CONESTOGA-ROVERS & ASSOCIATES

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TRANSMITTAL

DATE: May 25, 2012

REFERENCE NO.: 240524

PROJECT NAME: 4255 MacArthur Boulevard, Oakland

TO: Jerry Wickham
Alameda County Environmental Health
1131 Harbor Bay Parkway, Suite 250
Alameda, California 94502-6577

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2:29 pm, Jun 04, 2012
Alameda County
Environmental Health

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QUANTITY	DESCRIPTION
1	Subsurface Investigation Work Plan

- ☐ As Requested
- ☐ For Your Use
- ☒ For Review and Comment
- ☐

COMMENTS:
If you have any questions regarding the contents of this document, please call Peter Schaefer at (510) 420-3319.

Copy to: Denis Brown, Shell Oil Products US (electronic copy)
Roland C. Malone Trust (property owner), Erik Parrish, Trustee, 1359 Napa Valley Lane, Eugene, OR 97404
Kenneth Williams, MacArthur/High Trailer Park, c/o Bookkeeping, 332 Peyton Drive, Hayward, CA 94544
Ed C. Ralston, ConocoPhillips Risk Management & Remediation (electronic copy)

Completed by: Peter Schaefer Signed: Peter Schaefer

Filing: **Correspondence File**

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Jerry Wickham
Alameda County Environmental Health
1131 Harbor Bay Parkway, Suite 250
Alameda, California 94502-6577

Re: Former Shell Service Station
4255 MacArthur Boulevard
Oakland, California
SAP Code 135701
Incident No. 98995758
ACEH Case No. RO0000486

Dear Mr. Wickham:

The attached document is provided for your review and comment. Upon information and belief, I declare, under penalty of perjury, that the information contained in the attached document is true and correct.

If you have any questions or concerns, please call me at (707) 865-0251.

Sincerely,

Denis L. Brown
Senior Program Manager

SUBSURFACE INVESIGATION WORK PLAN

FORMER SHELL SERVICE STATION
4255 MACARTHUR BOULEVARD
OAKLAND, CALIFORNIA

SAP CODE	135701
INCIDENT NO.	98995758
AGENCY NO.	RO0000486

Prepared by:
Conestoga-Rovers & Associates

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MAY 25, 2012
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1.0 INTRODUCTION

Conestoga-Rovers & Associates (CRA) prepared this work plan on behalf of Equilon Enterprises LLC dba Shell Oil Products US (Shell) to assess potential for soil vapor intrusion near the site as requested in Alameda County Environmental Health's (ACEH's) April 9, 2012 letter.

The site is a former Shell Service Station located on the western corner of MacArthur Boulevard and High Street in Oakland, California (Figure 1). Currently the site is a vacant lot. The former site layout consisted of a kiosk, three underground storage tanks, and three dispenser islands (Figure 2). The area surrounding the site is of mixed commercial and residential use.

A summary of previous work performed at the site and additional background information is contained in Appendix A.

2.0 WORK TASKS

CRA proposes to install three nested soil vapor probes off site in the adjacent mobile home park to assess soil vapor concentrations down gradient of the site and two sub-slab soil vapor probes at the church property north of the site at the locations shown on Figure 2. Specific tasks are described below.

2.1 PERMIT

CRA will obtain the appropriate permits to install the nested soil vapor probes from Alameda County Public Works Agency (ACPWA). ACPWA does not require a permit to install sub-slab soil vapor probes.

2.2 HEALTH AND SAFETY PLAN (HASP)

CRA will prepare a HASP to protect site workers. The plan will be kept on site during field activities and will be reviewed and signed by each site worker.

2.3 UTILITY CLEARANCE

CRA will mark the proposed probe locations, and the locations will be cleared by Underground Service Alert and a private utility locator service prior to drilling.

2.4 SOIL VAPOR PROBE INSTALLATION

CRA proposes to install three nested soil vapor probes (SVP-13 through SVP-15) and two sub-slab soil vapor probes (SVP-16 and SVP-17) into the subsurface at the off-site locations shown on Figure 2. The nested probes are proposed on the adjacent property at 3521 High Street, down gradient of the subject site, and the sub-slab probes are proposed on the adjacent property at 4251 MacArthur Boulevard, north of the subject site.

2.4.1 NESTED SOIL VAPOR PROBE INSTALLATION

Assuming the absence of subsurface obstructions, CRA will advance the soil borings to 5.5 feet below grade (fbg) using an air-knife. The nested soil vapor probes will be installed with two screen intervals (2.5 fbg and 5 fbg) at each location to assess the vertical attenuation of soil vapors.

A CRA geologist will supervise the drilling and describe the encountered soils using the Unified Soil Classification System and Munsell Soil Color Charts. CRA will prepare a boring log for each soil vapor probe boring, and photoionization detector measurements will be recorded on the boring logs.

After the borings are drilled, fixed vapor-sampling points will be installed in each boring using ¼-inch-diameter Teflon® tubing. Each point will use a 1-inch screen interval attached to the Teflon® tubing. To ensure the tubing does not curl or kink during installation, CRA will first straighten out each length of tubing prior to installation, and then use a small-diameter PVC guide pipe to hold the tubing in place within the boring while packing the annulus with sand. A clean, fine-grained silica sand filter pack will be installed approximately 6 inches below and above the deepest sampling point (5 fbg), and the guide pipe will be lifted as the sand pack is installed to ensure the pack stabilizes the tubing within each boring. The annulus will then be sealed to 6 inches below the 2.5 fbg sample point, using hydrated granular bentonite, set atop a 1-foot base of dry granular bentonite. A clean, fine-grained silica sand filter pack will be installed approximately 6 inches below and above the 2.5 fbg sample point, and

the guide pipe will be lifted as the sand pack is installed in the same process as described for the deepest sample point. The annulus will then be sealed to the surface using hydrated granular bentonite, set atop a 1-foot base of dry granular bentonite. Each soil vapor probe will be completed at the surface using a traffic-rated well box at grade.

CRA will perform this work under the supervision of a professional geologist or engineer.

2.4.2 SUB-SLAB SOIL VAPOR PROBE INSTALLATION

Assuming the absence of subsurface obstructions, a rotary hammer drill will be used to drill a "shallow" (approximately 1-inch deep) outer borehole (approximately 7/8-inch diameter) that partially penetrates the floor slab. Cuttings will be removed using a towel moistened with distilled water or a portable vacuum cleaner.

The rotary hammer drill will then be used to drill a smaller diameter inner borehole within the center of the outer borehole (approximately 3/8-inch diameter) through the floor material and approximately 3 inches into the sub-slab bedding material to create an open cavity. The outer borehole will be cleaned a second time with a moistened towel or a portable vacuum cleaner.

Stainless steel tubing will be cut to a length that allows the probe to float within the slab thickness to avoid obstruction of the probe with sub-slab bedding material. The tubing will be approximately 1/4-inch diameter. Where necessary, the compression fittings will be stainless steel (approximately 1/4-inch outside diameter and 1/8-inch National Pipe Thread) Swagelok® female thread connectors. The probes will be constructed prior to drilling to minimize exposure time, or venting, of the sub-slab bedding material through the open borehole.

Each sub-slab soil vapor probe will be placed in the borehole so that the top of the probe is flush with the top of the floor. The top of the probe will have a recessed stainless steel plug. A quick-drying, Portland cement slurry will be injected or pushed into the annular space between the probe and the outer borehole. The cement will be allowed to dry for at least 24 hours prior to sampling.

CRA will perform this work under the supervision of a professional geologist or engineer.

2.5 SOIL VAPOR PROBE SAMPLING

At least 2 weeks following probe installation, CRA will collect soil vapor samples from each sampling point. Sampling is affected by rain. CRA's standard procedure is to allow 2 days or more after a heavy rain event prior to collecting soil vapor samples.

CRA will sample soil vapor probes (SVP-13 through SVP-17) using a vacuum pump and Tedlar® bags. Soil vapor samples will be collected from all screened intervals in each of the soil vapor probes. Prior to sampling the nested soil vapor probes, CRA will purge at least three tubing volumes of air from the probes using a vacuum pump. The sub-slab soil vapor probes do not require purging due to the negligible volume of the sample tubing. Then CRA will attach a sealed "lung sampler" containing a 1-liter Tedlar® bag to the probe and attach the vacuum pump to the box. The vacuum pump will lower the pressure in the "lung sampler" and draw air from the probe into the Tedlar® bag. To avoid breakage, CRA will fill the bags no more than two-thirds full. Each sample will be labeled, entered onto a chain-of-custody, and placed into a protective box at room temperature for transport to a State of California-certified laboratory for analysis within 72 hours.

2.6 LEAK TESTING

To check the system for leaks, CRA will cover the soil vapor probe surface casing and sampling equipment with a containment unit (or shroud). Prior to soil gas probe purging, CRA will introduce helium into the containment unit to obtain a minimum 50 percent (%) helium content level. CRA will confirm the helium content within the containment unit using a helium meter and will record the helium meter readings in our field notes. Helium will continue to be introduced to the containment unit during soil gas probe purging and sampling.

All samples will be analyzed in a laboratory for helium. In the event that a soil vapor sample contains a helium content of greater than 10% of the source concentration (i.e., 10% of the helium content measured within the containment unit), the soil gas sample will be considered invalid.

2.7 CHEMICAL ANALYSES

Vapor samples will be analyzed for total petroleum hydrocarbons as gasoline (carbon range C_6-C_{12}), benzene, toluene, ethylbenzene, total xylenes, and naphthalene by EPA Method 8260B, for oxygen plus argon, carbon dioxide, and methane by ASTM D Method 1946, and for helium by ASTM D Method 1946 (M).

2.8 REPORT PREPARATION

Following receipt of analytical results from the laboratory, CRA will prepare a written report, which will include field procedures, tabulated analytical data, boring logs, and analytical laboratory reports.

3.0 SCHEDULE

CRA will implement the soil vapor probe installations upon receiving ACEH's written approval of this work plan and the drilling permit from ACPWA.

All of Which is Respectfully Submitted,
CONESTOGA-ROVERS & ASSOCIATES

Peter Schaefer, CEG, CHG

Aubrey K. Cool, PG

FIGURES

12/16/08

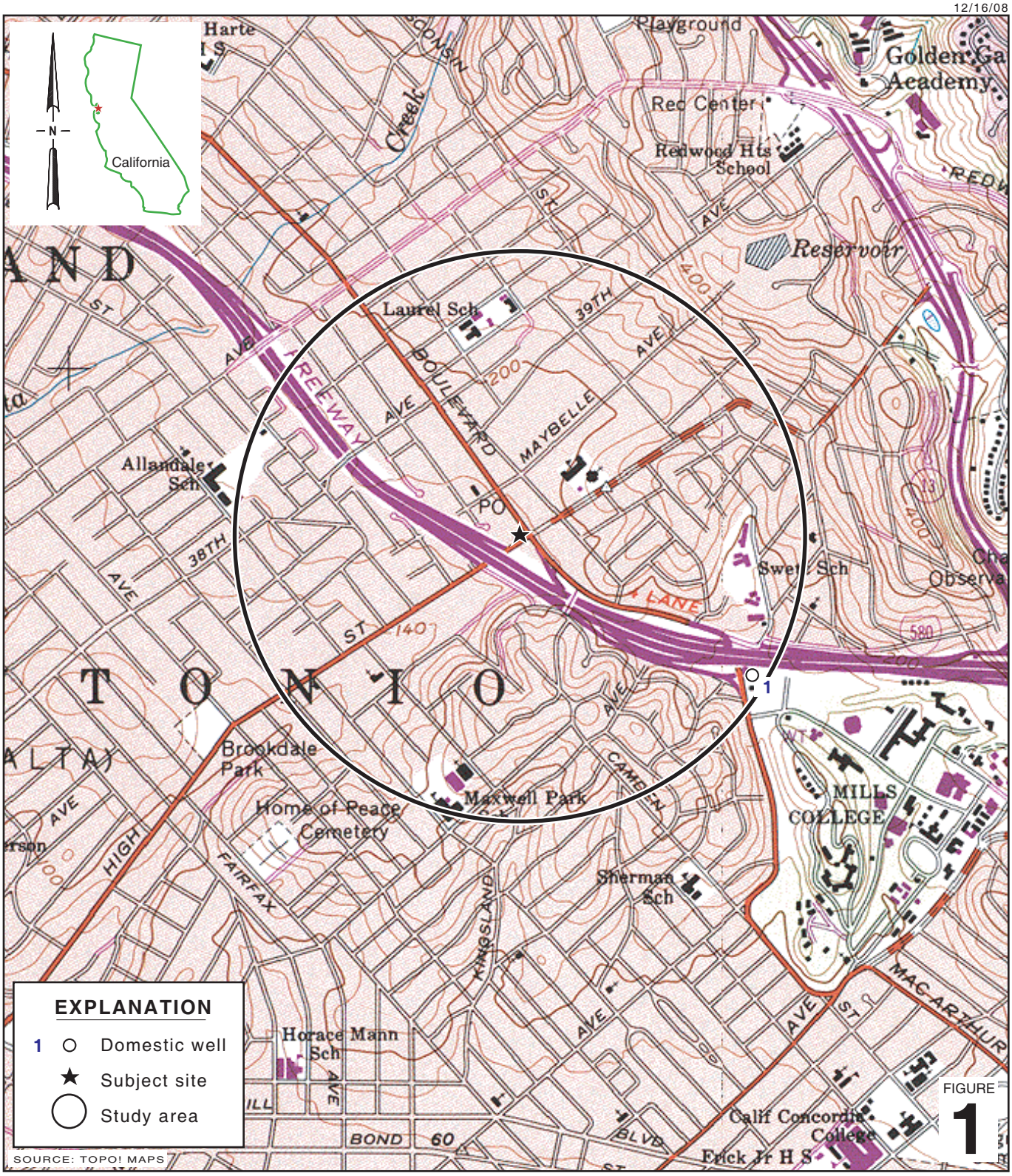

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FIGURE 1

Former Shell Service Station
4255 MacArthur Boulevard
Oakland, California

CONESTOGA-ROVERS & ASSOCIATES

Vicinity Map

05/08/2012

EXPLANATION

- SVP-16 — Proposed sub-slab soil vapor probe location
- SVP-13 — Proposed soil vapor probe location
- SVP-9 — Temporary soil vapor probe location
- SB-9 — Soil boring location (Shell)
- SVP-1 — Soil vapor probe location (Shell)
- MW-1 — Monitoring well location (Shell)
- MW-1B — Monitoring well location (ConocoPhillips)
- SVW-1 — Soil vapor well location (ConocoPhillips)
- TB-1 — Destroyed well location
- STM — Storm drain line (STM)
- SAN — Sanitary sewer line (SAN)
- W — Water line (W)

MW-8 MW-5 MW-6 MW-8 SVW-1 SVW-2 SVW-5 MW-1 SVW-3 MW-1B SVW-4 SVW-6 MW-4B MW-4 MW-2 MW-2B MW-3 MW-3B SVP-17 SVP-4 SB-16 SVP-16 SB-15 SB-14 SVP-3 MW-3 (BH-C) SVP-5 SB-12 SVP-15 SB-13 SB-11 MW-9 MW-7 SVP-6 SVP-7 MW-1 (BH-A) SVP-2 SB-9 SB-10 TB-2 TB-1 MW-2 (BH-B) MW-6 SVP-1 SVP-14 MW-7 SVP-8 SVP-12 SVP-11 SVP-10 SVP-9 MW-5 SVP-13 MW-4 (BH-F)

Parking Parking Parking Pharmacy Foot Clinic Church Structures Residence 4240 Redding Mobile Home Park Former Storage Building Former Dispenser Island (removed 1/03) Former Shell 4255 MacArthur Former Dispenser Island (removed 11/95) Former Dispenser Island (removed 1/03) Former USTs Building Dispenser Dispenser Driveway Driveway Driveway USTs Fenceline Steep Embankment

MACARTHUR BOULEVARD REDDING STREET HIGH STREET HIGHWAY 580 580 ON-RAMP

76 Station #1156
4276 MacArthur

N

0 20 40 80
Scale (ft)

I:\Shell\6-chars\2405--\240524-Oakland 4255 MacArthur\240524-FIGURES\240524 SITE PLAN.DWG

Site Plan

CONESTOGA-ROVERS & ASSOCIATES

Former Shell Service Station
4255 MacArthur Boulevard
Oakland, California

FIGURE
2

APPENDIX A

SITE HISTORY

SITE HISTORY

1985 Subsurface Investigation: In June 1985, Emcon Associates (Emcon) drilled two soil borings (S-A and S-B) and installed one groundwater monitoring well (S-1) adjacent to the underground storage tanks (USTs). Up to 15,800 milligrams per kilogram (mg/kg) total petroleum hydrocarbons as gasoline (TPHg) were detected in the shallow soil samples from inside the UST area. In July 1992, GeoStrategies, Inc. performed a site reconnaissance and verified that the original monitoring well had been destroyed during the 1985 UST replacement. Investigation results are presented in Emcon's July 26, 1985 letter to Gettler-Ryan, Inc.

1985 UST Replacement: In December 1985, the USTs were replaced, and approximately 938 cubic yards of hydrocarbon-bearing soil were transported to a disposal facility. Up to 22,000 mg/kg total volatile hydrocarbons, 500 mg/kg benzene, 2,200 mg/kg toluene, and 4,500 mg/kg xylenes were detected in the soil samples from the excavation.

1993 Subsurface Investigation: In November 1993, Weiss Associates (WA) drilled three soil borings (BH-A, BH-B, and BH-C), which were converted into monitoring wells (MW-1, MW-2, and MW-3). Soil samples contained up to 1,700 mg/kg TPHg, 3.3 mg/kg benzene, 5.7 mg/kg toluene, 33 mg/kg ethylbenzene, and 44 mg/kg xylenes. WA's March 14, 1994 *Subsurface Investigation* report details the investigation results.

1994 Subsurface Investigation: In November 1994, WA drilled two on-site soil borings (BH-D and BH-E) and one off-site boring (BH-F) which was subsequently completed as a monitoring well (MW-4). Soil samples contained up to 5,900 mg/kg TPHg, 23 mg/kg benzene, 160 mg/kg toluene, 120 mg/kg ethylbenzene, and 430 mg/kg xylenes (BH-E at 5 feet below grade [fbg]). WA's January 26, 1995 *Subsurface Investigation* report presents details of the investigation.

1994-1997 Separate-Phase Hydrocarbon (SPH) Removal: SPHs were observed periodically in wells MW-2 and MW-3 between 1994 and 1997. During that time, an estimated total of 19.6 pounds of SPHs were removed from monitoring wells by bailing.

1995 Dispenser and Piping Removal and Sampling: In November 1995, WA collected 15 soil samples during dispenser and piping replacements. The soil samples contained up to 7,800 mg/kg TPHg, 0.85 mg/kg benzene, 51 mg/kg toluene, 71 mg/kg ethylbenzene, and 540 mg/kg xylenes. During the dispenser replacements, horizontal wells HW-1 through HW-4 were installed in the vadose zone at approximately 5 fbg and adjacent to the former piping and dispensers to facilitate future removal of petroleum hydrocarbons from the impacted soil. Approximately 68 cubic yards of soil were excavated for off-site disposal from the area of the

piping and dispensers. Dispenser and piping investigation results are discussed in WA's April 1, 1996 *Dispenser Replacement Sampling* report.

1997 Soil Vapor Extraction (SVE) Test: In August 1997, Cambria Environmental Technology, Inc. (Cambria) performed short-term SVE tests using an internal combustion engine on horizontal vapor extraction wells HW-1 through HW-4 and monitoring wells MW-2 and MW-3. Cambria measured vapor extraction flow rates, the vacuum applied to the wellheads, and the vacuum influence in nearby wells. Cambria calculated an effective radius of influence of 35 to 50 feet during testing of wells MW-2 and MW-3. Cambria concluded that the relatively high TPHg removal rates measured in horizontal wells HW-1 through HW-4 were most likely temporary and were not representative of site conditions due to extensive well screen in permeable fill material and that the low hydrocarbon removal rates in wells MW-2 and MW-3 were likely more representative of native soil conditions. Cambria's February 23, 1997 *Soil Vapor Extraction Test Report* presents SVE test results.

1998 Subsurface Investigation: In February 1998, Cambria drilled two off-site borings (SB-1 and SB-2) in the mobile home park adjacent to the Shell site. No TPHg or benzene was detected in the soil samples. Soil samples contained up to 1.4 mg/kg methyl tertiary-butyl ether (MTBE) and 7,210 mg/kg total organic carbon. Grab groundwater samples contained up to 7,700 micrograms per liter (µg/L) TPHg, 210 µg/L benzene, and 46,000 µg/L MTBE (SB-2). Two soil samples (SB-1 and SB-2 at 5.5 fbg) were analyzed for physical parameters: total porosity was 35.2 percent (%) and 37.4% and specific permeability was 181 millidarcies (md) and 71 md, respectively; however, the laboratory noted that due to fine fractures that developed in the samples upon drying, the measured specific permeability values were an order of magnitude or more too high. The soil boring investigation results are presented in Cambria's March 19, 1998 *Subsurface Investigation* report.

1999-2003 Groundwater Extraction (GWE): From April 1999 until September 2003, Cambria conducted monthly GWE using a vacuum truck. Mobile GWE removed an estimated 15.1 pounds of liquid-phase hydrocarbons and 26.8 pounds of liquid-phase MTBE. GWE was discontinued at the site after September 2003 due to low pumping volumes. Quarterly groundwater monitoring reports during this period summarize GWE operations and mass removal.

2000-2003 Dual-Phase Vapor Extraction (DVE): From November 2000 to June 2001, from April 2002 to September 2003, and from July 2003 to September 2003, Cambria conducted mobile DVE using a vacuum truck. DVE was discontinued after September 2003 due to decreased mass removal. DVE removed an estimated 26.4 pounds of vapor-phase hydrocarbons. DVE dates and mass removal are provided in the quarterly groundwater monitoring reports during this period.

2001 Sensitive Receptor Survey (SRS), Conduit Study, and Site Conceptual Model (SCM): Cambria's SRS identified 25 monitoring wells, 4 cathodic protection wells, and 1 domestic well within one-half mile of the site. Cambria's conduit study concluded that nearby sewer, storm drain, and water lines located between 8 to 13 fbg could serve as preferential pathways for petroleum hydrocarbon and MTBE migration. However, Cambria did not identify any nearby conduits down gradient from the site. The SRS, conduit study, and SCM are included in Cambria's May 31, 2001 *First Quarter 2001 Monitoring Report, Sensitive Receptor Survey, and Site Conceptual Model.*

2001 Subsurface Investigation: In November 2001, Cambria installed one down-gradient monitoring well (MW-5) approximately 200 feet southwest of the site, on the Caltrans right-of-way adjacent to the I-580 on-ramp. No TPHg, benzene, toluene, ethylbenzene, and total xylenes (BTEX), or MTBE was detected in the soil sample collected during the investigation. Cambria's January 10, 2002 *Off-Site Monitoring Well Installation Report* presents the investigation results.

2003 Tank Removal and Soil Excavation: In January and February 2003, L.A. Perks Plumbing and Heating removed all surface features, USTs, fuel dispensers, associated product piping, two tank backfill wells (TB-1 and TB-2), and four horizontal wells (HW-1 through HW-4). Cambria collected 31 soil samples and 1 grab groundwater sample and supervised over-excavation of hydrocarbon-impacted soils. Approximately 875 cubic yards of soil were removed from the site during the tank pull and over-excavation activities. Approximately 4,600 gallons of groundwater were pumped to dewater the UST excavation prior to removing the tanks. Soil samples from the former UST area contained up to 380 mg/kg TPHg, 1.7 mg/kg benzene, and 1.2 mg/kg MTBE (TP-5). The grab groundwater sample (TP-1-Water) from the former tank excavation area contained 11,000 µg/L TPHg, 410 µg/L benzene, and 5,200 µg/L MTBE. Soil samples from soil remaining in soil in the former dispenser areas contained up to 980 mg/kg TPHg, 1.2 mg/kg benzene, and 0.9 mg/kg MTBE. Following over-excavation, approximately 720 pounds of oxygen-releasing compound were mixed in the excavation base before backfilling with 1.5-inch drain rock to 4 fbg. The remainder of the excavation was backfilled and compacted with Class II road base material. Cambria's April 28, 2003 *Tank Closure and Soil Excavation Report* provides details of these activities.

2003-2011 SPH Removal: SPHs were observed periodically in wells MW-2, MW-3, and MW-4 between 2003 and 2011. An estimated total of 28.53 pounds of SPHs have been removed from monitoring wells by manual bailing, with a skimmer bailer, and using SPH-absorbent canisters. In September 2009, Conestoga-Rovers & Associates (CRA) conducted mobile GWE on wells MW-2 and MW-3, which yielded approximately 44 gallons of water from each well with negligible SPHs.

April 2005 Subsurface Investigation: In April 2005, Cambria drilled 11 cone penetrometer test (CPT) borings (CPT-1 through CPT-11) and 2 direct push borings (SB-3 and SB-4). At each CPT location, an ultraviolet-induced florescence module was used to identify hydrocarbons in the subsurface. No soil samples were submitted for laboratory analysis. Based on the data collected during this investigation, it appeared that no SPHs were present at these locations, but that dissolved-phase hydrocarbons are present at most locations at two distinct depths: a shallow zone in the silt and clay above 17 fbg and a deeper zone in the silt, clay, and sand from approximately 19 to 20 fbg to the bottom of the borings at 25 fbg. Cambria's June 6, 2005 *Subsurface Investigation Report* presents details of this investigation.

October 2005 Subsurface Investigation: In October 2005, Cambria drilled four soil borings (SB-5 through SB-8). Soil samples contained up to 2,600 mg/kg TPHg, 13 mg/kg benzene, 17 mg/kg toluene, 45 mg/kg ethylbenzene, 270 mg/kg xylenes, 1.2 mg/kg MTBE, and 1.6 mg/kg tertiary-butyl alcohol. Cambria's December 14, 2005 *Subsurface Investigation Report presents* details of the investigation.

2006 Subsurface Investigation: In June 2006, Cambria installed four groundwater monitoring wells (MW-6 through MW-9). Soil samples from the well borings contained up to 552 mg/kg TPHg, 1.4 mg/kg benzene, and 3.1 mg/kg MTBE. Cambria's September 6, 2006 *Well Installation Report* presents details of the investigation.

2011 Subsurface Investigations: In February 2011, CRA installed eight nested soil vapor probes (SVP-1 through SVP-8) with screens at approximately 3 and 5 fbg. Soil vapor samples from the probes contained up to 270,000,000 micrograms per cubic meter ($\mu g/m^3$) TPHg, 650,000 $\mu g/m^3$ benzene, 420,000 $\mu g/m^3$ ethylbenzene, 1,500 $\mu g/m^3$ total xylenes, and 4,600 $\mu g/m^3$ MTBE. No toluene was detected in the soil vapor samples. CRA's April 25, 2011 *Soil Vapor Probe Installation and Sampling Report* details this investigation.

In August 2011, CRA collected samples from six of the soil vapor probes, which contained up to 230,000,000 $\mu g/m^3$ TPHg, 310,000 $\mu g/m^3$ benzene, 140,000 $\mu g/m^3$ ethylbenzene, 88,000 $\mu g/m^3$ total xylenes, and 66,000 $\mu g/m^3$ MTBE. No toluene was detected in the soil vapor samples. CRA's January 9, 2012 *Soil Vapor Sampling Report* details these results.

In November 2011, CRA drilled eight soil borings (SB-9 through SB-16) to further evaluate on-site soil and groundwater conditions. Only the TPHg soil detections in boring SB-11 at 5 and 16 fbg and the TPHg, benzene, ethylbenzene, and total xylenes detections in SB-12 at 10 fbg exceed the San Francisco Bay Regional Water Quality Control Board environmental screening levels (ESLs)[1] for soil where groundwater is not a drinking water source. No

[1] *Screening for Environmental Concerns at Sites With Contaminated Soil and Groundwater,* California Regional Water Quality Control Board, Interim Final – November 2007 [Revised May 2008]

significant residual vadose zone BTEX source was identified during this investigation. Six grab groundwater samples were collected from borings SB-9 through SB-11 and SB-14 through SB-16. TPHg and/or BTEX concentrations exceeded ESLs in five of the six grab groundwater samples, with the maximum concentrations detected in the sample collected from boring SB-16. Fuel oxygenate concentrations in the grab groundwater samples did not exceed ESLs. One soil sample (SB-13) was collected for analysis of physical parameters. CRA's January 6, 2012 *Subsurface Investigation Report* provides investigation details.

2012 Subsurface Investigation: In April 2012, CRA installed and sampled four temporary soil vapor probes (SVP-9 through SVP-12) at the residential care facility located at 4240 Redding Street, Oakland. All constituent of concern detections were below ESLs for residential land use in all soil vapor samples. Investigation results are provided in CRA's May 4, 2012 *Subsurface Investigation Report.*

Groundwater Monitoring Program: Groundwater sampling began in November 1993. Historically, SPHs have been observed intermittently in wells MW-2 and MW-3. SPHs were also observed in MW-4 during a single sampling event in August 2010, and since the December 2008 sampling event, no SPHs have been observed in MW-3. Groundwater is currently monitored and sampled semiannually during the first and third quarters.