and Groundwater", dated July 5, 1995. The remedial measures involved the removal of approximately 1500 cubic yards of petroleum hydrocarbon impacted soil and the treatment and discharge of an estimated 116,000 gallons of petroleum hydrocarbon impacted groundwater.

Soils consisting primarily of clay and silty clay, were excavated to a depth of approximately 20 feet below ground surface (bgs). Elevated concentrations of petroleum hydrocarbon compounds (530 to 930 milligrams per kilogram [mg/kg] gasoline and 6.6 To 7.4 mg/kg benzene) remain in soil northeast and southeast of the final excavation limits. Groundwater recharge into the excavation area was slow. Soil boring logs suggest that a discontinuous lens of sandy and gravelly clay associated with perched groundwater ^{omit} occurs at approximately 10 to 14 feet bgs. Shallow groundwater occurs in a sandy soil at a depth of approximately 20 to 25 feet bgs.

Groundwater and surface water runoff accumulated in the excavation. This water was pumped intermittently from the excavation to collect representative soil confirmation samples from the excavation bottom and sidewalls. The water in the excavation was treated using granular activated carbon and discharged to the storm drain system. The discharge of the treated water was performed in accordance with the discharge requirements of the Regional Water Quality Control Board (RWQCB), San Francisco Bay Region. Authorization to discharge was obtained from the City of Oakland, which is the agency having jurisdiction over the use for the storm drain system.

WAC recommends further investigation to assess soil and groundwater quality. The investigation should be performed to assess the site environmental conditions and evaluate appropriate remedial alternatives for site closure. The site investigation should evaluate intrinsic bioremediation (natural degradation) and risk based corrective measures in accordance with the RWQCB recommended use of American Society for Testing and Materials (ASTM) *Standard Guide for Risk-Based Corrective Action Applied at Petroleum Release Sites* (ASTM, November 1995).

1.0 INTRODUCTION

This report presents the methods and procedures used during the remediation of petroleum hydrocarbon impacted soil and groundwater at Pacific Electric Motors (PEM) located at 1009 66th Avenue in Oakland, California (site). The site location is shown on Figure 1. The site remedial action was performed in response to a request by the Alameda County Environmental Health Division (ACEHD) to address residual petroleum hydrocarbon-affected soil and groundwater with respect to the release of regulated substances from a former Underground Storage Tank (UST) at the site. The remedial action was performed in accordance with the W. A. Craig, Inc. (WAC) "Workplan for Additional Remediation of Soil and Groundwater", dated July 5, 1995.

1.1 Site Location and Description

*electric motor + generator repair
rebuild facility.*

The site is located at 1009 66th Avenue in Oakland, California, approximately 0.5 miles north-northwest of the Oakland Alameda County Coliseum adjacent to Interstate-880 (Figure 1). The site is operating as an electric-generator production plant. A large production-warehouse building occupies two thirds of the site and a small stock-parts warehouse occupies the northwest portion of the site. The surrounding area is developed as a mix of residential apartment complexes and commercial/industrial businesses.

The site topography is essentially flat, with a slight regional slope to the southeast toward 66th Avenue. The surface is paved with asphalt. The site is graded to allow surface water runoff to flow into storm drains located throughout the site. There is a sump pump in one of the drains located along the south edge of the site. It is our understanding that there are no domestic water wells or groundwater monitoring wells at the site. The site layout is shown on Figure 2.

1.2 Background

On February 16, 1995, WAC removed one 2000-gallon gasoline UST, used to store gasoline. Clean overburden soil was stockpiled at the site and covered with plastic sheeting. Confirmation soil samples collected from the excavation and beneath associated product supply lines were reported to contain concentrations of gasoline ranging from 33 to 500 milligrams per kilogram (mg/kg), and benzene ranging from 0.045 to 0.54 mg/kg. Following their review of the confirmation sampling data, the ACEHD requested corrective action work be performed at the site.

In April, 1995, WAC excavated the petroleum hydrocarbon impacted soil in the UST area. Field observations indicated that the impacted soil extended to the southeast and southwest, beyond the immediate vicinity of the former UST, fuel dispensing island, and materials storage shed locations. Exploratory trenches were excavated southeast, southwest and northeast of the UST excavation to assess the extent of petroleum hydrocarbon impacted soil. Confirmation soil samples were collected from the bottoms and sidewalls of the trenches and analyzed for total petroleum hydrocarbons as gasoline (TPH-g), benzene, toluene, ethylbenzene and xylenes (BTEX).

WAC performed additional subsurface site investigation on April 24 and 25, 1995. The investigation included the drilling of nine exploratory soil borings and the collection of soil samples. The borings were advanced to depths ranging from approximately 17 to 29 feet below ground surface (bgs). Thirty-five soil samples were collected from the soil borings. However, the fine grained soils did not yield enough water in the exploratory borings to obtain representative grab groundwater samples. Laboratory analysis of soil samples collected from borings to the west of the UST excavation reported TPH-g concentrations ranging from 230 to 1300 mg/kg. Concentrations of TPH-g ranging from 530 to 1900 mg/kg and 6.5 to 1300 mg/kg were reported in soil samples collected south and east, respectively, of the UST excavation and the former pump area. The results of the subsurface investigation are presented in WAC's "Subsurface Environmental Investigation Report", dated May 16, 1995.

2.0 SCOPE OF WORK

The scope of work summarized below was performed in accordance with WAC's Workplan, dated July 5, 1995. The field work for this remedial action was performed between August and November, 1995. The results of the soil and groundwater remediation are presented herein. The scope of work for this project included:

- Preparation of an ACEHD approved Workplan and permitting, as required;
- Pumping, treating, and discharging of accumulated water from the excavation;
- Demolition of a fuel dispensing island, associated product supply lines, and a materials storage structure;
- Excavation of petroleum hydrocarbon impacted soil in the vicinity of the former UST excavation;
- Installation of a temporary groundwater monitoring well;

- Collection of excavation sidewall and bottom confirmation soil samples to assess the effectiveness of the soil removal activities;
- Laboratory analysis of excavation soil and water samples for TPH-g and total petroleum hydrocarbons as diesel (TPH-d), using EPA Method 8015 (modified), and BTEX using EPA Method 8020;
- Preparation of this report summarizing the field methods and procedures, the results of laboratory analyses, and our conclusions and recommendations regarding the site environmental quality.

3.0 SUBSURFACE CONDITIONS

The site soil consists of irregularly bedded clay, clayey-silt with sands and gravels, and lenses of coarse-grained, poorly sorted, sand. The upper 6 to 7 feet of soil consists of a mottled, dark and light brown clay with organic material. The soil is dry to moist, medium stiff, and slightly plastic. A coarse sandy-clay layer (with trace gravel), approximately 5 feet thick, was encountered in the excavation and the exploratory soil borings at depths ranging from approximately 10 to 25 feet bgs. During the installation of the temporary monitoring well a coarse-grained sand layer was encountered at a depth of approximately 21 to 25 feet bgs. Underlying this material to the depths explored (28 feet bgs) is a dark-brown clay that is wet, moderately to very stiff, and moderately plastic.

Moist to wet sandy-clay was encountered at a depth of approximately 10 to 14 feet bgs in the exploratory trenches and soil borings, during the a previous subsurface investigation. Soils encountered between this depth and approximately 20 feet bgs contained less water. Beneath this drier zone is wet, loose, coarse-grained, poorly sorted, brown sand and silty-clay at depths of approximately 21 to 25 feet bgs. From approximately 25 feet bgs to the depth explored is wet, clayey-silt.

4.0 EXCAVATION ACTIVITIES

4.1 Excavation

The site excavation activities included the removal of approximately 1500 cubic yards of petroleum hydrocarbon impacted soil. Field observation, olfactory, and confirmation soil sample analytical results were used to direct the excavation activities. The lateral limits of the excavation were restricted to the northeast and northwest by site boundaries and an onsite building.

4.2 Stockpiling

Approximately 1500 cubic yards of petroleum hydrocarbon impacted soil were excavated and stockpiled in the northwest portion of the site. The excavated soil was stockpiled on and covered with plastic sheeting. Approximately 45 cubic yards of clean over-burden soil were segregated and stockpiled separately.

4.3 Backfilling

Prior to backfilling, groundwater or surface water entering the excavation was removed by pumping into temporary storage tanks located onsite. The excavation was backfilled with clean, imported, fill material, and compacted. The backfill was completed to approximately 3-inches below grade. Aggregate rock surface material was used to complete the backfill to surface grade.

5.0 SOIL SAMPLING

5.1 Confirmation Soil Sampling

Confirmation soil samples were collected in accordance with the Workplan. An excavator was used to retrieve soil from the sampling areas in the excavation. Samples collected for laboratory analyses were obtained by driving two-inch diameter brass sampling tubes into the soil in the excavator bucket. Care was taken to immediately seal the sampling tubes and to limit headspace.

Prior to sampling, the soil sampling equipment was washed with a laboratory-grade detergent solution and rinsed with tap water to limit the potential for cross-contamination. Samples contained in the brass tubes were covered with Teflon® film, closed with polyethylene end-caps, and wrapped with duct tape. The sample tubes were labeled and placed inside a sealed plastic bag. All prepared soil samples were immediately placed inside a portable insulated container and stored under refrigeration for delivery. The confirmation soil samples were submitted to McCampbell Analytical, Inc. (MAI), of Pacheco, California, under chain-of-custody control. MAI is certified by the State of California to perform the required analysis.

5.2 Laboratory Analyses

Confirmation soil samples were analyzed by MAI for TPH-g using EPA Method 8015 (modified) and BTEX using EPA Method 8020. Selected soil samples were additionally analyzed for total petroleum hydrocarbons as diesel (TPH-d) and total petroleum hydrocarbons as oil and grease (TPH-o&g) using EPA Method 418.1, total petroleum hydrocarbons as motor oil (TPH-mo), acetone using EPA Method 8240, polychlorinated biphenyls (PCBs) using EPA 8080, and volatile organic compounds (VOCs) using EPA Method 8240.

5.2.1 Soil Sample Analytical Results - Preliminary Excavation

The range of reported petroleum hydrocarbon concentrations in soil samples collected from the preliminary excavation are as follows:

- TPH-g: 1.0 to 5700 mg/kg;
- Benzene: 0.018 to 62 mg/kg;
- Toluene: 0.035 to 420 mg/kg;
- Ethylbenzene: 0.024 to 130 mg/kg;
- Xylenes: 0.10 to 770 mg/kg; and
- TPH-d: 160 milligrams per kilogram (mg/kg);
- TPH-mo: 15 mg/kg.

The soil sample locations from the preliminary excavation are shown on Figure 2 and the laboratory analytical results are summarized on Table 1. Copies of the laboratory analytical reports and chain-of custody forms are included in Appendix A.

5.2.2 Soil Sample Analytical Results - Final Excavation

Eighteen (18) confirmation soil samples were collected from selected areas to assess soil quality in the final excavation. The range of reported concentrations of petroleum hydrocarbon constituents in soil samples from the final excavation are as follows:

- TPH-g: ND to 2800 mg/kg;
- Benzene: ND to 18 mg/kg;
- Toluene: ND to 150 mg/kg;
- Ethylbenzene: ND to 72 mg/kg; and
- Xylenes: ND to 420 mg/kg;
- TPH-o&g: ND to 210 mg/kg;
- VOCs: ND; and
- PCBs: ND.

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The confirmation soil sample locations from the final excavation are shown on Figure 3 and the laboratory analytical results are summarized on Table 2. Copies of the laboratory analytical reports and chain-of custody forms are included in Appendix A.

6.0 EXCAVATION WATER

Groundwater and surface water in the excavation was pumped intermittently into temporary storage tanks, treated and discharged. A letter of authorization was obtained from the San Francisco Regional Water Quality Control Board (RWQCB), prior to discharging any extracted groundwater. A copy of the letter of is contained in Appendix B.

6.1 Sampling

Water samples were collected from the temporary storage tanks, before and after treatment, using a polyethylene disposable bailer, and decanted into laboratory supplied containers. The water samples and travel-blanks were immediately placed on ice, inside a portable insulated container, and delivered to a State-Certified laboratory, under chain-of-custody control.

6.2 Water Treatment and Discharge

A primary and secondary liquid phase granular activated carbon (GAC) treatment system was used to reduce hydrocarbon concentrations to below discharge standards specified in RWQCB Order No. 91-056. Water samples were collected before and after GAC treatment to confirm acceptable petroleum hydrocarbons concentrations before discharge. The treated water was discharged to a storm drain following authorization to discharge by Mr. Joe Trapp, City of Oakland. Approximately 116,000 gallons of water was treated and discharged.

6.3 Laboratory Analytical Results

The excavation-water samples were analyzed by MAI for TPH-g, using EPA Method 8015 (modified); and BTEX, using EPA Method 8020. Selected water samples were additionally analyzed for MTBE, using EPA Method 8020; TPH-o&g, using EPA Method 418.1; PCBs, using EPA Method 8080; VOCs, using EPA Method 8240; total dissolved solids (TDS), using EPA Method 160.1; and LUFT Metals, using EPA Method 6010.

The water contained in the temporary holding tanks was sampled prior to treatment. The laboratory analytical results for these samples are presented on Table 3 as Influent samples. TPH-g was reported at concentrations ranging from not detected to 81,000 micrograms per liter ($\mu\text{g/l}$) and benzene was reported at concentrations ranging from not detected to 3100 $\mu\text{g/l}$ in Influent water samples. MTBE was detected in water samples at concentrations ranging from

43 to 250 $\mu\text{g/l}$. TDS and PCBs were reported at 810 $\mu\text{g/l}$ and 3.1 $\mu\text{g/l}$, respectively, in groundwater samples.

The analytical results of samples collected from treated water are also summarized on Table 3 as Effluent samples. Analysis of Effluent water samples reported petroleum hydrocarbons at concentrations below the limits specified in Board Order No. 91-056 for all constituents, except for 60 $\mu\text{g/l}$ TPH-g (reporting limit 50 $\mu\text{g/l}$) in sample 5-BT-1 collected on August 29, 1995, and 18 $\mu\text{g/l}$ MTBE (reporting limit 5 $\mu\text{g/l}$) in sample BT4CF1 collected on November 13, 1995. The laboratory analytical reports and chain-of-custody documents are included in Appendix A.

7.0 TEMPORARY MONITORING WELL INSTALLATION

7.1 Monitoring Well Construction

WAC supervised the drilling of a soil boring and the installation of a temporary groundwater monitoring well, on September 13, 1995. The borehole was drilled to a depth of approximately 28 feet bgs using a truck-mounted drill rig equipped with 24-inch, outside diameter, bucket auger. The borehole was logged in the field by a WAC geologist under the direct supervision of a California Registered Geologist. No soil samples were collected. The location of the monitoring well is presented on Figure 2. The soil boring log is presented in Attachment C. Soil cuttings were placed on the previously excavated stockpiled soil located onsite.

The temporary well was installed for the purpose of obtaining a representative groundwater sample in the vicinity of the former UST excavation. The well was installed to a depth of approximately 28 feet bgs. The well was constructed through the open borehole, with the annulus materials placed from the bottom of the borehole to the ground surface. The temporary monitoring well was constructed of ten-inch diameter, 0.032 machine slotted, flush threaded, Schedule 40 polyvinyl chloride (PVC) well screen. The well was screened from approximately 19 to 28 feet bgs. Blank PVC casing completed the well from the top of the screened interval to surface grade. A filter pack consisting of #3 Monterey Sand was placed in the annular space from the bottom of the screen to approximately one-foot above the top of the screened interval. A sanitary seal consisting of 6-feet of hydrated bentonite was placed on top of the filter pack. The remaining annulus was left open to the excavated surface, approximately 3 feet bgs. A protective cap was placed over the open end of the casing to prevent unauthorized entry into the well.

outside excavation

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7.2 Monitoring Well Sampling

7.2.1 Methods and Procedures

A groundwater sample was collected after developing the well. A minimum of three well casing volumes were pumped from the monitoring well on November 1, 1995 prior to collecting a groundwater sample.

A groundwater sample was collected using a disposable polyethylene bailer. The bailer was pre-cleaned by the manufacturer and sealed in plastic. The bailer was lowered into the well casing to extract a groundwater sample. The sample was decanted into laboratory supplied containers approved for the analyses required. The groundwater sample was immediately placed inside a portable insulated container, and delivered to MAI under chain-of-custody control.

7.2.2 Laboratory Analytical Results

The groundwater samples were analyzed by MAI for TPH-g using EPA Method 8015 (modified); BTEX and MTBE using EPA Method 8020; and acetone, using EPA Method 8240.

Analysis of the water sample from the temporary monitoring well reported concentrations of 3600 $\mu\text{g/l}$ TPH-g, 62 $\mu\text{g/l}$ MTBE, benzene 47 $\mu\text{g/l}$, toluene 5.7 $\mu\text{g/l}$, and xylenes 530 $\mu\text{g/l}$. The results of the temporary monitoring well groundwater analyses are presented in Table 4. Copies of the laboratory analytical report and chain-of-custody documents are in Appendix A. The temporary monitoring well was destroyed on December 6, 1995. A copy of the groundwater well abandonment Workplan and well destruction report are included in Appendix D.

NOT,
STILL
Present

8.0 CONCLUSIONS AND RECOMMENDATIONS

Petroleum hydrocarbon impacted soil in the former UST location has been excavated and removed from the site. To the northwest and northeast, where further excavation was precluded by the site boundary and the warehouse, analysis of excavation sidewall soil samples reported up to 930 mg/kg TPH-g. TPH-g was reported at a concentration of 2800 mg/kg in a sidewall sample collected at 18 feet bgs from the southwest sidewall. The vertical extent of impacted soil in the excavated area appears to be limited to approximately 23 feet bgs. The highest concentrations of gasoline remaining in soil occur between 10 feet bgs and 18 feet bgs.

Petroleum hydrocarbon impacted groundwater was reported in groundwater samples collected from the temporary monitoring well and excavation dewatering activities.

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WAC recommends further investigation to assess soil and groundwater quality. The investigation should be performed to assess the site environmental conditions and evaluate appropriate remedial alternatives for site closure. The site investigation should evaluate intrinsic bioremediation (natural degradation) and risk based corrective measures in accordance with the RWQCB recommended use of American Society for Testing and Materials (ASTM) *Standard Guide for Risk-Based Corrective Action Applied at Petroleum Release Sites* (ASTM, November 1995).

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TABLE 1
Soil Sample Analytical Results - Preliminary Excavation
1009 66th Avenue, Oakland, California
Analytical Results in milligrams per kilogram

Sample	Depth In feet	Date	ANALYTES						
			TPH-d	TPH-g	Benzene	Toluene	Ethyl- benzene	Xylenes	TPH-mo
1D1W	1.75	4-7-95	160	460	1.9	3.1	8.1	24	15
1-SW-1-S	9	4-11-95	NA	1100	16	94	25	140	NA
2-PB-1-W	10.5		NA	400	5.8	33	8.9	53	NA
3-SW-1-W	9		NA	3.6	0.024	0.12	0.054	0.36	NA
4-SW-1-S	9		NA	980	15	82	21	120	NA
5-SW-1-S	9		NA	900	17	90	22	130	NA
6-PB-1-E	10.5		NA	310	4.2	3	8.2	16	NA
7-TB-0-E	10		NA	1200	14	84	26	150	NA
8-TB-0-S	10		NA	600	7.2	16	11	41	NA
9-TB-0-S	10		NA	1	0.018	0.035	0.024	0.1	NA
10-TB-0-W	13		NA	5700	62	420	130	770	NA
11-TB-0-W	6		NA	2800	18	150	72	420	NA

Notes: NA = Not analyzed.

TABLE 2

Soil Sample Analytical Results - Final Excavation Limits
1009 66th Avenue, Oakland, California
Analytical Results in milligrams per kilogram

Sample	Depth in feet	Date	ANALYTES								
			TPH-g	MTBE	Benzene	Toluene	Ethyl- benzene	Xylenes	TPH-o&g	VOCs	PCBs
1 SWN	11	8-24-95	260	NA	4.4	10	8.1	38	NA	NA	NA
2 SWN	20		ND	NA	ND	ND	ND	ND	NA	NA	NA
3 SWN	10		530	NA	6.5	41	14	82	NA	NA	NA
4 SWN	14		51	NA	0.37	0.11	2.3	0.21	NA	NA	NA
5 SWN	21		300	NA	1.4	1.1	0.52	0.33	NA	NA	NA
6 PBN	22		300	NA	2.3	1.2	3.2	0.96	NA	NA	NA
7 PBN	24		58	NA	0.98	0.1	0.86	0.35	NA	NA	NA
8 SWN	13		930	NA	7.4	50	19	110	NA	NA	NA
9 SWN	20		1.7	NA	0.026	0.02	0.034	0.13	NA	NA	NA
10 PBS	21		93	NA	0.76	0.33	0.55	1.5	NA	NA	NA
11 PBS	12		320	NA	0.71	1.1	6.9	7.9	NA	NA	NA
12 SWE	21		120	NA	1.5	0.61	2.1	1.6	NA	NA	NA
1-82595	23	8-25-95	ND	NA	ND	ND	ND	ND	ND	NA	NA
4-82895	9	8-28-95	ND	NA	ND	ND	ND	0.014	ND	ND	ND
5-82895	3		1.2	NA	ND	0.005	ND	0.04	ND	ND	ND
6-82895	5		ND	NA	ND	ND	ND	0.012	ND	NA	NA
1-SW-SSW	13	8-29-95	690	NA	3.1	22	16	90	210	NA	NA
3-PB-N	24		ND	NA	ND	ND	ND	ND	ND	NA	NA
PBSE	19	11-8-95	ND	ND	ND	ND	ND	ND	ND	ND*	NA
PBSM	19	11-9-95	ND	ND	ND	ND	ND	ND	ND	ND*	NA
PBSW	14	11-10-95	ND	ND	ND	ND	ND	ND	NA	ND*	NA
PSSW	13		ND	ND	ND	ND	ND	ND	NA	ND*	NA

Notes:

NA = Not Analyzed

ND = Not detected at the laboratory reported limit of detection.

*Acetone analyzed only.

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TABLE 3

Water Sample Analytical Results - Excavation Water
1009 66th Avenue, Oakland, California
Analytical Results in micrograms per liter

Water Sample Influent Effluent			Date	ANALYTES										
				TPH-g	MTBE	Benzene	Toluene	Ethyl- benzene	Xylenes	TPH-o&g	VOCs	PCBs	Metals*	TDS
	BT1, BT1a	X	6-28-95	ND	NA	ND	ND	ND	ND	NA	NA	NA	NA	NA
X	1-PB-W		8-28-95	NA	NA	1100	690	280	2200	NA	ND	ND	NA	NA
X	2-PB-E			NA	NA	1300	2100	860	4700	NA	1200**	ND	NA	NA
X	3-Baker			NA	NA	NA	NA	NA	NA	NA	NA	ND	NA	NA
X	2-PB-W		8-29-95	81,000	NA	3100	8600	2500	15,000	42	NA	3.1	NA	810
X	3-B			NA	NA	NA	NA	NA	NA	NA	NA	ND	NA	NA
X	4-BT-2			13,000	NA	260	93	19	2900	6.2	NA	ND	NA	NA
	5-BT-1	X		60	NA	ND	0.75	0.6	1.2	ND	NA	ND	NA	NA
	GT1	X	10-3-95	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	NA
	BT41a	X		ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	NA
	BT1	X	10-12-95	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.069***	NA
	BT4	X		NA	NA	NA	NA	NA	NA	NA	NA	NA	0.11***	NA
X	BT4		11-6-95	ND	250	6.7	2.4	ND	ND	NA	ND	NA	NA	NA
	BT4CF 1	X	11-13-95	ND	18	ND	ND	ND	ND	NA	NA	NA	NA	NA
X	BT3CF1		11-17-95	ND	59	ND	ND	ND	ND	NA	NA	NA	NA	NA
	BTCF1	X	11-29-95	ND	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA
X	GTP 1		12-14-95	ND	43	ND	ND	ND	ND	NA	ND	ND	NA	NA
X	BT 2		12-20-95	ND	92	ND	1.2	ND	1.1	NA	ND	ND	NA	NA

Notes: NA = Not Analyzed
 ND = Not detected at the laboratory reported limit of detection.
 * Metals = CAM/CCR 17, title 22
 ** Acetone
 *** Barium

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SENT BY: ENVIRON-Emeryville ; 5- 9-97 ; 8:48AM ; 5106559517- 510 337 9335:#18


TABLE 4
Temporary Groundwater Monitoring Well Sample Analytical Results
1009 56th Avenue, Oakland, California
Analytical Results in micrograms per liter

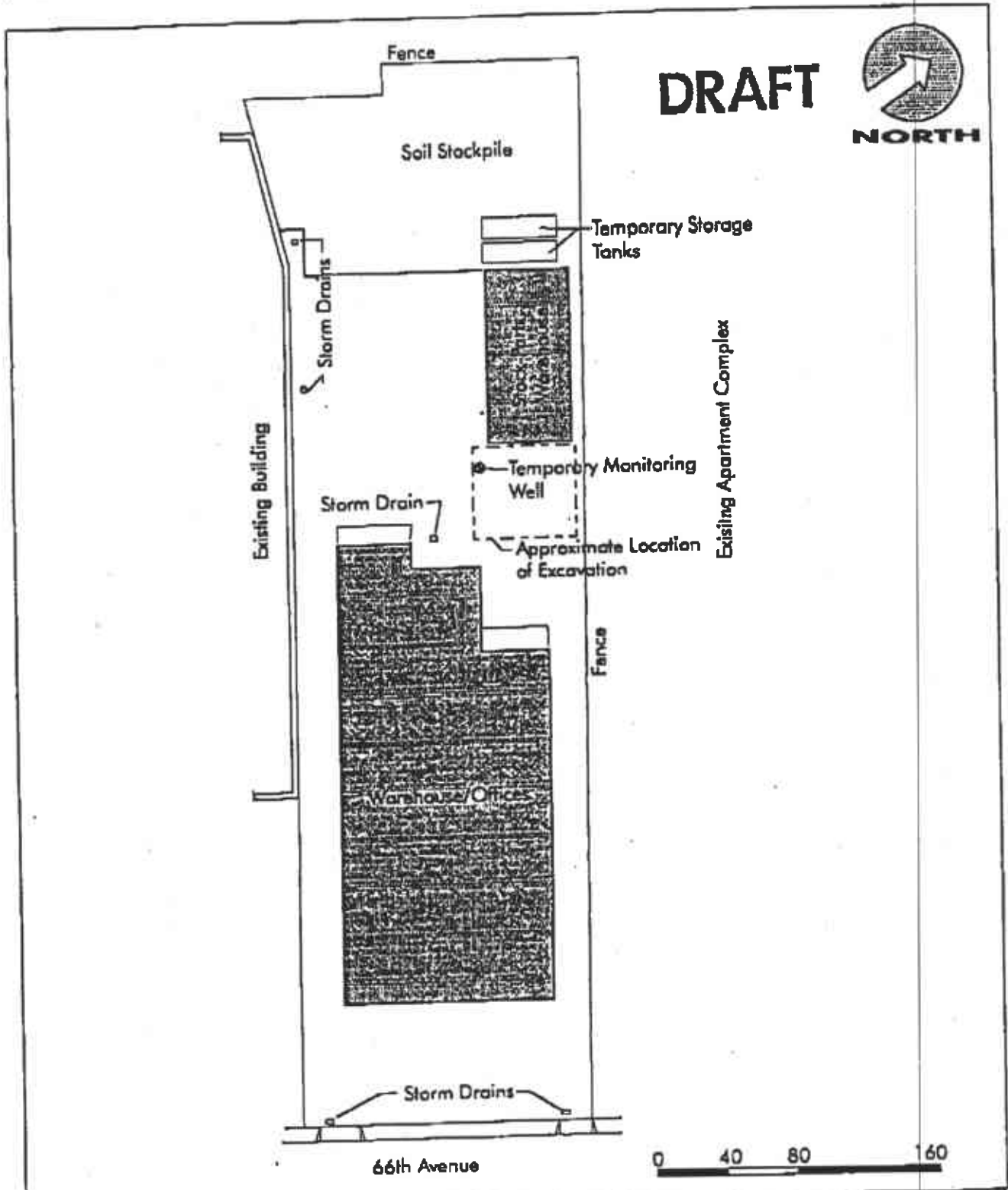
	Water Sample
	AW 1
Date	11-7-85
TPH-g	3,800
MTBE	62
Benzene	47
Toluene	57
Ethylbenzene	ND
Xylenes	630
Acetone	ND



Mag 14.00
 Mon Dec 02 13:40 1996
 Scale 1:31,250 (at center)
 2000 Feet
 NORTH

SITE LOCATION MAP
 PEM
 1009 66th Avenue
 Oakland, CA
 Project No. 3471.3
 December 1996
 Figure 1

Checked by:  **W. A. CRAIG, INC.**
 Environmental Contracting and Consulting
 P.O. Box 448
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Site Plan
 PEM
 1009 66th Avenue
 Oakland, CA

Project No. 3471.3
 December 1996

Figure 2

Checked by:

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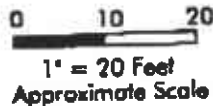
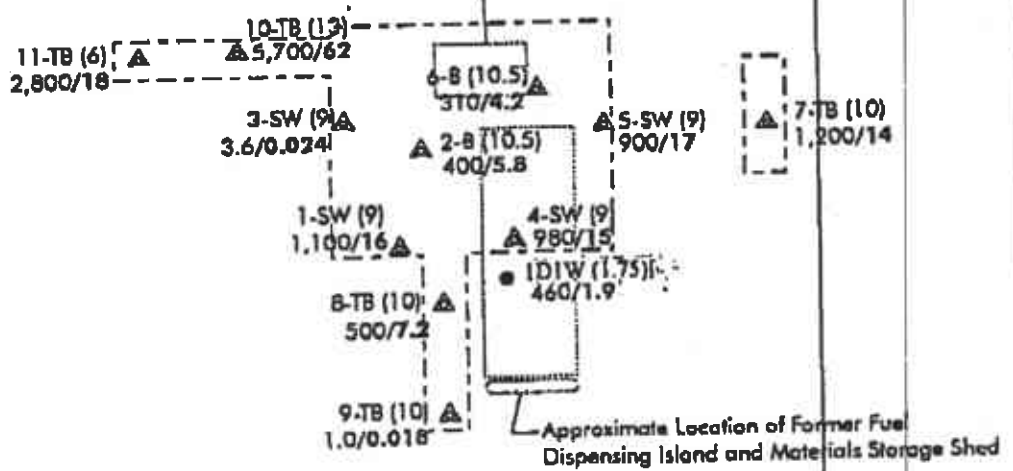


EXPLANATION

- - - Approximate limits of excavation
- 77/0.23 Gasolina/ Benzene (milligrams per kilogram)
- Confirmation Soil Samples:
 - 4/7/95
 - ▲ 4/11/95
- 1-8 (9) Sample Identification (depth in feet)



Stock, Parts Warehouse



Project No. 3471.3 Preliminary Excavation Limits PEM Figure 3
 December 1996 1009 66th Avenue Oakland, CA

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 Environmental Contracting and Consulting

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 Napa, California 94559-0448
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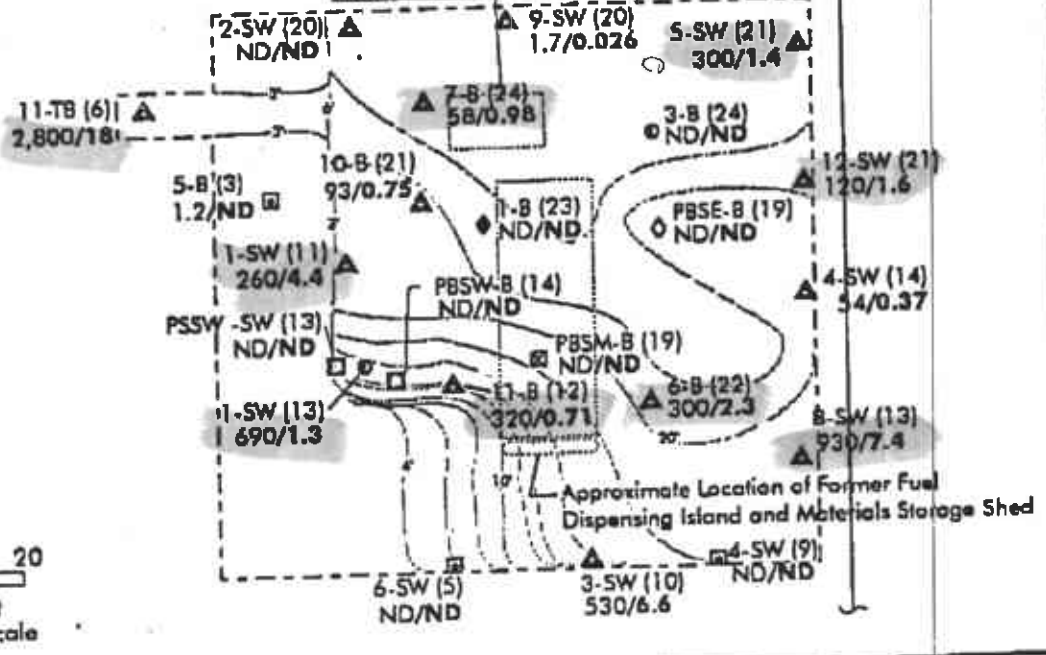
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EXPLANATION

- - - Approximate limits of excavation
- 77/0.22 Gasoline/ Benzene (milligrams per kilogram)
- Confirmation Soil Samples:
 - ▲ 8/24/95 □ 8/28/95 ○ 11/8/95
 - ◆ 8/25/95 ● 8/29/95 ▣ 11/9/95
 - 11/10/95
- 1-8 m Sample Identification (depth in feet)
- Contour of Excavation Bottom = 2.0 feet (or as indicated)



Project No. 3471.3
December 1996

Final Excavation Limits
PEM
1009 66th Avenue
Oakland, CA

Figure 4

Checked by:



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Comments

APPENDIX C

Boring GP extend beyond overexc area

SOIL BORING LOG

(West) GP 1 1100g, 13, 72, 28, 150 BTEX @ 9.5-10'

(NW) GP 4 970g, 11, 47, 23, 130 BTEX @ 10-10.5'

GP 5 230, 0.97, 10, 4.9, 27 BTEX @ 12-12 1/4'

GP 9 1300, 14, 75, 28, 16 BTEX @ 9.5-10'

Contamination appears "trapped" in layers ~ 9-12'

~~contamination~~ concentration varied in depth -

Contamination still present @ depth of final overexc

GW @ varying depths -

geology is irregular -

migration has been ~~at~~ all directions from pit.

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DRILLING LOG - DRAWING 2

BORING NO. B1

PROJECT NAME: PEM **PROJECT NO. 3471-C**
ADDRESS: 1009 66th Avenue, Oakland, California
FIELD GEOLOGIST: David Orr **DATE:** Sept. 13, 1995
DRILLING COMPANY: Weeks Drilling **SAMPLER:** None
DRILLING METHOD: Bucket Auger **TOTAL DEPTH:** 28'
BORING DIAMETER: 24"
REG. GEOLOGIST: Frank Goldman

DEPTH	SAMPLE RECOVERY	BLOW COUNT	PID [ppm]	BORING CONSTR.	LITHOLOGIC LOG	USCS SYMBOLS	LITHOLOGIC DESCRIPTION Description, Grain Size, Sorting, Color, Moisture, Mechanical Properties
0 - 6"							Asphalt.
6" - 12"							Basalt
12" - 18'						CL	Clay (Baymud)
12" - 18'						CL	Clay (Baymud)
18" - 20'						CL	Clayey Sand with Chert Fragments.
21" - 25'						GW ▽	Sand Layer, coarse grained, loose, saturated.
25" - 28'							Clay (Baymud)
							End of boring at 28'. Groundwater encountered at 22'.