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Alameda County
Environmental Health

August 20, 2008

Ms. Barbara Jakub
Alameda County Health Care Services Agency
1131 Harbor Bay Parkway
Alameda, CA 9502-6577

Subject: Former Val Strough Chevrolet Site
327 34th Street, Oakland, CA
Site ID #3035, RO#0000134

Dear Ms Jakub:

This letter is to accompany the *Interim Remediation Action Plan* for the above-referenced site prepared by LRM Consulting, Inc. of Burlingame, CA.

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

If you have any questions, please contact Mr. Mehrdad Javaherian of LRM Consulting, Inc. at 650-343-4633.

Sincerely,

Linda L. Strough
Trustee

cc: Mehrdad Javaherian, LRM Consulting, Inc., 1534 Plaza Lane, #145, Burlingame, CA 94010
Greggory Brandt, Wendel Rosen Black & Dean, 1111 Broadway, 24th Floor, Oakland, CA 94607

INTERIM REMEDIAL ACTION PLAN

Former Val Strough Chevrolet Site
327 34th Street, Oakland, California
Fuel Leak Case No. RO0000134

Prepared by
LRM Consulting, Inc.
1534 Plaza Lane, #145
Burlingame, CA 94010

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1534 Plaza Lane, #145
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August 2008

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1.0 INTRODUCTION

At the request of the Alameda County Health Care Services Agency (ACHCSA) and Strough Family Trust of 1983, LRM Consulting, Inc. (LRM) has prepared this *Interim Remedial Action Plan (IRAP) Report* for the former Val Strough Chevrolet located in Oakland, California. This report documents the proposed plan for pilot testing and evaluation of an in-situ remediation technology for potential full-scale application to the residual source area present at the subject site. In addition, the IRAP outlines a proposed approach for vertical characterization of the residual source area based on findings of the previous supplemental source area investigation, and placement of a groundwater monitoring well along the downgradient site boundary.

The need for the IRAP activities stems from the continued presence of elevated petroleum hydrocarbon concentrations in groundwater within a localized residual source area at the site, despite past dual phase extraction (DPE) remediation activities. The general scope of work documented herein was previously discussed with ACHCSA in telephone and email discussions in July 2008.

1.1 General Site Information

Site name:	Former Val Strough Chevrolet
Site address:	327 34th Street, Oakland, California
Current property owner:	Strough Family Trust of 1983
Current site use:	Automotive Dealership and Service Center
Current phase of project:	Groundwater monitoring and evaluation of need and approaches for additional remediation
Tanks at site:	Two former tanks (1 gasoline, 1 waste-oil) removed in 1993
Number of wells:	7 (all onsite)
Site ID #:	3035
RO #:	0000134

1.2 Site Contacts

Consultant:	Joel Greger, CEG, Senior Engineering Geologist Mitra Javaheiran, PE Mehrdad Javaherian, Ph.D/MPH(candidate), Principal-in-Charge LRM Consulting, Inc. 1534 Plaza Lane, # 145 Burlingame, CA 94010 (650) 343-4633

Regulatory agency:

Barbara Jakub, P.G.
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1131 Harbor Bay Parkway, Suite 250
Alameda, CA 94502-6577
(510) 567-6746

2.0 SITE BACKGROUND

2.1 Site Description

Site Location and Land Use: The former Val Strough Chevrolet site is currently an active Honda automobile dealership and service center located on the southwestern corner of the intersection of Broadway (Auto Row) and 34th Street (Figure 1). The property is located south of Interstate 580. Land use in the area is primarily commercial.

The site is situated approximately two miles east of San Francisco Bay at approximately 61 feet above mean sea level (msl) (EDR, 2003). The land surface in the vicinity slopes toward the south. The nearest surface water body is Lake Merritt, located approximately 1 mile south of the site (Figure 1).

Site Features: The site consists of a multi-level building and an adjacent parking lot. One former underground storage tank (UST) containing waste oil was reportedly preset onsite beginning in 1949, while a gasoline UST was reportedly installed in 1975 (ETIC, 2003a). The former fuel dispenser and USTs, removed in 1993, were located in the northwestern portion of the site. A routine groundwater monitoring program has been in place since 1993; seven groundwater monitoring wells are located at the site. Construction details for the wells are presented in Table 1.

Underground Utilities: Per the request of ACHCSA, ETIC (2003a) performed a preferential pathway survey of the site, with their findings summarized below. A box culvert for a former tributary of Glen Echo Creek is located approximately 17 feet below ground surface (bgs) in the eastern portion of the site (Figure 2). The culvert consists of a reinforced concrete box measuring 5 feet by 6 feet. During the winter of 1983, a section of the culvert collapsed and was replaced with a 5-foot-diameter pipeline.

Sanitary sewer, electrical, and natural gas utilities are generally present at depths less than 2 feet bgs at the site. Approximately 40 feet north of the site, along the northern edge of 34th Street, a storm sewer pipeline flows toward the east and into the box culvert. Sanitary sewer lines run parallel to both 34th Street and Broadway, north and east of the site, respectively. A lateral pipeline located along the western edge of the site connects to the sanitary sewer line below 34th Street. Natural gas service is located on the east side of the property. Water service appears to enter the site from the north.

Water Supply Well Search: A 2003 report compiled by EDR indicates that there are no federal U.S. Geological Survey wells and no public water supply wells located within a 1-mile radius of the site. No water supply wells were identified by the Alameda County Department of Public Works within a ½-mile radius of the site (ETIC, 2003a).

3.0 CONCEPTUAL SITE MODEL

Since 2003, multiple investigations, monitoring, and interim remedial events have taken place at the site. Data from these reports have been used to develop a conceptual site model (CSM) as summarized below. The CSM documents the site hydrogeology, primary sources, constituents of potential concern (COPCs), hydrocarbon distribution in soil and groundwater, previous interim remediation activities, definition of the residual source area, and identification of potential exposure pathways.

Site Hydrogeology: In general, the site is underlain by silt and clay to depths ranging from approximately 15 to 20 feet bgs. Silty sand and fine-grained sand interbedded with thin clay intervals are encountered from approximately 20 feet bgs to the total explored depth of 35 feet bgs (see Figures 2 and 3). The depth to groundwater beneath the site has ranged from approximately 12.5 to 23 feet bgs. As shown in the modified rose diagram on Figure 4, the direction of groundwater flow is generally toward the southwest to south-southeast, with average hydraulic gradients ranging from approximately 0.01 to 0.03 foot/foot.

Primary Sources: Two USTs (one gasoline and one waste-oil) were located beneath the sidewalk on the northern side of the property. A fuel dispenser was located inside the building (Figure 4). These primary sources of hydrocarbons were removed in 1993.

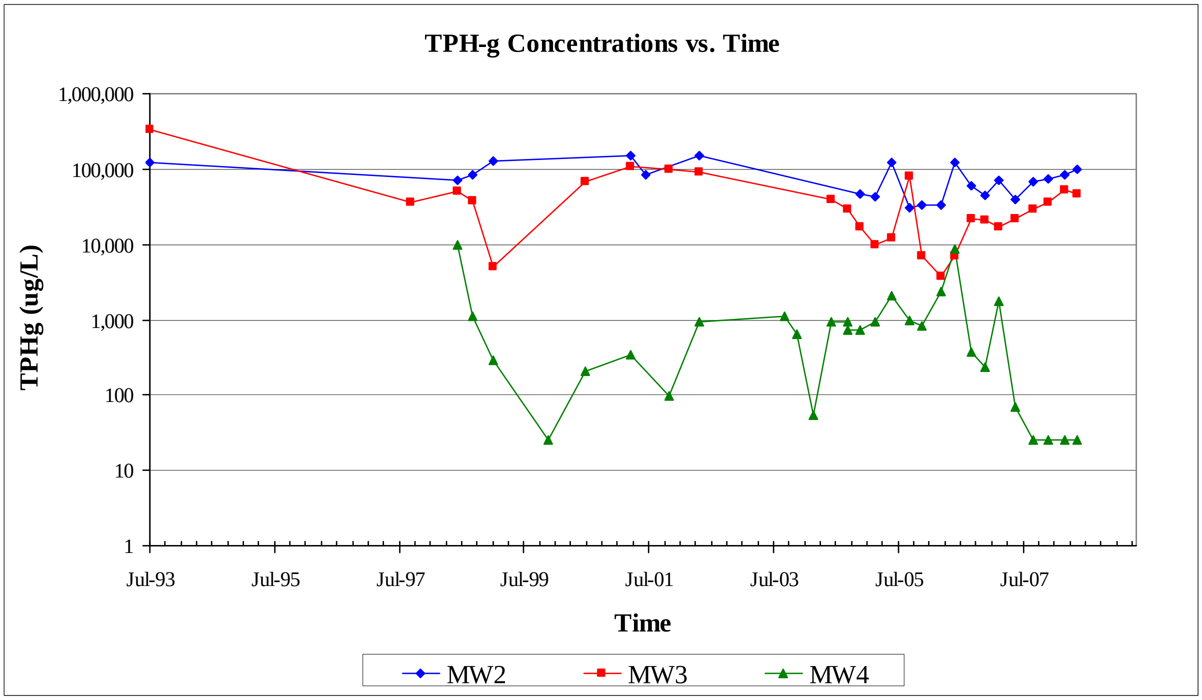
Separate Phase Hydrocarbons: Historically, separate phase hydrocarbons (SPHs) were encountered intermittently in wells MW2 (maximum thickness of 0.48 feet in 2003) and MW3 (maximum thickness of 0.06 feet in 1998), located near the former UST and fuel dispenser areas; however, no SPHs have been detected since March 2004 (sheen) in MW3 and June 2006 (sheen) in MW2. As discussed later herein, 1.5 years of DPE operations at MW2 and MW3 has likely contributed to removal of SPHs at the site.

Constituents of Potential Concern: Based on the type of fuel stored in the USTs and the results of previous subsurface investigations, COPCs at the site include total petroleum hydrocarbons as gasoline (TPH-g), benzene, toluene, ethylbenzene, and total xylenes (BTEX), and methyl t-butyl ether (MTBE). TPH as diesel (TPH-d) and TPH as motor oil (TPH-mo) are not routinely detected in groundwater samples and are considered secondary COPCs for the site.

Petroleum Hydrocarbon Distribution in Soil: Historical data suggest that elevated concentrations of TPH-g, BTEX, and MTBE were limited to the vadose zone and capillary fringe soils adjacent to the former UST fuel dispenser, near monitoring well MW2 (see Figures 2 and 3). These included TPH-g at concentrations greater than 1,000 milligrams per kilogram (mg/kg) extending to soils around well MW3. The highest concentrations of TPH-g and BTEX occurred at the capillary fringe (see Figures 2 and 3), consistent with the distribution of SPHs; importantly, these concentrations declined to non-detect levels below 25 feet bgs (see Figures 2 and 3).

To the extent that the MW2/MW3 area was targeted by approximately 1.5 years of DPE efforts (discussed later herein), much of the above-referenced hydrocarbon detections in vadose zone soils appear to have been removed. This is in large part corroborated by a supplemental source area investigation performed in 2007 (see Table 2), which indicated the consistent absence of petroleum hydrocarbons and MTBE in unsaturated soils and reduced levels (maximum concentration of 240 mg/kg) of TPH-g in capillary fringe and saturated soils within the MW2/MW3 area (LRM, 2008a).

Petroleum Hydrocarbon Distribution in Groundwater: Consistent with the historical and intermittent presence of SPHs in MW2 and MW3, the highest concentrations of petroleum hydrocarbons and MTBE have been consistently detected in samples collected from wells MW2 and MW3. These levels have ranged as high as 150,000 ug/L in MW2 (in 2002) and as high as 110,000[1] ug/L in MW3 (in 2001). During the latest round of groundwater monitoring (June 2008), TPH-g levels in MW2 and MW3 approximated 98,000 ug/L and 47,000 ug/L, respectively (see Figure 5). As shown on the graph below, TPH-g concentrations in MW2 remain below the historical maximum level, but continue to fluctuate and reflect an increase from 40,000 ug/L to 98,000 ug/L over the past five quarters of monitoring. TPH-g concentrations at MW3 exhibit a similar increasing pattern over the past year, increasing from 22,000 ug/L to 54,000 ug/L with a slight decline to 47,000 during the latest round of monitoring; both of these wells exhibit trends consistent with the continued presence of a residual source of hydrocarbons in the MW2 area.



[1] In 1993, TPH-g was detected at a concentration of 330,000 ug/L in MW3; however, the sample contained SPHs (see Table 3).

As shown on Table 3, benzene levels depict a similar trend as TPH-g over the past year, with generally stable (but elevated) levels in MW2 (1,900 ug/L range), slightly increasing levels in MW3 (1,300 to 4,500 ug/L range), and lower/declining levels in MW4 (60 ug/L to <0.5 ug/L); benzene remains undetected in wells MW5, MW6, and MW7.

Away form the residual source area, significantly lower levels of petroleum hydrocarbons have been detected in samples collected from well MW4, and the other site wells (i.e, wells outside of the MW2/MW3 area). TPH-g levels in MW4 continue to decline and remain below detection limits over the past several rounds of monitoring (see above graph). The extent of dissolved-phase petroleum hydrocarbons in groundwater is largely defined by non-detects, low levels, and/or stable TPH-g, BTEX, and MTBE concentrations detected in downgradient and cross-gradient monitoring wells MW5, MW6, and MW7 (Table 3); however, the absence of recent data from downgradient site boundary prompted the ACHCSA to request collection of grab groundwater data from this location as part of LRM's supplemental source area investigation (LRM, 2008a). While this investigation confirmed the absence of BTEX and only a single detection (at 67 ug/L) of TPH-g along the downgradient site boundary (see Figure 6), detected concentrations of TPH-mo (6,600 ug/L) and TPH-d (3,800 ug/L) at the site boundary are higher than levels encountered in the upgradient portions of the site (see Figure 6). To this end, monitoring of the downgradient site boundary was recommended.

Previous Interim Remediation Activities: In March 2004, ETIC performed a DPE pilot test at the site. As summarized in the June 2004 *Dual Phase Extraction Pilot Test and Interim Remedial Action Plan* (DPE and IRAP Report), vacuum was applied to source area wells MW2 and MW3 while water and vacuum levels were measured in nearby monitoring wells. The DPE pilot test induced more than 1 foot of drawdown up to 50 feet from the extraction wells and an estimated radius of vacuum influence of 55 to 70 feet. Based on vapor flow rates and petroleum hydrocarbon concentrations in the vapor stream during the short-term pilot test, removal rates of approximately 90 pounds of petroleum hydrocarbons per day were estimated.

Based on the pilot test result, a DPE system was designed to consist of a knockout vessel to be used for separation of the soil vapor and water streams. A thermal oxidizer (with propane as a supplemental fuel) was proposed for treatment of extracted vapor, and aqueous-phase granular activated carbon was proposed for treatment of extracted groundwater. Between February 2005 and June 2006, ETIC operated the DPE system on site. Vacuum was applied to remove groundwater and soil vapor from up to two wells (MW2 and/or MW3). The system was temporarily shutdown on 30 January 2006 for conversion of vapor treatment from thermal oxidation to carbon filtration, and remained offline until 22 May 2006, when it was restarted. Because the mass removal rates by the DPE system had reached asymptotic levels and high petroleum hydrocarbon concentrations continued to exist in extraction wells MW2 and MW3 despite the DPE operation, the benefit of continuation of DPE in its current configuration was considered to be low and the DPE operation was ceased on 30 June 2006. ETIC estimated removal of approximately 9,000 pounds of petroleum hydrocarbons, reaching asymptotic levels for both the magnitude and rate of mass removal. The remediation system was subsequently dismantled and the skid-mounted DPE unit was from the site.

Residual Source Area: Based on the above-summarized observations of soil and groundwater data, a localized, residual source area remains present within the MW2/MW3 area and was accordingly the primary focus of LRM's supplemental source area investigation (LRM, 2008a). This investigation, which focused on depth-discrete soil and grab groundwater sampling, aided the lateral definition of the residual source area and indicated the presence at elevated levels of dissolved TPH-g at the water table (i.e, 24 feet bgs) at concentrations approximating 110,000 ug/L in the immediate vicinity of MW2 (see Figure 6 and Table 4). In addition, the investigation revealed that at select locations near MW2, TPH-g concentrations were greater with depth (i.e, 40 feet bgs) than at the water table (SB4, SB6-see Figure 6), and/or otherwise exist at elevated levels at a depth of 40 feet bgs (SB7-see Figure 6); this finding warrants further vertical definition of hydrocarbons in the residual source area. Lastly, this investigation further confirmed that despite the past DPE efforts, significant hydrocarbon mass remains localized within the residual source area.

Potential Exposure Pathways: To the extent that the site remains an active car dealership and service center, is entirely paved, and does not contain any water supply wells, direct exposure pathways to COPCs onsite are considered incomplete. As previously discussed, despite the localized presence of elevated hydrocarbons within the residual source area, petroleum hydrocarbons and MTBE concentrations in groundwater in downgradient portions of the site are absent, low, and/or stable; this finding, together with the absence of water supply wells downgradient of the site (ETIC, 2003a) suggests that potential offsite exposure to site-related COPCs in groundwater is also negligible.

As discussed earlier herein, per the request of ACHCSA, ETIC (2003a) performed a utility survey of the site and did not find any potentially significant conduits or preferential pathways for potential offsite migration of groundwater. Recently, the ACHCSA has continued to raise concerns over the previously referenced box culvert present at 17 feet bgs onsite (see Figures 2 and 4) as a potential conduit to offsite migration. Worth noting is that hydrocarbons have been consistently absent in samples from nearby wells MW6 and MW7, and at low levels in nearby grab groundwater sample HP1 (see Tables 3 and 4); depth to groundwater at these locations approximates the elevation of the culvert (see Table 3). To further evaluate this potential exposure pathway, the ACHCSA has requested further analysis be performed.

Lastly, the potential for indirect exposure via volatilization of hydrocarbons and MTBE from soil and/or groundwater is considered a complete exposure pathway. However, this pathway was recently evaluated as part of the supplemental source area investigation (LRM, 2008a), which included collection of shallow soil vapor samples from the MW2/MW3 area (see Table 5). As indicated in the table, the observed levels of petroleum hydrocarbons, MTBE, and volatile organic compounds (VOCs) are well below the highly conservative Environmental Screening Levels (ESLs) for commercial/industrial land use (see Table 5). Hence, based on current site conditions, this exposure pathway is considered insignificant.

Based on the above summary and conceptualization, several IRAP activities have been outlined below.

4.0 INTERIM REMEDIAL ACTION ACTIVITIES

Based on the CSM, IRAP activities identified for the subject site include:

- Supplemental soil and groundwater investigation in the residual source area to vertically characterize localized areas where hydrocarbons in deep (40 feet bgs) groundwater samples were greater than shallow (24 feet bgs) groundwater samples;
- Supplemental groundwater investigation along the box culvert to evaluate the potential for preferential migration of hydrocarbons;
- Installation of one groundwater monitoring well along the downgradient site boundary coinciding with the location investigated by borings SB10 and SB13; and
- Pilot testing of enhanced bioremediation within the residual source area.

Each of these activities are summarized below

4.1 Vertical Groundwater Characterization within Residual Source Area

As shown on Figure 6, elevated TPH-g concentrations in groundwater exist at 40 feet bgs in borings SB4 through SB8, with SB4 and SB6 having higher concentrations at greater depths (40 feet bgs) than at shallower (24 feet bgs) depths. This includes as much as 35,000 ug/L of TPH-g in SB6, 20,000 ug/L in SB7, and 17,000 ug/L in SB8; all at 40 feet bgs. To this end, three deep borings (SB14 through SB16) are proposed in the immediate vicinity of SB5/SB6, SB7, and SB8 (see Figure 6), with saturated soil and grab groundwater samples proposed at the water table (approximately 24 feet bgs), at 50 feet bgs, and at 60 feet bgs.

The grab groundwater sampling protocols, including all pre-field activities, continuous soil coring, and PID screening will follow those previously approved by ACHCSA for LRM's supplemental source area investigation (LRM, 2006c, 2007a, 2007b); these protocols are included herein as Appendix A. Importantly, the approved protocols include use of the DT22 Geoprobe® system consisting of 2.25-inch (57 mm) OD probe rods as an outer casing and Geoprobe® Light-Weight Center Rods for the inner rod string to eliminate the potential for sample cross-contamination at depth.

As with past investigation and monitoring events, the samples will be analyzed for TPH-g, BTEX, and MTBE using USEPA Method 8260B, and TPH-d and TPH-mo using modified USEPA Method 8015 with silica gel cleanup at a California-certified laboratory.

4.2 Groundwater Characterization along Box Culvert

To evaluate the potential for preferential pathway of petroleum hydrocarbons and MTBE along the Box Culvert located onsite, four shallow borings (SB17 through SB20) are proposed for collection of soil and grab groundwater samples at the water table, estimated at 16 or 17 feet bgs, along the box culvert and relating piping (see Figure 6). Pre-field activities and sampling procedures and analyses will follow those outlined above and summarized in Appendix A.

4.3 Monitoring Well Installation along Downgradient Site Boundary

As previously discussed, based on the presence of TPH-d and TPH-mo in grab groundwater samples (SB10 and SB13) located along the downgradient site boundary, installation of a monitoring well (MW8) is proposed at this location (see Figure 6). As previously indicated, the concentrations of TPH-d and TPH-mo at this location are greater than those encountered in other onsite wells and/or grab groundwater samples, including those near the former USTs; hence the detections at SB10 and SB13 may reflect a distinct (potentially offsite) source. To this end, the proposed well will serve as the first step in investigating this potential source, and, more importantly, allow for routine monitoring of TPH-d and TPH-mo at the downgradient site boundary.

Pre-field activities related to installation of MW8 will follow those outlined in Appendix A, while construction details of the proposed well will follow that of existing wells MW2 and MW3. A California "C-57-licensed" contractor will install the well using a sonic drill rig under supervision of staff working under the direction of LRM's Professional Geologist. The borehole into which MW8 will be installed will be advanced to a target depth of approximately 35 feet bgs. Lithologic information obtained during drilling will be recorded on a soil boring log and will contain pertinent information for each boring. After the desired depth is reached, a 2-inch-diameter, Schedule 40, polyvinyl chloride (PVC) well screen and casing will be placed in the borehole. The well screen will be approximately 15 feet long and will be 0.020-inch-slotted PVC casing. Blank PVC casing will be installed from the top of the screened interval to the ground surface.

After the well casing has been placed inside the augers, the well annulus materials (sand, bentonite, and grout) will be added. The well annulus opposite the screened interval will be backfilled with 2/12 sand to a height of approximately of approximately 2 feet above the top of the well screen. A minimum of 2 feet of bentonite chips will be placed above the sand pack and hydrated to isolate the screened interval from material above and prevent the entrance of grout into the sand pack. After the bentonite seal has hydrated, a neat cement grout mix will then be placed in the annular space above the bentonite seal to the ground surface to seal the remainder of the borehole.

ACHCSA will be notified before the well is grouted so that a field inspector may witness the grouting activity, if required. The well will be completed at the surface with an approximately 3-foot by 3-foot, flush-mounted, traffic-rated well vault. Well MW8 will be developed a minimum of 24 hours after installation by bailing, surging, and/or pumping to remove sediment left in the well during construction and to enhance the hydraulic communication between the well and surrounding sediments. Observations of pH, temperature, specific conductance, quantity, and clarity of water withdrawn will be recorded after each casing volume has been purged during development. The well will be developed until approximately 3 to 10 casing volumes are removed or until monitored parameters stabilize and relatively sediment-free water is produced. After the well is completed, the top of casing will be surveyed to the nearest 0.01 foot and tied into the elevations of the existing wells by a licensed surveyor. Well MW8 will be incorporated into the routine groundwater monitoring activities for the site.

Investigation-derived wastewater and waste soil generated during field activities will be stored in properly labeled 55-gallon drums and placed in a designated, secure location. Wastewater will be transported by a licensed hauler for appropriate treatment and disposal at a recycling facility. Waste soil will be characterized and transported by a licensed hauler to an appropriate landfill for disposal.

4.4 Enhanced Aerobic Biodegradation Pilot Testing

To the extent that measurable levels of petroleum hydrocarbons remain within the localized residual source area following cessation of DPE operations, a phased approach to interim remediation and pilot testing is proposed in support of eventual transition toward full-scale application. Based on a review of historical petroleum hydrocarbon and geochemical analytical data, there is ample evidence to support the conclusion that biodegradation of petroleum hydrocarbons is occurring in groundwater beneath the site. As previously discussed, petroleum hydrocarbon and MTBE concentration trends have exhibited stable to decreasing concentration trends at locations peripheral to the main source area of the shallow groundwater hydrocarbon plume, suggesting that natural attenuation of petroleum hydrocarbons is occurring in these areas of the site. In addition, although petroleum hydrocarbons and BTEX compound concentrations have exhibited increasing concentration trends since DPE was performed on these wells in 2005 and 2006, MTBE has not increased as significantly, suggesting that the majority of residual SPHs were removed during DPE activities, and the recent increasing petroleum hydrocarbon concentrations are more likely a result of desorption phenomenon rather than dissolution of SPHs.

Geochemical data generally provide additional lines of evidence to support that biodegradation of petroleum hdyrocabons and MTBE is occurring in groundwater beneath the site. As shown in Table 2, wells located within the source are of the plume exhibit lower average DO, nitrate, and sulfate concentrations and higher ferrous iron and carbon dioxide concentrations than wells located upgradient, cross-gradient, or downgradient of the source area. The relatively lower concentrations of DO, nitrate and sulfate in the source area wells suggest that these compounds are being used as terminal electron acceptors during microbial respiration of petroleum hydrocarbons, or that reducing conditions imposed by the presence of petroleum hydrocarbons is causing a shift in the equilibrium concentrations of these compounds. However, evidence of increased carbon dioxide concentrations at source area wells, and even at more peripheral wells, strongly suggest that petroleum hydrocarbons are being biodegraded, and that microbially mediated reactions are responsible for the development of reducing conditions within the plume.

Further, the evidence of suppressed dissolved oxygen (DO) in the source area relative to wells that have not exhibited the presence of significant concentrations of petroleum hydrocarbons, suggests that addition of oxygen to the subsurface should result in a shift in redox conditions, development of an aerobic environment and enhancement of petroleum hydrocarbon degradation. Therefore, the following IRAP has been designed to enhance biodegradation of petroleum hydrocarbons and MTBE in groundwater beneath the site.

During pilot test operations and at the completion of pilot test activities, an evaluation of the groundwater geochemistry, microbe population density, and petroleum hydrocarbon and fuel oxygenate concentration trends will be performed. If pilot test results suggest that nutrient deficiencies (such as ortho-phosphate) are inhibiting microbe growth and interfering with pilot test effectiveness, then a brief pilot test work plan addendum will be prepared that details procedures proposed to address nutrient deficiencies.

If at the end of the 6-month pilot test, evidence of a change in groundwater geochemistry to less reducing or aerobic conditions and enhanced microbe growth are observed, a workplan to implement a full-scale system may be prepared. It is recognized that an oxygen generator may be necessary if substantial scale-up is needed to facilitate full-scale transition. Moreover, if such scale-up is needed, low-flow soil vapor extraction (SVE) may be required to avoid potential fugitive emissions.

Lastly, if at the end of the six-month test evidence of a change in groundwater geochemistry to less reducing or aerobic conditions, enhanced microbe growth, and positive trends in petroleum hydrocarbons and fuel oxygenates are not observed, a workplan addendum proposing a more aggressive remedy, such as ozone injection, will be prepared and submitted to the ACHCSA.

To meet the objectives of the proposed pilot test, the following activities will be conducted:

- installation of one well to facilitate oxygen diffusion at a location between monitoring wells MW2 and MW3;
- collection of baseline groundwater samples from the oxygen diffusion well and monitoring wells MW2 and MW3 before oxygen injection begins;
- diffusion of oxygen on a continuous basis for a minimum of 6 months;
- collection of groundwater samples from wells MW2 and MW3 two weeks after start-up, then monthly for 6 months;
- evaluation of the groundwater quality data during the pilot test to determine if the oxygen diffusion alternative is effective; and
- preparation of a report summarizing the oxygen injection well installations, system start-up, groundwater sampling results, and recommendations.

These tasks are described in greater detail below.

Oxygen Diffusion Well Installation

One oxygen diffusion well, designated as O-1, will be installed approximately 50 feet west-northwest of MW3 (see Figure 6). Pre-field activities prior to well installation will follow those outlined in Appendix A. Well O-1 will be installed with a design similar to MW2 and MW3 using a sonic drill rig and under supervision of an LRM geologist. The borehole into which O-1 will be installed will be advanced to a target depth of approximately 35 feet bgs. Lithologic information obtained during drilling will be recorded on a soil boring log and will contain pertinent information for each boring.

After the desired depth is reached, a two-inch-diameter, Schedule 40, PVC well screen and casing will be placed in the borehole. The well screen will be approximately 15 feet long and will be 0.020-inch-slotted PVC casing. Blank PVC casing will be installed from the top of the screened interval to the ground surface. After the well casing has been placed inside the augers, the well annulus materials (sand, bentonite, and grout) will be added. The well annulus opposite the screened interval will be backfilled with 2/12 sand to a height of approximately of approximately 2 feet above the top of the well screen. A minimum of 2 feet of bentonite chips will be placed above the sand pack and hydrated to isolate the screened interval from material above and prevent the entrance of grout into the sand pack. After the bentonite seal has hydrated, a neat cement grout mix will then be placed in the annular space above the bentonite seal to the ground surface to seal the remainder of the borehole. ACHCSA will be notified before the well is grouted so that a field inspector may witness the grouting activity, if required.

The well will be completed at the surface with an approximately 3-foot by 3-foot, flush-mounted, traffic-rated well vault. Well O-1 will be developed a minimum of 24 hours after installation by bailing, surging, and/or pumping to remove sediment left in the well during construction and to enhance the hydraulic communication between the well and surrounding sediments. Observations of pH, temperature, specific conductance, quantity, and clarity of water withdrawn will be recorded after each casing volume has been purged during development. The well will be developed until approximately 3 to 10 casing volumes are removed or until monitored parameters stabilize and relatively sediment-free water is produced. After the well is completed, the top of casing will be surveyed to the nearest 0.01 foot and tied into the elevations of the existing wells by a licensed surveyor.

As before, investigation-derived wastewater and waste soil generated during field activities will be stored in properly labeled 55-gallon drums and placed in a designated, secure location. Wastewater will be transported by a licensed hauler for appropriate treatment and disposal at a recycling facility. Waste soil will be characterized and transported by a licensed hauler to an appropriate landfill for disposal.

Baseline Monitoring

Prior to start-up of oxygen diffusion activities, baseline groundwater samples will be collected from monitoring wells MW2, MW3, and the newly installed oxygen diffusion well O-1. The groundwater samples will be submitted to a California-certified laboratory for analysis of the following compounds:

- TPH-g, benzene, toluene, ethylbenzene, and total xylenes (BTEX compounds) by EPA Method 8260B;
- MTBE and tertiary butyl alcohol (TBA) by EPA Method 8260B;
- TPH-d and TPH-mo by EPA Method 8015 with silica gel cleanup;
- biological oxygen demand (BOD) by Standard Method 5210B;
- chemical oxygen demand (COD) by EPA Method 410.1;
- nitrite/nitrate by EPA 354.1;
- total Kjeldahl nitrogen by Standard Method 4500; and
- ortho-phosphate by EPA 365.3.

Groundwater samples collected from MW2, MW3, and O-1 will also be sent to Respirtek, Inc., of Biloxi, Mississippi, on a 24-hour hold-time for microbial population heterotrophic and specific-degrader plate counts using Standard Method 9215-A.

In addition to the above laboratory analyses, field measurements of groundwater parameters, including DO, ferrous iron (Hach kit), pH, electrical conductivity, oxidation reduction potential (ORP), and temperature, will be recorded during the baseline sampling event at all three wells.

Oxygen Diffusion

Oxygen addition to groundwater will be facilitated by installing an in-situ oxygen curtain (iSOC®) oxygen diffuser into well O-1. The iSOC® technology is a low-cost alternative for supersaturating oxygen in groundwater to enhance natural attenuation. The technology supersaturates the groundwater with low decay DO at concentrations ranging from 40 to 200 parts per million (ppm), depending on aquifer conditions and depth of injection. The technology has no moving parts and does not require electricity. The iSOC® unit consists of a down-well diffuser containing microporous hollow-fiber membranes that supply groundwater with oxygen via diffusion mechanisms. No additional air sparging will be required, minimizing the potential for fugitive emissions from groundwater and sediments beneath the site. The diffuser element will be connected to an oxygen cylinder via polyurethane tubing and gas delivery is managed with a control panel that includes a gas flow meter and pressure gauges. The oxygen cylinder will be placed inside the traffic-rated vault within well O-1, so no additional trenching is required to implement this technology.

Operation, Maintenance, and Pilot Test Performance Monitoring

Weekly operations and maintenance (O&M) routine visits will be conducted to confirm that the system is operating appropriately. The O&M visits will generally consist of evaluating the pressure gauges, in-vault tubing and connections, wellhead integrity, and the security of the oxygen injection system. Oxygen canisters will be changed-out as-needed to maintain optimum oxygen delivery to groundwater.

Pilot test performance monitoring groundwater samples will be collected from well O-1 and monitoring wells MW2 and MW3 two weeks after start-up, then monthly for six months. Collected samples will be submitted to a state-certified laboratory and will be analyzed for the list of constituents and parameters identified above for the Baseline Monitoring. In addition to the above laboratory analyses, field measurements of groundwater parameters as previously stated will also be performed.

5.0 REPORTING AND SCHEDULE

The IRAP activities will be documented in three technical reports to be prepared and submitted to the ACHCSA. The first report will document the soil and grab groundwater sampling (vertical characterization and box culvert) investigations and well installation (MW8 and O-1) activities and results; it will be submitted within 30 days following completion of related field activities.

The second and third reports will focus on the results of the above-referenced baseline and pilot test performance monitoring data evaluation after 3 months and 6 months, respectively; these reports will document details of the pilot test data collected, evaluation of the data, and conclusions and recommendations related to future action. The third report will be submitted within 30 days following completion of pilot test activities.

The IRAP activities outlined herein may be initiated upon ACHCSA's approval of the IRAP. Field investigation activities, including soil and grab groundwater sampling and well installations may be performed within four weeks of IRAP approval. Oxygen addition to groundwater may be initiated two weeks following completion of the well installation and related baseline sampling activities.

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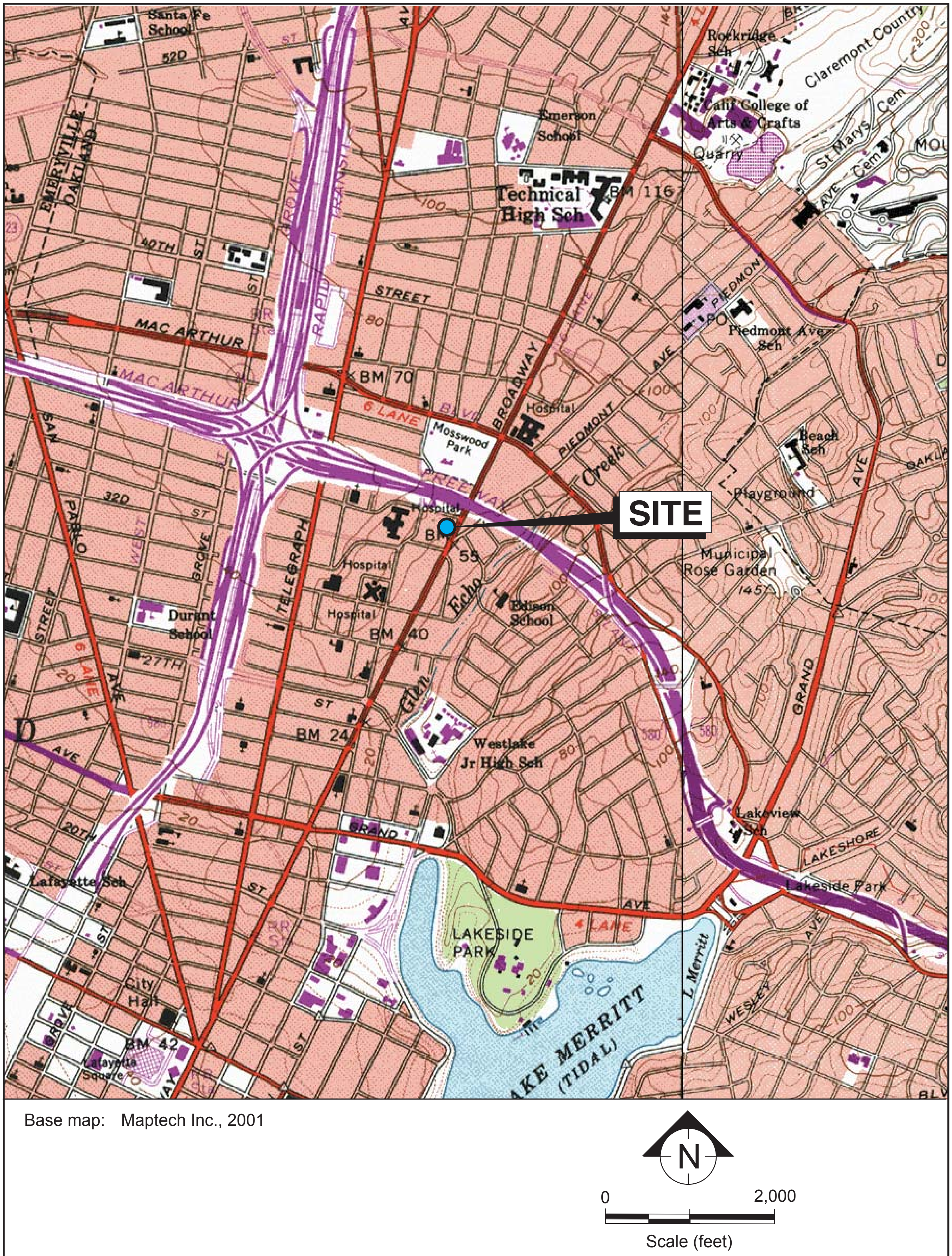
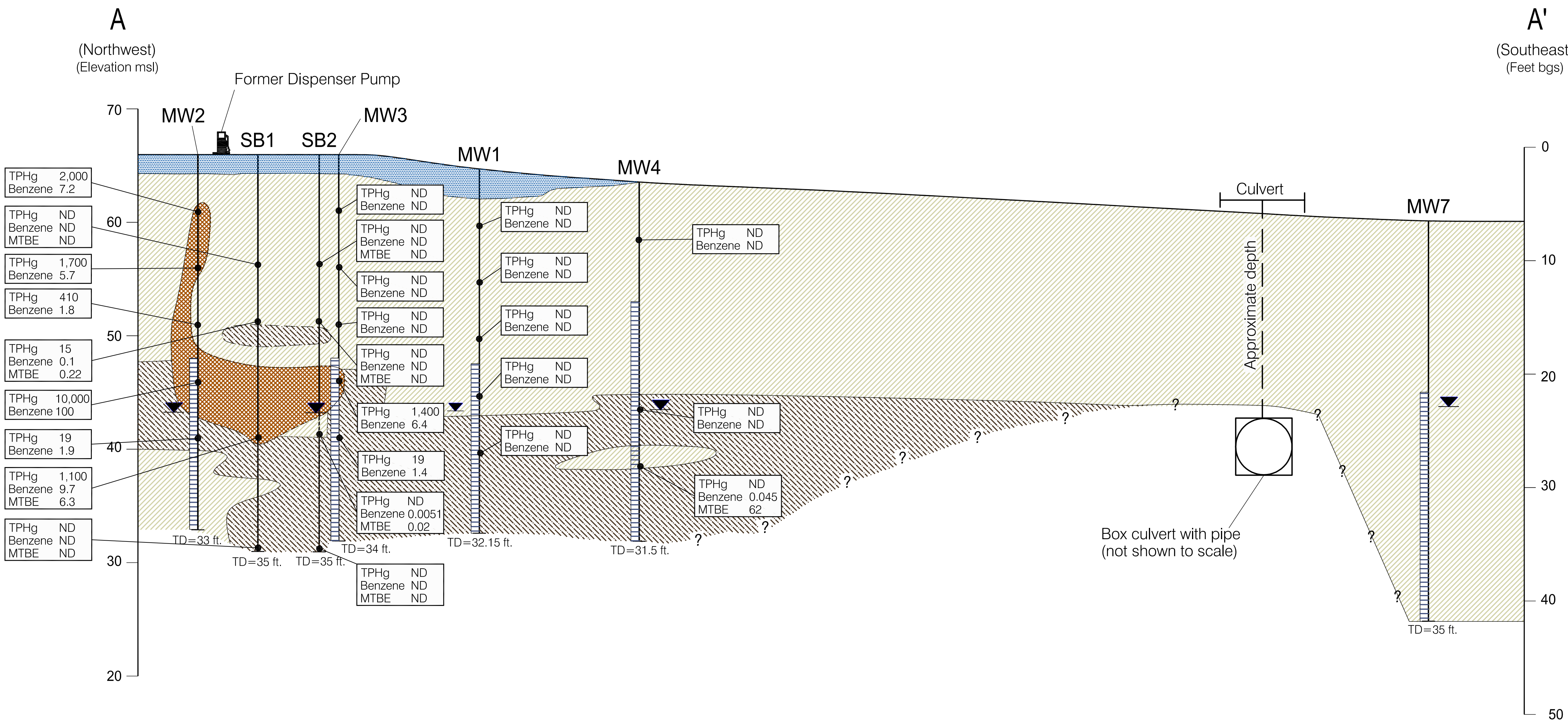
FIGURES



LRM consulting inc.

SITE LOCATION MAP
FORMER VAL STROUGH CHEVROLET
327 34TH STREET, OAKLAND, CALIFORNIA
AUGUST 2008

FIGURE: 1

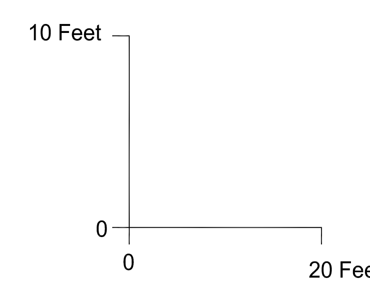


LEGEND:

- Groundwater elevation
- ND Not detected
- MSL Mean sea level
- BGS Below ground surface
- TD Total depth
- Fill
- Fine grained soil
- Coarse grained soil
- TPH-g>=1,000 mg/kg

Source: ETIC Schematic Geologic Cross-Section A-A', dated 06/21/07.

NOTE:
MW2 and MW3 soil analytical data from July 1993.
B6 and MW5 soil analytical data from June 1998.
Analytical data reported in milligrams per kilogram (mg/kg).



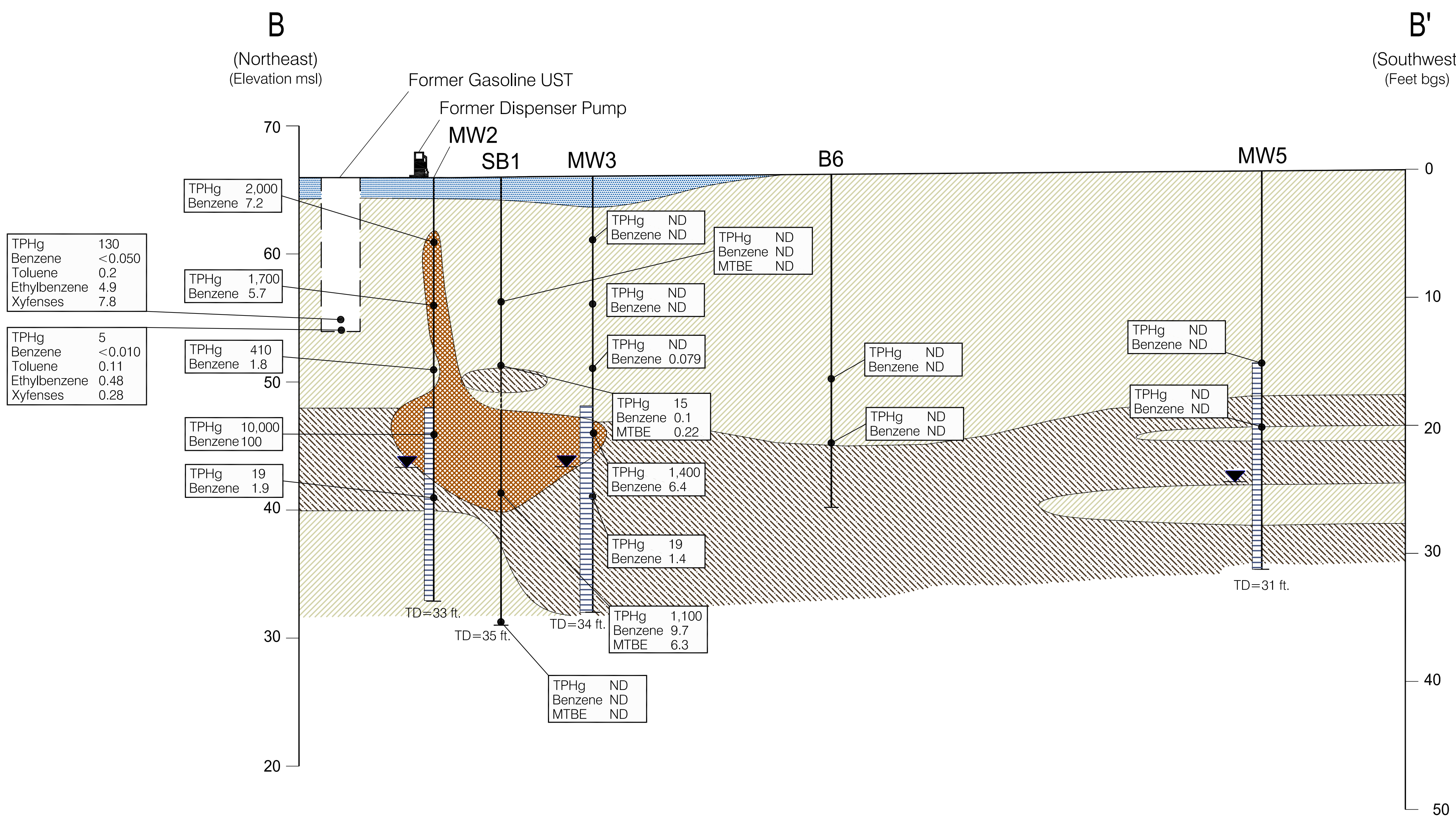
Approximate Scale

SCHEMATIC GEOLOGIC CROSS-SECTION A-A'

FORMER VAL STROUGH CHEVROLET
327 34TH STREET
OAKLAND, CALIFORNIA

LRM consulting inc.

Date:	Figure:
7/28/2008	2
Sections.dwg	



LEGEND:

- Groundwater elevation
- ND Not detected
- MSL Mean sea level
- BGS Below ground surface
- TD Total depth
- Fill
- Fine grained soil
- Coarse grained soil
- TPH-g>=1,000 mg/kg

Source: ETIC Schematic Geologic Cross-Section A-A', dated 06/21/07.

10 Feet
0
0
20 Feet
Approximate Scale

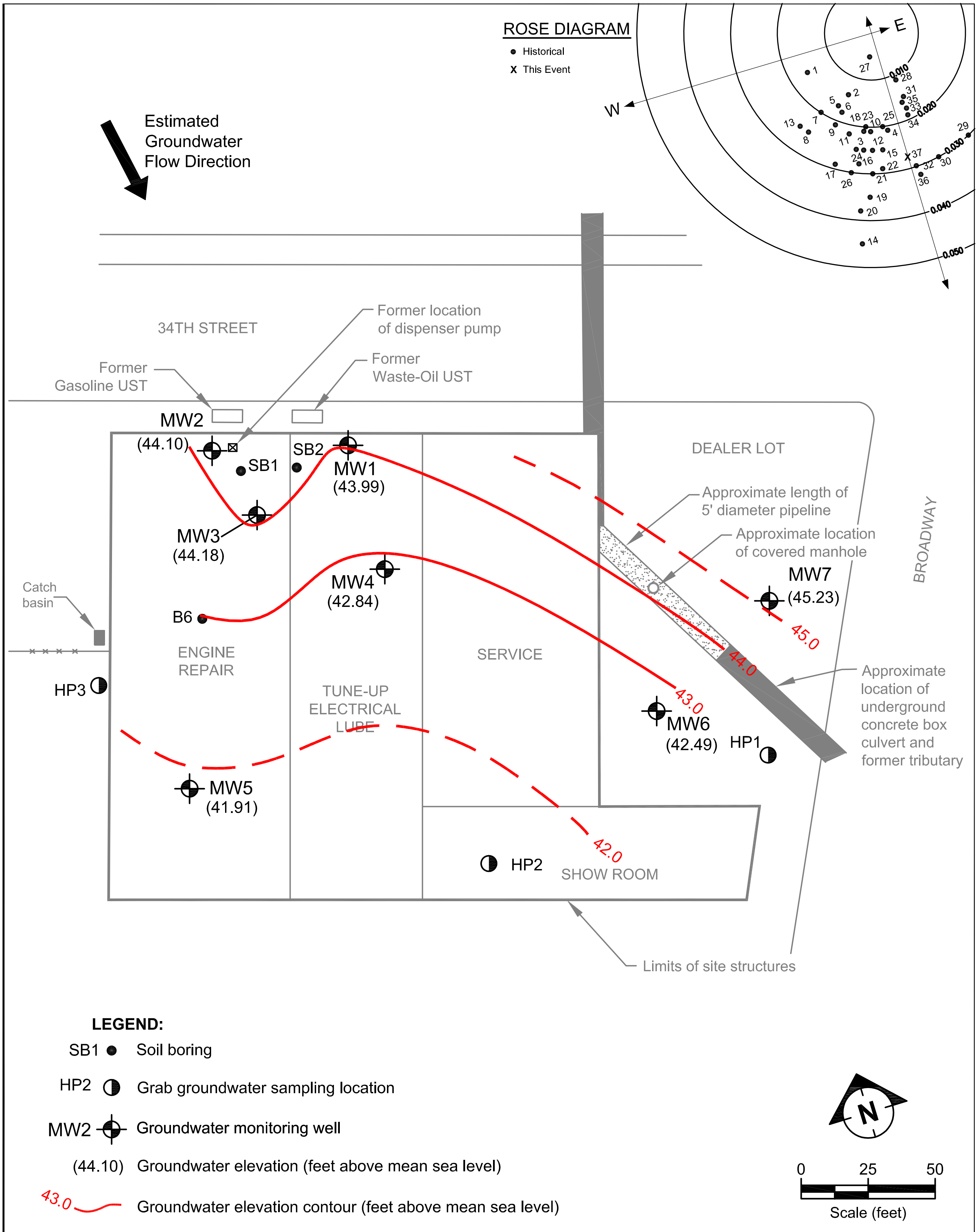
NOTE:
MW2 and MW3 soil analytical data from July 1993.
B6 and MW5 soil analytical data from June 1998.
Analytical data reported in milligrams per kilogram (mg/kg).

SCHEMATIC GEOLOGIC CROSS-SECTION B-B'

FORMER VAL STROUGH CHEVROLET
327 34TH STREET
OAKLAND, CALIFORNIA

LRM consulting inc.

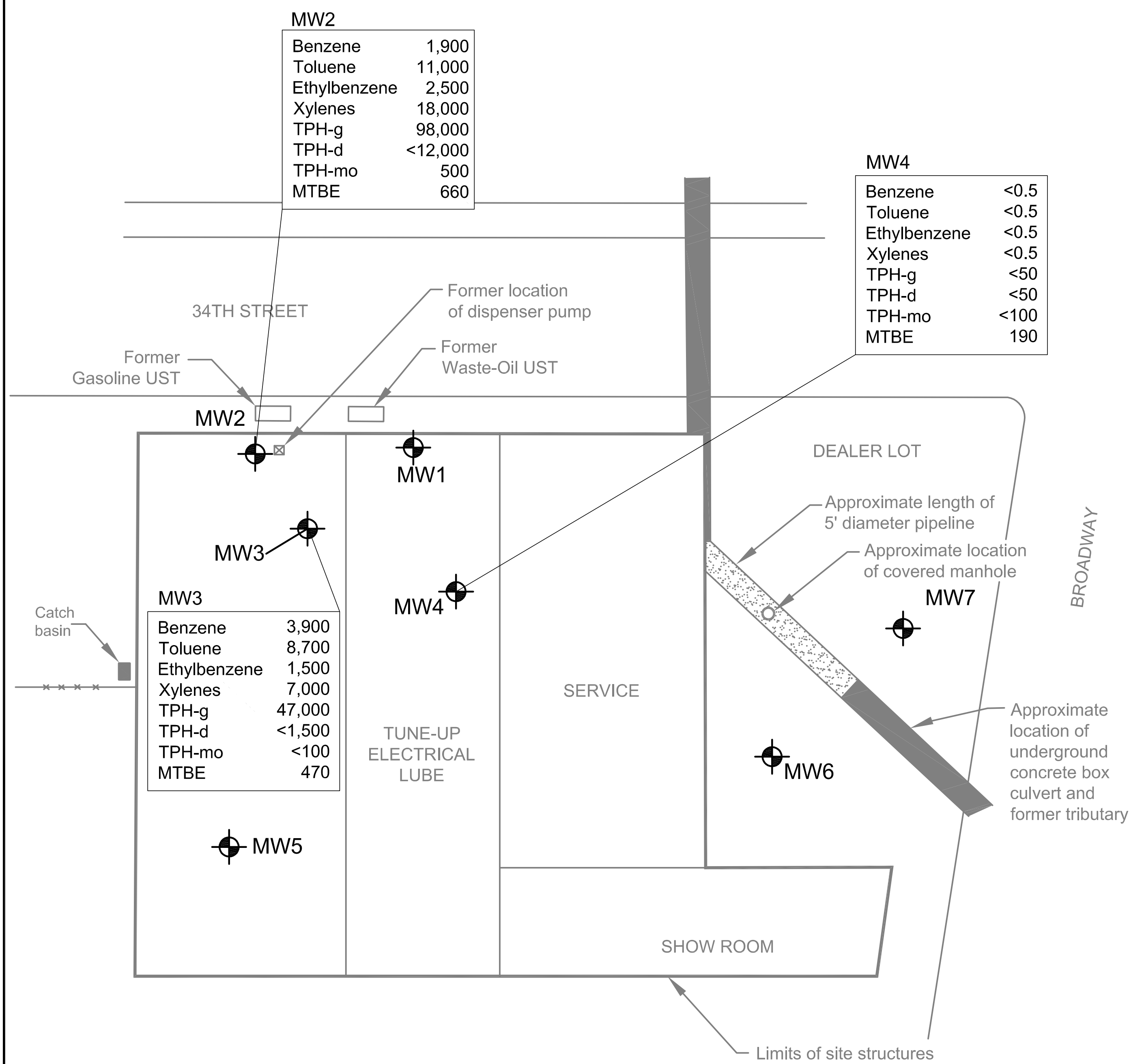
Date: 7/28/2008
Figure: 3
Sections.dwg



LRM consulting inc.

GROUNDWATER CONTOUR MAP AND ROSE DIAGRAM
FORMER VAL STROUGH CHEVROLET
327 34TH STREET, OAKLAND, CALIFORNIA
3 JUNE 2008

FIGURE: **4**



LEGEND:

MW5 ⌖ Groundwater monitoring well

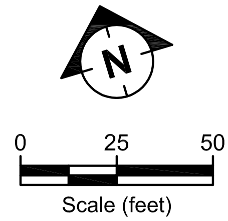
TPH-g Total Petroleum Hydrocarbons as gasoline

TPH-d Total Petroleum Hydrocarbons as diesel

TPH-mo Total Petroleum Hydrocarbons as motor oil

MTBE Methyl Tertiary Butyl Ether

All concentrations are reported in micrograms per liter (ug/L)



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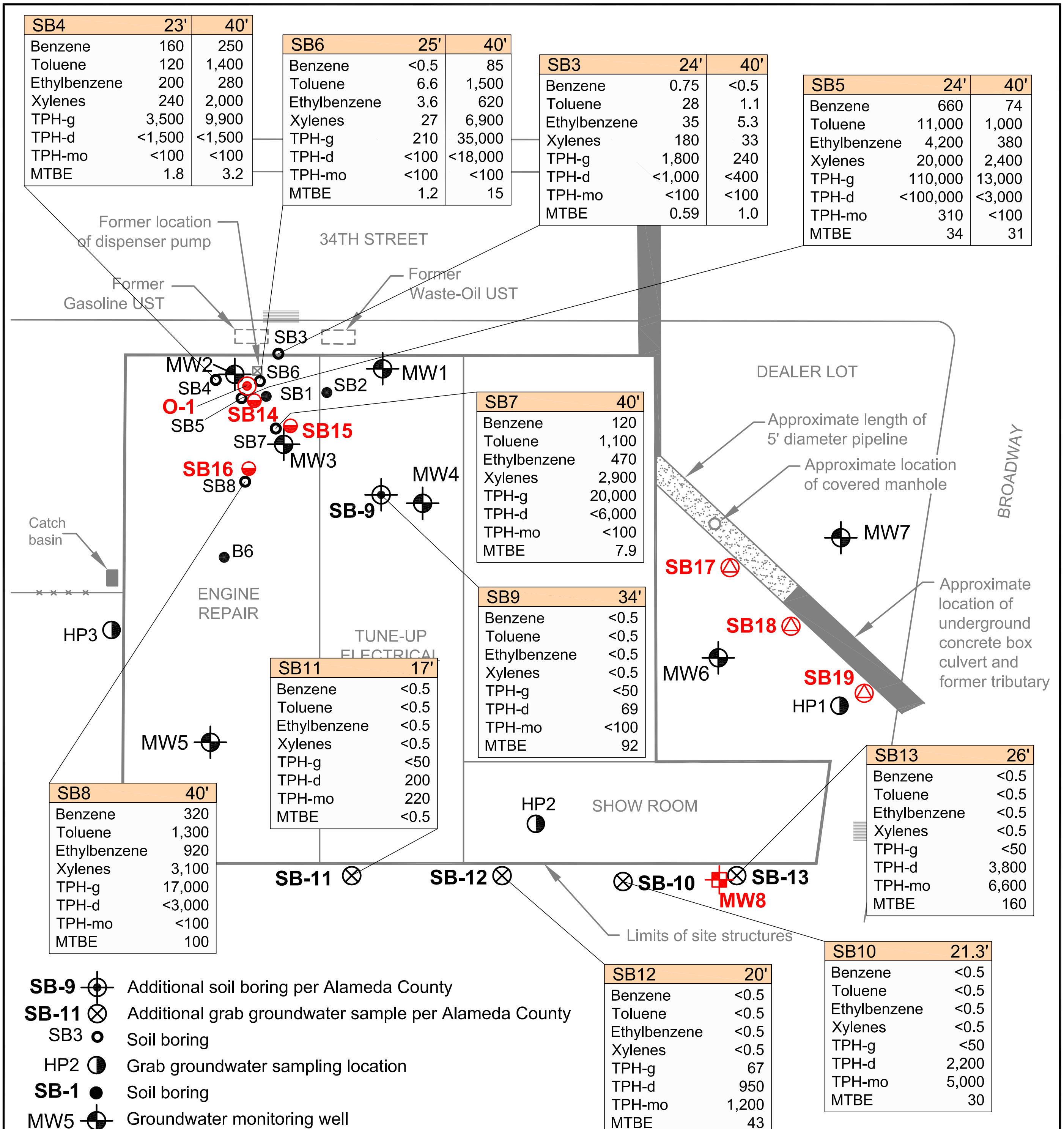
GROUNDWATER ANALYTICAL DATA
FORMER VAL STROUGH CHEVROLET
327 34TH STREET, OAKLAND, CALIFORNIA
3 JUNE 2008

FIGURE: **5**



SB4	23'	40'
Benzene	160	250
Toluene	120	1,400
Ethylbenzene	200	280
Xylenes	240	2,000
TPH-g	3,500	9,900
TPH-d	<1,500	<1,500
TPH-mo	<100	<100
MTBE	1.8	3.2

SB6	25'	40'
Benzene	<0.5	85
Toluene	6.6	1,500
Ethylbenzene	3.6	620
Xylenes	27	6,900
TPH-g	210	35,000
TPH-d	<100	<18,000
TPH-mo	<100	<100
MTBE	1.2	15

SB3	24'	40'
Benzene	0.75	<0.5
Toluene	28	1.1
Ethylbenzene	35	5.3
Xylenes	180	33
TPH-g	1,800	240
TPH-d	<1,000	<400
TPH-mo	<100	<100
MTBE	0.59	1.0

SB5	24'	40'
Benzene	660	74
Toluene	11,000	1,000
Ethylbenzene	4,200	380
Xylenes	20,000	2,400
TPH-g	110,000	13,000
TPH-d	<100,000	<3,000
TPH-mo	310	<100
MTBE	34	31

SB7	40'
Benzene	120
Toluene	1,100
Ethylbenzene	470
Xylenes	2,900
TPH-g	20,000
TPH-d	<6,000
TPH-mo	<100
MTBE	7.9

SB9	34'
Benzene	<0.5
Toluene	<0.5
Ethylbenzene	<0.5
Xylenes	<0.5
TPH-g	<50
TPH-d	69
TPH-mo	<100
MTBE	92

SB11	17'
Benzene	<0.5
Toluene	<0.5
Ethylbenzene	<0.5
Xylenes	<0.5
TPH-g	<50
TPH-d	200
TPH-mo	220
MTBE	<0.5

SB8	40'
Benzene	320
Toluene	1,300
Ethylbenzene	920
Xylenes	3,100
TPH-g	17,000
TPH-d	<3,000
TPH-mo	<100
MTBE	100

SB13	26'
Benzene	<0.5
Toluene	<0.5
Ethylbenzene	<0.5
Xylenes	<0.5
TPH-g	<50
TPH-d	3,800
TPH-mo	6,600
MTBE	160

SB12	20'
Benzene	<0.5
Toluene	<0.5
Ethylbenzene	<0.5
Xylenes	<0.5
TPH-g	67
TPH-d	950
TPH-mo	1,200
MTBE	43

SB10	21.3'
Benzene	<0.5
Toluene	<0.5
Ethylbenzene	<0.5
Xylenes	<0.5
TPH-g	<50
TPH-d	2,200
TPH-mo	5,000
MTBE	30

SB-9 Additional soil boring per Alameda County
SB-11 Additional grab groundwater sample per Alameda County
SB3 Soil boring
HP2 Grab groundwater sampling location
SB-1 Soil boring
MW5 Groundwater monitoring well
O-1 Proposed oxygen diffusion well
SB14 Proposed deep boring
MW8 Proposed montoring well
SB17 Proposed shallow boring

TPH-g Total Petroleum Hydrocarbons as gasoline
TPH-d Total Petroleum Hydrocarbons as diesel
TPH-mo Total Petroleum Hydrocarbons as motor oil
MTBE Methyl Tertiary Butyl Ether

All concentrations are reported in micrograms per liter (ug/L) and reflect samples collected on December 26, 2007.

N

0 25 50
Scale (feet)

LRM consulting inc.

GRAB GROUNDWATER ANALYTICAL RESULTS AND PROPOSED BORING AND WELL LOCATIONS
FORMER VAL STROUGH CHEVROLET
327 34TH STREET, OAKLAND, CALIFORNIA
AUGUST 2008

FIGURE: **6**

TABLES

TABLE 1 WELL CONSTRUCTION DETAILS
FORMER VAL STROUGH CHEVROLET, 327 34th STREET OAKLAND, CALIFORNIA

Well ID	Well Installation Date	Top-of-Casing Elevation* (feet)	Casing Material	Total Depth of Borehole (ft bgs)	Casing Diameter (inches)	Screened Interval (ft bgs)	Slot Size (inches)	Filter Pack Interval (ft bgs)	Filter Pack Material
MW1	07/19/93	64.69	PVC	32	2	17-32	0.020	15-32	Gravel Pack
MW2	07/20/93	65.95	PVC	33	2	18-33	0.020	16-33	Gravel Pack
MW3	07/20/93	65.99	PVC	34	2	18-34	0.020	16-34	Gravel Pack
MW4	06/26/98	63.35†	PVC	31	2	15-31	0.020	13-31.5	Lonestar #3 Sand
MW5	06/26/98	65.59	PVC	31	2	15-31	0.020	13-31.5	Lonestar #3 Sand
MW6	07/17/00	59.60	PVC	31.5	2	10-30	0.020	8-30	Lonestar #3 Sand
MW7	07/17/00	59.47	PVC	36.5	2	15-35	0.020	13-35	Lonestar #3 Sand

* Elevations based on a survey conducted August 2002 and referenced benchmark with known elevation (NGVD 29) of 60.40 feet above mean sea level.
† The casing elevation is uncertain.
PVC Polyvinyl chloride.
ft bgs Feet below ground surface.

TABLE 2 CUMULATIVE GROUNDWATER ELEVATION AND ANALYTICAL DATA
FORMER VAL STROUGH CHEVROLET, 327 34th STREET OAKLAND, CALIFORNIA

Well Number	Date	Casing Elevation (feet)		Depth to Water (feet)	GW Elevation (feet)	SPH Thickness (feet)	Concentration (μg/L) Benzene	Toluene	Ethyl-benzene	Total Xylenes	TPH-g	TPH-d	TPH-mo	MTBE	Concentration (mg/L) CO_2 (lab)	DO (field)	Eh (mv) (field)	pH (field)	Fe(II)	Mn	SO_4	$N\text{-}NH_3$	$N\text{-}NO_3$	$o\text{-}PO_4$
MW1	07/27/93	100.00	a	20.79	79.21	0.00	<0.50	<0.50	<0.50	<0.50	<50	<50	--	--	--	--	--	--	--	--	--	--	--	--
MW1	10/02/97	100.00	a	21.22	78.78	0.00	<0.50	<0.50	<0.50	<0.50	<50	--	--	<2.0	--	--	--	--	--	--	--	--	--	--
MW1	06/30/98	100.00	a	18.21	81.79	0.00	<0.50	<0.50	2.1	0.6	84	--	--	2.1	204	5	--	6.16	0.15	0.046	55	<0.10	<0.10	2
MW1	07/29/98	100.00	a	18.74	81.26	0.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW1	08/26/98	100.00	a	19.28	80.72	0.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW1	10/01/98	100.00	a	19.93	80.07	0.00	<1.0	<1.0	<1.0	<1.0	<50	--	--	<2.0	192	3.6	--	6.49	--	--	--	--	--	--
MW1	10/30/98	100.00	a	20.22	79.78	0.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW1	11/30/98	100.00	a	19.99	80.01	0.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW1	12/28/98	100.00	a	19.81	80.19	0.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW1	01/25/99	100.00	a	19.62	80.38	0.00	<1.0	<1.0	<1.0	<1.0	<50	--	--	<2.0	389	3.4	--	6.72	--	--	--	--	--	--
MW1	02/26/99	100.00	a	17.18	82.82	0.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW1	03/24/99	100.00	a	17.28	82.72	0.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW1	05/12/99	100.00	a	17.91	82.09	0.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW1	12/15/99	100.00	a	21.01	78.99	0.00	<0.50	<0.50	<0.50	<0.50	<50	--	--	<0.50	--	3.31	--	6.52	--	--	--	--	--	--
MW1	03/20/00	100.00	a	16.25	83.75	0.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW1	07/20/00	100.00	a	19.63	80.37	0.00	<0.50	<0.50	<0.50	<0.50	<50	<50	<300	3.4	120	7.37	--	6.66	0.13	<0.01	54	<0.10	3.4	<0.2
MW1	10/11/00	100.00	a	20.80	79.20	0.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW1	04/10-11/01	100.00	a	18.81	81.19	0.00	<0.50	<0.50	<0.50	<0.50	<50	<50	<300	1.2	117	NR	--	NR	<0.10	0.045	57	<0.10	6.6	0.15
MW1	07/10/01	100.00	a	20.51	79.49	0.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW1	11/20/01	64.69	b	21.36	43.33	0.00	<0.50	1.3	<0.50	0.81	<50	<50	<300	<2.0	--[C]	0.65	--	6.47	0.32	1.8	63	<0.10	--	<0.20
MW1	02/19/02	64.69	b	18.95	45.74	0.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW1	05/21/02	64.69	b	19.82	44.87	0.00	<0.50	<0.50	<0.50	<0.50	<50	<50	<300	<2.0	120	0.96	--	6.25	<0.10	0.5	58	<0.10	5.5	<0.20
MW1	06/27/03	64.69	b	19.93	44.76	0.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW1	09/29/03	64.69	b	21.24	43.45	0.00	<0.50	<0.50	<0.50	<1.0	<50	<50	<500	<0.50	--	--	--	--	--	--	--	--	--	--
MW1	12/12/03	64.69	b	21.27	43.42	0.00	<0.50	<0.50	<0.50	1.1	<50	58	<500	<0.50	--	--	--	--	--	--	--	--	--	--
MW1	03/15/04	64.69	b	18.18	46.51	0.00	<0.50	<0.50	<0.50	<1.0	<50	<50	<500	<0.50	--	0.14	--	--	--	--	--	--	--	--
MW1	06/24/04	64.69	b	20.48	44.21	0.00	<0.50	<0.50	<0.50	<1.0	<50	<50	<500	<0.50	--	0.15	--	--	--	--	--	--	--	--
MW1	09/29/04	64.69	b	21.37	43.32	0.00	<0.50	0.51	<0.50	<1.0	<50	<50	<500	<0.50	--	1.01	--	6.42	--	--	--	--	--	--
MW1	12/13/04	64.69	b	20.63	44.06	0.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW1	03/14/05	64.69	b	18.69	46.00	0.00	<0.50	<0.50	<0.50	<1.0	<50	73	<500	<0.50	--	1.96	--	6.04	--	--	--	--	--	--
MW1	06/15/05	64.69	b	20.32	44.37	0.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW1	09/26/05	64.69	b	22.10	42.59	0.00	<0.50	<0.50	<0.50	<1.0	<50	<50	<500	<0.50	--	1.84	317.4	6.43	--	--	--	--	--	--
MW1	12/12/05	64.69	b	22.39	42.30	0.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW1	03/29/06	64.69	b	15.24	49.45	0.00	<0.50	<0.50	<0.50	<0.50	<50	<50	<100	74	--	1.57	--	6.73	--	--	--	--	--	--
MW1	06/19/06	64.69	b	18.27	46.42	0.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW1	09/29/06	64.69	b	20.06	44.63	0.00	<0.50	<0.50	<0.50	<0.50	<50	<50	<100	7.9	--	0.43	--	6.40	--	--	--	--	--	--
MW1	12/12/06	64.69	b	20.32	44.37	0.00	<0.50	<0.50	<0.50	<0.50	<50	<50	<100	9.4	--	0.38	--	6.39	--	--	--	--	--	--
MW1	03/01/07	64.69	b	18.68	46.01	0.00	<0.50	<0.50	<0.50	<0.50	<50	<50	<100	3.5	--	0.86	--	6.39	--	--	--	--	--	--
MW1	06/12/07	64.69	b	20.28	44.41	0.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW1	09/25/07	64.69	b	21.37	43.32	0.00	<0.50	<0.50	<0.50	<0.50	<50	<50	<100	1.8	--	16.87	--	6.40	--	--	--	--	--	--
MW1	12/20/07	64.69	b	21.48	43.21	0.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW1	03/26/08	64.69	b	20.98	43.71	0.00	<0.50	<0.50	<0.50	<0.50	<50	<50	<100	<0.50	--	3.1	71.10	6.11	--	--	--	--	--	--
MW1	06/03/08	64.69	b	20.70	43.99	0.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW2	07/27/93	101.27	a	22.10	79.17	0.00	10,000	27,000	2,900	20,000	120,000	--	--	--	--	--	--	--	--	--	--	--	--	--
MW2	10/02/97	101.27	a	22.91	78.36	0.43	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
MW2	06/30/98	101.27	a	19.69	81.58	0.45	7,300	18,000	2,500	15,600	72,000	--	--	5,500	185	2.2	--	5.98	--	--	--	--	--	--
MW2	07/29/98	101.27	a	20.11	81.16	0.29	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW2	08/26/98	101.27	a	20.54	80.73	0.08	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW2	10/01/98	101.27	a	21.52	79.75	0.42	6,400	17,000	2,600	17,000	84,000	--	--	2,000	--	2.7	--	6.47	--	--	--	--	--	--
MW2	10/30/98	101.27	a	21.54	79.73	0.10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW2	11/30/98	101.27	a	21.21	80.06	0.04	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW2	12/28/98	101.27	a	21.10	80.17	0.02	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW2	01/25/99	101.27	a	20.80	80.47	0.01	9,000	26,000	3,800	27,500	130,000	--	--	5,800	386	0.3	--	6.69	--	--	--	--	--	--

TABLE 2 CUMULATIVE GROUNDWATER ELEVATION AND ANALYTICAL DATA
FORMER VAL STROUGH CHEVROLET, 327 34th STREET OAKLAND, CALIFORNIA

Well Number	Date	Casing Elevation (feet)		Depth to Water (feet)	GW Elevation (feet)	SPH Thickness (feet)	Concentration (µg/L) Benzene	Toluene	Ethyl-benzene	Total Xylenes	TPH-g	TPH-d	TPH-mo	MTBE	Concentration (mg/L) CO_2 (lab)	DO (field)	Eh (mv) (field)	pH (field)	Fe(II)	Mn	SO_4	$N\text{-}NH_3$	$N\text{-}NO_3$	$o\text{-}PO_4$
MW2	02/26/99	101.27	a	18.00	83.27	sheen	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW2	03/24/99	101.27	a	18.27	83.00	trace	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW2	05/12/99	101.27	a	19.08	82.19	trace	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW2	12/15-16/99	101.27	a	22.42	78.85	0.025	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
MW2	03/20/00	101.27	a	17.09	84.18	0.026	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW2	07/20/00	101.27	a	20.86	80.41	0.017	*	*	*	*	*	*	*	*	*	0.88	*	6.37	*	*	*	*	*	*
MW2	10/11/00	101.27	a	22.10	79.17	0.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW2	04/10-11/01	101.27	a	19.98	81.29	0.00	8,000	22,000	2,600	23,500	150,000	1,500	<600	3,600	168	NR	--	NR	3.1	2.5	16	0.14	0.19	<0.20
MW2	07/10/01	101.27	a	21.85	79.42	0.00	5,900	15,000	2,300	12,100	83,000	5,700	<1,500	2,800	--	--	--	--	--	--	--	--	--	--
MW2	11/20/01	65.95	b	22.75	43.20	0.00	--	--	--	--	--	--	--	--	120	NR	--	6.15	1.8	2	16	<0.10	--	<0.20
MW2	02/19/02	65.95	b	20.12	45.83	0.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW2	05/21/02	65.95	b	21.10	44.85	0.00	8,600	25,000	3,500	26,000	150,000	31,000	<3,000	4,800	160	0.88	--	5.99	3.9	1.7	13	<0.10	0.54	<0.20
MW2	06/27/03	65.95	b	21.48	44.47	0.35	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW2	09/29/03	65.95	b	23.04	42.91	0.48	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
MW2[e]	12/12/03	65.95	b	22.75	43.31	0.16	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
MW2[e]	03/15/04	65.95	b	19.24	46.72	0.01	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
MW2[e]	06/24/04	65.95	b	22.10	44.06	0.31	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
MW2[e]	09/29/04	65.95	b	22.81	43.14	sheen	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
MW2[e]	12/13/04	65.95	b	22.06	43.95	0.08	3,700	12,000	1,900	10,000	47,000	2,600	<500	1,200	*	0.27	*	6.63	*	*	*	*	*	*
MW2[j]	03/14/05	65.95	b	25.00	40.95	0.00	780	3,700	920	6,400	43,000	43,000	<5,000	<200	*	*	*	*	*	*	*	*	*	*
MW2	06/15/05	65.95	b	21.14	44.81	0.00	2,900	15,000	2,400	22,000	120,000	13,000	<2,500	810	--	3.05	-147.6	--	--	--	--	--	--	--
MW2	07/18/05	65.95		NM	NC	NM	2,700	13,000	1,800	15,000	120,000	17,000	--	530	--	--	--	--	--	--	--	--	--	--
MW2	09/26/05	65.95		22.93	43.02	0.00	570	4,000	620	6,200	31,000	63,000	28,000	<50	--	--	--	--	--	--	--	--	--	--
MW2	12/12/05	65.95		25.40	40.55	0.00	670	5,300	1,100	9,800	34,000	2,800	<500	65	--	--	--	--	--	--	--	--	--	--
MW2	03/29/06	65.95		15.66	50.29	sheen	620	2,800	540	4,700	33,000	<4,000	<100	37	--	7.59	--	6.9	--	--	--	--	--	--
MW2	06/19/06	65.95		19.14	46.81	sheen	680	5,200	990	16,000	120,000	<30,000	1,900	170	--	1.78	--	6.21	--	--	--	--	--	--
MW2	09/29/06	65.95	b	21.16	44.79	0.00	1,200	5,100	1,200	9,300	59,000	<8000	300	230	--	1.71	--	6.66	--	--	--	--	--	--
MW2	12/12/06	65.95	b	21.46	44.49	0.00	850	4,400	1,100	8,900	45,000	<10000	360	110	--	1.5	--	6.61	--	--	--	--	--	--
MW2	03/01/07	65.95	b	19.48	46.47	0.00	1,400	5,200	980	9,500	71,000	<18000	460	160	--	1.2	--	6.7	--	--	--	--	--	--
MW2	06/12/07	65.95	b	20.98	44.97	0.00	1,300	4,900	1,200	8,900	40,000	<3000	<100	130	--	1.12	--	6.7	--	--	--	--	--	--
MW2	09/25/07	65.95	b	22.57	43.38	0.00	1,400	6,500	1,900	13,000	68,000	<12000	250	240	--	2.52	--	6.57	--	--	--	--	--	--
MW2	12/20/07	65.95	b	22.70	43.25	0.00	1,400	7,000	2,400	16,000	75,000	<5000	650	270	--	1.1	--	6.47	--	--	--	--	--	--
MW2	03/26/08	65.95	b	22.51	43.44	0.00	1,400	6,200	1,800	16,000	83,000	<10000	360	480	--	4.13	-5.7	6.18	--	--	--	--	--	--
MW2	06/03/08	65.95	b	21.85	44.10	0.00	**1,900**	**11,000**	**2,500**	**18,000**	**98,000**	<12000	**500**	**660**	--	**0.91**	**-24.6**	**6.43**	--	--	--	--	--	--
MW3	07/27/93	101.29	a	22.28	79.01	0.02	9,100	24,000	5,300	33,000	330,000	--	--	--	--	--	--	--	--	--	--	--	--	--
MW3	10/02/97	101.29	a	22.71	78.58	0.03	4,200	11,000	1,800	10,600	36,000	--	--	3,500	--	--	--	--	--	--	--	--	--	--
MW3	06/30/98	101.29	a	19.47	81.82	0.00	4,800	11,000	1,200	7,100	51,000	--	--	3,900	300	2	--	6.03	1.4	9.8	13	1.4	<0.10	2.4
MW3	07/29/98	101.29	a	20.01	81.28	0.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW3	08/26/98	101.29	a	20.62	80.67	0.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW3	10/01/98	101.29	a	21.33	79.96	0.00	3,900	8,500	1,200	6,000	38,000	--	--	2,300	240	2	--	6.65	--	--	--	--	--	--
MW3	10/30/98	101.29	a	21.62	79.67	0.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW3	11/30/98	101.29	a	21.31	79.98	0.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW3	12/28/98	101.29	a	21.15	80.14	0.06	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW3	01/25/99	101.29	a	20.79	80.50	0.00	4,000	10,000	1200	6700	5,100	--	--	2900	238	1	--	7.01	--	--	--	--	--	--
MW3	02/26/99	101.29	a	18.02	83.27	0.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW3	03/24/99	101.29	a	18.37	82.92	0.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW3	05/12/99	101.29	a	19.22	82.07	0.0083	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW3	12/15-16/99	101.29	a	22.43	78.86	0.00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
MW3	03/20/00	101.29	a	17.14	84.15	0.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW3	07/20/00	101.29	a	20.98	80.31	0.00	5,700	14,000	1,600	9,300	69,000	2,900	<300	3,300	128	2.05	--	6.73	3.9	6.6	20	<0.10	0.55	<0.20
MW3	10/11/00	101.29	a	22.24	79.05	0.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW3	04/10-11/01	101.29	a	20.70	80.59	0.00	7,200	<0.001	2,300	12,900	110,000	4,700	<1,500	4,300	137	NR	--	NR	1	6	8.2	<0.10	0.13	<0.20
MW3	07/10/01	101.29	a	21.97	79.32	0.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

TABLE 2 CUMULATIVE GROUNDWATER ELEVATION AND ANALYTICAL DATA
FORMER VAL STROUGH CHEVROLET, 327 34th STREET OAKLAND, CALIFORNIA

		Casing		Depth to	GW	SPH	Concentration (µg/L)								Concentration (mg/L)									
Well Number	Date	Elevation (feet)		Water (feet)	Elevation (feet)	Thickness (feet)	Benzene	Toluene	Ethyl-benzene	Total Xylenes	TPH-g	TPH-d	TPH-mo	MTBE	CO_2 (lab)	DO (field)	Eh (mv) (field)	pH (field)	Fe(II)	Mn	SO_4	N-NH_3	N-NO_3	o-PO_4
MW3	11/20/01	65.99	b	22.80	43.19	0.00	6,300	16,000	2,400	14,900	100,000	5,900	<900	4,000	120	2.93	--	6.67	0.84	12	31	<0.10	--	<0.20
MW3	02/19/02	65.99	b	20.11	45.88	0.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW3	05/21/02	65.99	b	21.20	44.79	0.00	6,500	17,000	2,200	12,700	91,000	14,000	<3,000	2,200	130	1.01	--	6.62	4.2	9.6	25	<0.10	0.77	<0.20
MW3	06/27/03	65.99	b	21.32	44.67	sheen	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW3	09/29/03	65.99	b	22.79	43.20	sheen	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
MW3[e]	12/12/03	65.99	b	22.73	43.27	0.01	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
MW3[e]	03/15/04	65.99	b	19.32	46.67	sheen	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
MW3	06/24/04	65.99	b	21.99	44.00	0.00	3,400	7,700	1,000	4,800	39,000	1,700	<500	1,100	--	0.07	--	--	--	--	--	--	--	--
MW3	09/29/04	65.99	b	22.54	43.45	0.00	2,900	6,700	980	4,300	29,000	2,200	<500	1,100	--	0.80	--	6.42	--	--	--	--	--	--
MW3	12/13/04	65.99	b	22.06	43.93	0.00	1,700	2,900	790	3,400	17,000	1,300	<500	490	--	0.16	--	6.7	--	--	--	--	--	--
MW3[j]	03/14/05	65.99	b	24.00	41.99	0.00	680	1,700	380	1,600	10,000	670	<500	67	--	--	--	--	--	--	--	--	--	--
MW3	06/15/05	65.99	b	21.13	44.86	0.00	260	960	330	1,400	12,000	1,200	<500	31	--	1.93	-150.4	--	--	--	--	--	--	--
MW3	07/18/05	65.99	b	NM	NC	NM	1,000	5,600	1,100	4,300	23,000	1,700	--	81	--	--	--	--	--	--	--	--	--	--
MW3	09/26/05	65.99	b	22.92	43.07	0.00	4,000	17,000	1,900	17,000	79,000	5,100	540	270	--	--	--	--	--	--	--	--	--	--
MW3	12/12/05	65.99	b	23.30	42.69	0.00	200	710	450	1,400	7,000	550	<500	<10	--	--	--	--	--	--	--	--	--	--
MW3	03/29/06	65.99	b	15.70	50.29	0.00	110	300	130	490	3,800	<200	<100	13	--	1.23	--	6.89	--	--	--	--	--	--
MW3	06/19/06	65.99	b	19.11	46.88	0.00	160	500	320	840	7,000	<300	<100	3.1	--	2.30	--	6.40	--	--	--	--	--	--
MW3	09/29/06	65.99	b	21.15	44.84	0.00	1,300	2,300	720	2,900	22,000	<1500	<100	110	--	1.05	--	6.78	--	--	--	--	--	--
MW3	12/12/06	65.99	b	21.38	44.61	0.00	1,400	2,200	670	2,600	21,000	<1500	<100	130	--	0.6	--	6.72	--	--	--	--	--	--
MW3	03/01/07	65.99	b	19.50	46.49	0.00	1,100	2,500	510	2,200	17,000	<600	<100	51	--	1.11	--	6.76	--	--	--	--	--	--
MW3	06/12/07	65.99	b	21.00	44.99	0.00	1,800	4,000	800	3,300	22,000	<1500	<100	150	--	0.97	--	6.74	--	--	--	--	--	--
MW3	09/25/07	65.99	b	22.59	43.40	0.00	2,400	5,000	1,000	4,600	29,000	<500	<100	220	--	1.62	--	6.63	--	--	--	--	--	--
MW3	12/20/07	65.99	b	22.59	43.40	0.00	2,400	4,900	1,100	4,700	36,000	<2000	<100	240	--	0.9	--	6.62	--	--	--	--	--	--
MW3	03/26/08	65.99	b	22.13	43.86	0.00	4,500	11,000	1,700	7,800	54,000	<1500	<100	340	--	2.2	3.1	6.35	--	--	--	--	--	--
MW3	06/03/08	65.99	b	21.81	44.18	0.00	**3,900**	**8,700**	**1,500**	**7,000**	**47,000**	<1500	<100	**470**	**--**	**0.88**	**-29.2**	**6.64**	--	--	--	--	--	--
MW4	06/30/98	98.65	a	16.93	81.72	0.00	2,200	930	850	2,100	10,000	--	--	1,800	222	2.6	--	6.18	0.14	4.3	14	0.8	0.8	1.5
MW4	07/29/98	98.65	a	17.48	81.17	0.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW4	08/26/98	98.65	a	18.65	80.00	0.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW4	10/01/98	98.65	a	18.74	79.91	0.00	570	46	130	36	1,100	--	--	1,300	320	3.4	--	<0.001	--	--	--	--	--	--
MW4	10/30/98	98.65	a	19.02	79.63	0.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW4	11/30/98	98.65	a	18.74	79.91	0.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW4	12/28/98	98.65	a	18.60	80.05	0.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW4	01/25-26/99	98.65	a	18.32	80.33	0.00	230	<8.3	<8.3	<8.3	290	--	--	1,300	475	6.7	--	7	--	--	--	--	--	--
MW4	02/26/99	98.65	a	15.81	82.84	0.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW4	03/24/99	98.65	a	16.01	82.64	0.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW4	05/12/99	98.65	a	17.71	80.94	0.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW4	12/15-16/99	98.65	a	19.83	78.82	0.00	5.8	<0.50	<0.50	<0.50	<50	--	--	1,400	--	1.75	--	7.02	--	--	--	--	--	--
MW4	03/20/00	98.65	a	14.9	83.75	0.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW4	07/20/00	98.65	a	18.38	80.27	0.00	91	4.6	19	12.9	210	<50	<300	1,500	126	3.88	--	6.67	9.5	5.3	11	<0.10	0.04	<0.20
MW4	10/11/00	98.65	a	19.61	79.04	0.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW4	04/10-11/01	98.65	a	17.55	81.10	0.00	110	<5.0	<5.0	<5.0	350	<50	<300	1,100	107	NR	--	NR	0.8	6.3	10	<0.10	<0.05	<0.20
MW4	07/10/01	98.65	a	19.34	79.31	0.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW4	11/20/01	63.35	b	20.16	43.19	0.00	<2.5	4	<2.5	3.7	96	<50	<300	2,500	130	0.83	--	6.51	1.6	10	11	<0.10	--	<0.20
MW4	02/19/02	63.35	b	17.34	46.01	0.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW4	05/21/02	63.35	b	18.57	44.78	0.00	340	5.7	70	<1.0	940	83	<300	1,600	150	1.65	--	6.32	3.1	8.4	9	<0.10	0.06	<0.20
MW4	06/27/03	63.35	b	18.72	44.63	0.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW4	09/29/03	63.35	b	20.11	43.24	0.00	<5.0	<5.0	<5.0	<10	1,100	<50	<500	1,700	--	--	--	--	--	--	--	--	--	--
MW4	12/12/03	63.35	b	20.06	43.29	0.00	<13	<13	<13	<25	<1,300	<50	<500	1,000	--	--	--	--	--	--	--	--	--	--
MW4	03/15/04	63.35	b	16.89	46.46	0.00	1.5	<0.50	<0.50	<1.0	54	<50	<500	41	--	0.16	--	--	--	--	--	--	--	--
MW4	06/24/04	63.35	b	19.31	44.04	0.00	69	<5.0	<5.0	<10	920	<50	<500	1,100	--	0.15	--	--	--	--	--	--	--	--
MW4	09/29/04	63.35	b	20.20	43.15	0.00	<5.0	<5.0	<5.0	<10	940	<50	<500	1,200	--	0.13	--	6.63	--	--	--	--	--	--
MW4	12/13/04	**	b	20.44	NC	0.00	<5.0	<5.0	<5.0	<10	740	<50	<500	860	--	0.58	--	6.84	--	--	--	--	--	--
MW4	03/14/05	**	b	18.30	NC	0.00	20	<5.0	<5.0	<10	930	<50	<500	930	--	0.28	--	6.34	--	--	--	--	--	--

TABLE 2 CUMULATIVE GROUNDWATER ELEVATION AND ANALYTICAL DATA
FORMER VAL STROUGH CHEVROLET, 327 34th STREET OAKLAND, CALIFORNIA

Well Number	Date	Casing Elevation (feet)	Depth to Water (feet)	GW Elevation (feet)	SPH Thickness (feet)	Concentration (μg/L) Benzene	Toluene	Ethyl-benzene	Total Xylenes	TPH-g	TPH-d	TPH-mo	MTBE	Concentration (mg/L) CO_2 (lab)	DO (field)	Eh (mv) (field)	pH (field)	Fe(II)	Mn	SO_4	$N\text{-}NH_3$	$N\text{-}NO_3$	$o\text{-}PO_4$
MW4	06/15/05	** b	20.03	NC	0.00	350	6.1	<5.0	<10	2100	89	<500	1,100	--	0.46	-98.9	--	--	--	--	--	--	--
MW4	07/18/05	**	NM	NC	NM	11	<5.0	<5.0	<10	540	<50	--	1,100	--	--	--	--	--	--	--	--	--	--
MW4	09/26/05	**	21.79	NC	0.00	<5.0	<5.0	<5.0	<10	960	<50	<500	660	--	2.20	210.4	6.73	--	--	--	--	--	--
MW4	12/12/05	**	21.89	NC	0.00	<5.0	<5.0	<5.0	<10	820	<50	<500	1,000	--	2.05	--	6.62	--	--	--	--	--	--
MW4	03/29/06	**	14.85	NC	0.00	49	160	120	300	2,400	<100	<100	130	--	1.07	--	6.82	--	--	--	--	--	--
MW4	06/19/06	**	17.96	NC	0.00	100	940	540	1,800	8,800	<400	<100	55	--	2.49	--	5.76	--	--	--	--	--	--
MW4	09/29/06	63.35 b	19.85	43.50	0.00	18.0	2.6	1.5	3.5	370.0	<50	<100	180	--	0.25	--	6.66	--	--	--	--	--	--
MW4	12/12/06	63.35 b	20.03	43.32	0.00	11.0	0.77	<0.5	<0.5	230.0	<50	<100	260	--	0.90	--	6.61	--	--	--	--	--	--
MW4	03/01/07	63.35 b	18.33	45.02	0.00	63.0	7.10	40.0	190.0	1,800.0	<50	<100	130	--	0.76	--	6.6	--	--	--	--	--	--
MW4	06/12/07	63.35 b	19.70	43.65	0.00	9.3	<0.5	<0.5	<0.5	70.0	<50	<100	150	--	1.06	--	6.9	--	--	--	--	--	--
MW4	09/25/07	63.35 b	21.27	42.08	0.00	<0.5	<0.5	<0.5	<0.5	<50	<50	<100	300	--	6.67	--	6.59	--	--	--	--	--	--
MW4	12/20/07	63.35 b	21.30	42.05	0.00	<0.5	<0.5	<0.5	<0.5	<50	<50	<100	370	--	1.45	--	6.57	--	--	--	--	--	--
MW4	03/26/08	63.35 b	20.89	42.46	0.00	<0.5	<0.5	<0.5	<0.5	<50	<50	<100	260	--	4.56	65	6.35	--	--	--	--	--	--
MW4	06/03/08	63.35 b	20.51	42.84	0.00	<0.5	<0.5	<0.5	<0.5	<50	<50	<100	**190**	**--**	**1.34**	**101.3**	**6.49**	--	--	--	--	--	--
MW5	06/30/98	100.9 a	20.60	80.30	0.00	<0.50	<0.50	<0.50	<0.50	<50	--	--	23	220	4.3	--	6.1	--	--	--	--	--	--
MW5	07/29/98	100.9 a	21.52	79.38	0.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW5	08/26/98	100.9 a	22.21	78.69	0.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW5	10/01/98	100.9 a	22.95	77.95	0.00	<1.0	<1.0	<1.0	<1.0	<50	--	--	<2.0	256	4.8	--	6.71	--	--	--	--	--	--
MW5	10/30/98	100.9 a	23.23	77.67	0.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW5	11/30/98	100.9 a	23.12	77.78	0.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW5	12/28/98	100.9 a	23.18	77.72	0.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW5	01/25-26/99	100.9 a	22.61	78.29	0.00	<1.0	<1.0	<1.0	<1.0	<50	--	--	<2.0	305	9.7	--	7.04	--	--	--	--	--	--
MW5	02/26/99	100.9 a	19.78	81.12	0.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW5	03/24/99	100.9 a	20.25	80.65	0.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW5	05/12/99	100.9 a	21.06	79.84	0.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW5	12/15-16/99	100.9 a	24.19	76.71	0.00	<0.50	<0.50	<0.50	<0.50	<50	--	--	<0.50	--	2.72	--	7.19	--	--	--	--	--	--
MW5	03/20/00	100.9 a	19.15	81.75	0.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW5	07/20/00	100.9 a	21.84	79.06	0.00	<0.50	0.98	<0.50	<0.50	<50	<50	<300	1.9	134	5.58	--	6.35	0.11	0.017	49	<0.10	3.9	<0.20
MW5	10/11/00	100.9 a	23.4	77.50	0.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW5	04/10-11/01	100.9 a	22.3	78.60	0.00	<0.50	2.6	<0.50	0.6	<50	<50	<300	1.5	183	66	--	NR	<0.10	0.042	45	<0.10	2.9	0.11
MW5	07/10/01	100.9 a	23.64	77.26	0.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW5	11/20/01	65.59 b	24.65	40.94	0.00	0.83	12	1.2	11	140	860	2,500	10	--[c]	66	--	6.01	0.2	2.5	42	<0.10	--	<0.20
MW5	02/19/02	65.59 b	22.37	43.22	0.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW5	05/21/02	65.59 b	23.10	42.49	0.00	<0.50	<0.50	<0.50	<0.50	<50	2,200	<300	<2.0	140	66	--	6.3	<0.1	0.22	44	<0.10	3	<0.20
MW5	06/27/03	65.59 b	23.07	42.52	0.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW5	09/29/03	65.59 b	24.38	41.21	0.00	<0.50	0.52	7.1	35	100	<50	<500	1.4	--	--	--	--	--	--	--	--	--	--
MW5	12/12/03	65.59 b	23.90	41.69	0.00	<0.50	<0.50	<0.50	<1	<50	<50	<500	1.5	--	--	--	--	--	--	--	--	--	--
MW5	03/15/04	65.59 b	20.82	44.77	0.00	<0.50	<0.50	<0.50	<1.0	<50	<50	<500	<0.50	--	6.4	--	--	--	--	--	--	--	--
MW5	06/24/04	65.59 b	23.57	42.02	0.00	<0.50	<0.50	<0.50	<1.0	<50	130	<500	0.79	--	5.56	--	--	--	--	--	--	--	--
MW5	09/29/04	65.59 b	24.44	41.15	0.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW5	12/13/04	65.59 b	23.87	41.72	0.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW5	03/14/05	65.59 b	20.18	45.41	0.00	<0.50	1.3	1.5	8.6	82	<50	<500	<0.50	--	3.91	--	5.57	--	--	--	--	--	--
MW5	06/15/05	65.59 b	12.96	52.63	0.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW5	09/26/05	65.59 b	23.60	41.99	0.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW5	12/12/05	65.59 b	23.84	41.75	0.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW5	03/29/06	65.59 b	17.19	48.40	0.00	<0.50	<0.50	<0.50	<0.50	73	<50	<100	<0.50	--	2.3	--	6.3	--	--	--	--	--	--
MW5	06/19/06	65.59 b	20.22	45.37	0.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-5	09/29/06	65.59 b	22.80	42.79	0.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-5	12/12/06	65.59 b	23.08	42.51	0.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-5	03/01/07	65.59 b	21.02	44.57	0.00	<0.50	<0.50	<0.50	<0.50	54	<50	<100	<0.50	--	4.35	--	6.08	--	--	--	--	--	--
MW-5	06/12/07	65.59 b	22.78	42.81	0.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-5	09/25/07	65.59 b	24.45	41.14	0.00	<0.50	1.5	<0.50	<0.50	<50	<50	<100	0.64	--	18.71	--	6.26	--	--	--	--	--	--
MW-5	12/20/07	65.59 b	24.52	41.07	0.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

TABLE 2 CUMULATIVE GROUNDWATER ELEVATION AND ANALYTICAL DATA
FORMER VAL STROUGH CHEVROLET, 327 34th STREET OAKLAND, CALIFORNIA

Well Number	Date	Casing Elevation (feet)		Depth to Water (feet)	GW Elevation (feet)	SPH Thickness (feet)	Concentration (µg/L) Benzene	Toluene	Ethyl-benzene	Total Xylenes	TPH-g	TPH-d	TPH-mo	MTBE	Concentration (mg/L) CO_2 (lab)	DO (field)	Eh (mv) (field)	pH (field)	Fe(II)	Mn	SO_4	N-NH_3	N-NO_3	o-PO_4
MW-5	03/26/08	65.59	b	24.08	41.51	0.00	<0.50	1.5	<0.50	<0.50	<50	<50	<100	<0.5	--	7.93	88	5.86	--	--	--	--	--	--
MW-5	06/03/08	65.59	b	23.68	41.91	0.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW6	07/20/00	96.60	a	18.30	78.30	0.00	<0.50	<0.50	<0.50	<0.50	<50	<50	<300	160	122	2.72	--	6.66	120	1.9	53	6	0.05	<0.20
MW6	10/11/00	96.60	a	18.69	77.91	0.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW6	04/10-11/01	96.60	a	17.85	78.75	0.00	<0.50	<0.50	<0.50	<0.50	<50	<50	<300	180	142	NR	--	NR	22	2.2	0.69	5.2	<0.05	<0.20
MW6	07/10/01	96.60	a	18.43	78.17	0.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW6	11/20/01	59.60	b	18.67	40.93	0.00	<0.50	<0.50	<0.50	<0.50	<50	<50	<300	450	100	2.03	--	6.44	29	5.2	1.1	3.4	--	<0.20
MW6	02/19/02	59.60	b	17.40	42.20	0.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW6	05/21/02	59.60	b	17.68	41.92	0.00	<0.50	<0.50	<0.50	<0.50	<50	<50	<300	170	100	0.76	--	6.6	11	3.4	1.4	8.9	0.65	<0.20
MW6	06/27/03	59.60	b	17.73	41.87	0.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW6	09/29/03	59.60	b	18.48	41.12	0.00	<1.0	<1.0	<1.0	<2.0	230	<50	<500	340	--	--	--	--	--	--	--	--	--	--
MW6	12/12/03	59.60	b	17.89	41.71	0.00	<2.5	<2.5	<2.5	<5.0	<250	51	<500	190	--	--	--	--	--	--	--	--	--	--
MW6	03/15/04	59.60	b	16.46	43.14	0.00	<1.0	<1.0	<1.0	<2.0	200	<50	<500	220	--	0.11	--	--	--	--	--	--	--	--
MW6	06/24/04	59.60	b	17.97	41.63	0.00	<1.0	<1.0	<1.0	<2.0	130	<50	<500	190	--	0.05	--	--	--	--	--	--	--	--
MW6	09/29/04	59.60	b	18.55	41.05	0.00	<0.50	0.61	<0.50	1.2	210	<50	<500	190	--	0.37	--	6.60	--	--	--	--	--	--
MW6	12/13/04	59.60	b	17.88	41.72	0.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW6	03/14/05	59.60	b	16.82	42.78	0.00	<0.50	<0.50	<0.50	1.8	160	<50	<500	190	--	0.08	--	5.65	--	--	--	--	--	--
MW6	06/15/05	59.60	b	17.60	42.00	0.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW6	09/26/05	59.60	b	NM	NM	0.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW6	12/12/05	59.60	b	18.33	41.27	0.00	0.62	<0.50	<0.50	1.0	81	<50	<500	140	--	1.52	--	6.61	--	--	--	--	--	--
MW6	03/29/06	59.60	b	14.53	45.07	0.00	<0.50	<0.50	<0.50	<0.50	<50	<50	<100	120	--	6.93	--	6.06	--	--	--	--	--	--
MW6	06/19/06	59.60	b	16.46	43.14	0.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW6	09/29/06	59.60	b	17.60	42.00	0.00	0.87	<0.50	<0.50	<0.50	<50	<50	<100	140	--	0.16	--	6.49	--	--	--	--	--	--
MW6	12/12/06	59.60	b	16.93	42.67	0.00	0.67	<0.50	<0.50	<0.50	<50	<50	230	89	--	0.5	--	6.68	--	--	--	--	--	--
MW6	03/01/07	59.60	b	16.30	43.30	0.00	<0.50	<0.50	<0.50	<0.50	<50	<50	<100	78	--	0.83	--	6.66	--	--	--	--	--	--
MW6	06/12/07	59.60	b	17.38	42.22	0.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW6	09/25/07	59.60	b	18.36	41.24	0.00	<0.50	<0.50	<0.50	<0.50	<50	<50	<100	89	--	8.5	--	6.78	--	--	--	--	--	--
MW6	12/20/07	59.60	b	17.90	41.70	0.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW6	03/26/08	59.60	b	17.37	42.23	0.00	<0.50	<0.50	<0.50	<0.50	<50	<50	<100	68	--	5.57	-35	6.38	--	--	--	--	--	--
MW6	06/03/08	59.60	b	17.11	42.49	0.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW7	07/20/00	96.75	a	15.93	80.82	0.00	<0.50	<0.50	<0.50	<0.50	<50	<50	<300	<0.50	32.2	7.15	--	7.43	<0.1	0.002	7.5	<0.10	2.6	0.13
MW7	10/11/00	96.75	a	16.90	79.85	0.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW7	04/10-11/01	96.75	a	15.80	80.95	0.00	<0.50	<0.50	<0.50	<0.50	<50	<50	<300	<0.50	77.6	NR	--	NR	0.18	0.048	49	<0.10	2.7	0.31
MW7	07/10/01	96.75	a	16.71	80.04	0.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW7	11/20/01	59.47	b	16.17	43.30	0.00	<0.50	<0.50	<0.50	<0.50	<50	<50	<300	<2.0	62	0.96	--	7.11	0.16	1.8	63	<0.10	--	<0.20
MW7	02/19/02	59.47	b	14.92	44.55	0.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW7	05/21/02	59.47	b	15.18	44.29	0.00	<0.50	<0.50	<0.50	<0.50	<50	<50	<300	<0.50	68	1.03	--	7.57	0.11	0.35	51	<0.10	2.8	0.11
MW7	06/27/03	59.47	b	16.28	43.19	0.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
MW7	09/29/03	59.47	b	16.88	42.59	0.00	<0.50	<0.50	<0.50	<1.0	<50	<50	<500	0.62	--	--	--	--	--	--	--	--	--	--
MW7	12/12/03	59.47	b	14.95	44.52	0.00	<0.50	<0.50	<0.50	<1.0	<50	<50	<500	<0.50	--	--	--	--	--	--	--	--	--	--
MW7	03/15/04	59.47	b	14.77	44.70	0.00	<0.50	<0.50	<0.50	<1.0	<50	<50	<500	<0.50	--	0.54	--	--	--	--	--	--	--	--
MW7	06/24/04	59.47	b	16.33	43.14	0.00	<0.50	<0.50	<0.50	<1.0	<50	300	<500	<0.50	--	0.20	--	--	--	--	--	--	--	--
MW7	09/29/04	59.47	b	16.88	42.59	0.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW7	12/13/04	59.47	b	15.26	44.21	0.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW7	03/14/05	59.47	b	15.00	44.47	0.00	<0.50	<0.50	<0.50	<1.0	<50	<50	<500	<0.50	--	0.47	--	6.15	--	--	--	--	--	--
MW7	06/15/05	59.47	b	15.32	44.15	0.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW7	09/26/05	59.47	b	NM	NM	0.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW7	12/12/05	59.47	b	15.99	43.48	0.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW7	03/29/06	59.47	b	12.65	46.82	0.00	<0.50	<0.50	<0.50	<0.50	<50	<50	<100	<0.50	--	0.72	--	5.81	--	--	--	--	--	--
MW7	06/19/06	59.47	b	14.49	44.98	0.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW7	09/29/06	59.47	b	16.67	42.80	0.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW7	12/12/06	59.47	b	15.21	44.26	0.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

TABLE 2 CUMULATIVE GROUNDWATER ELEVATION AND ANALYTICAL DATA
FORMER VAL STROUGH CHEVROLET, 327 34th STREET OAKLAND, CALIFORNIA

Well Number	Date	Casing Elevation (feet)	Depth to Water (feet)	GW Elevation (feet)	SPH Thickness (feet)	Concentration (µg/L) Benzene	Toluene	Ethyl-benzene	Total Xylenes	TPH-g	TPH-d	TPH-mo	MTBE	Concentration (mg/L) CO_2 (lab)	DO (field)	Eh (mv) (field)	pH (field)	Fe(II)	Mn	SO_4	$N\text{-}NH_3$	$N\text{-}NO_3$	$o\text{-}PO_4$
MW7	03/01/07	59.47 b	14.68	44.79	0.00	<0.50	<0.50	<0.50	<0.50	<50	<50	<100	<0.50	--	0.92	--	6.84	--	--	--	--	--	--
MW7	06/12/07	59.47 b	16.2	43.27	0.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW7	09/25/07	59.47 b	16.72	42.75	0.00	<0.50	<0.50	<0.50	<0.50	<50	<50	<100	<0.50	--	6.11	--	6.78	--	--	--	--	--	--
MW7	12/20/07	59.47 b	15.02	44.45	0.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW7	03/26/08	59.47 b	15.95	43.52	0.00	<0.50	<0.50	<0.50	<0.50	<50	<50	<100	<0.50	--	3.3	23	6.46	--	--	--	--	--	--
MW7	06/03/08	59.47 b	14.24	45.23	0.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

SPH Separate-phase hydrocarbons.
CO_2 Carbon dioxide.
DO Dissolved oxygen.
Fe(II) Ferrous iron.
Mn Manganese.
SO_4 Sulfate.
$N\text{-}NH_3$ Ammonia.
$N\text{-}NO_3$ Nitrate.
$o\text{-}PO_4$ Ortho-Phosphate.
GW Groundwater.
TPH-g Total Petroleum Hydrocarbons as gasoline.
TPH-d Total Petroleum Hydrocarbons as diesel.
TPH-mo Total Petroleum Hydrocarbons as motor oil.
MTBE Methyl tertiary butyl ether.
NC Not calculated.
NM Not measured.
NR Not reported.
µg/L Micrograms per liter.
mg/L Milligrams per liter.
* SPH present; not sampled.
** Well MW4 elevation modified due to site renovation activities. Not Surveyed.
-- Not analyzed or not sampled.
< Less than the laboratory reporting limits.
a Elevations are referenced to monitoring well MW1, with assumed datum of 100.00 feet.
b Elevations based on a survey conducted August 2002 and referenced benchmark with known elevation (NGVD 29) of 60.40 feet above mean sea level.
c Analysis not conducted due to broken sample containers.
d Hydrocarbon reported in the gasoline range does not match laboratory gasoline standard.
e Groundwater elevation in wells with LPH are corrected by multiplying the specific gravity of gasoline (0.69) by the LPH thickness and adding this value to the water elevation.
f Hydrocarbon reported is in the early diesel range, and does not match the laboratory diesel standard.
g Sample contained discrete peak in gasoline range and identified by lab as MTBE.
h Quantity of unknown hydrocarbon(s) in sample based on diesel.
i The concentration reported reflect(s) individual or discrete unidentified peaks not matching a typical fuel pattern.
j Depth to groundwater is based on the depth of the stingers.
k Quantity of unknown hydrocarbon(s) in sample based on mtor oil.

TABLE 3 HISTORICAL SOIL ANALYTICAL DATA
FORMER VAL STROUGH CHEVROLET, 327 34th STREET OAKLAND, CALIFORNIA

Boring ID	Date	Depth (feet)	Benzene	Toluene	Ethyl-benzene	Total Xylenes	MTBE	TPH-g	TPH-d	TPH-mo
			Concentrations (mg/kg)							
MW1	7/19/1993	4.5-6	<0.005	<0.005	<0.005	0.0088	NA	<1	<10	NA
MW1	7/19/1993	9.5-11	<0.005	<0.005	<0.005	0.0088	NA	<1	<10	NA
MW1	7/19/1993	14.5-16	<0.005	<0.005	<0.005	<0.005	NA	<1	<10	NA
MW1	7/19/1993	19.5-21	<0.005	<0.005	<0.005	<0.005	NA	<1	<10	NA
MW1	7/19/1993	24.5-26	<0.005	<0.005	<0.005	<0.005	NA	<1	<10	NA
MW2	7/19/1993	4.5-6	7.2	71	31	260	NA	2000	NA	NA
MW2	7/19/1993	9.5-11	5.7	54	24	210	NA	1700	NA	NA
MW2	7/19/1993	14.5-16	1.8	14	5.1	51	NA	410	NA	NA
MW2	7/19/1993	19.5-21	**100**	**780**	**260**	**1700**	NA	**10000**	NA	NA
MW2	7/19/1993	24.5-26	1.9	5.2	0.56	3.4	NA	19	NA	NA
MW3	7/20/1993	4.5-6	ND	0.009	<0.005	0.014	NA	<1	NA	NA
MW3	7/19/1993	9.5-11	<0.005	<0.005	<0.005	0.009	NA	<1	NA	NA
MW3	7/19/1993	14.5-16	0.079	0.009	0.01	0.023	NA	<1	NA	NA
MW3	7/19/1993	19.5-21	6.4	46	14	150	NA	1400	NA	NA
MW3	7/19/1993	24.5-26	1.4	2.6	0.38	2	NA	19	NA	NA
MW4	6/26/1998	5-5.5	<0.005	<0.005	<0.005	<0.005	<0.02	<1	NA	NA
MW4	6/26/1998	20-20.5	<0.005	<0.005	<0.005	<0.005	<0.02	<1	NA	NA
MW4	6/26/1998	25-25.5	0.045	0.015	0.012	0.03	**62**	<1	NA	NA
MW5	7/19/1993	14.5-15	<0.005	<0.005	<0.005	<0.005	<0.02	<1	NA	NA
MW5	7/19/1993	20-20.5	<0.005	<0.005	<0.005	<0.005	<0.02	<1	NA	NA
B-6	6/26/1998	15.5-16	<0.005	<0.005	<0.005	<0.005	<0.02	<1	NA	NA
B-6	6/26/1998	21-21.5	<0.005	<0.005	<0.005	<0.005	<0.02	<1	NA	NA
TA001	3/14/1993	11	<0.010	0.11	0.48	0.28	NA	5	NA	NA
TA002	3/14/1993	11	<0.08	0.2	4.9	7.8	NA	130	NA	NA
TA003	3/14/1993	9	<0.005	<0.005	0.014	0.018	NA	<1	96	NA
TA004	3/14/1993	9	<0.005	<0.005	<0.005	<0.005	NA	<1	7	NA
SB3	12/26/2007	6	<0.005	<0.005	<0.005	0.0088	<0.005	2.1	7.6	<10
SB3	12/26/2007	10	<0.005	<0.005	<0.005	0.052	0.012	4.5	9.3	<10
SB3	12/26/2007	15	<0.005	<0.005	<0.005	<0.005	0.21	<1	2.4	<10
SB3	12/26/2007	23	0.0062	0.03	0.22	3	0.028	140	85	<10
SB4	12/26/2007	7	<0.005	<0.005	<0.005	<0.005	<0.005	<1	1.4	<10
SB4	12/26/2007	24	1.2	12	5	**26**	<0.025	240	47	<10
SB5	12/26/2007	11	<0.005	<0.005	<0.005	<0.005	<0.005	<1	<1	<10
SB5	12/26/2007	26	<0.005	<0.005	<0.005	<0.005	<0.005	<1	<1	<10
SB6	12/26/2007	10	<0.005	<0.005	<0.005	0.17	<0.005	19	250	<10
SB6	12/26/2007	18	<0.005	<0.005	<0.005	0.12	<0.005	7.2	64	<10
SB6	12/26/2007	26	<0.005	<0.005	<0.005	<0.005	<0.005	<1	<1	<10
SB7	12/26/2007	6	<0.005	<0.005	<0.005	<0.005	<0.005	<1	1.7	<10
SB7	12/26/2007	20	<0.005	<0.005	<0.005	0.048	<0.005	3.5	**720**	<10
SB7	12/26/2007	26	<0.005	<0.005	<0.005	0.0073	<0.005	<1	<1	<10
SB7	12/26/2007	35	<0.005	<0.005	<0.005	<0.005	<0.005	<1	<1	<10
SB8	12/26/2007	14	<0.005	<0.005	<0.005	<0.005	<0.005	<1	5	<10
SB8	12/26/2007	24	0.044	0.03	0.098	0.36	<0.005	1.9	2.7	<10
SB9	12/26/2007	8	<0.005	<0.005	<0.005	<0.005	<0.005	<1	47	<10
SB9	12/26/2007	22	<0.005	<0.005	<0.005	<0.005	<0.005	<1	<1	<10

TPH-g Total Petroleum Hydrocarbons as gasoline.

TPH-d Total Petroleum Hydrocarbons as diesel.

TPH-mo Total Petroleum Hydrocarbons as motor oil.

720 Bold values reflect maximum detected concentrations

< Less than the laboratory reporting limits.

TABLE 4 HISTORICAL GRAB GROUNDWATER ANALYTICAL DATA
FORMER VAL STROUGH CHEVROLET, 327 34th STREET OAKLAND, CALIFORNIA

Boring ID	Date	Depth (feet)	Benzene	Toluene	Ethyl-benzene	Total Xylenes	MTBE	TPH-g	TPH-d	TPH-mo
			Concentrations (µg/L)							
HP1	12/18/2003	26-30	<5.0	<5.0	<5.0	**11**	**480**	**410**	**180**	<500
HP3	12/18/2003	32-36	<0.50	<0.50	<0.50	<1.0	**0.55**	<50	**75**	<500
SB3	12/26/2007	24	0.75	28	35	180	0.59	1800	<1000	<100
SB3	12/26/2007	40	<0.50	1.1	5.3	33	1	240	<400	<100
SB4	12/26/2007	23	160	120	200	240	1.8	3500	<1500	<100
SB4	12/26/2007	40	250	1400	280	2000	3.2	9900	<1500	<100
SB5	12/26/2007	24	**660**	**11000**	**4200**	**20000**	34	**110000**	<100000	310
SB5	12/26/2007	40	74	1000	380	2400	31	13000	<3000	<100
SB6	12/26/2007	25	<0.5	6.6	3.6	27	1.2	210	<100	<100
SB6	12/26/2007	40	85	1500	620	6900	15	35000	<18000	<100
SB7	12/26/2007	40	120	1100	470	2900	7.9	20000	<6000	<100
SB8	12/26/2007	40	320	1300	920	3100	100	17000	<3000	<100
SB9	12/26/2007	34	<0.5	<0.5	<0.5	<0.5	92	<50	69	<100
SB10	12/26/2007	21.3	<0.5	<0.5	<0.5	<0.5	30	<50	2200	5000
SB11	12/26/2007	17	<0.5	<0.5	<0.5	<0.5	<50	<50	200	220
SB12	12/26/2007	20	<0.5	<0.5	<0.5	<0.5	43	67	950	1200
SB13	12/26/2007	26	<0.5	<0.5	<0.5	<0.5	**160**	<50	**3800**	**6600**

TPH-d Total Petroleum Hydrocarbons as diesel.

TPH-mo Total Petroleum Hydrocarbons as motor oil.
< less than the laboratory reporting limits.
660 Bold values reflect maximum detected concentrations

TABLE 5 SOIL VAPOR ANALYTICAL DATA
FORMER VAL STROUGH CHEVROLET, 327 34th STREET OAKLAND, CALIFORNIA

Boring ID	Date	Depth (feet)	Concentrations (ug/m3) Benzene	Toluene	Ethyl-benzene	Total Xylenes	MTBE	Propylene	Acetone	4-Ethyltoluene	Cyclohexane	Hexane	Heptane	2-Butanone**	2,2,4-Trimethylpentane	1,2,4-Trimethylbenzene	1,3,5-Trimethylbenzene
SB3	12/26/2007	5	<16	**38**	<22	<22	<18	38	**550**	<25	<17	<18	<20	<15	<23	43	<25
SB4	12/26/2007	5	<16	27	<22	<22	<18	33	65	<25	<17	<18	<20	<15	<23	<25	<25
SB6	12/26/2007	5	<130	<150	<170	**550**	<140	**160**	<240	**220**	**2300**	**5400**	**4500**	<120	**13,000**	**460**	**790**
SB7	12/26/2007	5	<16	27	<22	<22	<18	**160**	260	<25	<17	<18	<20	**42**	<23	36	<25
ESL-Shallow Soil Gas Screening Level*			280	1.80E+05	5.80E+05	5.80E+04	3.10E+04	NA	1.80E+06	NA	NA	NA	NA	2.90E+06	NA	NA	NA

< less than the laboratory reporting limits.
* Commercial/Industrial Land use (Table E-2 of RWQCB, 2007)
** Also known as methyl ethyl ketone
38 Bold values reflect maximum detected concentrations

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APPENDIX A

Standard Protocols for Soil and Grab Groundwater Sampling and Subsurface Clearance Procedures

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APPENDIX A
STANDARD PROTOCOLS FOR SOIL AND GRAB GROUNDWATER SAMPLING, AND SUBSURFACE CLEARANCE PROCEDURES

Prior to drilling, the proposed boring locations will be marked and Underground Service Alert (USA) will be contacted in accordance with local notification requirements. The proposed boring locations are also investigated by a geophysical surveying contractor using electromagnetic induction and magnetic surveys, among other methods. The choice of methods depends on shallow soil types and potential interference from surrounding cultural features. The borings are cleared by hand auger, shovel, or posthole digger to the full diameter of downhole equipment to at least 4 feet below ground surface. An air knife may also be used as necessary in conjunction with the above hand clearing tools.

Drilling permits will be acquired from the Alameda County Department of Public Works. In addition, prior to conducting the planned field activities, a comprehensive site health and safety plan (HSP) will be prepared, and a copy of the HSP will be kept on site during scheduled field activities. Lastly, downhole equipment, including drive casing, sample barrels, surge blocks and tools, will be detergent-washed using Alconox or equivalent, or steam-cleaned prior to and following drilling activities at each boring.

SOIL SAMPLING PROCEDURES

Borings are typically advanced using hollow-stem continuous-flight augers or direct-push technologies, such as cone penetration test or Geoprobe rigs. Each boring location will be continuously cored. During hollow-stem auger drilling, soil samples are typically collected using a 18-inch long modified California split-spoon sampler or 5-foot long continuous core barrel. At each sample depth, the split-spoon sampler, containing three 6-inch long brass or stainless steel liners, is driven 18 inches ahead of the augers into undisturbed soil. The core barrel advances with the augers during drilling. Alternatively, some drill rigs are capable of collecting soil samples using a direct-push 4-foot long macrocore sampler.

SOIL SAMPLE HANDLING

Soil samples are described by a trained geologist or engineer using the Unified Soil Classification System. The soil properties that are typically noted on boring logs include grain size category, color, density/firmness, plasticity and moisture content.

Selected samples are sealed with Teflon tape and plastic endcaps, and labeled with the boring number, sample depth, site location, date, and time. The samples are placed in bags and stored in an ice-filled cooler. Standard chain-of-custody procedures are followed. Select soil is also placed in a sealed plastic bag to allow volatile organic compounds (VOCs) to volatilize. A photoionization detector (PID) or other organic vapor analyzer is used to measure total VOC concentrations. This field screening, along with other observations, are used to select soil samples for analysis. Soil cuttings are either drummed or stockpile on and covered with plastic sheeting. Typically, the soils are profiled and transported to an approved landfill for disposal.

GRAB GROUNDWATER SAMPLING

Grab groundwater samples are typically collected using a Hydropunch or an open-hole piezometer. The Hydropunch sampler consists of an expendable drive point, a drive head, a protective sheath, a 3 or 4-foot long inner stainless steel screen (or polyvinyl chloride [PVC]) and an O-ring seal. Once the desired depth is achieved, the rods will be retracted to expose the Hydropunch screen to groundwater. Grab sampling with the open-hole piezometer consists of installing a small-diameter PVC well casing with 5 feet of 0.010-inch slotted well screen in the open boring. This method is typically used for shallow (i.e, at water table) grab water samples. Groundwater samples may then be collected with a bailer, peristaltic pump, bladder pump or inertial pump.

To ensure the integrity of the 50- and 60-foot bgs samples, the DT22 Geoprobe® system consisting of a 2.25 in. (57 mm) OD probe rods as an outer casing and Geoprobe® Light-Weight Center Rods for the inner rod string will be used. A DT22 cutting shoe is threaded into the leading end of the rod string. When driven into the subsurface, the cutting shoe shears a 1.125 in. (29 mm) OD soil core, which is collected inside the casing in a clear PETG liner.
The Light-Weight Center Rods hold the liner in place while collecting the soil core, and also provide a means of retrieving the liner once the sample is collected. The 2.25 inch probe rods provide a cased hole through which sampling can occur. Correspondingly, this approach provides the advantage of not having side slough to contend with and the outer casing effectively seals the probe hole when sampling deeper formations. These factors help eliminate the potential for cross contamination.

WATER SAMPLE HANDLING

The samples are decanted into containers with appropriate preservatives. Samples that will be analyzed for VOCs are collected in 40-milliliter glass volatile organic analysis (VOA) vials with Teflon-lined septum caps. VOA vials are filled so that there are no air bubbles. The sample containers are labeled with the well number, date, location, sampler's initials, and preservative used. The sample containers are placed in a cooler with ice for delivery to the laboratory. Standard chain-of-custody procedures are followed.