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March 6, 2002

MAR 11 2002

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

Re: **Well Installation Work Plan**
Shell-branded Service Station
3420 San Pablo Avenue
Oakland, California
Incident #98995748
Cambria Project #244-0554-007

Dear Ms. Drogos:

Cambria Environmental Technology, Inc. (Cambria) is submitting this *Well Installation Work Plan* on behalf of Equiva Services LLC as recommended in our March 6, 2002 *First Quarter 2002 Monitoring Report*. The purpose of this work plan is to further define the extent of methyl tertiary butyl ether (MTBE) at the site. Presented below are the site summary and the proposed scope of work.

SITE SUMMARY

Site Description: The site is a Shell-branded services station located at the southeast corner of the intersection of 35th Street and San Pablo Avenue in Oakland (Figure 1). Property use in the site vicinity is mixed residential/commercial.

Site Lithology: The site is underlain primarily by silty clay, sandy clay and gravelly sand to the total explored depth of 31.5 feet below grade (fbg).

Groundwater Flow Direction and Depth: Groundwater generally flows southwest at the site, as illustrated by the rose diagram shown on Figure 2. Groundwater depth beneath the site has ranged historically from approximately 2 to 13 fbg.

1984 Dispenser Leak: In December 1984, gasoline-saturated soil was discovered beneath the pump island area. A review of inventory records indicated a loss of approximately 2,500 gallons of super unleaded and 1,500 gallons of regular gasoline.

Oakland, CA
San Ramon, CA
Sonoma, CA

Cambria Environmental Technology, Inc.

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1985 Tank Replacement: In January 1985, the steel underground storage tanks (USTs) and the product lines were replaced with double-walled fiberglass tanks and product lines.

1988 Soil Borings: In August 1988, Ensco Environmental Services, Inc. drilled five soil borings (B-1 though B-5) to a maximum depth of 20.5 fbg. Total petroleum hydrocarbons as gasoline (TPHg) and benzene were detected at maximum concentrations of 1,400 parts per million (ppm) and 1.9 ppm, respectively, at 5 fbg in boring B-1, located at the north end of the UST pit.

1989 Monitoring Well Installations: In April 1989, Delta Environmental Consultants (Delta) drilled and installed four onsite monitoring wells (MW-1 though MW-4). TPHg and benzene were detected at maximum concentrations of 850 ppm and 1.2 ppm, respectively, at 5.5 fbg in well MW-1, located adjacent to soil boring B-1.

1990 Monitoring Well Installations: In January 1990, Delta drilled and installed four additional onsite monitoring wells (MW-5 though MW-8) and one offsite well (MW-9). Monitoring well MW-5 was drilled to a depth of 26.5 fbg and monitoring wells MW-6 though MW-9 were drilled to depths of 21.5 fbg. TPHg was detected at a maximum concentration of 6.1 ppm in soil collected from 10.5 fbg in offsite well MW-9. The maximum benzene concentration of 0.078 ppm was detected in the soil sample collected from 5.5 fbg in well MW-7.

1991 Monitoring Well Installations: In October 1991, Delta drilled and installed offsite monitoring wells MW-10 and MW-11. TPHg and benzene were detected at maximum concentrations of 1.8 ppm and 0.06 ppm, respectively, in the soil sample collected at 10 fbg in well MW-10.

1997 Station Renovation and Soil Sampling: In 1997, the station was renovated. As part of the site renovation, the station building, a 550-gallon waste oil UST, and two gasoline dispensers and associated piping were removed from the site. Two adjacent residential buildings were demolished and the site was regraded in preparation for future construction.

As described in our December 5, 1997 report, 2 soil samples were collected from the sidewalls of the waste oil tank pit and 10 soil samples were collected from beneath the former dispensers and gasoline product piping on June 26, 1997. TPHg was detected at a maximum concentration of 120 ppm in product piping sample P-8 at 2.5 fbg. The maximum benzene concentration of 0.13 ppm was detected at 2.5 fbg in piping sample P-1.

1998 Construction Activities: In 1998, a new station building was constructed at the site. As part of the building construction, perforated plastic piping was installed beneath the foundation of the building. If necessary and appropriate, this piping may be used to remove hydrocarbon

vapors, should they accumulate beneath the building. Soil excavated during grading and footing excavation was removed from the site and transported to an appropriate disposal facility.

1998 Monitoring Well Installations: The new building constructed at the site covered previously installed monitoring wells MW-3 and MW-6. Cambria installed replacement wells MW-3R and MW-6R in June 1998. No soil samples were submitted for chemical analysis during this investigation because data had been collected during previous well installations.

2001 Sensitive Receptor Survey: In 2001, Cambria conducted a ½-mile radius California Department of Water Resources well survey for the site. No surface water bodies were identified within the survey radius. The nearest well identified by the survey was a 97-foot deep irrigation well located approximately 700 feet west of the site. In January 2002, a representative for the property owner indicated to Cambria that the well had not been used in decades and was scheduled for destruction.

2001 Conduit Study: In 2001, Cambria conducted a conduit study for the site vicinity by reviewing maps and plans acquired from the City of Oakland Engineering Department and the East Bay Municipal Utility District. Results of the 2001 conduit study were presented in our July 6, 2001 *Second Quarter 2001 Monitoring Report*. The identified utility conduits are shown on Figure 2.

PROPOSED SCOPE OF WORK

Previous groundwater monitoring results at the site indicate that the highest MTBE concentrations have been detected in onsite monitoring well MW-4. In order to better define the downgradient extent of MTBE, Cambria proposes to advance one soil boring in the general downgradient direction of well MW-4 and to complete the boring as a groundwater monitoring well. The nearest practical location for monitoring well installation is within City of Oakland right-of-way. The proposed monitoring well location is shown on Figure 2. Our scope of work for this investigation will include the following tasks:

Utility Location: Cambria will notify Underground Services Alert (USA) of our drilling activities, and USA will identify utilities in the site vicinity.

Site Health and Safety Plan: We will prepare a comprehensive site safety plan to protect site workers. The plan will be reviewed and signed by each site worker and kept onsite during field activities.

Permits: We will obtain the required well installation and encroachment permits from the Alameda County Department of Public Works and the City of Oakland.

Soil Boring: Assuming the absence of subsurface and overhead obstructions, Cambria will use a drill rig equipped with 8-inch diameter hollow-stem augers to advance one soil boring in the approximate location shown on Figure 2. The boring will be advanced to approximately 20 fbg and converted to a 2-inch diameter groundwater monitoring well. Soil samples will be collected at 5-foot intervals in unsaturated soils. All collected soil samples will be transported to a State-approved analytical laboratory. Our standard field procedures are included as Attachment A.

Groundwater Monitoring Well Installation: The groundwater monitoring well will be constructed of PVC and screened with 15 feet of 0.010-inch machined slot. A traffic-rated vault box will be installed to protect the well. The groundwater monitoring well will be developed by surging and purging at least 10 casing volumes of water. Our standard field procedures for monitoring well installation are included as Attachment A.

Chemical Analysis: Selected soil samples will be analyzed by a State-certified analytical laboratory for TPHg, benzene, toluene, ethylbenzene and xylenes (BTEX), and MTBE.

Reporting: Upon receipt of analytical results, we will prepare a report that, at a minimum, will contain:

- A summary of the site background and history;
- Descriptions of the drilling and sampling methods;
- A boring/well log;
- Tabulated soil analytical results;
- Analytical reports and chain-of-custody forms; and
- Cambria's conclusions and recommendations.

Groundwater Monitoring: Following installation and development, the new monitoring well will be added to the current groundwater monitoring program at the site. Routine groundwater samples will be collected on a quarterly basis and analyzed for TPHg, BTEX and MTBE.

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 completing the field activities.

CLOSING

In a March 1 phone conversation with James Loetterle of Cambria, you stated that this case had not yet been reassigned from Susan Hugo to a new case worker. Equiva would like to proceed with this proposed work and would appreciate work plan approval at your earliest convenience. Cambria will call your office in late March to check on the work plan review status. Please call Jacquelyn Jones at (510) 420-3316 if you have any questions or comments.

Sincerely,
Cambria Environmental Technology, Inc

Stephan A. Bork
for: Jacquelyn L. Jones
Project Geologist

Stephan A. Bork, C.E.G., C.HG.
Associate Hydrogeologist

REGISTERED GEOLOGIST
STEPHAN A. BORK
No. EG 2058
CERTIFIED
ENGINEERING
GEOLOGIST
STATE OF CALIFORNIA

Figures: 1 - Vicinity/Area Well Survey Map
2 - Proposed Monitoring Well Location

Attachment: A - Standard Field Procedures for Monitoring Well Installation

cc: Karen Petryna, Equiva Services LLC, P.O. Box 7869, Burbank, California 91510-7869

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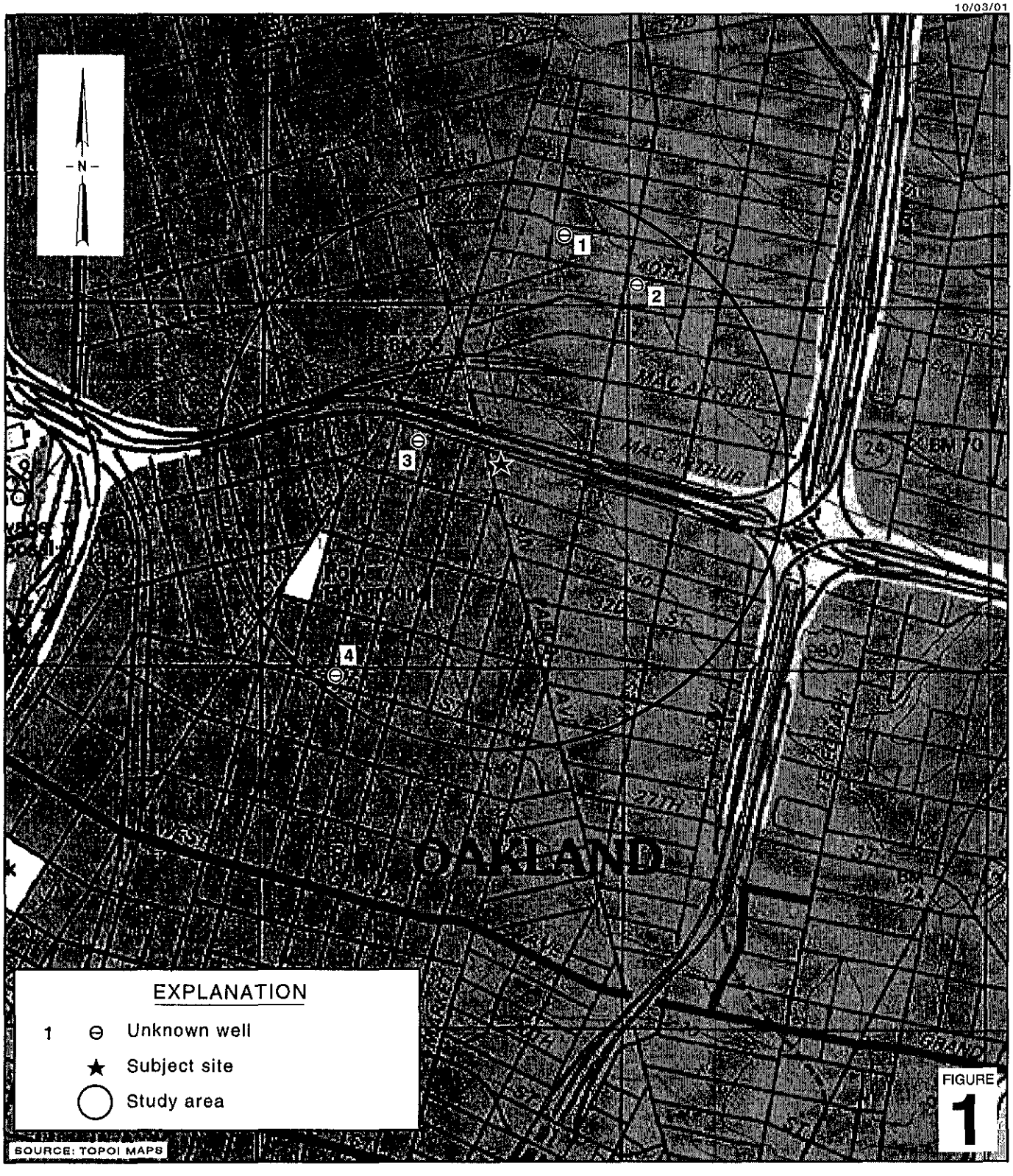
10/03/01



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0 1/8 1/4 1/2 1

SCALE : 1" = 1/4 MILE

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Vicinity / Area Well Survey Map
(1/2 Mile Radius)

03/01/02

EXPLANATION

- Proposed monitoring well location
- MW-1 — Monitoring well
- MW-3 — Destroyed monitoring well
- P-1/Disp-1 — Soil sample location (June 1997)
- B-1 — Soil sample location (May 1989)
- Storm drain line (SD)
- Sanitary sewer line (SS)
- Water main (W)
- Storm drain inlet
- Fire hydrant
- Flow direction indicator
- Misc. equipment vault as labeled

35th STREET

34th STREET

SAN PABLO AVENUE

MW-11
MW-9
MW-6
MW-6R
MW-3
MW-3R
MW-2
MW-8
MW-7
MW-4
MW-5
MW-1
MW-10
B-1
B-2
B-3
B-4
B-5
TP-N
TP-S
P-1
P-2
P-3
P-4
P-5
P-6
P-7
P-8
Disp-1
Disp-2

existing building
former building
550 gal waste oil tank removed June 26, 1997
former dispenser island
former product line
dispenser islands
USTs
trash enclosure
Thrifty Service Station
planter
EBMUD
pac bell
elec.
cable tv
FL = 25.22'
FL = 23.82'
FL = 21.0'
6" SS
W
18" SD
8" SS

0 20 40
Scale (ft)

Groundwater Flow Direction
(1Q00 through 4Q01)

Proposed Monitoring Well Location

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FIGURE
2

G:\OAKLAND\3420SANPABLO\FIGURES\UTILITIES.AI

ATTACHMENT A

Standard Field Procedures for Monitoring Well Installation

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STANDARD FIELD PROCEDURES FOR MONITORING WELL INSTALLATION

This document presents standard field methods for drilling and sampling soil borings and installing, developing and sampling groundwater 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 groundwater 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 groundwater 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

Groundwater monitoring wells are installed to monitor groundwater quality and 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 fee 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.

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 feet above the well screen. A two feet 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 groundwater surging and extraction. Surging agitates the groundwater and dislodges fine sediments from the sand pack. After about ten minutes of surging, groundwater 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 groundwater are extracted and the sediment volume in the groundwater 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.

Groundwater Sampling

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

Waste Handling and Disposal

Soil cuttings from drilling activities are usually stockpiled onsite and covered by plastic sheeting. At least three individual soil samples are collected from the stockpiles and composited at the analytic laboratory. The composite sample is analyzed for the same constituents analyzed in the borehole samples. Soil cuttings are transported by licensed waste haulers and disposed in secure, licensed facilities based on the composite analytic results.

Groundwater removed during development and sampling and rinseates are stored onsite in sealed 55-gallon drums. Each drum is labeled with the drum number, date of generation, suspected contents, generator identification and consultant contact. Upon receipt of analytic results, the water is either pumped out using a vacuum truck for transport to a licensed waste treatment/disposal facility or the individual drums are picked up and transported to the waste facility where the drum contents are removed and appropriately disposed.

ATTACHMENT A

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