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**Subsurface Investigation and
Product Recovery Work Plan**

Volkswagen Automobile Dealership
2740 Broadway Avenue
Oakland, California

September 13, 2012



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**Subsurface Investigation and
Product Recovery Work Plan**

Volkswagen Automobile
Dealership
2740 Broadway Avenue
Oakland, California

CBRE – Global Corporate Services

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Our Ref.:
EM001048.0001

Date:
September 13, 2012

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VOLKSWAGEN

GROUP OF AMERICA

September 10, 2012

Ms. Barbara J. Jakub, PG
Alameda County Health Care Services
Environmental Health Services
Environmental Protection
1131 Harbor Bay Parkway, Suite 250
Alameda, California 94502-6577

Subject:

Submittal of the Subsurface Investigation and Product Recovery Work Plan,
Volkswagen Automobile Dealership, 2740 Broadway Avenue, Oakland,
California, Fuel Leak Case No. RO0000400 and GeoTracker Global ID
T0600100227

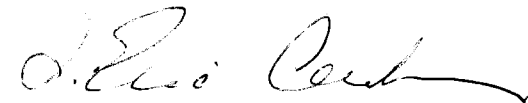
Dear Ms. Jakub:

Enclosed please find the Subsurface Investigation and Product Recovery Work Plan (work plan) prepared by ARCADIS U.S., Inc. (ARCADIS) for CBRE – Global Corporate Services (CBRE) on behalf of Volkswagen Group of America (VWoA). Based on the results of the groundwater monitoring activities that were conducted at the Site in June 2012, the Alameda County Department of Environmental Health (ACEH) requested a work plan for an additional subsurface investigation. The work plan was requested during a conference call with representatives of CBRE, ARCADIS, and the ACEH that took place on July 20, 2012.

I certify under penalty of law that this document and all attachments are prepared under my direction or supervision in accordance with a system designed to ensure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who managed the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

VWoA, CBRE, and ARCADIS appreciate the opportunity to submit the enclosed work plan to the ACEH for your consideration, and we look forward to working with you and your team to bring this project to regulatory case closure. If you have any questions or comments, please call me at (248) 754 4339 or Ron Goloubow of ARCADIS at (510) 596-9550.

Sincerely,



S. Eric Carlson
Director, Group Marketing, Real Estate, and
Affiliate Operations

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Certification

All hydrogeologic and geologic information, conclusions, and recommendations in this document have been prepared under the supervision of and reviewed by an ARCADIS U.S., Inc., California Professional Geologist.



9/13/12

Ron Goloubow
Principal Geologist
California Professional Geologist (8655)

Date



Expires Nov. 30, 2013

1. Introduction

CBRE - Global Corporate Services (CBRE) on behalf of Volkswagen Group of America (VWoA) has retained ARCADIS U.S., Inc. (ARCADIS) to prepare this work plan to further assess the lateral distribution of fuel-affected groundwater and to assess the light non-aqueous phase liquid (LNAPL) at the Volkswagen Automobile Dealership located at 2740 Broadway Avenue, Oakland, California (the Site). A Site Location Map and a Site Plan are included as Figures 1 and 2, respectively.

Based on the results of the groundwater monitoring activities conducted at the Site in June 2012, the Alameda County Department of Environmental Health (ACEH) requested a work plan for an additional subsurface investigation and LNAPL removal. The work plan was requested during a conference call with representatives of CBRE, ARCADIS, and the ACEH that took place on July 20, 2012. This document serves to satisfy that request. The scope of this work includes conducting a subsurface soil and groundwater investigation to better define the horizontal extent of the affected area as well as limited LNAPL removal from former soil vapor extraction well VW-3 where LNAPL has been observed in June 2012.

2. Background

Based on a review of available historical reports acquired from the ACEH website, soil and groundwater investigation activities have taken place at this Site since 1988 when four underground storage tanks (USTs) were removed from the Site (Engineering Services 1989): one 1,000-gallon capacity UST (Tank A) used to store waste oil (formerly located near the garage near 27th Street); one 300-gallon capacity UST (Tank B) used to store waste oil (formerly located along Broadway Avenue); and one 550-gallon capacity UST (Tank C) and one 1,500-gallon capacity UST (Tank D) both used to store gasoline (formerly located along 28th Street). Figure 2 illustrates the locations of the former USTs, current and former groundwater monitoring wells, and soil vapor extraction wells, as adapted from recent site reconnaissance and historical reports (Environmental Science and Engineering, Inc. [ESE] 1991b; QST Environmental 1999).

Soil samples collected during the removal of Tank A did not contain total petroleum hydrocarbons as gasoline (TPHg), or benzene, toluene, ethylbenzene, and total xylenes (BTEX) above laboratory reporting limits (Engineering Services 1989). Soil samples collected during the removal of Tank B contained TPHg at 640 milligrams per kilogram (mg/kg) and total oil and grease at 2,400 mg/kg. Soil samples collected during

the removal of Tanks C and D and from soil borings drilled near these USTs contained elevated concentrations of detectable levels of TPHg, as well as BTEX. In addition, LNAPL was reported to be observed in the excavation during the removal of these USTs.

Based on the soil samples collected and observations made during the removal of these USTs, a total of six groundwater monitoring wells (MW-1 and MW-3 through MW-7) were installed to a total depth of between 20 and 30 feet below grade in the sidewalk and 28th Street near the former USTs C and D. Groundwater monitoring well MW-2 was installed near the former waste oil UST located near Broadway Avenue (Tank B). Reportedly, three wells (MW-4, MW-5, and MW-6) were abandoned in 1994 leaving wells MW-1, MW-2, MW-3, and MW-7 in place. Additionally, well MW-2 was indicated as an abandoned well in a map included in an ESE report (ESE 1991a) and does not appear to be accessible during recent site reconnaissance. The highest concentrations of TPHg and BTEX have historically been detected in groundwater samples collected from well MW-3 located approximately 50 feet west of USTs C and D located along 28th Street (Mactec 2003).

A soil vapor and groundwater extraction system reportedly operated at the Site from February 1996 through March 1998. The extraction system was comprised of four vapor and groundwater extraction wells (SV-1 through SV-3 and MW-3; Mactec 2003). The details regarding the operational history of this extraction system were not provided (i.e., flow rates, mass of contaminants removed).

2.1 Groundwater Monitoring 2012

In order to respond to the letter from the ACEH to CBRE dated April 6, 2012, groundwater monitoring and reporting were conducted at the Site in June 2012 (ACEH 2012). The results of the groundwater monitoring that took place at the Site in June 2012 were provided in a Groundwater Monitoring Report prepared by ARCADIS dated July 2, 2012 (ARCADIS 2012). The results of the groundwater monitoring event were discussed during a conference call with representatives of CBRE, ARCADIS, and the ACEH that took place on July 20, 2012. Reportedly, prior to the June 2012 groundwater monitoring event, the most recent monitoring event took place at the Site in 1999 (Mactec 2003). Two requests for case closure were provided to the ACEH, one in March 1999 and one in April 2003 (QST Environmental 1999; Mactec 2003). The requests for case closure were likely denied because the analytical results for the groundwater samples collected from well MW-3 in 1999 after the soil vapor and groundwater extraction system was shut down increased to concentrations that are

comparable to concentrations detected prior to operating the soil vapor and groundwater extraction system.

In June 2012, ARCADIS coordinated the redevelopment and sampling of the remaining groundwater monitoring and vapor extraction wells on site. Three groundwater monitoring wells (MW-1, MW-3, and MW-7) and the three former soil vapor extraction wells (VW-1, VW-2, and VW-3) were redeveloped. The wells were redeveloped by Confluence Environmental, Inc. (Confluence) on June 6, 2012. Prior to redevelopment, down-hole piping associated with the former vapor extraction wells was removed. Redevelopment included removal of 6 to 10 well casing volumes of groundwater, and measurement of indicator parameters. While turbidity measurements were high, greater than 1,000 nephelometric turbidity units (NTUs), field observations indicated that the groundwater was relatively sediment-free and the bottom of the well did not contain sediment. Based on these observations, the development was considered successful despite the elevated turbidity measurements. Confluence observed approximately 0.02 feet of LNAPL in vapor extraction well VW-3. Therefore, this well was not redeveloped in a similar manner to the other wells.

Confluence conducted groundwater sampling at the Site on June 8, 2012. Groundwater purging and sampling was completed using conventional low-flow techniques in accordance with the United States Environmental Protection Agency's (USEPA's) protocol (USEPA 1996). The exception to this purging and sampling method was vapor extraction well VW-3. In that case, a grab groundwater sample was collected from below the LNAPL present in the well. Analytical results for groundwater samples collected at the Site indicate that detectable concentrations of petroleum-related compounds are present in the vicinity of the former gasoline USTs. A summary of the analytical results for groundwater samples collected at the Site from historical and recent monitoring events is included in Table 1.

Environmental screening levels (ESLs) published by the California Regional Water Quality Control Board – San Francisco Bay Region (RWQCB) are included on Table 1. The RWQCB has published the ESLs as a screening tool to be used to compare the analytical results for soil and groundwater samples collected at sites in the San Francisco Bay area. The ESLs were not published as values to be used to determine if remedial actions are warranted at a site. As stated in the ESL document (RWQCB 2008):

“The presence of a chemical at concentrations in excess of an ESL does not necessarily indicate that adverse impacts to human health or

the environment are occurring; this simply indicates that a potential for adverse risk may exist and that additional evaluation is warranted.”

TPHg was detected in samples collected from former vapor extraction wells VW-2 and VW-3 at concentrations of 36,000 and 120,000 micrograms per liter ($\mu\text{g/L}$), respectively. TPH as diesel (TPHd) was detected above laboratory reporting limits in samples collected from wells MW-1, MW-3, VW-2, and VW-3 at concentrations ranging from 56 to 9,300 $\mu\text{g/L}$. TPH as motor oil (TPHmo) was only detected above the laboratory reporting limit in the sample collected from former vapor extraction well VW-3. BTEX compounds were only detected above laboratory reporting limits in samples collected from vapor extraction wells VW-2 and VW-3. Other petroleum-related volatile organic compounds (VOCs) were also detected at low concentrations in samples collected from the former vapor extraction wells. Low concentrations of chlorinated VOCs (CVOCs), such as trichloroethene (TCE), cis-1,2-dichloroethene (cDCE), and 1,2-dichloroethane (EDC), were detected above laboratory reporting limits in the sample collected from monitoring well MW-7 (see Table 1).

3. Scope of Work

The scope of work for this investigation includes the following:

- LNAPL Assessment - Bail Down Test - Assess the presence of LNAPL at former vapor extraction well VW-3
- Subsurface Investigation - drilling of five soil borings for the collection of five grab groundwater samples and the installation of two groundwater monitoring wells
- Report Preparation

4. Task 1 - LNAPL Assessment - Bail Down Test

The scope of this task is to further assess the 0.02 feet of LNAPL that was measured at well VW-3 during the June 2012 groundwater monitoring event. Because of the presence of LNAPL within this vapor extraction well, it was not possible to properly redevelop the well or sample it using low-flow technique.

In order to move toward site closure, and at the request of the ACEH, ARCADIS proposes use of a vacuum-equipped truck to remove the LNAPL previously observed and serve to redevelop the well so it can be properly sampled in the future. Prior to

LNAPL recovery, the depth to product and depth to groundwater will be measured in each of the existing groundwater monitoring and vapor extraction wells using an oil/water interface probe. While vapor extraction well VW-3 is the focus of the product recovery effort, the effort will be extended to other groundwater monitoring or vapor extraction wells where LNAPL is observed.

The vacuum-equipped truck will use a hose to remove groundwater and LNAPL from well VW-3. The intent of the removal will be to quickly and completely dewater the well. The groundwater and any associated LNAPL will be allowed to recover to approximately 40 to 80 percent of its static water level before being purged dry again. The well will be dewatered until a maximum of ten well casing volumes are removed.

In order to better understand the potential mobility of the LNAPL, ARCADIS will document the product recovery within the well. This includes recording the depth to product and depth to water levels within the well at the time of the vacuum extraction, as well as following the extraction event. ARCADIS will mobilize to the Site to take these measurements daily for at least a week after the vacuum extraction, or until the observed LNAPL level is stable. Observation will continue on a weekly basis (for four weeks), if warranted.

Product recovery efforts will occur prior to the soil and groundwater investigation detailed below in order to properly develop vapor extraction well VW-3 in anticipation of groundwater sampling.

All groundwater and product waste will be collected within the vacuum-equipped truck and disposed of appropriately by the subcontractor.

5. Task 2 - Subsurface Investigation

The scope of work for the subsurface investigation includes drilling five soil borings using membrane interface probe (MIP) technology, collecting grab groundwater samples, and installation of two groundwater monitoring wells (see Figure 3).

5.1 Pre-Field Activities

ARCADIS will prepare a site-specific health and safety plan (HASP) detailing the scope of work and identifying the potential health and safety risks associated with the work. Prior to initiating field activities at the Site, ARCADIS will perform the following tasks:

- Obtain permits (and pay fees) required to access to the City of Oakland right of way from the City of Oakland Public Works Department.
- Obtain permits (and pay fees) required for the proposed five soil borings (for the collection of five grab groundwater samples and the installation of two groundwater monitoring wells) from the Alameda County Public Works Agency, Water Resources Section.
- Retain a private utility locator to clear each proposed drilling location for subsurface utilities.

5.2 Soil Borings

The proposed soil borings will be advanced using a direct-push drill rig equipped with a MIP tool. The tubing that houses the carrier gas and conductivity cable is connected to the MIP tool and is strung through the probe rod. As the probe is driven below grade into undisturbed soil, the advancement is stopped at desired intervals (typically 6 inches) to heat the permeable membrane interface located on the wall of the probe and gather VOC data. Conductivity logging data (which provide lithologic soil-type information) are gathered on a continuous basis. VOCs that are exposed to the membrane are volatilized and picked up by the carrier gas behind the membrane, which in turn delivers the gas to the gas chromatograph detector at the surface (typically an electron capture detector [ECD], photoionization detector [PID], and/or flame ionization detector [FID]). This drilling technology allows for the real-time collection of lithologic data as well as indicators for hydrocarbon-affected soils. ARCADIS will contract with California-licensed drilling subcontractors to advance the MIP soil borings to depths of approximately 25 to 30 feet below ground surface (bgs).

Groundwater grab samples will be collected at the three proposed soil boring locations along 28th Street, one proposed soil boring location at the northeast corner of 28th Street and Broadway Avenue, and one location inside of the Volkswagen parking garage (see Figure 3). The grab groundwater samples will be collected using a hydraulically driven temporary piezometer consisting of a hollow-rod assembly with a 3-foot-long stainless steel screen attached at the leading end of the assembly. The temporary piezometer will be advanced to the desired depth interval based upon the MIP results. At the selected depths, the rod assembly will then be retracted to raise the outer piezometer sleeve, exposing the screen and allowing groundwater to pass through the screen into the piezometer. Grab groundwater samples will be collected using a disposable bailer lowered through the hollow-push rods into the piezometer

screen. The groundwater will be transferred into clean, laboratory-provided sample containers, stored in an ice-chilled cooler, and transported under chain-of-custody protocol to the laboratory for analysis.

5.3 Well Installation

Groundwater monitoring wells will be installed at the northeast corner of 28th Street and Broadway Avenue and inside of the Volkswagen parking garage (see Figure 3). The primary purpose of these wells will be to assess the groundwater quality and the groundwater flow direction at the Site. Down-hole drilling equipment will be appropriately cleaned before use at each new drilling location. Investigation-derived waste generated during the field activities, including soil cuttings, decontamination or rinse water, and personal protective equipment, will be stored temporarily at the Site in clean, labeled, Department of Transportation-approved 55-gallon drums or similar, until waste disposal is arranged.

A C-57 licensed drilling subcontractor will be retained to install the two groundwater monitoring wells using hollow-stem auger drilling techniques. These soil borings will be installed under the supervision of a California-licensed professional geologist. Observation made during drilling regarding the lithology of the subsurface strata will be described and recorded in accordance with the Unified Soil Classification System (USCS). Based on the observed lithology the total depth of the wells will be less than 25 feet bgs and the final well depths and design will be based on observations made during the drilling of the soil borings at each location.

The groundwater monitoring wells will be constructed with 5 to 10 feet of 2-inch-diameter PVC 0.020 slotted screen, followed by 2-inch-diameter flush threaded Schedule 40 PVC blank casing to approximately ground surface. The annular well space will be filled with #2/12 sand pack from the total depth to approximately 1 foot above the screen interval, followed by 1 foot of hydrated bentonite seal above the sand pack. Cement grout will be placed above the bentonite seal to about 1 foot bgs. The final surface completion will consist of a traffic-rated flush-mound well box.

The northing, easting, and top-of-casing elevation of each well will be surveyed by a California-licensed land surveyor.

5.3.1 Well Development

The groundwater monitoring wells will be allowed to set for a minimum of 48 hours after installation, prior to well development. Well development will be performed using a combination of surge block, bailer, and/or pumping to remove entrained fines. A maximum of 10 casing volumes of groundwater will be purged from each well. Groundwater parameters including temperature, pH, specific conductivity, and turbidity will be measured during development, and the well will be considered developed when groundwater parameter measurements vary by ± 10 percent or less. Purged water generated during well development will be placed in 55-gallon drums and retained on site pending approval for off-site disposal at an appropriate facility.

5.3.2 Well Sampling

Samples will be collected from the newly installed groundwater monitoring wells approximately 48 hours after the well development has been completed. The depth to groundwater in each monitoring well will be measured to obtain groundwater elevation data prior to the collection of the groundwater samples.

Groundwater samples will be collected using conventional low-flow techniques in accordance with the USEPA's protocol published in the April 1996 "Ground Water Issue" under the title "Low-Flow (Minimal Drawdown) Groundwater Sampling Procedures" (USEPA 1996). A peristaltic pump will be used to purge groundwater from a well through polyethylene tubing lowered inside a well, with the intake placed in the middle of the screen interval. Purging of the wells will take place until the basic groundwater parameters stabilize (pH, temperature, dissolved oxygen, oxidation-reduction potential, and specific conductance). Flow rates will be maintained at approximately 50 to 100 milliliters per minute, while the drawdown is minimized to less than 0.3 feet. The wells will be sampled when groundwater parameters stabilize to within 10 percent of the previous readings.

For quality assurance/quality control purposes, one duplicate sample will be collected. Collection of field blank or equipment blank samples will not be necessary since each well will be equipped with new and dedicated polyethylene tubing.

5.4 Laboratory Analyses

Groundwater samples collected from the wells and the grab groundwater samples will be collected into clean, laboratory-provided sample containers, stored in an ice-chilled cooler, and transported under chain-of-custody protocol to the laboratory for analysis.

Groundwater samples will be submitted to a state-certified laboratory for the following analyses:

- VOCs with fuel oxygenates using EPA Method 8260B
- TPHg, TPHd, and TPHmo using EPA Method 8015

6. Task 3 - Reporting

A report summarizing the field investigation activities will be prepared and will include the following information at a minimum:

- A summary of the data gathered as part of the LNAPL Assessment - Bail Down Test, including the amount of LNAPL removed and the rate of LNAPL recovery into the well
- A summary of the MIP and grab groundwater sampling investigation activities, including summary table(s) and figures of the results
- Tables summarizing the analytical results of the groundwater samples
- Figure illustrating the groundwater flow direction
- Figures presenting the analytical results of the groundwater samples and the MIP data
- Soil and well installation boring logs
- Recommendations for further investigation, remediation, or case closure
- Well completion records and copies of the associated permits
- A summary of the groundwater monitoring activities, including a table and figure of the results
- Results of the monitoring well survey, groundwater elevation measurements, a groundwater elevation contour map and a rose diagram of the current and historical groundwater directions and magnitudes

7. Schedule

After receiving approval from ACEH for this work plan, ARCADIS will oversee the LNAPL recovery activities and subsurface investigation as described above within 90 to 120 days. In accordance with ACEH requirements, all reports will be uploaded to the ACEH FTP site.

8. References

Alameda County Department of Environmental Health (ACEH). 2012. Work Plan Approval and Request for Additional Work for Fuel Leak Case No. RO0000400 and GeoTracker Global ID T0600100227, Broadway Volkswagen, 2740 Broadway Oakland, California. April 6.

ARCADIS. 2012 Groundwater Monitoring Report, Volkswagen Automobile Dealership 2740 Broadway Avenue Oakland, California. July 2.

California Regional Water Quality Control Board – San Francisco Bay Region (RWQCB). 2008. Screening for Environmental Concerns at Sites with Contaminated Soil and Groundwater. Interim Final – November 2007. Revised 2008.

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Mactec. 2003. Sampling and Closure Report, Broadway Volkswagen, 2740 Broadway, Oakland, California. April 21.

QST Environmental. 1999. Site Closure Report, Property No. 4286, Broadway Volkswagen, 2740 Broadway, Oakland, California. March 1.



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2740 Broadway Avenue
Oakland, California

USEPA. 1996. Ground Water Issue: Low-Flow (Minimal Drawdown) Groundwater Sampling Procedures. Office of Solid Waste and Emergency Response. EPA/540/S-95/504. April.

Tables

Table 1
Summary of Groundwater Analytical Results
 Volkswagen Automobile Dealership
 2740 Broadway Avenue, Oakland, California

Well Number	Sample Date	TPHg µg/L	TPHd µg/L	TPHmo µg/L	Benzene µg/L	Toluene µg/L	Ethyl benzene µg/L	Total Xylenes µg/L	MTBE µg/L	TCE µg/L	cDCE µg/L	EDC µg/L	Isopropyl benzene µg/L	Propyl benzene µg/L	1,3,5- Trimethyl benzene µg/L	1,2,4- Trimethyl benzene µg/L	sec-Butyl benzene µg/L	para- Isopropyl Toluene µg/L	n-Butyl benzene µg/L	Naphthane µg/L	TDS µg/L	
Tier I ESL µg/L		100	100	100	1	40	30	20	5	5	6	50	na	na	na	na	na	na	na	17	na	
MW-1	01/21/89	ND	na	na	53	13	1.4	8.2	---	na	na	na	na	na	na	na	na	na	na	na	na	
	05/16/91	130	na	na	ND	ND	ND	ND	---	na	na	na	na	na	na	na	na	na	na	na	na	
	10/18/91	ND	na	na	ND	ND	ND	ND	---	na	na	na	na	na	na	na	na	na	na	na	na	
	10/27/91	ND	na	na	ND	ND	ND	ND	---	na	na	na	na	na	na	na	na	na	na	na	na	
	07/13/93	ND	na	na	ND	ND	ND	ND	---	na	na	na	na	na	na	na	na	na	na	na	na	
	06/27/96	ND	na	na	ND	ND	ND	ND	---	na	na	na	na	na	na	na	na	na	na	na	na	
	09/19/96	ND	na	na	ND	ND	ND	ND	---	na	na	na	na	na	na	na	na	na	na	na	na	
	12/13/96	ND	na	na	ND	ND	ND	ND	---	na	na	na	na	na	na	na	na	na	na	na	na	
	10/07/97	ND	na	na	ND	ND	ND	ND	ND	na	na	na	na	na	na	na	na	na	na	na	na	
	08/03/99	ND	na	na	ND	ND	ND	ND	ND	na	na	na	na	na	na	na	na	na	na	na	na	
	06/08/12	<50	290 Y	<300	<0.5	<0.5	<0.5	<0.5	0.3 J	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<2.0	410	
MW-2*	01/21/89	ND	na	na	ND	ND	ND	ND	---	na	na	na	na	na	na	na	na	na	na	na	na	
MW-3	01/21/89	32,000	na	na	9,600	8,200	1,800	6,200	---	na	na	na	na	na	na	na	na	na	na	na	na	
	05/16/91	81,000	na	na	7,800	12,000	1,200	4,000	---	na	na	na	na	na	na	na	na	na	na	na	na	
	10/18/91	73,000	na	na	9,400	8,600	750	3,300	---	na	na	na	na	na	na	na	na	na	na	na	na	
	10/27/91	37,000	na	na	7,100	4,900	970	3,500	---	na	na	na	na	na	na	na	na	na	na	na	na	
	07/13/93	41,000	na	na	8,100	6,200	8,100	4,400	---	na	na	na	na	na	na	na	na	na	na	na	na	
	06/27/96	370	na	na	120	75	6.2	47	---	na	na	na	na	na	na	na	na	na	na	na	na	
	09/19/96	15,000	na	na	6,000	2,700	450	2,180	---	na	na	na	na	na	na	na	na	na	na	na	na	
	12/13/96	ND	na	na	30	10	2	7.4	---	na	na	na	na	na	na	na	na	na	na	na	na	
	Dup	12/13/96	ND	na	na	21	7	1	4.9	---	na	na	na	na	na	na	na	na	na	na	na	na
	Dup	10/07/97	ND	na	na	ND	ND	ND	ND	ND	na	na	na	na	na	na	na	na	na	na	na	na
Dup	10/07/97	ND	na	na	21	7	1	4.9	5.7	na	na	na	na	na	na	na	na	na	na	na	na	
	08/03/99	21,000	na	na	5,500	2,300	470	990	---	na	na	na	na	na	na	na	na	na	na	na	na	
	06/08/12	<50	56	<300	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<2.0	310	
MW-4*	01/21/89	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
	05/16/91	13,000	---	---	160	690	250	1,100	---	---	---	---	---	---	---	---	---	---	---	---	---	
	10/18/91	ND	---	---	11	11	ND	15	---	---	---	---	---	---	---	---	---	---	---	---	---	
	10/27/91	180	---	---	6.4	2.8	1.2	6.2	---	---	---	---	---	---	---	---	---	---	---	---	---	
	07/13/93	320	---	---	36	4.4	1.8	5.3	---	---	---	---	---	---	---	---	---	---	---	---	---	
MW-5*	01/21/89	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
	05/16/91	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
	10/18/91	16,000	---	---	3,500	530	670	1,100	---	---	---	---	---	---	---	---	---	---	---	---	---	
	10/27/91	87	---	---	ND	ND	ND	ND	---	---	---	---	---	---	---	---	---	---	---	---	---	
	07/13/93	90	---	---	ND	ND	ND	ND	---	---	---	---	---	---	---	---	---	---	---	---	---	

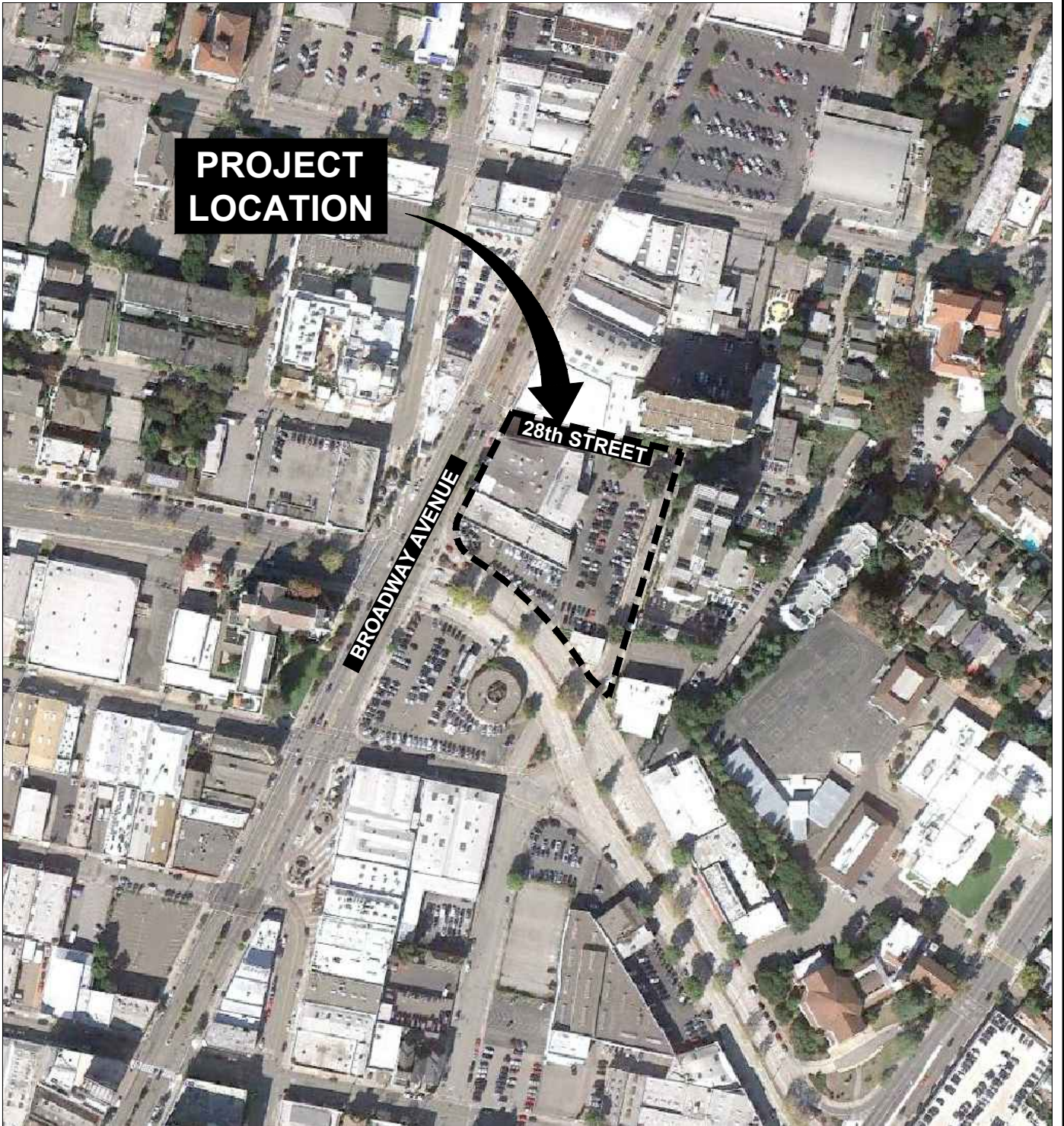
Table 1
Summary of Groundwater Analytical Results
 Volkswagen Automobile Dealership
 2740 Broadway Avenue, Oakland, California

Well Number	Sample Date	TPHg µg/L	TPHd µg/L	TPHmo µg/L	Benzene µg/L	Toluene µg/L	Ethyl benzene µg/L	Total Xylenes µg/L	MTBE µg/L	TCE µg/L	cDCE µg/L	EDC µg/L	Isopropyl benzene µg/L	Propyl benzene µg/L	1,3,5- Trimethyl benzene µg/L	1,2,4- Trimethyl benzene µg/L	sec-Butyl benzene µg/L	para- Isopropyl Toluene µg/L	n-Butyl benzene µg/L	Naphthane µg/L	TDS µg/L	
Tier I ESL µg/L		100	100	100	1	40	30	20	5	5	6	50	na	na	na	na	na	na	na	17	na	
MW-6*	01/21/89	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
	05/16/91	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
	10/18/91	28,000	---	---	640	2,700	1,100	4,500	---	---	---	---	---	---	---	---	---	---	---	---	---	
	10/27/91	1,300	---	---	48	130	55	230	---	---	---	---	---	---	---	---	---	---	---	---	---	
	07/13/93	1,100	---	---	5.1	30	30	230	---	---	---	---	---	---	---	---	---	---	---	---	---	
MW-7	01/21/89	---	na	na	---	---	---	---	---	na	na	na	na	na	na	na	na	na	na	na	na	
	05/16/91	---	na	na	---	---	---	---	---	na	na	na	na	na	na	na	na	na	na	na	na	
	10/18/91	---	na	na	---	---	---	---	---	na	na	na	na	na	na	na	na	na	na	na	na	
	10/27/91	---	na	na	---	---	---	---	---	na	na	na	na	na	na	na	na	na	na	na	na	
	07/13/93	---	na	na	---	---	---	---	---	na	na	na	na	na	na	na	na	na	na	na	na	
	06/27/96	ND	na	na	ND	ND	ND	ND	ND	na	na	na	na	na	na	na	na	na	na	na	na	
	09/19/96	67	na	na	ND	ND	ND	ND	ND	na	na	na	na	na	na	na	na	na	na	na	na	
	12/13/96	ND	na	na	ND	ND	ND	ND	ND	na	na	na	na	na	na	na	na	na	na	na	na	
	10/07/97	ND	na	na	ND	ND	ND	ND	ND	na	na	na	na	na	na	na	na	na	na	na	na	
	06/08/12	<50	<50	<300	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	4.6	0.5	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<2.0	290
VW-1	06/08/12	<50	<50	<300	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<2.0	210
Dup	06/08/12	<50	<50	<300	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<2.0	210
VW-2	06/08/12	36,000	3,400 Y	<300	1,800	3,000	1,200	4,900	<25	<25	<25	<25	44	140	240	960	<25	<25	70	480	370	
VW-3	06/08/12	120,000 Y	9,300	2,000	54	<20	84	640	<20	<20	<20	<20	100	340	650	2,000	37	22	83	240	370	

Notes:

- Tier I ESL Tier I Environmental Screening Levels (ESLs) for shallow soils of less than 3 meters below ground surface and groundwater that is a current or potential source of drinking water.
- TPHg total petroleum hydrocarbons as gasoline
- TPHd total petroleum hydrocarbons as diesel
- TPHmo total petroleum hydrocarbons as motor oil
- MTBE methyl tertiary-butyl ether
- cDCE cis-1,2-dichloroethene
- EDC 1,2-dichloroethane (ethylene dichloride)
- TCE trichloroethene
- TDS total dissolved solids
- µg/L micrograms per liter
- ND Not detected at or above detection limits (historical limits unknown).
- not analyzed
- na historical data not available
- Dup duplicate sample
- * wells abandoned
- < Not detected at or above the laboratory detection limit noted.
- Y Laboratory reports the sample exhibits chromatographic pattern which does not resemble standard.
- J Laboratory reports estimated value.

Figures



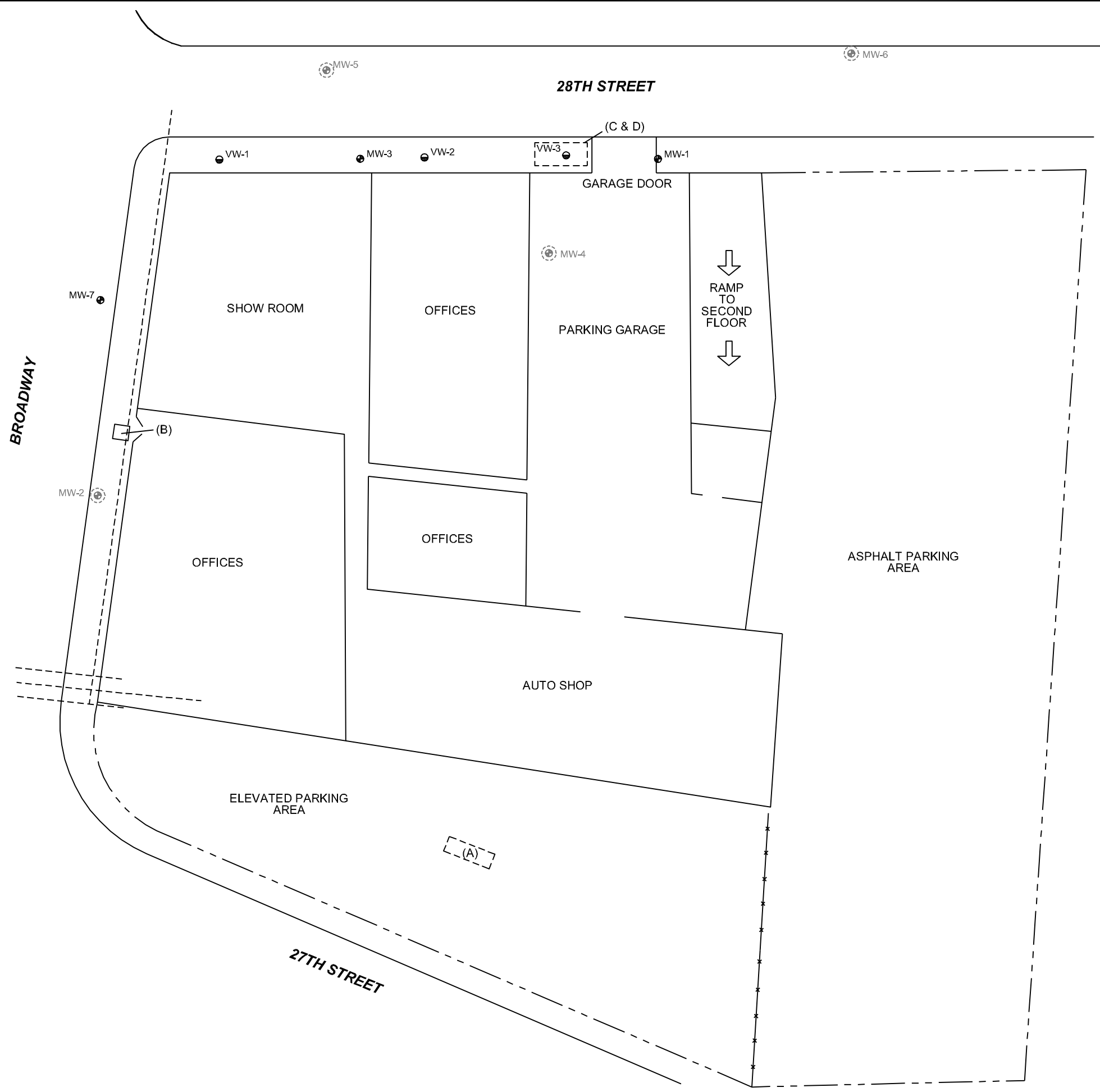
SOURCE: GOOGLE EARTH PRO



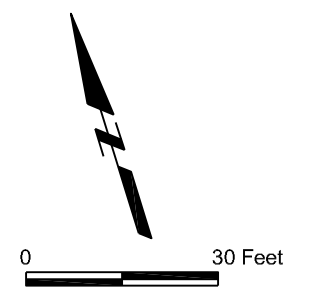
2740 BROADWAY OAKLAND, CALIFORNIA
SITE LOCATION MAP



CITY:\Read\ DIV\GROUP\Read\ DB\Read\ LD\Op\ PIC\Op\ PMS\Read\ TMS\Op\ LYS\Option\OFF\REF*
 G:\ENVCAD\emeryville\ACT\EM001048\0001\00001\GWINR 2012\DWG\EM001048 B102.dwg LAYOUT: 2. SAVED: 6/25/2012 3:01 PM ACADVER: 18.1S (LMS TECH) PAGES: 18. PLOT SETUP: --- PLOT STYLE/TABLE: ARCADIS.CTB PLOTTED: 9/7/2012 10:46 AM BY: REYES, ALEC



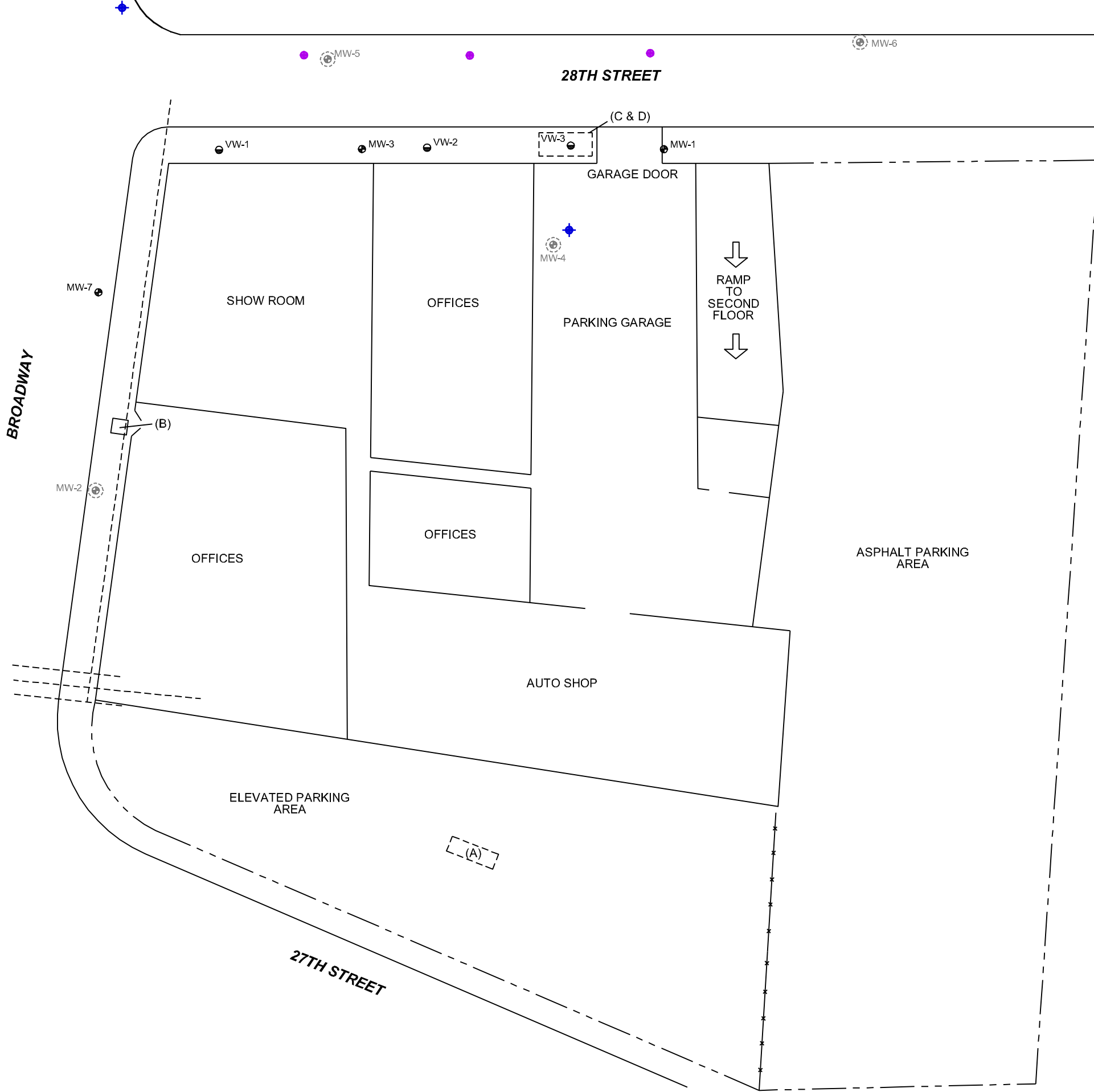
- LEGEND**
- PROPERTY LINE
 - x-x-x- FENCE LINE
 - - - - - UTILITY LINE
 - MW-3 ● MONITORING WELL LOCATION
 - MW-5 ● ABANDONED MONITORING WELL
 - VW-1 ● VAPOR EXTRACTION WELL
 - [- - -] FORMER UNDERGROUND STORAGE TANK LOCATION
 - (A) WASTE OIL (1,000 GAL); TANK REMOVED, SITE CLEAN
 - (B) WASTE OIL (550 GAL); TANK REMOVED
 - (C&D) WASTE OIL (550 GAL) AND UNLEADED GASOLINE (3,000 GAL); TANKS REMOVED



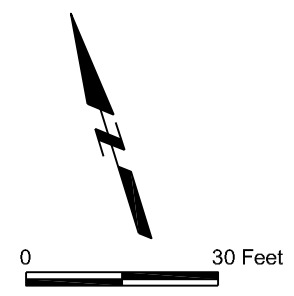
REFERENCES:
 MAP DIGITIZED FROM A SITE PLAN BY
 ENVIRONMENTAL SCIENCE & ENGINEERING (6/91)
 AND A SITE PLAN BY QST ENVIRONMENTAL (12/02/96 -
 REVISED 12/28/98)

2740 BROADWAY OAKLAND, CALIFORNIA	
SITE PLAN	
	FIGURE 2

CITY:\Read\ DIV\GROUP\F\Read\ DB\Read\ LD\Op\ PIC\Op\ PM\Read\ TM\Op\ LYR\Option\OFF\REF*
 G:\EN\CAJ\Emery\ACT\EM001\048\001\100001\GSMR 2012\DWG\EM001\048 ProposedSSub.dwg LAYOUT: 3 SAVED: 8/14/2012 10:53 AM ACADVER: 18.1S (LMS TECH) PAGES: 18 PAGES: 18 PLOTTABLE: ARCADIS\CTB PLOTTED: 9/7/2012 10:49 AM BY: REYES, ALEC



- LEGEND**
- — — — — PROPERTY LINE
 - x-x-x-x-x- FENCE LINE
 - - - - - UTILITY LINE
 - MW-3 ● MONITORING WELL LOCATION
 - MW-5 ⊙ ABANDONED MONITORING WELL
 - VW-1 ● VAPOR EXTRACTION WELL
 - [- - - -] FORMER UNDERGROUND STORAGE TANK LOCATION
 - (A) WASTE OIL (1,000 GAL); TANK REMOVED, SITE CLEAN
 - (B) WASTE OIL (550 GAL); TANK REMOVED
 - (C&D) WASTE OIL (550 GAL) AND UNLEADED GASOLINE (3,000 GAL); TANKS REMOVED
 - PROPOSED MEMBRANE INTERFACE PROBE (MIP) BORING LOCATION
 - ◆ PROPOSED MIP BORING AND PERMANENT MONITORING LOCATION



REFERENCES:
 MAP DIGITIZED FROM A SITE PLAN BY
 ENVIRONMENTAL SCIENCE & ENGINEERING (6/91)
 AND A SITE PLAN BY QST ENVIRONMENTAL (12/02/96 -
 REVISED 12/28/98)

2740 BROADWAY
OAKLAND, CALIFORNIA

**PROPOSED SUBSURFACE
INVESTIGATION LOCATIONS**


FIGURE
3