3849/R0487

WELL INSTALLATION REPORT

SHELL BRANDED SERVICE STATION
105 5TH STREET
OAKLAND, CALIFORNIA

Prepared For:

Karen Petryna
Shell Oil Products US
Post Office Box 7869
Burbank, California 91510-7869

By:

MILLER BROOKS ENVIRONMENTAL, INC.
2425 West 14th Street, D2
Oakland, California 94607
(510) 891-0092

Project Number 01-155-00305-01

September 16, 2002

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1.0 INTRODUCTION

On behalf of Equilon Enterprises LLC dba Shell Oil Products US, Miller Brooks Environmental, Inc. (Miller Brooks) is submitting this *Well Installation Report*. The well installation was conducted on August 1, 2002, by Cambria Environmental Technology, Inc. (Cambria), which was proposed to the County in Cambria's Subsurface Investigation Report/Quarterly Monitoring Report dated May 6, 2002. The purpose of the investigation was to monitor the effect of the interim remediation (vacuum truck groundwater extraction) downgradient of well MW-3 and to further define the onsite extent of hydrocarbon-impacted soil and groundwater. Presented below are summaries of the site background, investigation procedures, investigation results, and conclusions.

2.0 BACKGROUND

The site is an active Shell-branded service station located at the western corner of the 5th Street and Oak Street intersection in Oakland, California (Figure 1). The site is surrounded by commercial properties. The service station layout consists of an underground gasoline storage tank (UST) complex, two dispenser islands, and a service station kiosk.

During November and December of 1996, Armer/Norman & Associates of Walnut Creek, California (Armer/Norman) removed five gasoline dispensers, two diesel dispensers, associated piping and inactive piping to a former diesel fuel dispenser. Armer/Norman replaced the gasoline and diesel dispensers and associated piping with additional secondary containment. On November 27, 1996, Cambria Environmental Technology, Inc. (Cambria) collected soil samples 5 feet below grade (fbg) beneath the seven dispenser locations and the inactive diesel fuel piping prior to replacement. Sample locations from all past investigations are shown on Figure 2. After receiving analytical results indicating the presence of hydrocarbons, Shell filed an Underground Storage Tank Unauthorized Release Site Report with the ACHCSA.

In February 1998, Paradiso Mechanical of San Leandro, California installed secondary containment on the turbine sumps. Since secondary containment had previously been added to the dispensers, no additional dispenser upgrade activities were performed. Cambria inspected the tank pit on February 26, 1998, and no field indications of hydrocarbons, such as staining or odor, were observed.

On July 23, 1998, Cambria advanced three borings in the assumed downgradient direction from existing dispensers and two borings in the assumed upgradient direction from the existing dispensers (SB-1 through SB-5). The soil borings were advanced to depths of 11.0 to 12.0 fbg (Figure 2).

On May 14, 1999, Cambria installed three groundwater monitoring wells (MW-1, MW-2 and MW-3) to a depth of 25 fbg (Figure 2).

On February 12, 2001, Cambria advanced three soil borings (SB-6 and SB-7) and converted one into a groundwater monitoring well (MW-4) constructed to a depth of 25 fbg (Figure 2).

On March 7 and 8, 2002, Cambria advanced five soil borings (SB-8 through SB-12) and installed one groundwater monitoring well onsite (MW-5) constructed to a depth of 24 fbg (Figure 2).

3.0 SUMMARY OF FIELD ACTIVITIES

3.1 DRILLING, SOIL SAMPLING, AND WELL INSTALLATION

On August 1, 2002, groundwater monitoring well MW-6 was installed offsite on Oak Street, south of the dispenser islands. The well was drilled to a depth of approximately 24 feet bgs using a hollow-stem auger drilling rig operated by Gregg Drilling of Martinez, California. Soil samples were collected at 5-foot depth intervals for soil description and laboratory analysis. A description of Cambria's general field procedures is included with the boring logs in Appendix A.

Following completion of soil sampling activities, monitoring well MW-6 was installed to a depth of 24 feet bgs, and was constructed of 2-inch diameter, Schedule 40, polyvinyl chloride (PVC) casing with a screened casing interval extending from approximately 4 to 24 feet bgs. A copy of the monitoring well installation permit, obtained prior to drilling, is included in Appendix A.

Soil and decontamination rinse water generated during drilling and sampling activities was temporarily stored onsite in two labeled, sealed, Department of Transportation approved 55-gallon drums.

3.2 WELL SURVEYING, FLUID-LEVEL MONITORING, AND GROUNDWATER SAMPLING

The elevation of the top of the well casing for monitoring well MW-6 will be surveyed prior to fourth quarter 2002 groundwater monitoring. Monitoring well MW-6 will be developed by Blaine Tech Services (BTS) during the upcoming fourth quarter 2002 groundwater monitoring using a combination of surging and bailing techniques.

4.0 LABORATORY ANALYSIS

All samples collected during this investigation were submitted to a state-certified laboratory for analysis. Soil samples were analyzed for TPH-G using EPA Method 8015 modified for gasoline, and for BTEX, and MTBE using EPA Method 8260B. Results of laboratory analysis of soil samples collected during site assessment activities are presented in Table 1 and on Figure 2.

5.0 FINDINGS

Sediments observed in the subsurface generally consist of fine-grained sand from the surface to a depth of approximately 24 feet bgs (maximum depth of investigation). Groundwater was found in the monitoring well borehole at a depth of 10 feet bgs during drilling activities.

Soil samples collected from monitoring well MW-6, contained no detectable TPH-G, BTEX, or MTBE concentrations.

6.0 CONCLUSIONS AND PROPOSED WORK ACTIVITIES

Soil sample results of this investigation confirm that the lateral extent of petroleum hydrocarbon-affected soil has been adequately assessed and is bound towards the south by MW-6.

Monitoring well MW-6 is not scheduled for groundwater sampling until October, 2002 during the fourth quarter groundwater sampling event and therefore groundwater quality results forMW-6 are not be included in this report. During the fourth quarter sampling event, monitoring well MW-6 will be developed and added to the groundwater monitoring program for the site. Groundwater samples will be collected from the well on a quarterly basis and analyzed for TPH-g, BTEX and MTBE by EPA Method 8260.

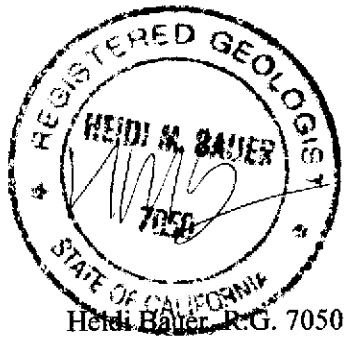
Proposed work activities for the Fourth Quarter of 2002 are as follows:

- Have a state certified surveyor survey the new Monitoring Well MW-6 and T-1.
- Prepare an interim remediation work plan for the site and continue the conceptual design of the interim active remediation system.
- Continue the quarterly groundwater monitoring and sampling program, including MW-6, to evaluate groundwater quality trends and flow direction over time.
- Continue semi-monthly groundwater extraction from well T-1.

7.0 STATEMENT OF LIMITATIONS AND PROFESSIONAL CERTIFICATION

The conclusions presented herein are based solely upon the agreed upon scope of work outlined in this report. Miller Brooks makes no warranties or guarantees as to the accuracy or completeness of information provided or compiled by others. It is possible that information exists beyond the scope of this investigation. Additional information, which was not found or available to Miller Brooks at the time of writing this report, may result in modification of the conclusions presented. This report is not a legal opinion. The services performed by Miller Brooks have been conducted in a manner consistent with the level of care ordinarily exercised by members of our profession currently practicing under similar conditions. No other warranty, expressed or implied, is made.

This investigation was supervised or personally conducted by the licensed professional whose signature and license number appear below.



Darren Butler
Senior Staff Scientist

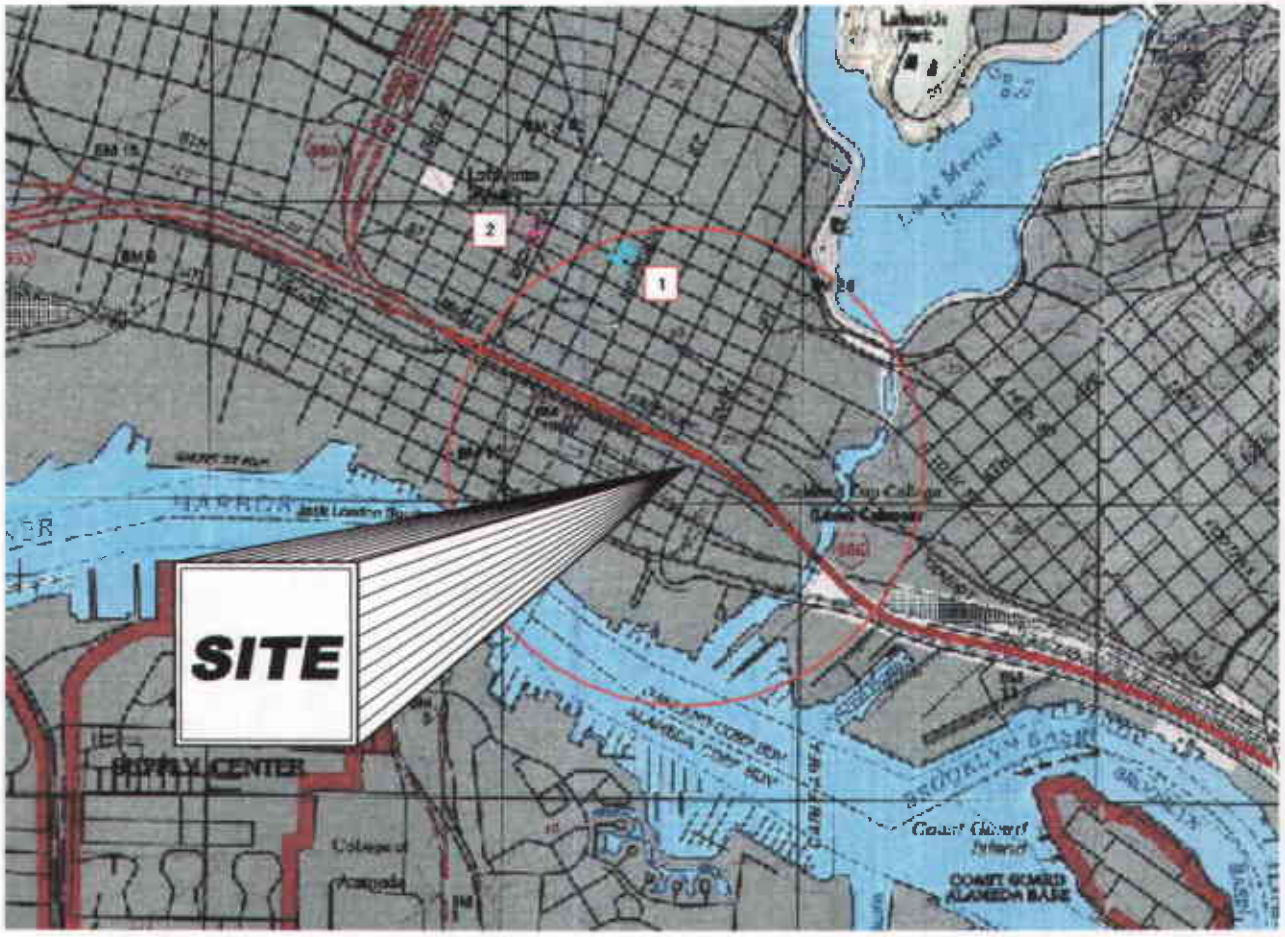
Heidi Bauer, R.G. 7050
Senior Project Geologist

Table 1. Results of Soil Analytical Data - Shell-branded Service Station - 105 5th Street, Oakland, California - Incident # 98995757

Date	Sample ID	Depth (ft bgs)	TPH-g	MTBE	Benzene	Toluene	Ethylbenzene	Total Xylenes
			← (mg/kg) →					
8/1/2002	MW-6-5.5	5.5	<1.0	<0.5	<0.005	<0.005	<0.005	<0.005
8/1/2002	MW-6-10.5	10.5	<1.0	<0.5	<0.005	<0.005	<0.005	<0.005
8/1/2002	MW-6-15.5	15.5	<1.0	<0.5	<0.005	<0.005	<0.005	<0.005
8/1/2002	MW-6-20.5	20.5	<1.0	<0.5	<0.005	<0.005	<0.005	<0.005
8/1/2002	MW-6-23.0	23.0	<1.0	<0.5	<0.005	<0.005	<0.005	<0.005

Abbreviations and Notes:

TPH-g = Total petroleum hydrocarbons as gasoline by EPA Method 8260B.
MTBE = Methyl tert-butyl ether by EPA Method 8260B.
Benzene, ethylbenzene, toluene, total xylenes by EPA Method 8260B.
ft bgs = feet below ground surface
mg/kg = milligram/kilogram = parts per million
<n = Below detection limit of n ppm.



LEGEND

1 IRRIGATION WELL

2 UNKNOWN WELL

STUDY AREA (1/2 MILE RADIUS)

FROM: U.S. GEOLOGICAL SURVEY, 1967
QUADRANGLE: OAKLAND
COUNTY: ALAMEDA
SERIES: 7.5-MINUTE QUAD

NOTE: ALL BOUNDARIES AND LOCATIONS ARE APPROXIMATE

N
W E
S

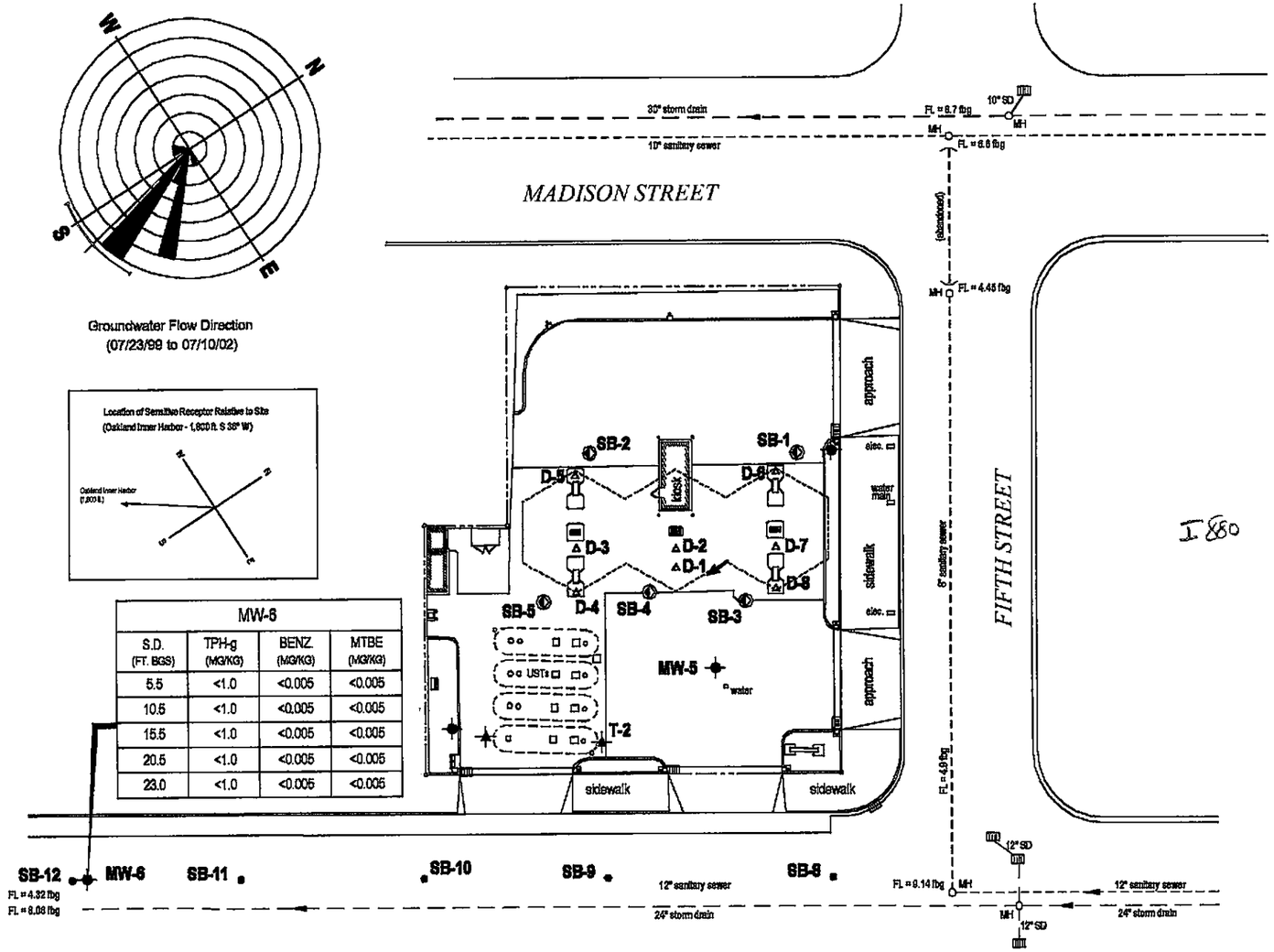
0 2000 Feet
SCALE

MILLER BROOKS Environmental, Inc.	DRAWN BY: PEL DATE: 02/05/01 REVISED BY: PEL	VICINITY/WELL SURVEY MAP	FIGURE 1
2425 W. 14TH STREET, D-2 OAKLAND, CA. (510) 891-0092	REVISED: 09/12/02 APPROVED BY: DWB	SHELL SERVICE STATION 105 5TH STREET OAKLAND, CA. INCIDENT #98995757	
PROJECT NO. 06-155-0305-01	DATE: 09/12/02	FILE: K:\DWGS\EQUILON\OAKLAND (105 5TH ST.)\HYD. IN SOIL MAP DATE PLOTTED: 09/12/02	

tb-b1.dwg--09/21/00

Groundwater Flow Direction
(07/23/99 to 07/10/02)

MW-6			
S.D. (FT. BGS)	TPH-g (MG/KG)	BENZ. (MG/KG)	MTBE (MG/KG)
5.5	<1.0	<0.005	<0.005
10.5	<1.0	<0.005	<0.005
15.5	<1.0	<0.005	<0.005
20.5	<1.0	<0.005	<0.005
23.0	<1.0	<0.005	<0.005



LEGEND

MW-1	✦	Monitoring well location
T-1	✦	Tank backfill well location
SB-1	◐	Soil boring location (7/98)
SB-6	◉	Soil boring location (2/01)
SB-8	•	Soil boring location (3/02)
D-1	△	Soil sample location
NS		Not surveyed
S.D.		Sample Depth
TPH-g		Total Petroleum Hydrocarbons As Gasoline
BENZ.		Benzene
MTBE		Methyl Tertiary Butyl Ether
MG/KG		Milligrams Per Kilogram
———		Storm drain line
———		Sanitary sewer line
◄		Flow direction
MH ○		Manhole
▥		Storm drain inlet
fbg		Feet below grade

NOTES:

All utility locations are approximate. Utility information was reported by Cambria during June 2001.

TPH-g, Benzene, and MTBE concentrations are reported in MG/KG and are analyzed by EPA Method 8260B.

0 40
SCALE

MILLER BROOKS Environmental, Inc.
2425 W. 14TH STREET, D-2
OAKLAND, CA
(510) 891-0092
PROJECT NO. 06-155-0305-01

DRAWN BY: DWB
DATE: 09/04/02
REVISED BY: PEL
REVISED: 09/12/02
APPROVED BY: DWB
DATE: 09/12/02

HYDROCARBON DISTRIBUTION
MAP IN SOIL
INCIDENT NO. 98995757

SHELL SERVICE STATION
105 5TH STREET
OAKLAND, CA.

FIGURE 2

FILE: K:\DWGS\EQUILON\OAKLAND (105 5TH ST.)\HYD. IN SOIL MAP
DATE PLOTTED: 09/12/02

CAMBRIA

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 4C, 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 in addition to any analytes required by the receiving disposal facility. 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 is typically 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.

PROJECT NAME: SHELL SERVICE STATION	SITE LOCATION: 106 6TH STREET, OAKLAND, CALIFORNIA		
DRILLING COMPANY: GREGG DRILLING	DRILL RIG:	DRILL CREW: BOBBY, JOSE	DATE DRILLED: AUGUST 1, 2002
DRILLING METHOD: HOLLOW-STEM AUGER	BORING DIAMETER (IN): 8	TOTAL DEPTH OF BORING (FT): 24.0	LOGGED BY: JAMES LOETTERLE
SAMPLING METHOD: SPLIT-SPOON	HAMMER WEIGHT (LBS): 140	HAMMER DROP (IN): 18	REVIEWED BY: H. BAUER

DEPTH (FT)	SAMPLE LOCATION	SAMPLE ID	BLOWS PER 6 IN	PID (ppm)	GRAPHIC LOG	USCS SOIL GROUP	DESCRIPTION OF SUBSURFACE MATERIALS
0						SM	5-inch asphalt surface; hand-augered to 5 feet below ground surface.
5		MW-6-5.5	NM	NM			WELL-GRADED SAND with SILT: black-brown, moist, fine- to coarse-grained, (5% clay, 15% silt, 75% sand, 5% gravel), with angular fragments of rock and wood.
10		MW-6-10.5	NM	NM		SM	SILTY SAND: light brown, wet, fine-grained, (5% clay, 20% silt, 75% sand).
15		MW-6-15.5	NM	NM			Brown, (5% clay, 35% silt, 60% sand).
20		MW-6-20.5	NM	NM			SILTY SAND with CLAY: brown, wet, fine-grained, (15% clay, 40% silt, 45% sand).
		MW-6-24	NM	NM			Light brown.
25							Boring terminated at 24 feet below ground surface.
30							
35							
40							

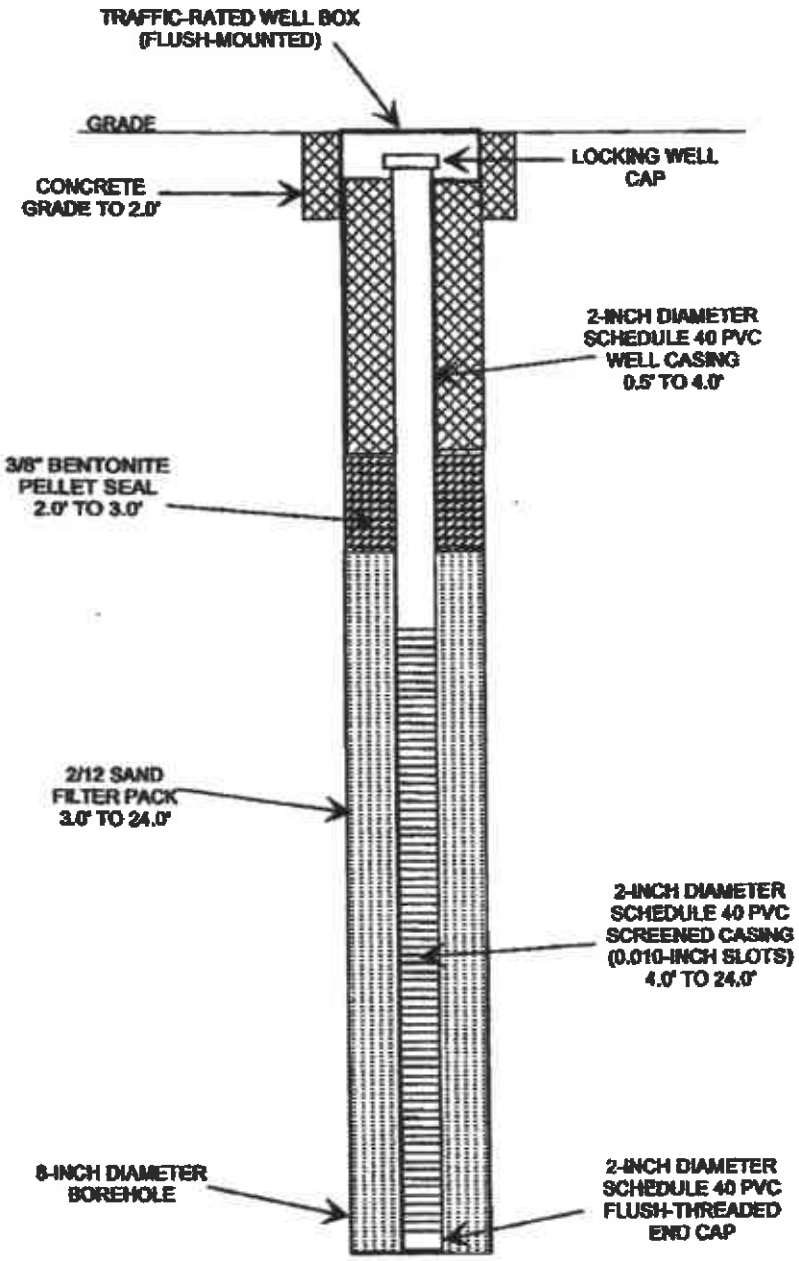
NOTES:
□ = sample interval
■ = laboratory sample
▼ = groundwater observed
PID = photoionization detector
NM = not measured
NA = not applicable
ppm = parts per million

Mary Shahbazian R.G. #6769

LOG OF BORING MW-6

PROJECT NUMBER 01-155-0305-01 | PAGE 1 OF 1

LOG OF BORING, USY BORELBL.GPJ MBE.GDT 6/12/02



NOTE: INSTALLED 8/1/02.

SHELL SERVICE STATION 105 5th STREET OAKLAND, CALIFORNIA	MONITORING WELL MW-6 CONSTRUCTION DETAIL
	PROJECT NUMBER 01-155-0305-01

ALAMEDA COUNTY PUBLIC WORKS AGENCY

WATER RESOURCES SECTION 510-670-6633 — James/00
399 ELMHURST ST. HAYWARD CA. 94544-1395
PHONE (510) 670-5554 ~~MARLON MAGALLANES/FRANK CODD (510) 670-6783~~
FAX (510)782-1939

DRILLING PERMIT APPLICATION

FOR APPLICANT TO COMPLETE

LOCATION OF PROJECT 105 5th St
Oakland, CA

CLIENT
Name Equilon Enterprises LLC dba Shell Oil Products US
Address P.O. Box 7869 Phone
City Burbank CA Zip 91510-7869

APPLICANT
Name Cambria Environmental Technology Inc.
Fax 510-420-9170
Address 1144 65 St Ste B Phone 510 420-3334
City Oakland CA Zip 94608

TYPE OF PROJECT
Well Construction
Cathodic Protection [ ]
Water Supply [ ]
Monitoring [X]
Geotechnical Investigation
General [ ]
Contamination [ ]
Well Destruction [ ]

PROPOSED WATER SUPPLY WELL USE
New Domestic [ ] Replacement Domestic [ ]
Municipal [ ] Irrigation [ ]
Industrial [ ] Other ______ [ ]

DRILLING METHOD:
Mud Rotary [ ] Air Rotary [ ] Auger [X]
Cable [ ] Other [ ]

DRILLER'S NAME Gregg Drilling

DRILLER'S LICENSE NO. 485165
exp 1-31-04

WELL PROJECTS
Drill Hole Diameter 9 in. Maximum Depth 25 ft.
Casing Diameter 2 in. Owner's Well Number MW-6
Surface Seal Depth 8 ft.

GEOTECHNICAL PROJECTS
Number of Borings ______ Maximum
Hole Diameter ______ in. Depth ______ ft.

ESTIMATED STARTING DATE ~~7/30/02~~ 8-1-02
ESTIMATED COMPLETION DATE ~~7/30/02~~ 8-1-02

I hereby agree to comply with all requirements of this permit and Alameda County Ordinance No. 73-68.

APPLICANT'S SIGNATURE [signature] DATE 7/26/02
PLEASE PRINT NAME James Loaiza

FOR OFFICE USE

PERMIT NUMBER W02-0766
WELL NUMBER ______
APN ______

PERMIT CONDITIONS
Circled Permit Requirements Apply

A. GENERAL
1. A permit application should be submitted so as to arrive at the ACPWA office five days prior to proposed starting date.
2. (circled) Submit to ACPWA within 60 days after completion of permitted original Department of Water Resources-Well Completion Report.
3. Permit is void if project not begun within 90 days of approval date

B. WATER SUPPLY WELLS
1. Minimum surface seal thickness is two inches of cement grout placed by tremie.
2. Minimum seal depth is 50 feet for municipal and industrial wells or 20 feet for domestic and irrigation wells unless a lesser depth is specially approved.

C. (circled) GROUNDWATER MONITORING WELLS INCLUDING PIEZOMETERS
1. Minimum surface seal thickness is two inches of cement grout placed by tremie.
2. Minimum seal depth for monitoring wells is the maximum depth practicable or 20 feet.

D. GEOTECHNICAL
Backfill bore hole by tremie with cement grout or cement grout/sand mixture. Upper two-three feet replaced in kind or with compacted cuttings.

E. CATHODIC
Fill hole anode zone with concrete placed by tremie.

F. WELL DESTRUCTION
See attached requirements for destruction of shallow wells. Send a map of work site. A different permit application is required for wells deeper than 45 feet.

G. SPECIAL CONDITIONS

NOTE: One application must be submitted for each well or well destruction. Multiple borings on one application are acceptable for geotechnical and contamination investigations.

APPROVED [signature] DATE 7-30-02

KIFF ANALYTICAL LLC

Report Number : 27813
Date : 8/9/02

Max Shahbazian
Cambria Environmental Technology INC.
1144 65th Street, Suite B
Oakland, CA 94808

Subject : 5 Soil Samples
Project Name : 105 5th Street, Oakland, CA
Project Number : 244-0472-010
P.O. Number : 98995757

Dear Mr. Shahbazian,

Chemical analysis of the samples referenced above has been completed. Summaries of the data are contained on the following pages. Sample(s) were received under documented chain-of-custody. US EPA protocols for sample storage and preservation were followed.

Kiff Analytical is certified by the State of California (# 2236). If you have any questions regarding procedures or results, please call me at 530-297-4800.

Sincerely,

Joel Kiff

Joel Kiff

KIFF ANALYTICAL LLC

Report Number : 27813
Date : 8/9/02

Subject : 5 Soil Samples
Project Name : 105 5th Street, Oakland, CA
Project Number : 244-0472-010
P.O. Number : 98995757

Case Narrative

Matrix Spike/Matrix Spike Duplicate Results associated with samples MW-6-10.5, MW-6-15.5, MW-6-23.0, MW-6-5.5, MW-6-20.5 for the analyte Methyl-t-butyl ether were affected by the analyte concentrations already present in the un-spiked sample.

Approved By: Joel Kiff

720 Olive Drive, Suite D Davis, CA 95616 916-297-4800

KIFF ANALYTICAL LLC

Report Number : 27813
Date : 8/9/02

Project Name : **105 5th Street, Oakland, CA**
Project Number : **244-0472-010**

Sample : **MW-6-5.5** Matrix : Soil Lab Number : 27813-01
Sample Date :8/1/02

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	**< 0.005**	0.005	mg/Kg	EPA 8260B	8/7/02
Toluene	**< 0.005**	0.005	mg/Kg	EPA 8260B	8/7/02
Ethylbenzene	**< 0.005**	0.005	mg/Kg	EPA 8260B	8/7/02
Total Xylenes	**< 0.005**	0.005	mg/Kg	EPA 8260B	8/7/02
Methyl-t-butyl ether (MTBE)	**< 0.5**	0.5	mg/Kg	EPA 8260B	8/7/02
TPH as Gasoline	**< 1.0**	1.0	mg/Kg	EPA 8260B	8/7/02
Toluene - d8 (Surr)	99.0		% Recovery	EPA 8260B	8/7/02
4-Bromofluorobenzene (Surr)	102		% Recovery	EPA 8260B	8/7/02

Sample : **MW-6-10.5** Matrix : Soil Lab Number : 27813-02
Sample Date :8/1/02

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	**< 0.005**	0.005	mg/Kg	EPA 8260B	8/7/02
Toluene	**< 0.005**	0.005	mg/Kg	EPA 8260B	8/7/02
Ethylbenzene	**< 0.005**	0.005	mg/Kg	EPA 8260B	8/7/02
Total Xylenes	**< 0.005**	0.005	mg/Kg	EPA 8260B	8/7/02
Methyl-t-butyl ether (MTBE)	**< 0.5**	0.5	mg/Kg	EPA 8260B	8/7/02
TPH as Gasoline	**< 1.0**	1.0	mg/Kg	EPA 8260B	8/7/02
Toluene - d8 (Surr)	99.3		% Recovery	EPA 8260B	8/7/02
4-Bromofluorobenzene (Surr)	103		% Recovery	EPA 8260B	8/7/02

Approved By: Joel Kiff

720 Olive Drive, Suite D Davis, CA 95616 530-297-4800

KIFF ANALYTICAL LLC

Report Number : 27813

Date : 8/9/02

Project Name : **105 5th Street, Oakland, CA**

Project Number : **244-0472-010**

Sample : **MW-6-23.0** Matrix : Soil Lab Number : 27813-05

Sample Date :8/1/02

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	**< 0.005**	0.005	mg/Kg	EPA 8260B	8/7/02
Toluene	**< 0.005**	0.005	mg/Kg	EPA 8260B	8/7/02
Ethylbenzene	**< 0.005**	0.005	mg/Kg	EPA 8260B	8/7/02
Total Xylenes	**< 0.005**	0.005	mg/Kg	EPA 8260B	8/7/02
Methyl-t-butyl ether (MTBE)	**< 0.5**	0.5	mg/Kg	EPA 8260B	8/7/02
TPH as Gasoline	**< 1.0**	1.0	mg/Kg	EPA 8260B	8/7/02
Toluene - d8 (Surr)	98.8		% Recovery	EPA 8260B	8/7/02
4-Bromofluorobenzene (Surr)	101		% Recovery	EPA 8260B	8/7/02

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Report Number : 27813

Date : 8/9/02

QC Report : Method Blank Data

Project Name : **105 5th Street, Oakland, CA**

Project Number : **244-0472-010**

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	< 0.005	0.005	mg/Kg	EPA 8260B	8/8/02
Toluene	< 0.005	0.005	mg/Kg	EPA 8260B	8/8/02
Ethylbenzene	< 0.005	0.005	mg/Kg	EPA 8260B	8/8/02
Total Xylenes	< 0.005	0.005	mg/Kg	EPA 8260B	8/8/02
Methyl-t-butyl ether (MTBE)	< 0.5	0.5	mg/Kg	EPA 8260B	8/8/02
TPH as Gasoline	< 1.0	1.0	mg/Kg	EPA 8260B	8/8/02
Toluene - d8 (Surr)	99.1		%	EPA 8260B	8/8/02
4-Bromofluorobenzene (Surr)	97.0		%	EPA 8260B	8/8/02

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed

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Report Number : 27813

Date : 8/9/02

QC Report : Matrix Spike/ Matrix Spike Duplicate

Project Name : **105 5th Street, Oakland,**

Project Number : **244-0472-010**

Parameter	Spiked Sample	Sample Value	Spike Level	Spike Dup. Level	Spiked Sample Value	Duplicate Spiked Sample Value	Units	Analysis Method	Date Analyzed	Spiked Sample Percent Recov.	Duplicate Spiked Sample Percent Recov.	Relative Percent Diff.	Spiked Sample Percent Recov. Limit	Relative Percent Diff. Limit
Benzene	27813-04	<0.0050	0.0398	0.0395	0.0406	0.0400	mg/Kg	EPA 8260B	8/8/02	102	101	1.08	70-130	25
Toluene	27813-04	<0.0050	0.0398	0.0395	0.0393	0.0389	mg/Kg	EPA 8260B	8/8/02	98.8	98.4	0.355	70-130	25
Tert-Butanol	27813-04	<0.0050	0.199	0.198	0.168	0.164	mg/Kg	EPA 8260B	8/8/02	84.5	83.0	1.80	70-130	25
Methyl-t-Butyl Ether	27813-04	0.15	0.0398	0.0395	0.190	0.171	mg/Kg	EPA 8260B	8/8/02	89.7	42.1	72.2	70-130	25

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Report Number : 27813

Date : 8/9/02

QC Report : Laboratory Control Sample (LCS)

Project Name : **105 5th Street, Oakland,**

Project Number : **244-0472-010**

Parameter	Spike Level	Units	Analysis Method	Date Analyzed	LCS Percent Recov.	LCS Percent Recov. Limit
Benzene	0.0400	mg/Kg	EPA 8260B	8/8/02	103	70-130
Toluene	0.0400	mg/Kg	EPA 8260B	8/8/02	99.1	70-130
Tert-Butanol	0.200	mg/Kg	EPA 8260B	8/8/02	83.3	70-130
Methyl-t-Butyl Ether	0.0400	mg/Kg	EPA 8260B	8/8/02	103	70-130

Approved By: Joel Kiff

KIFF ANALYTICAL, LLC

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KIFF ANALYTICAL

720 Olive Drive, Suite D
Davis, CA 95616
(530) 297-4800 (530) 297-4803 fax

SHELL Chain Of Custody Record

Shell Project Manager to be Invoiced:

☑ SCIENCE & ENGINEERING Karen Petryna
☐ TECHNICAL SERVICES
☐ CRMT HOUSTON

27813

INCIDENT NUMBER (ES ONLY): 9 8 9 9 5 7 5 7

DATE: 6/18/02-6/21/02

PAGE: 1 of 1

SAMPLING COMPANY: Cambria Environmental Technology Inc.	LOG CODE: CETO
ADDRESS: 1144 65th Street, Suite B, Oakland, CA, 94608	
PROJECT CONTACT (Hardcopy or PDF Report to): Max Shahbazian	
TELEPHONE: 510-420-3344	FAX: 510-420-0170
E-MAIL: mshahbazian@cambria-env.com	
SITE ADDRESS (Street and City): 105 5th Street, Oakland, CA	GLOBAL ID NO.: T0600102116
EDF DELIVERABLE TO (Responsible Party or Designee): ShellOaklandEDF@cambria-env.com	PHONE NO.: 510-420-3344
E-MAIL: ShellOaklandEDF@cambria-env.com	CONSULTANT PROJECT NO.: ~~244-0884-005~~ 0472-0100 C.L.
SAMPLER NAME(S) (Print): James Loetterle	

TURNAROUND TIME (BUSINESS DAYS): ☑ 10 DAYS ☐ 5 DAYS ☐ 72 HOURS ☐ 48 HOURS ☐ 24 HOURS ☐ LESS THAN 24 HOURS

☐ LA - RWQCB REPORT FORMAT ☐ UST AGENCY: ______

GC/MS MTBE CONFIRMATION: HIGHEST ______ HIGHEST per BORING ______ ALL ______

SPECIAL INSTRUCTIONS OR NOTES: CHECK BOX IF EDD IS NOT NEEDED ☐

REQUESTED ANALYSIS

Field Sample Identification	Sampling Date	Sampling Time	Matrix	No. of Cont.	TPH - Gas, Purgeable	BTEX	MTBE (8021B - 5ppb RL)	MTBE (8260B - 0.5ppb RL)	Oxygenates (5) by (8260B)	Ethanol (8260B)	Methanol	EDB & 1,2-DCA (8260B)	EPA 5035 Extraction for Volatiles	VOCs Halogenated/Aromatic (8021B)	TRPH (418.1)	Vapor VOCs BTEX / MTBE (TO-15)	Vapor VOCs Full List (TO-15)	Vapor TPH (ASTM 3416m)	Vapor Fixed Gases (ASTM D1946)	Test for Disposal (4E—)		TPH - Diesel, Extractable (8015m)		MTBE (8260B) Confirmation, See Note	FIELD NOTES: Container/Preservative or PID Readings or Laboratory Notes
MW-6-5.5	8/1/02	9:42	Soil	1	X	X	X																		-01
MW-6-10.5	↓	9:45	↓	↓	↓	↓	↓																		-02
MW-6-15.5	↓	9:47	↓	↓	↓	↓	↓																		-03
MW-6-20.5	↓	9:55	↓	↓	↓	↓	↓																		-04
MW-6-23.0	↓	10:00	↓	↓	↓	↓	↓																		-05

TEMPERATURE ON RECEIPT C°

Relinquished by: (Signature)	Received by: (Signature)	Date:	Time:
[signature]			
	John Cuttle / Kiff Analytical	080202	1330

DISTRIBUTION: White with final report, Green to File, Yellow and Pink to Client

10/16/00 Revision