CAMBRIA

March 19, 1998

Barney Chan
Alameda County Department
of Environmental Health
1131 Harbor Bay Parkway, Suite 250
Alameda, California 94502

#3769

Re: **Subsurface Investigation**
Shell Service Station
4255 MacArthur Boulevard
Oakland, California
WIC #204-5510-0600
Cambria Project #24-524-09

Dear Mr. Chan:

Cambria Environmental Technology, Inc. (Cambria) is pleased to present the results of the subsurface investigation conducted on February 13, 1998 at the Shell Oil Products Company (Shell) site referenced above. The investigation objective was to determine the extent of hydrocarbons in soil and ground water beneath the adjacent trailer park property immediately southwest of the site. The site background, investigation procedures, and investigation results are presented below.

SITE BACKGROUND

Site Description: The site is an active Shell service station located at the northwest corner of the intersection of MacArthur Boulevard and High Street in Oakland, California in a mixed commercial and residential area. A site plan is attached as Figure 1. Located northeast across MacArthur Boulevard is an active Unocal service station. A former Chevron service station site is located east of the site across MacArthur Boulevard.

Previous Investigations: In November 1993, Weiss Associates (WA) of Emeryville, California installed ground water monitoring wells MW-1, MW-2, and MW-3 as part of a site investigation. In November 1994, WA conducted an additional site investigation and installed ground water monitoring well MW-4. The site has been monitored since the fourth quarter 1993. The monitoring data indicates the presence of separate-phase hydrocarbons (SPH) in well MW-2, adjacent to the underground storage tanks (USTs), with typically lower hydrocarbon concentrations in surrounding wells. Cambria conducted a soil vapor extraction (SVE) pilot test at the site in September 1997.

CAMBRIA
ENVIRONMENTAL
TECHNOLOGY, INC.
1144 65TH STREET,
SUITE B
OAKLAND,
CA 94608
PH: (510) 420-0700
FAX: (510) 420-9170

INVESTIGATION PROCEDURES

Cambria installed two soil borings offsite and down-gradient of the site on the MacArthur-High Trailer Park property. Activities were conducted in accordance with Cambria's July 22, 1997 *Additional Offsite Subsurface Investigation Work Plan,* which was approved by the Alameda County Department of Environmental Health (ACDEH) in a letter dated December 5, 1997. Boring locations are shown in Figure 1. Cambria's standard field procedures for Geoprobe® sampling are included as Attachment A.

Soil Borings

Personnel Present: Geologist Aubrey Cool and Environmental Scientist Brian Busch directed the field sampling, working under the supervision of California Registered Geologist Khaled B. Rahman.

Permit: Drilling permit #98WR038 was obtained from the Alameda County Public Works Agency. A copy of the permit is included as Attachment B.

Drilling Company: Gregg Drilling of Martinez, California (C-57 License #485165).

Drilling Date: February 13, 1998.

Drilling Methods: Geoprobe® (hydraulic push with roto-hammer).

Number of Borings: Two; SB-1 and SB-2.

Boring Depths: 12.0 ft. Boring logs are included as Attachment C.

Subsurface Conditions: The site is underlain by silts, clayey silts, silty clays, sandy clays, and silty sands to the total explored depth of 31 ft. The first water-bearing zone is encountered beneath the site at approximately 7 to 8 ft depth and flows west-southwest. Ground water beneath the site is not a known drinking water source.

Chemical Analyses: Two soil samples and one grab ground water sample from each boring were selected for chemical analysis. The selected samples were analyzed for total petroleum hydrocarbons as gasoline (TPHg) using modified EPA Method 8015, and benzene, toluene, ethylbenzene, xylenes (BTEX) and methyl tert-butyl ether (MTBE) using EPA Method 8020. As requested in a February 18, 1998 letter from ACDEH, soil and ground water samples were also analyzed for MTBE using EPA Method 8260. Laboratory analytical results are summarized in Tables 1 and 2 and presented in Attachment D.

Soil Physical Analyses: One soil sample from each boring was analyzed for total porosity, permeability, moisture, and organic carbon content. Physical analysis results are presented in Attachment D.

Soil Handling: No soil cuttings were produced during sampling activities.

Backfill Method: Boring locations were backfilled with cement grout to match the existing grade.

INVESTIGATION RESULTS

Hydrocarbon Distribution in Soil: Soil samples from borings SB-1 and SB-2 were below laboratory detection limits for TPHg and BTEX. MTBE was detected at 1.4 milligrams per kilogram (mg/Kg) in soil boring SB-2 at 7 ft depth.

Hydrocarbon Distribution in Ground Water: Up to 7,700 micrograms per liter (μg/L) TPHg, 210 μg/L benzene, and 46,000 μg/L MTBE were detected in the grab ground water sample collected from soil boring SB-2. These concentrations are consistent with data obtained from nearby monitoring wells.

Soil Physical Analyses: 2,140 mg/Kg to 7,210 mg/Kg total organic carbon were detected in the analyzed soil samples. Effective and specific permeability values for analyzed soil samples confirm the low permeability of the shallow soils beneath the site.

CONCLUSIONS

The results of this subsurface investigation indicate that the offsite property is underlain by low permeability shallow soils with relatively high organic carbon content, and gasoline constituents are present in ground water. As outlined in our March 9, 1998 letter to the ACDEH, we will review the results of this investigation, the September 1997 soil vapor extraction (SVE) test data, and additional site history and data collected from previous investigations. As outlined in our March 9, 1998 letter to you, Cambria will issue a remedial work plan within 45 days of the date of this report.

CLOSING

We appreciate the opportunity to work with you on this project. If you have any questions or require additional information, please contact us at (510) 420-0700.

Sincerely,
Cambria Environmental Technology, Inc.

Aubrey K Cool

Aubrey K. Cool
Staff Geologist

Khaled Rah

Khaled B. Rahman, R.G., C.H.G.
Senior Geologist

Attachments: A - Standard Field Procedures for Geoprobe® Sampling
B - Drilling Permit
C - Soil Boring Logs
D - Laboratory Analytical Results

cc: A. E. (Alex) Perez, Shell Oil Products Company, P.O. Box 8080, Martinez, California 94553

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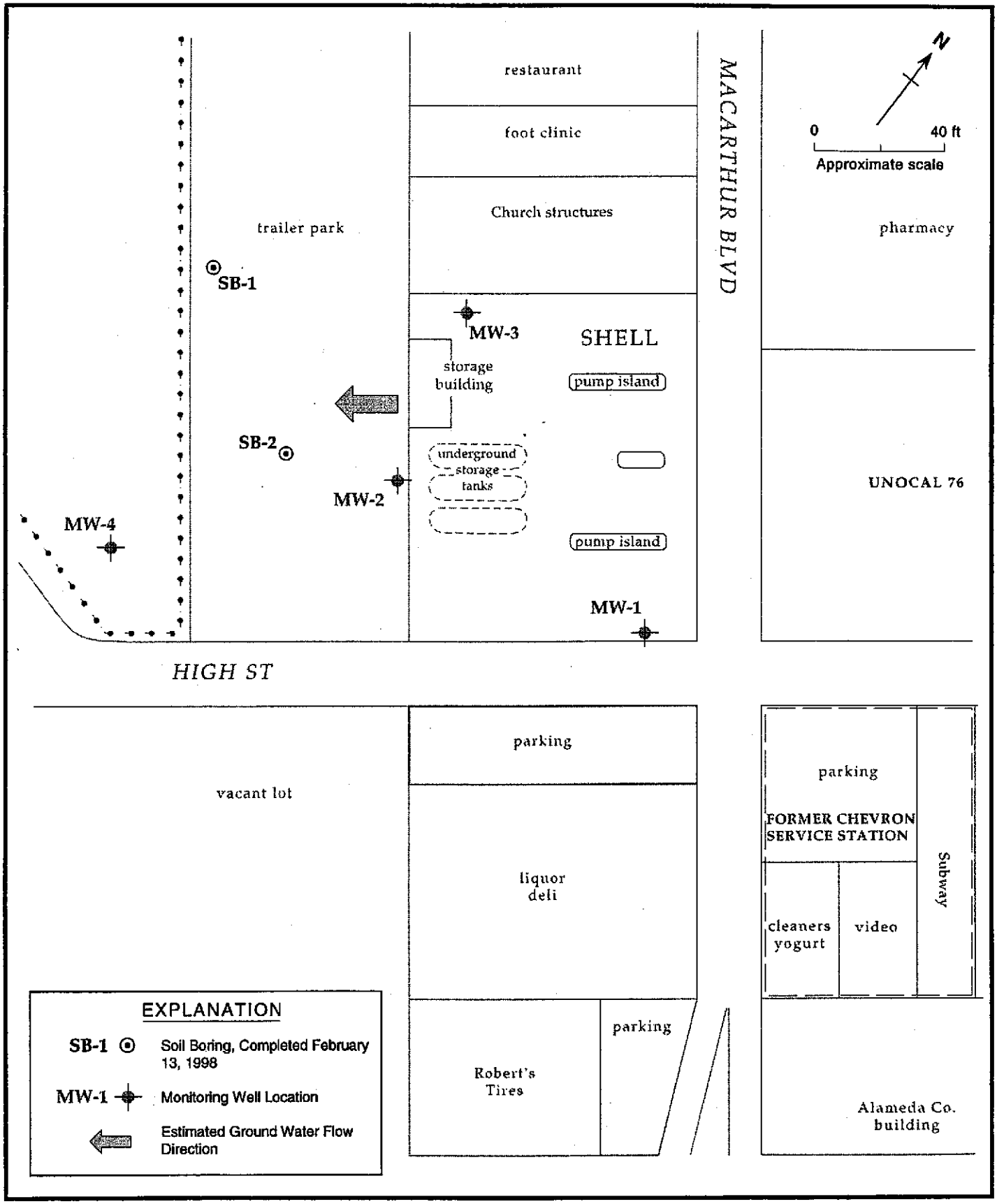

Figure 1. Soil Boring Locations - Shell Service Station WIC# 204-5510-0600, 4255 MacArthur Boulevard, Oakland, California

Table 1. Soil Analytical Data - Shell Service Station, WIC # 204-5510-0600, 4255 MacArthur Boulevard, Oakland, California

Sample ID	Date Sampled	TPHg	Benzene	Toluene	Ethylbenzene	Xylenes	MTBE	MTBE[a]
		←			(concentrations in mg/Kg)		→	
SB-1 - 5.0	2/13/98	<1.0	<0.0050	<0.0050	<0.0050	<0.0050	<0.025	<0.10
SB-1 - 7.0	2/13/98	<1.0	<0.0050	<0.0050	<0.0050	<0.0050	<0.025	<0.10
SB-2 - 5.0	2/13/98	<1.0	<0.0050	<0.0050	<0.0050	<0.0050	<0.025	<0.10
SB-2 - 7.0	2/13/98	<1.0	<0.0050	<0.0050	<0.0050	<0.0050	1.4	0.88

Abbreviations and Notes:

mg/Kg = Milligrams per kilogram

TPHg = Total petroleum hydrocarbons as gasoline by modified EPA Method 8015

Benzene, toluene, ethylbenzene, and xylenes by EPA Method 8020

MTBE = Methyl tert-butyl ether by EPA Method 8020

<**n** = Not detected at **n** mg/Kg

a = MTBE results quantified by EPA Method 8260. Results reported after sample hold time had expired.

Table 2. Ground Water Analytical Data - Shell Service Station, WIC # 204-5510-0600, 4255 MacArthur Boulevard, Oakland, California

Sample ID	Date Sampled	TPHg	Benzene	Toluene	Ethylbenzene	Xylenes	MTBE	MTBE[a]
		←			(concentrations in µg/L)			→
SB-1	2/13/98	1,400	22	3.3	<2.5	<2.5	410	390
SB-2	2/13/98	7,700	210	410	<200	750	33,000	46,000

Abbreviations and Notes:

µg/L = Micrograms per liter

TPHg = Total petroleum hydrocarbons as gasoline by modified EPA Method 8015

Benzene, toluene, ethylbenzene, and xylenes by EPA Method 8020

MTBE = Methyl tert-butyl ether by EPA Method 8020

<n = Not detected at n µg/L

a = MTBE results quantified by EPA Method 8260. Results reported after sample hold time had expired.

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ATTACHMENT A

Standard Field Procedures for Geoprobe® Sampling

STANDARD FIELD PROCEDURES FOR GEOPROBE® SAMPLING

This document describes Cambria Environmental Technology's standard field methods for GeoProbe® soil and ground water sampling. 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) or a Certified Engineering Geologist (CEG). 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

GeoProbe® soil samples are collected from borings driven 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 and sampling 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. 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 portable GasTech® or 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 analysis.

Grab Ground Water Sampling

Ground water samples are collected from the open borehole using bailers, advancing disposable Tygon® tubing into the borehole and extracting ground water using a diaphragm pump, or 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.

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ATTACHMENT B

Drilling Permit

ALAMEDA COUNTY PUBLIC WORKS AGENCY

WATER RESOURCES SECTION
951 TURNER COURT, SUITE 300, HAYWARD, CA 94545-2651
PHONE (510) 670-5575 ANDREAS GODFREY FAX (510) 670-5262
(510) 670-5248 ALVIN KAN

DRILLING PERMIT APPLICATION

FOR APPLICANT TO COMPLETE

LOCATION OF PROJECT 4255 MacArthur Blvd.
OAKLAND, CA

California Coordinates Source _____ ft. Accuracy ± ____ ft.
CCN _____ ft. CCE _____ ft.
APN 30-1981-133

CLIENT
Name SHELL OIL PRODUCTS CO. (ALEX PEREZ)
Address P.O. BOX 8080 Phone (510) 335-5027
City MARTINEZ, CA Zip 94553

APPLICANT
Name CAMBRIA ENVIRONMENTAL TECHNOLOGY
Fax (510) 420-9170
Address 1144 65th ST, SUITE C Phone (510) 420-0700
City OAKLAND, CA Zip 94608

TYPE OF PROJECT

Well Construction		Geotechnical Investigation	
Cathodic Protection	☐	General	☐
Water Supply	☐	Contamination	☑
Monitoring	☐	Well Destruction	☐

PROPOSED WATER SUPPLY WELL USE

New Domestic	☐	Replacement Domestic	☐
Municipal	☐	Irrigation	☐
Industrial	☐	Other N.A.	☑

DRILLING METHOD:

Mud Rotary	☐	Air Rotary	☐	Auger	☐
Cable	☐	Other	☑ GEOPROBE		

DRILLER'S LICENSE NO. C57 485165 - Gregg Drilling

WELL PROJECTS
Drill Hole Diameter _____ in. Maximum
Casing Diameter _____ in. Depth _____ ft.
Surface Seal Depth _____ ft. Number _____

GEOTECHNICAL PROJECTS
Number of Borings 2 Maximum
Hole Diameter 2 in. Depth 25 ft.

ESTIMATED STARTING DATE 2/2/98
ESTIMATED COMPLETION DATE 2/2/98

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

APPLICANT'S SIGNATURE Brian Bennett DATE 1-19-98

FOR OFFICE USE

PERMIT NUMBER 98WR038
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.) Submit to ACPWA within 60 days after completion of permitted work the original Department of Water Resources Water Well Drillers Report or equivalent for well projects, or drilling logs and location sketch for geotechnical projects.
(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. 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 with compacted cuttings or heavy bentonite and upper two feet with compacted material. In areas of known or suspected contamination, tremied cement grout shall be used in place of compacted cuttings.

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

F. WELL DESTRUCTION
See attached.

G. SPECIAL CONDITIONS

APPROVED [signature] DATE 1/26/98

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ATTACHMENT C

Soil Boring Logs

BORING LOG

Client: **Shell Oil Products Company**

Project No: **240-0524** Phase Task

Boring ID **SB-1**

Location **4255 MacArthur Blvd., Oakland**

Surface Elev. **NA ft,**

Page **1** of **1**

Depth (feet)	Blow Count	Sample	Interval	Lithologic Description
0	Ground Surface			**Asphalt**
5				**SILT**; (ML); brown; soft; damp; 10% clay, 80% silt, 10% gravel to 0.25 inch diameter; low plasticity; low estimated permeability.
				Clayey SILT; (ML); brown; soft; damp; 15% clay, 80% silt, 5% gravel to 0.5 inch diameter; low plasticity; low estimated permeability.
				wet.
10				**SILT**; (ML); dark brown; medium stiff; damp; 5% clay, 80% silt, 10% fine sand, 5% gravel to 0.5 inch diameter; low plasticity; low estimated permeability.
				black; 10% clay, 85% silt, 5% gravel to 0.5 inch diameter.

TPHg (ppm)	Graphic Log	Boring Completion Graphics	Depth (feet)	Additional Comments
			0	
			5	Water encountered @ 7 ft.
			10	Bottom of boring @ 12 ft.

Driller **Gregg**

Logged By **Brian Busch**

Water-Bearing Zones **NA**

Drilling Started **2/13/98**

Drilling Completed **2/13/98**

Grout Type **Portland Type I/II**

Notes: **See site map.**

BOR 24524 2/13/98

Cambria Environmental Technology, Inc.

BORING LOG

Client: **Shell Oil Products Company**

Project No: **240-0524** Phase Task

Boring ID **SB-2**

Location **4255 MacArthur Blvd., Oakland**

Surface Elev. **NA ft,**

Page **1** of **1**

Depth (feet)	Blow Count	Sample	Interval	Lithologic Description
0	Ground Surface			
				Asphalt
				Gravelly SAND; (SPG); brown; soft; damp; 10% silt, 70% sand, 20% gravel to 1 inch diameter with concrete and wood; no plasticity; moderate estimated permeability.
5				**SILT**; (ML); brown; medium stiff; damp; 10% clay, 85% silt, 5% gravel to 0.25 inch diameter with wood; low plasticity; low estimated permeability.
				dark brown; soft; 5% clay, 95% silt; no plasticity.
				moist; low plasticity.
				wet; 10% clay, 80% silt, 10% gravel to 0.125 inch diameter.
10				

TPHg (ppm) | Graphic Log | Boring Completion Graphics

Depth (feet)	Additional Comments
0	
5	Static water level @ 5 ft.
10	Water encountered @ 8 ft.
	Bottom of boring @ 12 ft.

Driller **Gregg**

Logged By **Brian Busch**

Water-Bearing Zones **NA**

Drilling Started **2/13/98**

Drilling Completed **2/13/98**

Grout Type **Portland Type I/II**

Notes: **See site map.**

BOR 24524 2/13/98

Cambria Environmental Technology, Inc.

CAMBRIA

ATTACHMENT D

Laboratory Analytical Results

Sequoia Analytical

680 Chesapeake Drive, Redwood City, CA 94063, (650) 364-9600, FAX (650) 364-9233
404 N. Wiget Lane, Walnut Creek, CA 94598, (510) 988-9600, FAX (510) 988-9673
819 Striker Avenue, Suite 8, Sacramento, CA 95834, (916) 921-9600, FAX (916) 921-0100

Cambria
1144 65th St. Suite C
Oakland, CA 94608
Attention: Brian Busch

Project: 4255 MacArthur, Oakland

Enclosed are the results from samples received at Sequoia Analytical on February 13, 1998. The requested analyses are listed below:

SAMPLE #	SAMPLE DESCRIPTION	DATE COLLECTED	TEST METHOD
9802931 -01	LIQUID, SB-1	02/13/98	Purgeable TPH/BTEX/MTBE
9802931 -02	LIQUID, SB-2	02/13/98	Purgeable TPH/BTEX/MTBE
9802931 -03	SOLID, SB-1-5.0'	02/13/98	Purgeable TPH/BTEX/MTBE
9802931 -04	SOLID, SB-1-7.0'	02/13/98	Purgeable TPH/BTEX/MTBE
9802931 -05	SOLID, SB-2-5.0'	02/13/98	Purgeable TPH/BTEX/MTBE
9802931 -06	SOLID, SB-2-7.0'	02/13/98	Purgeable TPH/BTEX/MTBE
9802931 -07	SOLID, SB-1-5.5'	02/13/98	Moisture, Percent
9802931 -07	SOLID, SB-1-5.5'	02/13/98	Permeability
9802931 -07	SOLID, SB-1-5.5'	02/13/98	Porosity
9802931 -07	SOLID, SB-1-5.5'	02/13/98	Organic Carbon : Total
9802931 -08	SOLID, SB-2-5.5'	02/13/98	Moisture, Percent
9802931 -08	SOLID, SB-2-5.5'	02/13/98	Permeability
9802931 -08	SOLID, SB-2-5.5'	02/13/98	Porosity
9802931 -08	SOLID, SB-2-5.5'	02/13/98	Organic Carbon : Total

Please contact me if you have any questions. In the meantime, thank you for the opportunity to work with you on this project.

Very truly yours,

SEQUOIA ANALYTICAL

Project Manager

Sequoia Analytical

680 Chesapeake Drive, Redwood City, CA 94063, (650) 364-9600, FAX (650) 364-9233
404 N. Wiget Lane, Walnut Creek, CA 94598, (510) 988-9600, FAX (510) 988-9673
819 Striker Avenue, Suite 8, Sacramento, CA 95834, (916) 921-9600, FAX (916) 921-0100

Cambria
1144 65th St. Suite C
Oakland, CA 94608

Attention: Brian Busch

Client Proj. ID: 4255 MacArthur, Oakland

Lab Proj. ID: 9802931

Sampled: 02/13/98
Received: 02/13/98
Analyzed: see below

Reported: 03/10/98

LABORATORY ANALYSIS

	Analyte	Units	Date Analyzed	Detection Limit	Sample Results
Lab No: 9802931-07					
Sample Desc : **SOLID,SB-1-5.5'**					
	Moisture, Percent	**%**	**03/03/98**	**1.0**	**24**
#1267	**Organic Carbon : Total**	**mg/kg**	**02/23/98**	**50**	**7210**
	Permeability	-		**See**	**Attached**
	Porosity	-		**See**	**Attached**
Lab No: 9802931-08					
Sample Desc : **SOLID,SB-2-5.5'**					
	Moisture, Percent	**%**	**03/03/98**	**1.0**	**18**
#1267	**Organic Carbon : Total**	**mg/kg**	**02/23/98**	**50**	**2140**
	Permeability	-		**See**	**Attached**
	Porosity	-		**See**	**Attached**

Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL - ELAP #1210

Richard Herling
Project Manager

Sequoia Analytical

680 Chesapeake Drive, Redwood City, CA 94063, (650) 364-9600, FAX (650) 364-9233
404 N. Wiget Lane, Walnut Creek, CA 94598, (510) 988-9600, FAX (510) 988-9673
819 Striker Avenue, Suite 8, Sacramento, CA 95834, (916) 921-9600, FAX (916) 921-0100

Cambria	Client Proj. ID: 4255 MacArthur, Oakland	Sampled: 02/13/98
1144 65th St. Suite C	Sample Descript: SB-1	Received: 02/13/98
Oakland, CA 94608	Matrix: LIQUID	
	Analysis Method: 8015Mod/8020	Analyzed: 02/26/98
Attention: Brian Busch	Lab Number: 9802931-01	Reported: 03/10/98

QC Batch Number: GC022698BTEX21A
Instrument ID: GCHP21

Total Purgeable Petroleum Hydrocarbons (TPPH) with BTEX and MTBE

Analyte	Detection Limit ug/L	Sample Results ug/L
TPPH as Gas	**250**	**1400**
Methyl t-Butyl Ether	**12**	**410**
Benzene	**2.5**	**22**
Toluene	**2.5**	**3.3**
Ethyl Benzene	2.5	N.D.
Xylenes (Total)	2.5	N.D.
Chromatogram Pattern:		**Gas**

Surrogates	Control Limits %		% Recovery
Trifluorotoluene	70	130	109

Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL - ELAP #1210

Richard Herling
Project Manager

Sequoia Analytical

680 Chesapeake Drive, Redwood City, CA 94063, (650) 364-9600, FAX (650) 364-9233
404 N. Wiget Lane, Walnut Creek, CA 94598, (510) 988-9600, FAX (510) 988-9673
819 Striker Avenue, Suite 8, Sacramento, CA 95834, (916) 921-9600, FAX (916) 921-0100

Cambria	Client Proj. ID: 4255 MacArthur, Oakland	Sampled: 02/13/98
1144 65th St. Suite C	Sample Descript: SB-2	Received: 02/13/98
Oakland, CA 94608	Matrix: LIQUID	
	Analysis Method: 8015Mod/8020	Analyzed: 02/27/98
Attention: Brian Busch	Lab Number: 9802931-02	Reported: 03/10/98

QC Batch Number: GC022798BTEX03A
Instrument ID: GCHP3

Total Purgeable Petroleum Hydrocarbons (TPPH) with BTEX and MTBE

Analyte	Detection Limit ug/L	Sample Results ug/L
TPPH as Gas	**5000**	**7700**
Methyl t-Butyl Ether	**1000**	**33000**
Benzene	**200**	**210**
Toluene	**200**	**410**
Ethyl Benzene	200	N.D.
Xylenes (Total)	**200**	**750**
Chromatogram Pattern:		

Surrogates	Control Limits %		% Recovery
Trifluorotoluene	70	130	89

Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL - ELAP #1210

Richard Herling
Project Manager

Sequoia Analytical

680 Chesapeake Drive, Redwood City, CA 94063, (650) 364-9600, FAX (650) 364-9233
404 N. Wiget Lane, Walnut Creek, CA 94598, (510) 988-9600, FAX (510) 988-9673
819 Striker Avenue, Suite 8, Sacramento, CA 95834, (916) 921-9600, FAX (916) 921-0100

Cambria	Client Proj. ID: 4255 MacArthur, Oakland	Sampled: 02/13/98
1144 65th St. Suite C	Sample Descript: SB-1-5.0'	Received: 02/13/98
Oakland, CA 94608	Matrix: SOLID	Extracted: 02/23/98
	Analysis Method: 8015Mod/8020	Analyzed: 02/26/98
Attention: Brian Busch	Lab Number: 9802931-03	Reported: 03/10/98

QC Batch Number: GC022398BTEXEXB
Instrument ID: GCHP22

Total Purgeable Petroleum Hydrocarbons (TPPH) with BTEX and MTBE

Analyte	Detection Limit mg/Kg	Sample Results mg/Kg
TPPH as Gas	1.0	N.D.
Methyl t-Butyl Ether	0.025	N.D.
Benzene	0.0050	N.D.
Toluene	0.0050	N.D.
Ethyl Benzene	0.0050	N.D.
Xylenes (Total)	0.0050	N.D.
Chromatogram Pattern:		

Surrogates	Control Limits %		% Recovery
Trifluorotoluene	70	130	106
4-Bromofluorobenzene	60	140	100

Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL - ELAP #1210

Richard Herling
Project Manager

Sequoia Analytical

680 Chesapeake Drive, Redwood City, CA 94063, (650) 364-9600, FAX (650) 364-9233
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819 Striker Avenue, Suite 8, Sacramento, CA 95834, (916) 921-9600, FAX (916) 921-0100

Cambria	Client Proj. ID: 4255 MacArthur, Oakland	Sampled: 02/13/98
1144 65th St. Suite C	Sample Descript: SB-1-7.0'	Received: 02/13/98
Oakland, CA 94608	Matrix: SOLID	Extracted: 02/23/98
	Analysis Method: 8015Mod/8020	Analyzed: 02/25/98
Attention: Brian Busch	Lab Number: 9802931-04	Reported: 03/10/98

QC Batch Number: GC022398BTEXEXB
Instrument ID: GCHP01

Total Purgeable Petroleum Hydrocarbons (TPPH) with BTEX and MTBE

Analyte	Detection Limit mg/Kg	Sample Results mg/Kg
TPPH as Gas	1.0	N.D.
Methyl t-Butyl Ether	0.025	N.D.
Benzene	0.0050	N.D.
Toluene	0.0050	N.D.
Ethyl Benzene	0.0050	N.D.
Xylenes (Total)	0.0050	N.D.
Chromatogram Pattern:		

Surrogates	Control Limits %		% Recovery
Trifluorotoluene	70	130	75
4-Bromofluorobenzene	60	140	90

Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL - ELAP #1210

Richard Herling
Project Manager

Sequoia Analytical

680 Chesapeake Drive, Redwood City, CA 94063, (650) 364-9600, FAX (650) 364-9233
404 N. Wiget Lane, Walnut Creek, CA 94598, (510) 988-9600, FAX (510) 988-9673
819 Striker Avenue, Suite 8, Sacramento, CA 95834, (916) 921-9600, FAX (916) 921-0100

Cambria	Client Proj. ID: 4255 MacArthur, Oakland	Sampled: 02/13/98
1144 65th St. Suite C	Sample Descript: SB-2-5.0'	Received: 02/13/98
Oakland, CA 94608	Matrix: SOLID	Extracted: 02/23/98
	Analysis Method: 8015Mod/8020	Analyzed: 02/25/98
Attention: Brian Busch	Lab Number: 9802931-05	Reported: 03/10/98

QC Batch Number: GC022398BTEXEXB
Instrument ID: GCHP01

Total Purgeable Petroleum Hydrocarbons (TPPH) with BTEX and MTBE

Analyte	Detection Limit mg/Kg	Sample Results mg/Kg
TPPH as Gas	1.0	N.D.
Methyl t-Butyl Ether	0.025	N.D.
Benzene	0.0050	N.D.
Toluene	0.0050	N.D.
Ethyl Benzene	0.0050	N.D.
Xylenes (Total)	0.0050	N.D.
Chromatogram Pattern:		

Surrogates	Control Limits %		% Recovery
Trifluorotoluene	70	130	79
4-Bromofluorobenzene	60	140	96

Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL - ELAP #1210

Richard Herling
Project Manager

Sequoia Analytical

680 Chesapeake Drive, Redwood City, CA 94063, (650) 364-9600, FAX (650) 364-9233
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819 Striker Avenue, Suite 8, Sacramento, CA 95834, (916) 921-9600, FAX (916) 921-0100

Cambria	Client Proj. ID: 4255 MacArthur, Oakland	Sampled: 02/13/98
1144 65th St. Suite C	Sample Descript: SB-2-7.0'	Received: 02/13/98
Oakland, CA 94608	Matrix: SOLID	Extracted: 02/23/98
	Analysis Method: 8015Mod/8020	Analyzed: 02/26/98
Attention: Brian Busch	Lab Number: 9802931-06	Reported: 03/10/98

QC Batch Number: GC022398BTEXEXB
Instrument ID: GCHP22

Total Purgeable Petroleum Hydrocarbons (TPPH) with BTEX and MTBE

Analyte	Detection Limit mg/Kg	Sample Results mg/Kg
TPPH as Gas	1.0	N.D.
Methyl t-Butyl Ether	**0.025**	**1.4**
Benzene	0.0050	N.D.
Toluene	0.0050	N.D.
Ethyl Benzene	0.0050	N.D.
Xylenes (Total)	0.0050	N.D.
Chromatogram Pattern:		

Surrogates	Control Limits %		% Recovery
Trifluorotoluene	70	130	98
4-Bromofluorobenzene	60	140	100

Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL - ELAP #1210

Richard Herling
Project Manager

Sequoia Analytical

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819 Striker Avenue, Suite 8, Sacramento, CA 95834, (916) 921-9600, FAX (916) 921-0100

Cambria Environmental Tech.
1144 65th St., Ste. C
Oakland, CA 94608
Attention: Brian Busch

Client Project ID: 4255 MacArthur,Oakland
Matrix: Liquid
Work Order #: 9802931 01, 02

Reported: Mar 12, 1998

QUALITY CONTROL DATA REPORT

Analyte:	Benzene	Toluene	Ethyl Benzene	Xylenes	Gas
QC Batch#:	GC022698BEX21A	GC022698BEX21A	GC022698BEX21A	GC022698BEX21A	GC022698BEX21A
Analy. Method:	EPA 8020	EPA 8020	EPA 8020	EPA 8020	EPA 8015M
Prep. Method:	EPA 5030	EPA 5030	EPA 5030	EPA 5030	EPA 5030
Analyst:	C. DeMartini	C. DeMartini	C. DeMartini	C. DeMartini	C. DeMartini
MS/MSD #:	9802C3804	9802C3804	9802C3804	9802C3804	9802C3804
Sample Conc.:	N.D.	N.D.	N.D.	N.D.	N.D.
Prepared Date:	2/26/98	2/26/98	2/26/98	2/26/98	2/26/98
Analyzed Date:	2/26/98	2/26/98	2/26/98	2/26/98	2/26/98
Instrument I.D.#:	GCHP21	GCHP21	GCHP21	GCHP21	GCHP21
Conc. Spiked:	10 µg/L	10 µg/L	10 µg/L	30 µg/L	60 µg/L
Result:	11	10	10	31	54
MS % Recovery:	110	100	100	103	90
Dup. Result:	11	11	10	31	56
MSD % Recov.:	110	110	100	103	93
RPD:	0.0	9.5	0.0	0.0	3.6
RPD Limit:	0-25	0-25	0-25	0-25	0-25
LCS #:	BLK022698	BLK022698	BLK022698	BLK022698	BLK022698
Prepared Date:	2/26/98	2/26/98	2/26/98	2/26/98	2/26/98
Analyzed Date:	2/26/98	2/26/98	2/26/98	2/26/98	2/26/98
Instrument I.D.#:	GCHP21	GCHP21	GCHP21	GCHP21	GCHP21
Conc. Spiked:	10 µg/L	10 µg/L	10 µg/L	30 µg/L	60 µg/L
LCS Result:	11	11	11	31	55
LCS % Recov.:	110	110	110	103	92
MS/MSD Control Limits	60-140	60-140	60-140	60-140	60-140
LCS Control Limits	70-130	70-130	70-130	70-130	70-130

SEQUOIA ANALYTICAL

Richard Herling
Project Manager

Please Note:
The LCS is a control sample of known, interferent-free matrix that is analyzed using the same reagents, preparation, and analytical methods employed for the samples. The matrix spike is an aliquot of sample fortified with known quantities of specific compounds and subjected to the entire analytical procedure. If the recovery of analytes from the matrix spike does not fall within specified control limits due to matrix interference, the LCS recovery is to be used to validate the batch.

** MS = Matrix Spike, MSD = MS Duplicate, RPD = Relative % Difference

Sequoia Analytical

680 Chesapeake Drive, Redwood City, CA 94063, (650) 364-9600, FAX (650) 364-9233
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819 Striker Avenue, Suite 8, Sacramento, CA 95834, (916) 921-9600, FAX (916) 921-0100

Cambria Environmental Tech.
1144 65th St., Ste. C
Oakland, CA 94608
Attention: Brian Busch

Client Project ID: 4255 MacArthur,Oakland
Matrix: Liquid
Work Order #: 9802931 02
Reported: Mar 12, 1998

QUALITY CONTROL DATA REPORT

Analyte:	Benzene	Toluene	Ethyl Benzene	Xylenes	Gas
QC Batch#:	GC022798BTEX03A	GC022798BTEX03A	GC022798BTEX03A	GC022798BTEX03A	GC022798BTEX03A
Analy. Method:	EPA 8020	EPA 8020	EPA 8020	EPA 8020	EPA 8015M
Prep. Method:	EPA 5030	EPA 5030	EPA 5030	EPA 5030	EPA 5030
Analyst:	C. DeMartini	C. DeMartini	C. DeMartini	C. DeMartini	C. DeMartini
MS/MSD #:	9802B6903	9802B6903	9802B6903	9802B6903	9802B6903
Sample Conc.:	N.D.	N.D.	N.D.	N.D.	N.D.
Prepared Date:	2/27/98	2/27/98	2/27/98	2/27/98	2/27/98
Analyzed Date:	2/27/98	2/27/98	2/27/98	2/27/98	2/27/98
Instrument I.D.#:	GCHP3	GCHP3	GCHP3	GCHP3	GCHP3
Conc. Spiked:	10 µg/L	10 µg/L	10 µg/L	30 µg/L	60 µg/L
Result:	9.8	9.7	9.9	30	64
MS % Recovery:	98	97	99	100	107
Dup. Result:	9.8	9.6	9.8	30	64
MSD % Recov.:	98	96	98	100	107
RPD:	0.0	1.0	1.0	0.0	0.0
RPD Limit:	0-25	0-25	0-25	0-25	0-25
LCS #:	BLK022798	BLK022798	BLK022798	BLK022798	BLK022798
Prepared Date:	2/27/98	2/27/98	2/27/98	2/27/98	2/27/98
Analyzed Date:	2/27/98	2/27/98	2/27/98	2/27/98	2/27/98
Instrument I.D.#:	GCHP3	GCHP3	GCHP3	GCHP3	GCHP3
Conc. Spiked:	10 µg/L	10 µg/L	10 µg/L	30 µg/L	60 µg/L
LCS Result:	10	9.9	10	30	65
LCS % Recov.:	100	99	100	100	108
MS/MSD Control Limits	60-140	60-140	60-140	60-140	60-140
LCS Control Limits	70-130	70-130	70-130	70-130	70-130

SEQUOIA ANALYTICAL

Richard Herling
Project Manager

Please Note:
The LCS is a control sample of known, interferent-free matrix that is analyzed using the same reagents, preparation, and analytical methods employed for the samples. The matrix spike is an aliquot of sample fortified with known quantities of specific compounds and subjected to the entire analytical procedure. If the recovery of analytes from the matrix spike does not fall within specified control limits due to matrix interference, the LCS recovery is to be used to validate the batch.

** MS = Matrix Spike, MSD = MS Duplicate, RPD = Relative % Difference

Sequoia Analytical

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Cambria Environmental Tech.
1144 65th St., Ste. C
Oakland, CA 94608
Attention: Brian Busch

Client Project ID: 4255 MacArthur,Oakland
Matrix: Liquid
Work Order #: 9802931 03, 04,05, 06
Reported: Mar 12, 1998

QUALITY CONTROL DATA REPORT

Analyte:	Benzene	Toluene	Ethyl Benzene	Xylenes	Gas
QC Batch#:	GC022398BTEXEXB	GC022398BTEXEXB	GC022398BTEXEXB	GC022398BTEXEXB	GC022398BTEXEXB
Analy. Method:	EPA 8020	EPA 8020	EPA 8020	EPA 8020	EPA 8015M
Prep. Method:	EPA 5030	EPA 5030	EPA 5030	EPA 5030	EPA 5030
Analyst:	J. Minkel	J. Minkel	J. Minkel	J. Minkel	J. Minkel
MS/MSD #:	9802A3809	9802A3809	9802A3809	9802A3809	9802A3809
Sample Conc.:	N.D.	N.D.	N.D.	N.D.	N.D.
Prepared Date:	2/23/98	2/23/98	2/23/98	2/23/98	2/23/98
Analyzed Date:	2/24/98	2/24/98	2/24/98	2/24/98	2/24/98
Instrument I.D.#:	GCHP7	GCHP7	GCHP7	GCHP7	GCHP7
Conc. Spiked:	0.20 mg/Kg	0.20 mg/Kg	0.20 mg/Kg	0.60mg/Kg	1.2 mg/Kg
Result:	0.19	0.19	0.19	0.59	1.2
MS % Recovery:	95	95	95	98	100
Dup. Result:	0.18	0.19	0.19	0.57	1.1
MSD % Recov.:	90	85	95	95	92
RPD:	5.4	0.0	0.0	3.4	8.7
RPD Limit:	0-25	0-25	0-25	0-25	0-25

LCS #:	BLK022398	BLK022398	BLK022398	BLK022398	BLK022398
Prepared Date:	2/23/98	2/23/98	2/23/98	2/23/98	2/23/98
Analyzed Date:	2/23/98	2/23/98	2/23/98	2/23/98	2/23/98
Instrument I.D.#:	GCHP7	GCHP7	GCHP7	GCHP7	GCHP7
Conc. Spiked:	0.20 mg/Kg	0.20 mg/Kg	0.20 mg/Kg	0.60mg/Kg	1.2 mg/Kg
LCS Result:	0.18	0.18	0.18	0.55	1.1
LCS % Recov.:	90	90	90	92	92
MS/MSD	60-140	60-140	60-140	60-140	60-140
LCS	70-130	70-130	70-130	70-130	70-130
Control Limits					

Please Note:
The LCS is a control sample of known, interferent-free matrix that is analyzed using the same reagents, preparation, and analytical methods employed for the samples. The matrix spike is an aliquot of sample fortified with known quantities of specific compounds and subjected to the entire analytical procedure. If the recovery of analytes from the matrix spike does not fall within specified control limits due to matrix interference, the LCS recovery is to be used to validate the batch.

SEQUOIA ANALYTICAL

Richard Herling
Project Manager

** MS=Matrix Spike, MSD=MS Duplicate, RPD=Relative % Difference

CORE LAB

CORE LABORATORIES

Mr. Richard Herling
Sequoia Analytical
680 Chesapeake Dr.
Redwood City, CA 94063

February 23, 1998

Subject : Transmittal of Geotechnical Analysis Data
SA Workorder # 9802931
Core Lab File No. 57111-98048

Dear Mr. Herling :

Two soil samples were submitted to our Bakersfield laboratory for geotechnical analysis. Determinations of permeability to air, and total porosity were requested. Permeability to air, and total porosity were measured and calculated as described in **API RP-40**, API Recommended Practice for Core-Analysis Procedure, 1960. Accompanying this letter please find the results of this study.

Permeabilities were measured first upon the "native state" samples (with all pore fluids in place) to determine the "effective" permeability to air, following fluid extraction and sample drying, permeabilities of each sample were re-measured to determine their "specific" permeability to air. The measured specific permeabilities to air are felt to be erroneously high due to microfractures that developed upon drying (presumably due to clay shrinkage).and were unsuitable for measurement. All permeability measurements were made using steady-state methods. Grain and pore volumes used for the porosity determinations were measured by Boyles Law double-cell methods utilizing an extended range helium porosimeter.

We appreciate this opportunity to be of service to you and to Sequoia Analytical. Should you have any questions, or if we may be of further help in the future, please do not hesitate to contact us.

Very truly yours,

Jeffry L. Smith
Laboratory Supervisor - Rock Properties

JLS:nw
1 original report, 1 cc report: Addressee

CORE LABORATORIES

GEOTECHNICAL ANALYSIS RESULTS

SEQUOIA ANALYTICAL
SA # 9802931
CL FILE 57111-98048

Performed by:
Core Laboratories
3430 Unicorn Road
Bakersfield, CA 93308
(805) 392-8600

Final Report Presented
February 23, 1998

CORE LAB

Sequoia Analytical

9802931

C.L. File: 57111-98048

Fraction No.	Sample Desc.	Sample Date	Sample Grain Vol. cc	Sample Pore Vol. cc	Sample Bulk Vol. cc	Total Porosity %	Permeability (Kair)		Description	Method
							Effective md	Specific md		
7	SB-1 (5.5')	13-Feb-98	11.92	6.49	18.41	35.2	<0.01	181*	Gray v clayey silt	API RP-40
8	SB-2 (5.5')	13-Feb-98	10.65	6.36	17.00	37.4	<0.01	71*	Gray v clayey silt	API RP-40

* Samples developed fine fractures upon drying probably due to clay shrinkage.
Measured permeability values are consequently an order of magnitude (or more) too high.

2/23/98

SHELL OIL COMPANY
RETAIL ENVIRONMENTAL ENGINEERING - WEST

CHAIN OF CUSTODY RECORD
Serial No: _____

Date: 2-13-98
Page 1 of 2

Site Address: 4255 MacArthur Oakland

WIC#:

Shell Engineer: Alex Perez
Phone No.: 510 335 5027
Fax #: 510 335 5029

Consultant Name & Address: CAMBRIA ENVIRONMENTAL
1144 65th St. Suite C, Oakland, CA 94608

Consultant Contact: Brian Busch
Phone No.: 510 420-0700
Fax #: 420-9170

Comments: 9802931

Sampled by: Brian Busch & Aubrey Cool

Printed Name:

LAB: Sequoia

CHECK ONE (1) BOX ONLY	C7/01
G.W. Monitoring	4461
Site Investigation	4441
Soil Classify/Disposal	4442
Water Classify/Disposal	4443
Soil/Air Remed. or Sys. O & M	4452
Water Remed. or Sys. O & M	4453
Other	

TURN AROUND TIME
24 hours
48 hours
10 days (Normal)
Other
NOTE: Notify Lab as soon as Possible of 24/48 hr. TAT.

UST AGENCY: _____

Analysis Required

Sample ID	Date	Sludge	Soil	Water	Air	No. of conts.	TPH (EPA 8015 Mod. Gas)	TPH (EPA 8015 Mod. Diesel)	BTEX (EPA 8020/602)	Volatile Organics (EPA 8240)	Test for Disposal	Combination TPH 8015 & BTEX 8020 + MTBE	Asbestos	Container Size	Preparation Used	Composite Y/N	MATERIAL DESCRIPTION	SAMPLE CONDITION/ COMMENTS
01 SB-1	2/13			X		3						X		40ml	HCl	N	ground water	
02 SB-2	"			X		3						X		40ml	HCl	N	"	
03 SB-1-5.0'	"		X			1						X		2x6 tube	0	N	soil	
04 SB-1-7.0'	"		X			1						X		"	0	N	"	13 4 16
SB-1-10.0'	"		X			1								"	0	N	"	HOLD
05 SB-2-5.0'	"		X			1						X		"	0	N	"	
06 SB-2-7.0'	"		X			1						X		"	0	N	"	

Relinquished By (signature)	Printed Name	Date/Time	Received (signature)	Printed Name	Date/Time
Aubrey K Cool	Aubrey Cool	Date: 2-13-98 Time: 2:45		EDWIN VILLEROS	Date: 2/13/98 Time: 2:45
		Date: 2/13/98 Time: 16:15			Date: Time:
		Date: Time:		MIKE	Date: 2/14/98 Time: 16:16

THE LABORATORY MUST PROVIDE A COPY OF THIS CHAIN-OF-CUSTODY WITH INVOICE AND RESULTS

White Original to Lab

SHELL OIL COMPANY
RETAIL ENVIRONMENTAL ENGINEERING - WEST

CHAIN OF CUSTODY RECORD
Serial No: _____

Date: 2-13-98
Page 2 of 2

Site Address: 4255 MacArthur, Oakland

WIC#:

Shell Engineer: Alex Perez
Phone No.: 510 335 5027
Fax #: 510 335 5029

Consultant Name & Address: CAMBRIA ENVIRONMENTAL
1144 65th St. Suite C, Oakland, CA 94608

Consultant Contact: Brian Busch
Phone No.: 510 420-0700
Fax #: 420-9170

Comments: 9802931

Sampled by: Brian Busch & Aubrey Cool

Printed Name:

LAB: Sequoia

CHECK ONE (1) BOX ONLY | C/D# | TURN AROUND TIME

- G.W. Monitoring [ ] 4441 — 24 hours [ ]
- Site Investigation [x] 4441 — 48 hours [ ]
- Soil Classify/Disposal [ ] 4442 — 15 days [x] (Normal)
- Water Classify/Disposal [ ] 4443 — Other [ ]
- Soil/Air Rem. or Sys. O & M [ ] 4452
- Water Rem. or Sys. O & M [ ] 4453 — NOTE: Notify Lab as soon as Possible of 24/48 hr. TAT.
- Other [ ]

UST AGENCY: _____

Analysis Required

Sample ID	Date	Sludge	Soil	Water	Air	No. of conts.	TPH (EPA 8015 Mod. Gas)	TPH (EPA 8015 Mod. Diesel)	BTEX (EPA 8020/602)	Volatile Organics (EPA 8240)	Test for Disposal	Combination TPH 8015 & BTEX 8020	Permeability, Moisture Content	Total porosity, Organic Carbon	Asbestos	Container Size	Preparation Used	Composite Y/N	MATERIAL DESCRIPTION	SAMPLE CONDITION/ COMMENTS
SB-1-5.5'	2/13		X			1							X	X		2x6 tube	0	N	Soil	
SB-1-7.5'	"		X			1										"	0	N	"	HOLD
SB-1-10.5'	"		X			1										"	0	N	"	HOLD
SB-2-5.5'	"		X			1							X	X		"	0	N	"	
SB-2-7.5'	↓		X			1										↓	0	N	↓	HOLD

FE 13 4 16

Relinquished By (signature)	Printed Name	Date / Time	Received (signature)	Printed Name	Date / Time
Aubrey K Cool	Aubrey Cool	Date: 2-13-98 Time: 2:45		Erwin Villegas	Date: 2/13/98 Time: 2:45
	Printed Name:	Date: 2/13/98 Time: 16:15		Printed Name:	Date: Time:
Relinquished By (signature):	Printed Name:	Date: Time:	Received (signature):	Printed Name: Alice Young	Date: 2/13/98 Time: 16:16

THE LABORATORY MUST PROVIDE A COPY OF THIS CHAIN-OF-CUSTODY WITH INVOICE AND RESULTS

Sequoia Analytical

680 Chesapeake Drive, Redwood City, CA 94063, (650) 364-9600, FAX (650) 364-9233
404 N. Wiget Lane, Walnut Creek, CA 94598, (510) 988-9600, FAX (510) 988-9673
819 Striker Avenue, Suite 8, Sacramento, CA 95834, (916) 921-9600, FAX (916) 921-0100

Cambria	Client Proj. ID: 4255 MacArthur, Oakland	Received: 02/13/98
1144 65th St. Suite C		
Oakland, CA 94608	Lab Proj. ID: 9802931	Reported: 03/10/98
Attention: Brian Busch		

LABORATORY NARRATIVE

In order to properly interpret this report, it must be reproduced in its entirety. This report contains a total of 12 pages including the laboratory narrative, sample results, quality control, and related documents as required (cover page, COC, raw data, etc.).

This project was revised on March 10, 1998.

Please Note: The TPH gas result for the Sample SB2 is reported from the QC batch GC022698BTEX21A.

SEQUOIA ANALYTICAL

Richard Herling
Project Manager

NORTH CREEK ANALYTICAL
Environmental Laboratory Services

BOTHELL ■ (425) 481-9200 ■ FAX 485-2992
SPOKANE ■ (509) 924-9200 ■ FAX 924-9290
PORTLAND ■ (503) 906-9200 ■ FAX 906-9210

Sequoia Analytical - Redwood City	Project:	Not Provided	Sampled: 2/13/98
680 Chesapeake Drive	Project Number:	9802931	Received: 2/19/98
Redwood City, CA 94063	Project Manager:	Rich Herling	Reported: 2/24/98 13:37

ANALYTICAL REPORT FOR SAMPLES:

Sample Description	Laboratory Sample Number	Sample Matrix	Date Sampled
07	B802340-01	Soil	2/13/98
08	B802340-02	Soil	2/13/98

North Creek Analytical, Inc.

Kirk Gendron, Project Manager

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

18939 120th Avenue N.E., Suite 101, Bothell, WA 98011-9508
East 11115 Montgomery, Suite B, Spokane, WA 99206-4776
9405 S.W. Nimbus Avenue, Beaverton, OR 97008-7132

NORTH CREEK ANALYTICAL
Environmental Laboratory Services

BOTHELL ■ (425) 481-9200 ■ FAX 485-2992
SPOKANE ■ (509) 924-9200 ■ FAX 924-9290
PORTLAND ■ (503) 906-9200 ■ FAX 906-9210

Sequoia Analytical - Redwood City	Project:	Not Provided	Sampled: 2/13/98
680 Chesapeake Drive	Project Number:	9802931	Received: 2/19/98
Redwood City, CA 94063	Project Manager:	Rich Herling	Reported: 2/24/98 13:37

Conventional Chemistry Parameters by APHA/EPA Methods
North Creek Analytical - Bothell

Analyte	Batch Number	Date Prepared	Date Analyzed	Specific Method	Reporting Limit	Result	Units	Notes*
07			**B802340-01**				**Soil**	
Total Organic Carbon	0280599	2/23/98	2/23/98	EPA 9060 mod.	50.0	**7210**	mg/kg dry	
08			**B802340-02**				**Soil**	
Total Organic Carbon	0280599	2/23/98	2/23/98	EPA 9060 mod.	50.0	**2140**	mg/kg dry	

North Creek Analytical, Inc.

**Refer to end of report for text of notes and definitions.*

Kirk Gendron, Project Manager

18939 120th Avenue N.E., Suite 101, Bothell, WA 98011-9508
East 11115 Montgomery, Suite B, Spokane, WA 99206-4776
9405 S.W. Nimbus Avenue, Beaverton, OR 97008-7132

NORTH CREEK ANALYTICAL
Environmental Laboratory Services

BOTHELL ▪ (425) 481-9200 ▪ FAX 485-2992
SPOKANE ▪ (509) 924-9200 ▪ FAX 924-9290
PORTLAND ▪ (503) 906-9200 ▪ FAX 906-9210

Sequoia Analytical - Redwood City	Project:	Not Provided	Sampled:	2/13/98
680 Chesapeake Drive	Project Number:	9802931	Received:	2/19/98
Redwood City, CA 94063	Project Manager:	Rich Herling	Reported:	2/24/98 13:37

Dry Weight Determination
North Creek Analytical - Bothell

Sample Name	Lab ID	Matrix	Result	Units
07	B802340-01	Soil	100	%
08	B802340-02	Soil	100	%

North Creek Analytical, Inc.

Kirk Gendron, Project Manager

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Sequoia Analytical - Redwood City	Project:	Not Provided	Sampled: 2/13/98
680 Chesapeake Drive	Project Number:	9802931	Received: 2/19/98
Redwood City, CA 94063	Project Manager:	Rich Herling	Reported: 2/24/98 13:37

Conventional Chemistry Parameters by APHA/EPA Methods/Quality Control
North Creek Analytical - Bothell

Analyte	Date Analyzed	Spike Level	Sample Result	QC Result	Units	Reporting Limit / Recov. Limits	Recov. %	RPD Limit	RPD %	Notes*
Batch: 0280599	**Date Prepared: 2/23/98**					**Extraction Method: General Preparation**				
Blank	**0280599-BLK1**									
Total Organic Carbon	2/23/98			**ND**	mg/kg dry	**50.0**				
LCS	**0280599-BS1**									
Total Organic Carbon	2/23/98	2500		2660	mg/kg dry	91.0-112	106			
Duplicate	**0280599-DUP1**		**B802340-02**							
Total Organic Carbon	2/23/98		2140	2250	mg/kg dry			24.0	**5.01**	

North Creek Analytical, Inc.

**Refer to end of report for text of notes and definitions.*

Kirk Gendron, Project Manager

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Sequoia Analytical - Redwood City	Project:	Not Provided	Sampled: 2/13/98
680 Chesapeake Drive	Project Number:	9802931	Received: 2/19/98
Redwood City, CA 94063	Project Manager:	Rich Herling	Reported: 2/24/98 13:37

Notes and Definitions

#	Note
DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
dry	Sample results reported on a dry weight basis
Recov.	Recovery
RPD	Relative Percent Difference

North Creek Analytical, Inc.

Kirk Gendron, Project Manager

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819 Striker Avenue, Suite 8, Sacramento, CA 95834, (916) 921-9600, FAX (916) 921-0100

Cambria
1144 65th St. Suite C
Oakland, CA 94608
Attention: Brian Busch

Project: 4255 MacArthur, Oakland

Enclosed are the results from samples received at Sequoia Analytical on February 13, 1998. The requested analyses are listed below:

SAMPLE #	SAMPLE DESCRIPTION	DATE COLLECTED	TEST METHOD
9803525 -01	LIQUID, SB-1	02/13/98	MTBEMW Methyl t-Butyl Ethe
9803525 -02	LIQUID, SB-2	02/13/98	MTBEMW Methyl t-Butyl Ethe
9803525 -03	SOLID, SB-1-5.0'	02/13/98	MTBEMS Methyl t-Butyl Ethe
9803525 -04	SOLID, SB-1-7.0'	02/13/98	MTBEMS Methyl t-Butyl Ethe
9803525 -05	SOLID, SB-2-5.0'	02/13/98	MTBEMS Methyl t-Butyl Ethe
9803525 -06	SOLID, SB-2-7.0'	02/13/98	MTBEMS Methyl t-Butyl Ethe

Please contact me if you have any questions. In the meantime, thank you for the opportunity to work with you on this project.

Very truly yours,

SEQUOIA ANALYTICAL

Project Manager

Sequoia Analytical

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Cambria	Client Proj. ID: 4255 MacArthur, Oakland	Sampled: 02/13/98
1144 65th St. Suite C	Sample Descript: SB-1	Received: 02/13/98
Oakland, CA 94608	Matrix: LIQUID	
	Analysis Method: EPA 8260	Analyzed: 03/10/98
Attention: Brian Busch	Lab Number: 9803525-01	Reported: 03/11/98

QC Batch Number: MS031098MTBEF3A
Instrument ID: F3

Methyl t-Butyl Ether (MTBE)

Analyte	Detection Limit ug/L	Sample Results ug/L
Methyl t-Butyl Ether	10	390

Surrogates	Control Limits %		% Recovery
1,2-Dichloroethane-d4	76	114	103

Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL - ELAP #1210

Richard Herling
Project Manager

Sequoia Analytical

680 Chesapeake Drive, Redwood City, CA 94063, (650) 364-9600, FAX (650) 364-9233
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819 Striker Avenue, Suite 8, Sacramento, CA 95834, (916) 921-9600, FAX (916) 921-0100

Cambria	Client Proj. ID: 4255 MacArthur, Oakland	Sampled: 02/13/98
1144 65th St. Suite C	Sample Descript: SB-2	Received: 02/13/98
Oakland, CA 94608	Matrix: LIQUID	
	Analysis Method: EPA 8260	Analyzed: 03/10/98
Attention: Brian Busch	Lab Number: 9803525-02	Reported: 03/11/98

QC Batch Number: MS031098MTBEF3A
Instrument ID: F3

Methyl t-Butyl Ether (MTBE)

Analyte	Detection Limit ug/L	Sample Results ug/L
Methyl t-Butyl Ether	1000	46000

Surrogates	Control Limits %		% Recovery
1,2-Dichloroethane-d4	76	114	105

Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL - ELAP #1210

Richard Herling
Project Manager

Sequoia Analytical

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Cambria	Client Proj. ID: 4255 MacArthur, Oakland	Sampled: 02/13/98
1144 65th St. Suite C	Sample Descript: SB-1-5.0'	Received: 02/13/98
Oakland, CA 94608	Matrix: SOLID	Extracted: 03/10/98
	Analysis Method: EPA 8260	Analyzed: 03/10/98
Attention: Brian Busch	Lab Number: 9803525-03	Reported: 03/11/98

QC Batch Number: MS031098MTBEEXA
Instrument ID: H6

Methyl t-Butyl Ether (MTBE)

Analyte	Detection Limit ug/Kg	Sample Results ug/Kg
Methyl t-Butyl Ether	100	N.D.

Surrogates	Control Limits %		% Recovery
1,2-Dichloroethane-d4	70	121	76

Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL - ELAP #1210

Richard Herling
Project Manager

Sequoia Analytical

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Cambria	Client Proj. ID: 4255 MacArthur, Oakland	Sampled: 02/13/98
1144 65th St. Suite C	Sample Descript: SB-1-7.0'	Received: 02/13/98
Oakland, CA 94608	Matrix: SOLID	Extracted: 03/10/98
	Analysis Method: EPA 8260	Analyzed: 03/10/98
Attention: Brian Busch	Lab Number: 9803525-04	Reported: 03/11/98

QC Batch Number: MS031098MTBEEXA
Instrument ID: H6

Methyl t-Butyl Ether (MTBE)

Analyte	Detection Limit ug/Kg	Sample Results ug/Kg
Methyl t-Butyl Ether	100	N.D.

Surrogates	Control Limits %		% Recovery
1,2-Dichloroethane-d4	70	121	75

Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL - ELAP #1210

Richard Herling
Project Manager

Sequoia Analytical

680 Chesapeake Drive, Redwood City, CA 94063, (650) 364-9600, FAX (650) 364-9233
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819 Striker Avenue, Suite 8, Sacramento, CA 95834, (916) 921-9600, FAX (916) 921-0100

Cambria	Client Proj. ID: 4255 MacArthur, Oakland	Sampled: 02/13/98
1144 65th St. Suite C	Sample Descript: SB-2-5.0'	Received: 02/13/98
Oakland, CA 94608	Matrix: SOLID	Extracted: 03/10/98
	Analysis Method: EPA 8260	Analyzed: 03/10/98
Attention: Brian Busch	Lab Number: 9803525-05	Reported: 03/11/98

QC Batch Number: MS031098MTBEEXA
Instrument ID: H6

Methyl t-Butyl Ether (MTBE)

Analyte	Detection Limit ug/Kg	Sample Results ug/Kg
Methyl t-Butyl Ether	100	N.D.

Surrogates	Control Limits %		% Recovery
1,2-Dichloroethane-d4	70	121	83

Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL - ELAP #1210

Richard Herling
Project Manager

Sequoia Analytical

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819 Striker Avenue, Suite 8, Sacramento, CA 95834, (916) 921-9600, FAX (916) 921-0100

Cambria	Client Proj. ID: 4255 MacArthur, Oakland	Sampled: 02/13/98
1144 65th St. Suite C	Sample Descript: SB-2-7.0'	Received: 02/13/98
Oakland, CA 94608	Matrix: SOLID	Extracted: 03/10/98
	Analysis Method: EPA 8260	Analyzed: 03/10/98
Attention: Brian Busch	Lab Number: 9803525-06	Reported: 03/11/98

QC Batch Number: MS031098MTBEEXA
Instrument ID: H6

Methyl t-Butyl Ether (MTBE)

Analyte	Detection Limit ug/Kg	Sample Results ug/Kg
Methyl t-Butyl Ether	100	880

Surrogates	Control Limits %		% Recovery
1,2-Dichloroethane-d4	70	121	75

Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL - ELAP #1210

Richard Herling
Project Manager

Sequoia Analytical

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Cambria Environmental Tech.	Client Project ID:	4255 MacArthur, Oakland	
1144 65th St., Ste. C	Matrix:	Liquid	
Oakland, CA 94608			
Attention: Brian Busch	Work Order #:	9803525 01-02	Reported: Mar 13, 1998

QUALITY CONTROL DATA REPORT

Analyte:	MTBE
QC Batch#:	MS031098MTBEF3A
Analy. Method:	EPA 8260
Prep. Method:	
Analyst:	E. Manuel
MS/MSD #:	980339107
Sample Conc.:	N.D.
Prepared Date:	3/10/98
Analyzed Date:	3/10/98
Instrument I.D.#:	F3
Conc. Spiked:	50 µg/L
Result:	42
MS % Recovery:	84
Dup. Result:	43
MSD % Recov.:	86
RPD:	2.4
RPD Limit:	0-25

LCS #:	LCS031098
Prepared Date:	N.A.
Analyzed Date:	3/10/98
Instrument I.D.#:	F3
Conc. Spiked:	50 µg/L
LCS Result:	43
LCS % Recov.:	86

MS/MSD	60-140
LCS	70-130
Control Limits	

SEQUOIA ANALYTICAL

Richard Herling
Project Manager

Please Note:
The LCS is a control sample of known, interferent-free matrix that is analyzed using the same reagents, preparation, and analytical methods employed for the samples. The matrix spike is an aliquot of sample fortified with known quantities of specific compounds and subjected to the entire analytical procedure. If the recovery of analytes from the matrix spike does not fall within specified control limits due to matrix interference, the LCS recovery is to be used to validate the batch.

** MS = Matrix Spike, MSD = MS Duplicate, RPD = Relative % Difference

Sequoia Analytical

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Cambria Environmental Tech.
1144 65th St., Ste. C
Oakland, CA 94608
Attention: Brian Busch

Client Project ID: 4255 MacArthur, Oakland
Matrix: Liquid
Work Order #: 9803525 03-06
Reported: Mar 13, 1998

QUALITY CONTROL DATA REPORT

Analyte:	MTBE
QC Batch#:	MS031098MTBEEXA
Analy. Method:	EPA 8260
Prep. Method:	

Analyst:	M. Williams
MS/MSD #:	980352503
Sample Conc.:	N.D.
Prepared Date:	3/10/98
Analyzed Date:	3/10/98
Instrument I.D.#:	H6
Conc. Spiked:	2500 µg/Kg
Result:	2200
MS % Recovery:	88
Dup. Result:	2100
MSD % Recov.:	84
RPD:	4.7
RPD Limit:	0-25

LCS #:	LCS031098
Prepared Date:	3/10/98
Analyzed Date:	3/10/98
Instrument I.D.#:	H6
Conc. Spiked:	2500 µg/Kg
LCS Result:	2400
LCS % Recov.:	96

MS/MSD	60-140
LCS	70-130
Control Limits	

SEQUOIA ANALYTICAL

Richard Herling
Project Manager

Please Note:
The LCS is a control sample of known, interferent-free matrix that is analyzed using the same reagents, preparation, and analytical methods employed for the samples. The matrix spike is an aliquot of sample fortified with known quantities of specific compounds and subjected to the entire analytical procedure. If the recovery of analytes from the matrix spike does not fall within specified control limits due to matrix interference, the LCS recovery is to be used to validate the batch.

** MS = Matrix Spike, MSD = MS Duplicate, RPD = Relative % Difference

SHELL OIL COMPANY
RETAIL ENVIRONMENTAL ENGINEERING - WEST

CHAIN OF CUSTODY RECORD
Serial No: _____

Date: 2-13-98
Page 1 of 2

Site Address: 4255 MacArthur Oakland
WIC#:

Shell Engineer: Alex Perez
Phone No.: 510 335 5027
Fax #: 510 335 5029

Consultant Name & Address: CAMBRIA ENVIRONMENTAL
1144 65th St. Suite C, Oakland, CA 94608

Consultant Contact: Brian Busch
Phone No.: 510 420-0700
Fax #: 420-9170

Comments: 9802931

Sampled by: Brian Busch & Aubrey Cool
Printed Name:

LAB: Sequoia

CHECK ONE (1) BOX ONLY — C/D/I

- G.W. Monitoring [ ] 4441
- Site Investigation [X] 4441
- Soil Classify/Disposal [ ] 4442
- Water Classify/Disposal [ ] 4443
- Soil/Air Remv. or Sys. O & M [ ] 4452
- Water Remv. or Sys. O & M [ ] 4453
- Other [ ]

TURN AROUND TIME

- 24 hours [ ]
- 48 hours [ ]
- 10 days [X] (Normal)
- Other [ ] _____

NOTE: Notify lab as soon as Possible of 24/48 hr. TAT.

UST AGENCY: _____

Analysis Required

Sample ID	Date	Sludge	Soil	Water	Air	No. of conts.	TPH (EPA 8015 Mod. Gas)	TPH (EPA 8015 Mod. Diesel)	BTEX (EPA 8020/602)	Volatile Organics (EPA 8240)	Test for Disposal	Combination TPH 8015 & BTEX 8020 + MTBE			Asbestos	Container Size	Preservation Used	Composite Y/N	MATERIAL DESCRIPTION	SAMPLE CONDITION/ COMMENTS
01 SB-1	2/13			X		3						X				40ml	HCl	N	groundwater	
02 SB-2				X		3						X				40ml	HCl	N		
03 SB-1-5.0'			X			1						X				2x6 tube	0	N	soil	
04 SB-1-7.0'			X			1						X					0	N		FEB 13 4 16
SB-1-10.0'			X			1											0	N		HOLD
05 SB-2-5.0'			X			1						X					0	N		
06 SB-2-7.0'			X			1						X					0	N		

Relinquished By (signature)	Printed Name	Date/Time	Received (signature)	Printed Name	Date/Time
Aubrey K Cool	Aubrey Cool	2-13-98 2:45		DAWN VILLEROS	2/13/98 2:45
		2/13/98 6:15			
					2/11/98 16:16

THE LABORATORY MUST PROVIDE A COPY OF THIS CHAIN-OF-CUSTODY WITH INVOICE AND RESULTS

SHELL OIL COMPANY
RETAIL ENVIRONMENTAL ENGINEERING - WEST

CHAIN OF CUSTODY RECORD
Serial No: _____

Date: 2-13-98
Page 2 of 2

Site Address: 4255 MacArthur, Oakland
WIC#:

Shell Engineer: Alex Perez
Phone No.: 510 335 5027
Fax #: 510 335 5029

Consultant Name & Address: CAMBRIA ENVIRONMENTAL
1144 65th St. Suite C, Oakland, CA 94608

Consultant Contact: Brian Busch
Phone No.: 510 420-0700
Fax #: 420-9170

Comments: 9802931

Sampled by: Brian Busch & Aubrey Cool

Printed Name:

LAB: Sequoia

CHECK ONE (1) BOX ONLY — C/D#

- G.W. Monitoring [ ] 4461
- Site Investigation [x] 4441
- Soil Classify/Disposal [ ] 4442
- Water Classify/Disposal [ ] 4443
- Soil/Air Rem. or Sys. O & M [ ] 4452
- Water Rem. or Sys. O & M [ ] 4453
- Other [ ]

TURN AROUND TIME

- 24 hours [ ]
- 48 hours [ ]
- 15 days [x] (Normal)
- Other [ ] _____

NOTE: Notify Lab as soon as Possible of 24/48 hr. TAT.

UST AGENCY: _____

Analysis Required

Sample ID	Date	Sludge	Soil	Water	Air	No. of conts.	TPH (EPA 8015 Mod. Gas)	TPH (EPA 8015 Mod. Diesel)	BTEX (EPA 8020/602)	Volatile Organics (EPA 8240)	Test for Disposal	Combination TPH 8015 & BTEX 8020	Permeability, Moisture Content	Total porosity, Organic carbon	Asbestos	Container Size	Preparation Used	Composite Y/N	MATERIAL DESCRIPTION	SAMPLE CONDITION/ COMMENTS
SB-1-5.5'	2/13		X			1							X	X		2x6 tube	0	N	Soil	
SB-1-7.5'	"		X			1										"	0	N	"	HOLD
SB-1-10.5'	"		X			1										"	0	N	"	HOLD
SB-2-5.5'	"		X			1							X	X		"	0	N	"	
SB-2-7.5'	"		X			1										"	0	N	"	HOLD

Relinquished By (signature): Aubrey K Cool
Printed Name: Aubrey Cool
Date: 2-13-98 Time: 2:45

Relinquished By (signature):
Printed Name:
Date: 2/13/98 Time: 16:15

Relinquished By (signature):
Printed Name:
Date: Time:

Received (signature):
Printed Name: ERWIN VILLEROS
Date: 2/13/98 Time: 2:45

Received (signature):
Printed Name:
Date: Time:

Received (signature):
Printed Name: Mike Young
Date: 2/13/98 Time: 16:16

THE LABORATORY MUST PROVIDE A COPY OF THIS CHAIN-OF-CUSTODY WITH ITS INVOICE AND RESULTS

Distribution of Copies

E 13 4 16

Sequoia Analytical

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819 Striker Avenue, Suite 8, Sacramento, CA 95834, (916) 921-9600, FAX (916) 921-0100

Cambria	Client Proj. ID: 4255 MacArthur, Oakland	Received: 02/13/98
1144 65th St. Suite C		
Oakland, CA 94608	Lab Proj. ID: 9803525	Reported: 03/11/98
Attention: Brian Busch		

LABORATORY NARRATIVE

In order to properly interpret this report, it must be reproduced in its entirety. This report contains a total of 12 pages including the laboratory narrative, sample results, quality control, and related documents as required (cover page, COC, raw data, etc.).

SEQUOIA ANALYTICAL

Richard Herling
Project Manager