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Alameda County
SEP 15 2005
Environmental Health

September 13, 2005

Jerry Wickham
Alameda County Health Care Services Agency
1131 Harbor Bay Parkway, Suite 250
Alameda, California 94502-6577

Re: **Plume Delineation Work Plan**
Shell-branded Service Station
630 High Street
Oakland, California
Incident #98995751
SAP Code #135693
ACHCSA #13-5693

Dear Mr. Wickham:

On behalf of Equilon Enterprises LLC dba Shell Oil Products US (Shell), Cambria Environmental Technology, Inc. (Cambria) is submitting this *Plume Delineation Work Plan.* In response to Alameda County Health Care Services (ACHCS) correspondence dated August 1, 2005, the purpose of this work plan is to define the extent of MTBE impact along the northwest boundary of the site and thus evaluate whether contaminants are entering preferential pathways at concentrations of significance, and to assess the vertical extent of impact on the site. Presented below are the site summary, site background, and the proposed scope of work. The proposed work will be performed in accordance with Regional Water Quality Control Board (RWQCB) and Alameda County Public Works Agency (ACPWA) guidelines.

SITE SUMMARY

Site Location: This active Shell-branded service station is located on the western corner of the intersection of High Street and Jensen Street in Oakland, California, adjacent to Interstate Highway 880 (Figures 1 and 2). The site is surrounded primarily by commercial and industrial development.

Site Lithology: The site is predominantly underlain by interbedded silty clay, sandy clay, clayey sand, silty sand and sands to the total depth explored of 25 feet below grade (fbg).

Groundwater Depth and Flow Direction: Historically, groundwater depth has ranged from approximately 3.9 to 13.2 fbg. Groundwater flow direction at the site consistently ranges from west to northwest.

Cambria
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Soil and Groundwater Investigation Summary

January 1989 Dispenser and Piping Removal and Replacement, and Waste Oil Tank Removal: In January 1989, soil samples were collected from beneath each of the dispensers and product piping runs at the site during dispenser and piping replacement. Maximum reported concentrations in soil of total petroleum hydrocarbons as gasoline (TPHg) and benzene were 75 parts per million (ppm) and 3.6 ppm, respectively. A soil sample collected from beneath the waste oil tank contained 600 ppm total oil and grease.

February 1989 Waste Oil Tank Overexcavation: In February 1989, additional excavation was completed around the former waste oil tank. Soil samples collected from the excavation contained a maximum of 41 ppm total petroleum hydrocarbons as diesel (TPHd). A grab groundwater sample collected from the open excavation contained 1,800 parts per billion (ppb) TPHg, 170 ppb benzene and 200 ppb TPHd.

April 1989 Subsurface Investigation: In April 1989, Converse Environmental Consultants California (CECC) of San Francisco, California installed two soil borings (S-1 and S-2) within the former underground storage tank pit and four monitoring wells (MW-1, MW-2, MW-3 and MW-4) at the site. The maximum TPHd, TPHg and benzene concentrations reported in soil samples collected were 27 ppm, 63 ppm and 0.046 ppm, respectively.

August 1989 Subsurface Investigation: In August 1989, Converse Environmental West (CEW) (formerly CECC) installed one soil boring (S-3) and four monitoring wells (MW-5, MW-6, MW-7 and MW-8) at the site. No TPHd, TPHg or benzene was reported in the soil samples collected during this investigation.

November 1989 Subsurface Investigation: In November 1989, CEW installed one soil boring (SB-4) and two monitoring wells (MW-9 and MW-10) at the site. Maximum TPHd concentration reported in soil samples collected was 380 ppm in the soil sample collected from 9 fbg in monitoring well MW-10. No TPHg or benzene was reported in the soil samples collected during this investigation.

2001 Sensitive Receptor Survey: During the fourth quarter 2001, Shell voluntarily requested that Cambria conduct a sensitive receptor survey for the site vicinity. Cambria identified surface water bodies and known water producing wells within a ½-mile radius of the site. Based on a review of the USGS Oakland West Quadrangle topographic map, the nearest surface water body is a tidal canal, with the closest point located approximately 1,400 feet southwest of the site.

Cambria also reviewed California Department of Water Resources (DWR) files to locate records of municipal and private wells within a ½-mile radius of the site. The DWR provided 13 well completion report forms or equivalents, some of which documented multiple wells. Forms were provided for one boring, and for nine test holes and one well of unknown use installed in one location (Figure 1). In addition, one form was provided for nine test holes at an unidentified location, and one form was provided which listed only lithology up to a depth of 286 fbg with no legible location or use information. The remaining nine reports provided by the DWR were for wells located outside the study area, none of which are shown on Figure 1. Results of the well survey were reported in Cambria's February 8, 2002 *Fourth Quarter 2001 Monitoring Report.*

November 2002 UST, Dispenser and Piping Upgrades, and Over-Excavation Activities: During UST, dispenser and piping upgrade activities in November 2002, soil samples were collected from beneath each of the UST's, dispensers and product piping runs at the site. Additionally, over-excavation was completed both in the tank pit area to a depth of 17 fbg and in the vicinity of one of the pump islands to a depth of approximately 13 fbg. In the tank pit area, the maximum reported TPHg concentration in soil was 110 ppm. A water sample collected from the tank pit area reported 500 ppb TPHg, 7,700 ppb TPHd, 1,200 ppb MTBE and 6.6 ppb benzene. In the dispenser locations the maximum reported concentrations in soil were 320 ppm TPHg, 1,400 ppm TPHd and 0.31 ppm of benzene. In the piping removal areas, the maximum reported TPHg and TPHd concentrations in soil were 250 ppm and 180 ppm, respectively. In the over-excavated area near well MW-3, the maximum TPHg, TPHd and benzene concentrations in soil were 2,100 ppm, 3,600 ppm and 0.22 ppm, respectively. A water sample collected from the MW-3 area reported 8,300 ppb TPHg, 160,000 ppb TPHd, 190 ppb MTBE and 51 ppb benzene.

2003 Conduit Study: In May of 2003, Cambria performed a utility survey for the site to evaluate the presence of potential preferential groundwater migration pathways and, if necessary, to aid in the determination of appropriate locations for soil borings to evaluate the potential for contaminant migration from the site. The utility survey consisted of site reconnaissance and a review of maps and plans from the various entities that own subsurface utilities near the site to determine conduit locations, depths, and diameters (Figure 2). The study identified four sanitary sewer, two storm drain, a petroleum, three water, numerous communication and electric, and two

gas conduits in the vicinity. The study concluded that the sanitary sewer and storm drain lines in the vicinity of the site could encounter groundwater at least seasonally, and that considering the predominant groundwater gradient direction and the layout of the utilities, it is possible that the utility trenches could serve intermittently as preferential pathways for the migration of groundwater and MTBE. However, study also noted that MTBE concentrations at the site attenuated two orders of magnitude between well MW-3 and well MW-6, located approximately 80 feet downgradient of MW-3, and attenuated an additional two orders of magnitude to below detection limits from well MW-3 to well MW-7, located approximately 190 feet downgradient and near the northwest corner of the site. Based on this attenuation, the study concluded that MTBE concentrations in the groundwater encountering the utilities were expected to be low. The results of the utility survey were reported in Cambria's May 16, 2003 *Conduit Study Report.*

Groundwater Monitoring: Groundwater monitoring has been ongoing at this site since the first quarter 1991. Historical maximum concentrations have been observed as follows: 15,000 ppb TPHg in MW-1 (11/92), 2,410 ppb benzene in MW-3 (8/99), and 38,000 ppb MTBE in MW-3 (4/00). During the second quarter 2005, the maximum TPHg, benzene and MTBE concentrations detected in groundwater samples collected at the site were 4,100 ppb (MW-1), 19 ppb (MW-3) and 320 ppb (MW-3), respectively, reflecting a significant reduction in contaminant concentrations at the site. The results of quarterly monitoring events are summarized in quarterly monitoring reports prepared by Cambria.

In a letter dated August 1, 2005, ACHCS requested an updated work plan to evaluate potential migration along utilities or a response addressing why these borings may not be warranted. An updated work plan is presented below.

PROPOSED SCOPE OF WORK

To assess the vertical and lateral extent of MTBE on the site, and thus evaluate the potential for and significance of contaminants entering preferential pathways, Cambria recommends the installation of five soil borings (SB-5 through SB-9). Three borings are positioned along the northwest property boundary, and two borings will be installed downgradient of the source area and well MW-3, and downgradient of the current UST's. The boring locations are shown on Figure 2, and may be modified based on site or access limitations. The specific work tasks are presented below.

Work Tasks

Permits: Appropriate permits for drilling will be obtained.

Site Safety Plan: Cambria will prepare a Site Safety Plan for field work, including a traffic control plan, if necessary.

Utility Clearance: Cambria will mark proposed drilling locations and the locations will be cleared through Underground Service Alert prior to drilling. Additionally, at each proposed boring location a private utility line locating service will be used to further identify any subsurface utilities or obstructions. The top five of each boring will be cleared with an air knife to at least 3-inches larger than the drilling equipment, to ensure protection of workers, and also that utilities are not damaged with the drilling equipment.

Soil Borings: Assuming the absence of subsurface and overhead obstructions, Cambria will use a Cone Penetration Testing (CPT) rig to advance the soil borings in the approximate locations shown on Figure 2. The borings will be advanced to approximately 40 fbg. The CPT borings will be electronically logged using CPT equipment logging techniques and soil samples will be collected for chemical analysis at approximate 5-foot intervals. All collected soil samples will be transported to a State-approved analytical laboratory.

Groundwater Sampling: Discrete groundwater samples will be collected from each of the borings by hydropunch screen or other similar device at first encountered groundwater, at approximately 20 fbg, and at approximately 40 fbg. All groundwater samples collected will be transported to a State-approved analytical laboratory.

Boring Backfill: Following soil and groundwater sampling, the borings will be backfilled with cement grout to total depth and capped to match the existing grade.

Chemical Analysis: Selected soil and groundwater samples will be analyzed by a State-certified analytical laboratory for TPHg, benzene, toluene, ethylbenzene, xylenes, and MTBE by EPA Method 8260.

Reporting

Upon receipt of the analytical results, Cambria will prepare a report that will contain:

- A summary of the site background and history;
- A description of the drilling and sampling methods;
- CPT electronic logs;
- Presentation of analytical results with tabulated data;
- Figures showing sample locations;
- The complete analytical laboratory reports and chain-of-custody forms; and
- Cambria's conclusions and recommendations.

Certification

The scope of work described in this work plan will be performed under the supervision of a California professional geologist or engineer.

Schedule

Upon receiving written work plan approval, permits will be acquired and the field activities will be scheduled. An investigation report will be submitted approximately 60 days after receipt of analytical results from the laboratory.

CLOSING

We appreciate the opportunity to work with you on this project. Please call Ana Friel at (707) 268-3812 if you have any questions or comments.

Sincerely,

Cambria Environmental Technology, Inc

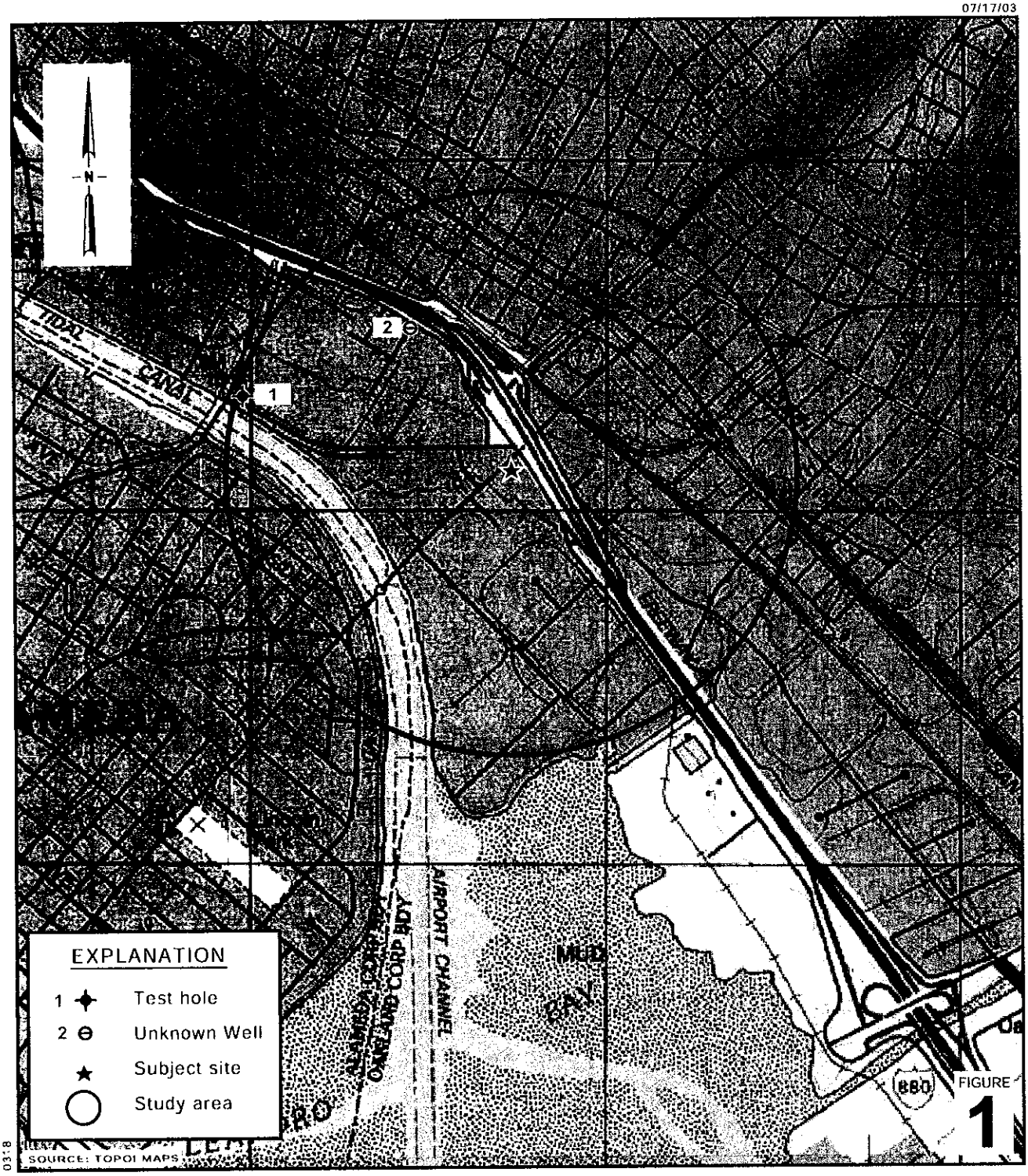
Dennis Baertschi
Project Geologist

Ana Friel.
Senior Project Geologist
PG 6452

Figure 1. Vicinity/Area Well Survey Map
Figure 2. Utility Location/Proposed Soil Boring Location Map

cc: Mr. Denis Brown, Shell Oil Products

07/17/03



Shell-branded Service Station
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Vicinity/Area Well Survey Map
(1/2-Mile Radius)

16-Jun-05

EXPLANATION

- Proposed Soil Boring
- Monitoring Well Location
- Electrical line (E)
- Storm drain line (SD)
- Sanitary sewer line (SS)
- Water line (W)
- Gas line (G)
- Comunications line (T)
- Shell oil pipeline (O)
- City of Oakland Electrical vault (E)
- Water vault (W)
- City of Oakland Manhole (MH)
- Utility Pole
- Storm Drain inlet (SD)
- Flow direction
- FL — Flow line elevation, in feet above mean sea level

ALAMEDA (WASHINGTON) AVENUE

EAST 1ST STREET

HWY. 880 OFF-RAMP

HWY. 880 (ELEVATED)

HIGH STREET

OAKPORT STREET

JENSEN STREET

Pursel Quality Paints

Carwash/ Building

cashier

former dispenser

former excavation area

over-ex excavation limits

former USTs

USTs

vault

planter

sidewalk

W meter

Interceptor (48")

MW-1 MW-2 MW-3 MW-4 MW-5 MW-6 MW-7 MW-8 MW-9 MW-10

SB-5 SB-6 SB-7 SB-8 SB-9

MH FL = 5.79

MH FL = 8.68

MH FL = 8.71 (20' deep)

MH FL = 2.5

MH FL = 4.27

FL = 2.4

FL = 1.7

FL = 3.10

FL = 1.94

FL = 16.65

SS (24", FL = 8.0)

SS (42")

SS (18")

G (12") SD (21", FL = 6.0) SS (8", abandoned & plugged)

W (12")

W (6-10")

SD (12") SS (8")

SS (abandoned & plugged) SS (12") G (10")

O (10")

Groundwater Flow Direction (2Q98 to 2Q05)

N

Scale (ft)

0 25 50 100

Utility Location/Proposed Soil Boring Location Map

September 16, 2005

Shell-branded Service Station
630 High Street
Oakland, California

FIGURE **2**

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