Reviewed on 9/6+9/7/95 by AReed

Golder Associates Inc.

1451 Harbor Bay Pkwy., Suite 1000
Alameda, CA USA 94502
Telephone (510) 521-0400
Fax (510) 865-9618

Golder Associates

Soil and Groundwater Investigation
Petroleum Hydrocarbon Release

J & M Inc.
Hayward, California

Prepared for:

J & M Inc.
3826 Depot Road
Hayward, California

Prepared by:

Golder Associates Inc.
Alameda, California

REGISTERED PROFESSIONAL ENGINEER
DIANE LESKO SARMIENTO
No. 047804
Exp. 12/31/97
CIVIL
STATE OF CALIFORNIA

Kent R. Reynolds
Senior Hydrogeologist

Diane L. Sarmiento, P.E.
Senior Project Engineer

August 1995

943-7017

Golder Associates Inc.

1451 Harbor Bay Pkwy, Suite 1000
Alameda, CA USA 94502
Telephone (510) 521-0400
Fax (510) 865-9618

August 4, 1995

Our Ref: 943-7017

Alameda County Health Agency
Department of Environmental Health
1131 Harbor Bay Parkway
Alameda, California 94502

Attention: Ms. Amy Leech

RE: REPORT ON SOIL AND GROUNDWATER INVESTIGATION
J & M INC. FACILITY - HAYWARD, CALIFORNIA

Dear Ms. Leech:

On behalf of J & M Inc., Golder Associates Inc. is submitting this report on soil and groundwater investigations for the J & M Inc. facility located at 3836 Depot Road in Hayward, California.

The investigation was performed to assess the lateral and vertical extent of petroleum hydrocarbons released to soil and groundwater associated with former underground storage tanks used at the site.

Please contact the undersigned if you have any questions or comments.

Sincerely,

GOLDER ASSOCIATES INC.

Kent R. Reynolds
Senior Hydrogeologist

Diane L. Sarmiento, P.E.
Senior Project Engineer

cc: Mr. Manuel Marques, Jr.
J & M Inc., Hayward

9437017.L02

Table of Contents

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

1. INTRODUCTION

This report summarizes the findings of a petroleum hydrocarbon leak investigation performed by Golder Associates Inc. (Golder) at the J & M, Inc. facility (the site) located at 3826 Depot Road, Hayward, California (Figure 1). This investigation was performed in response to a letter from the Alameda County Department of Environmental Health (ACDEH) dated April 17, 1995 requiring definition of the horizontal and vertical extent of petroleum hydrocarbons in soil and groundwater at the site, and in accordance with the Workplan For Soil and Groundwater Investigation J & M, Inc. Facility Hayward, California dated May 1, 1995 prepared by Golder. The work plan was approved by the ACDEH on May 11, 1995.

1.1 Site Description

The site is located approximately 1.1 miles east of the San Francisco Bay and is situated at an elevation of approximately 8 feet above mean sea level. The site is used by J & M, a pipeline contractor, for equipment maintenance and administrative offices. Four underground gasoline and diesel storage tanks (USTs 1, 2, 3, and 4) were present at the site. UST Nos. 1 and 2 were reportedly installed in the early 1970's and taken out of service in the early 1980's. UST Nos. 3 and 4 were installed in the 1960's and removed from service in 1991. The land use in the vicinity of the site includes a mixture of commercial offices and small to medium-sized industrial businesses. The site is bordered on the east and west by automotive wrecking yards, on the south by a pallet storage business, and on the north by Depot Road and low-rise commercial office buildings.

1.2 Previous Investigations

In June 1990, one, 4,000-gallon and one, 7,000-gallon underground diesel storage tank (UST) (identified as Tank Nos. 1 and 2) were removed from the northwest corner of the J & M facility (Figure 2; Terrasearch, 1991). In August 1990, the area of the former USTs was re-excavated and four soil samples and one groundwater sample were collected and analyzed for total petroleum hydrocarbons as diesel (TPHd) and benzene, toluene, ethylbenzene and xylene (BTEX). The results of the analyses identified the presence of low concentrations of TPHd (110 milligrams per kilogram, mg/kg) and toluene (6.2 mg/kg) in one of the four soil samples. The other three soil samples were non-detect for TPHd and BTEX. TPHd and BTEX was also reported in a groundwater sample collected from the excavation pit at concentrations of 8100, 4.7, 9.1, 22 and 6 micrograms per liter (ug/l), respectively.

In April 1991, three groundwater monitoring wells (MW-1, MW-2 and MW-3) were installed and sampled by Terrasearch Inc. to assess the potential impact of residual hydrocarbons in soil on groundwater at the site (Figure 2). Soil samples were collected from depths of 5 and 10 feet during the construction of wells MW-1, MW-2, and MW-3. No TPHg, TPHd or BTEX was reported in these samples (J & M Inc., 1992). Two subsequent rounds of groundwater sampling were performed by Geoenvironmental and Geologic Services (GGS) in January 1992 and March 1993 (GGS, 1992, 1993). Prior to the investigation described in this report,

the most recent round of groundwater sampling was conducted in September 1993 (Golder, 1994).

Groundwater monitoring has been conducted at the J & M facility since April 1991. The results of historical groundwater elevation measurements indicates groundwater occurs at a depth of 5 to 7 feet and flows to the northwest towards San Francisco Bay.

The results of groundwater monitoring conducted to date indicate that TPHd (57 µg/l) has been detected on one occasion in one sample collected from well MW-2. In addition, the results of TPH as gasoline (TPHg) analyses conducted in April 1991 and September 1993 have been non-detect. BTEX has not been detected in any groundwater samples collected from wells MW-1, MW-2 and MW-3.

On July 25, 1994, two underground gasoline storage tanks (identified as UST Nos. 3 and 4) were removed from the site. Soil samples collected and analyzed from beneath the tanks contained TPHg and BTEX at maximum concentrations of 550, 1.5, 2.1, 7.1 and 26 mg/kg , respectively. Following the tank removals, additional soil was excavated laterally and beneath the tanks to an approximate depth of 10 feet. Additional soil samples were collected from a depth of approximately 5 feet approximately 25 feet west and 15 feet north of the former USTs Nos. 3 and 4 and in the excavation. Chemical Analysis results revealed the presence of TPHd and BTEX (Golder, 1994b). Chemical analysis results for samples collected from the excavation are included in Table 1.

2. SCOPE OF WORK

The scope of work completed for this investigation as outlined in the workplan (Golder, 1995) included:

- Drilling nine exploratory boreholes (B-1 through B-9, Figure 2). Soil samples were collected and analyzed to assist in defining the lateral and vertical extent of petroleum hydrocarbons in soil.

- Collecting groundwater samples from four of the exploratory boreholes (B-1, B-2, B-5 and B-8) and three existing monitoring wells (MW-1, MW-2 and MW-3) to evaluate the presence of TPH affected groundwater in the vicinity of former USTs (Figure 2).

- Observing of the removal of a diesel product pipeline associated with former USTs 1 and 2 and collecting of three soil samples (DPL-1, DPL-2 and DPL-3) to assess the presence of TPH affected soil beneath the pipeline (Figure 2).

- Collecting three soil samples (SP-1, SP-2, and SP-3) to assess the presence of TPH in stockpiled soil previously excavated during the removal of USTs 3 and 4 and collecting of two soil samples (SP-4 and SP-5) to assess the presence of TPH in soil overburden excavated during removal of the diesel product pipeline.

2.1 Soil and Groundwater Investigation

On May 22, 1995, a soil and insitu groundwater sampling program consisting of drilling and sampling of nine exploratory boreholes was conducted to evaluate the vertical and lateral extent of TPH affected soil and groundwater associated with a release or releases from UST Nos. 3 and 4. All work was performed under the supervision of a California Registered Professional Engineer. Boring locations are shown on Figure 2. Each boring was drilled to a depth of approximately 16 feet below ground surface (bgs).

Prior to the start of drilling, the location of proposed borings were marked and checked for underground utilities. Soil samples were collected to approximately 15 feet below ground surface (bgs) using Precision Environmental's continuous core rig. The continuous coring provided detailed information on the lithology and stratigraphic relationships at the site. Soil samples from each boring were logged using the Unified Soil Classification System. Soil samples were also screened in the field for organic vapors using an organic vapor meter (OVM). Borehole logs are included in Appendix A. Three soil samples from each boring were retained for chemical analysis of TPHg, TPHd and BTEX using EPA Test Methods 5030/8015, 3550/8015 and 8020, respectively. Soil samples selected for analysis were collected in stainless steel tubes, labeled, sealed with Teflon and plastic caps and placed on ice in a cooler. Samples were transmitted under chain-of-custody procedures to Superior Precision Analytical, Inc., a State of California certified laboratory.

Initially, soil samples collected at a depth of 5 and 10 feet bgs were analyzed. Additional samples collected from 15 feet bgs were analyzed if TPH or BTEX was identified in the 10 foot depth sample. Soil chemical analysis results for the exploratory boreholes is summarized in Table 2 and the laboratory report is included in Appendix B.

Temporary, 1-inch diameter PVC casing was installed in boreholes B-1, B-2, B-5 and B-8, (Figure 2) to provide for subsequent groundwater sampling. By the end of the day (May 22, 1995), a sufficient quantity of groundwater, required to fill the sample bottles was not present in the four boreholes. On May 24, 1995 groundwater was observed at a depth of approximately 10 feet, bgs in the four boreholes and groundwater samples were collected from boreholes B-1, B-2, B-5 and B-8 and monitoring wells MW-1, MW-2 and MW-3. Groundwater samples were collected from the boreholes using a small diameter stainless steel bailer. decontaminated ?

Groundwater samples were collected from monitoring wells MW-1, MW-2 and MW-3 using the following procedures:

- Prior to purging and sampling, a water level was taken referenced to the top of the well casing;

- A 3-inch diameter bailer was lowered into each well to check the presence of floating product prior to purging the well. Three to five well volumes were purged from each well until field parameters (temperature, specific conductivity and pH) had stabilized. The purge water was contained onsite in 55-gallon drums. No free floating petroleum hydrocarbons or sheen was observed in the monitoring wells;

- After purging was completed, groundwater samples were collected using disposal Teflon bailers;

- Samples from each well and borehole were labeled, contained and preserved in two, 40-ml glass vials and only one, one liter amber bottle, supplied by the laboratory. The samples were chilled in coolers packed with "blue ice" and shipped to the analytical laboratory; and

- Groundwater samples, including one field duplicate, collected from well MW-1, were submitted for chemical analysis of TPHg. TPHd and BTEX. Chemical analysis results are summarized in Table 4 and the laboratory report is included as Appendix B.

All field equipment used in sampling was decontaminated between borings and samples. ok Water used to decontaminate the field equipment was contained in 55-gallon drums, labeled and is currently being stored onsite. Excess soil generated from drilling is also currently stored onsite in 5-gallon pails. At the completion of drilling and sampling, the borings were grouted back to the surface with neat cement.

2.2 Investigation and Removal of Diesel Product Line

During the removal of UST Nos. 3 and 4, a two-inch diameter steel pipeline was observed along the northwest portion of the excavation. The pipeline is believed to have previously conveyed diesel from UST Nos. 1 and 2 to a former pump island located above UST Nos. 3 and 4 (Figure 2).

The pipeline was removed on July 25, 1995 using a backhoe and soil samples were collected at approximately 20 foot intervals along the length of the pipeline trench (Figure 2). Three soil samples (DPL-1 through DPL-3) were collected and analyzed for TPHg, BTEX, and TPHd. The pipeline was initially located at a depth of approximately four feet bgs along the northwest portion of the excavation associated with UST Nos. 3 and 4 (Figure 2). The removal of the pipeline consisted of removing the overlying asphalt and soil, followed by lifting the pipeline from the excavated trench. The pipeline was observed to be generally intact with no noticeable holes. However, some corrosion was observed at the western most portion of the pipeline. No fuel or liquid was observed to be present in or adjacent to the pipeline. Upon removal, soil samples were collected at approximately 20 foot intervals within the trench with the backhoe bucket. Clean brass tubes were pushed into the soil contained in the bucket, sealed with Teflon sheets and plastic caps, labeled and placed in a cooler for transport to the laboratory.

Approximately 15 cubic yards of soil was excavated to access the pipeline. Excavated soil was segregated during removal based on odor and screening with an organic vapor monitor (OVM). Soil excavated to a depth of approximately 3 feet had no noticeable odors or elevated VOC concentrations based on OVM screening. Soil excavated between a depth of approximately 3 and 5 feet contained noticeable odors and elevated VOC concentrations ranging from 0.5 to 80 parts per million by volume (ppmv).

The excavation was subsequently backfilled on July 25, 1995 using imported pea gravel and the soil removed from the upper 3 feet of the excavation. The soil removed from a depth of 3 to 5 feet was placed on plastic sheeting and is currently stockpiled onsite. The product line is also currently onsite.

2.3 Stockpile Soil Sampling

Approximately 70 cubic yards (cy) of soil was excavated following the removal of UST Nos. 3 and 4. The soil is currently stockpiled on plastic sheeting in the south-central area of the site. Three grab soil samples (SP-1 through SP-3) were collected and analyzed to assess the concentration of petroleum hydrocarbons present in the stockpiled soil. In addition, two soil samples (SP-4 and SP-5) were collected from the overburden soil removed to access the diesel product line. Sample SP-4 was collected form soil excavated to a depth of approximately 3 feet and sample SP-5 was collected from soil excavated from 3 to 5 feet below grade. Soil stockpile samples were collected by pushing a clean brass tube into the soil using a backhoe. The top 4 to 6 inches of soil was removed prior to obtaining the sample. Stockpile samples were sealed with Teflon sheets and plastic caps, labeled and placed in a cooler for transport to the laboratory. Stockpile soil samples were analyzed for

TPHg, BTEX and TPHd. Soil stockpile chemical analysis results are presented in Table 3 and the laboratory report is included in Appendix B.

3. REGIONAL HYDROGEOLOGIC SETTING

3.1 Stratigraphy

The site is located near the edge of the San Francisco Bay within the San Lorenzo Alluvial Cone hydrogeologic unit of the East Bay Plain. The region is bounded on the north by the San Leandro Alluvial Cone, on the east by the foothills of the Diablo Range, on the south by the Niles Cone and on the west by San Francisco Bay.

The East Bay Plain is situated on the eastern side of the San Francisco Bay depression. The East Bay Plain includes an alluvial area close to the foothills of the Hayward Hills and a marshland area adjacent to San Francisco Bay. The alluvial materials in the vicinity of the site are included as part of the San Lorenzo Alluvial Cone.

In the vicinity of the site, estuarine deposits were laid down during times of transgressive seas associated with Pleistocene interglacial periods. These sediments are primarily bluish gray clays (Bay Mud) which are fairly continuous beneath the present-day San Francisco Bay. The Bay Mud deposits generally exhibit a low permeability and yield small quantities of groundwater to wells. The Bay Mud is not considered a useable source of groundwater because of its low permeability and general poor water quality.

The Alameda County Flood Control and Water Conservation District Geohydrology and Groundwater Quality Overview, East Bay Plain Area 205J Report (June, 1988) reports groundwater movement in a westerly direction towards San Francisco Bay in the vicinity of the J & M facility.

Unconsolidated deposits in the vicinity of the site are nearly 1,000 feet thick (Muir 1993). Groundwater used in the San Lorenzo Cone Subarea is generally pumped from the Alameda Formation at depths greater than 100 feet below ground surface. The closest municipal water supply well is a City of Hayward emergency supply well located at the Hayward Air Terminal approximately 1.5 miles north of the Site.

3.2 Groundwater Flow

Shallow groundwater is present throughout the Hayward area at depths ranging from 10 to 30 feet (approximately 5 feet at the J & M Site), and groundwater flow direction is generally to the northwest. No regionally extensive shallow aquifers have been identified in the area, but water yielding, discontinuous sand and gravel units are present throughout the area. These units are up to several tens of feet thick and several thousand feet in lateral extent, and are separated by interbedded clays and silts.

Groundwater recharge to shallow aquifers in the East Bay Plain is considered to be by a combination of direct infiltration of precipitation, irrigation and streamflow. Recharge to deeper confined aquifers is considered to be primarily by subsurface inflow from adjacent aquifers and leakage between aquifers (Hickenbottom and Muir, 1988).

Discharge of groundwater from the East Bay Plain is primarily through evapotranspiration, groundwater discharge to streams and San Francisco Bay, spring discharge, and pumping. Due to the scarcity of wells downgradient of the Site, the majority of the shallow groundwater flow in the vicinity of the Site most likely discharges to the San Francisco Bay.

3.3 Groundwater Quality

The groundwater in the deeper, useable aquifers of the East Bay Plain is generally of a calcium- to sodium-bicarbonate chemical type and is low in total dissolved solids (300 to 1000 mg/L) (Hickenbottom and Muir, 1988). Though the general water quality of the shallow aquifers of the East Bay Plain is reported to be of good quality (Hickenbottom and Muir, 1988), there are indications of high nitrate levels (Maslonkowski, 1984), salt-water intrusion (particularly in the San Leandro, San Lorenzo, Alameda, and Oakland areas) (Maslonkowski, 1984), and bacterial and chemical contamination (Hickenbottom and Muir, 1988). Chemical constituents reported to have been detected in the shallow groundwater include petroleum products, lead and chromium, and benzene, acetone and other volatile organic compounds (VOCs), and halogenated VOCs.

3.4 Groundwater Resources

The general hydrogeology, as well as groundwater resources in central Hayward, along with potential sources of contamination, have been summarized in a study titled "Geohydrology and Groundwater Quality Overview, East Bay Plain Area, Alameda County, California, 205(j) Report (June, 1988), prepared by the Alameda County Flood Control and Water Conservation District."

The water supply for the Hayward area is primarily imported surface water from Hetch-Hetchy Aqueduct. Groundwater use in the Hayward area includes irrigation, domestic and industrial. Water supply well (W-1) provides water for the J & M facility operations including equipment wash water and water used for hand washing and toilets. Bottled water is used for drinking purposes. The water supply well is constructed with 6-inch diameter PVC casing and is estimated to extend to a depth of 40 feet, bgs.

→ Tested?

This isn't right. get boring log from well

3.5 Surface Water

A surface water sewage outfall channel is approximately 1,000 feet west of the site. The channel flows northwest toward San Francisco Bay (Figure 1). No natural surface water resources for domestic or industrial use are present in the immediate vicinity of the Site. The nearest significant drainages include San Lorenzo Creek, approximately three miles to the north, and Sulphur Creek, approximately one and 1/2 miles to the north of the Site. Alameda Creek flows into the bay, approximately three miles south of the Site.

1456 Harbor Bay Pkwy., Suite 1000
Alameda, CA USA 94502
Telephone (510) 521-0400
Fax (510) 865-9618

4. DISCUSSION OF FINDINGS

4.1 Interpretation of Field Data

4.1.1 Site Stratigraphy

Figure 4 includes cross-sections depicting the shallow stratigraphic units underlying the site. The locations of the cross-sections are shown in Figure 3. The soil stratigraphy at the Site consists of a top layer of fill composed of silt and gravel ranging from approximately 1 to 4 feet in thickness. Underlying the fill material is bay mud consisting of clay, silty clay and minor, thin, discontinuous lenses of silty sand and clayey gravel.

4.1.2 Shallow Groundwater Flow and Gradient

Groundwater elevations have been periodically monitored in onsite wells since April 1991 and most recently in May 1995. The depths to groundwater measured in May 1995 in wells MW-1 through MW-3 ranged from 5.08 to 5.37 feet bgs.

The potentiometric surface of the uppermost water-bearing zone during May 1995 is shown in Figure 5. The groundwater elevations were used to determine the groundwater gradient, and flow direction. The groundwater gradient and estimated hydraulic conductivity values for Bay Mud were used to calculate groundwater velocity. Based on the pattern of the groundwater contours, the groundwater flow direction at the site is predicted to be generally northwest. This is consistent with the anticipated regional groundwater flow direction. Based on the groundwater elevation difference of 0.29 feet (ft) measured in wells MW-2 and MW-3, located approximately 45 feet apart, the groundwater flow gradient was calculated to be approximately 0.006 ft/ft toward the northwest.

An estimate of the groundwater velocity can be made using estimated hydraulic conductivity data for Bay Mud and gradient data discussed above into the equation describing 1-dimensional advective flow through a porous media.

$$V_h = K_h \cdot i / n_e$$

where,

V_h = average horizontal groundwater velocity (ft/day)
K_h = horizontal hydraulic conductivity (ft/day)
i = hydraulic gradient (ft/ft)
n_e = effective porosity (dimensionless).

Using estimated values of hydraulic conductivity of 1 x 10^{-6} centimeters per second (cm/sec) to 1 x 10^{-8}, cm/sec, an estimated specific yield of 3 percent (Freeze and Cherry, 1977), and a hydraulic gradient of 0.006, the horizontal groundwater velocity is estimated to be on the order of approximately 0.8 ft/yr to 0.008 ft/yr, respectively.

Soil and Groundwater Chemistry

Soil and groundwater chemical analysis results are summarized in Tables 1, 2, 3, and 4. Laboratory analytical results indicate there is no reportable TPHg and TPHd in soil in the area located east and south of former USTs 3 and 4 (Figure 3). In addition, no TPHg, TPHd and BTEX was reported in soil below a depth of 10 feet in borehole numbers B-1, B-2, B-3 and B-9 (Figure 3). Low concentrations of TPHg was reported in samples collected from borings B-1 through B-9 and trench samples DPL-1 through DPL-3 at depths of 5 to 15 feet ranging from non-detectable to 81 mg/kg. BTEX was detected in five of the borings and two of the pipeline trench samples at the following maximum concentrations: 0.25 mg/kg benzene (B-9); 0.41 mg/kg toluene (DPL-2); 0.80 mg/kg ethyl benzene (B-9); 1.4 mg/kg xylene (DPL-2). TPHd ranging from non-detectable to 3,000 mg/kg was reported in samples collected from boreholes B-1 through B-9 and trench samples DPL-1 through DPL-3.

Review of TPHg and TPHd chromatograms by the analytical laboratory indicates that the petroleum hydrocarbons present in the soil samples collected for this investigation more closely match the diesel standard than the gasoline standard used by the laboratory. Figure 3 is a plan view of the distribution of TPHd in soil and Figure 4 presents cross sectional profiles of the distribution of TPHd in soil.

No floating product or sheen was observed in monitoring wells MW-1 through MW-3 and boreholes B-1, B-2, B-5 and B-8. No TPHg, TPHd or BTEX was reported in groundwater samples collected from wells MW-1 through MW-3 and the grab groundwater sample collected from borehole B-5. TPHg was reported in samples collected from boreholes B-1, B-2 and B-8 ranging from 290 micrograms per liter (ug/l) in borehole B-1 to 730 ug/l in borehole B-2. TPHd was reported at concentrations ranging from 190 ug/l in B-8 to 5200 ug/l in borehole B-2. BTEX was reported at the following maximum concentrations: 6.9 ug/l benzene (B-2); 1.9 toluene (B-8); 13 ug/l ethyl benzene (B-8); 13 ug/l xylenes (B-2). Table 4 and Figure 6 summarize the groundwater analytical results and the laboratory reports are included in Appendix B.

4.1.4 Distribution of TPH in Soil and Groundwater

Figure 4 shows the estimated vertical extent of soil containing TPHd concentrations greater than 10 mg/kg. The boundary of the vertical extent is based on the chemical analyses of soil at the sampling locations shown on the cross-sections and the OVM readings shown on the boring logs. Based on this data, the vertical extent of TPH affected soil is within 4 to 12 feet bgs.

Figure 7 shows the estimated lateral extent of TPHd affected soil. The lateral extent of TPH affected soil was estimated using the chemical analyses from soil samples collected during

the installation of monitoring wells MW-1, MW-2 and MW-3, and exploratory trenches and boreholes associated with the removal of UST Nos. 3 and 4.

As indicated in Figure 7, TPH affected soil occurs north and west of the former UST Nos. 3 and 4. The highest concentration of TPHd occurs in soil located beneath the former diesel product line (3,000 mg/kg at DPL-2).

Shallow groundwater in the immediate vicinity of former UST Nos. 3 and 4, and near the diesel product line has been affected by TPHd, TPHg and BTEX. No TPH or BTEX was detected in samples collected from the water supply well (W-1) located approximately 50 feet south and upgradient of former UST Nos. 3 and 4.

In addition, no TPH or BTEX was reported in groundwater samples collected from boring B-5 or monitoring wells MW-1, MW-2, and MW-3. The absence of TPH and BTEX in groundwater at these locations suggests TPH and BTEX affected groundwater has not migrated beyond the property boundaries.

4.2 Environmental Assessment

4.2.1 Potentially Applicable Standards and Criteria

Current environmental regulations are intended to protect public health and the environment from adverse impacts resulting from exposure to hazardous substances or events. The most pertinent regulations which are developed to protect against water quality degradation from hazardous substances are those found in CCR Title 22, Division 4, Chapter 30 (Title 22) and Title 23, Chapter 15 (Title 23). California regulations are considered to meet or exceed equivalent federal regulations. The DTSC and the RWQCB enforce Title 22 and Title 23, respectively.

Maximum contaminant levels, discharge limits and resource protection or restoration goals have been established by local, state and federal regulatory agencies to protect human health and the environment. MCLs and maximum contaminant level goals (MCLGs) developed under the Federal Drinking Water Act (40 CFR 141) and state drinking water standards (22 CCR 64435) may also apply to the Site.

Under Section 1412 of the Safe Drinking Water Act (SDWA), for groundwater or surface water that are or could be drinking water sources, remedial actions must achieve MCLGs if the MCLGs are non-zero, if they are relevant and appropriate under the circumstances of the release.

SWRCB Resolution 68-16

California's Statement of Policy with Respect to Maintaining High Quality of Waters in California, Resolution 68-16, affects remedial standards. This policy, commonly known as the "non-degradation policy," requires maintenance of existing water quality unless it is

demonstrated that a change will benefit the people of the state, will not unreasonably affect existing or potential beneficial uses, and will not result in lowering of water quality to levels less than that established by other state policies. Specifically, this resolution states that "any activity which produces or may produce a waste or increased volume or concentration of waste" will be limited to "assure that (a) a pollution or nuisance will not occur and (b) the highest water quality consistent with maximum benefit to the people of the state will be maintained." The application of this resolution to the site has implications for the control of offsite migration.

SWRCB Resolution 88-63

The Resolution 88-63, included in the San Francisco Bay Basin Water Quality Control Plan (RWQCB, 1986) defines groundwater beneficial uses. According to Resolution 88-63, the primary beneficial use of groundwater is potential drinking water sources which are defined as follows:

- Have total dissolved solids (TDS) less than 3,000 mg/l,
- Have no contamination from natural or human activities that cannot reasonably be treated for domestic use using best management practices or best economically achievable treatment practices, and
- Provide sufficient water to supply a single well capable of producing an average sustained yield of 200 gallons per day.

Accordingly, the RWQCB has classified the shallow groundwater in the region as "potentially suitable for municipal or domestic uses."

4.2.2 Assessment of Impact of Chemicals of Concern on Soil & Groundwater Quality

The chemically affected soil and groundwater beneath the site do not affect present uses of the land. The Site is currently zoned for industrial and commercial use. Shallow groundwater beneath the Site is currently not being used for drinking purposes and it is not expected that the shallow groundwater is suitable for drinking on the basis of water quality and quantity limitations.

The RWQCB has defined the existing and potential beneficial uses of San Francisco Bay and groundwater in the Bay Area.

The existing and potential beneficial uses of the groundwater in the area are:

- Municipal and domestic supply
- Industrial process and service supply, and
- Agriculture supply

The presence of TPH in soil and groundwater at the site is not expected to adversely affect existing or potential future beneficial uses of San Francisco Bay. While shallow groundwater present beneath the site is interpreted to flow toward and discharge to San Francisco Bay, the fine grained nature and estimated low permeability of the soil underlying and adjacent to the site is expected to limit flow and transport of the TPH. The expected low mobility of the high boiling point hydrocarbons detected in site soil and groundwater is also expected to limit the offsite migration of TPH. Therefore, it is unlikely TPH affected groundwater will migrate offsite.

No domestic, industrial or municipal wells have been identified downgradient of the site. The shallow groundwater beneath the site is currently not being used for drinking and it is not expected the shallow groundwater beneath the Site will be utilized as a drinking water resource in the future. Current development plans are for continued industrial and commercial use.

4.2.3 Comparison with Risk-Based Screening Levels

The American Society of Testing Materials (ASTM) has published an Emergency Standard Guide for Risk-Based Correction Action at Petroleum Release Sites (ASTM ES-38 - 94). The guide includes an approach that presents screening target levels for use in assessing whether a more detailed site specific risk assessment and/or site remediation is warranted. The screening target levels are developed using a set of assumptions and exposure scenarios that are conservative. For example, at the subject site there are no direct exposure routes to the TPHd-impacted soil and possibly groundwater. Dermal, inhalation and ingestion exposure is precluded, except in the event contractors or others excavate in the site area, because the site is paved, the uppermost water bearing zone is not used as a resource for drinking or other purposes and diesel is not very volatile and biodegrades naturally in most environments. Exposure pathways considered, though improbable are: Vapor intrusion into buildings, Leachate from soil to groundwater that is ingested and groundwater ingestion.

Chemicals of Concern

Benzene is the major compound of concern with regard to risk of exposure at petroleum release sites. In general, benzene is present in low concentrations in gasoline and is not found or occurs at minimal concentrations in diesel. Benzene was not detected (less than 0.005 mg/kg) in 13 of 23 soil samples that contained TPHg and TPHd. Table 4 presents a comparison of maximum concentrations of BTEX concentrations in soil and groundwater with applicable Tier 1 Screening Level Concentrations presented in the ASTM Standard for Corrective Action at Petroleum Release sites.

The screening assessment indicates that the concentrations of BTEX in groundwater are well below the conservative risk values.

It is important to note that the Screening levels are generally conservative with respect to the site specific inputs. Therefore, the actual, site-specific risks are expected to be lower than the screening levels.

5. CONCLUSIONS

For the following reasons and based on the currently available site information, we believe that further action relative to the release of gasoline and diesel at the J & M Site is not warranted:

- Risk-based screening suggests that no unacceptable risk of exposure to human health or the environment is present.
- The extent of the release is limited based on observed attenuation in analyzed soil samples and the clayey soils at the site.
- Groundwater in the immediate vicinity of UST Nos. 3 and 4 contains low concentrations of diesel and BTEX, but the extent is limited to the immediate site area, and the water is not used for drinking.
- Petroleum hydrocarbons are known to biodegrade over time and therefore the risk of exposure will decline with time.

6. REFERENCES

ASTM Designation: ES 38-94 Emergency Standard Guide for Risk-Based Corrective Action Applied at Petroleum Release Sites, July 1994.

California Regional Water Quality control board, SFBR, December 1986, Water Quality Control Plan and Amendments adopted (September 1992, October 1992, August 1994).

Freeze, R. Allan, and J.A. Cherry, 1979, Groundwater, Prentice-Hall, Inc.

Geoenvironmental and Geologic Services, 1992, 1st Quarter 1992 Groundwater Sampling Report.

Geoenvironmental and Geologic Services, 1993, Groundwater Monitoring Tank No. 1 and 2 Excavation March 1993.

Golder Associates Inc., 1994a, Groundwater Monitoring Results J & M Inc. Facility - Hayward, California.

Golder Associates Inc., 1994b, Report on Removal of Underground Storage Tanks J & M Inc. Hayward, California.

Golder Associates Inc., 1995, Workplan for Soil and Groundwater Investigation J & M Inc. Facility - Hayward, California.

Helley, E.J., K.R. Lajoie, and D.B. Burne, 1972. Geologic Map of Late Cenozoic Deposits, Alameda County, California, U.S. Geological Survey Misc. Field Studies Map MR-429, 1:62,500.

Hickenbottom, K., and K. Muir, 1988. Geohydrology and Groundwater-Quality Overview, of the East Bay Plain Area, Alameda County, California, 205(j) Report, submitted to the California Regional Water Quality Control board, San Francisco Region, Alameda County Flood Control and Water Conservation District.

J & M Inc., 1992, Letter transmitting Results of Soil and Groundwater Chemical Analyses Associated with the Installation of Monitoring Wells MW-1, MW-2, and MW-3, dated January 28, 1992.

Maslonkowski, D.P., 1984. Groundwater in the San Leandro and San Lorenzo Alluvial Cones of the East Bay Plain of Alameda County, Alameda County Flood Control and Water Conservation District.

Muir, K.S., 1993, Geologic Framework of the East Bay Plain Groundwater Basin, Alameda County, California.

TABLES

Table 1
Summary of Exploratory Trench
Soil Chemical Analysis Results
J & M Inc. Facility - Hayward, California

Sample I.D.	TPHg	TPHd	Benzene	Toluene	Ethylbenzene	Xylenes
S-ET1(15)-5	37*	1,600	0.013	0.12	0.083	0.57
S-ET2(13)-5	65*	1,700	0.041	1.17	0.11	0.84
S-ET2(26)-5	38*	340	0.16	0.13	0.14	0.49
S-ET3(11)-5	ND<1	NA	ND<.005	ND<.005	ND<.005	ND<.005
S-ET3(17)-5	ND<1	NA	ND<.005	ND<.005	ND<.005	ND<.005

Notes:

All concentrations reported in milligrams per kilogram (mg/kg).
ND<1 = Not detected at detection limit of 1 mg/kg.
TPH-G; TPH-D = Total petroleum hydrocarbons (TPH) as gasoline (G) or diesel (D).
TPH-G and BTEX analyzed by EPA Method 5030/8015 modified and 8020.
TPH-D analyzed by EPA method 3550/8015 modified.
* Does not match gasoline standard - heavier hydrocarbons present.
NA = Not analyzed.

Table 2
Summary of Exploratory Borehole and Diesel Product Line Soil Chemical Analysis Results
J & M Inc. Facility - Hayward, California

Sample I.D. Boring No.	Depth (ft, bgs)	TPHg	TPHd	Benzene	Toluene	Ethyl-Benzene	Xylenes
B-1	5	17	1,400	ND<0.005	0.041	0.034	0.29
	10	7	620	ND<0.005	0.019	0.016	0.12
	15	ND<1	ND<10	ND<0.005	ND<0.005	ND<0.005	ND<0.005
B-2	5	26	940	0.046	0.1	0.063	0.43
	10	8	820	0.045	0.032	0.019	0.12
	15	ND<1	ND<10	ND<0.005	0.009	ND<0.005	0.01
B-3	5	ND<1	ND<10	ND<0.005	ND<0.005	ND<0.005	ND<0.005
	10	2	360	ND<0.005	ND<0.005	ND<0.005	0.022
	15	ND<1	ND<10	ND<0.005	ND<0.005	ND<0.005	ND<0.005
B-4	5	7	1,000	ND<0.005	0.028	0.018	0.12
	10	ND<1	ND<10	ND<0.005	ND<0.005	ND<0.005	ND<0.005
B-5	5	ND<1	ND<10	ND<0.005	ND<0.005	ND<0.005	ND<0.005
	10	ND<1	ND<10	ND<0.005	ND<0.005	ND<0.005	ND<0.005
B-6	5	ND<1	ND<10	0.042	0.007	ND	0.008
	10	ND<1	ND<10	0.056	0.007	0.010	0.030
B-7	5	ND<1	ND<10	ND<0.005	ND<0.005	ND<0.005	ND<0.005
	10	ND<1	ND<10	ND<0.005	ND<0.005	ND<0.005	ND<0.005
B-8	5	ND<1	ND<10	ND<0.005	ND<0.005	ND<0.005	ND<0.005
	10	ND<1	ND<10	ND<0.005	ND<0.005	ND<0.005	ND<0.005
B-9	5	29	170	0.25	0.22	0.700	0.32
	10	31	310	0.11	0.10	0.800	0.99
	15	ND<1	ND<10	ND<0.005	ND<0.005	ND<0.005	ND<0.005
DPL-1	5	ND<1	180	ND<0.005	ND<0.005	ND<0.005	ND<0.005
DPL-2	5	81	3,000	ND<0.10	0.41	0.2	1.4
DPL-3	5	29	1,300	0.053	0.11	ND<0.050	0.38

Notes:

All concentrations reported in milligrams per kilogram (mg/kg).
ND<1 = Not detected at detection limit of 1 mg/kg.
TPHg; TPHd = Total petroleum hydrocarbons (TPH) as gasoline (g) or diesel (d).
TPHg and BTEX analyzed by EPA Method 5030/8015 modified and 8020.
TPHd analyzed by EPA Method 3550/8015 modified.
Depth (ft, bgs) = Depth in feet below ground surface.

Table 3
Summary of Soil Stockpile
Chemical Analysis Results
J & M Inc. Facility - Hayward, California

Sample I.D.	TPHg	TPHd	Benzene	Toluene	Ethyl-Benzene	Xylene
SP-1	ND<1	ND<10	ND<0.005	ND<0.005	ND<0.005	ND<0.005
SP-2	ND<1	ND<10	ND<0.005	ND<0.005	ND<0.005	ND<0.005
SP-3	ND<1	140	ND<0.005	ND<0.005	ND<0.005	ND<0.005
SP-4	ND<1	82	ND<0.005	ND<0.005	ND<0.005	ND<0.005
SP-5	ND<1	2,100	ND<0.005	ND<0.005	ND<0.005	ND<0.005

Notes:

All concentrations reported in milligrams per kilogram (mg/kg).
ND<1 = Not detected at detection limit of 1 mg/kg.
TPHg; TPHd = Total petroleum hydrocarbons (TPH) as gasoline (g) or diesel (d).
TPHg and BTEX analyzed by EPA Method 5030/8015 modified and 8020.
TPHd analyzed by EPA Method 3550/8015 modified.
Depth (ft, bgs) = Depth in feet below ground surface.

SP1-SP3 ⇒ "grab" samples from 10 c.y. of stockpiled soil from excavation of gasoline USTs in 1994 (UST344).

SP4-SP5 ⇒ "grab" samples from ≈ 15 c.y. of excavated soil from the product line trench.

Table 4
Summary of Groundwater Chemical Analysis Results
J & M Inc. Facility - Hayward, California

Sample I.D.	TPHg	TPHd	Benzene	Toluene	Ethyl-Benzene	Xylene
B-1	290	4600	ND	1.0	0.6	4.5
B-2	730	5200	6.9	0.5	1.0	13.0
B-5	ND<50	ND<50	ND<0.5	0.7	ND<0.5	ND<0.5
B-8	350	190	4.7	1.9	13.0	0.9
MW-1	ND<50	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5
MW-2	ND<50	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5
MW-3	ND<50	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5
MW-3 (Dup)	ND<50	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5
Water Supply Well (W-1)	ND<50	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5 → 9/14/94

Notes:

Water supply well sampled on 9/14/94, all other samples collected on 5/24/95.
All concentrations reported in micrograms per liter (µg/l).
ND<50 = Not detected at reporting limit of 50 µg/l.
TPHg; TPHd = Total petroleum hydrocarbons (TPH) as gasoline (g) or diesel (d).
TPH and BTEX analyzed by EPA Method 5030/8015 modified and 8020.
TPHd analyzed by EPA Method 8015 modified.

Table 5
Comparison of Chemical Compounds in Soil with ASTM Tier 1-Risk-Based Screen Levels
J & M Inc. Facility - Hayward, California

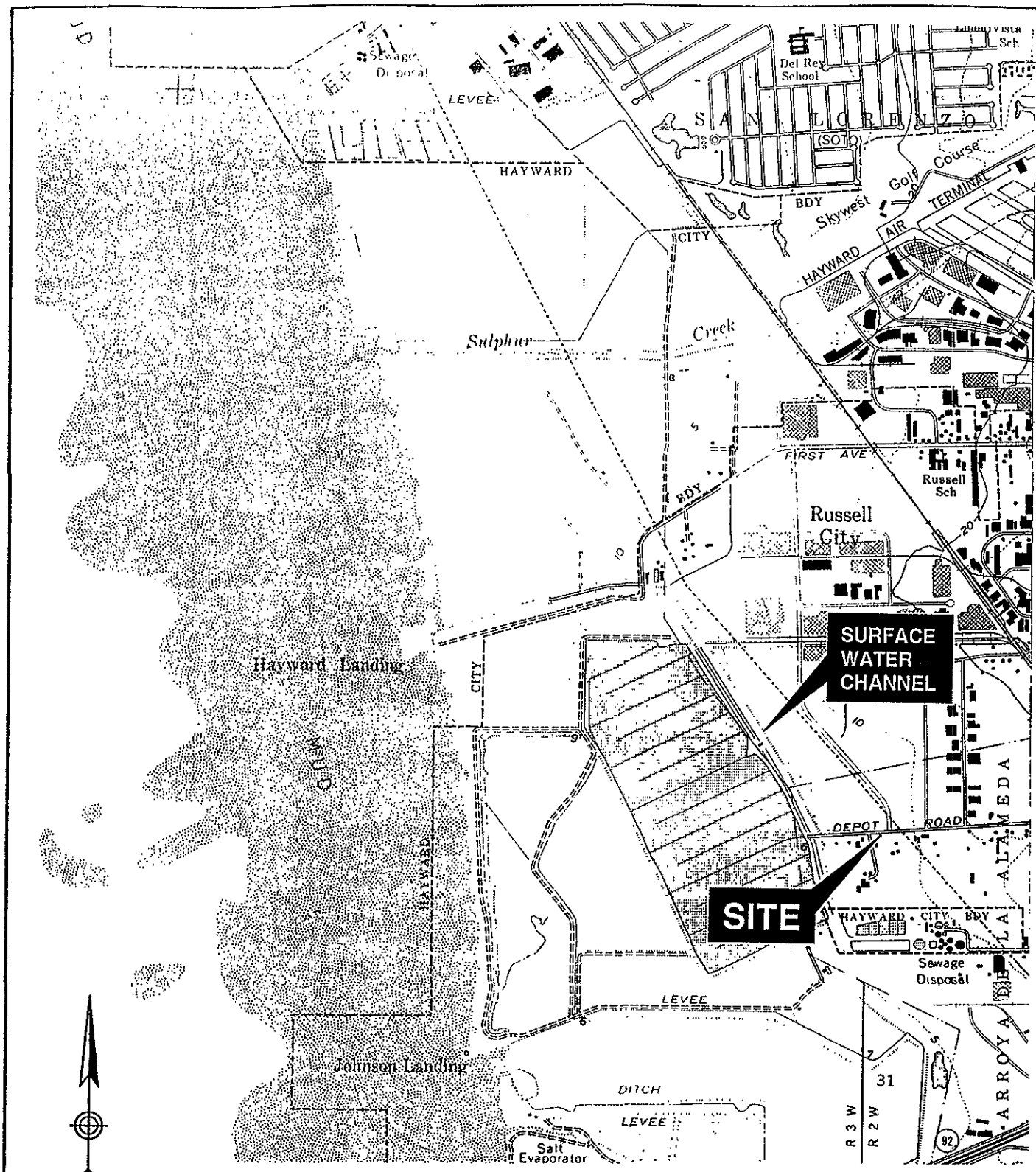
Compound	Benzene	Toluene	Ethylbenzene	Xylenes
Maximum Detected in Soil (mg/kg)	0.25	1.17	0.8	1.4
Maximum Detected in Groundwater (mg/l)	0.0069	0.0019	0.013	0.013
ASTM Tier 1 Screening Levels				
Soil - Vapor Intrusion into Building (mg/kg)				
Commerical/Industrial Use	0.005			
Cancer Risk 1 x 10-6	**0.0169**			
Cancer Risk 1 x 10-4	~~1.69~~			
Chronic HQ =1	0.49 ✓	90.8	54.5	RES
Soil - Leachate to Protect Groundwater Ingestion Level				
Commercial/Industrial Use	0.017			
Cancer Risk 1 x 10-6	**0.0578**			
Cancer Risk 1 x 10-4	5.78			
Chronic HQ =1	1.68 ✓	133	361	RES
Groundwater Ingestion (mg/l)(3)				
Commercial/Industrial Use	.005			
Cancer Risk 1 x 10-6	0.00987			
Cancer Risk 1 x 10-4	0.0987			
Chronic HQ =1	0.029 ✓	10.2	20.4	

Notes:

RES = selected risk level is not exceeded for pure compound present at any concentration.
Target levels are in bold where less than maximum detected in soil or groundwater.

Groundwater - Vapor Intrusion 0.074 ✓
7.424

FIGURES



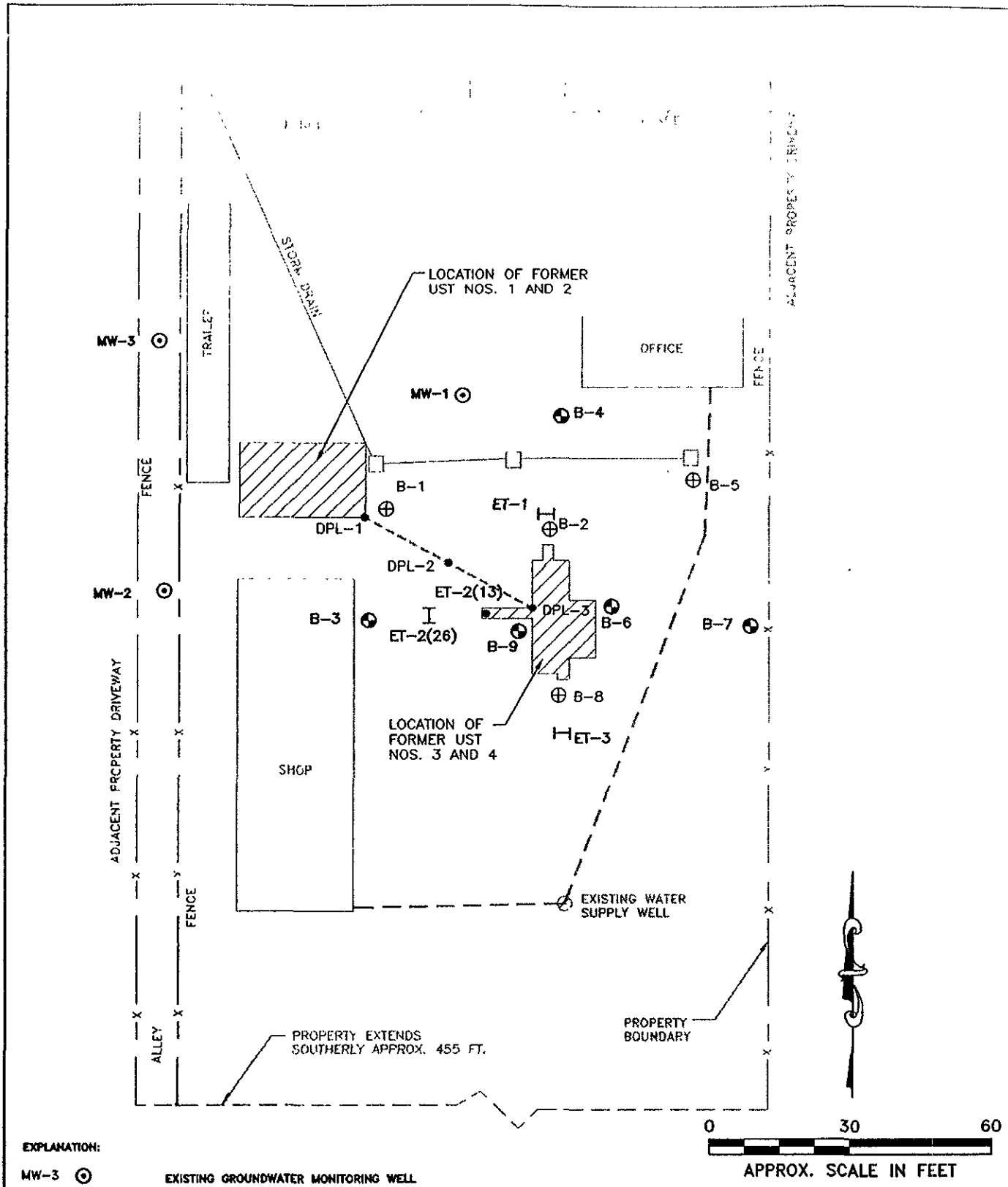
Scale 1 : 24000

Reference: Base map modified from USGS, San Leandro Quadrangle, 7.5 Minute Series (Topographic), Photorevised 1980.

Figure 1
SITE LOCATION MAP
J & M INC./UST CLOSURE/CA

Project No.: 943-7017 Dwg. No.: OAK00003217 Drawn by: DVR Check by: KRR Date: 7/29/94

Golder Associates



EXPLANATION:

- MW-3 ⊙ — EXISTING GROUNDWATER MONITORING WELL
- STORM DRAIN
- BURIED WATER PIPELINE
- FORMER DIESEL PIPELINE
- ET-1 — EXPLORATORY TRENCH
- B-3 — EXPLORATORY BOREHOLE
- ⊕ B-1 — EXPLORATORY BOREHOLE/ GROUNDWATER SAMPLING POINT
- • ET-2(13) — EXCAVATION SOIL SAMPLE

FIGURE **2**

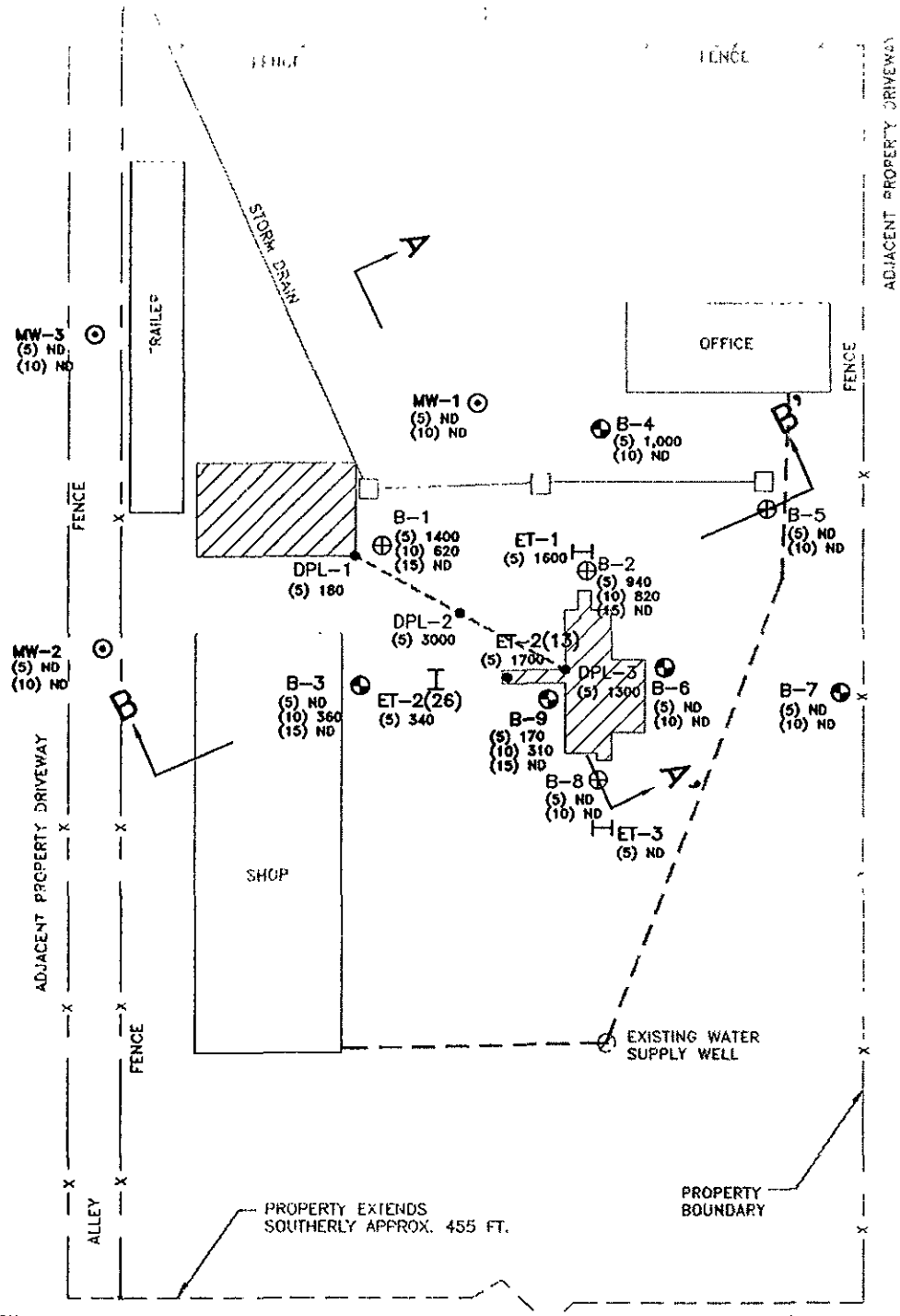
SITE PLAN

J & M INC./UST CLOSURE/CA

NOTE: Base map modified from Geoenvironmental and Geologic Services.

DWG ID: \9437017\3800 DATE 8-4-95 8:39 DRAWN DVR

Golder Associates



EXPLANATION:

- MW-3 ⊙ — EXISTING GROUNDWATER MONITORING WELL
- STORM DRAIN
- BURIED WATER PIPELINE
- FORMER DIESEL PIPELINE
- ET-1 — EXPLORATORY TRENCH
- B-3 — EXPLORATORY BOREHOLE
- A A' — CROSS-SECTION LOCATION
- B-1 — EXPLORATORY BOREHOLE/ GROUNDWATER SAMPLING POINT
- ET-2(13) — EXCAVATION SOIL SAMPLE
- (5) 340 — (DEPTH, FT.) TPHd CONCENTRATION
- APPROX. LIMITS OF EXCAVATION ASSOCIATED WITH UST NO. 1 & 2, 3 & 4

ND = NOT DETECTED AT/OR ABOVE LABORATORY REPORTING LIMIT.
ALL CONCENTRATIONS REPORTED IN MILLIGRAMS PER KILOGRAM (mg/kg) (PARTS PER MILLION)

SOIL SAMPLES COLECTED FROM MONITORING WELL MW-1, MW-2 AND MW-3 BY TERRASEARCH INC., APRIL 1991.

NOTE: Base map modified from Geoenvironmental and Geologic Services.

FIGURE 3

PLAN VIEW OF TPHd IN SOIL

J & M INC./UST CLOSURE/CA

DWG ID: \9437017\3775 DATE 8-4-95 16:00 DRAWN DVR

Golder Associates

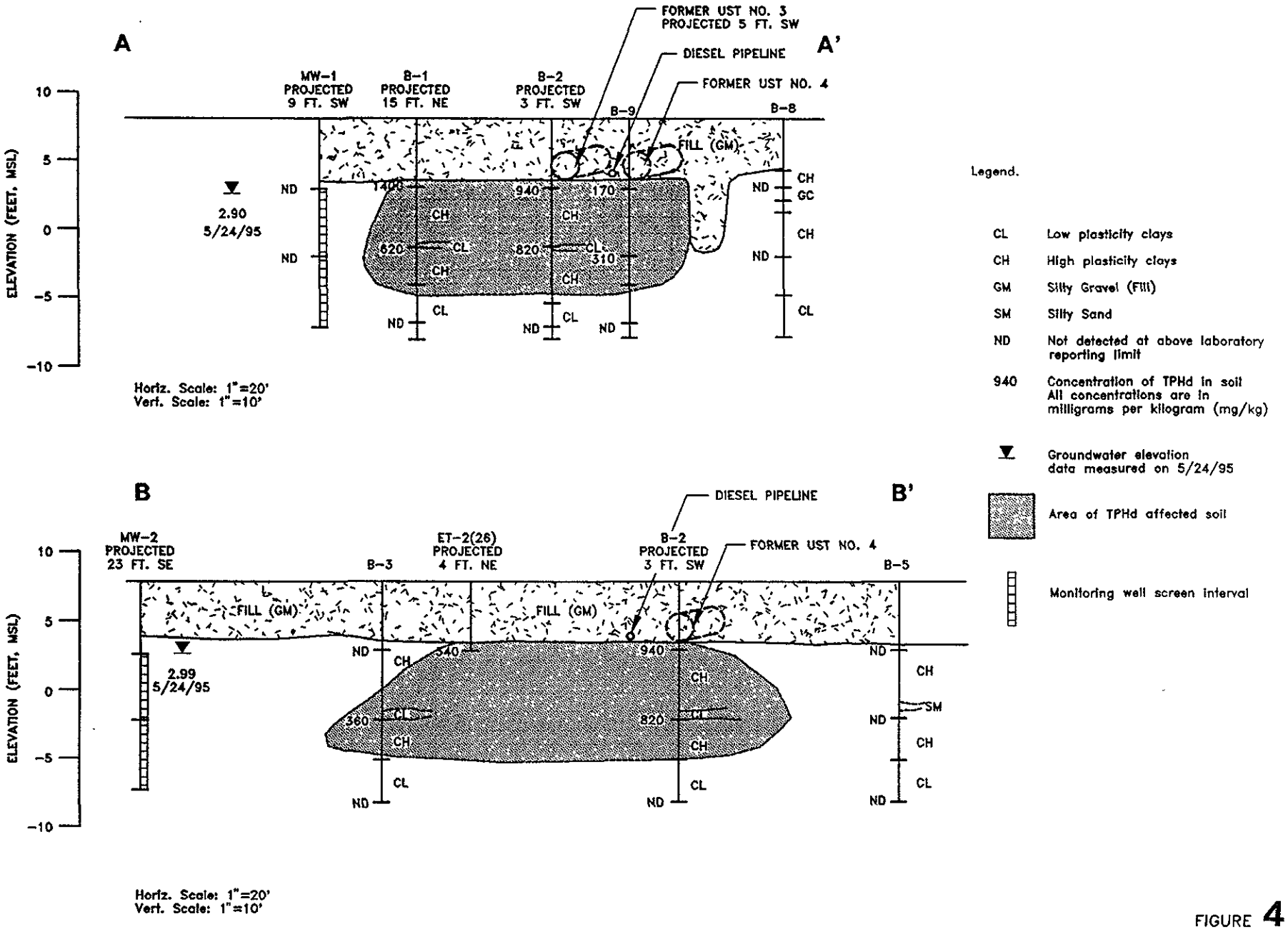


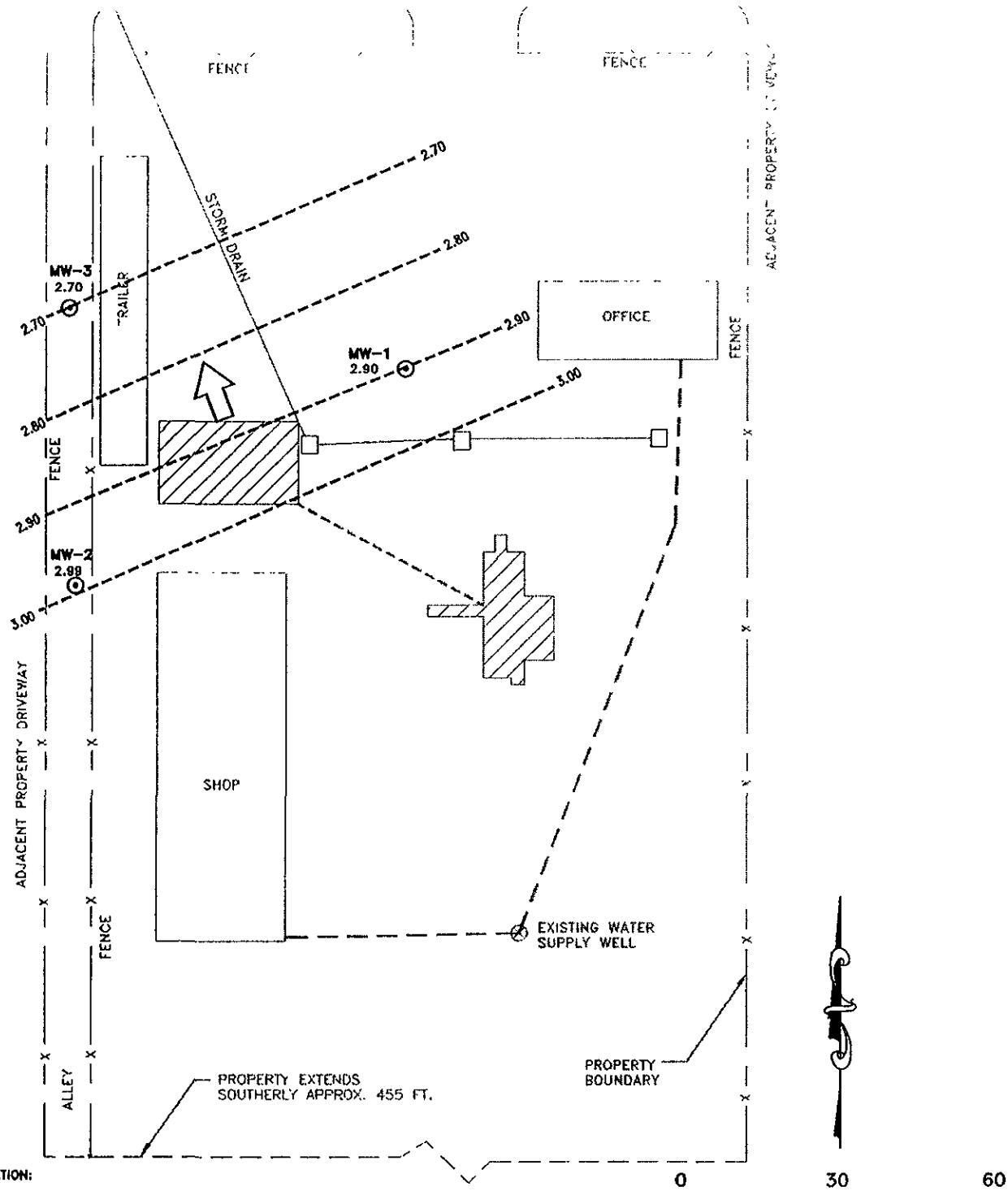
FIGURE **4**

CROSS-SECTIONS A-A' AND B-B'

J & M INC./UST CLOSURE/CA

DWG ID: \9437017\3779 DATE 8-4-95 16:01 DRAWN DVR

Golder Associates



EXPLANATION:

- MW-3 2.99 — EXISTING GROUNDWATER MONITORING WELL AND GROUNDWATER ELEVATION (MEASURED ON 5/24/95)
- STORM DRAIN
- BURIED WATER PIPELINE
- FORMER DIESEL PIPELINE
- APPROX. LIMITS OF EXCAVATION ASSOCIATED WITH UST NO. 1 & 2, 3 & 4
- 3.00 — GROUNDWATER ELEVATION CONTOUR IN FEET ABOVE MEAN SEA LEVEL
- INFERRED GROUNDWATER FLOW DIRECTION

FIGURE 5

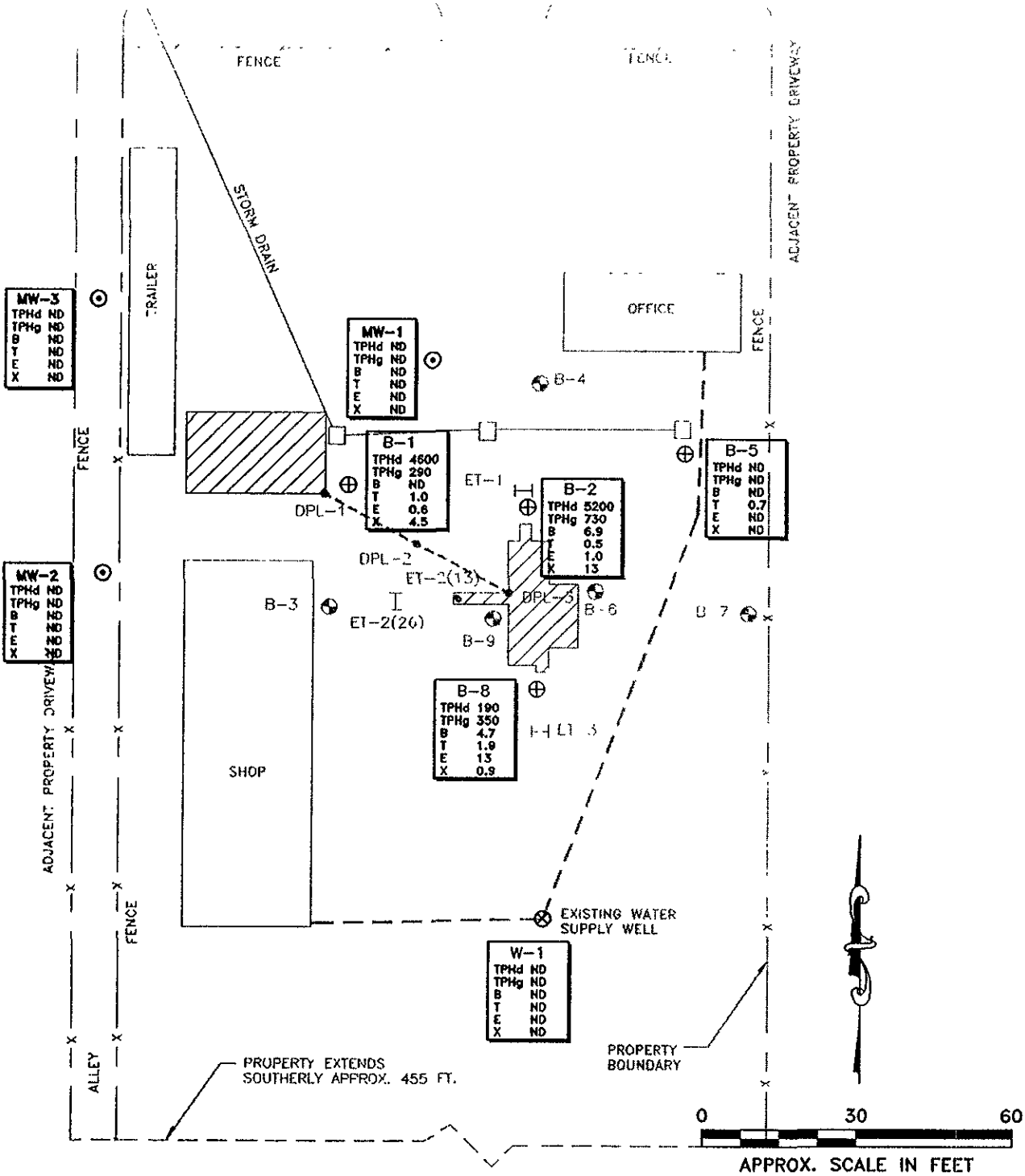
GROUNDWATER ELEVATION CONTOUR MAP

J & M INC./UST CLOSURE/CA

NOTE: Base map modified from Geoenvironmental and Geologic Services.

DWG ID: \9437017\3776 DATE 8-4-95 16:16 DRAWN DVR

Golder Associates



EXPLANATION:

- MW-3 ⊙ — EXISTING GROUNDWATER MONITORING WELL
- —□— STORM DRAIN
- — — — BURIED WATER PIPELINE
- - - - - - - FORMER DIESEL PIPELINE
- ⊢ ET-1 — EXPLORATORY TRENCH
- ⊕ B-3 — EXPLORATORY BOREHOLE
- ⊕ B-1 — EXPLORATORY BOREHOLE/ GROUNDWATER SAMPLING POINT
- • ET-2(13) — EXCAVATION SOIL SAMPLE
- ▨ — APPROX. LIMITS OF EXCAVATION ASSOCIATED WITH UST NO. 1 & 2, 3 & 4

TPH = TOTAL PETROLEUM HYDROCARBONS AS GASOLINE (TPHg) OR DIESEL (TPHd)
BTEX = BENZENE, TOLUENE, ETHYLBENZENE AND XYLENES
ND = NOT DETECTED AT/OR ABOVE LABORATORY REPORTING LIMIT
ALL CONCENTRATIONS REPORTED IN MICROGRAMS PER LITER (PARTS PER BILLION)
EXPLORATORY BORINGS AND MONITORING WELLS SAMPLED ON 5/24/95.
WATER SUPPLY WELL (W-1) SAMPLED ON 9/14/94.

FIGURE 6

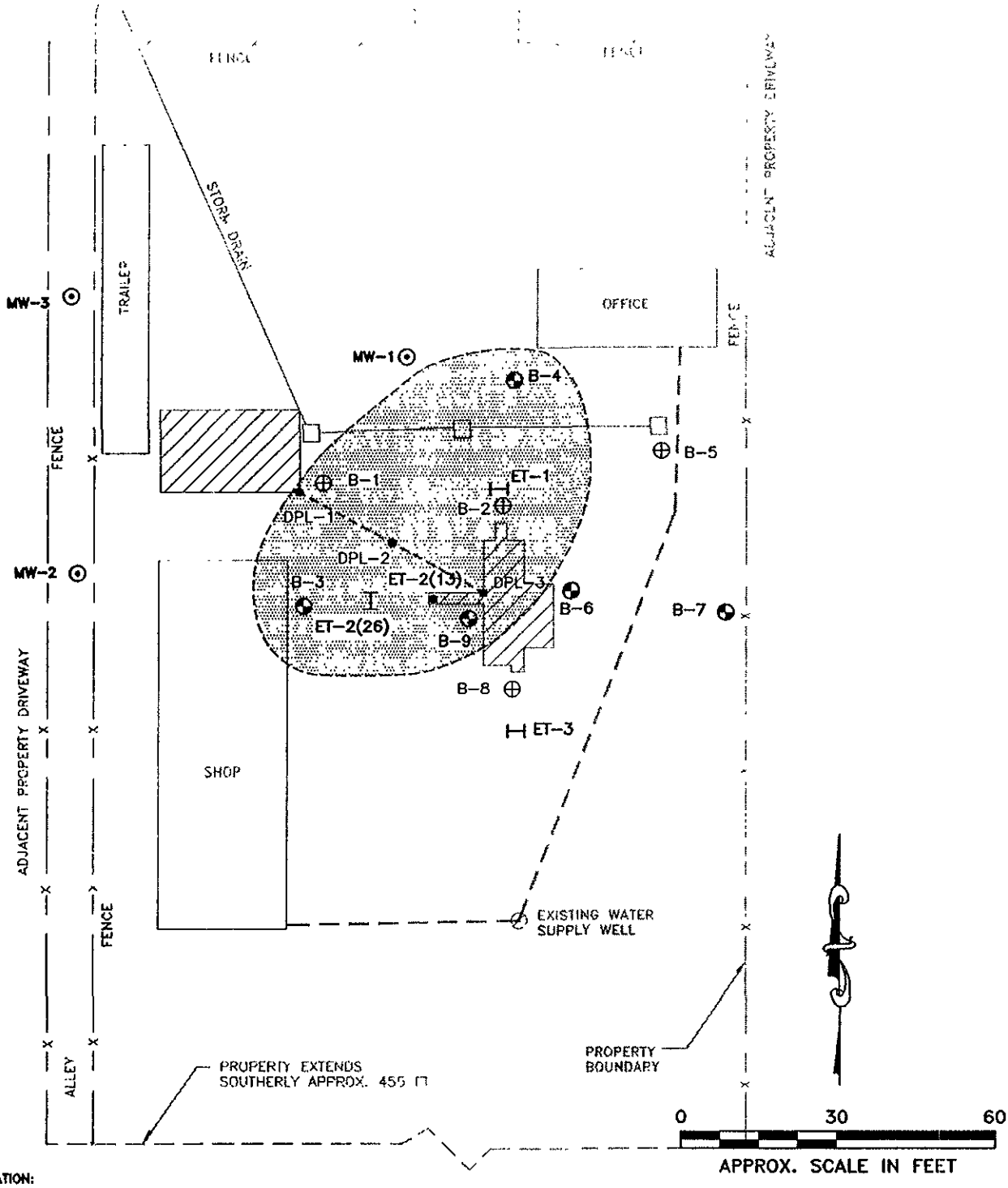
DISTRIBUTION OF TPHd, TPHg AND BTEX IN GROUNDWATER

J & M INC./UST CLOSURE/CA

NOTE: Base map modified from Geoenvironmental and Geologic Services.

DWG ID: \9437017\3777 DATE 8-4-95 16:10 DRAWN DVR

Golder Associates



EXPLANATION:

- MW-3 — EXISTING GROUNDWATER MONITORING WELL
- STORM DRAIN
- BURIED WATER PIPELINE
- FORMER DIESEL PIPELINE
- ET-1 — EXPLORATORY TRENCH AND
- B-3 — EXPLORATORY BOREHOLE
- B-1 — EXPLORATORY BOREHOLE/ GROUNDWATER SAMPLING POINT
- ET-2(13) — EXCAVATION SOIL SAMPLE
- APPROX. LIMITS OF EXCAVATION ASSOCIATED WITH UST NO. 1 & 2, 3 & 4
- TPHd AFFECTED SOIL

FIGURE 7

ESTIMATED AREAL EXTENT OF TPHd AFFECTED SOIL

J & M INC./UST CLOSURE/CA

NOTE: Base map modified from Geoenvironmental and Geologic Services.

DWG ID: \9437017\3778 DATE 8-4-95 9:06 DRAWN DVR

Golder Associates

APPENDIX A

Soil Boring Logs

RECORD OF BOREHOLE # B-1

STA. B-1 OFFSET L R ELEVATION --- SHEET 1 OF 1
PROJECT NO. 943-7017 DRILLING DATE 5/22/95 DATUM Ground Surface
INCLINATION 90° AZIMUTH NA DRILL RIG XD-2

DEPTH SCALE (FEET)	BORING METHOD	SOIL PROFILE DESCRIPTION	GRAPHIC LOG	USCS	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES BLOWS/6 IN.	SAMPLES RECOVERY	SAMPLE DESCRIPTION	NOTES / ANALYSIS
0		4-inch. Asphalt concrete.								
		0.5-4.5 ft. Dense, yellowish brown SILTY GRAVEL, dry, up to 3/4-in. subangular gravel (Fill).		GM	1	SS	N/A	100		
2									OVM = 0.0 ppm	
4		4.5-9.5 ft. Stiff, black CLAY, moist		CH					B1-5 OVM = 3.9 ppm	
6										
8										
10		9.5-10.0 ft. Stiff, gray SILTY CLAY moist-wet.		CL					BI-10 OVM = 36 ppm	
		10.0-12.0 ft. Stiff, dark gray CLAY, moist.		CH						
12		12.0-15.0 ft. Stiff, yellowish brown SILTY CLAY, moist.		CL						
14										
		15.0-16.0 ft. Stiff, olive brown SILTY CLAY, little fine sand and 1/4-in. gravel.		CL					B1-15 OVM 0.0 ppm	
16		Total depth = 16.0 ft.							No groundwater observed during drilling. Groundwater observed at a depth of approximately 10 ft. on 5/24/95. Borehole grounted to surface with neat cement on 5/24/95.	
18										
20										

DEPTH SCALE As indicated
DRILLING CONTRACTOR Precision Drilling
DRILLER M. Casey

Golder Associates

LOGGED BY K. Reynolds
CHECKED D. Sarmiento
DATE 7/31/95

RECORD OF BOREHOLE # B-2

STA. B-2 OFFSET L R ELEVATION — SHEET 1 OF 1
PROJECT NO. 943-7017 DRILLING DATE 5/22/95 DATUM Ground Surface
INCLINATION 90° AZIMUTH NA DRILL RIG XD-2

DEPTH SCALE (FEET)	BORING METHOD	SOIL PROFILE DESCRIPTION	GRAPHIC LOG	USCS	SAMPLES NUMBER	SAMPLES TYPE*	SAMPLES BLOWS/ 6 IN.	SAMPLES RECOVERY	SAMPLE DESCRIPTION	NOTES — ANALYSIS
0		4-inch. Asphalt concrete.								
		0.5-4.5 ft. Dense, yellowish brown, SILTY GRAVEL, dry to moist. (FILL)		GM					Poor recovery 1.0-4.0 ft.	
2										
4										
		4.5-9.5 ft. Stiff, dark gray CLAY, little gravel (1/4-in. angular) moist.		CH					B2-5 OVM = 60 ppm	
6										
8										
		9.5-10.0 ft. Stiff,grayish brown, SILTY CLAY, moist.		CL					9.5-10.0 Sample B2-10 OVM = 15 ppm	
10		10.0-13.0 ft. Stiff, brown CLAY, trace medium sand, moist		CH						
12										
		13.0-15.0 ft. Stiff to firm, pale yellow SILTY CLAY , moist.		CL					Sample B2-15 OVM = 0.0 ppm	
14										
16		Totla depth = 16.0 ft.							No groundwater observed during drilling. Groundwater observed at a depth of approximately 10 ft. on 5/24/95. Borehole grouted to surface with neat cement on 5/24/95.	
18										
20										

DEPTH SCALE As Indicated
DRILLING CONTRACTOR Precision Drilling
DRILLER M. Casey

Golder Associates

LOGGED BY K. Reynolds
CHECKED D. Sarmiento
DATE 7/31/95

RECORD OF BOREHOLE # B-3

STA. B-3 OFFSET L R ELEVATION — SHEET 1 OF 1
PROJECT NO. 943-7017 DRILLING DATE 5/22/95 DATUM Ground Surface
INCLINATION 90° AZIMUTH NA DRILL RIG XD-2

DEPTH SCALE (FEET)	BORING METHOD	SOIL PROFILE DESCRIPTION	GRAPHIC LOG	USCS	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES BLOWS/ 6 IN.	SAMPLES RECOVERY	SAMPLE DESCRIPTION	NOTES / ANALYSIS
0		4-inch. Asphalt concrete.								
		0.5-4.5 ft. Dense, yellowish brown SILTY GRAVEL, moist (FILL)		GM						
2										
4									4.0 ft. OVM = 0.0 ppm	
		4.5-9.5 ft. Stiff, dark grayish brown to black CLAY, moist.		CH					B3-5 OVM = 0.0 ppm	
6										
8									8.0 ft. OVM = 6.0 ppm	
		9.5-10.0 ft. Soft, olive brown, SILTY CLAY, wet.		CL					B3-10 OVM = 0.0 ppm	
10		10.0-13.0 ft. Firm, brown CLAY, moist.		CH						
12										
		13.0-16.0 ft. Pale yellow to yellowish brown SILTY CLAY, some fine sand, wet at ~ 15.0 ft.		CL						
14										
									B3-15 OVM = 0.0 ppm	
16		Total depth = 16.0 ft.							No groundwater observed during drilling. Borehole grouted to surface with neat cement on 5/22/95.	
18										
20										

DEPTH SCALE As Indicated
DRILLING CONTRACTOR Precision Drilling
DRILLER M. Casey

Golder Associates

LOGGED BY K. Reynolds
CHECKED D. Sarmiento
DATE 7/31/95

RECORD OF BOREHOLE # B-4

STA. B-4 OFFSET L R ELEVATION --- SHEET 1 OF 1
PROJECT NO. 943-7017 DRILLING DATE :— DATUM Ground Surface
INCLINATION 90° AZIMUTH NA DRILL RIG XD-2

DEPTH SCALE (FEET)	BORING METHOD	SOIL PROFILE DESCRIPTION	GRAPHIC LOG	USCS	SAMPLES NUMBER	SAMPLES TYPE*	SAMPLES BLOWS/ 6 IN.	SAMPLES RECOVERY	SAMPLE DESCRIPTION	NOTES / ANALYSIS
0		4-inch Asphalt concrete.								
		0.5-4.5 ft. Dense, yellowish brown, SILTY GRAVEL (FILL), dry.		GM						
2										
4										
		4.5-8.5 ft Stiff, dark brown, CLAY, moist.		CH					B4-5.5 OVM = 6.0 ppm	
6										
8										
		8.5-9.0 ft. Stiff, olive SILTY CLAY, moist		CL						
		9.0-13.0 ft. Stiff, dark brown to pale yellow CLAY, moist.		CH					B4-10 OVM = 6.5 ppm	
10										
12										
		13.0-16.0 ft. Stiff, pale yellow, SILTY CLAY, moist to wet.		CL					B4-15 OVM = 0.0 ppm	
14										
16		Total depth = 16.0 ft.							No groundwater observed during drilling. Borehole grouted to surface with neat cement on 5/22/95.	
18										
20										

DEPTH SCALE As Indicated
DRILLING CONTRACTOR Precision Drilling
DRILLER M. Casey

Golder Associates

LOGGED BY K. Reynolds
CHECKED D. Sarmiento
DATE 7/31/95

RECORD OF BOREHOLE # B-5

STA. B-5 OFFSET L R ELEVATION -- SHEET 1 OF 1
PROJECT NO. 943-7017 DRILLING DATE 5/22/95 DATUM Ground Surface
INCLINATION 90° AZIMUTH NA DRILL RIG XD-2

DEPTH SCALE (FEET)	BORING METHOD	SOIL PROFILE DESCRIPTION	GRAPHIC LOG	USCS	SAMPLES NUMBER	SAMPLES TYPE*	SAMPLES BLOWS/ 6 IN.	SAMPLES RECOVERY	SAMPLE DESCRIPTION	NOTES / ANALYSIS
0		4-inch. Asphalt concrete.								
		0.5-4.5 ft Dense, yellowish brown SILTY GRAVEL, moist up to 3/4-in. subangular gravel.		GM					3.0 ft. OVM = 0.0 ppm	
4		4.5-9.2 ft. Firm, dark brown to gray CLAY, moist		CH					B5-5 OVM = 0.0 ppm	
8		9.2-9.6 ft Dense, brown SILTY SAND, wet.		SM					9.0 ft. OVM = 0.0 ppm	
10		9.6-13.0 ft. Stiff, dark brown to olive CLAY, moist.		CH					B5-10	
12									12.0 ft. OVM = 0.0 ppm	
14		13.0-16.0 ft. Stiff, yellowish brown SILTY CLAY, some 1/4-1/2 in. subangular gravel, little fine to medium sand.		CL					B5-15 OVM = 0.0 ppm	
16		Total depth = 16.0 ft.							No groundwater observed during drilling. Groundwater observed at a depth of approximately 10 ft. on 5/24/95. Borehole grounted to surface with neat cement on 5/24/95.	
18										
20										

DEPTH SCALE As Indicated
DRILLING CONTRACTOR Precision Drilling
DRILLER M. Casey

Golder Associates

LOGGED BY K. Reynolds
CHECKED D. Sarmiento
DATE 7/31/95

RECORD OF BOREHOLE # B-6

STA. B-6 OFFSET L R ELEVATION --- SHEET 1 OF 1
PROJECT NO. 943-7017 DRILLING DATE 5/22/95 DATUM Ground Surface
INCLINATION 90° AZIMUTH NA DRILL RIG XD-2

DEPTH SCALE (FEET)	BORING METHOD	SOIL PROFILE DESCRIPTION	GRAPHIC LOG	USCS	SAMPLES NUMBER	SAMPLES TYPE*	SAMPLES BLOWS/ 6 IN.	SAMPLES RECOVERY	SAMPLE DESCRIPTION	NOTES / ANALYSIS
0		4-inch. Asphalt concrete.								
		0.5-3.5 ft. Dense, yellowish brown, SILTY GRAVEL (FILL) (1/4-1/2 in subangular gravel), dry.		GM					2.0 ft. OVM = 0.0 ppm	
2										
4		3.5-9.5 ft Stiff, dark brown, CLAY, moist.		CH					B6-5 OVM = 1.3 ppm	
6										
8										
10		9.5-10.0 ft. Stiff, pale yellow, SILTY CLAY, moist.		CL					B6-10 OVM = 56 ppm	
		10.0-12 5 ft. Stiff, dark brown, CLAY, moist.		CH						
12		12.5-13.5 ft. Stiff, pale yellow, SILTY CLAY, moist.		CL						
		13.5-14.5 ft. Stiff, pale yellow, CLAY, moist.		CH					14.0 ft. OVM = 0.0 ppm	
14		14.5-16.0 ft. Stiff, pale yellow SILTY CLAY, moist.		CL					B6-15 OVM = 0.0 ppm	
16		Total depth = 16.0 ft.							No groundwater observed during drilling Borehole grouted to surface with neat cement on 5/22/95.	
18										
20										

DEPTH SCALE As Indicated
DRILLING CONTRACTOR Precision Drilling
DRILLER M. Casey

Golder Associates

LOGGED BY K. Reynolds
CHECKED D. Sarmiento
DATE 7/31/95

RECORD OF BOREHOLE # B-7

STA. B-7 OFFSET L R ELEVATION — SHEET 1 OF 1
PROJECT NO. 943-7017 DRILLING DATE 5/22/95 DATUM Ground Surface
INCLINATION 90° AZIMUTH NA DRILL RIG XD-2

DEPTH SCALE (FEET)	BORING METHOD	SOIL PROFILE DESCRIPTION	GRAPHIC LOG	USCS	SAMPLES NUMBER	SAMPLES TYPE*	SAMPLES BLOWS/ 6 IN.	SAMPLES RECOVERY	SAMPLE DESCRIPTION	NOTES — ANALYSIS
0		4-inch. Asphalt concrete								
		0.5-3.5 ft. Dense, yellowish brown, SILTY GRAVEL (FILL), dry.		GM					3.0 ft. OVM = 0.0 ppm	
4		3.5-12.0 ft. Stiff, dark brown CLAY, moist.		CH					B7-5 OVM = 0.0 ppm	
10				CH					B7-10 OVM = 0.0 ppm	
12		12.0-16.0 ft. Soft to stiff, pale yellow SILTY CLAY, trace 1/4 in. gravel, moist to wet.		CL					13.0 ft. OVM = 0.0 ppm	
16									B7-15 OVM = 0.0 ppm	
		Total depth = 16.0 ft.							No groundwater observed during drilling. Borehole grouted to surface with neat cement on 5/22/95.	
20										

DEPTH SCALE As Indicated
DRILLING CONTRACTOR Precision Drilling
DRILLER M. Casey

Golder Associates

LOGGED BY K. Reynolds
CHECKED D. Sarmiento
DATE 7/31/95

RECORD OF BOREHOLE # B-8

STA. B-8 OFFSET L R ELEVATION — SHEET 1 OF 1
PROJECT NO. 943-7017 DRILLING DATE 5/22/95 DATUM Ground Surface
INCLINATION 90° AZIMUTH NA DRILL RIG XD-2

DEPTH SCALE (FEET)	BORING METHOD	SOIL PROFILE DESCRIPTION	GRAPHIC LOG	USCS	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES BLOWS/ 6 IN.	SAMPLES RECOVERY	SAMPLE DESCRIPTION	NOTES — ANALYSIS
0		4-inch. Asphalt concrete.								
		0.5-3 5 ft Dense, yellowish brown, SILTY GRAVEL, dry.		GM						
2										
4		3.5-6.0 ft. Stiff dark brown to black CLAY, moist.		CH					B8-5 OVM = 32 ppm	
6		6 0-6.5 ft Dense, black, CLAYEY GRAVEL, wet, 1/4 in subangular gravel.		GC					6.5.0 ft OVM = 49 ppm	
		6 5-12.5 ft. Stiff dark brown to black CLAY, moist.		CH					8.0 ft. OVM = 28 ppm	
8										
10									B8-10 OVM = 0.0 ppm	
12										
		12 5-16.0 ft. Stiff, pale yellow, SILTY CLAY, trace 1/16- 1/2 in. angular gravel, moist.		CL					B8-15 OVM = 0.0 ppm	
14										
16		Total depth = 16.0 ft.							No groundwater observed during drilling Groundwater observed at a depth of approximately 10 ft. on 5/24/95. Borehole grounted to surface with neat cement on 5/24/95.	
18										
20										

DEPTH SCALE As Indicated
DRILLING CONTRACTOR Precision Drilling
DRILLER M. Casey

Golder Associates

LOGGED BY K. Reynolds
CHECKED D. Sarmiento
DATE 7/31/95

RECORD OF BOREHOLE # B-9

STA. B-9 OFFSET L R ELEVATION — SHEET 1 OF 1
PROJECT NO. 943-7017 DRILLING DATE 5/22/95 DATUM Ground Surface
INCLINATION 90° AZIMUTH NA DRILL RIG XD-2

DEPTH SCALE (FEET)	BORING METHOD	SOIL PROFILE DESCRIPTION	GRAPHIC LOG	USCS	SAMPLES NUMBER	SAMPLES TYPE*	SAMPLES BLOWS/ 6 IN.	SAMPLES RECOVERY	SAMPLE DESCRIPTION	NOTES — ANALYSIS
0		4-Inch. Asphalt concrete								
		0.5-4.5 ft Dense, yellowish brown SILTY GRAVEL, dry (FILL).		GM						
2										
4										
		4.5-12.0 ft. Stiff, dark gray to black CLAY, moist.		CH					B9-5	
6										
8									8.0 ft OVM = 237 ppm	
10									B9-10 OVM = 60 ppm	
12		12.0-14.0 ft. Stiff pale yellow SILTY CLAY, moist.		CL					B9-13 OVM = 0.0 ppm	
14		14.0-16.0 ft. Some small 1/16-1/4 in. subangular gravel.							B9-15 16.0 ft. OVM = 0.0 ppm	
16		Total depth = 16.0 ft.							No groundwater observed during drilling. Borehole grouted to surface with neat cement on 5/22/95.	
18										
20										

DEPTH SCALE As Indicated
DRILLING CONTRACTOR Precision Drilling
DRILLER M. Casey

Golder Associates

LOGGED BY K. Reynolds
CHECKED D. Sarmiento
DATE 7/31/95

APPENDIX B

Laboratory Chemical Analysis Reports

Superior Precision Analytical, Inc.

A member of ESSCON Environmental Support Service Consortium

GOLDER ASSOC.
1451 HARBOR BAY PKWAY 1000
ALAMEDA, CA 94502

Date: June 5, 1995

Attn: KENT REYNOLDS

Laboratory Number : 81668

Project Number/Name : 943-7017

This report has been reviewed and

approved for release.

Michael R. Verona
Senior Chemist
Account Manager

Superior Precision Analytical, Inc.
A member of ESSCON Environmental Support Service Consortium

GOLDER ASSOC.
Attn: KENT REYNOLDS

Project 943-7017
Reported on June 9, 1995

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

Chronology

Laboratory Number 81668

Sample ID	Sampled	Received	Extract.	Analyzed	QC Batch	LAB #
B1-5	05/22/95	05/23/95	06/01/95	06/01/95	BE311.05	01
B1-10	05/22/95	05/23/95	06/01/95	06/01/95	BE311.05	02
B1-15	05/22/95	05/23/95	06/05/95	06/05/95	BF051.05	03
B2-05	05/22/95	05/23/95	06/01/95	06/01/95	BE311.05	04
B2-10	05/22/95	05/23/95	06/01/95	06/01/95	BE311.05	05
B2-15	05/22/95	05/23/95	06/06/95	06/06/95	BF061.05	06
B3-05	05/22/95	05/23/95	06/01/95	06/01/95	BE311.05	07
B3-10	05/22/95	05/23/95	06/01/95	06/01/95	BE311.05	08
B3-15	05/22/95	05/23/95	06/05/95	06/05/95	BF051.05	09
B4-05	05/22/95	05/23/95	06/01/95	06/01/95	BF011.05	10
B4-10	05/22/95	05/23/95	06/01/95	06/01/95	BF011.05	11
B5-05	05/22/95	05/23/95	06/01/95	06/01/95	BF011.05	13
B5-10	05/22/95	05/23/95	06/02/95	06/02/95	BF011.05	14
B6-05	05/22/95	05/23/95	06/02/95	06/02/95	BF011.05	16
B6-10	05/22/95	05/23/95	06/02/95	06/02/95	BF011.05	17
B7-05	05/22/95	05/23/95	06/02/95	06/02/95	BF011.05	19
B7-10	05/22/95	05/23/95	06/02/95	06/02/95	BF011.05	20
B8-05	05/22/95	05/23/95	06/02/95	06/02/95	BF011.05	22
B8-10	05/22/95	05/23/95	06/02/95	06/02/95	BF021.05	23
B9-05	05/22/95	05/23/95	06/02/95	06/02/95	BF011.05	25
B9-10	05/22/95	05/23/95	06/05/95	06/05/95	BF051.05	26
B9-15	05/22/95	05/23/95	06/05/95	06/05/95	BF051.05	27

QC Samples

QC Batch #	QC Sample ID	Type	Ref.	Matrix	Extract.	Analyzed
BE311.05-04	QA-7	MS	81657-01	Soil	05/31/95	05/31/95
BE311.05-05	QA-7	MSD	81657-01	Soil	05/31/95	05/31/95
BE311.05-21	Method Blank	MB		Soil	05/31/95	05/31/95
BF021.05-08	Laboratory Spike	LS		Soil	06/02/95	06/02/95
BF021.05-09	Laboratory Spike Duplicate	LSD		Soil	06/02/95	06/02/95
BF021.05-48	W01-2,3;W02-2,3	MS	81706-01	Soil	06/03/95	06/03/95
BF021.05-49	W01-2,3;W02-2,3	MSD	81706-01	Soil	06/03/95	06/03/95

Certified Laboratories

825 Arnold Dr., Suite 114
Martinez, California 94553
(510) 229-1512 / fax (510) 229-1526

1555 Burke St., Unit I
San Francisco, California 94124
(415) 647-2081 / fax (415) 821-7123

309 S. Cloverdale St., Suite B-24
Seattle, Washington 98108
(206) 763-2992 / fax (206) 763-8429

GOLDER ASSOC.
Attn: KENT REYNOLDS

Project 943-7017
Reported on June 9, 1995

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

LAB ID	Sample ID	Matrix	Dil.Factor	Moisture
81668-01	B1-5	Soil	1.0	-
81668-02	B1-10	Soil	1.0	-
81668-03	B1-15	Soil	1.0	-
81668-04	B2-05	Soil	1.0	-

R E S U L T S O F A N A L Y S I S

Compound	81668-01 Conc. mg/kg	RL	81668-02 Conc. mg/kg	RL	81668-03 Conc. mg/kg	RL	81668-04 Conc. mg/kg	RL
Gasoline_Range	17	1	7	1	ND	1	26	1
Benzene	ND	0.005	ND	0.005	ND	0.005	0.046	0.005
Toluene	0.041	0.005	0.019	0.005	ND	0.005	0.10	0.005
Ethyl Benzene	0.034	0.005	0.016	0.005	ND	0.005	0.063	0.005
Xylenes	0.29	0.005	0.12	0.005	ND	0.005	0.43	0.005
>> Surrogate Recoveries (%) <<								
Trifluorotoluene (SS)	99		104		108		155	

Certified Laboratories

825 Arnold Dr., Suite 114
Martinez, California 94553
(510) 229-1512 / fax (510) 229-1526

1555 Burke St., Unit I
San Francisco, California 94124
(415) 647-2081 / fax (415) 821-7123

309 S. Cloverdale St., Suite B-24
Seattle, Washington 98108
(206) 763-2992 / fax (206) 763-8429

GOLDER ASSOC.
Attn: KENT REYNOLDS

Project 943-7017
Reported on June 9, 1995

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

LAB ID	Sample ID	Matrix	Dil.Factor	Moisture
81668-05	B2-10	Soil	1.0	-
81668-06	B2-15	Soil	1.0	-
81668-07	B3-05	Soil	1.0	-
81668-08	B3-10	Soil	1.0	-

R E S U L T S O F A N A L Y S I S

Compound	81668-05 Conc. mg/kg	RL	81668-06 Conc. mg/kg	RL	81668-07 Conc. mg/kg	RL	81668-08 Conc. mg/kg	RL
Gasoline_Range	8	1	ND	1	ND	1	2	1
Benzene	0.045	0.005	ND	0.005	ND	0.005	ND	0.005
Toluene	0.032	0.005	0.009	0.005	ND	0.005	ND	0.005
Ethyl Benzene	0.019	0.005	ND	0.005	ND	0.005	ND	0.005
Xylenes	0.12	0.005	0.010	0.005	ND	0.005	0.022	0.005
<< Surrogate Recoveries (%) <<								
Trifluorotoluene (SS)	122		103		103		104	

Certified Laboratories

825 Arnold Dr., Suite 114
Martinez, California 94553
(510) 229-1512 / fax (510) 229-1526

1555 Burke St., Unit I
San Francisco, California 94124
(415) 647-2081 / fax (415) 821-7123

309 S. Cloverdale St., Suite B-24
Seattle, Washington 98108
(206) 763-2992 / fax (206) 763-8429

GOLDER ASSOC.
Attn: KENT REYNOLDS

Project 943-7017
Reported on June 9, 1995

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

LAB ID	Sample ID	Matrix	Dil.Factor	Moisture
81668-09	B3-15	Soil	1.0	-
81668-10	B4-05	Soil	1.0	-
81668-11	B4-10	Soil	1.0	-
81668-13	B5-05	Soil	1.0	-

R E S U L T S O F A N A L Y S I S

Compound	81668-09 Conc. mg/kg	RL	81668-10 Conc. mg/kg	RL	81668-11 Conc. mg/kg	RL	81668-13 Conc. mg/kg	RL
Gasoline_Range	ND	1	7	1	ND	1	ND	1
Benzene	ND	0.005	ND	0.005	ND	0.005	ND	0.005
Toluene	ND	0.005	0.028	0.005	ND	0.005	ND	0.005
Ethyl Benzene	ND	0.005	0.018	0.005	ND	0.005	ND	0.005
Xylenes	ND	0.005	0.12	0.005	ND	0.005	ND	0.005
>> Surrogate Recoveries (%) <<								
Trifluorotoluene (SS)	109		103		98		110	

Certified Laboratories

825 Arnold Dr., Suite 114
Martinez, California 94553
(510) 229-1512 / fax (510) 229-1526

1555 Burke St., Unit I
San Francisco, California 94124
(415) 647-2081 / fax (415) 821-7123

309 S. Cloverdale St., Suite B-24
Seattle, Washington 98108
(206) 763-2992 / fax (206) 763-8429

GOLDER ASSOC.
Attn: KENT REYNOLDS

Project 943-7017
Reported on June 9, 1995

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

LAB ID	Sample ID	Matrix	Dil.Factor	Moisture
81668-14	B5-10	Soil	1.0	-
81668-16	B6-05	Soil	1.0	-
81668-17	B6-10	Soil	1.0	-
81668-19	B7-05	Soil	1.0	-

R E S U L T S O F A N A L Y S I S

Compound	81668-14 Conc. mg/kg	RL	81668-16 Conc. mg/kg	RL	81668-17 Conc. mg/kg	RL	81668-19 Conc. mg/kg	RL
Gasoline_Range	ND	1	ND	1	ND	1	ND	1
Benzene	ND	0.005	0.042	0.005	0.056	0.005	ND	0.005
Toluene	ND	0.005	0.007	0.005	0.007	0.005	ND	0.005
Ethyl Benzene	ND	0.005	ND	0.005	0.010	0.005	ND	0.005
Xylenes	ND	0.005	0.008	0.005	0.030	0.005	ND	0.005
>> Surrogate Recoveries (%) <<								
Trifluorotoluene (SS)	109		122		104		104	

Certified Laboratories

825 Arnold Dr., Suite 114
Martinez, California 94553
(510) 229-1512 / fax (510) 229-1526

1555 Burke St., Unit I
San Francisco, California 94124
(415) 647-2081 / fax (415) 821-7123

309 S. Cloverdale St., Suite B-24
Seattle, Washington 98108
(206) 763-2992 / fax (206) 763-8429

GOLDER ASSOC.
Attn: KENT REYNOLDS

Project 943-7017
Reported on June 9, 1995

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

LAB ID	Sample ID	Matrix	Dil.Factor	Moisture
81668-20	B7-10	Soil	1.0	-
81668-22	B8-05	Soil	1.0	-
81668-23	B8-10	Soil	1.0	-
81668-25	B9-05	Soil	1.0	-

R E S U L T S O F A N A L Y S I S

Compound	81668-20 Conc. mg/kg	RL	81668-22 Conc. mg/kg	RL	81668-23 Conc. mg/kg	RL	81668-25 Conc. mg/kg	RL
Gasoline_Range	ND	1	ND	1	ND	1	29	1
Benzene	ND	0.005	ND	0.005	ND	0.005	0.25	0.005
Toluene	ND	0.005	ND	0.005	ND	0.005	0.22	0.005
Ethyl Benzene	ND	0.005	ND	0.005	ND	0.005	0.70	0.005
Xylenes	ND	0.005	ND	0.005	ND	0.005	0.32	0.005
>> Surrogate Recoveries (%) <<								
Trifluorotoluene (SS)	121		108		105		249i	

Certified Laboratories

825 Arnold Dr., Suite 114
Martinez, California 94553
(510) 229-1512 / fax (510) 229-1526

1555 Burke St., Unit I
San Francisco, California 94124
(415) 647-2081 / fax (415) 821-7123

309 S. Cloverdale St., Suite B-24
Seattle, Washington 98108
(206) 763-2992 / fax (206) 763-8429

GOLDER ASSOC.
Attn: KENT REYNOLDS

Project 943-7017
Reported on June 9, 1995

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

LAB ID	Sample ID	Matrix	Dil.Factor	Moisture
81668-26	B9-10	Soil	1.0	-
81668-27	B9-15	Soil	1.0	-

R E S U L T S O F A N A L Y S I S

Compound	81668-26 Conc. mg/kg	RL	81668-27 Conc. mg/kg	RL
Gasoline_Range	31	1	ND	1
Benzene	0.11	0.005	ND	0.005
Toluene	0.10	0.005	ND	0.005
Ethyl Benzene	0.80	0.005	ND	0.005
Xylenes	0.99	0.005	ND	0.005
>> Surrogate Recoveries (%) <<				
Trifluorotoluene (SS)	149		104	

Certified Laboratories

825 Arnold Dr., Suite 114
Martinez, California 94553
(510) 229-1512 / fax (510) 229-1526

1555 Burke St., Unit I
San Francisco, California 94124
(415) 647-2081 / fax (415) 821-7123

309 S. Cloverdale St., Suite B-24
Seattle, Washington 98108
(206) 763-2992 / fax (206) 763-8429

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

Quality Assurance and Control Data

Laboratory Number: 81668
Method Blank(s)

	BE311.05-21 Conc. mg/kg	 RL
Gasoline_Range	ND	1
Benzene	ND	0.005
Toluene	ND	0.005
Ethyl Benzene	ND	0.005
Xylenes	ND	0.005
>> Surrogate Recoveries (%) <<		
Trifluorotoluene (SS)	107	

Certified Laboratories

825 Arnold Dr., Suite 114
Martinez, California 94553
(510) 229-1512 / fax (510) 229-1526

1555 Burke St., Unit I
San Francisco, California 94124
(415) 647-2081 / fax (415) 821-7123

309 S. Cloverdale St., Suite B-24
Seattle, Washington 98108
(206) 763-2992 / fax (206) 763-8429

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

Quality Assurance and Control Data

Laboratory Number: 81668

Compound	Sample conc.	SPK Level	SPK Result	Recovery %	Limits %	RPD %
For Soil Matrix (mg/kg)						
BF021.05 08 / 09 - Laboratory Control Spikes						
Gasoline_Range		3.20	3/3	94/94	65-135	0
Benzene		0.200	0.20/0.21	100/105	65-135	5
Toluene		0.200	0.20/0.21	100/105	65-135	5
Ethyl Benzene		0.200	0.20/0.21	100/105	65-135	5
Xylenes		0.600	0.63/0.65	105/108	65-135	3
>> Surrogate Recoveries (%) <<						
Trifluorotoluene (SS)				98/97	50-150	
For Soil Matrix (mg/kg)						
BE311.05 04 / 05 - Sample Spiked: 81657 - 01						
Gasoline_Range	ND	3.20	3/3	94/94	65-135	0
Benzene	ND	0.200	0.20/0.20	100/100	65-135	0
Toluene	ND	0.200	0.20/0.20	100/100	65-135	0
Ethyl Benzene	ND	0.200	0.20/0.20	100/100	65-135	0
Xylenes	ND	0.600	0.61/0.61	102/102	65-135	0
>> Surrogate Recoveries (%) <<						
Trifluorotoluene (SS)				98/101	50-150	
For Soil Matrix (mg/kg)						
BF021.05 48 / 49 - Sample Spiked: 81706 - 01						
Gasoline_Range	ND	3.20	2.2/2.1	69/66	65-135	4
Benzene	ND	0.200	0.18/0.15	90/75	65-135	18
Toluene	ND	0.200	0.18/0.16	90/80	65-135	12
Ethyl Benzene	ND	0.200	0.18/0.16	90/80	65-135	12
Xylenes	0.006	0.600	0.58/0.55	96/91	65-135	5

Certified Laboratories

825 Arnold Dr., Suite 114
Martinez, California 94553
(510) 229-1512 / fax (510) 229-1526

1555 Burke St., Unit I
San Francisco, California 94124
(415) 647-2081 / fax (415) 821-7123

309 S. Cloverdale St., Suite B-24
Seattle, Washington 98108
(206) 763-2992 / fax (206) 763-8429

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

Quality Assurance and Control Data

Laboratory Number: 81668

Compound	Sample conc.	SPK Level	SPK Result	Recovery %	Limits %	RPD %
>> Surrogate Recoveries (%) <<						
rifluorotoluene (SS)				96/97	50-150	

i = The surrogate recovery was high due to the presence of interfering compounds in the sample.

Definitions:
ND = Not Detected
RL = Reporting Limit
NA = Not Analysed
RPD = Relative Percent Difference
ug/L = parts per billion (ppb)
mg/L = parts per million (ppm)
ug/kg = parts per billion (ppb)
mg/kg = parts per million (ppm)

Certified Laboratories

825 Arnold Dr., Suite 114
Martinez, California 94553
(510) 229-1512 / fax (510) 229-1526

1555 Burke St., Unit I
San Francisco, California 94124
(415) 647-2081 / fax (415) 821-7123

309 S. Cloverdale St., Suite B-24
Seattle, Washington 98108
(206) 763-2992 / fax (206) 763-8429

Superior Precision Analytical, Inc.
A member of ESSCON Environmental Support Service Consortium

GOLDER ASSOC.
Attn: KENT REYNOLDS

Project 943-7017
Reported on June 1, 1995

Total Petroleum Hydrocarbons as Diesel
by EPA SW-846 Method 8015M
Diesel Range quantitated as all compounds from C10-C25

Chronology

Laboratory Number 81668

Sample ID	Sampled	Received	Extract.	Analyzed	QC Batch	LAB #
B1-5	05/22/95	05/23/95	05/27/95	05/31/95	BE272.21	01
B1-10	05/22/95	05/23/95	05/27/95	05/31/95	BE272.21	02
B2-05	05/22/95	05/23/95	05/27/95	05/31/95	BE272.21	04
B2-10	05/22/95	05/23/95	05/27/95	05/31/95	BE272.21	05
B3-05	05/22/95	05/23/95	05/27/95	05/31/95	BE272.21	07
B3-10	05/22/95	05/23/95	05/27/95	05/31/95	BE272.21	08
B4-05	05/22/95	05/23/95	05/27/95	05/31/95	BE272.21	10
B4-10	05/22/95	05/23/95	05/27/95	05/31/95	BE272.21	11
B5-05	05/22/95	05/23/95	05/27/95	05/28/95	BE272.21	13
B5-10	05/22/95	05/23/95	05/27/95	05/28/95	BE272.21	14
B6-05	05/22/95	05/23/95	05/27/95	05/28/95	BE272.21	16
B6-10	05/22/95	05/23/95	05/27/95	05/28/95	BE272.21	17
B7-05	05/22/95	05/23/95	05/27/95	05/28/95	BE272.21	19
B7-10	05/22/95	05/23/95	05/27/95	05/28/95	BE272.21	20
B8-05	05/22/95	05/23/95	05/27/95	05/28/95	BE272.21	22
B8-10	05/22/95	05/23/95	05/27/95	05/28/95	BE272.21	23
B9-05	05/22/95	05/23/95	05/27/95	05/28/95	BE272.21	25
B9-10	05/22/95	05/23/95	05/27/95	05/28/95	BE272.21	26

QC Samples

QC Batch #	QC Sample ID	TypeRef.	Matrix	Extract.	Analyzed
BE272.21-01	Method Blank	MB	Soil	05/27/95	05/30/95
BE272.21-02	Laboratory Spike	LS	Soil	05/27/95	05/30/95
BE272.21-03	Laboratory Spike Duplicate	LSD	Soil	05/27/95	05/30/95
BE272.21-04	95-2002QS	MS 81679-01	Soil	05/27/95	05/30/95
BE272.21-05	95-2002QS	MSD 81679-01	Soil	05/27/95	05/30/95

Certified Laboratories

825 Arnold Dr., Suite 114
Martinez, California 94553
(510) 229-1512 / fax (510) 229-1526

1555 Burke St., Unit I
San Francisco, California 94124
(415) 647-2081 / fax (415) 821-7123

309 S. Cloverdale St., Suite B-24
Seattle, Washington 98108
(206) 763-2992 / fax (206) 763-8429

GOLDER ASSOC.
Attn: KENT REYNOLDS

Project 943-7017
Reported on June 1, 1995

Total Petroleum Hydrocarbons as Diesel
by EPA SW-846 Method 8015M
Diesel Range quantitated as all compounds from C10-C25

LAB ID	Sample ID	Matrix	Dil.Factor	Moisture
81668-01	B1-5	Soil	10.0	-
81668-02	B1-10	Soil	10.0	-
81668-04	B2-05	Soil	10.0	-
81668-05	B2-10	Soil	10.0	-

R E S U L T S O F A N A L Y S I S

Compound	81668-01 Conc. mg/kg	RL	81668-02 Conc. mg/kg	RL	81668-04 Conc. mg/kg	RL	81668-05 Conc. mg/kg	RL
Diesel:	1400	100	620	100	940	100	820	100
>> Surrogate Recoveries (%) <<								
Tetracosane	h		h		h		h	

Certified Laboratories

825 Arnold Dr., Suite 114
Martinez, California 94553
(510) 229-1517 / fax (510) 229-1526

1555 Burke St., Unit I
San Francisco, California 94124
(415) 647-2081 / fax (415) 821-7123

309 S. Cloverdale St., Suite B-24
Seattle, Washington 98108
(206) 763-2992 / fax (206) 763-8429

GOLDER ASSOC.
Attn: KENT REYNOLDS

Project 943-7017
Reported on June 1, 1995

Total Petroleum Hydrocarbons as Diesel
by EPA SW-846 Method 8015M
Diesel Range quantitated as all compounds from C10-C25

LAB ID	Sample ID	Matrix	Dil.Factor	Moisture
81668-07	B3-05	Soil	1.0	-
81668-08	B3-10	Soil	1.0	-
81668-10	B4-05	Soil	1.0	-
81668-11	B4-10	Soil	1.0	-

R E S U L T S O F A N A L Y S I S

Compound	81668-07 Conc. mg/kg	RL	81668-08 Conc. mg/kg	RL	81668-10 Conc. mg/kg	RL	81668-11 Conc. mg/kg	RL
Diesel:	ND	10	360	10	1000	10	ND	10
>> Surrogate Recoveries (%) <<								
Tetracosane	80		93		136		79	

Certified Laboratories

825 Arnold Dr., Suite 114
Martinez, California 94553
(510) 229-1512 / fax (510) 229-1526

1555 Burke St., Unit I
San Francisco, California 94124
(415) 647-2081 / fax (415) 821-7123

309 S. Cloverdale St., Suite B-24
Seattle, Washington 98108
(206) 763-2992 / fax (206) 763-8429

GOLDER ASSOC.
Attn: KENT REYNOLDS

Project 943-7017
Reported on June 1, 1995

Total Petroleum Hydrocarbons as Diesel
by EPA SW-846 Method 8015M
Diesel Range quantitated as all compounds from C10-C25

LAB ID	Sample ID	Matrix	Dil.Factor	Moisture
81668-13	B5-05	Soil	1.0	-
81668-14	B5-10	Soil	1.0	-
81668-16	B6-05	Soil	1.0	-
81668-17	B6-10	Soil	1.0	-

R E S U L T S O F A N A L Y S I S

Compound	81668-13 Conc. mg/kg	RL	81668-14 Conc. mg/kg	RL	81668-16 Conc. mg/kg	RL	81668-17 Conc. mg/kg	RL
Diesel:	ND	10	ND	10	ND	10	ND	10
Surrogate Recoveries (%) <<								
Tetracosane	58		53		57		58	

Certified Laboratories

825 Arnold Dr., Suite 114
Martinez, California 94553
(510) 229-1512 / fax (510) 229-1526

1555 Burke St., Unit I
San Francisco, California 94124
(415) 647-2081 / fax (415) 821-7123

309 S. Cloverdale St., Suite B-24
Seattle, Washington 98108
(206) 763-2992 / fax (206) 763-8429

GOLDER ASSOC.
Attn: KENT REYNOLDS

Project 943-7017
Reported on June 1, 1995

Total Petroleum Hydrocarbons as Diesel
by EPA SW-846 Method 8015M
Diesel Range quantitated as all compounds from C10-C25

LAB ID	Sample ID	Matrix	Dil.Factor	Moisture
81668-19	B7-05	Soil	1.0	-
81668-20	B7-10	Soil	1.0	-
81668-22	B8-05	Soil	1.0	-
81668-23	B8-10	Soil	1.0	-

R E S U L T S O F A N A L Y S I S

Compound	81668-19 Conc. mg/kg	RL	81668-20 Conc. mg/kg	RL	81668-22 Conc. mg/kg	RL	81668-23 Conc. mg/kg	RL
Diesel:	ND	10	ND	10	ND	10	ND	10
Surrogate Recoveries (%) <<								
Tetracosane	54		53		77		77	

Certified Laboratories

825 Arnold Dr., Suite 114
Martinez, California 94553
(510) 229-1512 / fax (510) 229-1526

1555 Burke St., Unit I
San Francisco, California 94124
(415) 647-2081 / fax (415) 821-7123

309 S. Cloverdale St., Suite B-24
Seattle, Washington 98108
(206) 763-2992 / fax (206) 763-8429

GOLDER ASSOC.
Attn: KENT REYNOLDS

Project 943-7017
Reported on June 1, 1995

Total Petroleum Hydrocarbons as Diesel
by EPA SW-846 Method 8015M
Diesel Range quantitated as all compounds from C10-C25

LAB ID	Sample ID	Matrix	Dil.Factor	Moisture
81668-25	B9-05	Soil	1.0	-
81668-26	B9-10	Soil	1.0	-

R E S U L T S O F A N A L Y S I S

Compound	81668-25 Conc. mg/kg	RL	81668-26 Conc. mg/kg	RL
Diesel:	170	10	310	10
>> Surrogate Recoveries (%) <<				
Tetracosane	128		97	

Certified Laboratories

825 Arnold Dr., Suite 114
Martinez, California 94553
(510) 229-1512 / fax (510) 229-1526

1555 Burke St., Unit I
San Francisco, California 94124
(415) 647-2081 / fax (415) 821-7123

309 S. Cloverdale St., Suite B-24
Seattle, Washington 98108
(206) 763-2992 / fax (206) 763-8429

Total Petroleum Hydrocarbons as Diesel
by EPA SW-846 Method 8015M
Diesel Range quantitated as all compounds from C10-C25

Quality Assurance and Control Data

Laboratory Number: 81668
Method Blank(s)

	BE272.21-01 Conc. mg/kg	RL
Diesel:	ND	10
>> Surrogate Recoveries (%) <<		
Tetracosane	82	

Certified Laboratories

825 Arnold Dr., Suite 114
Martinez, California 94553
(510) 229-1512 / fax (510) 229-1526

1555 Burke St., Unit I
San Francisco, California 94124
(415) 647-2081 / fax (415) 821-7123

309 S. Cloverdale St., Suite B-24
Seattle, Washington 98108
(206) 763-2992 / fax (206) 763-8429

Total Petroleum Hydrocarbons as Diesel
by EPA SW-846 Method 8015M
Diesel Range quantitated as all compounds from C10-C25

Quality Assurance and Control Data

Laboratory Number: 81668

Compound	Sample conc.	SPK Level	SPK Result	Recovery %	Limits %	RPD %
For Soil Matrix (mg/kg) BE272.21 02 / 03 - Laboratory Control Spikes						
Diesel:		100	106/108	106/108	50-150	2
>> Surrogate Recoveries (%) <<						
Tetracosane				82/89	50-150	
For Soil Matrix (mg/kg) BE272.21 04 / 05 - Sample Spiked: 81679 - 01						
Diesel:	90	100	148/155	58/65	50-150	11
>> Surrogate Recoveries (%) <<						
Tetracosane				92/87	50-150	

h - Accurate quanitiation of the surrogate was not possible due to the extent of sample dilution.

Definitions:
ND = Not Detected
R = Reporting Limit
N = Not Analysed
RPD = Relative Percent Difference
ug/L = parts per billion (ppb)
mg/L = parts per million (ppm)

ug/kg = parts per billion (ppb)
mg/kg = parts per million (ppm)

Certified Laboratories

825 Arnold Dr., Suite 114
Martinez, California 94553
(510) 229-1512 / fax (510) 229-1526

1555 Burke St., Unit I
San Francisco, California 94124
(415) 647-2081 / fax (415) 821-7123

309 S. Cloverdale St., Suite B-24
Seattle, Washington 98108
(206) 763-2992 / fax (206) 763-8429

CHAIN OF CUSTODY RECORD

81668

pg 1 of 2

PROJ. NO.	SITE / LOCATION
443-7017	J&M / Hayward

SAMPLERS: (Signature) Kent Reynolds

STA. NO.	DATE	TIME	SAMPLE TYPE	MEDIA	SAMPLE IDENTIFICATION	NO. OF CONTAINERS	AMOUNT / PRESERVATIVE	TPH g + BTEX	TPH diesel					SEAL NO.	SEAL INTACT? (Y or N)	REMARKS (with initials)
B1	5/22/95		Grab	Soil	B1-5	1	✓	✓								Hold samples
"					B1-10	1	✓	✓								B1-15, B2-15, B3-15
"					B1-15	1	✓	✓								B4-15, B5-15
B2					B2-5	1	✓	✓								pending results
"					B2-10	1	✓	✓								of balance of samples
"					B2-15	1	✓	✓								Quotation No.
B3					B3-5	1	✓	✓								95-00932
"					B3-10	1	✓	✓								
"					B3-15	1	✓	✓								
B4					B4-5.5	1	✓	✓								
"					B4-10	1	✓	✓								
"					B4-15	1	✓	✓								
B5					B5-5	1	✓	✓								
"					B5-10	1	✓	✓								
"					B5-15	1	✓	✓								

Relinquished by: (Signature/Firm)	Date / Time	Received by: (Signature/Firm)	Relinquished by: (Signature/Firm)	Date / Time	Received by: (Signature/Firm)
Kent Reynolds	5/23/95 10:07	D. Louie	D. Louie	5/23/95 1143	[signature]
Relinquished by: (Signature/Firm)	Date / Time	Received by: (Signature/Firm)	Relinquished by: (Signature/Firm)	Date / Time	Received by: (Signature/Firm)
Relinquished by: (Signature/Firm)	Date / Time	Received by: (Signature/Firm)	Date / Time		

Remarks (attachments if necessary)

Send Results to:
Builder Associates
Attn: Kent Reynolds

pg 2 of 2

CHAIN OF CUSTODY RECORD

PROJ. NO.: 943-7017 | SITE/LOCATION: J+M / Hayward

SAMPLERS: (Signature)

STA. NO.	DATE	TIME	SAMPLE TYPE	MEDIA	SAMPLE IDENTIFICATION	NO. OF CONTAINERS	AMOUNT/PRESERVATIVE: TPHg, BTEX	TPH diesel	SEAL NO.	SEAL INTACT? (Y or N)	REMARKS (with initials)
B6	5/22/95		Grab	Soil	B6-5	1	✓	✓			Hold samples
"					B6-10	1	✓	✓			B6-15, ~~B6~~ KAR, B7-15
"					B6-15	1	✓	✓			B8-15, B9-15
B7					B7-5	1	✓	✓			pending results of
"					B7-10	1	✓	✓			balance of samples
"					B7-15	1	✓	✓			Quotation No:
B8					B8-5	1	✓	✓			95-00832
"					B8-10	1	✓	✓			
"					B8-15	1	✓	✓			4.0 5.9°C
B9					B9-5	1	✓	✓			
"					B9-10	1	✓	✓			
"					B9-15	1	✓	✓			

Relinquished by: (Signature/Firm)	Date/Time	Received by: (Signature/Firm)	Relinquished by: (Signature/Firm)	Date/Time	Received by: (Signature/Firm)
K. Kent/Ray	5/23/95 10:07	D. Louie	D. Louie	5/23/95 1143	Gary Howell

Remarks (attachments if necessary)

Send Results to
Golder Associates
Attn: Kent Raymond

Superior Precision Analytical, Inc.

A member of ESSCON Environmental Support Service Consortium

GOLDER ASSOC.
1451 HARBOR BAY PKWAY 1000
ALAMEDA, CA 94502

Date: June 29, 1995

Attn: KENT REYNOLDS

Laboratory Number : 81904

Project Number/Name : 943-7017

This report has been reviewed and

approved for release.

Senior Chemist
Account Manager

Certified Laboratories

825 Arnold Dr., Suite 114
Martinez, California 94553
(510) 229-1512 / fax (510) 229-1526

1555 Burke St., Unit I
San Francisco, California 94124
(415) 647-2081 / fax (415) 821-7123

309 S. Cloverdale St., Suite B-24
Seattle, Washington 98108
(206) 763-2992 / fax (206) 763-8429

Superior Precision Analytical, Inc.
A member of ESSCON Environmental Support Service Consortium

GILDER ASSOC.
Attn: KENT REYNOLDS

Project 943-7017
Reported on June 19, 1995
Revised on June 27, 1995

Total Petroleum Hydrocarbons as Diesel
by EPA SW-846 Method 8015M
Diesel Range quantitated as all compounds from C10-C25

Chronology

Laboratory Number 81904

Sample ID	Sampled	Received	Extract.	Analyzed	QC Batch	LAB #
B1-15	05/22/95	06/14/95	06/16/95	06/16/95	BF161.42	01
B2-15	05/22/95	06/14/95	06/16/95	06/16/95	BF161.42	02
B3-15	05/22/95	06/14/95	06/16/95	06/16/95	BF161.42	03
B9-15	05/22/95	06/14/95	06/26/95	06/26/95	BF262.21	04

QC Samples

QC Batch #	QC Sample ID	Type	Ref.	Matrix	Extract.	Analyzed
BF161.42-09	Method Blank	MB		Soil	06/16/95	06/16/95
BF161.42-10	Laboratory Spike	LS		Soil	06/16/95	06/16/95
BF161.42-11	Laboratory Spike Duplicate	LSD		Soil	06/16/95	06/16/95
BF161.42-12	MW-3-1	MS	81880-05	Soil	06/16/95	06/16/95
BF161.42-13	MW-3-1	MSD	81880-05	Soil	06/16/95	06/17/95
BF262.21-02	Method Blank	MB		Soil	06/26/95	06/26/95
BF262.21-05	12SC062195D	MS	82016-01	Soil	06/26/95	06/26/95
BF262.21-06	12SC062195D	MSD	82016-01	Soil	06/26/95	06/26/95

Certified Laboratories

825 Arnold Dr., Suite 114
Martinez, California 94553
(510) 229-1517 / fax (510) 229-1526

1555 Burke St., Unit I
San Francisco, California 94124
(415) 647-2081 / fax (415) 821-7123

309 S. Cloverdale St., Suite B-24
Seattle, Washington 98108
(206) 763-2992 / fax (206) 763-8429

GOLDER ASSOC.
Attn: KENT REYNOLDS

Project 943-7017
Reported on June 19, 1995
Revised on June 27, 1995

Total Petroleum Hydrocarbons as Diesel
by EPA SW-846 Method 8015M
Diesel Range quantitated as all compounds from C10-C25

LAB ID	Sample ID	Matrix	Dil.Factor	Moisture
81904-01	B1-15	Soil	1.0	-
81904-02	B2-15	Soil	1.0	-
81904-03	B3-15	Soil	1.0	-
81904-04	B9-15	Soil	1.0	-

R E S U L T S O F A N A L Y S I S

Compound	81904-01 Conc. mg/kg	RL	81904-02 Conc. mg/kg	RL	81904-03 Conc. mg/kg	RL	81904-04 Conc. mg/kg	RL
Diesel:	ND	10	ND	10	ND	10	ND	10
>> Surrogate Recoveries (%) <<								
Tetracosane	52		51		49		61	

Certified Laboratories

825 Arnold Dr., Suite 114
Martinez, California 94553
(510) 229-1512 / fax (510) 229-1526

1555 Burke St., Unit I
San Francisco, California 94124
(415) 647-2081 / fax (415) 821-7123

309 S. Cloverdale St., Suite B-24
Seattle, Washington 98108
(206) 763-2992 / fax (206) 763-8429

Total Petroleum Hydrocarbons as Diesel
by EPA SW-846 Method 8015M
Diesel Range quantitated as all compounds from C10-C25

Quality Assurance and Control Data

Laboratory Number: 81904
Method Blank(s)

	BF161.42-09		BF262.21-02	
	Conc.	RL	Conc.	RL
	%		%	
Diesel:	ND	10	ND	10
>> Surrogate Recoveries (%) <<				
Tetracosane	131		137	

Certified Laboratories

825 Arnold Dr., Suite 114
Martinez, California 94553
(510) 229-1512 / fax (510) 229-1526

1555 Burke St., Unit I
San Francisco, California 94124
(415) 647-2081 / fax (415) 821-7123

309 S. Cloverdale St., Suite B-24
Seattle, Washington 98108
(206) 763-2992 / fax (206) 763-8429

Total Petroleum Hydrocarbons as Diesel
by EPA SW-846 Method 8015M
Diesel Range quantitated as all compounds from C10-C25

Quality Assurance and Control Data

Laboratory Number: 81904

Compound	Sample conc.	SPK Level	SPK Result	Recovery %	Limits %	RPD %
For Soil Matrix (mg/Kg)						
BF161.42 10 / 11 - Laboratory Control Spikes						
Diesel:		100	106/110	106/110	50-150	4
>> Surrogate Recoveries (%) <<						
Tetracosane				121/96	50-150	
For Soil Matrix (mg/Kg)						
BF161.42 12 / 13 - Sample Spiked: 81880 - 05						
Diesel:	ND	100	108/108	108/108	50-150	0
>> Surrogate Recoveries (%) <<						
Tetracosane				119/126	50-150	
For Soil Matrix (mg/Kg)						
BF262.21 05 / 06 - Sample Spiked: 82016 - 01						
Diesel:	ND	100	63/69	63/69	50-150	9
>> Surrogate Recoveries (%) <<						
Tetracosane				63/135	50-150	

Definitions:
ND = Not Detected
RL = Reporting Limit
NA = Not Analysed
RPD = Relative Percent Difference
ug/L = parts per billion (ppb)
mg/L = parts per million (ppm)
ug/kg = parts per billion (ppb)
mg/kg = parts per million (ppm)

Certified Laboratories

825 Arnold Dr., Suite 114
Martinez, California 94553
(510) 229-1512 / fax (510) 229-1526

1555 Burke St., Unit I
San Francisco, California 94124
(415) 647-2081 / fax (415) 821-7123

309 S. Cloverdale St., Suite B-24
Seattle, Washington 98108
(206) 763-2992 / fax (206) 763-8429

Superior Precision Analytical, Inc.

A member of ESSCON Environmental Support Service Consortium

GOLDER ASSOC.
1451 HARBOR BAY PKWAY 1000
ALAMEDA, CA 94502

Date: July 30, 1995

Attn: KENT REYNOLDS

Laboratory Number : 82119

Project Number/Name : 943-7017

This report has been reviewed and

approved for release.

Senior Chemist
Account Manager

Superior Precision Analytical, Inc.
A member of ESSCON Environmental Support Service Consortium

GOLDER ASSOC.
Attn: KENT REYNOLDS

Project 943-7017
Reported on July 30, 1995

Total Petroleum Hydrocarbons as Diesel
by EPA SW-846 Method 8015M
Diesel Range quantitated as all compounds from C10-C25

Chronology

Laboratory Number 82119

Sample ID	Sampled	Received	Extract.	Analyzed	QC Batch	LAB #
DPL-1	07/25/95	07/25/95	07/26/95	07/26/95	BG261.21	01
DPL-2	07/25/95	07/25/95	07/26/95	07/28/95	BG261.21	02
DPL-3	07/25/95	07/25/95	07/26/95	07/28/95	BG261.21	03
SP-1	07/25/95	07/25/95	07/26/95	07/27/95	BG261.21	04
SP-2	07/25/95	07/25/95	07/26/95	07/26/95	BG261.21	05
SP-3	07/25/95	07/25/95	07/26/95	07/27/95	BG261.21	06
SP-4	07/25/95	07/25/95	07/26/95	07/27/95	BG261.21	07
SP-5	07/25/95	07/25/95	07/26/95	07/28/95	BG261.21	08

QC Samples

QC Batch #	QC Sample ID	Type	Ref.	Matrix	Extract.	Analyzed
BG261.21-09	Method Blank	MB		Soil	07/26/95	07/26/95
BG261.21-10	Laboratory Spike	LS		Soil	07/26/95	07/26/95
BG261.21-11	Laboratory Spike Duplicate	LSD		Soil	07/26/95	07/26/95
BG261.21-13	SP-2	MS	82119-05	Soil	07/26/95	07/26/95
BG261.21-14	SP-2	MSD	82119-05	Soil	07/26/95	07/26/95

Certified Laboratories

825 Arnold Dr., Suite 114
Martinez, California 94553
(510) 229-1512 / fax (510) 229-1526

1555 Burke St., Unit I
San Francisco, California 94124
(415) 647-2081 / fax (415) 821-7123

309 S. Cloverdale St., Suite B-24
Seattle, Washington 98108
(206) 763-2992 / fax (206) 763-8429

GOLDER ASSOC.
Attn: KENT REYNOLDS

Project 943-7017
Reported on July 30, 1995

Total Petroleum Hydrocarbons as Diesel
by EPA SW-846 Method 8015M
Diesel Range quantitated as all compounds from C10-C25

LAB ID	Sample ID	Matrix	Dil.Factor	Moisture
82119-01	DPL-1	Soil	1.0	-
82119-02 X	DPL-2	Soil	10.0	-
82119-03 X	DPL-3	Soil	10.0	-
82119-04	SP-1	Soil	1.0	-

R E S U L T S O F A N A L Y S I S

Compound	82119-01 Conc. mg/kg	RL	82119-02 Conc. mg/kg	RL	82119-03 Conc. mg/kg	RL	82119-04 Conc. mg/kg	RL
Diesel:	180	10	3000	100	1300	100	ND	10
>> Surrogate Recoveries (%) <<								
Tetracosane	132		0h		48h		145	

Certified Laboratories

825 Arnold Dr., Suite 114
Martinez, California 94553
(510) 229-1512 / fax (510) 229-1526

1555 Burke St., Unit I
San Francisco, California 94124
(415) 647-2081 / fax (415) 821-7123

309 S. Cloverdale St., Suite B-24
Seattle, Washington 98108
(206) 763-2992 / fax (206) 763-8429

GOLDER ASSOC.
Attn: KENT REYNOLDS

Project 943-7017
Reported on July 30, 1995

Total Petroleum Hydrocarbons as Diesel
by EPA SW-846 Method 8015M
Diesel Range quantitated as all compounds from C10-C25

LAB ID	Sample ID	Matrix	Dil.Factor	Moisture
82119-05	SP-2	Soil	1.0	-
82119-06	SP-3	Soil	1.0	-
82119-07	SP-4	Soil	1.0	-
82119-08 X	SP-5	Soil	10.0	-

R E S U L T S O F A N A L Y S I S

Compound	82119-05 Conc. mg/kg	RL	82119-06 Conc. mg/kg	RL	82119-07 Conc. mg/kg	RL	82119-08 Conc. mg/kg	RL
Diesel:	ND	10	140**	10	82	10	2100**	100
>> Surrogate Recoveries (%) <<								
Tetracosane	106		785i		155i		270i	

Certified Laboratories

825 Arnold Dr., Suite 114
Martinez, California 94553
(510) 229-1512 / fax (510) 229-1526

1555 Burke St., Unit I
San Francisco, California 94124
(415) 647-2081 / fax (415) 821-7123

309 S. Cloverdale St., Suite B-24
Seattle, Washington 98108
(206) 763-2992 / fax (206) 763-8429

Total Petroleum Hydrocarbons as Diesel
by EPA SW-846 Method 8015M
Diesel Range quantitated as all compounds from C10-C25

Quality Assurance and Control Data

Laboratory Number: 82119
Method Blank(s)

	BG261.21-09 Conc. %	RL
Diesel:	ND	15
>> Surrogate Recoveries (%) <<		
Tetracosane	108	

Certified Laboratories

825 Arnold Dr., Suite 114
Martinez, California 94553
(510) 229-1512 / fax (510) 229-1526

1555 Burke St., Unit I
San Francisco, California 94124
(415) 647-2081 / fax (415) 821-7123

309 S. Cloverdale St., Suite B-24
Seattle, Washington 98108
(206) 763-2992 / fax (206) 763-8429

Total Petroleum Hydrocarbons as Diesel
by EPA SW-846 Method 8015M
Diesel Range quantitated as all compounds from C10-C25

Quality Assurance and Control Data

Laboratory Number: 82119

Compound	Sample conc.	SPK Level	SPK Result	Recovery %	Limits %	RPD %
For Soil Matrix (mg/Kg)						
BG261.21 10 / 11 - Laboratory Control Spikes						
Diesel:		150	114/101	76/67	50-150	13
>> Surrogate Recoveries (%) <<						
Tetracosane				131/129	50-150	
For Soil Matrix (mg/Kg)						
BG261.21 13 / 14 - Sample Spiked: 82119 - 05						
Diesel:	ND	150	133/126	89/84	50-150	6
>> Surrogate Recoveries (%) <<						
Tetracosane				120/123	50-150	

X - Detection limits were raised due to high level of target analytes in the sample
i - The surrogate recovery was high due to the presence of interfering compounds in the sample.
h - Accurate quanitiation of the surrogate was not possible due to the extent of sample dilution.
** - Hydrocarbons were found in the range of diesel, but do not resemble a diesel fingerprint.

Definitions:
ND = Not Detected
RL = Reporting Limit
NA = Not Analysed
RPD = Relative Percent Difference
ug/L = parts per billion (ppb)
mg/L = parts per million (ppm)
ug/kg = parts per billion (ppb)
mg/kg = parts per million (ppm)

Certified Laboratories

825 Arnold Dr., Suite 114
Martinez, California 94553
(510) 229-1512 / fax (510) 229-1526

1555 Burke St., Unit I
San Francisco, California 94124
(415) 647-2081 / fax (415) 821-7123

309 S. Cloverdale St., Suite B-24
Seattle, Washington 98108
(206) 763-2992 / fax (206) 763-8429

Superior Precision Analytical, Inc.
A member of ESSCON Environmental Support Service Consortium

GILDER ASSOC.
Attn: KENT REYNOLDS

Project 943-7017
Reported on July 30, 1995

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

Chronology

Laboratory Number 82119

Sample ID	Sampled	Received	Extract.	Analyzed	QC Batch	LAB #
DPL-1	07/25/95	07/25/95	07/27/95	07/27/95	BG271.05	01
DPL-2	07/25/95	07/25/95	07/27/95	07/27/95	BG271.05	02
DPL-3	07/25/95	07/25/95	07/27/95	07/27/95	BG271.05	03
SP-1	07/25/95	07/25/95	07/27/95	07/27/95	BG271.05	04
SP-2	07/25/95	07/25/95	07/27/95	07/27/95	BG271.05	05
SP-3	07/25/95	07/25/95	07/27/95	07/27/95	BG271.05	06
SP-4	07/25/95	07/25/95	07/27/95	07/27/95	BG271.05	07
SP-5	07/25/95	07/25/95	07/27/95	07/27/95	BG271.05	08

QC Samples

QC Batch #	QC Sample ID	TypeRef.	Matrix	Extract.	Analyzed
BG271.05-02	Method Blank	MB	Soil	07/27/95	07/27/95
BG271.05-04	SP-1	MS 82119-04	Soil	07/27/95	07/27/95
BG271.05-05	SP-1	MSD 82119-04	Soil	07/27/95	07/27/95

Certified Laboratories

825 Arnold Dr., Suite 114
Martinez, California 94553
(510) 229-1512 / fax (510) 229-1526

1555 Burke St., Unit I
San Francisco, California 94124
(415) 647-2081 / fax (415) 821-7123

309 S. Cloverdale St., Suite B-24
Seattle, Washington 98108
(206) 763-2992 / fax (206) 763-8429

GOLDER ASSOC.
Attn: KENT REYNOLDS

Project 943-7017
Reported on July 30, 1995

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

LAB ID	Sample ID	Matrix	Dil.Factor	Moisture
82119-01	DPL-1	Soil	1.0	-
82119-02	DPL-2	Soil	20.0	-
82119-03	DPL-3	Soil	10.0	-
82119-04	SP-1	Soil	1.0	-

R E S U L T S O F A N A L Y S I S

Compound	82119-01 Conc. mg/kg	RL	82119-02 Conc. mg/kg	RL	82119-03 Conc. mg/kg	RL	82119-04 Conc. mg/kg	RL
Gasoline_Range	ND	1	81	20	29	10	ND	1
Benzene	ND	0.005	ND	0.10	0.053	0.050	ND	0.005
Toluene	ND	0.005	0.41	0.10	0.11	0.050	ND	0.005
Ethyl Benzene	ND	0.005	0.20	0.10	ND	0.050	ND	0.005
Xylenes	ND	0.005	1.4	0.10	0.38	0.050	ND	0.005
>> Surrogate Recoveries (%) <<								
Trifluorotoluene (SS)	103		112		110		100	

Certified Laboratories

825 Arnold Dr., Suite 114
Martinez, California 94553
(510) 229-1512 / fax (510) 229-1526

1555 Burke St., Unit I
San Francisco, California 94124
(415) 647-2081 / fax (415) 821-7123

309 S. Cloverdale St., Suite B-24
Seattle, Washington 98108
(206) 763-2992 / fax (206) 763-8429

GOLDER ASSOC.
Attn: KENT REYNOLDS

Project 943-7017
Reported on July 30, 1995

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

LAB ID	Sample ID	Matrix	Dil.Factor	Moisture
82119-05	SP-2	Soil	1.0	-
82119-06	SP-3	Soil	1.0	-
82119-07	SP-4	Soil	1.0	-
82119-08	SP-5	Soil	1.0	-

R E S U L T S O F A N A L Y S I S

Compound	82119-05 Conc. mg/kg	RL	82119-06 Conc. mg/kg	RL	82119-07 Conc. mg/kg	RL	82119-08 Conc. mg/kg	RL
Gasoline_Range	ND	1	ND	1	ND	1	ND	1
Benzene	ND	0.005	ND	0.005	ND	0.005	ND	0.005
Toluene	ND	0.005	ND	0.005	ND	0.005	ND	0.005
Ethyl Benzene	ND	0.005	ND	0.005	ND	0.005	ND	0.005
Xylenes	ND	0.005	ND	0.005	ND	0.005	ND	0.005
<< Surrogate Recoveries (%) <<								
Trifluorotoluene (SS)	104		105		111		111	

Certified Laboratories

825 Arnold Dr., Suite 114
Martinez, California 94553
(510) 229-1512 / fax (510) 229-1526

1555 Burke St., Unit I
San Francisco, California 94124
(415) 647-2081 / fax (415) 821-7123

309 S. Cloverdale St., Suite B-24
Seattle, Washington 98108
(206) 763-2992 / fax (206) 763-8429

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

Quality Assurance and Control Data

Laboratory Number: 82119
Method Blank(s)

	BG271.05-02 Conc. mg/kg	 RL
Gasoline_Range	ND	1
Benzene	ND	0.005
Toluene	ND	0.005
Ethyl Benzene	ND	0.005
Xylenes	ND	0.005
Surrogate Recoveries (%) <<		
Trifluorotoluene (SS)	97	

Certified Laboratories

825 Arnold Dr., Suite 114
Martinez, California 94553
(510) 229-1512 / fax (510) 229-1526

1555 Burke St., Unit I
San Francisco, California 94124
(415) 647-2081 / fax (415) 821-7123

309 S. Cloverdale St., Suite B-24
Seattle, Washington 98108
(206) 763-2992 / fax (206) 763-8429

Superior Precision Analytical, Inc.
A member of ESSCON Environmental Support Service Consortium

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

Quality Assurance and Control Data

Laboratory Number: 82119

Compound	Sample conc.	SPK Level	SPK Result	Recovery %	Limits %	RPD %
For Soil Matrix (mg/kg) BG271.05 04 / 05 - Sample Spiked: 82119 - 04						
Gasoline_Range	ND	3.20	4/4	125/125	65-135	0
Benzene	ND	0.200	0.20/0.20	100/100	65-135	0
Toluene	ND	0.200	0.20/0.20	100/100	65-135	0
Ethyl Benzene	ND	0.200	0.20/0.20	100/100	65-135	0
Xylenes	ND	0.600	0.60/0.58	100/97	65-135	3
>> Surrogate Recoveries (%) <<						
Trifluorotoluene (SS)				98/99	50-150	

Definitions:
ND = Not Detected
RL = Reporting Limit
NA = Not Analysed
RPD = Relative Percent Difference
ug/L = parts per billion (ppb)
mg/L = parts per million (ppm)
ug/kg = parts per billion (ppb)
mg/kg = parts per million (ppm)

Certified Laboratories

825 Arnold Dr., Suite 114
Martinez, California 94553
(510) 229-1512 / fax (510) 229-1526

1555 Burke St., Unit I
San Francisco, California 94124
(415) 647-2081 / fax (415) 821-7123

309 S. Cloverdale St., Suite B-24
Seattle, Washington 98108
(206) 763-2992 / fax (206) 763-8429

CHAIN OF CUSTODY RECORD

PROJ. NO.	SITE / LOCATION
943-7017	J&M / Hayward

SAMPLERS: (Signature)

STA. NO.	DATE	TIME	SAMPLE TYPE	MEDIA	SAMPLE IDENTIFICATION	NO. OF CONTAINERS	AMOUNT/ PRESERVATIVE: TPHg / BTEX	TPH diesel					SEAL NO.	SEAL INTACT? (Y or N)	REMARKS (with initials)
DPL	7/25/95		Grab	soil	DPL-1	1	✓	✓							
					DPL-2	1	✓	✓							
					DPL-3	1	✓	✓							
SP1					SP-1	1	✓	✓							
					SP-2	1	✓	✓							
					SP-3	1	✓	✓							
					SP-4	1	✓	✓							
SP2					SP-5	1	✓	✓							

Relinquished by: (Signature/Firm)	Date / Time	Received by: (Signature/Firm)	Relinquished by: (Signature/Firm)	Date / Time	Received by: (Signature/Firm)
	7/25/95 15:36				
Relinquished by: (Signature/Firm)	Date / Time	Received by: (Signature/Firm)	Relinquished by: (Signature/Firm)	Date / Time	Received by (Signature/Firm)
Relinquished by: (Signature/Firm)	Date / Time	Received by (Signature/Firm)	Date / Time	Remarks (attachments if necessary)	
		SPA	07/25/95 18:10	Send results to: Golder Assoc. 1451 Harbor Bay Pkwy Alameda, CA 94502 Attn: Kent Reynolds	

Superior Precision Analytical, Inc.
A member of ESSCON Environmental Support Service Consortium

Date: June 7, 1995

GOLDER ASSOC.
1451 HARBOR BAY PKWAY 1000
ALAMEDA, CA 94502

Attn: KENT REYNOLDS

Laboratory Number : 81699

Project Number/Name : 943-7017

This report has been reviewed and

approved for release.

Senior Chemist
Account Manager

Superior Precision Analytical, Inc.
A member of ESSCON Environmental Support Service Consortium

GOLDER ASSOC.
Attn: KENT REYNOLDS

Project 943-7017
Reported on June 7, 1995

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

Chronology

Laboratory Number 81699

Sample ID	Sampled	Received	Extract.	Analyzed	QC Batch	LAB #
MW-1	05/24/95	05/25/95	06/05/95	06/05/95	BF051.19	01
MW-2	05/24/95	05/25/95	06/05/95	06/05/95	BF051.19	02
MW-3	05/24/95	05/25/95	06/05/95	06/05/95	BF051.19	03
MW-4	05/24/95	05/25/95	06/05/95	06/05/95	BF051.19	04
B-1	05/24/95	05/25/95	06/06/95	06/06/95	BF061.04	05
B-2	05/24/95	05/25/95	06/06/95	06/06/95	BF061.04	06
B-5	05/24/95	05/25/95	06/05/95	06/05/95	BF051.19	07
B-8	05/24/95	05/25/95	06/05/95	06/05/95	BF051.19	08

QC Samples

QC Batch #	QC Sample ID	Type	Ref.	Matrix	Extract.	Analyzed
BF051.19-01	Method Blank	MB		Water	06/05/95	06/05/95
BF051.19-05	MW-1	MS	81669-02	Water	06/05/95	06/05/95
BF051.19-06	MW-1	MSD	81669-02	Water	06/05/95	06/05/95
BF061.04-01	Method Blank	MB		Water	06/06/95	06/06/95
BF061.04-02	EL2-B03-L1	MS	81713-03	Water	06/06/95	06/06/95
BF061.04-03	EL2-B03-L1	MSD	81713-03	Water	06/06/95	06/06/95

Certified Laboratories

825 Arnold Dr., Suite 114
Martinez, California 94553
(510) 229-1512 / fax (510) 229-1526

1555 Burke St., Unit I
San Francisco, California 94124
(415) 647-2081 / fax (415) 821-7123

309 S. Cloverdale St., Suite B-24
Seattle, Washington 98108
(206) 763-2992 / fax (206) 763-8429

GOLDER ASSOC.
Attn: KENT REYNOLDS

Project 943-7017
Reported on June 7, 1995

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

LAB ID	Sample ID	Matrix	Dil.Factor	Moisture
81699-01	MW-1	Water	1.0	-
81699-02	MW-2	Water	1.0	-
81699-03	MW-3	Water	1.0	-
81699-04	MW-4	Water	1.0	-

R E S U L T S O F A N A L Y S I S

Compound	81699-01 Conc. ug/L	RL	81699-02 Conc. ug/L	RL	81699-03 Conc. ug/L	RL	81699-04 Conc. ug/L	RL
Gasoline_Range	ND	50	ND	50	ND	50	ND	50
Benzene	ND	0.5	ND	0.5	ND	0.5	ND	0.5
Toluene	ND	0.5	ND	0.5	ND	0.5	ND	0.5
Ethyl Benzene	ND	0.5	ND	0.5	ND	0.5	ND	0.5
Total Xylenes	ND	0.5	ND	0.5	ND	0.5	ND	0.5
>> Surrogate Recoveries (%) <<								
Trifluorotoluene (SS)	114		117		113		113	

Certified Laboratories

825 Arnold Dr., Suite 114
Martinez, California 94553
(510) 229-1512 / fax (510) 229-1526

1555 Burke St., Unit I
San Francisco, California 94124
(415) 647-2081 / fax (415) 821-7123

309 S. Cloverdale St., Suite B-24
Seattle, Washington 98108
(206) 763-2992 / fax (206) 763-8429

GOLDER ASSOC.
Attn: KENT REYNOLDS

Project 943-7017
Reported on June 7, 1995

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

LAB ID	Sample ID	Matrix	Dil.Factor	Moisture
81699-05	B-1	Water	1.0	-
81699-06	B-2	Water	1.0	-
81699-07	B-5	Water	1.0	-
81699-08	B-8	Water	1.0	-

R E S U L T S O F A N A L Y S I S

Compound	81699-05 Conc. ug/L	RL	81699-06 Conc. ug/L	RL	81699-07 Conc. ug/L	RL	81699-08 Conc. ug/L	RL
Gasoline_Range	290	50	730	50	ND	50	350	50
Benzene	ND	0.5	6.9	0.5	ND	0.5	4.7	0.5
Toluene	1.0	0.5	0.5	0.5	0.7	0.5	1.9	0.5
Ethyl Benzene	0.6	0.5	1.0	0.5	ND	0.5	13	0.5
Total Xylenes	4.5	0.5	13	0.5	ND	0.5	0.9	0.5
>> Surrogate Recoveries (%) <<								
Trifluorotoluene (SS)	117		104		112		142	

Certified Laboratories

825 Arnold Dr., Suite 114
Martinez, California 94553
(510) 229-1512 / fax (510) 229-1526

1555 Burke St., Unit I
San Francisco, California 94124
(415) 647-2081 / fax (415) 821-7123

309 S. Cloverdale St., Suite B-24
Seattle, Washington 98108
(206) 763-2992 / fax (206) 763-8429

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

Quality Assurance and Control Data

Laboratory Number: 81699
Method Blank(s)

	BF051.19-01		BF061.04-01	
	Conc. ug/L	RL	Conc. ug/L	RL
Gasoline_Range	ND	50	ND	50
Benzene	ND	0.5	ND	0.5
Toluene	ND	0.5	ND	0.5
Ethyl Benzene	ND	0.5	ND	0.5
Total Xylenes	ND	0.5	ND	0.5
>> Surrogate Recoveries (%) <<				
Trifluorotoluene (SS)	106		103	

Certified Laboratories

825 Arnold Dr., Suite 114
Martinez, California 94553
(510) 229-1512 / fax (510) 229-1526

1555 Burke St., Unit I
San Francisco, California 94124
(415) 647-2081 / fax (415) 821-7123

309 S. Cloverdale St., Suite B-24
Seattle, Washington 98108
(206) 763-2992 / fax (206) 763-8429

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

Quality Assurance and Control Data

Laboratory Number: 81699

Compound	Sample conc.	SPK Level	SPK Result	Recovery %	Limits %	RPD %
For Water Matrix (ug/L) BF051.19 05 / 06 - Sample Spiked: 81669 - 02						
Gasoline_Range	ND	320	340/350	106/109	65-135	3
Benzene	ND	20	18/19	90/95	65-135	5
Toluene	ND	20	18/19	90/95	65-135	5
Ethyl Benzene	ND	20	18/19	90/95	65-135	5
Total Xylenes	ND	60	56/56	93/93	65-135	0
>> Surrogate Recoveries (%) <<						
Trifluorotoluene (SS)				106/107	50-150	
For Water Matrix (ug/L) BF061.04 02 / 03 - Sample Spiked: 81713 - 03						
Gasoline_Range	ND	320	330/340	103/106	65-135	3
Benzene	ND	20	21/21	105/105	65-135	0
Toluene	ND	20	21/21	105/105	65-135	0
Ethyl Benzene	ND	20	21/21	105/105	65-135	0
Total Xylenes	ND	60	62/62	103/103	65-135	0
>> Surrogate Recoveries (%) <<						
Trifluorotoluene (SS)				107/105	50-150	

Definitions:
ND = Not Detected
RL = Reporting Limit
NA = Not Analysed
RPD = Relative Percent Difference
ug/L = parts per billion (ppb)
mg/L = parts per million (ppm)
ug/kg = parts per billion (ppb)
mg/kg = parts per million (ppm)

Certified Laboratories

825 Arnold Dr., Suite 114
Martinez, California 94553
(510) 229-1512 / fax (510) 229-1526

1555 Burke St., Unit I
San Francisco, California 94124
(415) 647-2081 / fax (415) 821-7123

309 S. Cloverdale St., Suite B-24
Seattle, Washington 98108
(206) 763-2992 / fax (206) 763-8429

GILDER ASSOC.
Attn: KENT REYNOLDS

Project 943-7017
Reported on June 1, 1995

Total Petroleum Hydrocarbons as Diesel
by EPA SW-846 Method 8015M
Diesel Range quantitated as all compounds from C10-C25

Chronology

Laboratory Number 81699

Sample ID	Sampled	Received	Extract.	Analyzed	QC Batch	LAB #
MW-1	05/24/95	05/25/95	05/30/95	05/31/95	BE301.02	01
MW-2	05/24/95	05/25/95	05/30/95	05/31/95	BE301.02	02
MW-3	05/24/95	05/25/95	05/30/95	05/31/95	BE301.02	03
MW-4	05/24/95	05/25/95	05/30/95	05/31/95	BE301.02	04
B-1	05/24/95	05/25/95	05/30/95	05/31/95	BE301.02	05
B-2	05/24/95	05/25/95	05/30/95	05/31/95	BE301.02	06
B-5	05/24/95	05/25/95	05/30/95	05/31/95	BE301.02	07
B-8	05/24/95	05/25/95	05/30/95	05/31/95	BE301.02	08

QC Samples

QC Batch #	QC Sample ID	TypeRef.	Matrix	Extract.	Analyzed
BE301.02-01	Method Blank	MB	Water	05/30/95	05/31/95
BE301.02-02	Laboratory Spike	LS	Water	05/30/95	05/31/95
BE301.02-03	Laboratory Spike Duplicate	LSD	Water	05/30/95	05/31/95

Certified Laboratories

825 Arnold Dr., Suite 114
Martinez, California 94553
(510) 229-1517 / fax (510) 229-1526

1555 Burke St., Unit I
San Francisco, California 94124
(415) 647-2081 / fax (415) 821-7123

309 S. Cloverdale St., Suite B-24
Seattle, Washington 98108
(206) 763-2992 / fax (206) 763-8429

GOLDER ASSOC.
Attn: KENT REYNOLDS

Project 943-7017
Reported on June 1, 1995

Total Petroleum Hydrocarbons as Diesel
by EPA SW-846 Method 8015M
Diesel Range quantitated as all compounds from C10-C25

LAB ID	Sample ID	Matrix	Dil.Factor	Moisture
81699-01	MW-1	Water	1.0	-
81699-02	MW-2	Water	1.0	-
81699-03	MW-3	Water	1.0	-
81699-04	MW-4	Water	1.0	-

R E S U L T S O F A N A L Y S I S

Compound	81699-01 Conc. ug/L	RL	81699-02 Conc. ug/L	RL	81699-03 Conc. ug/L	RL	81699-04 Conc. ug/L	RL
Diesel:	ND	50	ND	50	ND	50	ND	50
>> Surrogate Recoveries (%) <<								
Tetracosane	65		145		104		131	

Certified Laboratories

825 Arnold Dr., Suite 114
Martinez, California 94553
(510) 229-1517 / fax (510) 229-1526

1555 Burke St., Unit I
San Francisco, California 94124
(415) 647-2081 / fax (415) 821-7123

309 S. Cloverdale St., Suite B-24
Seattle, Washington 98108
(206) 763-2992 / fax (206) 763-8429

GOLDER ASSOC.
Attn: KENT REYNOLDS

Project 943-7017
Reported on June 1, 1995

Total Petroleum Hydrocarbons as Diesel
by EPA SW-846 Method 8015M
Diesel Range quantitated as all compounds from C10-C25

LAB ID	Sample ID	Matrix	Dil.Factor	Moisture
81699-05	B-1	Water	1.0	-
81699-06	B-2	Water	1.0	-
81699-07	B-5	Water	1.0	-
81699-08	B-8	Water	1.0	-

R E S U L T S O F A N A L Y S I S

Compound	81699-05 Conc. ug/L	RL	81699-06 Conc. ug/L	RL	81699-07 Conc. ug/L	RL	81699-08 Conc. ug/L	RL
Diesel:	4600	50	5200	50	ND	50	190	50
>> Surrogate Recoveries (%) <<								
Tetracosane	78		122		91		84	

Certified Laboratories

825 Arnold Dr., Suite 114
Martinez, California 94553
(510) 229-1512 / fax (510) 229-1526

1555 Burke St., Unit I
San Francisco, California 94124
(415) 647-2081 / fax (415) 821-7123

309 S. Cloverdale St., Suite B-24
Seattle, Washington 98108
(206) 763-2992 / fax (206) 763-8429

Total Petroleum Hydrocarbons as Diesel
by EPA SW-846 Method 8015M
Diesel Range quantitated as all compounds from C10-C25

Quality Assurance and Control Data

Laboratory Number: 81699
Method Blank(s)

	BE301.02-01
	Conc. RL
	ug/L
Diesel:	ND 50
>> Surrogate Recoveries (%) <<	
Tetracosane	121

Certified Laboratories

825 Arnold Dr., Suite 114
Martinez, California 94553
(510) 229-1512 / fax (510) 229-1526

1555 Burke St., Unit I
San Francisco, California 94124
(415) 647-2081 / fax (415) 821-7123

309 S. Cloverdale St., Suite B-24
Seattle, Washington 98108
(206) 763-2992 / fax (206) 763-8429

Total Petroleum Hydrocarbons as Diesel
by EPA SW-846 Method 8015M
Diesel Range quantitated as all compounds from C10-C25

Quality Assurance and Control Data

Laboratory Number: 81699

Compound	Sample conc.	SPK Level	SPK Result	Recovery %	Limits %	RPD %
For Water Matrix (ug/L)						
BE301.02 02 / 03 - Laboratory Control Spikes						
Diesel:		100	70/80	70/80	50-150	13
>> Surrogate Recoveries (%) <<						
Tetracosane				64/75	50-150	

Definitions:
ND = Not Detected
RL = Reporting Limit
NA = Not Analysed
RPD = Relative Percent Difference
ug/L = parts per billion (ppb)
mg/L = parts per million (ppm)
ug/kg = parts per billion (ppb)
mg/kg = parts per million (ppm)

Certified Laboratories

825 Arnold Dr., Suite 114
Martinez, California 94553
(510) 229-1512 / fax (510) 229-1526

1555 Burke St., Unit I
San Francisco, California 94124
(415) 647-2081 / fax (415) 821-7123

309 S. Cloverdale St., Suite B-24
Seattle, Washington 98108
(206) 763-2992 / fax (206) 763-8429

CHAIN OF CUSTODY RECORD 81679

PROJ. NO.: 943-7017 | SITE/LOCATION: J+M / Hayward / Ca

SAMPLERS: (Signature) Kent Reynolds

STA. NO.	DATE	TIME	SAMPLE TYPE	MEDIA	SAMPLE IDENTIFICATION	NO. OF CONTAINERS	AMOUNT/PRESERVATIVE	TPH g	TPH diesel	BTEX				SEAL NO.	SEAL INTACT? (Y or N)	REMARKS (with initials)
MW-1	5/24/95		Grab	H_2O	MW-1	4		✓	✓					9638		Quotation reference
MW-2	↓		↓	↓	MW-2	4		✓	✓					↓		No. 95-00832
MW-3					MW-3	4		✓	✓							
MW-4					MW-4	4		✓	✓							
B-1					B-1	4		✓	✓							
B-2					B-2	4		✓	✓							
B-5					B-5	4		✓	✓							
B-8	↓		↓	↓	B-8	4		✓	✓					↓		

9 yes 5.0

Relinquished by: (Signature/Firm)	Date/Time	Received by: (Signature/Firm)	Relinquished by: (Signature/Firm)	Date/Time	Received by: (Signature/Firm)
Kent Reynolds	5/25/95 10:15	[illegible] CEO			
		Sumona		5/25/95 12:30	

Relinquished by: (Signature/Firm) | Date/Time | Received by: (Signature/Firm) | Date/Time

Remarks (attachments if necessary)
Send Results to:
Golder Associates
Attn: Kent Reynolds

Superior Precision Analytical, Inc.
A member of ESSCON Environmental Support Service Consortium

GOLDER ASSOCIATES
ATTN: KENT REYNOLDS

Project 943-7017
Reported 09/21/94

TOTAL PETROLEUM HYDROCARBONS

Lab #	Sample Identification	Sampled	Analyzed	Matrix
92571 1	W 1	09/14/94	09/20/94	Water

RESULTS OF ANALYSIS

Laboratory Number: 92571- 1

Gasoline:	ND<50
Benzene:	ND<0.5
Toluene:	ND<0.5
Ethyl Benzene:	ND<0.5
Total Xylenes:	ND<0.5
Diesel:	ND<50
Concentration:	ug/L

Certified Laboratories

825 Arnold Dr., Suite 114
Martinez, California 94553
(510) 229-1512 / fax (510) 229 1526

1555 Burke St., Unit I
San Francisco, California 94124
(415) 647-2081 / fax (415) 821 7123

309 S. Cloverdale St., Suite B-24
Seattle, Washington 98108
(206) 763 2992 / fax (206) 763-8429

Superior Precision Analytical, Inc.
A member of ESSCON Environmental Support Service Consortium

CERTIFICATE OF ANALYSIS

ANALYSIS FOR TOTAL PETROLEUM HYDROCARBONS

QA/QC INFORMATION
SET: 92571

NA = ANALYSIS NOT REQUESTED
ND = ANALYSIS NOT DETECTED ABOVE QUANTITATION LIMIT
ug/L = parts per billion (ppb)

OIL AND GREASE ANALYSIS By Standard Methods Method 5520F:
Minimum Detection Limit in Water: 5000ug/L

Modified EPA SW-846 Method 8015 for Extractable Hydrocarbons:
Minimum Quantitation Limit for Diesel in Water: 50ug/L

EPA SW-846 Method 8015/5030 Total Purgable Petroleum Hydrocarbons:
Minimum Quantitation Limit for Gasoline in Water: 50ug/L

EPA SW-846 Method 8020/BTXE
Minimum Quantitation Limit in Water: 0.5ug/L

ANALYTE	MS/MSD RECOVERY	RPD	CONTROL LIMIT
Gasoline:	97/88	10%	56-117
Benzene:	81/84	4%	59-149
Toluene:	91/92	1%	59-149
Ethyl Benzene:	84/85	1%	59-149
Total Xylenes:	92/93	1%	59-149
Diesel:	102/104	2%	50-146

Senior Chemist

Certified Laboratories

825 Arnold Dr., Suite 114
Martinez, California 94553
(510) 229-1517 / fax (510) 229-1526

1555 Burke St., Unit I
San Francisco, California 94124
(415) 647 2081 / fax (415) 821-7123

309 S. Cloverdale St., Suite B-24
Seattle, Washington 98108
(206) 763-2992 / fax (206) 763-8129