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December 17, 2001

#3849/487

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

Re: **Subsurface Investigation Work Plan**
Shell-branded Service Station
105 Fifth Street
Oakland, California
Incident #98995757
Cambria Project #243-0472

DEC 19 2001

Dear Mr. Chan:

Cambria Environmental Technology, Inc. (Cambria) is submitting this *Subsurface Conduit Investigation Work Plan* on behalf of Equiva Services LLC in response to a phone conversation between you and Cambria on November 21, 2001. As you requested, the work plan proposes to further define the onsite and offsite extent of hydrocarbon-impacted soil and groundwater. The site background and proposed scope of work are presented below.

SITE BACKGROUND

Location: This active Shell-branded service station is located on the western corner of the Fifth Street and Oak Street intersection in Oakland, California. The site is surrounded by commercial property (Figures 1 and 2).

1996 Upgrade Activities: During November and December of 1996, Armer/Norman & Associates of Walnut Creek, California removed five gasoline dispensers, two diesel dispensers, associated piping and inactive piping to a former diesel fuel dispenser. Armer/Norman & Associates replaced the gasoline and diesel dispensers and associated piping with additional secondary containment. On November 27, 1996, Cambria collected soil samples 5 feet below grade (fbg) beneath the seven dispenser locations and the inactive diesel fuel piping prior to replacement. Sample locations from all past investigations are shown on Figure 2 and soil sample results from all past investigations are shown in Table 1. After receiving analytical results indicating the presence of hydrocarbons, Shell Oil filed an *Underground Storage Tank Unauthorized Release Site Report* with the Alameda County Health Care Services Agency.

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1998 Upgrade Activities: In February 1998, Paradiso Mechanical of San Leandro, California installed secondary containment on the turbine sumps. Since secondary containment had previously been added to the dispensers, no additional dispenser upgrade activities were performed. Cambria inspected the tank pit on February 26, 1998, and no field indications of hydrocarbons, such as staining or odor, were observed.

1998 Subsurface Investigation: On July 23, 1998, Cambria advanced three borings in the assumed downgradient direction from existing dispensers and two borings in the assumed upgradient direction from the existing dispensers (SB-1 through SB-5). The soil borings were advanced to depths of 11.0 to 12.0 fbg (Figure 2, Table 1).

1999 Monitoring Well Installations: On May 14, 1999, Cambria installed three groundwater monitoring wells (MW-1, MW-2 and MW-3) to a depth of 25 fbg (Figure 2, Table 1).

2000 Remedial Activities: Monthly mobile dual-phase vapor extraction (DVE), using wells MW-2 and MW-3, was initiated at the site on April 21, 2000 to remediate methyl tert butyl ether (MTBE) in soil and groundwater. DVE is the process of applying a high vacuum through an airtight well seal to simultaneously extract soil vapors from the vadose zone and enhance groundwater extraction from the saturated zone. A stinger is lowered into the well to draw down the water table and increase the unsaturated area available for soil vapor extraction. Mobile DVE utilitizes a vacuum truck as an extraction device, moisture separator, and temporary storage tank. Extracted soil vapors pass through the vacuum truck tank, and are abated through carbon filtration. Abatement of the extracted soil vapors through carbon filtration was determined to be inadequate. Therefore, mobile DVE was discontinued after October 26, 2000.

2001 Offsite Subsurface Investigation: On February 12, 2001, Cambria advanced three soil borings (SB-6 and SB-7) and converted one into a groundwater monitoring well (MW-4) constructed to a depth of 25 fbg (Figure 2, Table 1).

2001 DVE Pilot Test: On March 20, 2001, Cambria performed individual short-term DVE testing of MW-2 and MW-3. For each test, groundwater and vapor samples were collected for laboratory analysis. Vapor extraction data from the DVE pilot test indicated vapor-phase petroleum hydrocarbon recovery is possible, although expected recovery rates are relatively low. Groundwater extraction data from the DVE pilot test suggested liquid-phase petroleum hydrocarbon recovery is feasible. Based on the test data and conclusions presented, Cambria recommended conducting semi-monthly groundwater extraction from backfill well T-1 for a period of 6 months by means of a vacuum truck. Details of the DVE pilot test are presented in Cambria's July 17, 2001 *Dual-Phase Vacuum Extraction Pilot Test Report.*

Groundwater Depth and Flow Direction: Depth to groundwater has ranged from 4.5 to 6.5 fbg since groundwater monitoring was initiated in November of 1999. The groundwater gradient is generally to the southeast. A rose diagram showing past groundwater flow directions is presented on Figure 2.

PROPOSED SCOPE OF WORK

To further define the lateral extent of hydrocarbons and oxygenates in groundwater downgradient of the product dispenser islands, Cambria proposes installing a monitoring well downgradient of the northeastern dispenser-island (Figure 2). The monitoring well will be constructed similarly to the other onsite monitoring wells (MW-1, MW-2, and MW-3) and as described in our standard field procedures for monitoring wells, included as Attachment A.

As stated in Cambria's *Offsite Subsurface Investigation* report dated June 7, 2001, impacted groundwater from the site may have infiltrated the downgradient sewer and storm drain trenches and flowed preferentially within the more permeable backfill. To define the lateral extent of hydrocarbons in downgradient soil and groundwater, Cambria proposes advancing five geoprobe soil borings adjacent to the conduit trenches in Oak Street (Figure 2). Soil boring details are discussed below. all next to the sanitary sewer

Upon Alameda County Health Care Services Agency (ACHCSA) approval of this work plan, Cambria will complete the following tasks:

Utility Location: Cambria will notify Underground Service Alert (USA) of our drilling activities. USA will have the utilities in the vicinity identified. Cambria plans to visit the site along with appropriate utility company representatives to properly verify the utility trench location, depth, and conduit and trench backfill material before drilling in this sensitive area.

Permits: We will obtain necessary permits for soil boring installation and encroachment permits with the City of Oakland for drilling in Oak Street.

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

Monitoring Well Installation Activities: Using a hollow-stem auger rig, Cambria will install a 4-inch diameter, 24-feet deep well. Soil samples will be collected at 5-foot depth intervals for lithologic logging purposes. Selected soil samples will be submitted for chemical analysis based on field observations. Blaine Tech Services, of San Jose, California will develop the well

following installation and at least 72 hours prior to sampling. Well sampling will be performed during the following quarterly groundwater-monitoring event. Our standard field procedures for monitoring well installation are presented in Attachment A.

Soil Borings and Sampling Activities: Using a Geoprobe rig, Cambria will advance five soil borings a total depth of 15 fbg. A capillary fringe soil sample and a grab groundwater sample will be collected from each boring. Following sample collection, the borings will be grouted to the surface with neat-cement grout. Our standard field procedures for Geoprobe sampling are presented as Attachment A.

Laboratory Analyses: Grab-groundwater and selected soil samples from the borings will be analyzed for total petroleum hydrocarbons as gasoline, benzene, toluene, ethylbenzene, xylenes, and MTBE by EPA Method 8260B.

Subsurface Investigation Report: After the analytical results are received, Cambria will prepare a report that, at a minimum, will contain:

- A summary of the site background and history;
- Descriptions of drilling and sampling activities;
- Boring and well logs;
- Tabulated analytical results;
- A figure presenting new boring and well locations;
- Analytical reports and chain-of-custody forms; and
- A discussion of hydrocarbon distribution.

CLOSING

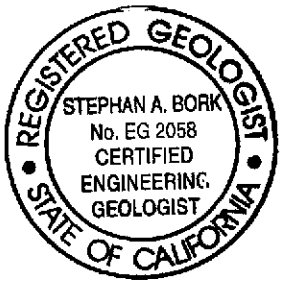
Please call James Loetterle at (510) 420-3336 if you have any questions or comments. Thank you for your assistance.

Sincerely,
Cambria Environmental Technology, Inc.

Stephan Bork

for: James Loetterle
Project Geologist

Stephan A. Bork, C.E.G., C.H.G.
Associate Hydrogeologist



Figures: 1 - Vicinity/Well Survey Map
2 - Site Plan with Proposed Monitoring Well and Soil Boring Locations

Table: 1 - Soil Analytical Data

Attachment: A - Standard Field Procedures for Geoprobe Sampling and Monitoring Well Installation

cc: Karen Petryna, Equiva Services LLC, P.O. Box 7869, Burbank CA 91510-7869

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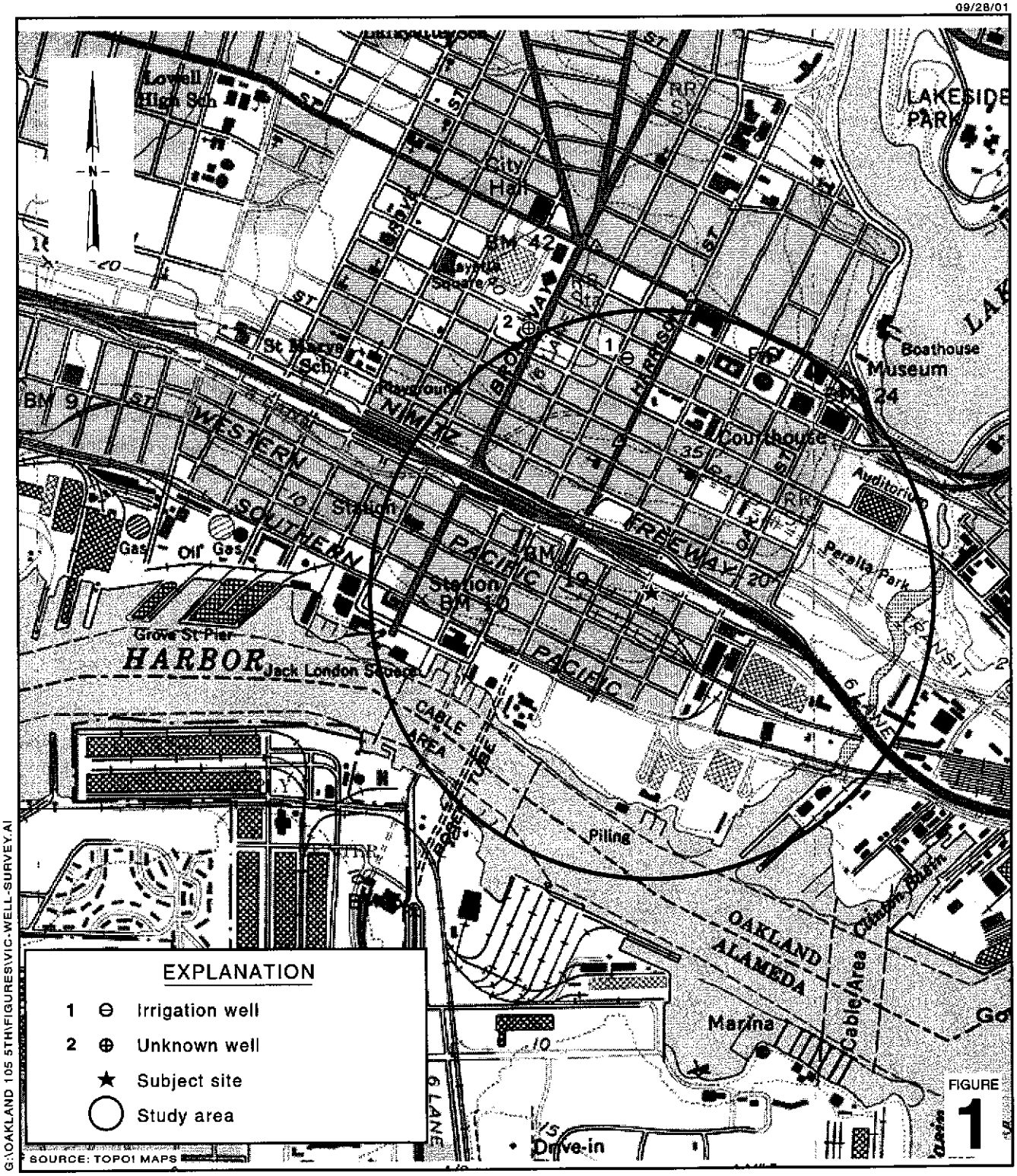

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FIGURE **1**

Shell-branded Service Station
105 Fifth Street
Oakland, California
Incident# 98995757

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Vicinity / Well Survey Map

(1/2 Mile Radius)

12/14/01

Site Plan with Proposed Monitoring Well and Soil Boring Locations

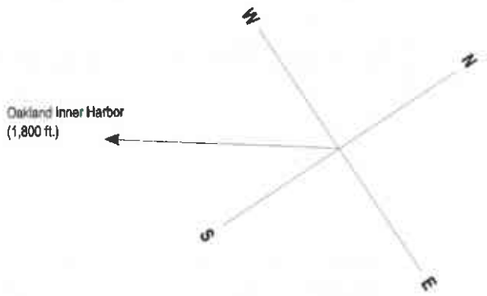
EXPLANATION

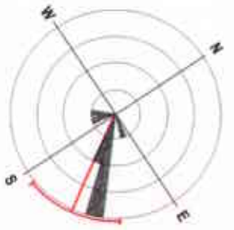
- Proposed monitoring well location
- Proposed soil boring location
- MW-1 — Monitoring well location
- T-1 — Tank backfill well location
- SB-1 — Soil boring location (7/98)
- SB-6 — Soil boring location (2/01)
- D-1 — Soil sample location
- Storm drain line
- Sanitary sewer line
- Flow direction
- MH — Manhole
- Storm drain inlet
- fbg — Feet below grade

All utility locations are approximate. Utility information was reported by Cambria during June 2001.

Location of Sensitive Receptor Relative to Site
(Oakland Inner Harbor - 1,800 ft. S 36° W)

Oakland Inner Harbor
(1,800 ft.)





Groundwater Flow Direction
(07/23/99 to 07/09/01)

0 20 40 80
Scale (ft)

MW-4

SB-6 SB-7

FOURTH STREET

880 ON RAMP

FIGURE
2

Shell-branded Service Station
105 Fifth Street
Oakland, California
Incident #98995777

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STANDARD FIELD PROCEDURES FOR MONITORING WELLS

This document describes Cambria Environmental Technology's standard field methods for drilling, installing, developing and sampling groundwater monitoring wells. These procedures are designed to comply with Federal, State and local regulatory guidelines. Specific field procedures are summarized below.

Well Construction and Surveying

Groundwater monitoring wells are installed in soil borings to monitor groundwater quality and determine the groundwater elevation, flow direction and gradient. Well depths and screen lengths are based on groundwater depth, occurrence of hydrocarbons or other compounds in the borehole, stratigraphy and State and local regulatory guidelines. Well screens typically extend 10 to 15 feet below and 5 feet above the static water level at the time of drilling. However, the well screen will generally not extend into or through a clay layer that is at least three feet thick.

Well casing and screen are flush-threaded, Schedule 40 PVC. Screen slot size varies according to the sediments screened, but slots are generally 0.010 or 0.020 inches wide. A rinsed and graded sand occupies the annular space between the boring and the well screen to about one to two ft above the well screen. A two feet thick hydrated bentonite seal separates the sand from the overlying sanitary surface seal composed of Portland type I,II cement.

Well-heads are secured by locking well-caps inside traffic-rated vaults finished flush with the ground surface. A stovepipe may be installed between the well-head and the vault cap for additional security. The well top-of-casing elevation is surveyed with respect to mean sea level and the well is surveyed for horizontal location with respect to an onsite or nearby offsite landmark.

Well Development

Wells are generally developed using a combination of groundwater surging and extraction. Surging agitates the groundwater and dislodges fine sediments from the sand pack. After about ten minutes of surging, groundwater is extracted from the well using bailing, pumping and/or reverse air-lifting through an eductor pipe to remove the sediments from the well. Surging and extraction continue until at least ten well-casing volumes of groundwater are extracted and the sediment volume in the groundwater is negligible. This process usually occurs prior to installing the sanitary surface seal to ensure sand pack stabilization. If development occurs after surface seal installation, then development occurs 24 to 72 hours after seal installation to ensure that the Portland cement has set up correctly.

All equipment is steam-cleaned prior to use and air used for air-lifting is filtered to prevent oil entrained in the compressed air from entering the well. Wells that are developed using air-lift evacuation are not sampled until at least 24 hours after they are developed.

Groundwater Sampling

Depending on local regulatory guidelines, three to four well-casing volumes of groundwater are purged prior to sampling. Purging continues until groundwater pH, conductivity, and temperature have stabilized. Groundwater samples are collected using bailers or pumps and 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. Laboratory-supplied trip blanks accompany the samples and are analyzed to check for cross-contamination. An equipment blank may be analyzed if non-dedicated sampling equipment is used.

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.

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.

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.

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STANDARD FIELD PROCEDURES FOR GEOPROBE® 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.

ATTACHMENT A

Standard Field Procedures for Geoprobe Sampling and Monitoring Well Installation