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GROUP OF AMERICA

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June 5, 2014

Mr. Jerry Wickham, PG, CEG, CHG
Alameda County Health Care Services
Environmental Health Services
Environmental Protection
1131 Harbor Bay Parkway, Suite 250
Alameda, California 94502-6577

Subject:
Submittal of the Conceptual Site Model and Low-Threat Closure Request for
Volkswagen Automobile Dealership
2740 Broadway Avenue, Oakland, California
Fuel Leak Case No. RO0000400 and GeoTracker Global ID T0600100227

Dear Mr. Wickham:

Enclosed please find the low-threat closure request report that was prepared by ARCADIS U.S., Inc. (ARCADIS) for Jones Lang LaSalle (JLL) on behalf of Volkswagen Group of America (VWoA). The historical and recent soil and groundwater investigation and monitoring activities are summarized therein. Additionally, the current soil and groundwater conditions are compared to the Low-Threat Underground Storage Tank Case Closure Policy and a request for closure is included.

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, JLL, and ARCADIS appreciate the opportunity to submit the enclosed report to the Alameda County Environmental Health Services 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 (703) 364-7230 or Ron Goloubow of ARCADIS at (415) 432-6942.

Sincerely,

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

Attachment

ARCADIS
Infrastructure · Water · Environment · Buildings

Imagine the result

Conceptual Site Model and Low-Threat Closure Request

Volkswagen Automobile Dealership
2740 Broadway Avenue
Oakland, California

June 17, 2014

ARCADIS

Ron Goloubow, PG
Principal Geologist
California Professional Geologist (8655)

Jay M. Shipley, PE
Senior Vice President

Conceptual Site Model and Low-Threat Closure Request

Volkswagen Automobile Dealership
2740 Broadway Avenue
Oakland, California

Prepared for:
Volkswagen Automobile Dealership

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Our Ref.:
EM001048.0002

Date:
June 17, 2014

ARCADIS

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Appendices

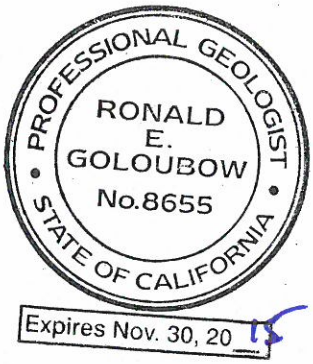
Certification

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.

June 17, 2014

Ronald E. Goloubow
Principal Geologist
California Professional Geologist (8655)

Date



1. Introduction

Jones Lang LaSalle on behalf of Volkswagen Group of America (VWoA) has retained ARCADIS U.S., Inc. (ARCADIS) to prepare this Conceptual Site Model and Low-Threat Closure Request (CSM and Closure Report) for the Volkswagen Automobile Dealership located at 2740 Broadway Avenue, in Oakland, California (the Site). A Site Location Map and a Site Plan are included as Figures 1 and 2, respectively.

ARCADIS has prepared this CSM and Closure Report to evaluate the Site for low-threat closure in accordance with the State Water Resources Control Board's (SWRCB's) resolution 2012-0016 adopted on May 1, 2012 and effective on August 17, 2012, otherwise known as the Low-Threat Underground Storage Tank (UST) Case Closure Policy (Low-Threat Closure Policy; SWRCB 2012b). The purpose of this CSM and Closure Report is to summarize and present the existing site data that were evaluated and used to support a request for low-threat case closure. Based on the soil, soil vapor, and groundwater quality data collected at and near the Site, the Site qualifies for closure as a low-threat fuel site, as described in the Low-Threat Closure Policy. The completed Low-Threat Closure Policy Checklist is included as Appendix A.

This CSM and Closure Report includes the following sections, in addition to this introductory section:

- Section 2 – Detailed site description
- Section 3 – CSM, including:
  - Discussion of regional geology and hydrology
  - Summary of previous work conducted at the Site
  - Discussion of the nature of impacts, including a description of the distribution of fuel hydrocarbons and oxygenates in soil, groundwater, and soil vapor
- Section 4 – Detailed evaluation of current conditions compared against closure criteria set forth in the Low-Threat Closure Policy
- Section 5 – Conclusions and recommendations
- Section 6 – Explanation of the intention to cease groundwater monitoring

- Section 7 – References

2. Site Description

The Site is located on the southeast corner of the intersection of Broadway Avenue and 28th Street in Oakland, California (Figures 1 and 2). The land use in this area is predominantly commercial and there are two high-rise apartment buildings located on the north side of the Site (see Figure 1). The Broadway Volkswagen automobile dealership currently occupies the Site and consists of a three-story steel-reinforced concrete building that includes multiple service bays for automobile repairs and a showroom for new cars (Figure 2). Several automobile dealerships and maintenance shops are in operation in the vicinity of the Site. Numerous subsurface utilities are present within the public right-of-way of 28th Street immediately adjacent to the Site. The Site is at an approximate elevation of 30 feet above mean sea level (amsl) in an area of moderately sloping topography (Environmental Science & Engineering, Inc. [ESE] 1995).

3. Conceptual Site Model

As part of the CSM, the Site history, Site geology and hydrogeology, the results from past investigations, the distribution of constituents of concern (COCs) within the subsurface and groundwater, and the potential risks to human health and the environment were evaluated and are presented in the following sections.

3.1 Site History

Based on a review of available historical reports acquired from the Alameda County Environmental Health (ACEH) website, soil and groundwater investigation activities have taken place at the Site since 1988. The initial work at the Site included the removal of four underground storage tanks (USTs; Engineering Services, Inc. 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 (ESE 1991 and QST Environmental 1999).

3.1.1 UST Removal

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, Inc. 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 TPHg, as well as BTEX. In addition, light non-aqueous phase liquid (LNAPL) was reported to be observed in the excavation during the removal of these USTs.

A summary of the analytical results for soil samples collected at the Site and analyzed for petroleum-related compounds such as TPHg and BTEX are provided in Table 1 and a summary of the analytical results for soil samples collected at the Site and analyzed for chlorinated volatile organic compounds (CVOCs) and metals is provided in Appendix B. Soil sample locations for samples collected from soil borings and borings for monitoring wells are provided on Figure 2 and the locations for soil samples collected during the UST removal activities are provided in Appendix B.

3.1.2 Well Installation

Based on the analytical results for 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 former USTs C and D (see Figure 2). The well construction details are summarized in Table 2.

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 on a map included in an ESE report (ESE 1991) and was not observed during recent site reconnaissance conducted by ARCADIS in 2012 and 2013. Water level elevations measured at the Site indicate that shallow groundwater flows in a west and northwesterly direction. This reported flow direction has been confirmed though recent water level elevation measurements collected at the Site (see Table 2 and Figure 3).

3.1.3 Soil Vapor and Groundwater Extraction System

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) that were located along 28th street, near former USTs C and D (see Figure 2; Mactec 2003). The details regarding the operational history of this extraction system were not provided (i.e., flow rates, mass of contaminants removed). Reportedly 44,837 gallons of water was extracted, treated, and discharged to the sewer system, and approximately 1,048.85 grams of TPHg (2.3 pounds) and 180 grams (0.4 pounds) of benzene were removed by the vapor extraction system (QST Environmental 1999).

Two requests for case closure were provided to the ACEH, one in March 1999 and one in April 2003 (QST Environmental 1999 and Mactec 2003). Both requests for case closure were denied (ACEH 2000). 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.

3.1.4 Recent Site Investigations and Groundwater Monitoring

Prior to the June 2012 groundwater monitoring event, the most recent monitoring event took place at the Site in 1999 (Mactec 2003). In June 2012, ARCADIS coordinated the redevelopment and sampling of the remaining groundwater monitoring and vapor extraction wells at the Site (ARCADIS 2012a). Groundwater monitoring wells MW-1, MW-3, and MW-7 and former soil vapor extraction wells VW-1, VW-2, and VW-3 were redeveloped and groundwater samples were collected from each location (Figure 2).

In July 2013, ARCADIS coordinated the installation of wells MW-8 and MW-9. Six soil samples were collected and analyzed for TPHg, total petroleum hydrocarbons as diesel (TPHd), total petroleum hydrocarbons as motor oil (TPHmo), methyl tertiary-butyl ether (MTBE), and BTEX (ARCADIS 2013a). All analytical results for the soil samples were below their respective Environmental Screening Levels (ESLs) put forth by the San Francisco Bay Regional Water Quality Control Board (SFRWQCB; see Table 1; SFRWQCB 2013). COCs were detected in groundwater samples collected at the Site exceeding their respective ESLs, as summarized in Table 3.

Based on the results of the groundwater monitoring activities conducted at the Site in June 2012, the ACEH requested a work plan for an additional subsurface investigation and the removal of LNAPL observed in well VW-3 (ARCADIS 2012b and c). The scope of the work plan included the following tasks:

- Conducting a subsurface soil and groundwater investigation to further define the lateral extent of the fuel-affected soil and groundwater at the Site

- Conducting a LNAPL bail down test to assess the presence of LNAPL at former soil vapor extraction well VW-3 where LNAPL was observed in June 2012

The bail down test was conducted to assess the potential mobility and presence of the LNAPL observed within monitoring well VW-3 in June 2012. No measurable thickness of LNAPL or sheen of petroleum product was observed in monitoring well VW-3 and the results of the testing suggest any LNAPL present in the subsurface is residual, and not mobile.

As part of the soil and groundwater investigation activities, ARCADIS advanced five soil borings (MIP-1 through MIP-5; Figure 2) to approximately 30 to 35 feet below ground surface (bgs) using a direct-push drill rig equipped with an electrical conductivity (EC) measurement device and membrane interface probe (MIP) sample collector. The response from the petroleum-related MIP detectors suggests the presence of petroleum-related compounds within the identified 3-foot-thick sand layer, beginning between approximately 11 to 21 feet bgs (ARCADIS 2013a). The response from the EC/MIP detectors that detect concentrations of CVOCs indicates that these compounds are not present at locations MIP-1 and MIP-2. The response at boring locations MIP-3, MIP-4, and MIP-5 did indicate the presence of low concentrations of CVOCs at these locations.

Grab groundwater samples were collected from each of the EC/MIP boring locations. Concentrations of TPHg, TPHd, TPHmo, benzene, ethylbenzene, and naphthalene were detected at various locations above the applicable 2013 Tier 1 ESLs (see Table 3; SFRWQCB 2013).

Another groundwater monitoring event was conducted in November 2013. This included the collection of groundwater samples from the six existing and two newly installed groundwater monitoring wells. The results of this monitoring event indicated the highest concentrations of TPHg, TPHd, and TPHmo were detected in samples collected from monitoring well VW-3, located closest to the former USTs that are

suspected to have released fuel to the subsurface (see Figures 4 and 5). Based on the concentrations of benzene and TPHg detected in groundwater samples collected at the Site since 1989 and given that the USTs were removed in 1988 (25 years ago), the plume of TPHg- and benzene-affected groundwater appears stable and is likely undergoing natural attenuation.

3.1.5 Soil Vapor Investigation 2014

Based on the results of the investigation conducted in 2012 (ARCADIS 2013a), ARCADIS developed a Soil Vapor Sampling Plan to evaluate the potential for migration of petroleum hydrocarbons in the subsurface into the site building (ARCADIS 2013b). In February 2014, ARCADIS installed and sampled three soil vapor monitoring wells (VW-4 through VW-6) to a depth of approximately 5.5 feet bgs and five sub-slab soil vapor probes (SS-SV-1 through SS-SV-5). The results of the February 2014 soil vapor monitoring activities indicated that site COCs do not exist in soil vapor at the Site at concentrations above the soil vapor ESLs for commercial land use (Table 4 and Figure 6). Concentrations of soil vapor detected below the ESLs indicate that potential human health risks and indoor air impacts are unlikely (ARCADIS 2014).

3.2 Site Geology and Hydrogeology

The Site is situated on an alleviated highland portion of Oakland and is topographically characterized by a gentle southeasterly slope toward Lake Merritt, which is located approximately 2,000 feet south of the Site. Soil borings drilled to depths of approximately 30 feet bgs indicated that the subsurface consists of interbedded clay, silty clay, sandy clay, silt and sandy silt, and sand. The finer grained soil (silt and clay) are the predominant soil type. A sand layer, approximately 3 feet thick, is present beneath the Site beginning at approximately 11 to 21 feet bgs and slopes in a northwesterly direction (see cross-sections that are presented in Appendix C). Field observations indicate that this sand is water-bearing and historical groundwater analytical data indicate groundwater affected with petroleum hydrocarbons is present in this shallow sand interval. The groundwater within this shallow sand layer was reported to be perched, because clay sediment observed during advancement of soil borings located above and below the sand layer was observed to be dry. The soil below the shallow sand layer is comprised of lower permeability clay to a depth of approximately 22 to 23 feet bgs where sandy clay with semi-confined groundwater has been observed (ESE 1995; ARCADIS 2013a; see cross-sections in Appendix C).

Shallow groundwater flows in a west and northwesterly direction. There are currently eight groundwater monitoring wells for the Site (Table 2; Figure 2). Recent groundwater elevations measured on December 10, 2013 ranged from 21.12 feet amsl to 25.25 amsl. The groundwater elevation contour map for the groundwater elevations measured on December 10, 2013 is presented on Figure 3.

3.3 Constituents of Concern

Based on a review of relevant documentation and the soil, soil vapor, and groundwater quality data summarized in this CSM and Closure Report, the source for the impacted soil and groundwater is from an undocumented release of fuel hydrocarbons (gasoline) from USTs C and/or D located along 28th Street (Figure 2). Site COCs include TPHg, BTEX, and MTBE. As presented below, CVOCs including trichloroethylene (TCE), tetrachloroethylene (PCE), and 1,2-dichloroethane (DCA) have been detected in groundwater samples collected at the Site. However, the source of the CVOCs detected in groundwater samples has been determined not to be associated with the Site.

3.4 Chlorinated Volatile Organic Compounds

The focus of the historical soil and groundwater investigations conducted at the Site has been related to the release of petroleum hydrocarbons from the former UST(s). The majority of the analyses performed at various soil borings, monitoring well locations, and soil excavations have included light-range and heavy-range petroleum hydrocarbons and an abbreviated list of petroleum-related VOCs. However, some soil sample samples collected in the vicinity of the former USTs were analyzed for the full suite of VOCs. In these cases, no CVOCs were detected in the soil samples above the laboratory reporting limits. These results suggest that petroleum-related constituents are the only compounds attributable to the former UST(s) at the Site.

Analytical results for groundwater samples collected from 1991 to 1993 indicate that CVOCs were present above laboratory reporting limits, specifically TCE and DCA, in samples collected from monitoring wells MW-1, MW-3, MW-4, MW-5, and MW-6 (see Table 3). Three of these wells (MW-4, MW-5, and MW-6) were screened within both the shallow sand layer (located at 11 or 17 feet bgs) and the deeper semi-confined aquifer (22 to 23 feet bgs; ESE 1994). Concentrations of TCE detected in samples collected from monitoring wells MW-4, MW-5, and MW-6 in 1993 were significantly higher (530 to 2,100 micrograms per liter [µg/L]) than the samples collected from monitoring wells MW-1 and MW-3 (6.4 to 14 µg/L). The highest concentrations of

CVOCs were detected in groundwater samples collected from wells screened within the deeper semi-confined aquifer.

Based on the lack of CVOCs detected in soil samples collected at the Site and the detection of CVOCs in groundwater samples collected from wells that were screened below the perched groundwater, ESE suggested that the source of TCE in groundwater was from an unknown off-site property (ESE 1994). The occurrence of CVOCs in groundwater samples collected from monitoring wells MW-1 and MW-3 was likely due to vertical migration of CVOCs from the deeper semi-confined aquifer into the shallow sand layer via the monitoring wells screened within both zones. Therefore, monitoring wells MW-4, MW-5, and MW-6 were abandoned in 1993 to prevent continued vertical migration of CVOCs to the shallow sand layer.

Groundwater samples collected at the Site were not routinely submitted for analysis of CVOCs after the abandonment of these wells. The groundwater samples collected during the June 2012 groundwater monitoring event included analysis for CVOCs. Concentrations of CVOCs were not detected above the applicable laboratory reporting limit at monitoring wells MW-1 and MW-3, but TCE, cis-1,2-dichloroethene, and DCA were detected above the laboratory reporting limit in monitoring well MW-7 (see Table 3). The monitoring well screen interval for MW-7 is from approximately 20 to 25 feet bgs and appears to be screened within the shallow sand layer (ESE 1994).

3.5 Current and Historical Distribution of Residual Hydrocarbons

Subsurface impacts are well delineated and understood. Subsurface fuel hydrocarbon concentrations have decreased over time by natural biodegradation, and are likely to continue decreasing. The current distribution of residual petroleum hydrocarbons and MTBE in soil, groundwater, and soil vapor are described in the following sections.

3.5.1 Soil

Forty soil samples have been collected at the Site at depths ranging from approximately 5 to 15.5 feet bgs to characterize concentrations of fuel hydrocarbons in site soils. As such, soil impacts at the Site have been delineated and are well understood. The analytical results for the soil samples collected and analyzed for petroleum and petroleum-related compounds are presented in Table 1. Soil sample locations are provided on Figure 2 and the locations for the soil samples collected during the removal of the USTs in 1988 are provided in Appendix B. The soil boring logs and cross-sections are provided in Appendix C.

Impacts to soil as defined by the presence of site COCs appear to be limited to the vicinity and downgradient of the former UST locations. Concentrations in soil appear greatest near former Tanks C and D between 7 and 15.8 feet bgs.

3.5.2 Non-Aqueous Phase Liquid

Although LNAPL was observed at the groundwater surface in the former Tank D excavation in 1988, there was no indication of LNAPL in the groundwater monitoring wells installed after that. During the redevelopment of the remaining groundwater monitoring wells (MW-1, MW-3, and MW-7) and soil vapor extraction wells (VW-1, VW-2, and VW-3), 0.02 feet of LNAPL was observed at VW-3 at the Site. Therefore, ARCADIS developed a work plan (ARCADIS 2012b) for a LNAPL bail down test to determine the potential mobility of LNAPL within the subsurface. However, there was no measurable thickness of LNAPL in monitoring well VW-3 or any observed sheen of petroleum product within the well on June 13, 2013.

For comparison, the depth to water measured in June 2012, when the LNAPL was observed, was 7.70 feet bgs while the depth to water measured on June 19, 2013 was lower (8.20 feet bgs). This decrease in groundwater elevation would suggest that if the LNAPL were mobile, more LNAPL would have accumulated in monitoring well VW-3. Because this was not the case, it can be inferred that residual LNAPL present in the vicinity of VW-3 is not mobile. Subsequent observations during the monitoring or purging of well VW-3 showed no measurable amount of LNAPL.

3.5.3 Groundwater

Concentrations of fuel hydrocarbons and/or fuel oxygenates in groundwater were detected in groundwater samples collected at and near the Site from 1989 through the most recent monitoring event during the fourth quarter of 2013 (December 10, 2013). Historical and current analytical results for groundwater samples are summarized in Table 3. Historical data were reviewed to evaluate the spatial extent of fuel hydrocarbon impacts in groundwater and concentration trends through time. Overall, decreasing or stable COC groundwater concentration trends have been observed and groundwater impacts are delineated.

To evaluate the distribution of fuel hydrocarbons and oxygenates in groundwater, concentrations were compared to the SFRWQCB groundwater ESLs for groundwater that is a current or potential drinking water resource (SFRWQCB 2013). The ESLs represent the water quality objectives (WQOs) for the Site.

Table A. Summary of WQOs

COCs	WQOs in µg/L
TPHg	100
Benzene	1
Ethylbenzene	30
Toluene	40
Total Xylenes	20
MTBE	5

Historical and recent maximum (December 2013) COC concentrations in groundwater are described below and isoconcentration maps for TPHg and benzene are shown on Figures 4 and 5, respectively.

- *TPHg.* The historical maximum concentration of TPHg was 120,000 µg/L measured in the groundwater sample collected from soil vapor extraction well VW-3, located within the former Tank C and Tank D excavation, in June 2012 (Table 3). The maximum concentration of TPHg detected during the most recent sampling event (December 2013) was 12,000 µg/L in the sample collected from monitoring well MW-9, located approximately 20 feet north of the former Tank C and Tank D excavation (Figure 4).

- *Benzene.* The historical maximum concentration of benzene was 9,600 µg/L, measured in the groundwater sample collected from monitoring well MW-3 in January 1989. The maximum concentration of benzene detected during the most recent sampling event (December 2013) was 500 µg/L in the sample collected from monitoring well MW-9 (Table 3 and Figure 5).

- *Toluene.* The historical maximum concentration of toluene was 12,000 µg/L, measured in the groundwater sample collected from monitoring well MW-3 in May 1991. The maximum concentration of toluene detected during the most recent sampling event (December 2013) was 260 µg/L in the sample collected from soil vapor extraction well VW-2 (Table 3).

- *Ethylbenzene.* The historical maximum concentration of ethylbenzene was 8,100 µg/L, measured in the groundwater sample collected from monitoring well MW-3 in July 1993. The maximum concentration of ethylbenzene detected during the most recent sampling event (December 2013) was 890 µg/L in the sample collected from monitoring well MW-9 (Table 3).

- *Total Xylenes.* The historical maximum concentration of total xylenes was 6,200 µg/L, measured in the groundwater sample collected from monitoring well MW-3 in January 1989. The maximum concentration of total xylenes detected during the most recent sampling event (December 2013) was 1,209 µg/L in the sample collected from monitoring well MW-9 (Table 3).

- *MTBE.* The historical maximum concentration of MTBE was 5.7 µg/L, measured in the groundwater sample collected from MW-3 in October 1997. The maximum concentration of MTBE detected during the most recent sampling event (December 2013) was 5.0 µg/L in the sample collected from monitoring well MW-8 (Table 3).

3.5.4 Soil Vapor

Concentrations of COCs in soil vapor collected during the February 2014 investigation were compared to SFRWQCB shallow soil vapor ESLs for commercial/industrial land uses (Table E; SFRWQCB 2013). As described below, the results of the soil vapor samples collected at the Site were compared to ESLs and no COC was detected in soil vapor above the ESL (Figure 6 and Table 4).

- The maximum concentration of TPHg was detected in the soil vapor sample collected from SS-SV-3 at 1,200 micrograms per cubic meter (µg/m^3), which is well below the ESL of 2,500,000 µg/m^3.

- The maximum concentration of benzene was detected in the soil vapor sample collected from SS-SV-5 at 4.4 µg/m^3, which is two orders of magnitude lower than the ESL of 420 µg/m^3.

- The maximum concentration of toluene was detected in the soil vapor sample collected from SS-SV-3 at 63 µg/m^3, which is well below the ESL of 1,300,000 µg/m^3.

- The maximum concentration of total xylenes was detected in the soil vapor sample collected from SS-SV-5 at 11 µg/m^3, which is well below the ESL of 440,000 µg/m^3.

- Ethylbenzene and naphthalene were not detected in any of the soil vapor samples.

COCs detected in soil vapor samples appear to be limited and decrease with depth; COC concentrations are lower in the soil vapor monitoring wells (VW-4 through VW-6) at 5.5 feet bgs compared with the COC concentrations in the sub-slab soil vapor probes. Concentrations of soil vapor detected below the ESLs indicate that potential human health risks and indoor air impacts are unlikely (ARCADIS 2014).

4. Assessment of Site Conditions Relative to Low-Threat Closure Policy Criteria

4.1 Low-Threat Closure Evaluation - General Criteria

The General Criteria evaluation “a through h” is described below.

4.1.1 Criterion A - The unauthorized release is located within the service area of a public water system

The Site is located within the service area of the City of Oakland and public water is supplied by the East Bay Municipal Utility District.

4.1.2 Criterion B - The unauthorized release consists of petroleum only

Soil and groundwater impacts occurred as a result of fuel leaks that occurred beneath Site UST(s). The current primary COCs at the Site are TPHg and BTEX. There have been no non-petroleum releases documented at the Site and groundwater impacted with CVOCs is attributed to an off-site source.

4.1.3 Criterion C - The unauthorized (“primary”) release from the UST system has been stopped

The Site operated as an automobile dealership with towing and auto repair services. During this period, four USTs were used at the Site. In 1988, one 1,000-gallon capacity waste oil UST (Tank A), one 300-gallon capacity waste oil UST (Tank B), one 550-gallon capacity gasoline UST (Tank C), and one 1,500-gallon capacity gasoline UST (Tank D) were removed. Additionally, soil was excavated to between 8 and 14 feet bgs under the tanks.

4.1.4 Criterion D - Free product has been removed to the maximum extent practicable

As described in Section 3.5.2, although free product in the form of LNAPL was observed at the groundwater surface in the former Tank D excavation in 1988, there was no indication of LNAPL in the groundwater monitoring wells installed after that. In June 2012, 0.02 foot of LNAPL was observed at VW-3; however, a bail-down test was conducted and it was concluded that the LNAPL was not mobile. Additionally, gauging of well VW-3 during periodic groundwater monitoring since June 2012 has not resulted in a measureable amount of LNAPL at well VW-3, or any other monitoring wells.

4.1.5 Criterion E - A conceptual site model that assesses the nature, extent, and mobility of the release has been developed

Section 3 of this CSM and Closure Report provides the current CSM updated with the most recent soil, soil vapor, and groundwater data collected at the Site.

4.1.6 Criterion F - Secondary source has been removed to the extent practicable

Secondary source removal has been achieved to the extent practicable. Following removal of the tanks in August 1988, soil was excavated to between 8 and 14 feet bgs at USTs C and D. Furthermore, as described in Section 3.1.3, a soil vapor and groundwater extraction system reportedly operated at the Site from February 1996 through March 1998 to remove COCs in soil, soil vapor, and groundwater as much as practicable.

4.1.7 Criterion G - Soil and groundwater have been tested for MTBE and results reported in accordance with Health and Safety Code section 25296.15

Both soil and groundwater samples have been analyzed for MTBE. MTBE was analyzed in soil samples collected in 2012 (Table 1) and in groundwater samples collected during monitoring events from 1997 to the present (Table 3). MTBE was not detected in soil samples collected in 2012 above the laboratory reporting limits. During the most recent monitoring event, MTBE was detected above laboratory reporting limits in two out of the eight groundwater samples collected from monitoring wells MW-1 through MW-8, and the highest concentration was 5.0 µg/L (well MW-8).

4.1.8 Criterion H - Nuisance as defined by Water Code section 13050 does not exist at the Site

No nuisance exists at the Site, as defined by Water Code section 13050. Site conditions and the treatment and disposal of solid wastes are not injurious to health, indecent or offensive to the senses, and do not obstruct free use of property or interfere with the comfortable enjoyment of life or property. Site conditions and the treatment and disposal of site wastes do not affect an entire community or neighborhood, or any considerable number of persons. Site impacts are restricted to the subsurface, and are present in a limited area that does not adversely affect the community at large.

4.2 Low-Threat Closure Evaluation: Media-Specific Criteria

The three exposure scenarios for the media-specific criteria evaluation (groundwater, vapor intrusion to indoor air, and direct contact and outdoor air exposure) are described below.

4.2.1 Groundwater

Site groundwater does not currently pose a risk to the existing or anticipated future beneficial uses of groundwater and meets the groundwater-specific criteria as outlined by the Low-Threat Closure Policy. The Low-Threat Closure Policy states that the contaminant plume that exceeds the WQOs must be stable or decreasing in lateral extent, and meet all of the additional characteristics of one of the five classes of sites (SWRCB 2012a). WQOs used in this analysis are presented in Table A. The following section summarizes the plume stability and additional groundwater-specific criteria.

4.2.1.1 Plume Stability

Groundwater monitoring data show that the groundwater plume (Figures 4 and 5) is stable and/or shrinking. According to the Technical Justification for Groundwater Media-Specific Criteria (SWRCB 2012a), plume stability can be demonstrated in two ways: 1) “routinely observe non-detect values for concentration levels in down gradient wells” or 2) “to show stable or decreasing concentrations levels in down gradient wells. As discussed in Section 3.2, historically groundwater flow direction has varied seasonally (west to northwest), and the most recent flows are predominantly to the northwest.

Concentrations of COCs have been detected in groundwater samples collected from monitoring wells MW-1, MW-3, MW-8, MW-9, VW-2, and VW-3. Monitoring wells

VW-2, VW-3, MW-8, and MW-9 are located downgradient and adjacent to the former USTs. MW-1 is located cross-gradient to the former USTs (Figure 2).

Monitoring well MW-8 delineates the plume to the northwest, as concentrations of COCs have been stable. Monitoring well MW-3 and vapor extraction well VW-1 delineate the plume to the west, as concentrations of COCs were below the laboratory reporting detection limits. It should be noted that due to the presence of a building north of the Site (across 28th Street), the northern portion of the plume was not further delineated (Figures 4 and 5).

4.2.2 Additional Groundwater-Specific Criteria

As described in the Low-Threat Closure Policy, sites can meet the groundwater media-specific criteria through five main classes. Based on the site data, it is ARCADIS' opinion that the Site meets the requirements of Class 2. The site requirements listed under Class 2 of the groundwater criteria include:

a. The contaminant plume that exceeds WQOs is less than 250 feet in length.

As shown on Figures 4 and 5, the lateral extent of TPHg and benzene concentrations exceeding the water quality objectives is less than 250 feet.

b. There is no free product.

With the exception of one well (VW-3) in June 2012 as discussed in Section 3.5.2, no free product has been observed in any of the monitoring wells.

c. The nearest existing water supply well or surface water body is greater than 1,000 feet from the defined plume boundary.

The nearest surface water body is Lake Merritt and is located approximately 2,000 feet south of the Site. ARCADIS and Volkswagen are not aware of any plans to install new municipal or domestic wells near the Site.

d. The dissolved concentration of benzene is less than 3,000 µg/L and the dissolved concentration of MTBE is less than 1,000 µg/L.

As shown on Figure 5, benzene concentrations were detected in five out of eight groundwater samples collected during the fourth quarter monitoring event (December

2013). Detected concentrations ranged from 28 µg/L (MW-3) to 500 µg/L (MW-9). The detected concentrations were below 3,000 µg/L and have been below 3,000 µg/L since 2012 (Table 3).

MTBE concentrations were detected in two out of eight groundwater samples collected during the fourth quarter monitoring event (December 2013). Detected concentrations are 0.7 µg/L and 5.0 µg/L, in samples collected from MW-1 and MW-8, respectively. The detected concentrations were below 1,000 µg/L and have been below 1,000 µg/L since 1997.

4.2.3 Petroleum Vapor Intrusion to Indoor Air

The Low-Threat Closure Policy states that sites shall satisfy the media-specific criteria for the vapor-intrusion-to-indoor-air pathway if:

1) "site-specific conditions at the release site satisfy all of the characteristics and screening criteria of scenarios 1 through 3, or all of the characteristics and screening criteria of scenario 4 as applicable, or

2) a site-specific risk assessment for the vapor intrusion pathway is conducted and demonstrates that human health is protected to the satisfaction of the regulatory agency" (SWRCB 2012a).

The Site meets the characteristics and screening criteria of Scenario 4, which involves the direct measurement of soil vapor beneath or adjacent to an existing building.

Site requirements listed under Scenario 4 of the vapor intrusion to indoor air section state that for an existing building, the soil vapor sample must be obtained from beneath or adjacent to the building. The soil vapor sample shall be collected at least 5 feet below the bottom of the building foundation.

As presented in Section 3.1.5, ARCADIS collected shallow soil vapor samples (5.5 foot depth) from three soil vapor monitoring wells (VW-4 through VW-6) and five sub-slab soil vapor probes (SS-SV-1 through SS-SV-5) in February 2014 (ARCADIS 2014).

The analytical results for soil vapor samples indicted that concentrations of site COCs were below the soil vapor ESLs for commercial land use (Table 4 and ARCADIS 2014). Oxygen concentrations in soil vapor samples ranged from 18 percent (VW-6) to 22 percent (VW-4, SS-SV-1, SS-SV-2, and SS-SV-5; Table 4). The Site meets

Scenario 4, with a bioattenuation zone where oxygen in soil vapor is greater than 4 percent, COC concentration requirements, as shown in the table below. The results indicate that site conditions for the vapor intrusion to indoor air pathway (Media-Specific Criterion #2) satisfy the definition of low risk in the Low-Threat Closure Policy. In preparation for this CSM and Closure Report, the analytical report originally presented as part of the Groundwater and Soil Vapor Monitoring Report (ARCADIS 2014) was revised to include naphthalene. The revised laboratory report is included in Appendix D.

Constituent	Bioattenuation Zone Criteria		Site Maximum Concentration ($\mu g/m^3$)
	Residential ($\mu g/m^3$)	Commercial/Industrial ($\mu g/m^3$)	
Benzene	<85,000	<280,000	<6.3
Ethylbenzene	<1,100,000	<3,600,000	<5.0
Naphthalene	<93,000	<310,000	<28

4.2.4 Direct Contact and Outdoor Air Exposure

As described in Low-Threat Closure Policy, sites will meet the media-specific criteria for direct contact with impacted soil or inhalation of constituents volatilized to outdoor air if any of the following are met:

- The maximum COC concentrations in soil are less than or equal to those listed in Table 1 of the Low-Threat Closure Policy (shown below)
- A site-specific risk assessment shows that COCs present in soil will not adversely affect human heath
- Exposure to COCs is mitigated through engineering controls

The Site meets the first criterion as listed below, and therefore site conditions for the direct contact and outdoor air exposure pathways (Media-Specific Criterion #3) satisfy the definition of low risk in the Low-Threat Closure Policy.

Constituent	Commercial/Industrial[1]				Utility Worker[1]	
	Direct contact 0 to 5 feet bgs (mg/kg)		Volatilization to outdoor air (5 to 10 feet bgs) (mg/kg)		0 to 10 feet bgs (mg/kg)	
	Low-Threat Closure Policy Table 1	Site Maximum (0-5 feet bgs)	Low-Threat Closure Policy Table 1	Site Maximum (5-10 feet bgs)	Low-Threat Closure Policy Table 1	Site Maximum (0-10 feet bgs)
Benzene	<8.2	0.0052	<12	2.2	<14	13.0
Ethylbenzene	<89	ND[2]	<134	14	<314	37.0
Naphthalene	<45	NA	<45	NA	<219	NA
PAHs	<0.68	NA	N/A	NA	<4.5	NA

Notes:
1. As defined in Table 1 of the Low-Threat Closure Policy (SWRCB 2012a).
2. Not detected above reporting limits.

NA = not analyzed
PAHs = polycyclic aromatic hydrocarbons

At the time the waste oil UST was removed, naphthalene and PAHs were not analyzed in soil samples collected, nor were they required to be analyzed. Therefore, the absence of this data does not constituent a data gap.

As shown in the table above, the maximum concentrations of benzene and ethylbenzene are below the Low-Threat Closure Policy values for commercial/industrial direct contact and volatilization to outdoor air and utility worker direct contact in soil samples collected from 0 to 10 feet bgs (SWRCB 2012a). Therefore, benzene and ethylbenzene are below the no significant risk values (SWRCB 2012a).

5. Conclusions and Recommendations

Site conditions meet all the general and media-specific criteria established in the Low-Threat Closure Policy. Therefore, the Site poses a low threat to human health, safety, and the environment, and satisfies the case-closure requirements of Health and Safety Code Section 25296.10. Case closure is consistent with Resolution 92-49 that requires that cleanup goals be met within a reasonable timeframe. ARCADIS respectfully requests that the ACEH grant low-threat site closure as site conditions meet all general and media-specific criteria established in the Low-Threat Closure Policy (SWRCB 2012a,b).

6. Intention to Cease Groundwater Monitoring and Sampling

Groundwater data, as presented in this CSM and Closure Report, support a conclusion that the Site and the impacted groundwater pose no significant threat to human health or the environment. Therefore, effective immediately, VWoA requests discontinuing groundwater monitoring and sampling activities pending a response and further direction from the ACEH.

7. References

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ARCADIS

Tables

Table 1
Summary of Soil Analytical Results for Total Petroleum Hydrocarbons and Related Compounds
Volkswagen Automobile Dealership
2740 Broadway Avenue, Oakland, CA

Sample ID	Sample Date	Depth Sampled (feet bgs)	Petroleum Hydrocarbons									
			TPHg mg/kg	TPH as Diesel mg/kg	Kerosene mg/kg	Motor Oil mg/kg	Oil and Grease (503E) mg/kg	MTBE mg/kg	Benzene mg/kg	Toluene mg/kg	Ethylbenzene mg/kg	Total Xylenes mg/kg
		Tier I ESL mg/kg	500	110	No Value	500	No Value	0.023	0.044	2.9	3.3	2.3
B-A	8/11/1988	8	<10	--	--	--	<50	--	<0.3	<0.3	<0.3	<0.3
B-B1	8/11/1988	11.33	56	--	--	--	680	--	<0.3	<0.3	<0.3	<0.3
B-B2	8/11/1988	10	**840**	--	--	--	2,400	--	<0.3	<0.3	<0.3	<0.3
B-C1	8/23/1988	13.33	<10	--	--	--	--	--	**1.3**	0.9	<0.3	0.3
B-C2	8/23/1988	8.33	<10	--	--	--	--	--	<0.3	<0.3	<0.3	<0.3
B-D1	8/23/1988	13.33	**2,900**	--	--	--	1,200	--	**1.4**	**7**	**12**	**46**
B-D2	8/23/1988	7.75	<10	--	--	--	< 50	--	**2.2**	**26**	**14**	**78**
MW-1	1/21/1989	7	<10	<10	--	--	< 20	--	--	--	--	--
MW-2	1/21/1989	5	--	--	--	--	< 20	--	--	--	--	--
MW-3	1/21/1989	7	--	--	--	--	35	--	--	--	--	--
MW-4	5/14/1991	5	ND	--	ND	ND	ND	--	ND	ND	ND	ND
		10	21	--	ND	ND	ND	--	**0.22**	**0.70**	0.260	1.300
MW-5	10/14/1991	5	<1.0	--	--	--	--	--	<0.005	<0.005	<0.005	<0.005
		10	<1.0	--	--	--	--	--	<0.005	<0.005	<0.005	<0.005
		15	<1.0	--	--	--	--	--	<0.005	<0.005	<0.005	<0.005
		18	2.0	--	--	--	--	--	**0.22**	<0.010	0.028	0.022
MW-6	10/14/1991	5	<1.0	--	--	--	--	--	<0.005	<0.005	<0.005	<0.005
		10	<1.0	--	--	--	--	--	<0.005	<0.005	<0.005	<0.005
		15	<1.0	--	--	--	--	--	<0.005	<0.005	<0.005	<0.005
SB-2A	5/14/1991	10	--	ND	ND	--	--	--	--	--	--	--
		15	--	ND	ND	--	--	--	--	--	--	--
SB-2B	5/14/1991	10	--	ND	ND	--	--	--	--	--	--	--
		15	--	ND	ND	--	--	--	--	--	--	--
SB-3	5/14/1991	5	2.3	ND	ND	ND	--	--	0.0052	0.0060	ND	0.021
		10	**740**	ND	ND	ND	--	--	**1.2**	**30**	**9.4**	**42**
		15	5.9	ND	ND	ND	--	--	**8.1**	0.48	0.099	0.38
SB-4	5/14/1991	5	ND	ND	ND	ND	--	--	ND	ND	ND	ND
	5/14/1991	15	13	ND	ND	14	--	--	**0.61**	1.1	0.17	0.84
SB-1E	8/5/1999	13.8-14.8	84	--	--	--	--	--	**0.94**	**4.5**	1.2	**7.4**
		14.8-15.8	**2,600**	--	--	--	--	--	**13**	**180**	**37**	**160**
SB-2E	8/5/1999	6.8-7.8	<1.0	--	--	--	--	--	<0.005	<0.005	<0.005	<0.005
		9.5-10.5	<1.0	--	--	--	--	--	<0.005	<0.005	<0.005	<0.005
MW-8	06/13/13	5.0 - 5.5	<1.1	1.9 Y	--	9.1	--	<0.025	<0.0063	<0.0063	<0.0063	<0.0063
	06/13/13	10.0 - 10.5	<1.4	<1.3	--	<6.3	--	<0.026	<0.0064	<0.0064	<0.0064	<0.0064
	06/13/13	15.0 - 15.5	<1.3	<1.3	--	<6.4	--	<0.028	<0.0069	<0.0069	<0.0069	<0.0069
MW-9	06/13/13	5.0 - 5.5	<1.2	6.7 Y	--	49	--	<0.022	<0.0055	<0.0055	<0.0055	<0.0055
	06/13/13	10.0 - 10.5	2.2	<1.3	--	<6.3	--	<0.023	<0.0061	<0.0057	0.016	0.035
	06/13/13	15.0 - 15.5	<1.3	<1.2	--	<6.1	--	<0.027	<0.0067	<0.0067	<0.0067	<0.0067

Notes:

feet bgs = Feet below ground surface
TPHg = Total petroleum hydrocarbons as gasoline
MTBE = Methyl tertiary butyl ether
mg/kg = Milligrams per kilogram
< = Not detected at detection or reporting limit indicated
ND = Not detected; no detection or reporting limit provided in source report
-- = Not analyzed
Y = Laboratory reports the sample exhibits chromatographic pattern which does not resemble standard
Bolded values are above the Tier I ESL
Tier I ESL = Tier I Environmental Screening Levels (ESLs) for shallow soils of less than 3 meters below ground surface and commercial land use.
While some samples were collected at depths greater than 3 meters below ground surface, these values were used for a conservative comparison.

Table 2
Groundwater Elevation and Well Construction Data
Volkswagen Automobile Dealership
2740 Broadway Avenue, Oakland, CA

Well	Well Casing Elevation [1][2]	Well Diameter (inches)	Total Well Depth (feet below grade)	Screen Interval (feet below grade)	Depth to Product [3] 8-Jun-12	Depth to Water [3] 8-Jun-12	Groundwater Elevation [2] 8-Jun-12	Depth to Product [3] 19-Jun-13	Depth to Water [3] 19-Jun-13	Groundwater Elevation [2] 19-Jun-13	Depth to Product [3] 26-Sep-13	Depth to Water [3] 26-Sep-13	Groundwater Elevation [2] 26-Sep-13
MW-1	31.28	2	19.20	5 to 20	NM	6.03	25.25	NM	6.40	24.88	NM	8.17	23.11
MW-3	31.68	2	18.60	5 to 20	NM	8.90	22.78	NM	9.30	22.38	NM	9.60	22.08
MW-7	31.53	4	23.50	20 to 25	NM	9.10	22.43	NM	9.59	21.94	NM	9.76	21.77
MW-8	32.70	2	20.01	16 to 20	Not yet installed	Not yet installed	Not yet installed	NM	10.40	22.30	NM	10.67	22.03
MW-9	31.85	2	14.90	11 to 15	Not yet installed	Not yet installed	Not yet installed	NM	9.44	22.41	NM	9.59	22.26
VW-1	31.67	4	18.55	14.5 to 19.5	NM	9.01	22.66	NM	9.42	22.25	NM	9.69	21.98
VW-2	31.71	4	16.93	12 to 16.5	NM	8.82	22.89	NM	9.23	22.48	NM	9.55	22.16
VW-3	31.11	4	14.10	5 to 15.5	7.70	7.72	23.41	NM	8.20	22.91	NM	8.66	22.45

Notes:

(1) Survey conducted by PLS Surveys Inc. on July 1, 2013
(2) In reference to feet above mean sea level
(3) In feet below top of casing (approximately at ground surface)
NM = Not measured

Table 3
Summary of Groundwater Analytical Results
Volkswagen Automobile Dealership
2740 Broadway Avenue, Oakland, CA

Well Number	Sample Date	TPHg µg/L (C7-C12)	TPHd µg/L (C10 - C24)	TPHmo µg/L (C24-C36)	Benzene µg/L	Toluene µg/L	Ethyl benzene µg/L	Total Xylenes µg/L	MTBE µg/L	TCE µg/L	cDCE µg/L	1,1-Dichlorothene µg/L	1,2-Dichloroethane µg/L	1,3,5-Trimethyl benzene µg/L	1,2,4-Trimethyl benzene µg/L	n-Butyl benzene µg/L	Naphthalene µg/L	trans-1,2-Dichloroethene µg/L	TDS µg/L
Tier I ESL µg/L		**100**	**100**	**100**	**1**	**40**	**30**	**20**	**5**	**5**	**6**	**5**	**0.5**	**No Value**	**No Value**	**No Value**	**6.1**	**10**	**No Value**
VI ESL (Fine-Coarse Mix) µg/L		**No Value**	**No Value**	**No Value**	**270**	**Sample Soil Gas**	**3,100**	**Sample Soil Gas**	**100,000**	**1,300**	**26,000**	**130,000**	**1,000**	**No Value**	**No Value**	**No Value**	**1,600**	**120,000**	**No Value**
MW-1	01/21/89	ND	na	na	**53**	13	1.4	8.2	---	na	na	---	na	na	na	na	na	---	na
	05/13/91	**130**	na	na	ND	ND	ND	ND	---	**58**	na	---	ND	na	na	na	na	---	na
	10/18/91	ND	na	na	ND	ND	ND	ND	---	**120**	na	---	ND	na	na	na	na	---	na
	10/27/91	ND	na	na	ND	ND	ND	ND	---	**11**	na	---	ND	na	na	na	na	---	na
	07/13/93	ND	na	na	ND	ND	ND	ND	---	**6.4**	na	---	ND	na	na	na	na	---	na
	06/27/96	ND	na	na	ND	ND	ND	ND	---	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
	12/13/96	ND	na	na	ND	ND	ND	ND	---	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
	08/03/99	ND	na	na	ND	ND	ND	ND	ND	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	<2.0	---	410
	06/19/13	<50	**290 Y**	<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	<2.0	<0.5	na
	09/26/13	<50	**120 Y**	<310	<0.5	<0.5	<0.5	<0.5	na	na	na	na	na	na	na	na	na	na	na
	12/10/13	85 Z	**220 Y**	<300	<0.5	<0.5	<0.5	<0.5	0.7	**52**	0.8	<0.5	<0.5	<0.5	<0.5	<0.5	<2.0	<0.5	na
MW-2*	01/21/89	ND	na	na	ND	ND	ND	ND	---	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
	05/13/91	**81,000**	na	na	***7,800***	**12,000**	**1,200**	**4,000**	---	**14**	na	---	**380**	na	na	na	na	---	na
	10/18/91	**73,000**	na	na	***9,400***	**8,600**	**750**	**3,300**	---	**14**	na	---	**8.3**	na	na	na	na	---	na
	10/27/91	**37000**	na	na	***7,100***	**4,900**	**970**	**3,500**	---	ND	na	---	**170**	na	na	na	na	---	na
	07/13/93	**41,000**	na	na	***8,100***	**6,200**	***8,100***	**4,400**	---	**14**	na	---	**150**	na	na	na	na	---	na
	06/27/96	**370**	na	na	**120**	**75**	6.2	**47**	---	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
	12/13/96	ND	na	na	**30**	10	2	7.4	---	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
	10/07/97	ND	na	na	ND	ND	ND	ND	ND	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
	08/03/99	**21,000**	na	na	***5,500***	**2,300**	**470**	**990**	---	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	<2.0	---	310
	06/19/13	<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	<2.0	<0.5	na
	09/26/13	<50	<51	<310	**2.6**	<0.5	<0.5	<0.5	na	na	na	na	na	na	na	na	na	na	na
	12/10/13	<50	<51	<300	***28***	<0.5	<0.5	1.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	1.1	<0.5	<2.0	<0.5	na
MW-4*	01/21/89	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	05/13/91	**13,000**	---	---	**160**	**690**	**250**	**1,100**	---	**490**	---	---	ND	---	---	---	---	---	---
	10/18/91	ND	---	---	**11**	11	ND	15	---	**450**	---	---	**3.9**	---	---	---	---	---	---
	10/27/91	**180**	---	---	**6.4**	2.8	1.2	6.2	---	**520**	---	---	ND	---	---	---	---	---	---
	07/13/93	**320**	---	---	***36***	4.4	1.8	5.3	---	**550**	---	---	ND	---	---	---	---	---	---

Table 3
Summary of Groundwater Analytical Results
Volkswagen Automobile Dealership
2740 Broadway Avenue, Oakland, CA

Well Number	Sample Date	TPHg µg/L (C7-C12)	TPHd µg/L (C10 - C24)	TPHmo µg/L (C24-C36)	Benzene µg/L	Toluene µg/L	Ethyl benzene µg/L	Total Xylenes µg/L	MTBE µg/L	TCE µg/L	cDCE µg/L	1,1-Dichlorothene µg/L	1,2-Dichloroethane µg/L	1,3,5-Trimethyl benzene µg/L	1,2,4-Trimethyl benzene µg/L	n-Butyl benzene µg/L	Naphthalene µg/L	trans-1,2-Dichloroethene µg/L	TDS µg/L
Tier I ESL µg/L		**100**	**100**	**100**	**1**	**40**	**30**	**20**	**5**	**5**	**6**	**5**	**0.5**	**No Value**	**No Value**	**No Value**	**6.1**	**10**	**No Value**
MW-5*	01/21/89	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	05/13/91	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	10/18/91	**16,000**	---	---	***3,500***	**530**	**670**	**1,100**	---	**120**	---	---	**32**	---	---	---	---	---	---
	10/27/91	87	---	---	ND	ND	ND	ND	---	**410**	---	---	ND	---	---	---	---	---	---
	07/13/93	90	---	---	ND	ND	ND	ND	---	**530**	---	---	ND	---	---	---	---	---	---
MW-6*	01/21/89	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	05/13/91	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	10/18/91	**28,000**	---	---	***640***	**2,700**	**1,100**	**4,500**	---	**230**	---	---	**60**	---	---	---	---	---	---
	10/27/91	**1,300**	---	---	**48**	**130**	**55**	**230**	---	***2,000***	---	---	ND	---	---	---	---	---	---
	07/13/93	**1,100**	---	---	**5.1**	30	**30**	**230**	---	***2,100***	---	---	ND	---	---	---	---	---	---
MW-7	06/27/96	ND	na	na	ND	ND	ND	ND	ND	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
	12/13/96	ND	na	na	ND	ND	ND	ND	ND	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
	06/08/12	<50	<50	<300	<0.5	<0.5	<0.5	<0.5	<0.5	4.6	0.5	---	**1.2**	<0.5	<0.5	<0.5	<2.0	---	290
	06/19/13	<50	<50	<300	<0.5	<0.5	<0.5	<0.5	<0.5	3.2	0.3 J	<0.5	**0.5**	<0.5	<0.5	<0.5	<2.0	<0.5	na
Dup	06/19/13	<50	<50	<300	**3.1**	<0.5	<0.5	<0.5	<0.5	<0.5	0.3 J	<0.5	**0.5**	<0.5	<0.5	<0.5	<2.0	<0.5	na
	09/26/13	<50	<49	<290	<0.5	<0.5	<0.5	<0.5	na	na	na	na	na	na	na	na	na	na	na
Dup	09/26/13	<50	<50	<300	<0.5	<0.5	<0.5	<0.5	na	na	na	na	na	na	na	na	na	na	na
	12/10/13	<50	<51	<300	<0.5	<0.5	<0.5	<0.5	<0.5	3.8	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<2.0	<0.5	na
Dup	12/10/13	<50	<50	<300	<0.5	<0.5	<0.5	<0.5	<0.5	3.4	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<2.0	<0.5	na
MW-8	06/19/13	**1,800 Y**	**650**	<300	***360***	2.3 J	16	2.2 J	1.3 J	<2.5	**19**	<2.5	**2.3 J**	<2.5	<2.5	<2.5	<10	<2.5	na
	09/26/13	**890**	**370 Y**	<290	***330***	3.3	**66**	8.3	na	na	na	na	na	na	na	na	na	na	na
	12/10/13	**1,200**	**550**	<340	***310***	5.7	**88**	14.0	**5.0**	4.3	**120**	<2.0	**2.7**	<2.0	<2.0	7.0	<8.0	<2.0	na
MW-9	06/19/13	**5,400**	**1,100**	<300	***1,500***	19	**110**	**37**	<8.3	**13**	**14**	<8.3	<8.3	<8.3	10	<8.3	**42**	<8.3	na
	09/26/13	**8,300**	**2,300**	<310	***650***	<6.3	**690**	**610**	na	na	na	na	na	na	na	na	na	na	na
	12/10/13	**12,000**	**1,900**	<300	***500***	<6.3	**890**	**1,209**	<6.3	<6.3	**7.5**	<6.3	<6.3	210	750	<6.3	**240**	<6.3	na
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	<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	<2.0	---	210
	06/19/13	<50	70 Y	<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	<2.0	<0.5	na
	09/26/13	<50	<52	<310	<0.5	<0.5	<0.5	<0.5	na	na	na	na	na	na	na	na	na	na	na
	12/10/13	<50	<51	<310	<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	<0.5	na
VW-2	06/08/12	**36,000**	**3,400 Y**	<300	***1,800***	**3,000**	**1,200**	**4,900**	<25	<25	<25	---	<25	240	960	70	**480**	---	370
	06/19/13	**4,300**	**830**	<300	***270***	**58**	**280**	**430**	<1.7	<1.7	<1.7	<1.7	**1.7**	16	260	<1.7	**22 J**	<1.7	na
	09/26/13	**850**	**240 Y**	<310	**26**	38	**56**	**118**	na	na	na	na	na	na	na	na	na	na	na
	12/10/13	**3,900**	**640**	<310	***300***	**260**	**210**	**490**	<0.5	<0.5	0.5	<0.5	**1.3**	18	110	<0.5	**37**	<0.5	na
VW-3	06/08/12	**120,000 Y**	**9,300**	**2,000**	**54**	<20	**84**	**640**	<20	<20	<20	---	<20	650	2,000	83	**240**	---	370
	06/19/13	**13,000**	**6,200**	**650**	**72**	<7.1	16	**119.7**	<7.1	<7.1	<7.1	<7.1	<7.1	300	1,000	58	**70**	<7.1	na
	09/26/13	**6,000**	**2,900**	**370**	***100***	<1.3	<1.3	**43.1**	na	na	na	na	na	na	na	na	na	na	na
	12/10/13	**6,500**	**3,200**	**730**	***120***	1.7	11	**49.6**	<1.3	<1.3	<1.3	<1.3	<1.3	170	410	64	**81**	<1.3	na

Table 3
Summary of Groundwater Analytical Results
Volkswagen Automobile Dealership
2740 Broadway Avenue, Oakland, CA

Well Number	Sample Date	TPHg µg/L (C7-C12)	TPHd µg/L (C10 - C24)	TPHmo µg/L (C24-C36)	Benzene µg/L	Toluene µg/L	Ethyl benzene µg/L	Total Xylenes µg/L	MTBE µg/L	TCE µg/L	cDCE µg/L	1,1-Dichlorothene µg/L	1,2-Dichloroethane µg/L	1,3,5-Trimethyl benzene µg/L	1,2,4-Trimethyl benzene µg/L	n-Butyl benzene µg/L	Naphthalene µg/L	trans-1,2-Dichloroethene µg/L	TDS µg/L
Tier I ESL µg/L		**100**	**100**	**100**	**1**	**40**	**30**	**20**	**5**	**5**	**6**	**5**	**0.5**	**No Value**	**No Value**	**No Value**	**6.1**	**10**	**No Value**
MIP-1 (grab groundwater sample)	04/05/13	**630 Y**	**590**	<300	**52**	1.0	0.5 J	0.7	1.6	**18**	**40**	0.3 J	**2.8**	<0.5	<0.5	<0.5	<2.0	0.3 J	---
MIP-2 (grab groundwater sample)	04/05/13	**510 Y**	**450**	<300	**140**	1.1	<1.0	0.7 J	<1.0	**42**	4.4	<1.0	**1.5**	<1.0	<1.0	<1.0	<4.0	<1.0	---
MIP-3 (grab groundwater sample)	04/05/13	**1,800**	**600**	<300	***270***	2.1	**120**	**135**	1.2 J	**270**	**17**	<1.7	**1.1 J**	<1.7	1.5 J	3.0	**17**	<1.7	---
MIP-4 (grab groundwater sample)	04/05/13	**13,000**	**4,300**	**320**	**15**	5.7	**510**	**1,490**	<5.0	**960**	**11**	<5.0	<5.0	290	850	57	**150**	<5.0	---
Dup	04/05/13	**14,000**	**1,700**	<300	**29**	8.5	**670**	**1,970**	<6.3	**750**	**7.0**	<6.3	<6.3	340	1,000	73	**200**	<6.3	---
MIP-5 (grab groundwater sample)	04/05/13	**4,200**	**1,000**	<300	**9.0**	18	**46**	**189**	<1.3	**170**	**10**	<1.3	**1.2 J**	58	170	19	**18**	<1.3	---

Notes:
Tier I ESL = Tier I Environmental Screening Levels (ESLs) for groundwater that is a potential drinking water source
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
TCE = Trichloroethene
TDS = Total dissolved solids
µg/L = Micrograms per liter
ND = Not detected; no detection or reporting limit provided in source report
--- = Not analyzed
na = Historical data not available
Dup = Duplicate sample
* = Well 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
Z = Sample exhibits unknown single peak or peaks
VI ESL = Groundwater Screening Levels for Evaluation of Potential Vapor Intrusion for Fine to Coarse Media for Commercial/Industrial Land Use
Bolded values are above the Tier I ESL
Italicized values are above the VI ESL

Table 4
Summary of Soil Vapor Analytical Results
Volkswagen Automobile Dealership
2740 Broadway Avenue, Oakland, CA

Well Number	Sample Date	TPHg (C7-C12) µg/m^3	Benzene µg/m^3	Toluene µg/m^3	Ethyl benzene µg/m^3	Total Xylenes µg/m^3	Naphthalene	TCE µg/m^3	cDCE µg/m^3	1,2-Dichloroethane µg/m^3	trans-1,2-Dichloroethene µg/m^3	Vinyl Chloride µg/m^3	Oxygen (%)	Helium (%)
Tier I ESL Commercial (µg/m^3)		**2,500,000**	**420**	**1,300,000**	**4,900**	**440,000**	**360**	**3,000**	**31,000**	**580**	**260,000**	**160**	**No Value**	**No Value**
LTC Commercial Scenario 4b (µg/m^3)		**No Value**	**280,000**	**No Value**	**3,600,000**	**No Value**	**310,000**	**No Value**	**No Value**	**No Value**	**No Value**	**No Value**	**No Value**	**No Value**
VW-4	02/17/14	390	<3.7	8.3	<5.0	<5.0	<24	<6.2	<4.6	<4.7	<4.6	<3.0	22	<0.12
VW-5	02/13/14	930	6.3	40	<5.4	<5.4	<26	<6.7	<4.9	<5.0	<4.9	<3.2	21	<0.12
VW-6	02/13/14	290	<4.1	34	<5.6	<5.6	<27	<6.9	<5.1	<5.2	<5.1	<3.3	18	<0.13
SS-SV-1	02/13/14	870	5.5	39	<4.6	10	<22	<5.7	<4.2	<4.3	<4.2	<2.7	22	<0.10
SS-SV-2	02/13/14	490	<4.3	8.4	<5.8	6.3	<28	<7.2	<5.3	<5.4	<5.3	<3.4	22	<0.13
SS-SV-3	02/13/14	1,200	<4.0	63	<5.5	5.6	<26	<6.8	<5.0	<5.1	<5.0	<3.2	21	<0.13
SS-SV-4	02/17/14	360	<3.9	13	<5.3	<5.3	<26	<6.6	<4.8	<5.0	<4.8	<3.1	21	<0.12
SS-SV-5	02/17/14	1,000	4.4	46	<5.4	11	<26	<6.7	<5.0	<5.1	<5.0	<3.2	22	<0.12

Notes:
Tier I ESL = Tier I Environmental Screening Levels (ESLs) for soil gas screening levels for evaluation of potential vapor intrusion for commercial/industrial facility
LTC Commercial Scenario 4b = Low-Threat Closure (LTC) Policy Petroleum Vapor Intrusion to Indoor Air Scenario 4b (direct Measurement of Soil Gas Concentrations - With Bioattenuation Zone) for commercial land use
TPHg = Total Petroleum Hydrocarbons as gasoline
TCE = Trichloroethene
cDCE = cis-1,2-Dichloroethene
µg/m^3 = Micrograms per cubic meter air
< = Not detected at or above the laboratory reporting limit noted

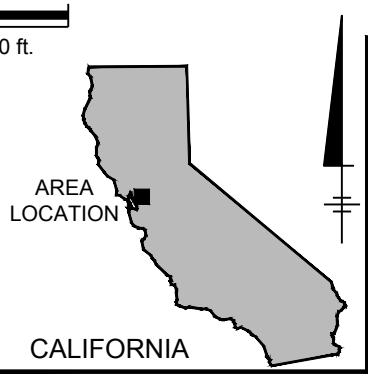
ARCADIS

Figures

SOURCE: GOOGLE EARTH PRO

0 250' 500'

Approximate Scale: 1 in. = 250 ft.



VW OAKLAND
2740 BROADWAY
OAKLAND, CALIFORNIA

SITE LOCATION MAP

ARCADIS

FIGURE
1

BUILDING

SIDEWALK

28TH STREET

SIDEWALK

BROADWAY

SHOW ROOM

OFFICES

PARKING GARAGE

RAMP TO SECOND FLOOR

OFFICES

OFFICES

ASPHALT PARKING AREA

AUTO SHOP

ELEVATED PARKING AREA

27TH STREET

GARAGE DOOR

MIP-1 MIP-2 MIP-3 MIP-4 MIP-5

MW-1 MW-2 MW-3 MW-4 MW-5 MW-6 MW-7 MW-8 MW-9

VW-1 VW-2 VW-3 VW-4 VW-5 VW-6

SB-1 SB-1E SB-2A SB-2B SB-2E SB-3 SB-4

SS-SV-1 SS-SV-2 SS-SV-3 SS-SV-4 SS-SV-5

(A) (B) (C & D)

LEGEND

- PROPERTY LINE
- FENCE LINE
- UTILITY LINE
- 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
- MW-3 MONITORING WELL LOCATION
- MW-5 ABANDONED MONITORING WELL
- VW-1 VAPOR EXTRACTION WELL
- VW-6 SOIL VAPOR MONITORING WELL
- SS-SV-1 SUB-SLAB SOIL VAPOR PROBE
- SB-3 SOIL BORING
- MIP-1 SOIL BORING LOCATIONS WITH EC/MIP CAPABILITIES
- EC/MIP ELECTRICAL CONDUCTIVITY / MEMBRANE INTERFACE PROBE

0 30 Feet

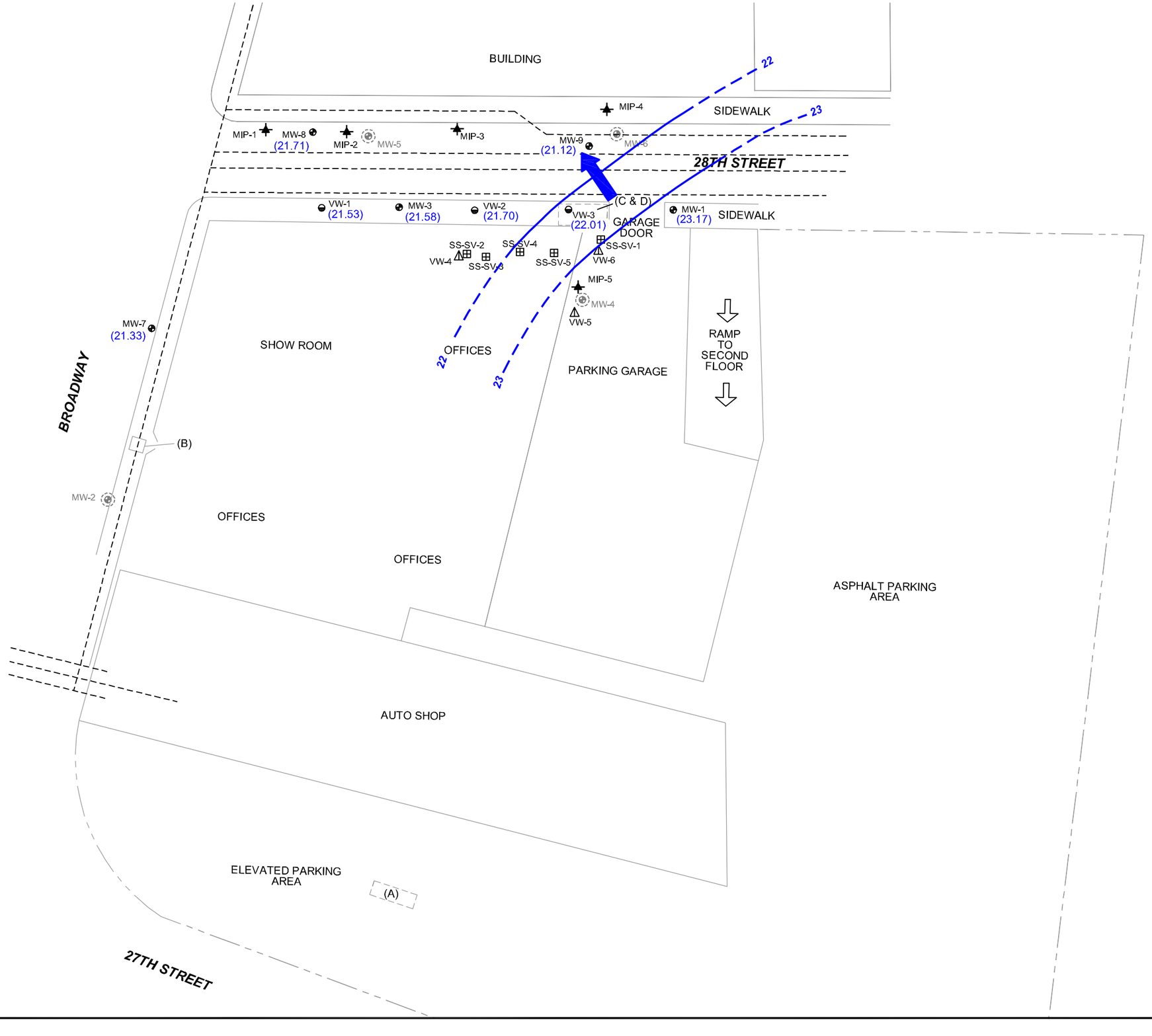
REFERENCES:
MAP DIGITIZED FROM A SITE PLAN BY ENVIRONMENTAL SCIENCE & ENGINEERING (6/91) AND A SITE PLAN BY QST ENVIRONMENTAL (12/02/96 - REVISED 12/28/98)

VW OAKLAND
2740 BROADWAY
OAKLAND, CALIFORNIA

SITE PLAN

ARCADIS

FIGURE 2



LEGEND

- PROPERTY LINE
- FENCE LINE
- UTILITY LINE
- 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
- MW-3 — MONITORING WELL LOCATION
- MW-5 — ABANDONED MONITORING WELL
- VW-1 — VAPOR EXTRACTION WELL
- VW-6 — SOIL VAPOR MONITORING WELL
- SS-SV-1 — SUB-SLAB SOIL VAPOR PROBE
- MIP-1 — SOIL BORING LOCATIONS WITH EC/MIP CAPABILITIES
- EC/MIP — ELECTRICAL CONDUCTIVITY / MEMBRANE INTERFACE PROBE
- (22.16) — GROUNDWATER ELEVATION IN FEET ABOVE MEAN SEA LEVEL
- 22 — CONTOUR OF CONSTANT GROUNDWATER ELEVATION
- INFERRED GROUNDWATER FLOW DIRECTION

0 30 Feet

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)

VW OAKLAND
2740 BROADWAY
OAKLAND, CALIFORNIA

GROUNDWATER CONTOUR MAP

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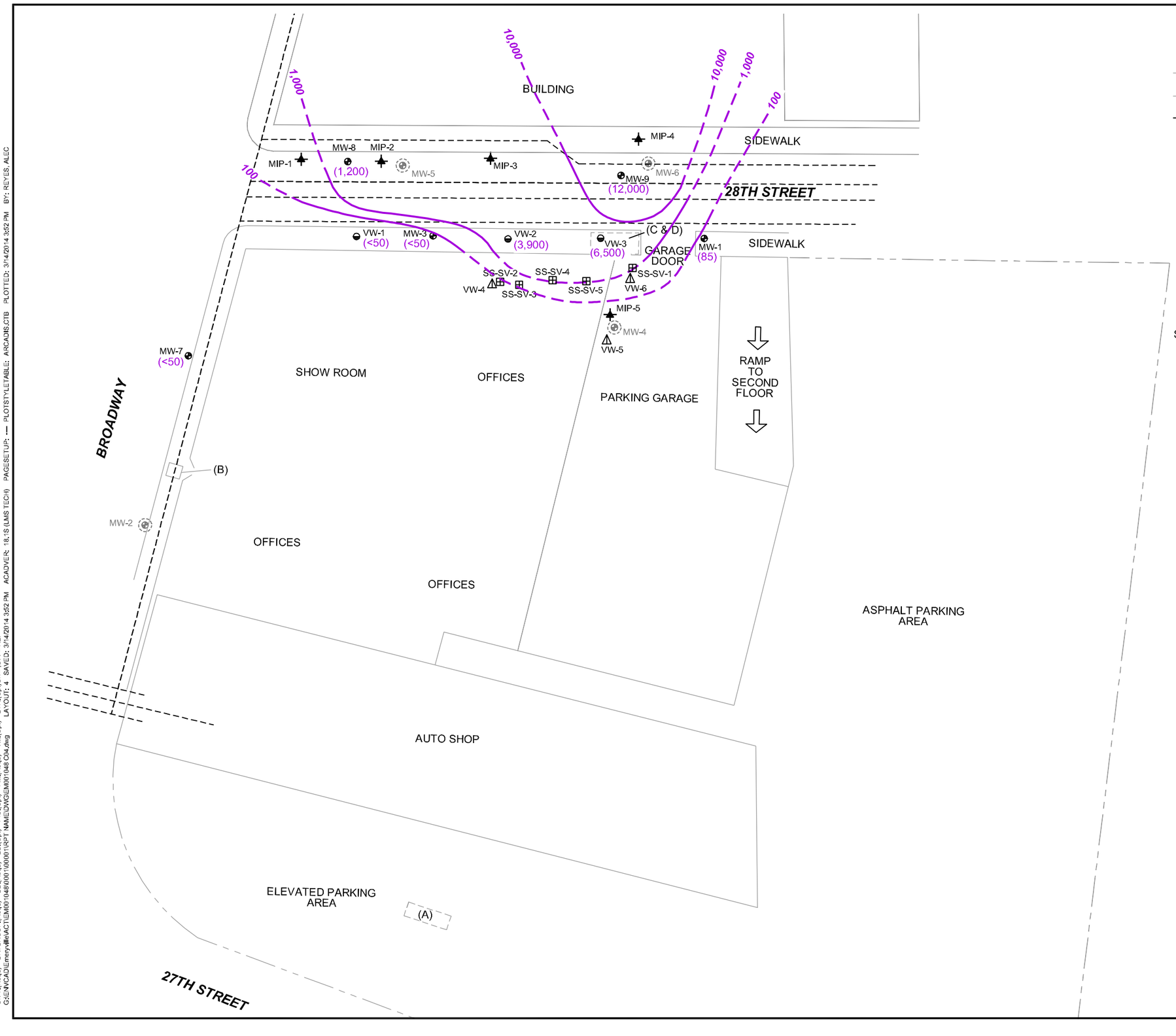
FIGURE 3



LEGEND

- PROPERTY LINE
- FENCE LINE
- UTILITY LINE
- 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
- MW-3 MONITORING WELL LOCATION
- MW-5 ABANDONED MONITORING WELL
- VW-1 VAPOR EXTRACTION WELL
- VW-6 SOIL VAPOR MONITORING WELL
- SS-SV-1 SUB-SLAB SOIL VAPOR PROBE
- MIP-1 SOIL BORING LOCATIONS WITH EC/MIP CAPABILITIES
- EC/MIP ELECTRICAL CONDUCTIVITY / MEMBRANE INTERFACE PROBE
- (6,500) TPHg CONCENTRATION IN MICROGRAMS PER LITER (µg/L) (DECEMBER 2013)
- 10,000 APPROXIMATE EXTENTS OF CONCENTRATION CONTOUR (DASHED WHERE INFERRED)
- TPHg GASOLINE-RANGE TOTAL PETROLEUM HYDROCARBONS

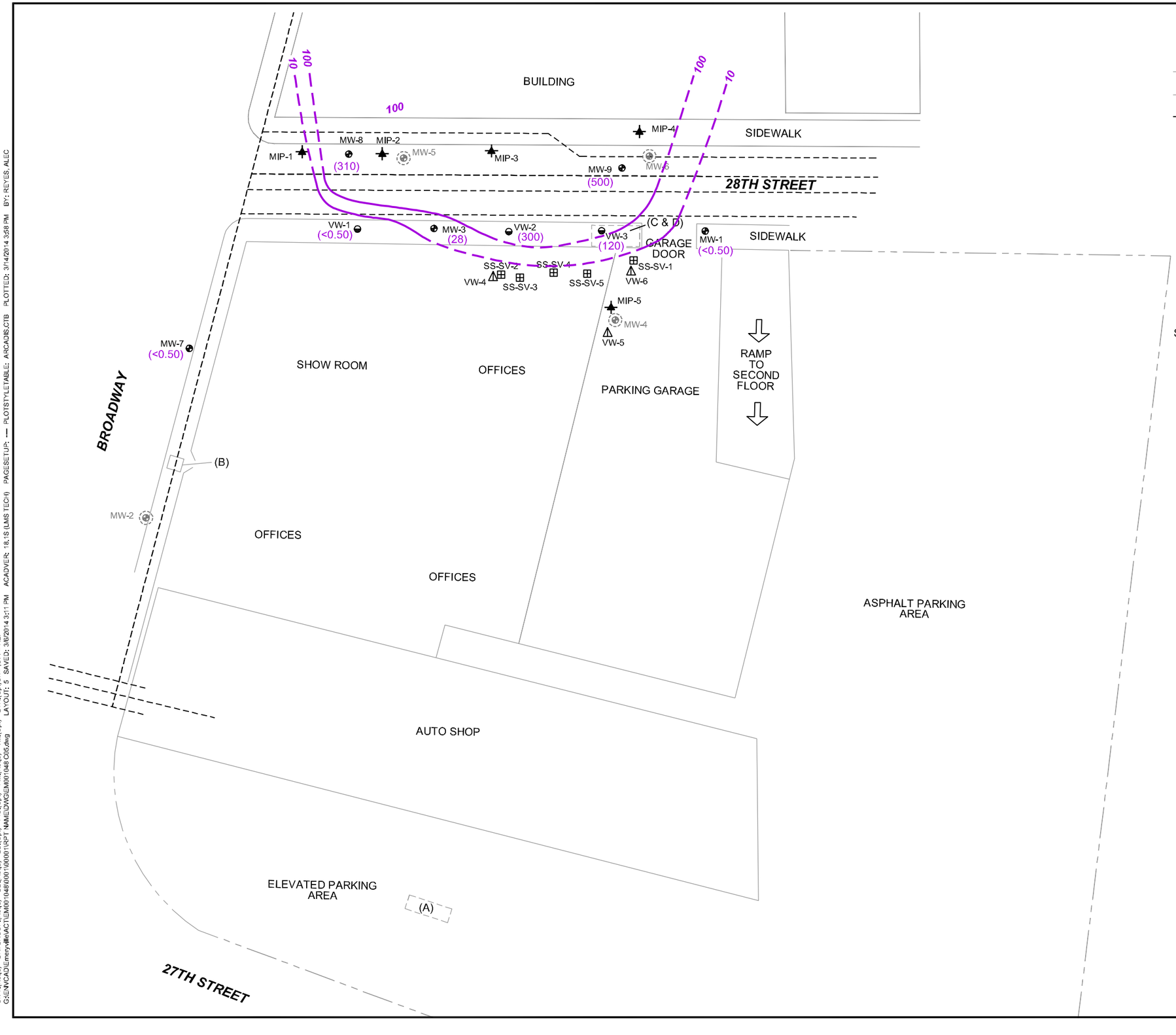
REFERENCES:
MAP DIGITIZED FROM A SITE PLAN BY ENVIRONMENTAL SCIENCE & ENGINEERING (6/91) AND A SITE PLAN BY QST ENVIRONMENTAL (12/02/96 - REVISED 12/28/98)

VW OAKLAND
2740 BROADWAY
OAKLAND, CALIFORNIA

TPHg GROUNDWATER CONCENTRATION CONTOUR MAP

ARCADIS

FIGURE 4



LEGEND

- PROPERTY LINE
- FENCE LINE
- UTILITY LINE
- 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
- MW-3 MONITORING WELL LOCATION
- MW-5 ABANDONED MONITORING WELL
- VW-1 VAPOR EXTRACTION WELL
- VW-6 SOIL VAPOR MONITORING WELL
- SS-SV-1 SUB-SLAB SOIL VAPOR PROBE
- MIP-1 SOIL BORING LOCATIONS WITH EC/MIP CAPABILITIES
- EC/MIP ELECTRICAL CONDUCTIVITY / MEMBRANE INTERFACE PROBE
- (1,330) BENZENE CONCENTRATION IN MICROGRAMS PER LITER (µg/L) (DECEMBER 2013)
- 100 APPROXIMATE EXTENTS OF CONCENTRATION CONTOUR (DASHED WHERE INFERRED)

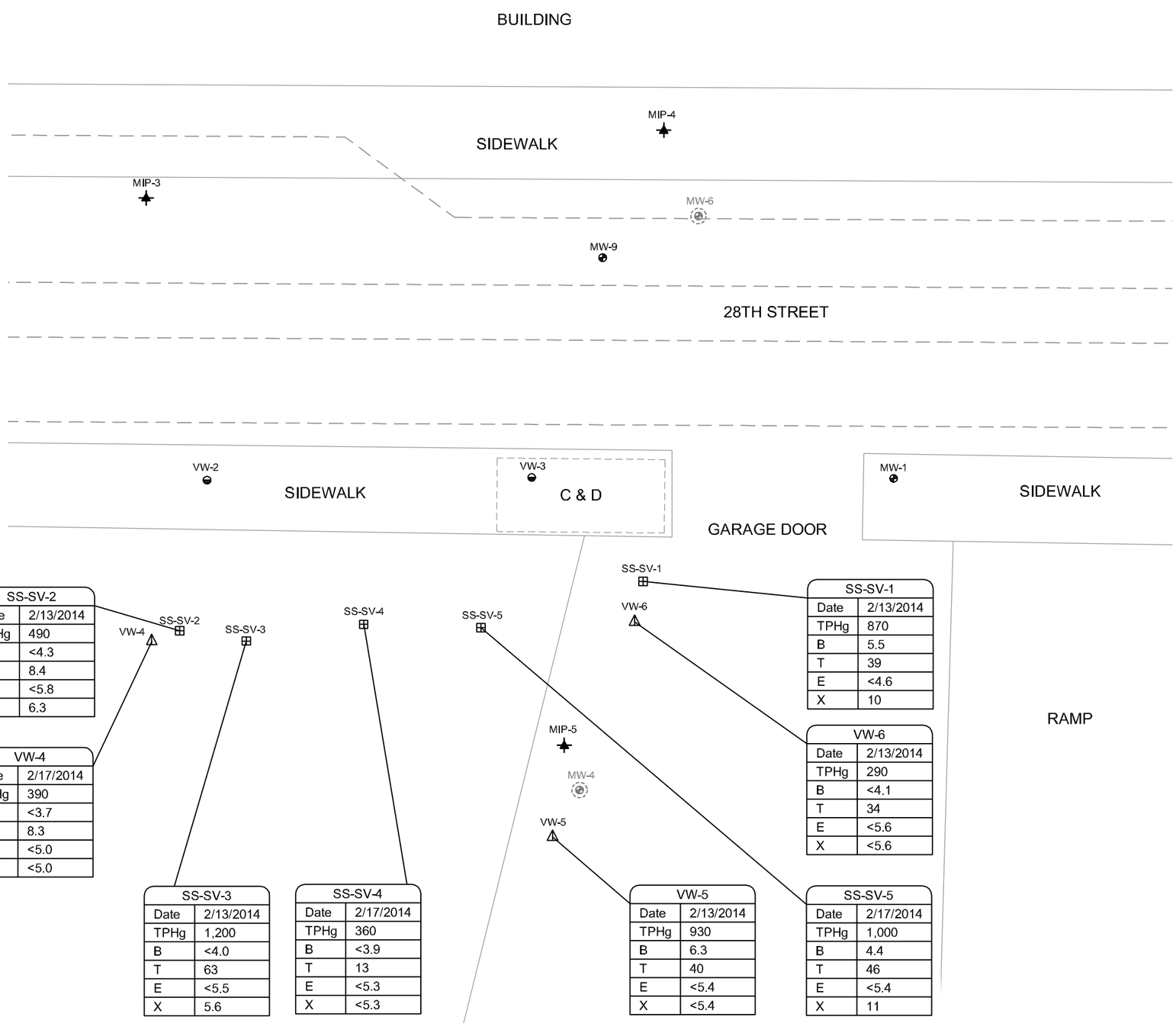
REFERENCES:
MAP DIGITIZED FROM A SITE PLAN BY ENVIRONMENTAL SCIENCE & ENGINEERING (6/91) AND A SITE PLAN BY QST ENVIRONMENTAL (12/02/96 - REVISED 12/28/98)

VW OAKLAND
2740 BROADWAY
OAKLAND, CALIFORNIA

BENZENE GROUNDWATER CONCENTRATION CONTOUR MAP

ARCADIS

FIGURE 5



LEGEND

- PROPERTY LINE
- UTILITY LINE
- 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
- MW-3 MONITORING WELL LOCATION
- MW-5 ABANDONED MONITORING WELL
- VW-1 VAPOR EXTRACTION WELL
- VW-6 SOIL VAPOR MONITORING WELL
- SS-SV-1 SUB-SLAB SOIL VAPOR PROBE
- MIP-1 SOIL BORING LOCATIONS WITH EC/MIP CAPABILITIES
- EC/MIP ELECTRICAL CONDUCTIVITY / MEMBRANE INTERFACE PROBE

LOCATION ID	
Date	DATE OF SAMPLE
TPHg	TOTAL PETROLEUM HYDROCARBONS IN GASOLINE
B	BENZENE
T	TOLUENE
E	ETHYLBENZENE
X	TOTAL XYLENES

NOTE:
ALL SOIL VAPOR ANALYTICAL RESULTS SHOWN IN MICROGRAMS PER CUBIC METER

0 10 Feet

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)

SS-SV-2	
Date	2/13/2014
TPHg	490
B	<4.3
T	8.4
E	<5.8
X	6.3

VW-4	
Date	2/17/2014
TPHg	390
B	<3.7
T	8.3
E	<5.0
X	<5.0

SS-SV-3	
Date	2/13/2014
TPHg	1,200
B	<4.0
T	63
E	<5.5
X	5.6

SS-SV-4	
Date	2/17/2014
TPHg	360
B	<3.9
T	13
E	<5.3
X	<5.3

SS-SV-1	
Date	2/13/2014
TPHg	870
B	5.5
T	39
E	<4.6
X	10

VW-6	
Date	2/13/2014
TPHg	290
B	<4.1
T	34
E	<5.6
X	<5.6

VW-5	
Date	2/13/2014
TPHg	930
B	6.3
T	40
E	<5.4
X	<5.4

SS-SV-5	
Date	2/17/2014
TPHg	1,000
B	4.4
T	46
E	<5.4
X	11

VW OAKLAND
2740 BROADWAY
OAKLAND, CALIFORNIA

SOIL VAPOR ANALYTICAL DATA FOR SAMPLES COLLECTED FEBRUARY 13 AND 17, 2014

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FIGURE 6

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Appendix A

Low-Threat Closure Evaluation

Site Name: Volkswagen Dealership
Site Address: 2740 Broadway Avenue, Oakland, CA

Site meets the criteria of the Low-Threat Underground Storage Tank (UST) Case Closure Policy as described below.[1]

General Criteria General criteria that must be satisfied by all candidate sites:	
Is the unauthorized release located within the service area of a public water system?	■ Yes ☐ No
Does the unauthorized release consist only of petroleum?	■ Yes ☐ No
Has the unauthorized ("primary") release from the UST system been stopped?	■ Yes ☐ No
Has free product been removed to the maximum extent practicable?	☐ Yes ☐ No ■ NA
Has a conceptual site model that assesses the nature, extent, and mobility of the release been developed?	■ Yes ☐ No
Has secondary source been removed to the extent practicable?	■ Yes ☐ No
Has soil or groundwater been tested for MTBE and results reported in accordance with Health and Safety Code Section 25296.15?	■ Yes ☐ No
Does nuisance as defined by Water Code section 13050 exist at the site?	☐ Yes ■ No
Are there unique site attributes or site-specific conditions that demonstrably increase the risk associated with residual petroleum constituents?	☐ Yes ■ No
Media-Specific Criteria Candidate sites must satisfy all three of these media-specific criteria: **1. Groundwater:** To satisfy the media-specific criteria for groundwater, the contaminant plume that exceeds water quality objectives must be stable or decreasing in areal extent, and meet all of the additional characteristics of one of the five classes of sites:	
Is the contaminant plume that exceeds water quality objectives stable or decreasing in areal extent?	■ Yes ☐ No ☐ NA
Does the contaminant plume that exceeds water quality objectives meet all of the additional characteristics of one of the five classes of sites? If YES, check applicable class: ☐ **1** ■ **2** ☐ **3** ☐ **4** ☐ **5**	▣ Yes ☐ No ☐ NA

[1] Refer to the Low-Threat Underground Storage Tank Case Closure Policy for closure criteria for low-threat petroleum UST sites.

For sites with releases that have not affected groundwater, do mobile constituents (leachate, vapors, or light non-aqueous phase liquids) contain sufficient mobile constituents to cause groundwater to exceed the groundwater criteria?	☐ Yes ☐ No ■ NA
2. Petroleum Vapor Intrusion to Indoor Air: The site is considered low-threat for vapor intrusion to indoor air if site-specific conditions satisfy all of the characteristics of one of the three classes of sites (a through c) or if the exception for active commercial fueling facilities applies. **Is the site an active commercial petroleum fueling facility?** Exception: Satisfaction of the media-specific criteria for petroleum vapor intrusion to indoor air is not required at active commercial petroleum fueling facilities, except in cases where release characteristics can be reasonably believed to pose an unacceptable health risk. **a. Do site-specific conditions at the release site satisfy all of the applicable characteristics and criteria of scenarios 1 through 3 or all of the applicable characteristics and criteria of scenario 4?** If YES, check applicable scenarios: ☐ **1** ☐ **2** ☐ **3** ▣ **4** **b. Has a site-specific risk assessment for the vapor intrusion pathway been conducted and demonstrates that human health is protected to the satisfaction of the regulatory agency?** **c. As a result of controlling exposure through the use of mitigation measures or through the use of institutional or engineering controls, has the regulatory agency determined that petroleum vapors migrating from soil or groundwater will have no significant risk of adversely affecting human health?**	☐ Yes ■ No ■Yes ☐ No ☐ NA ☐ Yes ☐ No ■ NA ☐ Yes ☐ No ■ NA
3. Direct Contact and Outdoor Air Exposure: The site is considered low-threat for direct contact and outdoor air exposure if site-specific conditions satisfy one of the three classes of sites (a through c). **a. Are maximum concentrations of petroleum constituents in soil less than or equal to those listed in Table 1 for the specified depth below ground surface (bgs)?** **b. Are maximum concentrations of petroleum constituents in soil less than levels that a site specific risk assessment demonstrates will have no significant risk of adversely affecting human health?** **c. As a result of controlling exposure through the use of mitigation measures or through the use of institutional or engineering controls, has the regulatory agency determined that the concentrations of petroleum constituents in soil will have no significant risk of adversely affecting human health?**	■ Yes ☐ No ☐ NA ☐ Yes ☐ No ■ NA ☐ Yes ☐ No ■ NA

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Appendix B

Historical Soil Sample Locations

Historical Soil Analytical Results
Volatile Organic Compounds
Broadway Volkswagen
2470 Broadway, Oakland, CA

Sample ID	Sample Date	Depth Sampled (feet bgs)	Volatile Organic Compounds (mg/kg)														
			1,1,1-Trichloroethane	1,1-Dichloroethane	1,1-Dichloroethene	1,2-Dichloroethene	2-Butanone	Acetone	Carbon disulfide	Carbon tetrachloride	Chlorobenzene	Chloroethane	Tetra chloroethene	trans-1,2-Dichloroethene	trans-1,3-Dichloropropene	Trichloroethene	Vinyl chloride
B-A	8/11/1988	8	< 0.005	< 0.005	< 0.005	< 0.005	<0.1	<0.1	<0.01	--	< 0.005	<0.01	< 0.005	< 0.005	< 0.005	< 0.005	<0.01
B-B1	8/11/1988	11.33	< 0.005	< 0.005	< 0.005	< 0.005	<0.1	<0.1	<0.01	--	< 0.005	<0.01	< 0.005	< 0.005	< 0.005	< 0.005	<0.01
B-B2	8/11/1988	10	< 0.005	< 0.005	< 0.005	< 0.005	<0.1	<0.1	<0.01	--	< 0.005	<0.01	< 0.005	< 0.005	< 0.005	< 0.005	<0.01
B-C1	8/23/1988	13.33	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
B-C2	8/23/1988	8.33	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
B-D1	8/23/1988	13.33	<0.2	<0.2	<0.2	<0.2	--	--	--	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
B-D2	8/23/1988	7.75	<0.2	<0.2	<0.2	<0.2	--	--	--	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
MW-1	1/21/1989	7	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-2	1/21/1989	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-3	1/21/1989	7	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-4	5/14/1991	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
		10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	5/23/1991	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	5/24/1991	10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-5	10/14/1991	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
		10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
		15	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
		18	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-6	10/14/1991	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
		10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
		15	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SB-1E	8/5/1999	13.8-14.8	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
		14.8-15.8	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SB-2A	5/14/1991	10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
		15	ND	ND	ND	--	--	--	--	ND	ND	ND	--	--	ND	ND	ND
SB-2B	5/14/1991	10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
		15	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SB-2E	8/5/1999	6.8-7.8	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
		9.5-10.5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SB-3	5/14/1991	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
		10	ND	ND	ND	--	--	--	--	ND	ND	ND	--	--	ND	ND	ND
		15	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SB-4	5/14/1991	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	5/14/1991	15	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	5/21/1991	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	5/22/1991	15	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-8	06/13/13	5.0 - 5.5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	06/13/13	10.0 - 10.5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	06/13/13	15.0 - 15.5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-9	06/13/13	5.0 - 5.5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	06/13/13	10.0 - 10.5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	06/13/13	15.0 - 15.5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

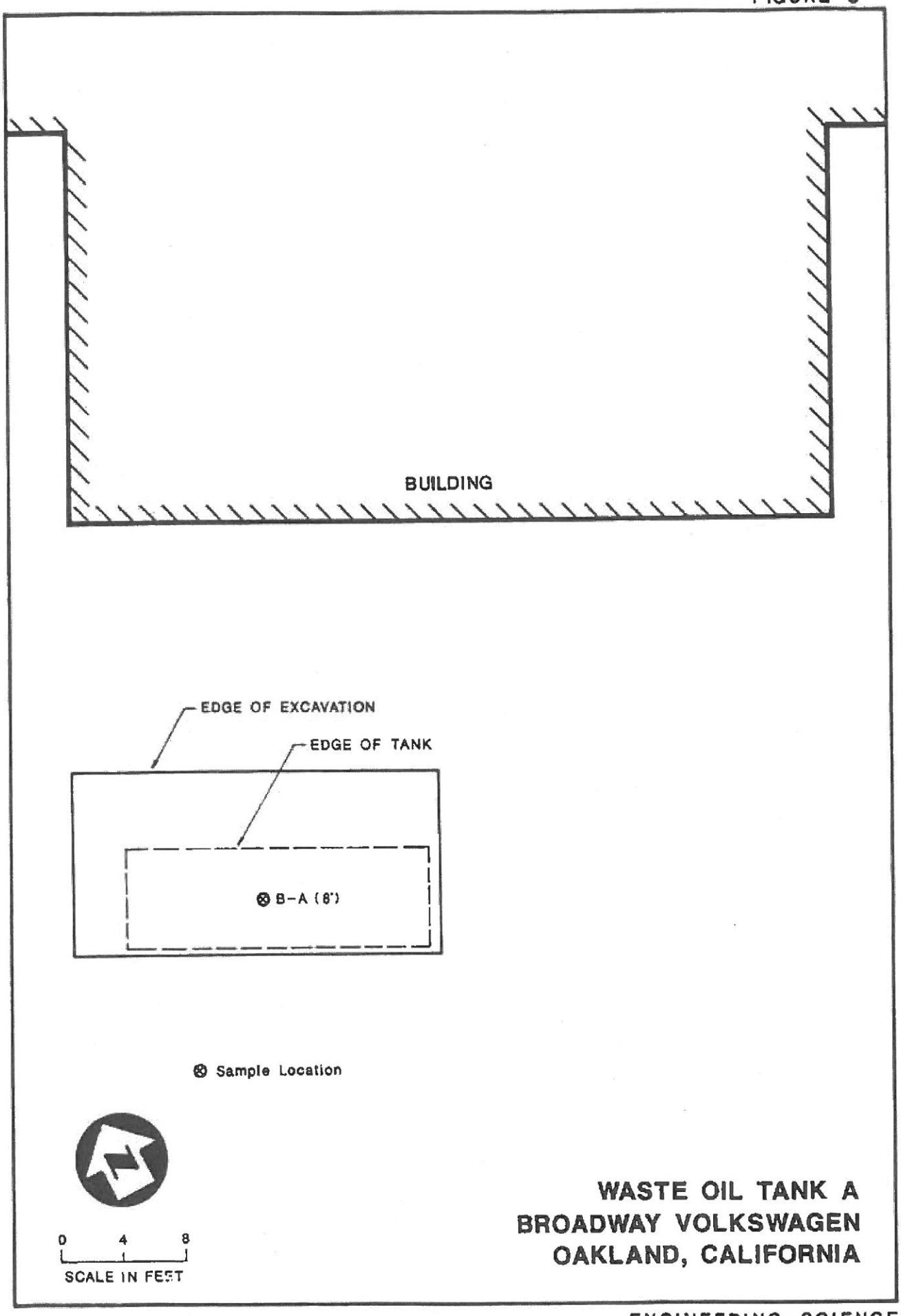
Notes:
feet bgs = Feet below ground surface
mg/kg = Milligrams per kilogram
< = Not detected at detection or reporting limit indicated
ND = Not detected; no detection or reporting limit provided in source report
-- = Not analyzed

Historical Soil Analytical Results
Metals and Other Analyses
Broadway Volkswagen
2470 Broadway, Oakland, CA

Sample ID	Sample Date	Depth Sampled (feet bgs)	Metals (mg/kg)					
			Cadmium	Chromium	Cyanide	Lead (total)	Nickel	Zinc
MW-5	10/14/1991	5	--	--	--	--	--	--
		10	< 0.25	39.8	--	7.5	60.0	53.9
		15	--	--	--	--	--	--
		18	--	--	--	--	--	--
SB-3	5/14/1991	5	--	--	--	--	--	--
		10	0.27	27.4	ND	5	42.5	42.5
		15	--	--	--	--	--	--

Notes:
feet bgs = Feet below ground surface
mg/kg = Milligrams per kilogram
< = Not detected at detection or reporting limit indicated
ND = Not detected; no detection or reporting limit provided in source report
-- = Not analyzed

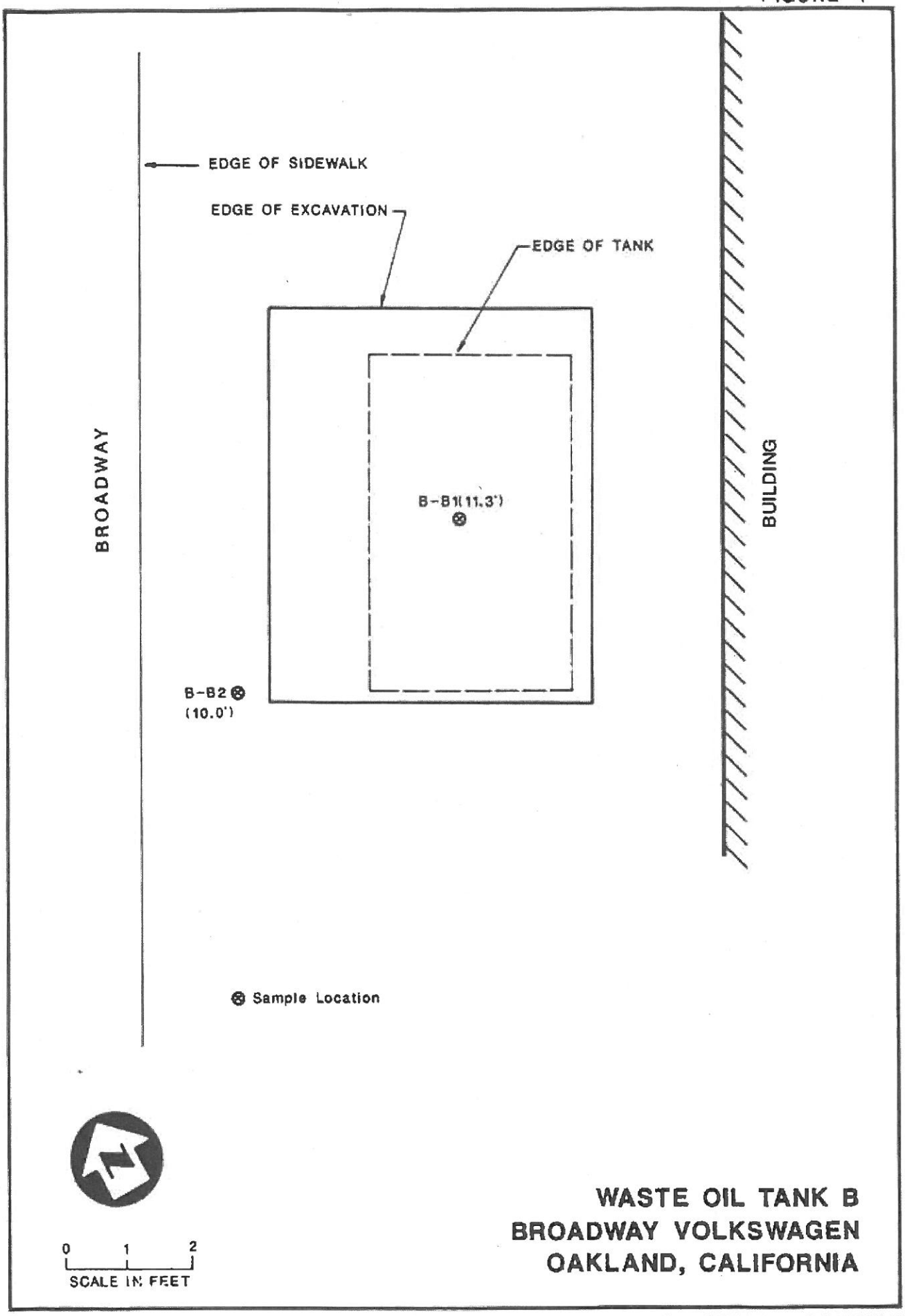
FIGURE 3



WASTE OIL TANK A
BROADWAY VOLKSWAGEN
OAKLAND, CALIFORNIA

ENGINEERING-SCIENCE

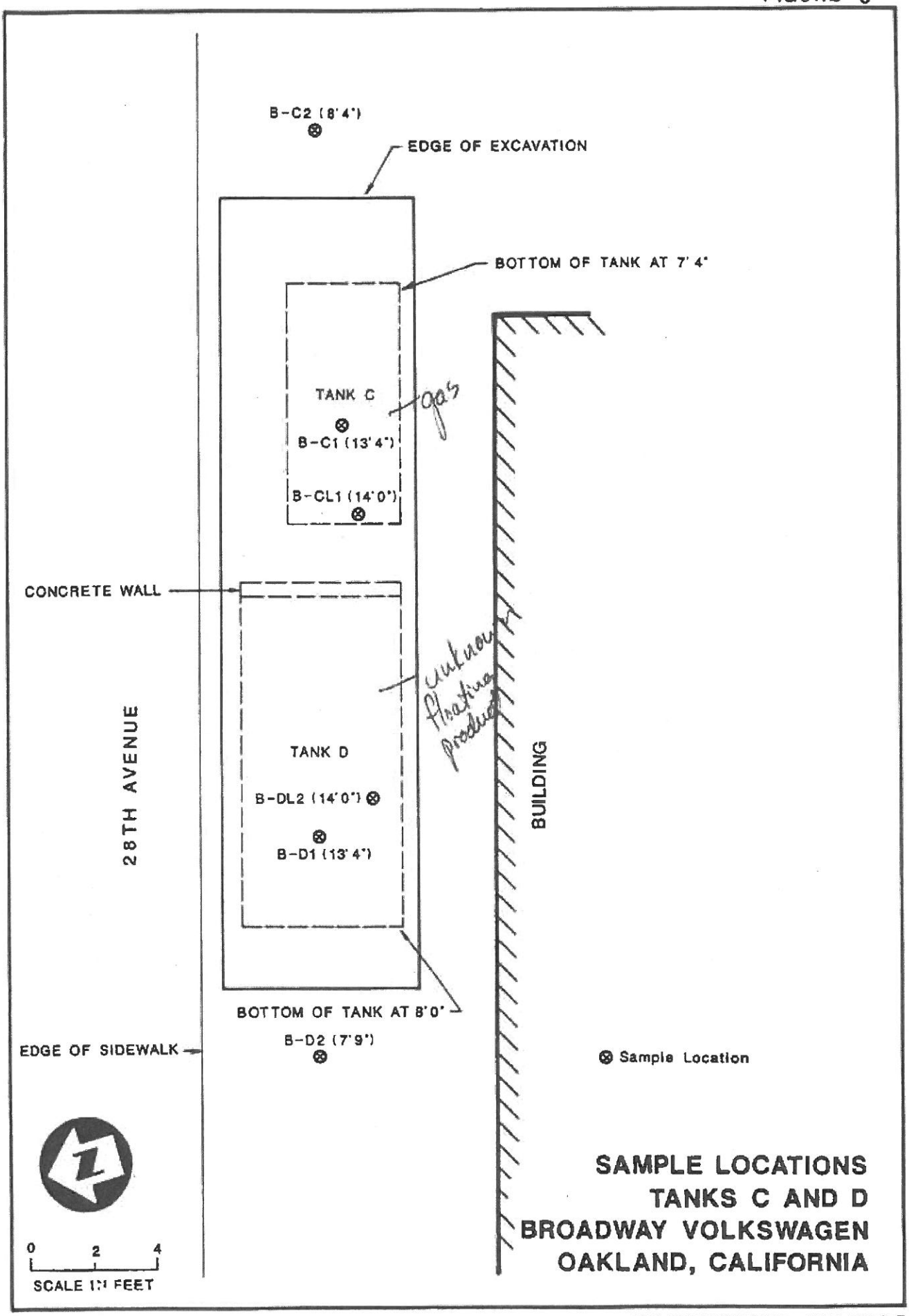
FIGURE 4



WASTE OIL TANK B
BROADWAY VOLKSWAGEN
OAKLAND, CALIFORNIA

ENGINEERING-SCIENCE

FIGURE 5



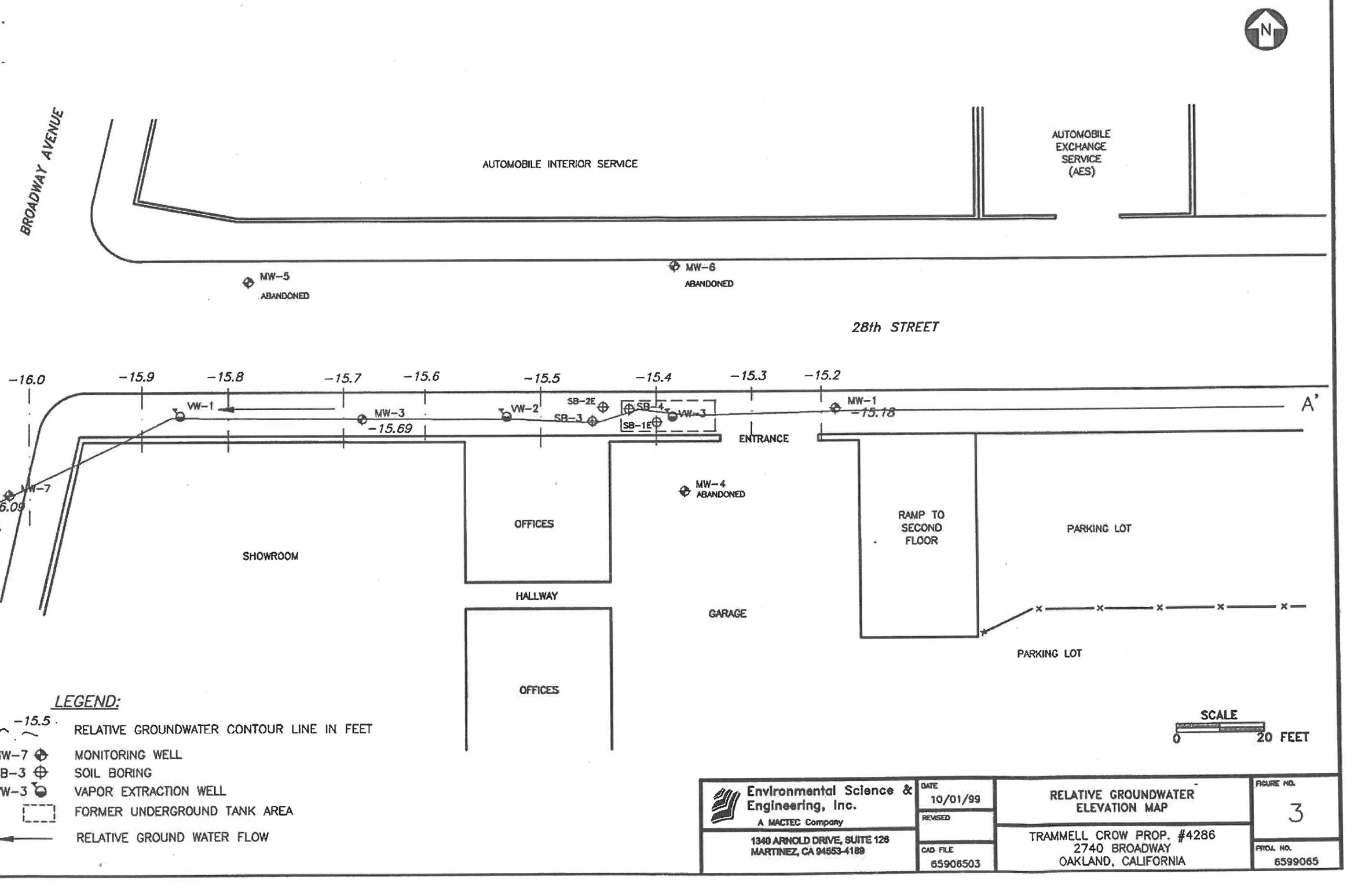
SAMPLE LOCATIONS
TANKS C AND D
BROADWAY VOLKSWAGEN
OAKLAND, CALIFORNIA

ENGINEERING-SCIENCE

ARCADIS

Appendix C

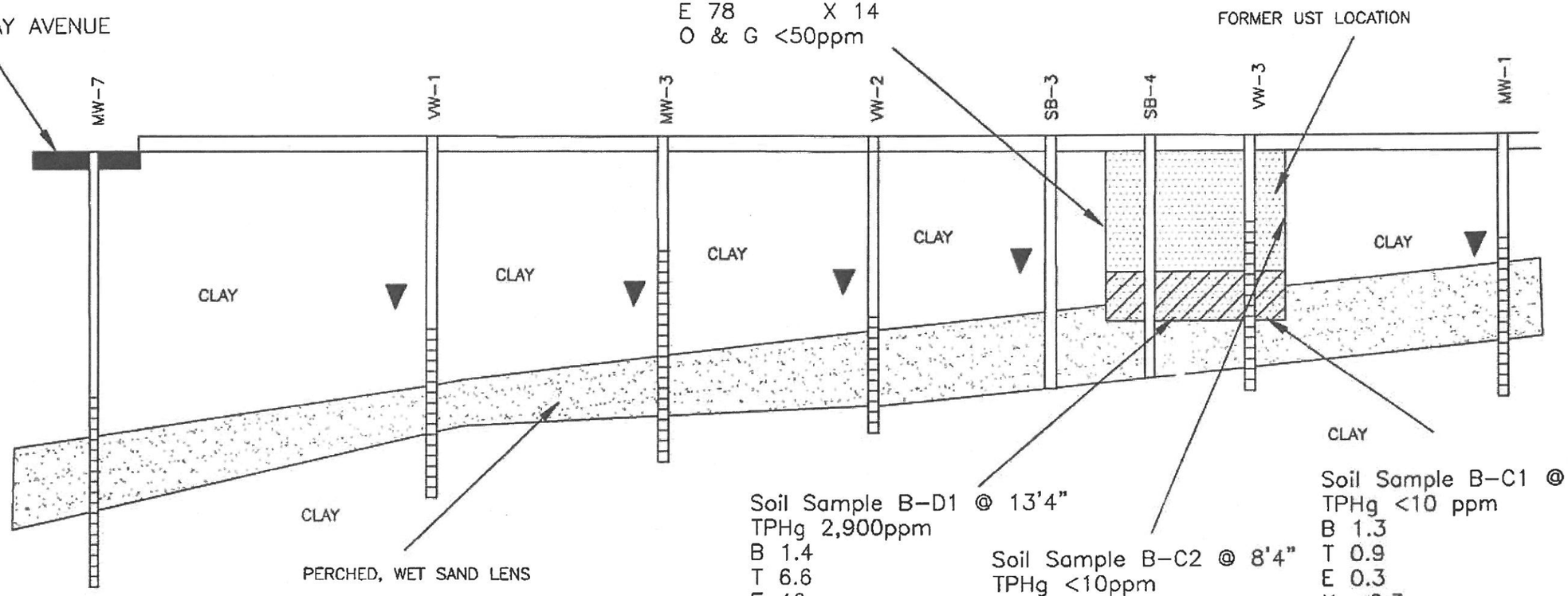
Soil Boring Logs and Cross-Sections



Environmental Science & Engineering, Inc. A MACTEC Company 1340 ARNOLD DRIVE, SUITE 126 MARTINEZ, CA 94553-4189	DATE 10/01/99 REVISED CAD FILE 65906503	RELATIVE GROUNDWATER ELEVATION MAP TRAMMELL CROW PROP. #4286 2740 BROADWAY OAKLAND, CALIFORNIA	FIGURE NO. 3 PROJ. NO. 6599065

WEST A

EAST A'



Soil Sample B-D2 @ 7'9"
TPHg <10ppm
B 2.2 T 26
E 78 X 14
O & G <50ppm

Soil Sample B-D1 @ 13'4"
TPHg 2,900ppm
B 1.4
T 6.6
E 46
X 12
O & G 1,200ppm

Soil Sample B-C2 @ 8'4"
TPHg <10ppm
B <0.3
T <0.3
E <0.3
X <0.3
O & G - NA

Soil Sample B-C1 @ 13'4"
TPHg <10 ppm
B 1.3
T 0.9
E 0.3
X <0.3
O & G - NA

LEGEND

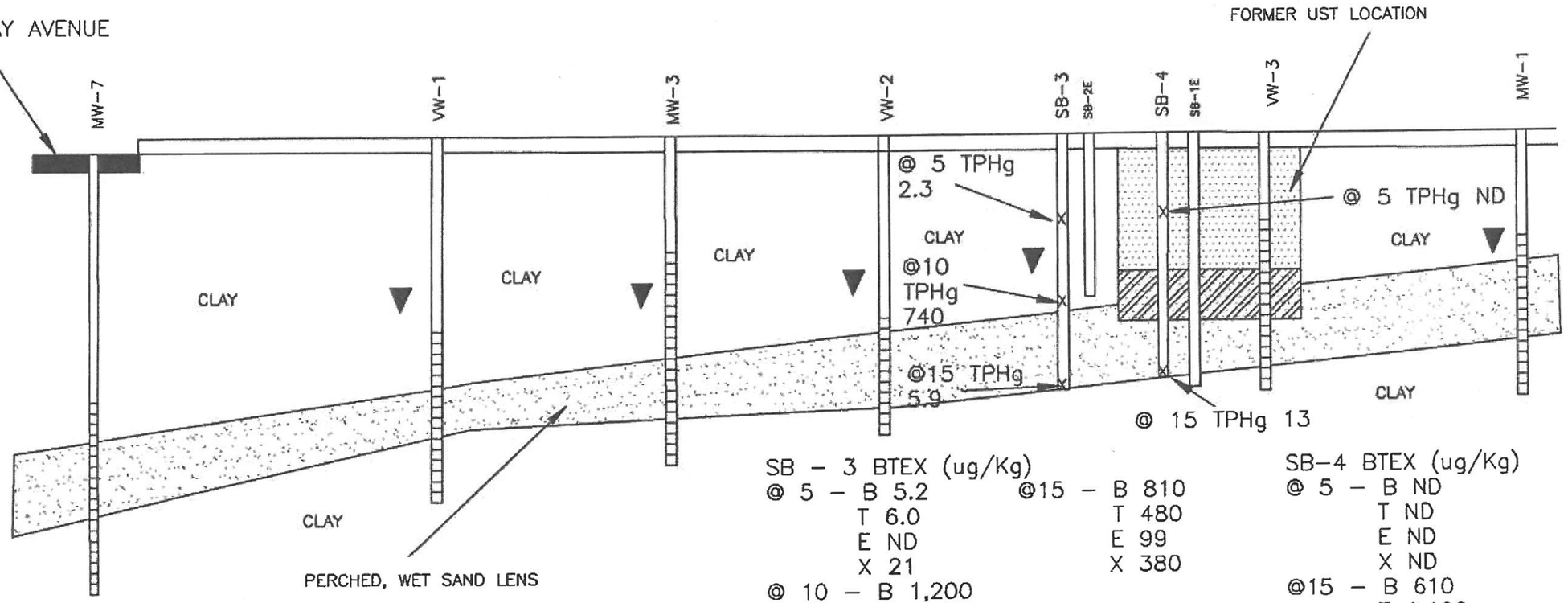
- CLAY
- SAND
- PEA GRAVEL BACKFILL
- GROUND WATER WITH DETECTED HIGH CONCENTRATIONS OF PETROLEUM HYDROCARBONS
- MEASURED WATER LEVEL (7/1/94)
- MONITORING WELL BLANK CASING OR SOIL BORING
- MONITORING WELL SCREENED INTERVAL
- X SOIL SAMPLE LOCATION TPH-g, BTEX, O&G IN ppm, 1988 SOIL

NOT TO SCALE

Environmental Science & Engineering, Inc. A MACTEC Company 1340 ARNOLD DRIVE, SUITE 126 MARTINEZ, CA. 94553-4189	DATE 10/27/99 REVISED CAD FILE 69906504	CROSS SECTION A-A' LOCATION OF UST REMOVAL SAMPLES AND SOIL BORINGS TRAMMEL CROW PROPERTY #4286 2740 BROADWAY OAKLAND, CALIFORNIA	FIGURE NO. 4 PROJ. NO. 6599065

WEST A

EAST A'



SB – 3 BTEX (ug/Kg)

@ 5 – B 5.2
T 6.0
E ND
X 21

@ 10 – B 1,200
T 30,000
E 9,400
X 42,000

@15 – B 810
T 480
E 99
X 380

SB–4 BTEX (ug/Kg)

@ 5 – B ND
T ND
E ND
X ND

@15 – B 610
T 1,100
E 170
X 840

LEGEND

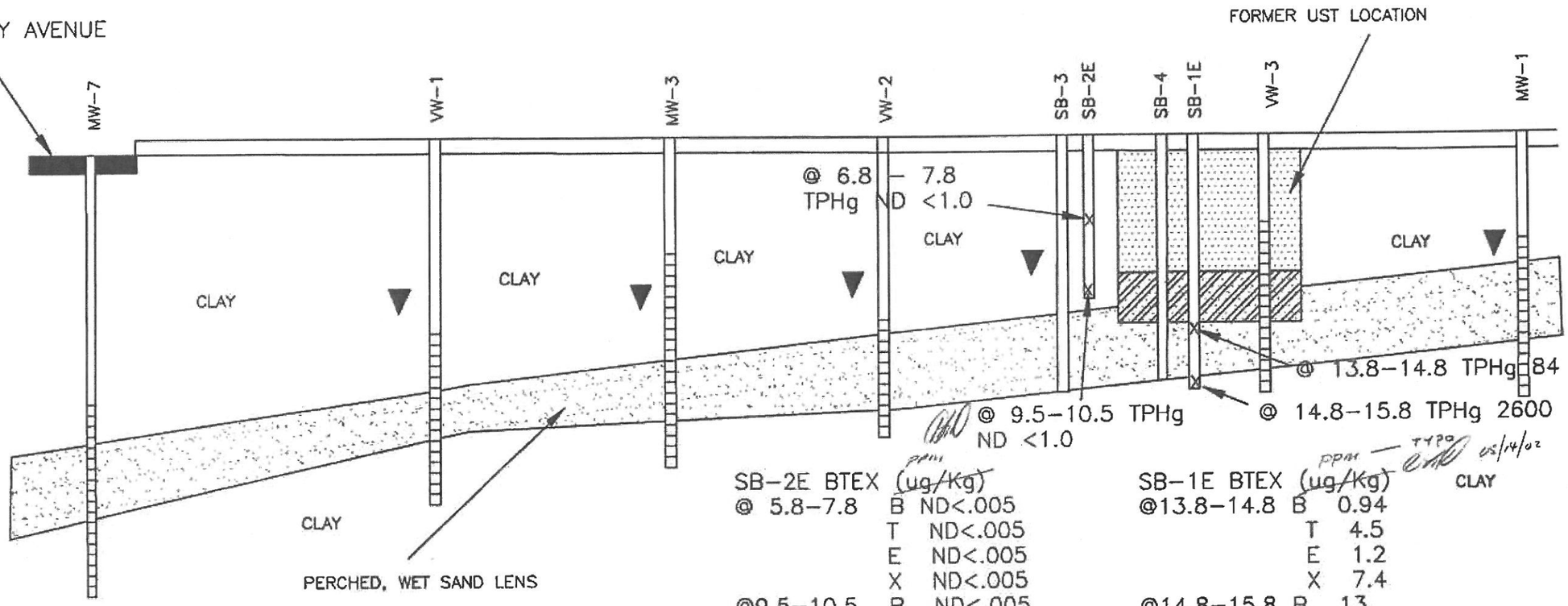
- CLAY
- SAND
- PEA GRAVEL BACKFILL
- GROUND WATER WITH DETECTED HIGH CONCENTRATIONS OF PETROLEUM HYDROCARBONS
- MEASURED WATER LEVEL (7/1/94)
- MONITORING WELL BLANK CASING OR SOIL BORING
- MONITORING WELL SCREENED INTERVAL
- X SOIL SAMPLE LOCATION TPH–g in ppm, BTEX (ug/Kg), 1991 SOIL

NOT TO SCALE

Environmental Science & Engineering, Inc. A MACTEC Company 1340 ARNOLD DRIVE, SUITE 126 MARTINEZ, CA. 94553–4189	DATE 10/27/99 REVISED CAD FILE 69906505	CROSS SECTION A–A' LOCATION OF SOIL BORINGS TRAMMEL CROW PROPERTY #4286 2740 BROADWAY OAKLAND, CALIFORNIA	FIGURE NO. 5 PROJ. NO. 6599065

WEST A

EAST A'



SB-2E BTEX ~~(ug/Kg)~~ ppm

@ 5.8–7.8	B	ND<.005
	T	ND<.005
	E	ND<.005
	X	ND<.005
@9.5–10.5	B	ND<.005
	T	ND<.005
	E	ND<.005
	X	ND<.005

SB-1E BTEX ~~(ug/Kg)~~ ppm — TYPO cnb 05/14/02

@13.8–14.8	B	0.94
	T	4.5
	E	1.2
	X	7.4
@14.8–15.8	B	13
	T	180
	E	37
	X	160

LEGEND

- CLAY
- SAND
- PEA GRAVEL BACKFILL
- GROUND WATER WITH DETECTED HIGH CONCENTRATIONS OF PETROLEUM HYDROCARBONS
- MEASURED WATER LEVEL (7/1/94)
- MONITORING WELL BLANK CASING OR SOIL BORING
- MONITORING WELL SCREENED INTERVAL
- X SOIL SAMPLE LOCATION TPH-g, BTEX, O&G IN ppm, 1988 SOIL

NOT TO SCALE

Environmental Science & Engineering, Inc. A MACTEC Company 1340 ARNOLD DRIVE, SUITE 126 MARTINEZ, CA. 94553-4189	DATE 10/27/99 REVISED CAD FILE 69906506	CROSS SECTON A-A' APPROXIMATE LOCATION OF CONFIRMATION SOIL BORINGS TRAMMEL CROW PROPERTY #4286 2740 BROADWAY OAKLAND, CALIFORNIA	FIGURE NO. 6 PROJ. NO. 6599065

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A CILCORP Company

BORING LOG AND WELL COMPLETION SUMMARY

SB1

Page 1 of 1

WELL COMPLETION

Completion Depth: N/A

	Size/Type	From	To
Casing:			
Screen:			
Filter:	BACKFILLED WITH GROUT		
Seal:			

Well Cap or Box:

Project Name: Vorelco Project No: 6-91-5165

Location: Broadway Volkswagen
2740 Broadway Ave.
Oakland, CA

Driller: Gregg Drilling and Testing
Method: Hollow Stem Auger
Hole Diameter: 8 in. Total Depth: 15 Feet
Ref. Elevations: NA
Logged By: Bart Miller

Dates:
Start: 5-13-91
Finish: 5-13-91

Depth (ft)	Lithologic Description	USC	Graphic Log: Sample/Blows	Graphic Log: Lithology	Graphic Log: Well Installation	Vapor	Remarks: Water, drilling/completion, summary, sample type	TIME:
0	CEMENT - 4 in. GRAVEL FILL - 2 in. FORMATIONAL SEDIMENTS	GP						
5	CLAY, dark brown, moderate to low plasticity, slightly moist, no odor.	CL	10 13 15			0	RING @ 5 FEET (*)	8:40
10	CLAY, grey with some visible reddish brown mottling, low plasticity, slightly moist, no odor.	CL				1	RING @ 10 FEET (*)	8:45
15	CLAY, grey with some reddish brown mottling, silty, low plasticity, slightly moist, no odor.	CL	15 20 25			1	RING @ 15 FEET (*)	8:55
20							(*) - Sample submitted for analysis	
25								
30								
35								

REVIEWED AND APPROVED BY:
Susan Welch

Environmental Science & Engineering, Inc.

A DILCORP Company

BORING LOG AND WELL COMPLETION SUMMARY

SB-2A

Page 1 of 1

WELL COMPLETION

Completion Depth: N/A

	Size/Type	From	To
Casing:			
Screen:			
Filter:	BACKFILLED WITH GROUT		
Seal:			

Well Cap or Box:

Project Name: Vorelco Project No: 6-91-5165

Location: Broadway Volkswagen
2740 Broadway Ave.
Oakland, CA

Driller: Gregg Drilling and Testing
Method: SIMCO Rig
Hole Diameter: 8 in. Total Depth: 15 Feet
Ref. Elevations: NA
Logged By: Oliver Christen

Dates:
Start: 5-15-91
Finish: 5-15-91

Depth (ft)	Lithologic Description	USC	Graphic Log: Sample/Blows	Graphic Log: Lithology	Graphic Log: Well Installation	Vapor	Remarks: Water, drilling/completion, summary, sample type
							TIME: 13:30
0	CEMENT - 4 in. GRAVEL FILL - 1 in. FORMATIONAL SEDIMENTS	GP					
5	CLAY with trace silt and gravel, tan brown, slightly grey mottled, dry, no odor, trace root stains.	CL				2	RING @ 5 FEET
10	AS ABOVE, but slightly damp.	CL				3	RING @ 10 FEET
15	AS ABOVE	CL				0	RING @ 15 FEET 14:15
20							
25							
30							
35							

REVIEWED AND APPROVED BY:
Susan Wickham
SUSAN S. WICKHAM
REGISTERED CALIFORNIA
GEOLOGIST #3931

Environmental Science & Engineering, Inc.
A GILCORP Company

BORING LOG AND WELL COMPLETION SUMMARY

SB-2B

Page 1 of 1

WELL COMPLETION

Completion Depth: N/A

Size/Type	From	To
Casing:		
Screen:		
Filter:	BACKFILLED WITH GROUT	
Seal:		

Well Cap or Box:

Project Name: Voreico Project No: 6-91-5165
Location: Broadway Volkswagen
2740 Broadway Ave.
Oakland, CA

Driller: Gregg Drilling and Testing
Method: SIMCO Rig
Hole Diameter: 8 in. Total Depth: 15 Feet
Ref. Elevations: NA
Logged By: Oliver Christen

Dates:
Start: 5-15-91
Finish: 5-15-91

Depth (ft)	Lithologic Description	USC	Graphic Log: Sample/Blows	Graphic Log: Lithology	Graphic Log: Well Installation	Vapor	Remarks: Water, drilling/completion, summary, sample type
0	CEMENT - 4 In. GRAVEL FILL - 2 In. FORMATIONAL SEDIMENTS	GP					TIME: 14:20
5	CLAY with trace gravel, brown, soft, dry, no odor.	CL				3	RING @ 5 FEET
10	GRAVEL, approximately 1 inch diameter, poorly graded, trace Clay, brown, moist, no odor (possible fill).	GP				1	RING @ 10 FEET
15	CLAY, tan brown, soft, moist, no odor.	CL				0	RING @ 15 FEET 15:00
20							
25							
30							
35							

REVIEWED AND APPROVED BY:
Susan Wickham
SUSAN S. WICKHAM
REGISTERED CALIFORNIA
GEOLOGIST #3991

Environmental Science & Engineering, Inc.

BORING LOG AND WELL COMPLETION SUMMARY

VB3

Page 1 of 1

WELL COMPLETION

Completion Depth: N/A

Size/Type	From	To
Casing:		
Screen:		
Filter:	BACKFILLED WITH GROUT	
Seal:		

Well Cap or Box:

Project Name: Vorelco Project No: 6-91-5165

Location: Broadway Volkswagen
2740 Broadway Ave.
Oakland, CA

Driller: Gregg Drilling and Testing
Method: Hollow Stem Auger
Hole Diameter: 8 in. Total Depth: 15 Feet
Ref. Elevations: NA
Logged By: Bart Miller

Dates:
Start: 5-13-91
Finish: 5-13-91

Depth (ft)	Lithologic Description	USC	Graphic Log: Sample/Blows	Graphic Log: Lithology	Graphic Log: Well Installation	Vapor	Remarks: Water, drilling/completion, summary, sample type	TIME:
0	CEMENT - 4 in. GRAVEL FILL - 2 in. FORMATIONAL SEDIMENTS	GP						
5	CLAY, light brown, silty to sandy, minor mottling, low to moderate plasticity, slightly moist, no odor.	CL	15 12 20			1	RING @ 5 FEET (*)	10:01
10	CLAY, light brown, silty low plasticity, moist, strong fuel odor (i.e. gasoline).	CL	8 10 20			8	RING @ 10 FEET (*)	10:10
							Water Saturation	
15	CLAY, light brown with grey mottling, low to medium plasticity, moist, strong fuel oder (i.e. gasoline).	CL	10 20 30			5	RING @ 15 FEET (*)	10:16
20							(*) - Sample submitted for analysis	
25								
30								
35								

REVIEWED AND APPROVED BY:

SUSAN S. WORKMAN
REGISTERED GEOLOGIST
GEOLOGIST #6451

Environmental Science & Engineering, Inc.
A CALCORP Company

BORING LOG AND WELL COMPLETION SUMMARY

B4

Page 1 of 1

WELL COMPLETION

Completion Depth: N/A

Size/Type	From	To
Casing:		
Screen:		
Filter:	BACKFILLED WITH GROUT	
Seal:		

Well Cap or Box:

Project Name: Voreico Project No: 6-91-5165
Location: Broadway Volkswagen
2740 Broadway Ave.
Oakland, CA

Driller: Gregg Drilling and Testing
Method: Hollow Stem Auger
Hole Diameter: 8 in. Total Depth: 15 Feet
Ref. Elevations: NA
Logged By: Bart Miller

Dates:
Start: 5-13-91
Finish: 5-13-91

Depth (ft)	Lithologic Description	USC	Graphic Log: Sample/Blows	Graphic Log: Lithology	Graphic Log: Well Installation	Vapor	Remarks (Water, drilling/completion, summary, sample type)	
							TIME:	
0	CEMENT - 4 in. GRAVEL FILL - 2 in.	GP						
5	PEA GRAVEL FILL, abundant gasoline product, impossible to sample	GP	10 8 9			1	RING @ 5 FEET (*)	10:49
10						8	Lost all sample @ 10 Feet	
15	FORMATIONAL SEDIMENTS CLAY, light brown with grey mottling, low to medium plasticity, moist, strong fuel odor (i.e. gasoline).	CL	30 40			5	RING @ 15 FEET (*)	11:00
20							(*) - Sample submitted for analysis	
25								
30								
35								

REVIEWED AND APPROVED BY:
SUSAN S. WISEMAN
REGISTERED CALIFORNIA
GEOLOGIST #2551

HUNTER
ENVIRONMENTAL SERVICES, INC.

597 Center Avenue, Suite 350
Martinez, California 94553
415-372-3637

LOG OF BORING NO. MW-1 PAGE 1 of 1

PROJECT NO: 02-258-003 DATE: 1/20/89
CLIENT: Semco/Broadway VW REF. ELEV.
SITE LOCATION: Broadway & 27th St., Oakland, Ca. METHOD: Hollow-Stem Auger
BORING LOCATION: HOLE DIA: 8.25"
DRILLER: ASE
LOGGED BY: J. BRYSON
SUPERVISOR: S. WICKHAM R.G. #3851 Susan Wickham

DEPTH (FT)	GRAPHIC LOG	BLOW/FT	VAPOR (PPM)	SAMPLE TYPE AND DEPTH	UNIFIED SOIL CLASSIFICATION	DESCRIPTION	WELL CONSTRUCTION
0						4" Concrete at surface	
2					CL	CLAY, silty, brown, slightly moist, no odor	
4							
6		14		Ring @ 7'	CL	As above, sandy	
8							
10						Odor detected at approx. 10'	
12					CL	As above	
14							
16							
18					CL	As above	
20						Total depth 20'	
22						Groundwater measured at 7.5 feet	
24						0.02" slotted 2" PVC 20-5', blank 2"PVC 5-0'/#3 sand 20-4', 0.5 bentonite 4-3', concrete (5% bentonite) 3-0.5', Allen key well box	

HUNTER
ENVIRONMENTAL SERVICES, INC.
597 Center Avenue, Suite 350
Martinez, California 94553
415-372-3637

LOG OF BORING NO. MW-2 PAGE 1 of 1

PROJECT NO: 02-258-003 DATE: 1/19/89
CLIENT: Semco/Broadway VW REF. ELEV.
SITE LOCATION: Broadway & 27th St., Oakland, Ca. METHOD: Hollow-Stem Auger
BORING LOCATION: HOLE DIA: 8.25"
DRILLER: ASE
LOGGED BY: J. BRYSON
SUPERVISOR: S. WICKHAM R.G. #3851 Susan Wickham

DEPTH (FT)	GRAPHIC LOG	BLOW/FT	VAPOR (PPM)	SAMPLE TYPE AND DEPTH	UNIFIED SOIL CLASSIFICATION	DESCRIPTION	WELL CONSTRUCTION
0						4" Concrete at surface	
2					CL	CLAY, dark brown, silty, soft, slightly moist, no odor	
4		12		Ring @ 5'	CL	As above, with some medium sand	
6							
8							
10					CL	As above, light greenish-brown	
12							
14					CL	As above, light brown	
16							
18							
20					CL	As above	
22						Total depth 20' Groundwater measured at 11.1 feet	
24						0.02" slotted 2" PVC 20-5', blank 2"PVC 5-0'/#3 sand 20-4', 0.5 bentonite 4-3', concrete (5% bentonite) 3-0.5', Allen key well box	

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597 Center Avenue, Suite 350
Martinez, California 94553
415-372-3637

LOG OF BORING NO. MW-3 PAGE 1 of 1

PROJECT NO: 02-258-003 DATE: 1/19/89
CLIENT: Semco/Broadway VW REF. ELEV.
SITE LOCATION: Broadway & 27th St., Oakland, Ca. METHOD: Hollow-Stem Auger
BORING LOCATION: HOLE DIA: 8.25"
DRILLER: ASE
LOGGED BY: J. BRYSON
SUPERVISOR: S. WICKHAM R.G. #3851 Susan Wickham

DEPTH (FT)	GRAPHIC LOG	BLOW/FT	VAPOR (PPM)	SAMPLE TYPE AND DEPTH	UNIFIED SOIL CLASSIFICATION	DESCRIPTION	WELL CONSTRUCTION
0						4" Concrete at surface	
2					CL	CLAY, light brown, firm, slightly moist, no odor	
4					SP	SAND, light brown, medium dense, slightly moist, no odor	
6		23		Ring @ 7'	SP	As above, some gravel	
8							
10							
12							
14					CL	CLAY, silty, light brown, firm, moist, no odor	
16							
18					CL	CLAY, sandy, light brown, firm, wet, no odor	
20						Total depth 20'	
22						Groundwater measured at 11.7 feet 0.02" slotted 2" PVC 20-5', blank 2"PVC 5-0'/#3 sand 20-4', 0.5 bentonite 4-3', concrete (5% bentonite) 3-0.5', Allen key well box	
24							

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BORING LOG AND WELL COMPLETION SUMMARY

MW4

WELL COMPLETION

Completion Depth: 25 Feet

	Size/Type	From	To
Casing:	2 In. Blank PVC	0 Feet	5 Feet
Screen:	2 In. (0.02 In. Slotted) PVC	5 Feet	25 Feet
Filter:	#2 Sand	4 Feet	25 Feet
Seal:	Bentonite Pellets	3 Feet	4 Feet
	Grout	0 Feet	3 Feet

Well Cap or Box:

Project Name: Vorelco Project No: 6-91-5165

Location: Broadway Volkswagen
2740 Broadway Ave.
Oakland, CA
Inside Building

Driller: Gregg Drilling and Testing

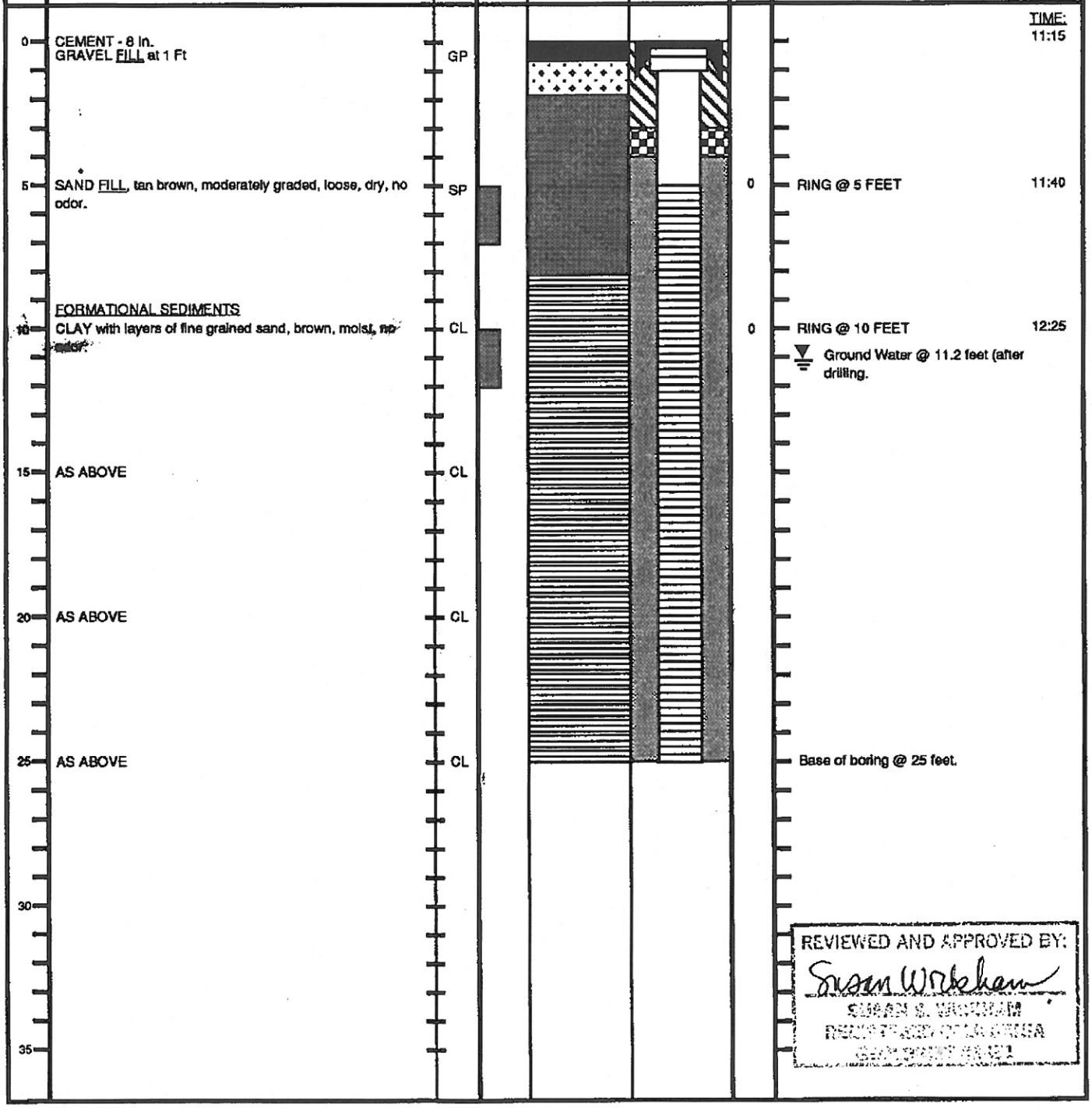
Method: Simco Rig

Hole Diameter: 8 In. Total Depth: 25 Feet

Ref. Elevations: NA

Logged By: Oliver Christen

Dates:
Start: 5-13-91
Finish: 5-15-91



REVIEWED AND APPROVED BY:

Susan Wickham

SUSAN S. WICKHAM

REGISTERED GEOLOGIST

Environmental Science & Engineering, Inc.
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BORING LOG AND WELL COMPLETION SUMMARY

MW-5

Page 1 of 1

WELL COMPLETION

Completion Depth: 25 Feet

	Size/Type	From	To
Casing:	4 in. Diam. Blank PVC	1 Foot	9 Feet
Screen:	4 in. Diam. (0.02 in. Slotted) PVC	9 Feet	30 Feet
Filter:	#3 Sand	7 Feet	30 Feet
Seal:	Bentonite Pellets	6 Feet	7 Feet
	Cement Grout	1 Foot	6 Feet
Well Cap or Box: Flush Mounted		0 Feet	1 Foot

Project Name: Vorelco Project No: 6-91-5165
Location: Broadway Volkswagen
2740 Broadway Ave.
Oakland, CA

Driller: Exploration Geoservices, Inc.
Method: Hollow-Stem Auger
Hole Diameter: 12 in. Total Depth: 30 Feet
Ref. Elevations: NA
Logged By: Bart Miller

Dates:
Start: 10-10-91
Finish: 10-10-91

Depth (ft)	Lithologic Description	USC	Graphic Log: Sample/Blows	Graphic Log: Lithology / Well Installation	Vapor	Remarks: Water, drilling/completion, summary, sample type
0	ASPHALT - 4 in. GRAVEL FILL - 6 in.	GP				TIME: 9:25
	Formational Sediments					
1	CLAY; reddish brown, sandy, brittle, unconsolidated, dry, no odor.	CL	20 22 23			
5					0	Collect soil sample* 9:44
	CLAY; olive green, sandy, high plasticity, moist, no odor.	CL	10 12 16			Mechanical problem with drill rig. 10:00
10	CLAY, as above with reddish Fe mottling.				0	Collect soil sample* 12:45
		CL	8 10 14			
15					0	Collect soil sample* 12:55
	SAND; brown, wet, no clay, two-foot thick bed, fuel odor detected.	SP	4 13 8			
20	CLAY; greenish-gray, sandy, slightly moist, high plasticity, no odor.	CL			0	Collect soil sample* 13:15
	CLAY; gray to brown, sandy, wet, high plasticity, no odor.	CL				
25						
30						Total Depth: 30 Feet
						* Samples submitted for chemical analysis.
35						

REGISTERED GEOLOGIST
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BORING LOG AND WELL COMPLETION SUMMARY

MW-6

Page 1 of 1

WELL COMPLETION

Completion Depth: 25 Feet

	Size/Type	From	To
Casing:	4 In. Diam. Blank PVC	1 Foot	6.5 Feet
Screen:	4 In. Diam. (0.02 In. Slotted) PVC	6.5 Feet	26.5 Feet
Filter:	#3 Sand	5 Feet	26.5 Feet
Seal:	Bentonite Pellets	4 Feet	5 Feet
	Cement Grout	1 Foot	4 Feet
Well Cap or Box: Flush Mounted		0 Feet	1 Foot

Project Name: Vorelco Project No: 6-91-5165

Location: Broadway Volkswagen
2740 Broadway Ave.
Oakland, CA

Driller: Exploration Geoservices, Inc.
Method: Hollow-Stem Auger
Hole Diameter: 9 In. Total Depth: 26.5 Feet
Ref. Elevations: NA
Logged By: Bart Miller

Dates:
Start: 10-11-91
Finish: 10-11-91

Depth (ft)	Lithologic Description	USC	Graphic Log: Sample/Blows	Graphic Log: Lithology	Graphic Log: Well Installation	Vapor	Remarks: Water, drilling/completion, summary, sample type	
								TIME:
0	ASPHALT - 2 In. CONCRETE curb extension - 4 In. Quarried rock slabs - 4 In.	GP						13:00
	SAND FILL; tan brown, moderately graded, some pebbles, moist, unindurated, no odor.		3 2 3					
5						0	Collect soil sample*	13:20
	Formational Sediments CLAY; olive green, sandy, high plasticity, no odor.	CL	8 10 12					
10						0	Collect soil sample*	13:35
	SAND; brown, wet, no clay, two-foot thick bed, slight fuel odor detected.	SP				3	Vapor measurement taken using drill cuttings.	
	CLAY; olive green to brown, sandy, moist, high plasticity, no odor.	CL	6 7 10					
15						0	Collect soil sample*	13:53
20								
	CLAY; gray to brown, sandy, wet, high plasticity, no odor.							
25								
30								
35								

Total Depth: 26.5 Feet

* Samples submitted for chemical analysis.

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STATE OF CALIFORNIA

Environmental Science & Engineering, Inc.

BORING LOG AND WELL COMPLETION SUMMARY

MW7

Page 1 of 1

WELL COMPLETION

Completion Depth: 25 Feet

	Size/Type	From	To
Casing:	4" Diam. Blank PVC	0 Feet	19.5 Feet
	4" Diam. Blank PVC	24.5 Feet	25.0 Feet
Screen:	4" Diam. Slotted (0.030") PVC	19.5 Feet	24.5 Feet
Filter:	#3 Monterey Sand	18.5 Feet	25.0 Feet
Seal:	Bentonite Pellets	16.5 Feet	18.5 Feet
	Grout	1.0 Feet	16.5 Feet

Well Cap or Box: Emco-Wheaton (15/16-inch bolts)

Project Name: Vorelco Project No: 6-93-5093

Location: 2740 Broadway
Oakland, California

Driller: Exploration Geoservices, Inc.
Method: Mobile B61 Hollow-Stem Auger
Hole Diameter: 10 Inches Total Depth: 25.0 Feet
Ref. Elevations:
Logged By: Bart Miller

Dates:
Start: 3-18-94
Finish: 3-16-94

Depth (ft)	Lithologic Description	USCS	Graphic Log: Sample/Blows	Graphic Log: Lithology	Graphic Log: Well Installation	Vapor	Remarks: Water, drilling/completion, summary, sample type
0	CONCRETE						START 13:20
	FORMATIONAL SEDIMENTS SILTY CLAY, reddish-brown, slightly moist, moderate plasticity, no odor	CL					
	SILT, some gravel fragments and sand, brown, slightly moist, low plasticity, no odor.	ML					
5							
	SILTY CLAY, brown, slightly moist, moderate plasticity, no odor.	CL					Minor perched water observed at 7.5-10 feet
10	SANDY SILT, greenish-grey, dry, low plasticity, no odor.	ML					
	SILTY CLAY, greyish-green, dry, moderate plasticity, no odor.	CL					
15	SILT, greyish-green, dry, low plasticity, no odor.	ML	7 11 16 8 7 10 10			4.0	
	SILT, as above except becoming sandy.		20 35 9 20 28			5.0	
20	SILTY SAND, brown, slightly moist, well graded, fine to coarse grained, no odor.	SW	10 16 32 9 19			11.0	
	CLAY, brown, dry, moderate plasticity, no odor	CL	30			7.0	
25							Well installed to depth of 25 feet. Screened over target sand lens. No samples submitted for analysis.
30							
35							

REGISTERED GEOLOGIST
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STATE OF CALIFORNIA

Environmental Science & Engineering, Inc.

BORING LOG AND WELL COMPLETION SUMMARY

VW1

Page 1 of 1

WELL COMPLETION

Completion Depth: 20 Feet

	Size/Type	From	To
Casing:	4" Diam. Blank PVC	0 Feet	14.5 Feet
	4" Diam. Blank PVC	19.5 Feet	20.0 Feet
Screen:	4" Diam. Slotted (0.030") PVC	14.5 Feet	19.5 Feet
Filter:	#3 Monterey Sand	13.0 Feet	20.0 Feet
Seal:	Bentonite Pellets	11.0 Feet	13.0 Feet
	Grout	1.0 Feet	11.0 Feet

Well Cap or Box: Emco-Wheaton (15/16-inch bolts)

Project Name: Voreloo Project No: 6-93-5093

Location: 2740 Broadway
Oakland, California

Driller: Exploration Geoservices, Inc
Method: Mobile B61 Hollow-Stem Auger
Hole Diameter: 10 Inches Total Depth: 20.0 Feet
Ref. Elevations:
Logged By: Bart Miller

Dates:
Start: 3-17-94
Finish: 3-18-94

Depth (ft)	Lithologic Description	USC	Graphic Log: Sample/Blows	Graphic Log: Lithology	Graphic Log: Well Installation	Vapor	Remarks (Water, drilling/completion, summary, sample type)
0	CONCRETE						START 9:40
	FORMATIONAL SEDIMENTS						
	SILTY CLAY, reddish brown, slightly moist, moderate plasticity, no odor	CL	1 2 3 4				
	SANDY SILT with minor clay, mottled reddish-brown, dry, low plasticity, no odor	ML	12 16 14 15			6.5	
5			22 12 12 11			6.5	
	SAND, four-inch lens, minor silt, dry, no odor	SP	8 9 11 7				
		ML	14 26			7.0	
	SAND, six-inch lens contains small amount of perched water, no odor	SP	13 15				Perched water observed in sand layer at 9.5-10 feet
10	SILTY CLAY, greyish-green, dry, moderate plasticity, no odor	CL	17 9 12 13			6.5	
			9 12 17 9				
15	SANDY CLAY, greenish-brown, slightly moist, moderate plasticity, no odor.	CL	16 20 11 20			4.0	
	SAND, slightly moist, well graded, fine to coarse grained, no odor	SW	25 17 33 40			1.5	
	CLAY, brown, dry, moderate plasticity, no odor	CL	6 10 12			1.5	
20							Well installed to depth of 20 feet. Screened over target sand lens. No samples submitted for analysis.
25							
30							
35							

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Environmental Science & Engineering, Inc.

BORING LOG AND WELL COMPLETION SUMMARY

VW2

Page 1 of 1

WELL COMPLETION

Completion Depth: 17 Feet

	Size/Type	From	To
Casing:	4" Diam. Blank PVC	0 Feet	12.0 Feet
	4" Diam. Blank PVC	16.5 Feet	17.0 Feet
Screen:	4" Diam. Slotted (0.030") PVC	12.0 Feet	16.5 Feet
Filter:	#3 Monterey Sand	11.0 Feet	17.0 Feet
Seal:	Bentonite Pellets	9.0 Feet	11.0 Feet
	Grout	1.0 Feet	9.0 Feet

Well Cap or Box: Emco-Wheaton (15/16-inch bolts)

Project Name: Vorelco Project No: 6-93-5093

Location: 2740 Broadway
Oakland, California

Driller: Exploration Geoservices, Inc.
Method: Mobile B61 Hollow-Stem Auger
Hole Diameter: 10 Inches Total Depth: 17.0 Feet
Ref. Elevations:
Logged By: Bart Miller

Dates:
Start: 3-17-94
Finish: 3-18-94

Depth (ft)	Lithologic Description	USC	Graphic Log: Sample/Blows	Graphic Log: Lithology	Graphic Log: Well Installation	Vapor	Remarks: Water, drilling/completion, summary, sample type
0	CONCRETE						START 13:55
	FORMATIONAL SEDIMENTS						
	SILTY CLAY, reddish brown, slightly moist, moderate plasticity, no odor.	CL					
	SANDY SILT, mottled reddish-brown, dry, low plasticity, no odor	ML					
5							
	SILTY CLAY, greyish-green, dry, moderate plasticity, no odor	CL					
10							
	SAND, moist, well graded, fine to coarse grained, strong petroleum hydrocarbon odor	SW				100	Minor wetness observed (not saturated)
15			12 16 23 5 9 22			1500	
	CLAY, brown, dry, moderate plasticity, no odor	CL				17	Well installed to depth of 17 feet Screened over target sand lens No samples submitted for analysis.
20							
25							
30							
35							

REGISTERED GEOLOGIST
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#5315
STATE OF CALIFORNIA

Environmental Science & Engineering, Inc.

BORING LOG AND WELL COMPLETION SUMMARY

VW3

Page 1 of 1

WELL COMPLETION

Completion Depth: 16 Feet

	Size/Type	From	To
Casing:	4" Diam. Blank PVC	0 Feet	5.5 Feet
	4" Diam. Blank PVC	15.5 Feet	16.0 Feet
Screen:	4" Diam. Slotted (0.030") PVC	5.5 Feet	15.5 Feet
Filter:	#3 Monterey Sand	4.5 Feet	16.0 Feet
Seal:	Bentonite Pellets	1.5 Feet	4.5 Feet
	Grout	1.0 Feet	1.5 Feet

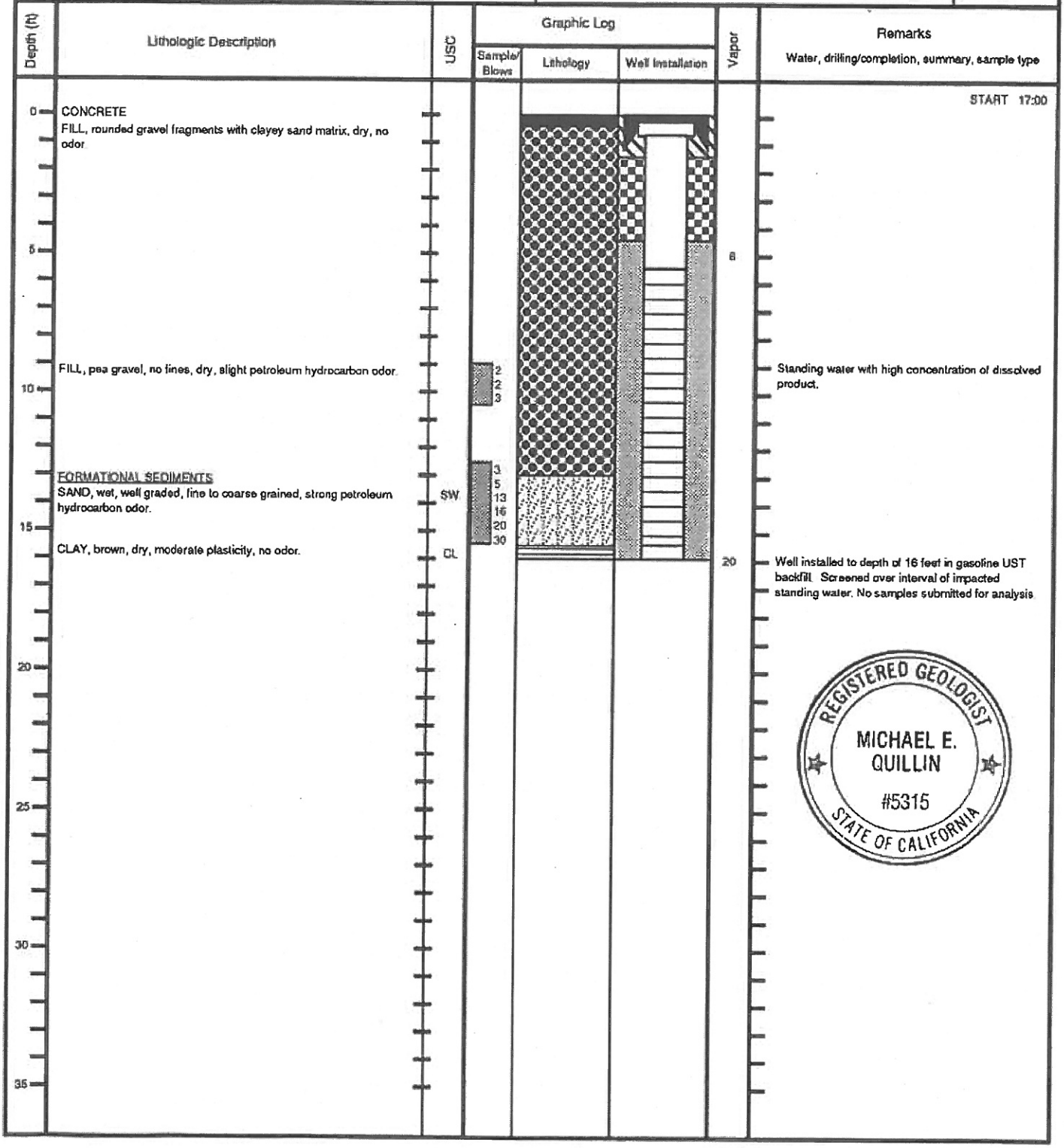
Well Cap or Box: Emco-Wheaton (15/16-inch bolts)

Project Name: Voreloo Project No: 6-93-5093

Location: 2740 Broadway
Oakland, California

Driller: Exploration Geoservices, Inc.
Method: Mobile B61 Hollow-Stem Auger
Hole Diameter: 10 Inches Total Depth: 16.0 Feet
Ref. Elevations:
Logged By: Bart Miller

Dates:
Start: 3-17-94
Finish: 3-18-94



REGISTERED GEOLOGIST
MICHAEL E. QUILLIN
#5315
STATE OF CALIFORNIA

ARCADIS

Appendix D

Revised Soil Vapor Laboratory Analysis Report

eurofins | Air Toxics

6/4/2014
Mr. Arpen Shah
Arcadis U.S., Inc.
100 Montgomery Street
Suite 300
San Francisco CA 94104

Project Name: VW Oakland
Project #: EM001048.0001
Workorder #: 1402239AR1

Dear Mr. Arpen Shah

The following report includes the data for the above referenced project for sample(s) received on 2/18/2014 at Air Toxics Ltd.

The data and associated QC analyzed by TO-15 are compliant with the project requirements or laboratory criteria with the exception of the deviations noted in the attached case narrative.

Thank you for choosing Air Toxics Ltd. for your air analysis needs. Air Toxics Ltd. is committed to providing accurate data of the highest quality. Please feel free to contact the Project Manager: Kelly Buettner at 916-985-1000 if you have any questions regarding the data in this report.

Regards,

Kelly Buettner

Project Manager

eurofins | Air Toxics

WORK ORDER #: 1402239AR1

Work Order Summary

CLIENT:	Mr. Arpen Shah Arcadis U.S., Inc. 100 Montgomery Street Suite 300 San Francisco, CA 94104	**BILL TO:**	Accounts Payable Arcadis U.S., Inc. 630 Plaza Drive Suite 600 Highlands Ranch, CO 80129
PHONE:	415-432-6916	**P.O. #**	VW-WA-01142014
FAX:	415-374-2745	**PROJECT #**	EM001048.0001 VW Oakland
DATE RECEIVED:	02/18/2014	**CONTACT:**	Kelly Buettner
DATE COMPLETED:	03/03/2014		
DATE REISSUED:	06/04/2014		

FRACTION #	NAME	TEST	RECEIPT VAC./PRES.	FINAL PRESSURE
01A	SS-SV-2	TO-15	7.3 "Hg	15.1 psi
02A	SS-SV-1	TO-15	1 "Hg	15.3 psi
03A	VW-6	TO-15	6.5 "Hg	14.9 psi
04A	VW-5	TO-15	5.5 "Hg	15 psi
05A	SS-SV-4	TO-15	5.3 "Hg	15 psi
06A	VW-4	TO-15	3.9 "Hg	15 psi
07A	SS-SV-5	TO-15	5.7 "Hg	15.2 psi
08A	SS-SV-3	TO-15	5.9 "Hg	15.1 psi
09A	Lab Blank	TO-15	NA	NA
10A	CCV	TO-15	NA	NA
11A	LCS	TO-15	NA	NA
11AA	LCSD	TO-15	NA	NA

CERTIFIED BY: Heidi Hayes DATE: 06/04/14

Technical Director

Certification numbers: AZ Licensure AZ0775, CA NELAP - 12282CA, NJ NELAP - CA016, NY NELAP - 11291, TX NELAP - T104704434-13-6, UT NELAP CA009332013-4, VA NELAP - 460197, WA NELAP - C935
Name of Accrediting Agency: NELAP/ORELAP (Oregon Environmental Laboratory Accreditation Program)
Accreditation number: CA300005, Effective date: 10/18/2013, Expiration date: 10/17/2014.
Eurofins Air Toxics Inc.. certifies that the test results contained in this report meet all requirements of the NELAC standards

180 BLUE RAVINE ROAD, SUITE B FOLSOM, CA - 9563
(916) 985-1000 . (800) 985-5955 . FAX (916) 985-1020

LABORATORY NARRATIVE
EPA Method TO-15
Arcadis U.S., Inc.
Workorder# 1402239AR1

Eight 1 Liter Summa Canister samples were received on February 18, 2014. The laboratory performed analysis via EPA Method TO-15 using GC/MS in the full scan mode.

This workorder was independently validated prior to submittal using 'USEPA National Functional Guidelines' as generally applied to the analysis of volatile organic compounds in air. A rules-based, logic driven, independent validation engine was employed to assess completeness, evaluate pass/fail of relevant project quality control requirements and verification of all quantified amounts.

Receiving Notes

The Chain of Custody (COC) was not relinquished properly. A signature and date were not provided by the field sampler.

Analytical Notes

There were no analytical discrepancies.

THE WORKORDER WAS REISSUED ON JUNE 4, 2014 TO REPORT NAPHTHALENE PER CLIENT'S REQUEST.

Definition of Data Qualifying Flags

Eight qualifiers may have been used on the data analysis sheets and indicates as follows:

B - Compound present in laboratory blank greater than reporting limit (background subtraction not performed).

J - Estimated value.

E - Exceeds instrument calibration range.

S - Saturated peak.

Q - Exceeds quality control limits.

U - Compound analyzed for but not detected above the reporting limit, LOD, or MDL value. See data page for project specific U-flag definition.

UJ- Non-detected compound associated with low bias in the CCV

N - The identification is based on presumptive evidence.

File extensions may have been used on the data analysis sheets and indicates as follows:

a-File was requantified

b-File was quantified by a second column and detector

r1-File was requantified for the purpose of reissue

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Summary of Detected Compounds
EPA METHOD TO-15 GC/MS FULL SCAN

Client Sample ID: SS-SV-2

Lab ID#: 1402239AR1-01A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Ethanol	5.4	17	10	32
Acetone	13	25	32	59
Toluene	1.3	2.2	5.0	8.4
m,p-Xylene	1.3	1.4	5.8	6.3
1,2,4-Trimethylbenzene	1.3	1.8	6.6	9.0

Client Sample ID: SS-SV-1

Lab ID#: 1402239AR1-02A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Ethanol	4.2	22	8.0	41
Acetone	10	130	25	300
2-Propanol	4.2	4.8	10	12
2,2,4-Trimethylpentane	1.0	1.4	4.9	6.6
Benzene	1.0	1.7	3.4	5.5
Toluene	1.0	10	4.0	39
m,p-Xylene	1.0	2.3	4.6	10

Client Sample ID: VW-6

Lab ID#: 1402239AR1-03A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Acetone	13	24	30	57
Toluene	1.3	9.1	4.8	34

Client Sample ID: VW-5

Lab ID#: 1402239AR1-04A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Ethanol	5.0	23	9.3	44
Acetone	12	170	29	410
Hexane	1.2	1.4	4.4	4.9

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Summary of Detected Compounds
EPA METHOD TO-15 GC/MS FULL SCAN

Client Sample ID: VW-5

Lab ID#: 1402239AR1-04A

2,2,4-Trimethylpentane	1.2	1.7	5.8	7.8
Benzene	1.2	2.0	4.0	6.3
Toluene	1.2	11	4.7	40

Client Sample ID: SS-SV-4

Lab ID#: 1402239AR1-05A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Ethanol	4.9	15	9.2	28
Acetone	12	49	29	120
Toluene	1.2	3.4	4.6	13

Client Sample ID: VW-4

Lab ID#: 1402239AR1-06A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Ethanol	4.6	21	8.7	39
Acetone	12	12	28	28
Toluene	1.2	2.2	4.4	8.3

Client Sample ID: SS-SV-5

Lab ID#: 1402239AR1-07A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Ethanol	5.0	87	9.4	160
Acetone	12	160	30	370
2,2,4-Trimethylpentane	1.2	1.3	5.9	6.1
Benzene	1.2	1.4	4.0	4.4
Toluene	1.2	12	4.7	46
m,p-Xylene	1.2	2.5	5.4	11

Client Sample ID: SS-SV-3

Lab ID#: 1402239AR1-08A

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Summary of Detected Compounds
EPA METHOD TO-15 GC/MS FULL SCAN

Client Sample ID: SS-SV-3

Lab ID#: 1402239AR1-08A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Ethanol	5.0	59	9.5	110
Acetone	13	230	30	540
Hexane	1.3	1.5	4.4	5.4
Toluene	1.3	17	4.7	63
m,p-Xylene	1.3	1.3	5.5	5.6

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Client Sample ID: SS-SV-2

Lab ID#: 1402239AR1-01A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**17022515r1**	**Date of Collection:**	**2/13/14 8:45:00 AM**
Dil. Factor:	**2.68**	**Date of Analysis:**	**2/25/14 03:26 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	1.3	Not Detected	6.6	Not Detected
Freon 114	1.3	Not Detected	9.4	Not Detected
Chloromethane	13	Not Detected	28	Not Detected
Vinyl Chloride	1.3	Not Detected	3.4	Not Detected
1,3-Butadiene	1.3	Not Detected	3.0	Not Detected
Bromomethane	13	Not Detected	52	Not Detected
Chloroethane	5.4	Not Detected	14	Not Detected
Freon 11	1.3	Not Detected	7.5	Not Detected
Ethanol	5.4	17	10	32
Freon 113	1.3	Not Detected	10	Not Detected
1,1-Dichloroethene	1.3	Not Detected	5.3	Not Detected
Acetone	13	25	32	59
2-Propanol	5.4	Not Detected	13	Not Detected
Carbon Disulfide	5.4	Not Detected	17	Not Detected
3-Chloropropene	5.4	Not Detected	17	Not Detected
Methylene Chloride	13	Not Detected	46	Not Detected
Methyl tert-butyl ether	1.3	Not Detected	4.8	Not Detected
trans-1,2-Dichloroethene	1.3	Not Detected	5.3	Not Detected
Hexane	1.3	Not Detected	4.7	Not Detected
1,1-Dichloroethane	1.3	Not Detected	5.4	Not Detected
2-Butanone (Methyl Ethyl Ketone)	5.4	Not Detected	16	Not Detected
cis-1,2-Dichloroethene	1.3	Not Detected	5.3	Not Detected
Tetrahydrofuran	1.3	Not Detected	4.0	Not Detected
Chloroform	1.3	Not Detected	6.5	Not Detected
1,1,1-Trichloroethane	1.3	Not Detected	7.3	Not Detected
Cyclohexane	1.3	Not Detected	4.6	Not Detected
Carbon Tetrachloride	1.3	Not Detected	8.4	Not Detected
2,2,4-Trimethylpentane	1.3	Not Detected	6.2	Not Detected
Benzene	1.3	Not Detected	4.3	Not Detected
1,2-Dichloroethane	1.3	Not Detected	5.4	Not Detected
Heptane	1.3	Not Detected	5.5	Not Detected
Trichloroethene	1.3	Not Detected	7.2	Not Detected
1,2-Dichloropropane	1.3	Not Detected	6.2	Not Detected
1,4-Dioxane	5.4	Not Detected	19	Not Detected
Bromodichloromethane	1.3	Not Detected	9.0	Not Detected
cis-1,3-Dichloropropene	1.3	Not Detected	6.1	Not Detected
4-Methyl-2-pentanone	1.3	Not Detected	5.5	Not Detected
Toluene	1.3	2.2	5.0	8.4
trans-1,3-Dichloropropene	1.3	Not Detected	6.1	Not Detected
1,1,2-Trichloroethane	1.3	Not Detected	7.3	Not Detected
Tetrachloroethene	1.3	Not Detected	9.1	Not Detected
2-Hexanone	5.4	Not Detected	22	Not Detected

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Client Sample ID: SS-SV-2

Lab ID#: 1402239AR1-01A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**17022515r1**	**Date of Collection:**	**2/13/14 8:45:00 AM**
Dil. Factor:	**2.68**	**Date of Analysis:**	**2/25/14 03:26 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Dibromochloromethane	1.3	Not Detected	11	Not Detected
1,2-Dibromoethane (EDB)	1.3	Not Detected	10	Not Detected
Chlorobenzene	1.3	Not Detected	6.2	Not Detected
Ethyl Benzene	1.3	Not Detected	5.8	Not Detected
m,p-Xylene	1.3	1.4	5.8	6.3
o-Xylene	1.3	Not Detected	5.8	Not Detected
Styrene	1.3	Not Detected	5.7	Not Detected
Bromoform	1.3	Not Detected	14	Not Detected
Cumene	1.3	Not Detected	6.6	Not Detected
1,1,2,2-Tetrachloroethane	1.3	Not Detected	9.2	Not Detected
Propylbenzene	1.3	Not Detected	6.6	Not Detected
4-Ethyltoluene	1.3	Not Detected	6.6	Not Detected
1,3,5-Trimethylbenzene	1.3	Not Detected	6.6	Not Detected
1,2,4-Trimethylbenzene	1.3	1.8	6.6	9.0
1,3-Dichlorobenzene	1.3	Not Detected	8.0	Not Detected
1,4-Dichlorobenzene	1.3	Not Detected	8.0	Not Detected
alpha-Chlorotoluene	1.3	Not Detected	6.9	Not Detected
1,2-Dichlorobenzene	1.3	Not Detected	8.0	Not Detected
1,2,4-Trichlorobenzene	5.4	Not Detected	40	Not Detected
Hexachlorobutadiene	5.4	Not Detected	57	Not Detected
Naphthalene	5.4	Not Detected	28	Not Detected

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	98	70-130
1,2-Dichloroethane-d4	85	70-130
4-Bromofluorobenzene	100	70-130

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Client Sample ID: SS-SV-1

Lab ID#: 1402239AR1-02A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**17022517r1**	**Date of Collection:**	**2/13/14 10:30:00 AM**
Dil. Factor:	**2.11**	**Date of Analysis:**	**2/25/14 04:19 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	1.0	Not Detected	5.2	Not Detected
Freon 114	1.0	Not Detected	7.4	Not Detected
Chloromethane	10	Not Detected	22	Not Detected
Vinyl Chloride	1.0	Not Detected	2.7	Not Detected
1,3-Butadiene	1.0	Not Detected	2.3	Not Detected
Bromomethane	10	Not Detected	41	Not Detected
Chloroethane	4.2	Not Detected	11	Not Detected
Freon 11	1.0	Not Detected	5.9	Not Detected
Ethanol	4.2	22	8.0	41
Freon 113	1.0	Not Detected	8.1	Not Detected
1,1-Dichloroethene	1.0	Not Detected	4.2	Not Detected
Acetone	10	130	25	300
2-Propanol	4.2	4.8	10	12
Carbon Disulfide	4.2	Not Detected	13	Not Detected
3-Chloropropene	4.2	Not Detected	13	Not Detected
Methylene Chloride	10	Not Detected	37	Not Detected
Methyl tert-butyl ether	1.0	Not Detected	3.8	Not Detected
trans-1,2-Dichloroethene	1.0	Not Detected	4.2	Not Detected
Hexane	1.0	Not Detected	3.7	Not Detected
1,1-Dichloroethane	1.0	Not Detected	4.3	Not Detected
2-Butanone (Methyl Ethyl Ketone)	4.2	Not Detected	12	Not Detected
cis-1,2-Dichloroethene	1.0	Not Detected	4.2	Not Detected
Tetrahydrofuran	1.0	Not Detected	3.1	Not Detected
Chloroform	1.0	Not Detected	5.2	Not Detected
1,1,1-Trichloroethane	1.0	Not Detected	5.8	Not Detected
Cyclohexane	1.0	Not Detected	3.6	Not Detected
Carbon Tetrachloride	1.0	Not Detected	6.6	Not Detected
2,2,4-Trimethylpentane	1.0	1.4	4.9	6.6
Benzene	1.0	1.7	3.4	5.5
1,2-Dichloroethane	1.0	Not Detected	4.3	Not Detected
Heptane	1.0	Not Detected	4.3	Not Detected
Trichloroethene	1.0	Not Detected	5.7	Not Detected
1,2-Dichloropropane	1.0	Not Detected	4.9	Not Detected
1,4-Dioxane	4.2	Not Detected	15	Not Detected
Bromodichloromethane	1.0	Not Detected	7.1	Not Detected
cis-1,3-Dichloropropene	1.0	Not Detected	4.8	Not Detected
4-Methyl-2-pentanone	1.0	Not Detected	4.3	Not Detected
Toluene	1.0	10	4.0	39
trans-1,3-Dichloropropene	1.0	Not Detected	4.8	Not Detected
1,1,2-Trichloroethane	1.0	Not Detected	5.8	Not Detected
Tetrachloroethene	1.0	Not Detected	7.2	Not Detected
2-Hexanone	4.2	Not Detected	17	Not Detected

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Client Sample ID: SS-SV-1

Lab ID#: 1402239AR1-02A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**17022517r1**	**Date of Collection:**	**2/13/14 10:30:00 AM**
Dil. Factor:	**2.11**	**Date of Analysis:**	**2/25/14 04:19 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Dibromochloromethane	1.0	Not Detected	9.0	Not Detected
1,2-Dibromoethane (EDB)	1.0	Not Detected	8.1	Not Detected
Chlorobenzene	1.0	Not Detected	4.8	Not Detected
Ethyl Benzene	1.0	Not Detected	4.6	Not Detected
m,p-Xylene	1.0	2.3	4.6	10
o-Xylene	1.0	Not Detected	4.6	Not Detected
Styrene	1.0	Not Detected	4.5	Not Detected
Bromoform	1.0	Not Detected	11	Not Detected
Cumene	1.0	Not Detected	5.2	Not Detected
1,1,2,2-Tetrachloroethane	1.0	Not Detected	7.2	Not Detected
Propylbenzene	1.0	Not Detected	5.2	Not Detected
4-Ethyltoluene	1.0	Not Detected	5.2	Not Detected
1,3,5-Trimethylbenzene	1.0	Not Detected	5.2	Not Detected
1,2,4-Trimethylbenzene	1.0	Not Detected	5.2	Not Detected
1,3-Dichlorobenzene	1.0	Not Detected	6.3	Not Detected
1,4-Dichlorobenzene	1.0	Not Detected	6.3	Not Detected
alpha-Chlorotoluene	1.0	Not Detected	5.5	Not Detected
1,2-Dichlorobenzene	1.0	Not Detected	6.3	Not Detected
1,2,4-Trichlorobenzene	4.2	Not Detected	31	Not Detected
Hexachlorobutadiene	4.2	Not Detected	45	Not Detected
Naphthalene	4.2	Not Detected	22	Not Detected

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	96	70-130
1,2-Dichloroethane-d4	84	70-130
4-Bromofluorobenzene	98	70-130

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Client Sample ID: VW-6

Lab ID#: 1402239AR1-03A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**17022518r1**	**Date of Collection:**	**2/13/14 12:00:00 PM**
Dil. Factor:	**2.57**	**Date of Analysis:**	**2/25/14 04:41 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	1.3	Not Detected	6.4	Not Detected
Freon 114	1.3	Not Detected	9.0	Not Detected
Chloromethane	13	Not Detected	26	Not Detected
Vinyl Chloride	1.3	Not Detected	3.3	Not Detected
1,3-Butadiene	1.3	Not Detected	2.8	Not Detected
Bromomethane	13	Not Detected	50	Not Detected
Chloroethane	5.1	Not Detected	14	Not Detected
Freon 11	1.3	Not Detected	7.2	Not Detected
Ethanol	5.1	Not Detected	9.7	Not Detected
Freon 113	1.3	Not Detected	9.8	Not Detected
1,1-Dichloroethene	1.3	Not Detected	5.1	Not Detected
Acetone	13	24	30	57
2-Propanol	5.1	Not Detected	13	Not Detected
Carbon Disulfide	5.1	Not Detected	16	Not Detected
3-Chloropropene	5.1	Not Detected	16	Not Detected
Methylene Chloride	13	Not Detected	45	Not Detected
Methyl tert-butyl ether	1.3	Not Detected	4.6	Not Detected
trans-1,2-Dichloroethene	1.3	Not Detected	5.1	Not Detected
Hexane	1.3	Not Detected	4.5	Not Detected
1,1-Dichloroethane	1.3	Not Detected	5.2	Not Detected
2-Butanone (Methyl Ethyl Ketone)	5.1	Not Detected	15	Not Detected
cis-1,2-Dichloroethene	1.3	Not Detected	5.1	Not Detected
Tetrahydrofuran	1.3	Not Detected	3.8	Not Detected
Chloroform	1.3	Not Detected	6.3	Not Detected
1,1,1-Trichloroethane	1.3	Not Detected	7.0	Not Detected
Cyclohexane	1.3	Not Detected	4.4	Not Detected
Carbon Tetrachloride	1.3	Not Detected	8.1	Not Detected
2,2,4-Trimethylpentane	1.3	Not Detected	6.0	Not Detected
Benzene	1.3	Not Detected	4.1	Not Detected
1,2-Dichloroethane	1.3	Not Detected	5.2	Not Detected
Heptane	1.3	Not Detected	5.3	Not Detected
Trichloroethene	1.3	Not Detected	6.9	Not Detected
1,2-Dichloropropane	1.3	Not Detected	5.9	Not Detected
1,4-Dioxane	5.1	Not Detected	18	Not Detected
Bromodichloromethane	1.3	Not Detected	8.6	Not Detected
cis-1,3-Dichloropropene	1.3	Not Detected	5.8	Not Detected
4-Methyl-2-pentanone	1.3	Not Detected	5.3	Not Detected
Toluene	1.3	9.1	4.8	34
trans-1,3-Dichloropropene	1.3	Not Detected	5.8	Not Detected
1,1,2-Trichloroethane	1.3	Not Detected	7.0	Not Detected
Tetrachloroethene	1.3	Not Detected	8.7	Not Detected
2-Hexanone	5.1	Not Detected	21	Not Detected

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Client Sample ID: VW-6

Lab ID#: 1402239AR1-03A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**17022518r1**	**Date of Collection: 2/13/14 12:00:00 PM**	
Dil. Factor:	**2.57**	**Date of Analysis: 2/25/14 04:41 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Dibromochloromethane	1.3	Not Detected	11	Not Detected
1,2-Dibromoethane (EDB)	1.3	Not Detected	9.9	Not Detected
Chlorobenzene	1.3	Not Detected	5.9	Not Detected
Ethyl Benzene	1.3	Not Detected	5.6	Not Detected
m,p-Xylene	1.3	Not Detected	5.6	Not Detected
o-Xylene	1.3	Not Detected	5.6	Not Detected
Styrene	1.3	Not Detected	5.5	Not Detected
Bromoform	1.3	Not Detected	13	Not Detected
Cumene	1.3	Not Detected	6.3	Not Detected
1,1,2,2-Tetrachloroethane	1.3	Not Detected	8.8	Not Detected
Propylbenzene	1.3	Not Detected	6.3	Not Detected
4-Ethyltoluene	1.3	Not Detected	6.3	Not Detected
1,3,5-Trimethylbenzene	1.3	Not Detected	6.3	Not Detected
1,2,4-Trimethylbenzene	1.3	Not Detected	6.3	Not Detected
1,3-Dichlorobenzene	1.3	Not Detected	7.7	Not Detected
1,4-Dichlorobenzene	1.3	Not Detected	7.7	Not Detected
alpha-Chlorotoluene	1.3	Not Detected	6.6	Not Detected
1,2-Dichlorobenzene	1.3	Not Detected	7.7	Not Detected
1,2,4-Trichlorobenzene	5.1	Not Detected	38	Not Detected
Hexachlorobutadiene	5.1	Not Detected	55	Not Detected
Naphthalene	5.1	Not Detected	27	Not Detected

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	96	70-130
1,2-Dichloroethane-d4	86	70-130
4-Bromofluorobenzene	101	70-130

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Client Sample ID: VW-5

Lab ID#: 1402239AR1-04A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**17022519r1**	**Date of Collection:**	**2/13/14 1:50:00 PM**
Dil. Factor:	**2.48**	**Date of Analysis:**	**2/25/14 05:03 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	1.2	Not Detected	6.1	Not Detected
Freon 114	1.2	Not Detected	8.7	Not Detected
Chloromethane	12	Not Detected	26	Not Detected
Vinyl Chloride	1.2	Not Detected	3.2	Not Detected
1,3-Butadiene	1.2	Not Detected	2.7	Not Detected
Bromomethane	12	Not Detected	48	Not Detected
Chloroethane	5.0	Not Detected	13	Not Detected
Freon 11	1.2	Not Detected	7.0	Not Detected
Ethanol	5.0	23	9.3	44
Freon 113	1.2	Not Detected	9.5	Not Detected
1,1-Dichloroethene	1.2	Not Detected	4.9	Not Detected
Acetone	12	170	29	410
2-Propanol	5.0	Not Detected	12	Not Detected
Carbon Disulfide	5.0	Not Detected	15	Not Detected
3-Chloropropene	5.0	Not Detected	16	Not Detected
Methylene Chloride	12	Not Detected	43	Not Detected
Methyl tert-butyl ether	1.2	Not Detected	4.5	Not Detected
trans-1,2-Dichloroethene	1.2	Not Detected	4.9	Not Detected
Hexane	1.2	1.4	4.4	4.9
1,1-Dichloroethane	1.2	Not Detected	5.0	Not Detected
2-Butanone (Methyl Ethyl Ketone)	5.0	Not Detected	15	Not Detected
cis-1,2-Dichloroethene	1.2	Not Detected	4.9	Not Detected
Tetrahydrofuran	1.2	Not Detected	3.6	Not Detected
Chloroform	1.2	Not Detected	6.0	Not Detected
1,1,1-Trichloroethane	1.2	Not Detected	6.8	Not Detected
Cyclohexane	1.2	Not Detected	4.3	Not Detected
Carbon Tetrachloride	1.2	Not Detected	7.8	Not Detected
2,2,4-Trimethylpentane	1.2	1.7	5.8	7.8
Benzene	1.2	2.0	4.0	6.3
1,2-Dichloroethane	1.2	Not Detected	5.0	Not Detected
Heptane	1.2	Not Detected	5.1	Not Detected
Trichloroethene	1.2	Not Detected	6.7	Not Detected
1,2-Dichloropropane	1.2	Not Detected	5.7	Not Detected
1,4-Dioxane	5.0	Not Detected	18	Not Detected
Bromodichloromethane	1.2	Not Detected	8.3	Not Detected
cis-1,3-Dichloropropene	1.2	Not Detected	5.6	Not Detected
4-Methyl-2-pentanone	1.2	Not Detected	5.1	Not Detected
Toluene	1.2	11	4.7	40
trans-1,3-Dichloropropene	1.2	Not Detected	5.6	Not Detected
1,1,2-Trichloroethane	1.2	Not Detected	6.8	Not Detected
Tetrachloroethene	1.2	Not Detected	8.4	Not Detected
2-Hexanone	5.0	Not Detected	20	Not Detected

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Client Sample ID: VW-5

Lab ID#: 1402239AR1-04A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**17022519r1**	**Date of Collection: 2/13/14 1:50:00 PM**	
Dil. Factor:	**2.48**	**Date of Analysis: 2/25/14 05:03 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Dibromochloromethane	1.2	Not Detected	10	Not Detected
1,2-Dibromoethane (EDB)	1.2	Not Detected	9.5	Not Detected
Chlorobenzene	1.2	Not Detected	5.7	Not Detected
Ethyl Benzene	1.2	Not Detected	5.4	Not Detected
m,p-Xylene	1.2	Not Detected	5.4	Not Detected
o-Xylene	1.2	Not Detected	5.4	Not Detected
Styrene	1.2	Not Detected	5.3	Not Detected
Bromoform	1.2	Not Detected	13	Not Detected
Cumene	1.2	Not Detected	6.1	Not Detected
1,1,2,2-Tetrachloroethane	1.2	Not Detected	8.5	Not Detected
Propylbenzene	1.2	Not Detected	6.1	Not Detected
4-Ethyltoluene	1.2	Not Detected	6.1	Not Detected
1,3,5-Trimethylbenzene	1.2	Not Detected	6.1	Not Detected
1,2,4-Trimethylbenzene	1.2	Not Detected	6.1	Not Detected
1,3-Dichlorobenzene	1.2	Not Detected	7.4	Not Detected
1,4-Dichlorobenzene	1.2	Not Detected	7.4	Not Detected
alpha-Chlorotoluene	1.2	Not Detected	6.4	Not Detected
1,2-Dichlorobenzene	1.2	Not Detected	7.4	Not Detected
1,2,4-Trichlorobenzene	5.0	Not Detected	37	Not Detected
Hexachlorobutadiene	5.0	Not Detected	53	Not Detected
Naphthalene	5.0	Not Detected	26	Not Detected

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	97	70-130
1,2-Dichloroethane-d4	86	70-130
4-Bromofluorobenzene	98	70-130

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Client Sample ID: SS-SV-4

Lab ID#: 1402239AR1-05A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**17022520r1**	**Date of Collection:**	**2/17/14 9:10:00 AM**
Dil. Factor:	**2.45**	**Date of Analysis:**	**2/25/14 05:24 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	1.2	Not Detected	6.0	Not Detected
Freon 114	1.2	Not Detected	8.6	Not Detected
Chloromethane	12	Not Detected	25	Not Detected
Vinyl Chloride	1.2	Not Detected	3.1	Not Detected
1,3-Butadiene	1.2	Not Detected	2.7	Not Detected
Bromomethane	12	Not Detected	48	Not Detected
Chloroethane	4.9	Not Detected	13	Not Detected
Freon 11	1.2	Not Detected	6.9	Not Detected
Ethanol	4.9	15	9.2	28
Freon 113	1.2	Not Detected	9.4	Not Detected
1,1-Dichloroethene	1.2	Not Detected	4.8	Not Detected
Acetone	12	49	29	120
2-Propanol	4.9	Not Detected	12	Not Detected
Carbon Disulfide	4.9	Not Detected	15	Not Detected
3-Chloropropene	4.9	Not Detected	15	Not Detected
Methylene Chloride	12	Not Detected	42	Not Detected
Methyl tert-butyl ether	1.2	Not Detected	4.4	Not Detected
trans-1,2-Dichloroethene	1.2	Not Detected	4.8	Not Detected
Hexane	1.2	Not Detected	4.3	Not Detected
1,1-Dichloroethane	1.2	Not Detected	5.0	Not Detected
2-Butanone (Methyl Ethyl Ketone)	4.9	Not Detected	14	Not Detected
cis-1,2-Dichloroethene	1.2	Not Detected	4.8	Not Detected
Tetrahydrofuran	1.2	Not Detected	3.6	Not Detected
Chloroform	1.2	Not Detected	6.0	Not Detected
1,1,1-Trichloroethane	1.2	Not Detected	6.7	Not Detected
Cyclohexane	1.2	Not Detected	4.2	Not Detected
Carbon Tetrachloride	1.2	Not Detected	7.7	Not Detected
2,2,4-Trimethylpentane	1.2	Not Detected	5.7	Not Detected
Benzene	1.2	Not Detected	3.9	Not Detected
1,2-Dichloroethane	1.2	Not Detected	5.0	Not Detected
Heptane	1.2	Not Detected	5.0	Not Detected
Trichloroethene	1.2	Not Detected	6.6	Not Detected
1,2-Dichloropropane	1.2	Not Detected	5.7	Not Detected
1,4-Dioxane	4.9	Not Detected	18	Not Detected
Bromodichloromethane	1.2	Not Detected	8.2	Not Detected
cis-1,3-Dichloropropene	1.2	Not Detected	5.6	Not Detected
4-Methyl-2-pentanone	1.2	Not Detected	5.0	Not Detected
Toluene	1.2	3.4	4.6	13
trans-1,3-Dichloropropene	1.2	Not Detected	5.6	Not Detected
1,1,2-Trichloroethane	1.2	Not Detected	6.7	Not Detected
Tetrachloroethene	1.2	Not Detected	8.3	Not Detected
2-Hexanone	4.9	Not Detected	20	Not Detected

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Client Sample ID: SS-SV-4

Lab ID#: 1402239AR1-05A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**17022520r1**	**Date of Collection: 2/17/14 9:10:00 AM**	
Dil. Factor:	**2.45**	**Date of Analysis: 2/25/14 05:24 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Dibromochloromethane	1.2	Not Detected	10	Not Detected
1,2-Dibromoethane (EDB)	1.2	Not Detected	9.4	Not Detected
Chlorobenzene	1.2	Not Detected	5.6	Not Detected
Ethyl Benzene	1.2	Not Detected	5.3	Not Detected
m,p-Xylene	1.2	Not Detected	5.3	Not Detected
o-Xylene	1.2	Not Detected	5.3	Not Detected
Styrene	1.2	Not Detected	5.2	Not Detected
Bromoform	1.2	Not Detected	13	Not Detected
Cumene	1.2	Not Detected	6.0	Not Detected
1,1,2,2-Tetrachloroethane	1.2	Not Detected	8.4	Not Detected
Propylbenzene	1.2	Not Detected	6.0	Not Detected
4-Ethyltoluene	1.2	Not Detected	6.0	Not Detected
1,3,5-Trimethylbenzene	1.2	Not Detected	6.0	Not Detected
1,2,4-Trimethylbenzene	1.2	Not Detected	6.0	Not Detected
1,3-Dichlorobenzene	1.2	Not Detected	7.4	Not Detected
1,4-Dichlorobenzene	1.2	Not Detected	7.4	Not Detected
alpha-Chlorotoluene	1.2	Not Detected	6.3	Not Detected
1,2-Dichlorobenzene	1.2	Not Detected	7.4	Not Detected
1,2,4-Trichlorobenzene	4.9	Not Detected	36	Not Detected
Hexachlorobutadiene	4.9	Not Detected	52	Not Detected
Naphthalene	4.9	Not Detected	26	Not Detected

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	96	70-130
1,2-Dichloroethane-d4	83	70-130
4-Bromofluorobenzene	102	70-130

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Client Sample ID: VW-4

Lab ID#: 1402239AR1-06A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**17022521r1**	**Date of Collection: 2/17/14 8:20:00 AM**	
Dil. Factor:	**2.32**	**Date of Analysis: 2/25/14 05:46 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	1.2	Not Detected	5.7	Not Detected
Freon 114	1.2	Not Detected	8.1	Not Detected
Chloromethane	12	Not Detected	24	Not Detected
Vinyl Chloride	1.2	Not Detected	3.0	Not Detected
1,3-Butadiene	1.2	Not Detected	2.6	Not Detected
Bromomethane	12	Not Detected	45	Not Detected
Chloroethane	4.6	Not Detected	12	Not Detected
Freon 11	1.2	Not Detected	6.5	Not Detected
Ethanol	4.6	21	8.7	39
Freon 113	1.2	Not Detected	8.9	Not Detected
1,1-Dichloroethene	1.2	Not Detected	4.6	Not Detected
Acetone	12	12	28	28
2-Propanol	4.6	Not Detected	11	Not Detected
Carbon Disulfide	4.6	Not Detected	14	Not Detected
3-Chloropropene	4.6	Not Detected	14	Not Detected
Methylene Chloride	12	Not Detected	40	Not Detected
Methyl tert-butyl ether	1.2	Not Detected	4.2	Not Detected
trans-1,2-Dichloroethene	1.2	Not Detected	4.6	Not Detected
Hexane	1.2	Not Detected	4.1	Not Detected
1,1-Dichloroethane	1.2	Not Detected	4.7	Not Detected
2-Butanone (Methyl Ethyl Ketone)	4.6	Not Detected	14	Not Detected
cis-1,2-Dichloroethene	1.2	Not Detected	4.6	Not Detected
Tetrahydrofuran	1.2	Not Detected	3.4	Not Detected
Chloroform	1.2	Not Detected	5.7	Not Detected
1,1,1-Trichloroethane	1.2	Not Detected	6.3	Not Detected
Cyclohexane	1.2	Not Detected	4.0	Not Detected
Carbon Tetrachloride	1.2	Not Detected	7.3	Not Detected
2,2,4-Trimethylpentane	1.2	Not Detected	5.4	Not Detected
Benzene	1.2	Not Detected	3.7	Not Detected
1,2-Dichloroethane	1.2	Not Detected	4.7	Not Detected
Heptane	1.2	Not Detected	4.8	Not Detected
Trichloroethene	1.2	Not Detected	6.2	Not Detected
1,2-Dichloropropane	1.2	Not Detected	5.4	Not Detected
1,4-Dioxane	4.6	Not Detected	17	Not Detected
Bromodichloromethane	1.2	Not Detected	7.8	Not Detected
cis-1,3-Dichloropropene	1.2	Not Detected	5.3	Not Detected
4-Methyl-2-pentanone	1.2	Not Detected	4.8	Not Detected
Toluene	1.2	2.2	4.4	8.3
trans-1,3-Dichloropropene	1.2	Not Detected	5.3	Not Detected
1,1,2-Trichloroethane	1.2	Not Detected	6.3	Not Detected
Tetrachloroethene	1.2	Not Detected	7.9	Not Detected
2-Hexanone	4.6	Not Detected	19	Not Detected

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Client Sample ID: VW-4

Lab ID#: 1402239AR1-06A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**17022521r1**	**Date of Collection: 2/17/14 8:20:00 AM**	
Dil. Factor:	**2.32**	**Date of Analysis: 2/25/14 05:46 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Dibromochloromethane	1.2	Not Detected	9.9	Not Detected
1,2-Dibromoethane (EDB)	1.2	Not Detected	8.9	Not Detected
Chlorobenzene	1.2	Not Detected	5.3	Not Detected
Ethyl Benzene	1.2	Not Detected	5.0	Not Detected
m,p-Xylene	1.2	Not Detected	5.0	Not Detected
o-Xylene	1.2	Not Detected	5.0	Not Detected
Styrene	1.2	Not Detected	4.9	Not Detected
Bromoform	1.2	Not Detected	12	Not Detected
Cumene	1.2	Not Detected	5.7	Not Detected
1,1,2,2-Tetrachloroethane	1.2	Not Detected	8.0	Not Detected
Propylbenzene	1.2	Not Detected	5.7	Not Detected
4-Ethyltoluene	1.2	Not Detected	5.7	Not Detected
1,3,5-Trimethylbenzene	1.2	Not Detected	5.7	Not Detected
1,2,4-Trimethylbenzene	1.2	Not Detected	5.7	Not Detected
1,3-Dichlorobenzene	1.2	Not Detected	7.0	Not Detected
1,4-Dichlorobenzene	1.2	Not Detected	7.0	Not Detected
alpha-Chlorotoluene	1.2	Not Detected	6.0	Not Detected
1,2-Dichlorobenzene	1.2	Not Detected	7.0	Not Detected
1,2,4-Trichlorobenzene	4.6	Not Detected	34	Not Detected
Hexachlorobutadiene	4.6	Not Detected	49	Not Detected
Naphthalene	4.6	Not Detected	24	Not Detected

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	98	70-130
1,2-Dichloroethane-d4	85	70-130
4-Bromofluorobenzene	98	70-130

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Client Sample ID: SS-SV-5

Lab ID#: 1402239AR1-07A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**17022522r1**	**Date of Collection:**	**2/17/14 9:55:00 AM**
Dil. Factor:	**2.51**	**Date of Analysis:**	**2/25/14 06:08 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	1.2	Not Detected	6.2	Not Detected
Freon 114	1.2	Not Detected	8.8	Not Detected
Chloromethane	12	Not Detected	26	Not Detected
Vinyl Chloride	1.2	Not Detected	3.2	Not Detected
1,3-Butadiene	1.2	Not Detected	2.8	Not Detected
Bromomethane	12	Not Detected	49	Not Detected
Chloroethane	5.0	Not Detected	13	Not Detected
Freon 11	1.2	Not Detected	7.0	Not Detected
Ethanol	5.0	87	9.4	160
Freon 113	1.2	Not Detected	9.6	Not Detected
1,1-Dichloroethene	1.2	Not Detected	5.0	Not Detected
Acetone	12	160	30	370
2-Propanol	5.0	Not Detected	12	Not Detected
Carbon Disulfide	5.0	Not Detected	16	Not Detected
3-Chloropropene	5.0	Not Detected	16	Not Detected
Methylene Chloride	12	Not Detected	44	Not Detected
Methyl tert-butyl ether	1.2	Not Detected	4.5	Not Detected
trans-1,2-Dichloroethene	1.2	Not Detected	5.0	Not Detected
Hexane	1.2	Not Detected	4.4	Not Detected
1,1-Dichloroethane	1.2	Not Detected	5.1	Not Detected
2-Butanone (Methyl Ethyl Ketone)	5.0	Not Detected	15	Not Detected
cis-1,2-Dichloroethene	1.2	Not Detected	5.0	Not Detected
Tetrahydrofuran	1.2	Not Detected	3.7	Not Detected
Chloroform	1.2	Not Detected	6.1	Not Detected
1,1,1-Trichloroethane	1.2	Not Detected	6.8	Not Detected
Cyclohexane	1.2	Not Detected	4.3	Not Detected
Carbon Tetrachloride	1.2	Not Detected	7.9	Not Detected
2,2,4-Trimethylpentane	1.2	1.3	5.9	6.1
Benzene	1.2	1.4	4.0	4.4
1,2-Dichloroethane	1.2	Not Detected	5.1	Not Detected
Heptane	1.2	Not Detected	5.1	Not Detected
Trichloroethene	1.2	Not Detected	6.7	Not Detected
1,2-Dichloropropane	1.2	Not Detected	5.8	Not Detected
1,4-Dioxane	5.0	Not Detected	18	Not Detected
Bromodichloromethane	1.2	Not Detected	8.4	Not Detected
cis-1,3-Dichloropropene	1.2	Not Detected	5.7	Not Detected
4-Methyl-2-pentanone	1.2	Not Detected	5.1	Not Detected
Toluene	1.2	12	4.7	46
trans-1,3-Dichloropropene	1.2	Not Detected	5.7	Not Detected
1,1,2-Trichloroethane	1.2	Not Detected	6.8	Not Detected
Tetrachloroethene	1.2	Not Detected	8.5	Not Detected
2-Hexanone	5.0	Not Detected	20	Not Detected

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Client Sample ID: SS-SV-5

Lab ID#: 1402239AR1-07A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**17022522r1**	**Date of Collection:**	**2/17/14 9:55:00 AM**
Dil. Factor:	**2.51**	**Date of Analysis:**	**2/25/14 06:08 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Dibromochloromethane	1.2	Not Detected	11	Not Detected
1,2-Dibromoethane (EDB)	1.2	Not Detected	9.6	Not Detected
Chlorobenzene	1.2	Not Detected	5.8	Not Detected
Ethyl Benzene	1.2	Not Detected	5.4	Not Detected
m,p-Xylene	1.2	2.5	5.4	11
o-Xylene	1.2	Not Detected	5.4	Not Detected
Styrene	1.2	Not Detected	5.3	Not Detected
Bromoform	1.2	Not Detected	13	Not Detected
Cumene	1.2	Not Detected	6.2	Not Detected
1,1,2,2-Tetrachloroethane	1.2	Not Detected	8.6	Not Detected
Propylbenzene	1.2	Not Detected	6.2	Not Detected
4-Ethyltoluene	1.2	Not Detected	6.2	Not Detected
1,3,5-Trimethylbenzene	1.2	Not Detected	6.2	Not Detected
1,2,4-Trimethylbenzene	1.2	Not Detected	6.2	Not Detected
1,3-Dichlorobenzene	1.2	Not Detected	7.5	Not Detected
1,4-Dichlorobenzene	1.2	Not Detected	7.5	Not Detected
alpha-Chlorotoluene	1.2	Not Detected	6.5	Not Detected
1,2-Dichlorobenzene	1.2	Not Detected	7.5	Not Detected
1,2,4-Trichlorobenzene	5.0	Not Detected	37	Not Detected
Hexachlorobutadiene	5.0	Not Detected	54	Not Detected
Naphthalene	5.0	Not Detected	26	Not Detected

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	97	70-130
1,2-Dichloroethane-d4	84	70-130
4-Bromofluorobenzene	100	70-130

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Client Sample ID: SS-SV-3

Lab ID#: 1402239AR1-08A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**17022523r1**	**Date of Collection:**	**2/13/14 9:20:00 AM**
Dil. Factor:	**2.52**	**Date of Analysis:**	**2/25/14 06:29 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	1.3	Not Detected	6.2	Not Detected
Freon 114	1.3	Not Detected	8.8	Not Detected
Chloromethane	13	Not Detected	26	Not Detected
Vinyl Chloride	1.3	Not Detected	3.2	Not Detected
1,3-Butadiene	1.3	Not Detected	2.8	Not Detected
Bromomethane	13	Not Detected	49	Not Detected
Chloroethane	5.0	Not Detected	13	Not Detected
Freon 11	1.3	Not Detected	7.1	Not Detected
Ethanol	5.0	59	9.5	110
Freon 113	1.3	Not Detected	9.6	Not Detected
1,1-Dichloroethene	1.3	Not Detected	5.0	Not Detected
Acetone	13	230	30	540
2-Propanol	5.0	Not Detected	12	Not Detected
Carbon Disulfide	5.0	Not Detected	16	Not Detected
3-Chloropropene	5.0	Not Detected	16	Not Detected
Methylene Chloride	13	Not Detected	44	Not Detected
Methyl tert-butyl ether	1.3	Not Detected	4.5	Not Detected
trans-1,2-Dichloroethene	1.3	Not Detected	5.0	Not Detected
Hexane	1.3	1.5	4.4	5.4
1,1-Dichloroethane	1.3	Not Detected	5.1	Not Detected
2-Butanone (Methyl Ethyl Ketone)	5.0	Not Detected	15	Not Detected
cis-1,2-Dichloroethene	1.3	Not Detected	5.0	Not Detected
Tetrahydrofuran	1.3	Not Detected	3.7	Not Detected
Chloroform	1.3	Not Detected	6.2	Not Detected
1,1,1-Trichloroethane	1.3	Not Detected	6.9	Not Detected
Cyclohexane	1.3	Not Detected	4.3	Not Detected
Carbon Tetrachloride	1.3	Not Detected	7.9	Not Detected
2,2,4-Trimethylpentane	1.3	Not Detected	5.9	Not Detected
Benzene	1.3	Not Detected	4.0	Not Detected
1,2-Dichloroethane	1.3	Not Detected	5.1	Not Detected
Heptane	1.3	Not Detected	5.2	Not Detected
Trichloroethene	1.3	Not Detected	6.8	Not Detected
1,2-Dichloropropane	1.3	Not Detected	5.8	Not Detected
1,4-Dioxane	5.0	Not Detected	18	Not Detected
Bromodichloromethane	1.3	Not Detected	8.4	Not Detected
cis-1,3-Dichloropropene	1.3	Not Detected	5.7	Not Detected
4-Methyl-2-pentanone	1.3	Not Detected	5.2	Not Detected
Toluene	1.3	17	4.7	63
trans-1,3-Dichloropropene	1.3	Not Detected	5.7	Not Detected
1,1,2-Trichloroethane	1.3	Not Detected	6.9	Not Detected
Tetrachloroethene	1.3	Not Detected	8.5	Not Detected
2-Hexanone	5.0	Not Detected	21	Not Detected

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Client Sample ID: SS-SV-3

Lab ID#: 1402239AR1-08A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**17022523r1**	**Date of Collection:**	**2/13/14 9:20:00 AM**
Dil. Factor:	**2.52**	**Date of Analysis:**	**2/25/14 06:29 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Dibromochloromethane	1.3	Not Detected	11	Not Detected
1,2-Dibromoethane (EDB)	1.3	Not Detected	9.7	Not Detected
Chlorobenzene	1.3	Not Detected	5.8	Not Detected
Ethyl Benzene	1.3	Not Detected	5.5	Not Detected
m,p-Xylene	1.3	1.3	5.5	5.6
o-Xylene	1.3	Not Detected	5.5	Not Detected
Styrene	1.3	Not Detected	5.4	Not Detected
Bromoform	1.3	Not Detected	13	Not Detected
Cumene	1.3	Not Detected	6.2	Not Detected
1,1,2,2-Tetrachloroethane	1.3	Not Detected	8.6	Not Detected
Propylbenzene	1.3	Not Detected	6.2	Not Detected
4-Ethyltoluene	1.3	Not Detected	6.2	Not Detected
1,3,5-Trimethylbenzene	1.3	Not Detected	6.2	Not Detected
1,2,4-Trimethylbenzene	1.3	Not Detected	6.2	Not Detected
1,3-Dichlorobenzene	1.3	Not Detected	7.6	Not Detected
1,4-Dichlorobenzene	1.3	Not Detected	7.6	Not Detected
alpha-Chlorotoluene	1.3	Not Detected	6.5	Not Detected
1,2-Dichlorobenzene	1.3	Not Detected	7.6	Not Detected
1,2,4-Trichlorobenzene	5.0	Not Detected	37	Not Detected
Hexachlorobutadiene	5.0	Not Detected	54	Not Detected
Naphthalene	5.0	Not Detected	26	Not Detected

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	97	70-130
1,2-Dichloroethane-d4	86	70-130
4-Bromofluorobenzene	100	70-130

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Client Sample ID: Lab Blank

Lab ID#: 1402239AR1-09A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**17022505**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 2/25/14 09:57 AM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	0.50	Not Detected	2.5	Not Detected
Freon 114	0.50	Not Detected	3.5	Not Detected
Chloromethane	5.0	Not Detected	10	Not Detected
Vinyl Chloride	0.50	Not Detected	1.3	Not Detected
1,3-Butadiene	0.50	Not Detected	1.1	Not Detected
Bromomethane	5.0	Not Detected	19	Not Detected
Chloroethane	2.0	Not Detected	5.3	Not Detected
Freon 11	0.50	Not Detected	2.8	Not Detected
Ethanol	2.0	Not Detected	3.8	Not Detected
Freon 113	0.50	Not Detected	3.8	Not Detected
1,1-Dichloroethene	0.50	Not Detected	2.0	Not Detected
Acetone	5.0	Not Detected	12	Not Detected
2-Propanol	2.0	Not Detected	4.9	Not Detected
Carbon Disulfide	2.0	Not Detected	6.2	Not Detected
3-Chloropropene	2.0	Not Detected	6.3	Not Detected
Methylene Chloride	5.0	Not Detected	17	Not Detected
Methyl tert-butyl ether	0.50	Not Detected	1.8	Not Detected
trans-1,2-Dichloroethene	0.50	Not Detected	2.0	Not Detected
Hexane	0.50	Not Detected	1.8	Not Detected
1,1-Dichloroethane	0.50	Not Detected	2.0	Not Detected
2-Butanone (Methyl Ethyl Ketone)	2.0	Not Detected	5.9	Not Detected
cis-1,2-Dichloroethene	0.50	Not Detected	2.0	Not Detected
Tetrahydrofuran	0.50	Not Detected	1.5	Not Detected
Chloroform	0.50	Not Detected	2.4	Not Detected
1,1,1-Trichloroethane	0.50	Not Detected	2.7	Not Detected
Cyclohexane	0.50	Not Detected	1.7	Not Detected
Carbon Tetrachloride	0.50	Not Detected	3.1	Not Detected
2,2,4-Trimethylpentane	0.50	Not Detected	2.3	Not Detected
Benzene	0.50	Not Detected	1.6	Not Detected
1,2-Dichloroethane	0.50	Not Detected	2.0	Not Detected
Heptane	0.50	Not Detected	2.0	Not Detected
Trichloroethene	0.50	Not Detected	2.7	Not Detected
1,2-Dichloropropane	0.50	Not Detected	2.3	Not Detected
1,4-Dioxane	2.0	Not Detected	7.2	Not Detected
Bromodichloromethane	0.50	Not Detected	3.4	Not Detected
cis-1,3-Dichloropropene	0.50	Not Detected	2.3	Not Detected
4-Methyl-2-pentanone	0.50	Not Detected	2.0	Not Detected
Toluene	0.50	Not Detected	1.9	Not Detected
trans-1,3-Dichloropropene	0.50	Not Detected	2.3	Not Detected
1,1,2-Trichloroethane	0.50	Not Detected	2.7	Not Detected
Tetrachloroethene	0.50	Not Detected	3.4	Not Detected
2-Hexanone	2.0	Not Detected	8.2	Not Detected

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Client Sample ID: Lab Blank

Lab ID#: 1402239AR1-09A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**17022505**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 2/25/14 09:57 AM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Dibromochloromethane	0.50	Not Detected	4.2	Not Detected
1,2-Dibromoethane (EDB)	0.50	Not Detected	3.8	Not Detected
Chlorobenzene	0.50	Not Detected	2.3	Not Detected
Ethyl Benzene	0.50	Not Detected	2.2	Not Detected
m,p-Xylene	0.50	Not Detected	2.2	Not Detected
o-Xylene	0.50	Not Detected	2.2	Not Detected
Styrene	0.50	Not Detected	2.1	Not Detected
Bromoform	0.50	Not Detected	5.2	Not Detected
Cumene	0.50	Not Detected	2.4	Not Detected
1,1,2,2-Tetrachloroethane	0.50	Not Detected	3.4	Not Detected
Propylbenzene	0.50	Not Detected	2.4	Not Detected
4-Ethyltoluene	0.50	Not Detected	2.4	Not Detected
1,3,5-Trimethylbenzene	0.50	Not Detected	2.4	Not Detected
1,2,4-Trimethylbenzene	0.50	Not Detected	2.4	Not Detected
1,3-Dichlorobenzene	0.50	Not Detected	3.0	Not Detected
1,4-Dichlorobenzene	0.50	Not Detected	3.0	Not Detected
alpha-Chlorotoluene	0.50	Not Detected	2.6	Not Detected
1,2-Dichlorobenzene	0.50	Not Detected	3.0	Not Detected
1,2,4-Trichlorobenzene	2.0	Not Detected	15	Not Detected
Hexachlorobutadiene	2.0	Not Detected	21	Not Detected
Naphthalene	2.0	Not Detected	10	Not Detected

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	97	70-130
1,2-Dichloroethane-d4	84	70-130
4-Bromofluorobenzene	99	70-130

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Client Sample ID: CCV

Lab ID#: 1402239AR1-10A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**17022502**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 2/25/14 08:39 AM**	

Compound	%Recovery
Freon 12	95
Freon 114	105
Chloromethane	91
Vinyl Chloride	102
1,3-Butadiene	92
Bromomethane	100
Chloroethane	102
Freon 11	95
Ethanol	76
Freon 113	106
1,1-Dichloroethene	97
Acetone	94
2-Propanol	81
Carbon Disulfide	104
3-Chloropropene	99
Methylene Chloride	90
Methyl tert-butyl ether	88
trans-1,2-Dichloroethene	99
Hexane	92
1,1-Dichloroethane	92
2-Butanone (Methyl Ethyl Ketone)	96
cis-1,2-Dichloroethene	87
Tetrahydrofuran	84
Chloroform	97
1,1,1-Trichloroethane	89
Cyclohexane	92
Carbon Tetrachloride	93
2,2,4-Trimethylpentane	95
Benzene	100
1,2-Dichloroethane	87
Heptane	92
Trichloroethene	94
1,2-Dichloropropane	97
1,4-Dioxane	104
Bromodichloromethane	96
cis-1,3-Dichloropropene	94
4-Methyl-2-pentanone	89
Toluene	97
trans-1,3-Dichloropropene	95
1,1,2-Trichloroethane	102
Tetrachloroethene	109
2-Hexanone	94

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Client Sample ID: CCV

Lab ID#: 1402239AR1-10A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**17022502**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 2/25/14 08:39 AM**	

Compound	%Recovery
Dibromochloromethane	104
1,2-Dibromoethane (EDB)	106
Chlorobenzene	102
Ethyl Benzene	102
m,p-Xylene	101
o-Xylene	99
Styrene	101
Bromoform	108
Cumene	98
1,1,2,2-Tetrachloroethane	102
Propylbenzene	98
4-Ethyltoluene	101
1,3,5-Trimethylbenzene	91
1,2,4-Trimethylbenzene	93
1,3-Dichlorobenzene	102
1,4-Dichlorobenzene	101
alpha-Chlorotoluene	87
1,2-Dichlorobenzene	103
1,2,4-Trichlorobenzene	107
Hexachlorobutadiene	110
Naphthalene	88

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	96	70-130
1,2-Dichloroethane-d4	88	70-130
4-Bromofluorobenzene	98	70-130

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Client Sample ID: LCS

Lab ID#: 1402239AR1-11A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**17022503**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 2/25/14 09:01 AM**	

Compound	%Recovery	Method Limits
Freon 12	84	70-130
Freon 114	92	70-130
Chloromethane	74	70-130
Vinyl Chloride	88	70-130
1,3-Butadiene	78	70-130
Bromomethane	85	70-130
Chloroethane	89	70-130
Freon 11	84	70-130
Ethanol	70	70-130
Freon 113	104	70-130
1,1-Dichloroethene	94	70-130
Acetone	87	70-130
2-Propanol	70	70-130
Carbon Disulfide	84	70-130
3-Chloropropene	85	70-130
Methylene Chloride	85	70-130
Methyl tert-butyl ether	76	70-130
trans-1,2-Dichloroethene	74	70-130
Hexane	80	70-130
1,1-Dichloroethane	83	70-130
2-Butanone (Methyl Ethyl Ketone)	81	70-130
cis-1,2-Dichloroethene	85	70-130
Tetrahydrofuran	71	70-130
Chloroform	86	70-130
1,1,1-Trichloroethane	79	70-130
Cyclohexane	81	70-130
Carbon Tetrachloride	79	70-130
2,2,4-Trimethylpentane	84	70-130
Benzene	84	70-130
1,2-Dichloroethane	74	70-130
Heptane	80	70-130
Trichloroethene	81	70-130
1,2-Dichloropropane	81	70-130
1,4-Dioxane	88	70-130
Bromodichloromethane	84	70-130
cis-1,3-Dichloropropene	82	70-130
4-Methyl-2-pentanone	74	70-130
Toluene	83	70-130
trans-1,3-Dichloropropene	73	70-130
1,1,2-Trichloroethane	85	70-130
Tetrachloroethene	92	70-130
2-Hexanone	72	70-130

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Client Sample ID: LCS

Lab ID#: 1402239AR1-11A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**17022503**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 2/25/14 09:01 AM**	

Compound	%Recovery	Method Limits
Dibromochloromethane	90	70-130
1,2-Dibromoethane (EDB)	87	70-130
Chlorobenzene	85	70-130
Ethyl Benzene	83	70-130
m,p-Xylene	84	70-130
o-Xylene	80	70-130
Styrene	78	70-130
Bromoform	94	70-130
Cumene	83	70-130
1,1,2,2-Tetrachloroethane	85	70-130
Propylbenzene	84	70-130
4-Ethyltoluene	79	70-130
1,3,5-Trimethylbenzene	77	70-130
1,2,4-Trimethylbenzene	75	70-130
1,3-Dichlorobenzene	87	70-130
1,4-Dichlorobenzene	86	70-130
alpha-Chlorotoluene	70	70-130
1,2-Dichlorobenzene	89	70-130
1,2,4-Trichlorobenzene	98	70-130
Hexachlorobutadiene	99	70-130
Naphthalene	70	60-140

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	97	70-130
1,2-Dichloroethane-d4	89	70-130
4-Bromofluorobenzene	100	70-130

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Client Sample ID: LCSD

Lab ID#: 1402239AR1-11AA

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**17022504**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 2/25/14 09:22 AM**	

Compound	%Recovery	Method Limits
Freon 12	78	70-130
Freon 114	88	70-130
Chloromethane	72	70-130
Vinyl Chloride	83	70-130
1,3-Butadiene	75	70-130
Bromomethane	81	70-130
Chloroethane	86	70-130
Freon 11	80	70-130
Ethanol	69 Q	70-130
Freon 113	100	70-130
1,1-Dichloroethene	91	70-130
Acetone	83	70-130
2-Propanol	65 Q	70-130
Carbon Disulfide	81	70-130
3-Chloropropene	81	70-130
Methylene Chloride	82	70-130
Methyl tert-butyl ether	73	70-130
trans-1,2-Dichloroethene	72	70-130
Hexane	78	70-130
1,1-Dichloroethane	80	70-130
2-Butanone (Methyl Ethyl Ketone)	77	70-130
cis-1,2-Dichloroethene	84	70-130
Tetrahydrofuran	69 Q	70-130
Chloroform	82	70-130
1,1,1-Trichloroethane	76	70-130
Cyclohexane	80	70-130
Carbon Tetrachloride	77	70-130
2,2,4-Trimethylpentane	81	70-130
Benzene	86	70-130
1,2-Dichloroethane	75	70-130
Heptane	80	70-130
Trichloroethene	83	70-130
1,2-Dichloropropane	82	70-130
1,4-Dioxane	89	70-130
Bromodichloromethane	84	70-130
cis-1,3-Dichloropropene	82	70-130
4-Methyl-2-pentanone	74	70-130
Toluene	81	70-130
trans-1,3-Dichloropropene	70	70-130
1,1,2-Trichloroethane	81	70-130
Tetrachloroethene	87	70-130
2-Hexanone	70	70-130

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Client Sample ID: LCSD

Lab ID#: 1402239AR1-11AA

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**17022504**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 2/25/14 09:22 AM**	

Compound	%Recovery	Method Limits
Dibromochloromethane	87	70-130
1,2-Dibromoethane (EDB)	85	70-130
Chlorobenzene	82	70-130
Ethyl Benzene	80	70-130
m,p-Xylene	81	70-130
o-Xylene	77	70-130
Styrene	75	70-130
Bromoform	91	70-130
Cumene	81	70-130
1,1,2,2-Tetrachloroethane	83	70-130
Propylbenzene	82	70-130
4-Ethyltoluene	79	70-130
1,3,5-Trimethylbenzene	75	70-130
1,2,4-Trimethylbenzene	73	70-130
1,3-Dichlorobenzene	85	70-130
1,4-Dichlorobenzene	84	70-130
alpha-Chlorotoluene	67 Q	70-130
1,2-Dichlorobenzene	87	70-130
1,2,4-Trichlorobenzene	98	70-130
Hexachlorobutadiene	101	70-130
Naphthalene	69	60-140

Q = Exceeds Quality Control limits.

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	98	70-130
1,2-Dichloroethane-d4	85	70-130
4-Bromofluorobenzene	98	70-130