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REPORT OF FINDINGS SOIL AND GROUNDWATER INVESTIGATION

PACIFIC SUPPLY COMPANY OAKLAND, CALIFORNIA

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November 30, 1990

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90 DEC -3 AM 8:52

90 NOV 33 AM 8:50

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1.0 INTRODUCTION

In May, 1987, efforts were initiated to abandon an underground gasoline storage tank at Pacific Supply Company's West Oakland site (Figures 1 and 2). Gas chromatography analyses of soil and associated vapor from exploratory boreholes at the site were carried out by CHIPS Environmental Consultants and Anatec Laboratories, Inc. (Figure 3). The results indicated that soil in the vicinity of the tank was contaminated with gasoline and raised the possibility that gasoline may have reached groundwater below the site. During subsequent removal of the tank by Erikson Industrial Services, substantial deterioration of the tank body was documented. Gasoline odors were also detected during tank removal operations.

In order to assess the extent of soil and groundwater quality below and immediately adjacent to the Pacific Supply Company site, and to determine the potential for migration of contaminants from off-site sources, Brunsing Associates carried out a two phase soil and groundwater investigation. The initial phase of work (Phase I) included the installation of five shallow on-site groundwater monitoring wells. This phase of work was carried out in September 1988. The second investigatory phase of work (Phase II) included the installation of two shallow off-site monitoring wells as well as the resampling of the Phase I on-site monitoring wells. The Phase II investigation was carried out in December 1989.

This Report of Findings summarizes the recent Phase II field and analytical data and combines it with the initial data collected as part of Phase I. The following report sections have been employed to discuss the major components of Phase I and II investigations:

- Installation of five on-site and two off-site groundwater monitoring wells;
- Borehole soil analyses;
- Groundwater chemical analyses;
- Groundwater elevation survey;
- Interpretation of chemistry and hydrogeology;
- Recommendations for remediation.

The results of these tasks are described below.

2.0 METHODS

2.1 PHASE I INVESTIGATION

Five on-site groundwater monitoring wells were installed during field efforts on Pacific Supply Company's Oakland property in order to assess the local groundwater gradient, the extent of soil and possible groundwater contamination, and to determine whether or not off-site migration of contamination had occurred. The locations of the five on-site monitoring wells are shown on Figure 2. Three monitoring wells were installed within 50 feet of the former gasoline tank location in a triangular pattern in order to investigate the distribution of possible gasoline contamination in soil and water in the immediate vicinity of the excavation. The location of monitoring well MW-1 was specifically designed to assess whether or not groundwater contamination could have originated from off-site sources to the north. The locations of wells MW-2 and MW-3 were intended to provide groundwater quality information to the immediate west and south of the excavation. Monitoring well head elevations were surveyed by Sam Kushner, a California licensed land surveyor, and are believed to be accurate to 0.01 feet. A check was subsequently performed of the surveyed elevations of on-site monitoring wellheads to confirm the accuracy of the survey data.

Two monitoring wells (MW-4 and MW-5) were installed approximately 200 feet east and 150 feet south, respectively, of the former tank location. Well MW-4 is located on the eastern property boundary to evaluate the possible contribution of groundwater contamination from off-site sources to the east while the location of well MW-5 was chosen to assess groundwater quality and gradient information on the southern boundary of the site.

2.2 Phase II Investigation

An additional two off-site monitoring wells were installed just beyond Pacific Supply Company's property. As shown in Figure 2, MW-6 was installed immediately adjacent to the property currently occupied by the Yellow Cab Company on Willow Street. Also shown on Figure 2, MW-7 was installed immediately adjacent to the property occupied by the C & L Trucking Company on 24th Street. The intent of these groundwater monitoring wells was to assess the potential for off-site contamination to migrate on to Pacific Supply Company property. Both MW-6 and MW-7 were placed between neighboring underground storage tanks (currently removed) and Pacific Supply Company property as shown on Figure 2.

As was the case for the five on-site monitoring wells, both off-site wells were surveyed for horizontal and vertical control.

As part of the Phase II investigation the five on-site monitoring wells were resurveyed for groundwater elevation. In addition the on-site monitoring wells were resampled for groundwater chemistry. Discussions of the soil and groundwater chemical analyses for MW-1 through MW-7 are included as part of the following sections.

Boring logs and monitoring well completion details are presented in Appendices A and B, respectively. The geologic logging, construction, installation, and development methods employed in the monitoring well installation program undertaken at the Pacific Supply Company site are detailed in Appendix C.

3.0 SOIL CHEMISTRY

3.1 ON-SITE BORINGS

Soil samples representative of the unsaturated zone/groundwater interface were collected during the boring program as part of the Phase I investigation and analyzed for Total Petroleum Hydrocarbons (TPH), benzene, toluene, and xylene (BTX) by NET Pacific Laboratories, Inc. The protocol used to collect and manage soil samples is detailed in Appendix D. The complete laboratory reports are provided in Appendices E and F, and the results are summarized in Table 1.

The results of soil analyses indicate that detectable gasoline constituents occur at the saturated/unsaturated zone interface at all three observation points, suggesting the existence of past or present floating product in groundwater. This is corroborated by the fact that the sample obtained from MW-3 at a depth of 7.5-8.0 feet was located slightly above the saturated/unsaturated zone interface and has a lower TPH concentration than the sample taken at the interface.

The results of soil analyses performed in 1988 are consistent with soil and vapor analyses undertaken in 1987 by CHIPS and Anatech (Appendix G). Figure 3 schematically shows the locations and results of soil and vapor analyses performed in both 1987 and 1988. Although it is generally believed that vapor analyses are a poor indicator of soil chemistry, both soil and vapor TPH levels were found to range between ND [less than 10 parts per million (ppm)] and 4000 ppm. The data indicate that gasoline constituents are present throughout the vadose zone (unsaturated zone above the water table) within a minimum 50-foot radius of the former tank location. The number and distribution of soil samples analyzed to date are insufficient to define the maximum extent of vadose zone contamination,

however. For the purposes of remediation, analysis of additional soil samples will be necessary to define the limits of TPH contamination relative to the clean-up levels established for the site.

3.2 OFF-SITE BORINGS

Soil samples representative of the unsaturated zone/groundwater interface were collected during the boring program as part of the Phase II investigation. Those samples were collected and analyzed for TPH (gasoline), Total Extractable Petroleum Hydrocarbons [(TEPH) - diesel, kerosene, motor oil], benzene, toluene, ethylbenzene, xylene (BTEX) and organic lead. The Acurex Corporation - Environmental Systems Division (acquired by Mid-Pacific Environmental Laboratory in January 1990) performed the analyses. As a result of noticeable levels of an oily residue within the soil during utility location auguring and subsequent boring of MW-6, additional analyses were performed which included volatile organics and semi-volatile organics. The protocols used to collect and manage the soil samples is described in Appendix D. The complete laboratory reports are provided as part of Appendices E and F. The results of the soil analyzes for MW-6 and MW-7 for TPH, TEPH, BTEX and organic lead are summarized on Table 2.

In addition to the analytical tests reported in Table 2, soil samples from MW-6 were analyzed for Purgeable Halocarbons [United States Environmental Protection Agency (EPA) Method 8010] and Semi-Volatile Organics (EPA Method 8270). The results of the EPA Method 8010 and 8270 are provided in Appendix E.

The results of the soil analyses indicates that detectable levels of gasoline constituents occur at the saturated zone/groundwater interface for monitoring well MW-6, adjacent to the Yellow Cab Company property. This is evidenced by the positive analytical results for both TPH and organic lead. The semi-volatile organic analyses indicate relatively low concentrations of naphthalene [6.4 milligrams per kilogram (mg/kg)]. No other analytes were above detection limits for the semi-volatile organic analyses. However, four tentatively identified EPA Method 8270 compounds were identified. These compounds and their concentrations are listed below:

8015

1. Alkyl Benzene - 2.20 mg/kg;
2. Hydrocarbon - 0.52 mg/kg;
3. Dimethyl Naphthalene - 0.16 mg/kg;
4. 1H-Idene, 2, 3-Dihydrodimethyl - 0.077 mg/kg.

Indene

The above compounds are related to the presence of light petroleum fuels and industrial solvents.

petroleum const.

The results of the purgeable halocarbon analysis for MW-7, adjacent to the C & L Trucking Company property, indicate that heavy petroleum hydrocarbon products are present at concentrations of 160 mg/kg. Organic lead was also detected in this sample at low concentrations. As with MW-6, no BTEX constituents were detected on the soil which may indicate the existence of a weathering process that has effectively reduced BTEX concentration levels in the soil.

The off-site soil data indicate that petroleum hydrocarbon constituents are present at the MW-6 and MW-7 locations at depths equivalent to the groundwater/unsaturated zone interface. These borings were placed in close proximity to previously existing underground storage tanks that are suspected to have had prior uncontrolled releases. The current data supports the contention that potential off-site sources for petroleum hydrocarbon do exist adjacent to the Pacific Supply Company site. The 370 mg/kg of TPH-Gasoline found at MW-6 is significant and adds strong support that the removed underground fuel tank on Yellow Cab Company property may have been a source of leakage. A thick oil-like substance was observed at a depth of approximately five feet at MW-6 during soil sampling. In addition, floating product was observed in an excavation adjacent to MW-7 during a recent underground storage tank removal on C & L Trucking Company property. However, the analytical soil data do not verify that off-site sources have contributed to the elevated hydrocarbon concentrations observed on Pacific Supply Company property.

4.0 GROUNDWATER CHEMISTRY

4.1 ON-SITE GROUNDWATER MONITORING WELLS

Groundwater samples were obtained from the five on-site monitoring wells on October 10, 1988 and December 29, 1989 using appropriate EPA protocol as detailed in Appendix D and were submitted to NET Pacific Laboratories, Inc. (1988) and the Acurex Corporation analytical laboratory (1989) for hydrocarbon analysis. During the sampling procedure, an effort was made to determine whether or not floating product occurs by carefully lowering a clear teflon bailer into the well and capturing the first several inches of liquid. There was no observable floating product in any of the five monitoring wells, although a gasoline odor was detected in groundwater obtained from MW-1, MW-2, and MW-4. Despite considerable purging of the five monitoring wells (greater than five well casing volumes) during the well development and sample collection process, the water extracted from the wells persistently remained turbid and laden with sediment. The difficulty in clarifying

the water is attributable to the fine-grained silty nature of the Bay Mud and the inability of the monitoring well sand pack to filter formation sediments. The analytical laboratory indicated that the turbidity of the groundwater samples is not likely to affect the chemical data, however, due to laboratory filtration procedures.

The results of TPH and BTX analysis of groundwater obtained from the five on-site wells and two off-site monitoring wells are schematically shown on Figures 4 and 5 and are summarized in Table 3.

The complete laboratory reports prepared by Anatech and Acurex Corporation laboratories are given in Appendices E and F.

The results of both sampling events indicate that gasoline constituents occur in groundwater obtained from all five wells. The data suggest that gasoline contamination is pervasive in the upper Bay Mud throughout the site, rather than being localized around a particular hot spot normally indicative of a source area. Field observations indicate that these constituents are dispersed in the groundwater rather than occurring as floating product. free prod observed in excav. next to mw 1

The 1988 Phase I investigation indicated that groundwater from two of the five monitoring wells (MW-1 and MW-2) had benzene concentrations which exceed California Department of Health Services (DHS) Recommended Drinking Water Action Levels for this particular constituent. Based on the chemical results and distribution of monitoring wells on-site, there is no evidence indicating that gasoline constituents are significantly elevated in the vicinity of the former underground fuel tank relative to other areas of the site. The limited range of chemical variation observed in groundwater from the five on-site monitoring wells precluded full definition of contaminant plume geometry and did not resolve the source area for TPH contamination at the site. TPH concentration contours shown in Figure 4 for the Phase I investigation suggest that multiple contaminant sources may exist. The TPH concentration observed in MW-4 in relation to other on-site wells indicated that there may be or may have been an off-site source east of the site.

With the exception of benzene in groundwater samples obtained from MW-2 and MW-4, the TPH and BTX groundwater data from the five on-site monitoring wells indicate either no change or a slight dilution between samples obtained in 1988 and 1989. In contrast, groundwater samples obtained from MW-2 increased its benzene content approximately one order of magnitude from 1988 to 1989. This may be explained by the fact that benzene is more soluble in water than toluene, xylene, and ethylbenzene. If as a result of an increase in groundwater elevation an additional quantity of product was released in the vadose zone, an increase in concentration of this magnitude would be reasonable. Another explanation would include laboratory error. Acurex Corporation has checked their records and found no analytical or procedural errors.

MW-4 also showed an increase in concentration from nondetect (ND) to 0.0007 milligram per liter (mg/L). This can be explained by the fact that the detection limit for benzene is 0.0003 mg/L. A difference of 0.0005 mg/L or more could have occurred and accounted for this increase in concentration. This increase in concentration is not of the same magnitude as the increase observed in MW-2.

Relative to the DHS Minimum Contaminant Levels (MCL) and the Recommended Drinking Water Action Levels, elevated concentration levels of benzene are still present in MW-2. The 1989 data indicates that the present concentration exceeds the MCL by nearly 285 times. It is important to note that the MCL is not a clean up level but a criteria by which to compare. The actual clean up level imposed by the California Regional Water Quality Control Board (RWQCB) and the Alameda County Department of Environmental Health - Hazardous Materials Management [(ACDEH) which acts as the Local Enforcement Agency (LEA)] will be determined through negotiated efforts in assessing the potential risk of public exposure and off-site groundwater quality.

At this time Brunsing Associates, Inc. recommends that biannual groundwater monitoring and sampling be performed. Monitoring Wells MW-1 through MW-5 should be monitored for water level, then sampled and analyzed for TPH and BTEX. The purpose of this groundwater monitoring would be twofold:

1. Verify previous analytical data;

2. Develop historical database to use during clean-up level negotiations with RWQCB and LEA officials from the ACDEH.

4.2 OFF-SITE GROUNDWATER MONITORING WELLS

Groundwater samples taken from the off-site monitoring wells MW-6 and MW-7 were obtained December 29, 1989 using the appropriate EPA protocol as detailed in Appendix D. Samples were submitted to the Acurex Corporation analytical laboratory for petroleum hydrocarbons, organic lead, volatile and semi-volatile organic analyses. The results of the TPH, TEPH, BTEX and organic lead analyses are provided in Table 4.

In addition to the above analyses, MW-6 was analyzed for volatile and semi-volatile organic compounds. No compounds from either of these tests were observed to be above detection limits. Additional compounds were tentatively identified by EPA Test Methods 624 and 625. These tentatively identified compounds for volatile and semi-volatile organics are related to light petroleum fuels. These compounds are included in the laboratory reports provided in Appendix E.

See p 4 naphthalene a.16

The results of the MW-6 groundwater analytical data indicate that positive detections were observed for benzene and toluene. The benzene concentration exceeds the MCL by a factor of five. The toluene concentration is below the MCL and the DHS Recommended Drinking Water Action Levels. A positive detection for TEPH-Kerosene and TPH-Gasoline was also observed. TPH-Gasoline concentrations are slightly higher for MW-6 than MW-4, approximately 30 to 40 feet west of MW-6 and on Pacific Supply property. In addition elevated levels of benzene and xylene also were observed in groundwater data obtained from MW-6. This data supports the on-site soil and groundwater chemistry data that an off-site source likely exists or has previously existed near the MW-6 location.

The results of the MW-7 groundwater analytical data indicate that only relatively low concentrations of organic lead were detected. This data does not support the soil chemical data which detected 370 mg/kg of TPH-Gasoline. This may be explained by a fluctuating hydraulic gradient and groundwater table discussed below as part of Hydrogeology.

Brunsing Associates, Inc. recommends that biannual monitoring for groundwater elevation be performed and that annual sampling and analyses be performed for TPH, TEPH and BTEX. This information will be used to support the existence of elevated off-site groundwater quality background levels during negotiations to establish groundwater clean-up levels.

5.0 HYDROGEOLOGY

Borehole logging of the five monitoring wells to a depth of 20 feet indicates that approximately five feet of sandy fill material overlies organic clayey silts comprising the Bay Mud formation. Regional geologic information derived from other sites in the West Oakland area reveal that the Bay Mud typically extends to a depth of approximately 50-60 feet where it is underlain by alluvium. The Bay Mud comprises a gray to black silty clay with abundant organic material such as grasses and mollusk shells. The boring log generated for MW-4 (Appendix A) documents the existence of a peaty silty stratum between 10 and 15 feet below ground surface. This stratum was not observed in the other four borings. Although the Bay Mud formation is typically saturated, it generally exhibits very low permeability [less than 10^{-5} centimeter per second (cm/sec)] and does not constitute a usable water-bearing formation as normally defined by regulatory agencies. The low permeability of the Bay Mud is evident from water yield behavior of the five monitoring wells at the Pacific Supply Company site. A downhole submersible pump extracted less than five gallons per minute from MW-2 during well development and purging operations on October 10, 1988.

In order to evaluate the groundwater gradient direction and magnitude below the site, groundwater elevation surveys of the five monitoring wells were conducted on October 10, 1988, December 8, 1988 and December 29, 1989. The two off-site wells were monitored for groundwater elevation on December 29, 1989 and March 5, 1990. This data is presented in Table 5. The October 1988 survey is representative of dry season conditions while the December and March surveys were conducted after several rainfall events. The groundwater elevation data obtained from the December 1988 survey indicate that the phreatic surface had risen as much as 0.5 feet since the October 1988 survey, indicating that recharge had taken place. In general all on-site monitoring wells showed an increase in water level from December 1988 to December 1989. This trend continued from December 1989 to March 1990 with the exception of MW-2 which lost 0.29 inches in elevation in the course of approximately two months.

The off-site monitoring wells showed a reverse trend from the on-site wells over the course of two months from December 1989 to March 1990. MW-6 lost 0.02 inches and MW-7 lost 2.35 feet.

Groundwater elevation contour maps are presented in Figures 6, 7, 8 and 9 for the October 1989, December 1988, December 1989 and March 1990 surveys, respectively. The contours indicate that the groundwater gradient below the site is generally shallow and has a complex multi-directional pattern which masks a regional gradient direction expected to be westerly towards the San Francisco Bay. The local hydraulic gradient appears to have an easterly component between well MW-3, MW-4 and MW-6, and a northwesterly direction between well MW-3, MW-1 and MW-7. Although there is a significant increase in groundwater gradient magnitude in the December 1988 survey relative to the October 1988 survey, the groundwater gradient directions did not change significantly over this two month period.

The groundwater elevation data from MW-6 and MW-7 during the December 1989 and March 1990 surveys modified the groundwater gradient slightly. Groundwater elevations from MW-6 supports an easterly off-site groundwater gradient towards the Yellow Cab Company property. The groundwater elevations recorded from MW-7 indicate an artificial lowering of the groundwater. The difference between MW-1 and MW-7 (December 1989) is 4.95 feet. This difference increased to 7.48 feet in March 1990. This may be explained by the underground storage tank excavation adjacent to MW-7 on C & L Trucking Company property. In December 1989 the tank was in place. In January 1990 the tank was removed. The excavation remained open through March 5, 1990. This excavation had a significant impact on the local groundwater hydraulics by creating a sump to off-set the local gradient. It can be expected that when the excavation is backfilled that the local gradient will recover.

However, it is not likely that the gradient would reverse its direction towards Pacific Supply Company property. The 1989 and 1990 data indicates that the gradient has shifted slightly but is still off-site to the north and east as shown on Figures 8 and 9.

The complexity of the groundwater gradient below the site precludes an accurate assessment of contaminant migration behavior. It is evident from the groundwater elevation contour maps, however, that the gradient is shallow and does not correlate with TPH isopleths shown in Figures 4 and 5. Although the groundwater gradient direction is westerly between MW-1 and MW-4, for instance, the TPH concentration gradient is easterly between these two wells. This phenomenon suggests that the shallow gradient observed below the site may not be a controlling factor in the distribution of contaminants in local groundwater. ?

In order to evaluate the potential for migration of constituents from off-site sources into groundwater underlying the Pacific Supply Company site, a groundwater flow analysis was conducted using the Dupuit-Forchheimer equation (Bear, 1979) in conjunction with the 1988 groundwater data. By making a number of conservative assumptions concerning source configuration, tank leakage rate, and aquifer homogeneity, the groundwater flow velocity below the site is estimated to be 10^{-7} centimeter per second (cm/sec) assuming that the Bay Mud has a hydraulic conductivity of 10^{-5} cm/sec. Based on this velocity, the following estimates were calculated for the rate of contaminant migration below the site if no retardation is assumed:

From	To	Time Required
Pacific Supply Company tank	MW-4	35-40 years
Pacific Supply Company tank	MW-1	5-10 years
Yellow Cab Company tank	MW-4	15-20 years
C&L Trucking Company tank	MW-1	10-15 years

These calculations suggest that the rate of contamination migration is likely to be very slow underneath the site. The distance between the former Pacific Supply Company Tank and well MW-4 is sufficiently great that potential sources closer to this well location (ie. Yellow Cab Company) need to be evaluated for potential contribution of gasoline contamination observed in groundwater from MW-4. In order to refine these calculations and be able to draw substantive conclusions about source areas, a pump test as described in the workplan dated February 29, 1988 must be performed to establish aquifer properties.

6.0 CONCLUSIONS

From a regulatory perspective, the results of the Phase I soil and groundwater investigation reveal gasoline contamination of soil and groundwater in the Bay Mud below much of the Pacific Supply Company property in Oakland. The presence of light petroleum fuels was confirmed in the groundwater from on-site monitoring well samples obtained as part of the Phase II investigation. Gasoline contamination of groundwater at the site occurs as dissolved product rather than free product. The data obtained during the Phase I investigation did not conclusively resolve the source area or maximum extent of this contamination.

The Phase II investigation attempted to assess the possible existence of a nearby off-site petroleum fuel source and its potential impact on the Pacific Supply Company site. The results indicate that elevated hydrocarbon levels exist in the shallow soils and groundwater immediately to the north and east of the site. The source to the north which is adjacent to the C & L Trucking Company appears to be associated with heavy petroleum fuels such as diesel. The proximity of MW-7 to the location where C & L Trucking Company had their underground storage tank supports this result. The source to the east which is adjacent to the Yellow Cab Company appears to be of a light petroleum fuel such as gasoline. The proximity to the removed underground storage tank on Yellow Cab Company property supports this data. Similar chemical constituents are found to be in both the soil and groundwater of the on-site monitoring wells and MW-6. However, it is not likely that either of these off-site sources contributed to the contamination below the Pacific Supply Company site for the following reasons:

1. The local hydraulic gradient in the upper water bearing strata appears to have an off-site component to the north and to the east.

2. The chemical components found in the soil and groundwater in MW-7 and those found in the on-site monitoring wells appear to be from different sources.

3. The estimated transport times would not allow sufficient time for significant lateral migration to take place.

Brunsing Associates, Inc. recommends that additional groundwater monitoring as outlined in Section 4.0 of this report be integrated with interim groundwater remediation in an effort to minimize costs and potential liability to Pacific Supply Company. Negotiations with the LEA should be initiated immediately in order to establish soil and groundwater clean-up levels for the site.

7.0 RECOMMENDATIONS

As a means to remove the contaminant source from the Pacific Supply Company site, Brunsing Associates, Inc. is recommending that on-site contaminated soils be excavated and replaced with clean backfill. The estimated lateral extent of soil contamination is presented on Figure 11. Actual excavated area and volumes would depend on final soil clean-up levels. Brunsing Associates, Inc. has considered several potential remedial alternatives including in-situ flushing, bio-remediation, volatization, in-situ soil venting and isolation and containment. Based on time of construction, disposal/treatment considerations, technical feasibility and available on-site yard space excavation combined with in-house soil treatment offers the most practical and cost-effective remedial action. Pacific Coast Building Products has previously incorporated fine grain soils containing hydrocarbons into various clay building products at various other subsidiary sites. This treatment method would be evaluated for soils at the Pacific Supply Company site.

The remedial action would be composed of approximately six tasks:

1. Prepare remedial construction workplan for LEA review;

2. Arrange for the containment and discharge of groundwater which could potentially infiltrate the excavation;

3. Identify approximate limits of remedial excavation, underground utilities and monitoring wells. Remove all monitoring wells and utilities prior to remedial construction; within the exc av

4. Implement remedial excavation and backfill;

5. Determine if excavated soils are hazardous/non-hazardous for trucking and treatment considerations; - how

6. Treat or dispose of excavated soils in an appropriate fashion approved by the LEA. -

After source removal has been successfully completed, the installation of one four-inch diameter groundwater monitoring well will be installed. The current four-inch diameter monitoring well may be abandoned as a result of remedial excavation.

Once a functional, down-gradient shallow groundwater monitoring well is in place after excavation and backfill is completed, groundwater will be sampled for TPH-gasoline and BTEX. Based on the analytical results, various groundwater remedial action alternatives will be evaluated. In addition, Pacific Supply Company will initiate quarterly groundwater monitoring.

Based on the evaluation of groundwater remedial action alternatives, an appropriate remedial action will be selected and implemented with LEA approval.

Oct. / 1988

Table 1
Results of On-Site Soil Chemical Analyses

Monitoring Well	Depth of Sample (ft.)	TPH mg/kg	Benzene mg/kg	Toluene mg/kg	Xylene mg/kg
MW-1	8.0-8.5	26	ND	0.22	0.85
MW-2	7.5-8.0	1400	0.99	0.70	1.10
MW-3	7.5-8.0	1300	0.53	5.90	22.0
MW-3	8.0-8.5	3700	2.40	8.90	12.0
MCL (mg/L)[1]		N/A	0.001	N/A	1.750
Action Levels (mg/L)[2]		N/A	0.0007	0.1	0.62
Detection Limits (mg/L)[3]		0.50	0.0003	0.0003	0.0006
EBMUD Discharge Limits		N/A	0.003	0.031	0.042

Notes
1. California department of Health Services (DHS): Minimum Contaminant Level, Section 6444.5, Article 5.5, division 4, Title 22, California Code of Regulations.
2. DHS: Recommended Drinking Water Action Levels, January 1987.
3. California Regional Water Quality Control Board: Leaking Underground Fuel Tank Field Manual, October 1989.
4. N/A = Not Applicable; ND = Nondetect

Table 2
Results Of Off-Site Soil Chemical Analyses

~~date?~~ Dec. 89

Monitoring Well	Depth of Sample	TPH-Gasoline mg/kg	TEPH-Diesel mg/kg	TEPH-Kerosene mg/kg	TEPH-Motor Oil mg/kg	Benzene mg/kg	Toluene mg/kg	Ethylbenzene mg/kg	Xylene mg/kg	Organic Lead mg/kg
MW-6	5.5'	370	N/A	N/A	N/A	ND	ND	ND	ND	1.5
MW-7	5.5'	<2.5	<1.0	<1.0	160	ND	ND	ND	ND	1.7
Detection Limits (mg/kg)[1]		10.0	10.0	10.0	10.0	0.005	0.005	N/A	0.015	N/A

Notes
1. California Regional Water Quality Control Board: Leaking Underground Fuel Tank Field Manual, October 1989.
2. N/A = Not Applicable; ND = Nondetect

Table 3
Results Of On-Site Groundwater Chemical Analyses

Monitoring Well	TPH mg/L 1988	TPH mg/L 1989	Benzene mg/L 1988	Benzene mg/L 1989	Toluene mg/L 1988	Toluene mg/L 1989	Xylene mg/L 1988	Xylene mg/L 1989	Ethyl-benzene mg/L 1988	Ethyl-benzene mg/L 1989	Organic Lead mg/L 1988	Organic Lead mg/L 1989
MW-1	1.1	ND	0.0011	ND	ND	ND	ND	ND	N/A	ND	N/A	ND
MW-2	11.0	4.0	0.023	0.2	0.02	0.0067	0.016	ND	N/A	ND	N/A	0.22
MW-3	3.4	ND	ND	ND	ND	ND	0.0028	ND	N/A	ND	N/A	0.205
MW-4	4.6	0.5	ND	0.0007	ND	ND	0.0022	ND	N/A	ND	N/A	ND
MW-5	3.2	ND	ND	ND	ND	ND	ND	ND	N/A	ND	N/A	ND
MCL (mg/L)[1]	N/A		0.001		N/A		1.750		0.68		N/A	
Action Levels (mg/L)[2]	N/A		0.0007		0.1		0.62		0.68		N/A	
Detection Limits (mg/L)[3]	0.50		0.0003		0.0003		0.0006		N/A		N/A	
EBMUD Discharge Limits	N/A		0.003		0.031		0.042		0.005		2.0	

Notes

1. California Department of Health Services (DHS): Minimum Contaminant Level, Section 6444.5, Article 5.5, Division 4, Title 22, California Code of Regulations.
2. DHS: Recommended Drinking Water Action Levels, January 1987.
3. California Regional Water Quality Control Board: Leaking Underground Fuel Tank Field Manual, October 1989.
4. N/A = Not Applicable; ND = Nondetect

Table 4
Results Of Off-Site Groundwater Chemical Analyses

date?

Monitoring Well	TPH-Gasoline mg/L	TEPH-Diesel mg/L	TEPH-Kerosene mg/L	TEPH-Motor Oil mg/L	Benzene mg/L	Toluene mg/L	Ethylbenzene mg/L	Xylene mg/L	Organic Lead mg/L
MW-6	1.1	ND	2.1	ND	0.0054	0.0045	ND	ND	ND
MW-7	ND	ND	ND	ND	ND	ND	ND	ND	0.235
MCL (mg/L)[1]	N/A	N/A	N/A	N/A	0.001	1.0	0.68	1.75	N/A
Action Levels (mg/L)[2]	N/A	N/A	N/A	N/A	0.0007	0.1	0.68	0.62	N/A
Detection Limits (mg/L)[3]	0.50	0.50	0.50	0.50	0.0003	0.0003	N/A	0.0006	N/A

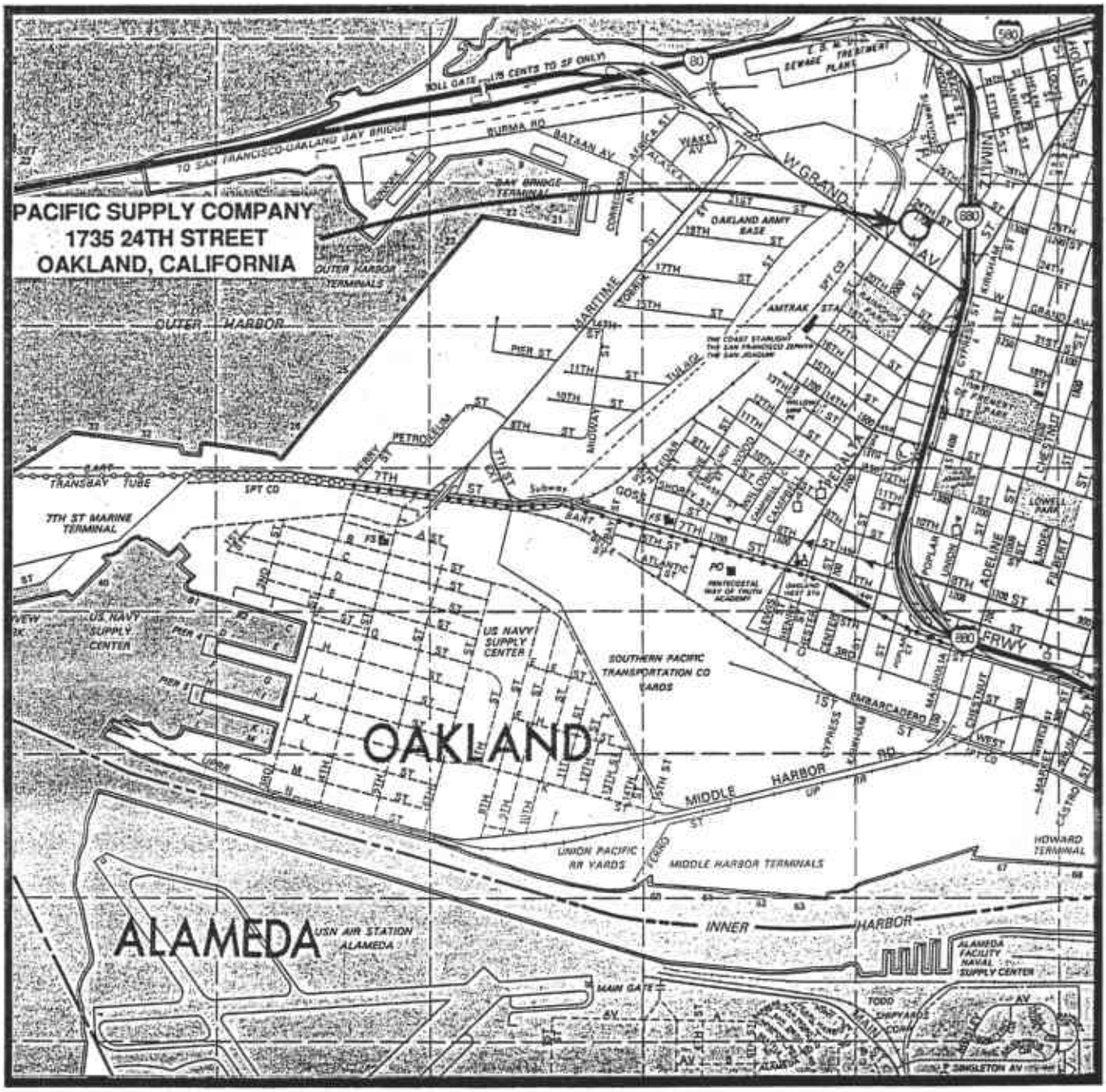
Notes

1. Minimum Containment Level, Section 6444.5, Article 5.5, Division 4, Title 22 CCR.
2. DHS: Recommended Drinking Water Action Levels, January 1987.
3. California Regional Water Quality Control Board: Leaking Underground Fuel Tank Field Manual, October 1989.
4. N/A = Not Applicable; ND = Nondetect

Table 5
Groundwater Elevation Data

Monitoring Well	Groundwater Elevations 10-Oct-88 (feet, MSL)	Groundwater Elevations 08-Dec-88 (feet, MSL)	Groundwater Elevations 29-Dec-89 (feet, MSL)	Groundwater Elevations 05-Mar-90 (feet, MSL)
On-Site				
MW-1	0.88	1.11	1.13	1.31
MW-2	0.85	1.01	1.27	0.98
MW-3	0.88	1.05	1.34	1.69
MW-4	0.74	0.87	0.99	1.05
MW-5	0.89	1.28	1.53	1.81
Off-Site				
MW-6	N/A	N/A	0.61	0.58
MW-7	N/A	N/A	-3.82	-6.17

Notes
1. N/A = Not Applicable



APPROXIMATE SCALE
(feet)

NORTH

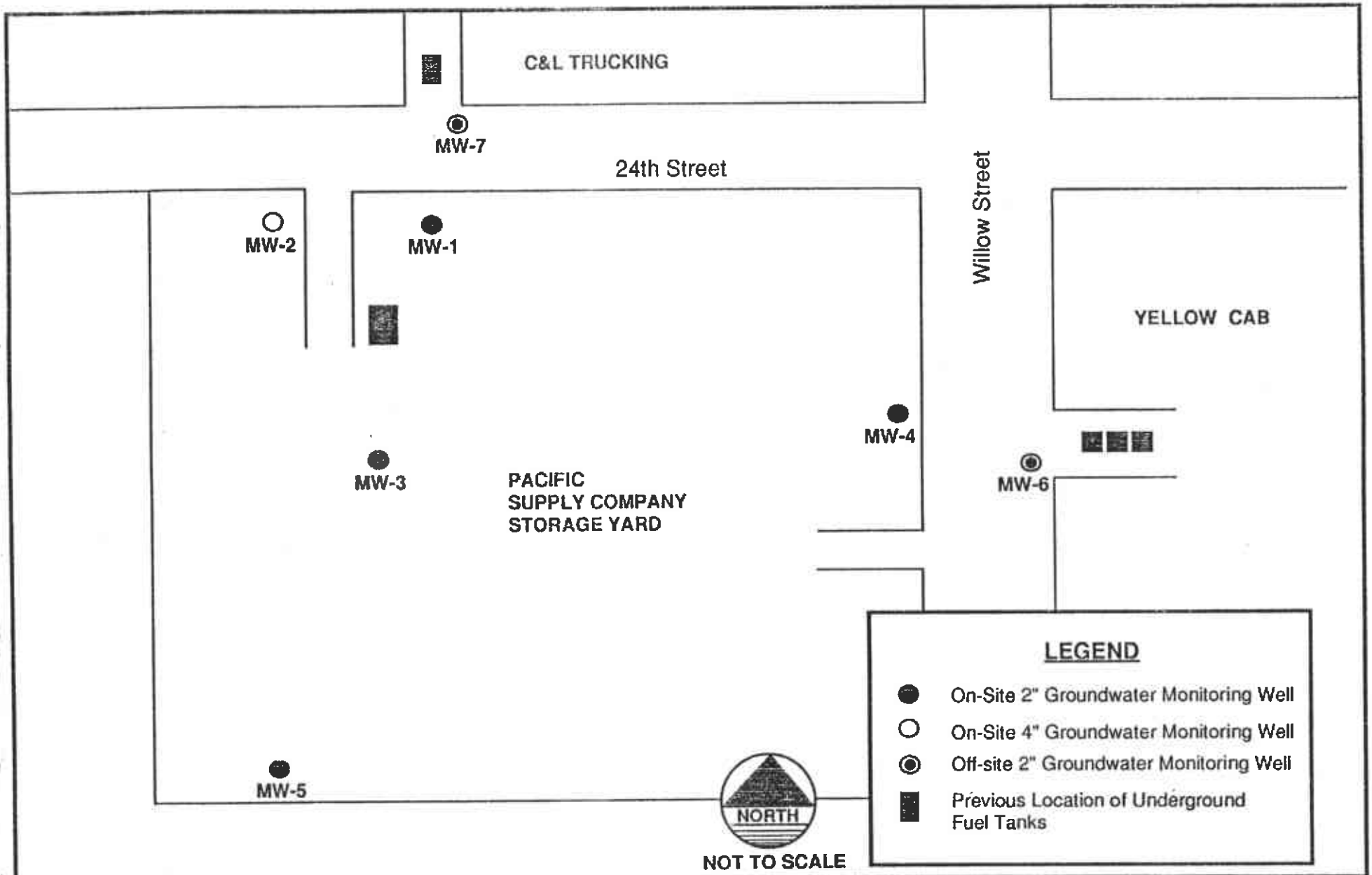
0 1100 2200 4400

REFERENCE: Thomas Guide, Alameda Couty, 1989

PROJECT NO.: 029.5		
DRAWN BY:	JG	3/21/90
CHECKED BY:	MEV	3/21/90
APPROVED BY:	MEV	3/22/90
REVISION NO.:	2	6/26/90

BRUNSING ASSOCIATES, INC.

FIGURE 1
VICINITY MAP
PACIFIC SUPPLY COMPANY
OAKLAND, CALIFORNIA

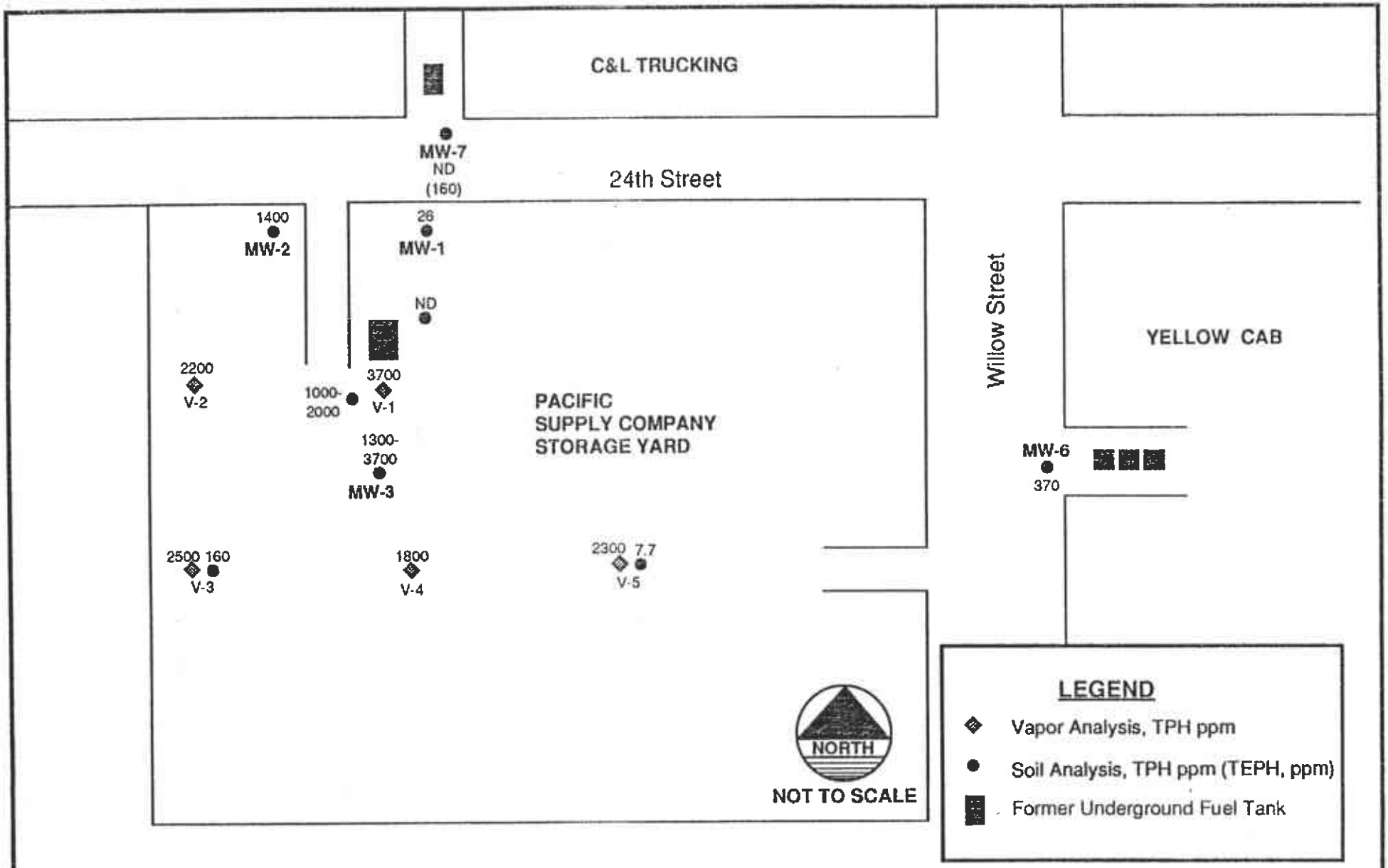


PROJECT NO. 29.5		
DRAWN BY	MEV/JG	3/21/90
CHECKED BY	MEV	3/21/90
APPROVED BY	MEV	3/21/90
REVISION NO.	2	6/26/90

BRUNSING ASSOCIATES, INC.

PACIFIC SUPPLY CO.
1735 24TH STREET
OAKLAND, CALIFORNIA

FIGURE 2
SITE PLAN
SOIL AND GROUNDWATER INVESTIGATION

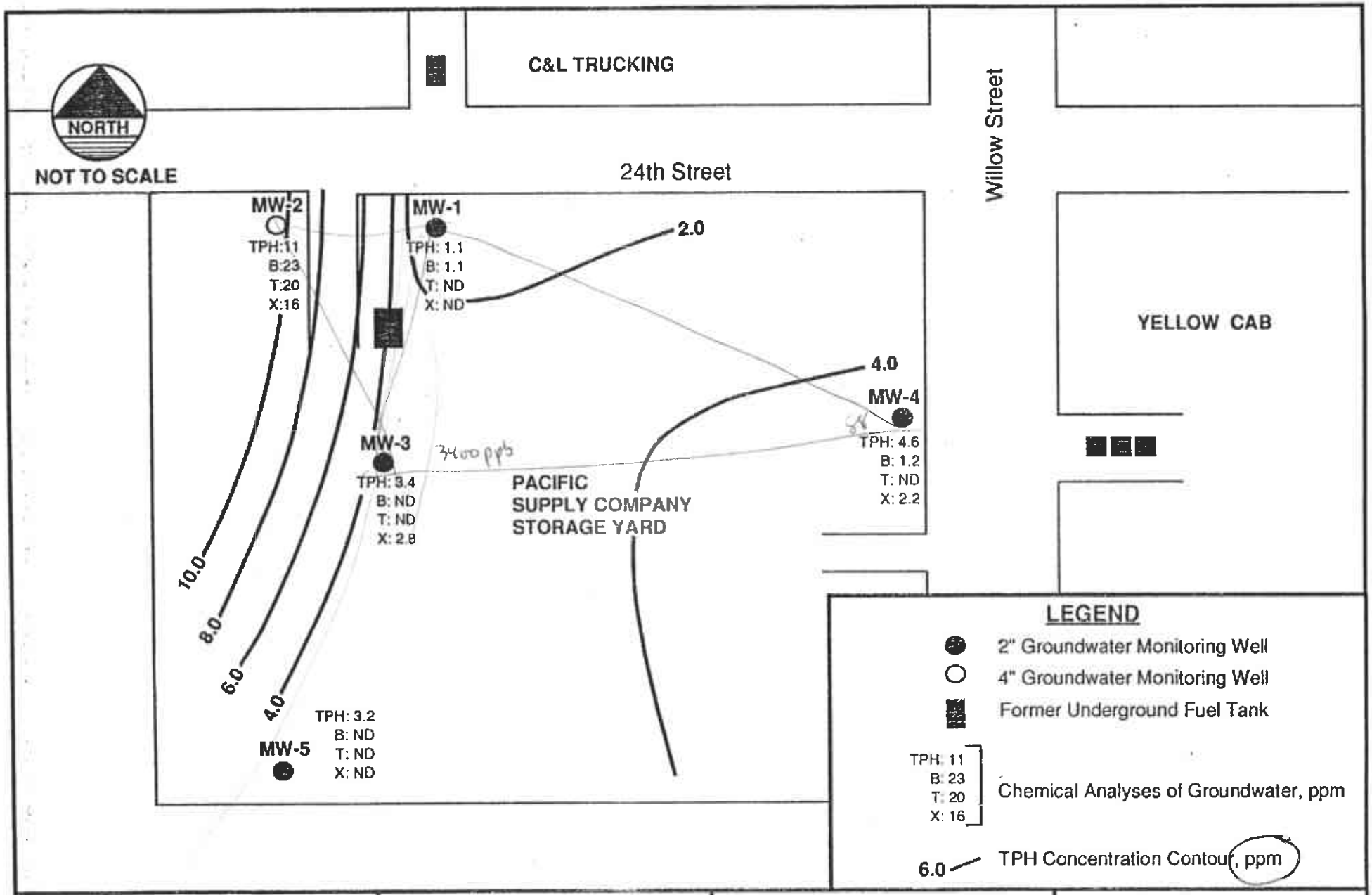


PROJECT NO.	29.5	
DRAWN BY	MEV/JG	3/21/90
CHECKED BY	MEV	3/21/90
APPROVED BY	MEV	3/22/90
REVISION NO.	2	6/26/90

BRUNSING ASSOCIATES, INC.

PACIFIC SUPPLY CO.
1735 24TH STREET
OAKLAND, CALIFORNIA

FIGURE 3
SAMPLE LOCATIONS AND RESULTS OF SOIL AND VAPOR ANALYSES

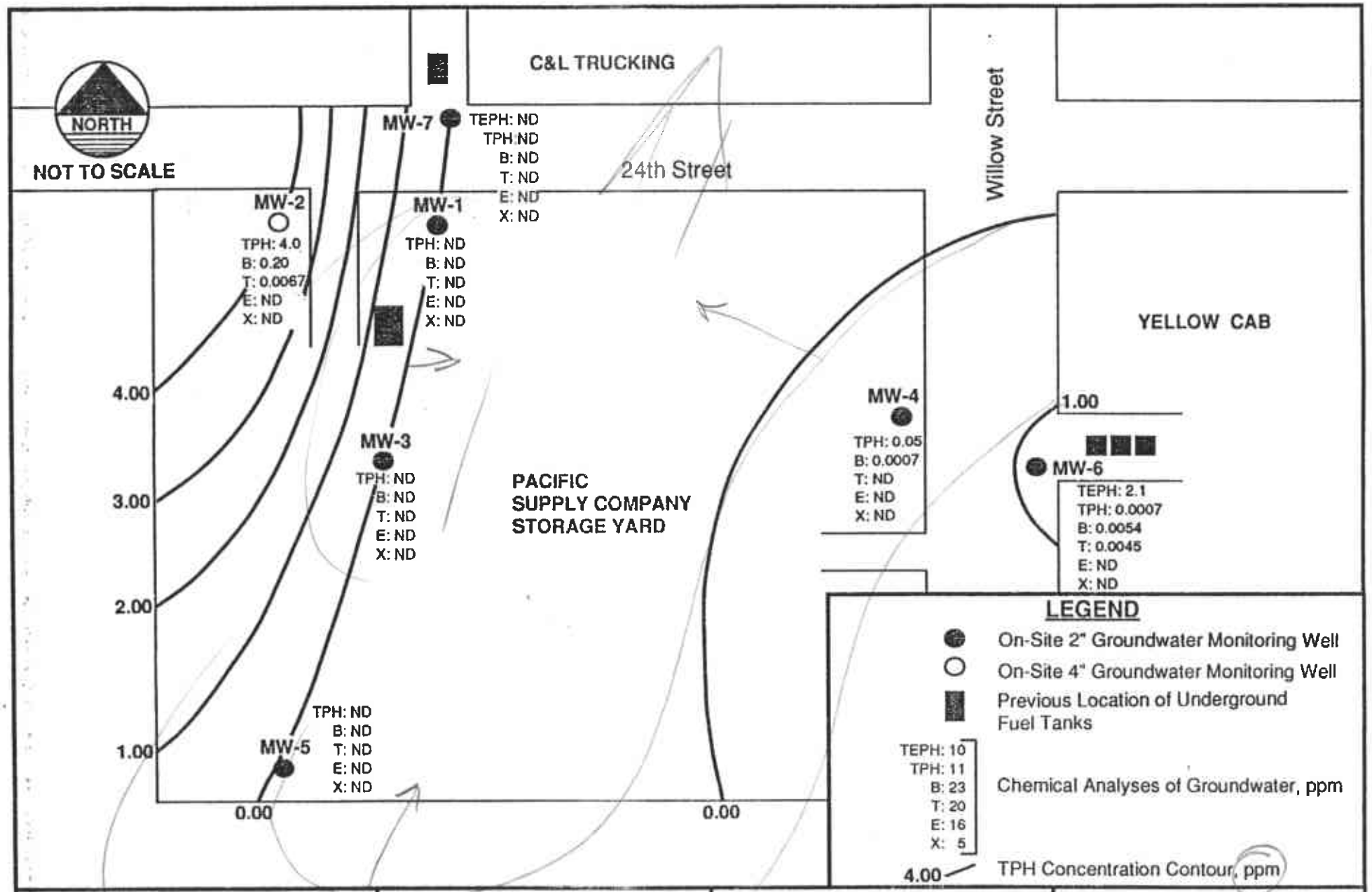


PROJECT NO.	29.5	
DRAWN BY	GE/JG	3/21/90
CHECKED BY	MEV	3/21/90
APPROVED BY	MEV	3/21/90
REVISION NO.	2	6/26/90

BRUNSING ASSOCIATES, INC.

PACIFIC SUPPLY CO.
1735 24TH STREET
OAKLAND, CALIFORNIA

FIGURE 4
GROUNDWATER ANALYSES
OCTOBER 1988

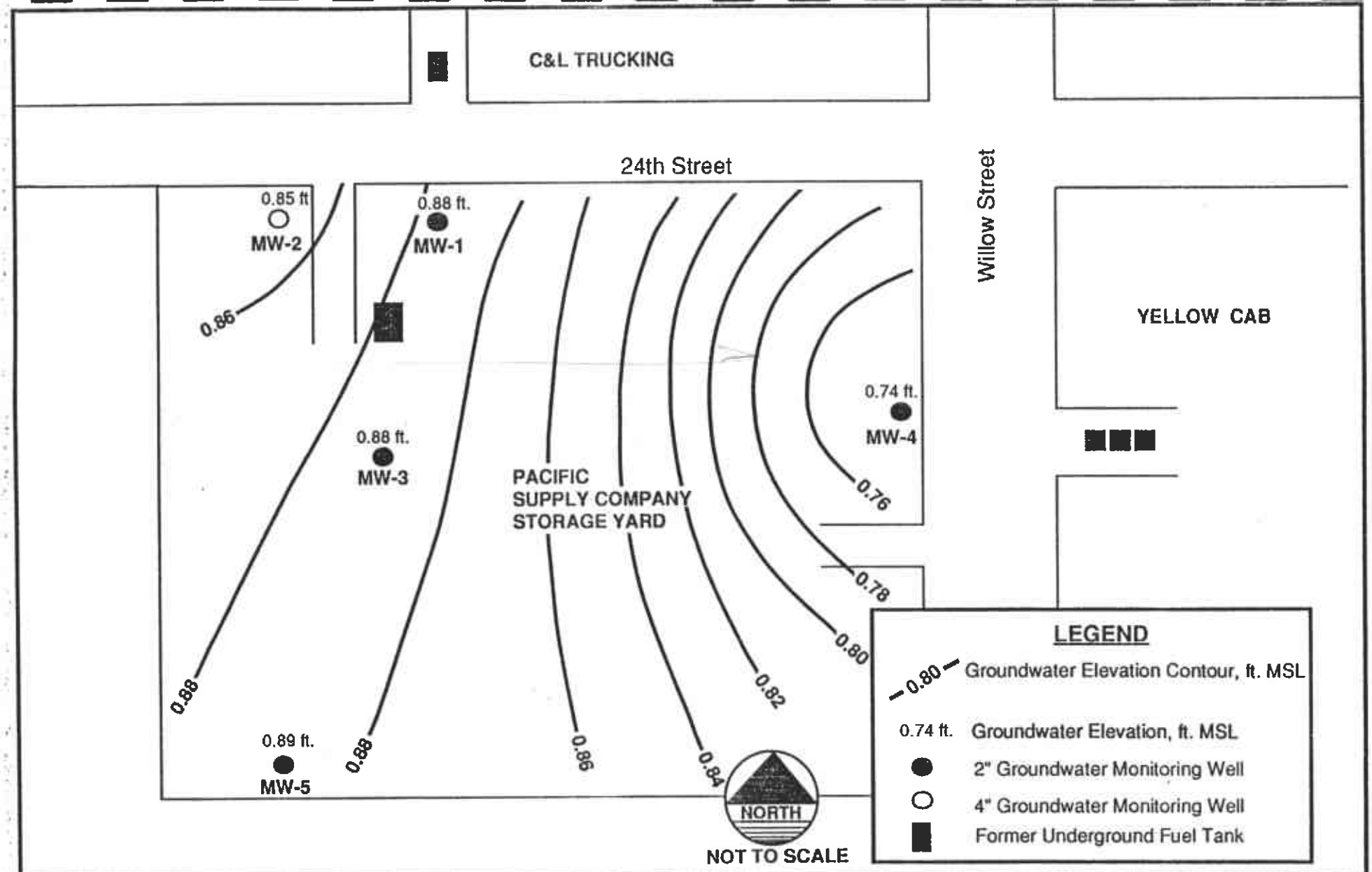


PROJECT NO. 29.5		
DRAWN BY	MEV/JG	3/21/90
CHECKED BY	MEV	3/21/90
APPROVED BY	MEV	3/22/90
REVISION NO.	2	6/26/90

BRUNSING ASSOCIATES, INC.

PACIFIC SUPPLY CO.
1735 24TH STREET
OAKLAND, CALIFORNIA

FIGURE 5
GROUNDWATER ANALYSES
DECEMBER 1989

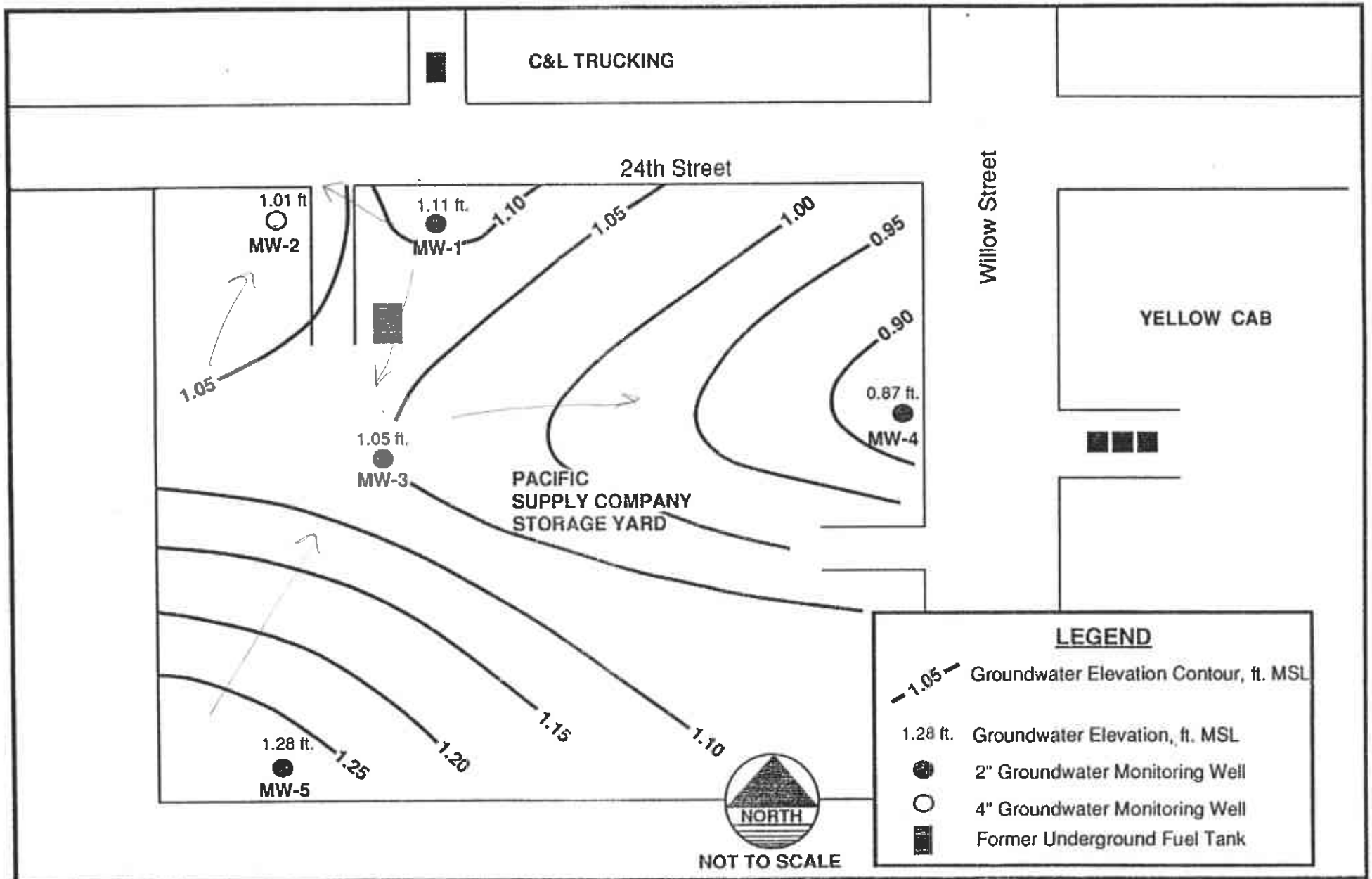


PROJECT NO.	29.5	
DRAWN BY	GE/JG	3/21/90
CHECKED BY	MEV	3/16/90
APPROVED BY	MEV	3/22/90
REVISION NO.	2	6/26/90

BRUNSING ASSOCIATES, INC.

PACIFIC SUPPLY CO.
1735 24TH STREET
OAKLAND, CALIFORNIA

FIGURE 6
GROUNDWATER ELEVATIONS
OCTOBER 1988

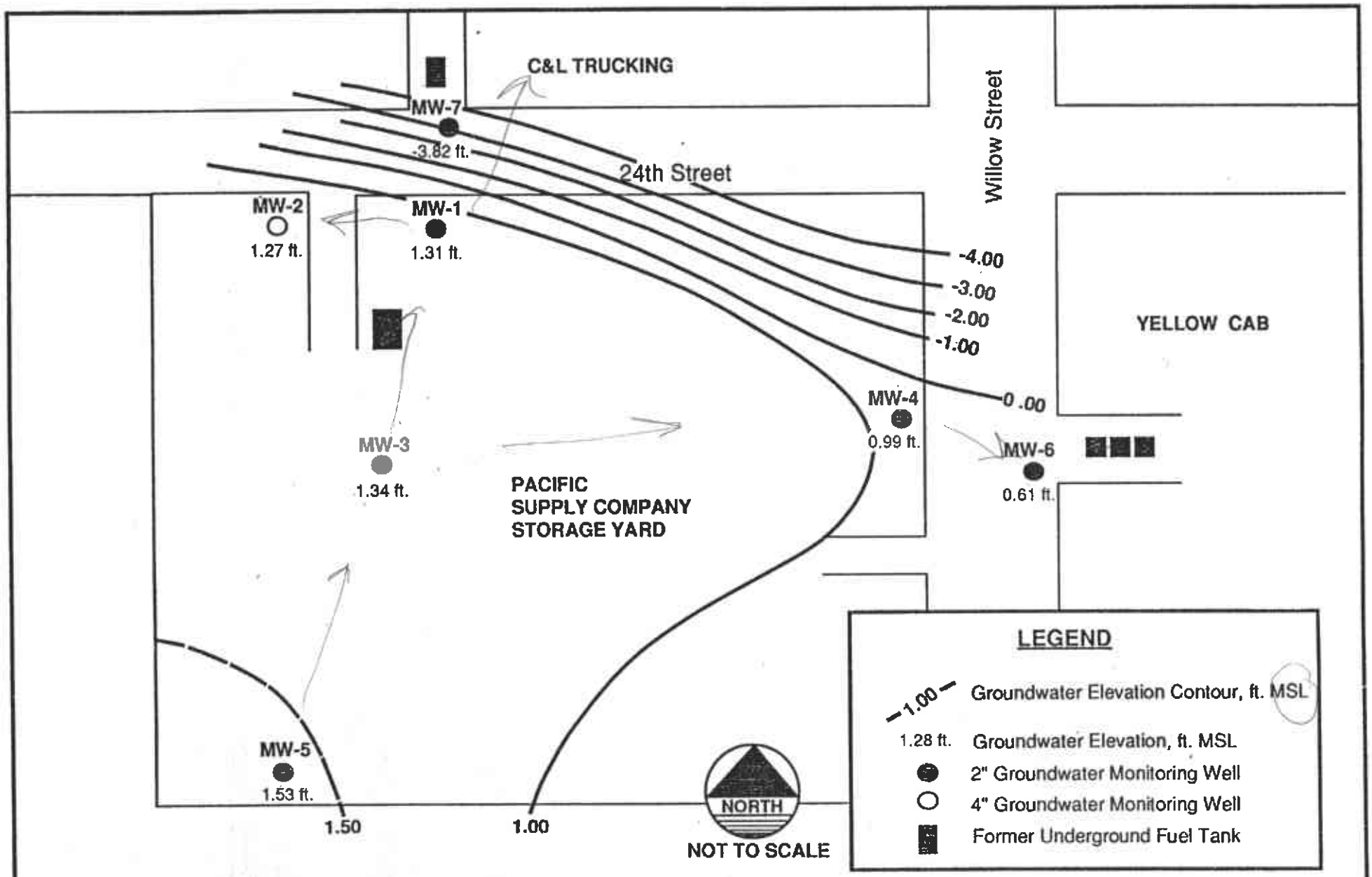


PROJECT NO.	29.5	
DRAWN BY	GE/JG	3/21/90
CHECKED BY	MEV	3/21/90
APPROVED BY	MEV	3/22/90
REVISION NO.	2	6/26/90

BRUNSING ASSOCIATES, INC.

PACIFIC SUPPLY CO.
1735 24TH STREET
OAKLAND, CALIFORNIA

FIGURE 7
GROUNDWATER ELEVATIONS
DECEMBER, 1988

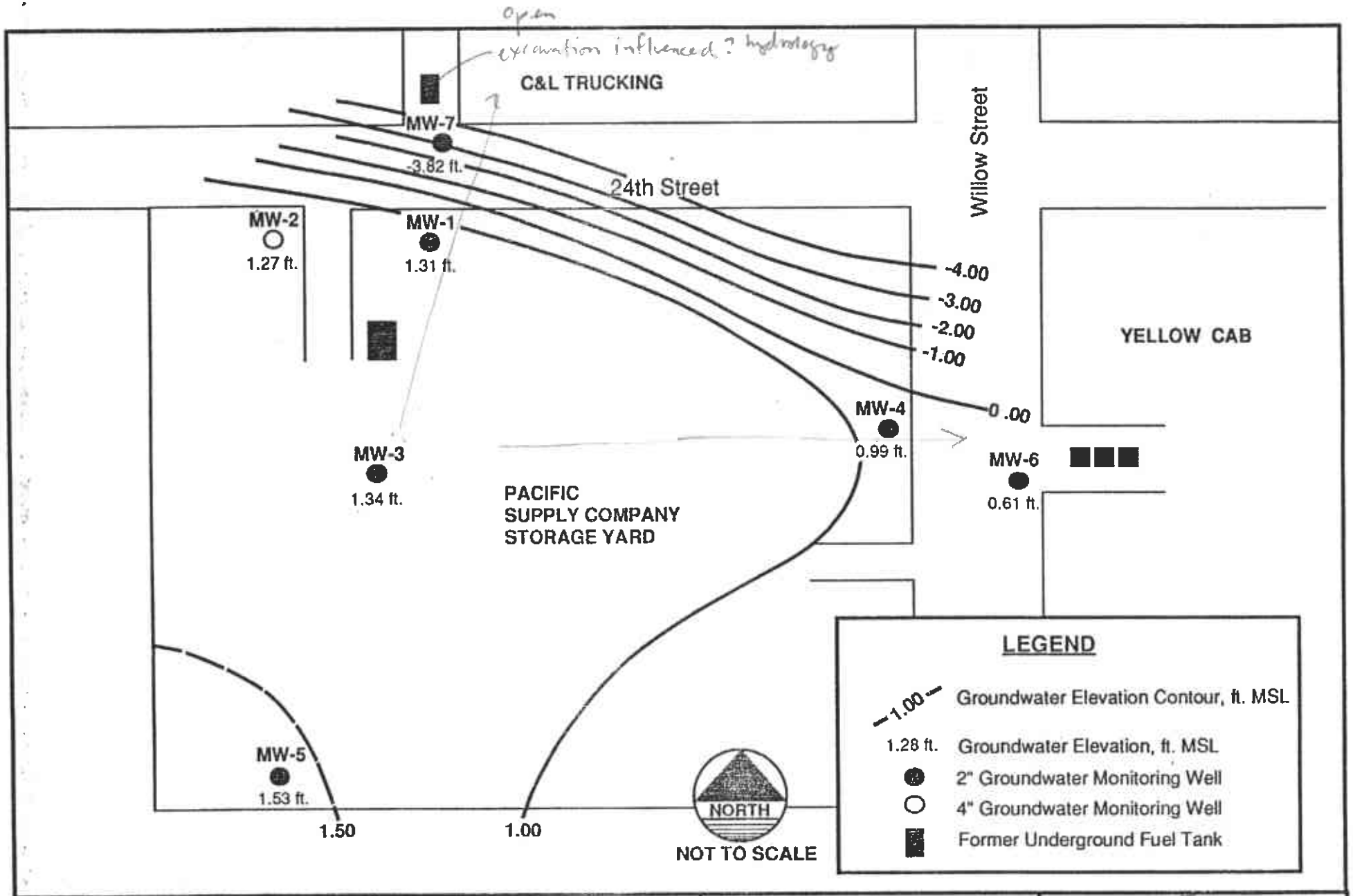


PROJECT NO. 29.5		
DRAWN BY	MEV/JG	3/21/90
CHECKED BY	MEV	3/21/90
APPROVED BY	MEV	3/22/90
REVISION NO.	2	6/26/90

BRUNSING ASSOCIATES, INC.

PACIFIC SUPPLY CO.
1735 24TH STREET
OAKLAND, CALIFORNIA

FIGURE 8
GROUNDWATER ELEVATIONS
DECEMBER 1989

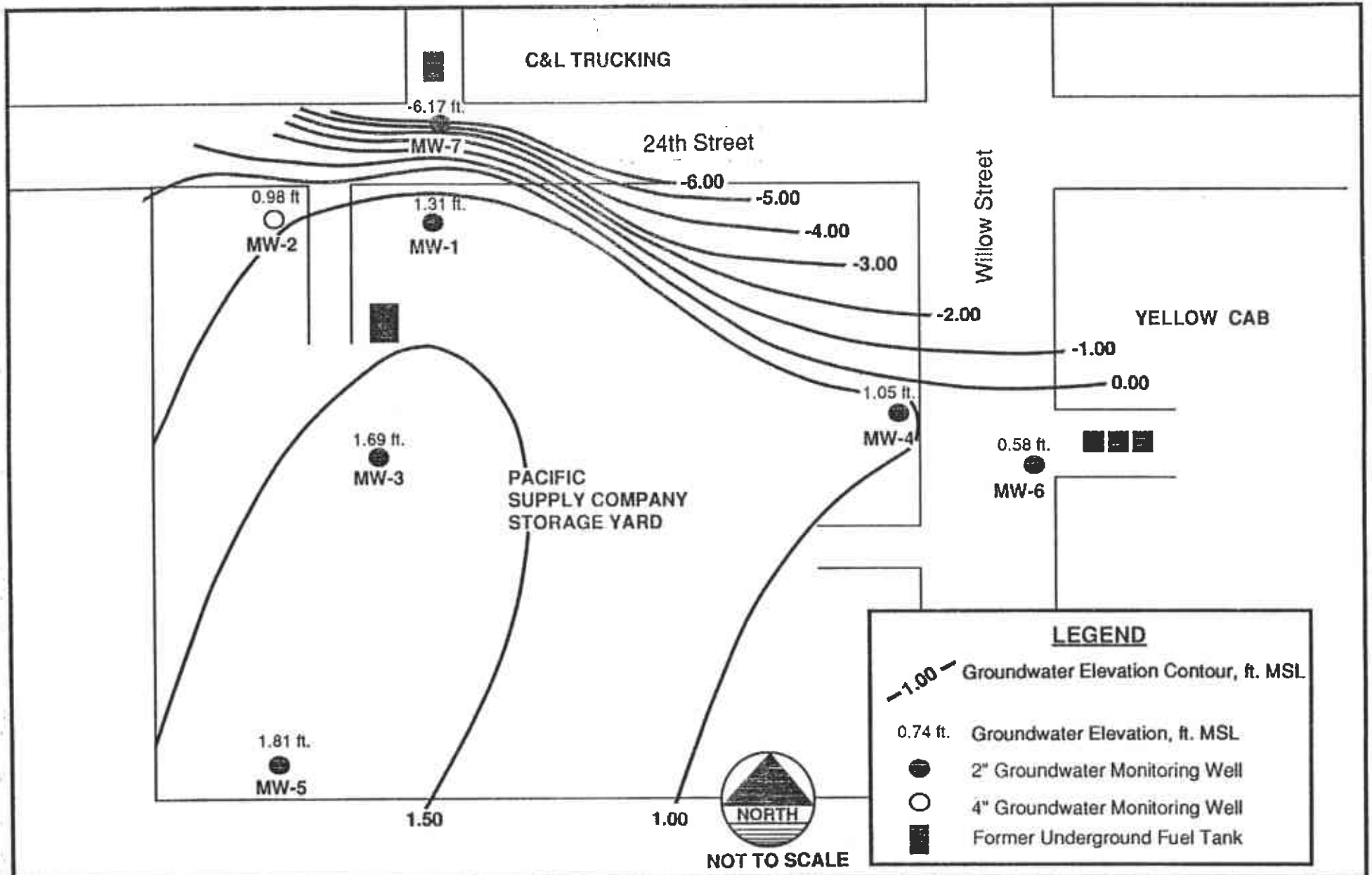


PROJECT NO. 29.5		
DRAWN BY	MEV/JG	3/21/90
CHECKED BY	MEV	3/21/90
APPROVED BY	MEV	3/22/90
REVISION NO.	2	6/26/90

BRUNSING ASSOCIATES, INC.

PACIFIC SUPPLY CO.
1735 24TH STREET
OAKLAND, CALIFORNIA

FIGURE 8
GROUNDWATER ~~ANALYSES~~
DECEMBER, 1989

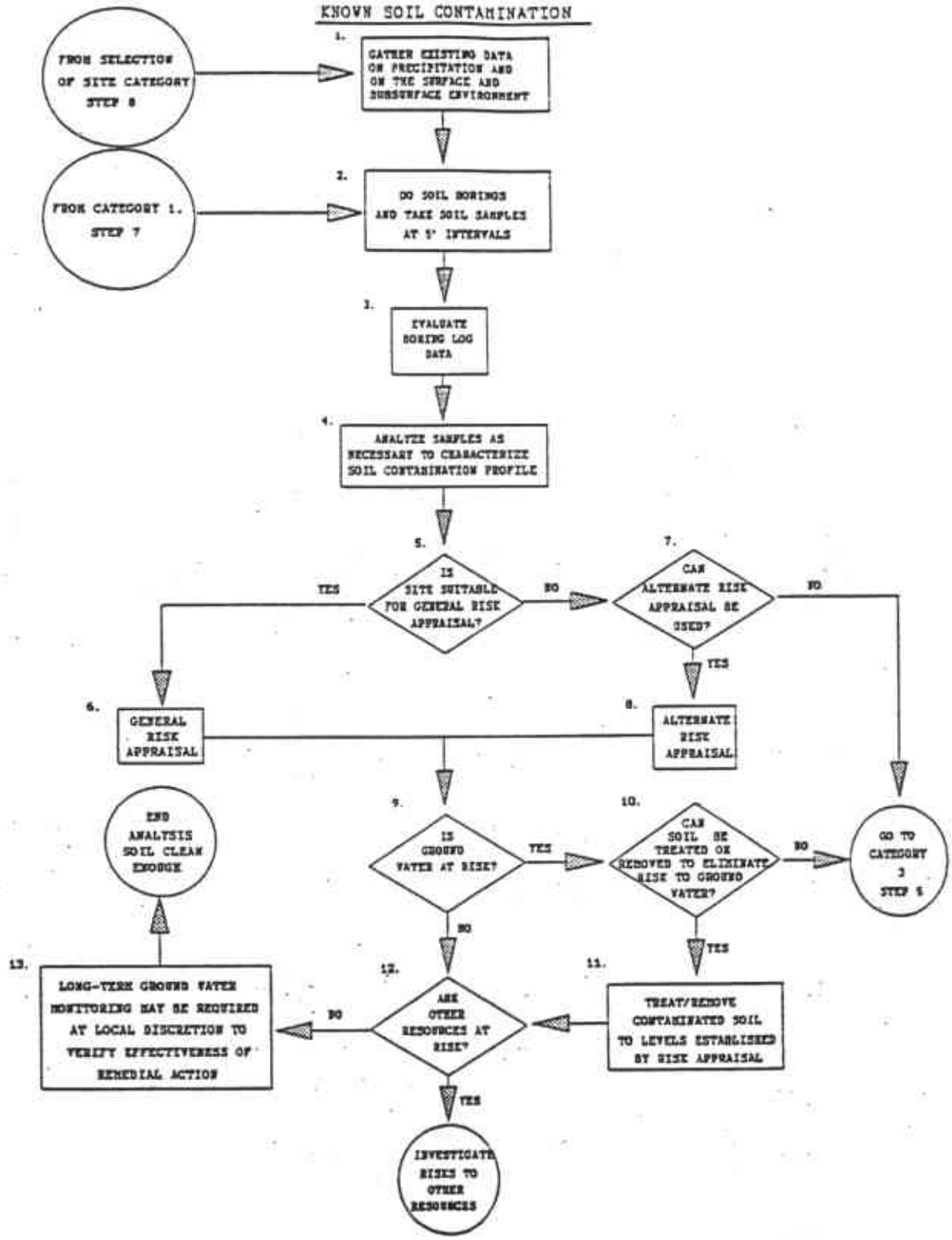


PROJECT NO. 29.5		
DRAWN BY	MEV/JG	3/21/90
CHECKED BY	MEV	3/21/90
APPROVED BY	MEV	3/22/90
REVISION NO.	2	6/26/90

BRUNSING ASSOCIATES, INC.

PACIFIC SUPPLY CO.
1735 24TH STREET
OAKLAND, CALIFORNIA

FIGURE 9
GROUNDWATER ELEVATIONS
MARCH 1990

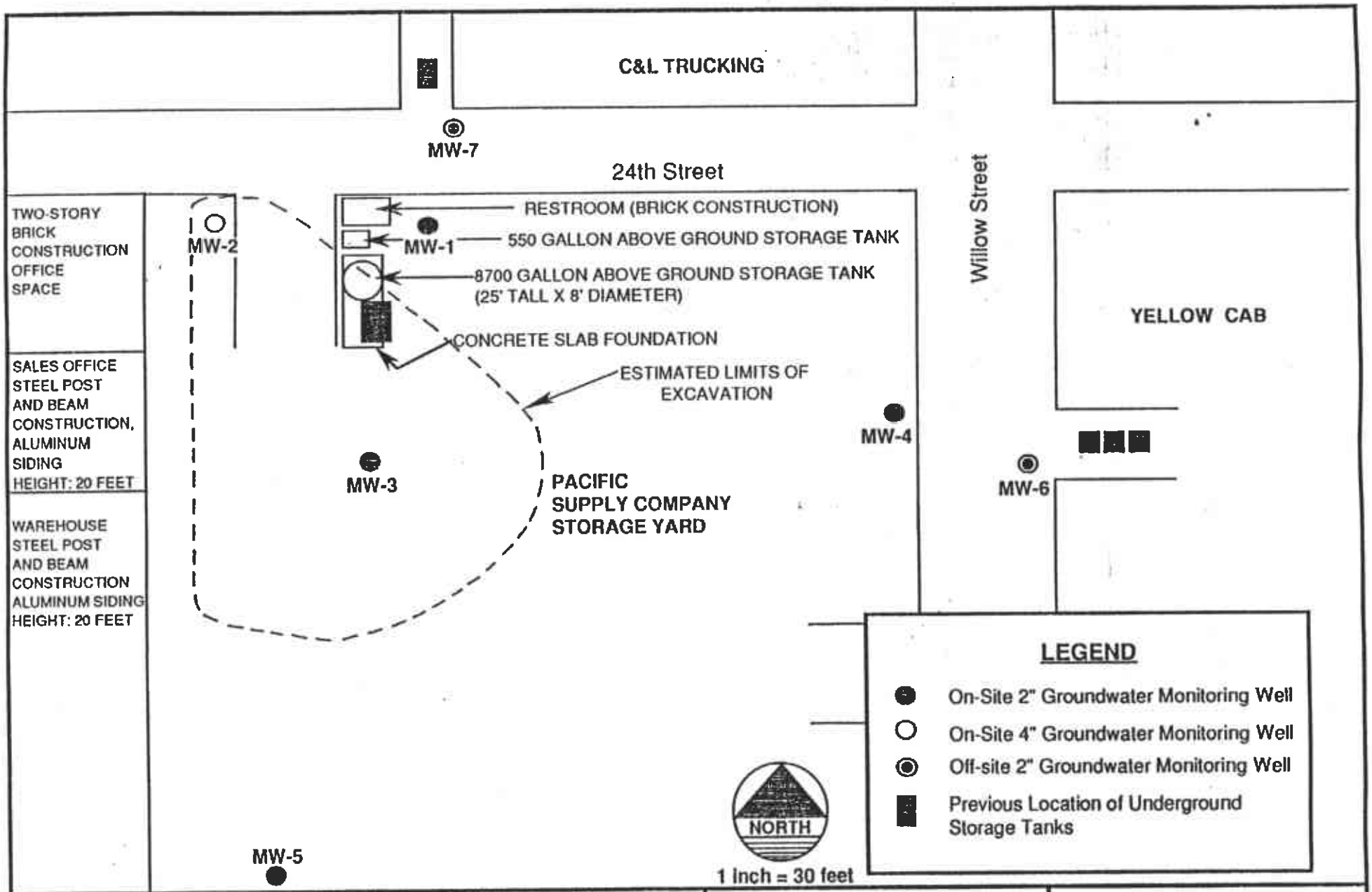


REFERENCE: State Water Resources Control Board, Leaking Underground Tank Field Manual: Guidelines for Site Assessment, Cleanup, and Underground Storage Tank Closure, April 1989

PROJECT NO.:	29.5	
DRAWN BY:	WJF	11-29-90
CHECKED BY:	MEV	11-29-90
APPROVED BY:	MEV	11-29-90
REVISION NO.:		

BRUNSING ASSOCIATES, INC.

FIGURE 10
LUFT MANUAL - DECISION TREE FLOW CHART
PACIFIC SUPPLY COMAPNY
OAKLAND, CALIFORNIA



PROJECT NO. 29.5		
DRAWN BY	MEV/JG	7/2/90
CHECKED BY	MEV/JG	7/2/90
APPROVED BY	MEV	10/29/90
REVISION NO.	2	10/29/90

BRUNSING ASSOCIATES, INC.

PACIFIC SUPPLY CO.
1735 24TH STREET
OAKLAND, CALIFORNIA

FIGURE 11
ESTIMATED LIMITS OF REMEDIAL EXCAVATION

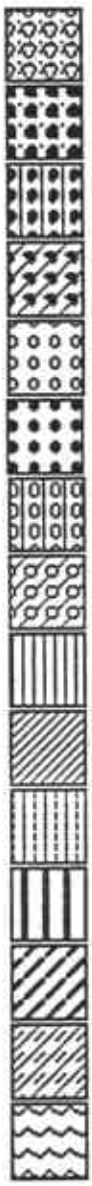
APPENDICES

APPENDIX A

BORING LOGS

LEGEND

BORING LOG
LITHOLOGIC SYMBOLS



GW: Well=Graded Gravels, gravel-like mixtures, little or no fines

GP: Poorly-graded gravels or gravel-sand mixtures, little or no fines

GM: Silty gravels, gravel-sand-silt mixture

GC: Clayey gravels, gravel-sand-clay mixtures

SW: Well-graded sands, gravelly sands, little or no fines

SP: Poorly graded sands or gravelly sands, little or no fines

SM: Silty sands, sand-silt mixtures

SC: Clayey sands, sand-clay mixture

ML: Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity

CL: Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays

OL: Organic silts and organic silty clays of low plasticity

MH: Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts

CH: Inorganic clays of high plasticity, fat clays

OH: Organic clays of medium to high plasticity, organic silts

Pt: Peat and other highly organic soils

BRUNSING ASSOCIATES
Consulting Engineers

Project Name **PACIFIC SUPPLY**

Project No. **029**

Boring Location **MW-1 1735 24th Street, Oakland**

Surface Elevation **9.11 feet** Driller **ASE** Date **9/13/88**

Depth	SOIL DESCRIPTION AND REMARKS	Lithology	U.S.C.S Soil Type	qu TSF	Contact Depth	SAMPLE No.	SAMPLE Type	SAMPLE Interval From	SAMPLE Interval To	BLOW COUNT 0-6	BLOW COUNT 6-12	BLOW COUNT 12-18	Recovery In Inches	Piezometer
	asphalt first 3 inches base aggregate													
	green loose silty sand with abundant quartz grains; moist; marsh gas odor?					1	SS	3.0	4.5				18	
5			SW			2	SS	5.0	6.5	1	1	1	12	
	green soft clay; very plastic; moist; strong SO4 odor		CL		6.0	3	SS	6.5	8.0	1	1	1	18	
	black soft silty clay; very moist to wet, very abundant grass, etc.		CL		7.5									
10	green, soft clay; very plastic, very moist abundant grass, clams, etc.		CL		8.5	4	SS	10.0	11.5	2	3	1	18	
15	brown-black; very soft, very plastic clay; very moist; abundant grass, roots, clamshells, etc. strong SO4 odor.				15.0	5	SS	15.0	16.5	2	3	3	18	
20	Bottom of Boring at 20 feet													
25														
30														
35														

Field Log of Boring No. **MW-1** By: **G. Eiche** Page **1** of **1**

BRUNSING ASSOCIATES
Consulting Engineers

Project Name **PACIFIC SUPPLY**

Project No. **029**

Boring Location **MW-2** **1735 24th Street, Oakland**

Surface Elevation **8.14 feet** Driller **ASE** Date **9/13/88**

Depth	SOIL DESCRIPTION AND REMARKS	Lithology	U.S.C.S Soil Type	qu TSF	Contact Depth	SAMPLE No.	SAMPLE Type	SAMPLE Interval From	SAMPLE Interval To	BLOW COUNT 0–6	BLOW COUNT 6–12	BLOW COUNT 12–18	Recovery In Inches	Piezometer
	asphalt first 3 inches													
	green loose silty sand; predominantly quartz, well-rounded, well-sorted grains. Heavy "marsh gas" odor		SW			1	SS	3.0	4.5	2	3	2	14	
5						2	SS	5.0	6.5	1	2	1	18	
	light green, very pastic soft clay; abundant roots and miscellaneous organic material; very strong SO4 odor		CL		6.0									
						3	SS	6.5	8.0				18	
	black soft silty clay; very plastic; very wet abundant debris: glass fragments, roots, etc.; v. strong SO_4^{-2} odor		CL		7.5	4	SS	8.0	9.5	3	3	1	4	
10														
	green very plastic soft clay; wet; abundant clamshells, grasses, roots, etc. very strong SO_4^{-2} odor		CL		9.5 to 13.5									
15						5	SS	13.5	15.0	1	1	1	18	
	brown very plastic soft clay; very moist; very abundant grassy material; strong SO_4^{-2} odor		CL		18.5	6	SS	18.5	20.0	1	1	1	18	
20														
	Bottom of Boring at 20 feet													
25														
30														
5														

Field Log of Boring No. **MW-2** By: **G. Eiche** Page **1** of **1**

BRUNSING ASSOCIATES
Consulting Engineers

Project Name PACIFIC SUPPLY

Project No. 029

Boring Location MW-3 1735 24th Street, Oakland

Surface Elevation 9.49 feet Driller ASE Date 9/13/88

Depth	SOIL DESCRIPTION AND REMARKS	Lithology	U.S.C.S Soil Type	qu TSF	Contact Depth	SAMPLE No.	SAMPLE Type	SAMPLE Interval From	SAMPLE Interval To	BLOW COUNT 0-6	BLOW COUNT 6-12	BLOW COUNT 12-18	Recovery In Inches	Piezometer
	asphalt first 3 inches													
	green, loose sand; moist; some organic material (i.e. roots).		SW			1	SS	3.0	4.5				12	
5	predominantly quartz, well-rounded grains													
	black, soft silty clay; very moist; strong hydrocarbon odor; extreme abundant grasses, leaves, etc. - Major fraction = organic debris.		CL			2	SS	6.5	8.0				18	
						3	SS	8.0	9.5				18	
	No hydrocarbon odor detected at greater than 9.0 feet							9.5	11.0				18	
10														
						4	SS	14.5	16.0				18	
	green soft, very plastic clay; very moist; abundant clam shells, grasses, roots.		CL		14.5									
15														
20	Bottom of Boring at 20 feet													
25														
30														
35														

Field Log of Boring No. MW-3 By: G. Eiche Page 1 of 1

BRUNSING ASSOCIATES
Consulting Engineers

Project Name PACIFIC SUPPLY

Project No. 029

Boring Location MW-4 1735 24th Street, Oakland

Surface Elevation 9.30 feet Driller ASE Date 9/14/88

Depth	SOIL DESCRIPTION AND REMARKS	Lithology	U.S.C.S Soil Type	qu TSF	Contact Depth	SAMPLE No.	SAMPLE Type	SAMPLE Interval From	SAMPLE Interval To	BLOW COUNT 0-6	BLOW COUNT 6-12	BLOW COUNT 12-18	Recovery In Inches	Piezometer
	3" asphalt cover													
5	green, fine to medium grained, well-sorted sand; moist; abundant quartz; well-rounded; green color the result of chlorite? NO ODOR		SW			1	SS	4.0	5.5	1	1	2	12	
	dark brown/black silty sandy clay; wet; very abundant organic debris (i.e. peachpit?, leaves, grass, etc.). NO ODOR		CL			2	SS	7.0	8.5	2	1	1	4	
10	dark brown/black extremely organic silt? (resembles spahnum moss, i.e. marsh deposit?). no odor wet		Pt			3	SS	9.5	11.0	1	2	1	4	
15	light green, soft clay; very plastic, wet; abundant organic debris - clam shells, grass, etc. SO4 odor.		CL			4	SS	14.5	16.0	1	3	2	18	
20	black soft clay; very plastic; wet, abundant grass. SO4 odor.		CL			5	SS	19.5	21.0				18	
	Bottom of Boring at 21.0 feet													
25														
30														
35														

Field Log of Boring No. MW-4 By: Greg Eiche Page 1 of 1

BRUNSING ASSOCIATES
Consulting Engineers

Project Name **PACIFIC SUPPLY**

Project No. **029**

Boring Location **MW-5 1735 24th Street, Oakland**

Surface Elevation **9.31 feet** Driller **ASE** Date **9/14/88**

Depth	SOIL DESCRIPTION AND REMARKS	Lithology	U.S.C.S Soil Type	qu TSF	Contact Depth	SAMPLE No.	SAMPLE Type	SAMPLE Interval From	SAMPLE Interval To	BLOW COUNT 0–6	BLOW COUNT 6–12	BLOW COUNT 12–18	Recovery In Inches	Piezometer
	3" asphalt cover													
5	highly variable fill and base aggregate: sand, gravel, clay... some organic debris					1	SS	4.0	5.5	1	1	3	12	
						2	SS	6.5	8.0	1	1	1	12	
	dark brown/black silt with very abundant organic material; wood, clamshells, grass; very wet; no odor		CL			3	SS	8.0	9.5	1	1	1	0	
10														
15	black-gray clay; very plastic, very wet abundant organic debris (grass, shells, etc.)		CL			4	SS	14.5	16.0	1	1	1	18	
	as above					5	SS	19.5	21				18	
20	Bottom of boring at 21 feet		CL											
25														
30														
35														

Field Log of Boring No. **MW-5** By: **G. Eiche** Page **1** of **1**

BRUNSING ASSOCIATES, INC.

Project Name: PACIFIC SUPPLY COMPANY
1735 24TH STREET, OAKLAND, CALIFORNIA

Project No.: 029.2

Boring Location: MW-6; Yellow Cab Co. Driveway, Willow Street

Surface Elevation: 6.13 feet Driller: Aqua Science Engineers Date: December 19, 1989

Depth	SOIL DESCRIPTION AND REMARKS	Lithology	U.S.C.S Soil Type	qu TSF	Contact Depth	SAMPLE No.	SAMPLE Type	SAMPLE Interval From	SAMPLE Interval To	BLOW COUNT 0 to 6	BLOW COUNT 6 to 12	BLOW COUNT 12 to 18	Recovery In Inches	Piezometer
	Asphalt													
	Black/green/brown/grey mottled soft clayey sand and sandy clay; abundant brick, glass, and organic debris; moist; oily odor		SC	< 0.5		1	ss	2.0	3.5	2	2	2	4	
5.0	As above, but saturated with abundant water and oily substance; heavy hydrocarbon or solvent odor.		SC	< 0.5		2	ss	4.5	6.0	2	2	2	8	
	Black clayey slurry; very abundant oily substance; heavy has or solvent odor; abundant debris	?				3	ss	6.0	7.5	1	1	1	2	
10.0	Grey/green soft clayey silt; trace organic material; Hydrogen sulfide odor	?	ML	< 0.5		4	ss	10.0	11.5	2	3	3	18	
15.0	Grey/green/brpwm spft c;aueu so;t' abundant mollusc fragments; hydrogen sulfide odor		ML	< 0.5		5	ss	15.0	16.5	1	1	1	18	
20.0	Bottom of boring @ 17.0 ft.													

Sampled collected for chemical analysis

MW-6 / 3.5 ft.
MW-6 / 5..0 ft.
MW-6 / 5.5 ft.

Field Log of Boring No. MW-6 By: Greg Eiche Page 1 of 1

BRUNSING ASSOCIATES, INC.

Project Name: PACIFIC SUPPLY COMPANY
1735 24TH STREET, OAKLAND, CALIFORNIA

Project No.: 029.2

Boring Location: MW-7; C & L Trucking, Inc. Driveway, 24th Street

Surface Elevation: 5.03 feet | Driller: Aqua Science Engineers | Date: December 19, 1989

Depth	SOIL DESCRIPTION AND REMARKS	Lithology	U.S.C.S Soil Type	qu TSF	Contact Depth	SAMPLE No.	SAMPLE Type	SAMPLE Interval From	SAMPLE Interval To	BLOW COUNT 0–6	BLOW COUNT 6–12	BLOW COUNT 12–18	Recovery In Inches	Piezometer
	Asphalt													
	Green slightly dense quartz-rich sand inter-fingered with thin veins of black, highly organic clayey material; moist; no odor		SC			1	ss	2.0	3.5	7	7	6	12	
5.0	Black/grey mottled soft clay; highly organic; abundant grasses and roots; hydrogen sulfide odor; wet		CL	< 0.5		2	ss	4.5	6.0	2	2	2	18	
10.0	Grey/green soft clayey silt; some organic matter; grasses and roots; wet		ML	< 0.5		3	ss	10.0	11.5	2	5	7	18	
15.0	Grey/black stiff clayey silt; some organic matter (grasses and roots); trace of mollusc shells; moist; hydrogen sulfide odor		ML	3.0		4	ss	15.0	16.5	7	7	8	18	
20.0	Tan/brown stiff silty clay; no organic material; mottled white/green/tan zones; moist; no odor		CL	3.5		5	ss	18.0	19.5	5	7	9	18	
	Bottom of boring @ 20.0 ft.													

Sampled collected for chemical analysis

MW-7 / 3.5 ft.
MW-7 / 5.5 ft.
MW-7 / 11.5 ft.
MW-7 / 16.5 ft.

Field Log of Boring No. MW-7 By: Greg Eiche Page 1 of 1

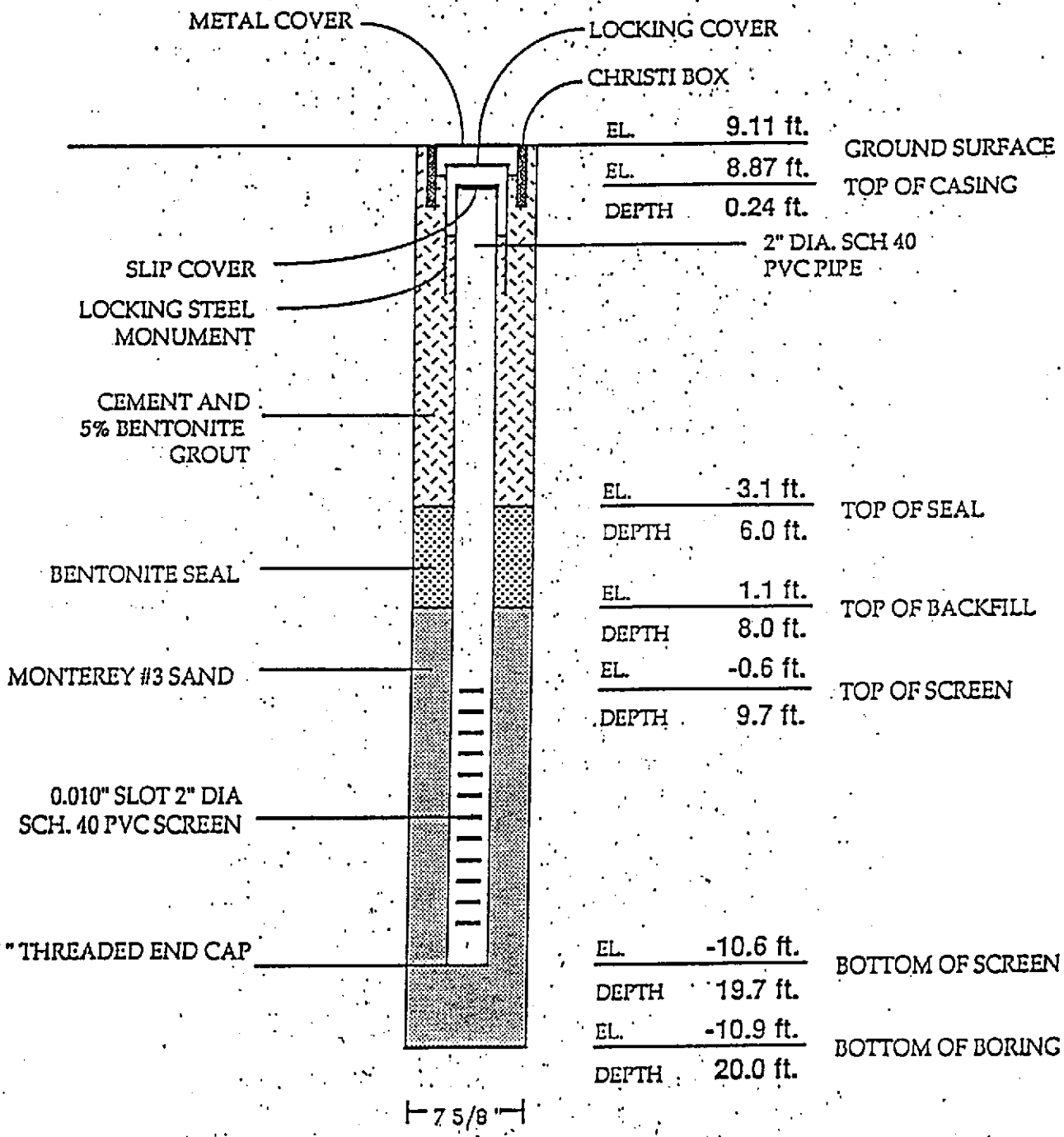
APPENDIX B

MONITORING WELL COMPLETION DETAILS

WELL COMPLETION DETAIL

PROJECT NAME: PACIFIC SUPPLY COMPANY PROJECT NO. 029

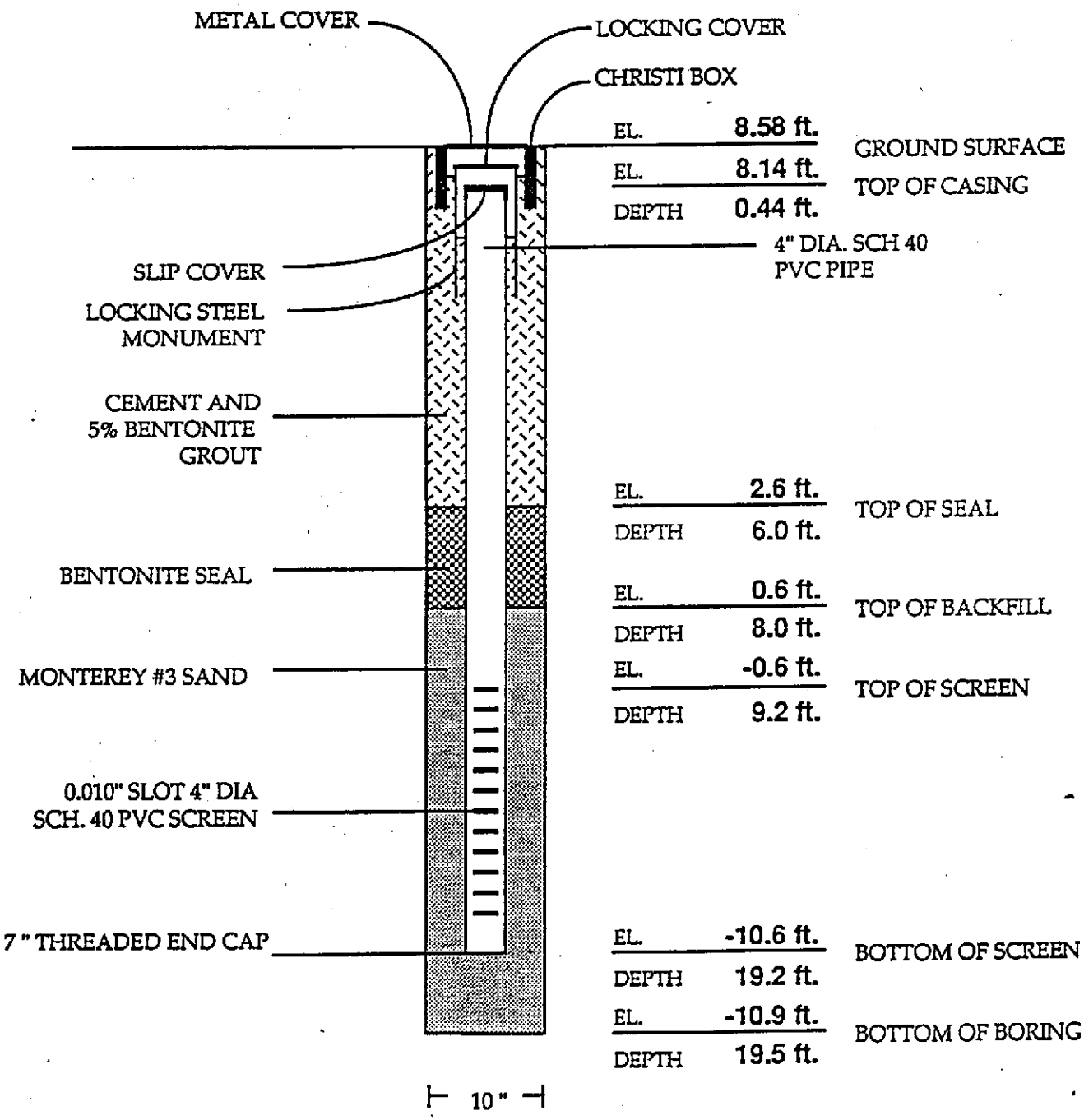
BORING LOCATION: MW-1 DATE: 9/13/88 BY: GE



WELL COMPLETION DETAIL

PROJECT NAME: PACIFIC SUPPLY COMPANY PROJECT NO. 029

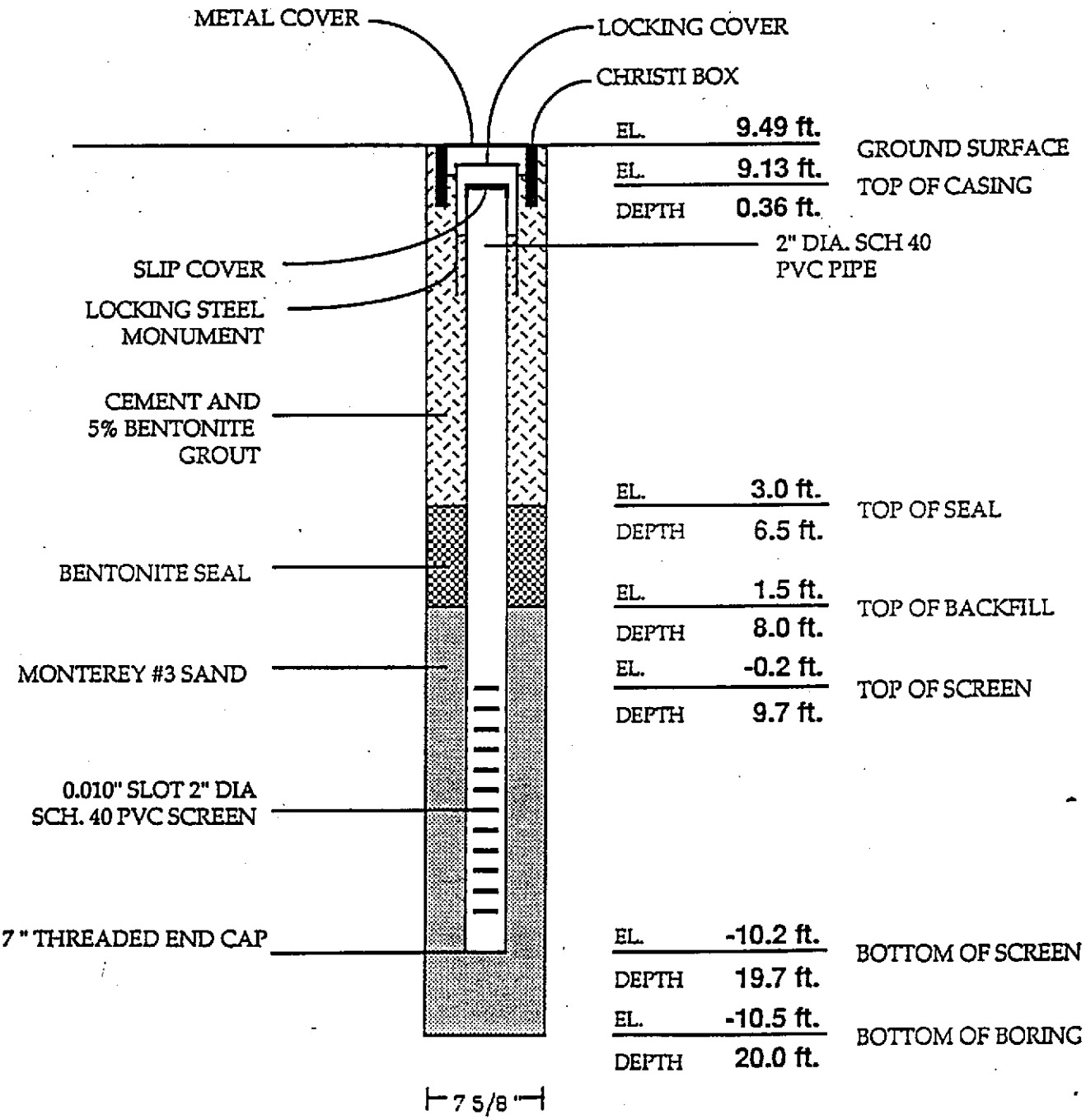
BORING LOCATION: MW-2 DATE: 9/13/88 BY: GE



WELL COMPLETION DETAIL

PROJECT NAME: **PACIFIC SUPPLY COMPANY** PROJECT NO. **029**

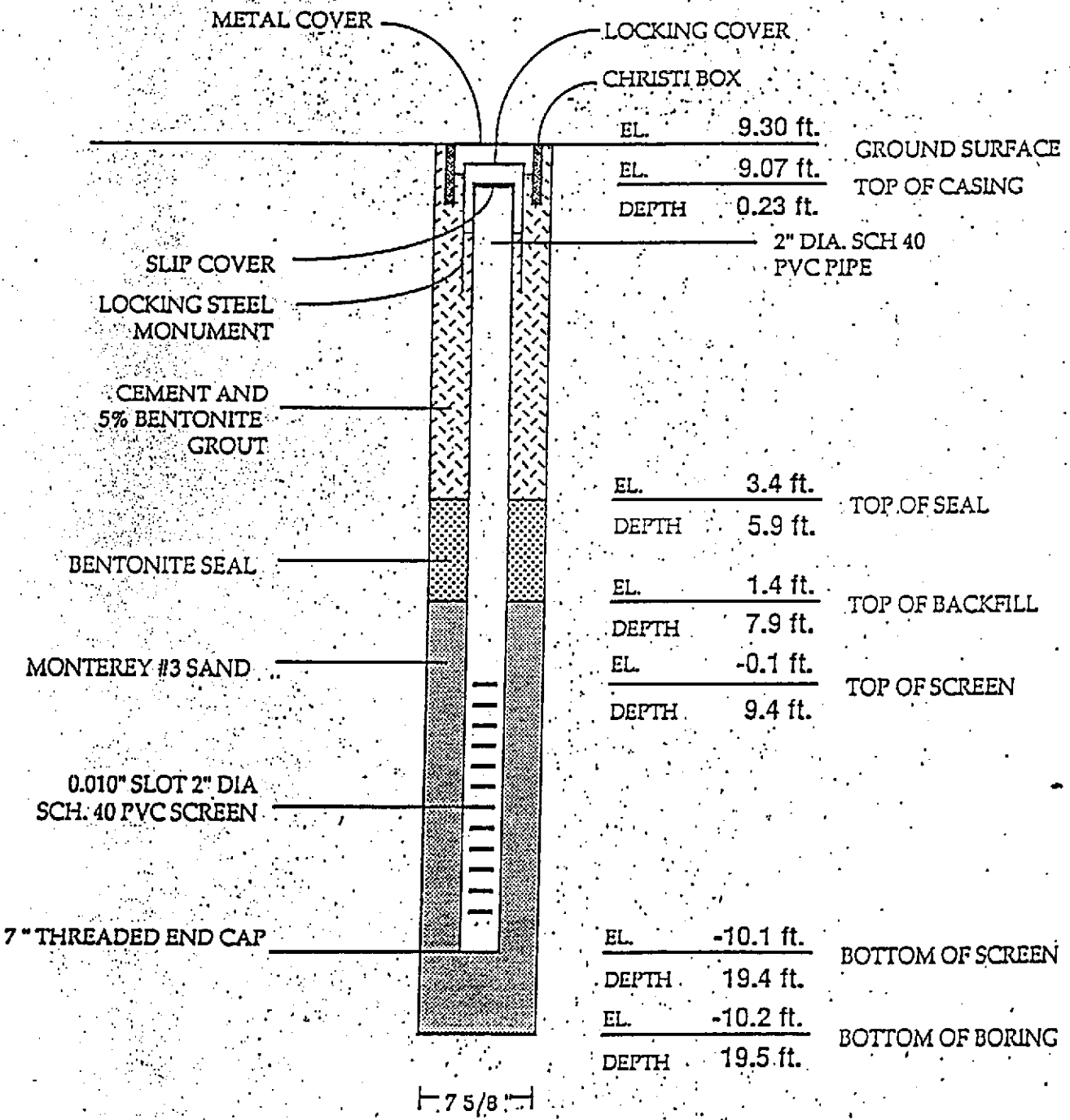
BORING LOCATION: **MW-3** DATE: **9/13/88** BY: **GE**



WELL COMPLETION DETAIL

PROJECT NAME: PACIFIC SUPPLY COMPANY PROJECT NO. 029

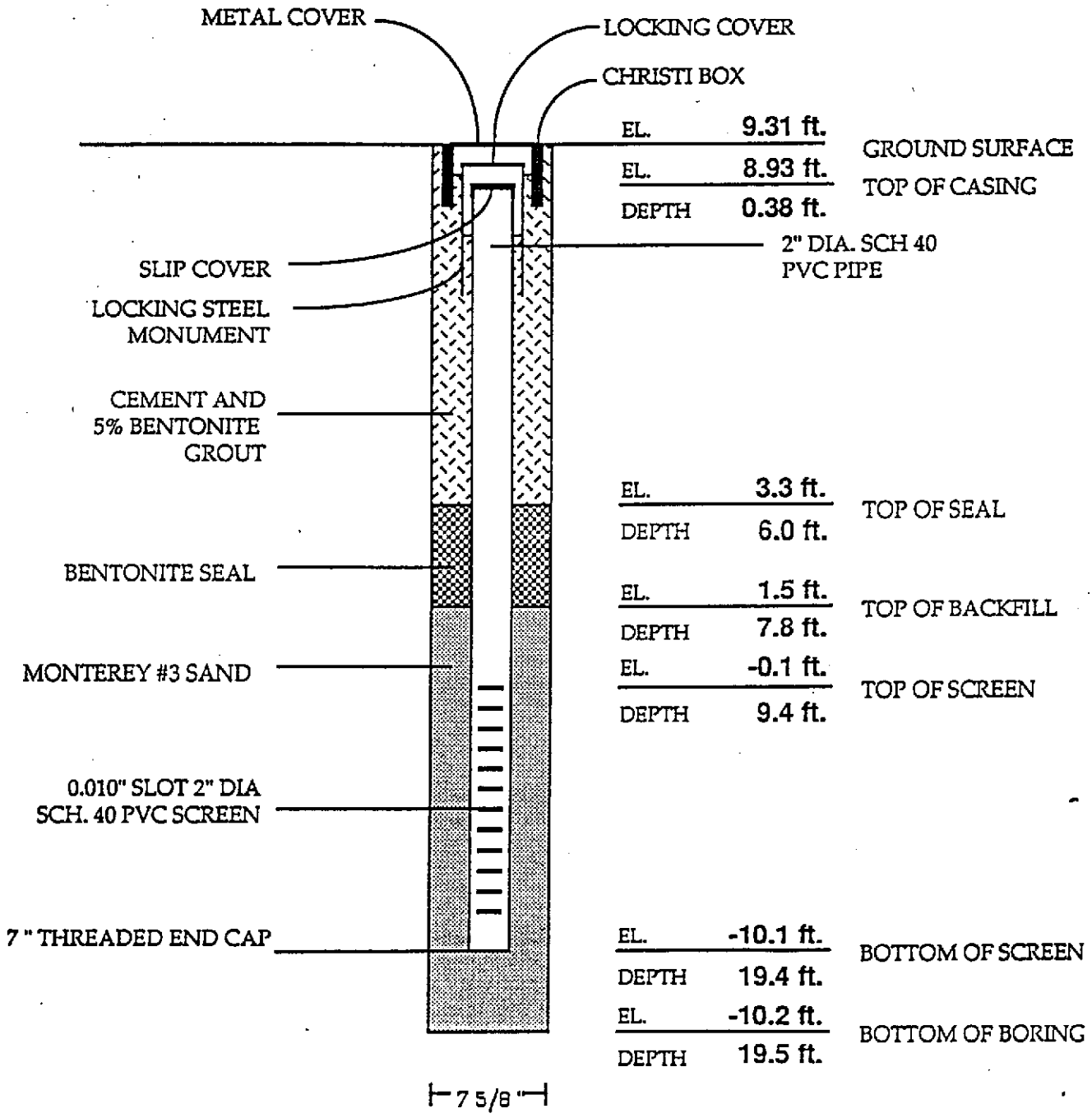
BORING LOCATION: MW-4 DATE: 9/13/88 BY: GE



WELL COMPLETION DETAIL

PROJECT NAME: **PACIFIC SUPPLY COMPANY** PROJECT NO. **029**

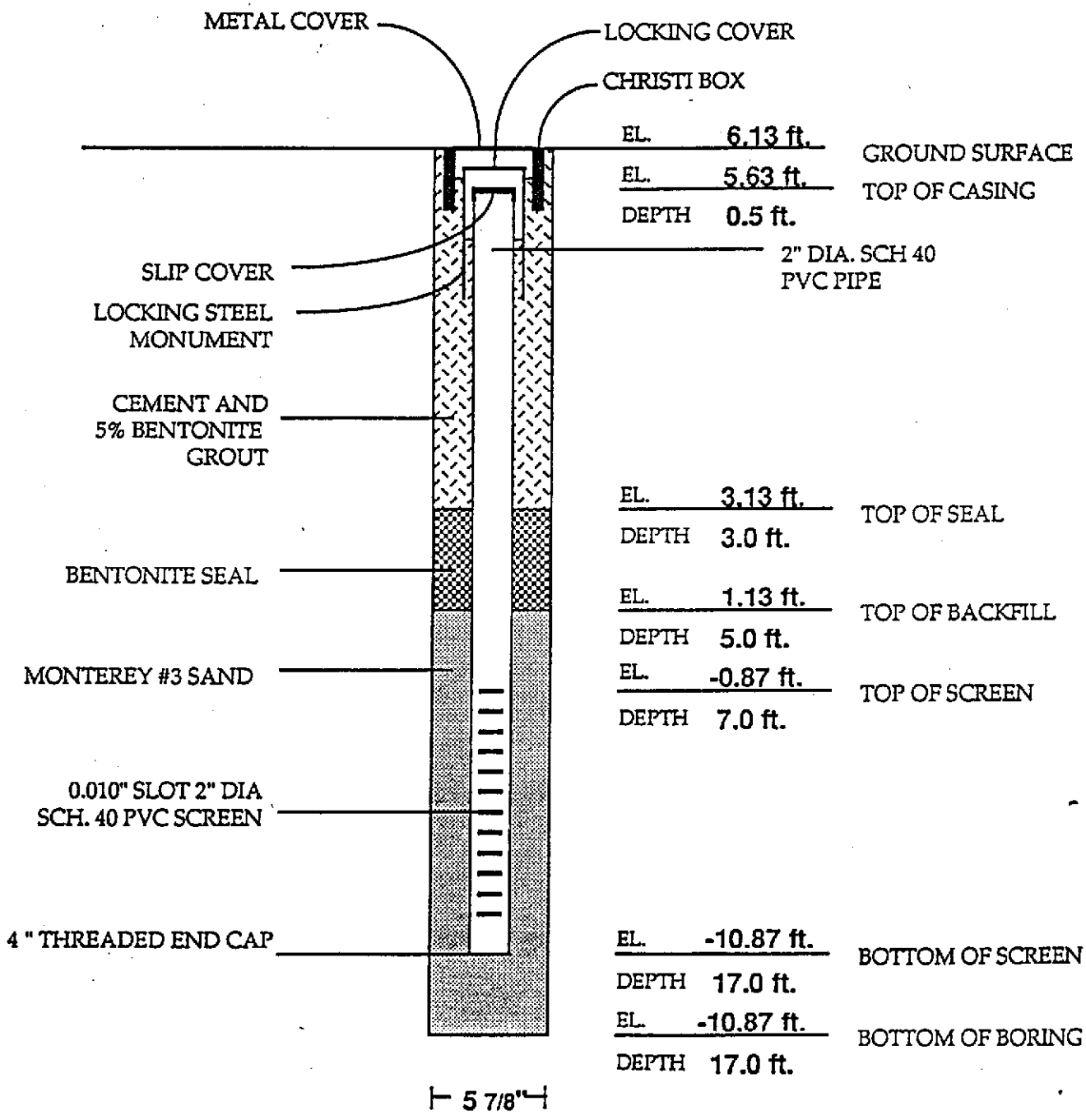
BORING LOCATION: **MW-5** DATE: **9/13/88** BY: **GE**



WELL COMPLETION DETAIL

PROJECT NAME: PACIFIC SUPPLY CO. 1735 24th STREET, OAKLAND, CALIFORNIA PROJECT NO. 029.2

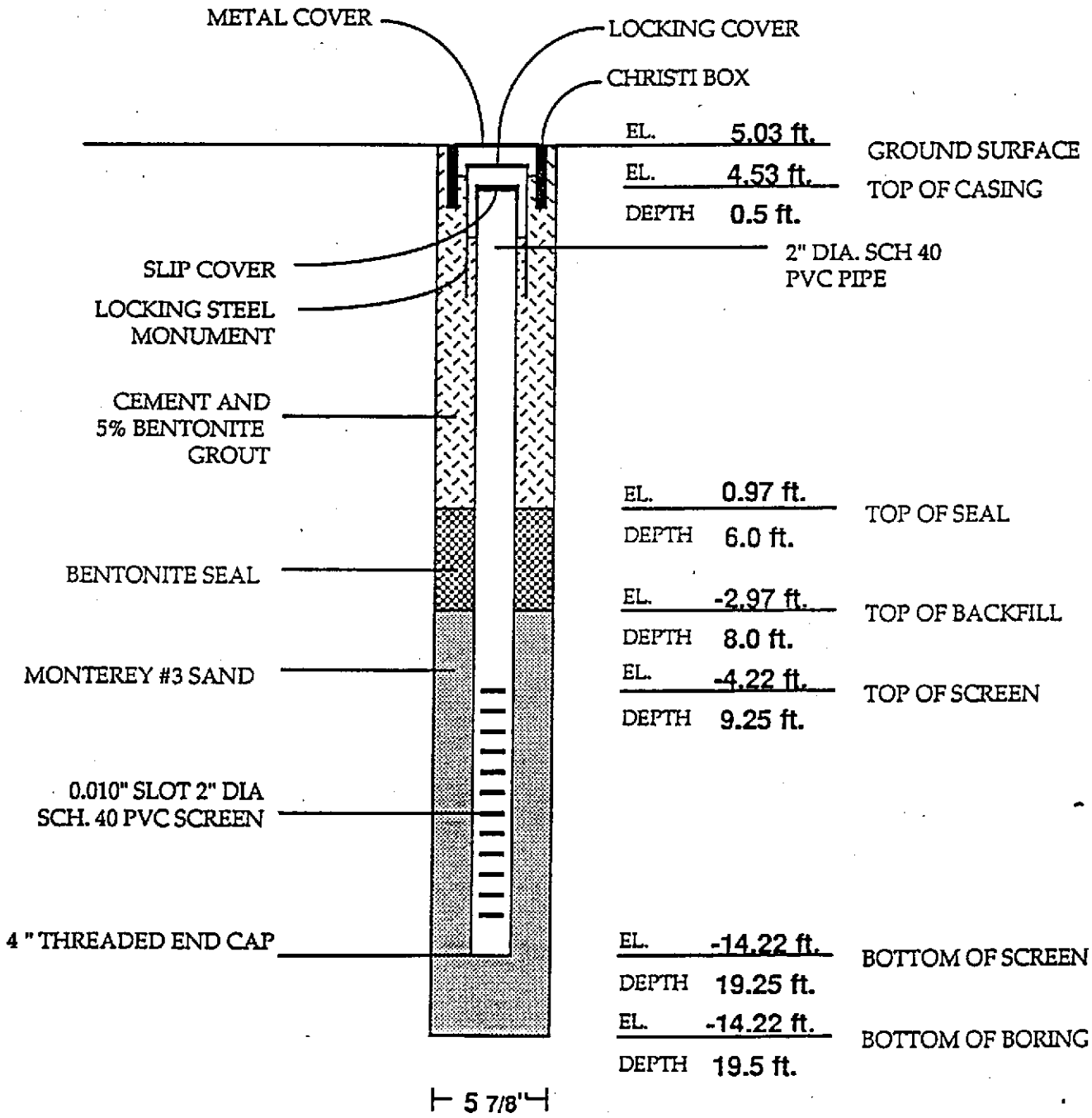
BORING LOCATION: MW-6 DATE: December 19,1989 BY: G. Eiche



WELL COMPLETION DETAIL

PROJECT NAME: PACIFIC SUPPLY CO. 1735 24th STREET, OAKLAND, CALIFORNIA PROJECT NO. 029.2

BORING LOCATION: MW-7 DATE: December 19,1989 BY: G. Eiche



APPENDIX C

GEOLOGIC LOGGING AND WELL CONSTRUCTION PROTOCOL

APPENDIX C

GEOLOGIC LOGGING & WELL CONSTRUCTION PROTOCOL
PACIFIC SUPPLY COMPANY SOIL AND GROUNDWATER INVESTIGATION

1.0 Geologic Logging

A field notebook was maintained by the field team leader to provide a record of significant events, general observations of climatic and site conditions, personnel present, augering procedures, sampling procedures (see Appendix D), and calibration records. Lithologic logging of soil borings was performed by a qualified geologist or engineer, who was responsible for recording at a minimum the following information on the borehole log sheets:

1. At predetermined intervals the geologist or engineer obtained a sample of the cuttings from the soil core drive sampler. Cutting depth was noted.

2. The description of the auger cuttings included the following:

    - Color of cuttings.
    - Size of cuttings (e.g., cobbles, sand, silt, and/or clay according to the Wentworth or an equivalent size scale).
    - Percentage of cobbles, sand, silt, and/or clay.
    - Descriptive comments (e.g., degree of cementation).
    - Moisture content.

3. Drilling speed and rig behavior was noted to help verify the nature of the material encountered by the drill bit.

4. When obtaining samples with a split-spoon sampler, blow counts were recorded for every six-inch penetration of a 140-pound weight free-falling thirty inches.

2.0 Well Construction

The five on-site and two off-site monitoring wells were installed at the locations shown on Figure 1 of the text using hollow-stem flight auger techniques. A truck-mounted rig was used. The auger size was eight inches.

As detailed previously, soil samples were collected at specified intervals. All wells were drilled to a depth of approximatley 20 feet below ground surface. The well casings and screens for wells MW-1, MW-3, MW-4, and MW-5 were constructed with a two-inch diameter, Schedule 40, flush-joint threaded PVC pipe. Well MW-2 was constructed with four-inch diamter casing. The PVC screens consisted of factory-milled 0.020-inch slots. The screens were installed at the interval from approximately ten feet to twenty feet below ground surface. A sand pack of clean water-washed Monterey #3 sand or equivalent was placed adjacent to the entire screened interval and was extended a recommended minimum distance of two feet above the top of the screen. The sand pack was placed by carefully pouring sand down the annulus between the hollow stem and the well casing. The auger was raised periodically and an auger flight removed to allow the sand to fill the annulus between the casing and the borehole wall.

A one- to two-foot thick bentonite pellet seal was placed above the sand pack. The seal was placed in the same manner as the sand pack. The annulus above the bentonite seal was grouted with a cement/bentonite grout. The bentonite content of the grout did not exceed five percent by weight. The grouted consisted of clean water mixed with Portland cement. The grout was placed in the same manner as the sand pack, or after the auger flights were entirely withdrawn from the borehole.

Well completions consisted of a locking PVC or steel cap with precast utility box set at grade. The utility boxes were set in concrete. All wells were footed in cement/bentonite grout to ensure that they were securely set in place. After the concrete and cement/bentonite grout had set for a minimum of 24 hours, each well was developed as described below.

Each well was developed by swabbing, surging, and/or bailing in an attempt to clean the well and obtain representative formation water. The four on-site and two off-site two-inch wells (MW-1, MW-3, MW-4, MW-5, MW-6, MW-7) were hand bailed while the one four-inch well (MW-2) was pumped with a submersible pump. Despite removal of more than five casing volumes of water from each well, it was noted that the turbidity of the water remained excessive. Due to the very silty nature of the Bay Mud in which the wells are screened, it was determined by the site geologist or engineer that additional well development would not significantly reduce sample turbidity.

Monitoring well head were surveyed for horizontal and vertical control by Sam Kushner, a California licensed land surveyor, and are believed to be accurate to 0.01 feet. A check was subsequently performed of the surveyed elevations of on-site monitoring well heads to confirm the accuracy of the survey data.

APPENDIX D

SOIL AND GROUNDWATER SAMPLING PROTOCOL

APPENDIX D

SOIL AND WATER SAMPLING PROTOCOL
PACIFIC SUPPLY COMPANY SOIL AND GROUNDWATER INVESTIGATION

1.0 Quality Control and Quality Assurance

Quality Assurance (QA) is defined as the integrated program designed for assuring reliability of monitoring and measurement data. Quality Control (QC) is defined as the routine application of procedures for obtaining prescribed standards of performance in the monitoring and measurement process. The overall QA objectives are to develop and implement standardized procedures for obtaining and evaluating data that can be used to assess site hazards and develop and evaluate alternative remedial actions.

The QA/QC plan presented herein was designed to implement the procedures necessary to maintain consistent quality of technical products. This consistency is accomplished through the standardization and documentation of field techniques and activities. All field activities were planned in advance and reviewed by the technical project personnel to ensure consistency with overall project objectives. Actual field and laboratory activities were performed by properly trained and qualified personnel and conformed to the specific procedures outlined in the subsequent sections. Project deliverables resulting from these activities were submitted and reviewed for completeness, reliability, accuracy, and conformance with specified procedures.

2.0 Sampling Techniques

2.1 Soil Sampling Technique

As described in the workplan dated February 29, 1988, subsurface soil samples were collected in order to evaluate for the presence of various hydrocarbon fuel products at the groundwater/vadose zone interface. The samples were collected using a hollowstem auger/split spoon sampling apparatus. After augering to the desire depth, a clean decontaminated two-inch diameter brass sampler tube was driven into the soil. The brass tube was then removed from the sample driver and prepared for shipment.

2.2 Groundwater Sampling Technique

Groundwater was sampled from the monitoring wells installed as part of the Phase I and II investigations. A portable submersible geofilter pump was used for evacuation of three to five casing volumes from monitoring well MW-2 (four-inch casing). A teflon bailer was used to evacuate a minimum of three casing volumes from monitoring wells MW-1, MW-3, MW-4, MW-5, MW-6, and MW-7.

All information pertinent to sampling such as the well designation, time the pump is turned on and off, time of sampling, and volume of water pumped, pH, temperature and electrical conductivity, was recorded on the field logs. The following steps were followed for sampling of monitoring well MW-2:

1. Calculate the well water volume.

2. Measure discharge rate from the pump and calculate the time required for evacuation of three to five casing volumes.

3. Collect water sample directly from the pump discharge line into appropriate sample containers.

4. Put the sample on ice for preservation and ship to the analytical laboratory as discussed below.

5. Remove pump from well and decontaminate by steam cleaning.

The following steps were followed for bailer sampling of monitoring wells MW-1, MW-3, MW-4, MW-5, MW-6, and MW-7:

1. Take a water level measurement prior to bailing.

2. Attach the bailer to a clean nylon rope and raise and lower by hand. Different ropes were used for each well so that there would be no cross-contamination between wells.

3. Collect water sample directly from bailer to appropriate container. Measure sample for pH, temperature and electrical conductivity.

4. Put the sample on ice for preservation and ship to the analytical laboratory as discussed below.

3.0 Sample Handling and Chain of Custody Procedure

Soil samples were collected in brass tubes. The ends were covered with aluminum foil and capped. The brass tubes were labeled using a waterproof marker to designate the location, date, name of person doing the sampling, depth at which the sample was taken, and sample identification (ID). These samples were then sealed in plastic ziplock bags and placed in a cooled ice chest and shipped to the analytical laboratory within twenty-four hours of collection.

Groundwater samples were collected in one-liter laboratory-prepared glass jars. The jars were labeled with the location of the well, date, name of person doing the sampling, and sample ID. The jars were packed to avoid breakage and placed in a cold ice chest for shipment to the analytical laboratory.

A separate chain of custody form, placed in a sealed plastic bag, was included with each ice chest. When transferring samples, the relinquishing and receiving individuals were instructed to sign, date, and note the time on the chain of custody form. A designated sample custodian accepted the shipped samples at the laboratory and verified that the sample identification numbers matched those on the chain of custody record.

The custodian entered the sample identification number data into a log book, arranged by project code and station number, and either used the sample identification number or assigned a unique laboratory number to each sample and ensured that all samples were transferred to the proper analyst or stored in the appropriate secure area. Laboratory personnel were responsible for the care and custody of samples from the time they are received until the samples are exhausted or returned to the custodian.

When sample analyses and necessary QA checks were completed in the laboratory, the unused portion of the sample were disposed of properly. All data sheets and laboratory records were retained as part of the permanent project documentation.

APPENDIX E

1989 LABORATORY REPORTS: SOIL AND GROUNDWATER ANALYSES

FILE COPY
029.2
K

ACUREX Corporation

Environmental Systems Division

Brunsing Associates
1607 Industrial Way
Belmont, CA 94002

January 16, 1990
Acurex ID: 9001002
Client PO: 029.2

Attention: Michael Velzy

Subject: Analysis of 1 Soil Sample, Received 12/20/90.

The sample was analyzed for semivolatile organic compounds according to U.S. EPA Method 8270 (Test Methods for Evaluating Solid Waste - SW846, 3rd Ed.,1986). Results are presented in Table 1. The method can be summarized as follows:

> A weighed aliquot of sample is extracted with methylene chloride/acetone (1:1) at neutral pH. The extract is dried using sodium sulfate and concentrated to 1 mL. Just prior to injection into a Gas Chromatograph/Mass Spectrometer (GC/MS), internal standards are added. The GC/MS is equipped with a fused silica capillary column and is set up for the analysis of semivolatile priority pollutants.

Qualitative identification of the priority pollutants is performed initially using the relative retention times and the relative abundance of three unique ions. The entire mass spectrum is checked before any final identifications are recorded. Quantitative analysis is performed by the internal standard method using a single characteristic ion and response factors obtained from a daily calibration standard. In the tables, an entry such as "<5" means that the compound was not found at a level above the laboratory's reporting limit. The reporting limit, which is based on EPA reporting levels, has been corrected for any sample dilution.

Prior to analysis, every sample is spiked with surrogate compounds as part of Acurex's Quality Control Program. These compounds simulate the behavior of compounds of interest and confirm that acceptable recoveries are being achieved on every sample. The results of surrogate recoveries are reported with the sample results.

485 Clyde Avenue, P.O. Box 7044, Mountain View, CA 94039 (415) 961-5700 Telex: 325961 FAX: (415) 964-5145

If you should have any technical questions, please contact the undersigned at (415)964-0844.

Approved by: M. Claire Ferguson
M. Claire Ferguson
Client Services Manager

These results were obtained by following standard laboratory procedures; the liability of Acurex Corporation shall not exceed the amount paid for this report. In no event shall Acurex be liable for special or consequential damages.

Table 1. Semivolatile Organic Results

Brunsing Assoc. Sample ID

8270 Compounds	MW-6 5.5' ug/kg	Method Blank ug/kg	Spike % Recov	Dup Spike % Recov
Phenol	<660	<660	59	59
Bis(2-chloroethyl)ether	<660	<660	NS	NS
2-Chlorophenol	<660	<660	62	62
1,3-Dichlorobenzene	<660	<660	NS	NS
1,4-Dichlorobenzene	<660	<660	54	53
1,2-Dichlorobenzene	<660	<660	NS	NS
Bis(2-chloroisopropyl)ether	<660	<660	NS	NS
N-Nitroso-di-n-propylamine	<660	<660	66	64
Hexachloroethane	<660	<660	NS	NS
Nitrobenzene	<660	<660	NS	NS
Isophorone	<660	<660	NS	NS
2-Nitrophenol	<660	<660	NS	NS
2,4-Dimethylphenol	<660	<660	NS	NS
Bis(2-chloroethoxy)methane	<660	<660	NS	NS
2,4-Dichlorophenol	<660	<660	NS	NS
1,2,4-Trichlorobenzene	<660	<660	59	57
Naphthalene	6400	<660	NS	NS
Hexachlorobutadiene	<660	<660	NS	NS
4-Chloro-3-methylphenol	<660	<660	65	61
Hexachlorocyclopentadiene	<660	<660	NS	NS
2,4,6-Trichlorophenol	<660	<660	NS	NS
2-Chloronaphthalene	<660	<660	NS	NS
Dimethyl phthalate	<660	<660	NS	NS
Acenaphthylene	<660	<660	NS	NS
Acenaphthene	<660	<660	61	64
2,4-Dinitrophenol	<3200	<3200	NS	NS
4-Nitrophenol	<3200	<3200	57	55
2,4-Dinitrotoluene	<660	<660	68	65
2,6-Dinitrotoluene	<660	<660	NS	NS
Diethyl phthalate	<660	<660	NS	NS
4-Chlorophenyl phenylether	<660	<660	NS	NS
Fluorene	<660	<660	NS	NS
4,6-Dinitro-2-methylphenol	<3200	<3200	NS	NS
N-Nitrosodiphenylamine	<660	<660	NS	NS
4-Bromophenyl phenylether	<660	<660	NS	NS

NS - Not spiked

Table 1. Semivolatile Organic Results (Continued)

Brunsing Assoc. Sample ID

8270 Compounds	MW-6 5.5' ug/kg	Method Blank ug/kg	Spike % Recov	Dup Spike % Recov
Hexachlorobenzene	<660	<660	NS	NS
Pentachlorophenol	<3200	<3200	55	50
Phenanthrene	<660	<660	NS	NS
Anthracene	<660	<660	NS	NS
Di-n-Butyl phthalate	<660	<660	NS	NS
Fluoranthene	<660	<660	NS	NS
Pyrene	<660	<660	66	65
Date Analyzed	1/10/90	1/10/90	1/10/90	1/10/90
Date Extracted				
Surrogates	Percent Recovery (%)			
2-Fluorophenol	50	70	64	64
Phenol-d5	44	63	61	61
Nitrobenzene-d5	50	70	62	63
2-Fluorobiphenyl	59	75	67	67
2,4,6-Tribromophenol	75	78	79	76
p-Terphenyl-d14	54	63	53	52

NS - Not spiked

8912-099

PROJ. NO.	PROJECT NAME
029.2	PACIFIC SUPPLY CO, OAKLAND
L.P. NO.	SAMPLERS (Signature)
	Greg Eiche

R3/515

DATE	SAMPLE I.D.	TYPE	NO. OF CONTAINERS	ANALYSIS: TPH (gasoline) per EPA 8015	BTXE (per EPA 8020)	ORGANIC LEAD	HOLD	ANALYZE	REMARKS
12/19/89	MW-6 / 3.5'	S	1	X	X	X	X		HOLD UNTIL FURTHER NOTICE
"	MW-6 / 5.5'	S	1	X	X	X		X	ANALYZE IMMEDIATELY
"	MW-7 / 3.5'	S	1	X	X	X	X		HOLD UNTIL FURTHER NOTICE
"	MW-7 / 5.5'	S	1	X	X	X		X	ANALYZE IMMEDIATELY
"	MW-7 / 11.5'	S	1	X	X	X	X		HOLD UNTIL FURTHER NOTICE
"	MW-7 / 16.5'	S	1	X	X	X	X		" " " "
"	MW-6 / 5.0'	S	1	X	X	X	X		" " " "

NOTE: OPEN MW-7, 5.5 N/ CANTON.

(12/20) 4PM
Note! per Mike Velzy: Sample MW-6/5.5 may be analyzed for VOA: 8010. Client will decide week of 12/25/89 MEF

As per Mike Velzy, 12/20. Please add 8270 to the analyses on (12/28) per Greg Eiche / Brunsing, analyze

LABORATORY: ACCUREX

Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Remarks
Greg Eiche	12/19/89	Sample MW-6/5.5	DETECTION LIMITS for VOA: EPA 8010
Relinquished by: (Signature)	Date/Time	Received by: (Signature) MEF	• TPH(gas) = 1.0 mg/kg • BTXE =
Relinquished by: (Signature)	Date/Time	Received for Laboratory by: (Signature)	• STANDARD 2-WEEK TAT
	12/20/89 2pm	Marsha Dept	

MEF
ATTN: MIKE VELZY

BRUNSING ASSOCIATES
Consulting Engineers
~~P.O. Box 586, Windsor, CA 95492~~
~~(707) 838-3027~~
1607 INDUSTRIAL WAY, BELMONT

MID-PACIFIC ENVIRONMENTAL LABORATORY

formerly Acurex Lab

NOTIFICATION OF REVISED REPORT

DATE: 1/31/90

ACUREX ID: 9001-002

CLIENT: Brunsing Associates

1. Page 5: 8270 tentatively identified compounds added.

625B Clyde Avenue, Mountain View, CA 94043 (415) 964-0844 FAX:(415) 961-7113

FILE COPY

ACUREX Corporation

Environmental Systems Division

Brunsing Associates
1607 Industrial Way
Belmont, CA 94002

January 12, 1990
Acurex ID: 8912099
Client PO: 029.2

Attention: Michael Velzy

Subject: Analysis of 2 Soil Samples, Received 12/20/89; 5 Samples are "On Hold".

Soil samples were analyzed for purgeable halogenated organic compounds according to U.S. EPA Method 8010 (Test Methods for Evaluating Solid Waste -- SW846, 3rd Ed.,1986). Results are presented in Table 1. The method can be summarized as follows:

> Soil samples are introduced into a purge and trap apparatus. Helium is bubbled through the water contained in a specially designed purging chamber at ambient temperature. The purgeable halogenated organic compounds are efficiently transferred from the aqueous phase to the vapor phase. The vapor is swept through a sorbent column where the purgeables are trapped. After purging is completed, the sorbent column is heated and back flushed with helium to desorb the purgeables onto a gas chromatographic column. The gas chromatograph is temperature programmed to separate the purgeables which are then detected with a Hall detector.

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JAN 17 1990

485 Clyde Avenue, P.O. Box 7044, Mountain View, CA 94039 (415) 961-5700 Telex: 325961 FAX: (415) 964-5145

Soil samples were analyzed for benzene, toluene, ethyl benzene, total xylenes (BTEX), and gasoline according to the guidelines established in the Regional Water Quality Control Board (RWQCB) Leaking Underground Fuel Tank (LUFT) manual. Results are presented in Table 2. The method for BTEX and gasoline can be summarized as follows:

> Samples are extracted using purge and trap grade methanol. An aliquot of sample is added to organic free water and introduced into a purge and trap apparatus. Helium is bubbled through the water contained in a specially designed purging chamber. Low boiling petroleum hydrocarbons are efficiently transferred from aqueous phase to the vapor phase. After purging is completed, the sorbent column is heated and back-flushed with helium to desorb the purgeables onto a gas chromatographic column. The gas chromatograph is temperature programmed to separate BTEX and other components of gasoline. BTEX is detected using a photoionization detector (PID) and gasoline is detected using a flame ionization detector (FID). Other petroleum hydrocarbons may be quantified using this technique.

The samples were digested using EPA method 3050 prior to analysis. The digestate was analyzed for requested metals using Inductively Coupled Argon Plasma Spectroscopy or Atomic Absorption spectrophotometry following Test Methods for Evaluating Solid Waste (SW-846 3rd. Ed.,1986). The EPA method employed is listed alongside of the parameter. The results are presented in Table 3.

If you should have any technical questions, please contact the undersigned at (415)964-0844.

Approved by: M. Claire Ferguson
M. Claire Ferguson
Client Services Manager

These results were obtained by following standard laboratory procedures; the liability of Acurex Corporation shall not exceed the amount paid for this report. In no event shall Acurex be liable for special or consequential damages.

Table 1. Volatile Organic Results

Brunsing Assoc. Sample ID

8010 Compounds	MW-6 5.5' ug/kg	Purge Blank ug/kg	Storage Blank ug/L	Spike % Recov	Dup Spike % Recov
Dichlorodifluoromethane	<250	<25	<0.5	NS	NS
Chloromethane	<250	<25	<0.5	NS	NS
Vinyl Chloride	<250	<25	<0.5	20	20
Bromomethane	<250	<25	<0.5	NS	NS
Chloroethane	<250	<25	<0.5	NS	NS
Trichlorofluoromethane	<500	<50	<1.0	NS	NS
1,1-Dichloroethene	<250	<25	<0.5	NS	NS
Methylene Chloride	<250	<25	<0.5	NS	NS
trans-1,2-Dichloroethene	<250	<25	<0.5	70	60
1,1-Dichloroethane	<250	<25	<0.5	NS	NS
cis-1,2-Dichloroethene	<250	<25	<0.5	NS	NS
Chloroform	<250	<25	<0.5	NS	NS
1,1,1-Trichloroethane	<250	<25	<0.5	NS	NS
Carbon Tetrachloride	<250	<25	<0.5	NS	NS
1,2-Dichloroethane	<250	<25	<0.5	NS	NS
Trichloroethene	<250	<25	<0.5	40	50
1,2-Dichloropropane	<250	<25	<0.5	NS	NS
Dibromomethane	<250	<25	<0.5	NS	NS
Bromodichloromethane	<250	<25	<0.5	NS	NS
2-Chloroethylvinyl ether	<250	<25	<0.5	NS	NS
trans-1,3-Dichloropropene	<500	<50	<1.0	NS	NS
1,1,2-Trichloroethane	<500	<50	<1.0	NS	NS
Tetrachloroethene	<250	<25	<0.5	50	30
Dibromochloromethane	<250	<25	<0.5	NS	NS
Chlorobenzene	<250	<25	<0.5	70	70
1-Chlorohexane	<250	<25	<0.5	NS	NS
1,1,1,2-Tetrachloroethane	<250	<25	<0.5	NS	NS
Bromoform	<250	<25	<0.5	NS	NS
Bromobenzene	<250	<25	<0.5	NS	NS
1,1,2,2-Tetrachloroethane	<500	<50	<1.0	NS	NS
1,2,3-Trichloropropane	<500	<50	<1.0	NS	NS
Chlorotoluene	<250	<25	<0.5	NS	NS
1,3-Dichlorobenzene	<250	<25	<0.5	NS	NS
1,4-Dichlorobenzene	<250	<25	<0.5	NS	NS
Benzyl chloride	<500	<50	<1.0	NS	NS
1,2-Dichlorobenzene	<250	<25	<0.5	NS	NS
Date Analyzed:	1/5/90	1/5/90	1/5/90	1/5/90	1/5/90
Surrogate	Percent Recoveries (%)				
Bromochloromethane:	111	30	90	111	111

NS - Not spiked

Table 2. BTEX Results

Brunsing Sample ID

Low Boiling Petroleum Hydrocarbons	MW-6 5.5'	MW-7 5.5'	Method Blank	Storage Blank	Spike
	ug/kg	ug/kg	ug/kg	ug/L	% Recov
Benzene	<500	<5.0	<5.0	<1.0	93.0
Toluene	<500	<5.0	<5.0	1.0	85.6
Ethylbenzene	<500	<5.0	<5.0	<1.0	82.2
Total Xylenes	<500	<5.0	<5.0	<1.0	81.7
	mg/kg	mg/kg	mg/kg	mg/L	% Recov
Gasoline	370	<2.5	<2.5	<0.5	NS
Date Analyzed:	1/10/90	1/10/90	1/9/90	1/9/90	1/9/90

NS - Not spiked

Table 2. BTEX Results (Continued)

Brunsing Sample ID

Low Boiling Petroleum Hydrocarbons	Dup Spike % Recov	Method Blank ug/kg
Benzene	94.0	<5.0
Toluene	83.8	<5.0
Ethylbenzene	82.2	<5.0
Total Xylenes	83.1	<5.0
	% Recov	mg/kg
Gasoline	NS	<2.5
Date Analyzed:	1/9/90	1/10/90

NS - Not spiked

Table 3. Metals Results

Brunsing Assoc. Sample ID

Parameter	EPA Method	MW-6 5.5'	MW-7 5.5'	Spike	Dup Spike	Method Blank
		mg/kg	mg/kg	% Recov	RPD	mg/L
Lead (Org.)		1.5	1.7	74	24	<0.1

Table 3. Metals Results

Parameter	EPA Method	Brunsing Assoc. Sample ID Method Detection Limit mg/kg
Lead (Org.)		1.0

8912-099 052

PROJ. NO.	PROJECT NAME
029.2	PACIFIC SUPPLY CO. OAKLAND
L.P. NO.	SAMPLERS (Signature): Greg Eiché

R3/515

DATE	SAMPLE I.D.	TYPE	NO. OF CONTAINERS	ANALYSIS: TPH (gas) (per EPA 5030)	BTXE (per EPA 8020)	OXYGENATES + LEAD	HOLD	ANALYZE	REMARKS
12/19/89	MW-6 / 3.5'	S	1	X	X	X	X		HOLD UNTIL FURTHER NOTICE
"	MW-6 / 5.5'	S	1	X	X	X		X	ANALYZE IMMEDIATELY
"	MW-7 / 3.5'	S	1	X	X	X	X		HOLD UNTIL FURTHER NOTICE
"	MW-7 / 5.5'	S	1	X	X	X		X	ANALYZE IMMEDIATELY
"	MW-7 / 11.5'	S	1	X	X	X	X		HOLD UNTIL FURTHER NOTICE
"	MW-7 / 16.5'	S	1	X	X	X	X		" " " "
"	MW-6 / 5.0'	S	1	X	X	X	X		" " " "

NOTE: OPEN MW-7, 5.5' W/ CAUTION.

12/20 4PM
Note! Per Mike Velzy: Sample MW-6/5.5' may be analyzed for 8010. Client will decide week of 12/25/89
MCE

12/20 per Greg Eiche of Brunsing, analyze for VOA; EPA 8010 MCE

LABORATORY: ACCUREX

Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Greg Eiché	12/19/89	
Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Mike Velzy	12/20/89	
Relinquished by: (Signature)	Date/Time	Received for Laboratory by: (Signature)
	12/20/89 2pm	Marsha Dapi

Remarks

DETECTION LIMITS
- TPH (gas) = 1.0 mg/kg
- BTXE =

- STANDARD 2-WEEK TAT

ATTN: MIKE VELZY

BRUNSING ASSOCIATES
Consulting Engineers
~~P.O. Box 586, Windsor, CA 95492~~
~~(707) 838-3027~~
1607 INDUSTRIAL WAY, BELMONT
(415) 637-0170

5512-039

PROJ. NO.	PROJECT NAME
029.2	PACIFIC SUPPLY CO. OAKLAND
L.P. NO.	SAMPLERS (Signature): Greg Eiché

R3/515

DATE	SAMPLE I.D.	TYPE	NO. OF CONTAINERS	ANALYSIS: TPH (gasoline) per EPA 8020	BTXE (per EPA 8020)	ORGANIC LEAD	HOLD	ANALYZE	REMARKS
12/19/89	MW-6 / 3.5'	S	1	X	X	X	X		HOLD UNTIL FURTHER NOTICE
"	MW-6 / 5.5'	S	1	X	X	X		X	ANALYZE IMMEDIATELY
"	MW-7 / 3.5'	S	1	X	X	X	X		HOLD UNTIL FURTHER NOTICE
"	MW-7 / 5.5'	S	1	X	X	X		X	ANALYZE IMMEDIATELY
"	MW-7 / 11.5'	S	1	X	X	X	X		HOLD UNTIL FURTHER NOTICE
"	MW-7 / 16.5'	S	1	X	X	X	X		" " " "
"	MW-6 / 5.0'	S	1	X	X	X	X		" " " "

NOTE: OPEN MW-7, 5.5' W/ CAUTION.

12/20 4PM

Note! Per Mike Velzy: Sample MW-6/5.5' may be analyzed for 8010. Client will decide week of 12/25/89 MEF

12/22 per Greg Eiche of Brunsing, analyze 601 VOA; EPA 8010 MEF

LABORATORY: ACCUREX

Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Greg Eiché	12/19/89	
Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Mike Velzy	12/19/89	
Relinquished by: (Signature)	Date/Time	Received for Laboratory by: (Signature)
	12/20/89 2pm	Marsha Dyer

Remarks

DETECTION LIMITS

- TPH(gas) = 1.0 mg/kg
- BTXE =
- STANDARD 2-WEEK TAT

BRUNSING ASSOCIATES
Consulting Engineers
~~P.O. Box 586, Windsor, CA 95492~~
~~(707) 838-3027~~
1607 INDUSTRIAL WAY, BELMONT
(415) 637-0170
ATTN: MIKE VELZY

APPENDIX F

1988 LABORATORY REPORTS: SOIL AND GROUNDWATER ANALYSES

BRUNSING ASSOCIATES, INC.

NET NATIONAL ENVIRONMENTAL TESTING, INC.

received
1-9-89

C135

NET Pacific, Inc.
435 Tesconi Circle
Santa Rosa, CA 95401
Tel: (707) 526-7200
Fax: (707) 526-9623

Formerly: ANATEC Labs, Inc.

Greg Eiche
Brunsing & Associates
PO Box 586
Windsor, CA 95492

12-30-88
NET Pacific Log No: 4214B (1-4)
Series No: 421/048
Client Ref: Project # 029

Subject: Revised Analytical Results for Four Soil Samples Identified as "Pacific Supply Co." Received 09-15-88.

Dear Mr. Eiche:

Analysis of the samples referenced above has been completed. This report is written in confirmation of results transmitted verbally on September 30, 1988. Results are presented following this page.

Please feel welcome to contact us should you have questions regarding procedures or results.

Submitted by:

Diane Braithwaite
Project Chemist

Approved by:

Judy Ridley
Project Manager

/ml
Enc: Sample Custody Document

KEY TO ABBREVIATIONS

mg/Kg (ppm)	:	Concentration in units of milligrams of analyte per kilogram of sample, wet-weight basis (parts per million).
mg/L	:	Concentration in units of milligrams of analyte per liter of sample, unless noted otherwise.
mL/L/hr	:	Milliliters per liter per hour.
MPN/100 mL	:	Most probable number of bacteria per one hundred milliliters of sample.
NA	:	Not analyzed; see cover letter for details.
ND	:	Not detected; the analyte concentration is less than the listed reporting limit.
NR	:	Not requested.
NTU	:	Nephelometric turbidity units.
RL	:	Reporting limit.
RPD	:	Relative percent deviation.
SNA	:	Standard not available.
ug/Kg (ppb)	:	Concentration in units of micrograms of analyte per kilogram of sample, wet-weight basis (parts per billion).
ug/L	:	Concentration in units of micrograms of analyte per liter of sample.
ug/filter	:	Concentration in units of micrograms of analyte per filter.
umhos/cm	:	Micromhos per centimeter.
*	:	See cover letter for details.

Parameter	Reporting Limit (mg/Kg)	MW-2 7.5-8ft 09-13-88 (15362)	MW-3 8-8.5ft 09-13-88 (15363)	MW-3 7.5-8ft 09-13-88 (15364)	MW-1 8-8.5ft 09-13-88 (15365)
		Descriptor, Lab No. & Results (mg/Kg)			
PETROLEUM HYDROCARBONS					
Volatile, as gasoline	10	1,400[a]	3,700[a]	1,300[a]	26

Parameter	Reporting Limit (ug/Kg)	MW-2 7.5-8ft 09-13-88 (15362)	MW-3 8-8.5ft 09-13-88 (15363)	MW-3 7.5-8ft 09-13-88 (15364)	MW-1 8-8.5ft 09-13-88 (15365)
		Descriptor, Lab No. & Results (ug/Kg)			
PURGEABLE AROMATICS (8020)					
Benzene	2.5	990	2,400	530	ND[b]
Toluene	2.5	700	8,900	5,900	220
Xylenes, total	3.0	1,100	12,000	22,000	850

[a]The reporting limit for this sample is 10 times the listed reporting limit.
[b]The reporting limit for this sample is 40 times the listed reporting limit.

NATIONAL ENVIRONMENTAL TESTING, INC.

received 10-31-88

0109

NET Pacific, Inc.
435 Tesconi Circle
Santa Rosa, CA 95401
Tel: (707) 526-7200
Fax: (707) 526-9623

Formerly: ANATEC Labs, Inc.

Greg Eiche
Brunsing & Associates
PO Box 586
Windsor, CA 95492

10-27-88
NET Pacific Log No: 4517 (1-7)
Series No: 421/052
Client Ref: Project# 029

Subject: Analytical Results for Seven Water Samples Identified as "Pacific Supply" Received 10-14-88.

Dear Mr. Eiche:

Analysis of the samples referenced above has been completed. This report is written in confirmation of results transmitted verbally on October 27, 1988. Results are presented on the following pages.

Samples were delivered to the laboratory under documented chain-of-custody. On receipt, sample custody was transferred to NET Pacific sample control personnel who subsequently documented receipt and condition of the samples and placed them in secured storage at 4°C until analysis commenced.

In preparation for volatile hydrocarbons measurements, aliquots of samples were pipetted into septum-capped vials and sealed. Additionally, vials were prepared in essentially the same fashion to represent method blanks, commercial gasoline standards, gasoline-fortified sample spikes and sample replicates. Each vial was heated for a period of one hour at 90°C during which time light hydrocarbons (such as gasoline) were expected to equilibrate in distribution between sample and headspace. Headspace gases were subsequently analyzed by gas chromatography to measure total light hydrocarbons. Response of the chromatographic system to samples was compared with response to standards prepared with gasoline, and from reagent grade volatile aromatics for purposes of qualitative and quantitative interpretation.

Details of the analytical methodologies are consistent with requirements specified in Methods "I" ("Total Fuel Hydrocarbons, Low-to-Medium Boiling Point Hydrocarbons") "Guidelines for Addressing Fuel Leaks," Regional Water Quality Control Board, San Francisco Bay Region, revised 1986; the preparation procedures used are described in detail in "Headspace Method," Method 5020 for volatile hydrocarbons, and in "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," U.S. EPA, SW-846, 3rd edition, revised 1986.

The samples were analyzed to measure purgeable aromatic compounds in accord with Method 602, "Purgeable Aromatics" in "Guidelines Establishing Test Procedures for the Analysis of Pollutants Under the Clean Water Act," U.S. EPA, 40 CFR 136, 1984. Briefly, the method involved the sparging of a 5-milliliter portion of sample with reagent helium in a closed system. Volatile compounds purged from the sample were swept onto a solid sorbent "trap" from which they were subsequently desorbed and passed onto the analytical column of a gas chromatograph; column effluent was monitored by a Hall electrolytic conductivity detector (halocarbons) and a photoionization detector (aromatics). Response of the chromatographic system to the sample was compared with responses generated by analysis of analytical grade standards for purposes of qualitative and quantitative interpretation.

Please feel welcome to contact us should you have questions regarding procedures or results.

Submitted by:

Kenneth A Crawford FOR
Kim Hansard
Project Chemist

Approved by:

Judy Ridley
Judy Ridley
Project Manager

/sm
Enc: Sample Custody Document

		Descriptor, Lab No. and Results (mg/L)				
		MW-1 10-14-88 1441	MW-2 10-14-88 1545	MW-3 10-14-88 1351	MW-4 10-14-88 1245	MW-5 10-14-88 1158
Parameter	Reporting Limit (mg/L)	(-16951)	(-16952)	(-16953)	(-16954)	(-16955)
PETROLEUM HYDROCARBONS						
Volatile, as Gasoline	0.05	1.1	11	3.4	4.6	3.2

		Descriptor, Lab No. and Results (ug/L)				
		MW-1 10-14-88 1441	MW-2 10-14-88 1545	MW-3 10-14-88 1351	MW-4 10-14-88 1245	MW-5 10-14-88 1158
Parameter	Reporting Limit (ug/L)	(-16951)	(-16952)	(-16953)	(-16954)	(-16955)
PURGEABLE AROMATICS (602)						
Benzene	0.5	1.1	23	ND	1.2	ND
Toluene	0.5	ND	20	ND	ND	ND
Xylenes, total	0.6	ND	16	2.8	2.2	ND

Parameter	Reporting Limit (mg/L)	Descriptor, Lab No. and Results (mg/L) MW-6 10-14-88 1330 (-16956)	Field Blank 10-14-88 1410 (-16957)
PETROLEUM HYDROCARBONS			
Volatile, as Gasoline	0.05	5.3	ND

Parameter	Reporting Limit (ug/L)	Descriptor, Lab No. and Results (ug/L) MW-6 10-14-88 1330 (-16956)	Field Blank 10-14-88 1410 (-16957)
PURGEABLE AROMATICS (602)			
Benzene	0.5	1.2	ND
Toluene	0.5	ND	ND
Xylenes, total	0.6	2.2	ND

Log# 4517

№ 046

PROJ. NO.	PROJECT NAME
029	PACIFIC SUPPLY
L.P. NO.	SAMPLERS: (Signature)
	Dave Rutherford

DATE	SAMPLE I.D.	TYPE	NO. OF CONTAINERS	ANALYSIS: TPH - low boiler (DHS Procedure)	BTEX (602/8020)	REMARKS
10/1-4/88	MW-1 6 samples 1441	W		X	X	
"	MW-2 6 samples 1545	W		X	X	
"	MW-3 6 samples 1351	W		X	X	
"	MW-4 6 samples 1245	W		X	X	
"	MW-5 6 samples 1158	W		X	X	
"	MW-6 6 samples 1330	W		X	X	
"	Field Blank 6 samples 1400	W		X	X	

LABORATORY: ANATECH

Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Dave Rutherford	10/7/88 1800	
Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Relinquished by: (Signature)	Date/Time	Received for Laboratory by: (Signature)
		K Temple

Remarks

- 2 WEEK TAT

BRUNSING ASSOCIATES
Consulting Engineers
P. O. Box 586, Windsor, CA 95492
(707) 838-3027

APPENDIX F

1988 LABORATORY REPORTS: SOIL AND GROUNDWATER ANALYSES

1989

1 Soil sample mw 6 at 5.5'

8010 ND

TPH(g) 370 ppm

~~[redacted]~~ soil data for mw 7

TPH(g) < 2.5

	Soil	water
mw 2	1,400	
mw 3	3700, 1300	

NATIONAL ENVIRONMENTAL TESTING, INC.

NET Pacific, Inc.
435 Tesconi Circle
Santa Rosa, CA 95401
Tel: (707) 526-7200
Fax: (707) 526-9623

Formerly: ANATEC Labs, Inc.

received
1-5-89

C135

Greg Eiche
Brunsing & Associates
PO Box 586
Windsor, CA 95492

12-30-88
NET Pacific Log No: 4214B (1-4)
Series No: 421/048
Client Ref: Project # 029

Subject: Revised Analytical Results for Four Soil Samples Identified as "Pacific Supply Co." Received 09-15-88.

Dear Mr. Eiche:

Analysis of the samples referenced above has been completed. This report is written in confirmation of results transmitted verbally on September 30, 1988. Results are presented following this page.

Please feel welcome to contact us should you have questions regarding procedures or results.

Submitted by:

Diane Braithwaite
Project Chemist

Approved by:

Judy Ridley
Project Manager

/ml
Enc: Sample Custody Document

KEY TO ABBREVIATIONS

mg/Kg (ppm)	:	Concentration in units of milligrams of analyte per kilogram of sample, wet-weight basis (parts per million).
mg/L	:	Concentration in units of milligrams of analyte per liter of sample, unless noted otherwise.
mL/L/hr	:	Milliliters per liter per hour.
MPN/100 mL	:	Most probable number of bacteria per one hundred milliliters of sample.
NA	:	Not analyzed; see cover letter for details.
ND	:	Not detected; the analyte concentration is less than the listed reporting limit.
NR	:	Not requested.
NTU	:	Nephelometric turbidity units.
RL	:	Reporting limit.
RPD	:	Relative percent deviation.
SNA	:	Standard not available.
µg/Kg (ppb)	:	Concentration in units of micrograms of analyte per kilogram of sample, wet-weight basis (parts per billion).
µg/L	:	Concentration in units of micrograms of analyte per liter of sample.
µg/filter	:	Concentration in units of micrograms of analyte per filter.
µmhos/cm	:	Micromhos per centimeter.
	:	See cover letter for details.

KEY TO ABBREVIATIONS

mg/Kg (ppm)	:	Concentration in units of milligrams of analyte per kilogram of sample, wet-weight basis (parts per million).
mg/L	:	Concentration in units of milligrams of analyte per liter of sample, unless noted otherwise.
mL/L/hr	:	Milliliters per liter per hour.
MPN/100 mL	:	Most probable number of bacteria per one hundred milliliters of sample.
NA	:	Not analyzed; see cover letter for details.
ND	:	Not detected; the analyte concentration is less than the listed reporting limit.
NR	:	Not requested.
NTU	:	Nephelometric turbidity units.
RL	:	Reporting limit.
RPD	:	Relative percent deviation.
SNA	:	Standard not available.
ug/Kg (ppb)	:	Concentration in units of micrograms of analyte per kilogram of sample, wet-weight basis (parts per billion).
ug/L	:	Concentration in units of micrograms of analyte per liter of sample.
ug/filter	:	Concentration in units of micrograms of analyte per filter.
umhos/cm	:	Micromhos per centimeter.
*	:	See cover letter for details.

Parameter	Reporting Limit (mg/Kg)	Descriptor, Lab No. & Results (mg/Kg) MW-2 7.5-8ft 09-13-88 (15362)	MW-3 8-8.5ft 09-13-88 (15363)	MW-3 7.5-8ft 09-13-88 (15364)	MW-1 8-8.5ft 09-13-88 (15365)
PETROLEUM HYDROCARBONS					
Volatile, as gasoline	10	1,400[a]	3,700[a]	1,300[a]	26

Parameter	Reporting Limit (ug/Kg)	Descriptor, Lab No. & Results (ug/Kg) MW-2 7.5-8ft 09-13-88 (15362)	MW-3 8-8.5ft 09-13-88 (15363)	MW-3 7.5-8ft 09-13-88 (15364)	MW-1 8-8.5ft 09-13-88 (15365)
PURGEABLE AROMATICS (8020)					
Benzene	2.5	990	2,400	530	ND[b]
Toluene	2.5	700	8,900	5,900	220
Xylenes, total	3.0	1,100	12,000	22,000	850

[a] The reporting limit for this sample is 10 times the listed reporting limit.
[b] The reporting limit for this sample is 40 times the listed reporting limit.

NATIONAL ENVIRONMENTAL TESTING, INC.

NET Pacific, Inc.
43 Desconi Circle
Santa Rosa, CA 95401
Tel: (707) 526-7200
Fax: (707) 526-9623

received 10-31-88

C109

Formerly: ANATEC Labs, Inc.

Greg Eiche
Brunsing & Associates
PO Box 586
Windsor, CA 95492

10-27-88
NET Pacific Log No: 4517 (1-7)
Series No: 421/052
Client Ref: Project# 029

Subject: Analytical Results for Seven Water Samples Identified as "Pacific Supply" Received 10-14-88.

Dear Mr. Eiche:

Analysis of the samples referenced above has been completed. This report is written in confirmation of results transmitted verbally on October 27, 1988. Results are presented on the following pages.

Samples were delivered to the laboratory under documented chain-of-custody. On receipt, sample custody was transferred to NET Pacific sample control personnel who subsequently documented receipt and condition of the samples and placed them in secured storage at 4°C until analysis commenced.

In preparation for volatile hydrocarbons measurements, aliquots of samples were pipetted into septum-capped vials and sealed. Additionally, vials were prepared in essentially the same fashion to represent method blanks, commercial gasoline standards, gasoline-fortified sample spikes and sample replicates. Each vial was heated for a period of one hour at 90°C during which time light hydrocarbons (such as gasoline) were expected to equilibrate in distribution between sample and headspace. Headspace gases were subsequently analyzed by gas chromatography to measure total light hydrocarbons. Response of the chromatographic system to samples was compared with response to standards prepared with gasoline, and from reagent grade volatile aromatics for purposes of qualitative and quantitative interpretation.

Details of the analytical methodologies are consistent with requirements specified in Methods "I" ("Total Fuel Hydrocarbons, Low-to-Medium Boiling Point Hydrocarbons") "Guidelines for Addressing Fuel Leaks," Regional Water Quality Control Board, San Francisco Bay Region, revised 1986; the preparation procedures used are described in detail in "Headspace Method," Method 5020 for volatile hydrocarbons, and in "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," U.S. EPA, SW-846, 3rd edition, revised 1986.

The samples were analyzed to measure purgeable aromatic compounds in accord with Method 602, "Purgeable Aromatics" in "Guidelines Establishing Test Procedures for the Analysis of Pollutants Under the Clean Water Act," U.S. EPA, 40 CFR 136, 1984. Briefly, the method involved the sparging of a 5-milliliter portion of sample with reagent helium in a closed system. Volatile compounds purged from the sample were swept onto a solid sorbent "trap" from which they were subsequently desorbed and passed onto the analytical column of a gas chromatograph; column effluent was monitored by a Hall electrolytic conductivity detector (halocarbons) and a photoionization detector (aromatics). Response of the chromatographic system to the sample was compared with responses generated by analysis of analytical grade standards for purposes of qualitative and quantitative interpretation.

Please feel welcome to contact us should you have questions regarding procedures or results.

Submitted by:

Kenneth A Crawford FOR
Kim Hansard
Project Chemist

Approved by:

Judy Ridley
Judy Ridley
Project Manager

/sm
Enc: Sample Custody Document

Parameter	Reporting Limit (mg/L)	Descriptor, Lab No. and Results (mg/L) MW-1 10-14-88 1441 (-16951)	MW-2 10-14-88 1545 (-16952)	MW-3 10-14-88 1351 (-16953)	MW-4 10-14-88 1245 (-16954)	MW-5 10-14-88 1158 (-16955)
PETROLELM HYDROCARBONS Volatile, as Gasoline	0.05	1.1	11	3.4	4.6	3.2

Parameter	Reporting Limit (ug/L)	Descriptor, Lab No. and Results (ug/L) MW-1 10-14-88 1441 (-16951)	MW-2 10-14-88 1545 (-16952)	MW-3 10-14-88 1351 (-16953)	MW-4 10-14-88 1245 (-16954)	MW-5 10-14-88 1158 (-16955)
PURGEABLE AROMATICS (602)						
Benzene	0.5	1.1	23	ND	1.2	ND
Toluene	0.5	ND	20	ND	ND	ND
Xylenes, total	0.6	ND	16	2.8	2.2	ND

Parameter	Reporting Limit (mg/L)	Descriptor, Lab No. and Results (mg/L) MW-6 10-14-88 1330 (-16956)	Field Blank 10-14-88 1410 (-16957)
PETROLELM HYDROCARBONS Volatile, as Gasoline	0.05	5.3	ND

Parameter	Reporting Limit (ug/L)	Descriptor, Lab No. and Results (ug/L) MW-6 10-14-88 1330 (-16956)	Field Blank 10-14-88 1410 (-16957)
PURGEABLE AROMATICS (602)			
Benzene	0.5	1.2	ND
Toluene	0.5	ND	ND
Xylenes, total	0.6	2.2	ND

Log # 1947

PROJ. NO.	PROJECT NAME
029	PACIFIC SUPPLY
L.P. NO.	SAMPLERS: (Signature)
	D Hurd Rothwell

DATE	SAMPLE I.D.	TYPE	NO. OF CONTAINERS	ANALYSIS: TPH - low boiler (DHS Rpt)	BTEX (602/8020)	REMARKS
12/1/88	MW-1 6 Samples 1441	W		X	X	
"	MW-2 6 SAmples 1545	W		X	X	
"	MW-3 6 SAMPLES 1351	W		X	X	
"	MW-4 6 SAmples 1245	W		X	X	
"	MW-5 6 samples 1158	W		X	X	
"	MW-6 6 SAmples 1330	W		X	X	
"	Field Blank 6 samples 1400	W		X	X	

LABORATORY: ANATECH

Relinquished by: (Signature)	Date/Time	Received by: (Signature)
D Hurd Rothwell	12/1/88 1800	
Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Relinquished by: (Signature)	Date/Time	Received for Laboratory by: (Signature)
		K Temple

Remarks
• 2 WEEK TAT

BRUNSING ASSOCIATES
Consulting Engineers
P. O. Box 586, Windsor, CA 95492
(707) 838-3027

APPENDIX G

1987 LABORATORY REPORTS: SOIL AND VAPOR ANALYSES

027

FILE COPY

CHIPS
Environmental
Consultants

718 E. Evelyn Avenue
Sunnyvale, CA 94086

(408)736-1380

\JN

5-12-87 JF36-B:PacSup.SSE 280

Service Station Equipment Company
562 St. Mary Drive
Santa Rosa, CA 95405

ATTENTION: Chuck Bear

SUBJECT: Field sampling and analysis at Pacific Supply Co.
1735 24th street, Oakland, CA on 5-11-87

Dear Mr. Bear:

Enclosed are the results for the analysis of vapor and soil samples taken from exploratory holes at the subject facility on 5-11-87. This site presented one 1000 gallon gasoline tank.

The attached plot plan shows the approximate location of the tank in respect to the facility.

Steel pipe was driven into the soil to obtain vapor samples. The bottom 12 inches of the pipe was perforated so that soil gas could be obtained at that level. A 5 liter per minute diaphram pump was used to purge the pipe. The vapor sample was obtained at the top pipe fitting using a 5 ml gas-tight syringe through a teflon faced silicone septa. The soil gas vapor samples were analyzed on a Hewlett-Packard 5890A Gas Chromatograph equipped with an FID. The column was 6' glass w/10% OV-101 on Chromasorb AW. Analysis was performed isothermally at 200 deg. C.

Soil sample cores were taken from V-3 and V-5 at 7 feet depth with 1/2 inch pipe legnths. These samples were analyzed back at the laboratory by headspace protocol. All standards were prepared with gasoline in air and soil.

The results are presented on page three of this report.

If you have any questions or if we can be of further assistance, please feel free to contact us at your convenience.

Sincerely,

Mark Chips

CHIPS
Environmental
Consultants

718 E. Evelyn Avenue
Sunnyvale, CA 94086

(408)736-1380

5-12-87 JF36-B:PacSup.SSE 28(

Client: Service Station Equipment Co.

Project No: Pacific Supply Co. 1735 24th st.
Oakland, California

Comments: Sampled 5-11-87

ANALYSIS: Soil and Vapor Analysis for Gasoline

Sample #		Result PPM mole/mole
V-1	Vapor	3700 +/- 400 PPM as Gasoline
V-2	Vapor	2200 +/- 250 PPM as Gasoline
V-3	Vapor	2500 +/- 270 PPM as Gasoline
V-3	Soil 7 feet deep	160 +/- 16 PPM as Gasoline
		2.2 +/- 0.2 PPM Benzene
		4.0 +/- 0.4 PPM Toluene
		12 +/- 1 PPM Xylenes
V-4	Vapor	1800 +/- 200 PPM as Gasoline
V-5	Vapor	2300 +/- 260 PPM as Gasoline

435 Tesconi Circle, Santa Rosa, CA 95401

CHAIN OF CUSTODY RECORD

PROJ. NO. Service Station Equip

PROJECT NAME Pacific Supply 24th St & Wood Oakland

SAMPLERS: (Signature) Kim Hansard

STA. NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CONTAINERS	HSHC (gasoline)						REMARKS
	4/28/87	12:45		X	Pacific Supply	1	X						Pipe ASAP T.A.

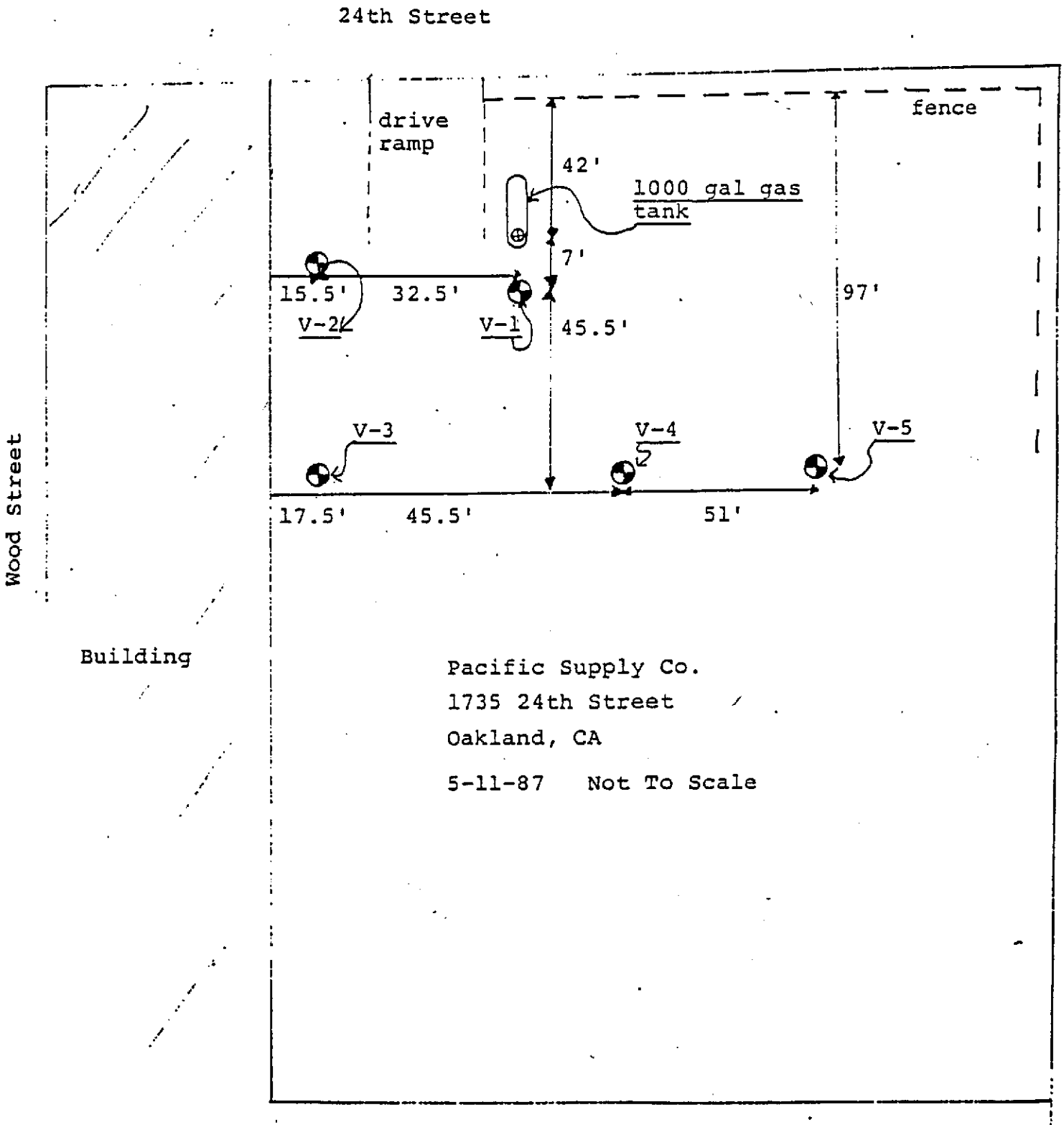
Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Kim Hansard	4/28/87 3:10				
Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Relinquished by: (Signature)	Date / Time	Received for Laboratory by: (Signature)	Date / Time	Remarks	
		Judy Ridley	4/28/87 1510	9182	

CHIPS
Environmental
Consultants

718 E. Evelyn Avenue
Sunnyvale, CA 94086

(408)736-1380

V-5	Soil 7 feet deep . 125 " deep (Fill pipe end)	7.7 +/- 1 PPM as Gasoline
		0.41 +/- 0.04 PPM Benzene
		0.25 +/- 0.03 PPM Toluene
		0.81 +/- 0.1 PPM Xylenes


24th Street
drive ramp
fence
42'
1000 gal gas tank
7'
15.5'
32.5'
V-2
V-1
45.5'
97'
V-3
V-4
V-5
17.5'
45.5'
51'
Wood Street
Building
Pacific Supply Co.
1735 24th Street
Oakland, CA
5-11-87 Not To Scale

ANATEC LABORATORIES INC.

435 Tesconi Circle • Santa Rosa, California 95401 • 707-526-7200

Mr. Chuck Baer
Service Station Equipment
562 St. Mary Drive
Santa Rosa, CA 95405

May 8, 1987
ANATEC Log No: 9182 (-1a,b)
Series No: 383/006
Client Ref: (V) C. Baer

Subject: ASAP Priority Analysis of Two Portions of One Soil Sample Collected at Pacific Supply, 24th St & Wood, Oakland on April 28, 1987

Dear Mr. Baer:

Collection and analysis of the sample referenced above has been completed. This report is written to confirm results transmitted verbally on April 29, 1987. The sample was collected by ANATEC field personnel from a single boring driven through a concrete slab to an 8-foot, 4-inch depth (location of tank bottom) between 11:45 and 1:00 pm, April 28, 1987. The sample was collected in an 11-inch length of steel pipe which had previously been thoroughly cleaned with trisodium phosphate solution and deionized water.

Following collection the sample was immediately sealed with aluminum foil and placed under refrigeration for transport to the laboratory. Collection and delivery to the laboratory were conducted under documented chain-of-custody.

On receipt at the laboratory, sample custody was transferred to ANATEC sample control personnel who subsequently documented receipt and condition of the sample and placed it in secured storage at 4°C until analysis commenced.

In preparation for volatile hydrocarbons measurements, two aliquots of sample were taken from the core ends with stainless steel implements, immediately weighed, and sealed in septum-capped vials. These aliquots were representative of 7-foot, 9-inch and 8-foot, 4-inch depths, respectively. Additionally, vials were prepared in essentially the same fashion to represent method blanks, commercial gasoline standards, gasoline-fortified sample spikes and sample replicates. Each vial was heated for a period of one hour at 90°C during which time light hydrocarbons (such as gasoline) were expected to equilibrate in distribution between sample and headspace. Headspace gases were subsequently analyzed by gas chromatography to measure total light hydrocarbons. Response of the chromatographic system to samples was compared with response to standards prepared with commercial gasoline.

Details of the analytical methodology are consistent with requirements specified in "Guidelines for Addressing Fuel Leaks," Regional Water Quality Control Board, San Francisco Bay Region, revised 1986; the preparation procedure used is described in detail in "Headspace Method," Method 5020 in "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," U.S. EPA, SW-846, 2nd edition, revised 1984.

Results of analyses are summarized in Table 1. Attached is the chain-of-custody form and site diagram. Please feel welcome to contact us should you have questions regarding procedures or results.

Submitted by:

Kim E. Hansard
Project Chemist

Approved by:

Greg Anderson, Director
Analytical Laboratories

Enc: Custody Record
Site Diagram

TABLE 1. SUMMARIZED RESULTS FOR "24TH ST & WOOD, OAKLAND" SOIL SAMPLES (mg/Kg)[a]

ANATEC Lab No.	Client Descriptor	Headpace Hydrocarbons, as gasoline
9167-1	WEST END, 4/23/87, 1100	1,000
9167-2	EAST END, 4/23/87, 1130	<10

[a]mg/Kg--Data are expressed as milligrams gasoline per kilogram sample, as-received basis.

ANATEC LABORATORIES INC.

435 Tesconi Circle • Santa Rosa, California 95401 • 707-526-7200

Chuck Baer
Service Station Equipment
562 St. Mary Dr.
Santa Rosa, CA 95405

May 4, 1987
ANATEC Log No: 9167 (-1,2)
Series No: 383/004
Client Ref: (V) C. Baer

Subject: ASAP Priority Collection and Analysis of Two Soil Samples Identified as "24th St and Wood, Oakland" Received April 23, 1987.

Dear Mr. Baer:

Collection and analysis of the samples referenced above have been completed. This report is written to confirm results transmitted verbally on April 24, 1987. The samples were collected by an ANATEC field chemist from two borings at 10-foot depths between 9:50 a.m. and 12:00 noon. The samples were collected in cores which had previously been thoroughly cleaned with trisodium phosphate solution and deionized water.

Following collection the samples were immediately sealed with foil and tape and placed under refrigeration for transport to the laboratory. Collection and delivery to the laboratory were conducted under documented chain-of-custody.

On receipt at the laboratory, sample custody was transferred to ANATEC sample control personnel who subsequently documented receipt and condition of the samples and placed them in secured storage at 4°C until analysis commenced.

In preparation for volatile hydrocarbons measurements, aliquots of samples were taken from the core centers with stainless steel implements, immediately weighed, and sealed in septum-capped vials. Additionally, vials were prepared in essentially the same fashion to represent method blanks, commercial gasoline standards, gasoline-fortified sample spikes and sample replicates. Each vial was heated for a period of one hour at 90°C during which time light hydrocarbons (such as gasoline) were expected to equilibrate in distribution between sample and headspace. Headspace gases were subsequently analyzed by gas chromatography to measure total light hydrocarbons. Response of the chromatographic system to samples was compared with response to standards prepared with commercial gasoline.

Details of the analytical methodology are consistent with requirements specified in "Guidelines for Addressing Fuel Leaks," Regional Water Quality Control Board, San Francisco Bay Region, revised 1986; the preparation procedure used is described in detail in "Headspace Method," Method 5020 in "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," U.S. EPA, SW-846, 2nd edition, revised 1984.

Results of analyses are summarized in Table 1. Attached is the chain-of-custody form and site diagram. Please feel welcome to contact us should you have questions regarding procedures or results.

Submitted by:

Kim L. Hansard
Project Chemist

Approved by:

Greg Anderson, Director
Analytical Laboratories

Enc: Custody Record
Site Diagram

TABLE 1. SUMMARIZED RESULTS FOR "24TH ST & WOOD, OAKLAND" SOIL SAMPLES (mg/Kg)[a]

ANATEC Lab No.	Client Descriptor	Headpace Hydrocarbons, as gasoline
9167-1	WEST END, 4/23/87, 1100	1,000
9167-2	EAST END, 4/23/87, 1130	<10

[a]mg/Kg--Data are expressed as milligrams gasoline per kilogram sample, as-received basis.

ANATEC LABORATORIES INC.

435 Tesconi Circle • Santa Rosa, California 95401 • 707-526-7200

Mr. Chuck Baer
Service Station Equipment
562 St. Mary Drive
Santa Rosa, CA 95405

May 8, 1987
ANATEC Log No: 9182 (-1a,b)
Series No: 383/006
Client Ref: (V) C. Baer

Subject: ASAP Priority Analysis of Two Portions of One Soil Sample Collected at Pacific Supply, 24th St & Wood, Oakland on April 28, 1987

Dear Mr. Baer:

Collection and analysis of the sample referenced above has been completed. This report is written to confirm results transmitted verbally on April 29, 1987. The sample was collected by ANATEC field personnel from a single boring driven through a concrete slab to an 8-foot, 4-inch depth (location of tank bottom) between 11:45 and 1:00 pm, April 28, 1987. The sample was collected in an 11-inch length of steel pipe which had previously been thoroughly cleaned with trisodium phosphate solution and deionized water.

Following collection the sample was immediately sealed with aluminum foil and placed under refrigeration for transport to the laboratory. Collection and delivery to the laboratory were conducted under documented chain-of-custody.

On receipt at the laboratory, sample custody was transferred to ANATEC sample control personnel who subsequently documented receipt and condition of the sample and placed it in secured storage at 4°C until analysis commenced.

In preparation for volatile hydrocarbons measurements, two aliquots of sample were taken from the core ends with stainless steel implements, immediately weighed, and sealed in septum-capped vials. These aliquots were representative of 7-foot, 9-inch and 8-foot, 4-inch depths, respectively. Additionally, vials were prepared in essentially the same fashion to represent method blanks, commercial gasoline standards, gasoline-fortified sample spikes and sample replicates. Each vial was heated for a period of one hour at 90°C during which time light hydrocarbons (such as gasoline) were expected to equilibrate in distribution between sample and headspace. Headspace gases were subsequently analyzed by gas chromatography to measure total light hydrocarbons. Response of the chromatographic system to samples was compared with response to standards prepared with commercial gasoline.

Details of the analytical methodology are consistent with requirements specified in "Guidelines for Addressing Fuel Leaks," Regional Water Quality Control Board, San Francisco Bay Region, revised 1986; the preparation procedures used are described in detail in "Headspace Method," Method 5020 in "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," U.S. EPA, SW-846, 2nd edition, revised 1984.

Results of analyses are summarized in Table 1. Attached are the sample custody document and site diagram. Please feel welcome to contact us should you have questions regarding procedures or results.

Submitted by:

Kim L. Hansard
Project Chemist

Approved by:

Greg Anderson, Director
Analytical Laboratories

Enc: Custody Record
Site Diagram

TABLE 1. SUMMARIZED TESTING RESULTS FOR PACIFIC SUPPLY, 24TH ST. & WOOD, OAKLAND, APRIL 28, 1987

ANATEC Lab No.	Descriptor	Headspace Hydrocarbons, as Gasoline (mg/Kg)[a]
9182-1a	7'9", 1245, 4/28/87	1,400
9182-1b	8'4", 1245, 4/28/87	2,000

[a]mg/Kg--Data are expressed in units of milligrams gasoline per kilogram sample, as-received basis.

[redacted] INC.

35 Tesconi Circle, Santa Rosa, CA 95401

CHAIN OF CUSTODY RECORD

PROJ. NO.

PROJECT NAME: Service Stat. Equip. @ 24th St + Wood, Oakland

SAMPLERS: (Signature) Kim Hansard

STA. NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CONTAINERS	1 HR TPH (gasoline)						REMARKS
1	4/23	11:00		X	West End	1	X						No Odor Pipe ASAP T.A.
2	↓	11:30		X	East End	1	X						

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Kim Hansard	4/23/87 5:15				
Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Relinquished by: (Signature)	Date / Time	Received for Laboratory by: (Signature)	Date / Time	Remarks	
		Judy Ridley	4/23/87 1715	9167	

MID-PACIFIC ENVIRONMENTAL LABORATORY

formerly Acurex Lab

Brunsing Associates
1607 Industrial Way
Belmont, CA 94002

January 31, 1990
Acurex ID: 9001082
Client PO: 029.2

Attention: Michael Velzy

Subject: Analysis of 7 Soil Samples, Received 1/17/90.

Soil samples were analyzed for higher boiling petroleum hydrocarbons using guidelines established in the Regional Water Quality Control Board (RWQCB) Leaking Underground Fuel Tank (LUFT) manual. This method is also known as the modified 8015 protocol. Results are summarized in Table 1. The method can be summarized as follows:

> Higher boiling petroleum hydrocarbons such as diesel, kerosene and motor oil are extracted into organic solvent and analyzed using a gas chromatograph equipped with an FID.

If you should have any technical questions, please contact the undersigned at (415)964-0844.

Approved by: M. Claire Ferguson
M. Claire Ferguson
Client Services Manager

These results were obtained by following standard laboratory procedures; the liability of Acurex Corporation shall not exceed the amount paid for this report. In no event shall Acurex be liable for special or consequential damages.

Table 1. Petroleum Hydrocarbon Results

	Brunsing Sample ID				
8015 Compounds	MW-7 5.5' mg/kg	Method Blank mg/kg	Method Spike % Recov	Matrix Spike % Recov	Dup Matrix Spike % Recov
Diesel	<1.0	<1.0	83	76	66
Kerosene	<1.0	<1.0	NS	NS	NS
Motor Oil	160	<10.0	NS	NS	NS
Date Extracted:	1/23/90	1/23/90	1/23/90	1/23/90	1/23/90
Date Analyzed:	1/26/90	1/25/90	1/25/90	1/25/90	1/25/90

NS - Not spiked

8512-099 ,1002

R3/515

PROJ. NO.	PROJECT NAME	NO. OF CONTAINERS	ANALYSIS: TPH (gasoline) per CA DHS; BTXE (per EPA 8020 or equiv.); LEAD; HOLD; ANALYZE; TCLP; ADDED VOA/GW	REMARKS
029.2	PACIFIC SUPPLY CO., OAKLAND			
L.P. NO.	SAMPLERS (Signature): Greg Eiché			

DATE	SAMPLE I.D.	TYPE	NO. OF CONTAINERS	TPH (gasoline) per CA DHS	BTXE (per EPA 8020 or equiv.)	LEAD	HOLD	ANALYZE	TCLP	ADDED VOA/GW	REMARKS
12/19/89	MW-6 / 3.5'	S	1	X	X	X		X			HOLD UNTIL FURTHER NOTICE
"	MW-6 / 5.5' INSUFFICIENT	S	1	X	X	X			X		ANALYZE IMMEDIATELY
"	MW-7 / 3.5'	S	1	X	X	X	X				HOLD UNTIL FURTHER NOTICE
"	MW-7 / 5.5'	S	1	X	X	X		X			ANALYZE IMMEDIATELY
"	MW-7 / 11.5'	S	1	X	X	X	X				HOLD UNTIL FURTHER NOTICE
"	MW-7 / 16.5'	S	1	X	X	X	X				" " " "
"	MW-6 / 5.0'	S	1	X	X	X	X				" " " "

1/18/90: Per Mike Velzy Analyze MW-6/5.5' for TEPH, diesel only. Note: MW-6/5.5 gone for TPH, diesel not

Note: Open MW-7, 5.5' N/ Chevron.

12/20 4PM Note! Per Mike Velzy: Sample MW-6/5.5' may be analyzed for BTEX. Client will decide week of 12/25/89 MCE

1/2/90: As per Mike Velzy Please add B270 to the analysis on Sample MW-6/5.5' MCE

12/28 per Greg Eiché if Brunsing, analyze for VOA; EPA 8010 MCE

LABORATORY: ACCUREX

Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Remarks
Greg Eiché	12/19/89		DETECTION LIMITS
Relinquished by: (Signature)	Date/Time	Received by: (Signature)	• TPH(gas) = 1.0 mg/kg
Mike Velzy	12/19/89	MCE	• BTXE =
Relinquished by: (Signature)	Date/Time	Received for Laboratory by: (Signature)	• STANDARD 2-WEEK TAT
	12/20/89 2pm	Marsha Dodi	

ATTN: MIKE VELZY

BRUNSING ASSOCIATES
Consulting Engineers
~~P.O. Box 586, Windsor, CA 95492~~
~~(707) 838-3027~~

MID-PACIFIC ENVIRONMENTAL LABORATORY

formerly Acurex Lab

NOTIFICATION OF REVISED REPORT

DATE: 1/31/90

ACUREX ID: 8912-116

CLIENT: Brunsing Associates

1. Pages 10 & 13: Tentatively identified compounds added for 624 and 625 analyses

625B Clyde Avenue, Mountain View, CA 94043 (415) 964-0844 FAX:(415) 961-7113

MID-PACIFIC ENVIRONMENTAL LABORATORY

formerly Acurex Lab

Brunsing Associates
1607 Industrial Way
Belmont, CA 94002

January 16, 1990
Acurex ID: 8912116
Project: #029
Proposal: 8910017

Rev. 1/31/90

Attention: Michael Velzy

Subject: Analysis of 7 Water Samples, Received 12/29/89.

Water samples were analyzed for benzene, toluene, ethyl benzene, total xylenes (BTEX) and gasoline according to the guidelines established in the Regional Water Quality Control Board (RWQCB) Leaking Underground Fuel Tank (LUFT) manual. Results are presented in Table 1. The method for BTEX and gasoline can be summarized as follows:

> An aliquot of sample is introduced into a purge and trap using a gas-tight syringe. Helium is bubbled through the water contained in a specially designed purging chamber. Low boiling petroleum hydrocarbons are efficiently transferred from aqueous phase to the vapor phase. After purging is completed, the sorbent column is heated and back-flushed with helium to desorb the purgeables onto a gas chromatographic column. The gas chromatograph is temperature programmed to separate BTEX and other components of gasoline. BTEX is detected using a photo ionization detector (PID) and gasoline is detected using a flame ionization detector (FID). Other petroleum hydrocarbons may be quantified using this technique.

Water samples were analyzed for higher boiling petroleum hydrocarbons using guidelines established in the Regional Water Quality Control Board (RWQCB) Leaking Underground Fuel Tank (LUFT) manual. This method is also known as the modified 8015 protocol. Results are summarized in Table 2. The method can be summarized as follows:

> Higher boiling petroleum hydrocarbons such as diesel, kerosene and motor oil are extracted into organic solvent and analyzed using a gas chromatograph equipped with an FID.

625B Clyde Avenue, Mountain View, CA 94043 (415) 964-0844 FAX:(415) 961-7113

Water samples were analyzed for purgeable organic compounds according to U.S. EPA Method 624 (Federal Register, Volume 49 No. 209, Oct. 26, 1984; Page 141). Results are presented in Table 3. The method can be summarized as follows:

> Helium is bubbled through an aliquot of sample contained in a specially designed purging chamber. The purgeable volatile organic compounds are efficiently transferred from the aqueous phase to the vapor phase. The vapor is swept through a sorbent column where the purgeables are trapped. After purging is completed, the trap is heated and back flushed with helium to desorb the purgeables onto a gas chromatographic column. The gas chromatograph is temperature programmed to separate the purgeables that are then detected with a mass spectrometer.

Identification and quantitation of other volatile compounds are presented in Table 3.

Water samples were analyzed for semivolatile organic compounds according to U.S. EPA Method 625 (Federal Register, Volume 49 No. 209, Oct. 26, 1984; Page 153). Results are presented in Table 5. The method can be summarized as follows:

> A measured volume of water is serially extracted with methylene chloride at pH >11 and again at pH <2. The resulting base/neutral and acid extracts are each concentrated to 1 mL. Just prior to injection into a Gas Chromatograph/Mass Spectrometer (GC/MS), the acid and base/neutral extracts are combined and internal standards are added. The GC/MS is equipped with a fused silica capillary column and is set up for the analysis of semivolatile priority pollutants.

Qualitative identification of the priority pollutants is performed initially using the relative retention times and the relative abundance of three unique ions. The entire mass spectrum is checked before any final identifications are recorded. Quantitative analysis is performed by the internal standard method using a single characteristic ion and response factors obtained from a daily calibration standard. In the tables, an entry such as "<5" means that the compound was not found at a level above the laboratory's reporting limit. The reporting limit, which is based on EPA reporting levels, has been corrected for any sample dilution.

Prior to analysis, every sample is spiked with surrogate compounds as part of Acurex's Quality Control Program. These compounds simulate the behavior of compounds of interest and confirm that acceptable recoveries are being achieved on every sample. The results of surrogate recoveries are reported with the sample results.

Identification and quantitation of other semivolatile compounds is presented in Table 6.

Aqueous samples were analyzed for requested metals using Inductively Coupled Argon Plasma spectroscopy or Atomic Absorption spectrophotometry following Methods for Chemical Analysis of Water and Wastes (EPA 1983). The EPA method employed is listed alongside of the parameter. Samples were digested using EPA Method 3010 and/or 3020 prior to analysis. The results are presented in Table 7.

If you should have any technical questions, please contact the undersigned at (415)964-0844.

Approved by: M. Claire Ferguson
M. Claire Ferguson
Client Services Manager

These results were obtained by following standard laboratory procedures; the liability of Acurex Corporation shall not exceed the amount paid for this report. In no event shall Acurex be liable for special or consequential damages.

Table 1. BTEX Results

Brunsing Assoc. Sample ID

Low Boiling Petroleum Hydrocarbons	MW-1	MW-2	MW-3	MW-4	MW-5
	ug/L	ug/L	ug/L	ug/L	ug/L
Benzene	<0.5	200	<0.5	0.7	<0.5
Toluene	<0.5	6.7	<0.5	<0.5	<0.5
Ethylbenzene	<0.5	<5.0	<0.5	<0.5	<0.5
Total Xylenes	<0.5	<5.0	<0.5	<0.5	<0.5
	mg/L	mg/L	mg/L	mg/L	mg/L
Gasoline	<0.1	4.0	<0.1	0.5	<0.1
Date Analyzed:	1/10/90	1/10/90	1/10/90	1/11/90	1/12/90

Table 1. BTEX Results (Continued)

Brunsing Assoc. Sample ID

Low Boiling Petroleum Hydrocarbons	MW-6	MW-6	MW-7	Purge Blank	Storage Blank
	ug/L	ug/L	ug/L	ug/L	ug/L
Benzene	5.4	**	<0.5	<0.5	<0.5
Toluene	4.5	**	<0.5	<0.5	<0.5
Ethylbenzene	<0.5	**	<0.5	<0.5	<0.5
Total Xylenes	<0.5	**	<0.5	<0.5	<0.5
	mg/L	mg/L	mg/L	mg/L	mg/L
Gasoline	*	1.1	<0.1	<0.1	<0.1
Date Analyzed:	1/11/90	1/11/90	1/11/90	1/10/90	1/10/90

* - Value above calibration range, see diluted data
** - Value below calibration range, see undiluted data

Table 1. BTEX Results (Continued)

Brunsing Assoc. Sample ID

Low Boiling Petroleum Hydrocarbons	Spike	Dup Spike	Purge Blank	Storage Blank	Spike
	% Recov	% Recov	ug/L	ug/L	% Recov
Benzene	101	101	<0.5	<0.5	92
Toluene	91	93	<0.5	<0.5	90
Ethylbenzene	92	92	<0.5	<0.5	90
Total Xylenes	93	94	<0.5	<0.5	95
	% Recov	% Recov	mg/L	mg/L	% Recov
Gasoline	NS	NS	<0.1	<0.1	NS
Date Analyzed:	1/10/90	1/10/90	1/11/90	1/11/90	1/11/90

NS - Not spiked

Table 1. BTEX Results (Continued)

Brunsing Assoc. Sample ID

Low Boiling Petroleum Hydrocarbons	Dup Spike % Recov	Purge Blank ug/L	Storage Blank ug/L	Spike % Recov	Dup Spike % Recov
Benzene	91	<0.5	<0.5	105	103
Toluene	90	<0.5	<0.5	103	104
Ethylbenzene	91	<0.5	<0.5	68	104
Total Xylenes	93	<0.5	<0.5	97	102
	% Recov	mg/L	mg/L	% Recov	% Recov
Gasoline	NS	<0.1	<0.1	NS	NS
Date Analyzed:	1/11/90	1/12/90	1/12/90	1/12/90	1/12/90

NS - Not spiked

Table 2. Petroleum Hydrocarbon Results

Brunsing Assoc. Sample ID

8015 Compounds	MW-6 ug/L	MW-7 ug/L	Method Blank ug/L	Spike % Recov	Dup Spike % Recov
Diesel	<50	<50	<50	50	64
Kerosene	2100	<50	<50	NS	NS
Motor Oil	<500	<500	<500	NS	NS
Date Extracted:	1/2/90	1/2/90	1/2/90	1/2/90	1/2/90
Date Analyzed:	1/3/90	1/3/90	1/3/90	1/3/90	1/3/90

NS - Not spiked

Table 3. Volatile Organic Results

Brunsing Assoc. Sample ID

624 Compounds	MW-6*	Method Blank	Storage Blank	Spike	Dup Spike
	ug/L	ug/L	ug/L	% Recov	% Recov
Chloromethane	<50	<10	<10	NS	NS
Vinyl chloride	<50	<10	<10	NS	NS
Bromomethane	<50	<10	<10	NS	NS
Chloroethane	<50	<10	<10	NS	NS
Trichlorofluoromethane	<25	<5	<5	NS	NS
1,1-Dichloroethene	<25	<5	<5	110	98
Methylene chloride	<25	<5	<5	NS	NS
trans-1,2-Dichloroethene	<25	<5	<5	NS	NS
1,1-Dichloroethane	<25	<5	<5	NS	NS
Chloroform	<25	<5	<5	NS	NS
1,1,1-Trichloroethane	<25	<5	<5	NS	NS
Carbon tetrachloride	<25	<5	<5	NS	NS
Benzene	<25	<5	<5	105	102
1,2-Dichloroethane	<25	<5	<5	NS	NS
Trichloroethene	<25	<5	<5	106	97
1,2-Dichloropropane	<25	<5	<5	NS	NS
Bromodichloromethane	<25	<5	<5	NS	NS
2-Chloroethylvinylether	<50	<10	<10	NS	NS
cis-1,3-Dichloropropene	<25	<5	<5	NS	NS
Toluene	<25	<5	<5	98	97
trans-1,3-Dichloropropene	<25	<5	<5	NS	NS
1,1,2-Trichloroethane	<25	<5	<5	NS	NS
Tetrachloroethene	<25	<5	<5	NS	NS
Dibromochloromethane	<25	<5	<5	NS	NS
Chlorobenzene	<25	<5	<5	110	106
Ethylbenzene	<25	<5	<5	NS	NS
Bromoform	<25	<5	<5	NS	NS
1,1,2,2-Tetrachloroethane	<25	<5	<5	NS	NS
1,3-Dichlorobenzene	<25	<5	<5	NS	NS
1,4-Dichlorobenzene	<25	<5	<5	NS	NS
1,2-Dichlorobenzene	<25	<5	<5	NS	NS
Date Analyzed	1/5/90	1/5/90	1/5/90	1/5/90	1/5/90
Surrogates	Percent Recoveries (%)				
1,2-Dichloroethane-d4	99	101	97	100	101
Toluene-d8	95	93	95	93	97
p-Bromofluorobenzene	96	98	102	99	98

NS - Not spiked

* - Sample was diluted 1:5 because of high levels of substituted benzenes.

Table 5. Semivolatile Organic Results

Brunsing Assoc. Sample ID

625 Compounds	MW-6 ug/L	Method Blank ug/L	Spike % Recov	Dup Spike % Recov
Phenol	<10	<10	74	73
Bis(2-chloroethyl)ether	<10	<10	NS	NS
2-Chlorophenol	<10	<10	77	76
1,3-Dichlorobenzene	<10	<10	NS	NS
1,4-Dichlorobenzene	<10	<10	63	63
1,2-Dichlorobenzene	<10	<10	NS	NS
Bis(2-chloroisopropyl)ether	<10	<10	NS	NS
N-Nitroso-di-n-propylamine	<10	<10	73	73
Hexachloroethane	<10	<10	NS	NS
Nitrobenzene	<10	<10	NS	NS
Isophorone	<10	<10	NS	NS
2-Nitrophenol	<10	<10	NS	NS
2,4-Dimethylphenol	<10	<10	NS	NS
Bis(2-chloroethoxy)methane	<10	<10	NS	NS
2,4-Dichlorophenol	<10	<10	NS	NS
1,2,4-Trichlorobenzene	<10	<10	66	69
Naphthalene	<10	<10	NS	NS
Hexachlorobutadiene	<10	<10	NS	NS
4-Chloro-3-methylphenol	<10	<10	74	75
Hexachlorocyclopentadiene	<10	<10	NS	NS
2,4,6-Trichlorophenol	<10	<10	NS	NS
2-Chloronaphthalene	<10	<10	NS	NS
Dimethyl phthalate	<10	<10	NS	NS
Acenaphthylene	<10	<10	NS	NS
Acenaphthene	<10	<10	72	73
2,4-Dinitrophenol	<50	<50	NS	NS
4-Nitrophenol	<50	<50	59	57
2,4-Dinitrotoluene	<10	<10	68	67
2,6-Dinitrotoluene	<10	<10	NS	NS
Diethyl phthalate	<10	<10	NS	NS
4-Chlorophenyl phenylether	<10	<10	NS	NS
Fluorene	<10	<10	NS	NS
4,6-Dinitro-2-methylphenol	<50	<50	NS	NS
N-Nitrosodiphenylamine	<10	<10	NS	NS
4-Bromophenyl phenylether	<10	<10	NS	NS

NS - Not spiked

Table 5. Semivolatile Organic Results (Continued)

Brunsing Assoc. Sample ID

625 Compounds	MW-6 ug/L	Method Blank ug/L	Spike % Recov	Dup Spike % Recov
Hexachlorobenzene	<10	<10	NS	NS
Pentachlorophenol	<50	<50	67	65
Phenanthrene	<10	<10	NS	NS
Anthracene	<10	<10	NS	NS
Di-n-Butyl phthalate	<10	<10	NS	NS
Fluoranthene	<10	<10	NS	NS
Pyrene	<10	<10	55	49
NS - Not spiked				
Date Analyzed	1/9/90	1/9/90	1/9/90	1/9/90
Date Extracted				
Surrogates	Percent Recovery (%)			
2-Fluorophenol	66	69	75	76
Phenol-d5	67	71	74	77
Nitrobenzene-d5	75	73	71	74
2-Fluorobiphenyl	78	72	72	79
2,4,6-Tribromophenol	90	87	85	87
p-Terphenyl-d14	42	72	36	33

NS - Not spiked

Table 6. Tentatively Identified Compounds

Brunsing Assoc. Sample ID

625 Compounds	MW-6 ug/L	Method Blank ug/L
Alkyl benzene	740	ND
1H-Indene,2,3-dihydro -dimethyl	23	ND
Methyl naphthalene	37	ND
Dimethyl naphthalene	27	ND
Sulfur, Mol. (S8)	15	ND
Fatty acid ester	109	ND

ND - Not detected among the major peaks examined, detection limit unknown.

The above compounds (idents) are reported at the client's request. They were identified and quantitated by the following procedure:

After identification and quantitation of the target compounds, the 20 most intense peaks remaining in the chromatogram are selected for examination. The spectra for these peaks are compared by computer with a National Bureau of Standards library containing 42,000 entries. A chemist trained in mass spectral interpretation then examines the results. Since at the outset these peaks are unknown, no standards are usually analyzed to obtain retention time or response factor data. Quantitation is based on a comparison of the area of the reconstructed ion chromatogram from the unknown peak and the nearest internal standard. This follows the EPA CLP protocol.

Table 7. Metals Results

Brunsing Associates Sample ID

Parameter	EPA Method	MW-1 ug/L	MW-2 ug/L	MW-3 ug/L	MW-4 ug/L	MW-5 ug/L
Lead Organic*		<100	220	205	<100	<100

* - Determination of organic lead - DHS method

Table 7. Metals Results

Brunsing Associates Sample ID

Parameter	EPA Method	MW-6 ug/L	MW-7 ug/L	Spike % Recov	Dup RPD	Method Blank ug/L
Lead Organic*		<100	235	97	1.8	<100

* - Determination of organic lead - DHS method

Table 7. Metals Results

Parameter	EPA Method	Brunsing Associates Sample ID Method Detection Limit ug/L
Lead Organic*		1.0

* - Determination of organic lead - DHS method

PROJ. NO.	PROJECT NAME
029	Pacific Supply
L.P. NO.	SAMPLERS: (Signature)

Pb - R3/S4
40ml - Rm 109
See - R2/S11

DATE	SAMPLE I.D.	TYPE	NO. OF CONTAINERS	ANALYSIS: TPH Gas & BTXE (A)	Organic Lead (B)	TPH Diesel (C)	Volatile Organics (EPA)	Semi-Volatile Organics (E)	REMARKS
12/19/89	MW-1	Water	3	✓	✓				2-40ml vials, 1-125ml plastic
	MW-2	Water	3	✓	✓				"
	MW-3	Water	3	✓	✓				"
	MW-4	Water	3	✓	✓				"
	MW-5	Water	3	✓	✓				"
	MW-6	Water	~~3~~ 7	✓	✓	✓	✓	✓	4-40 ml, 1-125ml, 2-1gallon
	MW-7	Water	4	✓	✓	✓			2-40ml, 1-125ml, 1-1gallon

LABORATORY: ACCUREX LAB, MOUNTAIN VIEW

Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Carl Schwedt	12/19/89 17:15	
Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Relinquished by: (Signature)	Date/Time	Received for Laboratory by: (Signature)
	12/19/89 17:15	Elaine Ferguson

Remarks: Results to Belmont office (415)-637-0170
Attn: Mike Velzy

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