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September 16, 2002

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

Alameda County
SEP 19 2002
Environmental Health

Re: **Subsurface Investigation Work Plan**
Shell-branded Service Station
630 High Street
Oakland, California
Incident #98995751
Cambria Project #244-0318

Dear Mr. Chan:

On behalf of Equilon Enterprises LLC dba Shell Oil Products US (Shell), Cambria Environmental Technology, Inc. (Cambria) is submitting this *Subsurface Investigation Work Plan*. Shell is voluntarily submitting this work plan based on the elevated methyl tertiary butyl ether (MTBE) concentrations recently detected in onsite well MW-3. The purpose of this work plan is to further define the extent of MTBE impact northwest of the site. Presented below are the site summary, site background and the proposed scope of work.

## SITE SUMMARY

***Site Location:*** This active Shell-branded service station is located on the western corner of the intersection of High Street and Jensen Street in Oakland, California, adjacent to Interstate Highway 880 (Figures 1 and 2). The site is surrounded primarily by commercial and industrial development.

***Site Lithology:*** The site is predominantly underlain by interbedded silty clay, sandy clay, clayey sand, silty sand and sands to the total depth explored of 25 feet below grade (fbg).

***Groundwater Depth and Flow Direction:*** Historically, groundwater depth has ranged from approximately 3.9 to 13.2 fbg. Groundwater flow direction at the site typically ranges from west to northwest.

Oakland, CA
San Ramon, CA
Sonoma, CA

**Cambria Environmental Technology, Inc.**

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## Soil and Groundwater Investigation Summary

***January 1989 Dispenser and Piping Removal and Replacement, and Waste Oil Tank Removal:*** In January 1989, soil samples were collected from beneath each of the dispensers and product piping runs at the site during dispenser and piping replacement. Maximum reported concentrations in soil of total petroleum hydrocarbons as gasoline (TPHg) and benzene were 75 parts per million (ppm) and 3.6 ppm, respectively. A soil sample collected from beneath the waste oil tank contained 600 ppm total oil and grease.

***February 1989 Waste Oil Tank Overexcavation:*** In February 1989, additional excavation was completed around the former waste oil tank. Soil samples collected from the excavation contained a maximum of 41 ppm total petroleum hydrocarbons as diesel (TPHd). A grab groundwater sample collected from the open excavation contained 1,800 parts per billion (ppb) TPHg, 170 ppb benzene and 200 ppb TPHd.

***April 1989 Subsurface Investigation:*** In April 1989, Converse Environmental Consultants California (CECC) of San Francisco, California installed two soil borings (S-1 and S-2) within the former underground storage tank pit and four monitoring wells (MW-1, MW-2, MW-3 and MW-4) at the site. The maximum TPHd, TPHg and benzene concentrations reported in soil samples collected were 27 ppm, 63 ppm and 0.046 ppm, respectively.

***August 1989 Subsurface Investigation:*** In August 1989, Converse Environmental West (CEW) (formerly CECC) installed one soil boring (S-3) and four monitoring wells (MW-5, MW-6, MW-7 and MW-8) at the site. No TPHd, TPHg or benzene was reported in the soil samples collected during this investigation.

***November 1989 Subsurface Investigation:*** In November 1989, CEW installed one soil boring (SB-4) and two monitoring wells (MW-9 and MW-10) at the site. Maximum TPHd concentration reported in soil samples collected was 380 ppm in the soil sample collected from 9 fbg in monitoring well MW-10. No TPHg or benzene was reported in the soil samples collected during this investigation.

***2001 Sensitive Receptor Survey:*** During the fourth quarter 2001, Shell voluntarily requested that Cambria conduct a sensitive receptor survey for the site vicinity. Cambria identified surface water bodies and known water producing wells within a ½-mile radius of the site. Based on a review of the USGS Oakland West Quadrangle topographic map, the nearest surface water body is a tidal canal, with the closest point located approximately 1,400 feet southwest of the site.

Cambria also reviewed California Department of Water Resources (DWR) files to locate records of municipal and private wells within a ½-mile radius of the site. The DWR provided 13 well

completion report forms or equivalents, some of which documented multiple wells. Forms were provided for one boring, and for nine test holes and one well of unknown use installed in one location (Figure 1). In addition, one form was provided for nine test holes at an unidentified location, and one form was provided which listed only lithology up to a depth of 286 fbg with no legible location or use information. The remaining nine reports provided by the DWR were for wells located outside the study area, none of which are shown on Figure 1. Results of the well survey were reported in Cambria's February 8, 2002 *Fourth Quarter 2001 Monitoring Report.*

***Groundwater Monitoring:*** Groundwater monitoring has been ongoing at this site since the first quarter 1991. Up to 15,000 ppb TPHg, 2,410 ppb benzene and 38,000 ppb MTBE have been reported in groundwater samples collected at the site. During the third quarter 2002, the maximum TPHg, benzene and MTBE concentrations detected in groundwater samples collected at the site were 8,600 ppb, 290 ppb and 2,100 ppb, respectively. The results of quarterly monitoring events are summarized in quarterly monitoring reports prepared by Cambria.

## PROPOSED SCOPE OF WORK

Due to the elevated MTBE concentrations detected in onsite monitoring well MW-3, Cambria recommended additional investigation in our August 6, 2002 *Second Quarter 2002 Monitoring Report.* To evaluate the presence of preferential groundwater migration pathways, Cambria recommends completing a subsurface utility survey for the site vicinity. Following the utility survey, Cambria recommends the installation of several soil borings in the general downgradient direction of the site to better define the northwestern extent of MTBE in groundwater. Tentative proposed soil boring locations are shown on Figure 2; these locations may be modified based on the results of the utility survey and site access limitations. Cambria's scope of work for this investigation will include the following tasks:

### Utility Survey

Cambria will obtain and review all available utility maps for locations and approximate depths of any existing utility trenches in the site vicinity. In addition, Cambria will perform a field search to identify and verify conduit trenches. The information collected will be compared against known ranges of groundwater depths to determine if preferential migration of groundwater due to subsurface utilities is possible. Based on the results of this survey and evaluation, amended boring locations for the subsequent investigation may be submitted in an addendum to the Alameda County Health Care Services for approval.

## Subsurface Investigation

***Utility Location:*** Cambria will notify Underground Services Alert (USA) of our drilling activities, and USA will identify utilities in the site vicinity.

***Site Health and Safety Plan:*** Cambria will prepare a comprehensive site safely plan to protect site workers. The plan will be reviewed and signed by each site worker and kept onsite during field activities.

***Permits:*** Cambria will obtain the required boring installation permits from the Alameda County Public Works Department and encroachment permits from the City of Oakland.

***Soil Borings:*** Assuming the absence of subsurface and overhead obstructions, Cambria will use a direct-push drill rig to advance five soil borings in the approximate locations shown on Figure 2. The borings will be advanced to approximately 20 fbg. Soil will be continuously cored for lithologic logging purposes, and soil samples will be collected for chemical analysis at approximate 5-foot intervals. All collected soil samples will be transported to a State-approved analytical laboratory. Cambria's standard field procedures for soil boring installation are included as Attachment A.

***Grab Groundwater Sampling:*** Grab groundwater samples will be collected at first encountered groundwater from the open borehole using a disposable bailer and at approximately 20 fbg using a hydropunch screen. All collected grab groundwater samples will be transported to a State-approved analytical laboratory.

***Boring Backfill:*** Following soil and grab groundwater sampling, the borings will be backfilled with cement grout to total depth and capped to match the existing grade.

***Chemical Analysis:*** Selected soil and grab groundwater samples will be analyzed by a State-certified analytical laboratory for TPHg, benzene, toluene, ethylbenzene, xylenes, and MTBE by EPA Method 8260.

## Reporting

Upon receipt of the analytical results, Cambria will prepare a report that, at a minimum, will contain:

- A summary of the site background and history;
- Results of the utility survey;
- Descriptions of the drilling and sampling methods;
- Boring logs;
- Tabulated soil and grab groundwater analtical results;

- Analytical reports and chain-of-custody forms; and
- Cambria's conclusions and recommendations.

### Schedule

Upon receiving written work plan approval, permits will be acquired and the field activities will be scheduled. An investigation report will be submitted approximately 60 days after completing the field activities.

### CLOSING

We appreciate the opportunity to work with you on this project. Please call Jacquelyn Jones at (510) 420-3316 if you have any questions or comments.

Sincerely,
**Cambria Environmental Technology, Inc**

Jacquelyn L. Jones
Project Geologist

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

REGISTERED PROFESSIONAL ENGINEER
MATTHEW W. DERBY
No. C055475
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CIVIL
STATE OF CALIFORNIA

Figures: 1 - Vicinity/Area Well Survey Map
2 - Proposed Soil Boring Location Map

Attachment: A - Standard Field Procedures for Soil Boring Installation

cc: Karen Petryna, Shell Oil Products US, P.O. Box 7869, Burbank, California 91510-7869

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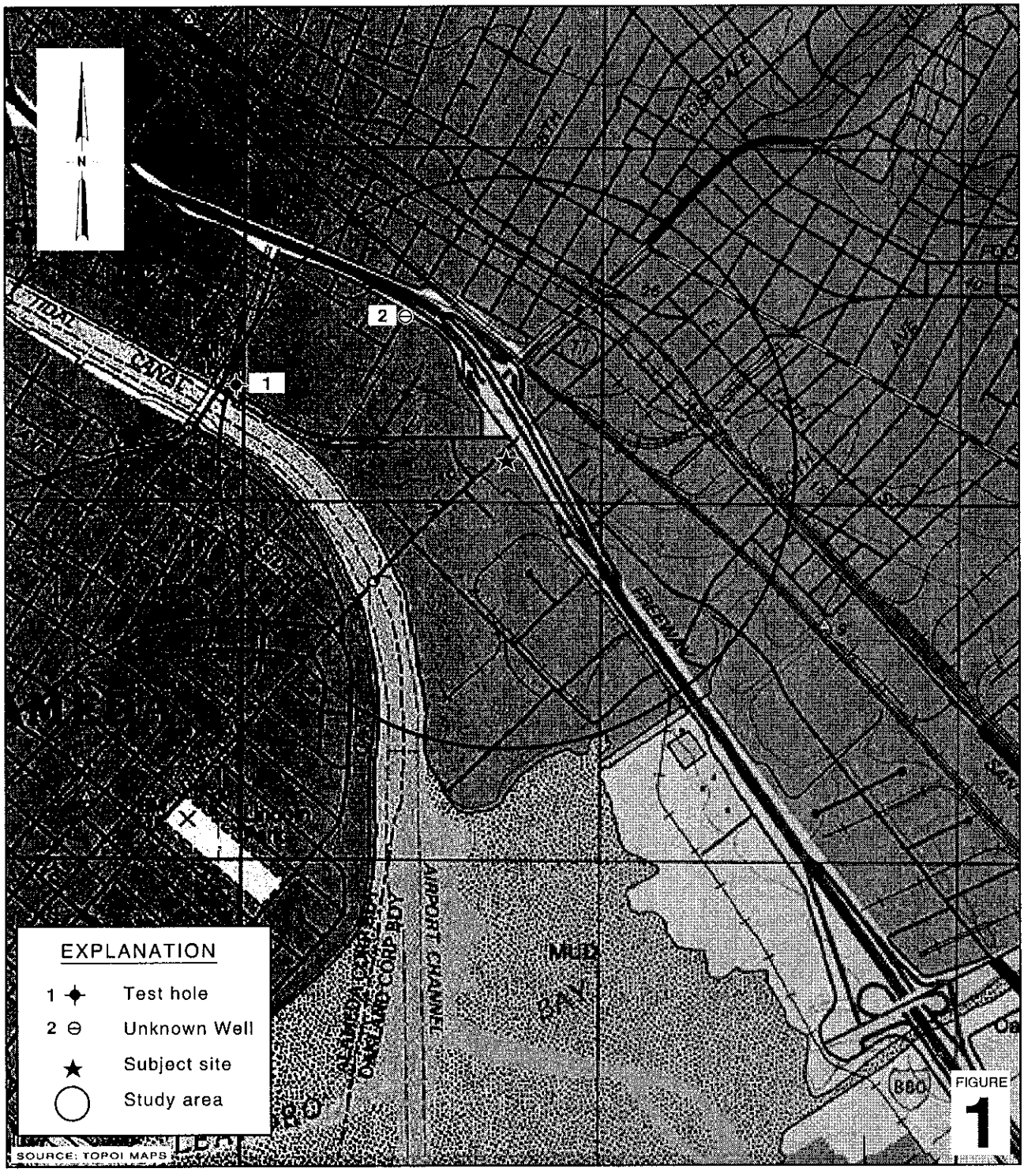


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0 1/8 1/4 1/2 1

SCALE : 1" = 1/4 MILE

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

08/23/02

# Proposed Soil Boring Location Map

ALAMEDA (WASHINGTON) AVENUE

EAST 8TH STREET

HWY. 880 OFF-RAMP

HWY. 880 (ELEVATED)

HIGH STREET

OAKPORT STREET

HOWARD STREET

JENSEN STREET

vacant

vacant

grass

Pursel Quality Paints

High Street Auto Cleaning

former excavation area

former USTs

cashier

pump islands

USTs

carwash/ building

sidewalk

planter

MW-1

MW-2

MW-3

MW-4

MW-5

MW-6

MW-7

MW-8

MW-9

MW-10

MH

SD

E

W

T

N

W

E

S

Groundwater Flow Direction
(2Q98 to 1Q02)

## EXPLANATION

- Proposed soil boring location
- MW-1 Monitoring well location
- Overhead Electrical line (E)
- Overhead Telephone line (T)
- Water line (W)
- City of Oakland Electrical vault (E)
- Water vault (W)
- City of Oakland Manhole (MH)
- Utility Pole
- Storm Drain inlet (SD)

0 30 60 120

Scale (ft)

FIGURE

**2**

**Shell-branded Service Station**
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# ATTACHMENT A

Standard Field Procedures for Soil Boring Installation

# CAMBRIA

## STANDARD FIELD PROCEDURES FOR SOIL BORINGS

This document describes Cambria Environmental Technology's standard field methods for drilling and sampling soil borings. 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:

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

### Soil Boring and Sampling

Soil borings are typically drilled using hollow-stem augers or hydraulic push technologies. At least one and one half ft of the soil column is collected for every five ft of drilled depth. Additional soil samples are collected near the water table and at lithologic changes. Samples are collected using lined split-barrel or equivalent samplers driven into undisturbed sediments beyond the bottom of the borehole. The vertical location of each soil sample is determined by measuring the distance from the middle of the soil sample tube to the end of the drive rod used to advance the split barrel sampler. All sample depths use the ground surface immediately adjacent to the boring as a datum. The horizontal location of each boring is measured in the field from an onsite permanent reference using a measuring wheel or tape measure.

Drilling and sampling equipment is steam-cleaned 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.

### Field Screening

One of the remaining tubes is partially emptied leaving about one-third of the soil in the tube. The tube is capped with plastic end caps and set aside to allow hydrocarbons to volatilize from the soil. After ten to fifteen minutes, a portable photoionization detector (PID) measures volatile hydrocarbon vapor concentrations in the tube headspace, extracting the vapor through a slit in the cap. PID measurements are used along with the field observations, odors, stratigraphy and ground water depth to select soil samples for analysis.

### Water Sampling

Water samples, if they are collected from the boring, are either collected using a driven Hydropunch type sampler or are collected from the open borehole using bailers. 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 collected 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 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.

### Waste Handling and Disposal

Soil cuttings from drilling activities are usually stockpiled onsite on top of and covered by plastic sheeting. At least four individual soil samples are collected from the stockpiles for later compositing at the analytic laboratory. The composite sample is analyzed for the same constituents analyzed in the borehole samples. Soil cuttings are transported by licensed waste haulers and disposed in secure, licensed facilities based on the composite analytic results.

Ground water removed during sampling and/or rinsate generated during decontamination procedures are stored onsite in sealed 55 gallon drums. Each drum is labeled with the drum number, date of generation, suspected contents, generator identification and consultant contact. Disposal of the water is based on the analytic results for the well samples. The water is either pumped out using a vacuum truck for transport to a licensed waste treatment/disposal facility or the individual drums are picked up and transported to the waste facility where the drum contents are removed and appropriately disposed.