

Jonas & Associates Inc.

GROUNDWATER MONITORING REPORT
Sampling Rounds One, Two, and Three

PACO PUMPS, INC.
9201 San Leandro Street
Oakland, California

December 10, 1993

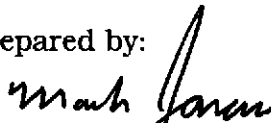
Report Prepared for:

PACO PUMPS, INC.
9201 San Leandro Street
Oakland, California 94603-1237

GROUNDWATER MONITORING REPORT
Sampling Rounds One, Two, and Three
PACO PUMPS, INC.
9201 San Leandro Street, Oakland, California

Jonas and Associates Inc. Job No. PCO-220

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GROUNDWATER MONITORING REPORT
Sampling Rounds One, Two, and Three

PACO PUMPS, INC.
9201 San Leandro Street
December 10, 1993

1.0 INTRODUCTION

Jonas and Associates Inc. (J&A) has been retained by PACO Pumps Inc. (PACO or PACO Pumps) to perform an environmental site characterization of its property located at 9201 San Leandro Street, in Oakland, California 94603-1237. The results of an initial site characterization study for the facility was presented in the October 16, 1992, "Site Characterization Report and Work Plan - PACO Pumps Inc., 9201 San Leandro Street, Oakland, California". After the installation of four monitoring wells and an initial round of groundwater samples collected on November 15 and 16, 1992, the results were presented in a February 24, 1993 document titled "First Quarterly Status Report". Two additional rounds of groundwater samples and analyses were performed on March 9, 1993 and July 21, 1993. The results of all three groundwater sampling rounds are presented in this "Groundwater Monitoring Report, Sampling Rounds One, Two, and Three". A Round Four sampling event will be performed in January 1994 to represent winter conditions.

PACO Pumps' environmental representative for this project is Mr. John Lilla {(415) 925-3100}. The lead agency for this project is the Alameda County Health Care Services Agency, Department of Environmental Health, Hazardous Division (Alameda County Health Services). The address of Alameda County Health Services is 80 Swan Way, Room 200, Oakland, California 94621. The agency representative is Ms. Eva Chu {(510) 271-4530}.

1.1 Site Description

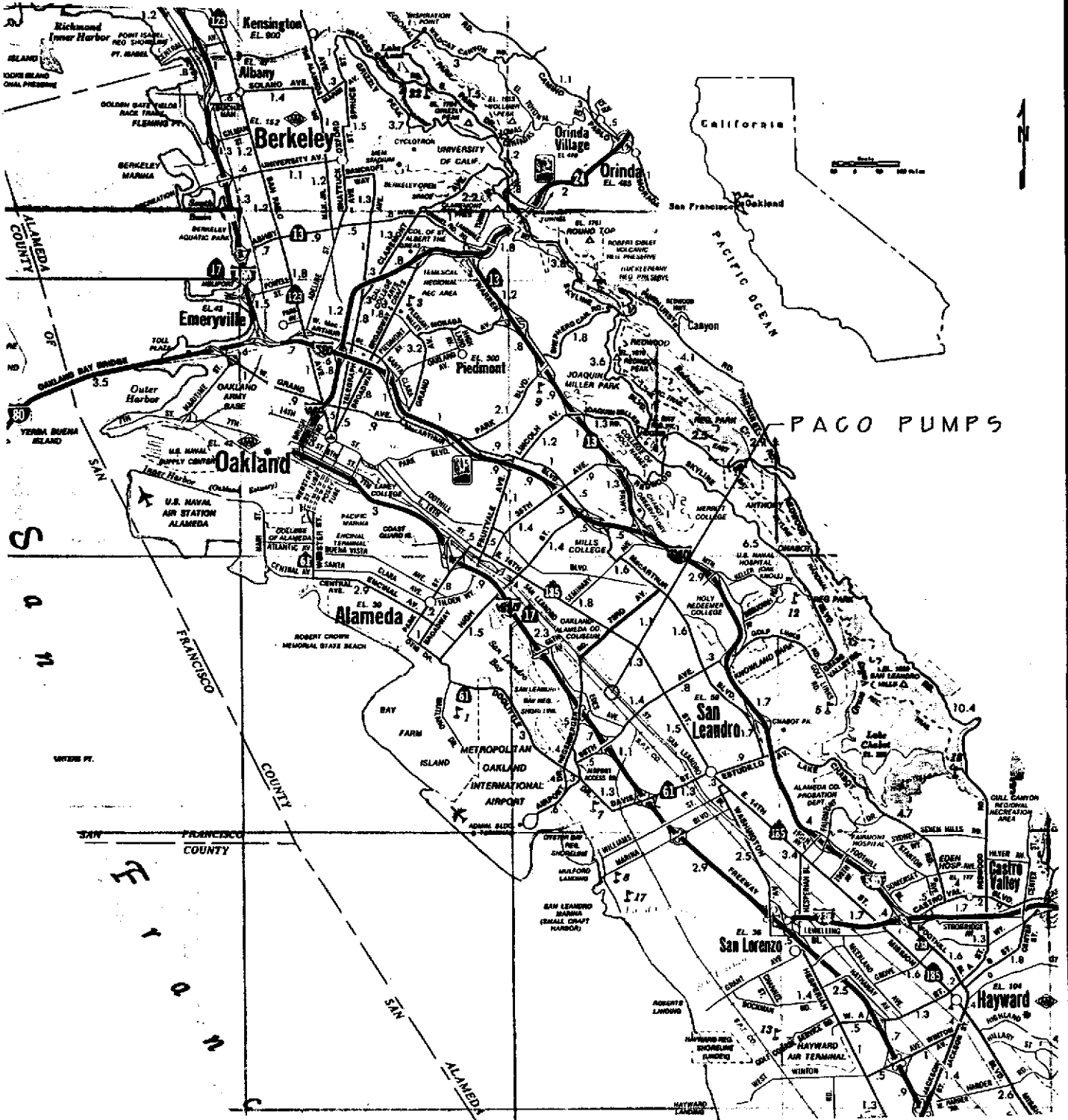
The PACO Pumps facility presented in this report is located at 9201 San Leandro Street, in Oakland, California. Prior to May 1992, PACO Pumps had an active facility at this location. The facility contained a manufacturing, engineering, and storage building, a purchasing and data processing building, a warehouse, a welding shop, employee parking, and outside storage. Apparently, the property also had two underground tanks used for the storage of gasoline. The property is largely bound by a Cyclone fence and gates. PACO Pumps has closed this facility and removed its equipment. Currently, this property is leased to a local company which primarily uses it to warehouse glassware.

The regional location of the property is presented in Figure 1-1. The facility is located in Township 2 South, Range 3 West, Section 22, Mount Diablo Baseline and Meridian. The land is essentially flat. Prior to moving, PACO Pumps' Environmental Protection Agency identification number for the facility was CAD088772629.

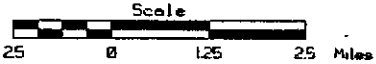
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Number

Checked by
10-11-1991
Approved by

Drawn by



Regional Location
PACO PUMPS
Oakland, California
Prepared by
JONAS AND ASSOCIATES INC.



Date: 10-11-1991
Scale as shown

Figure 1-1

Drawing Number
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Adjacent to the PACO Pumps property is Saint Vincent DePaul Resale, where a previous investigation by Subsurface Consultants Inc. (1992) identified the presence of trichloroethene (TCE) in soil next to a "sump inlet". Other chemicals were also identified in soil on the property of Saint Vincent DePaul. Numerous drums were also previously stored on the Saint Vincent DePaul's property. A recent groundwater sample collected from a monitoring well on the PACO Pumps facility identified the presence of TCE in groundwater beneath the facility. From these results it appears that the contamination found on the Saint Vincent DePaul property may have impacted the groundwater quality under the PACO Pumps' facility. Alameda County Health Care Services Agency is apparently overseeing environmental investigation activities on the Saint Vincent DePaul property.

1.2 Scope of Report

This Groundwater Monitoring Report, Sampling Rounds One, Two, and Three is presented in four sections and five appendices. Section 1, Introduction, provides a brief description of the site and the scope of the report. Section 2, Monitoring Wells and Hydrogeology, presents the well construction details for the four monitoring wells, the results of an elevation and location survey, a conceptual model of regional hydrogeology, and a local hydrogeologic cross-section. Section 3, Groundwater Sampling and Analysis, presents groundwater sampling procedures and results, and water level and free product measurements. Section 4, References, cites various references relevant to this report.

The appendices of the report include groundwater analysis summary tables, chain-of-custody records, laboratory data sheets, monitoring well lithologic logs and drilling permits, and the results of the Kier & Wright survey of the four monitoring wells.

2.0 MONITORING WELLS AND HYDROGEOLOGY

This section of the report presents a brief history and construction details of the four monitoring wells located at the PACO Pumps' 9201 San Leandro Street facility. In addition, a summary of the location and elevation survey performed by Kier & Wright is provided. Appendix D presents well and lithologic logs along with the permits associated with the monitoring wells. Appendix E presents the Kier & Wright survey report. A conceptual model of regional hydrogeology is presented including a brief discussion of the lithology penetrated by the monitoring wells. A local hydrogeologic cross-section is also provided using lithologic logs from on-site monitoring well boreholes.

2.1 Monitoring Wells

Four monitoring wells are located at the PACO Pumps' facility. These monitoring wells were drilled and installed during a period from November 3 through November 9, 1992. The J&A February 1993 "First Quarterly Status Report, PACO Pumps, 9201 San Leandro Street" presents the installation details and the rationale for locating and sampling each of the monitoring wells. All of the monitoring wells are screened at an apparently transmissive sandy clay found underneath the facility. Figure 2-1 presents the locations of the four monitoring wells and the analyses performed, the previous excavation site, suspected former underground storage tank locations, Saint Vincent DePaul, and other on-site structures.

2.1.1 Construction Details

All of the four monitoring wells are constructed in boreholes drilled to depths of 21 feet. One pilot borehole next to the borehole for monitoring well 9MW3 was drilled down to a depth of 30 feet to collect lithologic samples for analyses. Each of four monitoring wells have a fifteen foot well screen set between 5¼ to 20¼ feet below ground surface (bgs). All of the wells have a casing and screen diameter of four inches, placed in an 8½ inch borehole.

Monitoring well 9MW1 was constructed on November 4, 1992. The well was installed in a western corner of the facility adjacent to the former manufacturing building, and next to a transformer and the Central Pacific Railroad track. The lithology encountered during drilling ranged from an apparent fill, comprised of a silty gravel to a gravelly sand clay, to a sandy clay between 5 and 21 feet bgs. During drilling, first water was encountered at an approximate depth of 16 feet bgs. Measurement of first water is only approximate because of the difficulty in identifying water while drilling with a hollow stem auger. After the screen was installed, the well water level was measured at 9.74 feet bgs on November 15, 1992.

Monitoring well 9MW2 is located adjacent to the former welding shop. The well was installed on November 3, 1992. The lithology encountered during drilling was gravelly silty sand, probably a fill material, and a sandy clay located from 4 feet to the bottom of

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Drawing Number PC0220-10/93:F2-1

Figure 2-1

9MW1
TEPH - Diesel, Kerosene, Motor Oil
CAM 17 Metals
PCBs

9MW3
TPH - Gasoline with BTEX
TEPH - Diesel, Kerosene, Motor Oil
Volatile Organics
Selenium

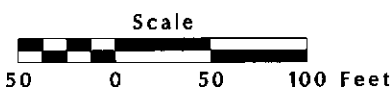
9MW2
TPH - Gasoline with BTEX
TEPH - Diesel, Kerosene, Motor Oil
Volatile Organics
Selenium

9MW4
TPH - Gasoline with BTEX
TEPH - Diesel, Kerosene, Motor Oil

Legend:

- ⊕ Monitoring Well
With groundwater analyses performed during Round One, Two, &/or Three.
- TPH = Total Petroleum Hydrocarbons
- TEPH = Total Extractable Petroleum Hydrocarbons
- BTEX = Benzene, Toluene, Ethyl Benzene, Total Xylenes
- PCBs = Polychlorinated biphenyls
- UST = Underground Storage Tank

Well	Date Installed	Total Depth	Casing Diameter	Borehole Diameter	Screen Depth	Sand Pack Depth
9MW1	11-4-1992	21'	4"	8.5"	5.25'-20.25'	4.25'-21'
9MW2	11-3-1992	21'	4"	8.5"	5.25'-20.25'	4.25'-21'
9MW3	11-4-1992	21'	4"	8.5"	5.25'-20.25'	4.25'-21'
9MW4	11-9-1992	21'	4"	8.5"	5.25'-20.25'	4.25'-21'

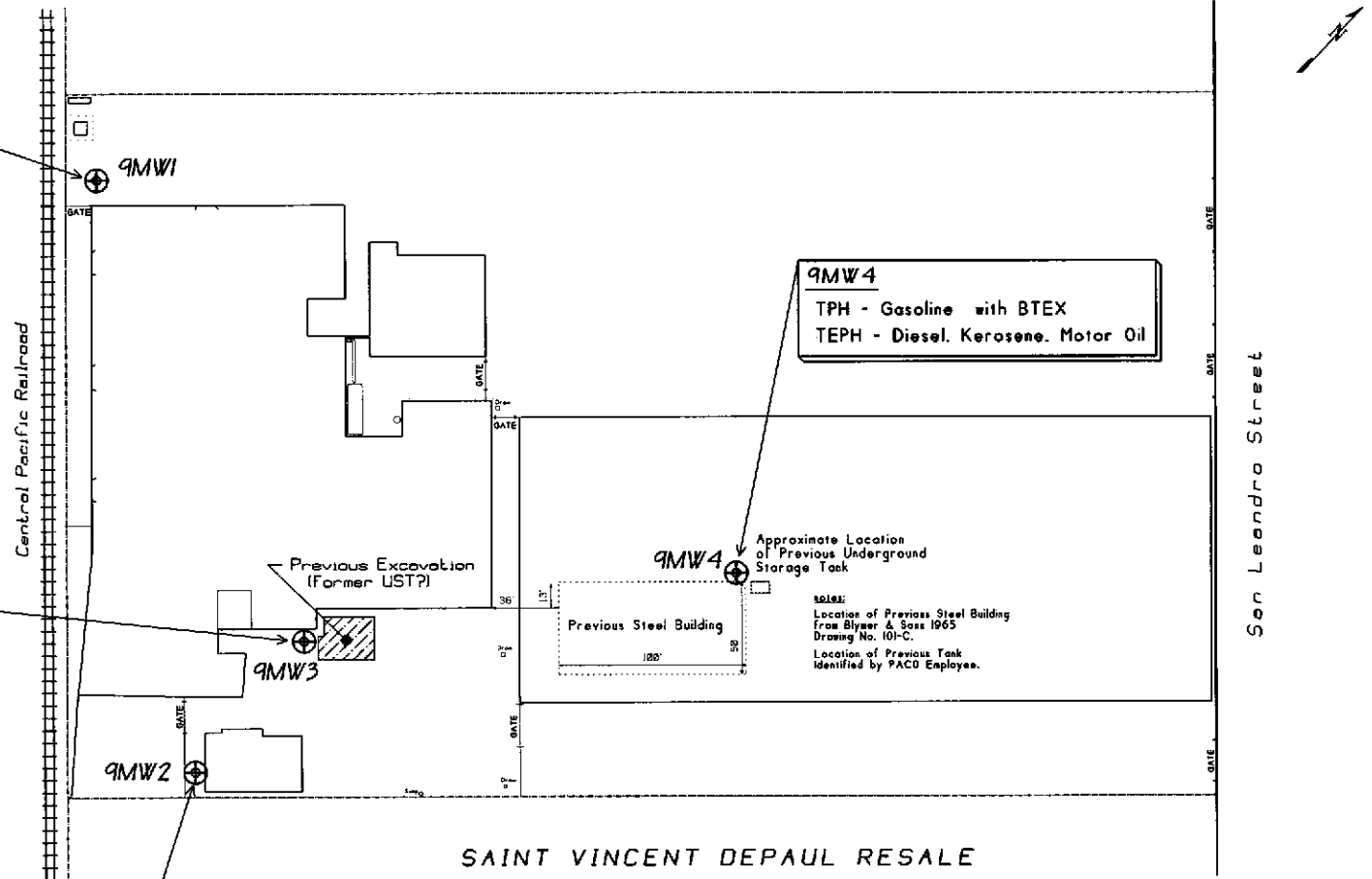


Monitoring Wells & Groundwater Analyses

PACO Pumps Inc.
9201 San Leandro Street
Oakland, California

Prepared by
JONAS & ASSOCIATES INC.

Date: 10-29-1993
Locations Approx. **Figure 2-1** Drawing Number PC0220-10/93:F2-1



the borehole at 21 feet bgs. First water was not clearly identified. On November 16, 1992 water level in monitoring well 9MW2 was measured at 10.45 feet bgs.

Monitoring well 9MW3 is located adjacent to a previous excavation where a former underground storage tank may have been present. No tank was found, but remnants of a former tank appears to have been identified during the excavation. The tank was reportedly used to store gasoline. Excavation activities and results have been documented in the October 16, 1992 "Site Characterization Report and Work Plan, PACO Pumps, 9201 San Leandro Street, Oakland, California". The well was drilled and constructed on November 4, 1992. During drilling of the borehole for monitoring well 9MW3, the lithology encountered was an apparent fill composed of gravelly silty sand, with a sandy clay between 2 and 21 feet bgs. A pilot boring adjacent to 9MW3 also found sandy clay between 20 and 30 feet bgs. After the construction of monitoring well 9MW3, water level was measured at 10.64 bgs.

Monitoring well 9MW4 was constructed on November 9, 1992. The location of the well is apparently near a former UST, which was said to have been located below the floor of the current warehouse. Prior to drilling the borehole for the monitoring well, 1¼ feet of flooring and sub-base was cored with a diamond-studded core barrel. The flooring and sub-base appears to be 6" of concrete, 3" of rock, and 3" of asphalt. Below the flooring and sub-base was a sandy clay down to a depth of 21 feet. During drilling, first water was identified at an approximate depth of 13.5 feet bgs. On November 16, 1992 well water was measured at 9.41 feet bgs.

The following Table 2-1 present a summary of construction details for monitoring wells 9MW1, 9MW2, 9MW3, and 9MW4:

Table 2-1
Monitoring Well Construction Details
PACO PUMPS - 9201 San Leandro Street
Oakland, California

Well Number	Date Completed	Casing Diameter	~ Depth in feet bgs					Borehole Diameter
			Screen {0.020"}	Sand Pack {#3 Sand}	Bentonite Seal	Portland Cement ¹	Borehole	
9MW1	11/4/1992	4"	5¼ - 20¼	4¼ - 21	3¾ - 4¼	¼ - 3¾	21	8½"
9MW2	11/3/1992	4"	5¼ - 20¼	4¼ - 21	3¾ - 4¼	¼ - 3¾	21	8½"
9MW3	11/4/1992	4"	5¼ - 20¼	4¼ - 21	3¾ - 4¼	¼ - 3¾	21	8½"
9MW4	11/9/1992	4"	5¼ - 20¼	4¼ - 21	3¾ - 4¼	¼ - 3¾	21	8½"

notes: 1) Portland Cement mixed with ~5% bentonite for plasticity.
bgs = below ground surface

2.1.2 Monitoring Well Survey

During August 1993, monitoring wells 9MW1, 9MW2, 9MW3, and 9MW4 were surveyed by Kier & Wright Civil Engineers & Surveyors, Inc. The documentation associated with the results of the survey is presented in Appendix E. The locations of the wells were surveyed using the California State Coordinate System which identifies the well locations using Eastings and Northings, in feet. The monitoring wells were surveyed at a point representing the north side mark on top of the PVC casing. The survey was based on the City of Oakland Benchmark 721, located at 92nd Avenue and G Street. The following Table 2-2 presents the monitoring well survey results.

Table 2-2
Monitoring Well Survey Data
PACO PUMPS - 9201 San Leandro Street
Oakland, California

Well	Easting	Northing	M.S.L. Elevation
9MW1	1512710.22	456699.01	Top PVC: 15.51'
9MW2	1512968.11	456507.34	Top PVC: 16.83'
9MW3	1512963.22	456602.8	Top PVC: 17.13'
9MW4	1513102.34	456789.38	Top PVC: 17.08'

Legend - M.S.L.: Mean Sea Level
Top PVC: Top north edge of PVC casing.

2.2 Regional Hydrogeology and Local Cross-Section

The following sections present a brief conceptual model of regional hydrogeology and a local hydrogeologic cross-section based on the borehole logs for the four on-site monitoring wells.

2.2.1 Regional Hydrogeology

The regional hydrogeology of the site is conceptually represented as a distal end of a gentle southwestward-sloping alluvial plain bordering estuarine marsh environments. The alluvial plain is probably Quaternary in age, representing relatively recent deposits. Generally, alluvial plains typically are comprised of consolidated to unconsolidated clays, silts, sands, and gravels. Estuarine deposits tend to contain organic-rich clays and silts, but also can contain sands and larger clastics. Bay muds may also be present associated with deposition in the current and pre-historic San Francisco Bay.

PACO Pumps' facility is located in the Alameda Bay Plain Groundwater Basin. Much of the groundwater present in this basin is generally not used due to low permeability, limit thickness of transmissive units, and salt water intrusion along the border of the bay. Within the general region of the site, two potential aquifers are apparently present.

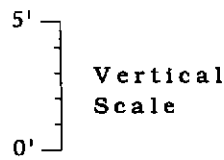
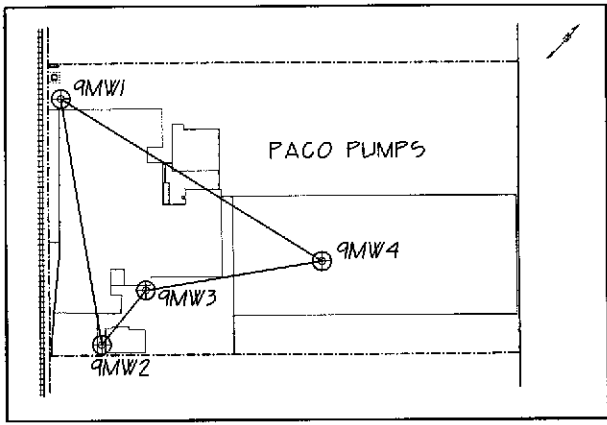
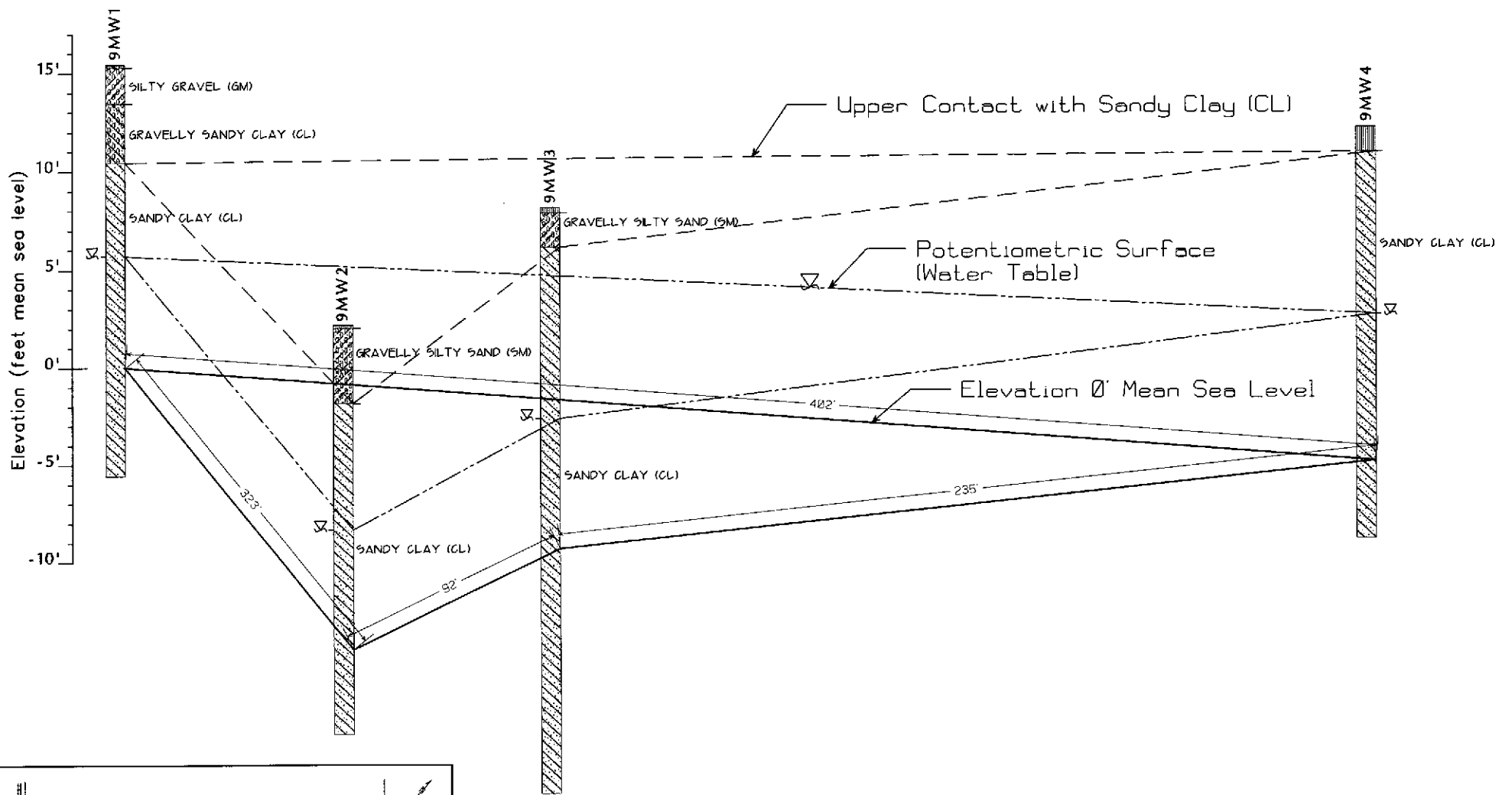
These are identified as the Merritt Sand and the Alameda Formation (California Department of Water Resources 1982). The Merritt Sand is reported to be composed of a fine-grained sand, silt, and clay. The Alameda Formation is said to be a marine deposit that commonly contains alternating layers of sandy clay and sand. Permeability of the Alameda Formation is moderate to low and it is used as a limited source of water within the Oakland area. Currently, it is undefined which unit is screened by the on-site monitoring wells, but because of the prominence of sandy clay in the borehole it is probably Alameda Formation.

The hydrogeology in the flatlands of Oakland is considered to be influenced by alluvial recharge from upland drainages, infiltration, the San Leandro Creek, the saltwater tidal sloughs, and urbanization. Typically, recharge of alluvium occurs in the area of upland contact with underlying bedrock, which also typically would contain larger alluvial clastics. Infiltration can occur where water percolates through the soil, but aquifer recharge may be limited in the area around the site because of the low permeability of shallow clays and the large amount of paved and covered areas with drainage collection. It is unknown how San Leandro Creek actually influences the regional hydrogeology, but it is probably both influent and effluent in character with respect to groundwater levels and tidal waters.

Regional subsurface hydrology can be locally influenced by the salt-water sloughs. These sloughs, at the border of San Francisco Bay, may result in brackish groundwater and may produce tidal influences resulting in fluctuating groundwater levels. Even though regional hydrogeology may be influenced by the tidal sloughs, their potential tidal impact at the PACO Pumps site is undefined at this time. Groundwater found in the on-site monitoring wells is considered to be brackish and is probably impacted by salt-water.

2.2.2 Local Hydrogeologic Cross-Section

This section of the report presents geologic cross sections describing the hydrogeologic conditions of the site. Lithologic descriptions were previously identified for the boreholes associated with on-site monitoring wells 9MW1, 9MW2, 9MW3, and 9MW4. Figure 2-2 presents the hydrogeologic cross-section for relatively shallow lithology underlying the facility. Detailed lithologic descriptions for each borehole are presented in Appendix D. The monitoring well survey performed by Kier & Wright defined borehole elevations. Groundwater levels presented on Figure 2-2 represent the initial groundwater sampling event conducted in November 1992.



Hydrogeologic Cross Section

PACO Pumps Inc.
 9201 San Leandro Street
 Oakland, California

Prepared by
JONAS & ASSOCIATES INC.

Date: 10-29-1993
 Locations Approx.

Figure 2-2

Drawing Number
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3.0 GROUNDWATER SAMPLING AND ANALYSIS

Following is a discussion of the procedures and results associated with sampling of monitoring wells 9MW1, 9MW2, 9MW3, and 9MW4, on November 16, 1992 (Round One), March 9, 1993 (Round Two), and July 21, 1993 (Round Three). These three rounds represent fall, spring, and summer seasonal conditions, respectively. The fourth sampling round will be collected in the January timeframe for a representation of winter groundwater conditions. Also included are the water level and free product measurements for each well since the inception of on-site groundwater sampling activities.

A summary of all laboratory results from samples collected from the on-site monitoring wells is presented in Appendix A. The chain-of-custody records for the sampling events are presented in Appendix B. The laboratory data sheets associated with these sampling events are presented in Appendix C.

3.1 Groundwater Sampling Procedures

The general groundwater sampling procedures presented in the "Site Characterization Report and Work Plan" (J&A 1992) for the facility were followed. After samples were collected and labeled, they were placed into ice chests chilled with blue ice for transport to the Chromalab analytical laboratory. Chromalab Inc. performed the analysis for all three sampling rounds. For each sampling round, a chain-of-custody record was completed and signed by a representative of Jonas & Associates Inc. and upon delivery, by a representative of Chromalab Inc. Chain-of-custody records for this sampling event are presented in Appendix B. The analysis and results of groundwater samples collected during the three sampling rounds are presented in Section 3.2.

3.1.1 Round One Groundwater Sampling Procedures

The first sampling round was performed on November 15 and 16, 1992 and represents fall groundwater conditions.

On November 15, 1992 prior to purging the well, the depth to groundwater in monitoring well 9MW1 was measured at 9.74 feet bgs. The water level was measured with an electronic water level indicator on a stretch resistant measuring tape. After measuring the depth to groundwater, a clear bailer was placed into the well to collect a water sample for visual observations. No petroleum products were identified floating on groundwater in monitoring well 9MW1. After assessing for the presence of floating product, approximately 30 gallons of groundwater was removed from the well. Monitoring well 9MW1 appeared to recover well. A well volume was calculated at approximately six gallons. Temperature, pH, and electric conductivity were measured after each five gallons of purging. These parameters appeared to stabilize and were recorded in the field log book for the project. Purged water was collected in dated and labeled 55-gallon drums for temporary storage. After purging the well, groundwater samples were collected with a clean bailer. The groundwater samples from monitoring

well 9MW1, collected on November 15, 1992, were identified as GW9-MW1-Q1. Three liters of sample were collected for analysis for Polychlorinated Biphenyls (PCB) and Total Extractable Petroleum Hydrocarbons (TEPH) as -Diesel, -Kerosene, and -Motor oil. One 250 ml bottle with HNO₃ as preservative was used to collect the sample for the CAM 17 metals. The water collected for metals analyses was filter prior to filling of the sample bottles.

On November 16, 1992, prior to purging, the water level in monitoring well 9MW2 was measured at 10.45 feet bgs. A clean, clear bailer was then used to collect a sample from the surface of the groundwater. No floating products were identified. The well was then purged of 35 gallons of well water. During completion of the purging activities the temperature, pH, and electric conductivity appeared to stabilize. The well also appeared to recover well. Six bottles were collected for laboratory analysis: two liters for TEPH as -Diesel, -Kerosene, and -Motor Oil; two Volatile Organic Analysis containers (VOAs) with HCl for Method 624 Volatile Organic Compounds (VOCs); and two VOAs with HCl for Total Petroleum Hydrocarbons (TPH) as Gasoline and Benzene, Toluene, Ethyl Benzene, and Total Xylenes (BTEX). The samples collected on November 16, 1992 from monitoring well 9MW2 are identified as GW9-MW2-Q1.

On November 16, 1992, the water level in monitoring well 9MW3 was measured at 10.64 feet bgs. No floating petroleum products were identified. After approximately 30 gallons were purged from the well, four bottles were collected for laboratory analysis: two liters for TEPH as -Diesel, -Kerosene, and -Motor Oil; and two VOAs with HCl for the TPH as Gasoline and BTEX. For this event the samples are identified as GW9-MW3-Q1.

Also on November 16, 1992, the groundwater level in monitoring well 9MW4 was measured at 9.41 feet bgs. After not identifying any floating products, the well was purged of approximately 35 gallons. Eight bottles for laboratory analysis were collected: four liters for TEPH as -Diesel, -Kerosene, -Motor Oil; and four VOAs with HCl for TPH as Gasoline and BTEX. Two sets of groundwater samples were collected from this well: one set identified as GW9-MW4-Q1 and a duplicate identified as GW9-MW41-Q1 for quality control.

3.1.2 Round Two Groundwater Sampling Procedures

The second round of groundwater sampling occurred on March 9, 1993 and represents spring seasonal groundwater conditions.

Prior to purging monitoring well 9MW1, the depth to groundwater was measured at 8.90 feet bgs. Well water level from the top of the PVC casing was 8.50 feet in depth. The water level was measured with an electronic water level indicator on a stretch resistant measuring tape. After measuring the depth to groundwater, a clear bailer was placed into the well to collect a water sample for visual observations. Floating petroleum products were not observed. After assessing for the presence of floating

product, approximately 18 gallons of groundwater was removed from the four-inch well. Temperature, pH, and electric conductivity were measured after each six gallons of purging. These parameters appeared to stabilize and were recorded. Purge water was collected in a 55-gallon drum for proper disposal. After purging the well, groundwater was collected with a clean bailer and poured into sampling containers. The following sampling containers were used: two liters for TEPH as -Diesel, -Kerosene, and -Motor Oil; one liter for PCBs; and one 250 ml poly with HNO₃ preservative for analysis of CAM 17 metals. The groundwater sample collected for the CAM 17 metals used a Posi-Filter with a 0.45 micron filter. Samples from this well for this event are identified as GW9-MW1-Q2.

Monitoring well 9MW2 was sampled using the same procedures as described for 9MW1. Prior to purging, the well water level was measured at a depth of 9.61 bgs and 9.21 from the top of the PVC well casing. A thin "oily sheen" was observed in the first water drawn from the well. After purging approximately 18 gallons of well water, the following water quality samples were collected: two VOAs with HCl for TPH as Gasoline and BTEX; two liters for TEPH as -Diesel, -Kerosene, and -Motor Oil; two VOAs with HCl preservative for VOCs; and one 250 ml poly with HNO₃ preservative for soluble selenium. These samples are identified as GW9-MW2-Q2.

Monitoring well 9MW3 was sampled using the same procedures as the other wells. Prior to purging, the well water level was measured at a depth of 9.48 bgs and 9.19 from the top of the PVC well casing. A thin "oily sheen" was observed. After purging approximately 18 gallons of well water, the following water quality samples were collected: two VOAs with HCl for TPH as Gasoline and BTEX; and two liters for TEPH as -Diesel, -Kerosene, and -Motor Oil. These samples are identified as GW9-MW3-Q2.

Monitoring well 9MW4 was sampled using the same procedures. Prior to purging, the well water level was measured at a depth of 8.50 bgs and 7.96 from the top of the PVC well casing. A thin "oily sheen" was observed. After purging approximately 18 gallons of well water, the following water quality samples were collected: two VOAs with HCl for TEPH as Gasoline and BTEX; and two liters for TEPH as -Diesel, -Kerosene, and -Motor Oil. These samples are identified as GW9-MW4-Q2.

3.1.3 Round Three Groundwater Sampling Procedures

The third round of groundwater sampling occurred on July 21, 1993 and represents summer groundwater conditions.

Prior to purging monitoring well 9MW1, the depth to groundwater was measured at 9.40 feet bgs and 9.00 feet from the top of the PVC well casing. The water level was measured with an electronic water level indicator on a stretch resistant measuring tape. After measuring the depth to groundwater, a clear bailer was placed into the well to collect a water sample for visual observations. Floating petroleum products were not observed. After assessing for the presence of floating product, approximately 21 gallons

of groundwater was removed from the four-inch well. Temperature, pH, and electric conductivity were measured after each seven gallons of purging. These parameters appeared to stabilize and were recorded. Purge water was collected in a 55-gallon drum for proper disposal. After purging the well, groundwater was collected with a clean bailer and poured into sample containers. The following sampling containers were used: two liters for TEPH as -Diesel, -Kerosene, and -Motor Oil; and one 250 ml poly with HNO₃ preservative for analysis of CAM 17 metals. The groundwater sample collected for the CAM 17 metals used a Posi-Filter with a 0.45 micron filter. These samples for this event are identified as GW9-MW1-Q3 on the chain-of-custody record.

Monitoring well 9MW2 was sampled using the same procedures as described for 9MW1. Prior to purging, the well water level was measured at a depth of 10.12 bgs and 9.72 from the top of the PVC well casing. An "oily sheen" was also observed in the first water drawn from the well. After purging approximately 18 gallons of well water, the following water quality samples were collected: two VOAs with HCl for TPH as Gasoline and BTEX; two liters for TEPH as -Diesel, -Kerosene, and -Motor Oil; and one 250 ml poly with HNO₃ preservative for soluble selenium. These samples for this event are identified as GW9-MW2-Q3.

Monitoring well 9MW3 was sampled using the same procedures as the other two wells. Prior to purging, the well water level was measured at a depth of 11.36 bgs and 11.07 from the top of the PVC well casing. An "oily sheen" was observed. After purging approximately 15 gallons of well water, the following water quality samples were collected: two VOAs with HCl for TPH as Gasoline and BTEX; two liters for TEPH as -Diesel, -Kerosene, and -Motor Oil; two VOAs with HCl preservative for VOCs; and one 250 ml poly with HNO₃ preservative for soluble selenium. These samples are identified as GW9-MW3-Q3.

During a quality control review of the data it appeared that a discrepancy was identified. It appears that a J&A technical field engineer apparently labeled samples GW9-MW2-Q3 as GW9-MW3-Q3 and vice versa. This error appears also to exist in the field log book. The evidence for this apparent mislabeling was the presence of Benzene, Toluene, Ethyl Benzene and Total Xylenes reported for the GW9-MW2-Q3 sample, when BTEX was not detected in the first two rounds of samples. In addition, the sample erroneously labeled as GW9-MW3-Q3 did not contain any BTEX, which contradicts the results of the two previous sampling rounds. Significant concentrations of BTEX were detected in groundwater samples collected from monitoring well 9MW3 during Round One and Round Two sampling events. The tables and figures presenting Round Three groundwater results for monitoring wells 9MW2 and 9MW3 are modified to reflect this error and are noted as "probably corrected". The legitimacy of this modification will further be examined during the Round Four groundwater sampling event.

Monitoring well 9MW4 was sampled using the same general procedures. Prior to purging, the well water level was measured at a depth of 8.60 bgs and 8.06 from the top of the PVC well casing. No "oily sheen" was observed. After purging approximately 21 gallons of well water, the following water quality samples were collected: two VOAs with HCl for TPH as Gasoline and BTEX; and two liters for TEPH as -Diesel, -Kerosene, and -Motor Oil. These samples are identified as GW9-MW4-Q3.

3.2 Groundwater Sampling Results

This section of the report presents the analytical results for Round One, Round Two, and Round Three groundwater sampling events. Water level measurements and free product measurements for all sampling events are also presented.

3.2.1 Analytical Results

As stated previously, summary tables, chain-of-custody records, and laboratory data sheets for groundwater samples collected for all groundwater sampling rounds are presented in Appendix A, B, and C, respectively. The following Tables 3-1, 3-2, and 3-3 present a summary of the analysis performed and the analytes detected during Round One, Two, and Three sampling events, respectively. Figures 3-1, 3-2, and 3-3 provide a graphical display of the analytical results from these sampling events.

Table 3-1
November 1992 Groundwater Sampling Results
PACO PUMPS - 9201 San Leandro Street
Oakland, California

Sample I.D.	Analysis	Detected
GW9-MW1-Q1	TEPH as Diesel, Kerosene, Motor Oil (3510/8015) PCBs (608 modified) CAM 17 Metals (3010/6010/7470)	Barium: 0.18 mg/L Beryllium: 0.002 mg/L Copper: 0.007 mg/L Selenium: 0.021 mg/L
GW9-MW2-Q1	TPH as Gasoline (5030/8015) BTEX (602) TEPH as Diesel, Kerosene, Motor Oil (3510/8015) Volatile Organics (624)	TEPH as Kerosene: 0.590 mg/L TEPH as Motor Oil: 9.5 mg/L 1,1-Dichloroethane: 0.0026 mg/L
GW9-MW3-Q1	TPH as Gasoline (5030/8015) BTEX (602) TEPH as Diesel, Kerosene, Motor Oil (3510/8015)	TPH as Gasoline: 40.000 mg/L Benzene: 2.900 mg/L Toluene: 6.700 mg/L Ethyl Benzene: 0.557 mg/L Total Xylenes: 1.700 mg/L
GW9-MW4-Q1	TPH as Gasoline (5030/8015) BTEX (602) TEPH as Diesel, Kerosene, Motor Oil (3510/8015)	TPH as Gasoline: 0.560 mg/L Benzene: 0.066 mg/L Toluene: 0.073 mg/L Ethyl Benzene: 0.016 mg/L Total Xylenes: 0.140 mg/L
GW9-MW41-Q1 (duplicate)	TPH as Gasoline (5030/8015) BTEX (602) TEPH as Diesel, Kerosene, Motor Oil (3510/8015)	TPH as Gasoline: 0.520 mg/L Benzene: 0.063 mg/L Toluene: 0.067 mg/L Ethyl Benzene: 0.015 mg/L Total Xylenes: 0.130 mg/L

Legend - TPH: Total Petroleum Hydrocarbons; TEPH: Total Extractable Petroleum Hydrocarbons;
BTEX: Benzene, Toluene, Ethyl Benzene, Total Xylenes

Table 3-2
 March 1993 Groundwater Sampling Results
 PACO PUMPS - 9201 San Leandro Street
 Oakland, California

Sample I.D.	Analysis	Detected
GW9-MW1-Q2	TEPH as Diesel, Kerosene, Motor Oil (3510/8015) PCBs (608) CAM 17 Metals (3010/6010/7470)	TEPH as Diesel: 0.140 mg/L Antimony: 0.03 mg/L Barium: 0.19 mg/L Mercury: 0.003 mg/L Selenium: 0.04 mg/L Zinc: 0.03 mg/L
GW9-MW2-Q2	TPH as Gasoline (5030/8015) BTEX (602) TEPH as Diesel, Kerosene, Motor Oil (3510/8015) Volatile Organics (624) Selenium (3010/6010)	TEPH as Kerosene: 0.210 mg/L TEPH as Diesel: 0.430 mg/L TEPH as Motor Oil: 4.3 mg/L Selenium: 0.08 mg/L
GW9-MW3-Q2	TPH as Gasoline (5030/8015) BTEX (602) TEPH as Diesel, Kerosene, Motor Oil (3510/8015)	TPH as Gasoline: 12.000 mg/L Benzene: 1.000 mg/L Toluene: 0.300 mg/L Ethyl Benzene: 0.110 mg/L Total Xylenes: 0.170 mg/L TEPH as Diesel: 0.290 mg/L
GW9-MW4-Q2	TPH as Gasoline (5030/8015) BTEX (602) TEPH as Diesel, Kerosene, Motor Oil (3510/8015)	TPH as Gasoline: 0.750 mg/L Benzene: 0.067 mg/L Toluene: 0.012 mg/L Ethyl Benzene: 0.029 mg/L Total Xylenes: 0.062 mg/L

Legend - TPH: Total Petroleum Hydrocarbons
 TEPH: Total Extractable Petroleum Hydrocarbons
 BTEX: Benzene, Toluene, Ethyl Benzene, Total Xylenes

Table 3-3
 July 1993 Groundwater Sampling Results
 PACO PUMPS - 9201 San Leandro Street
 Oakland, California

Sample I.D.	Analysis	Detected
GW9-MW1-Q3	TEPH as Diesel, Kerosene, Motor Oil (3510/8015) CAM 17 Metals (3010/6010/7470)	Barium: 0.27 mg/L Copper: 0.007 mg/L Molybdenum: 0.010 mg/L Silver: 0.011 mg/L Zinc: 0.015 mg/L
GW9-MW2-Q3 ¹	TPH as Gasoline (5030/8015) BTEX (602) TEPH as Diesel, Kerosene, Motor Oil (3510/8015) Selenium (3010/6010)	TEPH as Motor Oil: 0.52 mg/L
GW9-MW3-Q3 ¹	TPH as Gasoline (5030/8015) BTEX (602) TEPH as Diesel, Kerosene, Motor Oil (3510/8015) Volatile Organics ¹ (624) Selenium (3010/6010)	TPH as Gasoline: 3.400 mg/L Benzene: 0.420 mg/L (602 & 624) 0.450 mg/L Toluene: 0.063 mg/L (602 & 624) 0.050 mg/L Ethyl Benzene: 0.036 mg/L (602 & 624) 0.049 mg/L Total Xylenes: 0.037 mg/L (602 & 624) 0.047 mg/L 1,2-Dichloroethane: 0.330 mg/L Trichloroethene: 0.0024 mg/L
GW9-MW4-Q3	TPH as Gasoline (5030/8015) BTEX (602) TEPH as Diesel, Kerosene, Motor Oil (3510/8015)	TPH as Gasoline: 0.250 mg/L Benzene: 0.021 mg/L Toluene: 0.0042 mg/L Ethyl Benzene: 0.0084 mg/L Total Xylenes: 0.011 mg/L

Legend - ¹ = probably corrected, apparently switched.

Drawn by M.J. 10-29-1993

Drawing Number PCO220-10/93:F3-1

Figure 3-1

9MW1 (Water Elev.: 6.17')

November 15, 1992 sampling results:

(mg/L)		(mg/L)	
TEPH-Diesel	ND(0.05)	Detected CAM 17 Metals:	
-Kerosene	ND(0.05)	Barium	0.18
-Motor Oil	ND(0.5)	Beryllium	0.002
PCBs	ND(0.05)	Copper	0.007
		Selenium	0.021

9MW3 (Water Elev.: 6.78')

November 16, 1992 sampling results:

(mg/L)		(mg/L)	
TPH-Gasoline	40.000	Benzene	2.900
TEPH-Diesel	ND(0.05)	Toluene	6.700
-Kerosene	ND(0.05)	Ethyl Benzene	0.550
-Motor Oil	ND(0.5)	Total Xylenes	1.700

9MW2 (Water Elev.: 6.78')

November 16, 1992 sampling results:

(mg/L)		(mg/L)	
TPH-Gasoline	ND(0.05)	Benzene	ND(0.0005)
TEPH-Diesel	ND(0.05)	Toluene	ND(0.0005)
-Kerosene	0.590	Ethyl Benzene	ND(0.0005)
-Motor Oil	9.5	Total Xylenes	ND(0.0015)
Detected Method 624			
Volatile Organics: (mg/L)			
1,1-Dichloroethane		0.0026	

9MW4 (Water Elev.: 8.21')

November 16, 1992 sampling results:

(mg/L)		(mg/L)	
TPH-Gasoline	0.568	Benzene	0.068
TEPH-Diesel	ND(0.05)	Toluene	0.073
-Kerosene	ND(0.05)	Ethyl Benzene	0.016
-Motor Oil	ND(0.5)	Total Xylenes	0.130

Legend:

⊕ Monitoring Well

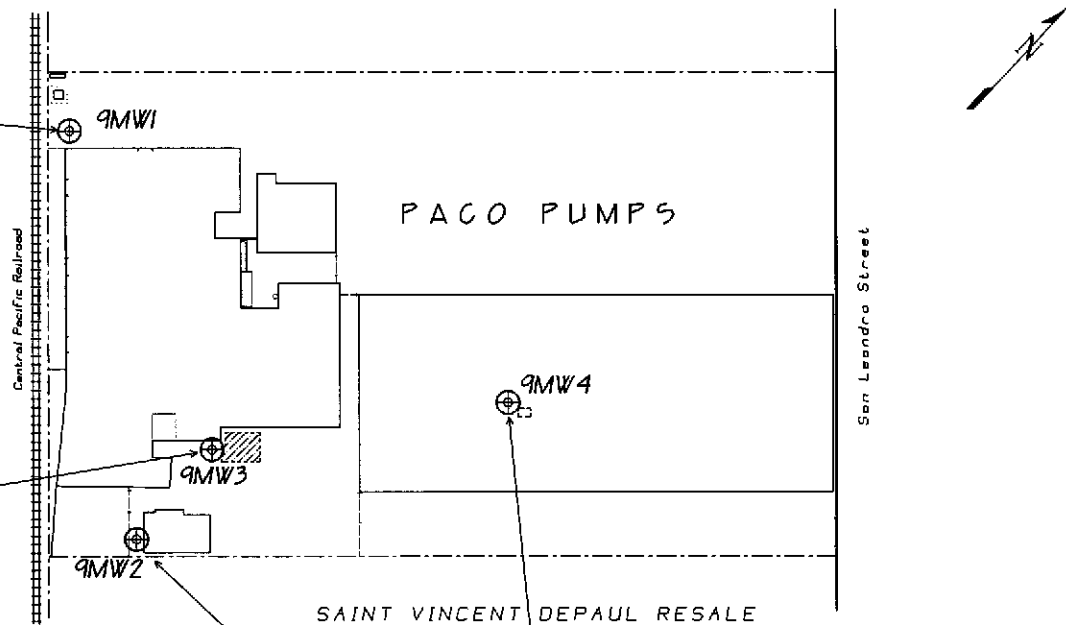
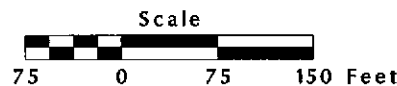
TPH = Total Petroleum Hydrocarbons

TEPH = Total Extractable Petroleum Hydrocarbons

PCBs = Polychlorinated biphenyls

ND(0.05) = Not Detected above laboratory detection limit in parentheses.

Well	Date Installed	Total Depth	Casing Diameter	Borehole Diameter	Screen Depth	Sand Pack Depth
9MW1	11-4-1992	21'	4"	8.5"	5.25'-20.25'	4.25'-21'
9MW2	11-3-1992	21'	4"	8.5"	5.25'-20.25'	4.25'-21'
9MW3	11-4-1992	21'	4"	8.5"	5.25'-20.25'	4.25'-21'
9MW4	11-9-1992	21'	4"	8.5"	5.25'-20.25'	4.25'-21'



Round One Groundwater Sampling Results

PACO Pumps Inc.
9201 San Leandro Street
Oakland, California

Prepared by

JONAS & ASSOCIATES INC.

Date: 10-29-1993
Locations Approx.

Figure 3-1

Drawing Number
PCO220-10/93:F3-1

Drawn by M.J. 10-29-1993

Drawing Number PCO220-10/93:F3-2

Figure 3-2

9MW1 (Water Elev.: 7.01')
March 9, 1993 sampling results:

(mg/L)		(mg/L)	
TEPH-Diesel	0.140	Detected CAM 17 Metals:	
-Kerosene	ND(0.05)	Antimony	0.03
-Motor Oil	ND(0.5)	Barium	0.19
PCBs	ND(0.0005)	Mercury	0.003
		Selenium	0.04
		Zinc	0.03

9MW3 (Water Elev.: 7.94')
March 9, 1993 sampling results:

(mg/L)		(mg/L)	
TPH-Gasoline	12.00	Benzene	1.000
TEPH-Diesel	0.290	Toluene	0.300
-Kerosene	ND(0.05)	Ethyl Benzene	0.110
-Motor Oil	ND(0.5)	Total Xylenes	0.170

9MW2 (Water Elev.: 7.62')
March 9, 1993 sampling results:

(mg/L)		(mg/L)	
TPH-Gasoline	ND(0.05)	Benzene	ND(0.0005)
TEPH-Diesel	0.43	Toluene	ND(0.0005)
-Kerosene	0.210	Ethyl Benzene	ND(0.0005)
-Motor Oil	4.3	Total Xylenes	ND(0.0015)
Selenium	0.08		
Method 624 Volatile Organics: none detected			

9MW4 (Water Elev.: 9.12')
March 9, 1993 sampling results:

(mg/L)		(mg/L)	
TPH-Gasoline	0.20	Benzene	0.00
TEPH-Diesel	ND(0.05)	Toluene	0.012
-Kerosene	ND(0.05)	Ethyl Benzene	0.029
-Motor Oil	ND(0.5)	Total Xylenes	0.062

Legend:

⊕ Monitoring Well

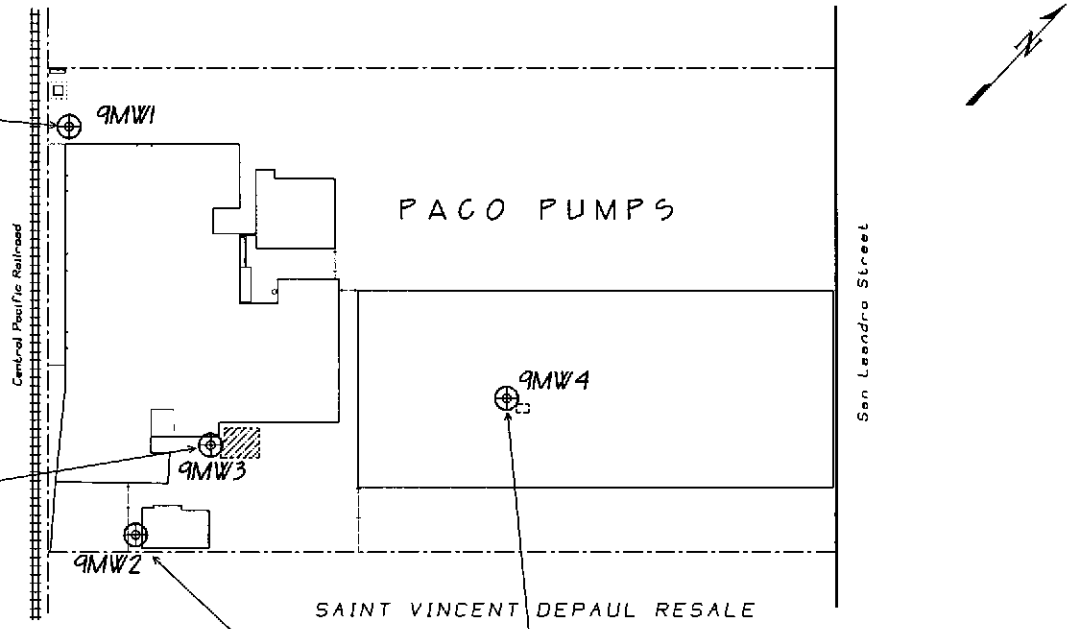
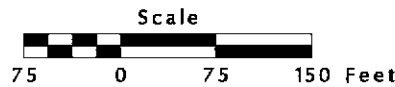
TPH = Total Petroleum Hydrocarbons

TEPH = Total Extractable Petroleum Hydrocarbons

PCBs = Polychlorinated biphenyls

ND(0.05) = Not Detected above laboratory detection limit in parentheses.

Well	Date Installed	Total Depth	Casing Diameter	Borehole Diameter	Screen Depth	Sand Pack Depth
9MW1	11-4-1992	21'	4"	8.5"	5.25'-20.25'	4.25'-21'
9MW2	11-3-1992	21'	4"	8.5"	5.25'-20.25'	4.25'-21'
9MW3	11-4-1992	21'	4"	8.5"	5.25'-20.25'	4.25'-21'
9MW4	11-9-1992	21'	4"	8.5"	5.25'-20.25'	4.25'-21'



Round Two Groundwater Sampling Results

PACO Pumps Inc.
9201 San Leandro Street
Oakland, California

Prepared by

JONAS & ASSOCIATES INC.

Date: 10-29-1993
Locations Approx.

Figure 3-2

Drawing Number
PCO220-10/93:F3-2

Drawn by M.J. 10-29-1993

Drawing Number PC0220-10/93:F3-3

Figure 3-3

9MW1 (Water Elev.: 6.51')
July 21, 1993 sampling results:

(mg/L)		(mg/L)	
TEPH-Diesel	ND(0.05)	Detected CAM 17 Metals:	
-Kerosene	ND(0.05)	Barium	0.27
-Motor Oil	ND(0.5)	Copper	0.007
		Molybdenum	0.010
		Silver	0.011
		Zinc	0.015

9MW3¹ (Water Elev.: 6.06')
July 21, 1993 sampling results:

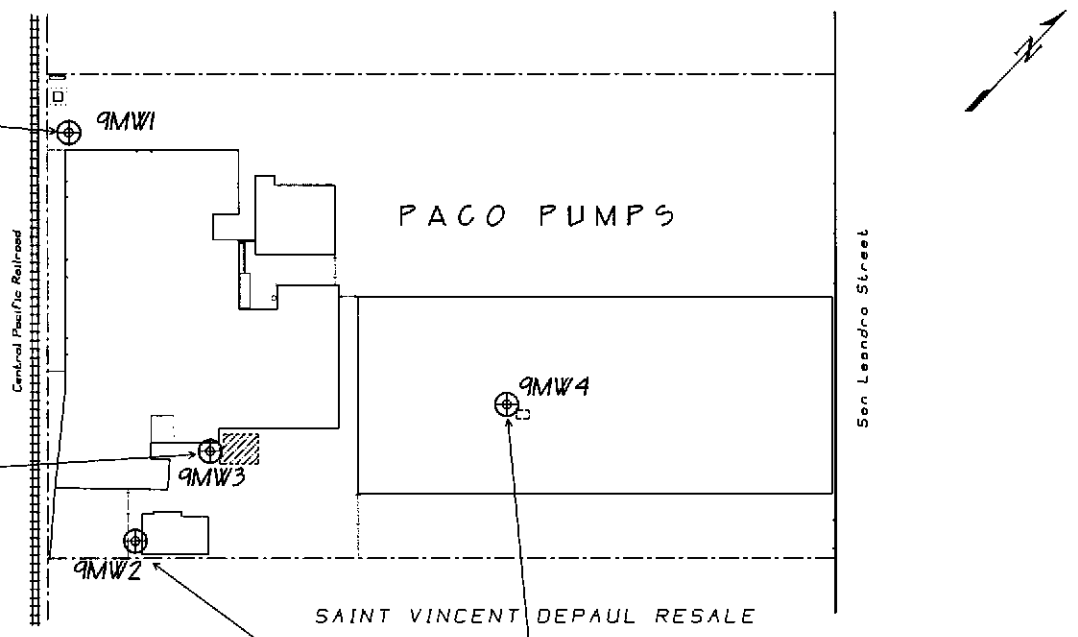
(mg/L)		(mg/L)	
TPH-Gasoline	3.40	Benzene	0.420
TEPH-Diesel	ND(0.050)	Toluene	0.063
-Kerosene	ND(0.050)	Ethyl Benzene	0.036
-Motor Oil	ND(0.5)	Total Xylenes	0.037
Selenium	ND(0.01)		
Detected Method 624 Volatile Organics:			
(mg/L)		(mg/L)	
1,2-Dichloroethane	0.330	Trichloroethene	0.0024

9MW2¹ (Water Elev.: 7.11')
July 21, 1993 sampling results:

(mg/L)		(mg/L)	
TPH-Gasoline	ND(0.05)	Benzene	ND(0.0005)
TEPH-Diesel	ND(0.05)	Toluene	ND(0.0005)
-Kerosene	ND(0.05)	Ethyl Benzene	ND(0.0005)
-Motor Oil	0.52	Total Xylenes	ND(0.0005)
Selenium	ND(0.01)		

9MW4 (Water Elev.: 9.02')
July 21, 1993 sampling results:

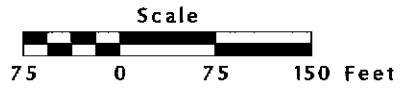
(mg/L)		(mg/L)	
TPH-Gasoline	0.220	Benzene	0.021
TEPH-Diesel	ND(0.05)	Toluene	0.0042
-Kerosene	ND(0.05)	Ethyl Benzene	0.0084
-Motor Oil	ND(0.5)	Total Xylenes	0.011



Legend:

- ⊕ Monitoring Well
- TPH = Total Petroleum Hydrocarbons
- TEPH = Total Extractable Petroleum Hydrocarbons
- PCBs = Polychlorinated biphenyls
- ND(0.05) = Not Detected above laboratory detection limit in parentheses.
- 1 = Probably corrected. Apparently 9MW2 samples were labeled as 9MW3 and vice versa.

Well	Date Installed	Total Depth	Casing Diameter	Borehole Diameter	Screen Depth	Sand Pack Depth
9AW1	11-4-1992	21'	4"	8.5"	5.25'-20.25'	4.25'-21'
9AW2	11-3-1992	21'	4"	8.5"	5.25'-20.25'	4.25'-21'
9AW3	11-4-1992	21'	4"	8.5"	5.25'-20.25'	4.25'-21'
9AW4	11-9-1992	21'	4"	8.5"	5.25'-20.25'	4.25'-21'



Round Three Groundwater Sampling Results

PACO Pumps Inc.
9201 San Leandro Street
Oakland, California

Prepared by
JONAS & ASSOCIATES INC.

3.2.2 Results of Water Level and Free Product Measurements

As previously stated, water level measurements were recorded each time water quality samples were collected. In addition, a determination was made with respect to the presence or absence of floating product.

The following Table 3-3 provides a summary of groundwater levels and free product measurements. Water level elevations were calculated using the results of the Kier & Wright survey.

Table 3-4
Groundwater Levels and Free Product Measurements
PACO PUMPS - 9201 San Leandro Street
Oakland, California

Date	Well ID	Water Level from Lid/Pavement:		Pavement vs. Casing Top Δ	Water Level from Top of Casing:		Free Product
		Depth	Elevation		Depth	Elevation	
11/15/92	9MW1	9.74'	6.17'	0.40'	9.34'	6.17'	no free product
11/16/92	9MW2	10.45'	6.78'	0.40'	10.05'	6.78'	"oily" sheen
"	9MW3	10.64'	6.78'	0.29'	10.35'	6.78'	no free product
"	9MW4	9.41'	8.21'	0.54'	8.87'	8.21'	no free product
3/9/93	9MW1	8.90'	7.01'	0.40'	8.50'	7.01'	no free product
"	9MW2	9.61'	7.62'	0.40'	9.21'	7.62'	"oily" sheen
"	9MW3	9.48'	7.94'	0.29'	9.19'	7.94'	slight "oily" sheen
"	9MW4	8.50'	9.12'	0.54'	7.96'	9.12'	slight "oily" sheen
7/21/93	9MW1	9.40'	6.51'	0.40'	9.00'	6.51'	no free product
"	9MW2 ¹	10.12'	7.11'	0.40'	9.72'	7.11'	"oily" sheen
"	9MW3 ¹	11.36'	6.06'	0.29'	11.07'	6.06'	"oily" sheen
"	9MW4	8.60'	9.02'	0.54'	8.06'	9.02'	no free product

Notes - » ¹ = probably corrected, apparently switched.
 » Elevation with respect to Mean Sea Level (MSL) and Kier & Wright survey.

Figures 3-4, 3-5, and 3-6 graphically present the results of the well water level collected during Round One, Two, and Three sampling events, respectively. As identified in Figure 3-4 and 3-6, based upon groundwater elevation data from monitoring wells 9MW2, 9MW3, and 9MW4, the direction of groundwater flow during November and July is in a westerly direction from the Saint Vincent DePaul facility to PACO Pumps' property.

Drawn by M.J. 10-29-1993
 Drawing Number PCO220-10/93:F3-4
 Figure 3-4

9MW1 Well Water Level
 Date Feet Mean Sea Level
 11/15/92 +6.17

9MW3 Well Water Level
 Date Feet Mean Sea Level
 11/16/92 +6.78

9MW2 Well Water Level
 Date Feet Mean Sea Level
 11/16/92 +6.78

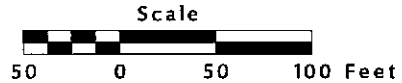
9MW4 Well Water Level
 Date Feet Mean Sea Level
 11/16/92 +8.21

Legend:

⊕ Monitoring Well with Well Water Level Feet Mean Sea Level

--- 11/15-16/92 Equipotential Line
 ← Assumed Groundwater Flow Direction

Well	Date Installed	Total Depth	Casing Diameter	Borehole Diameter	Screen Depth	Sand Pack Depth
9AW1	11-4-1992	21'	4"	8.5"	5.25'-20.25'	4.25'-21'
9AW2	11-3-1992	21'	4"	8.5"	5.25'-20.25'	4.25'-21'
9AW3	11-4-1992	21'	4"	8.5"	5.25'-20.25'	4.25'-21'
9AW4	11-9-1992	21'	4"	8.5"	5.25'-20.25'	4.25'-21'

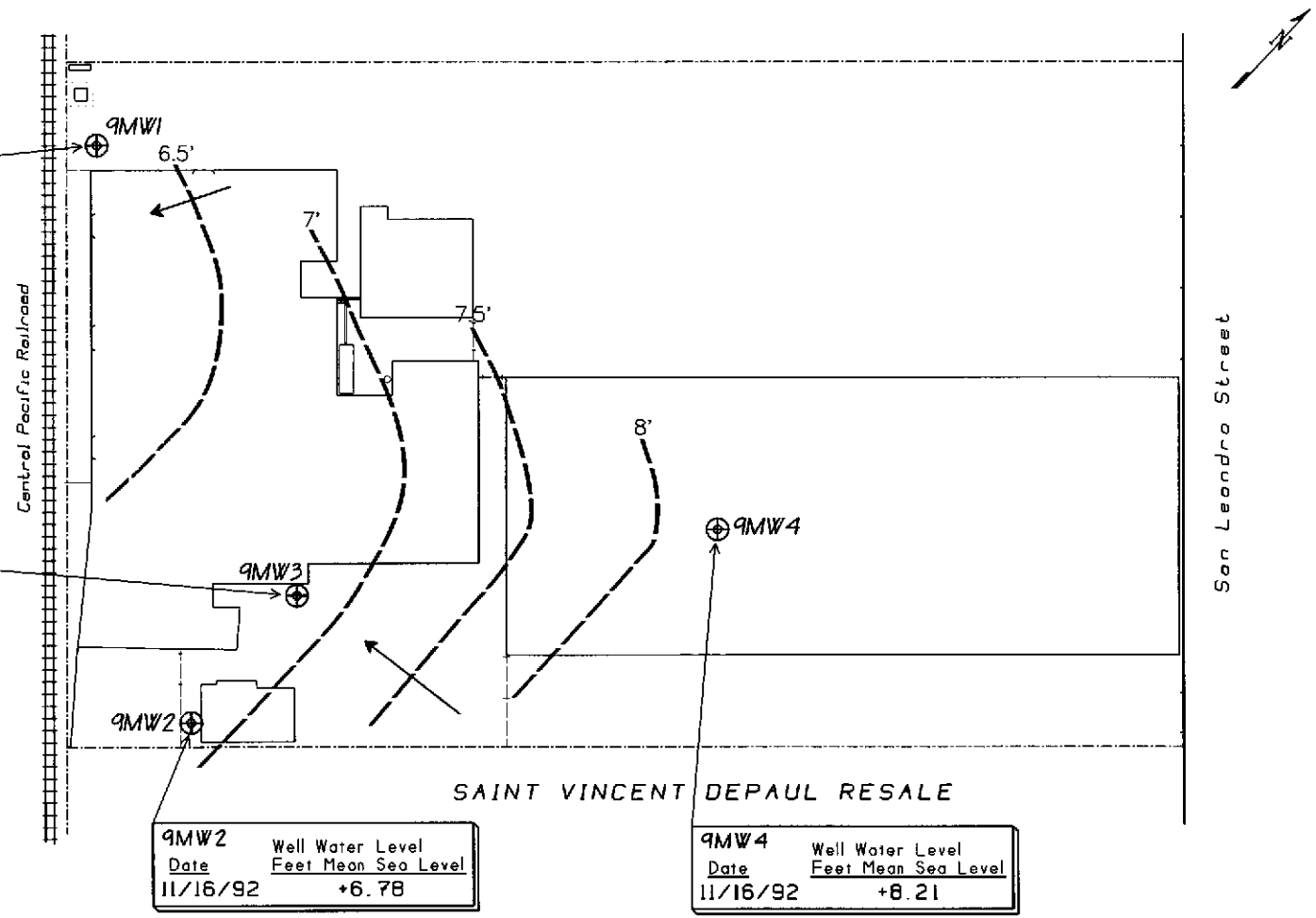


**November 1992 - Fall Season
 Potentiometric/Water Table Results**

PACO Pumps Inc.
 9201 San Leandro Street
 Oakland, California

Prepared by
JONAS & ASSOCIATES INC.

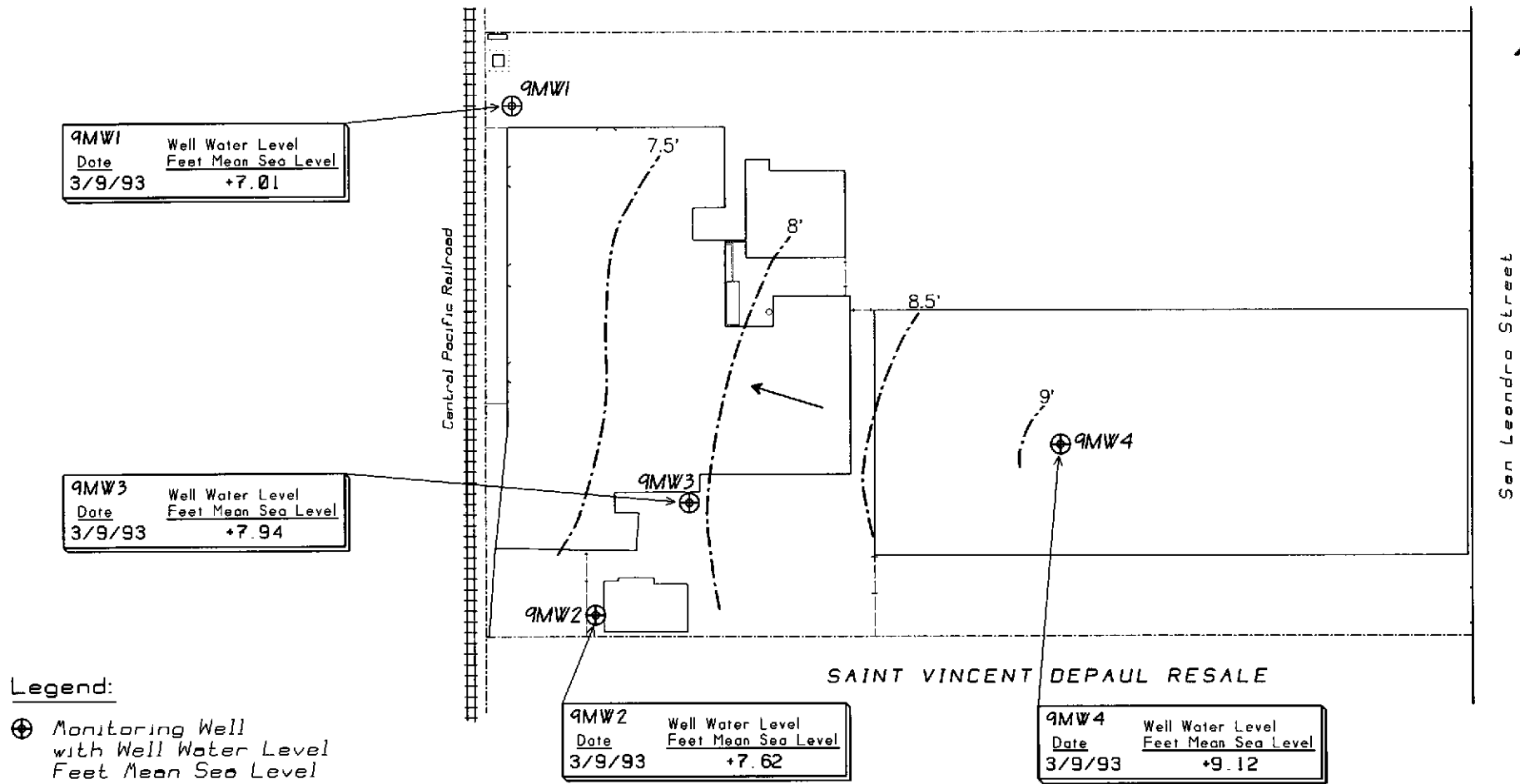
Date: 10-29-1993
 Locations Approx. **Figure 3-4** Drawing Number PCO220-10/93:F3-4



Drawn by M.J. 10-29-1993

Drawing Number PCO220-10/93:F3-5

Figure 3-5

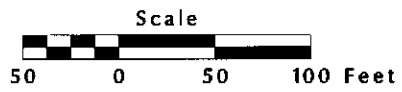


March 1993 - Spring Season
Potentiometric/Water Table Results

PACO Pumps Inc.
9201 San Leandro Street
Oakland, California

Prepared by
JONAS & ASSOCIATES INC.

Well	Date Installed	Total Depth	Casing Diameter	Borehole Diameter	Screen Depth	Sand Pack Depth
9MW1	11-4-1992	21'	4"	8.5"	5.25'-20.25'	4.25'-21'
9MW2	11-3-1992	21'	4"	8.5"	5.25'-20.25'	4.25'-21'
9MW3	11-4-1992	21'	4"	8.5"	5.25'-20.25'	4.25'-21'
9MW4	11-9-1992	21'	4"	8.5"	5.25'-20.25'	4.25'-21'



Date: 10-29-1993
Locations Approx.

Figure 3-5

Drawing Number
PCO220-10/93:F3-5

Drawn by M.J. 10-29-1993
 Drawing Number PC0220-10/93:FS-6
 Figure 3-6

9MW1 Well Water Level
 Date 7/21/93 Feet Mean Sea Level +6.51

9MW3 Well Water Level
 Date 7/21/93 Feet Mean Sea Level +6.06

9MW2 Well Water Level
 Date 7/21/93 Feet Mean Sea Level +7.11

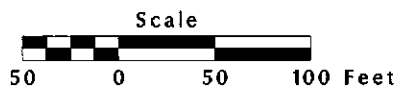
9MW4 Well Water Level
 Date 7/21/93 Feet Mean Sea Level +9.02

Legend:

⊕ Monitoring Well with Well Water Level Feet Mean Sea Level

--- 7/21/93 Equipotential Line
 ↗ Assumed Groundwater Flow Direction

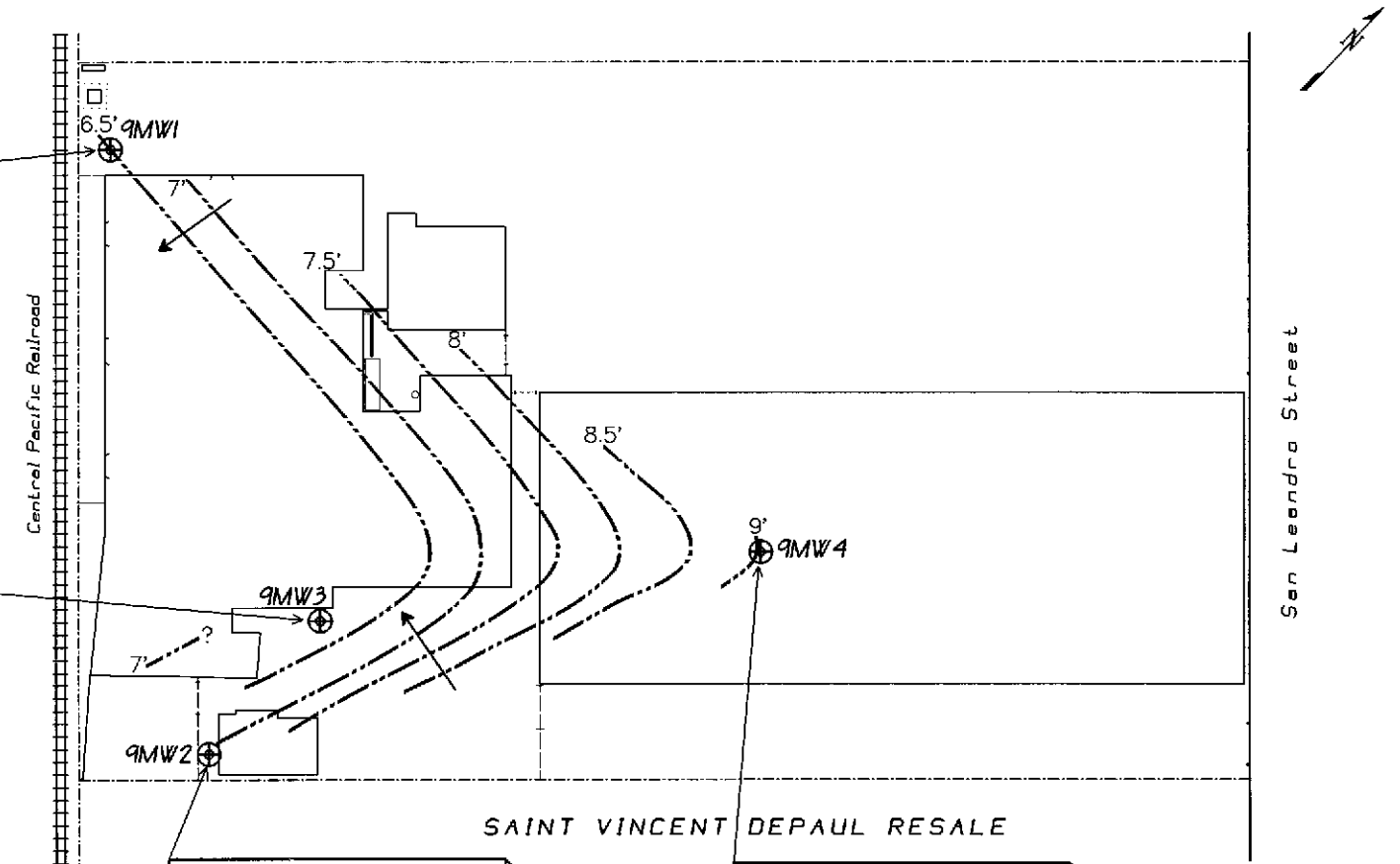
Well	Date Installed	Total Depth	Casing Diameter	Borehole Diameter	Screen Depth	Sand Pack Depth
9MW1	11-4-1992	21'	4"	8.5"	5.25'-20.25'	4.25'-21'
9MW2	11-3-1992	21'	4"	8.5"	5.25'-20.25'	4.25'-21'
9MW3	11-4-1992	21'	4"	8.5"	5.25'-20.25'	4.25'-21'
9MW4	11-9-1992	21'	4"	8.5"	5.25'-20.25'	4.25'-21'



July 1993 - Summer Season
 Potentiometric/Water Table Results

PACO Pumps Inc.
 9201 San Leandro Street
 Oakland, California

Prepared by
 JONAS & ASSOCIATES INC.



4.0 REFERENCES

California Department of Water Resources, 1982. "Phase I Water Well Survey, Proposed Oakland Inner Harbor Deepening Project, Central District", September 1982.

Jonas & Associates Inc., 1992. "Site Characterization Report and Work Plan, PACO Pumps, 9201 San Leandro Street, Oakland, California", October 16, 1992.

_____, 1993. "First Quarterly Status Report, PACO Pumps, 9201 San Leandro Street, Oakland, California", February 24, 1993.

Subsurface Consultants Inc., 1992. "Soil Contamination Assessment Drum Storage Areas, St. Vincent DePaul Distribution Center, 9234 San Leandro Street, Oakland, California", December 16, 1992.

Appendix A

Summary Tables of Laboratory Results

TPH-GASOLINE & BTEX GROUNDWATER RESULTS
PACO PUMPS - 9201 SAN LEANDRO STREET

Sample I.D.	Sampling Date	Depth (feet)	Matrix	Lab	TPH-Gasoline (5030/8015) (mg/L)	Benzene (602) (mg/L)	Toluene (602) (mg/L)	Ethyl Benzene (602) (mg/L)	Total Xylenes (602) (mg/L)
<u>Monitoring Well 9MW2</u>									
GW9-MW2-Q1	11/16/92	5¼'-20¼' _{screen}	water	CrLab	ND(0.050)	ND(0.0005)	ND(0.0005)	ND(0.0005)	ND(0.0015)
GW9-MW2-Q2	3/9/93	5¼'-20¼' _{screen}	water	CrLab	ND(0.050)	ND(0.0005)	ND(0.0005)	ND(0.0005)	ND(0.0005)
GW9-MW2-Q3 ¹	7/21/93	5¼'-20¼' _{screen}	water	CrLab	ND(0.050)	ND(0.0005)	ND(0.0005)	ND(0.0005)	ND(0.0005)
<u>Monitoring Well 9MW3</u>									
GW9-MW3-Q1	11/16/92	5¼'-20¼' _{screen}	water	CrLab	40.000	2.900	6.700	0.550	1.700
GW9-MW3-Q2	3/9/93	5¼'-20¼' _{screen}	water	CrLab	12.000	1.000	0.300	0.110	0.170
GW9-MW3-Q3 ¹	7/21/93	5¼'-20¼' _{screen}	water	CrLab	3.400	0.420	0.063	0.036	0.037
<u>Monitoring Well 9MW4</u>									
GW9-MW4-Q1	11/16/92	5¼'-20¼' _{screen}	water	CrLab	0.560	0.066	0.073	0.016	0.130
GW9-MW41-Q1	11/16/92	5¼'-20¼' _{screen}	water	CrLab	0.520	0.063	0.067	0.015	0.140
GW9-MW4-Q2	3/9/93	5¼'-20¼' _{screen}	water	CrLab	0.750	0.067	0.012	0.029	0.062
GW9-MW4-Q3	7/21/93	5¼'-20¼' _{screen}	water	CrLab	0.250	0.021	0.0042	0.0084	0.011

notes: TPH: Total Petroleum Hydrocarbons

BTEX: Benzene, Toluene, Ethyl Benzene, Total Xylenes

CrLab: Chromalab, Inc. (San Ramon, California)

¹ = probably corrected, apparently switched.

ND(0.1) = Not Detected above the laboratory detection limit in parentheses.

TEPH & PCB GROUNDWATER RESULTS
PACO PUMPS - 9201 SAN LEANDRO STREET

Sample I.D.	Sampling Date	Depth (feet)	Matrix	Lab	TEPH-Diesel (3510/8015) (mg/L)	TEPH-Kerosene (3510/8015) (mg/L)	TEPH-Motor Oil (3510/8015) (mg/L)	PCBs (608 mod.) (mg/L)
<u>Monitoring Well 9MW1</u>								
GW9-MW1-Q1	11/15/92	5¼'-20¼' _{screen}	water	CrLab	ND(0.050)	ND(0.050)	ND(0.5)	ND(0.05)
GW9-MW1-Q2	3/9/93	5¼'-20¼' _{screen}	water	CrLab	0.140	ND(0.050)	ND(0.5)	ND(0.0005)
GW9-MW1-Q3	7/21/93	5¼'-20¼' _{screen}	water	CrLab	ND(0.050)	ND(0.050)	ND(0.5)	-
<u>Monitoring Well 9MW2</u>								
GW9-MW2-Q1	11/16/92	5¼'-20¼' _{screen}	water	CrLab	ND(0.050)	0.590	9.5	-
GW9-MW2-Q2	3/9/93	5¼'-20¼' _{screen}	water	CrLab	0.430	0.210	4.3	-
GW9-MW2-Q3 ¹	7/21/93	5¼'-20¼' _{screen}	water	CrLab	ND(0.050)	ND(0.050)	0.52	-
<u>Monitoring Well 9MW3</u>								
GW9-MW3-Q1	11/16/92	5¼'-20¼' _{screen}	water	CrLab	ND(0.050)	ND(0.050)	ND(0.5)	-
GW9-MW3-Q2	3/9/93	5¼'-20¼' _{screen}	water	CrLab	0.290	ND(0.050)	ND(0.5)	-
GW9-MW3-Q3 ¹	7/21/93	5¼'-20¼' _{screen}	water	CrLab	ND(0.050)	ND(0.050)	ND(0.5)	-
<u>Monitoring Well 9MW4</u>								
GW9-MW4-Q1	11/16/92	5¼'-20¼' _{screen}	water	CrLab	ND(0.050)	ND(0.050)	ND(0.5)	-
GW9-MW41-Q1	11/16/92	5¼'-20¼' _{screen}	water	CrLab	ND(0.050)	ND(0.050)	ND(0.5)	-
GW9-MW4-Q2	3/9/93	5¼'-20¼' _{screen}	water	CrLab	ND(0.050)	ND(0.050)	ND(0.5)	-
GW9-MW4-Q3	7/21/93	5¼'-20¼' _{screen}	water	CrLab	ND(0.050)	ND(0.050)	ND(0.5)	-

notes: TEPH: Total Extractable Petroleum Hydrocarbons

PCBs: Polychlorinated Biphenyls

CrLab: Chromalab, Inc. (San Ramon, California)

¹ = probably corrected, apparently switched.

ND(0.004) = Not Detected above the laboratory detection limit in parentheses.

VOLATILE ORGANIC COMPOUND GROUNDWATER RESULTS
PACO PUMPS - 9201 SAN LEANDRO STREET

{mg/L}

Sample I.D.	Sampling Date	Depth (feet)	Matrix	Lab	Acetone	Benzene	Bromodichloro-methane	Bromoform	Bromo-methane	Carbon Tetrachloride	Chloro-benzene	Chloro-ethane	2-Chloroethyl Vinyl Ether	Chloroform	Chloro-methane
<u>Monitoring Well 9MW2</u>															
GW9-MW2-Q1	11/15/92	5 1/4'-20 1/4' screen	water	CrLab	ND(0.002)	ND(0.002)	ND(0.002)	ND(0.002)	ND(0.002)	ND(0.002)	ND(0.002)	ND(0.002)	ND(0.002)	ND(0.002)	ND(0.002)
GW9-MW2-Q2	3/9/93	5 1/4'-20 1/4' screen	water	CrLab	ND(0.002)	ND(0.002)	ND(0.002)	ND(0.002)	ND(0.002)	ND(0.002)	ND(0.002)	ND(0.002)	ND(0.002)	ND(0.002)	ND(0.002)
<u>Monitoring Well 9MW3</u>															
GW9-MW3-Q3 ¹	7/21/93	5 1/4'-20 1/4' screen	water	CrLab	ND(0.002)	0.450	ND(0.002)	ND(0.002)	ND(0.002)	ND(0.002)	ND(0.002)	ND(0.002)	ND(0.002)	ND(0.002)	ND(0.002)

Sample I.D.	Sampling Date	Depth (feet)	Matrix	Lab	Dibromo-chloromethane	1,2-Dichloro-benzene	1,3-Dichloro-benzene	1,4-Dichloro-benzene	1,1-Dichloro-ethane	1,2-Dichloro-ethane	1,1-Dichloro-ethene	trans 1,2-Dichloroethene	cis 1,2-Dichloroethene	1,2-Dichloro-propane	cis-1,3-Di-chloropropene
<u>Monitoring Well 9MW2</u>															
GW9-MW2-Q1	11/15/92	5 1/4'-20 1/4' screen	water	CrLab	ND(0.002)	ND(0.002)	ND(0.002)	ND(0.002)	0.0026	ND(0.002)	ND(0.002)	ND(0.002)	ND(0.002)	ND(0.002)	ND(0.002)
GW9-MW2-Q2	3/9/93	5 1/4'-20 1/4' screen	water	CrLab	ND(0.002)	ND(0.002)	ND(0.002)	ND(0.002)	ND(0.002)	ND(0.002)	ND(0.002)	ND(0.002)	ND(0.002)	ND(0.002)	ND(0.002)
<u>Monitoring Well 9MW3</u>															
GW9-MW3-Q3 ¹	7/21/93	5 1/4'-20 1/4' screen	water	CrLab	ND(0.002)	ND(0.002)	ND(0.002)	ND(0.002)	ND(0.002)	0.350	ND(0.002)	ND(0.002)	ND(0.002)	ND(0.002)	ND(0.002)

Sample I.D.	Sampling Date	Depth (feet)	Matrix	Lab	trans-1,3-Di-chloropropene	Ethyl-Benzene	Methyl Ethyl Ketone	Methyl Isobutyl Ketone	Methylene Chloride	1,1,2,2-Tetra-chloroethane	Tetra-chloroethene	Toluene	1,1,1-Tri-chloroethane	1,1,2-Tri-chloroethane	Tri-chloroethene
<u>Monitoring Well 9MW2</u>															
GW9-MW2-Q1	11/15/92	5 1/4'-20 1/4' screen	water	CrLab	ND(0.002)	ND(0.002)	ND(0.002)	ND(0.002)	ND(0.002)	ND(0.002)	ND(0.002)	ND(0.002)	ND(0.002)	ND(0.002)	ND(0.002)
GW9-MW2-Q2	3/9/93	5 1/4'-20 1/4' screen	water	CrLab	ND(0.002)	ND(0.002)	ND(0.002)	ND(0.002)	ND(0.002)	ND(0.002)	ND(0.002)	ND(0.002)	ND(0.002)	ND(0.002)	ND(0.002)
<u>Monitoring Well 9MW3</u>															
GW9-MW3-Q3 ¹	7/21/93	5 1/4'-20 1/4' screen	water	CrLab	ND(0.002)	0.049	ND(0.002)	ND(0.002)	ND(0.002)	ND(0.002)	ND(0.002)	0.050	ND(0.002)	ND(0.002)	0.0024

Sample I.D.	Sampling Date	Depth (feet)	Matrix	Lab	Trichlorofluoro-methane	Vinyl Chloride	Total Xylenes
<u>Monitoring Well 9MW2</u>							
GW9-MW2-Q1	11/15/92	5 1/4'-20 1/4' screen	water	CrLab	ND(0.002)	ND(0.002)	ND(0.002)
GW9-MW2-Q2	3/9/93	5 1/4'-20 1/4' screen	water	CrLab	ND(0.002)	ND(0.002)	ND(0.002)
<u>Monitoring Well 9MW3</u>							
GW9-MW3-Q3 ¹	7/21/93	5 1/4'-20 1/4' screen	water	CrLab	ND(0.002)	ND(0.002)	0.047

notes: CrLab: Chromalab Inc.

¹ = probably corrected, apparently not GW9-MW2-Q3.

ND(0.002) = Not Detected above the laboratory detection limit in parentheses.

METALS GROUNDWATER RESULTS
PACO PUMPS - 9201 SAN LEANDRO STREET
{mg/L}

Sample I.D.	Sampling Date	Depth (feet)	Matrix	Lab	Ag Silver	As Arsenic	Ba Barium	Be Beryllium	Cd Cadmium	Co Cobalt	Cr Chromium	Cu Copper	Hg Mercury	Mo Molybdenum	Ni Nickel
<u>Monitoring Well 9MW1</u>															
GW9-MW1-Q1	11/15/92	5¼'-20¼' screen	water	CrLab	ND(0.005)	ND(0.005)	0.18	0.002	ND(0.001)	ND(0.01)	ND(0.01)	0.007	ND(0.001)	ND(0.005)	ND(0.020)
GW9-MW1-Q2	3/9/93	5¼'-20¼' screen	water	CrLab	ND(0.005)	ND(0.005)	0.19	ND(0.001)	ND(0.001)	ND(0.01)	ND(0.01)	ND(0.005)	0.003	ND(0.005)	ND(0.020)
GW9-MW1-Q3	7/21/93	5¼'-20¼' screen	water	CrLab	0.011	ND(0.005)	0.27	ND(0.001)	ND(0.001)	ND(0.01)	ND(0.01)	0.007	ND(0.001)	0.010	ND(0.020)

Sample I.D.	Sampling Date	Depth (feet)	Matrix	Lab	Pb Lead	Sb Antimony	Se Selenium	Tl Thallium	V Vanadium	Zn Zinc
<u>Monitoring Well 9MW1</u>										
GW9-MW1-Q1	11/15/92	5¼'-20¼' screen	water	CrLab	ND(0.010)	ND(0.020)	0.021	ND(0.01)	ND(0.01)	ND(0.005)
GW9-MW1-Q2	3/9/93	5¼'-20¼' screen	water	CrLab	ND(0.010)	0.03	0.04	ND(0.01)	ND(0.01)	0.03
GW9-MW1-Q3	7/21/93	5¼'-20¼' screen	water	CrLab	ND(0.010)	ND(0.020)	ND(0.01)	ND(0.01)	ND(0.01)	0.015
<u>Monitoring Well 9MW2</u>										
GW9-MW2-Q2	3/9/93	5¼'-20¼' screen	water	CrLab			0.08			
GW9-MW2-Q3	7/21/93	5¼'-20¼' screen	water	CrLab			ND(0.01)			
<u>Monitoring Well 9MW3</u>										
GW9-MW3-Q3	7/21/93	5¼'-20¼' screen	water	CrLab			ND(0.01)			

notes: CrLab: Chromalab Inc.
ND(0.25) = Not Detected above the laboratory detection limit in parentheses.

Appendix B
Chain-of-Custody Records

CHROMALAB, INC.

2239 O

SUBM #: 9307232
 CLIENT: JONAS
 DUE: 07/29/93
 REF: 12534

Order # 12934
 23210939-109

Chain of Custody

DATE July 21, 1993 PAGE 1 OF 1

PROJ. MGR. <u>Mark Jonas/Jeff Sullivan, R.G.</u>					ANALYSIS REPORT														NUMBER OF CONTAINERS							
COMPANY <u>Jonas & Associates Inc.</u>					TPH - Gasoline (EPA 5030, 8015)	TPH - Gasoline (5030, 8015) w/BTEX (EPA 602, 8020)	TPH - Diesel, Kef, MO (EPA 3510/3550, 8015)	PURGEABLE AROMATICS BTEX (EPA 802, 8020)	PURGEABLE HALOCARBONS (EPA 801, 8010)	VOLATILE ORGANICS (EPA 624, 8240, 524.2)	BASE/NEUTRALS, ACIDS (EPA 625/627, 8270, 525)	TOTAL OIL & GREASE (EPA 5520 E&F)	PESTICIDES/PCB (EPA 608, 8080)	PHENOLS (EPA 604, 8040)	TOTAL RECOVERABLE HYDROCARBONS (EPA 418.1)	soluble Selenium	METALS: Cd, Cr, Pb, Zn, Ni	CAM METALS (17)		PRIORITY POLLUTANT METALS (13)	EXTRACTION (TCLP, STLC)					
ADDRESS <u>1056 Dale Place</u> <u>Concord, California 94518</u>																										
SAMPLERS (SIGNATURE)					(PHONE NO.)																					
Jonas & Associates Inc.					(510) 676-8554																					
SAMPLE ID.	DATE	TIME	MATRIX	LAB ID.																						
GW9-MW1-Q3	7/21/93	10:35	gw				X											X							3	
GW9-MW2-Q3	7/21/93	4:30	gw		X	X				X								X								7
GW9-MW3-Q3	7/21/93	2:30	gw		X	X												X								5
GW9-MW4-Q3	7/21/93	12:20	gw		X	X																				4
					2 VOA w/HCL					2 VOA w/HCL								1-250ml poly w/HNO3								
					2 L													1-250ml poly w/HNO3								

PROJECT INFORMATION		SAMPLE RECEIPT		RELINQUISHED BY 1.		RELINQUISHED BY 2.		RELINQUISHED BY 3.	
PROJECT NAME: 9201 PACO Pumps	TOTAL NO. OF CONTAINERS			Mark Jonas 1420					
PROJECT NUMBER: PCO-220-02	CHAIN OF CUSTODY SEALS			(SIGNATURE) (TIME)		(SIGNATURE) (TIME)		(SIGNATURE) (TIME)	
SHIPPING ID. NO.	REC'D GOOD CONDITION/COLD			Mark L. Jonas 7/21/93					
VIA: hand-to-hand	CONFORMS TO RECORD			(PRINTED NAME) (DATE)		(PRINTED NAME) (DATE)		(PRINTED NAME) (DATE)	
SPECIAL INSTRUCTIONS/COMMENTS: Posi-Filter w/0.45 micro filter used for metal(s) samples.	LAB NO.			Jonas & Associates Inc.					
				(COMPANY)		(COMPANY)		(COMPANY)	
				RECEIVED BY 1.		RECEIVED BY 2.		RECEIVED BY (LABORATORY) 3.	
				(SIGNATURE) (TIME)		(SIGNATURE) (TIME)		(SIGNATURE) (TIME)	
				(PRINTED NAME) (DATE)		(PRINTED NAME) (DATE)		(PRINTED NAME) (DATE)	
				(COMPANY)		(COMPANY)		(LAB)	

10765

CHROMALAB, INC.

2239 Omega Road, #1 • San Ramon, California 94
510/831-1788 • Facsimile 510/831-8798

DATE March 9, 1993 PAGE 1 OF 1

PROJ. MGR. <u>Mark Jonas/Jeff Sullivan, R.G.</u>					ANALYSIS REPORT																					
COMPANY <u>JONAS & ASSOCIATES INC.</u>					TPH - Gasoline (EPA 5030, 8015)	TPH - Gasoline (5030, 8015) w/BTEX (EPA 602, 8020)	TPH - Diesel, Kér, MO (EPA 3510/3550, 8015)	PURGEABLE AROMATICS BTEX (EPA 602, 8020)	PURGEABLE HALOCARBONS (EPA 601, 8010)	VOLATILE ORGANICS (EPA 624, 8240, 524.2)	BASENEUTRALS, ACIDS (EPA 625/627, 8270, 525)	TOTAL OIL & GREASE (EPA 5520 E&F)	RESIDUES/PCB (EPA 608, 8080)	PHENOLS (EPA 604, 8040)	TOTAL RECOVERABLE HYDROCARBONS (EPA 418.1)	soluble Selenium	METALS: Cd, Cr, Pb, Zn, Ni	CAM METALS (17)	PRIORITY POLLUTANT METALS (13)	EXTRACTION (TCLP, STLC)					NUMBER OF CONTAINERS	
ADDRESS <u>1056 Dale Place</u> <u>Concord, California 94518</u>																										
SAMPLERS (SIGNATURE)					(PHONE NO.)																					
<u>Jonas & Associates Inc. (510) 676-8554</u>																										
SAMPLE ID.	DATE	TIME	MATRIX	LAB ID.																						
GW9-MW1-Q2	3/9/93	1320	gw				X					X					X							4		
GW9-MW2-Q2	3/9/93	1450	gw			X	X			X						X								7		
GW9-MW3-Q2	3/9/93	1600	gw			X	X																	4		
GW9-MW4-Q2	3/9/93	1720	gw			X	X																	4		

PROJECT INFORMATION				SAMPLE RECEIPT				RELINQUISHED BY 1.			RELINQUISHED BY 2.			RELINQUISHED BY 3.						
PROJECT NAME: <u>9201 PACO Pumps</u>		TOTAL NO. OF CONTAINERS <u>19</u>		CHAIN OF CUSTODY SEALS <u>-</u>		REC'D GOOD CONDITION/COLD <u>✓</u>		CONFORMS TO RECORD <u>✓</u>		LAB NO.		(SIGNATURE) <u>Mark L. Jonas 3/9/93</u> (TIME) <u>17:15</u> (PRINTED NAME) <u>Mark L. Jonas</u> (DATE) <u>3/9/93</u>			(SIGNATURE) _____ (TIME) _____ (PRINTED NAME) _____ (DATE) _____			(SIGNATURE) _____ (TIME) _____ (PRINTED NAME) _____ (DATE) _____		
VIA: <u>hand-to-hand</u>										RECEIVED BY 1. (SIGNATURE) <u>Cary Cook 17:15</u> (TIME) <u>17:15</u> (PRINTED NAME) <u>Cary Cook</u> (DATE) <u>3/10/93</u>			RECEIVED BY 2. (SIGNATURE) _____ (TIME) _____ (PRINTED NAME) _____ (DATE) _____			RECEIVED BY (LABORATORY) 3. (SIGNATURE) _____ (TIME) _____ (PRINTED NAME) _____ (DATE) _____				
SPECIAL INSTRUCTIONS/COMMENTS: <u>Posi-Filter w/ 0.45 micron filter used for metal(s) samples.</u>								(COMPANY) <u>Jonas & Associates Inc.</u>			(COMPANY) _____			(COMPANY) <u>Chromalab, Inc.</u> (LAB)						

CHROMALAB, INC.

2239 Orms
511

CHROMALAB FILE # 1192132
ORDER # 8532

Chain of Custody

DATE 11/16/92 PAGE 1 OF 1

PROJ. MGR. <u>Mark L. Jonas</u>					ANALYSIS REPORT														NUMBER OF CONTAINERS			
COMPANY <u>JONAS & ASSOCIATES INC.</u>					TPH - Gasoline (EPA 5030, 8015)	TPH - Gasoline (5030, 8015) w/BTEX (EPA 3002/8020)	TPH - Diesel (EPA 3510/3550, 8015)	PURGEABLE AROMATICS BTEX (EPA 602, 8020)	PURGEABLE HALOCARBONS (EPA 601, 8010)	VOLATILE ORGANICS (EPA 604-8240, 504-2)	BASE/NEUTRALS, ACIDS (EPA 625/627, 8270, 525)	TOTAL OIL & GREASE (EPA 5520 E&F)	PCB/PHIBES/PCB (EPA 698-8080) PCBs	PHENOLS (EPA 604, 8040)	TOTAL RECOVERABLE HYDROCARBONS (EPA 418.1)	TEPH-Diesel, Kero., Motor O. (3510/8020)	METALS: Cd, Cr, Pb, Zn, Ni	CAM METALS (17)		PRIORITY POLLUTANT METALS (13)	EXTRACTION (TCLP, STLC)	
ADDRESS <u>1056 Dale Place</u> <u>Concord, California 94518</u>					SAMPLERS (SIGNATURE) _____ (PHONE NO.) _____																	
SAMPLERS (SIGNATURE) _____ (PHONE NO.) _____					Jonas & Associates Inc. (510) 676-8554																	
SAMPLE ID.	DATE	TIME	MATRIX	LAB ID.	TPH - Gasoline (EPA 5030, 8015)	TPH - Gasoline (5030, 8015) w/BTEX (EPA 3002/8020)	TPH - Diesel (EPA 3510/3550, 8015)	PURGEABLE AROMATICS BTEX (EPA 602, 8020)	PURGEABLE HALOCARBONS (EPA 601, 8010)	VOLATILE ORGANICS (EPA 604-8240, 504-2)	BASE/NEUTRALS, ACIDS (EPA 625/627, 8270, 525)	TOTAL OIL & GREASE (EPA 5520 E&F)	PCB/PHIBES/PCB (EPA 698-8080) PCBs	PHENOLS (EPA 604, 8040)	TOTAL RECOVERABLE HYDROCARBONS (EPA 418.1)	TEPH-Diesel, Kero., Motor O. (3510/8020)	METALS: Cd, Cr, Pb, Zn, Ni	CAM METALS (17)	PRIORITY POLLUTANT METALS (13)	EXTRACTION (TCLP, STLC)	NUMBER OF CONTAINERS	
GW9-MW1-Q1	11/15/92	1230	water										X		X			X				5
GW9-MW2-Q1	11/16/92	1010	water		X					X					X							6
GW9-MW3-Q1	11/16/92	1355	water		X										X							5
GW9-MW4-Q1	11/16/92	1525	water		X										X							5
GW9-MW41-Q1	11/16/92	1425	water		X										X							5
PROJECT INFORMATION					SAMPLE RECEIPT					RELINQUISHED BY 1.			RELINQUISHED BY 2.			RELINQUISHED BY 3.						
PROJECT NAME: <u>9201 PACO Pumps</u>					TOTAL NO. OF CONTAINERS					<u>Mark Jones</u> 1635 (SIGNATURE) (TIME)			_____ (SIGNATURE) (TIME)			_____ (SIGNATURE) (TIME)						
PROJECT NUMBER: <u>PCO-220-02-REM</u>					CHAIN OF CUSTODY SEALS					<u>Mark Jones</u> 11/16/92 (PRINTED NAME) (DATE)			_____ (PRINTED NAME) (DATE)			_____ (PRINTED NAME) (DATE)						
SHIPPING ID. NO.					REC'D GOOD CONDITION/COLD					<u>Jonas & Associates Inc.</u> (COMPANY)			_____ (COMPANY)			_____ (COMPANY)						
VIA: <u>hand-to-hand</u>					CONFORMS TO RECORD					<u>RECEIVED BY</u> 1.			<u>RECEIVED BY</u> 2.			<u>RECEIVED BY (LABORATORY)</u> 3.						
SPECIAL INSTRUCTIONS/COMMENTS:					LAB NO.					_____ (SIGNATURE) (TIME)			_____ (SIGNATURE) (TIME)			<u>Gary Cook</u> 16:40 (SIGNATURE) (TIME)						
										_____ (PRINTED NAME) (DATE)			_____ (PRINTED NAME) (DATE)			<u>Gary Cook</u> 11/16/92 (PRINTED NAME) (DATE)						
										_____ (COMPANY)			_____ (COMPANY)			<u>Chromalab, Inc.</u> (LAB)						

CHROMALAB, INC.

Environmental Laboratory (1094)

5 DAYS TURNAROUND

November 24, 1992

ChromaLab File No.: 1192132

JONAS & ASSOCIATES, INC.

Attn: Mark L. Jonas

RE: Four water samples for Gasoline and BTEX analysis

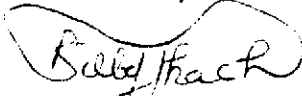
Project Name: 9201 PACO PUMPS
Project Number: PCO-220-02-REM
Date Sampled: Nov. 16, 1992
Date Analyzed: Nov. 20, 1992

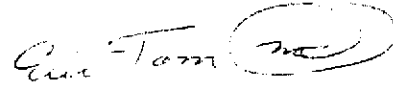
Date Submitted: Nov. 16, 1992

RESULTS:

Sample I.D.	Gasoline ($\mu\text{g/L}$)	Benzene ($\mu\text{g/L}$)	Toluene ($\mu\text{g/L}$)	Ethyl Benzene ($\mu\text{g/L}$)	Total Xylenes ($\mu\text{g/L}$)
GW9-MW2-Q1	N.D.	N.D.	N.D.	N.D.	N.D.
GW9-MW3-Q1	40000	2900	6700	550	1700
GW9-MW41-Q1	520	63	67	15	130
GW9-MW4-Q1	560	66	73	16	140
BLANK	N.D.	N.D.	N.D.	N.D.	N.D.
SPIKE RECOVERY	91%	95%	95%	95%	93%
DUP SPIKE RECOVERY	----	94%	97%	94%	92%
DETECTION LIMIT	50	0.5	0.5	0.5	1.5
METHOD OF ANALYSIS	5030/8015	602	602	602	602

ChromaLab, Inc.


Billy Thach
Analytical Chemist


Eric Tam
Laboratory Director

cc

CHROMALAB, INC.

Environmental Laboratory (1094)

5 DAYS TURNAROUND

November 23, 1992

ChromaLab File No.: 1192132

JONAS & ASSOCIATES, INC.

Attn: Mark L. Jonas

RE: Five water samples for TEPH analysis

Project Name: 9201 PACO PUMPS

Project Number: PCO-220-02-REM

Date Sampled: Nov. 15-16, 1992

Date Submitted: Nov. 16, 1992

Date Extracted: Nov. 18, 1992


Date Analyzed: Nov. 18, 1992

RESULTS:

Sample I.D.	Kerosene ($\mu\text{g/L}$)	Diesel ($\mu\text{g/L}$)	Motor Oil (mg/L)
GW9-MW1-Q1	N.D.	N.D.	N.D.
GW9-MW2-Q1	590	N.D.	9.5
GW9-MW3-Q1	N.D.	N.D.	N.D.
GW9-MW4-Q1	N.D.	N.D.	N.D.
GW9-MW41-Q1	N.D.	N.D.	N.D.
BLANK	N.D.	N.D.	N.D.
SPIKE RECOVERY	----	109%	----
DUP SPIKE RECOVERY	----	105%	----
DETECTION LIMIT	50.0	50.0	0.5
METHOD OF ANALYSIS	3510/8015	3510/8015	3510/8015

ChromaLab Inc.,


Yiu Tam
Analytical Chemist


Eric Tam
Laboratory Director

cc

CHROMALAB, INC.

Environmental Laboratory (1094)

5 DAYS TURNAROUND

November 24, 1992

ChromaLab File # 1192132

REVISED May 5, 1993

JONAS & ASSOCIATES, INC.

Attn: Mark L. Jonas

Project Name: 9201 PACO PUMPS
Date Sampled: Nov. 16, 1992
Date Submitted: Nov. 16, 1992
Date of Analysis: Nov. 20, 1992
Sample I.D.: GW9-MW2-Q1

Project No: PCO-220-02-REM
Method of Analysis: EPA 624
Matrix: Water
Reporting Limit: 2.0 µg/L
Dilution Factor: None

COMPOUND NAME	µg/L	Spike Recovery
CHLOROMETHANE	N.D.	---
VINYL CHLORIDE	N.D.	---
BROMOMETHANE	N.D.	---
CHLOROETHANE	N.D.	---
TRICHLOROFLUOROMETHANE	N.D.	---
1,1-DICHLOROETHENE	N.D.	118% 120%
METHYLENE CHLORIDE	N.D.	---
1,2-DICHLOROETHENE (TRANS)	N.D.	---
1,2-DICHLOROETHENE (CIS)	N.D.	---
1,1-DICHLOROETHANE	2.6	---
CHLOROFORM	N.D.	---
1,1,1-TRICHLOROETHANE	N.D.	---
CARBON TETRACHLORIDE	N.D.	---
1,2-DICHLOROETHANE	N.D.	---
BENZENE	N.D.	---
TRICHLOROETHENE	N.D.	104% 107%
1,2-DICHLOROPROPANE	N.D.	---
BROMODICHLOROMETHANE	N.D.	---
2-CHLOROETHYLVINYLEETHER	N.D.	---
TRANS-1,3-DICHLOROPROPENE	N.D.	---
TOLUENE	N.D.	---
CIS-1,3-DICHLOROPROPENE	N.D.	---
1,1,2-TRICHLOROETHANE	N.D.	---
TETRACHLOROETHENE	N.D.	101% 101%
DIBROMOCHLOROMETHANE	N.D.	---
CHLOROBENZENE	N.D.	---
ETHYL BENZENE	N.D.	---
BROMOFORM	N.D.	---
1,1,2,2-TETRACHLOROETHANE	N.D.	102% 121%
1,3-DICHLOROBENZENE	N.D.	---
1,4-DICHLOROBENZENE	N.D.	---
1,2-DICHLOROBENZENE	N.D.	---
TOTAL XYLENES	N.D.	---
ACETONE	N.D.	---
METHYL ETHYL KETONE	N.D.	---
METHYL ISOBUTYL KETONE	N.D.	---

ChromaLab, Inc.


Mary Cappelli
Analytical Chemist


Eric Tam
Lab Director

CHROMALAB, INC.

Environmental Laboratory (1094)

5 DAYS TURNAROUND

November 23, 1992

ChromaLab File No.: 1192132

REVISED May 5, 1993

JONAS & ASSOCIATES, INC.

Attn: Mark L. Jonas

RE: One water sample for Total CAM 17 Metals analyses
(CA Title 22)

Project Name: 9201 PACO PUMPS

Project Number: PCO-220-02-REM

Date Sampled: Nov. 15, 1992

Date Submitted: Nov. 16, 1992

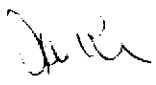
Date Analyzed: Nov. 18, 1992

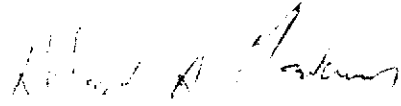
RESULTS: Sample I.D.: GW9-MW1-Q1

Metals	Concentration (mg/L)	Detection Limit (mg/L)
Antimony (Sb)	N.D.	0.020
Arsenic (As)	N.D.	0.005
Barium (Ba)	0.18	0.005
Beryllium (Be)	0.002	0.001
Cadmium (Cd)	N.D.	0.001
Cobalt (Co)	N.D.	0.01
Chromium (Cr)	N.D.	0.01
Copper (Cu)	0.007	0.005
Lead (Pb)	N.D.	0.010
Mercury (Hg)	N.D.	0.001
Molybdenum (Mo)	N.D.	0.005
Nickel (Ni)	N.D.	0.020
Selenium (Se)	0.021	0.01
Silver (Ag)	N.D.	0.005
Thallium (Tl)	N.D.	0.01
Vanadium (V)	N.D.	0.01
Zinc (Zn)	N.D.	0.005

Method of Analysis: 3010/6010/7470

ChromaLab, Inc.


Jack Kelly
Analytical Chemist


Refaat Mankarious
Inorganic Supervisor

cc

CHROMALAB, INC.

Environmental Laboratory (1094)

5 DAYS TURNAROUND

November 21, 1992

ChromaLab File No.:1192132

Jonas & Associates, Inc.

Attn: Mark Jonas

RE: One water sample for PCB analysis.

Project Name: 9201 PACO Pumps

Project No.: PCO-220-02-REM

Date Sampled: Nov. 15, 1992

Date Submitted: Nov. 16, 1992


Date Analyzed: Nov. 20, 1992


RESULTS:

<u>SAMPLE I.D.</u>	<u>PCB (mg/L)</u>
MW-1	N.D.

BLANK	N.D.
SPIKE RECOVERY	98%
DUPLICATE SPIKE RECOVERY	103%
DETECTION LIMIT	0.05
METHOD OF ANALYSIS	608

ChromaLab, Inc.


Yiu Tam
Analytical Chemist


Eric Tam
Laboratory Director

CHROMALAB, INC.

Environmental Laboratory (1094)

5 DAYS TURNAROUND

March 17, 1993

ChromaLab File No.: 0393129
REVISED April 16, 1993

JONAS & ASSOCIATES, INC.

Attn: Mark Jonas / Jeff Sullivan, R.G.

RE: Three water samples for Gasoline and BTEX analysis

Project Name: 9201 PACO PUMPS

Project Number: PCO-220-02

Date Sampled: Mar. 9, 1993


Date Submitted: Mar. 10, 1993


Date Analyzed: Mar. 16, 1993

RESULTS:

Sample I.D.	Gasoline ($\mu\text{g/L}$)	Benzene ($\mu\text{g/L}$)	Toluene ($\mu\text{g/L}$)	Ethyl Benzene ($\mu\text{g/L}$)	Total Xylenes ($\mu\text{g/L}$)
GW9-MW2-Q2	N.D.	N.D.	N.D.	N.D.	N.D.
GW9-MW3-Q2	12000	1000	300	110	170
GW9-MW4-Q2	750	67	12	29	62
BLANK	N.D.	N.D.	N.D.	N.D.	N.D.
SPIKE RECOVERY	88%	100%	105%	101%	101%
DUP SPIKE RECOVERY	----	100%	101%	97%	97%
DETECTION LIMIT	50	0.5	0.5	0.5	0.5
METHOD OF ANALYSIS	5030/8015	602	602	602	602

ChromaLab, Inc.


Billy Thach
Analytical Chemist


Eric Tam
Laboratory Director

cc

CHROMALAB, INC.

Environmental Laboratory (1094)

5 DAYS TURNAROUND

March 18, 1993

ChromaLab File No.: 0393129

JONAS & ASSOCIATES, INC.

Attn: Mark Jonas / Jeff Sullivan, R.G.

RE: Four water samples for TEPH analysis

Project Name: 9201 PACO PUMPS

Project Number: PCO-220-02

Date Sampled: Mar. 9, 1993

Date Submitted: Mar. 10, 1993

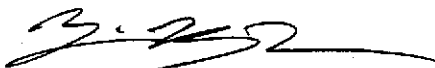
Date Extracted: Mar. 16, 1993

Date Analyzed: Mar. 17, 1993

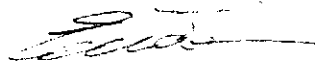
RESULTS:

Sample I.D.	Kerosene (µg/L)	Diesel (µg/L)	Motor Oil (mg/L)
GW9-MW1-Q2	N.D.	140	N.D.
GW9-MW2-Q2	210	430	4.3
GW9-MW3-Q2	N.D.	290	N.D.
GW9-MW4-Q2	N.D.	N.D.	N.D.
BLANK	N.D.	N.D.	N.D.
SPIKE RECOVERY	----	108%	----
DUP SPIKE RECOVERY	----	91%	----
DETECTION LIMIT	50	50	0.5
METHOD OF ANALYSIS	3510/8015	3510/8015	3510/8015

ChromaLab, Inc.



Yiu Tam
Analytical Chemist



Eric Tam
Laboratory Director

cc

CHROMALAB, INC.

Environmental Laboratory (1094)

5 DAYS TURNAROUND

March 16, 1993

ChromaLab File No.: 0393129

Jonas & Associates, Inc.

Attn: Mark Jonas / Jeff Sullivan, R.G.

RE: One water sample for chlorinated pesticides analysis by EPA 608 method.

Project Name: 9201 PACO PUMPS

Project Number: PCO-220-02

Date Sampled: Mar. 9, 1993

Date Submitted: Mar. 10, 1993

Date Extracted: Mar. 15, 1993

Date Analyzed: Mar. 15, 1993

Dilution Factor: None

Sample I.D.: GW9-MW1-Q2

CHLORINATED PESTICIDE ANALYSIS

<u>Compounds</u>	<u>Concentration ($\mu\text{g/L}$)</u>	<u>Reporting Detection Limit ($\mu\text{g/L}$)</u>
ALDRIN	N.D.	.10
DIELDRIN	N.D.	.10
ENDRIN ALDEHYDE	N.D.	.50
ENDRIN	N.D.	.10
HEPTACHLOR	N.D.	.10
HEPTACHLOR EPOXIDE	N.D.	.10
p,p' - DDT	N.D.	.50
p,p' - DDE	N.D.	.10
p,p' - DDD	N.D.	.50
ENDOSULFAN I	N.D.	.50
ENDOSULFAN II	N.D.	.50
α - BHC	N.D.	.10
β - BHC	N.D.	.10
γ - BHC (LINDANE)	N.D.	.10
δ - BHC	N.D.	.10
ENDOSULFAN SULFATE	N.D.	.50
p,p' - METHOXYCHLOR	N.D.	.50
TOXAPHENE	N.D.	.50
PCB'S	N.D.	.50
CHLORDANE	N.D.	.50

ChromaLab, Inc.


Yiu Tam
Analytical Chemist


Eric Tam
Laboratory Director

CHROMALAB, INC.

Environmental Laboratory (1094)

5 DAYS TURNAROUND

March 16, 1993

ChromaLab File # 0393129


JONAS & ASSOCIATES, INC. Attn: Mark Jonas / Jeff Sullivan, R.G.


Project Name: 9201 PACO PUMPS
Date Sampled: Mar. 9, 1993
Date Submitted: Mar. 10, 1993
Date of Analysis: March 17, 1993
Sample I.D.: GW9-MW2-Q2

Project No: PCO-220-02
Method of Analysis: EPA 624
Matrix: Water
Reporting Limit: 2.0 µg/L
Dilution Factor: None

COMPOUND NAME	µg/L	Spike Recovery
CHLOROMETHANE	N.D.	---
VINYL CHLORIDE	N.D.	---
BROMOMETHANE	N.D.	---
CHLOROETHANE	N.D.	---
TRICHLOROFLUOROMETHANE	N.D.	---
1,1-DICHLOROETHENE	N.D.	103% 100%
METHYLENE CHLORIDE	N.D.	---
1,2-DICHLOROETHENE (TRANS)	N.D.	---
1,2-DICHLOROETHENE (CIS)	N.D.	---
1,1-DICHLOROETHANE	N.D.	---
CHLOROFORM	N.D.	---
1,1,1-TRICHLOROETHANE	N.D.	---
CARBON TETRACHLORIDE	N.D.	---
1,2-DICHLOROETHANE	N.D.	---
BENZENE	N.D.	---
TRICHLOROETHENE	N.D.	104% 100%
1,2-DICHLOROPROPANE	N.D.	---
BROMODICHLOROMETHANE	N.D.	---
2-CHLOROETHYLVINYLEETHER	N.D.	---
TRANS-1,3-DICHLOROPROPENE	N.D.	---
TOLUENE	N.D.	---
CIS-1,3-DICHLOROPROPENE	N.D.	---
1,1,2-TRICHLOROETHANE	N.D.	---
TETRACHLOROETHENE	N.D.	102% 98%
DIBROMOCHLOROMETHANE	N.D.	---
CHLOROBENZENE	N.D.	---
ETHYL BENZENE	N.D.	---
BROMOFORM	N.D.	---
1,1,2,2-TETRACHLOROETHANE	N.D.	109% 108%
1,3-DICHLOROBENZENE	N.D.	---
1,4-DICHLOROBENZENE	N.D.	---
1,2-DICHLOROBENZENE	N.D.	---
TOTAL XYLENES	N.D.	---
ACETONE	N.D.	---
METHYL ETHYL KETONE	N.D.	---
METHYL ISOBUTYL KETONE	N.D.	---

ChromaLab, Inc.


David Wintergrass
Analytical Chemist
do


Eric Tam
Laboratory Director

CHROMALAB, INC.

Environmental Laboratory (1094)

5 DAYS TURNAROUND

March 17, 1993

ChromaLab File No.: 0393129

JONAS & ASSOCIATES, INC.

Attn: Mark Jonas / Jeff Sullivan, R.G.

RE: One water sample for Selenium analysis

Project Name: 9201 PACO PUMPS

Project Number: PCO-220-02

Date Sampled: Mar. 9, 1993

Date Submitted: Mar. 10, 1993

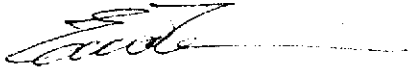
Date Analyzed: Mar. 16, 1993

RESULTS:

<u>Sample I.D.</u>	<u>Selenium (mg/L)</u>
GW9-MW2-02	0.08
BLANK	N.D.
DETECTION LIMIT	0.005
METHOD OF ANALYSIS	3010/6010

ChromaLab, Inc.

Refaat A. Mankarious
Refaat A. Mankarious
Inorganic Supervisor


Eric Tam
Laboratory Director

cc

CHROMALAB, INC.

Environmental Laboratory (1094)

5 DAYS TURNAROUND

March 17, 1993

ChromaLab File No.: 0393129

JONAS & ASSOCIATES, INC.

Attn: Mark Jonas / Jeff Sullivan, R.G.

RE: One water sample for Total CAM 17 Metals analyses
(CA Title 22)

Project Name: 9201 PACO PUMPS

Project Number: PCO-220-02

Date Sampled: Mar. 9, 1993

Date Submitted: Mar. 10, 1993

Date Analyzed: Mar. 16, 1993

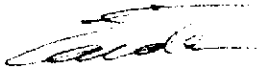
RESULTS: Sample I.D.: GW9-MW1-Q2

<u>Metals</u>	<u>Concentration</u> (mg/L)	<u>Detection</u> <u>Limit</u> (mg/L)
Antimony (Sb)	0.03	0.020
Arsenic (As)	N.D.	0.005
Barium (Ba)	0.19	0.005
Beryllium (Be)	N.D.	0.001
Cadmium (Cd)	N.D.	0.001
Cobalt (Co)	N.D.	0.01
Chromium (Cr)	N.D.	0.01
Copper (Cu)	N.D.	0.005
Lead (Pb)	N.D.	0.010
Mercury (Hg)	0.003	0.001
Molybdenum (Mo)	N.D.	0.005
Nickel (Ni)	N.D.	0.02
Selenium (Se)	0.04	0.01
Silver (Ag)	N.D.	0.005
Thallium (Tl)	N.D.	0.01
Vanadium (V)	N.D.	0.01
Zinc (Zn)	0.03	0.005

Method of Analysis: 3010/6010/7470

ChromaLab, Inc.

Refaat A. Mankarious
Inorganic Supervisor


Eric Tam
Laboratory Director

cc

CHROMALAB, INC.

Environmental Laboratory (1094)

5 DAYS TURNAROUND

July 29, 1993

ChromaLab File No.: 9307232
Submission #: 9307000232

JONAS & ASSOCIATES, INC.

Attn: M. Jonas/J. Sullivan

RE: Three water samples for Gasoline and BTEX analysis

Project Name: 9201 PACO PUMPS

Project Number: PCO-220-0

Date Sampled: July 21, 1993

Date Submitted: July 22, 1993

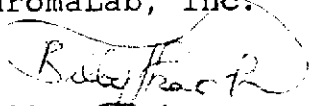
Date Analyzed: July 28, 1993

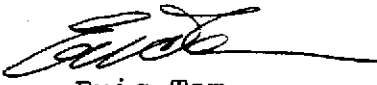
RESULTS:

Sample I.D.	Gasoline ($\mu\text{g/L}$)	Benzene ($\mu\text{g/L}$)	Toluene ($\mu\text{g/L}$)	Ethyl Benzene ($\mu\text{g/L}$)	Total Xylenes ($\mu\text{g/L}$)
GW9-MW2-Q3 ³	3400	420	63	36	37
GW9-MW3-Q3 ²	N.D.	N.D.	N.D.	N.D.	N.D.
GW9-MW4-Q3	250	21	4.2	8.4	11

BLANK	N.D.	N.D.	N.D.	N.D.	N.D.
SPIKE RECOVERY	103%	82%	94%	94%	95%
DUP SPIKE RECOVERY	---	86%	94%	96%	95%
DETECTION LIMIT	50	0.5	0.5	0.5	0.5
METHOD OF ANALYSIS	5030/8015	602	602	602	602

ChromaLab, Inc.


Billy Thach
Analytical Chemist


Eric Tam
Laboratory Director

do

CHROMALAB, INC.

Environmental Laboratory (1094)

5 DAYS TURNAROUND

July 29, 1993

ChromaLab File No.: 9307232

Submission #: 9307000232

JONAS & ASSOCIATES, INC.

Attn: M. Jonas/J. Sullivan

RE: Four water samples for TEPH analysis

Project Name: 9201 PACO PUMPS

Project Number: PCO-220-0

Date Sampled: July 21, 1993

Date Submitted: July 22, 1993


Date Extracted: July 27, 1993

Date Analyzed: July 28, 1993

RESULTS:

Sample I.D.	Kerosene ($\mu\text{g/L}$)	Diesel ($\mu\text{g/L}$)	Motor Oil (mg/L)
GW9-MW1-Q3	N.D.	N.D.	N.D.
GW9-MW2-Q3	N.D.	N.D.	N.D.
GW9-MW3-Q3	N.D.	N.D.	0.52
GW9-MW4-Q3	N.D.	N.D.	N.D.
BLANK	N.D.	N.D.	N.D.
SPIKE RECOVERY	---	79%	---
DUP SPIKE RECOVERY	---	84%	---
DETECTION LIMIT	50	50	0.5
METHOD OF ANALYSIS	3510/8015	3510/8015	3510/8015

ChromaLab, Inc.


Alex Tam
Analytical Chemist


Eric Tam
Laboratory Director

do

CHROMALAB, INC.

Environmental Laboratory (1094)

5 DAYS TURNAROUND

July 29, 1993

JONAS & ASSOCIATES, INC.


ChromaLab File # 9307232
Submission #: 9307000232
Attn: M. Jonas/J. Sullivan


Project Name: 9201 PACO PUMPS
Date Sampled: July 21, 1993
Date Submitted: July 22, 1993
Date of Analysis: July 28, 1993
Sample I.D.: GW9-MW₃-Q3

Project No: PCO-220-0
Method of Analysis: EPA 624
Matrix: Water
Reporting Limit: 2.0 µg/L
Dilution Factor: None

COMPOUND NAME	µg/L	Spike Recovery
CHLOROMETHANE	N.D.	---
VINYL CHLORIDE	N.D.	---
BROMOMETHANE	N.D.	---
CHLOROETHANE	N.D.	---
TRICHLOROFLUOROMETHANE	N.D.	---
1,1-DICHLOROETHENE	N.D.	83% 80%
METHYLENE CHLORIDE	N.D.	---
1,2-DICHLOROETHENE (TRANS)	N.D.	---
1,2-DICHLOROETHENE (CIS)	N.D.	---
1,1-DICHLOROETHANE	N.D.	---
CHLOROFORM	N.D.	---
1,1,1-TRICHLOROETHANE	N.D.	---
CARBON TETRACHLORIDE	N.D.	---
1,2-DICHLOROETHANE	330	---
BENZENE	450	---
TRICHLOROETHENE	2.4	106% 110%
1,2-DICHLOROPROPANE	N.D.	---
BROMODICHLOROMETHANE	N.D.	---
2-CHLOROETHYLVINYLEETHER	N.D.	---
TRANS-1,3-DICHLOROPROPENE	N.D.	---
TOLUENE	50	---
CIS-1,3-DICHLOROPROPENE	N.D.	---
1,1,2-TRICHLOROETHANE	N.D.	---
TETRACHLOROETHENE	N.D.	110% 114%
DIBROMOCHLOROMETHANE	N.D.	---
CHLOROBENZENE	N.D.	---
ETHYL BENZENE	49	---
BROMOFORM	N.D.	---
1,1,2,2-TETRACHLOROETHANE	N.D.	107% 107%
1,3-DICHLOROBENZENE	N.D.	---
1,4-DICHLOROBENZENE	N.D.	---
1,2-DICHLOROBENZENE	N.D.	---
TOTAL XYLENES	47	---
ACETONE	N.D.	---
METHYL ETHYL KETONE	N.D.	---
METHYL ISOBUTYL KETONE	N.D.	---

ChromaLab, Inc.


David Wintergrass
Analytical Chemist


Eric Tam
Laboratory Director

dt

CHROMALAB, INC.

Environmental Laboratory (1094)

5 DAYS TURNAROUND

July 29, 1993

ChromaLab File No.: 9307232
Submission #: 9307000232

JONAS & ASSOCIATES, INC.

Attn: M. Jonas/J. Sullivan

RE: One water sample for Total CAM 17 Metals analyses
(CA Title 22)

Project Name: 9201 PACO PUMPS
Project Number: PCO-220-0
Date Sampled: July 21, 1993
Date Analyzed: July 28, 1993

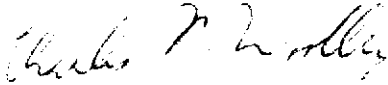
Date Submitted: July 22, 1993

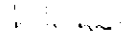
RESULTS: Sample I.D.: GW9-MW1-Q3

<u>Metals</u>	<u>Concentration</u> (mg/L)	<u>Detection</u> <u>Limit</u> (mg/L)
Antimony (Sb)	N.D.	0.020
Arsenic (As)	N.D.	0.005
Barium (Ba)	0.27	0.005
Beryllium (Be)	N.D.	0.001
Cadmium (Cd)	N.D.	0.001
Cobalt (Co)	N.D.	0.01
Chromium (Cr)	N.D.	0.01
Copper (Cu)	0.007	0.005
Lead (Pb)	N.D.	0.010
Mercury (Hg)	N.D.	0.001
Molybdenum (Mo)	0.010	0.005
Nickel (Ni)	N.D.	0.020
Selenium (Se)	N.D.	0.01
Silver (Ag)	0.011	0.005
Thallium (Tl)	N.D.	0.01
Vanadium (V)	N.D.	0.01
Zinc (Zn)	0.015	0.005

Method of Analysis: 3010/6010/7470

ChromaLab, Inc.


Charles Woolley
Analytical Chemist


Refaat A. Mankarious
Inorganic Supervisor

do

CHROMALAB, INC.

Environmental Laboratory (1094)

5 DAYS TURNAROUND

July 29, 1993

ChromaLab File No.: 9307232
Submission #: 9307000232

JONAS & ASSOCIATES, INC.

Attn: M. Jonas/J. Sullivan

RE: Two water samples for Soluble Selenium analysis

Project Name: 9201 PACO PUMPS

Project Number: PCO-220-0

Date Sampled: July 21, 1993

Date Submitted: July 22, 1993

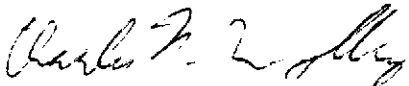
Date Analyzed: July 28, 1993


RESULTS:

<u>Sample I.D.</u>	<u>Selenium (mg/L)</u>
GW9-MW2-Q3	N.D.
GW9-MW3-Q3	N.D.

BLANK	N.D.
DETECTION LIMIT	0.01
METHOD OF ANALYSIS	3010/6010

ChromaLab, Inc.


Charles Woolley
Analytical Chemist


Refaat A. Mankarious
Inorganic Supervisor

do

Appendix D
Monitoring Well Documentation

Table D-1
Monitoring Well Survey Data
PACO PUMPS - 9201 San Leandro Street
Oakland, California

Well	Easting	Northing	M.S.L. Elevation
9MW1	1512710.22	456699.01	Top PVC: 15.51'
9MW2	1512968.11	456507.34	Top PVC: 16.83'
9MW3	1512963.22	456602.8	Top PVC: 17.13'
9MW4	1513102.34	456789.38	Top PVC: 17.08'

Legend - M.S.L.: Mean Sea Level
Top PVC: Top north edge of PVC casing.

Table D-2
Groundwater Levels and Free Product Measurements
PACO PUMPS - 9201 San Leandro Street
Oakland, California

Date	Well ID	Water Level from Lid/Pavement:		Pavement vs. Casing Top Δ	Water Level from Top of Casing:		Free Product
		Depth	Elevation		Depth	Elevation	
11/15/92	9MW1	9.74'	6.17'	0.40'	9.34'	6.17'	no free product
11/16/92	9MW2	10.45'	6.78'	0.40'	10.05'	6.78'	"oily" sheen
"	9MW3	10.64'	6.78'	0.29'	10.35'	6.78'	no free product
"	9MW4	9.41'	8.21'	0.54'	8.87'	8.21'	no free product
3/9/93	9MW1	8.90'	7.01'	0.40'	8.50'	7.01'	no free product
"	9MW2	9.61'	7.62'	0.40'	9.21'	7.62'	"oily" sheen
"	9MW3	9.48'	7.94'	0.29'	9.19'	7.94'	slight "oily" sheen
"	9MW4	8.50'	9.12'	0.54'	7.96'	9.12'	slight "oily" sheen
7/21/93	9MW1	9.40'	6.51'	0.40'	9.00'	6.51'	no free product
"	9MW2 ¹	10.12'	7.11'	0.40'	9.72'	7.11'	"oily" sheen
"	9MW3 ¹	11.36'	6.06'	0.29'	11.07'	6.06'	"oily" sheen
"	9MW4	8.60'	9.02'	0.54'	8.06'	9.02'	no free product

Notes - » ¹ = probably corrected, apparently switched.
» Elevation with respect to Mean Sea Level (MSL) and Kier & Wright survey.



ZONE 7 WATER AGENCY

5997 PARKSIDE DRIVE

PLEASANTON, CALIFORNIA 94588

VOICE (510) 484-2800

FAX (510) 482-3914

DRILLING PERMIT APPLICATION

FOR APPLICANT TO COMPLETE

FOR OFFICE USE

LOCATION OF PROJECT PACO PUMPS
9201 San Leandro Street (near 92nd Ave.)
Oakland, California 94603

PERMIT NUMBER 92543
LOCATION NUMBER _____

CLIENT
Name PACO PUMPS INC. 845-92nd Avenue
Address P.O. Box 12924 Phone (510) 521-8780 (Scott Liddicoat)
City Oakland, California Zip 94604-2924

PERMIT CONDITIONS

Circled Permit Requirements Apply

APPLICANT
Name Jonas and Associates Inc.
attn: Mark L. Jonas
Address 1056 Dale Place Phone (510) 676-8554
City Concord, California Zip 94518

A. GENERAL

1. A permit application should be submitted so as to arrive at the Zone 7 office five days prior to proposed starting date.
2. Submit to Zone 7 within 60 days after completion of permitted work the original Department of Water Resources Water Well Drillers Report or equivalent for well Projects, or drilling logs and location sketch for geotechnical projects.
3. Permit is void if project not begun within 90 days of approval date.

B. WATER WELLS, INCLUDING PIEZOMETERS

1. Minimum surface seal thickness is two inches of cement grout placed by tremie.
2. Minimum seal depth is 50 feet for municipal and industrial wells or 20 feet for domestic and irrigation wells unless a lesser depth is specially approved. Minimum seal depth for monitoring wells is the maximum depth practicable or 20 feet.

C. GEOTECHNICAL. Backfill bore hole with compacted cuttings or heavy bentonite and upper two feet with compacted material. In areas of known or suspected contamination, tremied cement grout shall be used in place of compacted cuttings.

D. CATHODIC. Fill hole above anode zone with concrete placed by tremie.

E. WELL DESTRUCTION. See attached.

TYPE OF PROJECT
 Construction
 Cathodic Protection
 Water Supply
 Monitoring x 4
 Geotechnical Investigation
 General
 Contamination
 Well Destruction

PROPOSED WATER SUPPLY WELL USE
 Domestic
 Industrial
 Other
 Municipal
 Irrigation
 not a water supply well, possibly used for remediation if it is necessary.

DRILLING METHOD:
 Conventional Rotary
 Air Rotary
 Other
 Auger

DRILLER'S LICENSE NO. C-57 #607458

WELL PROJECTS
Drill Hole Diameter 8.5 in. Maximum
Casing Diameter 4 in. Depth 20-30 ft.
Surface Seal Depth 4 ft. Number 4

GEOTECHNICAL PROJECTS
Number of Borings _____ Maximum
Hole Diameter _____ in. Depth _____ ft.

ESTIMATED STARTING DATE 11/3/1992
ESTIMATED COMPLETION DATE 11/5/1992

I hereby agree to comply with all requirements of this permit and Alameda County Ordinance No. 73-68.

Approved Wyman Hong Date 29 Oct 92
Wyman Hong

APPLICANT'S SIGNATURE Mark L. Jonas Date 10/26/92
Mark L. Jonas (J&A)

DRILLING & CONSTRUCTION WELL LOG

Well #: **9 M W 1**
 Site: PACO Pumps
 9201 San Leandro St.
 Sheet: 1 of 1

Driller: Advance Drilling Co. Inc. Rig: CME-75 Method: Hollow Stem Auger
 Started: November 4, 1992 Finished: November 4, 1992 Location: N. of Mnft. Bldg.
 Elevation: Top PVC: 15.51'; Lid/PVT: 15.91' Boring Depth: 21 feet bgs Screen Depth: 5.25'-20.25'bgs
 Field Supervisor: Mark Jonas Supervising Engineer/Geologist: Dr. Jeff Sullivan, R.G.
 Note: _____

Construction Details	Depth Below Surface (ft.)	Sample Depth Interval (ft.)	Lab. Sample I.D. #	G.W. Depth drilling w/casing	Graphic Log	Soil Description & Classification	Notes
	0	0-0.5	-0.5			0-2': SILTY GRAVEL (GM): ~20% grayish brown (5YR 3/2) silt; ~80% subangular/subrounded gravels.	0-2': Surfacing. 2'-2': fill.
	5	5-5	-5			2'-5': GRAVELLY SANDY CLAY (CL): ~15% subangular/subrounded gravels; ~35% sand; ~50% dusky yellowish brown (10YR 2/2) clay.	2'-5': probably fill.
	10	10-10	-10	▼		5'-9': SANDY CLAY (CL): ~20% subangular/subrounded sand; ~80% moderately plastic dusky yellowish brown (10YR 2/2) clay.	9.74': Well water level on 11/15/92.
	15	15-15	-15	▼		9'-21': SANDY CLAY (CL): ~20% subangular/subrounded sand; 80% moderately plastic dark yellowish brown (10YR 4/2) clay.	~16': First Water on 11/4/92.
	20					Base of borehole.	

9MW1 Well Log

Figure D-1

DRILLING & CONSTRUCTION WELL LOG

Well #: **9 M W 2**
 Site: PACO Pumps
 9201 San Leandro St.
 Sheet: 1 of 1

Driller: Advance Drilling Co. Inc. Rig: CME-75 Method: Hollow Stem Auger
 Started: November 3, 1992 Finished: November 3, 1992 Location: Welding Shop
 Elevation: Top PVC: 16.83'; Lid/PVT: 17.23' Boring Depth: 21 feet bgs Screen Depth: 5.25'-20.25'bgs
 Field Supervisor: Mark Jonas Supervising Engineer/Geologist: Dr. Jeff Sullivan, R.G.
 Note: _____

Construction Details	Depth Below Surface (ft.)	Sample Depth Interval (ft.)	Lab. Sample I.D. #	G.W. Depth drilling w/casing	Graphic Log	Soil Description & Classification	Notes
	<p>0' 5' 10' 15' 20' 25' 30' 35'</p>	<p>0-0.5' 0.5-1.5' 1.5-5' 5-10' 10-15' 15-20.25'</p>	<p>-0.5' -1.5' -5' -10' -15'</p>	<p>10.45'</p>		<p>2'-4': GRAVELLY SILTY SAND (SM): <5% gravel; ~25% dusky yellowish brown (10YR 2/2) silt; ~70% subangular/subrounded sand.</p> <p>4'-12': SANDY CLAY (CL): ~15 subrounded/sub-angular sand; ~85% moderately plastic dusky yellowish brown (10YR 2/2) clay.</p> <p>12'-21': SANDY CLAY (CL): ~25 subrounded/sub-angular sand; ~75% moderately plastic dark yellowish brown (10YR 4/2) clay.</p>	<p>0-2': Surfacing. 2'-4': possibly till.</p> <p>10.45': Well water level on 11/16/92.</p>


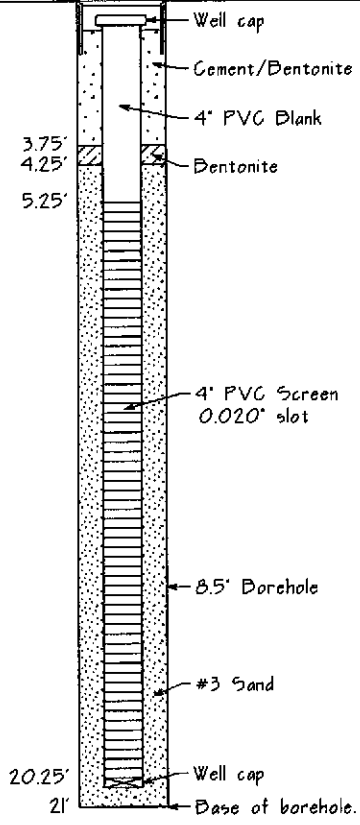
DRILLING & CONSTRUCTION WELL LOG

Well #: **9 MW 3**

Site: PACO Pumps
9201 San Leandro St.

Sheet: 1 of 1

Driller: Advance Drilling Co. Inc. Rig: CME-75 Method: Hollow Stem Auger
 Started: November 4, 1992 Finished: November 4, 1992 Location: Former Excavation
 Elevation: Top PVC: 17.13'; Lid/PVT: 17.42' Boring Depth: 21 feet bgs Screen Depth: 5.25'-20.25'bgs
 Field Supervisor: Mark Jonas Supervising Engineer/Geologist: Dr. Jeff Sullivan, R.G.
 Note: Soil at depths of 21' to 30' from pilot boring PB-MW3, adjacent to 9MW3.

Construction Details	Depth Below Surface (ft.)	Sample Depth Interval (ft.)	Lab. Sample I.D. #	G.W. Depth  drilling w/casing	Graphic Log	Soil Description & Classification	Notes
 <p>Well cap Cement/Bentonite 4' PVC Blank Bentonite 3.75' 4.25' 5.25' 4' PVC Screen 0.020" slot 8.5" Borehole #3 Sand Well cap 21' Base of borehole.</p>	0-35'					<p>3'-2': GRAVELLY SILTY SAND (SM): ~25% gravel; ~25% dusky yellowish brown (10YR 2/2); ~50% sand.</p> <p>2'-5': SANDY CLAY (CL): ~30% subrounded/sub-angular sand; ~70% moderately plastic dusky yellowish brown (10YR 2/2) clay.</p> <p>5'-10': SANDY CLAY (CL): ~20% subrounded/sub-angular sand; ~80% moderately plastic dusky yellowish brown (10YR 2/2) clay.</p> <p>10'-15': SANDY CLAY (CL): ~25% subrounded/sub-angular sand; ~75% moderately plastic dark yellowish brown (10YR 4/2) clay.</p> <p>15'-21': SANDY CLAY (CL): ~20% subrounded/sub-angular sand; ~80% moderately plastic dark yellowish brown (10YR 4/2) clay.</p> <p>21'-30': SANDY CLAY (CL): ~20% subrounded/sub-angular sand; ~80% moderately plastic dark yellowish brown (10YR 4/2) clay.</p>	<p>0-3': Surfacing. 3'-2': possibly fill.</p> <p>10.64': Well water level on 11/16/92.</p> <p>21' Base 9MW3.</p> <p>From PB-MW3.</p> <p>30' Base PB-MW3.</p>
			B-MW3-				

9MW3 Well Log

Figure D-3

DRILLING & CONSTRUCTION WELL LOG

Well #: **9 M W 4**
 Site: **PACO Pumps**
 9201 San Leandro St.
 Sheet: 1 of 1

Driller: Advance Drilling Co. Inc. Rig: CME-75 Method: Hollow Stem Auger
 Started: November 9, 1992 Finished: November 9, 1992 Location: Inside Warehouse
 Elevation: Top PVC: 17.08'; Lid/PVT: 17.62' Boring Depth: 21 feet bgs Screen Depth: 5.25'-20.25'bgs
 Field Supervisor: Mark Jonas Supervising Engineer/Geologist: Dr. Jeff Sullivan, R.G.
 Note: Cored 1.25' through floor of building: concrete (6"), rock (6"), & asphalt (3").

Construction Details	Depth Below Surface (ft.)	Sample Depth Interval (ft.)	Lab. Sample I.D. #	G.W. Depth <input checked="" type="checkbox"/> drilling <input checked="" type="checkbox"/> w/casing	Graphic Log	Soil Description & Classification	Notes
	0-21					0-1.25': Floor & sub-base: concrete; rock; asphalt. 1.25'-2': SANDY CLAY (CL): ~20% sand; ~80% olive black (5YR 2/1) clay. 2'-5': SANDY CLAY (CL): ~25% sand; ~75% moderately plastic dusky yellowish brown (10YR 2/2) clay. 5'-10': SANDY CLAY (CL): ~15% sand; ~85% moderately plastic dusky yellowish brown (10YR 2/2) clay. 10'-13': SANDY CLAY (CL): ~30% sand; ~70% moderately plastic dark yellowish brown (10YR 4/2) clay. 13'-18.5': SANDY CLAY (CL): ~25% sand; ~75% moderately plastic dark yellowish brown (10YR 4/2) clay. 18.5'-21': SANDY CLAY (CL): ~20% sand; ~80% moderately plastic dark yellowish brown (10YR 4/2) clay. Base of borehole.	0-1.25': Floor & Sub-base. 9.41': Well water level on 11/16/92. 13.5': First water on 11/9/92.
	3.75'						
	4.25'						
	5.25'						
	10'						
	15'						
	20'						
	21'						
	25'						
	30'						
	35'						

9MW4 Well Log

Figure D-4

CONFIDENTIAL

STATE OF CALIFORNIA DWR
WELL COMPLETION REPORT
(WELL LOGS)

REMOVED

CONFIDENTIAL

STATE OF CALIFORNIA DWR
WELL COMPLETION REPORT
(WELL LOGS)

REMOVED

CONFIDENTIAL

STATE OF CALIFORNIA DWR
WELL COMPLETION REPORT
(WELL LOGS)

REMOVED

CONFIDENTIAL

STATE OF CALIFORNIA DWR
WELL COMPLETION REPORT
(WELL LOGS)

REMOVED

Appendix E

Well Survey Documentation



KIER & WRIGHT
Civil Engineers & Surveyors, Inc.

August 25, 1993
Job No. 93552

Table of Elevation & Coordinates
On
Monitoring Wells
Paco Pumps Facility
845 92nd Avenue - Oakland, CA
9201 San Leandro Avenue - Oakland, CA

<u>Well No.</u>	<u>Northing</u>	<u>Easting</u>	<u>Elevation</u>
8 MW-1	457478.76	1513485.26	17.60 Cut notch on top North edge of PVC casing
8 MW-2	457627.58	1513797.62	19.07 Cut notch on top North edge of PVC casing
9 MW-1	456699.01	1512710.22	15.51 Cut notch on top North edge of PVC casing
9 MW-2	456507.34	1512968.11	16.83 Cut notch on top North edge of PVC casing
9 MW-3	456602.8	1512963.22	17.13 Cut notch on top North edge of PVC casing
9 MW-4	456789.38	1513102.34	17.08 Cut notch on top North edge of PVC casing

Benchmark:

City of Oakland Benchmark Number 721, cut square in North curb 92nd Avenue, 10 feet East of the Northeast corner of 92nd Avenue and G Street.

Elevation = 19.415 M.S.L.

Basis of Bearings and Coordinates:

The bearing North 60° 36' 22" East taken on the monument line of 92nd Avenue between the City of Oakland Monument located at the intersection of 92nd Avenue and G Street (coordinate values North 457,577.52 / East 1,514,029.15) and the City of Oakland Monument located at the intersection of 92nd Avenue and E Street (coordinate values North 457,937.52 / East 1,514,668.21) was taken as the basis of all bearings and coordinates shown hereon.



KIER & WRIGHT
Civil Engineers & Surveyors, Inc.

August 25, 1993
Job No. 93552

Mr. Mark L. Jonas
Jonas & Associates, Inc.
Environmental Consultants
1056 Dale Place
Concord, California 94518
FAX 510/680-6511

RECEIVED
JA 8/30/93

RE: PACO PUMPS FACILITY

Dear Mark:

As you have requested we have surveyed the elevations on the top of the monitoring well covers at the Paco Pumps Facilities in Oakland. This site was surveyed to Mean Sea Level.

If we can be of further services or if you have any questions please do not hesitate to give us a call.

Sincerely,

KIER & WRIGHT

Tony McCants

Tony McCants

ACM/rl

Enclosure