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Shell Oil Products US

March 14, 2003

Alameda County
MAR 19 2003
Environmental Health

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

Subject: **Shell-branded Service Station**
5755 Broadway
Oakland, California

Dear Ms. Drogos:

Attached for your review and comment is a copy of the *Interim Remedial Action Work Plan* for the above referenced site. Upon information and belief, I declare, under penalty of perjury, that the information contained in the attached document is true and correct.

As always, please feel free to contact me directly at (559) 645-9306 with any questions or concerns.

Sincerely,

Shell Oil Products US

Karen Petryna

Karen Petryna
Sr. Environmental Engineer

P.O. Box 7869 Burbank, CA 91510-7869 Phone (559) 645-9306 Facsimile (559) 645-5643

CAMBRIA

March 14, 2003

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

Re: **Interim Remedial Action Work Plan**
Shell-branded Service Station
5755 Broadway
Oakland, California
Incident #98995756
Cambria Project #245-0483

Dear Ms. Drogos:

On behalf of Equilon Enterprises LLC dba Shell Oil Products US (Shell), Cambria Environmental Technology, Inc. (Cambria) is submitting this *Interim Remedial Action Work Plan* to install a groundwater extraction (GWE) system at the subject site. The proposed GWE system will be used to address elevated concentrations of dissolved methyl-tertiary-butyl ether (MTBE) in groundwater at the site. A site summary and our proposed scope of work are presented below.

SITE BACKGROUND

Site Description: This Shell-branded service station is located on the northern corner of the Broadway and Taft Street intersection in Oakland, California (Figure 1). The area surrounding the site is primarily residential.

Subsurface Conditions: The site is underlain by sand and silty clays to the total explored depth of 16 feet below grade (fbg). Fractured shale was identified at depths ranging from 5 to 11 fbg in several of the site borings.

Groundwater Depth and Flow Direction: Depth to groundwater has ranged from 0.58 to 4.83 fbg since groundwater monitoring was initiated in January of 1991. The groundwater gradient is generally to the south.

Cambria Environmental Technology, Inc.

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Emeryville, CA 94608
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(510) 420-9170

PREVIOUS SOIL AND GROUNDWATER INVESTIGATIONS

1985 Soil and Groundwater Investigation: In July 1985, EMCON Associates (EMCON) conducted a subsurface investigation. The investigation consisted of advancing two onsite soil borings and converting one boring into groundwater monitoring well S-1. The maximum detection of total petroleum hydrocarbons as gasoline (TPHg) was 3 milligrams per kilogram (mg/kg) in soil boring S-A at 4.0 fbg. Details of the EMCON investigation are presented in the EMCON report dated August 1, 1985.

1992 Product Release and Tank Backfill Well Purging: In December 1992, Gettler-Ryan of Hayward, California replaced an unleaded pipe fitting reported to have released about 200 gallons of gasoline. Tank backfill well purging was conducted on a daily basis from December 24, 1992 through January 7, 1993, at which point the free product originally observed in the well was reduced to a sheen. According to Shell records, a total of about 40,000 gallons of mixed water and gasoline were purged from the tank backfill wells.

1993 Soil Sample and Sanitary Sewer Upgrade: Concurrent with purging free product from tank backfill wells, three trenches at the southeast corner of the site were excavated to identify hydrocarbon-impacted areas near sewer piping. Soil samples collected within the trench excavations were collected from 4 to 12 fbg. The highest TPHg concentration from the sewer trench excavations was 1,300 mg/kg in sample S-J at 4 fbg.

The onsite sanitary sewer piping and portions of the offsite sewer piping were replaced with piping resistant to hydrocarbon penetration. Additionally, a horizontal GWE well was installed within the excavated sewer trench below a section of sewer piping. A grout barrier was also installed in the sewer trench to prevent further offsite migration of residual hydrocarbons. Approximately 126 cubic yards of soil were excavated during sewer upgrade activities. Details of the soil investigation, sewer replacement, grout barrier installation, and horizontal well installation are presented in Weiss Associates' June 18, 1993 report.

1998 Dispenser Upgrade: In March, 1998, Paradiso Mechanical of San Leandro, California upgraded the station by adding secondary containment to the existing dispensers and the turbine pumps. Soil samples, collected below each dispenser, showed field indications of hydrocarbons. Each sample was collected at a depth of approximately 2 fbg. The highest detected TPHg concentration was 990 mg/kg in sample D-4. The highest detected MTBE concentration by EPA Method 8020 was 9.8 mg/kg in sample D-3. The highest detected benzene concentration

was 1.8 mg/kg in sample D-4. Details of the dispenser upgrades activities were presented in Cambria's April 9, 1998 *Dispenser Sampling Report.*

2002 Soil Borings: During August 2002, Cambria advanced eleven soil borings as proposed in our January 24, 2002 *On/Offsite Subsurface Investigation Work Plan.* Miller Brooks Environmental prepared a *Subsurface Investigation Report* dated October 21, 2002 documenting this work. MTBE was detected in grab groundwater samples collected from these borings at concentrations ranging from 30 parts per billion (ppb) to 9,100 ppb. No MTBE was detected in groundwater samples collected from the borings drilled adjacent to utility conduits in Taft Street.

2000-2003 INTERIM REMEDIATION EFFORTS

Mobile GWE using a vacuum truck was conducted periodically at the site from April to November 2000. A single dual-phase vacuum extraction (DVE) event was performed at the site on February 7, 2001, and monthly mobile DVE was conducted at the site from May to November 2001. GWE and DVE have extracted approximately 20,038 gallons of groundwater from wells S-2, H-1, and T-2, and removed 0.46 pounds of MTBE. Subsequent to Alameda County Health Care Services Agency (ACHCSA) notification in our November 7, 2001 *Third Quarter 2001 Monitoring Report*, Cambria suspended monthly DVE from wells S-2 and H-1 due to the low influent volume of groundwater from S-2 and the low influent MTBE concentrations from H-1.

PROPOSED GWE SYSTEM

Shell has determined that conditions identified at this facility warrant further remedial action. Shell authorized Cambria to design a GWE system to mitigate and remediate dissolved-phase MTBE in groundwater onsite and to hydraulically control MTBE migration in groundwater at the perimeter of the site. The system will also treat other fuel-related hydrocarbons detected in limited amounts in the groundwater, including benzene, ethylbenzene, xylene and tert-butanol. Cambria will complete the permitting and installation of this system. The conceptual design of the system is described below.

System Design: Cambria will prepare engineering design drawings for permitting and construction of the GWE system. The system will be designed with capacity for easy expansion to additional wells, and to handle additional groundwater flow, if necessary. In addition, the

system will be designed so that a soil vapor extraction system can be added to the system in the future, if found to be feasible and warranted. Depending on the results of future activities, additional pumping wells may be added.

Data pertaining to anticipated groundwater flow rates has been collected during mobile GWE events currently conducted at the site between April and November 2000. Although these events do not serve as a formal pump test designed to calculate properties such as transmissivity or hydraulic conductivity, sufficient data was gathered to allow for a reasonable estimation of system flow rates. Monitoring well S-2 is anticipated to produce a flow of less than 0.5 gallons per minute (gpm), horizontal well, H-1 and tank backfill well T-2 are anticipated to produce flows of approximately 3 gpm each, and pre-packed monitoring well T-3 is estimated to produce a flow of approximately 1 gpm. Therefore, the average total flow from all wells is estimated to be approximately 7.5 gpm.

Pumping Locations: The proposed GWE and treatment system design includes pumping from wells S-2, T-2, T-3, and H-1. Refer to Figure 1 for the location of these wells. Well S-2 was constructed using 4-inch diameter polyvinyl chloride (PVC) casing installed to a depth of 9.5 bgs. Well S-2 is screened with 0.020-inch slotted perforation from a depth of 2 to 9.5 fbg. Horizontal well H-1 was constructed using approximately 60 feet of 4-inch diameter PVC casing installed horizontally at a depth of 12 bgs with a slope of 0.010 feet per foot from the vertical access point for H-1 to the center of Taft Street. Well H-1 is screened the entire 60-foot length of the horizontal section with 0.010-inch slotted perforation. Well T-2 is a 12-inch slotted PVC casing installed within the pea gravel tank backfill. Well T-3 is a 4-inch diameter pre-packed well installed to a depth of 9 feet. Well T-3 is screened with 0.010-inch slotted perforation from a depth of 2 to 9 fbg.

System Equipment: Due to the relatively low anticipated flow rates, groundwater will be extracted from the wells using pneumatic submersible pumps. Selection of pump makes and models will be determined as part of the final design. An air compressor will provide compressed air to drive the pneumatic pumps.

The extracted groundwater will be pumped from the wells into a 500-gallon surge tank, located in the remediation compound. The compound will be located along the western property line of the station as shown in Figure 1. The surge tank will be equipped with two high/low water level shutoffs to control the downhole well pumps and the treatment system transfer pump.

From the transfer pump, water will flow through a particulate bag filter and then through three 1,200-pound aqueous-phase carbon vessels (in series) prior to discharge to the sanitary sewer.

Flow meters, pressure gauges, and sample ports will be installed to control and monitor system operation.

The steel adsorber tanks will be bolted down onto a concrete pad surrounded by a 6-foot high chain-link fence. Prior to construction and installation of the proposed treatment system, Cambria will obtain necessary permits from the City of Oakland, Pacific Gas and Electric, and the East Bay Municipal Utility District (EBMUD).

An electrical control panel with a programmable logic controller will interlock and operate the GWE system controls. A telephone autodialer will be installed to remotely notify Cambria of system shutdown events.

Building Permits: Cambria will prepare engineered drawings and specifications to submit to the City of Oakland for review and issuance of applicable construction permits.

Discharge Permitting: Cambria anticipates discharging treated groundwater to the local sanitary sewer system, under the authorization of an EBMUD discharge permit. Cambria will obtain necessary permits from EBMUD on behalf of Shell.

Construction: Cambria will issue engineered drawings, specifications, and a detailed scope of work to a Shell-preferred contractor for submittal of construction costs and schedule. The contractor will begin construction after Shell approves the construction cost and schedule and all permits are obtained. Cambria will provide oversight of construction activities included in the contractor's scope of work. The contractor will arrange all required inspections.

Utility Location: The contractor will notify Underground Service Alert of the construction activities.

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

Start-up: After inspection approval, Cambria will collect GWE system start-up samples and operational data as specified by sewer discharge permit. The samples will be transported to a State-approved analytical laboratory for the appropriate chemical analysis. The analytical results will be submitted to EBMUD for review. Start-up of the GWE system will occur after receiving discharge approval from EBMUD. Copies of any start-up reports submitted to EBMUD will also be sent to the ACHCSA.

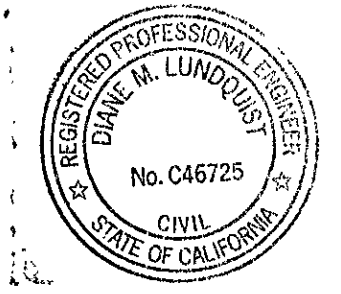
Additional Offsite Investigation: In their October 21, 2002 *Subsurface Investigation Report*, Miller Brooks recommended offsite investigation downgradient of boring B-1, which was installed during the August 2002 investigation. We will reconsider the necessity of this investigation after installation and operation of the proposed GWE system.

CLOSING

Please call Diane Lundquist at (510) 420-3334 if you have any questions or comments. Thank you for your assistance.

Sincerely,

Cambria Environmental Technology, Inc.



Diane M. Lundquist, P.E.
Principal Engineer

Figure: 1 - Groundwater Remediation System Layout

cc: Karen Petryna, Shell Oil Products US, P.O. Box 7869, Burbank, CA 91510-7869
Thrifty Oil Company, c/o Mr. Raymond Fredricksen, PO Box 2128, Santa Fe Springs, CA 90670

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Groundwater Remediation System Layout

EXPLANATION

- S-1 Monitoring well location
- T-1 Tank backfill well location
- T-3 Pre-pack monitoring well location
- H-1 Horizontal extraction well location
- B-1 Soil boring location (Miller-Brooks, 8/6-7/02)
- C-4 / 3 Cross-section indicator & Detail designator
- Proposed trench / electrical service
- Proposed trench / piping layout
- Sanitary sewer line (SS)
- Storm drain (SD)
- Flow direction
- Manhole
- 4.5 fbg Feet below grade

residential

station building

residential

approximate property line

water and air

S-3

T-1

B-7

USTs

B-11

B-10

B-8

B-6

B-9

T-2

pumps

pumps

Remediation Compound A / 2

(1) 3" Dia. containment pipe
(1) 2" Dia. compressed air chase
(1) 3" Dia. PVC elec. conduit
(1) 2" Dia. SDR-35 discharge pipe

C-3 / 3

C / 3

(3) 3" Dia. containment pipes
(2) 2" Dia. compressed air chase

C-3 / 3

C-4 / 3

T-3 (Pre-pack 4" monitoring well)

grout barrier

C-4 / 3

24" deep trench containing 4" SCH 40 PVC pipe

B-5

S-1

S-2

C-4 / 3

sidewalk

sidewalk

A / 7

PG&E pole

TAFT STREET

H-1

4" SCH 40 PVC vertical access pipe to horizontal well H-1

BROADWAY

A / 5

Proposed sewer connection

4" horizontal groundwater extraction well

crosswalk

B-1

2.2 fbg

2.1 fbg

4 fbg

N

0 10 20

SCALE 1" = 20

FIGURE

1

Shell-branded Service Station

5755 Broadway
Oakland, California
Incident #98995756

CAMBRIA

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