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Alameda County
Environmental Health

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 enclosed report has been prepared by LRM Consulting, Inc. on behalf of the Strough Family Trust. 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.
534 Plaza Lane, #145, Burlingame, CA 94010

Greggory Brandt, Wendel Rosen Black & Dean
1111 Broadway, 24th Floor, Oakland, CA 94607

DRAFT
CORRECTIVE 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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Mehrdad Javaherian, Ph.D(cand.), MPH, PE

September 2011

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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 Draft *Corrective Action Plan (CAP)* for the former Val Strough Chevrolet located in Oakland, California (see Figure 1). This report documents the evaluation of remedial alternatives (RAs) and outlines a preferred remedial alternative for addressing petroleum hydrocarbon impacts in groundwater underlying the site. In doing so, this Draft CAP builds on past remediation efforts implemented as interim measures, including high-vacuum dual phase extraction (DPE) and in-situ chemical oxidation (ISCO) activities implemented within the residual source area remaining at the site.

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:	11 (all onsite)
Site ID #:	3035
RO #:	0000134

1.2 Site Contacts

Consultant:	Mehrdad Javaherian LRM Consulting, Inc. 1534 Plaza Lane, # 145 Burlingame, CA 94010 (415) 706-8935
Regulatory agency:	Barbara Jakub, P.G. Alameda County Health Services Agency (ACHCSA) 1131 Harbor Bay Parkway, Suite 250 Alameda, CA 94502-6577 (510) 567-6746

1.3 Organization of the CAP

In addition to this introduction, this CAP contains the following sections:

Section 2.0 Site Background: Provides a brief description of the physical setting at the site and its immediate vicinity, summarizes the site use, and features including utilities and assessment of nearby water supply wells.

Section 3.0 Conceptual Site Model (CSM): Presents a brief description of the hydrogeologic conditions, primary contaminant sources at the site, chemicals of potential concern (COPCs), and the extent of petroleum hydrocarbons beneath the site, including in the residual source area.

Section 4.0 Remedial Action Objectives: Identifies the chemicals of potential concern and discusses the Remedial Action Objectives (RAOs) for the site. Included in this section is the delineation of the target remediation area at the site.

Section 5.0 Remedial Alternative Evaluation and Selection: Lists RAs to address petroleum hydrocarbons at the site; presents an evaluation of the effectiveness of the RAs in achieving the defined RAOs, and recommends the preferred RAs for the site.

Section 6.0 Remedial Action Implementation Plan: Presents the remedial approach for the site, including the proposed remedial and monitoring plan, and other remedial contingencies.

Section 7.0 Reporting and Schedule: Presents a preliminary schedule for implementation of the preferred remedial alternative and the related reporting.

Section 8.0 Bibliography: A listing of pertinent reports for the site, including those referenced in the CAP, are presented.

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 present 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; eleven 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).

2.2 Summary of Historical Site Investigations

Since 1993, soil and groundwater investigations have been implemented, largely in the form of routine groundwater monitoring activities at the site; this includes routine quarterly groundwater monitoring events across onsite monitoring wells. These data show the continued presence of a residual source area in the vicinity of the former UST, centered around onsite monitoring wells MW2, MW9A/9b, and MW3 (see Figure 2). The residual source area includes concentrations of total petroleum hydrocarbons (TPH) as gasoline (TPH-g), together with benzene, toluene ethylbenzene, and xylenes (BTEX) in groundwater at above drinking water standards (see Figure 3); lower levels of TPH as motor oil (TPH-mo) and methyl tert butyl ether (MTBE) are also present within the residual source area (see Figure 3), while TPH as diesel (TPH-d) has remained undetected since 2006. Hydrocarbon concentrations in unsaturated soils within the residual source area remain limited in concentration, with the highest soil detections being limited to saturated soils beneath the water table and coinciding with elevated groundwater concentrations; hence, the remaining hydrocarbon impacts in the residual source area largely occur in groundwater and within a depth profile of 15 to 40 feet bgs.

With downgradient distance away from the residual source area, hydrocarbon concentrations in groundwater decline significantly, largely remaining at low to non-detect levels (see Table 2). The extent of petroleum hydrocarbon impacts in soil and groundwater resulting from past site investigation and monitoring activities are summarized in more detail within the CSM section presented later herein.

2.3 Summary of Interim Remedial Action Activities

In addition to the routine groundwater monitoring activities, remediation pilot testing and remediation activities were conducted at the site between 2004 and 2006. A summary of these activities and associated regulatory correspondence with the ACHCSA are presented below:

DPE Pilot Test: In March 2004, ETIC Engineering, Inc. (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 residual 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.

June 2004 DPE and IRAP Report: The DPE and interim remedial action plan (IRAP) Report (ETIC, 2004) described the planned reduction of residual petroleum hydrocarbon mass in the source area through temporary DPE system installation and operation and dual phase extraction from residual source area wells MW2 and MW3 to extract soil vapor and groundwater simultaneously. The 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.

Interim Remedial Action: Between February 2005 and June 2006, ETIC operated a 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 wells MW2 and MW3 despite the DPE operation, the benefit of continuation of DPE in its then-current configuration was considered to be low and the DPE operation was ceased on 30 June 2006. ETIC subsequently dismantled the remediation system and removed the skid-mounted DPE unit from the site.

August 2006 LRM Consulting, Inc. Correspondence and 11 December 2006 LRM Supplemental Source Area Investigation Work Plan: In an August 25, 2006 correspondence, LRM notified the ACHCSA of a project consultant change from ETIC to LRM. Also, based on a review of the available site data, the response of the hydrocarbon concentrations to past DPE operations, and the ACHCSA's comments on ETIC's Work Plan, LRM recommended a technical meeting with the ACHCSA to discuss the project direction. Based on this meeting, a supplemental source area investigation work plan outlining the proposed scope of work was prepared and submitted to ACHCSA on 11 December 2006; that work plan was revised through multiple discussions with Donna Drogos of the ACHCSA and was finalized in December of 2007. The subject investigation was conducted beginning on December 12, 2007, the results of which were documented in a report to ACHCSA (LRM, 2008a).

August 2008 –September 2010. LRM Consulting, Inc. IRAP Activities: In an August 25, 2008 IRAP report, LRM, in response to a request by Barbara Jakub of the ACHCSA, proposed a series of site investigation and pilot testing activities to address the residual source area at the site. These activities included: 1) soil and grab groundwater sampling to vertically characterize the extent of hydrocarbons within the residual source area previously encountered during the supplemental investigation referenced above; 2) grab groundwater sampling along the existing culvert at the site to evaluate the potential for preferential migration of hydrocarbons along the culvert backfill; 3), placement of a groundwater monitoring well (MW-8) at the downgradient site boundary to define the downgradient extent of hydrocarbons; and 4) pilot testing activities including injection and observation well installation and pilot testing protocols for implementation of in-situ oxygen curtain (iSOC) technology within the residual source area. The investigation activities associated with the IRAP, including installation of additional monitoring wells MW9A and MW9B, were completed by July 2009. On January 13, 2010, an addendum to the IRAP was prepared by LRM, reflecting a proposed change from iSOC technology originally outlined in the IRAP, due to hydrocarbon concentrations which were determined to be too elevated for treatment via iSOC technology. Specifically, pilot testing of in-situ chemical oxidation (ISCO) technology was proposed for the residual source area instead of iSOC. The IRAP Addendum was approved by the ACHCSA in a letter dated April 22, 2010.

The IRAP pilot testing included three rounds of RegenOx injections from August 15th through September 13th within a depth interval of 15 to 40 feet below ground surface (bgs), per the approved IRAP. All IRAP activities were reported to the ACHCSA via a Technical Memorandum dated October 6, 2010, with post-injection groundwater monitoring results documented in subsequent groundwater monitoring events. To summarize, over 9,500 gallons of RegenOx was injected into the residual source area via 20 direct-push borings across the three injection events (see Figure 2). The table below summarizes the pre- and post-injection groundwater concentrations within the residual source area.

Pre- and Post-Injection Groundwater Quality Data
Former Val Strough Chevrolet Site, Oakland, CA

Well Number	Date	SPH Thickness (feet)	Concentration (µg/L) Benzene	Toluene	Ethyl-benzene	Total Xylenes	TPH-g	DO (mg/L)	Comment
MW2	05/28/10	0.00	260	1,100	650	4,700	23,000	2	Pre-injection event
MW2	08/26/10	0.00	160	980	490	4,200	22,000	16	Sampling following first injection event
MW2	09/20/10	0.00	52	360	210	1,600	8,800	18	Sampling following third injection event
MW2	12/22/10	0.00	130	1,100	430	6,000	26,000	1.6	Sampling two months after final (3rd) injection event
MW2	03/16/11	0.00	430	1700	490	3,700	29,000	3.5	Sampling six months after final (3rd) injection event
MW3	05/28/10	0.00	1,200	4,600	920	4,800	31,000	2	Pre-injection event
MW3	08/26/10	sheen	Not Sampled due to Free Product						Sampling following first injection event
MW3	09/20/10	SPH Sheen-Removed	2,700	13,000	2,900	18,000	110,000	11.3	Sampling following third injection event
MW3	12/22/10	0.20	Not Sampled due to Free Product						Sampling two months after final (3rd) injection event
MW3	03/16/11	0.00	4,000	16,000	2,800	15,000	91,000	4.2	Four weekly SPH bailing events performed from 1/6/11 to 2/6/11. No SPHs detected after 2/6/11. Sampling six months after final (3rd) injection event
MW9A	05/28/10	0.02	Not Sampled due to Free Product						Pre-injection event
MW9A	08/26/10	0.00	2,600	19,000	3,000	22,000	150,000	10.3	Sampling following first injection event
MW9A	09/21/10	0.00	1,400	9,600	1,600	12,000	70,000	20.9	Sampling following third injection event
MW9A	12/22/10	0.00	4,400	17,000	1,900	13,000	83,000	NA	Sampling two months after final (3rd) injection event
MW9A	03/16/11	0.00	4,900	22,000	2,800	20,000	130,000	1.5	Sampling six months after final (3rd) injection event
MW9B	05/28/10	0.00	31	75	150	270	2,900	2	Pre-injection event
MW9B	08/26/10	0.00	13	160	310	2,000	14,000	40	Sampling following first injection event
MW9B	09/20/10	0.00	6.7	110	140	830	6,200	26.9	Sampling following third injection event
MW9B	12/22/10	0.00	<0.5	2.6	1.1	9.9	140	5.3	Sampling two months after final (3rd) injection event
MW9B	03/16/11	0.00	22	39	47	290	3,500	4.5	Sampling six months after final (3rd) injection event
O1	05/28/10	0.00	610	2,000	1,000	4,200	21,000	1.4	Pre-injection event
O1	08/26/10	0.00	29	160	59	680	5,000	39	Sampling following first injection event
O1	09/20/10	0.00	24	140	28	330	2,000	24.7	Sampling following third injection event
O1	12/22/10	0.00	9.8	35	3.4	30	460	2.3	Sampling two months after final (3rd) injection event
O1	03/16/11	0.00	200	440	240	850	6,900	2.8	Sampling six months after final (3rd) injection event

Notes:
Data collected on 5/28/10 represents baseline sampling event and corresponds to 2nd Quarter 2010 groundwater monitoring event
Data collected on 8/26/10 represents sampling event following first round of RegenOx injection that was conducted from August 15 to 17, 2010.
Data collected on 9/20/10 represents sampling event following the third round of RegenOx injection that was conducted from September 12 to 13, 2010.

As indicated in the above table, the following observations were made in each of the following wells:

- MW2: ISCO injections resulted in a reduction in TPH-g concentrations from 23,000 ug/L to 8,800 ug/L; however, within 2 to six months after the final injection event, the TPH-g concentrations rebounded to pre-injection concentrations.

- MW3: ISCO injections appear to have resulted in induced migration of previously trapped SPHs near this well to flow into this well; hence, sampling of groundwater was limited in this well during ISCO activities. SPHs have been bailed out of this well per ACHCSA request and TPH-g concentrations remain at elevated levels.

- MW9A: ISCO injections resulted in a decline in TPH-g concentration from a pre-injection concentration of 150,000 ug/L to a concentration of 70,000 ug/L. Six months following the final injection event, the TPH-g concentrations rebounded to pre-injection concentrations.

- MW9B: TPH-g concentrations increased from 2,900 ug/L to 14,000 ug/L following the first injection event (likely due to dissolution of adsorbed hydrocarbons in soils), but declined significantly (to 140 ug/L) during the subsequent injection events. Six months following termination of injection activities, the TPH-g concentration in this well has rebounded to pre-injection levels.

- O1: TPH-g concentrations in this well declined from a pre-injection concentration of 21,000 ug/L to 460 ug/L. Rebounded concentrations (6,900 ug/L) remain significantly below the pre-injection concentration six months after the final injection event.

Based on the ISCO pilot test results, it is evident that ISCO can be an effective technology in reducing hydrocarbon concentrations within the residual source area, including dissolution of concentrated hydrocarbons adsorbed to soils and reductions of dissolved TPH-g concentrations from 150,000 ug/L to 70,000 ug/L in a short period. The pilot test further revealed the ability of this technology to increase dissolved oxygen (DO) levels in injection areas, creating conditions for longer-term, natural biodegradation; however, the post-pilot test results further indicate that a significant hydrocarbon mass, including residual SPHs, remains trapped in the fine-grained soils within the localized residual source area, capable of yielding elevated dissolved concentrations following cessation of ISCO injections.

While SPHs observed during the pilot testing have since been bailed and remained absent in wells during the two quarterly monitoring events following the pilot testing, SPHs (0.17 foot) were observed during the recent 3rd quarter monitoring event in MW3; hence, it is expected that residual SPHs remain trapped near existing monitoring wells within the residual source area. Combined, these data suggest that a larger-scale application (i.e, compared to a pilot-scale application applied per the IRAP) of RegenOx is necessary to reduce and maintain lower levels of hydrocarbon impacts in groundwater within the residual source area; these applications may be greatly benefited by a broader effort to remove SPHs in advance of the ISCO injections.

3.0 CONCEPTUAL SITE MODEL

Data from past site investigation and remediation activities have been used to develop a CSM as summarized below. The CSM documents the site hydrogeology, primary sources, COPCs, hydrocarbon distribution in soil and groundwater, 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.

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 2, 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 2). These primary sources of petroleum hydrocarbons were removed from the site in 1993.

Constituents of Potential Concern: Based on the type of fuel stored in the USTs and the results of previous subsurface investigations, the COPCs at the site include TPH-g, BTEX, and MTBE; these constituents occur primarily within the residual source area, with declining concentrations largely at or below detection limits beyond the residual source area.

TPH-mo has been sporadically detected in monitoring wells within the residual source area, but at concentrations well below TPH-g. TPH-d remains below detection limits within the residual source area, although detection limits in samples have been elevated due to interference from highly concentrated TPH-g detections in residual source area samples.

Based on the above observations, TPH-g, BTEX, and MTBE are considered the primary COPCs at the site.

Residual Source Area: Elevated concentrations of TPH-g, BTEX, and MTBE have been observed in groundwater underlying the former USTs and fuel dispenser, herein referred to as the residual source area. Laterally, the residual source area is bounded by existing monitoring wells MW2, MW3, MW9A/9B, and includes well O-1 (see Figure 3). Vertically, the hydrocarbon impacted depth within the residual source area appears largely limited to the saturated zone extending from 15 to 40 feet bgs. The extent of the residual source area was in part defined by the supplemental hydropunch investigation outlined by LRM (2008a), the data for which are included in Appendix A herein.

Historically SPHs were intermittently detected in wells MW2 and MW3; however, SPHs have not been detected in MW2 since June 2006. Intermittent detections, including in response to ISCO injections, have been observed at MW3. These data suggest that most of the residual petroleum hydrocarbon mass is present near the former USTs and fuel dispenser, herein referred to as the residual source area.

An important feature of this residual source area is the consistent presence of fine-grained soils which have largely contained the hydrocarbon mass within this area. As discussed in more detail below, the hydrocarbon plume remains stable and has exhibited little to no potential for migration beyond the residual source area.

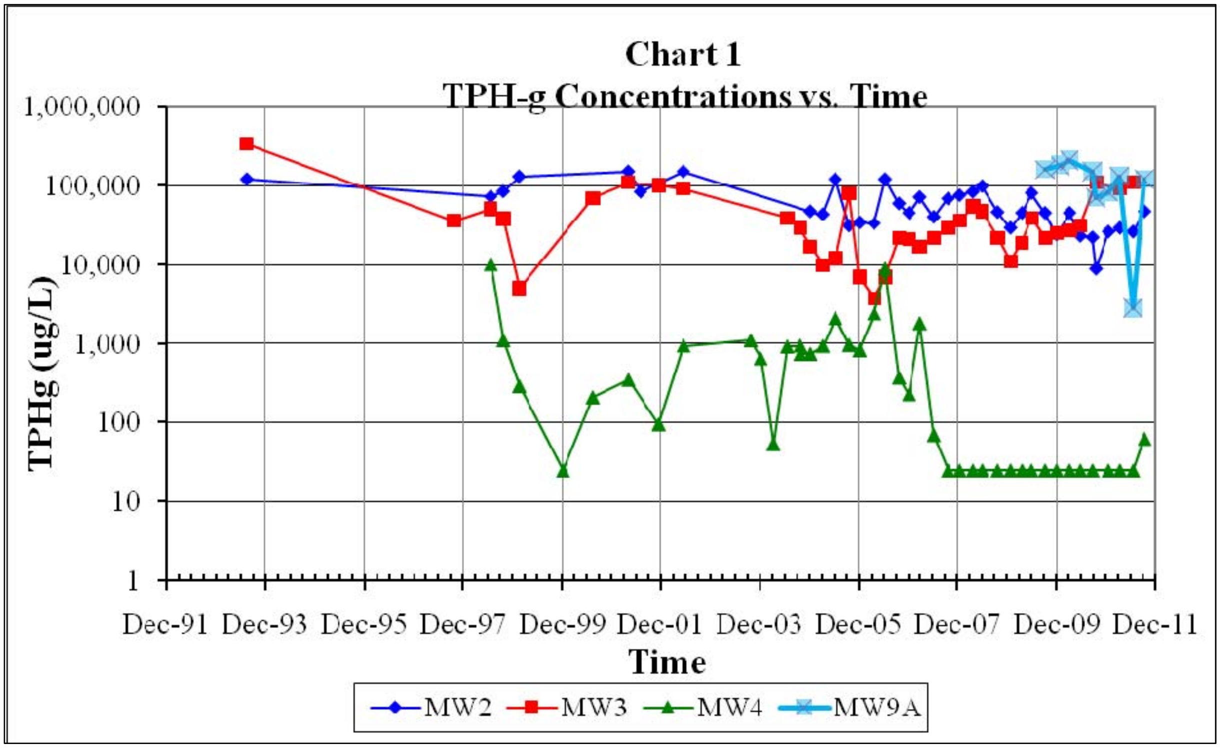
Also worth noting is that hydrocarbon impacts in the residual source area appear to be largely limited to groundwater. Specifically, hydrocarbon concentrations in unsaturated soils within the residual source area remain largely below detection limits and/or at residual levels; the highest detections in soil, including maximum TPH-g concentrations approximating 240 mg/kg and a maximum benzene concentration 1.2 mg/kg (Appendix A), occur beneath the water table and coincide with elevated groundwater concentrations.

Lastly, it is important to recognize that the residual source area covers a portion of the site which imposes significant logistical constraints related to access and routine remedial activities. Specifically, this source area lies at the mouth of a ramp and related roll-up door which serves as an access to and from the service area for the active car dealership. Tight dimensions caused by a presence of a secured fence area and a tire storage room further complicate access to and maneuverability within the residual source area. Moreover, during work hours, the area is frequented by cars and passengers; hence, to date, most of the monitoring and pilot testing activities have taken place at off-peak or off-business hours.

Petroleum Hydrocarbon Distribution in Groundwater: The highest concentrations of petroleum hydrocarbons have been detected in samples collected from wells MW2, MW3, MW9A/9B, and O1, located immediately downgradient of the former USTs and within the previously defined residual source area.

The chart below depicts TPH-g concentration trends for wells MW2, MW3, and MW9A located within the residual source area, and MW4 located approximately 50 feet downgradient of the residual source area. As indicated on the chart, the TPH-g concentrations declined in residual source area wells MW2 and MW9A between May 2010 and October 2010 as a result of the IRAP activities involving injection of RegenOx. Following cessation of ISCO injections in October 2010, TPHg concentrations at both of these source area wells rebounded. As previously indicated in the IRAP Memorandum (LRM, 2010d), injections near MW3 resulted in the presence of SPHs in this well, so TPHg levels in this well increased due to the presence of product and were not positively affected by the IRAP activities; the

SPHs have since been removed by bailing and were not observed in the first and second quarterly monitoring events in 2011 (see Table 2). Most recently, the third quarterly monitoring event (see Table 2) in 2011 revealed the presence of SPHs at 0.17 foot at MW3.



Away from the residual source area and no more than 50 feet away from the residual source area wells MW2, MW3, and MW9A, hydrocarbon concentrations in well MW4 remain predominantly at non-detect levels, with very sporadic detections at residual levels for the past 4 years. In addition, routine sampling from other onsite downgradient wells (MW5, MW6, MW7, and MW8) have not contained detectable levels of TPH-g or BTEX for at least the past two years, with detections in these wells being limited to low-levels of MTBE (see Table 2).

Combined, these data indicate the presence of a stable plume characterized by a localized hydrocarbon source area (residual source area) embedded within fine-grained soils, with limited potential for migration and insignificant impacts to downgradient portions of the site.

Potential Exposure Pathways and Receptors: As previously indicated, the site and its vicinity are zone for commercial use and largely limited to active auto dealerships. In the absence of water supply wells at and in the vicinity of the site, direct exposure pathways to groundwater are considered incomplete. Also, with a paved surface across the site and with residual soil impacts limited to depths beneath the water table, direct exposure to hydrocarbon impacts in soils are considered unlikely for both daily site occupants and potential future construction workers. Moreover, potential construction worker exposure, which would require such activities to depths beneath the water table (highly unlikely) may be addressed via appropriate health and safety measures during construction activities. Lastly, while the potential for vapor intrusion from groundwater may be considered a complete exposure pathway, a previous soil vapor survey under the ACHCSA's oversight demonstrated the absence of potential risk via this pathway (LRM, 2008a). Worth noting is that the planned groundwater remediation activities discussed later herein target hydrocarbon groundwater impacts within the residual source area which would only serve to further reduce potential vapor intrusion risks.

4.0 REMEDIAL ACTION OBJECTVES

Identification and evaluation of potential RAs for the site requires identification of RAOs, representing site-specific goals for source abatement and for protecting human health and the environment, including the beneficial uses of groundwater; these are evaluated using applicable or relevant and appropriate requirements (ARARs). The following presents an evaluation of COPCs, ARARs, and RAOs for the site.

4.1 Chemicals of Potential Concern and their Physical Properties

As previously indicated, the primary COPCs at the site are TPH-g, BTEX, and MTBE, which occur at elevated levels in groundwater within the residual source area. The presence of SPHs have been sporadic and had not occurred since 2003, until ISOC injections locally mobilized trapped SPHs toward MW-3 (LRM, 2010); SPHs have since been bailed and remained absent for the first two rounds of monitoring in 2011, returning at 0.17 foot in MW3 during the 3rd quarter 2011 monitoring event (see Table 2).

TPH-mo has been sporadically detected in monitoring wells within the residual source area, but at concentrations well below TPH-g. TPH-d remains below detection limits within the residual source area for the past five years, although detection limits in samples have been elevated due to interference from highly concentrated TPH-g detections in residual source area samples.

Based on the above observations, primary COPCs at the site include TPH-g, BTEX, and MTBE in groundwater. TPH-mo is considered a secondary COPC. In general, gasoline-range hydrocarbons, including BTEX compounds, are characterized as the most soluble and mobile hydrocarbons. Of these, benzene remains the most mobile and volatile and toxic of these compounds. Similarly, the fuel oxygenate, MTBE, is a highly soluble compound (greater than 45,000 mg/L), is also considered highly mobile and volatile. Importantly, as previously indicated, the hydrocarbon impacts from these COPCs remains largely limited in extent to the residual source area, with negligible impacts to onsite areas downgradient of the residual source area. Potential vapor intrusion impacts have also been previously addressed and deemed insignificant (LRM, 2008a).

4.2 Applicable or Relevant and Appropriate Requirements

ARARs are the promulgated laws and regulations that specifically address, or may address, a hazardous substance, remedial action, location, or other circumstance at the Site. ARARs generally fall into three categories as defined below:

Chemical-Specific Requirements: Health- or risk-based concentration limits or a range in concentration of specific chemicals present in different site media.

Action-Specific Requirements: Govern the design and performance of remedial systems or activities associated with the remedial/removal action.

Location-Specific Requirements: Restrict concentrations of chemicals or otherwise govern cleanup activities based on the location of the site.

Also presented are non-promulgated regulatory (i.e., To-Be-Considered [TBC]) criteria which may be considered when selecting a remedy. ARARs and TBCs considered for the site are summarized in Table 3.

4.3 Site Remedial Action Objectives

The RAOs for the site are evaluated utilizing both the qualitative and quantitative objectives; this is particularly critical since numerical RAOs may not be achievable within the residual source area given the magnitude and depth of the hydrocarbon impacts embedded within a matrix of very fine-grained sediments, together with other logistical constraints which impose significant limitations on technologies considered for remediating the site.

The following considerations were taken into account in the development of these objectives:

- The Site is currently zoned under commercial land use and is located along the Oakland Auto Row, where continued use as an automobile sales and repair facility is expected to continue into the future.
- Hydrocarbon impacts to groundwater remain localized to the residual source area, with the plume remaining stable and contained onsite some 18 years after removal of the UST.
- No water supply wells exist within a ½-mile radius of the site.

4.3.1 Qualitative Objectives

Qualitative RAOs for the Site include the following considerations:

- Removal of SPHs to the extent practicable, as outlined by the RWQCB (1996); and

- To the extent practicable, establishment of a reducing trend in dissolved hydrocarbon concentrations in groundwater within the residual source area, recognizing that away from the residual source area, the hydrocarbon plume has remained at residual levels and is stable.

4.3.2 Quantitative Objectives

While shallow groundwater beneath the site is not being used for potable purposes, and is unlikely to be used as such due to regional groundwater quality impacts, shallow groundwater beneath the site is designated by the Basin Plan as having beneficial uses, including potable uses. Hence, Maximum Contaminant Level Drinking Water Standards (MCLs) are considered applicable to numerical RAOs for the site. MCLs are health-based drinking water standards that have been adopted by the California Department of Health Services under Title 22 California Code of Regulations (CCR) and by the United States Environmental Protection Agency (USEPA) under the Safe Drinking Water Act (SDWA). MCLs are available for BTEX compounds only and include 1 ug/L, 150 ug/L, 300 ug/L, and 1,800 ug/L, respectively.

In the absence of MCLs for MTBE, TPH-g, and TPH-mo, Environmental Screening Levels (ESLs) protective of potable drinking water use are used as the numerical RAOs for these COPCs in groundwater. Specific ESLs for MTBE, TPH-g, and TPH-mo include 13 ug/L, 100 ug/L, and 100 ug/L, respectively.

To the extent that hydrocarbon detections within the residual source area are largely limited to beneath the water table, no RAOs for hydrocarbons in soil are identified. Treatment of hydrocarbons in saturated soils will occur together with those dissolved in groundwater, and the ultimate demonstration of remedial progress will be done so via a comparison of resulting groundwater concentrations with both qualitative and numerical groundwater RAOs listed above.

4.4 Area Warranting Remediation

The area warranting remediation at the site is the residual source area, the extent of which was previously defined herein. As previously indicated, COPCs at the site occur at elevated levels in groundwater within the residual source area, extending from a depth of 15 to 40 feet bgs.

Away from the residual source area, are COPCs are largely below detection limits, with the sole exception of MTBE which remains below the numerical RAO in MW5, MW7, and MW-8, but slightly exceeds the RAO in MW4 and MW6. Given the stability of the hydrocarbon plume in downgradient wells at the site, and that MTBE impacts on the most downgradient points onsite remain non-detect or below RAOs, remediation of areas away from the residual source area is not warranted.

5.0 EVALUATION AND SELECTION OF REMEDIAL ALTERNTIVES

Evaluation of RA's for achieving the RAOs at the site are evaluated below. Four RAs, including a no-action alternative and three engineered alternatives, were evaluated. This evaluation included an assessment of effectiveness, time frame, advantages and disadvantages of the alternative, and potential costs. The four alternatives evaluated include:

- No remedial action/long-term monitoring
- Groundwater pump and treat
- ISCO
- High-vacuum dual-phase extraction

The above RA's are evaluated for the residual source area.

5.1 Remedial Alternatives

Alternative 1: No Remedial Action/Long-Term Monitoring

Effectiveness: In the absence of active engineered controls, this alternative relies on natural attenuation and related monitoring for reduction of hydrocarbon levels to below RAOs. The effectiveness of this methodology is in part tied to the extent of hydrocarbon impacts in groundwater and their potential for natural attenuation over time. Under conditions where SPHs or highly concentrated hydrocarbon sources are absent, dissolved impacts are limited, and biological conditions are appropriate, natural attenuation over time may be effective and the related monitoring may be sufficient as a corrective action alternative. Alternatively, under conditions where SPH or concentrated hydrocarbon sources remain, natural attenuation and related monitoring are typically insufficient to minimize impacts; especially within a reasonable amount of time.

Time Frame: In the presence of SPHs in contact with soils and groundwater, the time frame associated with this potential alternative is considered very long and likely in excess of 30 years. A more reasonable time frame is expected in areas where SPHs and elevated soil concentrations are absent.

Advantages: The advantage of this approach is a low annual cost and the ease of implementability, with negligible interference with potential future daily Site activities.

Disadvantages: Disadvantages of this approach include the fact that existing hydrocarbon sources, including SPHs, will continue to persist over time, with resulting impacts remaining above RAOs for the foreseeable future. In addition, this approach limits the ability to define a reasonable time frame for project closure.

Cost: In the absence of remedial actions, the cost for this alternative is considered relatively low.

Conclusion**:** Since the residual source area is characterized by sporadic SPH detections and highly concentrated hydrocarbon concentrations beneath the water table, a no-action alternative or long-term monitoring of groundwater quality are not considered appropriate as a means of meeting the RAOs in the residual source area; however, based on the limited extent of hydrocarbon impacts downgradient of the residual source area, this RA is considered applicable to the remaining portions of the site.

Alternative 2: Groundwater Pump-and-Treat

Effectiveness: This alternative relies on extraction of groundwater followed by treatment and (typically) offsite disposal. This technology is widely recognized as a hydraulic control measure, minimizing the potential for downgradient migration of dissolved constituents in groundwater. This RA is also widely recognized for its inability to minimize the SPH-soil interfacial tension such that the SPHs are mobilized and/or removed. With concentrated source material in place, extraction of groundwater is not likely to be effective in removing significant mass from beneath the water table.

Time Frame: This alternative is not likely to remove SPHs or significant mass in the dissolved-phase within a reasonable time frame.

Advantages: The primary advantage of this approach is the potential for creation of hydraulic control of dissolved plumes, where present, which if achieved can help minimize the potential for migration beyond the extraction area.

Disadvantages: Disadvantages of this approach include: 1) the limited ability for removing SPHs and dissolved mass from groundwater; 2) the inherent generation of and need for treatment/disposal of significant volumes of extracted groundwater; 3) potential interference or hindrance to active site activities; and 4) long-term construction and operation and maintenance (O&M) costs associated with the extraction system.

Cost: The cost of this alternative is considered high.

Conclusion**:** The potential effectiveness of this RA in the residual source Area is considered negligible, given the lack of effectiveness of this technology on removing SPHs or concentrated source material. Moreover, given the localized extent of hydrocarbon impacts within the residual source area and the absence of significant migration beyond this zone, hydraulic control of dissolved hydrocarbons is unnecessary; hence, this RA is not considered applicable to the site.

Alternative 3: In-Situ Chemical Oxidation

Effectiveness: ISCO is the injection of liquid or gas into the subsurface that causes oxidation, resulting in the direct destruction of petroleum hydrocarbon contamination dissolved in groundwater. This process may also result in the indirect decrease of petroleum contamination by increasing the dissolved oxygen content in groundwater, which in turn serves to enhance biodegradation. ISCO has been effective in rapidly reducing hydrocarbon mass at sites with similar conditions to the subject Site (Miller et. al, 2007). For example, its success through the application of Regenesis' proprietary compound, RegenOx™, in significantly reducing diesel and residual fuel concentrations in groundwater at several sites with similar geologic conditions has been documented in several case studies (www.regenesis.com). This technology is often followed by enhanced bioremediation using oxygen reducing compounds (ORC), once source material and dissolved-phase concentrations are shown to decline following RegenOx injections.

As discussed previously herein, a pilot test of ISCO using RegenOx was performed within the residual source area at the site. The pilot testing revealed that ISCO is an effective technology in rapidly reducing dissolved hydrocarbon concentrations within the residual source area at the site, and to yield increased DO levels to promote longer-term natural attenuation; however, the pilot testing further revealed the continued presence of SPHs trapped in the fine-grained soils within the residual source area, which had otherwise remained undetected in existing monitoring wells for the past several years. The pilot testing further revealed that a significant hydrocarbon mass is present beneath the water table, warranting larger-scale applications (i.e, multiple injections) of ISCO in order to maintain reduced levels stemming from this technology.

Time Frame: The duration for this alternative is considered to be short- to medium-term. Specifically, in the short-term, injections would be performed and followed by quarterly monitoring to evaluate the need, if any, for subsequent re-injections. Studies have shown that this type of remediation has been achieved in time frames ranging from six to 18 months of active treatment (Miller et. al., 2007). The site-specific pilot testing has corroborated the ability to observe positive effects in a short period, with additional injections necessary to fully treat the residual source area at the site.

Advantages: The advantages of this approach include: 1) potential for significant dissolved mass reduction in a relatively short period of time; 2) imposition of favorable declining concentration trends toward RAOs beyond injection events; 3) limited construction, and O&M requirements; and 4) low to moderate costs.

ISCO can also serve as an oxygen source for microbes in the subsurface to enhance biodegradation of contaminants. Therefore, many ISCO projects are designed to move into a second, longer-term bioremediation phase due to all the newly available oxygen in the subsurface. While RegenOx at higher concentrations may eliminate microbes, the oxygen rich treatment area will be attractive to indigenous populations in adjacent zones.

Disadvantages: This alternative is most effective in the absence of SPHs, focusing on dissolving adsorbed concentrations beneath the water table and treating elevated dissolved concentrations within the residual source area. In addition, injection in fine-grained soils can limit the rate of injection (and time required to complete injection rounds) and the ability to readily distribute the oxidant within the targeted area. A disadvantage of utilizing only RegenOx would be that the product is only active within approximately one month after injection, thereby requiring multiple rounds of treatment.

ISCO is often challenged by the potential of surfacing of the oxidant through conduits such as well casings; while some surfacing occurred during the ISCO IRAP activities at the site, this was deemed minimal and surfaced material was readily removed. In addition, ISCO has been tied to the potential for change in soil permeability, possible generation of by-products (e.g, sodium and carbon dioxide), and the potential for vapor generation; however, these conditions are less related to the use of RegenOx as the oxidant and were not observed during the IRAP pilot testing conducted at the site.

Lastly, ISCO has the potential to spread contamination in response to injections; the observation of SPHs in MW3 following ISCO injections suggest that such activities may locally mobilize SPHs that are trapped in between well locations within the residual source area. This disadvantage suggests the need for SPH removal from the source prior to ISCO activities.

Cost: The cost of this alternative is considered low to moderate.

Conclusion**:** As previously discussed herein, the ISCO pilot testing conducted at the site has confirmed that ISCO technology using RegenOx can reduce elevated dissolved hydrocarbon concentrations beneath the residual source area within a short period of time, and to create subsurface conditions (i.e., high DO levels) beyond the injection period which can promote longer-term natural biodegradation; however, the pilot testing further revealed the presence of trapped SPHs and elevated hydrocarbons beneath the water table which will require a larger-scale injection effort to treat. More specifically, this technology is expected to be far more effective in achieving RAOs if trapped SPHs are removed. Based on these observations, ISCO using RegenOx is considered a viable technology for the residual source area, particularly if implemented in conjunction with a robust SPH-removal alternative.

Alternative 4: High-Vacuum Dual-Phase Extraction

Effectiveness: DPE is an effective method for reducing hydrocarbon mass concentrated at and beneath the water table. The methodology relies on reduction of the water level elevation (through groundwater extraction) in order expose otherwise trapped hydrocarbon mass (SPHs or mass adsorbed to saturated soils), and removal of SPHs and vapors through extraction under high-vacuum conditions. Simultaneous removal of groundwater, vapor, and SPHs may be accordingly achieved.

As previously indicated herein, between February 2005 and June 2006, DPE was applied as a pilot test and intermittently as an interim measure within the residual source area. Vacuum was applied to remove groundwater and soil vapor from up to two wells (MW-2 and/or MW-3). 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.

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. Because the mass removal rates by the DPE system had reached asymptotic levels and high petroleum hydrocarbon concentrations continued to exist in wells MW-2 and MW-3 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.

Time Frame: From an SPH removal standpoint, DPE is considered a highly aggressive technology, capable of removing highly concentrated pockets of hydrocarbons and SPHs within a short period of time; however, as evidenced by the observation of a relatively rapid transition toward asymptotic mass removal rates during the pilot test/interim measure implemented at the site, this RA will have to be implemented for a potentially long period of time in order to achieve desired effectiveness from an overall mass reduction standpoint to reach numerical RAOs.

Advantages: The primary advantage of this approach is aggressive SPH and concentrated mass removal from the "smear zone" at and in the immediate vicinity of the water table, and from beneath the water table as this zone is exposed through dewatering. DPE has the ability to overcome the soil-SPH interfacial tension and remove SPHs and concentrated hydrocarbons trapped in fine-grained soils such as those in the residual source area at the site; this source removal at and beneath the water table is typically achieved within a relatively short period, rending DPE most effective as an aggressive, short-term source removal technology.

Disadvantages: Disadvantages of this approach include: 1) potentially generating a significant amount of groundwater if operated for long periods 2) the inherent generation of and need for treatment/disposal of significant volumes of vapor and water; 3) the limited potential to reach RAOs based on long-term groundwater and vapor extraction alone; 4) the likelihood of reaching diminishing returns in the form of asymptotic mass removal rates within months after startup (as evidenced by site-specific pilot testing); and 5) long-term construction, operation, and maintenance efforts and costs associated with the DPE system.

Cost: The cost of this alternative is considered high if considered for long-term application, but low-to-moderate if considered for a short-term application such as aggressive SPH removal.

Conclusion**:** In conclusion, this alternative is considered as a viable alternative for short-term application targeting SPH/source removal within the residual source area. Conversely, it is not considered a suitable approach for longer-term application and to reach other RAOs, including numerical groundwater RAOs for hydrocarbons dissolved in groundwater.

5.2 Preferred Remedial Alternatives

Identification of preferred RA's included consideration of the goal of achieving the RAOs and meeting the ARARs, while accounting for effectiveness, implementability, and costs. Based on the evaluation RA's summarized above, two RA's are recommended:

- Short-term application of DPE to remove trapped SPHs and reduce the magnitude of the hydrocarbon source within the residual source area; this application is expected to occur for a period of 6 months, or until the system mass removal rates depict a declining trend and/or reach asymptotic levels; and

- Following completion of DPE activities, implement ISCO within the residual source area using RegenOx to further reduce dissolved concentrations of hydrocarbons toward RAOs.

The first alternative targets the qualitative RAO of reducing SPHs within the residual source area, while the second alternative targets reduction of dissolved hydrocarbon concentrations toward numerical RAOs and/or establishing a declining COPC concentration trend over time.

Details for proposed application of the preferred RA alternatives for the site are summarized below.

6.0 REMEDIAL ACTION IMPLEMENTATION PLAN

6.1 Proposed Remedial Approach

As previously indicated, the primary goals for remediation include achieving SPH source removal to the extent practicable and achieving numerical RAOs which help protect human health and the environment. Therefore, the proposed remedial approach for the site consists of short-term application of DPE to remove SPHs to the extent practicable, followed by ISCO applications to reduce dissolved COPC concentrations toward meeting RAOs.

The details for these activities are defined in detail below.

6.2 DPE for Removal of SPHs

The proposed short-term application of DPE is intended to target SPH removal to the extent practicable within the residual source area. The same approach previously approved by the County and implemented at the site during DPE IRAP activities will be followed, including system setup, permitting, and O&M activities as outlined below:

- Application of DPE to existing wells MW2 and MW3 within the residual source area, with existing monitoring wells MW-9A/9B and O-1 in close proximity serving as monitoring points during DPE activities;

- Existing trenching and related piping used during previous DPE activities will be used to connect MW2 and MW3 to the DPE system;

- A skid-mounted DPE system will be used, housed in the compound previously used; this compound is located immediately adjacent (west) to the onsite building, along the eastern boundary of the Alta Bates Medical Center parking lot;

- As with previous applications under a County-approved workplan, high vacuum (up to 29 inches of mercury (in. Hg)) will be applied to an extraction "stinger" installed through an airtight wellseal, allowing for simultaneous extraction of soil vapor, groundwater, and SPHs from each of the extraction wells;

- The stingers will be placed at an initial depth of approximately 20 feet below the top of casing in MW2 and at 22 feet below top of casing at MW3. After initial placement, the stinger will be gradually lowered in each well as part of a step test.

- Step testing will be performed to estimate the applied vacuum and stinger depth that will produce the maximum vapor flow and concentrations, and to determine the required minimum vacuum to extract groundwater from each well at a given depth of stinger. Step testing will be performed on each of the two wells individually, and in combination.

- A mobile DPE unit will be used, housing an oil-sealed liquid ring vacuum pump capable of generating vacuum up to 29 in. Hg and a maximum vapor flow rate of 300 actual cubic feet per minute (acfm). Extracted fluids will pass through a 150-gallon knockout vessel, which will separate vapor and liquid streams.

- The extracted vapor stream will be treated by passing through two 200-pound granulated activated carbon vessels in accordance with a Bay Area Air Quality Management District (BAAQMD) permit to be secured prior to DPE applications.

- The extracted liquid stream will be passed through two 200-pound liquid phase granular activated carbon vessels connected in series and pumped into a storage tank. The treated groundwater will be discharged to an onsite sanitary sewer under a special discharge permit to be obtained from the East Bay Municipal Utility District (EBMUD).

- During the combined well DPE testing, extracted vapor samples will be collected in Tedlar bags using vacuum pump and analyzed for TPH-g, BTEX, and MTBE. Groundwater samples will be collected from the two extraction wells and the knockout tank at the end of the step testing, and will be analyzed for TPH-g, TPH-d, TPH-mo, BTEX, and MTBE. Samples of treated water will also be collected and analyzed to comply with the EBMUD discharge permit.

Once the system has been installed and step-testing has been completed, the DPE system will be operated continuously. The estimated period of operation is 3 to 6 months based on past pilot testing results, but the actual duration of operations will be determined based on the demonstrated ability of the DPE system to remove SPHs and based on observed changes in mass removal rates. Specifically, as long as evidence of SPH removal is observed, the system will be operated to maximize SPH removal to the extent practicable. Moreover, should the vapor mass removal rates obtained from routine O&M activities indicate a reduction in mass removal rates toward asymptotic levels, the system operations will be terminated; this decision-making process will account for the intent of remedial activities to minimize the generation of water through DPE operations. Prior to termination of system operation, the ACHCSA will be contacted and supplied with the data and rationale (via a Technical Memorandum) for system termination, and concurrence from the ACHCSA will be obtained in concert with the stated objectives of the short-term DPE activities outlined herein.

The frequency of O&M activities will correspond to those outlined the BAAQMD permit, but is likely to include monthly site visits and related sampling to confirm the absence of carbon breakthrough and compliance with both the BAAQMD and liquid discharge permits, and to determine the efficiency of system operations to meet the afore-mentioned objectives. For the first four weeks of system operation, weekly O&M visits are proposed to ensure system optimization; O&M activities may then be reduced to monthly visits, pending concurrence with permit requirements. The O&M activities will, at a minimum, include gauging and groundwater sampling at extraction wells MW2/MW3 and DPE observation wells MW9A/B and O1, and sampling of the groundwater knockout tank in accordance with the permit. Also, vapor sampling using Tedlar bags at both individual wells MW2/MW3 and at influent and effluent locations will be performed during routine O&M events. Baseline groundwater samples will be collected from residual source area wells (MW2, MW3, MW9A/9B, and O-1) prior to initiation of DPE activities, as will vapor samples from MW2/MW3. Groundwater and vapor samples will be analyzed for the afore-mentioned COPCs bulleted above.

6.3 ISCO Applications for Reducing COPC Concentrations in Groundwater

The afore-mentioned Technical Memorandum supplying the data for County approval for termination of the DPE activities will include a schedule for initiation of ISCO activities. Application of ISCO activities will also follow the County-approved procedures for RegenOx injections and monitoring implemented during the IRAP activities in 2011. This approach will include:

- Approximately 10,000 gallons of RegenOx will be injected into the ground via a total of 20 direct-push boring locations largely corresponding to the location of those previously advanced (see Figure 3). The boring advancement and related injections will occur in three events separated in time by three weeks between each event;
- Following obtainment of a drilling permit and USA Alert notification, the surface concrete will be cored and the top five feet of soil will be hand-augered to further clear potential utilities;
- A direct push unit will be set up at each location and 1.5-inch O.D./0.625-inch I.D drive rods will be advanced to the desired depth of 15 to 40 feet bgs;
- After the drive rods are pushed to the desired depth, the rod assembly will be withdrawn three to six inches. Then the expendable tip will be dropped from the drive rods.
- The appropriate quantity of RegenOx™ Oxidizer for five vertical feet of injection will be measured and poured into a mixing tank. The volume of water per injection location will be calculated from the following formula:

$$\frac{\text{RegenOx Oxidizer lbs/foot}}{(8.34\ \text{lbs/gal water})(\%\ \mathit{RegenOx\_Oxidizer}\ \text{solids})}\left[1-(\%\ \mathit{RegenOx\_Oxidizer}\ \text{solids})\right]$$

- The pre-measured quantity of RegenOx™ Oxidizer and RegenOx Activator will be mixed into the pre-measured volume of water to make the desired target % oxidant in solution. The volumes of water and oxidant mixed and injected at each direct-push location will be summarized in field forms.

- The sub-assembly from the mixing tanks will be connected to the drive rod. After confirming that all of the connections are secure, the RegenOx will be pumped through the delivery system to displace the water/fluid in the rods;

- The drive rods will be slowly withdrawn and the pre-determined volume of RegenOx™ will be pumped into the aquifer across the desired treatment interval of 15 to 40 feet bgs.

- Following completion of RegenOx injections, each boring will be grouted and later inspected by the Alameda County Department of Public Works.

- The existing wells and the ground surface will be observed for any indications of aquifer refusal. This includes observations for a spike in pressure as indicated or RegenOx "surfacing" around the injection rods or previously installed injection points.

- The injection rates will be accordingly altered to allow the aquifer to accept the RegenOx and to minimize pressure and surfacing across the three injection events.

To provide an assessment of baseline groundwater conditions prior to initiation of ISOC injection events, baseline groundwater samples will be collected from residual source area wells MW2, MW3, MW9A/9B, and O1. To the extent possible, efforts will be made to align baseline sampling with routine quarterly groundwater monitoring conducted at the site to minimize field efforts and costs. The baseline groundwater samples will be analyzed for TPH-g, BTEX, and MTBE. In addition, field measurements of temperature, pH, oxidation reduction potential (ORP), and DO will be obtained prior to beginning chemical oxidation injection activities.

Supplementing the baseline sampling, three rounds of O&M groundwater sampling will implemented two weeks after each RegenOx injection event and one week prior to the next event. A fourth round of sampling will be conducted six weeks after the final injection event. If possible, O&M sampling will be combined with routine groundwater monitoring events at the site. O&M samples will be analyzed for the parameters identified above for the baseline sampling.

While it is expected that the DPE activities will remove trapped SPHs prior to initiation of ISCO activities, should RegenOx injections induce additional SPHs to migrate into any of the residual source area wells, RegenOx injections will be terminated and SPHs will be hand-bailed as a contingency. Weekly observations will be performed to ensure no additional SPHs occur in any of the residual source area wells. After confirmation of the absence of SPHs, the RegenOx injections will resume as outlined herein. As yet another contingency, the direct push borings and RegenOx injections will be advanced in order from a southeast to northwest direction (i.e, from downgradient toward upgradient) in order to reduce the potential for trapped SPHs to be spread and/or pushed (via injection pressure) in the downgradient direction.

6.4 Continuation of Routine Groundwater Monitoring Activities

In concert with the planned RA's, routine groundwater monitoring will continue on a quarterly basis and in accordance with the existing ACHCSA-approved monitoring plan. To the extent possible, quarterly monitoring activities will be scheduled to meet the needs of the RA-related monitoring documented herein. Quarterly reporting will incorporate all available groundwater sampling data, including those associated with RA's.

7.0 REPORTING AND SCHEDULE

The CAP activities will be primarily documented in two technical documents to be prepared and submitted to the County. The first is the afore-mentioned Technical Memorandum summarizing the DPE activities following completion of the proposed short-term application for SPH removal; this memorandum will include the data and rationale for termination of DPE activities and a schedule for initiation of ISCO activities targeting hydrocarbon concentrations beneath the water table.

The Second document, referred to as the ISCO Implementation Report, will document the activities and results of the three injection events related to ISCO, including post-remediation monitoring results and the need, if any, for additional injection events. Should additional injection events be deemed necessary, those will largely follow the procedures outlined in this CAP and will be accordingly summarized in the ISCO Implementation Report. Should additional injections be implemented, those results and related recommendations will be summarized in an addendum to the ISCO Implementation Report. Lastly, routine groundwater monitoring reports will continue to summarize groundwater analytical results, including those collected during the afore-mentioned remediation activities.

The CAP activities outlined herein may be initiated immediately upon the County's approval of the CAP. Initial activities will relate to obtainment of BAAQMD and EBMUD permits for short-term operation of the DPE system. These activities will be followed by system mobilization, testing, and startup. DPE O&M activities will then follow, culminating in documentation of completion of DPE activities and transition to ISCO. The ISCO activities will be initiated with obtainment of drilling permits, followed by three rounds of injections and related monitoring. Overall, the referenced activities are expected to take place within a 12-month period following approval of the CAP.

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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	7/19/1993	64.71	PVC	32	2	17 to 32	0.020	15 to 32	Gravel Pack
MW2	7/20/1993	65.71	PVC	33	2	18 to 33	0.020	16 to 33	Gravel Pack
MW3	7/20/1993	65.7	PVC	34	2	18 to 34	0.020	16 to 34	Gravel Pack
MW4	6/26/1998	64.37	PVC	31	2	15 to 31	0.020	13 to 31.5	Lonestar #3 Sand
MW5	6/26/1998	65.59	PVC	31	2	15 to 31	0.020	13 to 31.5	Lonestar #3 Sand
MW6	7/17/2000	59.60	PVC	31.5	2	10 to 30	0.020	8 to 30	Lonestar #3 Sand
MW7	7/17/2000	59.49	PVC	36.5	2	15 to 35	0.020	13 to 35	Lonestar #3 Sand
MW8	12/17/2008	57.07	PVC	26	1	11 to 26	0.010	9 to 26	#2/12 Sand
O1	12/12/2008	65.91	PVC	40	2	15 to 40	0.020	13 to 40	#3 Sand
MW9A	7/15/2009	65.90	PVC	25	2	15 to 25	0.020	14 to 25	#3 Monterey Sand
MW9B	7/15/2009	65.85	PVC	39	2	29 to 39	0.020	28 to 39	#3 Monterey sand

Abbreviations:
ft bgs feet below ground surface
PVC Polyvinyl chloride.

Note:
* Elevations Based on Survey Conducted in 1st Quarter 2009 relative to NAVD88 datum. Wells O1, MW9A, and MW9B were surveyed on November 12, 2009.

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	TBA
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	--
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	--
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	--
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	--
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	--
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	--
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	--
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	--
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	--
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	--
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	--
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	--
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	--
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	--
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	--
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	--
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	--
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	--
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	--
MW1	06/03/08	64.69	b	20.70	43.99	0.00	--	--	--	--	--	--	--	--	--
MW1	09/25/08	64.69	b	22.30	42.39	0.00	<0.50	<0.50	<0.50	<0.50	<50	<50	<100	0.57	<5.0
MW1	12/29/08	64.69	b	21.77	42.92	0.00	<0.50	<0.50	<0.50	<0.50	<50	<50	<100	<0.50	<5.0
MW1	03/24/09	64.71	l	18.68	46.03	0.00	<0.50	<0.50	<0.50	<0.50	<50	<50	<100	<0.50	<5.0
MW1	06/02/09	64.71	l	19.60	45.11	0.00	<0.50	<0.50	<0.50	<0.50	<50	<50	<100	<0.50	<5.0
MW1	09/10/09	64.71	l	21.20	43.51	0.00	<0.50	<0.50	<0.50	<0.50	<50	<50	<100	<0.50	<5.0
MW1	12/04/09	64.71	l	22.86	41.85	0.00	<0.50	<0.50	<0.50	<0.50	<50	<50	<100	<0.50	<5.0

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	TBA
MW1	03/10/10	64.71	l	21.06	43.65	0.00	< 0.50	0.97	< 0.50	1.6	< 50	< 50	< 100	< 0.50	--
MW1	05/28/10	64.71	l	21.19	43.52	0.00	--	--	--	--	--	--	--	--	--
MW1	08/26/10	64.71	1	21.82	42.89	0.00	<0.50	<0.50	<0.50	<0.50	<50	<50	<100	<0.50	--
MW1	12/22/10	64.71	1	21.42	43.29	0.00	--	--	--	--	--	--	--	--	--
MW1	03/16/11	64.71	1	19.18	45.53	0.00	< 0.50	< 0.50	< 0.50	< 0.50	< 50	< 50	< 100	< 0.50	--
MW1	03/16/11	64.71	1	19.18	45.53	0.00	--	--	--	--	--	--	--	--	--
MW1	06/21/11	64.71	1	19.18	45.53	0.00	--	--	--	--	--	--	--	--	--
MW1	09/14/11	64.71	1	20.87	43.84	0.00	< 0.50	< 0.50	< 0.50	< 0.50	< 50	< 50	< 100	< 0.50	--
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	--
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	--
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	--
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	*	*	*	*	*	*	*	*	--
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	--
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	--	--	--	--	--	--	--	--	--
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	--
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	--
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	--
MW2	07/18/05	65.95	b	NM	NC	NM	2,700	13,000	1,800	15,000	120,000	17,000	--	530	--
MW2	09/26/05	65.95	b	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	b	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	b	15.66	50.29	sheen	620	2,800	540	4,700	33,000	<4,000	<100	37	--
MW2	06/19/06	65.95	b	19.14	46.81	sheen	680	5,200	990	16,000	120,000	<30,000	1,900	170	--
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	--
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	--
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	--
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	--
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	--

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	TBA
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	--
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	--
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	--
MW2	09/25/08	65.95	b	23.30	42.65	0.00	740	3,500	1,700	10,000	46,000	<8000	170	340	180
MW2	12/29/08	65.95	b	22.95	43.00	0.00	260	1,500	1,100	6,400	29,000	<4000	<100	110	<50
MW2	03/24/09	65.71	l	19.58	46.13	0.00	410	2,000	900	8,900	45,000	<8,000	420	300	210
MW2	06/02/09	65.71	l	20.50	45.21	0.00	680	3,100	1,200	10,000	80,000	<12000	480	330	180
MW2	09/10/09	65.71	l	22.40	43.31	0.00	700	3,000	1,300	9,400	45,000	< 8000	190	370	220
MW2	12/04/09	65.71	l	24.30	41.41	0.00	290	1,500	930	4,900	24,000	< 2000	170	200	92
MW2	03/10/10	65.71	l	22.20	43.51	0.00	200	1,300	700	9,500	45,000	< 6,000	< 100	340	--
MW2	05/28/10	65.71	l	22.41	43.30	0.00	260	1,100	650	4,700	23,000	< 8000	170	380	--
MW2	08/26/10	65.71	1	23.00	42.71	0.00	160	980	490	4,200	22,000	<2000	<100	180	--
MW2	09/20/10	65.71	1	NM	NC	0.00	52	360	210	1,600	8,800	--	--	--	--
MW2	12/22/10	65.71	1	22.47	43.24	0.00	130	1,100	430	6,000	26,000	<3000	<100	640	--
MW2	03/16/11	65.71	1	19.00	46.71	0.00	430	1700	490	3700	29000	< 3000	190	500	--
MW2	06/21/11	65.71	1	20.10	45.61	0.00	640	2100	680	4000	26000	< 3000	< 100	660	--
MW2	09/14/11	65.71	1	21.97	43.74	0.00	460	3200	1200	7600	47000	< 30000	520	380	--
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	--
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	--
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	--
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	--
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	--
MW3	07/10/01	101.29	a	21.97	79.32	0.00	--	--	--	--	--	--	--	--	--
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	--
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	--
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	--
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	--
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	--
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	--
MW3	07/18/05	65.99	b	NM	NC	NM	1,000	5,600	1,100	4,300	23,000	1,700	--	81	--

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	TBA
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	--
MW3	06/19/06	65.99	b	19.11	46.88	0.00	160	500	320	840	7,000	<300	<100	3.1	--
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	--
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	--
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	--
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	--
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	--
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	--
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	--
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	--
MW3	09/25/08	65.99	b	23.30	42.69	0.00	1,600	3,700	700	3,300	22,000	<3000	<100	220	180
MW3	12/29/08	65.99	b	22.92	43.07	0.00	310	910	320	1,300	11,000	<1500	<100	35	23
MW3	03/24/09	65.70	l	19.43	46.27	0.00	1,400	4,200	600	2,500	19,000	<1,000	<100	160	60
MW3	06/02/09	65.70	l	20.70	45.00	0.00	2,800	7,600	1,300	5,600	39,000	<1,500	<100	240	180
MW3	09/10/09	65.70	l	22.32	43.38	0.00	1,800	3,900	790	3,500	22,000	< 1500	< 100	190	110
MW3	12/04/09	65.70	l	24.20	41.50	0.00	1,600	3,400	860	3,900	25,000	< 800	< 100	210	81
MW3	03/10/10	65.70	l	22.03	43.67	0.00	420	2,400	640	3,600	27,000	< 3,000	< 100	24	--
MW3	05/28/10	65.70	l	22.84	42.86	0.00	1,200	4,600	920	4,800	31,000	< 5000	< 100	120	--
MW3	08/26/10	65.70	1	23.42	42.28	sheen	--	--	--	--	--	--	--	--	--
MW3	09/20/10	65.70	1	NM	NC	sheen	2700	13000	2900	18000	110000	--	--	--	--
MW3	12/22/10	65.70	1	22.70	43.00	0.20	--	--	--	--	--	--	--	--	--
MW3	03/16/11	65.70	1	20.13	45.57	0.00	4000	16000	2800	15000	91000	< 3000	< 100	230	--
MW3	06/21/11	65.70	1	20.20	45.50	0.00	5200	16000	3200	18000	110000	< 10000	130	490	--
MW3	09/14/11	65.70	1	22.15	43.55	0.17	--	--	--	--	--	--	--	--	--
MW4	06/30/98	98.65	a	16.93	81.72	0.00	2,200	930	850	2,100	10,000	--	--	1,800	--
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	--
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	--
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	--
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	--
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	--
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	--
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	--
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	--

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	TBA
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	--
MW4	06/24/04	63.35	b	19.31	44.04	0.00	69	<5.0	<5.0	<10	920	<50	<500	1,100	--
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	--
MW4	12/13/04	**	b	20.44	NC	0.00	<5.0	<5.0	<5.0	<10	740	<50	<500	860	--
MW4	03/14/05	**	b	18.30	NC	0.00	20	<5.0	<5.0	<10	930	<50	<500	930	--
MW4	06/15/05	**	b	20.03	NC	0.00	350	6.1	<5.0	<10	2100	89	<500	1,100	--
MW4	07/18/05	**	b	NM	NC	NM	11	<5.0	<5.0	<10	540	<50	--	1,100	--
MW4	09/26/05	**	b	21.79	NC	0.00	<5.0	<5.0	<5.0	<10	960	<50	<500	660	--
MW4	12/12/05	**	b	21.89	NC	0.00	<5.0	<5.0	<5.0	<10	820	<50	<500	1,000	--
MW4	03/29/06	**	b	14.85	NC	0.00	49	160	120	300	2,400	<100	<100	130	--
MW4	06/19/06	**	b	17.96	NC	0.00	100	940	540	1,800	8,800	<400	<100	55	--
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	--
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	--
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	--
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	--
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	--
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	--
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	--
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	--
MW4	09/25/08	63.35	b	22.03	41.32	0.00	<0.5	<0.5	<0.5	<0.5	<50	<50	<100	380	<5.0
MW4	12/29/08	63.35	b	21.62	41.73	0.00	<0.5	<0.5	<0.5	<0.5	<50	<50	<100	230	<5.0
MW4	03/24/09	64.37	l	18.38	45.99	0.00	<0.5	<0.5	<0.5	<0.5	<50	<50	<100	370	<5.0
MW4	06/02/09	64.37	l	19.32	45.05	0.00	0.64	<0.5	<0.5	<0.5	<50	<50	<100	320	<5.0
MW4	09/10/09	64.37	l	21.00	43.37	0.00	< 0.50	< 0.50	< 0.50	< 0.50	< 50	< 50	< 100	280	< 5.0
MW4	12/04/09	64.37	l	22.76	41.61	0.00	< 0.50	< 0.50	< 0.50	2.9	< 50	< 50	< 100	430	< 5.0
MW4	03/10/10	64.37	l	20.87	43.50	0.00	< 0.50	< 0.50	< 0.50	< 0.50	< 50	< 50	< 100	130	--
MW4	05/28/10	64.37	l	21.07	43.30	0.00	< 0.50	< 0.50	< 0.50	< 0.50	< 50	< 50	< 100	140	--
MW4	08/26/10	64.37	1	21.71	42.66	0.00	<0.50	<0.50	<0.50	2.0	<50	<50	<100	160	--
MW4	12/02/10	64.37	1	21.21	43.16	0.00	<0.50	<0.50	<0.50	<0.50	<50	<50	<100	50	--
MW4	03/16/11	64.37	1	18.82	45.55	0.00	<0.50	<0.50	<0.50	<0.50	<50	<50	<100	220	--
MW4	06/21/11	64.37	1	18.95	45.42	0.00	0.70	< 0.50	1.4	< 0.50	< 50	< 50	< 100	220	--
MW4	09/14/11	64.37	1	20.68	43.69	0.00	< 0.50	< 0.50	< 0.50	2.9	63	< 50	< 100	150	--
MW5	06/30/98	100.9	a	20.60	80.30	0.00	<0.50	<0.50	<0.50	<0.50	<50	--	--	23	--
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	--
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	--
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	--
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	--
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	--
MW5	07/10/01	100.9	a	23.64	77.26	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	TBA
MW5	11/20/01	65.59	b	24.65	40.94	0.00	0.83	12	1.2	11	140	860	2,500	10	--
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	--
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	--
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	--
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	--
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	--
MW5	06/19/06	65.59	b	20.22	45.37	0.00	--	--	--	--	--	--	--	--	--
MW5	09/29/06	65.59	b	22.80	42.79	0.00	--	--	--	--	--	--	--	--	--
MW5	12/12/06	65.59	b	23.08	42.51	0.00	--	--	--	--	--	--	--	--	--
MW5	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	--
MW5	06/12/07	65.59	b	22.78	42.81	0.00	--	--	--	--	--	--	--	--	--
MW5	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	--
MW5	12/20/07	65.59	b	24.52	41.07	0.00	--	--	--	--	--	--	--	--	--
MW5	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	--
MW5	06/03/08	65.59	b	23.68	41.91	0.00	--	--	--	--	--	--	--	--	--
MW5	09/25/08	65.59	b	25.00	40.59	0.00	<0.50	<0.50	<0.50	<0.50	<50	<50	<100	0.66	<5.0
MW5	12/29/08	65.59	b	24.92	40.67	0.00	<0.50	<0.50	<0.50	<0.50	71	<50	<100	<0.5	<5.0
MW5	03/24/09	65.59	l	21.85	43.74	0.00	<0.50	<0.50	<0.50	<0.50	<50	<50	<100	0.54	<5.0
MW5	06/02/09	65.59	l	22.70	42.89	0.00	<0.50	<0.50	<0.50	<0.50	<50	<50	<100	<0.5	<5.0
MW5	09/10/09	65.59	l	24.12	41.47	0.00	< 0.50	< 0.50	< 0.50	< 0.50	< 50	< 50	< 100	0.56	< 5.0
MW5	12/04/09	65.59	l	dry	--	0.00	--	--	--	--	--	--	--	--	--
MW5	03/10/10	65.59	l	25.90	39.69	0.00	< 0.50	< 0.50	< 0.50	< 0.50	55	< 50	< 100	0.71	--
MW5	05/28/10	65.59	l	25.54	40.05	0.00	--	--	--	--	--	--	--	--	--
MW5	08/26/10	65.59	1	25.59	40.00	0.00	<0.50	<0.50	<0.50	<0.50	<50	<50	<100	0.52	--
MW5	12/22/10	65.59	l	24.80	40.79	0.00	--	--	--	--	--	--	--	--	--
MW5	03/16/11	65.59	l	22.02	43.57	0.00	< 0.50	< 0.50	< 0.50	< 0.50	< 50	< 50	< 100	< 0.50	--
MW5	06/21/11	65.59	l	22.41	43.18	0.00	--	--	--	--	--	--	--	--	--
MW5	09/14/11	65.59	l	24.39	41.20	0.00	< 0.50	< 0.50	< 0.50	< 0.50	< 50	< 50	< 100	< 0.50	--
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	--
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	--
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	--
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	--
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	--
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	--

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	TBA
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	--
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	--
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	--
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	--
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	--
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	--
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	--
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	--
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	--
MW6	06/03/08	59.60	b	17.11	42.49	0.00	--	--	--	--	--	--	--	--	--
MW6	09/25/08	59.60	b	18.82	40.78	0.00	<0.50	<0.50	<0.50	<0.50	<50	<50	<100	78	<5.0
MW6	12/29/08	59.60	b	18.30	41.30	0.00	0.77	<0.50	<0.50	<0.50	<50	<50	<100	44	<5.0
MW6	03/24/09	59.60	l	16.80	42.80	0.00	<0.50	<0.50	<0.50	<0.50	<50	<50	<100	51	<5.0
MW6	06/02/09	59.60	l	17.27	42.33	0.00	<0.50	<0.50	<0.50	<0.50	<50	<50	<100	59	<5.0
MW6	09/10/09	59.60	l	18.20	41.40	0.00	< 0.50	< 0.50	< 0.50	< 0.50	< 50	< 50	< 100	73	< 5.0
MW6	12/04/09	59.60	l	19.07	40.53	0.00	< 0.50	< 0.50	< 0.50	< 0.50	< 50	< 50	< 100	50	< 5.0
MW6	03/10/10	59.60	l	17.80	41.80	0.00	< 0.50	< 0.50	< 0.50	< 0.50	< 50	< 50	< 100	51	--
MW6	05/28/10	59.60	l	18.02	41.58	0.00	--	--	--	--	--	--	--	--	--
MW6	08/26/10	59.60	1	18.70	40.90	0.00	<0.50	<0.50	<0.50	<0.50	<50	<0.50	<100	47	--
MW6	12/22/10	59.60	l	17.84	41.76	0.00	--	--	--	--	--	--	--	--	--
MW6	03/16/11	59.60	l	16.94	42.66	0.00	< 0.50	< 0.50	< 0.50	< 0.50	< 50	< 50	< 100	44	--
MW6	06/21/11	59.60	l	17.05	42.55	0.00	--	--	--	--	--	--	--	--	--
MW6	09/14/11	59.60	l	17.97	41.63	0.00	< 0.50	< 0.50	< 0.50	< 0.50	< 50	< 50	< 100	50	--
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	--
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	--
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	--
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	--
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	--
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	--
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	--
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	--
MW7	06/19/06	59.47	b	14.49	44.98	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	TBA
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	--	--	--	--	--	--	--	--	--
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	--
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	--
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	--
MW7	06/03/08	59.47	b	14.24	45.23		0.00	--	--	--	--	--	--	--	--	--
MW7	09/25/08	59.47	b	17.07	42.40		0.00	<0.50	<0.50	<0.50	<0.50	<50	<50	<100	<0.50	<5.0
MW7	12/29/08	59.47	b	15.64	43.83		0.00	<0.50	<0.50	<0.50	<0.50	<50	<50	<100	<0.50	<5.0
MW7	03/24/09	59.49	l	14.57	44.92		0.00	<0.50	<0.50	<0.50	<0.50	<50	<50	<100	<0.50	<5.0
MW7	06/02/09	59.49	l	16.10	43.39		0.00	<0.50	<0.50	<0.50	<0.50	<50	<50	<100	<0.50	<5.0
MW7	09/10/09	59.49	l	17.10	42.39		0.00	<0.50	<0.50	<0.50	<0.50	<50	<50	<100	<0.50	<5.0
MW7	12/04/09	59.49	l	17.10	42.39		0.00	--	--	--	--	--	--	--	--	--
MW7	03/10/10	59.49	l	15.17	44.32		0.00	--	--	--	--	--	--	--	--	--
MW7	05/28/10	59.49	l	15.20	44.29		0.00	--	--	--	--	--	--	--	--	--
MW7	08/26/10	59.49	1	17.10	42.39		0.00	<0.50	<0.50	<0.50	<0.50	<50	<50	<100	<0.50	--
MW7	12/22/10	59.49	l	14.94	44.55		0.00	--	--	--	--	--	--	--	--	--
MW7	03/16/11	59.49	l	14.75	44.74		0.00	--	--	--	--	--	--	--	--	--
MW7	06/21/11	59.49	l	15.74	43.75		0.00	--	--	--	--	--	--	--	--	--
MW7	09/14/11	59.49	l	16.68	42.81		0.00	< 0.50	< 0.50	< 0.50	< 0.50	< 50	< 50	< 100	< 0.50	--
MW8	12/29/08	NS	b	15.71	NC		0.00	<0.50	0.64	<0.50	0.78	<50	<50	<100	1.5	<5.0
MW8	03/24/09	57.07	l	16.08	40.99		0.00	<0.50	<0.50	<0.50	<0.50	<50	<50	<100	<0.50	<5.0
MW8	06/02/09	57.07	l	15.46	41.61		0.00	<0.50	<0.50	<0.50	<0.50	<50	<50	<100	<0.50	<5.0
MW8	09/10/09	57.07	l	15.58	41.49		0.00	< 0.50	< 0.50	< 0.50	< 0.50	< 50	< 50	< 100	2.4	< 5.0
MW8	12/04/09	57.07	l	16.27	40.80		0.03	--	--	--	--	--	--	--	--	--
MW8	03/10/10	57.07	l	14.47	42.60		0.03	--	--	--	--	--	--	--	--	--
MW8	05/28/10	57.07	l	16.12	40.95		0.03	--	--	--	--	--	--	--	--	--
MW8	08/26/10	57.07	1	16.36	40.71		0.00	<0.50	<0.50	<0.50	<0.50	<50	<50	<100	1.1	--
MW8	12/22/10	57.07	l	16.25	40.82		0.03	--	--	--	--	--	--	--	--	--
MW8	03/16/11	57.07	l	15.66	41.41		0.03	--	--	--	--	--	--	--	--	--
MW8	06/21/11	57.07	l	15.72	41.35		0.03	--	--	--	--	--	--	--	--	--
MW8	09/14/11	57.07	l	15.88	41.19		0.03	< 0.50	< 0.50	< 0.50	< 0.50	< 50	< 50	< 100	1.4	--
MW9A	09/10/09	65.90		22.51	43.39		0.00	7,800	33,000	4,500	25,000	160,000	< 20,000	410	1,800	780
MW9A	12/04/09	65.90		24.42	41.48		0.00	--	--	--	--	--	--	--	--	--
MW9A (m)	12/28/09	65.90		24.62	41.28		sheen	12,000	34,000	4,300	24,000	180,000	<200,000	3,400	2,100	680
MW9A	03/10/10	65.90		22.30	43.60		0.00	15,000	42,000	4,800	26,000	210,000	< 40,000	250	2,300	--
MW9A	05/28/10	65.90		22.62	43.29	(n)	0.02	Not Sampled due to Free Product								
MW9A	08/26/10	65.90		23.21	42.70		0.00	2,600	19,000	3,000	22,000	150,000	<500,000	11,000	75	--
MW9A	09/21/10	65.90		NM	NC		0.00	1,400	9,600	1,600	12,000	70,000	--	--	--	--
MW9A	12/22/10	65.90		22.63	43.28		0.00	4,400	17,000	1,900	13,000	83,000	<1500	<100	250	--
MW9A	03/16/11	65.90		20.31	45.60		0.00	4,900	22,000	2,800	20,000	130,000	< 1500	230	620	--
MW9A	06/21/11	65.90		20.36	45.55		0.00	16	33	39	230	2800	< 300	< 100	28	--
MW9A	09/14/11	65.90		22.24	43.67		0.00	3700	17000	2800	21000	120000	< 25000	1400	720	--
MW9B	09/10/09	65.85		22.30	43.55		0.00	640	4,500	1,100	6,500	36,000	< 3,000	< 100	61	< 50
MW9B	12/04/09	65.85		24.00	41.85		0.00	63	250	180	620	5,600	< 300	< 100	3.1	< 5.0
MW9B	03/10/10	65.85		22.41	43.44		0.00	98	310	340	900	7,500	< 600	< 100	5.7	--

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	TBA
MW9B	05/28/10	65.85	22.50	43.35	0.00	31	75	150	270	2,900	< 400	< 100	2.9	--
MW9B	08/26/10	65.85	23.31	42.54	0.00	13	160	310	2,000	14,000	<1000	<100	88	--
MW9B	09/20/10	65.85	NM	NC	0.00	7	110	140	830	6,200	--	--	--	--
MW9B	12/22/10	65.85	23.20	42.65	0.00	<0.5	3	1	10	140	<50	<100	4.5	--
MW9B	03/16/11	65.85	20.14	45.71	0.00	22	39	47	290	3,500	< 300	< 100	38	--
MW9B	06/21/11	65.85	20.30	45.55	0.00	9.2	29	38	260	2200	< 300	< 100	41	--
MW9B	09/14/11	65.85	21.44	44.41	0.00	17	22	47	220	2200	< 400	< 100	66	--
O1	09/10/09	65.91	22.44	43.47	0.00	960	2,400	1,000	4,600	23,000	< 1,500	< 100	180	84
O1	12/04/09	65.91	24.33	41.58	0.00	1,000	3,700	1,700	7,400	38,000	< 1000	< 100	310	200
O1	03/10/10	65.91	22.20	43.71	0.00	660	2,600	970	5,300	29,000	< 1000	< 100	200	--
O1	05/28/10	65.91	22.49	43.42	0.00	610	2,000	1,000	4,200	21,000	< 1500	< 100	270	--
O1	08/26/10	65.91	23.25	42.66	0.00	29	160	59	680	5,000	<500	<100	97	--
O1	09/20/10	65.91	NM	NC	0.00	24	140	28	330	2,000	--	--	--	--
O1	12/22/10	65.91	22.70	43.21	0.00	10	35	3	30	460	<50	<100	220	--
O1	03/16/11	65.91	20.19	45.72	0.00	200	440	240	850	6,900	< 300	< 100	180	--
O1	06/21/11	65.91	20.31	45.60	0.00	320	530	400	1500	8900	< 400	< 100	260	--
O1	09/14/11	65.91	22.16	43.75	0.00	320	540	510	1500	9000	< 1000	< 100	170	--

Table 3. Potentially Applicable or Relevant and Appropriate Requirements (ARARS) and To Be Considered (TBC) Criteria
Former Val Strough Chevrolet Site, Oakland, CA

Type	Standard, Requirement, Criteria, Limitation	Citation	Description
Chemical	Chemical Hazardous Waste Identification	40 CFR 261.24	Establishes criteria to determine whether solid waste exhibits hazard characteristics of federal hazardous waste
Chemical/ Action	Classification and regulation of hazardous waste	40 CFR 260	Establishes criteria for the determination of hazardous waste and its regulation.
Action	Drinking Water Standards	40 CFR Part 141	Establishes maximum contaminant levels to protect water quality in public drinking water systems
Action	Occupational Health and Safety	29 CFR 1910.120	Establishes requirements for health and safety training.
Action	Resource Conservation and Recovery Act (RCRA)	40 CFR 239-299	Primary federal law governing the disposal of solid and hazardous waste.
Chemical	Ambient Air Quality Standards	HSC 39000-44071	Establishes standards for emissions of chemical vapors and dust.
Action	Clean Air Act	42 USC 7401-7642	Emission standards from stationary and mobile sources
Action	Determination of Characteristic Wastes	22 CCR 66261.24	Establishes criteria for identifying characteristic wastes.
Chemical	Determination of Characteristic Wastes	22 CCR 66261.24	Establishes criteria for identifying characteristic wastes.
Action	Hazardous Waste Control	HSC 25100-25250.26 Establishes hazardous waste control measures.	Establishes hazardous waste control measures.
Action	Hazardous Waste Generator Requirements	22 CCR 66262.11 et seq.	Establishes standards applicable to generators of hazardous waste
Action	Drinking Water Standards (MCLs)	22 CCR 64431 and 64444	Establishes maximum contaminant levels to protect drinking water in public water supply systems
Action	Porter-Cologne Water Quality Control Act	RWQCB California Water Code, Division 7. Water Quality	Establishes policies and procedures for investigation and remediation decisions for preservation and protection of water of the state for benefecial uses
Action	Water Quality Control Plan	RWQCB California Water Code, Division 7. Water Quality	Establishes water quality objectives for the San Francisco Bay
Action	California Occupational Health and Safety	8 CCR 1500, 2300, and 3200 et seq.	Establishes standards for working conditions and employees matter; and notification requirements
Action	Land Use- California Environmental Quality Act	Pbulic Resources Code Sections 21000-21177	Mandates environmental impact review of projects approved by government agencies.
Action	Land Use Covenants	22 CCR 67391.1	Specify that a land use covenant imposing appropriate restrictions on land use shall be executed and recorded when hazardous materials, hazardous wastes or constituents, or hazardous substances will remain at the property at levels which are not suitable for unrestricted use of the land.
TBC/Action	Health Risk Assessment	USEPA Risk Assessment Guidance for Superfund, 1989	Guidance and framework to assess health risk.
TBC/chemical	Health Risk Screening Assessment	Enviornmental Screening Levels (ESLs) for protection of soil, groundwater, and indoor air quality (RWQCB, 2007)	Establishes screening levels for soil, groundwater, soil vapor, and indoor iar quality based on health risk assessment
TBC	Soil Screening Guidance	USEPA Soil Screening Guidance, July 1996	Methodology for developing site-specific screening levels
TBC	Health Risk Screening Assessment	USEPA Region 9 Regional Screening Levels (RSLs)	Guidance and framework to assess health risk.

NOTES:

CCR California Code of Regulations
CFR Code of Federal Regulations
HSC California Health and Safety Code
RWQCB Regional Water Quality Control Board, San Francisco Bay Region
RCRA Resource Conservation and Recovery Act
USC United States Code
TBC To Be Considered

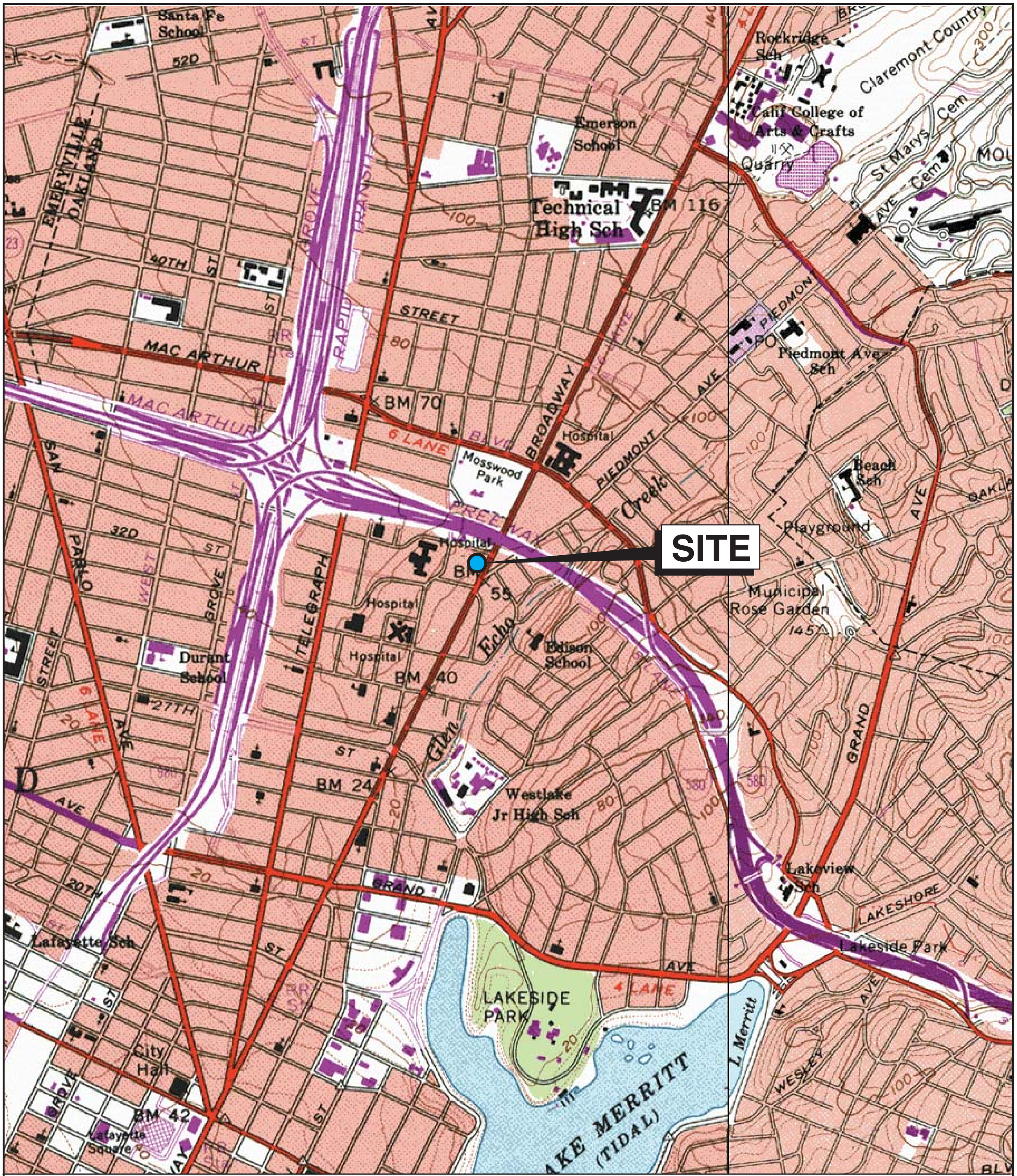
TABLE 4 GROUNDWATER MONITORING SCHEDULE
FORMER VAL STROUGH CHEVROLET, 327 34th STREET OAKLAND, CALIFORNIA

Well Number	Groundwater Gauging Frequency	Groundwater Sampling and Analysis Frequency		
		BTEX and TPH-g	MTBE	TEPH
MW1	Q	S	S	S
MW2	Q	Q	Q	Q
MW3	Q	Q	Q	Q
MW4	Q	Q	Q	Q
MW5	Q	S	S	S
MW6	Q	S	S	S
MW7	Q	A	A	A
MW8	Q	A	A	A
MW9A	Q	Q	Q	Q
MW9B	Q	Q	Q	Q
O1	Q	Q	Q	Q

Q = Quarterly.
S = Semiannual (1st and 3rd Quarters).
A = Annual.

BTEX = Benzene, toluene, ethylbenzene, total xylenes.
MTBE = Methyl tertiary butyl ether.
TPH-g = Total Petroleum Hydrocarbons as gasoline.
TEPH = Total Extractable Petroleum Hydrocarbons, includes TPH-diesel and TPH-motor oil.

Figures



Base map: Maptech Inc., 2001

N

0 2,000

Scale (feet)

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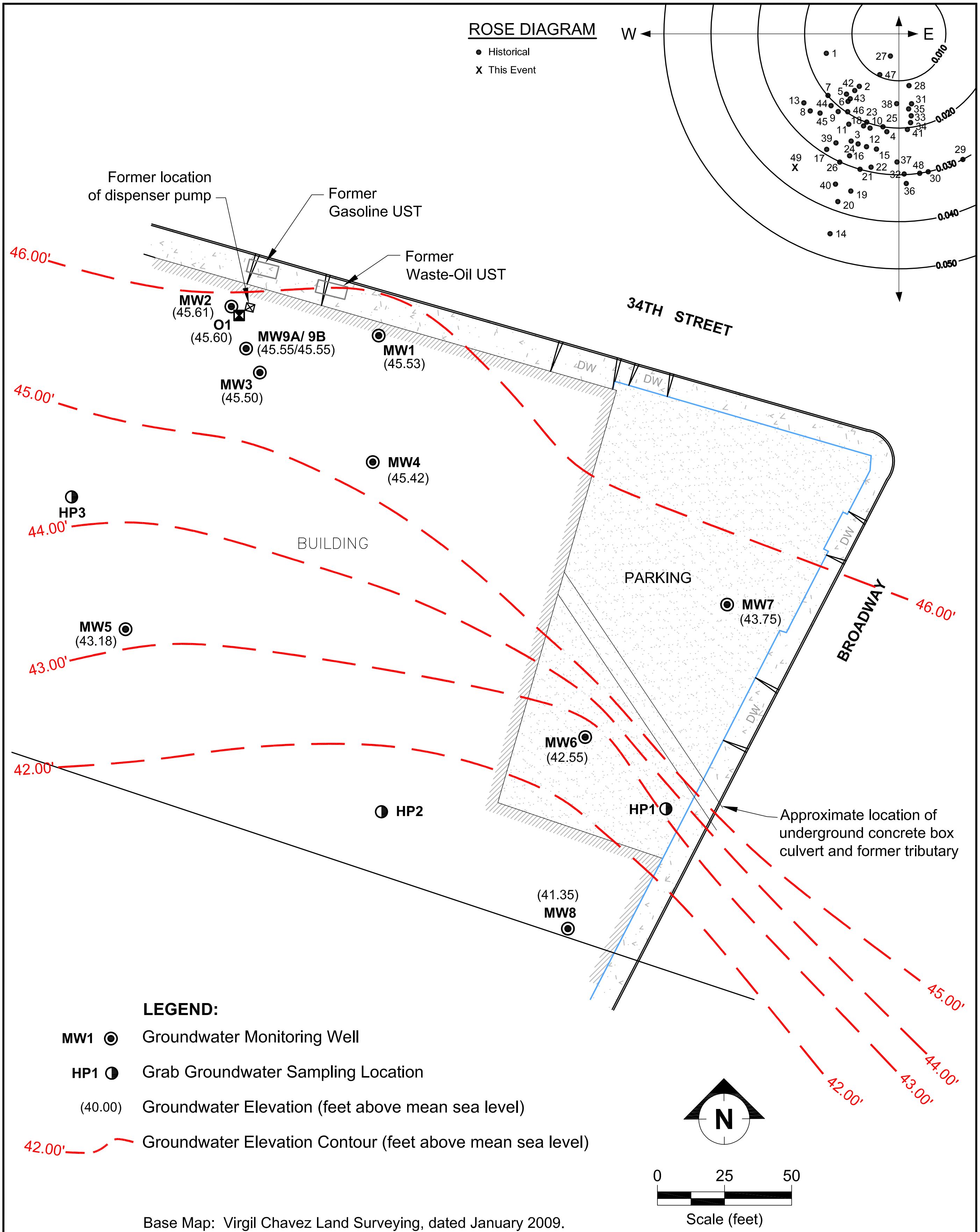
SITE LOCATION MAP
FORMER VAL STROUGH CHEVROLET
327 34TH STREET, OAKLAND, CALIFORNIA

FIGURE: **1**



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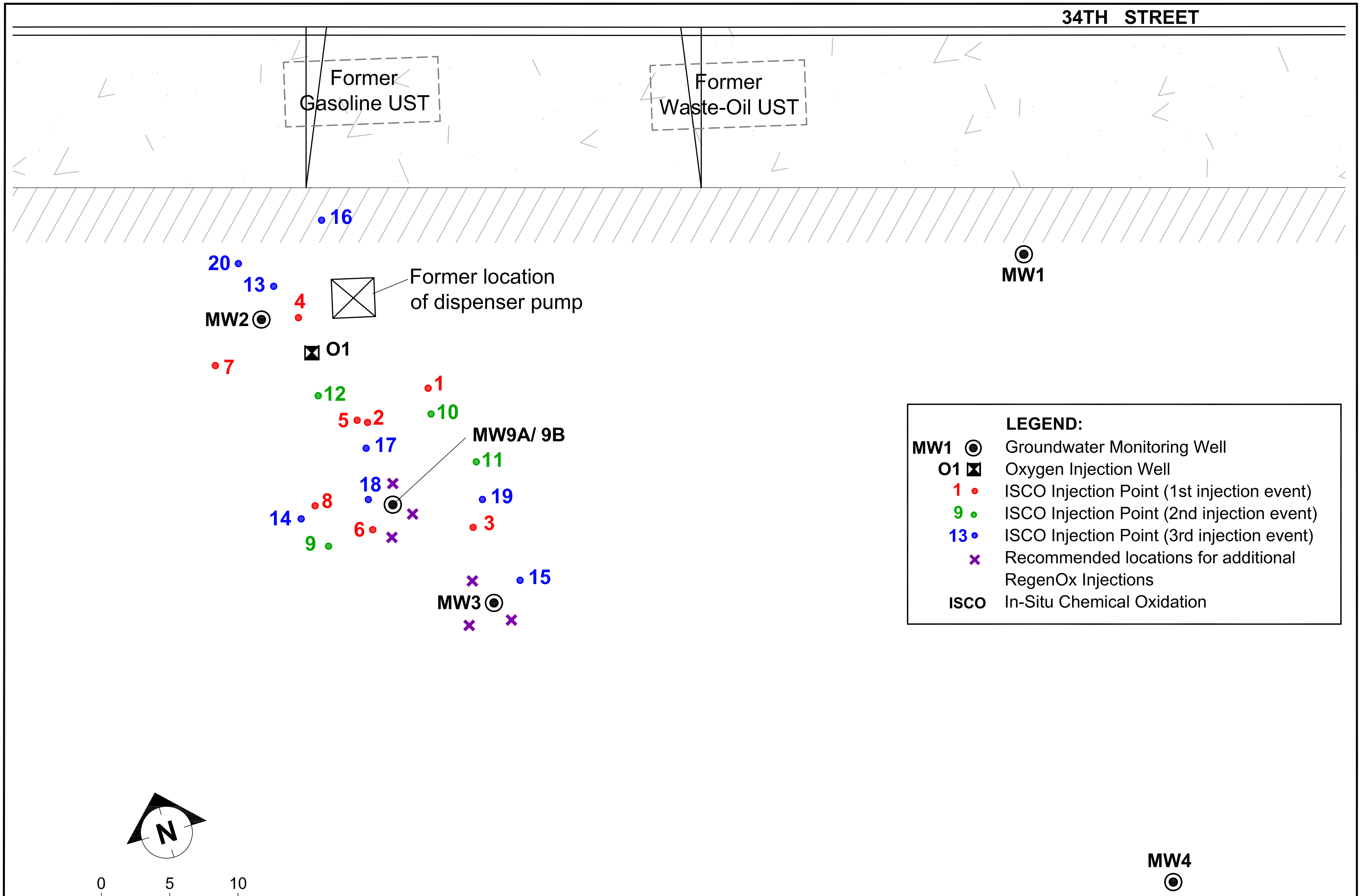
GROUNDWATER ELEVATION CONTOUR MAP AND ROSE DIAGRAM
2ND QUARTER 2011 MONITORING EVENT
FORMER VAL STROUGH CHEVROLET
327 34TH STREET, OAKLAND, CALIFORNIA
AUGUST 2011

FIGURE: **2**



Base Map: Virgil Chavez Land Surveying, dated January 2009.

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ISCO APPLICATION AREA
FORMER VAL STROUGH CHEVROLET
327 34TH STREET, OAKLAND, CALIFORNIA

FIGURE: 3

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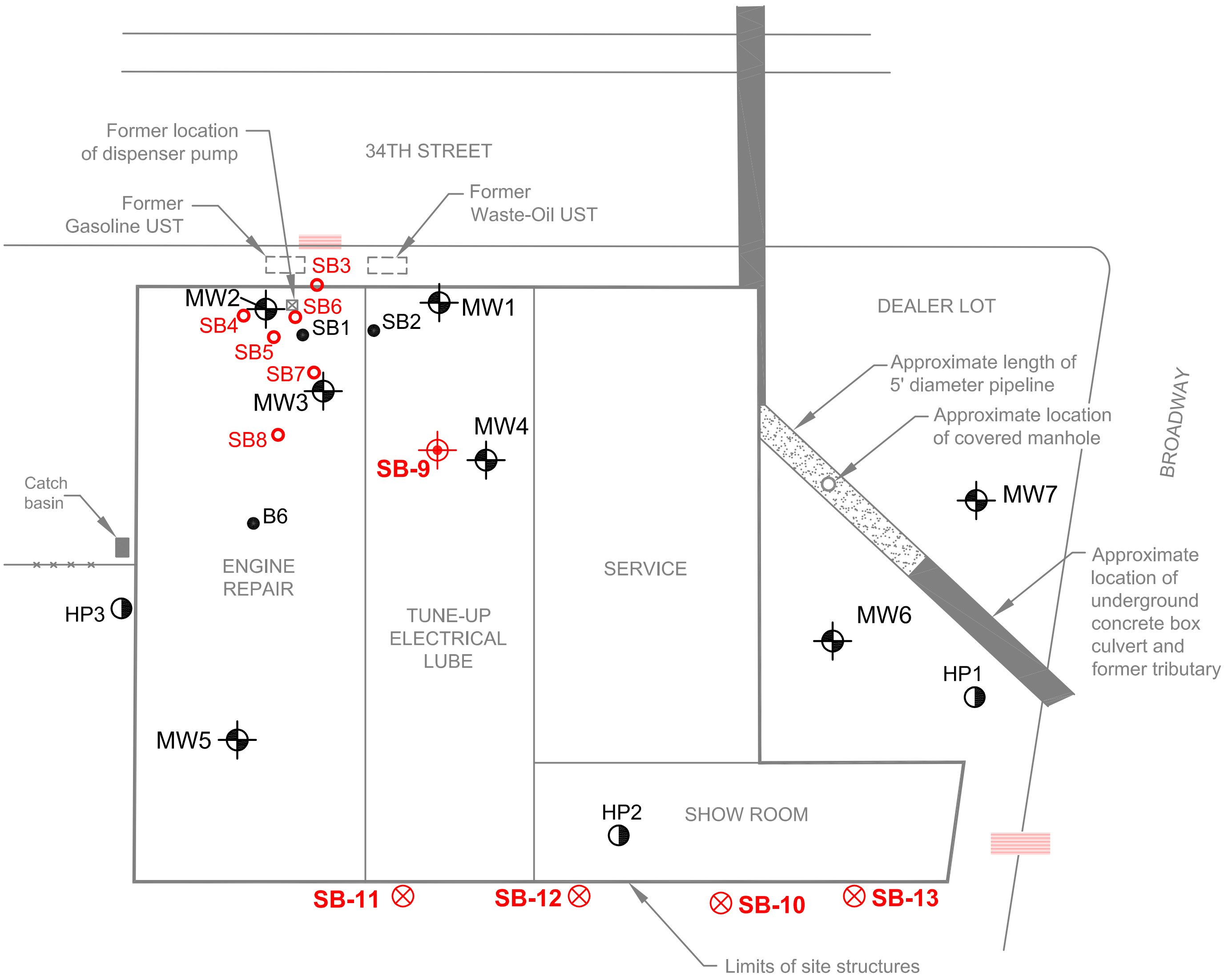
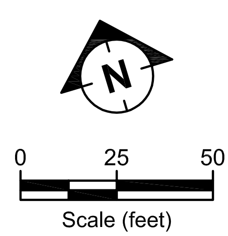
Appendix A

Historical Site Investigation Data



LEGEND:

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



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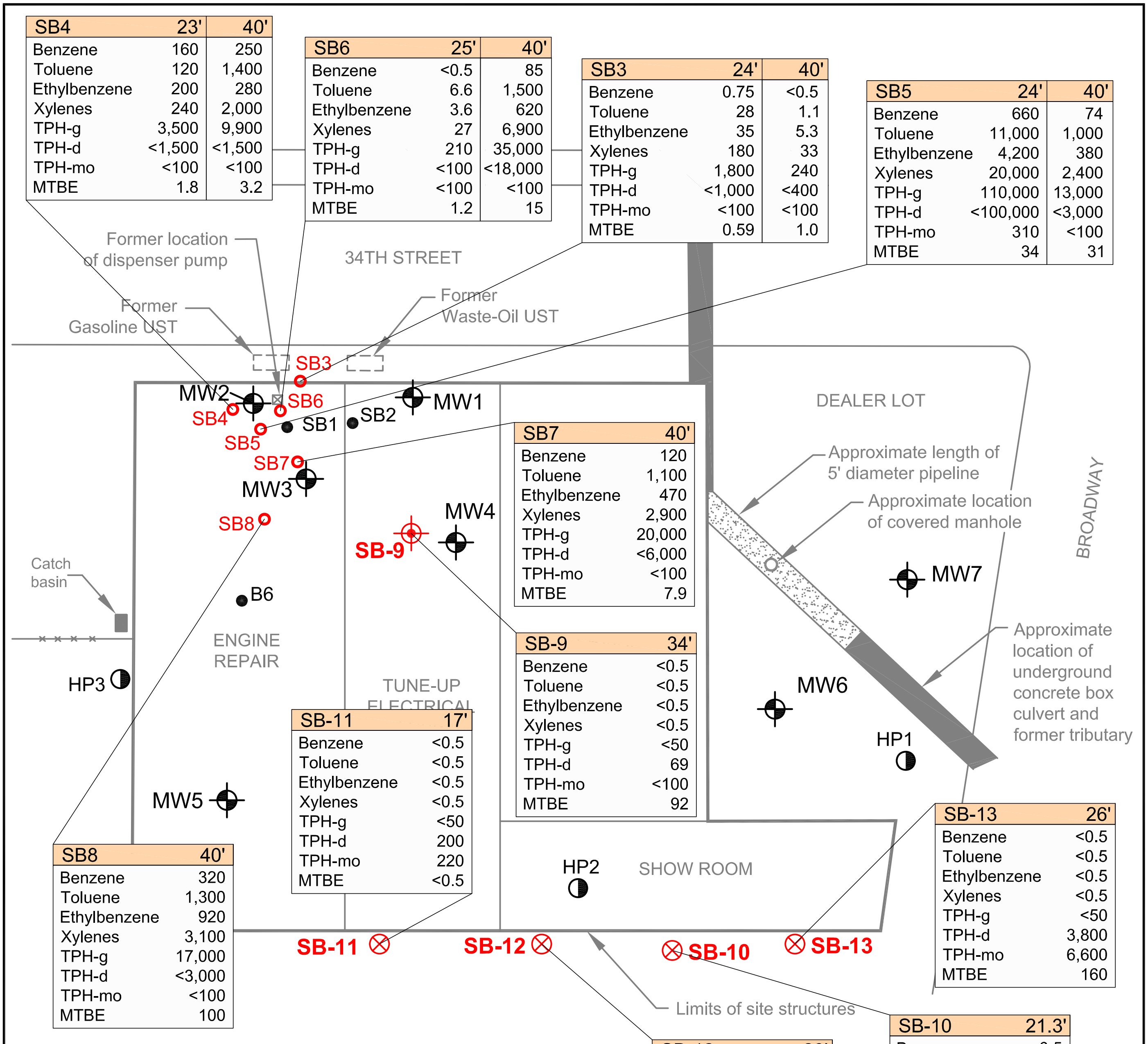
LOCATIONS OF SOIL BORINGS
FORMER VAL STROUGH CHEVROLET
327 34TH STREET, OAKLAND, CALIFORNIA
FEBRUARY 2008

FIGURE: **4**



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

SB-9	34'
Benzene	<0.5
Toluene	<0.5
Ethylbenzene	<0.5
Xylenes	<0.5
TPH-g	<50
TPH-d	69
TPH-mo	<100
MTBE	92

SB-11	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

SB-13	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

SB-12	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

SB-10	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

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.

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GRAB GROUNDWATER ANALYTICAL RESULTS
FORMER VAL STROUGH CHEVROLET
327 34TH STREET, OAKLAND, CALIFORNIA
FEBRUARY 2008

FIGURE: **5**

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

			Concentrations (mg/kg)							
Boring ID	Date	Depth (feet)	Benzene	Toluene	Ethyl-benzene	Total Xylenes	MTBE	TPH-g	TPH-d	TPH-mo
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 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)							
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-g Total Petroleum Hydrocarbons as gasoline.

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

			Concentrations (ug/m3)															
Boring ID	Date	Depth (feet)	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