3 March 2006

Mr. Don Hwang
Hazardous Materials Specialist
Alameda County Health Care Services Agency
1131 Harbor Bay Parkway
Alameda, California 94502-6577

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

Dear Mr. Hwang:

This letter is to accompany the *Work Plan for Well Installation and Remediation Enhancements* for the above-referenced site previously sent to your attention by ETIC Engineering, Inc. of Pleasant Hill, California.

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 Thomas E. Neely of ETIC Engineering, Inc. at (925) 602-4710, ext. 17.

Sincerely,

Don Strough

cc: Mr. Thomas E. Neely, ETIC Engineering, Inc., 2285 Morello Avenue, Pleasant Hill, California 94523
Mr. Gregory Brandt, Esq., Wendel Rosen Black & Dean, 1111 Broadway, 24th Floor, Oakland, California 94607
Mr. Jonathan Redding, Esq., Wendel Rosen Black & Dean, 1111 Broadway, 24th Floor, Oakland, California 94607

ETIC ENGINEERING

3 March 2006

Mr. Don Hwang
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Alameda County Health Care Services Agency
1131 Harbor Bay Parkway
Alameda, California 94502-6577

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

Dear Mr. Hwang:

Attached for your review and comment is a copy of the *Work Plan for Well Installation and Remediation Enhancements* for the above-referenced site. ETIC Engineering, Inc. of Pleasant Hill, California, is submitting the attached report on behalf of the owner of the property. The signed letter from the owner of the property will be submitted under separate cover.

If you have any questions or require further information, please contact me at (925) 602-4710, ext. 17.

Sincerely,
ETIC Engineering, Inc.

Thomas E. Neely, PG, CHG, REA II
Senior Project Manager

Attachment

cc: Mr. Don Strough, Strough Family Trust, P.O. Box 489, Orinda, California 94563
Mr. Gregory Brandt, Esq., Wendel Rosen Black & Dean, 1111 Broadway, 24th Floor, Oakland, California 94607
Mr. Jonathan Redding, Esq., Wendel Rosen Black & Dean, 1111 Broadway, 24th Floor, Oakland, California 94607

Work Plan for Well Installation and Remediation Enhancements

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

3 March 2006

Prepared for:

Mr. Don Strough
Strough Family Trust of 1983
P.O. Box 489
Orinda, California 94563

Prepared by:

ETIC Engineering, Inc.
2285 Morello Avenue
Pleasant Hill, California 94523

David Pew
Staff Geologist

3/3/2006
Date

Thomas E. Neely, PG, CHG, REA II
Senior Project Manager

3/3/06
Date

REGISTERED GEOLOGIST
THOMAS E. NEELY
Exp. 9/30/07
No. 7652
STATE OF CALIFORNIA

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SITE CONTACTS

Site Name:	Former Val Strough Chevrolet
Site Address:	327 34th Street Oakland, California
Consultant:	ETIC Engineering, Inc. 2285 Morello Ave. Pleasant Hill, CA 94523 (925) 602-4710
ETIC Project Manager:	Thomas E. Neely, PG, CHG, REA II
Regulatory Oversight:	Don Hwang Alameda County Health Care Services Agency (ACHCSA) 1131 Harbor Bay Parkway, Suite 250 Alameda, California 94502-6577 (510) 567-6746

1.0 INTRODUCTION

At the request of the Strough Family Trust of 1983, ETIC Engineering, Inc. (ETIC) has prepared this work plan for well installation and remediation system enhancements for the site located at 327-34th Street in Oakland, California (Figure 1).

The work plan is organized as follows:

Section 1 – Introduction
Section 2 – Site Background
Section 3 – Well Installation
Section 4 – Proposed Remediation Enhancements
Section 5 – Proposed Schedule
Section 6 – References

Scope of Work

This work plan addresses the further investigation and remediation of the source area of shallow contamination of the site as requested by the ACHCSA in a letter dated 20 August 2004.

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 2 miles east of San Francisco Bay at approximately 61 feet above mean sea level (msl). 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 (Figure 2). The former fuel dispenser and underground storage tanks (USTs) were located in the northwestern portion of the site. Seven groundwater monitoring wells are located at the site.

Underground Utilities: 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 two 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, 2003).

2.2 SUMMARY OF PREVIOUS INVESTIGATIONS AND REMEDIATION

As presented in previous reports, the USTs were removed and multiple investigations, including the installation of seven groundwater monitoring wells, were conducted. In addition, a routine groundwater monitoring program has been in place since 1993. The following paragraphs summarize the findings of these activities.

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 layers 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 17 to 23 feet bgs. The direction of groundwater flow is generally toward the southwest to south-southwest, with an average hydraulic gradient of approximately 0.02 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 constituents of potential concern (COPCs) at the site include total petroleum hydrocarbons as gasoline (TPH-g), benzene, toluene, ethylbenzene, and total xylenes (BTEX), and methyl t-butyl ether (MTBE). TPH as diesel (TPH-d) and TPH as motor oil (TPH-mo) are not routinely detected in groundwater samples and are considered secondary COPCs for the site.

Residual Source Area: Elevated concentrations of TPH-g, BTEX, and MTBE are present in soil in the vadose zone and upper portion of the aquifer near the former USTs and fuel dispenser. Separate phase petroleum hydrocarbons (SPH) have been intermittently detected in wells MW2 and MW3. These data indicate that most of the residual petroleum hydrocarbon mass is present near the former USTs and fuel dispenser, herein referred to as the source area.

Petroleum Hydrocarbon Distribution in Groundwater: The highest concentrations of petroleum hydrocarbons have been detected in samples collected from wells MW2 and MW3. Generally lower levels of petroleum hydrocarbons have been detected in samples collected from well MW4.
The extent of dissolved-phase petroleum hydrocarbons in groundwater is largely defined by concentrations detected in downgradient and cross-gradient monitoring wells MW5, MW6, and MW7. Historically, TPH-g, BTEX, and MTBE concentrations in samples from wells MW5, MW6, and MW7 are relatively low and stable. In addition, fuel oxygenates (tertiary amyl methyl ether, ethyl tertiary butyl ether, di-isopropyl ether, tertiary butyl alcohol and ethanol) and lead scavengers (ethylene dibromide and ethylene dichloride) were detected near laboratory reporting limits or were not detected in groundwater samples collected from borings HP1 and HP3, drilled on 18 December 2003. These data suggest that the petroleum hydrocarbon plume is stable.

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

Interim Remedial Action: The DPE and IRAP Report (ETIC, 2004) described the planned reduction of residual petroleum hydrocarbon mass in the source area through temporary DPE system installation and operation. The remediation technology consists of a liquid ring pump which applies high vacuum to source area wells MW2 and MW3 to extract soil vapor and groundwater simultaneously. A knockout vessel is used to separate the soil vapor and water streams. Extracted vapor is treated using a thermal oxidizer (with propane as a supplemental fuel), and extracted water is treated using aqueous-phase granular activated carbon.

20 August 2004 ACHCSA Correspondence: In a 20 August 2004 correspondence, the ACHCSA provided general concurrence with the scope of work presented in the DPE Report and IRAP and requested that additional activities be performed, including preparation of a work plan for source characterization and shallow soil remediation. In the 26 October 2004 *Technical Memorandum*, ETIC presented an evaluation of site data concluding that the source area was adequately characterized and that the planned DPE interim remedial action would address the shallow soil remediation requested by the ACHCSA.

4 February 2005 ACHSCA Correspondence: In a 4 February 2005 correspondence, the ACHCSA provided concurrence with initiation of DPE interim remedial activities and requested an Addendum to the Interim Remedial Action Plan for verification monitoring of remediation effectiveness. The following summarizes ETIC's response to this request.

During operation of the remediation system, petroleum hydrocarbon concentrations in vapor and water are anticipated to decline, resulting in reduction in mass removal rates. As mass removal rates approach asymptotic levels, operation of the DPE system will cease temporarily (2 to 4 weeks) to allow the subsurface to re-equilibrate. Following re-equilibration, the site data will be evaluated and if warranted the system will be restarted and operated until mass removal rates again approach asymptotic levels. This process may be repeated. As described in ETIC's 24 June 2004 DPE Report and IRAP, the effectiveness of interim remedial action activities will be evaluated through multiple lines of evidence. The following provides a brief summary:

- Extracted water entering and exiting the carbon vessels will be analyzed to comply with

EBMUD permit conditions and to evaluate carbon breakthrough. These data will also be used with groundwater extraction rates to evaluate mass removal rates in the aqueous phase.

- Extracted vapors entering and exiting the thermal oxidizer will be monitored using a photoionization detector (PID) on a weekly basis to comply with Bay Area Air Quality Management District (BAAQMD) permit conditions and determine the effectiveness of the treatment system. These data, along with monthly laboratory analyses of vapor samples, will be used with vapor extraction rates to evaluate mass removal rates in the vapor phase.

- Groundwater monitoring at the site, including the extraction wells, will continue on a quarterly basis. Additional groundwater samples from these extraction wells will be collected intermittently to evaluate the effectiveness of the DPE system. The absence of SPH and declining hydrocarbon concentrations in these wells will also be used to evaluate the system effectiveness.

Current System Operational Status: On 30 January 2006, the DPE system was shut down to allow conversion of vapor treatment from thermal oxidation to carbon filtration. The influent vapor concentrations had decreased significantly, causing treatment through thermal oxidation (with supplemental propane fuel) to be inefficient and not cost-effective. The vapor treatment equipment was switched to carbon filtration in February 2006. The DPE system will resume operation upon receiving the revised permit from the Bay Area Air Quality Management District (BAAQMD). The BAAQMD permit is also being converted from the existing temporary permit (that was to expire in February 2006) to an extended-use permit.

3.0 WELL INSTALLATION

The proposed extraction wells are designed to enhance the remediation of TPH-g impacted soil and groundwater beneath the site. The groundwater plume is currently being monitored by seven wells (MW1 through MW7) at the site. Dual phase extraction has been applied to two wells (MW2 and MW3) to extract TPH-g from soil and groundwater. On 15 July 2005, dual phase extraction was discontinued in well MW3 due to operational issues. Although a significant amount of TPH-g was initially extracted from well MW2, subsequent field measurements and analytical data have indicated that the well is not suitably constructed to remediate contamination in shallow soil near the former tanks and dispenser. We propose to install, develop, and sample three additional wells (MW8, MW9, and MW10) to enhance remediation efforts at the site. Wells MW8 and MW9 will be installed closer to the source of contamination (the former underground tanks and dispenser) and will be constructed to enhance remediation of shallow soil and groundwater. Well MW10 will be installed downgradient of the source area and near MW3. This work is also being performed in accordance with the request from ACHCSA, dated 20 August 2004.

3.1 DRILLING AND SOIL SAMPLING

Well installation permits will be obtained from Alameda County Public Works, prior to drilling. Drilling will be accomplished, using a rig equipped with 10-inch diameter, hollow stem augers. Soil samples will be collected at 5-foot intervals for lithologic identification and laboratory analysis. The samples will be collected in clean stainless steel liners. The liners will be sealed, labeled, stored on ice in a cooler, and transported under chain-of-custody protocol to a state-certified laboratory for analysis. If there is evidence of contamination, additional soil samples may be collected and submitted for laboratory analysis. The soil samples will be analyzed for TPH-g by EPA Method 8015 Modified, TPH-d and TPH-mo by EPA Method 8015 Modified with a silica gel cleanup, BTEX by EPA Method 8021B or 8260B, and MTBE by EPA Method 8260B.

3.2 WELL INSTALLATION

We propose to install three 4-inch diameter extraction wells, designated MW8, MW9, and MW10. The wells will contain a 0.010-inch factory-slotted section. The screened interval will be selected to target the zone of residual contamination for subsequent remediation.

3.3 WELL DEVELOPMENT AND SAMPLING

At least 72 hours after installation, the wells will be developed using surging and bailing or pumping techniques. Well development will be considered complete when water quality parameters (temperature, pH, and specific conductance) have stabilized. Following development, each well will be purged and groundwater samples will be collected. Groundwater samples will be collected in clean bottles supplied by the analytical laboratory. The sample containers will be sealed, labeled, stored on ice in a cooler, and transported under chain-of-custody protocol to a state-certified

laboratory for analysis. The groundwater samples will be analyzed for TPH-g by EPA Method 8015 Modified, TPH-d and TPH-mo by EPA Method 8015 Modified with a silica gel cleanup, BTEX by EPA Method 8021B or 8260B, and MTBE by EPA Method 8260B.

3.4 GROUNDWATER MONITORING FREQUENCY

Wells MW8, MW9, and MW10 will be sampled quarterly, in accordance with the existing groundwater monitoring schedule.

3.5 REPORTING

The results of well installation, development, and sampling will be included in the subsequent quarterly groundwater monitoring report.

4.0 PROPOSED REMEDIATION ENHANCEMENTS

Implementation of the following remediation enhancements is intended to: 1) specifically target the shallow zone of impacted soil, 2) minimize the amount of silt and very fine sand produced during extraction, 3) expand the influence of the remediation system, and 4) shorten the length of time required for remediation of the site.

We propose to connect wells MW8, MW9, and MW10 to the DPE system. This will require some trenching and installation of conveyance piping. Well MW8 will be trenched to MW2 (approximately 10 to 15 linear feet), and connected to the existing underground pipeline. Well MW9 will be trenched to MW3 (approximately 25 linear feet) to connect to the existing underground conveyance piping. Well MW10 will also be trenched to the location of MW3 (approximately 10 linear feet) in order to utilize the existing underground pipeline. The installation of extraction wells MW8, MW9, and MW10, and operation of the expanded system is intended to specifically target the zone of residual contamination. Figure 2 shows the proposed locations of MW8, MW9, and MW10.

The DPE technology currently in use involves application of a high-vacuum (up to 29 inches of mercury) to an airtight well seal to simultaneously extract soil vapor, groundwater, and free product, if present, from the subsurface. High-vacuum equipment typically consists of a dedicated extraction "stinger" installed in each extraction well (currently MW2), a vacuum source, a knockout device to separate groundwater from soil vapor, and treatment and/or collection systems for the vapor and liquid streams. We propose to exchange the current DPE system equipped with a propane-fired oxidizer to a system that will accommodate the propane-fired oxidizer, an electrical oxidizer, or carbon filters for the vapor stream. The appropriate treatment device will depend on contaminant concentrations. We anticipate that carbon filters or an electrical oxidizer will be the most efficient treatment method for the vapor stream. An electrical oxidizer will require upgraded electrical services for the remediation system, which we anticipate acquiring from Honda of Oakland, the current occupant of the site.

Influent and effluent concentrations of TPH-g and BTEX to the remediation system will be monitored for permit compliance and evaluation of system performance. Initially, extracted vapors will be treated using two 1,000-pound vapor-phase carbon canisters in series, in accordance with a permit from the Bay Area Air Quality Management District (BAAQMD). An FID will be used to monitor the effectiveness of vapor abatement. Groundwater from the DPE system will be treated with carbon filters and discharged to the sanitary sewer system in accordance with the existing East Bay Municipal Utility District (EBMUD) permit. Groundwater samples will be collected from the extraction wells on a quarterly basis for laboratory analysis. Additional groundwater samples may be collected from the extraction wells to evaluate the performance of the remediation system.

5.0 PROPOSED SCHEDULE

The three wells can be installed within approximately four weeks of approval of this work plan. The wells will be developed, sampled, and surveyed approximately one week following installation. Trenching, piping, system connections, and site restoration can be completed approximately three weeks following well installation. Significant trenching activities will be performed over approximately three days. Plates will cover the trenches, as necessary, to allow site operations to continue during construction. System startup is anticipated for the week following the completion of system installation.

6.0 REFERENCES

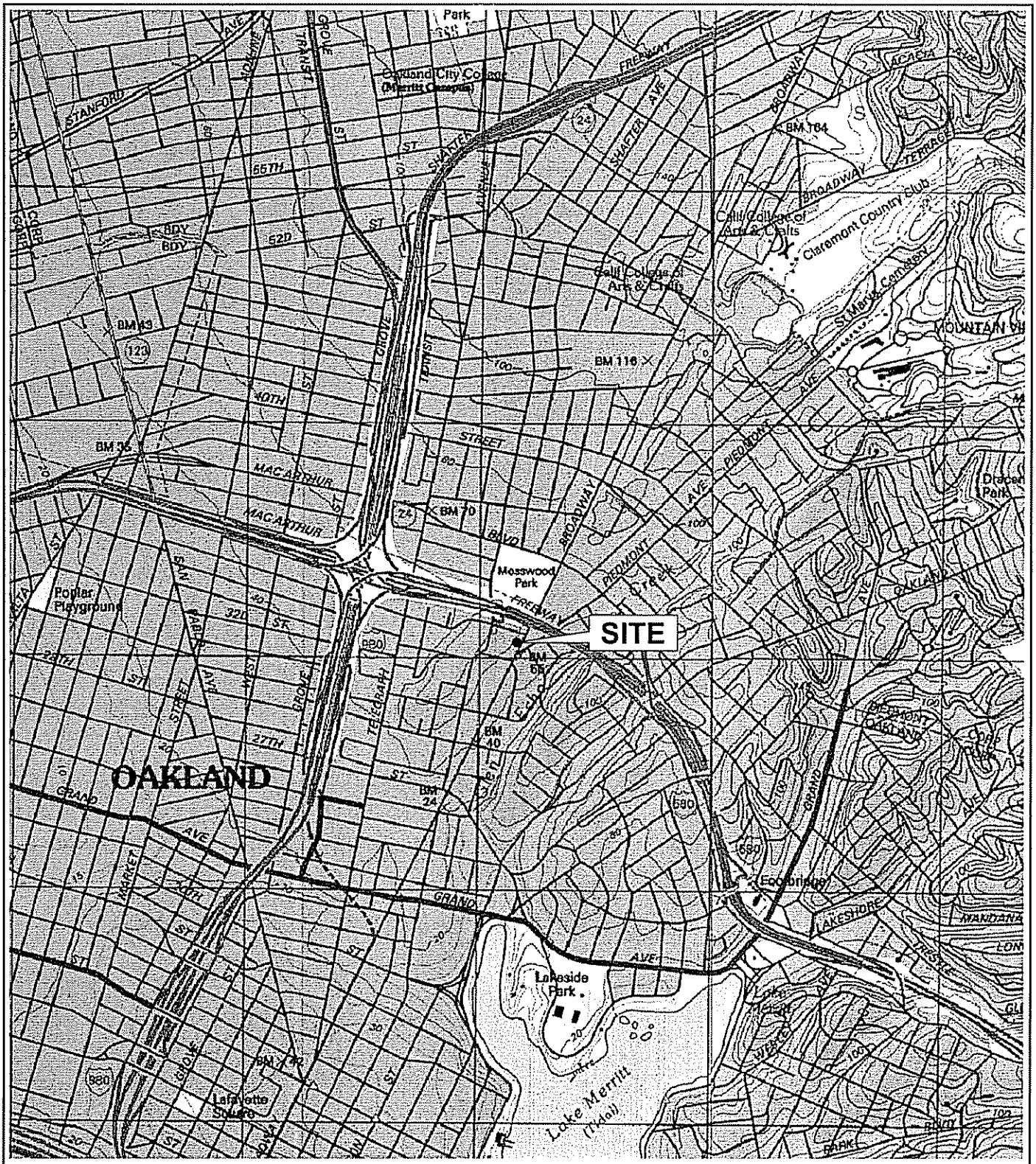
Subsurface Consultants, Inc. 2003. Site Investigation and Groundwater Monitoring Program Activities Conducted November 2001 to November 2002. January 8.

ETIC Engineering, Inc. 2003. Supplemental Site Investigation Workplan, Strough Family Trust of 1983, Val Strough Site, 327 34th Street, Oakland, California. September.

ETIC Engineering, Inc. 2004. Dual Phase Extraction Pilot Test Report and Interim Remedial Action Plan, Strough Family Trust of 1983, Former Val Strough Chevrolet, 327 34th Street, Oakland, California. June.

ETIC Engineering, Inc. 2005. Third Quarter 2005 Groundwater Monitoring Report, Strough Family Trust of 1983, Former Val Strough Chevrolet, 327 34th Street, Oakland, California. September.

Figures



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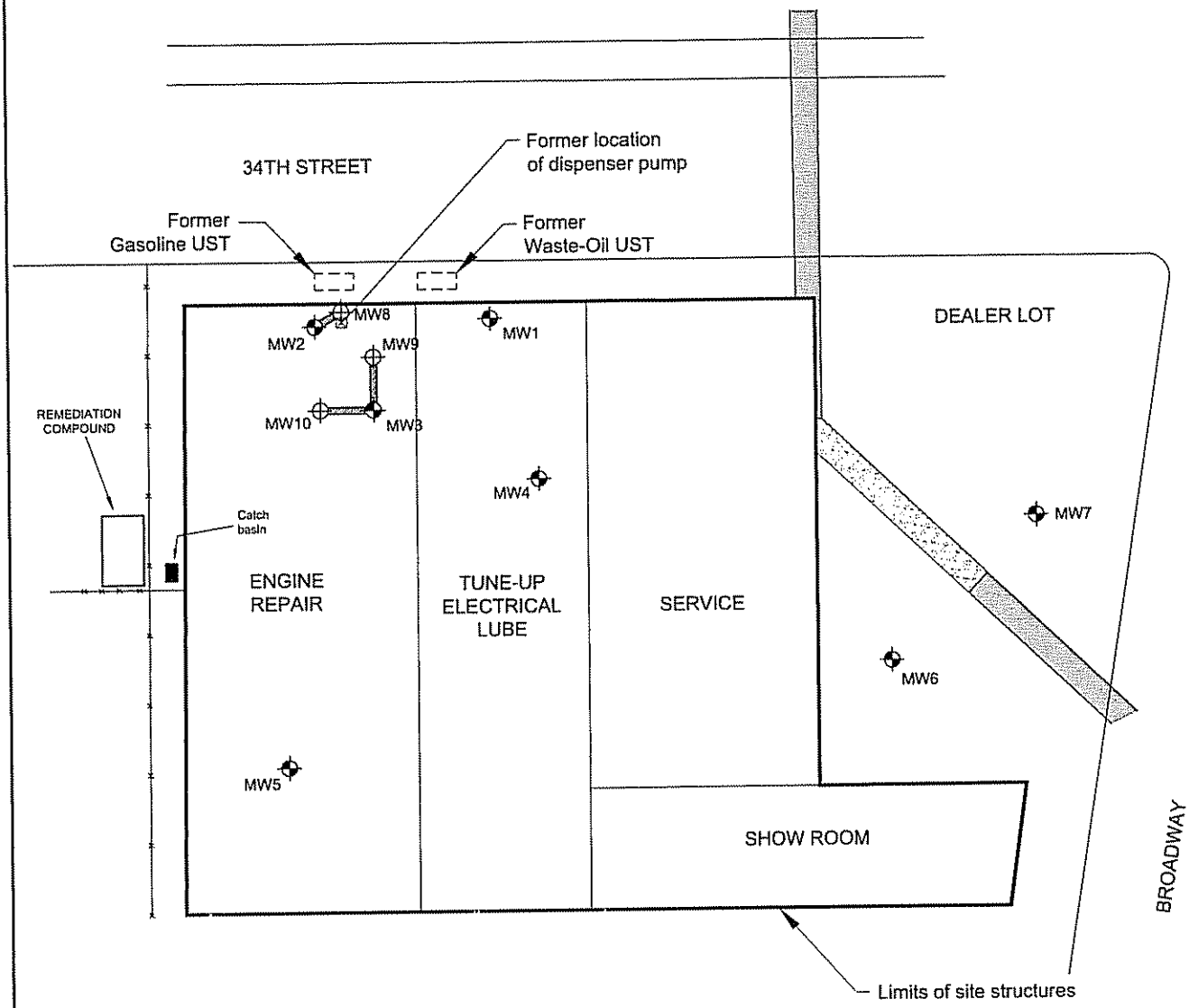
SITE LOCATION MAP
VAL STROUGH CHEVROLET
327 34TH STREET
OAKLAND, CALIFORNIA

FIGURE:
1

FILENAME: 4q2005.DWG 01/13/2006



LEGEND:

- Groundwater monitoring well
- Proposed Groundwater monitoring well
- Proposed Trench

N

0 25 50

Scale (feet)

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SITE MAP SHOWING PROPOSED WELL AND TRENCH LOCATIONS
FORMER VAL STROUGH CHEVROLET
327 34TH STREET
OAKLAND, CALIFORNIA

FIGURE: **2**

FILENAME: PROP0306.DWG 03/03/2006