

C A M B R I A

SEP 18 '98 PM 3:34

September 15, 1998

Mr. Larry Seto
Alameda County
Environmental Health Services Agency
1131 Harbor Bay Parkway, Suite 250
Alameda, CA 94502-6577



Re: **Additional Investigation Work Plan**
Shell Service Station
610 Market Street
Oakland, California
WIC #204-5508-5702
Cambria Project #240-594

Dear Mr. Seto:

On behalf of Equilon Enterprises, LLC (Equilon), Cambria Environmental Technology, Inc. (Cambria) has prepared this work plan to conduct additional site investigation at the Shell-branded service station referenced above. This work plan was requested in your August 3, 1998 letter to Mr. Alex Perez of Equilon. The objective of this investigation is to further assess the horizontal and vertical extent of subsurface hydrocarbons beneath the site. Our proposed scope of work for this investigation is presented below.

PROPOSED SCOPE OF WORK

To determine the extent of hydrocarbons in soil and ground water beneath the site, we propose installing three ground water monitoring wells on site and analyzing selected soil samples for petroleum hydrocarbons (Figure 1).

Our scope of work for this investigation includes:

- Preparing a site Health and Safety Plan, coordinating field activities, securing drilling permits and notifying Underground Service Alert;
- Drilling and installing three 4-inch diameter ground water monitoring wells and collecting soil samples; and

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

**Cambria
Environmental
Technology, Inc.**

1144 65th Street
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Oakland, CA 94608
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- Preparing an investigation report presenting the results of the soil 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 underground utilities in the site vicinity identified. In addition, Cambria will arrange to have a private line locator survey the proposed drilling location for underground utilities.



Permits: We will obtain the necessary permits for the installation of the wells from the Alameda County Department of Public Works.

Monitoring Well Installation: The 4-inch diameter ground water monitoring wells will be installed using a drill rig equipped with hollow-stem augers. 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. The well will be developed using a combination of ground water surging and extraction. Following development, the well will be sampled on a quarterly basis. The well top-of-casing elevation will be surveyed with respect to mean sea level and for horizontal location with respect to an on site or nearby off site landmark. Our standard field procedures for monitoring wells are presented as Attachment A.

→ 1 sample /
season each
boring

Chemical Analysis: Selected soil samples will be analyzed for total petroleum hydrocarbons as gasoline (TPHg) by modified EPA Method 8015, and benzene, toluene, ethylbenzene, and xylenes (BTEX) and methyl tertiary butyl ether (MTBE) by EPA Method 8020. The highest MTBE concentrations detected by EPA Method 8020 in each boring will be confirmed by EPA Method 8260. Groundwater samples collected during scheduled monitoring events will be analyzed for TPHg by modified EPA Method 8015, and BTEX and MTBE by EPA Method 8020.

Reporting: Upon receipt of 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 well installation methods;

- Boring logs;
- Tabulated analytic results;
- Analytic reports and chain-of-custody forms;
- Soil and water disposal methods; and,
- A discussion of the hydrocarbon distribution in the subsurface.

SCHEDULE



Upon receiving written approval of this work plan from your office, Cambria will apply for the necessary permits and schedule drilling. We will provide you with 72-hour notice prior to field activities. We anticipate submitting our investigation report four to six weeks after completing the field work.

CLOSING

We appreciate the opportunity to work with you on this project. Please call Brian Busch at (510) 420-3312 if you have any questions or comments.

Sincerely,
Cambria Environmental Technology, Inc.

Brian Busch
Environmental Scientist

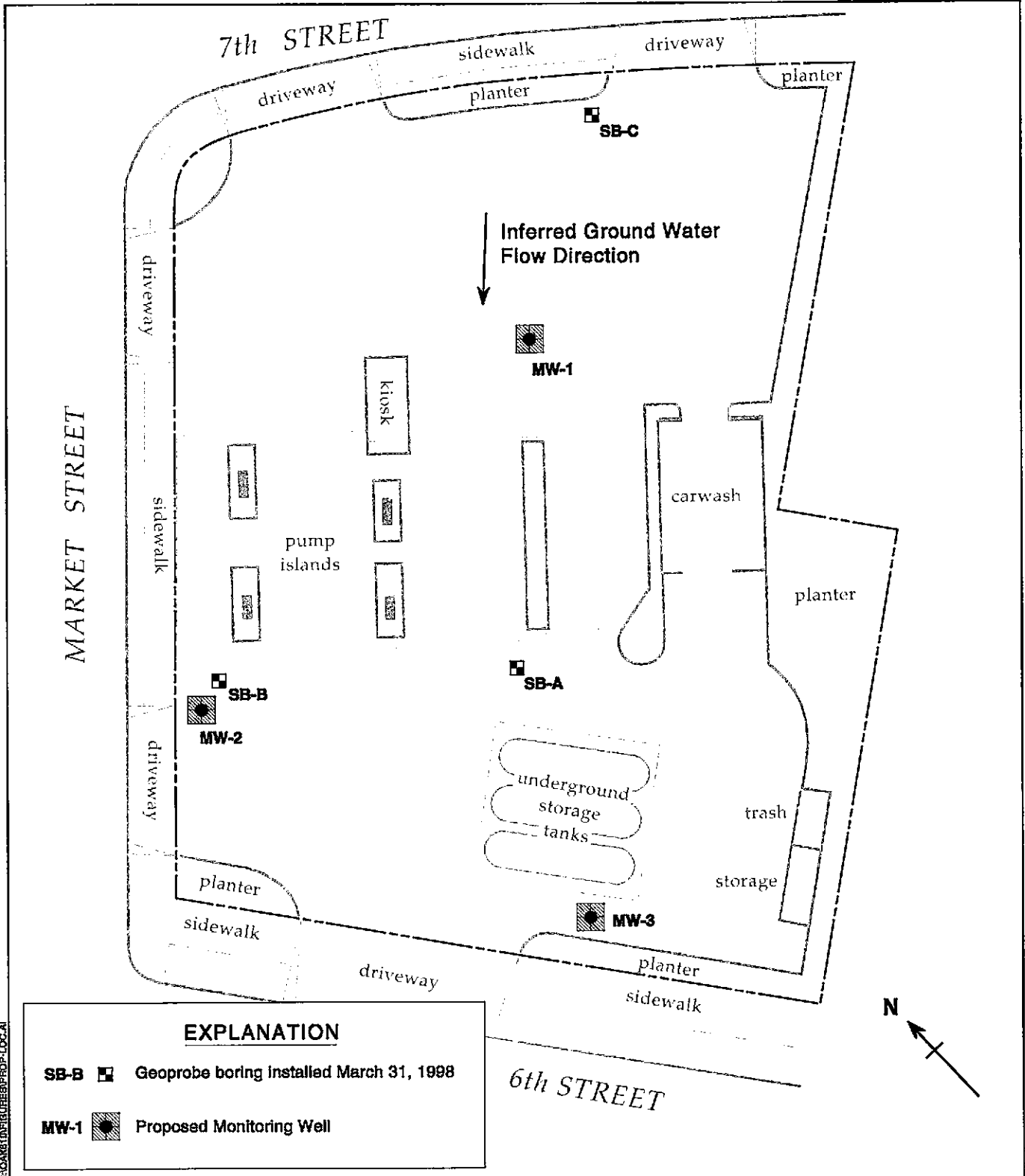
Diane Lundquist, P.E.
Principal Engineer



Attachments: A - Standard Field Procedures for Monitoring Wells

cc: Karen Petryna, Equiva Services LLC, P.O. Box 8080, Martinez, CA 94553

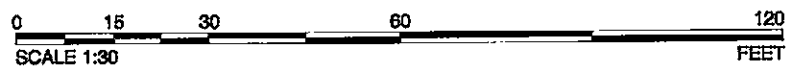
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EXPLANATION

SB-B Geoprobe boring installed March 31, 1998

MW-1 Proposed Monitoring Well



08/21/98

Shell-branded Service Station
 610 Market Street
 Oakland, California



Proposed Monitoring Well Locations
 WIC #204-5508-5702
 Figure No. 1

CAMBRIA

Attachment A

Standard Field Procedures for Monitoring Wells

STANDARD FIELD PROCEDURES FOR MONITORING WELL INSTALLATION

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).

Soil Boring and Sampling

Soil borings are typically drilled using hollow-stem augers or direct-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 volatile vapor analyzer measures volatile hydrocarbon vapor concentrations in the tube headspace, extracting the vapor through a slit in the cap. Volatile vapor analyzer 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.

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