CAMBRIA

ENVIRONMENTAL PROTECTION

97 JAN -2 PM 2:14

January 2, 1997

Mr. Scott Seery
Alameda County Health Care Services Agency
1131 Harbor Bay Parkway
Alameda, California 94502

Re: **Investigation Work Plan**
Shell Service Station
4226 First Street
Pleasanton, California
WIC # 204-6138-0303

Dear Mr. Seery:

On behalf of Shell Oil Products Company (Shell), Cambria Environmental Technology, Inc. (Cambria) is submitting this work plan for a subsurface soil and water investigation at the site referenced above, as requested by your July 31, 1996 letter. The objective of this investigation is to determine whether ground water has been affected by the apparent releases from the former underground storage tank complex. A site summary and our proposed scope of work for this investigation are presented below.

SITE SUMMARY

The site is an active service station with three 10,000-gallon double-walled fiberglass gasoline underground storage tanks (USTs) and one used oil tank. The tanks were installed in 1986 after the removal of four gasoline USTs and one used oil tank.

In 1985, before the tanks were removed, Emcon Associates of San Jose, California installed soil borings between 20 and 30 ft deep near the tanks and collected soil samples. One soil boring was converted into a monitoring well of 30 ft depth. Soil samples from these borings contained up to 1300 parts per million (ppm) at 15 ft depth. No ground water was ever encountered in the monitoring well. After the removal of the gasoline USTs in 1986, Blaine Technologies of San Jose, California collected soil samples from the excavation at each end of each tank and analyzed the samples for total petroleum hydrocarbons as gasoline (TPHg) and for benzene, toluene, ethylbenzene, and xylenes (BTEX). The concentrations of TPHg in the samples ranged from 240 ppm to below detection limits. A soil sample was also collected from the used oil tank excavation; no oil was detected in this sample.

CAMBRIA
ENVIRONMENTAL
TECHNOLOGY, INC.
1144 65TH STREET,
SUITE B
OAKLAND,
CA 94608
PH: (510) 420-0700
FAX: (510) 420-9170

In March 1990, Hart Crowser, Inc. of San Francisco, California drilled three soil borings between 30 and 50 ft deep in the vicinity of the former gasoline tanks and collected soil samples. They also abandoned the monitoring well at the site by drilling it out, and they continued drilling past the depth of the monitoring well to 45 ft below the surface. Soil samples were also collected from the well abandonment boring. The soil samples from all four borings were analyzed for TPHg and BTEX. Concentrations of 380 ppm and 290 ppm TPHg were detected in the samples from the well abandonment boring at 30 and 35 ft depths, respectively. TPHg concentrations in the other soil samples were only as high as 18 ppm. In April 1990, Hart Crowser, Inc. drilled two more soil borings at the site to 51.5 ft depth and collected soil samples. In one of the borings, no TPHg was detected in any of the soil samples. In the other boring, the soil sample from 35 ft contained 820 ppm TPHg and 65 ppm benzene, and the samples from 40 ft and 50 ft had no TPHg or BTEX detected. A small amount of ground water was present at 49.5 ft in this boring. The reports from previous consultants indicate that the ground water is estimated to be between 50 and 100 ft deep in the site area.

PROPOSED SCOPE OF WORK

To determine if ground water beneath the former USTs has been impacted by petroleum hydrocarbons, we propose installing one boring in the former tank area and collecting soil samples and a grab water sample. If there is evidence of petroleum hydrocarbons in the ground water or within 15 ft of the water table, we will convert the boring into a permanent monitoring well. Our scope of work for this investigation includes the following tasks:

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

Site Health and Safety Plan: We 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: We will obtain any necessary permits for the installation of the boring/well.

Soil Boring/Well Installation: Cambria will drill one boring in the center of the former tank area. The boring will be drilled 10 ft into the water table (approximately 60 to 110 ft depth). Since the soil in this area has been well characterized between 0 and 40 ft depth, we will not collect soil samples for screening from this range. Beginning at 40 ft depth, we will collect soil samples approximately every five ft, at lithologic changes, and immediately 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 portable vapor analyzer. We will also collect a grab ground water sample from the open borehole. If there is no evidence of hydrocarbons within 15 ft of the water table, and if there is no evidence of hydrocarbons in the grab water sample, we will grout the boring. If hydrocarbons are observed in soil within 15 ft of the water table or in the grab water sample, we will install a two-

inch monitoring well screened 5 ft above and 15 ft into the water table. If a well is installed, we will develop the well using surge agitation and bailer evacuation and sample the well.

Chemical Analysis: Selected soil samples and the ground water sample will be analyzed for TPHg by modified EPA Method 8015 and for BTEX and methyl-tert-butyl-ether (MTBE) by EPA Method 8020.

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

- A summary of the site background and history;
- Descriptions of the drilling and soil sampling methods;
- Boring logs;
- Tabulated soil and ground water analytic results;
- Analytic reports and chain-of-custody forms;
- Soil and water disposal methods; and
- A discussion of the hydrocarbon distribution in soil and ground water.

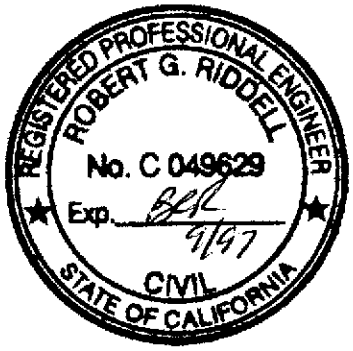
SCHEDULE

Upon receiving written approval of our work plan from the Alameda County Health Care Services Agency, Cambria will submit a cost pre-approval request form to the California UST Cleanup Fund for approval. After pre-approval by the Fund, Cambria will obtain any necessary permits and commence drilling. We will submit our investigation report about four to six weeks after completing the field work.

Please call if you have any questions or comments.

Sincerely,
Cambria Environmental Technology, Inc.

Bob Clark-Riddell, P.E.
Principal Engineer



Attachments: A - Standard Field Procedures

cc: Mr. R. Jeff Granberry, Shell Oil Products Company

F:\PROJECT\SHELL\PLE4226\WORKPLAN.WPD

CAMBRIA

Attachment A

Standard Field Procedures

STANDARD FIELD PROCEDURES FOR MONITORING WELLS

This document presents standard field methods for drilling and sampling soil borings and installing, developing and sampling ground water monitoring wells. These procedures are designed to comply with Federal, State and local regulatory guidelines. Specific field procedures are summarized below.

SOIL BORINGS

Objectives

Soil samples are collected to characterize subsurface lithology, assess whether the soils exhibit obvious hydrocarbon or other compound vapor or staining, and to collect samples for analysis at a State-certified laboratory. All borings are logged using the Unified Soil Classification System by a trained geologist working under the supervision of a California Registered Geologist (RG) or a Certified Engineering Geologist (CEG).

Soil Boring and Sampling

Soil borings are typically drilled using hollow-stem augers or push technologies such as the Geoprobe. Soil samples are collected at least every five ft to characterize the subsurface sediments and for possible chemical analysis. 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 at the bottom of the borehole.

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 Analysis

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. 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.

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.

MONITORING WELL INSTALLATION, DEVELOPMENT AND SAMPLING

Well Construction and Surveying

Ground water monitoring wells are installed to monitor ground water quality and determine the ground water elevation, flow direction and gradient. Well depths and screen lengths are based on ground water depth, occurrence of hydrocarbons or other compounds in the borehole, stratigraphy and State and local regulatory guidelines. Well screens typically extend 10 to 15 ft below and 5 ft 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 ft 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 ft 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 ground water surging and extraction. Surging agitates the ground water and dislodges fine sediments from the sand pack. After about ten minutes of surging, ground water 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 ground water are extracted and the sediment volume in the ground water 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.

Ground Water Sampling

Depending on local regulatory guidelines, three to four well-casing volumes of ground water are purged prior to sampling. Purging continues until ground water pH, conductivity, and temperature have stabilized. Ground water 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.

G:\TEMPLATE\SOPS\WELLS-GW.WPD