CAMBRIA

October 27, 1998

Mr. Barney Chan
Alameda County Health Care Services Agency
Department of Environmental Health
1131 Harbor Bay Parkway, Suite 250
Alameda, California 94502-6577

Re: **Investigation Work Plan**
Former Shell Service Station
2001 Fruitvale Avenue
Oakland, California
WIC# 204-5508-2105
Cambria Project# 240-1296-001

Dear Mr. Chan:

On behalf of Shell Oil Products Company (Shell), Cambria Environmental Technology, Inc. (Cambria) is submitting this work plan for a subsurface investigation at the site referenced above. Our objective is to collect the data necessary to achieve closure through a risk-based corrective action (RBCA) analysis and to define the extent of hydrocarbons in soil and ground water on the property. A site summary, our proposed scope of work, and a schedule for this investigation are presented below.

SITE SUMMARY

Site Description: The site is located at the intersection of Foothill Boulevard and Fruitvale Avenue in Oakland, California. The site is currently a vacant lot, and all underground storage tanks (USTs) have been removed.

January 1996 Soil and Ground Water Investigation: On January 3, 1996, AllCal Property Services, Inc. of Hayward, California drilled five soil borings on site (Figure 1). The area beneath the former UST complex contained the highest detected hydrocarbon concentrations at 830 milligrams per kilogram (mg/kg) total petroleum hydrocarbons as gasoline (TPHg) and 410 mg/kg total petroleum hydrocarbons as diesel (TPHd) in soil at 21 feet below ground surface (ft bgs) and 3,400 micrograms per liter (μg/L) TPHg, 40,000 μg/L TPHd, and 9.6 μg/L benzene in ground water.

Ground Water Depth: Ground water depth on site is approximately 21.5 to 23 ft bgs.

Oakland, CA
Sonoma, CA
Portland, OR
Seattle, WA

Cambria Environmental Technology, Inc.

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Lithology: The site subsurface consists of several inches of fill material underlain primarily by sand to a depth of 4 to 8 ft bgs, then sandy, gravelly clay to a depth of 15 to 20 ft bgs, and gravelly sand to a maximum explored depth of 26.5 ft bgs.

PROPOSED SCOPE OF WORK

To delineate the extent of hydrocarbons in soil and ground water beneath the site, we propose drilling three soil borings in the vicinity of the former waste oil UST and near the property boundaries along Foothill Boulevard and Fruitvale Avenue (Figure 1).

Our scope of work for this investigation includes the following tasks:

Utility Location: Cambria will notify Underground Service Alert (USA) at least 48 hours in advance of our drilling activities. USA will have the utilities in the site vicinity identified.

Site Health and Safety Plan: Cambria will prepare a site safety plan to protect site workers. The plan will be kept on site at all times and signed by all site workers.

Permits: Cambria will obtain the necessary permits for the installation of the borings from the Alameda County Public Works Agency.

Soil Borings: Cambria will drill three soil borings using a limited access GeoProbe® direct-push rig, collecting soil samples at five foot intervals and from just above the water table. We will select soil samples for chemical analysis based on observations of hydrocarbon staining and odor and on the results of field screening with a photo-ionization detector, and we will select shallow soil samples for physical analysis for use in a RBCA analysis. We will also collect grab ground water samples from the borings. Our standard field procedures are presented as Attachment A.

Chemical Analyses: Selected soil samples and the ground water sample collected in the vicinity of the former waste oil UST will be analyzed for TPHg and TPHd by modified EPA Method 8015, total oil and grease by EPA Method 418.1, benzene, toluene, ethylbenzene, and xylenes (BTEX) and methyl tert-butyl ether (MTBE) by EPA Method 8020, chlorinated hydrocarbons by EPA Method 8010, and cadmium, chromium, lead, nickel, and zinc by EPA Method 6010. Selected soil and ground water samples from the other two borings will be analyzed for TPHg and TPHd by modified EPA Method 8015 and BTEX and MTBE by EPA Method 8020. Any MTBE detected in ground water samples will be confirmed by EPA Method 8260.

8270 ? in GW

Physical Analyses: Selected soil samples will be analyzed for dry bulk density, moisture content, porosity, and fraction organic carbon.

Reporting: After we receive the analytical results, we will prepare a subsurface investigation report that, at a minimum, will contain:

- A site summary;
- Descriptions of the drilling and sampling methods;
- Boring logs;
- Tabulated soil and ground water analytical results;
- Analytical reports and chain-of-custody forms;
- Soil disposal methods;
- A discussion of the hydrocarbon distribution in soil and ground water; and,
- A RBCA analysis and request for case closure, if appropriate.

SCHEDULE

Upon receiving written approval of our work plan from Alameda County Department of Environmental Health, Cambria will obtain the necessary permits and commence drilling. We will submit our investigation report approximately four to six weeks after completing the field work.

CLOSING

We appreciate the opportunity to work with you on this project. Please call Aubrey Cool at (510) 420-3315 if you have any questions or comments.

Sincerely,
Cambria Environmental Technology, Inc.

Aubrey K Cool

Aubrey K. Cool
Staff Geologist

Diane M. Lundquist, P.E.
Principal Engineer

REGISTERED PROFESSIONAL ENGINEER
DIANE M. LUNDQUIST
No. C46725
CIVIL
STATE OF CALIFORNIA

Attachment: A - Standard Field Procedures for GeoProbe® Sampling

415-567-1171

cc: Karen Petryna, Equiva Services LLC, P.O. Box 6249, Carson, California 90749-6249
Tom Maher, Shell Oil Products Company, P.O. Box 2099, Houston, Texas 7252
David Harris, Trump, Alioto, Trump & Prescott LLP, 2280 Union Street, San Francisco, California 94123

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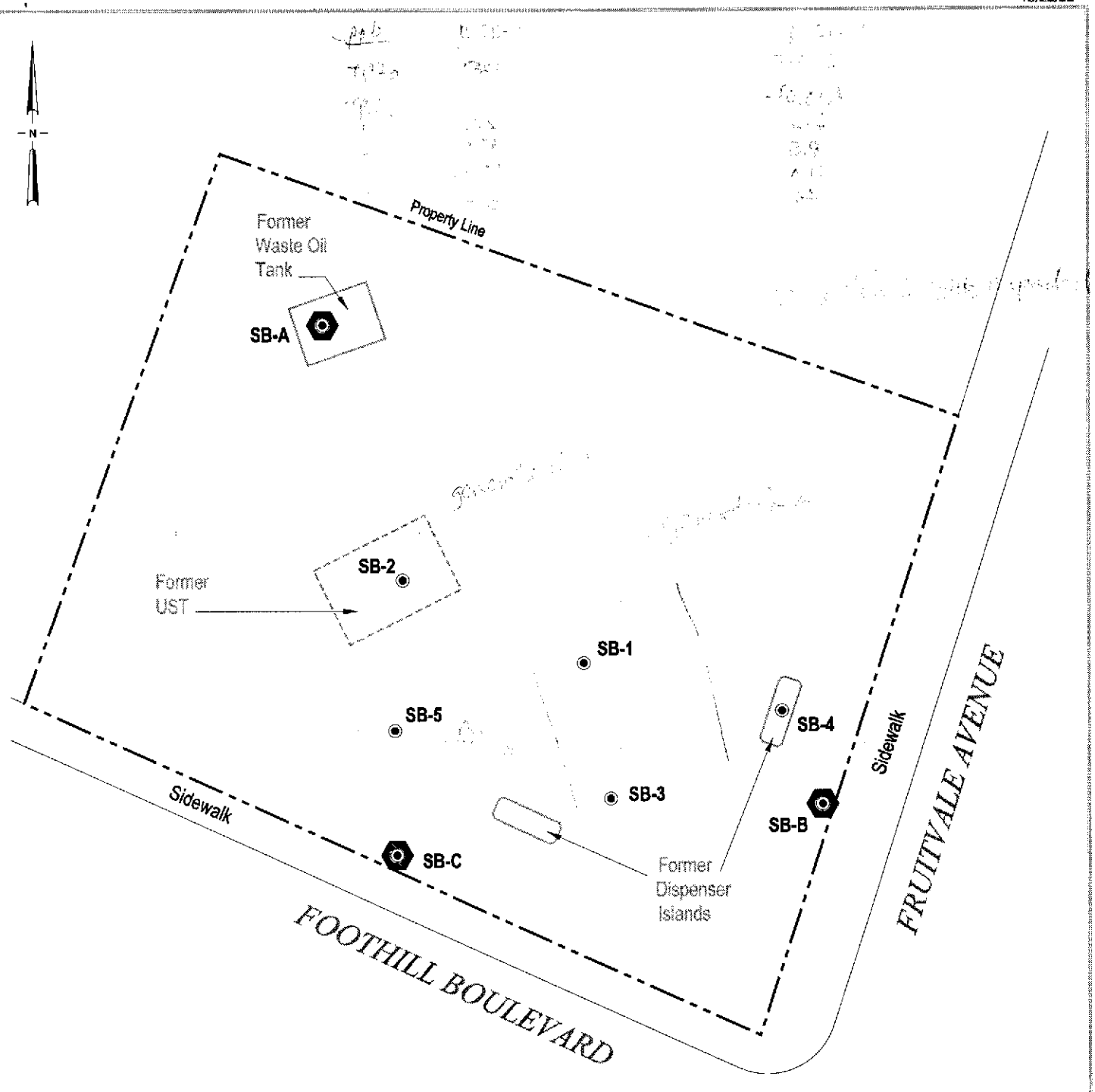
Pager. 800-462-7512



EXPLANATION

SB-A ◉ Proposed Soil Boring Location

SB-1 ◉ Previous Soil Boring Location

0 10 20

Scale (ft)

FIGURE

1

G:\OAK2001\FIGURES\PROP-BOR.DWG

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Proposed Soil Boring Locations

Comments on wp

1) Need temporary wells for spling + GW gradient (horizontal [illegible])

2) Run SBA boring for SVOCs [illegible] if TOG detected.

3/31/99 Soil sples/5' Sp w/ T. Bogle of Ambrea.

SBA 5-5, 10-, 15, 20, 22.5-23

GW @ 23', 16.82 Stabilized

All 3 borings advanced

Attachment A

Standard Field Procedures for GeoProbe® Sampling

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.

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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