Douglas Parking Company
1721 Webster Street
Oakland, California 94612

Ms. Barbara Jakub
Alameda County Environmental Health
Department of Environmental Health
1131 Harbor Bay Parkway, 2nd Floor
Alameda, CA 94502-6577

Re: Douglas Parking Company
1721 Webster Street
Oakland, California
ACEH File No. 129

Dear Ms. Jakub:

I, Mr. Lee Douglas, have retained Pangea Environmental Services, Inc. (Pangea) as the environmental consultant for the project referenced above. Pangea is submitting the attached Investigation and Remediation Workplan on my behalf.

I declare, under penalty of perjury, that the information and/or recommendations contained in the attached report are true and correct to the best of my knowledge.

Sincerely,

Lee Douglas

March 5, 2009

VIA ALAMEDA COUNTY FTP SITE

Ms. Barbara Jakub
Alameda County Environmental Health
1131 Harbor Bay Parkway, 2nd Floor
Alameda, California 94502

Re: **Investigation and Remediation Workplan**
Douglas Parking Company
1721 Webster Street
Oakland, California
ACEH File No. 129

Dear Ms. Jakub:

On behalf of Douglas Parking Company, Pangea Environmental Services, Inc. (Pangea) has prepared this *Investigation and Remediation Workplan* (Workplan). This Workplan was requested in a February 5, 2009 email from Barbara Jakub of Alameda County Environmental Health (ACEH). The Workplan scope was initially proposed by Pangea to enhance facilitate expansion and optimization of the existing site remediation system, and to provide additional vertical assessment to help pursue future regulatory case closure.

This Workplan also summarizes the contaminant distribution with respect to known offsite contamination across Webster Street (adjacent to 1700 Webster and 1750 Webster Street properties). Pangea respectfully requests that ACEH confirm that remediation system expansion does not need to target known hydrocarbon impact across Webster Street.

Pangea hopes to perform the bioparameter sampling during the upcoming second quarter 2009 monitoring event, so your quick review of this Workplan would be greatly appreciated. If you have any questions or comments, please call me at (510) 435-8664.

Sincerely,
Pangea Environmental Services, Inc.

Bob Clark-Riddell, P.E.
Principal Engineer

Attachment: *Investigation and Remediation Workplan*

cc: Mr. Lee Douglas, Douglas Parking Company, 1721 Webster Street, Oakland, California 94612 (2 copies)
SWRCB Geotracker Database (electronic copy)

INVESTIGATION AND REMEDIATION WORKPLAN

Douglas Parking Company
1721 Webster Street
Oakland, California
File No. 4070

March 5, 2009

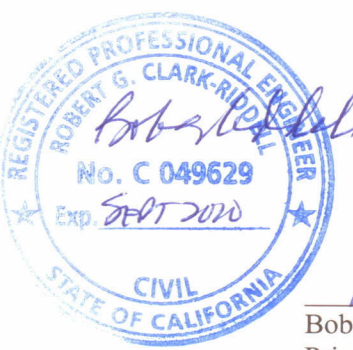
Prepared for:

Mr. Lee Douglas
1721 Webster Street
Oakland, California 94612

Prepared by:

Pangea Environmental Services, Inc.
1710 Franklin Street, Suite 200
Oakland, California 94612

Written by:



Morgan Gillies
Project Manager

Bob Clark-Riddell, P.E.
Principal Engineer

INTRODUCTION

On behalf of Douglas Parking Company, Pangea Environmental Services, Inc. (Pangea) has prepared this *Investigation and Remediation Workplan* (Workplan). This Workplan was requested in a February 5, 2009 email from Barbara Jakub of Alameda County Environmental Health (ACEH). The Workplan scope was initially proposed by Pangea to enhance facilitate expansion and optimization of the existing site remediation system, and to provide additional vertical assessment to help pursue future regulatory case closure.

The Workplan proposes the following:

- Vertical and lateral assessment to more thoroughly identify primary source area contamination for better targeting with an expanded site remediation system (characterizing the vertical contaminant extent will also help facilitate case closure);

- Installation of two additional soil vapor extraction (SVE) wells and three additional air sparge (AS) wells to expand the existing SVE/AS system;

- Connection of new remediation wells to the existing remediation compound, procurement of a larger air sparging compressor, and resumption of SVE/AS; and

- Natural attenuation/bioparameter assessment during routine groundwater monitoring to evaluate site groundwater potential for hydrocarbon biodegradation and natural attenuation. Pangea will evaluate hydrocarbon-degrading bacteria and groundwater geochemistry and consider augmentation of site groundwater.

Note that the initial remediation plan approved by ACEH included reconstruction of existing wells MW-2 and MW-3 into two additional SVE wells. To avoid costly well reconstruction and trenching in the sidewalk, Pangea first performed SVE/AS using the existing SVE/AS well network. Due to apparent limited effectiveness of existing system, the Workplan scope will expand the system to include the two approved SVE wells and three additional AS wells to better target the hydrocarbon source area. The benefit of the initial system operation was realizing that additional AS wells are merited before trenching down the sidewalk. Unlike the original plan, the new plan will retain the existing monitoring wells (rather than reconstruct them) to better evaluate remedial effectiveness.

The proposed system expansion targets the primary hydrocarbon impact near and downgradient of the former USTs at 1721 Webster. By locating the proposed SVE wells further from the former UST backfill material where some vapor flow may short circuit to the surface, the new SVE wells may better influence offsite hydrocarbons. This Workplan also summarizes the contaminant distribution with respect to known offsite

contamination across Webster Street (adjacent to 1700 Webster and 1750 Webster Street properties). Prior agency correspondence pertaining to 1721 and 1750 Webster Street sites did not require that the system target impact across Webster Street (Appendix A). Pangea respectfully requests that ACEH reconfirm that remediation system expansion does not need to target known hydrocarbon impact across Webster Street.

Pangea hopes to perform the bioparameter sampling during the upcoming second quarter 2009 monitoring event, so quick review of this portion of the Workplan would be greatly appreciated. The site background and proposed work scope are detailed below.

SITE BACKGROUND

Site Description

The site is currently being utilized as a parking garage, and is located between 17th and 19th Streets in downtown Oakland, California, approximately five miles east of San Francisco Bay and half a mile west of Lake Merritt (Figure 1). The site is relatively flat with an elevation of approximately 30 feet (ft) above mean sea level (msl).

Tank Removal and Prior Investigation at Subject Site

On August 3 and 6, 1992, Parker Environmental Services removed one 1,000-gallon and two 500-gallon gasoline underground storage tanks (USTs) from the site. Up to 1,500 milligrams per kilogram (mg/kg) total petroleum hydrocarbons as gasoline (TPHg) and up to 12 mg/kg benzene were detected in the soil samples collected from the UST excavation.

Several investigations have been completed at the site. On July 8 and September 8, 1994, Gen Tech/Piers Environmental, Inc. (Gen Tech) of San Jose, California drilled six exploratory borings and installed three groundwater monitoring wells (MW-1 through MW-3). In February and May 1996, Cambria Environmental Technology (Cambria) of Emeryville, California advanced seven geoprobe soil borings and installed two groundwater monitoring wells (MW-4 and MW-5). On June 27, 2003 Cambria installed two additional offsite monitoring wells (MW-6 and MW-7). Periodic groundwater monitoring has been conducted at the site since 1994.

Environmental Work at Adjacent Sites

Several former or possible underground storage tank (UST) sites are located close to the site: 1700 Webster, 1750 Webster Street; 1633 Harrison Street, and 1833 Harrison Street. Historic soil and groundwater data for these sites are included in Appendix A.

A former gas station was located directly southeast of the site at 1700 Webster Street, in the crossgradient direction from the subject site. A review of Sanborn maps indicated that a gas station operated there from approximately 1953 to 1964. Pangea is not aware of additional site information.

Prentiss Properties is located northeast of the site at 1750 Webster Street, primarily in the crossgradient direction from the subject site. The ACEH closed this case in 2001, citing an unknown upgradient source. Two asphalt patches at the site are suspected to be former UST locations. There is no documentation of UST removal for the two suspected UST locations in ACEH records (However, Prentiss Properties did remove a 5,000-gallon UST removed an a two-stage wash rack water clarifier from the adjacent property at 1833 Harrison Street in September 1991 and reported limited soil impact, according to an undated UST Closure Report by James M. Montgomery Consulting Engineers, Inc). Several investigations have been performed at the Prentiss Properties site at 1750 Webster Street, including the drilling of eighteen soil borings and the installations of three monitoring wells. Groundwater samples collected by ATC Associates, Inc. (ATC) on February 8, 1998 detected MTBE concentrations up to 2,900 micrograms per liter (µg/L). Eleven of the twelve groundwater samples collected during ATC's investigation contained detectable MTBE concentrations. Additionally, a shallow soil sample (10 ft bgs) collected at the site in February 1998 contained 6.5 mg/kg total xylenes. During a monitoring event in February 1999, well A-3 was found to contain 30,000 µg/L TPHg and 160 µg/L benzene, while Douglas Parking well MW-4, located between the two properties, had a much lower impact (9,800 µg/L TPHg and no benzene)(Table 2). Wells A-3 and MW-4 are screened at the same interval. Pangea observed the well vault for well A-3 and suspects that wells AS-1 and AS-2 are also still present at the site.

A former Chevron Service station is located approximately 400 feet southeast of the site, on the corner of 17th Street and Harrison Street (1633 Harrison Street). Groundwater in the vicinity of the Chevron station has been impacted by hydrocarbons. As of the most recent groundwater monitoring report (Gettler-Ryan, 2008) available on the Geotracker website for the former Chevron station, all site wells had been abandoned, with the exception of offsite downgradient wells MW-9, MW-13, MW-15 and MW-16. All sampled wells contained low to non-detect contaminant concentrations, with the exception of well MW-16, which contained 7,100 µg/L TPHg and 180 µg/L benzene (Appendix A).

Prior Site Remediation

Several remedial techniques have been utilized at the subject site, 1721 Webster Street. In January 1998, Cambria installed ORC socks in well MW-2 to enhance the natural attenuation of dissolved-phase hydrocarbons. Dissolved oxygen (DO) concentrations temporarily increased in well MW-2 following the ORC sock installation. In February and March 1999, a total of 120 gallons of 7.5% hydrogen peroxide solution was added into monitoring wells MW-2 and MW-3 to oxidize hydrocarbons and also increase DO

levels to enhance biodegradation of dissolved-phase hydrocarbons. While hydrogen peroxide *temporarily* increased groundwater DO levels, hydrocarbon concentrations fluctuated (even increased) before returning to similar pre-remediatoin elevated levels.

On March 4, 2003, Cambria installed a co-axial air sparging/soil vapor extraction well (SV-1/AS-1) and two angled air sparging wells (AS-2 and AS-3) to approximately 30 ft bgs. The wells were installed to facilitate feasibility testing and future site remediation. Site remediation via soil vapor extraction and air sparging began in October 2007. Despite over 12 months of SVE/AS system operation groundwater conditions have not significantly improved, although the recent benzene reduction in well MW-2 may be due to enhanced sparging efforts in well AS-2. The limited system effectiveness may be due to insufficient well spacing/quantity or due to a possible offsite source.

Site Geology & Hydrogeology

Unconfined groundwater conditions exist at the site. A shallow water-bearing zone consisting of highly permeable sand is present from approximately 14 to 30 feet bgs, and is underlain by a silty clay layer. Groundwater beneath the site generally flows *northwards* to *north-northeastwards*, consistent with the local topography. Since 1994, the depth to groundwater beneath and surrounding the site has ranged from approximately 13.6 feet bgs (MW-5) to 23.4 feet bgs (MW-7), equivalent to a groundwater elevation range from 5 to 13 feet above msl over thirteen years of monitoring. For source area well MW-2, groundwater depth has fluctuated only three feet, from 17.8 to 20.8 ft bgs (Hydrocarbon concentrations generally decrease during low groundwater depth in well MW-2).

Contaminant Distribution in Soil

Based on previous site investigations, the extent of detected TPHg and benzene concentrations in soil is primarily limited to the area around the former site USTs. Generally, the highest concentrations of contaminants in soil were detected during tank removal activities in August 1992, when shallow soil samples were collected at depths ranging from 7 to 14 ft bgs. Additional soil samples were collected in July 1994 and February and May 1996 at depths ranging from 15.5 to 31 ft bgs, the depth where groundwater has been generally first encountered during site assessment. The deeper soil samples, collected in 1994 and 1996, contained very low to non-detect concentrations of contaminants in the immediate area around the former site USTs. Historical soil analytical results are included in Table 1.

Contaminant Distribution in Groundwater

The lateral extent of contaminants in shallow groundwater appears to be fairly well defined by data from existing monitoring wells and historical grab groundwater sampling. To facilitate data evaluation, Pangea illustrated the extent of benzene in grab samples (Figure 2) and in groundwater monitoring wells (Figure 3) using data from similar time periods. Figure 2 shows the estimated extent of benzene in *grab* groundwater samples at each site for samples collected between 1994 and 1998. Figure 3 shows the estimated extent of benzene in *monitoring wells* at each site for samples collected between 1999 and 2003. Site groundwater analytical data (Table 2) and historical groundwater analytical data from the nearby site at 1750 Webster Street (Appendix A) suggests that at least two contaminant plumes are contributing to groundwater contamination in the area. It is unclear if the two apparent plumes are commingled beneath Webster Street, but the elevated concentrations suggest two distinct source areas. A letter from ACEH dated August 15, 2001 states that site remediation at 1721 Webster need not extend to the 1750 Webster Street site.

Some vertical assessment of contamination in groundwater at 1721 Webster Street is provided by air sparge wells screened at approximately 27 to 30 ft bgs. Most site monitoring wells are screened between 15 and 30 feet bgs. The concentrations are significantly lower in deeper air sparge wells (and even non-detect in well AS-3), located near impacted well MW-2. To provide additional vertical delineation of contamination at the site, Pangea recommends grab groundwater sampling from depths below 30 ft bgs downgradient of the source area.

PROPOSED INVESTIGATION AND REMEDIATION WELL INVESTIGATION

The primary objective of the proposed investigation is to better characterize the lateral and vertical extent of source area contamination during installation of new remediation wells that will expand the existing remediation system. Characterizing the vertical contaminant extent will also help facilitate case closure. The proposed boring and well locations to target the primary contaminant area are shown on Figure 4. The proposed scope of work to accomplish these objectives is detailed below.

Task 1 - Pre-Field Activities

Prior to initiating field activities, Pangea will conduct the following tasks:

- Obtain encroachment and excavation permits from the City of Oakland and drilling permits from Alameda County Public Works Agency (ACPWA) as necessary;

- Pre-mark the boring locations with white paint, notify Underground Service Alert (USA) of the drilling and sampling activities at least 72 hours before work begins, and conduct private line locating as merited;

- Prepare a site-specific health and safety plan to educate personnel and minimize their exposure to potential hazards related to site activities; and

- Coordinate with drilling and laboratory subcontractors and other involved parties.

Task 2 – Deep Boring DB-1

Pangea proposes to collect groundwater samples from potential deeper water-bearing zones at one location downgradient of the source area. As shown on Figure 4, boring location DB-1 is proposed downgradient of the former USTs and adjacent to well MW-2. (Soil logging for boring DB-1 will also allow screening the proposed air sparge wells as deep as possible without screening into deeper clayey soil). As described below, Pangea will collect deeper groundwater samples using dual-tube sampling techniques to prevent infiltration from the shallow water-bearing zone. All field activities will be conducted in accordance with the Standard Operating Procedures (SOPs) detailed in Appendix B.

To log site soil, Pangea will advance borings DB-1 to a depth of approximately 40 ft bgs or deeper using *dual-tube* direct-push drilling methods. Soil will be continuously logged and classified according to the Unified Soil Classification System by a trained geologist/scientist or engineer working under the supervision of a California Professional Engineer (PE) or a California Professional Geologist (PG). Soil samples will be collected for hydrocarbon analysis every four feet (especially from 16 to 28 feet bgs) to evaluate the vertical extent of hydrocarbons. Pangea proposes using the *dual-tube* direct-push drilling method to minimize the potential for cross-contamination of shallow and deeper water-bearing zones.

After identifying the depth of a deeper water-bearing zone below 30 ft, a discrete-depth grab groundwater sample will be collected by pulling back the outer wall of the dual-tube system. Based on prior results, Pangea anticipates collecting a water sample from approximately 36 to 40 ft bgs. Completed borings will be tremie-grouted from the bottom of the hole to the surface.

Groundwater and select soil samples will be analyzed for total petroleum hydrocarbons as gasoline (TPHg), benzene, toluene, ethylbenzene, xylenes (BTEX) and methyl-tertiary butyl ether (MTBE) by EPA Method 8015Cm/8021B.

Task 3 – Additional Assessment and Remediation Well Installation

To help evaluate the lateral and vertical extent of dissolved hydrocarbons, Pangea will coordinate groundwater sampling in conjunction with installation of SVE wells SVE-2 and SVE-3 and air sparge wells AS-4 through AS-6. The proposed well locations are shown on Figure 4. Groundwater sampling will also establish baseline conditions prior to implementation of expanded remediation.

The assessment and well installation will include:

- SVE-2 screened into vadose-zone soil (10 to 20 ft bgs) for vapor extraction;
- SVE-3 screened into vadose-zone soil and into groundwater (10 to 25 ft bgs) for vapor extraction and monitoring of shallow groundwater near proposed deeper sparge well AS-6;
- AS-4, AS-5 and AS-6 screened into deeper water for sparging (27 to 30 ft bgs);
- Groundwater sampling from SVE-3 and AS-4, AS-5 and AS-6 following well development; and
- No soil sampling or logging will be performed to control drilling costs. Soil analytical data and lithology was provided during prior investigation/well installation, and will be provided during completion of boring DB-1 as described above.

The locations of the SVE and AS wells are based on the estimated extent of primary groundwater impact and the assumed/measured radii of influence. The measured radius of vacuum influence during feasibility testing in October 2003 was approximately 50 ft (Cambria, 2004). The assumed radius of sparging influence based on the depth of the screened interval beneath the water table and soil type is approximately 15 to 20 ft. The proposed SVE and AS well locations and radii of influence are shown on Figure 4. The final well screen intervals may be slightly modified based on field observations of lithology and relative soil permeability during drilling of boring DB-1. Based on prior well log information, the AS wells will be screened near the bottom of the shallow water-bearing zone, just above the silty clay layer historically encountered at approximately 30 ft bgs.

SVE wells will be constructed using 4-inch diameter, 0.010-inch slotted, schedule 40 PVC casing. The AS wells will be constructed of 2-inch diameter, 0.010-inch slotted, schedule 80 PVC casing. The filter pack for all wells will be constructed of #2/12 sand and will extend approximately 6 inches to 1 ft above the well screen. Wells will be protected by traffic-rated well vaults upon completion of remediation piping installation. Standard procedures for well installation are included in Appendix B. At least 72 hours after installation, Pangea plans to develop the AS wells and SVE-3 by surge block agitation and evacuation. To control cost,

groundwater samples will be collected at the end of the well development rather than after 48 hours development and additional purging. Groundwater samples will be analyzed for TPHg/BTEX/MTBE by EPA Method 8015Cm/8021B.

Task 4 – Waste Management and Disposal

Soil cuttings and other investigation-derived waste will be stored onsite in Department of Transportation (DOT)-approved 55-gallon drums. The drums and their contents will be held onsite pending laboratory analytical results. Upon receipt of the analytical reports and within 60 days of generation, the waste will be transported to an appropriate disposal/recycling facility. Copies of the waste manifest(s) will be included in the technical report described above.

Task 5 – Report Preparation

Upon completion of site investigation and well installation, Pangea will prepare an investigation and well installation report. The report will describe the investigation and well installation activities, present tabulated analytical data, and offer conclusions and recommendations.

PROPOSED REMEDIATION EXPANSION

The proposed expansion of the existing SVE/AS system and estimated primary influence area is illustrated on Figure 4. The system expansion includes connecting to the proposed new SVE and AS wells, whose installation is described above. Pangea will perform related design, permitting, equipment procurement, system installation and system startup as detailed below.

Task 1 – System Design

Pangea will design the piping layout and prepare construction drawings. The drawings will include trenching, piping layout, and wellhead diagrams. The SVE and AS remediation piping to each well will be manifolded near the treatment equipment, and will include valves, meters, gauges and/or sampling ports to facilitate flow control flow and parameter measurement for individual wells.

Task 2 – System Permitting

Pangea anticipates that the remediation installation contractor will obtain permits from the City of Oakland Building Department as required. Pangea will notify the Bay Area Air Quality Management District (BAAQMD) of the system expansion and conduct additional testing as necessary.

Task 3 – Equipment Procurement

Pangea may procure a larger air compressor to provide increased flow rates to the existing and proposed AS wells. To control cost, Pangea may perform initial air sparging with the existing compressor and evaluate groundwater monitoring data for effectiveness. To help control noise levels, Pangea may add additional acoustical panels to the fenced enclosure as merited.

Task 4 – Remediation System Installation

Pangea will solicit bids from qualified remediation installation contractors and observe system installation. The installation contractor will be retained to install the system in accordance with building and other applicable permit conditions.

The remediation piping will be installed underground from the sites wells to the junction box near the entrance to the parking garage and then follow the existing piping to the equipment compound. The remediation piping to each well will be manifolded near the equipment enclosure, and will include valves, meters, gauges and/or sampling ports to facilitate flow control flow and parameter measurement for individual wells. All piping will be buried at least 18 inches below grade with magnetic warning tape within each trench. Long-radius elbow piping will be used to ease pulling of conduits and reduce pressure loss during extraction and injection. The underground piping will be tested prior to completion of installation activities. All conveyance piping will be pneumatically tested at 10 psi for one hour, or in accordance with additional specifications or manufacturer requirements.

Task 5 – System Startup, Operation and Maintenance

Upon completion of system installation, Pangea will commence equipment testing and system startup. The remediation system will be started and operated in accordance with BAAQMD air permit requirements and manufacturer recommendations. Pangea will monitor the applied vacuum, vapor extraction flow rates, and hydrocarbon concentrations in extracted vapor for individual wells and the system influent. Pangea will monitor the air injection pressures and flow rates for each air sparge well. Vapor samples will be periodically collected from each vapor extraction well and analyzed using a PID or organic vapor analyzer. Vapor samples will also be periodically collected for laboratory analysis.

Pangea will first conduct SVE without AS to establish initial vapor-phase concentrations in the subsurface. Pangea will then commence AS in new and existing wells. Pangea will also keep the AS rate well below the vapor extraction flow rate.

Pangea plans to conduct operation and maintenance at least weekly during the first months of operation with the new SVE/AS wells. We will perform routine system maintenance, record meter readings, and collect vapor samples to comply with permit conditions and evaluate system performance. If allowed by the BAAQMD, Pangea will request to reduce the monitoring frequency to semi-monthly or monthly. Due to the proximity to our office, Pangea will frequently observe the system to confirm system is operational.

Task 6 – Report Preparation

System operation and performance data will be described within quarterly groundwater monitoring and remediation progress reports. The reports will describe the remedial activities, present tabulated data, and offer conclusions and recommendations for future site remediation.

NATURAL ATTENUATION EVALUATION

This task involves the collection of data to evaluate the potential for natural attenuation at the site. Pangea will collect data regarding population of hydrocarbon-degrading bacteria and groundwater chemistry.

Task 1 - Bacteria and Nutrient Data Collection

To evaluate the presence and population density of naturally-occurring bacteria that will contribute to the degradation of petroleum hydrocarbon constituents, Pangea will submit soil samples collected from below the water table during drilling of boring DB-1 described above. These analyses, at a minimum, will include plate counts for total heterotrophic bacteria by EPA Method 9215B. Plate count results are normally reported in terms of colony-forming units (CFUs) per gram of soil. Microbial population densities in typical soils range from 10^4 to 10^7 CFU/gram of soil. Plate counts lower than 10^3 could indicate the presence of toxic concentrations of organic or inorganic (e.g., metals) compounds. Even when plate counts are lower than 10^3, sparging may reduce the toxic concentrations and increase the microbial population density.

These same soil samples will also be analyzed to determine the available concentrations of nitrogen (expressed as ammonia) and phosphate that occur naturally in the soil. Bacteria require inorganic nutrients such as nitrogen and phosphate to support cell growth and sustain biodegradation processes. Nutrients may be available in sufficient quantities beneath the site but, in some cases, nutrients need to be added to maintain adequate bacterial populations. However, excessive amounts of certain nutrients (i.e., phosphate and sulfate) can repress metabolism.

Task 2 - Key Parameter Evaluation

Certain parameters in groundwater can be cost-effectively monitored during routine groundwater monitoring to confirm that contaminant degradation is occurring. Pangea will evaluate the following six primary parameters: dissolved oxygen (DO), oxidation/reduction potential (ORP), alkalinity, nitrate, sulfate, and dissolved ferrous iron. To summarize parameter relationships, active biodegradation is indicated by *inverse* relationships between hydrocarbon concentrations and DO, ORP, nitrate and sulfate concentrations, and *direct* relationships between hydrocarbon concentrations and alkalinity and ferrous iron concentrations (CRTC, 1995). A discussion of each of the parameters is presented below. These analyses will provide additional information on the presence or absence of conditions favorable to the bioremediation of petroleum hydrocarbons.

During the first groundwater monitoring event after Workplan approval, Pangea will collect groundwater samples in appropriate containers from two impacted monitoring wells (MW-2 and MW-3), and two un-impacted wells (MW-5 and MW-7). The groundwater samples will be submitted for analysis for alkalinity, nitrate, sulfate, and dissolved ferrous iron by EPA Methods 310.2, 353.2, 375.4, and 200.7, respectively. Groundwater from these wells will also be analyzed in the field with portable meters for dissolved oxygen (DO) and oxidation/reduction potential (ORP). Additional parameter measurement may be performed during or after remediation to further assess performance.

Dissolved Oxygen: During aerobic biodegradation, DO levels are reduced as aerobic respiration occurs. DO is the most thermodynamically favored electron acceptor used in aerobic biodegradation of hydrocarbons. Active aerobic biodegradation of BTEX compounds requires at least 1 ppm DO in groundwater, and DO concentrations can be as high as 8 to 13 ppm in oxygen-saturated groundwater that is free of hydrocarbons. Observed inverse relationships between DO and hydrocarbon concentrations indicate the occurrence of aerobic degradation, provided that at least 1 to 2 ppm of DO is present in groundwater.

Oxidation-Reduction Potential: The ORP of groundwater is a measure of electron activity and is an indicator of the relative tendency of a solute species to gain or lose electrons. The ORP of groundwater generally ranges from -400 millivolts (mV) to +800 mV. Under oxidizing conditions, the ORP of groundwater is positive, while under reducing conditions, the ORP is usually negative. Reducing conditions (negative ORP) suggests that anaerobic biodegradation is occurring. Generally, the ORP of groundwater inside a hydrocarbon plume should be somewhat less than that measured outside the plume.

Alkalinity: The total alkalinity of groundwater indicates groundwater's ability to neutralize acid. High alkalinity (high pH) conditions occur when groundwater contains elevated hydroxides, carbonates, and bicarbonates of elements such as calcium, magnesium sodium, potassium, or ammonia. Since these chemical

species are created by the respiration of microorganisms, high alkalinity is an indicator of biological activity. However, these chemical species may also result from the dissolution of rock (especially carbonate rocks) and the transfer of carbon dioxide form the atmosphere. Alkalinity also buffers groundwater pH against acid generation by both aerobic and anaerobic biodegradation processes. Higher alkalinity in the source area as compared to clean areas suggests that biodegradation is occurring.

Nitrate: After DO has been depleted in the groundwater, nitrate may be used as an electron acceptor for anaerobic biodegradation. In this denitrification process, nitrate is reduced to nitrite. Reduced nitrate concentrations in the source area compared to clean areas suggest that anaerobic biodegradation is occurring.

Sulfate: After DO and nitrate have been depleted in the groundwater, sulfate may be used as an electron acceptor for anaerobic biodegradation. If sulfate concentrations vary inversely with hydrocarbon concentrations, anaerobic biodegradation of hydrocarbons is likely occurring.

Ferrous Iron: In some cases ferric iron (Fe^{+3}) acts as an electron acceptor during anaerobic biodegradation of petroleum hydrocarbons. In this process, ferric iron is reduced to ferrous iron (Fe^{+2}), which may be soluble in water and therefore can be measured by groundwater testing. If ferrous iron concentrations vary directly with hydrocarbon concentrations, anaerobic biodegradation may be occurring.

Pangea will also evaluate ferrous iron concentrations since the presence of dissolved ferrous iron in groundwater can reduce the permeability of the saturated zone soils during sparging. When dissolved iron is exposed to oxygen, it is oxidized to ferric iron oxide which, because it is less soluble than ferrous iron, can precipitate within the saturated zone and occlude soil pore space. On a large scale this could reduce the region available for air (and groundwater) flow, thereby reducing permeability. Precipitation of iron oxide occurs predominantly in the saturated zone near sparging well screens where oxygen content (from injected air) is the highest. This oxidation can render sparging wells useless over time, and may necessitate new well installation for effective sparging to continue.

Task 3 - Report Preparation

Natural attenuation evaluation will be described in the investigation and remediation well installation report or within a quarterly monitoring and remediation report.

REFERENCES

Cambria Environmental Technology, Inc., 2004, *Feasibility Test Report*, Douglas Parking Company, 1721 Webster Street, Oakland, California, April 22.

Chevron Research and Technology Company (CRTC), 1995, *Protocol for Monitoring Intrinsic Bioremediation in Groundwater*, March.

Figures, S., 1998, *Groundwater study and water supply history of the East Bay Plain*, Alameda and Contra Costa Counties, California: Norfleet Consultants, June 15.

Gettler-Ryan, Inc., 2008, *Second Semi-Annual Event of September 12, 2008*, Groundwater Monitoring and Sampling Report, Former Chevron Service Station #9-0020, 1633 Harrison Street, Oakland, California, October 28.

Graymer, R.W., 2000, *Geologic map and map database of the Oakland metropolitan area*, Alameda, Contra Costa and San Francisco Counties, California: USGS.

ATTACHMENTS

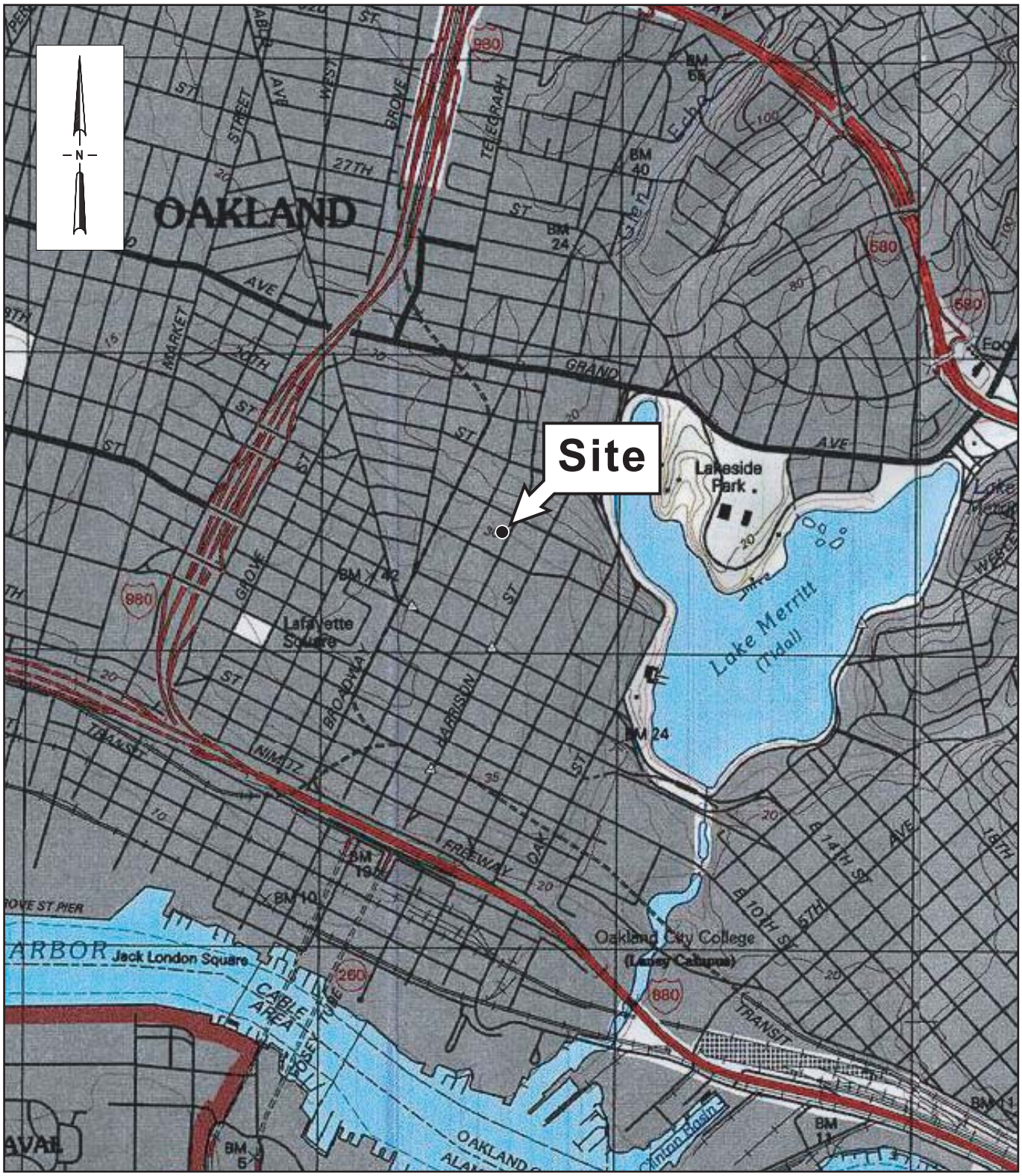
Figure 1 – Vicinity Map
Figure 2 – Estimated Extent of Benzene in Grab Groundwater Samples (1994 to 1998)
Figure 3 – Estimated Extent of Benzene in Groundwater Monitoring Wells (1999 to 2003)
Figure 4 – Proposed Well/Boring Locations and Estimated Radii of Influence

Table 1 – Soil Analytical Data
Table 2 – Groundwater Analytical Data

Appendix A – Agency Correspondence and Historic Soil and Groundwater Data for 1633 Harrison and 1750 Webster

Appendix B – Standard Operating Procedures

10/7/2006



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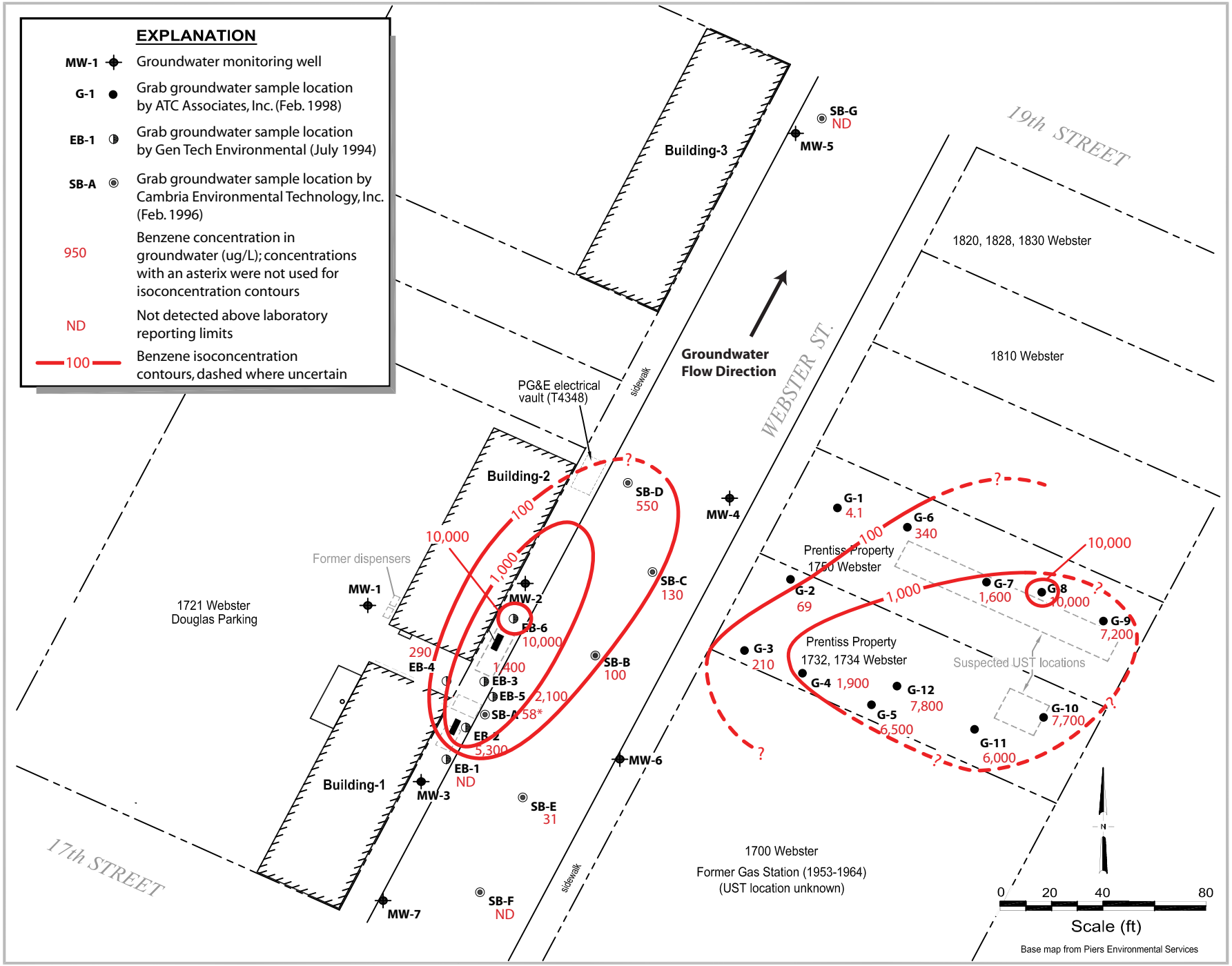
SCALE : 1" = 1/4 MILE

Figure 1

Douglas Parking Vacility
1721 Webster Street
Oakland, California

PANGEA

Vicinity Map

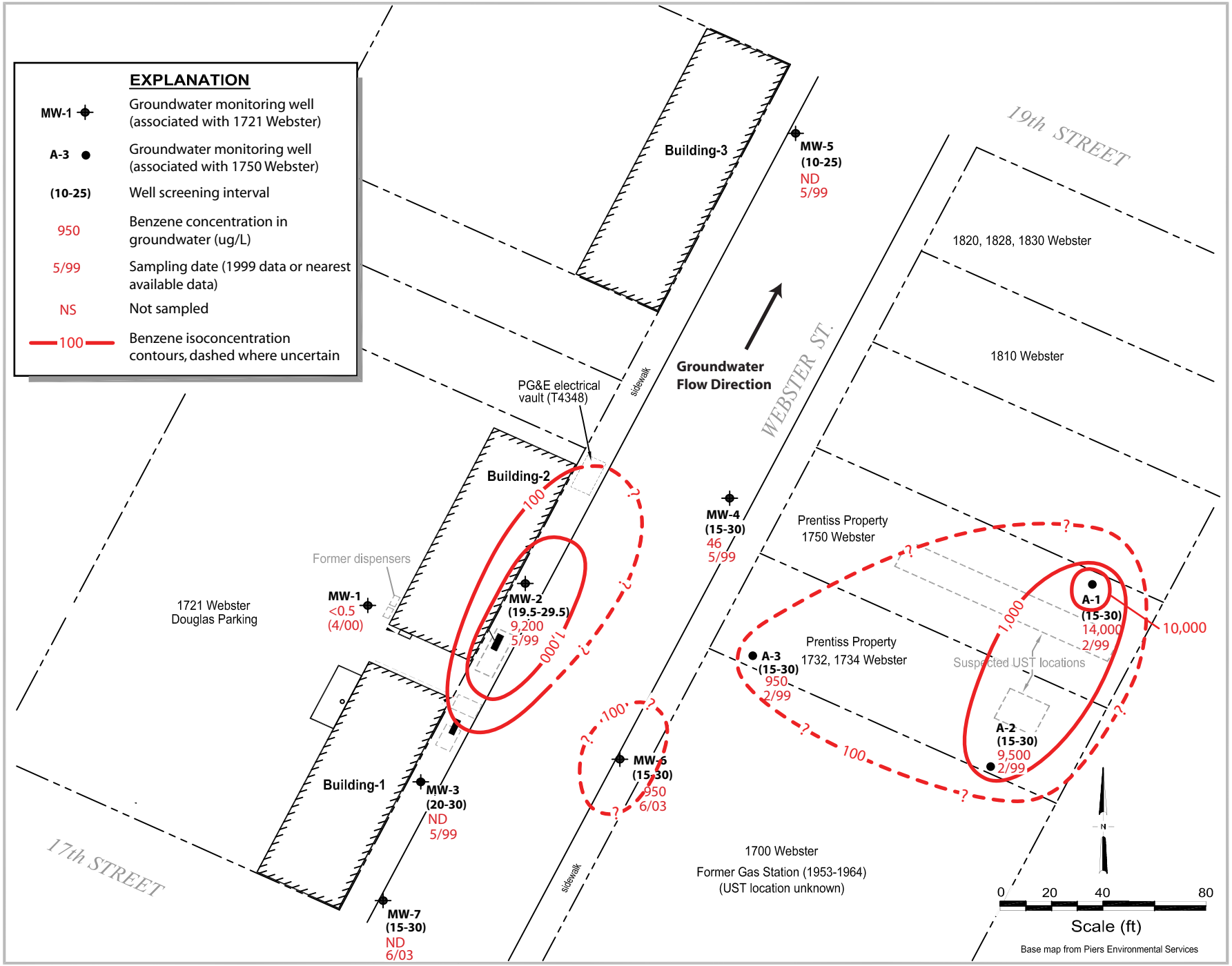


Douglas Parking
1721 Webster Street
Oakland, California

PANGEA

Benzene Isoconcentration Map - Grab Sampling Data July 1994 to February 1998

FIGURE
2



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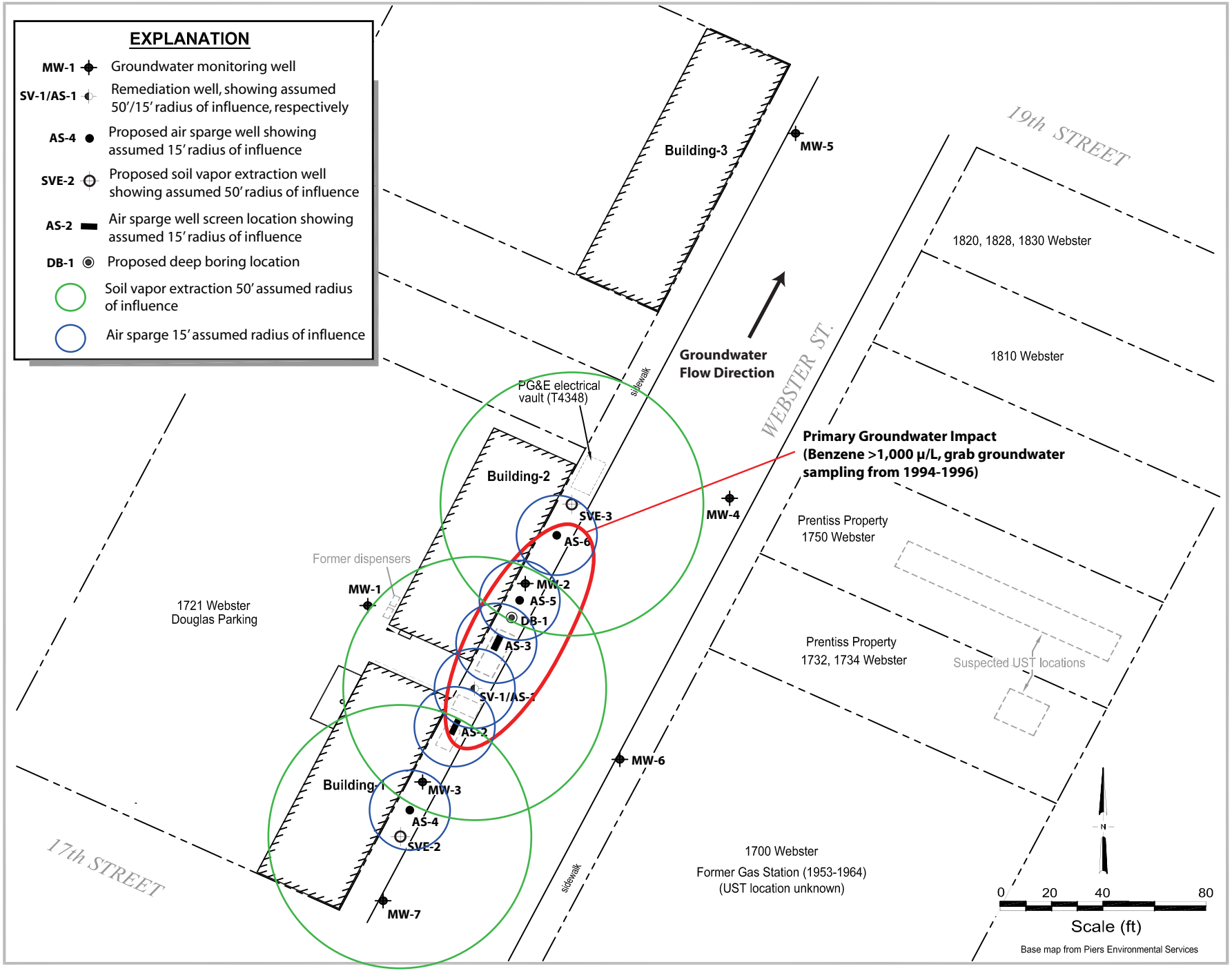
1721 Webster Street
Oakland, California

PANGEA

Benzene Isoconcentration Map - Well Data 1999

FIGURE
3



Douglas Parking
1721 Webster Street
Oakland, California

PANGEA

Proposed Well/Boring Locations and Estimated Radii of Influence

FIGURE
4

Table 1. Historical Soil Analytical Data - Douglas Parking, 1721 Webster Street, Oakland, California

Well/Boring ID	Date Sampled	Depth of Sample (feet-bgs)	TPHg	Benzene	Toluene	Ethylbenzene	Xylenes	MTBE
			mg/kg					
August 1992 Tank Removal								
Beneath 1,000-gallon gasoline tank								
T-1	8/3/1992	9	150	2.2	2.9	1.8	13	--
T-2	8/3/1992	9	120	0.62	0.56	0.87	2.2	--
Beneath two 500-gallon tanks								
T-3	8/6/1992	8	580	1.7	5.9	5.6	43	--
T-4	8/6/1992	8	1,500	11	140	48	280	--
T-5	8/6/1992	8	410	6.7	22	6.2	35	--
T-6	8/6/1992	12	1,400	12	71	29	150	--
T-7	8/6/1992	14	2.3	0.11	0.19	0.05	0.31	--
South excavation side walls (two 500-gallon tanks)								
SW1	8/6/1992	9.5	280	2.9	5.8	3.2	15	--
SW2	8/6/1992	7	1,500	5.7	40	18	150	--
SW3	8/6/1992	8	400	2.7	5.8	4.0	21	--
SW4	8/6/1992	9	2.3	0.42	0.028	0.077	0.18	--
Beneath line and pump trenches								
L-1	8/3/1992	1.5	2.6	ND	0.010	ND	0.030	--
L-2	8/3/1992	1.5	ND	ND	ND	ND	ND	--
L-3	8/3/1992	1.5	ND	ND	ND	ND	ND	--
L-4	8/3/1992	1.5	ND	ND	ND	ND	ND	--
L-5	8/3/1992	2	8.2	0.010	0.020	0.012	0.092	--
L-6	8/3/1992	2	ND	ND	0.007	ND	0.034	--
Composite soil sample from soil pile								
C1	8/6/1992	--	560	<0.1	5.0	3.1	24	--
Site Assessment								
EB-1	7/8/1994	20	ND	ND	ND	ND	ND	--
EB-2	7/8/1994	20	300	0.2	1.7	0.26	3.0	--
EB-3	7/8/1994	20	51	0.039	0.56	0.32	2.9	--
EB-4	7/8/1994	20	ND	ND	ND	ND	ND	--
EB-5	7/8/1994	20	650	0.17	5.2	4.4	48	--
EB-6	7/8/1994	20	68	ND	22	4.3	23	--
SB-A	2/22/1996	19.5	ND	ND	0.007	ND	ND	--
SB-B	2/22/1996	20.5	680	ND	1.3	1.8	4.2	--
SB-C	2/22/1996	19.5	1.4	ND	0.013	0.027	0.12	--
SB-D	2/22/1996	20.5	660	ND	2.3	ND	5.2	--
SB-E	2/23/1996	20.5	ND	ND	0.009	ND	ND	--
SB-F	2/23/1996	20	ND	ND	0.006	ND	ND	--
SB-G	2/23/1996	20	ND	ND	0.009	ND	ND	--
SB-H (MW-4)	5/3/1996	20.5	1.2	ND	0.006	0.025	0.038	--
SB-H (MW-4)	5/3/1996	31	ND	ND	ND	ND	ND	--
SB-I (MW-5)	5/3/1996	15.5	ND	ND	ND	ND	ND	--
SB-I (MW-5)	5/3/1996	26	ND	ND	ND	ND	ND	--
MW-6	6/27/2003	20	220	<0.10	0.14	<0.10	0.35	--

Notes, Abbreviations and Methods:

feet-bgs = feet below ground surface.

TPHg = Total petroleum hydrocarbons by EPA Method 8015.

BTEX = Benzen, toluene, ethylbenzene, xylenes by EPA Method 8020/8021.

mg/kg = Milligrams per kilogram, approximately equivalent to parts per million (ppm).

ND = Chemical not present at a concentration above laboratory detection limit.

-- = Not available or not analyzed.

Table 2. Groundwater Elevation and Analytical Data - Douglas Parking, 1721 Webster St, Oakland, CA

Boring / Well ID *TOC*	Date	Depth to Water (ft)	Groundwater Elevation (ft amsl)	TPHg	Benzene	Toluene	Ethylbenzene	Xylenes	MTBE
				◄			(µg/L)		►
MW-1	12/2/1994	19.42	9.83	ND	ND	ND	ND	ND	-
29.25	3/6/1995	20.69	9.04	ND	ND	ND	ND	ND	-
29.73	7/11/1995	20.65	9.16	ND	ND	ND	ND	ND	-
29.81	5/10/1996	20.80	9.01	ND	ND	ND	ND	ND	-
	10/2/1996	21.35	8.46	-	-	-	-	-	-
	2/28/1997	20.57	9.24	-	-	-	-	-	-
	9/16/1997	21.50	8.31	-	-	-	-	-	-
	2/5/1998	20.91	8.90	-	-	-	-	-	-
	8/11/1998	20.50	9.31	-	-	-	-	-	-
	2/8/1999	21.42	8.39	-	-	-	-	-	-
	2/24/1999	22.99	6.82	-	-	-	-	-	-
	3/3/1999	20.84	8.97	-	-	-	-	-	-
	3/10/1999	20.89	8.92	-	-	-	-	-	-
	3/17/1999	20.84	8.97	-	-	-	-	-	-
	5/4/1999	20.80	9.01	-	-	-	-	-	-
	7/20/1999	21.25	8.56	-	-	-	-	-	-
	10/5/1999	21.37	8.44	-	-	-	-	-	-
	1/7/2000	21.65	8.16	-	-	-	-	-	-
	4/6/2000	21.05	8.76	<50	<0.5	<0.5	<0.5	<0.5	<5.0
	7/31/2000	21.13	8.68	-	-	-	-	-	-
	10/3/2000	21.69	8.12	-	-	-	-	-	-
	1/12/2001	22.00	7.81	-	-	-	-	-	-
	4/11/2001	22.16	7.65	-	-	-	-	-	-
	7/6/2001	22.57	7.24	-	-	-	-	-	-
	10/25/2001	22.71	7.10	-	-	-	-	-	-
	3/4/2002	22.53	7.28	-	-	-	-	-	-
	4/18/2002	22.81	7.00	-	-	-	-	-	-
	7/9/2002	22.95	6.86	-	-	-	-	-	-
	10/4/2002	23.13	6.68	-	-	-	-	-	-
	1/12/2003	22.05	7.76	-	-	-	-	-	-
	4/21/2003	21.17	8.64	-	-	-	-	-	-
32.75	7/21/2003	21.39	11.36	-	-	-	-	-	-
	10/2/2003	21.64	11.11	-	-	-	-	-	-
	1/15/2004	21.10	11.65	-	-	-	-	-	-
	4/5/2004	21.20	11.55	-	-	-	-	-	-
	8/9/2004	22.97	9.78	-	-	-	-	-	-
	10/7/2004	23.55	9.20	-	-	-	-	-	-
	2/7/2005	20.90	11.85	<50	<0.5	<0.5	<0.5	<0.5	<5.0
	4/5/2005	20.60	12.15	-	-	-	-	-	-
	7/6/2005	20.66	12.09	-	-	-	-	-	-
	10/10/2005	21.16	11.59	-	-	-	-	-	-
	1/26/2006	20.73	12.02	<50	<0.5	<0.5	<0.5	<0.5	<5.0
	4/10/2006	20.05	12.70	-	-	-	-	-	-
	7/6/2006	20.90	11.85	<50	<0.5	<0.5	<0.5	<0.5	<5.0
	10/26/2006	21.80	10.95	<50	<0.5	<0.5	<0.5	<0.5	<5.0
	1/19/2007	22.02	10.73	--	--	--	--	--	--
	4/17/2007	22.13	10.62	--	--	--	--	--	--
	7/6/2007	21.83	10.92	--	--	--	--	--	--
	10/15/2007	22.28	10.47	--	--	--	--	--	--
	1/17/2008	22.33	10.42	<50	<0.5	<0.5	<0.5	<0.5	<5.0
	4/9/2008	22.11	10.64	--	--	--	--	--	--
	7/17/2008	22.50	10.25	--	--	--	--	--	--
	10/27/2008	22.75	10.00	--	--	--	--	--	--
	1/9/2009	**22.89**	**9.86**	**<50**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<5.0**

Table 2. Groundwater Elevation and Analytical Data - Douglas Parking, 1721 Webster St, Oakland, CA

Boring / Well ID *TOC*	Date	Depth to Water (ft)	Groundwater Elevation (ft amsl)	TPHg	Benzene	Toluene	Ethylbenzene	Xylenes	MTBE
				◄			(µg/L)		►
MW-2	12/2/1994	19.50	7.60	61,300	3,000	3,900	160	4,500	-
27.10	3/6/1995	18.49	8.61	98,000	8,400	16,000	2,000	2,600	-
27.40	7/11/1995	18.45	8.95	38,000	3,100	7,500	940	3,700	-
	5/10/1996	18.56	8.84	63,000	7,400	16,000	1,500	6,000	-
	10/2/1996	19.15	8.25	21,000	2,200	3,400	430	1,600	-
	2/28/1997	18.43	8.97	39,000	4,700	9,600	950	4,200	ND
	9/16/1997	19.26	8.14	29,000	3,300	5,800	690	2,900	<620
	2/5/1998	18.66	8.74	10,000	1,000	2,000	170	860	<330
	8/11/1998	18.41	8.99	12,000	1,200	2,300	260	1,400	300
	2/8/1999	19.84	7.56	5,500	740	1,200	150	780	60
	2/17/1999	18.94	8.46	-	-	-	-	-	-
	2/24/1999	20.76	6.64	-	-	-	-	-	-
	3/3/1999	18.55	8.85	-	-	-	-	-	-
	3/10/1999	20.74	6.66	-	-	-	-	-	-
	3/17/1999	18.57	8.83	-	-	-	-	-	-
	5/4/1999	18.55	8.85	90,000	9,200	21,000	1,600	10,000	560
	7/20/1999	18.98	8.42	28,000	2,100	3,700	900	4,200	<860
	10/5/1999	19.10	8.30	11,000	870	180	30	1,400	<110
	1/7/2000	19.41	7.99	15,000	1,300	2,100	440	1,800	<14
	4/6/2000	18.80	8.60	17,000	1,800	3,100	500	2,200	<50
	7/31/2000	18.87	8.53	17,000	1,500	2,700	430	2,100	<200
	10/3/2000	19.45	7.95	27,000	2,500	4,000	660	2,900	<50
	1/12/2001	19.80	7.60	25,000	2,700	4,100	670	3,000	<200
	4/11/2001	20.03	7.37	97,000	9,500	21,000	2,200	7,900	<200
	7/6/2001	20.19	7.21	3,500	500	150	11	420	<5.0
	10/25/2001	20.35	7.05	3,800	620	230	70	400	<50
	3/4/2002	20.37	7.03	46,000	7,300	12,000	870	3,200	<500
	4/18/2002	20.15	7.25	68,000	5,100	8,900	1,100	4,000	<1,000
	7/9/2002	21.09	6.31	1,000	200	8.9	0.67	82	<10
	10/4/2002	21.28	6.12	270	100	3.4	0.53	10	<5.0
	1/12/2003	20.59	6.81	67,000	7,600	13,000	1,400	5,600	<500
	4/21/2003	19.98	7.42	78,000	7,700	12,000	1,900	6,900	<500
30.40	7/21/2003	20.08	10.32	1,800	360	16	<5.0	190	<50
	10/2/2003	20.41	9.99	4,000	790	110	60	350	<50
	1/15/2004	19.93	10.47	8,100	6.1	23	44	530	<50
	4/5/2004	18.99	11.41	14,000	1,600	2,100	550	2,500	<500
	8/9/2004	19.79	10.61	1,200	210	16	14	100	<20
	10/7/2004	20.26	10.14	1,100	2.3	9.8	2.9	36	<5.0
	2/7/2005	18.80	11.60	45,000	4,400	4,800	1,400	5,800	<200
	4/5/2005	18.40	12.00	34,000	3,700	3,600	1,200	5,300	<500 (<5.0)
	7/6/2005	18.48	11.92	24,000	1,600	1,700	570	2,800	<500
	10/10/2005	19.00	11.40	25,000	1,700	2,100	710	3,200	<500
	1/26/2006	18.58	11.82	60,000	4,600	7,200	1,600	6,900	<1,000
	4/10/2006	17.84	12.56	56,000	4,900	7,500	1,200	7,400	<500
	7/6/2006	18.76	11.64	28,000	1,900	1,700	720	2,900	<500
	10/26/2006	19.60	10.80	43,000	2,800	2,500	1,700	7,600	<500
	1/19/2007	19.84	10.56	31,000	2,700	2,400	1,400	5,800	<150
	4/17/2007	19.90	10.50	37,000	3,200	2,900	1,600	6,400	<400
	7/6/2007	19.63	10.77	30,000	3,200	2,000	1,500	5,200	<250
	10/15/2007	20.11	10.29	20,000	1,200	990	650	2,300	<500
	1/17/2008	20.10	10.30	38,000	2,900	5,100	1,200	5,000	<210
	4/9/2008	20.12	10.28	51,000	3,000	6,400	1,700	6,500	<250
	7/17/2008	20.01	10.39	22,000	180	500	660	2,100	<250
	10/27/2008	20.61	9.79	26,000	570	2,100	670	3,400	<50
	1/9/2009	**20.80**	**9.60**	**16,000**	**240**	**680**	**460**	**3,000**	**<100**

Table 2. Groundwater Elevation and Analytical Data - Douglas Parking, 1721 Webster St, Oakland, CA

Boring / Well ID *TOC*	Date	Depth to Water (ft)	Groundwater Elevation (ft amsl)	TPHg	Benzene	Toluene	Ethylbenzene	Xylenes	MTBE
				◄			(µg/L)		►
MW-3	12/2/1994	22.15	7.35	394,000	1,200	ND	1,800	4,000	-
29.50	3/6/1995	20.09	9.16	21,000	400	150	24	62	-
29.25	7/11/1995	19.99	9.57	12,000	ND	10	16	99	-
29.56	5/10/1996	20.24	9.32	8,600	ND	7.6	16	84	-
	10/2/1996	20.90	8.66	11,000	ND	7.4	19	92	-
	2/28/1997	20.12	9.44	6,000	ND	4.4	17	88	50
	9/16/1997	20.97	8.59	6,500	<0.5	0.69	1.2	6.7	<5.0
	2/5/1998	20.39	9.17	5,400	<0.5	6.3	15	86	<63
	8/11/1998	19.95	9.61	2,700	<0.5	3.5	3.2	12	<10
	2/8/1999	20.58	8.98	6,100	<0.5	8.1	18	80	<140
	2/17/1999	20.53	9.03	-	-	-	-	-	-
	2/24/1999	22.53	7.03	-	-	-	-	-	-
	3/3/1999	20.28	9.28	-	-	-	-	-	-
	3/10/1999	22.45	7.11	-	-	-	-	-	-
	3/17/1999	20.26	9.30	-	-	-	-	-	-
	5/4/1999	20.24	9.32	11,000	<2	<2	9.8	140	<10
	7/20/1999	20.68	8.88	11,000	<0.5	3.1	13	88	<80
	10/5/1999	20.81	8.75	31,000	62	<0.5	21	170	<90
	1/7/2000	21.09	8.47	13,000	<0.5	<2	21	140	<80
	4/6/2000	20.48	9.08	5,300	1.5	1.4	9.8	60	<30
	7/31/2000	20.62	8.94	7,100	3.5	1.0	12	66	<5.0
	10/3/2000	21.13	8.43	8,000	<0.5	3.3	11	70	<40
	1/12/2001	21.45	8.11	11,000	4.3	6.7	11	73	<70
	4/11/2001	21.69	7.87	10,000	<0.5	<0.5	11	65	<10
	7/6/2001	21.60	7.96	13,000	5.3	1.6	11	58	<5.0
	10/25/2001	21.70	7.86	11,000	<0.5	3.0	15	70	<10
	3/4/2002	21.65	7.91	1,900	1.3	0.8	<0.5	15	<5.0
	4/18/2002	21.77	7.79	1,500	1.0	0.97	1.3	5.8	<5
	7/9/2002	22.03	7.53	13,000	6.8	5.7	13	59	<90
	10/4/2002	22.15	7.41	8,400	<10	<10	<10	42	<100
	1/12/2003	21.13	8.43	9,000	9.5	5.1	8.5	46	<90
	4/21/2003	20.63	8.93	10,000	<5.0	<5.0	8.5	32	<50
32.56	7/21/2003	20.68	11.88	9,600	<2.5	<2.5	7.4	39	48 (<1.0)
	10/2/2003	20.99	11.57	12,000	<5.0	<5.0	10	40	<90
	1/15/2004	20.74	11.82	13,000	37	41	78	930	<50
	4/5/2004	20.59	11.97	4,500	<1.7	<1.7	<1.7	12	<17
	8/9/2004	22.18	10.38	2,100	<1.0	3.7	<1.0	8.1	<10
	10/7/2004	22.79	9.77	2,400	6.5	26	7.5	89	<15
	2/7/2005	20.35	12.21	6,800	2.2	5.6	2.0	12	<30
	4/5/2005	19.95	12.61	6,100	2.3	2.6	1.3	8.3	<45 (<0.5)
	7/6/2005	19.93	12.63	4,500	<1.0	1.5	1.0	8.3	<10
	10/10/2005	20.45	12.11	3,800	0.73	<0.5	0.98	5.7	<15
	1/26/2006	20.05	12.51	5,100	<0.5	1.1	<0.5	6.6	<15
	4/10/2006	19.39	13.17	1,900	0.55	1.6	0.51	4.1	<10
	7/6/2006	20.25	12.31	5,600	<1.0	2.3	<1.0	6.4	<20
	10/26/2006	21.07	11.49	8,000	2.5	1.0	2.3	12	<35
	1/19/2007	21.38	11.18	77,000	19	40	9.5	130	<300
	4/17/2007	21.45	11.11	7,400	2.7	6.6	1.1	12	<40
	7/6/2007	21.29	11.27	7,100	2.4	5.6	0.85	10	<30
	10/15/2007	21.62	10.94	10,000	<5.0	<5.0	<5.0	14	<50
	1/17/2008	21.68	10.88	6,400	1.8	<0.5	1.0	8.4	23
	4/9/2008	21.42	11.14	4,700	1.7	2.2	<0.5	3.8	<18
	7/17/2008	22.10	10.46	7,700	2.9	3.1	1.4	11	<60
	10/27/2008	22.13	10.43	9,700	<1.7	1.8	2.3	11	<17
	1/9/2009	**22.27**	**10.29**	**9,800**	**1.7**	**2.0**	**3.0**	**14**	**<17**

Table 2. Groundwater Elevation and Analytical Data - Douglas Parking, 1721 Webster St, Oakland, CA

Boring / Well ID *TOC*	Date	Depth to Water (ft)	Groundwater Elevation (ft amsl)	TPHg	Benzene	Toluene	Ethylbenzene	Xylenes	MTBE
				◄			(µg/L)		►
MW-4	5/10/1996	16.98	8.31	14,000	ND	1,200	720	3,100	-
25.29	10/2/1996	17.65	7.64	12,000	ND	650	580	2,200	-
	2/28/1997	16.80	8.49	13,000	ND	1,100	750	2,700	110
	9/17/1997	17.93	7.36	13,000	<2.5	820	750	2,900	<190
	2/5/1998	16.78	8.51	13,000	<1.0	690	690	2,900	<170
	8/11/1998	16.59	8.70	15,000	<5	360	520	1,900	280
	2/8/1999	17.10	8.19	9,800	<5	680	770	2,200	300
	2/24/1999	18.95	6.34	-	-	-	-	-	-
	3/3/1999	16.80	8.49	-	-	-	-	-	-
	3/10/1999	16.86	8.43	-	-	-	-	-	-
	3/17/1999	16.82	8.47	-	-	-	-	-	-
	5/4/1999	16.86	8.43	11,000	46	600	620	1,900	<100
	7/20/1999	17.30	7.99	13,000	<0.5	470	7.0	2,000	<150
	10/5/1999	17.43	7.86	18,000	4.4	720	800	2,100	<120
	1/7/2000	17.78	7.51	18,000	<2	930	990	2,700	<30
	4/6/2000	17.17	8.12	8,000	31	390	530	1,300	<10
	7/31/2000	17.21	8.08	6,200	13	170	460	850	<10
	10/3/2000	18.00	7.29	14,000	42	820	730	2,000	<50
	1/12/2001	18.20	7.09	<50	<0.5	<0.5	<0.5	<0.5	<5.0
	4/11/2001	18.31	6.98	<50	<0.5	<0.5	<0.5	<0.5	<5.0
	7/6/2001	18.35	6.94	470	2.3	1.6	0.81	43	<5.0
	10/25/2001	18.47	6.82	110	0.70	<0.5	<0.5	3.3	<5.0
	3/4/2002	18.43	6.86	<50	<0.5	<0.5	<0.5	<0.5	<5.0
	4/18/2002	18.61	6.68	<50	<0.5	<0.5	<0.5	<0.5	<5.0
	7/9/2002	19.50	5.79	<50	<0.5	<0.5	<0.5	<0.5	<5.0
	10/4/2002	19.83	5.46	310	2.0	2.9	13	16	<0.5
	1/12/2003	19.07	6.22	<50	<0.5	<0.5	<0.5	<0.5	<5.0
	4/21/2003	18.71	6.58	<50	<0.5	<0.5	<0.5	<0.5	<5.0
28.29	7/21/2003	18.81	9.48	<50	<0.5	<0.5	<0.5	<0.5	<5.0
	10/2/2003	19.02	9.27	59	0.78	<0.5	1.1	0.91	<5.0
	1/15/2004	18.68	9.61	<50	<0.5	<0.5	<0.5	<0.5	<5.0
	4/5/2004	17.41	10.88	6,200	29	250	450	730	<100
	8/9/2004	19.07	9.22	<50	<0.5	<0.5	<0.5	<0.5	<5.0
	10/7/2004	19.65	8.64	<50	<0.5	<0.5	<0.5	<0.5	<5.0
	2/7/2005	17.21	11.08	8,700	48	340	550	720	<100
	4/5/2005	16.78	11.51	6,900	27	290	520	660	<170 (<0.5)
	7/6/2005	16.98	11.31	5,600	<5.0	130	470	480	<50
	10/10/2005	17.59	10.70	6,300	23	78	530	430	<50
	1/26/2006	17.08	11.21	5,600	41	68	400	290	<120
	4/10/2006	16.27	12.02	2,900	39	32	200	140	<60
	7/6/2006	17.20	11.09	5,400	65	59	340	150	<120
	10/26/2006	18.06	10.23	7,200	72	46	460	200	<150
	1/19/2007	18.29	10.00	7,100	140	35	520	150	<200
	4/17/2007	18.30	9.99	4,900	90	32	290	89	<110
	7/6/2007	18.00	10.29	4,600	91	30	210	55	<90
	10/15/2007	18.52	9.77	8,600	200	62	480	110	<210
	1/17/2008	18.46	9.83	820	15	3.7	25	9.3	<10
	4/9/2008	18.23	10.06	3,600	55	20	160	64	<60
	7/17/2008	18.72	9.57	6,500	210	47	510	180	<180
	10/27/2008	19.07	9.22	7,700	200	28	450	87	<150
	1/9/2009	**19.12**	**9.17**	**4,400**	**180**	**34**	**180**	**93**	**<150**

Table 2. Groundwater Elevation and Analytical Data - Douglas Parking, 1721 Webster St, Oakland, CA

Boring / Well ID *TOC*	Date	Depth to Water (ft)	Groundwater Elevation (ft amsl)	TPHg	Benzene	Toluene	Ethylbenzene	Xylenes	MTBE
				◄			(µg/L)		►
MW-5	5/10/1996	14.60	7.37	ND	ND	ND	ND	ND	-
21.97	10/2/1996	15.25	6.72	ND	ND	ND	ND	ND	-
	2/28/1997	14.31	7.66	ND	ND	ND	ND	ND	ND
	9/17/1997	15.18	6.79	<0.5	<0.5	<0.5	<0.5	<0.5	<5.0
	2/5/1998	13.64	8.33	<50	<0.5	<0.5	<0.5	<0.5	<5.0
	8/11/1998	13.92	8.05	<50	<0.5	<0.5	<0.5	<0.5	<5.0
	2/8/1999	14.19	7.78	<50	<0.5	<0.5	<0.5	<0.5	<5.0
	2/24/1999	16.18	5.79	-	-	-	-	-	-
	3/3/1999	14.23	7.74	-	-	-	-	-	-
	3/10/1999	14.32	7.65	-	-	-	-	-	-
	3/17/1999	14.25	7.72	-	-	-	-	-	-
	5/4/1999	14.41	7.56	<50	<0.5	<0.5	<0.5	<0.5	<5.0
	7/20/1999	14.44	7.53	<50	<0.5	<0.5	<0.5	<0.5	<5.0
	10/5/1999	14.79	7.18	<50	<0.5	<0.5	<0.5	<0.5	<5.0
	1/7/2000*	15.23	6.74	-	-	-	-	-	-
	4/6/2000	14.74	7.23	<50	<0.5	<0.5	<0.5	<0.5	<5.0
	7/31/2000	14.52	7.45	<50	<0.5	<0.5	<0.5	<0.5	<5.0
	10/3/2000	15.37	6.60	<50	<0.5	<0.5	<0.5	<0.5	<5.0
	1/12/2001	15.70	6.27	6,400	13	290	450	1,100	<40
	4/11/2001	15.78	6.19	<50	<0.5	<0.5	<0.5	<0.5	<5.0
	7/6/2001	15.97	6.00	<50	<0.5	<0.5	<0.5	<0.5	<5.0
	10/25/2001	16.05	5.92	<50	<0.5	<0.5	<0.5	<0.5	<5.0
	3/4/2002	16.21	5.76	<50	<0.5	<0.5	<0.5	<0.5	<5.0
	4/18/2002	16.59	5.38	<50	<0.5	<0.5	<0.5	<0.5	<5.0
	7/9/2002	16.94	5.03	170	1.0	0.65	2.1	4.0	<15
	10/4/2002	17.14	4.83	<50	<0.5	<0.5	<0.5	<0.5	<5.0
	1/12/2003	16.58	5.39	<50	<0.5	<0.5	<0.5	<0.5	<5.0
	4/21/2003	15.90	6.07	<50	<0.5	<0.5	<0.5	<0.5	<5.0
	7/21/2003	16.03	8.96	<50	<0.5	<0.5	<0.5	<0.5	<5.0
24.99	10/2/2003	16.33	8.66	<50	<0.5	<0.5	<0.5	<0.5	<5.0
	1/15/2004	16.21	8.78	<50	<0.5	<0.5	<0.5	<0.5	<5.0
	4/5/2004	15.01	9.98	<50	<0.5	<0.5	<0.5	<0.5	<5.0
	8/9/2004	16.85	8.14	<50	<0.5	<0.5	<0.5	<0.5	<5.0
	10/7/2004	17.48	7.51	<50	<0.5	<0.5	<0.5	<0.5	<5.0
	2/7/2005	16.52	8.47	<50	<0.5	<0.5	<0.5	<0.5	<5.0
	4/5/2005	14.45	10.54	<50	<0.5	<0.5	<0.5	<0.5	<5.0 (<0.5)
	7/6/2005	14.85	10.14	<50	<0.5	<0.5	<0.5	<0.5	<5.0
	10/10/2005	15.44	9.55	<50	<0.5	<0.5	<0.5	<0.5	<5.0
	1/26/2006	14.96	10.03	<50	<0.5	<0.5	<0.5	<0.5	<5.0
	4/10/2006	14.01	10.98	<50	<0.5	<0.5	<0.5	<0.5	<5.0
	7/6/2006	15.17	9.82	<50	<0.5	<0.5	<0.5	<0.5	<5.0
	10/26/2006	15.94	9.05	<50	<0.5	<0.5	<0.5	<0.5	<5.0
	1/19/2007	16.05	8.94	<50	<0.5	<0.5	<0.5	<0.5	<5.0
	4/17/2007	15.99	9.00	<50	<0.5	<0.5	<0.5	<0.5	<5.0
	7/6/2007	15.50	9.49	<50	<0.5	<0.5	<0.5	<0.5	<5.0
	10/15/2007	16.27	8.72	<50	<0.5	<0.5	<0.5	<0.5	<5.0
	1/17/2008	15.10	9.89	<50	<0.5	<0.5	<0.5	<0.5	<5.0
	4/9/2008	15.96	9.03	<50	<0.5	<0.5	<0.5	<0.5	<5.0
	7/17/2008	16.44	8.55	<50	<0.5	<0.5	<0.5	<0.5	<5.0
	10/27/2008	16.78	8.21	<50	<0.5	<0.5	<0.5	<0.5	<5.0
	1/9/2009	**16.75**	**8.24**	**<50**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<5.0**

Table 2. Groundwater Elevation and Analytical Data - Douglas Parking, 1721 Webster St, Oakland, CA

Boring / Well ID *TOC*	Date	Depth to Water (ft)	Groundwater Elevation (ft amsl)	TPHg	Benzene	Toluene	Ethylbenzene	Xylenes	MTBE
				← (µg/L) →					
MW-6	6/30/2003	19.60	11.39	68,000	950	6,000	2,400	10,000	<1,000
30.99	7/21/2003	19.67	11.32	120,000	170	1,400	1,100	10,000	<1,000
	10/2/2003	19.97	11.02	16,000	7.6	200	38	1,800	<100
	1/15/2004	19.55	11.44	14,000	48	51	94	1,100	<50
	4/5/2004	19.17	11.82	24,000	180	900	430	1,800	<500
	8/9/2004	20.98	10.01	5,300	6.4	25	5.3	69	<17 (<0.5)
	10/7/2004	21.52	9.47	5,600	11	58	18	210	<50 (<0.5)
	2/7/2005	19.00	11.99	31,000	120	620	310	1,200	<500
	4/5/2005	18.60	12.39	21,000	170	1,100	350	1,300	<500 (<5.0)
	7/6/2005	18.56	12.43	26,000	130	920	320	1,200	<500
	10/10/2005	19.99	11.00	19,000	140	840	250	980	<500
	1/26/2006	18.70	12.29	10,000	140	1,100	270	1,200	<170
	4/10/2006	18.04	12.95	13,000	140	1,000	280	1,000	<250
	7/6/2006	18.80	12.19	17,000	150	1,000	290	1,000	<250
	10/26/2006	19.62	11.37	23,000	230	660	470	1,500	<500
	1/19/2007	19.92	11.07	18,000	190	620	350	1,100	<150
	4/17/2007	19.97	11.02	23,000	380	1,400	590	2,000	<450
	7/6/2007	19.81	11.18	28,000	600	3,000	900	2,700	<500
	10/15/2007	20.15	10.84	25,000	290	680	410	1,100	<250
	10/15/2007	20.15	10.84	25,000	290	680	410	1,100	<250
	1/17/2007	20.22	10.77	16,000	200	130	130	460	<150
	4/9/2008	19.86	11.13	18,000	320	870	480	1,500	<250
	7/17/2008	20.36	10.63	18,000	320	510	420	1,200	<500
	10/27/2008	20.69	10.30	31,000	320	320	410	990	<350
	1/9/2009	**20.83**	**10.16**	**22,000**	**340**	**390**	**560**	**1,400**	**<250**
MW-7	6/30/2003	21.40	11.71	170	<0.5	2.1	2.0	8.7	<5.0
33.11	7/21/2003	21.44	11.67	<50	<0.5	<0.5	<0.5	<0.5	<5.0
	10/2/2003	21.73	11.38	<50	<0.5	<0.5	<0.5	<0.5	<5.0
	1/15/2004	21.57	11.54	<50	<0.5	<0.5	<0.5	<0.5	<5.0
	4/5/2004	20.84	12.27	<50	<0.5	<0.5	<0.5	<0.5	<5.0
	8/9/2004	22.68	10.43	<50	<0.5	<0.5	<0.5	<0.5	<5.0
	10/7/2004	23.27	9.84	<50	<0.5	<0.5	<0.5	<0.5	<5.0
	2/7/2005	20.60	12.51	<50	<0.5	<0.5	<0.5	<0.5	<5.0
	4/5/2005	20.22	12.89	<50	<0.5	0.75	<0.5	<0.5	<5.0 (<0.5)
	7/6/2005	20.25	12.86	<50	<0.5	<0.5	<0.5	<0.5	<5.0
	10/10/2005	20.70	12.41	<50	<0.5	<0.5	<0.5	<0.5	<5.0
	1/26/2006	20.32	12.79	<50	<0.5	<0.5	<0.5	<0.5	<5.0
	4/10/2006	19.62	13.49	<50	<0.5	<0.5	<0.5	<0.5	<5.0
	7/6/2006	20.47	12.64	<50	<0.5	<0.5	<0.5	<0.5	<5.0
	10/26/2006	21.30	11.81	<50	<0.5	<0.5	<0.5	<0.5	<5.0
	1/19/2007	21.62	11.49	<50	<0.5	<0.5	<0.5	<0.5	<5.0
	4/17/2007		11.49	<50	<0.5	<0.5	<0.5	<0.5	<5.0
	7/6/2007	21.59	11.52	<50	<0.5	<0.5	<0.5	<0.5	<5.0
	10/15/2007	21.85	11.26	<50	<0.5	<0.5	<0.5	<0.5	<5.0
	1/17/2007	21.90	11.21	<50	<0.5	<0.5	<0.5	<0.5	<5.0
	4/9/2008	21.61	11.50	<50	<0.5	<0.5	<0.5	<0.5	<5.0
	7/17/2008	22.09	11.02	<50	<0.5	<0.5	<0.5	<0.5	<5.0
	10/27/2008	22.39	10.72	<50	<0.5	<0.5	<0.5	<0.5	<5.0
	1/9/2009	**22.52**	**10.59**	**<50**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<5.0**
AS-1	7/6/2006	19.53	--	18,000	2,700	570	700	1,900	<500
	10/26/2006	20.33	--	15,000	1,900	340	360	1,400	<250
	1/19/2007	20.64	--	5,700	1,100	110	88	630	<50
	1/19/2007	20.64	--	5,700	1,100	110	88	630	<50

Table 2. Groundwater Elevation and Analytical Data - Douglas Parking, 1721 Webster St, Oakland, CA

Boring / Well ID *TOC*	Date	Depth to Water (ft)	Groundwater Elevation (ft amsl)	TPHg	Benzene	Toluene	Ethylbenzene	Xylenes	MTBE
				◄			(µg/L)		►
AS-2	7/6/2006	22.26	--	2,100	6.1	<0.5	33	200	<20
	10/26/2006	23.25	--	280	1.1	<0.5	<0.5	6.0	<15
	1/19/2007	23.61	--	2,100	2.3	<0.5	96	310	<35
	4/17/2007	23.70	--	--	--	--	--	--	--
AS-3	7/6/2006	21.77	--	<50	<0.5	<0.5	<0.5	<0.5	<5.0
	10/26/2006	22.66	--	<50	<0.5	<0.5	<0.5	<0.5	<5.0
	1/19/2007	22.97	--	<50	<0.5	<0.5	<0.5	<0.5	<5.0
	4/17/2007	23.06	--	--	--	--	--	--	--
Trip Blank	01/12/01	-	-	<50	<0.5	<0.5	<0.5	<0.5	<5.0
	4/11/2001	-	-	<50	<0.5	<0.5	<0.5	<0.5	<5.0
	7/6/2001	-	-	<50	<0.5	<0.5	<0.5	<0.5	<5.0
	3/4/2002	-	-	<50	<0.5	<0.5	<0.5	<0.5	<5.0
	10/2/2003	-	-	<50	<0.5	<0.5	<0.5	<0.5	<5.0
GRAB GROUNDWATER DATA									
Gen-Tech Environmental, December 1994									
EB-1GWS	7/8/1994	--	--	62,000	ND	26	850	8,900	--
EB-2GWS	7/8/1994	--	--	160,000	5,300	20,000	2,100	17,000	--
EB-3GWS	7/8/1994	--	--	87,000	1,400	21,000	1,700	19,000	--
EB-4GWS	7/8/1994	--	--	350,000	290	1,300	3,200	31,000	--
EB-5GWS	7/8/1994	--	--	120,000	2,100	13,000	1,300	16,000	--
EB-6GWS	7/8/1994	--	--	230,000	10,000	34,000	2,300	16,000	--
MW-1	7/8/1994	--	--	ND	ND	ND	ND	ND	--
MW-2	7/8/1994	--	--	61,300	3,000	3,000	160	4,500	--
MW-3	7/8/1994	--	--	394,000	1,200	ND	1,800	4,000	--
Cambria, July 1996									
SB-A	2/22/1996	--	--	16,000	38	16	180	620	--
SB-B	2/22/1996	--	--	20,000	100	29	320	590	--
SB-C	2/22/1996	--	--	1,200	130	100	68	230	--
SB-D	2/22/1996	--	--	7,400	550	110	160	89	--
SB-E	2/23/1996	--	--	16,000	31	160	390	1,400	--
SB-F	2/23/1996	--	--	ND	ND	1.4	ND	2.3	--
SB-G	2/23/1996	--	--	5,200	1.3	ND	0.70	ND	--

Notes and Abbreviations:

TOC = Top of casing elevations in feet above mean sea level.

ft amsl = Measured in feet above mean sea level

µg/L = Micrograms per liter.

TPHg = Total petroleum hydrocarbons as gasoline by modified EPA Method 8015C.

BTEX = Benzene, toluene, ethylbenzene, and xylenes by EPA Method 8021B.

MTBE = Methyl tertiary butyl ether by EPA Method 8021B, and by EPA Method 8260 in parenthesis.

<0.5 = Concentration not detected above specific laboratory reporting limit.

-- = Not analyzed, not sampled, or not applicable.

ND = Not detected.

Data prior to 7/11/95 from Gen Tech and Piers Environmental Quarterly Groundwater Monitoring Reports dated December 2, 1994 and March 6, 1995, respectively.

On July 31, 2003, Virgil Chavez Land Surveying of Vallejo, California surveyed monitoring wells using a benchmark in the top of the curb near the SW return of the NW corner of 34th and Broadway.

APPENDIX A

Agency Correspondence and Historic Soil and Groundwater Data
for 1633 Harrison and 1750 Webster Street

ALAMEDA COUNTY
HEALTH CARE SERVICES
AGENCY
DAVID J. KEARS, Agency Director

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

August 15, 2001
StID 4070/ RO0000129

Mr. Lee Douglas
Douglas Parking
1721 Webster St.
Oakland CA 94612

Re: Status of Site Investigation at 1721 Webster St., Oakland CA 94607

Dear Mr. Douglas:

Please be informed that the undersigned is the new case worker for the oversight of the on-going petroleum release at the above referenced site. I have reviewed the file and have spoken with Mr. John Riggi of Cambria Environmental. I was informed that the work plan for the proposed soil vapor extraction / air sparge pilot test has been approved by the Clean-up Fund. After reviewing the February 2001 Feasibility Testing and Feasibility Study Plan, I told Mr. Riggi that the Three Month Biosparge Testing outlined in Task 4, is not recommended by our office. Therefore, you should proceed with the soil vapor extraction / air sparge (SVE/AS) pilot test and then report your findings and recommendations.

As you are aware, based upon testing data it was decided that the groundwater contamination found beneath 1750 Webster St. was not likely from a release on this site, therefore, no further action was required of the property owner. Up-gradient off-site sources were implicated as possible sources of this contamination. Though 1721 Webster St. is an up-gradient source, it has not been shown that it is the source of the contamination found beneath 1750 Webster St., therefore, your remediation need not extend to this property at this time. Our office reserves the right to change this opinion should additional information indicating the contrary arise.

To better characterize this site, our office requests additional site investigation up and cross-gradient of the former underground tanks. The gasoline concentration has remained elevated in MW-3, the up-gradient well and the results of the 2/1996 investigation indicated elevated gasoline in groundwater in the cross-gradient boring SB-E. Please have your consultant propose work, which will further characterize these areas.

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

Sincerely,

Barney M. Chan
Hazardous Materials Specialist

C: B. Chan, files
Mr. J. Riggi, Cambria Environmental, 1144 65th St., Suite B, Oakland 94608
Mr. S. Ramdass, UST Cleanup Fund Technical Review Unit, 1001 I St., 17th Floor, Sacramento CA 95814-2828

1721WebsterSt

SENT 2-18-2000
Including COC's

ALAMEDA COUNTY
HEALTH CARE SERVICES
AGENCY
DAVID J. KEARS, Agency Director

RO2672

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

February 16, 2000

Mr. Charles A. Sumner II
Vice President – Development & Asset Management
Prentiss Properties (Property owner of 1750 Webster Street)
2485 Natomas Park Drive, Suite 350
Sacramento, CA 95833

Mr. Leland Douglas
Douglas Parking LLC (Property owner of 1721 Webster Street)
1721 Webster Street
Oakland, CA 94612-3411

RE: STID 4617, 1750 Webster Street, Oakland, CA 94612

Dear Messrs. Sumner & Douglas:

I have reviewed the site file for the above address for the purpose of determining whether the subsurface contamination at the above site is from an on-site or off-site source. In summary, the following information is contained in the County's file. The site and site vicinity have generally been developed since at least 1899. The site was used for residential purposes until at least 1936 based on the Reverse Business Directory. Since 1936, the site has been used for a parking lot.

A geophysical survey and groundwater investigation was performed at the site in March 1993. No underground storage tank (UGT) were identified by the geophysical survey, but the two groundwater samples collected (HP-1 and HP-2) had concentrations of total petroleum hydrocarbons as gasoline (TPH-g), and the gasoline related compounds benzene, toluene, ethylbenzene, and total xylenes (BTEX).

In May 1993, a geophysical survey and a follow-up investigation was performed which included advancing four soil borings to depths of approximately 20 feet below ground surface (bgs). Two samples were analyzed from each boring. No significant concentrations of TPH(g) or BTEX were detected in any of the soil samples. No USTs were identified by the geophysical survey.

A subsurface investigation that involved the advancement of twelve soil borings and ground penetrating radar (GPR) survey was performed in February 1998. Groundwater was detected at a depth of approximately 20 feet bgs. None of the soil samples collected from above that depth had detectable concentrations of TPH(g), BTEX or MTBE. All of the ground water samples did have detectable concentrations of TPH(g), BTEX and MTBE, and three had detectable concentrations of HVOCs. Groundwater had up to 760,000 ppb TPH(g), 10,000 ppb benzene, 29,000 ppb toluene, 5,800 ppb ethylbenzene, 17,500 ppb total xylenes.

In order to determine the groundwater gradient at the site, and to perform regular groundwater monitoring, three groundwater monitoring wells (A-1, A-2 and A-3) were installed at the site on April 26, 1998. The soil samples collected during the drilling of the monitoring wells were non-detect for TPH(g), BTEX and MTBE. Groundwater samples collected on April 28, 1998 contained up to 84,000 ppb TPH(g), 12,000 ppb benzene, 20,000 ppb toluene, 1,700 ppb ethylbenzene and 8,400 ppb total xylenes. MTBE was not detected in the groundwater samples.

Groundwater samples were collected for four quarters from April 1998 to February 1999. The most recent groundwater sampling on February 26, 1999 detected up to 89,000 ppb TPH(g), 14,000 ppb benzene, 22,000 ppb toluene, 2,000 ppb ethylbenzene, 9,300 ppb total xylenes. In addition, halogenated volatile organic compounds (HVOC) were detected in the samples. These results are consistent with historical results.

The first quarter 1999 groundwater monitoring event completes a full year of quarterly groundwater monitoring at the site. The groundwater gradient has been consistent northeasterly at the site. None of the contaminants have been detected in the vadose zone soils in any of the 18 soil borings completed.

Based on information currently available to this office and the Regional Water Quality Control Board, San Francisco Bay Region (RWQCB), we conclude that groundwater pollution detected beneath the subject property is likely the result of the migration of pollutants in groundwater from upgradient sites. In general, this office and RWQCB does not pursue enforcement action against a property owner whose land overlies contaminated groundwater if that contamination is solely the result of the migration of groundwater contaminants from an off-site source (possibly1721 Webster Street) or sources. Accordingly, this office and RWQCB will not name current and future owners of the subject property as dischargers with respect to groundwater pollution from off-site

sources. However, this office and RWQCB may hold such a property owner responsible for investigation or cleanup tasks if he or she refuses to provide reasonable access to an upgradient discharger attempting to investigate and cleanup off-site groundwater pollution.

The site is currently a parking lot, and the proposed development plan is to erect an aboveground, non-enclosed parking structure. The groundwater beneath the site has been impacted with petroleum constituents. The soil has not been significantly impacted. Versar, Inc. prepared a risk based corrective action assessment (February 23, 1998) only evaluating groundwater. This office concurs with Versar's conclusion that the presence of petroleum constituents within the shallow groundwater does not represent a health concern that will restrict the development of the site as a parking (non-enclosed) structure. However, it is anticipated that any parking structure built on the site would contain some environments which will be more representative of indoor exposures (i.e.- toll booth, maintenance closets). The site specific target levels derived for benzene in groundwater under the indoor exposure scenario was determined to be 1.1 ppm. Currently the highest concentration of benzene in the site groundwater is 14 ppm.

A risk assessment evaluating the "indoor exposure pathway" must be submitted to the local implementing agency for review and approval if any enclosed structure is proposed for the site.

A deed restriction on the site needs to be recorded to ensure the site is re-evaluated if site use changes.

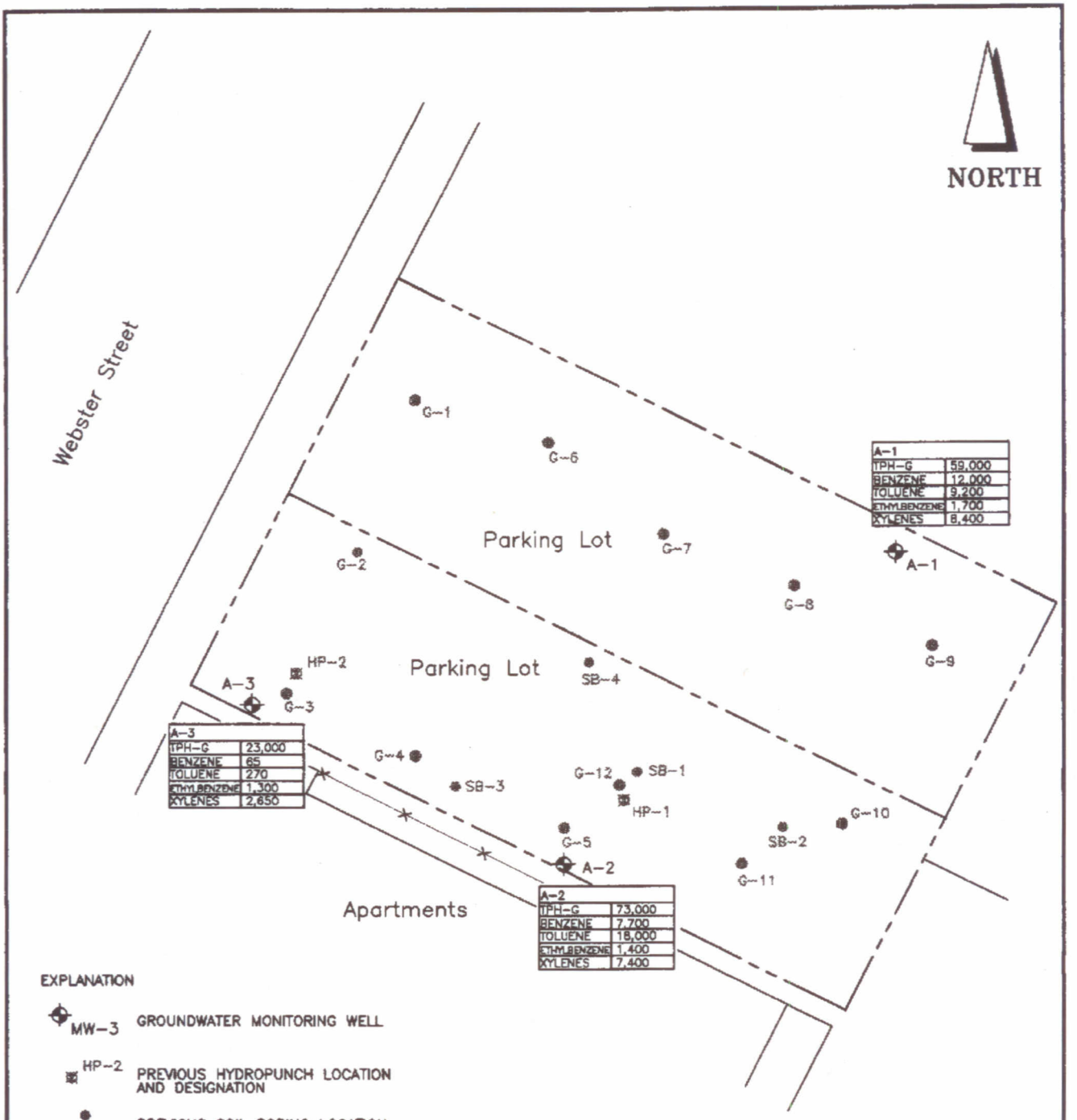
The three monitoring wells on-site, A-1, A- 2 and A-3 should not be destroyed. The monitoring well covers must be locked at all times to prevent vandalism. The responsible party for the plume beneath your property can use these wells for future monitoring.

If you have any questions, please contact this office at (510) 567-6774.

Sincerely,

Larry Seto
Sr. Hazardous Materials Specialist

Cc: Chuck Headlee, Regional Water Control Board, 1515 Clay Street, Suite 1400, Oakland, CA 94612
Leroy Griffin, 1605 Martin Luther King, Oakland, CA 94612
William Wick, Crosby, Heafey, Roach, & May, 1999 Harrison Street, Oakland, CA 94612-3573
Ariu Levi, Chief, Alameda County Environmental Health, Hazardous Materials Division
Files



NOTES

1) All locations and dimensions are approximate.

SOURCE: SITE SURVEY BY RON ARCHER CIVIL ENGINEER, INC., APRIL 28, 1998

VATC ASSOCIATES INC.
ENVIRONMENTAL, GEOTECHNICAL AND MATERIALS PROFESSIONALS

TPH-G/BENZENE CONCENTRATIONS IN GROUNDWATER (8-4-98)
PRENTISS
1750 WEBSTER STREET
OAKLAND, CALIFORNIA

PROJECT NO. 61877.0004 | FIGURE 6

TABLE 1

SUMMARY OF GROUNDWATER SAMPLE ANALYTICAL RESULTS
PRENTISS PROPERTIES LTD. INC.
1750 WEBSTER STREET
OAKLAND, CA 94612

Sample ID	Sample Date	TPH-G (ug/l)	Benzene (ug/l)	Toluene (ug/l)	Ethyl-benzene (ug/l)	Total Xylenes (ug/l)	MTBE (ug/l)	Detected HVOCs (EPA 8260)						Well Elevation (ft., MSL)	Depth to Water (ft)	Ground Water Elevation (ft., MSL)
								1,1-DCA (ug/l)	Cis-1,2-DCE (ug/l)	1,2-DCA (ug/l)	TCE (ug/l)	PCE (ug/l)	1,2-DCP (ug/l)			
Primary	MCLs	---	1	150	700	1750	---	5	6	0.5	5	5	5			
A-1	4/28/98	56,000	12,000	8,500	1,500	7,300	<200	ND 1.0	21	13	5.5	4.8	ND 1.0	30.20	19.45	10.75
	8/4/98	59,000	12,000	9,200	1,700	8,400	<200	ND 5.0	19	ND 5.0	8.4	ND 5.0	ND 5.0		19.80	10.40
	11/18/98	61,000	12,000	8,400	1,800	8,300	<160	ND 5.0	21	13	ND 5.0	ND 5.0	ND 5.0		20.39	9.81
	2/26/99	68,000	14,000	9,900	2,000	9,300	<200	1.9	16	10	4.0	3.5	3.8		19.82	10.38
A-2	4/28/98	84,000	8,600	20,000	1,600	8,000	<250	ND 1.0	18	ND 1.0	3.1	2.7	ND 1.0	31.31	19.65	11.66
	8/4/98	73,000	7,700	18,000	1,400	7,400	<400	ND 17	22	ND 17	52	ND 17	ND 17		19.97	11.34
	11/18/98	110,000	10,000	25,000	2,000	10,300	<400	ND 5.0	10	5.7	ND 5.0	ND 5.0	ND 5.0		20.57	10.74
	2/26/99	89,000	9,500	22,000	1,600	8,100	<400	ND 0.5	8.7	ND 0.5	5.0	4.8	4.5		20.23	11.08
A-3	4/28/98	23,000	89	460	1,400	2,870	<40	ND 1.0	ND 1.0	ND 1.0	10	2.5	ND 1.0	30.71	18.81	11.90
	8/4/98	23,000	65	270	1,300	2,650	<20	ND 5.0	ND 5.0	ND 5.0	9.6	ND 5.0	ND 5.0		19.05	11.66
	11/18/98	24,000	73	370	1,200	2,210	<20	ND 2.5	ND 2.5	ND 2.5	6.7	ND 2.5	ND 2.5		19.66	11.05
	2/26/99	30,000	160	520	1,400	2,630	<20	ND 0.5	0.9	0.7	11	3.1	0.8		19.32	11.39

Notes:

TPH-G denotes total petroleum hydrocarbons as gasoline
MTBE denotes methyl-tert-butyl ether
1,2-DCA denotes 1,2-dichloroethane
Cis-1,2-DCE denotes Cis-1,2-dichloroethene
TCE denotes Trichloroethene
PCE denotes Tetrachloroethene
1,2-DCP denotes 1,2-dichloropropane
ND denotes not detected at stated detection limit
Primary MCls (Maximum Contaminant Levels) from California Dept. of Health Services; if none exist, US EPA levels aer listed

ft., MSL denotes feet, mean sea leve
ft denotes feet
HVOCs denotes Halogenated Volatile Organic Compounds
ug/l denotes micrograms per liter

TABLE 1

SUMMARY OF SOIL SAMPLE ANALYTICAL RESULTS
PRENTISS PROPERTIES LTD. INC.
1750 WEBSTER STREET SITE
OAKLAND, CA 94612

Sample ID	Date Sampled	TPH-G (mg/kg)	Benzene (mg/kg)	Toluene (mg/kg)	Ethyl-benzene (mg/kg)	Total Xylenes (mg/kg)	MTBE (mg/kg)
G-1-10FT	02/07/98	<1	<5	<5	<5	<5	<20
G-1-24FT	02/07/98	200	250	310	1,700	1830	1,000
G-2-10FT	02/07/98	<1	<5	<5	<5	6.5	<20
G-2-22-FT	02/07/98	4	6.6	8.7	87	82	27
G-3-10FT	02/07/98	<1	<5	<5	<5	<5	<20
G-3-16FT	02/07/98	<1	<5	<5	<5	<5	<20
G-4-12FT	02/07/98	<1	<5	<5	<5	<5	<20
G-4-22FT	02/07/98	17	<5	20	110	304	<20
G-5-11FT	02/07/98	<1	<5	<5	<5	<5	<20
G-5-21FT	02/07/98	<1	<5	8.2	<5	<5	<20
G-6-10FT	02/08/98	<1	<5	<5	<5	<5	<20
G-6-15FT	02/08/98	<1	<5	<5	<5	<5	<20
G-7-15FT	02/08/98	<1	<5	<5	<5	<5	<20
G-7-19FT	02/08/98	<1	<5	<5	<5	<5	<20
G-8-12FT	02/08/98	<1	<5	<5	<5	<5	<20
G-8-16FT	02/08/98	<1	<5	<5	<5	<5	<20
G-9-11FT	02/08/98	<1	<5	<5	<5	<5	<20
G-9-16FT	02/08/98	<1	<5	<5	<5	<5	<20
G-10-10FT	02/08/98	<1	<5	<5	<5	<5	<20
G-10-17FT	02/08/98	<1	<5	<5	<5	<5	<20
G-11-11FT	02/08/98	<1	<5	<5	<5	<5	<20
G-11-16FT	02/08/98	<1	<5	<5	<5	<5	<20
G-12-11-FT	02/08/98	<1	<5	<5	<5	<5	<20
G-12-16FT	02/08/98	<1	<5	<5	<5	<5	<20

Notes:

TPH-G denotes total petroleum hydrocarbons as gasoline
MTBE denotes methyl-tert-butyl ether
Cis-1,2-DCE denotes Cis-1,2-dichloroethylene
TCE denotes Trichloroethylene
PCE denotes Tetrachloroethylene
mg/kg denotes milligrams per kilogram (ppm)
ND 1.0 denotes not detected at or above practical quantitation limit of 1.0 ug/l for the method
For detection limits listed as ND, refer to laboratory reports

TABLE 2

SUMMARY OF GROUNDWATER SAMPLE ANALYTICAL RESULTS
PRENTISS PROPERTIES LTD. INC.
1750 WEBSTER STREET SITE
OAKLAND, CA 94612

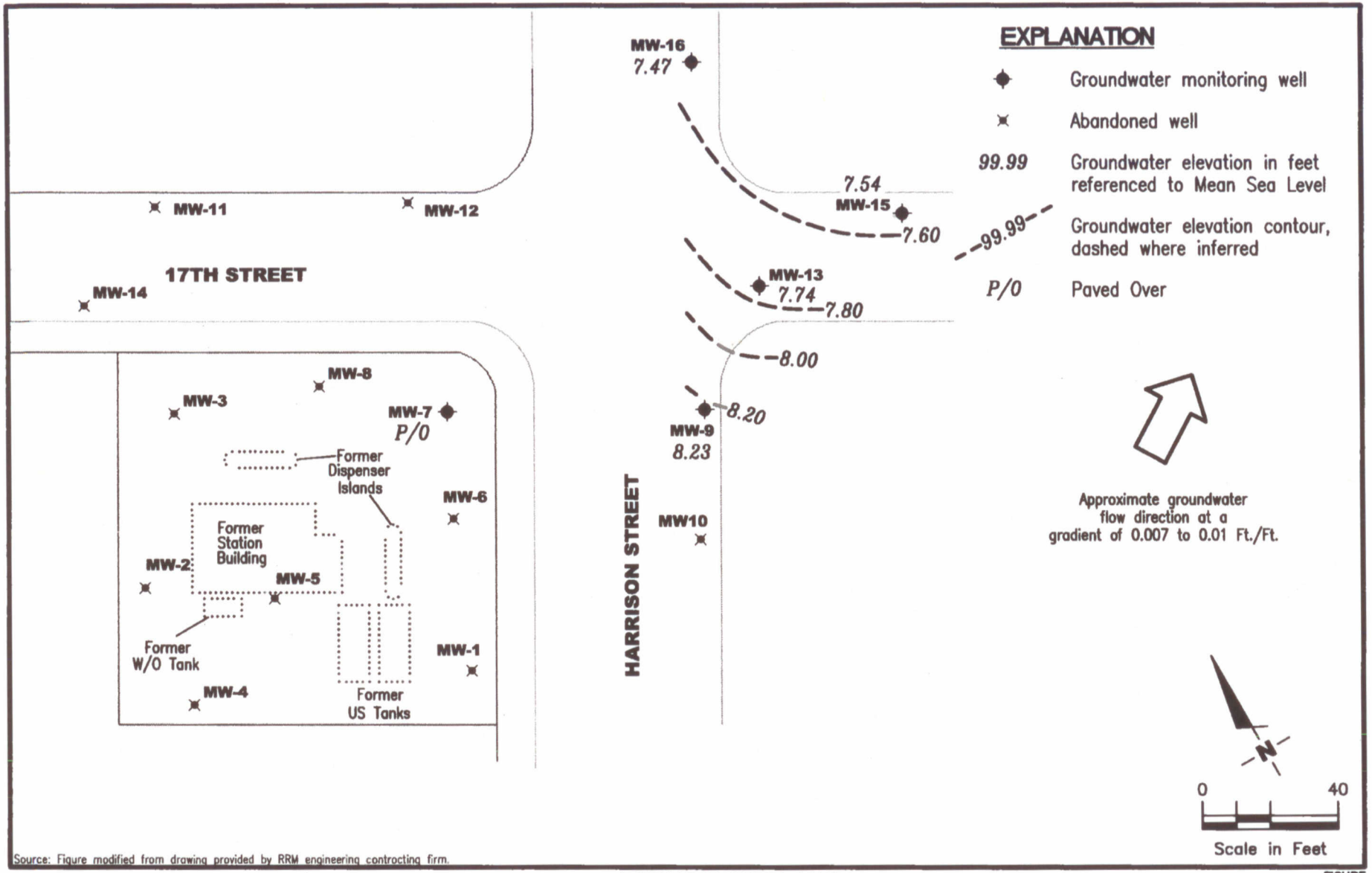
Sample ID	Date Sampled	TPH-G (ug/l)	Benzene (ug/l)	Toluene (ug/l)	Ethyl-benzene (ug/l)	Total Xylenes (ug/l)	MTBE (ug/l)	Detected HVOCs (EPA 8010)		
								Cis-1,2-DCE (ug/l)	TCE (ug/l)	PCE (ug/l)
G-1	02/07/98	700	4.1	9	140	63	50	NR	NR	NR
G-2	02/07/98	7,300	69	870	660	1,350	510	NR	NR	NR
G-3	02/07/98	20,000	210	1,300	1,300	3,120	560	ND 1.0	13	1.2
G-4	02/07/98	36,000	1,900	3,100	1,400	4,700	620	ND 1.0	11	1.1
G-5	02/07/98	32,000	6,500	9,600	1,100	5,000	390	8.2	4.2	1.0
G-6	02/08/98	760,000	340	730	5,800	13,400	2,000	NR	NR	NR
G-7	02/08/98	46,000	1,600	670	2,700	7,600	1,100	NR	NR	NR
G-8	02/08/98	51,000	10,000	7,200	2,300	9,900	930	NR	NR	NR
G-9	02/08/98	19,000	7,200	7,900	490	2,370	<200	NR	NR	NR
G-10	02/08/98	280,000	7,700	29,000	3,600	17,500	2,900	NR	NR	NR
G-11	02/08/98	17,000	6,000	4,600	740	2,760	420	ND 4.0	ND 4.0	ND 4.0
G-12	02/08/98	78,000	7,800	8,500	2,200	9,200	1,300	ND 10	ND 10	ND 10
								MCL= 6	MCL=5	MCL=5

Notes:

TPH-G denotes total petroleum hydrocarbons as gasoline
MTBE denotes methyl-tert-butyl ether
Cis-1,2-DCE denotes Cis-1,2-dichloroethylene
TCE denotes Trichloroethylene
PCE denotes Tetrachloroethylene
ug/l denotes micrograms per liter
ND 1.0 denotes not detected at or above practical quantitation limit of 1.0 ug/l for the method
NR indicates analysis not requested
For detection limits listed as ND, refer to laboratory reports

HVOCs

DCE + TCE
> MCLs in
some analyses



Source: Figure modified from drawing provided by RRM engineering contracting firm.

GETTLER - RYAN INC.
6747 Sierra Court, Suite J
Dublin, CA 94568
(925) 551-7555

POTENTIOMETRIC MAP
Former Chevron Service Station #9-0020
1633 Harrison Street
Oakland, California

FIGURE
1

PROJECT NUMBER	REVIEWED BY	DATE	REVISED DATE
386499		September 12, 2008	

FILE NAME: P:\Enviro\Chevron\9-0020\Q08-9-0020.dwg | Layout Tab: Pot3

Table 1

Groundwater Monitoring Data and Analytical Results

Former Chevron Service Station #9-0020

1633 Harrison Street

Oakland, California

WELL ID/ DATE		TOC (ft.)	GWE (msl)	DTW (ft.)	TPH-G (µg/L)	B (µg/L)	T (µg/L)	E (µg/L)	X (µg/L)	MTBE (µg/L)	TOG (µg/L)
MW-7											
04/23/89		29.01	10.02	18.99	--	--	--	--	--	--	--
04/24/89		29.01	--	--	8400	100	260	160	1300	--	<3.0
07/28/89		29.01	9.07	19.94	7000	230	90	70	440	--	<3000
07/28/89	(D)	29.01	--	--	6000	280	180	58	430	--	--
10/30/89		29.01	9.04	19.97	10,000	570	55	160	400	--	--
10/30/89	(D)	29.01	--	--	9900	520	82	180	410	--	--
01/09/90		29.01	8.86	20.15	3400	290	72	9.0	200	--	--
04/18/90		29.01	8.64	20.37	6800	350	140	110	400	--	--
06/22/90		29.01	8.61	20.40	--	--	--	--	--	--	--
08/09/90		29.01	8.63	20.38	11,000	360	130	14	660	--	--
11/13/90		29.01	8.60	20.41	6500	230	110	97	460	--	--
05/15/91		29.01	8.54	20.47	4600	180	55	46	300	--	--
08/27/91		29.01	8.87	20.14	7000	220	53	63	340	--	--
11/15/91		29.01	8.79	20.22	3300	150	19	4.9	200	--	--
02/20/92		29.01	8.69	20.32	5200	520	150	100	380	--	--
06/15/92		29.01	9.03	19.98	10,000	760	430	320	1100	--	--
12/16/92		29.01	8.87	20.14	11,000	810	350	280	1100	--	--
04/07/93		29.01	9.87	19.14	150	1.4	0.9	0.9	4.5	--	--
06/09/93		29.01	9.96	19.05	180	4.0	1.0	1.0	3.0	--	--
09/10/93		29.01	--	--	--	--	--	--	--	--	--
09/27/93		29.01	--	--	--	--	--	--	--	--	--
12/17/93		29.01	--	--	--	--	--	--	--	--	--
03/10/94		29.01	--	--	--	--	--	--	--	--	--
06/16/94		29.01	--	--	--	--	--	--	--	--	--
09/07/94		29.01	--	--	--	--	--	--	--	--	--
11/30/94		29.01	INACCESSIBLE	--	--	--	--	--	--	--	--
01/17/95		29.01	17.39	11.62	2700	140	65	44	200	--	--
03/22/95		29.01	11.33	17.68	160	3.4	<0.5	1.1	0.77	--	--
06/27/95		29.01	9.75	19.26	<50	<0.5	<0.5	<0.5	<0.5	--	--
09/28/95		29.01	9.67	19.34	1500	84	24	26	130	--	--
12/30/95		29.01	9.85	19.16	200	1.6	<0.5	1.3	5.9	5.5	--
02/28/96		29.01	10.57	18.44	650	14	1.3	4.2	16	34	--
06/27/96		29.01	10.29	18.72	640	140	10	9.8	14	55	--
09/13/96		29.01	9.61	19.40	1400	100	30	24	66	130	--
12/16/96		29.01	8.91	20.10	2600	140	72	51	180	<50	--
03/20/97		29.01	10.06	18.95	64	1.7	2.4	<0.5	0.67	<2.5	--

Table 1

Groundwater Monitoring Data and Analytical Results

Former Chevron Service Station #9-0020

1633 Harrison Street

Oakland, California

WELL ID/ DATE	TOC (ft.)	GWE (msl)	DTW (ft.)	TPH-G (µg/L)	B (µg/L)	T (µg/L)	E (µg/L)	X (µg/L)	MTBE (µg/L)	TOG (µg/L)
MW-7 (cont)										
09/08/97	29.01	9.34	19.67	590	45	<1.0	7.7	<1.0	46	--
02/16/98	29.01	10.41	18.60	120	8.7	7.5	1.9	11	4.4	--
08/25/98	29.01	9.61	19.40	160	6.2	33	0.84	2.0	<2.5	--
03/09/99	29.01	13.01	16.00	<50	<0.5	<0.5	<0.5	<0.5	<2.5	--
09/29/99	29.01	12.12	16.89	276	35.1	2.54	2.17	5.43	<5.0/<2.0[1]	--
03/27/00	29.01	9.42	19.59	721	38.5	1.06	6.31	9.38	7.75	--
09/18/00[3]	29.01	8.99	20.02	88[4]	2.5	0.92	<0.50	1.3	8.7	--
03/27/01[3]	29.01	9.16	19.85	<50.0	<0.500	<0.500	<0.500	<0.500	<0.500	--
09/05/01[3]	29.01	8.60	20.41	220	1.9	2.3	<0.50	<3.0	<2.5	--
03/15/02[3]	29.01	9.16	19.85	NOT SAMPLED - DUE TO INSUFFICIENT WATER				--	--	--
09/14/02[3]	29.01	8.72	20.29	69	2.2	0.85	<0.50	<1.5	<2.5	--
03/26/03[3]	29.01	8.89	20.12	78	<0.50	0.68	<0.50	<1.5	<2.5	--
09/02/03[6,7]	29.01	7.99	21.02	76	<0.5	<0.7	<0.8	<1.6	<0.5	--
03/29/04[6]	29.01	10.13	18.88	160	1	<0.5	0.5	0.6	1	--
09/03/04[6]	29.01	9.52	19.49	110	2	1	0.8	0.8	<0.5	--
03/02/05[6]	29.01	15.59	13.42	850	3	0.9	6	1	<0.5	--
09/22/05[6]	29.01	10.13	18.88	490	29	5	14	4.9	<0.5	--
03/30/06[6]	29.01	10.88	18.13	1,400	51	9	26	10	<0.5	--
08/28/06[6]	29.01	10.16	18.85	1,300	53	12	21	16	<0.5	--
03/05/07[6]	29.01	10.76	18.25	1,800	66	16	17	19	<0.5	--
09/24/07[6]	29.01	9.11	19.90	1,700	76	21	19	24	<0.5	--
PAVED OVER										
MW-9										
06/22/90	28.67	7.87	20.80	5700	47	31	280	530	--	<1000
08/09/90	28.67	7.93	20.74	8000	<0.3	17	210	480	--	--
11/13/90	28.67	7.89	20.78	6400	<3.0	20	240	450	--	--
05/15/91	28.67	8.19	20.48	5700	2.0	16	190	390	--	--
08/27/91	28.67	8.12	20.55	6700	<3.0	31	180	350	--	--
11/15/91	28.67	8.10	20.57	4000	8.8	26	150	280	--	--
02/20/92	28.67	6.90	21.77	3400	13	30	230	460	--	--
06/15/92	28.67	8.30	20.37	4500	19	72	280	560	--	--
12/16/92	28.68	8.39	20.29	9900	380	220	380	1300	--	--
04/07/93	28.68	9.36	19.32	8700	51	150	360	1000	--	--

Table 1

Groundwater Monitoring Data and Analytical Results

Former Chevron Service Station #9-0020

1633 Harrison Street

Oakland, California

WELL ID/ DATE	TOC (ft.)	GWE (msl)	DTW (ft.)	TPH-G (µg/L)	B (µg/L)	T (µg/L)	E (µg/L)	X (µg/L)	MTBE (µg/L)	TOG (µg/L)
MW-9 (cont)										
06/09/93	28.68	9.52	19.16	8900	170	160	350	1100	--	--
09/10/93	28.68	--	--	4600	110	63	190	350	--	--
09/27/93	28.68	8.74	19.94	--	--	--	--	--	--	--
12/17/93	28.68	8.37	20.31	4600	92	85	180	300	--	--
03/10/94	28.68	8.38	20.30	3300	8.0	29	120	170	--	--
06/16/94	28.68	8.42	20.26	2900	4.8	16	85	64	--	--
09/07/94	28.68	8.27	20.41	2900	<0.5	9.9	70	75	--	--
11/30/94	28.68	8.70	19.98	2100	<5.0	<5.0	53	51	--	--
03/22/95	28.68	9.27	19.41	2200	<5.0	5.3	26	69	--	--
06/27/95	28.68	9.28	19.40	2900	7.4	10	68	99	--	--
09/28/95	28.68	9.13	19.55	4000	32	<10	36	44	--	--
12/30/95	28.68	8.88	19.80	3800	<5.0	13	<5.0	120	120	--
02/28/96	28.68	8.93	19.75	2000	9.9	<5.0	46	30	<25	--
06/27/96	28.68	9.13	19.55	2400	36	7.1	65	72	<50	--
09/13/96	28.68	8.86	19.82	2500	26	8.4	53	39	36	--
12/16/96	28.68	7.91	20.77	1200	3.5	2.4	12	14	<10	--
03/20/97	28.68	9.28	19.40	2400	25	5.8	26	22	<25	--
09/08/97	28.68	8.59	20.09	1800	9.5	8.1	22	21	12	--
02/16/98	28.68	9.45	19.23	950	5.6	3.1	13	13	18	--
08/25/98	28.68	9.18	19.50	2100	2.5	6.4	35	51	8.9	--
03/09/99	28.68	8.87	19.81	1400	12	7.8	8.8	16	8.8	--
07/19/99[2]	28.68	--	--	--	--	--	--	--	--	--
09/29/99	28.68	8.27	20.41	217	1.36	1.14	1.56	1.49	<5.0/<2.0[1]	--
03/27/00	28.68	INACCESSIBLE	--	--	--	--	--	--	--	--
09/18/00[3]	28.68	8.63	20.05	<50	<0.50	<0.50	<0.50	<0.50	<2.5	--
03/27/01[3]	28.68	8.84	19.84	718	<0.500	<0.500	3.31	12.3	<0.500	--
09/05/01[3]	28.68	8.39	20.29	1,500	<0.50	2.9	11	25	<2.5	--
03/15/02[3]	28.68	8.07	20.61	740	0.56	<0.50	4.0	5.3	<2.5	--
09/14/02[3]	28.68	8.62	20.06	580	<1.0	<1.0	1.8	3.4	3.4	--
03/26/03[3]	28.68	8.71	19.97	440	1.7	0.69	<5.0	<1.5	<2.5	--
09/02/03[6,7]	28.68	7.82	20.86	<50	<0.5	<0.5	<0.5	<1.0	<0.5	--
03/29/04[6]	28.68	9.54	19.14	660	<0.5	<0.5	12	11	0.8	--
09/03/04[6]	28.68	8.91	19.77	350	<0.5	<0.5	2	0.9	<0.5	--
03/02/05[6]	28.68	9.57	19.11	800	<0.5	<0.5	3	1.6	<0.5	--
09/22/05[6]	28.68	9.67	19.01	690	<0.5	<0.5	0.6	<1.0	<0.5	--

Table 1

Groundwater Monitoring Data and Analytical Results

Former Chevron Service Station #9-0020

1633 Harrison Street

Oakland, California

WELL ID/ DATE	TOC (ft.)	GWE (msl)	DTW (ft.)	TPH-G (µg/L)	B (µg/L)	T (µg/L)	E (µg/L)	X (µg/L)	MTBE (µg/L)	TOG (µg/L)
MW-9 (cont)										
03/30/06[6]	28.68	10.02	18.66	540	<0.5	0.9	4	4	<0.5	--
08/28/06[6]	28.68	9.43	19.25	2,700	<0.5	7	10	56	<0.5	--
03/05/07[6]	28.68	9.89	18.79	800	<0.5	<0.5	0.7	1	<0.5	--
09/24/07[6]	28.68	7.98	20.70	360	<0.5	<0.5	0.6	0.9	<0.5	--
03/10/08[6]	28.68	8.82	19.86	390	<0.5	<0.5	<0.5	0.9	<0.5	--
09/12/08[6]	**28.68**	**8.23**	**20.45**	**540**	**<0.5**	**<0.5**	**0.7**	**6.5**	**<0.5**	**--**
MW-13										
11/15/91	28.63	7.56	21.07	3100	68	40	110	270	--	--
02/20/92	28.63	6.46	22.17	3100	120	50	240	400	--	--
06/15/92	28.63	7.96	20.67	3200	35	33	210	300	--	--
12/16/92	28.62	8.28	20.34	87,000	1400	540	2400	11,000	--	--
04/07/93	28.62	9.21	19.41	1500	72	12	70	160	--	--
06/09/93	28.62	9.42	19.20	210	6.0	2.0	7.0	16	--	--
09/10/93	28.62	--	--	73	3.0	<0.5	2.0	3.0	--	--
09/27/93	28.62	8.27	20.35	--	--	--	--	--	--	--
12/17/93	28.62	7.86	20.76	640	43	12	12	37	--	--
03/10/94	28.62	7.93	20.69	540	44	22	10	69	--	--
06/16/94	28.62	7.95	20.67	1800	63	12	18	64	--	--
09/07/94	28.62	7.79	20.83	1400	59	12	22	50	--	--
11/30/94	28.62	8.21	20.41	700	36	4.4	18	31	--	--
03/22/95	28.62	8.80	19.82	190	1.4	1.4	<0.5	<0.5	--	--
06/27/95	28.62	8.86	19.76	220	1.8	<0.5	<0.5	0.84	--	--
09/28/95	28.62	8.58	20.04	160	3.2	<0.5	0.97	2.2	--	--
12/30/95	28.62	8.32	20.30	190	0.94	<0.5	0.74	1.1	<2.5	--
02/28/96	28.62	8.73	19.89	130	<0.5	<0.5	<0.5	<0.5	<2.5	--
06/27/96	28.62	8.64	19.98	280	<0.5	1.4	<0.5	3.8	9.4	--
09/13/96	28.62	8.34	20.28	170	<0.5	<0.5	<0.5	0.89	2.7	--
12/16/96	28.62	8.15	20.47	170	<0.5	0.51	0.6	3.0	<2.5	--
03/20/97	28.62	8.72	19.90	290	1.6	0.78	1.1	1.5	3.4	--
09/08/97	28.62	8.13	20.49	140	0.52	1.5	<0.5	1.2	<2.5	--
02/16/98	28.62	8.87	19.75	64	<0.5	<0.5	<0.5	<0.5	<2.5	--
08/25/98	28.62	8.60	20.02	99	<0.5	<0.5	<0.5	1.7	<2.5	--
03/09/99	28.62	8.62	20.00	<50	<0.5	<0.5	<0.5	<0.5	<2.5	--

Table 1

Groundwater Monitoring Data and Analytical Results

Former Chevron Service Station #9-0020

1633 Harrison Street

Oakland, California

WELL ID/ DATE	TOC (ft.)	GWE (msl)	DTW (ft.)	TPH-G (µg/L)	B (µg/L)	T (µg/L)	E (µg/L)	X (µg/L)	MTBE (µg/L)	TOG (µg/L)
MW-13 (cont)										
09/29/99	28.62	8.13	20.49	<50	<0.5	<0.5	<0.5	<0.5	<5.0/<2.0[1]	--
03/27/00	28.62	8.58	20.04	89.5	0.765	0.682	<0.5	0.688	4.04	--
09/18/00	28.62	8.13	20.49	1,300[5]	6.9	2.8	14	28	12	--
03/27/01	28.62	8.34	20.28	<50.0	<0.500	<0.500	<0.500	<0.500	<0.500	--
09/05/01	28.62	7.96	20.66	<50	<0.50	<0.50	<0.50	<1.5	<2.5	--
03/15/02	28.62	8.52	20.10	<50	<0.50	<0.50	<0.50	<1.5	<2.5	--
09/14/02	28.62	8.16	20.46	<50	<0.50	<0.50	<0.50	<1.5	<2.5	--
03/26/03	28.62	8.20	20.42	<50	<0.50	<0.50	<0.50	<1.5	<2.5	--
09/02/03[6]	28.62	7.27	21.35	<50	<0.5	<0.5	<0.5	<1.0	<0.5	--
03/29/04[6]	28.62	8.96	19.66	<50	<0.5	<0.5	<0.5	<1.0	<0.5	--
09/03/04[6]	28.62	8.48	20.14	<50	<0.5	<0.5	<0.5	<1.0	<0.5	--
03/02/05[6]	28.62	9.11	19.51	<50	<0.5	<0.5	<0.5	<1.0	<0.5	--
09/22/05[6]	28.62	9.33	19.29	<50	<0.5	<0.5	<0.5	<1.0	<0.5	--
03/30/06[6]	28.62	9.52	19.10	<50	<0.5	<0.5	<0.5	<1.0	<0.5	--
08/28/06[6]	28.62	9.08	19.54	<50	<0.5	<0.5	<0.5	<1.0	<0.5	--
03/05/07[6]	28.62	9.44	19.18	<50	<0.5	<0.5	<0.5	<1.0	<0.5	--
09/24/07[6]	28.62	7.92	20.70	<50	<0.5	<0.5	<0.5	<1.0	<0.5	--
03/10/08[6]	28.62	8.41	20.21	<50	<0.5	<0.5	<0.5	<1.0	<0.5	--
09/12/08[6]	**28.62**	**7.74**	**20.88**	**<50**	**<0.5**	**<0.5**	**<0.5**	**<1.0**	**<0.5**	**--**
MW-15										
12/16/92	28.04	8.30	19.74	<50	<0.5	<0.5	<0.5	<0.5	--	--
04/07/93	28.04	9.24	18.80	<50	1.3	<0.5	<0.5	<1.5	--	--
06/09/93	28.04	9.44	18.60	<50	<0.5	<0.5	<0.5	<0.5	--	--
09/10/93	28.04	--	--	--	--	--	--	--	--	--
09/27/93	28.04	8.11	19.93	<50	2.0	<0.5	<0.5	<0.5	--	--
12/17/93	28.04	7.72	20.32	<50	<0.5	<0.5	<0.5	<0.5	--	--
03/10/94	28.04	7.75	20.29	<50	<0.5	<0.5	<0.5	<0.5	--	--
06/16/94	28.04	7.73	20.31	<50	<0.5	<0.5	<0.5	<0.5	--	--
09/07/94	28.04	7.61	20.43	<50	<0.5	<0.5	<0.5	<0.5	--	--
11/30/94	28.04	8.03	20.01	<50	<0.5	<0.5	<0.5	<0.5	--	--
03/22/95	28.04	8.57	19.47	69	4.9	<0.5	<0.5	<0.5	--	--
06/27/95	28.04	8.70	19.34	<50	3.9	<0.5	1.4	<0.5	--	--
09/28/95	28.04	8.38	19.66	<50	0.82	<0.5	<0.5	<0.5	--	--

Table 1

Groundwater Monitoring Data and Analytical Results

Former Chevron Service Station #9-0020

1633 Harrison Street

Oakland, California

WELL ID/ DATE	TOC (ft.)	GWE (msl)	DTW (ft.)	TPH-G (µg/L)	B (µg/L)	T (µg/L)	E (µg/L)	X (µg/L)	MTBE (µg/L)	TOG (µg/L)
MW-15 (cont)										
12/30/95	28.04	8.10	19.94	160	7.0	1.4	<0.5	1.8	14	--
02/28/96	28.04	8.41	19.63	81	1.7	<0.5	<0.5	<0.5	<2.5	--
06/27/96	28.04	8.44	19.60	<50	<0.5	<0.5	<0.5	<0.5	<5.0	--
09/13/96	28.04	8.14	19.90	<50	<0.5	<0.5	<0.5	<0.5	<2.5	--
12/16/96	28.04	7.81	20.23	<50	<0.5	<0.5	<0.5	<0.5	<2.5	--
03/20/97	28.04	8.52	19.52	<50	<0.5	<0.5	<0.5	<0.5	<2.5	--
09/08/97	28.04	7.86	20.18	<50	<0.5	<0.5	<0.5	<0.5	<2.5	--
02/16/98	28.04	8.67	19.37	<50	<0.5	<0.5	<0.5	<0.5	<2.5	--
08/25/98	28.04	8.34	19.70	<50	<0.5	<0.5	<0.5	<0.5	<2.5	--
03/09/99	28.04	8.35	19.69	<50	<0.5	<0.5	<0.5	<0.5	<2.5	--
09/29/99	28.04	7.92	20.12	<50	<0.5	<0.5	<0.5	<0.5	<5.0	--
03/27/00	28.04	8.37	19.67	<50	<0.5	<0.5	<0.5	<0.5	<2.5	--
09/18/00	28.04	7.91	20.13	<50	<0.50	<0.50	<0.50	<0.50	<2.5	--
03/27/01	28.04	8.13	19.91	<50.0	<0.500	<0.500	<0.500	<0.500	<0.500	--
09/05/01	28.04	7.76	20.28	<50	<0.50	<0.50	<0.50	<1.5	<2.5	--
03/15/02	28.04	8.33	19.71	<50	<0.50	<0.50	<0.50	<1.5	<2.5	--
09/14/02	28.04	7.94	20.10	<50	<0.50	<0.50	<0.50	<1.5	<2.5	--
03/26/03	28.04	7.99	20.05	<50	<0.50	<0.50	<0.50	<1.5	<2.5	--
09/02/03[6]	28.04	7.12	20.92	<50	<0.5	<0.5	<0.5	<1.0	<0.5	--
03/29/04[6]	28.04	8.73	19.31	<50	<0.5	<0.5	<0.5	<1.0	<0.5	--
09/03/04[6]	28.04	8.31	19.73	<50	<0.5	<0.5	<0.5	<1.0	<0.5	--
03/02/05[6]	28.04	8.93	19.11	<50	<0.5	<0.5	<0.5	<1.0	<0.5	--
09/22/05[6]	28.04	9.19	18.85	<50	<0.5	<0.5	<0.5	<1.0	<0.5	--
03/30/06[6]	28.04	9.29	18.75	<50	<0.5	<0.5	<0.5	<1.0	<0.5	--
08/28/06[6]	28.04	8.92	19.12	<50	<0.5	<0.5	<0.5	<1.0	<0.5	--
03/05/07[6]	28.04	9.19	18.85	<50	<0.5	<0.5	<0.5	<1.0	<0.5	--
09/24/07[6]	28.04	7.71	20.33	<50	<0.5	<0.5	<0.5	<1.0	<0.5	--
03/10/08[6]	28.04	8.17	19.87	<50	<0.5	<0.5	<0.5	<1.0	<0.5	--
09/12/08[6]	**28.04**	**7.54**	**20.50**	**<50**	**<0.5**	**<0.5**	**<0.5**	**<1.0**	**<0.5**	**--**
MW-16										
12/16/92	28.32	8.74	19.58	--	--	--	--	--	--	--
12/21/92	28.32	--	--	<50	<0.5	<0.5	<0.5	<0.5	--	--
04/07/93	28.32	9.91	18.41	<50	<0.5	6.8	<0.5	<0.5	--	--

Table 1

Groundwater Monitoring Data and Analytical Results

Former Chevron Service Station #9-0020

1633 Harrison Street

Oakland, California

WELL ID/ DATE	TOC (ft.)	GWE (msl)	DTW (ft.)	TPH-G (µg/L)	B (µg/L)	T (µg/L)	E (µg/L)	X (µg/L)	MTBE (µg/L)	TOG (µg/L)
MW-16 (cont)										
06/09/93	28.32	10.07	18.25	<50	<0.5	<0.5	<0.5	<0.5	--	--
09/10/93	28.32	--	--	<50	<0.5	<0.5	<0.5	<0.5	--	--
09/27/93	28.32	8.16	20.16	--	--	--	--	--	--	--
12/17/93	28.32	--	--	--	--	--	--	--	--	--
03/10/94	28.32	7.77	20.55	<50	<0.5	<0.5	<0.5	<0.5	--	--
06/16/94	28.32	7.67	20.65	<50	0.9	0.7	<0.5	<0.5	--	--
09/07/94	28.32	7.59	20.73	150	1.3	0.8	1.2	3.6	--	--
11/30/94	28.32	8.04	20.28	4200	300	<5.0	34	350	--	--
03/22/95	28.32	8.65	19.67	2900	180	5.7	21	91	--	--
06/27/95	28.32	8.72	19.60	2000	330	10	27	48	--	--
09/28/95	28.32	INACCESSIBLE	--	--	--	--	--	--	--	--
12/30/95	28.32	8.06	20.26	3100	770	39	30	80	<12	--
02/28/96	28.32	8.48	19.84	1600	320	15	11	21	<25	--
06/27/96	28.32	8.45	19.87	2900	670	48	54	86	280	--
09/13/96	28.32	8.17	20.15	1400	18	4.0	8.6	16	<10	--
12/16/96	28.32	7.53	20.79	3100	500	25	23	52	<25	--
03/20/97	28.32	8.52	19.80	3800	550	23	14	8.4	140	--
09/08/97	28.32	7.97	20.35	2800	470	28	24	41	<10	--
02/16/98	28.32	8.40	19.92	3100	570	35	27	54	<25	--
08/25/98	28.32	8.12	20.20	3500	520	43	57	75	<12	--
03/09/99	28.32	8.15	20.17	4900	750	55	40	120	<50	--
09/29/99	28.32	7.77	20.55	5480	717	45.3	44	100	<125/<10[1]	--
03/27/00	28.32	INACCESSIBLE	--	--	--	--	--	--	--	--
09/18/00[3]	28.32	7.85	20.47	--	--	--	--	--	--	--
03/27/01	28.32	INACCESSIBLE	--	--	--	--	--	--	--	--
09/05/01[3]	28.32	8.70	19.62	6,500	710	72	45	94	<20	--
03/15/02[3]	28.32	8.28	20.04	5,800	520	60	28	68	<2.5	--
09/14/02[3]	28.32	7.84	20.48	7,300	560	75	52	100	<50	--
03/26/03[3]	28.32	7.91	20.41	8,200	650	96	66	120	<50	--
09/02/03[7]	28.32	7.02	21.30	INACCESSIBLE - VEHICLE PARKED OVER WELL				--	--	--
03/29/04	28.32	INACCESSIBLE - VEHICLE PARKED OVER WELL				--	--	--	--	--
09/03/04[6]	28.32	8.12	20.20	7,400	140	89	58	139	<0.5	--
03/02/05[6]	28.32	8.74	19.58	6,500	74	55	31	69	<1	--
09/22/05[6]	28.32	8.91	19.41	8,500	60	46	35	64	<3	--
03/30/06[6]	28.32	9.08	19.24	8,000	110	72	55	111	<0.5	--

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1633 Harrison Street

Oakland, California

WELL ID/ DATE	TOC (ft.)	GWE (msl)	DTW (ft.)	TPH-G (µg/L)	B (µg/L)	T (µg/L)	E (µg/L)	X (µg/L)	MTBE (µg/L)	TOG (µg/L)
MW-16 (cont)										
08/28/06[6]	28.32	8.77	19.55	10,000	210	100	58	152	<0.5	--
03/05/07[6]	28.32	8.95	19.37	8,900	330	78	38	122	<1	--
09/24/07[6]	28.32	7.67	20.65	8,000	310	97	55	131	<0.5	--
03/10/08[6]	28.32	7.90	20.42	7,200[8]	300	100	75	244	<0.5	--
09/12/08[6]	**28.32**	**7.47**	**20.85**	**7,100**	**180**	**95**	**64**	**172**	**<3**	--
MW-1										
11/03/88	29.82	9.42	20.40	<1000	<1.0	<1.0	<1.0	<1.0	--	--
02/02/89	29.82	9.11	20.71	--	--	--	--	--	--	--
02/10/89	29.82	--	--	<100	<0.2	<0.2	<0.2	<0.4	--	--
04/23/89	29.82	9.48	20.34	--	--	--	--	--	--	--
04/24/89	29.82	--	--	<50	<0.5	<1.0	<1.0	<1.0	--	<3000
07/28/89	29.82	9.24	20.58	<50	<0.1	<0.5	<0.2	<0.5	--	<3000
10/30/89	29.82	9.30	20.52	<500	<0.3	<0.3	<0.3	<0.6	--	--
01/09/90	29.82	9.05	20.77	<50	<0.3	<0.3	<0.3	<0.6	--	--
04/18/90	29.82	8.87	20.95	<50	<0.3	<0.3	<0.3	<0.6	--	--
06/22/90	29.82	8.82	21.00	--	--	--	--	--	--	--
08/09/90	29.82	8.88	20.94	<50	<0.3	<0.3	<0.3	<0.6	--	--
11/13/90	29.82	8.84	20.98	<50	<0.5	<0.5	<0.5	<0.5	--	--
05/15/91	29.82	9.18	20.64	<50	<0.5	<0.5	<0.5	<0.5	--	--
08/27/91	29.82	9.03	20.79	110	<0.5	<0.5	<0.5	<0.5	--	--
11/15/91	29.82	9.07	20.75	<50	<0.5	<0.5	<0.5	<0.5	--	--
02/20/92	29.82	8.92	20.90	<50	0.5	0.6	<0.5	0.9	--	--
06/15/92	29.82	9.18	20.64	<50	<0.5	<0.5	<0.5	<0.5	--	--
12/16/92	29.82	8.98	20.84	<50	<0.5	<0.5	<0.5	<0.5	--	--
04/07/93	29.82	9.91	19.91	<50	<0.5	<0.5	<0.5	<1.5	--	--
06/09/93	29.82	9.97	19.85	--	--	--	--	--	--	--
09/10/93	29.82	--	--	--	--	--	--	--	--	--
09/27/93	29.82	9.47	20.35	<50	<0.5	<0.5	<0.5	<0.5	--	--
12/17/93	29.82	9.14	20.68	<50	<0.5	<0.5	<0.5	<0.5	--	--
03/10/94	29.82	9.25	20.57	<50	<0.5	<0.5	<0.5	<0.5	--	--
06/16/94	29.82	9.27	20.55	<50	<0.5	<0.5	<0.5	<0.5	--	--
09/07/94	29.82	9.13	20.69	<50	<0.5	<0.5	<0.5	<0.5	--	--

Table 1

Groundwater Monitoring Data and Analytical Results

Former Chevron Service Station #9-0020

1633 Harrison Street

Oakland, California

WELL ID/ DATE	TOC (ft.)	GWE (msl)	DTW (ft.)	TPH-G (µg/L)	B (µg/L)	T (µg/L)	E (µg/L)	X (µg/L)	MTBE (µg/L)	TOG (µg/L)
MW-1 (cont)										
11/30/94	29.82	9.59	20.23	<50	<0.5	<0.5	<0.5	<0.5	--	--
03/22/95	29.82	10.37	19.45	<50	<0.5	<0.5	<0.5	<0.5	--	--
ABANDONED										
MW-2										
11/03/88	30.59	9.70	20.89	<1000	<1.0	<1.0	<1.0	<1.0	--	--
02/02/89	30.59	9.38	21.21	--	--	--	--	--	--	--
02/10/89	30.59	--	--	<100	<0.2	<0.2	<0.2	<0.4	--	--
04/23/89	30.59	9.77	20.82	--	--	--	--	--	--	--
04/24/89	30.59	--	--	<50	<0.5	<1.0	<1.0	<1.0	--	<3000
07/28/89	30.59	9.57	21.02	<100	<0.2	<1.0	<0.2	<0.5	--	<3000
10/30/89	30.59	9.63	20.96	<500	<0.3	<0.3	<0.3	<0.6	--	--
01/09/90	30.59	9.34	21.25	<50	<0.3	<0.3	<0.3	<0.6	--	--
04/18/90	30.59	9.06	21.53	<50	<0.3	<0.3	<0.3	<0.6	--	--
06/22/90	30.59	9.02	21.57	--	--	--	--	--	--	--
08/09/90	30.59	9.04	21.55	<50	<0.3	<0.3	<0.3	<0.6	--	--
11/13/90	30.59	9.05	21.54	<50	<0.5	0.8	<0.5	0.9	--	--
05/15/91	30.59	9.44	21.15	83	<0.5	<0.5	<0.5	<0.5	--	--
08/27/91	30.59	9.32	21.27	97	<0.5	<0.5	<0.5	<0.5	--	--
11/15/91	30.59	9.29	21.30	<50	0.5	1.5	0.8	3.6	--	--
02/20/92	30.59	9.13	21.43	<50	<0.5	<0.5	<0.5	<0.5	--	--
06/15/92	30.59	9.41	21.18	<50	<0.5	<0.5	<0.5	<0.5	--	--
12/16/92	30.56	9.09	21.47	<50	<0.5	<0.5	<0.5	<0.5	--	--
04/07/93	30.56	10.03	20.53	66	<0.5	<0.5	<0.5	<1.5	--	--
06/09/93	30.56	10.11	20.45	<50	<0.5	<0.5	<0.5	<0.5	--	--
09/10/93	30.56	--	--	--	--	--	--	--	--	--
09/27/93	30.56	9.59	20.97	--	--	--	--	--	--	--
12/17/93	30.56	9.25	21.31	<50	<0.5	<0.5	<0.5	<0.5	--	--
03/10/94	30.56	9.33	21.23	<50	<0.5	<0.5	<0.5	<0.5	--	--
06/16/94	30.56	9.35	21.21	<50	<0.5	<0.5	<0.5	<0.5	--	--
09/07/94	30.56	9.22	21.34	<50	<0.5	<0.5	<0.5	<0.5	--	--
11/30/94	30.56	9.66	20.90	<50	<0.5	<0.5	<0.5	<0.5	--	--
03/22/95	30.56	10.22	20.34	<50	<0.5	<0.5	<0.5	<0.5	--	--
ABANDONED										

Table 1

Groundwater Monitoring Data and Analytical Results

Former Chevron Service Station #9-0020

1633 Harrison Street

Oakland, California

WELL ID/ DATE	TOC (ft.)	GWE (msl)	DTW (ft.)	TPH-G (µg/L)	B (µg/L)	T (µg/L)	E (µg/L)	X (µg/L)	MTBE (µg/L)	TOG (µg/L)
MW-3										
11/03/88	30.09	9.55	20.54	<1000	<1.0	<1.0	<1.0	<1.0	--	--
02/02/89	30.09	9.24	20.85	--	--	--	--	--	--	--
02/10/89	30.09	--	--	<100	<0.2	<0.2	<0.2	<0.4	--	--
04/23/89	30.09	9.66	20.43	--	--	--	--	--	--	--
04/24/89	30.09	--	--	<50	<0.5	<1.0	<1.0	<1.0	--	<3000
07/28/89	30.09	9.45	20.64	<100	<0.2	<1.0	<0.2	<0.4	--	<3000
10/30/89	30.09	9.48	20.61	<500	<0.3	<0.3	<0.3	<0.6	--	--
01/09/90	30.09	9.21	20.88	<50	<0.3	<0.3	<0.3	<0.6	--	--
04/18/90	30.09	8.94	21.15	<50	<0.3	<0.3	<0.3	<0.6	--	--
06/22/90	30.09	8.89	21.20	--	--	--	--	--	--	--
08/09/90	30.09	8.91	21.18	<50	<0.3	<0.3	<0.3	<0.6	--	--
11/13/90	30.09	8.94	21.15	51	<0.5	<0.5	<0.5	<0.5	--	--
05/15/91	30.09	9.18	20.91	85	<0.5	<0.5	<0.5	<0.5	--	--
08/27/91	30.09	9.20	20.89	91	<0.5	<0.5	<0.5	<0.5	--	--
11/15/91	30.09	9.07	21.02	<50	<0.5	0.7	<0.5	1.3	--	--
02/20/92	30.09	9.02	21.07	<50	<0.5	<0.5	<0.5	0.9	--	--
06/15/92	30.09	9.27	20.82	50	<0.5	<0.5	<0.5	<0.5	--	--
12/16/92	30.08	9.07	21.07	<50	<0.5	<0.5	<0.5	<0.5	--	--
04/07/93	30.08	9.95	20.13	<50	<0.5	<0.5	<0.5	<1.5	--	--
06/09/93	30.08	10.03	20.05	<50	<0.5	<0.5	<0.5	<0.5	--	--
09/10/93	30.08	--	--	<50	<0.5	<0.5	<0.5	<0.5	--	--
09/27/93	30.08	9.50	20.58	--	--	--	--	--	--	--
12/17/93	30.08	9.07	21.01	<50	<0.5	<0.5	<0.5	<0.5	--	--
03/10/94	30.08	9.22	20.86	<50	<0.5	<0.5	<0.5	1.1	--	--
06/16/94	30.08	9.21	20.87	<50	<0.5	<0.5	<0.5	<0.5	--	--
09/07/94	30.08	9.11	20.97	<50	<0.5	<0.5	<0.5	<0.5	--	--
11/30/94	30.08	10.45	19.63	<50	<0.5	<0.5	<0.5	<0.5	--	--
03/22/95	30.08	10.27	19.81	<50	<0.5	<0.5	<0.5	<0.5	--	--
ABANDONED										
MW-4										
04/23/89	31.17	9.84	21.33	--	--	--	--	--	--	--
04/24/89	31.17	--	--	<50	<0.5	<1.0	<1.0	<1.0	--	<3000
07/28/89	31.17	9.59	21.58	<50	<0.1	<0.5	<0.1	<0.2	--	<3000
10/30/89	31.17	9.63	21.54	<500	<0.3	<0.3	<0.3	<0.6	--	--
01/09/90	31.17	9.35	21.82	<50	<0.3	<0.3	<0.3	<0.6	--	--

Table 1

Groundwater Monitoring Data and Analytical Results

Former Chevron Service Station #9-0020

1633 Harrison Street

Oakland, California

WELL ID/ DATE	TOC (ft.)	GWE (msl)	DTW (ft.)	TPH-G (µg/L)	B (µg/L)	T (µg/L)	E (µg/L)	X (µg/L)	MTBE (µg/L)	TOG (µg/L)
MW-4 (cont)										
04/18/90	31.17	9.08	22.09	<50	<0.3	<0.3	<0.3	<0.6	--	--
06/22/90	31.17	9.05	22.12	--	--	--	--	--	--	--
08/09/90	31.17	9.06	22.11	<50	<0.3	<0.3	<0.3	<0.6	--	--
11/13/90	31.17	9.07	22.10	<50	<0.5	1.0	0.5	1.0	--	--
05/15/91	31.17	9.46	21.71	<50	<0.5	<0.5	<0.5	<0.5	--	--
08/27/91	31.17	9.30	21.87	<50	<0.5	<0.5	<0.5	<0.5	--	--
11/15/91	31.17	9.37	21.80	97	<0.5	0.9	<0.5	1.9	--	--
02/20/92	31.17	9.18	21.99	<50	<0.5	<0.5	<0.5	<0.5	--	--
06/15/92	31.17	9.43	21.74	<50	<0.5	<0.5	<0.5	<0.5	--	--
12/16/92	31.17	9.12	22.05	<50	0.7	0.5	0.5	1.3	--	--
04/07/93	31.17	10.06	21.11	<50	<0.5	<0.5	<0.5	<1.5	--	--
06/09/93	31.17	--	--	--	--	--	--	--	--	--
09/10/93	31.17	--	--	--	--	--	--	--	--	--
09/27/93	31.17	9.63	21.54	<50	<0.5	<0.5	<0.5	<0.5	--	--
12/17/93	31.17	9.28	21.89	<50	<0.5	<0.5	<0.5	<0.5	--	--
03/10/94	31.17	--	--	--	--	--	--	--	--	--
06/16/94	31.17	10.63	20.54	--	--	--	--	--	--	--
09/07/94	31.17	9.27	21.90	<50	<0.5	<0.5	<0.5	<0.5	--	--
11/30/94	31.17	9.83	21.34	<50	<0.5	<0.5	<0.5	<0.5	--	--
03/21/95	31.17	10.55	20.62	<50	<0.5	<0.5	<0.5	<0.5	--	--
ABANDONED										
MW-5										
04/23/89	30.28	9.66	20.62	--	--	--	--	--	--	--
04/24/89	30.28	--	--	<50	<0.5	<1.0	<1.0	<1.0	--	<3000
07/28/89	30.28	9.42	20.86	<100	<0.2	<1.0	<0.2	<0.4	--	<3000
10/30/89	30.28	9.46	20.82	<500	<0.3	<0.3	<0.3	<0.6	--	--
01/09/90	30.28	9.21	21.07	<50	<0.3	<0.3	<0.3	<0.6	--	--
04/18/90	30.28	8.93	21.35	<50	<0.3	<0.3	<0.3	<0.6	--	--
06/22/90	30.28	8.90	21.38	--	--	--	--	--	--	--
08/09/90	30.28	8.92	21.36	<50	<0.3	<0.3	<0.3	<0.6	--	--
11/13/90	30.28	8.93	21.35	<50	<0.5	1.0	<0.5	1.0	--	--
05/15/91	30.28	8.99	21.29	<50	<0.5	<0.5	<0.5	<0.5	--	--
08/27/91	30.28	9.17	21.11	94	3.0	5.0	1.5	5.5	--	--
11/15/91	30.28	9.10	21.18	<50	0.9	1.7	<0.5	2.2	--	--
02/20/92	30.28	9.03	21.25	<50	<0.5	<0.5	<0.5	<0.5	--	--

Table 1

Groundwater Monitoring Data and Analytical Results

Former Chevron Service Station #9-0020

1633 Harrison Street

Oakland, California

WELL ID/ DATE	TOC (ft.)	GWE (msl)	DTW (ft.)	TPH-G (µg/L)	B (µg/L)	T (µg/L)	E (µg/L)	X (µg/L)	MTBE (µg/L)	TOG (µg/L)
MW-5 (cont)										
06/15/92	30.28	9.28	21.00	<50	<0.5	<0.5	<0.5	<0.5	--	--
12/16/92	30.28	9.05	21.23	<50	<0.5	<0.5	<0.5	<0.5	--	--
04/07/93	30.28	9.97	20.31	<50	<0.5	<0.5	<0.5	<1.5	--	--
06/09/93	30.28	--	--	--	--	--	--	--	--	--
09/10/93	30.28	--	--	--	--	--	--	--	--	--
09/27/93	30.28	9.52	20.76	--	--	--	--	--	--	--
ABANDONED										
MW-6										
04/23/89	29.46	9.41	20.05	--	--	--	--	--	--	--
04/24/89	29.46	--	--	<50	<0.5	<1.0	<1.0	<1.0	--	<3.0
07/28/89	29.46	9.16	20.30	<100	<0.2	<1.0	<0.2	<0.4	--	<3.0
10/30/89	29.46	9.14	20.32	<500	<0.3	<0.3	<0.3	<0.6	--	--
01/09/90	29.46	8.95	20.51	<50	<0.3	<0.3	<0.3	<0.6	--	--
04/18/90	29.46	8.74	20.72	<50	<0.3	<0.3	<0.3	<0.6	--	--
06/22/90	29.46	8.69	20.77	--	--	--	--	--	--	--
08/09/90	29.46	8.72	20.74	<50	<0.3	<0.3	<0.3	<0.6	--	--
11/13/90	29.46	8.71	20.75	<50	3.0	5.0	0.5	2.0	--	--
05/15/91	29.46	8.85	20.61	<50	<0.5	<0.5	<0.5	<0.5	--	--
08/27/91	29.46	8.93	20.53	180	6.1	12	3.8	14	--	--
11/15/91	29.46	8.93	20.53	<50	<0.5	0.6	<0.5	<0.5	--	--
02/20/92	29.46	8.77	20.69	<50	0.9	1.1	<0.5	1.4	--	--
06/15/92	29.46	9.08	20.38	<50	<0.5	<0.5	<0.5	<0.5	--	--
12/16/92	29.45	8.88	20.57	<50	<0.5	<0.5	<0.5	<0.5	--	--
04/07/93	29.45	9.86	19.59	<50	<0.5	<0.5	<0.5	<1.5	--	--
06/09/93	29.45	9.95	19.50	<50	<0.5	<0.5	<0.5	<0.5	--	--
09/10/93	29.45	--	--	--	--	--	--	--	--	--
09/27/93	29.45	9.38	20.07	--	--	--	--	--	--	--
ABANDONED										
MW-8										
04/23/89	29.57	9.43	20.14	--	--	--	--	--	--	--
04/24/89	29.57	--	--	<50	<0.5	<1.0	<1.0	<1.0	--	3000
04/24/89[1]	29.57	--	--	<50	<0.5	<1.0	<1.0	<1.0	--	--
07/28/89	29.57	9.20	20.37	<100	<0.2	<1.0	<0.2	<0.4	--	<3000
10/30/89	29.57	9.25	20.32	<500	<0.3	<0.3	<0.3	<0.6	--	--
01/09/90	29.57	8.97	20.60	<50	<0.3	<0.3	<0.3	<0.6	--	--

Table 1

Groundwater Monitoring Data and Analytical Results

Former Chevron Service Station #9-0020

1633 Harrison Street

Oakland, California

WELL ID/ DATE	TOC (ft.)	GWE (msl)	DTW (ft.)	TPH-G (µg/L)	B (µg/L)	T (µg/L)	E (µg/L)	X (µg/L)	MTBE (µg/L)	TOG (µg/L)
MW-8 (cont)										
04/18/90	29.57	8.70	20.87	<50	<0.3	<0.3	<0.3	<0.6	--	--
06/22/90	29.57	9.23	20.34	--	--	--	--	--	--	--
08/09/90	29.57	8.68	20.89	<50	<0.3	<0.3	<0.3	<0.6	--	--
11/13/90	29.57	8.71	20.86	<50	<0.5	0.8	<0.5	2.0	--	--
05/15/91	29.57	9.08	20.49	<50	<0.5	<0.5	<0.5	<0.5	--	--
08/27/91	29.57	8.97	20.60	73	<0.5	<0.5	<0.5	<0.5	--	--
11/15/91	29.57	8.95	20.62	<50	<0.5	0.7	<0.5	2.1	--	--
02/20/92	29.57	8.77	20.80	<50	<0.5	<0.5	<0.5	<0.5	--	--
06/15/92	29.57	9.09	20.48	<50	<0.5	<0.5	<0.5	<0.5	--	--
12/16/92	29.57	8.89	20.68	<50	<0.5	<0.5	<0.5	<0.5	--	--
04/07/93	29.57	9.87	19.70	<50	<0.5	<0.5	<0.5	<1.5	--	--
06/09/93	29.57	9.97	19.60	<50	<0.5	<0.5	<0.5	<0.5	--	--
09/10/93	29.57	--	--	--	--	--	--	--	--	--
09/27/93	29.57	9.35	20.22	--	--	--	--	--	--	--
ABANDONED										
MW-10										
06/22/90	28.60	8.12	20.48	<50	<0.5	<0.5	<0.5	<0.5	--	<1000
08/09/90	28.60	8.15	20.45	<50	<0.3	<0.3	<0.3	<0.6	--	--
11/13/90	28.60	8.13	20.47	<50	<0.5	2.0	0.5	2.0	--	--
05/15/91	28.60	8.45	20.15	<50	<0.5	<0.5	<0.5	<0.5	--	--
08/27/91	28.60	8.33	20.27	<50	<0.5	<0.5	<0.5	<0.5	--	--
11/15/91	28.60	8.27	20.33	<50	<0.5	<0.5	<0.5	<0.5	--	--
02/20/92	28.60	7.15	21.45	<50	2.0	2.2	<0.5	2.1	--	--
06/15/92	28.60	7.30	21.30	<50	<0.5	<0.5	<0.5	<0.5	--	--
12/16/92	28.62	8.45	20.17	<50	<0.5	<0.5	<0.5	<0.5	--	--
04/07/93	28.62	9.41	19.26	<50	<0.5	<0.5	<0.5	<1.5	--	--
06/09/93	28.62	9.55	19.07	<50	<0.5	<0.5	<0.5	<0.5	--	--
09/10/93	28.62	--	--	<50	<0.5	<0.5	<0.5	<0.5	--	--
09/24/93	28.62	8.90	19.72	--	--	--	--	--	--	--
12/17/93	28.62	8.55	20.07	<50	<0.5	<0.5	<0.5	<0.5	--	--
03/10/94	28.62	8.65	19.97	<50	<0.5	<0.5	<0.5	<0.5	--	--
06/16/94	28.62	8.64	19.98	<50	<0.5	<0.5	<0.5	<0.5	--	--
09/07/94	28.62	8.50	20.12	<50	<0.5	<0.5	<0.5	<0.5	--	--

Table 1

Groundwater Monitoring Data and Analytical Results

Former Chevron Service Station #9-0020

1633 Harrison Street

Oakland, California

WELL ID/ DATE	TOC (ft.)	GWE (msl)	DTW (ft.)	TPH-G (µg/L)	B (µg/L)	T (µg/L)	E (µg/L)	X (µg/L)	MTBE (µg/L)	TOG (µg/L)
MW-10 (cont)										
11/30/94	28.62	8.92	19.70	<50	<0.5	<0.5	<0.5	<0.5	--	--
03/22/95	28.62	9.70	18.92	<50	<0.5	<0.5	<0.5	<0.5	--	--
ABANDONED										
MW-11										
06/22/90	29.37	8.34	21.03	<50	<0.5	<0.5	<0.5	<0.5	--	<1000
08/09/90	29.37	8.35	21.02	<50	<0.3	<0.3	<0.3	<0.6	--	--
11/13/90	29.37	8.44	20.93	76	0.6	1.0	0.9	4.0	--	--
05/15/91	29.37	8.76	20.61	78	<0.5	<0.5	<0.5	<0.5	--	--
08/27/91	29.37	8.67	20.70	110	<0.5	<0.5	<0.5	<0.5	--	--
11/15/91	29.37	8.69	20.68	<50	<0.5	<0.5	<0.5	<0.5	--	--
02/20/92	29.37	7.46	21.91	<50	1.9	2.1	1.0	4.4	--	--
06/15/92	29.37	8.81	20.56	--	--	--	--	--	--	--
12/16/92	29.39	8.64	20.75	<50	<0.5	<0.5	<0.5	<0.5	--	--
04/07/93	29.39	9.56	19.83	<50	<0.5	<0.5	<0.5	<1.5	--	--
06/09/93	29.39	9.72	19.67	<50	<0.5	<0.5	<0.5	<0.5	--	--
09/10/93	29.39	--	--	--	--	--	--	--	--	--
09/27/93	29.39	9.06	20.33	<50	<0.5	<0.5	<0.5	<0.5	--	--
12/17/93	29.39	8.66	20.73	<50	<0.5	<0.5	<0.5	<0.5	--	--
03/10/94	29.39	8.70	20.69	--	--	--	--	--	--	--
06/16/94	29.39	8.83	20.56	<50	<0.5	<0.5	<0.5	<0.5	--	--
ABANDONED										
MW-12										
06/22/90	28.43	7.98	20.45	<50	<0.5	<0.5	<0.5	<0.5	--	<1000
08/09/90	28.43	8.00	20.43	<50	<0.3	<0.3	<0.3	<0.6	--	--
11/13/90	28.43	7.98	20.45	<50	<0.5	<0.5	<0.5	<0.5	--	--
05/15/91	28.43	8.36	20.07	<50	<0.5	<0.5	<0.5	<0.5	--	--
08/27/91	28.43	8.28	20.15	56	<0.5	<0.5	<0.5	<0.5	--	--
11/15/91	28.43	8.18	20.25	<50	<0.5	<0.5	<0.5	<0.5	--	--
02/20/92	28.43	7.06	21.37	<50	2.5	3.1	0.7	3.0	--	--
06/15/92	28.43	8.53	19.90	<50	<0.5	<0.5	<0.5	<0.5	--	--
12/16/92	28.43	8.63	19.80	<50	<0.5	<0.5	<0.5	<0.5	--	--
04/07/93	28.43	9.68	18.75	<50	<0.5	<0.5	<0.5	<1.5	--	--
06/09/93	28.43	--	--	--	--	--	--	--	--	--

Table 1

Groundwater Monitoring Data and Analytical Results

Former Chevron Service Station #9-0020

1633 Harrison Street

Oakland, California

WELL ID/ DATE	TOC (ft.)	GWE (msl)	DTW (ft.)	TPH-G (µg/L)	B (µg/L)	T (µg/L)	E (µg/L)	X (µg/L)	MTBE (µg/L)	TOG (µg/L)
MW-12 (cont)										
09/10/93	28.43	--	--	--	--	--	--	--	--	--
09/27/93	28.43	8.80	19.63	--	--	--	--	--	--	--
ABANDONED										
MW-14										
11/15/91	29.46	9.13	20.33	<50	<0.5	<0.5	<0.5	<0.5	--	--
02/20/92	29.46	8.05	21.41	<50	1.3	1.8	1.1	5.2	--	--
06/15/92	29.46	--	--	--	--	--	--	--	--	--
12/16/92	29.45	8.79	20.66	<50	<0.5	<0.5	<0.5	<0.5	--	--
04/07/93	29.45	--	--	--	--	--	--	--	--	--
06/09/93	29.45	--	--	--	--	--	--	--	--	--
09/10/93	29.45	--	--	--	--	--	--	--	--	--
09/27/93	29.45	9.19	20.26	--	--	--	--	--	--	--
ABANDONED										
TRIP BLANK										
11/03/88	--	--	--	--	<1.0	<1.0	<1.0	<1.0	--	--
02/10/89	--	--	--	<50	<0.1	<0.1	<0.1	<0.2	--	--
04/24/89	--	--	--	<50	<0.5	<0.5	<1.0	<1.0	--	--
07/28/89	--	--	--	<50	<0.1	<0.1	<0.1	<0.2	--	--
10/30/89	--	--	--	<500	<0.3	<0.3	<0.3	<0.6	--	--
01/09/90	--	--	--	<50	<0.3	<0.3	<0.3	<0.6	--	--
04/18/90	--	--	--	<50	<0.3	<0.3	<0.3	<0.6	--	--
06/22/90	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	--	--
08/09/90	--	--	--	<50	<0.3	<0.3	<0.3	<0.6	--	--
11/13/90	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	--	--
05/15/91	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	--	--
08/27/91	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	--	--
11/15/91	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	--	--
02/20/92	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	--	--
06/15/92	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	--	--
12/16/92	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	--	--
04/07/93	--	--	--	<50	<0.5	<0.5	<0.5	<1.5	--	--
06/09/93	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	--	--
09/10/93	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	--	--
09/27/93	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	--	--

Table 1

Groundwater Monitoring Data and Analytical Results

Former Chevron Service Station #9-0020

1633 Harrison Street

Oakland, California

WELL ID/ DATE	TOC (ft.)	GWE (msl)	DTW (ft.)	TPH-G (µg/L)	B (µg/L)	T (µg/L)	E (µg/L)	X (µg/L)	MTBE (µg/L)	TOG (µg/L)
TRIP BLANK (cont)										
12/17/93	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	--	--
03/10/94	--	--	--	<50	<0.5	0.6	<0.5	0.6	--	--
06/16/94	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	--	--
09/07/94	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	--	--
11/30/94	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	--	--
01/17/95	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	--	--
03/22/95	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	--	--
06/27/95	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	--	--
09/28/95	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	--	--
12/30/95	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	--	--
02/28/96	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	<2.5	--
06/27/96	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	<5.0	--
09/13/96	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	--	--
12/16/96	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	<2.5	--
03/20/97	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	<2.5	--
09/08/97	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	<2.5	--
02/16/98	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	<2.5	--
08/25/98	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	<2.5	--
03/09/99	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	<2.5	--
09/29/99	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	<5.0	--
03/27/00	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	<2.5	--
09/18/00	--	--	--	<50	<0.50	<0.50	<0.50	<0.50	<2.5	--
03/27/01	--	--	--	<50.0	<0.500	<0.500	<0.500	<0.500	<0.500	--
09/05/01	--	--	--	<50	<0.50	<0.50	<0.50	<1.5	<2.5	--
QA										
03/15/02	--	--	--	<50	<0.50	<0.50	<0.50	<1.5	<2.5	--
09/14/02	--	--	--	<50	<0.50	<0.50	<0.50	<1.5	<2.5	--
03/26/03	--	--	--	<50	<0.50	<0.50	<0.50	<1.5	<2.5	--
09/02/03[6]	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	<0.5	--
03/29/04[6]	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	<0.5	--
09/03/04[6]	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	<0.5	--
03/02/05[6]	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	<0.5	--
09/22/05[6]	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	<0.5	--
03/30/06[6]	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	<0.5	--

Table 1

Groundwater Monitoring Data and Analytical Results

Former Chevron Service Station #9-0020

1633 Harrison Street

Oakland, California

WELL ID/ DATE	TOC (ft.)	GWE (msl)	DTW (ft.)	TPH-G (µg/L)	B (µg/L)	T (µg/L)	E (µg/L)	X (µg/L)	MTBE (µg/L)	TOG (µg/L)
QA (cont)										
08/28/06[6]	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	<0.5	--
03/05/07[6]	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	<0.5	--
09/24/07[6]	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	<0.5	--
03/10/08[6]	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	<0.5	--
09/12/08[6]	**--**	**--**	**--**	**<50**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**--**

Table 1

Groundwater Monitoring Data and Analytical Results

Former Chevron Service Station #9-0020

1633 Harrison Street

Oakland, California

EXPLANATIONS:

Groundwater monitoring data and analytical results prior to September 18, 2000, were compiled from reports prepared by Blaine Tech Services, Inc.

TOC = Top of Casing
(ft.) = Feet
GWE = Groundwater Elevation
(msl) = Mean sea level
DTW = Depth to Water
TPH-G = Total Petroleum Hydrocarbons as Gasoline
B = Benzene
T = Toluene
E = Ethylbenzene
X = Xylenes
MTBE = Methyl tertiary butyl ether
TOG = Total Oil and Grease
(µg/L) = Micrograms per liters
-- = Not Measured/Not Analyzed
(D) = Duplicate
QA = Quality Assurance/Trip Blank

1 Confirmation run.
2 ORC installed.
3 ORC in well.
4 Laboratory report indicates gasoline C6-C12.
5 Laboratory report indicates gasoline C6-C12 + unidentified hydrocarbons C6-C12.
6 BTEX and MTBE by EPA Method 8260.
7 Removed ORC in well.
8 Laboratory report indicates this sample was analyzed 1 day outside the method hold time.

APPENDIX B

Standard Operating Procedures

STANDARD FIELD PROCEDURES FOR SOIL BORINGS

This document describes Pangea Environmental Services' standard field methods for drilling and sampling soil borings. These procedures are designed to comply with Federal, State and local regulatory guidelines. Specific field procedures are summarized below.

Objectives

Soil samples are collected to characterize subsurface lithology, assess whether the soils exhibit obvious hydrocarbon or other compound vapor odor or staining, estimate ground water depth and quality, and to submit samples for chemical analysis.

Soil Classification/Logging

All soil samples are classified according to the Unified Soil Classification System by a trained geologist, scientist or engineer working under the supervision of a California Registered Engineer, California Registered Geologist (RG) or a Certified Engineering Geologist (CEG). The following soil properties are noted for each soil sample:

- Principal and secondary grain size category (i.e. sand, silt, clay or gravel)
- Approximate percentage of each grain size category,
- Color,
- Approximate water or product saturation percentage,
- Observed odor and/or discoloration,
- Other significant observations (i.e. cementation, presence of marker horizons, mineralogy), and
- Estimated permeability.

Soil Boring and Sampling

Soil borings are typically drilled using hollow-stem augers or hydraulic-push technologies. At least one and one half ft of the soil column is collected for every five ft of drilled depth. Additional soil samples are collected near the water table and at lithologic changes. With hollow-stem drilling, samples are collected using lined split-barrel or equivalent samplers driven into undisturbed sediments beyond the bottom of the borehole. With hydraulic-push drilling, samples are typically collected using acetate liners. The vertical location of each soil sample is determined by measuring the distance from the middle of the soil sample tube to the end of the drive rod used to advance the split barrel sampler. All sample depths use the ground surface immediately adjacent to the boring as a datum. The horizontal location of each boring is measured in the field from an onsite permanent reference using a measuring wheel or tape measure.

Drilling and sampling equipment is steam-cleaned prior to drilling and between borings to prevent cross-contamination. Sampling equipment is washed between samples with trisodium phosphate or an equivalent EPA-approved detergent.

Sample Storage, Handling and Transport

Sampling tubes or cut acetate liners chosen for analysis are trimmed of excess soil and capped with Teflon tape and plastic end caps. Soil samples are labeled and stored at or below 4°C on either crushed or dry ice, depending upon local regulations. Samples are transported under chain-of-custody to a State-certified analytic laboratory.

Field Screening

Soil samples collected during drilling will be analyzed in the field for ionizable organic compounds using a photo-ionization detector (PID) with a 10.2 eV lamp. The screening procedure will involve placing an undisturbed soil sample in a sealed container (either a zip-lock bag, glass jar, or a capped soil tube). The container will be set aside, preferably in the sun or warm location. After approximately fifteen minutes, the head space within the container will be tested for total organic vapor, measured in parts per million on a volume to volume basis (ppmv) by the PID. The PID instrument will be calibrated prior to boring using hexane or isobutylene. PID measurements are used along with the field observations, odors, stratigraphy and ground water depth to select soil samples for analysis.

Water Sampling

Water samples collected from borings are either collected from the open borehole, from within screened PVC inserted into the borehole, or from a driven Hydropunch-type sampler. Groundwater is typically extracted using a bailer, check valve and/or a peristaltic pump. The ground water samples are decanted into the appropriate containers supplied by the analytic laboratory. Samples are labeled, placed in protective foam sleeves, stored on crushed ice at or below 4°C, and transported under chain-of-custody to the laboratory.

Pangea often performs electrical conductivity (EC) logging and/or continuous coring to identify potential water-bearing zones. Hydropunch-type sampling is then performed to provide discrete-depth grab groundwater sampling within potential water-bearing zones for vertical contaminant delineation. Hydropunch-type sampling typically involves driving a cylindrical sheath of hardened steel with an expendable drive point to the desired depth within undisturbed soil. The sheath is retracted to expose a stainless steel or PVC screen that is sealed inside the sheath with Neoprene O-rings to prevent infiltration of formation fluids until the desired depth is attained. The groundwater is extracted using tubing inserted down the center of the rods into the screened sampler.

Duplicates and Blanks

Blind duplicate water samples are collected usually collected only for monitoring well sampling programs, at a rate of one blind sample for every 10 wells sampled. Laboratory-supplied trip blanks accompany samples collected for all sampling programs to check for cross-contamination caused by sample handling and transport. These trip blanks are analyzed if the internal laboratory QA/QC blanks contain the suspected field contaminants. An equipment blank may also be analyzed if non-dedicated sampling equipment is used.

Grouting

If the borings are not completed as wells, the borings are filled to the ground surface with cement grout poured or pumped through a tremie pipe.

Waste Handling and Disposal

Soil cuttings from drilling activities are usually stockpiled onsite on top of and covered by plastic sheeting. At least four individual soil samples are collected from the stockpiles for later compositing at the analytic laboratory. The composite sample is analyzed for the same constituents analyzed in the borehole samples. Soil cuttings are transported by licensed waste haulers and disposed in secure, licensed facilities based on the composite analytic results.

Ground water removed during sampling and/or rinsate generated during decontamination procedures are stored onsite in sealed 55 gallon drums. Each drum is labeled with the drum number, date of generation, suspected contents, generator identification and consultant contact. Disposal of the water is based on the analytic results for the well samples. The water is either pumped out using a vacuum truck for transport to a licensed waste treatment/disposal facility or the individual drums are picked up and transported to the waste facility where the drum contents are removed and appropriately disposed.

STANDARD FIELD PROCEDURES FOR MONITORING WELLS

This document describes Pangea Environmental Services' standard field methods for drilling, installing, developing and sampling groundwater monitoring wells. These procedures are designed to comply with Federal, State and local regulatory guidelines. Specific field procedures are summarized below.

Well Construction and Surveying

Groundwater monitoring wells are installed in soil borings to monitor groundwater quality and determine the groundwater elevation, flow direction and gradient. Well depths and screen lengths are based on groundwater depth, occurrence of hydrocarbons or other compounds in the borehole, stratigraphy and State and local regulatory guidelines. Well screens typically extend 10 to 15 feet below and 5 feet above the static water level at the time of drilling. However, the well screen will generally not extend into or through a clay layer that is at least three feet thick.

Well casing and screen are flush-threaded, Schedule 40 PVC. Screen slot size varies according to the sediments screened, but slots are generally 0.010 or 0.020 inches wide. A rinsed and graded sand occupies the annular space between the boring and the well screen to about one to two ft above the well screen. A two feet thick hydrated bentonite seal separates the sand from the overlying sanitary surface seal composed of Portland type I, II cement.

Well-heads are secured by locking well-caps inside traffic-rated vaults finished flush with the ground surface. A stovepipe may be installed between the well-head and the vault cap for additional security. The well top-of-casing elevation is surveyed with respect to mean sea level and the well is surveyed for horizontal location with respect to an onsite or nearby offsite landmark.

Well Development

Wells are generally developed using a combination of groundwater surging and extraction. Surging agitates the groundwater and dislodges fine sediments from the sand pack. Wells may be surged prior to installation of the well seal to ensure that there are no voids in the sand pack. Development occurs 24 to 72 hours after seal installation to ensure that the Portland cement has set up correctly. After about ten minutes of surging, groundwater is extracted from the well using bailing, pumping and/or reverse air-lifting through an eductor pipe to remove the sediments from the well. Surging and extraction continue until at least ten well-casing volumes of groundwater are extracted and the sediment volume in the groundwater is negligible.

All equipment is steam-cleaned prior to use and air used for air-lifting is filtered to prevent oil entrained in the compressed air from entering the well. Wells that are developed using air-lift evacuation are not sampled until at least 24 hours after they are developed.

Groundwater Sampling

Depending on local regulatory guidelines, three to four well-casing volumes of groundwater are purged prior to sampling. Purging continues until groundwater pH, conductivity, and temperature have stabilized. Groundwater samples are collected using bailers or pumps and are decanted into the appropriate containers supplied by the analytic laboratory. Samples are labeled, placed in protective foam sleeves, stored on crushed ice at or below 4°C, and transported under chain-of-custody to the laboratory. Laboratory-supplied trip blanks accompany the samples and are analyzed to check for cross-contamination. An equipment blank may be analyzed if non-dedicated sampling equipment is used.