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PROTECTION  
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July 22, 1997

Juliet Shin  
Alameda Health Care Services  
Department of Environmental Health  
1131 Harbor Bay Parkway, Suite 250  
Alameda, California 94502-6577

Re: **Additional Offsite Subsurface Investigation Work Plan**  
Shell Service Station  
4255 MacArthur Boulevard  
Oakland, California  
WIC #204-5510-0600  
Cambria Project #240-524-1

Dear Ms. Shin:

On behalf of Shell Oil Products Company (Shell), Cambria Environmental Technology, Inc. (Cambria) has prepared this work plan responding to a June 25, 1997 letter from the Alameda County Health Care Services Agency (ACHCSA) regarding the site referenced above. As you requested in your letter, the next phase of work includes an assessment of hydrocarbon concentrations beneath the trailer park adjacent to the site (Figure 1). This work plan includes a detailed description of the scope of work and the procedures proposed to perform that work. The background of the site was included in previous correspondence and is not duplicated here.

### PROPOSED SCOPE OF WORK

To determine the extent of hydrocarbons in soil and ground water adjacent to the site, we propose drilling two soil borings off site and down-gradient of the site and analyzing selected soil and ground water samples for petroleum hydrocarbons (Figure 1).

Our scope of work for this investigation includes:

- Updating our access agreement with the owner of the trailer park property;
- Preparing a site Health and Safety Plan, coordinating field activities, securing drilling and encroachment permits and notifying Underground Service Alert;
- Drilling two soil borings off site and down-gradient of the site in the adjacent trailer park, and;

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- Preparing an investigation report presenting the results of the soil and ground water sampling.

Specific tasks are discussed below.

**Site Health and Safety Plan:** We will prepare a comprehensive site safety plan to protect site workers. The plan will be kept on site and signed by each site worker.

**Utility Location:** Cambria will notify Underground Service Alert (USA) of our proposed drilling activities. USA will have the utilities in the site vicinity identified.

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

**Soil Boring Installation:** Two soil borings will be drilled using a Geoprobe rig. We will collect soil samples at five foot intervals, at lithologic changes, and from just above the water table. We will select soil samples for chemical analysis based on observations of staining and odor and on the results of field screening with a volatile vapor analyzer. We will also collect grab ground water samples from each of the borings. Following sampling activities, each boring will be backfilled to grade with cement grout. Our standard field procedures are presented as Attachment A.

**Chemical and Physical Analysis:** The soil and grab ground water samples will be analyzed for total petroleum hydrocarbons as gasoline (TPHg) by modified EPA Method 8015, benzene, toluene, ethylbenzene, and xylenes (BTEX), and methyl tertiary butyl ether (MTBE) by EPA Method 8020. Selected soil samples will also be analyzed for permeability, moisture content, total porosity, and organic carbon content. These analyses may be used for a RBCA in the future.

**Reporting:** After we receive the analytic results, we will prepare an investigation report that, at a minimum, will contain:

- A summary of the site background and history;
- Descriptions of the drilling, soil sampling, and ground water sampling methods;
- Boring logs;
- Geologic cross sections including the new information;
- Tabulated soil and ground water analytic results;

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- Analytic reports and chain-of-custody forms;
- Soil and water disposal methods; and,
- A discussion of the hydrocarbon distribution in soil and ground water.

### SCHEDULE

Upon receiving written approval of this work plan from the ACHCSA, Cambria will apply for the necessary permits and schedule drilling. After the report is submitted, Cambria will proceed with plans for the SVE pilot test. We will submit our investigation report about six weeks after completing the field work.

### CLOSING

We appreciate your assistance with this project. Please contact us at (510) 420-3301 if you have any questions or comments.

Sincerely,  
Cambria Environmental Technology, Inc.

  
N. Scott MacLeod, R.G.  
Principal Geologist



cc: A. E. (Alex) Perez, Shell Oil Products Company, P.O. Box 4023, Concord, California 94524

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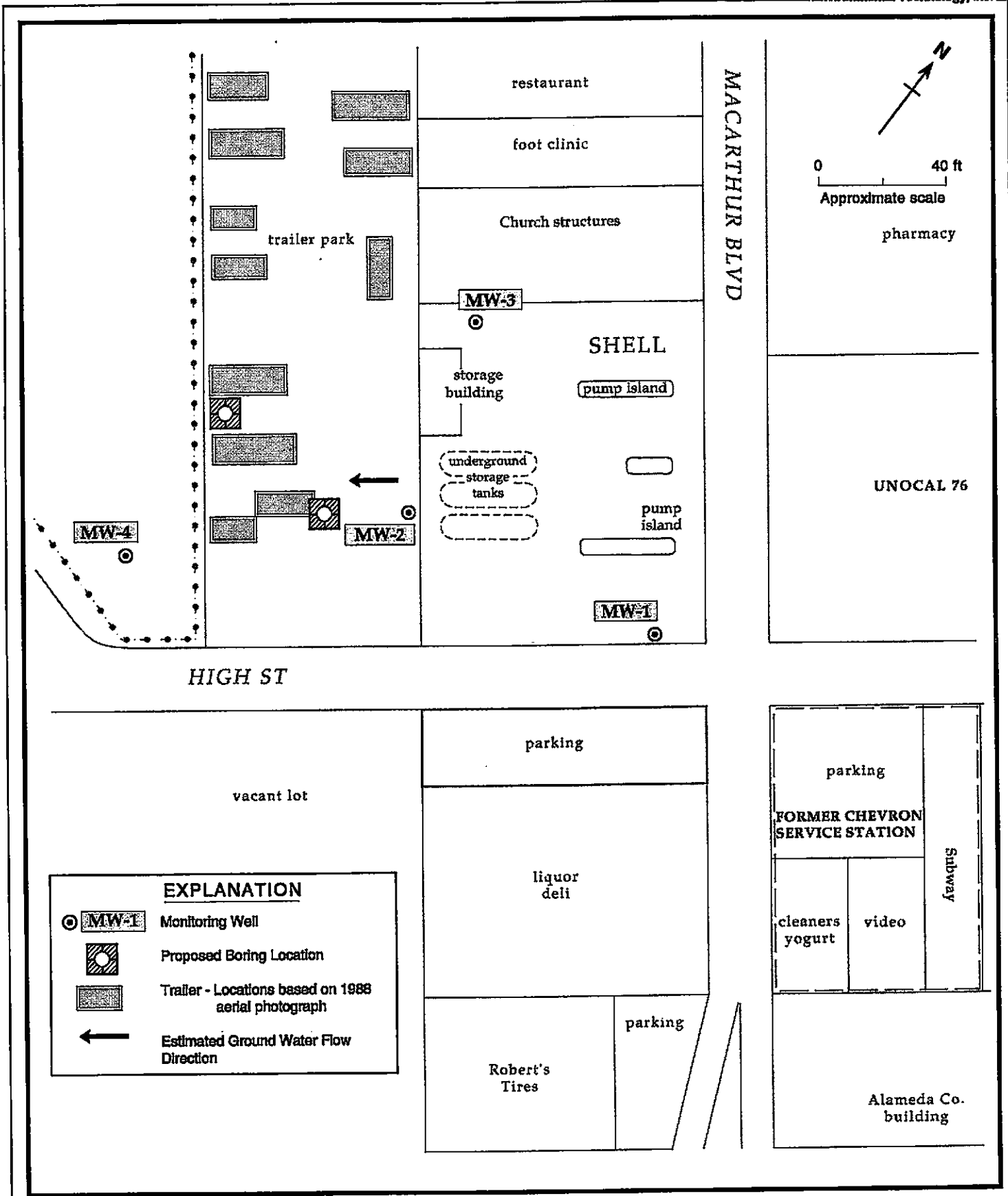


Figure 1. Site Plan and Proposed Boring Locations - Shell Service Station WIC# 204-5510-0600, 4255 MacArthur Boulevard, Oakland, California

**Attachment A**

**Standard Field Procedures for Geoprobe**

## 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

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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.