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Alameda County

AUG 24 2005

Environmental Health

Denis L. Brown

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August 22, 2005

Jerry Wickham
Alameda County Health Care Services Agency
1131 Harbor Bay Parkway, Suite 250
Alameda, CA 94502-6577

Re: Subsurface Investigation Work Plan
Former Shell Service Station
4411 Foothill Boulevard
Oakland, California
SAP Code 135686
Incident #98995746

Dear Mr. Wickham:

Attached for your review and comment is a copy of the *Subsurface Investigation Work Plat* for the above referenced site. 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,

A handwritten signature in black ink that reads "Denis L. Brown".

Denis L. Brown
Sr. Environmental Engineer

August 22, 2005

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

Re: **Subsurface Investigation Work Plan**
Former Shell Service Station
4411 Foothill Boulevard
Oakland, California
Incident #98995746
Cambria Project #247-0897-011
ACHCSA Case #113



Dear Mr. Wickham:

On behalf of Equilon Enterprises LLC dba Shell Oil Products US (Shell), Cambria Environmental Technology, Inc. (Cambria) has prepared this *Subsurface Investigation Work Plan*. This work plan is proposed as a result of the August 10, 2005 meeting with Alameda County Health Care Services Agency (ACHCSA). During that meeting, Cambria and ACHCSA discussed the recently discovered information regarding a 1958 gasoline release in the vicinity of the underground storage tanks (USTs) that were apparently on site until 1971. Since no documentation exists detailing the tanks' removal or any soil sampling or excavation, Cambria proposes to investigate subsurface conditions at this location.

SITE CHARACTERISTICS

Site Description: The site is a former Shell service station located on the southwest corner of the Foothill Boulevard and High Street intersection in Oakland, California (Figures 1 and 2). Land use in the site vicinity is mixed commercial and residential, with 76-branded and Chevron-branded gasoline service stations occupying the northeastern and northwestern corners of the intersection, respectively. Fremont High School is located on the southeastern intersection corner.

1958 UST Piping Leak: During a review of project correspondence, Cambria found documents related to an April 19, 1958 gasoline shortage discovered at the operating Shell station. Shell's contractor determined that there was a piping leak into a concrete pump pit and then into the soil in the vicinity of the storage tanks whenever the pump submerged in one of the site's three 6,000-gallon tanks was activated. Product was found in an irrigation well located at 4320 Bond Street,

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adjacent to the Shell site. Shell installed 22 8-inch wells to depths of 15 feet below grade (fbg) along the property boundary and one within the tank complex. Groundwater was pumped from the wells and the extracted water was routed to a separator for product recovery. Though the volume of the release is not known, Shell reported in a June 2, 1958 letter that 650 gallons of gasoline were recovered from the wells. No documentation of any soil or groundwater sampling in response to the release has been located.

1971 UST Removal and Replacement: During a review of archived files for the site, Cambria found a Shell document dated July 15, 1971 regarding plans to remove the existing 6,000-gallon USTs. No documentation of the removal or of any soil or groundwater sampling was located in the archived files.

Cambria also found a September 17, 1971 invoice for the delivery of one 10,000-gallon UST, one 8,000-gallon UST, and one 550-gallon underground waste oil tank. No documentation of the tank installations was located in the archived files.

1977 Dispenser Piping Leak: During a review of archived files for the site, Cambria found a October 19, 1977 Shell Oil Company Spill Report documenting the release of 2,000 gallons of gasoline from a pipe from the USTs to the dispenser located closest to High Street. The report notes that the damaged pipe section was replaced and that leak detectors were installed on all systems. No documentation of the repair or of any soil or groundwater sampling in response to the release was located in the archived files.

1984 UST Removal and Replacement: During a review of archived files for the site, Cambria found an October 1, 1984 Shell purchase order for the removal of the existing USTs and the installation of three 10,000-gallon fiberglass tanks. No documentation of the removal or of any confirmation sampling was located in the archived files.

1991 Waste Oil Tank Leak: During a review of archived files for the site, Cambria found a June 5, 1991 Underground Storage Tank Unauthorized Release Report submitted by Shell to ACHCSA detailing a release from the 550-gallon waste oil tank at the site. The report states that the release was caused by tank failure, that the volume of release was unknown, and that the tank contents had been removed. Shell's suggested remedial action was to remove the waste oil tank.

1992 Waste Oil Tank Removal: The 550-gallon waste oil tank was removed on February 5, 1992. A soil sample was collected at the bottom of the excavation at a depth of approximately 11 fbg. No total petroleum hydrocarbons as gasoline (TPHg), diesel (TPHd), benzene, toluene, ethylbenzene and xylenes (BTEX), oil and grease, halogenated volatile organic compounds, or metals were detected in the sample. Total lead was detected at 6.7 parts per million (ppm). This likely represents the background lead concentration in the local soil. A sample of the stockpiled soil contained 5.2 ppm of TPHg, 14 ppm of TPHd, and 130 ppm of total

oil and grease. GeoStrategies Inc. (GeoStrategies) March 26, 1992 report presents details of the waste oil tank removal and sampling activities.

1992 Monitoring Well Installation: A single monitoring well (S-1) was installed in the vicinity of the waste-oil tank location. Details of this well installation are presented in GeoStrategies' January 19, 1993 *Monitoring Well Installation Report*.

1993 Monitoring Well Installations: Hydro Environmental Technologies, Inc. (HETI) installed monitoring wells S-2 and S-3 on May 21, 1993. Details of the well installations are presented in HETI's July 22, 1993 report.

1995 Soil and Groundwater Investigation: Pacific Environmental Group (PEG) of San Jose, California conducted a Geoprobe® investigation in June 1995. The investigation consisted of advancing eight on-site soil borings and two off-site borings for collecting soil and groundwater samples. Details of this investigation are presented in PEG's September 12, 1995 *Site Investigation* report.

1998 Product Equipment Upgrades: In November 1998, Paradiso Mechanical (Paradiso) of San Leandro, California upgraded the service station by adding secondary containment to the gasoline turbines and dispensers. Details of dispenser upgrade and sampling activities are presented in Cambria's November 30, 1998 *Dispenser Soil Sampling Report*.

January 1999 Letter Response and Work Plan: In response to the December 7, 1998 ACHCSA letter to Equiva Services LLC (Equiva), Cambria prepared a January 11, 1999 *Letter Response and Work Plan*. In the work plan, Cambria proposed an additional on-site groundwater monitoring well (S-4) and enhanced groundwater oxygenation via hydrogen peroxide injection into existing site wells.

March 1999 Work Plan Addendum: In a phone conversation with Cambria on February 1, 1999, the ACHCSA requested additional information regarding the location of proposed well S-4 and the use of hydrogen peroxide. As a result, Cambria submitted a March 18, 1999 *Work Plan Addendum*. In it, Cambria proposed that well S-4 be located between the station building and the nearest dispenser island to the north. Due to the lack of requested response from the Oakland Fire Department on the safety of hydrogen peroxide use, Cambria also proposed applying oxygen releasing compound (ORC) in lieu of hydrogen peroxide.

April 1999 ACHCSA Letter: In an April 30, 1999 letter to Equiva, ACHCSA requested further information regarding the application of ORC. In addition, the ACHCSA requested that Cambria perform a feasibility study to evaluate alternatives to prevent the migration of methyl tertiary butyl ether (MTBE). Cambria provided the requested information in the June 15, 1999 *Letter Response*. In September 1999, ORC socks were subsequently installed in wells S-1, S-2, and BW-A.

December 1999 Letter Response, Work Plan and Conduit Study: In a letter dated November 10, 1999, the ACHCSA requested that a site conceptual model and work plan be prepared for the site. Cambria submitted a December 13, 1999 *Letter Response and Work Plan*. In that work plan, Cambria presented findings of a subsurface conduit study. Several conduits, which may provide limited preferential groundwater flow at times of high groundwater elevations, were identified.

The deepest conduits located near the site are sanitary sewer pipelines with flowlines ranging from approximately 6 to 11 fbg. Although the depth to water in wells S-2 and S-3 along the western perimeter of the site has ranged from approximately 6 to 10.5 fbg, the depth to water is typically 8 to 9 fbg. Therefore, only the deepest sanitary sewer conduit trench has the potential to cause preferential flow of impacted groundwater. However, given that only a small portion of the trench backfill typically intersects groundwater and the fact that gravel lenses exist locally from 10 to 13 fbg, the potential for significant preferential groundwater flow in the utility trench is considered to be low.

January 2000 Site Investigation: Cambria conducted a site investigation in January 2000. Per the ACHCSA request, well S-4 was proposed between the station building and southeastern dispenser-island. However, a conduit was encountered while drilling boring SB-4 and the boring was relocated approximately 50 feet southeast. The second boring (SB-4B) was located adjacent to the southeast corner of the station building, and well S-4 was installed in boring SB-4B to a depth of 20 fbg. In boring SB-4B, the maximum TPHd and TPHg concentrations were detected in sample SB-4B-5.5 at 27.2 ppm and 28.2 ppm, respectively. The maximum benzene concentration was detected in sample SB-4B-10.5 at 0.0696 ppm. The maximum MTBE concentration by EPA Method 8020 was reported in sample SB-4B-19.0 at 0.233 ppm. MTBE was confirmed by EPA Method 8260 in sample SB-4B-19.0 at a concentration of 0.0549 ppm. Details of the investigation are contained in Cambria's November 17, 2000 *Site Investigation Report*.

November 2001 Corrective Action Plan (CAP): On November 12, 2001, Cambria submitted a CAP in preparation for impending site demolition and fueling facility removal. In the CAP, Cambria discussed remedial alternatives and made recommendations for remedial action. Cambria recommended additional on-site over-excavation, following removal of the underground facilities, to substantially remove residual impacted soils from within the property boundaries. Cambria also recommended removal of groundwater from the excavation and placing ORC at the base of the excavation to enhance biological degradation of residual impacted soil and groundwater. Continued quarterly groundwater monitoring was recommended to track the subsequent natural attenuation process.

February 2002 UST Closure Report: Paradiso removed the gasoline USTs and hydraulic hoists, and over-excavated approximately 1,250 cubic yards of impacted soil around and beneath the USTs, product dispenser islands, and hydraulic hoists. Phillips Services Corporation extracted

approximately 16,000 gallons of groundwater from the excavation pits. Subsequent to over-excavation, Paradiso placed 810 pounds of ORC powder over the excavation bottom. Details of the fuel facilities removal and corrective action are presented in Cambria's February 25, 2002 *Underground Storage Tank Closure Report*.

May 2002 Well Installation: In May 2002, Cambria installed one groundwater monitoring well (S-5) to complete the network of monitoring wells on site. The well was installed at a depth of 22 fbg. Soil samples were collected during the boring advancement at 15 and 20 fbg for lithologic logging purposes. Because these soil samples were collected beneath the water table, they were not submitted for chemical analysis. The well installation is described in Cambria's July 2, 2002 *Monitoring Well Installation Report*.

2005 Well Destructions: The site is currently a vacant lot at which, according to the property owner, redevelopment construction will begin in September 2005. The five on-site wells (S-1 through S-5) were located in areas where new buildings and a parking lot are proposed. Since the proposed buildings will cover three wells (S-2, S-4 and S-5), and grading for the proposed parking lot could damage wells S-1 and S-3, Cambria destroyed the wells on July 14, 2005 by pressure grouting with neat Portland Type I/II cement. Cambria will submit a report documenting these activities under separate cover.

Per the June 10, 2005 ACHCSA letter which requested a work plan for re-installation of monitoring wells at the site and a site conceptual model, Cambria proposes to advance borings SB-5 through SB-12 to vertically profile the lithology and hydrocarbon impacts prior to installing the new monitoring wells. This work is proposed in a *Subsurface Investigation and Site Conceptual Model* to be submitted under separate cover.

Sediment Lithology: Sandy clay underlies the site from approximately 6 to 10 fbg. Clayey sand with lenses of gravel underlies the sandy clay from approximately 10 to 13 fbg. Sandy clay underlies the clayey sand to the maximum on-site explored depth of 26 fbg.

Groundwater Characteristics and Monitoring Results: Groundwater has been monitored at the site since December 1992. Since then, groundwater depths have ranged from approximately 6 to 12 fbg. The calculated groundwater gradient typically trends to the south-southwest at approximately 0.12 ft/ft.

Elevated concentrations of gasoline hydrocarbons and oxygenates are present in groundwater at the site. During the second quarter 2005 monitoring event, the highest TPHg concentration detected was 13,000 parts per billion (ppb) in both wells S-1 and S-4. At that time, the maximum benzene and MTBE concentrations in groundwater were 1,900 ppb and 460 ppb, respectively, in S-4. Tert-butyl alcohol (TBA) has been detected in wells S-2, S-4, and S-5 at concentrations of 450, 140, and 3,700 ppb, respectively, during the September 2004 sampling event. No other oxygenates have been detected in groundwater at the site.

TECHNICAL RATIONALE FOR PROPOSED SCOPE OF WORK

As discussed in the August 10, 2005 meeting with ACHCSA, information regarding a 1958 piping leak was recently discovered. No documentation has been located describing the removal of the tanks, which is thought to have occurred in 1971, or soil sampling or excavation in the vicinity of the leak. The site is scheduled for redevelopment and the former location of the tanks appears to lie within the footprint of the proposed Building B (Figure 2). The proposed soil and investigation will provide information on whether impacted soil remains at this location and, if so, the level and vertical extent of impact.



Cambria's standard field procedures for Geoprobe® soil sampling are included as Attachment A.

WORK TASKS

Permits: Cambria will obtain required permits for advancing the borings from Alameda County Public Works Agency.

Site Safety Plan: Cambria will prepare a comprehensive site safety plan to protect site workers. The plan will be kept on site during field activities and signed by each site worker.

Utility Clearance: Cambria will mark proposed drilling locations, and the locations will be cleared through Underground Service Alert prior to drilling. Additionally, a private utility locator will be used to identify subsurface obstacles to drilling.

Soil Borings: Cambria proposes to advance three borings (TB-1 through TB-3) to investigate the presence and vertical extent of petroleum hydrocarbon-impacted soil and groundwater in this portion of the site. Assuming the absence of overhead and subsurface obstructions, Cambria will advance three borings at the approximate locations shown on Figure 2. To characterize soil, two of the three borings (TB-1 and TB-3) will be advanced to an approximate total depth of 20 fbg, and soil samples will be collected for laboratory analysis every 3 feet from the surface to the total depth of the borings. TB-2 will be advanced to approximately 40 fbg, and soil samples will be collected for laboratory analysis every 3 feet from the surface to 20 fbg and every 5 feet from 20 fbg to the total depth of the boring.

To characterize the vertical extent of hydrocarbon impact to shallow groundwater, a grab groundwater sample will be collected from the first-encountered groundwater at TB-1. Groundwater is expected to occur at approximately 8 fbg. At TB-2, a grab groundwater sample will be collected approximately 5 feet below the first-encountered groundwater. At TB-3, a grab

groundwater sample will be collected approximately 10- feet below the first-encountered groundwater.

Upon sampling completion, the borings will be grouted to the surface with neat Portland cement and surfaced to match the existing grade. Soil and groundwater samples will be transported to a State of California-approved analytical laboratory for chemical analysis. Cambria's standard field procedures for soil borings are presented as Attachment A.

A Cambria geologist will supervise the borings, and borings will be continuously logged to provide detailed lithologic profiles. Soil samples for laboratory analysis will be retained in the Geoprobe® liner and will be covered on both ends with Teflon sheets and plastic end caps. Soil samples will be labeled, entered onto a chain-of-custody record, and placed into a cooler with ice for transport to a State-certified laboratory for analysis.

The proposed scope of work will be performed under the supervision of a California registered geologist or engineer.

Chemical Analyses: A State-approved analytical laboratory will analyze soil and groundwater samples for TPHg, BTEX, TBA, di-isopropyl ether, ethyl tert butyl ether, tert amyl methyl ether, and MTBE using EPA Method 8260. In order to receive results prior to the start of anticipated construction, the samples will be analyzed on a 72-hour turnaround schedule.

Report Preparation: In order to allow sufficient time for additional activities based on the sampling results that will also accommodate the construction schedule, Cambria will provide the soil and groundwater results to ACHCSA as soon as the laboratory provides a final report. Additionally, within 60 days following the receipt of analytical results from the laboratory, Cambria will prepare a written report which will include field procedures, laboratory results, boring logs, conclusions and recommendations.

SCHEDULE

Redevelopment construction is scheduled to begin at the site on approximately September 15, 2005. In order to complete the investigation prior to the beginning of construction, Cambria has tentatively scheduled the field activities for August 29, 2005 and is prepared to begin work upon written approval of this work plan by ACHCSA and receipt of drilling permits.

CLOSING

If you have any questions regarding the scope of work outlined in this work plan, please call David Gibbs at (510) 420-3363.

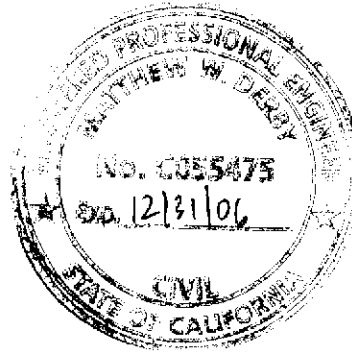
Sincerely,
Cambria Environmental Technology, Inc.



David M. Gibbs, P.G.
Project Geologist



Matthew W. Derby, P.E.
Senior Project Engineer

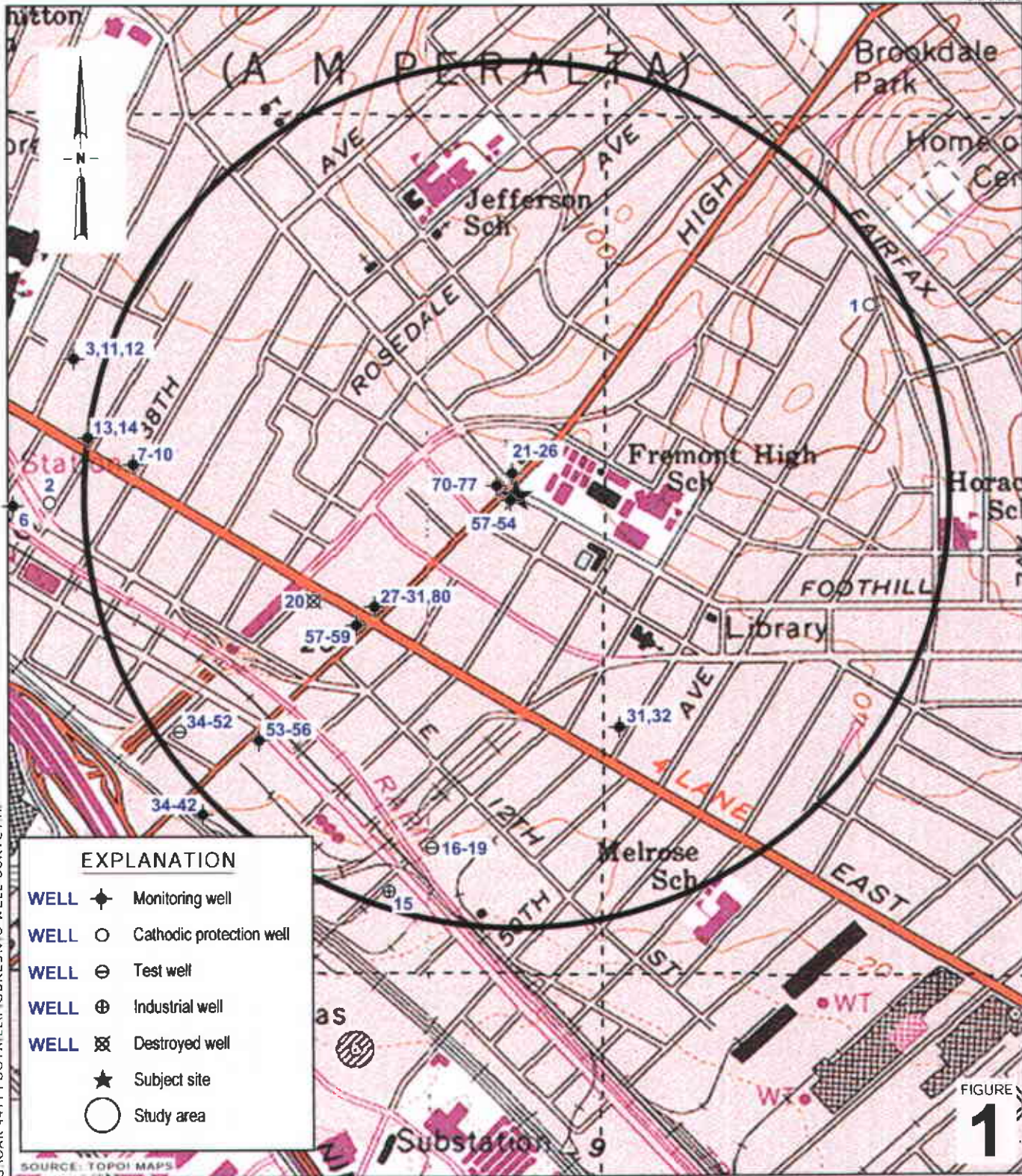


Figures: 1 - Vicinity/Area Well Survey Map
 2 - Site Plan

Attachment: A - Standard Field Procedures for Geoprobe® Soil and Groundwater Sampling

cc: Denis Brown, Shell Oil Products US, 20945 S. Wilmington Ave., Carson, CA 90810
 Bill Phua c/o Jay-Phares, 10700 MacArthur Boulevard, Suite 200, Oakland, CA
 94605-5260, Attention: H.K. Phares

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EXPLANATION	
WELL	◆ Monitoring well
WELL	○ Cathodic protection well
WELL	⊖ Test well
WELL	⊕ Industrial well
WELL	⊗ Destroyed well
	★ Subject site
	○ Study area

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SOURCE: TOPOI MAPS



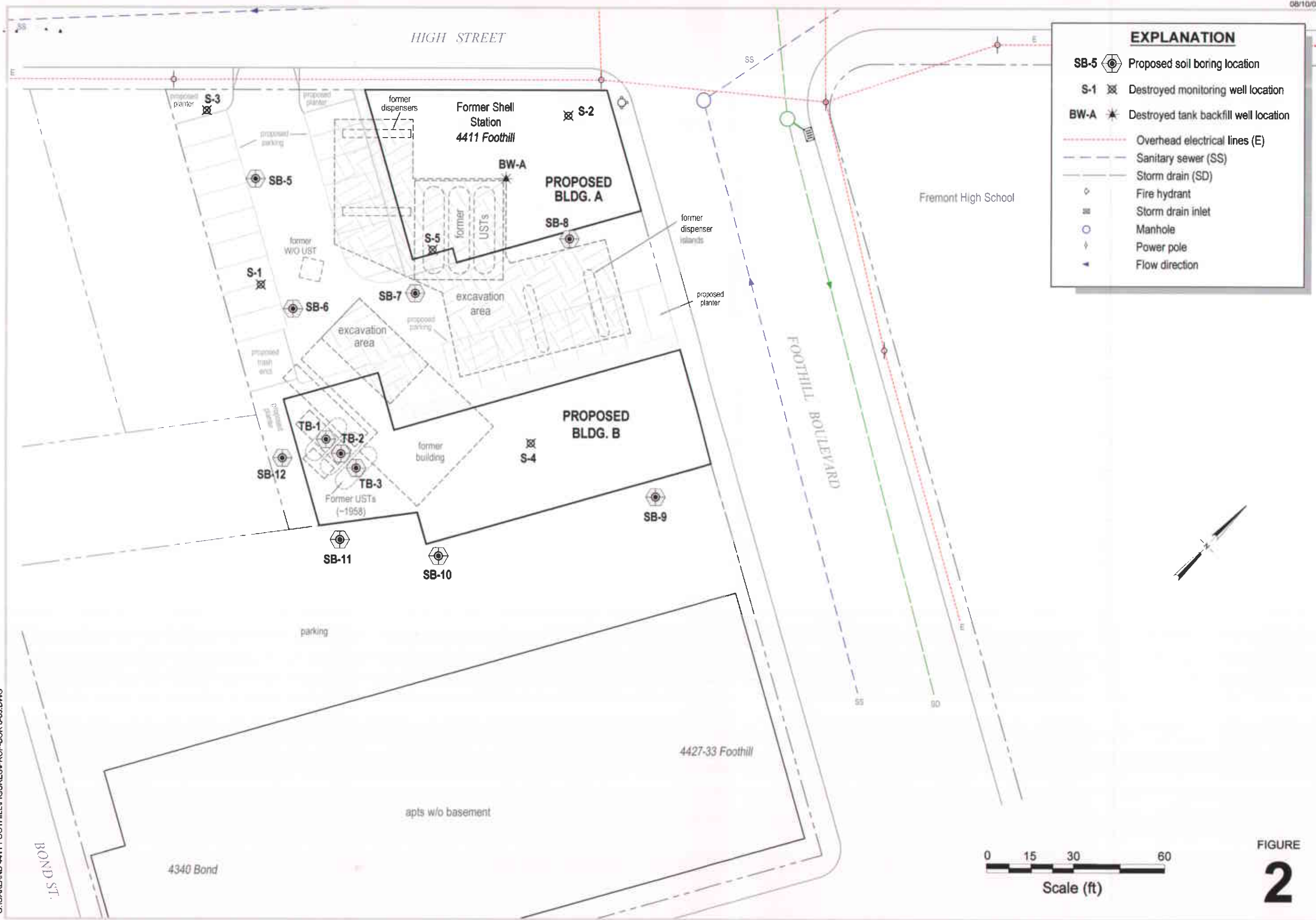
FIGURE 1

Former Shell Service Station
 4411 Foothill Boulevard
 Oakland, California
 Incident #98995746



C A M B R I A

Vicinity/Area Well Survey Map
 (1/2-Mile Radius)



EXPLANATION	
SB-5	Proposed soil boring location
S-1	Destroyed monitoring well location
BW-A	Destroyed tank backfill well location
(Red dashed line)	Overhead electrical lines (E)
(Blue dashed line)	Sanitary sewer (SS)
(Green dashed line)	Storm drain (SD)
(Diamond symbol)	Fire hydrant
(Cross-hatch symbol)	Storm drain inlet
(Circle symbol)	Manhole
(Vertical line with crossbar symbol)	Power pole
(Arrow symbol)	Flow direction

Site Plan



C A M B R I A

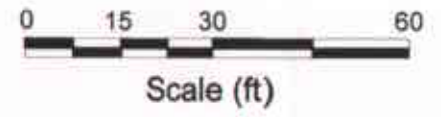


FIGURE 2

Former Shell Service Station

4411 Foothill Boulevard
Oakland, California
Incident No. 98995746

ATTACHMENT A

**Standard Field Procedures for Geoprobe[®] Soil and Groundwater
Sampling**

CAMBRIA

STANDARD FIELD PROCEDURES FOR GEOPROBE® SOIL AND GROUNDWATER SAMPLING

This document describes Cambria Environmental Technology's standard field methods for GeoProbe® soil and ground water sampling. These procedures are designed to comply with Federal, State and local regulatory guidelines. Specific field procedures are summarized below.

Objectives

Soil samples are collected to characterize subsurface lithology, assess whether the soils exhibit obvious hydrocarbon or other compound vapor odor or staining, estimate ground water depth and quality and to submit samples for chemical analysis.

Soil Classification/Logging

All soil samples are classified according to the Unified Soil Classification System by a trained geologist or engineer working under the supervision of a California Registered Geologist (RG) or a Certified Engineering Geologist (CEG). The following soil properties are noted for each soil sample:

- Principal and secondary grain size category (i.e., sand, silt, clay or gravel)
- Approximate percentage of each grain size category,
- Color,
- Approximate water or separate-phase hydrocarbon saturation percentage,
- Observed odor and/or discoloration,
- Other significant observations (i.e., cementation, presence of marker horizons, mineralogy), and
- Estimated permeability.

Soil Sampling

GeoProbe® soil samples are collected from borings driven using hydraulic push technologies. A minimum of one and one half ft of the soil column is collected for every five ft of drilled depth. Additional soil samples can be collected near the water table and at lithologic changes. Samples are collected using samplers lined with polyethylene or brass tubes driven into undisturbed sediments at the bottom of the borehole. The ground surface immediately adjacent to the boring is used as a datum to measure sample depth. The horizontal location of each boring is measured in the field relative to a permanent on-site reference using a measuring wheel or tape measure.

Drilling and sampling equipment is steam-cleaned or washed prior to drilling and between borings to prevent cross-contamination. Sampling equipment is washed between samples with trisodium phosphate or an equivalent EPA-approved detergent.

Sample Storage, Handling and Transport

Sampling tubes chosen for analysis are trimmed of excess soil and capped with Teflon® tape and plastic end caps. Soil samples are labeled and stored at or below 4°C on either crushed or dry ice, depending upon local regulations. Samples are transported under chain-of-custody to a State-certified analytic laboratory.

CAMBRIA

Field Screening

After a soil sample has been collected, soil from the remaining tubing is placed inside a sealed plastic bag and set aside to allow hydrocarbons to volatilize from the soil. After ten to fifteen minutes, a portable GasTech[®] or photoionization detector measures volatile hydrocarbon vapor concentrations in the bag's headspace, extracting the vapor through a slit in the plastic bag. The measurements are used along with the field observations, odors, stratigraphy and ground water depth to select soil samples for analysis.

Grab Ground Water Sampling

Ground water samples are collected from the open borehole using bailers, advancing disposable Tygon[®] tubing into the borehole and extracting ground water using a diaphragm pump, or using a hydro-punch style sampler with a bailer or tubing. The ground water samples are decanted into the appropriate containers supplied by the analytic laboratory. Samples are labeled, placed in protective foam sleeves, stored on crushed ice at or below 4° C, and transported under chain-of-custody to the laboratory.

Discrete Depth Soil and Ground Water Sampling

Soil and groundwater samples are collected for lithologic and chemical analysis using a direct driven, dual tube soil coring system. A hydraulic hammer drives sampling rods into the ground to collect continuous soil cores. Two nested sampling rods are driven at the same time: a larger diameter outer rod to act as a temporary drive casing and a smaller inner rod to retrieve soil cores. As the rods are advanced the soil is driven into a sample barrel that is attached to the end of the inner rod. The outer rod ensures that the sample is collected from the desired interval by preventing sloughing of the overlying material. After reaching the desired depth the inner rods are removed from the boring and the sleeves containing the soil sample are removed from the inner sample barrel. Sampling tubes chosen for analysis are trimmed of excess soil and capped with Teflon[®] tape and plastic end caps. Soil samples are labeled and stored at or below 4°C on either crushed or dry ice, depending upon local regulations. Samples are transported under chain-of-custody to a State-certified analytic laboratory.

When collecting groundwater samples, the sample barrel and inner rods are removed from the boring once the targeted water bearing zone has been reached. The drive casing is pulled up from 0.5 to 5 feet to allow groundwater to enter the borehole. Small diameter well casing and screen is then installed in the borehole to facilitate sample collection. The drive casing is then pulled up sufficiently to expose the desired length of screen and samples are collected using a bailer, peristaltic, bladder or inertial pump. The ground water samples are decanted into the appropriate containers supplied by the analytic laboratory. Samples are labeled, placed in protective foam sleeves, stored on crushed ice at or below 4° C, and transported under chain-of-custody to the laboratory.

Duplicates and Blanks

Blind duplicate water samples are usually collected only for monitoring well sampling programs, at a rate of one blind sample for every 10 wells sampled. Laboratory-supplied trip blanks accompany samples collected for all sampling programs to check for cross-contamination caused by sample handling and transport. These trip blanks are analyzed if the internal laboratory quality assurance/quality control (QA/QC) blanks contain the suspected field contaminants. An equipment blank may also be analyzed if non-dedicated sampling equipment is used.

CAMBRIA

Grouting

If the borings are not completed as wells, the borings are filled to the ground surface with cement grout poured or pumped through a tremie pipe. If the dual tube system is used, the borings are filled to the ground surface with cement grout poured or pumped through the dual tube casing.

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