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August 27, 2001

Mr. Scott Hooton
BP Oil Company
Environmental Resources Management
295 SW 41st Street
Bldg. 13 STE N.
Renton, Washington 98055-4931

AUG 2 9 2001

Re: **LETTER OF TRANSMITTAL**
Supplemental Investigation Work Plan
BP Site No. 11133
2220 98th Avenue
Oakland, California

Dear Mr. Hooton:

Cambria Environmental Technology, Inc. has enclosed the *Supplemental Investigation Work Plan* for the above-referenced site for your use. We have distributed copies of the report on your behalf as noted below.

We appreciate the opportunity to provide BP with environmental consulting services. If you have any questions or comments, please do not hesitate to call me at (510) 450-1985.

Sincerely,
Cambria Environmental Technology, Inc.

Khaled Rahman, R.G., C.H.G.
Associate Geologist

Enclosures: *Supplemental Investigation Work Plan* dated August 27, 2001 (4 copies)

cc: Eva Chu, Alameda County Health Services Agency, 1131 Harbor Bay Parkway, 2nd Floor, Alameda, California 94502 (1 copy)

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SUPPLEMENTAL INVESTIGATION WORK PLAN

BP Oil Site No. 11133
2220 98th Avenue
Oakland, California
Cambria Project No. 852-1692-1

August 27, 2001

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WP looks fine. SGV should be added in some comments

Prepared for:

BP Oil Company
Environmental Resources Management
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Renton, Washington 98055

Prepared by:

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BP Oil Site No. 11133
2220 98th Avenue
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INTRODUCTION

Cambria Environmental Technology, Inc. (Cambria) is submitting this *Supplemental Investigation Work Plan* (Work Plan) for the above-referenced BP Oil Company (BP) site. The Alameda County Health Services Agency (ACHSA) requested collection of additional samples to supplement a December 15, 2000 *Risk-Based Corrective Action (RBCA) Evaluation* for the site. The proposed scope of work is based, in part, on recent discussions with Ms. Eva Chu of the ACHSA. The site background and our proposed scope of work for this investigation are described below.

SITE BACKGROUND

Site Description: The site is a dormant 76-branded gasoline retail outlet located at the southeast corner of Bancroft Avenue and 98th Avenue in Oakland, California (see Figure 1). The site is located in a largely residential area.

BP acquired the property from Mobil Oil Corporation in 1989. In 1994, BP transferred the property to TOSCO Marketing Company and has not operated the facility since that time. In 1999, TOSCO removed the underground storage tanks and associated piping, and ceased gasoline retail operations at the site. We understand that redevelopment of the site as a commercial car wash is planned.

The site consists of a fenced lot with a service station building and canopy. Currently, seven onsite monitoring wells and five offsite monitoring wells are located at the site (see Figure 2).

Site Hydrogeology: The site is typically underlain by clay and silt with clayey sand, silty sand and silty or clayey gravel intervals locally observed. Groundwater was observed at about 20 feet below ground surface (bgs) in onsite wells during monitoring in 1999. Groundwater flow fluctuates across the site but is generally westward.

PROPOSED SCOPE OF WORK

To further assess the subsurface conditions, six onsite soil borings will be advanced along the eastern and southern property boundary (see Figure 2). The specific tasks to be performed are described below.

Subsurface Utility Survey: The proposed borings will be marked and Underground Service Alert will be contacted to locate of subsurface utilities. Each boring location will be hand augered to 5 feet bgs.

Site Health and Safety Plan: A comprehensive site safety plan will be prepared for sampling activities. The plan will be kept on site during field activities and signed by each site worker.

Permits: Soil boring permits will be obtained from Alameda County Department of Public Works prior to performing sampling activities.

Direct-Push Sampling: The borings will be advanced using direct-push sampling equipment (see Appendix A). Soil samples will be collected at 5-foot intervals and field screened for volatile organic compounds using a photoionization detector. In addition, 2 to 3 soil vapor samples will be collected from unsaturated soil in each boring. The borings will be advanced 5 to 10 feet into first-encountered groundwater. Use Summa canisters

Is this only for soil screening?

Temporary Well Installation: Upon reaching the total depth of the boring, a temporary well will be installed using 3/4-inch diameter PVC casing with 0.010-inch machined slot, and No. 2/12 sand filter pack. Depending on recharge rates, 1 to 3 casing volumes of water will be purged from each temporary well to reduce particulates. Following purging, each well will be sampled using a bailer or equivalent (see Appendix A). Following completion of sampling activities, the temporary wells will be removed and the borings will be sealed to the surface with bentonite-cement grout.

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Chemical Analysis: Selected soil and grab water samples from each boring will be analyzed for total petroleum hydrocarbons as gasoline (TPHg) by modified EPA Method 8015, and benzene, toluene, ethylbenzene, xylenes (BTEX) and methyl tert butyl ether (MTBE) by EPA Method 8021. Selected vapor samples will be analyzed for TPHg, BTEX and MTBE using EPA Method TO-3 or equivalent, and/or oxygen, carbon dioxide and methane using EPA Method 3C.

Reporting: The results of the investigation will be presented in a report. At a minimum, the report will contain:

- Descriptions of the soil, water and soil-vapor sampling methods,
- Boring logs,
- Tabulated soil, grab water, and vapor analytical results,
- Laboratory reports and chain-of-custody forms, and
- Our findings and conclusions.

SCHEDULE

Upon receiving written work plan approval from the ACHSA, the drilling permits will be acquired and the field work will be scheduled. The investigation report will be submitted approximately six to eight weeks after completing the field work.

ATTACHMENTS

Figure 1 – Vicinity Map
Figure 2 – Site Plan

Appendix A – Standard Field Procedures for Direct-Push Sampling and Temporary Well Installation

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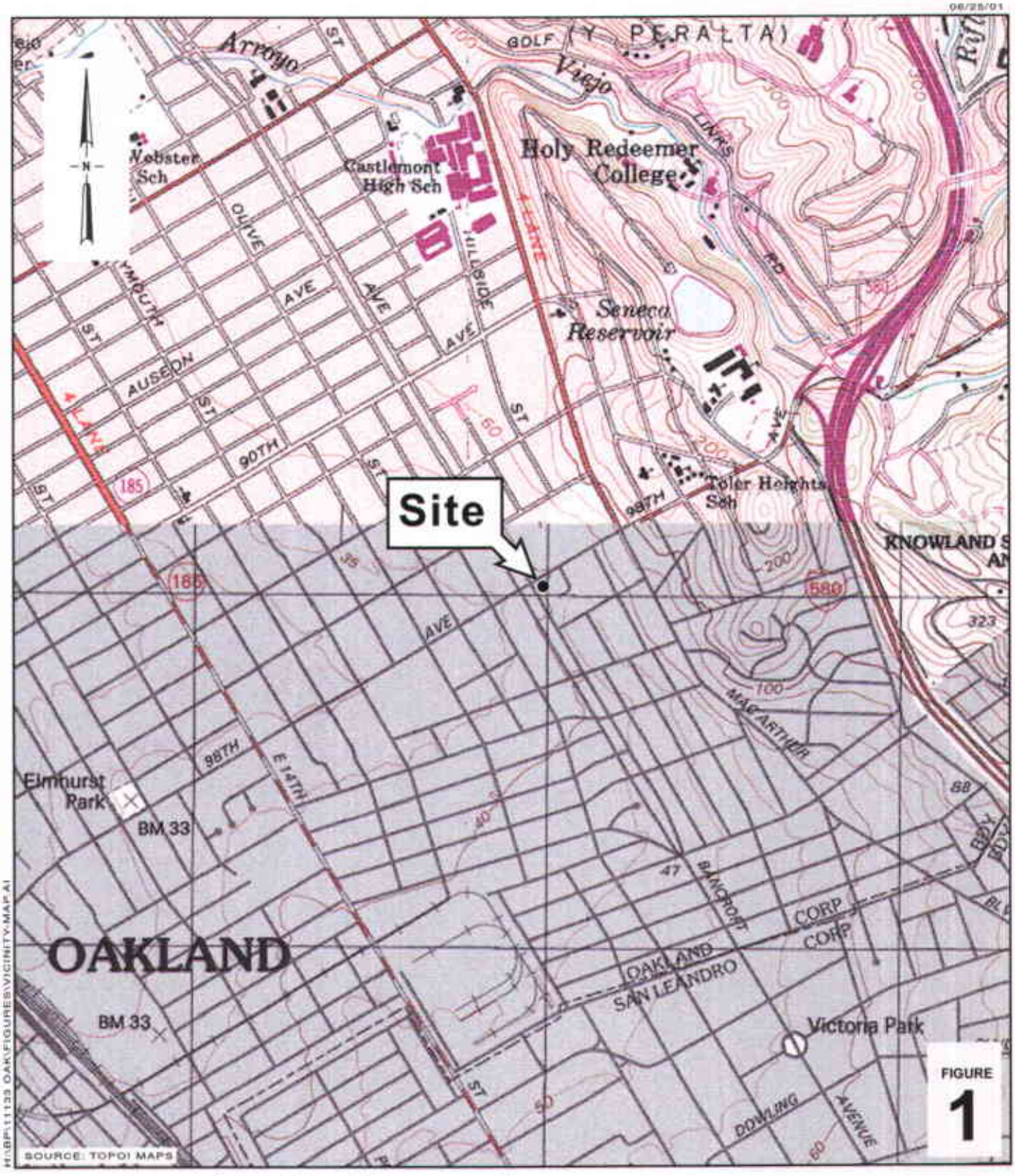
FIGURES



0 1/8 1/4 1/2 1

SCALE : 1" = 1/4 MILE

FIGURE 1

BP Oil Site No. 11133

2220 98th Avenue

Oakland, California

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Vicinity Map

Site Plan

FIGURE
2

BP Oil Site No. 11133
2220 98th Avenue
Oakland, California

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APPENDIX A

STANDARD FIELD PROCEDURES FOR DIRECT-PUSH SAMPLING AND TEMPORARY WELL INSTALLATION

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STANDARD FIELD PROCEDURES FOR DIRECT-PUSH SAMPLING AND TEMPORARY WELL INSTALLATION

This document describes Cambria Environmental Technology's standard field methods for direct-push soil and groundwater sampling and temporary well installation. 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), Certified Engineering Geologist (CEG), or Professional Engineer (PE). 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

Soil samples are collected from borings 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 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 and sealed in an individual zip-lock bag. 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 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 laboratory analysis.

Soil Vapor Sampling

A hollow vapor probe is pushed into the ground, rather than augured, and the stratigraphy forms a vapor seal between the surface and subsurface environments ensuring that the surface and subsurface gases do not mix. Once the desired soil vapor sampling depth has been reached, the field technician installs disposable polyethylene tubing with a threaded adapter that screws into the bottom of the rods. The screw adapter ensures that the vapor sample comes directly from the bottom of the drill rods and does not mix with other vapor from inside the rod or from the ground surface. The operator then pulls up on the rods and exposes the desired stratigraphy by leaving an expendable drive point at the maximum depth. The required volume of soil vapor is then purged through the polyethylene tubing using a standard vacuum pump. The soil vapor can be sampled for direct injection into a field gas chromatograph, pumped into inert tedlar bags using a "bell jar" sampling device, or allowed to enter a Summa vacuum canister. Once collected, the vapor sample is transported under chain-of-custody to a state-certified laboratory.

Grab Ground Water Sampling

Ground water samples are collected from the open borehole using bailers, by advancing disposable Tygon® tubing into the borehole and extracting ground water using a diaphragm pump, or by 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. When required by local regulations, the borings are abandoned using chipped or pellitized bentonite.

Temporary Well Installation and Surveying

Temporary monitoring wells are installed in soil borings to monitor ground water quality and/or determine the groundwater elevation, flow direction and gradient. Well depths and screen lengths are based on groundwater depth, occurrence of hydrocarbons or other compounds in the borehole, stratigraphy, and State and local regulatory guidelines. Well screens typically extend 10 to 15 feet below and 5 feet 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 feet thick.

Prior to well installation, a 2-inch rod casing with an expendable point is advanced to the desired depth. The 3-foot length screened well sections are then threaded together with the associated PVC riser and placed through the 2-inch rod casing. The temporary well is typically comprised a stainless steel exterior and schedule-80 PVC screen inner core that is coupled together to create the desired filtered well length. Screen slot size varies according to the sediments screened, but slots are generally 0.010 or 0.020 inches wide.

Well Development

If the temporary wells are developed prior to sampling, they are generally developed using a combination of groundwater 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.