CAMBRIA

January 30, 2006

Mr. Amir Gholami
Alameda County Health Care Services Agency
1131 Harbor Bay Parkway, Suite 250
Alameda, California 94502

Re: **Revised Remediation Work Plan**
Former Exxon Service Station
3055 35th Avenue
Oakland, California
Cambria Project #130-0105

Dear Mr. Gholami,

On behalf of Mr. Lynn Worthington of Golden Empire Properties, Cambria Environmental Technology, Inc. (Cambria) has revised the *Remediation Work Plan* dated February 22, 2005 for the above referenced site submitted to Alameda County Health Care Services per your email request. In-situ chemical oxidation using ozone is being proposed as a remedial alternative to cleanup the remaining hydrocarbons beneath the site.

Please call me at (510) 420-3361, if you have any questions regarding this report.

Sincerely,
Cambria Environmental Technology, Inc.

Subbarao Nagulapaty
Project Engineer

Attachment: Revised Remediation Work Plan

cc: Mr. Lynn Worthington, Golden Empire Properties, Inc. 5942 MacArthur Boulevard, Suite B, Oakland, California 94605

Cambria Environmental Technology, Inc.

5900 Hollis Street
Suite A
Emeryville, CA 94608
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REVISED REMEDIATION WORK PLAN

Former Exxon Service Station
3055 35th Avenue
Oakland, California
Cambria Project #130-0105

January 30, 2006

Prepared For:

Mr. Lynn Worthington
Golden Empire Properties, Inc.
5942 MacArthur Boulevard, Suite B
Oakland, California 94605

Prepared By:

Cambria Environmental Technology, Inc.
5900 Hollis Street, Suite A
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PROFESSIONAL GEOLOGIST
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Senior Geologist

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REVISED REMEDIATION WORK PLAN

Former Exxon Service Station
3055 35th Avenue
Oakland, California

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CAMBRIA

REVISED REMEDIATION WORK PLAN

Former Exxon Service Station
3055 35th Avenue
Oakland, California
Cambria Project #130-0105

January 30, 2006

1.0 INTRODUCTION

On behalf of Mr. Lynn Worthington of Golden Empire Properties, Inc., Cambria Environmental Technology, Inc. (Cambria) has submitted a *Remediation Work Plan* for the above-referenced site per the Alameda County Health Care Services Agency's (ACHCSA) letter dated December 8, 2004 (Appendix A). The *Remediation Work Plan* is revised to include evaluation of remedial alternatives for the site as requested by Mr. Amir Gholami of ACHCSA in an email dated October 6, 2005. Presented in the work plan are the site background, hydrocarbon distribution, evaluation of remedial alternatives, proposed remedial alternative, reporting, and schedule.

2.0 SITE BACKGROUND

2.1 Site Description

The site is a former Exxon Service Station located at the northeast corner of 35th Avenue and School Street in Oakland, California (Figure 1). Currently, the site is an unpaved vacant lot situated within a mixed commercial and residential setting approximately 3 blocks west of the 580 Freeway. The topography in the area slopes generally westward towards the Oakland Inner Harbor and San Francisco Bay. The nearest surface water is Peralta Creek, located approximately 0.1 miles north of the site.

An active Unocal 76 (former British Petroleum) service station is located on 35th Avenue, one block east of the site. A former Texaco station is located across School Street immediately east of the site. Texaco's underground storage tanks were removed about 22 years ago. No soil samples were collected during the tank removal and no investigation has been conducted at the former Texaco site.

2.2 Site Geology and Hydrogeology

The site lithology is heterogeneous consisting of interbedded lenses of silty gravel, sands, silty sands, and sandy silts and clays to the maximum explored depth of 30 feet. The clayey soils are generally

stiff and very plastic. Local base rock backfill is present in the excavations related to the former underground storage tanks (USTs) and pump islands.

Static groundwater levels have historically ranged from approximately 8 to 17 ft below grade surface (bgs) in monitoring well MW-3 located in the southwest side of the site. Note that the water depths for MW-1 and MW-2 are not reflective of groundwater levels due to their high casing elevations within monument well boxes. Groundwater beneath the site flows primarily towards the southwest.

2.3 Summary of Previous Work

October 1990 Geotechnical Investigation: In October 1990, Geotechnical Engineering Inc. of Fremont, California, drilled two soil borings at the site for an pre-construction engineering analysis. No samples were collected for hydrocarbon analysis.

January 1991 Tank Removal: In January 1991, Pacific Excavators removed two 4,000-gallon USTs, two 6,000-gallon gasoline USTs, and one 500-gallon waste oil UST from the site. According to a September 24, 1992 report prepared by Consolidated Technologies of San Jose, California (CT), soil samples were collected during the tank removal, but were not analyzed or reported by Pacific Excavators (CT, 1992).

November 1991 Subsurface Investigation: In November 1991, CT drilled twelve soil borings (B-1 to B-12) to depths up to 35 ft bgs (Figure 1). Total petroleum hydrocarbons as gasoline (TPHg) concentrations were detected in soil samples collected from 11 of the 12 soil borings up to 2,100 milligrams per kilogram (mg/kg). No total petroleum hydrocarbons as diesel (TPHd) or oil and grease (O&G) concentrations were detected in boring B-7, which is immediately down gradient of the former waste oil tank.

May 1994 Subsurface Investigation: Between May 5 and 9, 1994, Cambria drilled seven soil borings (SB-A through SB-G) and installed three onsite monitoring wells (MW-1 through MW-3). TPHg concentrations were detected in six of the seven soil borings at concentrations up to 2,900 mg/kg. TPHg and benzene concentrations were detected in groundwater at maximum concentrations of 130,000 and 22,000 parts per billion (ppb), respectively. Historical soil analytical data are presented as Table 1.

Feasibility Testing: In July 1996, Cambria conducted a series of feasibility tests involving soil vapor extraction (SVE), SVE combined with air sparging (AS), and SVE combined with aquifer pumping. Using an internal combustion engine, vacuums up to 150 inches of water were applied to each test well (MW-1 through MW-3) for a period ranging from 20 to 45 minutes. Very low air flow rates of

0.06, 0.36 and 0.40 cubic feet per minute were achieved from test wells MW-1, MW-2, and MW-3, respectively. TPHg soil vapor concentrations collected from each well at the end of the test ranged from less than 250 parts per million by volume (ppmv) in test wells MW-1 and MW-2, and greater than 10,000 ppmv in test well MW-3. No significant increases in air flow or soil vapor concentrations were observed when SVE was combined with AS. When SVE was combined with aquifer dewatering (0.5 gpm), the air flow rate from MW-2 increased significantly to 15 cfm, however, no corresponding increase in soil vapor concentrations was observed. No vacuum radius of influence or groundwater drawdown influence was observed in any well. The generally low air and groundwater flow rates were indicative of low permeability soils. Results of the remedial testing also indicated that SVE and/or AS with vacuums up to 150 inches of water, would not be effective in removing hydrocarbons from the subsurface soils. However, dewatering combined with SVE could enhance remedial efforts.

February 1997 Site Assessment: On February 26, 1997, Cambria installed one additional onsite monitoring well (MW-4) at the site (Figure 1). TPHg was detected in soil at a maximum concentration of 150 mg/kg at 15 ft bgs. TPHg and benzene concentrations were detected in groundwater at concentrations of 47,000 and 11,000 parts per billion (ppb), respectively.

August 1998 Remediation Well Installation: In August 1998, Cambria installed ten dual phase extraction remediation wells (RW-5 through RW-14) onsite. Additionally, two soil borings (B-1 and B-2) were advanced up-gradient of the site along School Street. Due to low soil permeability, no groundwater entered the borehole preventing the collection of a groundwater sample. No soil samples were collected during the well and geoprobe drilling activities. No hydrocarbon odors were observed during geoprobe drilling activities.

August 1999 Hydrogen Peroxide Injections: On August 5, 1999, Cambria injected between 7 to 12 gallons of 7.5% hydrogen peroxide (H_2O_2) solution into each of the fourteen site monitoring/remediation wells. Dissolved oxygen (DO) concentrations in groundwater beneath the site did not vary as a result of H_2O_2 injection. Also, no reduction in dissolved phase hydrocarbon concentrations was observed.

September 2000 Dual-Phase Vacuum Extraction: In September 2000, Cambria installed a dual-phase extraction (DPE) remediation system which incorporated 14 remediation wells. The DPE system utilized a positive displacement blower to simultaneously extract liquid/dissolved-phase and vapor phase hydrocarbons from the subsurface. Vapor phase hydrocarbons were destroyed by catalytic oxidizer and discharged to the atmosphere under a Bay Area Air Quality Management District (BAAQMD) air discharge permit. Dissolved phase hydrocarbons were treated by filtration

through granulated activated carbon vessels and discharged into the sanitary sewer under an East Bay Municipal Utility District (EBMUD) discharge permit.

August 2002 DPE System Upgrade: In August 2002, the DPE system was upgraded with a liquid ring vacuum pump capable of generating a higher vacuum to maximize hydrocarbon removal.

September 2004 DPE System Shutdown and Removal: In September 2004, Cambria requested and received approval from the ACHCSA to shutdown the DPE system operations due to low hydrocarbon removal rates. The DPE system was removed from the site on September 30, 2004. During SPE operations between September 2000 and September 2004, a total of approximately 6,545 pounds of vapor-phase hydrocarbons and 11 pounds of dissolved-phase hydrocarbons were removed.

Groundwater Monitoring: Quarterly groundwater monitoring and sampling has been performed at the site since May 1994. Historical groundwater analytical data is presented as Table 2.

3.0 HYDROCARBON DISTRIBUTION

3.1 Hydrocarbons in Soil

Gasoline-range hydrocarbons were detected in a majority of the onsite borings drilled during previous investigations. The highest hydrocarbon concentrations in soil are present in the vicinity southwest of the former underground gasoline storage tanks and the southernmost pump island (Figure 3 and Table 1). Based on soil boring observations and analytical data, hydrocarbon-impacted soil is present within a smear zone extending from 8 to 30 ft bgs with the highest hydrocarbon concentrations at approximately 15 ft bgs.

3.2 Hydrocarbons in Groundwater

Gasoline-range hydrocarbons have been previously detected in the four onsite monitoring wells and all of the remediation wells. The highest hydrocarbon concentrations in groundwater are present, primarily in the vicinity southwest of the former underground gasoline storage tanks and the southernmost pump island (Figure 4 and Table 2).

4.0 EVALUATION OF REMEDIAL ALTERNATIVES

Remedial Objective: Cambria understands that the remedial objective for this site is to remediate the remaining hydrocarbons present beneath the site, specifically benzene and MTBE, to the point where

natural attenuation can remediate residual hydrocarbons within a reasonable time frame and case closure can be granted.

Remedial Technologies Considered: Our evaluation of potentially applicable technologies is tabulated below. It includes a comparative analysis of each technology's relative cost effectiveness and applicability at the site.

Table D – Potentially Applicable Remedial Technologies

Potentially Applicable Technology	Applicability to Impacted Media			Relative Cost	Comments
	Soil	TPH in Water	MTBE in Water		
Natural Attenuation	L	L	L	Low	Given the current elevated hydrocarbon concentrations at the site, a long time frame can be expected. Recent studies suggest that MTBE biodegrades but typically at a lower rate than TPH/BTEX.
Excavation	M	L	L	High	Effective for remediating unsaturated zone where a shorter-term remediation time frame is required. Given the depth to impacted soils of approximately 30 ft below grade at the site and presence of residual hydrocarbons in the dissolved phase, excavation may not be an economically feasible alternative.
Ground water extraction (GWE)	L	L	M	Moderate	GWE should be effective in hydraulically controlling dissolved phase hydrocarbons, but is ineffective for mass removal with the exception of MTBE due to MTBE's high solubility. GWE is not effective in addressing the impact to the unsaturated zone. Given the low permeability soils present beneath the site and low expected groundwater flow rates, GWE would not be effective in addressing the remaining hydrocarbons beneath the site.
Soil vapor extraction (SVE)	M	L	L	Moderate	Test results indicate that hydrocarbon removal rates are low and will not address the dissolved phase hydrocarbons. Due to the large smear zone, SVE by itself would not be effective in addressing the remaining hydrocarbons beneath the site.

Table D – Potentially Applicable Remedial Technologies

Potentially Applicable Technology	Applicability to Impacted Media			Relative Cost	Comments
	Soil	TPH in Water	MTBE in Water		
Dual Phase Extraction (DPE)	M	L	L	Moderate To High	A DPE system was in operation at the site for four years and was shutdown in October 2004 due to low influent hydrocarbon concentrations and asymptotic mass removal rates. DPE has proven to no longer be effective in remediating the remaining hydrocarbons present beneath the site.
In-situ Steam Enhanced Extraction (SEE)	H	H	H	Very High	In-situ SEE has proven to be effective in remediating VOCs under a wide range of subsurface conditions. In-situ SEE involves injecting steam into the subsurface to dissolve, vaporize, and mobilize VOCs that are then recovered using SVE and/or GWE. SVE and GWE equipment selected for the purpose should be designed to withstand elevated operating temperature. Though very expensive, in-situ SEE may be an effective technology in addressing the residual hydrocarbons beneath the site.
In-situ Chemical Oxidation (ISCO)	H	H	H	Moderate to High	ISCO involves injection of a chemical oxidizer into the subsurface that will destroy the hydrocarbons upon contact. Delivery of the chemical oxidizer to the impacted zone in low permeability soils is a challenge for the technology. Ozone, a gas phase oxidizer, can be effectively delivered even in low permeability soils. ISCO using ozone could be an economically feasible and effective technology to address the residual hydrocarbons present beneath the site.

L - Low Applicability M - Moderate Applicability H - High Applicability

Estimated Costs of Applicable Technologies: Cambria selected the most cost effective and technically applicable potential technologies and prepared a more detailed estimate of anticipated costs. The estimated costs summarized below are based, in part, on our experience and currently available treatment technologies. Duration estimates are best professional estimates to meet site cleanup goals.

Table E – Duration and Cost Estimates

Potentially Applicable Technology	Permits and Approvals	Installation	Operations And Maintenance (Annual)	Quarterly Monitoring (Annual)	Estimated Project Duration (Years)	Estimated First Year Cost	Estimated Life Cycle Cost
Natural Attenuation	$0	$0	$0	$18,000	30	$18,000	$540,000
Excavation (assumes 18,000 cubic yards)	$10,000	$1,283,000 (excavating, dewatering, water and soil disposal, and backfill and compaction; excludes shoring)	$0	$18,000	2	$1,311,000	$1,329,000
In-situ SEE (assumes 18,000 cubic yards)	$20,000	$1,267,350 (Install SEE system and one year of operation & maintenance)	$0 (included in system installation)	$18,000	4 total 1 in-situ SEE 3 monitoring	$1,305,350	$1,359,350
ISCO using Ozone	$10,000	$166,200 (Install 25 sparge points, install ozone sparge system, and install piping)	$48,000 (Ozone sparge system)	$22,000	5 total 2 ISCO 3 monitoring	$246,200	$382,200

Discussion: Based on our more detailed evaluation presented above, the most cost-effective remedial technique is ISCO using ozone. Cambria has found that ISCO using ozone is an excellent technique for addressing hydrocarbon-impacted soils and groundwater. Also, recent studies indicate that ozone destroys hydrocarbons upon contact and also provides oxygen upon decomposition to enhance biodegradation. Studies indicate that given appropriate site conditions, MTBE can biodegrade, although slower than other gasoline-range hydrocarbons. Therefore, ISCO using ozone should address the impacted subsurface to the point where natural attenuation can remediate any residual hydrocarbons within a reasonable time frame.

5.0 PROPOSED REMEDIAL ALTERNATIVE

In October 2004, Cambria requested and received approval from ACHCSA to shutdown the DPE remediation system due to low influent hydrocarbon concentrations and asymptotic hydrocarbon removal rates. To help reduce the remaining hydrocarbons concentrations in groundwater and achieve

remediation cleanup goals, Cambria has proposed an alternative remedial approach consisting of in-situ chemical oxidation (ISCO) using ozone.

5.1 ISCO Using Ozone

Ozone is a strong chemical oxidizer that will, upon contact, "oxidize" or destroy any hydrocarbons present within the subsurface. Unlike many other chemical oxidizers, ozone is a gas which enables it to migrate more easily through fine grained soils. To maximize mass transfer to groundwater, ozone is commonly injected into sparge wells where small fine bubbles of ozone are generated and dispersed through the subsurface. This favorable delivery method allows for the oxidation of hydrocarbons impacted soil trapped below the groundwater. ISCO using ozone is rapidly becoming a preferred method to remediate hydrocarbons in low permeability soils.

5.2 Interim Remedial Activities

To evaluate the effectiveness of ISCO using ozone, Cambria is proposing to first conduct interim remedial activities covering only a portion of the site. A sparge point network consisting of seven points (SP-1 through SP-7) will be installed near the southernmost former pump island (Figure 2). Ozone injection will be conducted for approximately three months. Existing monitoring wells (MW-2, RW-11, and RW-12) will be used to monitor the zone of influence and groundwater quality. Based on the results of these activities, Cambria will determine if and how this remedial alternative should be expanded to cleanup the entire site.

5.2.1 Ozone Sparge Wells

Prior to the installation of the sparge points, the following activities will be performed:

Site Health and Safety Plan: A comprehensive site safety plan will be prepared to protect site workers. The plan will be kept onsite during all field activities and signed by each site worker.

Permits: Drilling permits will be obtained from the Alameda County Public Works Agency for installation of the proposed sparge points. Building permits will be obtained from City of Oakland Building Department, if needed, for installing the ozone generator system.

Subsurface Utility Clearance: The proposed sparge point locations will be marked and Underground Service Alert will be notified of Cambria's activities. A subsurface utility locating contractor may be used to clear each sparge point location, if necessary.

Sparge Point Installation: Seven sparge points (SP-1 through SP-7) will be installed using six-inch diameter hollow-stem augers. The sparge points will be installed at two different depths to facilitate the transfer of ozone into the subsurface and in contact with the remaining hydrocarbons. Three borings will be drilled to 20 ft bgs and converted into a sparge point (SP-1 through SP-3). The sparge points will be constructed of two-inch diameter stainless steel casing with 0.010-inch wire wrapped screen from 15 to 20 ft bgs. Four deeper borings will be drilled to 28 ft bgs and converted into sparge points (SP-4 through SP-7). The sparge points will be constructed of 2-inch diameter stainless steel casing with 0.010-inch wire wrapped screen from 23 to 28 ft bgs. A sand pack will be placed across each screen interval and overlaid with a bentonite and cement grout seal.

5.2.2 Baseline Groundwater Sampling

Injecting ozone will likely influence the geochemistry of the groundwater beneath the site. Cambria anticipates that over the short-term, dissolved oxygen (DO) and oxidation-reduction potential (ORP) levels will increase in the monitoring wells. To establish a baseline for the groundwater parameters prior to initiating ozone injection activities, groundwater samples and field readings will be collected from wells MW-2, RW-11, and RW-12. The following table summarizes the baseline groundwater sampling parameters and associated rationale.

Baseline Analyses and Rationale

Parameter	Analysis	Rationale
Dissolved Oxygen (DO)	Field Reading	Increased DO concentrations can indicate the radius of influence from ozone injection. DO is an oxidation-reduction potential indicator and is the preferred electron acceptor used in aerobic biodegradation of petroleum hydrocarbons.
pH	Field Reading	Changing pH levels can provide an indication of the type of reaction mechanism (direct ozonation or hydroxyl radical) that is occurring beneath the site. Usually pH does not change appreciably as both reaction mechanisms occur simultaneously and balance the pH.
Temperature	Field Reading	Elevated temperature provides an indication that exothermic chemical oxidation reaction occurring in the subsurface.
ORP	Field Reading	Provides a relative measure of oxidation-reduction conditions and can be calibrated to indicate likely oxidation-reduction reactions.
Alkalinity	SM 2320B	A general geochemical parameter used to evaluate buffering capacity of aquifer and can assist with the sizing of a full scale ozone injection system.

Baseline Analyses and Rationale		
Parameter	**Analysis**	**Rationale**
Chemical Oxygen Demand (COD)	EPA Method 410.1	A general geochemical parameter used to evaluate oxidation-reduction potential and can assist with the sizing of a full scale ozone injection system.
Total Organic Carbon (TOC)	EPA Method 415.1	Provides a measurement of the amount of carbon/energy source beneath the site which can drive ozone demand and affect the sizing of a full scale ozone injection system.
CAM 17 Metals	EPA Method 200.7	May be used to evaluate the potential for metal precipitation or migration.
TPHg, TPHd	EPA Method 8015M	Carbon and energy source. Concentration trend data provides evidence of success for ISCO using ozone.
BTEX, MTBE	EPA Method 8020	Carbon and energy source. Concentration trend data provides evidence of success for ISCO using ozone.

5.2.3 ISCO Ozone System

An electronically controlled ozone generator will be connected to the onsite electrical service. The ozone generator will be capable of generating approximately 1 pound/day of ozone. The sparge point wellheads will be constructed to enable connection of threaded or quick-connect fittings. Aboveground flexible tubing composed of Teflon or an equivalent ozone resistant material will connect the sparge points with a manifold on the outlet of the ozone generator. Each branch on the manifold will include valves and gauges to adjust the ozone injection flow rate and pressure.

5.2.4 System Operations and Monitoring

Ozone will be injected at approximately 0.5 to 5 cfm depending upon the permeability of the soil. Ozone injection will be alternated on a weekly basis between the shallow and deeper sparge points to facilitate mass transfer of ozone through the subsurface. The interim remediation system will be monitored weekly during the first month of operation and monthly thereafter.

Various parameters will be measured before, during, and after ozone injection. At each sparge point (SP-1 through SP-7), the pressure, flow rate, temperature, pH, and DO will be recorded prior to system startup, after one week, and then monthly thereafter. At each monitoring well (MW-2, RW-11, and RW-12), the depth to water, temperature, pH, and DO will be recorded prior to system startup, after one week, and then monthly thereafter. Groundwater samples will also be collected prior to startup, after one week and then every month thereafter and analyzed for TPHd, TPHg, BTEX, MtBE, and CAM 17 metals. Adjustments to the monitoring schedule may be made based on conditions encountered in the field.

6.0 REPORTING

Following the completion of field activities, the effectiveness of interim remediation will be evaluated based on the reduction in dissolved-phase hydrocarbon concentrations in groundwater and evidence of increased biological activity beneath the site. A full-scale remediation system may be proposed if the results of interim remediation appear favorable. Cambria will prepare and submit an *Interim Remediation Evaluation Report* to the ACHCSA. which, at a minimum, will contain:

- Summary and evaluation of the interim remediation activities;
- Tabulated field parameter data, and analytical results;
- Individual well concentration trend plots for the observation wells;
- Analytical reports and chain-of-custody forms; and
- Recommendations for future activities.

7.0 SCHEDULE

Upon receiving written work plan approval from the ACHCSA, Cambria will commence implementation of the *Workplan.* Cambria will submit an *Interim Remediation Evaluation Report* to ACHCSA within approximately 6 weeks following the completion of field activities.

H:\Worthington - Oakland\Reports\Rev Remedial Work Plan RAS 12-2005.doc

FIGURES

01/31/06

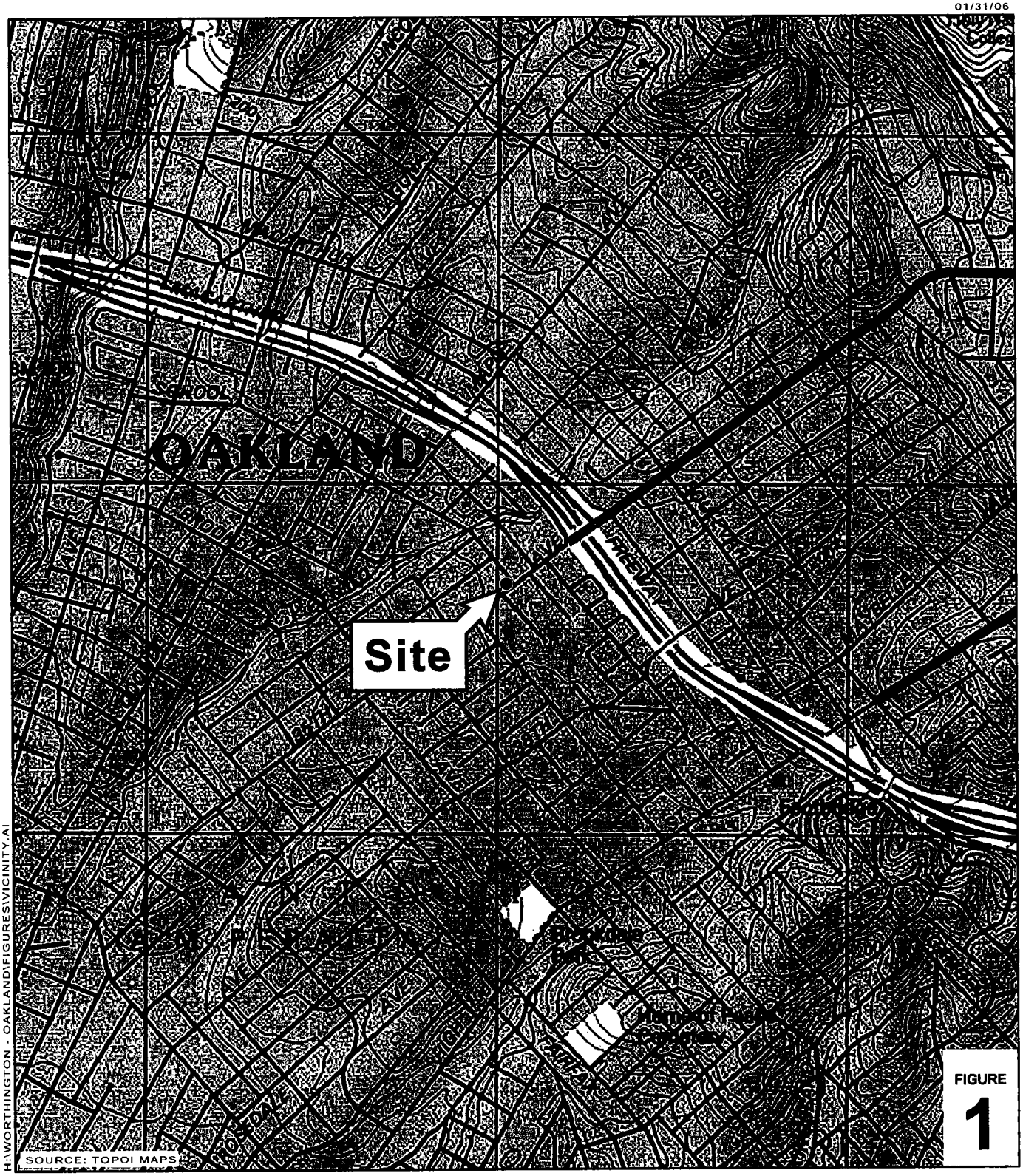

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FIGURE
1

0 1/8 1/4 1/2 1

SCALE : 1" = 1/4 MILE

Former Exxon Station

3035 35th Avenue

Oakland, California

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Vicinity Map

EXPLANATION

- MW-1 — Monitoring well location
- RW-6 — Remediation well location
- B-1 — Soil Boring Location
- B-1 — Soil Boring Location (1998)

Former Texaco Station

B-1

SCHOOL STREET

B-2

sidewalk

driveway

driveway

SB-A

B-3

B-5

B-2

Former Pump Island

SB-E

RW-13

RW-14

driveway

Residence

B-1

RW-10

B-10

Former Gasoline UST Cavity

Former Pump Island

B-6

B-4

building

Former Waste-Oil UST Cavity

MW-2 (SB-F)

fenceline

RW-9

MW-1 (SB-G)

B-11

B-7

B-9

RW-8

RW-12

RW-11

driveway

SB-B

MW-4

B-8

RW-7

SB-D

MW-3 (SB-C)

RW-6

RW-5

B-12

building

Residence

35th AVENUE

0 15 30 60

Scale (ft)

Source: Virgil Chavez Land Surveying

H:\WORTHINGTON\FIGURES\2006\MAP Pg 1.DWG

FIGURE

2

Site Plan

Former Exxon Station

3055 35th Avenue

Oakland, California

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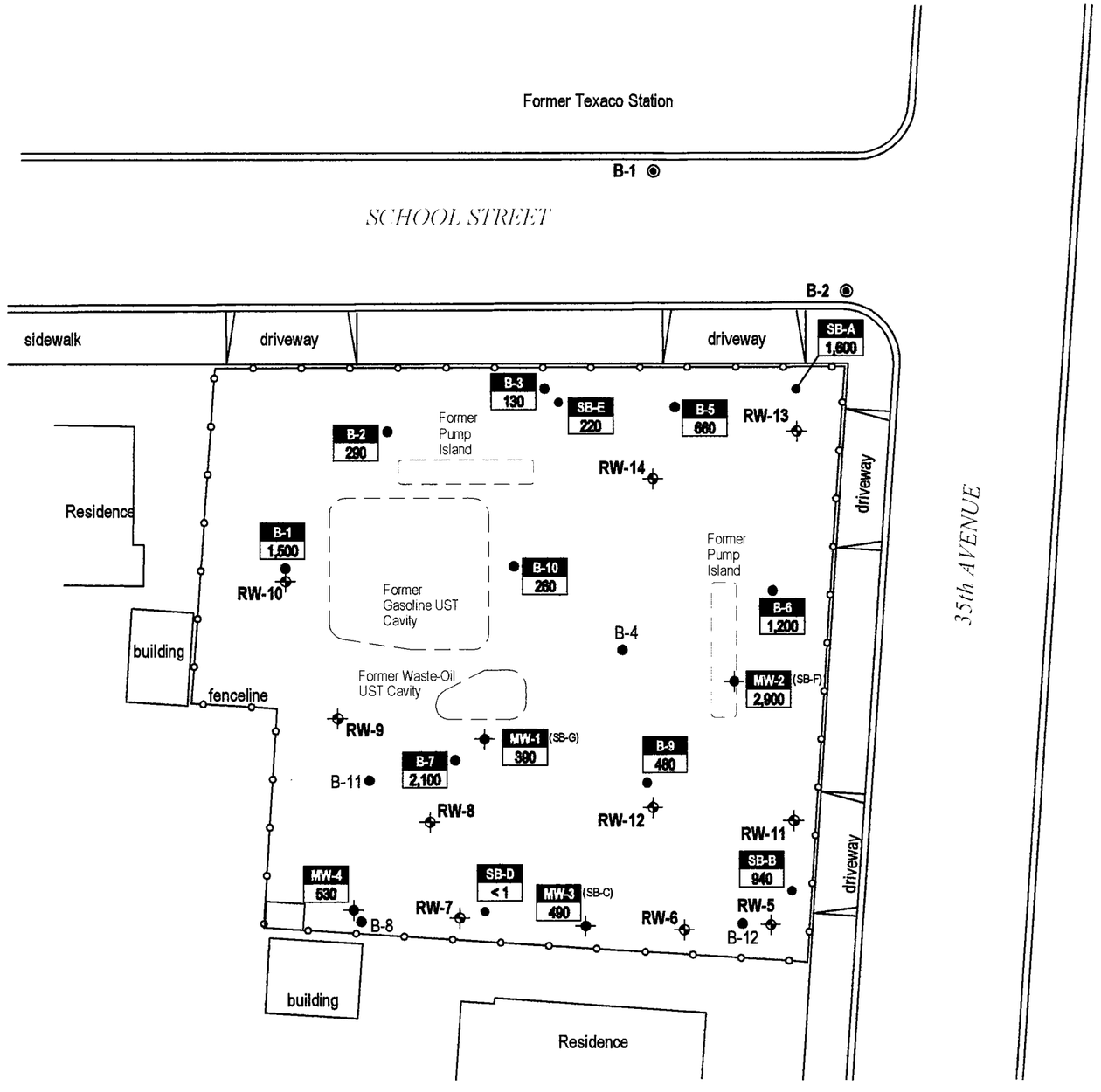
Hydrocarbon Concentrations in Soil

EXPLANATION

- MW-1 — Monitoring well location
- RW-6 — Remediation well location
- B-1 — Soil Boring Location
- B-1 — Soil Boring Location (1998)
- Well ID / TPHg — Well/Boring designation; TPHg concentration, in mg/kg



0 15 30 60

Scale (ft)

Source: Virgil Chavez Land Surveying

H:\WORTHINGTON\FIGURES\2006\TPHG IN SOIL.DWG

FIGURE

3

Former Exxon Station
3055 35th Avenue
Oakland, California

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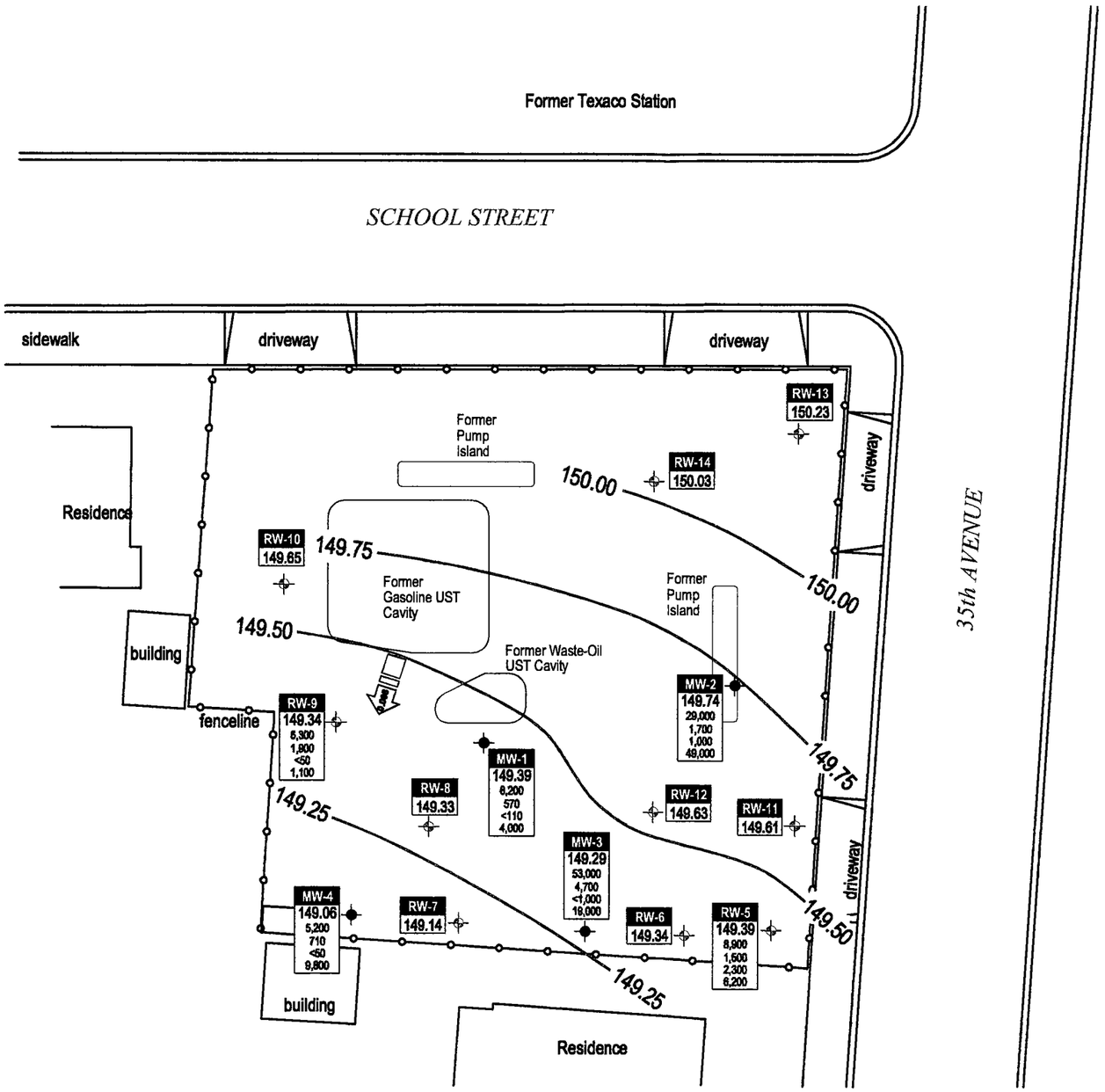
01/06/06

Groundwater Elevation and Hydrocarbon Concentration Map

December 14, 2005



EXPLANATION

- MW-1 — Monitoring well location
- RW-6 — Remediation well location
- 148.00 — Groundwater elevation contour, in feet above mean sea level (msl), dashed where inferred
- 0.006 — Groundwater flow direction and gradient
- Well ID — Well designation
- ELEV — Groundwater elevation (msl)
- TPHg / Benzene / MTBE / TPHd — Hydrocarbon concentrations in groundwater, in micrograms per liter (µg/L)

0 15 30 60

Scale (ft)

Source: Virgil Chavez Land Surveying

H:\WORTHINGTON\FIGURES\2005\4Q05-GW.DWG

FIGURE

4

Former Exxon Station
3055 35th Avenue
Oakland, California

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Proposed Sparge Points Location Map

EXPLANATION

- MW-1 — Monitoring well location
- RW-6 — Remediation well location
- SP-1 — Proposed Sparge Point

Former Texaco Station

SCHOOL STREET

35th AVENUE

sidewalk

driveway

driveway

driveway

driveway

Residence

building

fenceline

building

Residence

Former Pump Island

Former Pump Island

Former Gasoline UST Cavity

Former Waste-Oil UST Cavity

RW-13

RW-14

RW-10

RW-9

RW-8

RW-12

RW-11

RW-7

RW-6

RW-5

MW-1

MW-2

MW-3

MW-4

SP-1

SP-2

SP-3

SP-4

SP-5

SP-6

SP-7

0 15 30 60

Scale (ft)

Source: Virgil Chavez Land Surveying

H:\WORTHINGTON\FIGURES\2009\PROP SPARGE LOC.DWG

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Former Exxon Station
3055 35th Avenue
Oakland, California

FIGURE
5

TABLES

Table 1. Soil Analytical Data - Former Exxon Service Station, 3055 35th Avenue, Oakland, California

Sample ID	Date Sampled	Sample Depth (ft)	GW Depth (ft)	TPHg	TPHd	Benzene	Toluene	Ethylbenzene	Xylenes	MTBE	Notes
				<---------- Concentrations in mg/kg ---------->							
B1	11/5/91	20	---	1,500	---	56	44	24	140	---	
B2	11/5/91	15	---	290	---	0.057	1.3	3.8	17	---	
B3	11/6/91	20	---	130	---	1.9	4.7	2.4	19	---	
B5	11/6/91	15	---	660	---	1.8	4.1	8.9	29	---	
B6	11/6/91	15	---	1,200	---	6.6	21	18	98	---	
B7	11/6/91	15	---	2,100	<1.0	28	100	38	290	---	
B9	11/6/91	15	---	480	---	5.9	23	8.9	72	---	
B10	11/6/91	20	---	260	---	7.3	21	6.6	54	---	
SB-A	5/5/94	11	14.5	3.4	4.2	<10	0.0072	0.0015	0.015	0.031	a
	5/5/94	16	---	1,600	620	<1,000	1.8	3.4	17	54	a
SB-B	5/6/94	11	15.0	170	52	<100	0.45	2.5	1.7	11	a
	5/6/94	16	---	940	120	<100	6.3	28	12	70	a
SB-C	5/6/94	11	13.9	25	6.7	<10	0.22	0.62	0.49	2.1	a
(MW-3)	5/6/94	16	---	490	280	<500	1.9	14	7.4	42	a
SB-D	5/6/94	11	19.5	<1	5.2	<10	<0.0025	<0.0025	<0.0025	<0.0025	
	5/6/94	16	---	<1	<1	<10	<0.0025	<0.0025	<0.0025	<0.0025	
SB-E	5/9/94	11	dry boring	220	56	<10	0.55	2.1	1.7	2.8	a
	5/9/94	16		3.8	1.4	<10	0.19	0.20	0.059	0.20	a
SB-F	5/9/94	11	13.3	370	57	<10	<0.25	<0.25	3.9	6.2	a
(MW-2)	5/9/94	15	---	2,900	450	<100	24	41	48	196	a
SB-G	5/9/94	11	14.5	20	18	<10	0.061	0.014	0.093	0.34	a
(MW-1)	5/9/94	15	---	390	52	<10	1.4	6.1	3.9	16	b
MW-4-10	2/26/97	10	---	64	62	0.24	1.1	0.7	2.6	<0.2	c,d
MW-4-15	2/26/97	15	---	530	150	5.1	18	8.4	39	5.4	c,d

Abbreviations:

ft = feet

GW = Groundwater

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

TPHd = Total petroleum hydrocarbons as diesel by modified EPA Method 8015

Benzene, Toluene, Ethylbenzene, and Xylenes by EPA Method 8020

MTBE = Methyl Tertiary Butyl Ether by EPA Method 8020

mg/kg = milligrams per kilogram

Notes:

(a) The positive TPHd response appears to be a lighter hydrocarbon than diesel

(b) The positive TPHd result has an atypical chromatographic pattern

(c) Unmodified or weakly modified gasoline is significant (TPHg)

(d) Gasoline range compounds are significant (TPHd)

Table 2. Groundwater Elevations and Analytical Data - Former Exxon Service Station, 3055 35th Avenue, Oakland, California

Well ID	Date	GW	SPH	GW	TPHg	TPHd	TPHmo	Benzene	Toluene	Ethylbenzene	Xylenes	MTBE	DO	TPE System
TOC		Depth (ft)	(ft)	Elev. (ft)	<---------- Concentrations in micrograms per liter (µg/L) ---------->								(mg/L)	Status
MW-1	5/25/1994	16.79	Sheen	84.06	120,000	25,000	<50,000	22,000	17,000	2,800	16,000	---	---	
100.85	7/19/1994	20.77	---	80.08	---	---	---	---	---	---	---	---	---	
	8/18/1994	21.04	Sheen	79.81	925,000	---	---	16,500	6,200	1,000	9,400	---	---	
	11/11/1994	15.80	---	85.05	57,000	---	---	14,000	4,400	1,400	6,400	---	---	
	2/27/1995	15.53	---	85.32	45,000	---	---	2,900	2,500	760	4,100	---	---	
	5/23/1995	15.29	---	85.56	22,000	---	---	9,900	990	790	2,000	---	---	
	8/22/1995	20.90	---	79.95	23,000	---	---	6,900	340	1,200	1,900	---	---	
	11/29/1995	22.19	---	78.66	37,000	---	---	9,900	530	1,600	2,900	---	---	
	2/21/1996	11.69	---	89.16	33,000	4,300	---	10,000	480	1,000	1,800	3,300	---	
	5/21/1996	14.62	---	86.23	36,000	8,500	---	8,500	1,400	1,300	2,800	1,900	---	
	8/22/1996	22.30	---	78.55	41,000	6,200	---	8,600	1,300	1,500	2,900	<200	8.0	
	11/27/1996	17.24	Sheen	83.61	38,000	6,100	---	9,600	950	1,600	3,100	<400	5.6	
	3/20/1997	16.65	---	84.20	33,000	10,000	---	6,100	560	970	2,200	<400	8.5	
	6/25/1997	19.77	---	81.08	31,000	7,400[a]	---	7,400	440	890	1,800	<400	3.7	
	9/17/1997	20.12	---	80.73	32,000[d]	3,500[e]	---	9,100	550	1,000	2,000	<1,000	2.1	
	12/22/1997	12.95	---	87.90	26,000[d]	5,800[e]	---	7,900	370	920	1,500	<790	0.7	
	3/18/1998	12.34	Sheen	88.51	30,000[d]	4,200[e,f]	---	7,800	820	840	2,000	<1,100	1.3	
	7/14/1998	17.34	---	83.51	41,000[d]	8,900[e,f]	---	8,200	1,100	1,200	3,000	<200	1.8	
	9/30/1998	19.90	---	80.95	37,000	3,300	---	11,000	950	1,200	2,800	<20	2.0	
	12/8/1998	15.62	---	85.23	22,000	3,700	---	3,000	1,200	730	3,100	<900	---	
	3/29/1999	11.98	---	88.87	36,000[d]	6,800[e]	---	12,000	750	1,300	2,400	950	0.50	
	6/29/1999	20.77	---	80.08	28,000[d]	3,500[e]	---	7,300	420	810	1,700	<1,300	0.10	
	9/28/1999	19.68	---	81.17	13,000[d]	3,600 [e,f]	---	3,200	130	320	1,100	<210	0.55	
	12/10/1999	17.02	---	83.83	25,000[d]	2,900 [e,f]	---	5,400	130	620	1,400	<1,000	1.03	
	3/23/2000	12.76	---	88.09	21,000[d]	3,300[f]	---	4,700	140	470	1,100	<350	---	
	9/7/2000	19.45	---	81.40	40,000[d,g]	12,000[e,g]	---	3,700	1,400	910	4,900	<50	0.17	
	12/5/2000	18.60	---	82.25	26,000[a]	3,400[e]	---	7,900	150	580	810	<300	0.35	Not operating
	3/7/2001	16.19	---	84.66	13,000	2,400	---	2,700	43	69	300	<100	0.49	Not operating
	6/6/2001	18.47	---	82.38	19,000	4,000	---	4,500	130	270	430	<400	0.39	Not operating
	8/30/2001	21.70	---	79.15	8,800[a]	1,400[d]	---	2,100	45	91	240	<130	0.27	Operating
	12/7/2001	26.55	---	74.30	8,700[d]	1,900[e,f]	---	1,300	160	38	730	<20	0.59	Operating
	3/11/2002	17.13	---	83.72	9,400[d]	1,400[e]	---	2,100	200	74	470	<20	0.39	Operating
	6/10/2002	24.10	---	76.75	4,200[d]	900[e,k]	---	830	170	110	460	<100	---	Operating
	9/26/2002	20.30	---	80.55	7,000[d]	1,300[e,f,k]	---	1,300	190	200	760	<100	0.70	Operating
	11/21/2002	21.55	---	79.30	83,000[d,g]	200,000[e,g]	---	7,100	1,700	3,000	13,000	<1,000	0.49	Operating
	1/13/2003	14.80	---	86.05	20,000[d]	5,300[e,f]	---	2,300	480	300	2,100	<500	0.33	Not operating
	4/25/2003	20.90	---	79.95	4,200[d]	320[e]	---	580	81	59	470	<50	---	Operating
	5/30/2003	16.65	---	84.20	---	---	---	---	---	---	---	---	---	Not operating
	9/3/2003	24.16	---	76.69	14,000[d]	36,000[e,f]	---	300	50	33	480	<50	---	Operating
	12/2/2003	24.12	---	76.73	7,100[d,g]	9,300[e,f,g]	---	1,400	230	160	820	<100	---	Operating

Table 2. Groundwater Elevations and Analytical Data - Former Exxon Service Station, 3055 35th Avenue, Oakland, California

Well ID	Date	GW	SPH	GW	TPHg	TPHd	TPHmo	Benzene	Toluene	Ethylbenzene	Xylenes	MTBE	DO	TPE System
TOC		Depth (ft)	(ft)	Elev. (ft)	<---------- Concentrations in micrograms per liter (µg/L) ---------->								(mg/L)	Status
MW-1	3/18/2004	17.70	---	83.15	3,600[d]	1,100[e,f]	---	650	59	38	370	<90	---	Operating
Continued	6/16/2004	19.20	---	147.82	8,100[d]	2,300[e,f]	---	1,500	69	22	1,000	<100	---	Not operating
167.02	9/27/2004	23.07	---	143.95	7,800[d]	1,700[e]	---	1,800	110	120	670	<180	0.28	Not operating
(Monument	12/27/2004	17.04	---	149.98	10,000[d]	1,400[e]	---	2,400	170	170	1,500	<120	0.41	Not operating
Well box)	3/7/2005	10.73	---	156.29	8,700[d]	1,300[e,f,k]	---	1,200	99	140	770	<500	0.91	Not operating
	6/21/2005	14.60	---	152.42	6,500[d]	930[e,k]	---	820	26	57	110	<250	---	Not operating
	9/21/2005	19.64	---	147.38	2,900[d]	860[e,k,f]	---	430	19	46	150	<50	1.14	Not operating
	12/14/2005	**17.63**	**---**	**149.39**	**6,200[d]**	**4,000[e,f,k]**	**---**	**570**	**32**	**72**	**420**	**<110**	**1.08**	Not operating
MW-2	5/25/1994	15.65	---	84.35	61,000	6,900	<5,000	9,900	7,400	960	4,600	---	---	
100.00	7/19/1994	19.81	---	80.19	---	---	---	---	---	---	---	---	---	
	8/18/1994	20.37	---	79.63	88,000	---	---	10,750	10,500	1,850	9,600	---	---	
	11/11/94	15.52	---	84.48	54,000	---	---	5,900	6,700	1,300	7,500	---	---	
	2/27/1995	14.46	Sheen	85.54	44,000	---	---	5,100	5,300	930	6,400	---	---	
	5/23/1995	14.17	---	85.83	33,000	---	---	8,200	5,600	900	6,600	---	---	
	8/22/1995	19.80	---	80.20	38,000	---	---	6,400	5,000	1,100	5,600	---	---	
	11/29/95	21.05	---	78.95	46,000	---	---	7,100	5,300	1,300	6,000	---	---	
	2/21/1996	10.53	---	89.47	59,000	---	---	8,000	6,000	1,800	8,900	4,500	---	
	5/21/1996	13.47	---	86.53	51,000	3,400	---	8,200	5,200	1,300	6,600	2,400	---	
	8/22/1996	19.12	---	80.88	37,000	5,700	---	5,100	3,500	960	4,500	<200	3.0	
	11/27/1996	16.61	Sheen	83.39	54,000	10,000	---	9,800	7,000	1,800	7,900	<2,000	3.1	
	3/20/1997	15.39	---	84.61	27,000	6,100	---	3,700	2,300	580	2,800	<400	8.1	
	6/25/1997	18.62	---	81.38	42,000	7,800[b]	---	7,400	3,800	1,200	5,700	<200	0.9	
	9/17/1997	19.05	Sheen	80.95	41,000[d]	8,900[e]	---	5,200	3,400	1,300	5,900	<700	1.2	
	12/22/1997	14.09	---	85.91	47,000[d]	6,100[e]	---	8,500	4,600	1,800	8,400	<1,200	1.2	
	3/18/1998	10.83	Sheen	89.17	58,000[d]	7,000[e,f]	---	9,300	6,100	1,800	8,200	<1,100	1.1	
	7/14/1998	16.07	---	83.93	42,000[d]	5,300[e,f]	---	6,000	3,000	1,000	4,800	<200	1.5	
	9/30/1998	18.71	---	81.29	22,000	2,400	---	3,600	1,300	720	3,200	<30	1.8	
	12/8/1998	14.80	---	85.20	32,000	3,100	---	9,200	680	1,100	2,300	<2,000	---	
	3/29/1999	11.81	---	88.19	28,000[d]	7,500[e,f]	---	4,400	1,600	950	4,100	410	1.86	
	6/29/1999	19.54	---	80.46	28,000[d]	3,300[e]	---	3,500	1,100	690	3,100	<1,000	0.41	
	9/28/1999	18.61	---	81.39	15,000[d]	3,400[e,f]	---	1,200	540	230	2,300	<36	1.18	
	12/10/1999	16.53	---	83.47	17,000[d]	2,500[e,f]	---	1,300	780	420	2,700	<40	0.17	
	3/23/2000	13.56	---	86.44	25,000[d]	3,100[i]	---	1,900	1,100	660	3,700	<500	---	
	9/7/2000	18.25	---	81.75	62,000[d,g]	32,000[e,g]	---	5,300	2,300	1,500	8,400	<100	0.39	
	12/5/2000	17.45	---	82.55	60,000[d,g]	87,000[e,f,g]	---	5,100	2,200	1,600	9,000	<200	0.31	Not operating
	3/7/2001	15.68	---	84.32	34,000	3,900	---	1,200	770	620	4,300	<200	0.44	Not operating
	6/6/2001	17.51	---	82.49	110,000	48,000	---	14,000	9,000	1,900	12,000	<950	0.24	Not operating
	8/30/2001	21.00	---	79.00	43,000[a,h]	15,000[d,h]	---	3,100	720	980	5,500	<200	---	Operating
	12/7/2001	24.45	---	75.55	4,100[d]	750[e,f]	---	510	88	8.2	580	<20	0.47	Operating

Table 2. Groundwater Elevations and Analytical Data - Former Exxon Service Station, 3055 35th Avenue, Oakland, California

Well ID *TOC*	Date	GW Depth (ft)	SPH (ft)	GW Elev. (ft)	TPHg <---------- Concentrations in micrograms per liter (µg/L) ---------->	TPHd	TPHmo	Benzene	Toluene	Ethylbenzene	Xylenes	MTBE	DO (mg/L)	TPE System Status
MW-2	3/11/2002	16.95	---	83.05	4,700[d]	590[e]	---	1,200	150	30	310	<50	0.24	Operating
Continued	6/10/2002	18.59	---	81.41	14,000[d]	2,000[e]	---	2,600	710	150	2,000	<800	---	Operating
	9/26/2002	20.39	---	79.61	4,800[d]	660[e]	---	770	200	140	740	<50	0.29	Operating
	11/21/2002	18.75	---	81.25	210,000[d,g]	350,000[e,g]	---	14,000	23,000	4,400	28,000	<1,700	0.43	Operating
	1/13/2003	13.60	---	86.40	32,000[d,g]	14,000[e,f,g,k]	---	4,500	1,600	920	3,600	<1000	0.39	Not operating
	4/25/2003	19.05	---	80.95	3,800[d]	310[e]	---	460	78	72	410	310	---	Operating
	5/30/2003	15.23	---	84.77	---	---	---	---	---	---	---	---	---	Not operating
	9/3/2003	23.57	---	76.43	2,900[d]	2,300[e]	---	240	57	68	380	770	---	Operating
	12/2/2003	23.17	---	76.83	2,400[d,g]	3,300[e,f,g]	---	91	20	14	250	890	---	Operating
	3/18/2004	15.78	---	84.22	4,200[d]	870[e,f]	---	730	89	<5.0	480	2,300	---	Operating
166.14	6/16/2004	18.15	---	147.99	15,000[d]	9,800[e,f]	---	800	210	290	1,800	2,000	---	Not operating
(Monument	9/27/2004	27.55**	---	138.59	770[d]	1,000[e,f,k]	---	20	7.9	10	140	1,600	0.79	Operating
Well box)	12/27/2004	16.81	---	149.33	17,000[d]	3,800[e,f]	---	1,300	370	540	3,800	620	0.94	Not operating
	3/7/2005	9.31	Sheen	156.83	20,000[d,g]	8,300[e,f,k,g]	---	1,400	330	430	2,600	1,100	0.88	Not operating
	6/21/2005	13.42	---	152.72	36,000[d,g]	15,000[e,f,g]	---	1,700	310	460	3,100	1,200	---	Not operating
	9/21/2005	18.50	---	147.64	4,600[d]	1,100[e,f]	---	370	62	110	740	1,100	0.86	Not operating
	12/14/2005	**16.40**	---	**149.74**	**29,000[d,g]**	**49,000[e,f,k,g]**	---	**1,700**	**260**	**600**	**3,700**	**1,000**	**0.99**	Not operating
MW-3	5/25/1994	13.93	Sheen	82.94	56,000	14,000	<50,000	14,000	14,000	1,300	11,000	---	---	
96.87	7/19/1994	17.04	---	79.83	---	---	---	---	---	---	---	---	---	
	8/18/1994	17.75	---	79.12	116,000	---	---	28,300	26,000	2,400	15,000	---	---	
	11/11/94	17.80	---	79.07	89,000	---	---	1,600	1,900	1,900	14,000	---	---	
	2/27/1995	11.86	Sheen	85.01	250,000	---	---	22,000	26,000	7,800	21,000	---	---	
	5/23/1995	11.60	Sheen	85.27	310,000	---	---	18,000	17,000	4,500	2,800	---	---	
	8/22/1995	17.10	---	79.77	74,000	---	---	14,000	13,000	1,900	11,000	---	---	
	11/29/1995	16.34	---	80.53	220,000	---	---	25,000	25,000	3,500	19,000	---	---	
	2/21/1996	7.92	---	88.95	60,000	---	---	10,000	7,800	1,500	8,800	3,400	---	
	5/21/1996	10.86	Sheen	86.01	69,000	13,000	---	17,000	9,400	1,700	9,400	2,600	---	
	8/22/1996	16.50	---	80.37	94,000	16,000	---	17,000	15,000	2,100	12,000	330	2.0	
	11/27/1996	13.47	Sheen	83.40	82,000	24,000	---	14,000	13,000	2,400	13,000	<1,000	2.4	
	3/20/1997	12.86	---	84.01	56,000	11,000	---	9,900	6,900	1,300	8,000	3,500	9.0	
	6/25/1997	15.98	---	80.89	49,000	7,700[b]	---	9,700	7,100	1,300	7,000	220	5.8	
	9/17/1997	16.34	Sheen	80.53	78,000[d]	15,000[e]	---	11,000	9,900	1,800	10,000	<1,200	0.7	
	12/22/1997	10.71	Sheen	86.16	49,000[d]	14,000[e]	---	7,300	5,300	1,400	7,500	<1,100	3.1	
	3/18/1998	8.41	Sheen	88.46	120,000[d]	20,000[e,f]	---	21,000	19,000	2,600	15,000	<1,600	1.6	
	7/14/1998	13.51	---	83.36	94,000[d,g]	65,000[e,f,g]	---	18,000	14,000	1,900	11,000	<1,400	1.8	
	9/30/1998	16.14	---	80.73	91,000	9,800	---	17,000	13,000	2,100	12,000	<1300	2.0	
	12/8/1998	11.20	---	85.67	51,000	4,200	---	8,000	6,800	1,400	7,500	<1,100	---	
	3/29/1999	7.95	---	88.92	39,000[d]	4,600[e]	---	8,900	4,400	940	4,500	810	0.56	
	6/29/1999	16.98	---	79.89	71,000[d]	6,900[e]	---	12,000	7,300	1,400	8,400	<1,700	0.19	

Table 2. Groundwater Elevations and Analytical Data - Former Exxon Service Station, 3055 35th Avenue, Oakland, California

Well ID *TOC*	Date	GW Depth (ft)	SPH (ft)	GW Elev. (ft)	TPHg	TPHd	TPHmo	Benzene	Toluene	Ethylbenzene	Xylenes	MTBE	DO (mg/L)	TPE System Status
					<---------- Concentrations in micrograms per liter (µg/L) ---------->									
MW-3	9/28/1999	15.99	---	80.88	60,000[d]	7,800[e]	---	9,400	9,200	1,000	9,900	200	0.53	
Continued	12/10/1999	13.31	---	83.56	53,000[d]	5,300[e,f]	---	8,000	6,400	1,100	8,100	<200	0.48	
	3/23/2000	8.98	---	87.89	77,000[d,g]	11,000[g,j]	---	10,000	9,400	1,600	11,000	<430	---	
	9/7/2000	15.61	---	81.26	100,000[d,g]	19,000[e,f,g]	---	17,000	12,000	1,600	11,000	<500	---	
	12/5/2000	14.80	---	82.07	110,000[d,g]	17,000[e,g]	---	17,000	11,000	1,900	12,000	<750	0.37	Not operating
	3/7/2001	14.27	---	82.60	60,000	13,000	---	7,000	4,600	900	7,100	<350	0.49	Not operating
	6/6/2001	14.88	---	81.99	43,000	12,000	---	3,000	1,000	770	5,200	<400	1.71	Not operating
	8/30/2001	12.43	---	84.44	95,000[a,h]	190,000[d,h]	---	6,900	10,000	2,700	15,000	<250	0.24	Operating
	12/7/2001	24.65	---	72.22	25,000[d]	3,900[e,f]	---	2,500	1,700	64	2,200	<200	0.19	Operating
	3/11/2002	14.69	---	82.18	30,000[d]	2,800[f,e,k]	---	5,000	2,400	190	1,800	<1,300	0.30	Operating
	6/10/2002	22.94	---	73.93	9,000[d]	990[e,k]	---	1,800	1,300	96	1,000	<300	---	Operating
	9/26/2002	18.85	---	78.02	50,000[d,g]	130,000[e,g]	---	3,900	5,400	820	6,600	<500	0.19	Operating
	11/21/2002	17.85	0.05	79.06	37,000[d,g]	120,000[e,g]	---	4,000	660	1,200	5,100	<1,700	0.28	Operating
	1/13/2003	11.43	---	85.44	21,000[d,g]	6,300[e,f,g,k]	---	2,400	2,300	390	3,000	<500	0.31	Not operating
	4/25/2003	18.30	---	78.57	12,000[d]	1,200[e]	---	1,800	850	150	1,200	<500	---	Operating
	5/30/2003	13.30	---	83.57	---	---	---	---	---	---	---	---	---	Not operating
	9/3/2003	21.65	---	75.22	8,100[d]	3,300[e]	---	220	170	66	560	<50	---	Operating
	12/2/2003	17.70	---	79.17	30,000[d,g]	8,400[e,f,g]	---	2,900	2,100	530	3,600	<500	---	Operating
	3/18/2004	16.49	---	80.38	15,000[d]	2,300[e,f]	---	2,600	990	260	1,700	<300	---	Operating
162.94	6/16/2004	15.40	---	147.54	23,000[d]	8,800[e,f]	---	2,100	1,300	360	2,800	<1,000	---	Operating
	9/27/2004	23.65	---	139.29	5,200[d]	1,700[e,f]	---	430	220	100	680	250	0.55	Operating
	12/27/2004	14.58	---	148.36	32,000[d,g]	24,000[e,f,g,k]	---	4,400	2,800	650	4,800	<250	0.71	Not operating
	3/7/2005	6.91	Sheen	156.03	50,000[d,g]	14,000[e,f,g]	---	6,100	2,100	1,300	7,400	<500	0.62	Not operating
	6/21/2005	10.79	---	152.15	44,000[d,g]	12,000[e,g]	---	4,900	870	1,100	6,500	<1,200	---	Not operating
	9/21/2005	15.73	---	147.21	41,000[d,g]	16,000[e,f,k,g]	---	3,700	480	930	5,700	<500	0.90	Not operating
	12/14/2005	**13.65**	---	**149.29**	**53,000[d,g]**	**19,000[e, f, k, g]**	---	**4,700**	**350**	**1,100**	**7,400**	**<1,000**	**0.95**	Not operating
MW-4	3/20/1997	13.75	---	83.59	47,000	3,100	---	11,000	4,500	1,100	5,200	3,400	8.4	
97.34	6/25/1997	16.15	---	81.19	61,000	5,800[b]	---	16,000	6,100	1,500	5,900	780[c]	1.4	
	9/17/1997	17.10	---	80.24	60,000[d]	4,400[e]	---	17,000	4,900	1,500	5,700	<1,500	1.5	
	12/22/1997	9.21	---	88.13	43,000[d]	3,100[e]	---	13,000	3,900	1,100	4,200	<960	3.7	
	3/18/1998	9.54	---	87.80	58,000[d]	5,500[e,f]	---	14,000	4,700	1,400	5,700	<1,200	0.8	
	7/14/1998	14.15	---	83.19	73,000[d]	2,900[e,f]	---	22,000	7,000	1,800	7,300	<200	1.0	
	9/30/1998	16.84	---	80.50	39,000	2,100	---	12,000	2,700	1,000	3,400	510	1.1	
	12/8/1998	13.45	---	83.89	27,000	1,600	---	8,900	1,600	730	2,300	<1,500	---	
	3/29/1999	9.10	---	88.24	48,000[d]	2,400[e,f,h]	---	15,000	3,000	1,300	5,000	1,300	1.32	
	06/29/99*	---	---	---	---	---	---	---	---	---	---	---	---	
	9/28/1999	16.58	---	80.76	24,000[d]	3,200[e,f]	---	7,500	1,200	190	2,200	210	14.29[#]	
	12/10/1999	13.99	---	83.35	47,000[d]	3,100[e,f]	---	12,000	1,800	1,000	4,400	<100	0.62	
	3/23/2000	10.22	---	87.12	40,000[d]	3,100[e,f]	---	11,000	1,600	910	3,100	690	---	

Table 2. Groundwater Elevations and Analytical Data - Former Exxon Service Station, 3055 35th Avenue, Oakland, California

Well ID	Date	GW	SPH	GW	TPHg	TPHd	TPHmo	Benzene	Toluene	Ethylbenzene	Xylenes	MTBE	DO	TPE System
TOC		Depth (ft)	(ft)	Elev. (ft)	<---------- Concentrations in micrograms per liter (µg/L) ---------->								(mg/L)	Status
MW-4	9/7/2000	16.40	---	80.94	43,000[d]	5,900[e]	---	10,000	1,100	1,100	3,400	<450	1.04	
Continued	12/5/2000	15.55	---	81.79	69,000[d,g]	2,600[e,g]	---	16,000	1,300	1,300	3,400	<200	0.35	Not operating
	3/20/2001	14.03	---	83.31	46,000	---	---	13,000	1,000	900	2,800	<350	0.39	Not operating
	6/6/2001	15.49	---	81.85	75,000	5,400	---	22,000	1,800	1,900	6,400	<1,200	2.22	Not operating
	8/30/2001	18.00	---	79.34	43,000[a]	3,200[d]	---	6,400	630	510	2,600	<200	0.32	Operating
	12/7/2001	23.45	---	73.89	32,000[d,g]	11,000[e,f,g]	---	4,500	740	310	2,300	<200	0.21	Operating
	3/11/2002	14.95	---	82.39	15,000[d]	1,600[e,f,k]	---	3,700	500	92	790	<500	0.30	Operating
	6/10/2002	22.30	---	75.04	9,400[d]	3,400[e]	---	1,400	50	<5.0	690	<200	---	Operating
	9/26/2002	17.93	---	79.41	21,000[d]	800[e]	---	3,300	1,300	450	2,900	<500	0.24	Operating
	11/21/2002	17.55	---	79.79	5,700[d]	2,400[e,k]	---	1,400	290	63	640	550	---	Operating
	1/13/2003	11.75	---	85.59	35,000[d,g]	15,000[e,f,g,k]	---	5,100	1,500	510	4,500	<800	0.28	Not operating
	4/25/2003	19.37	---	77.97	6,600[d]	2,200[e,f]	---	960	130	100	560	<170	---	Operating
	5/30/2003	13.56	---	83.78	---	---	---	---	---	---	---	---	---	Not operating
	9/3/2003	21.65	---	75.69	29,000[d]	27,000[e,f]	---	2,200	380	280	2,300	65	---	Operating
	12/2/2003	19.17	---	78.17	13,000[d]	5,800[e,f]	---	1,300	180	120	1,900	<250	---	Operating
	3/18/2004	14.92	---	82.42	5,300[d]	1,500[e]	---	1,300	55	37	440	<180	---	Operating
163.49	6/16/2004	16.02	---	147.47	9,100[d]	3,400[e,f]	---	940	96	120	800	<50	---	Not operating
	9/27/2004	19.93	---	143.56	1,300[d]	980[e,f,k]	---	140	10	11	81	<50	0.68	Not operating
	12/27/2004	14.79	---	148.70	10,000[d,g]	5,300[e,f,g,k]	---	1,000	99	34	1,600	<50	0.74	Not operating
	3/7/2005	7.81	Sheen	155.68	15,000[d,g]	9,300[e,f,g]	---	1,100	140	88	1,900	<100	0.65	Not operating
	6/21/2005	11.82	---	151.67	30,000[d,g]	12,000[e,g]	---	3,300	270	250	2,800	<500	---	Not operating
	9/21/2005	16.55	---	146.94	12,000 [d,g]	15,000 [e,f,k,g]	---	540	100	54	1,800	<50	0.89	Not operating
	12/14/2005	**14.43**	---	**149.06**	**5,200 [d, g]**	**9,800 [e, f, k, g]**	---	**710**	**41**	**91**	**540**	**<50**	**0.91**	Not operating
RW-5	6/16/2004	14.73	---	147.61	---	---	---	---	---	---	---	---	---	Not operating
162.34	9/27/2004	25.55**	---	136.79	---	---	---	---	---	---	---	---	---	Operating
	12/27/2004	10.45	---	151.89	---	---	---	---	---	---	---	---	---	Not operating
	3/7/2005	4.42	Sheen	157.92	7,000[d]	6,100[e, f, k]	---	720	63	97	670	<400	0.93	Not operating
	6/21/2005	10.02	---	152.32	11,000[d]	490[e]	---	1,200	67	68	690	<500	---	Not operating
	9/21/2005	15.07	---	147.27	2,000 [d,g]	2,500 [e,f,k,g]	---	390	16	24	170	1,300	0.99	Not operating
	12/14/2005	**12.95**	---	**149.39**	**8,900 [d, g]**	**6,200 [e, f, k, g]**	---	**1,500**	**92**	**180**	**750**	**2,300**	**1.03**	Not operating
RW-6	6/16/2004	14.80	---	147.56	---	---	---	---	---	---	---	---	---	Not operating
162.36	9/27/2004	18.46	---	143.90	---	---	---	---	---	---	---	---	---	Not operating
	12/27/2004	9.82	---	152.54	---	---	---	---	---	---	---	---	---	Not operating
	3/7/2005	6.05	---	156.31	---	---	---	---	---	---	---	---	---	Not operating
	6/21/2005	10.13	---	152.23	---	---	---	---	---	---	---	---	---	Not operating
	9/21/2005	15.13	---	147.23	---	---	---	---	---	---	---	---	---	Not operating
	12/14/2005	**13.02**	---	**149.34**	---	---	---	---	---	---	---	---	---	Not operating

Table 2. Groundwater Elevations and Analytical Data - Former Exxon Service Station, 3055 35th Avenue, Oakland, California

Well ID	Date	GW	SPH	GW	TPHg	TPHd	TPHmo	Benzene	Toluene	Ethylbenzene	Xylenes	MTBE	DO	TPE System
TOC		Depth (ft)	(ft)	Elev. (ft)	<---------- Concentrations in micrograms per liter (µg/L) ---------->								(mg/L)	Status
RW-7	6/16/2004	15.22	---	147.50	---	---	---	---	---	---	---	---	---	Not operating
162.72	9/27/2004	18.98	---	143.74	---	---	---	---	---	---	---	---	---	Not operating
	12/27/2004	9.85	---	152.87	---	---	---	---	---	---	---	---	---	Not operating
	3/7/2005	5.82	---	156.90	---	---	---	---	---	---	---	---	---	Not operating
	6/21/2005	10.85	---	151.87	---	---	---	---	---	---	---	---	---	Not operating
	9/21/2005	15.70	---	147.02	---	---	---	---	---	---	---	---	---	Not operating
	12/14/2005	**13.58**	---	**149.14**	---	---	---	---	---	---	---	---	---	Not operating
RW-8	6/16/2004	16.41	---	147.72	---	---	---	---	---	---	---	---	---	Not operating
164.13	9/27/2004	19.74	---	144.39	---	---	---	---	---	---	---	---	---	Not operating
	12/27/2004	12.32	---	151.81	---	---	---	---	---	---	---	---	---	Not operating
	3/7/2005	8.10	---	156.03	---	---	---	---	---	---	---	---	---	Not operating
	6/21/2005	12.15	---	151.98	---	---	---	---	---	---	---	---	---	Not operating
	9/21/2005	16.90	---	147.23	---	---	---	---	---	---	---	---	---	Not operating
	12/14/2005	**14.80**	---	**149.33**	---	---	---	---	---	---	---	---	---	Not operating
RW-9	6/16/2004	16.03	---	147.83	---	---	---	---	---	---	---	---	---	Not operating
163.86	9/27/2004	19.83	---	144.03	---	---	---	---	---	---	---	---	---	Not operating
	12/27/2004	24.88	---	138.98	---	---	---	---	---	---	---	---	---	Not operating
	3/7/2005	7.87	---	155.99	9,000[d]	510[e]	---	2,600	69	200	550	<500	0.91	Not operating
	6/21/2005	11.90	---	151.96	9,400[d]	630[e]	---	2,400	69	210	470	<350	---	Not operating
	9/21/2005	16.62	---	147.24	8,300 [d,g]	820 [e,f,g]	---	2,500	36	190	310	<170	1.04	Not operating
	12/14/2005	**14.52**	---	**149.34**	**6,300 [d]**	**1,100 [e,f]**	---	**1,900**	**29**	**150**	**260**	**<50**	**0.98**	Not operating
RW-10	6/16/2004	15.03	---	147.99	---	---	---	---	---	---	---	---	---	Not operating
163.02	9/27/2004	18.35	---	144.67	---	---	---	---	---	---	---	---	---	Not operating
	12/27/2004	19.39	---	143.63	---	---	---	---	---	---	---	---	---	Not operating
	3/7/2005	6.40	---	156.62	---	---	---	---	---	---	---	---	---	Not operating
	6/21/2005	10.95	---	152.07	---	---	---	---	---	---	---	---	---	Not operating
	9/21/2005	15.51	---	147.51	---	---	---	---	---	---	---	---	---	Not operating
	12/14/2005	**13.37**	---	**149.65**	---	---	---	---	---	---	---	---	---	Not operating
RW-11	6/16/2004	14.75	---	147.82	---	---	---	---	---	---	---	---	---	Not operating
162.57	9/27/2004	18.44	---	144.13	---	---	---	---	---	---	---	---	---	Not operating
	12/27/2004	10.07	---	152.50	---	---	---	---	---	---	---	---	---	Not operating
	3/7/2005	5.95	---	156.62	---	---	---	---	---	---	---	---	---	Not operating
	6/21/2005	9.96	---	152.61	---	---	---	---	---	---	---	---	---	Not operating
	9/21/2005	15.09	---	147.48	---	---	---	---	---	---	---	---	---	Not operating
	12/14/2005	**12.96**	---	**149.61**	---	---	---	---	---	---	---	---	---	Not operating

Table 2. Groundwater Elevations and Analytical Data - Former Exxon Service Station, 3055 35th Avenue, Oakland, California

Well ID	Date	GW	SPH	GW	TPHg	TPHd	TPHmo	Benzene	Toluene	Ethylbenzene	Xylenes	MTBE	DO	TPE System
TOC		Depth (ft)	(ft)	Elev. (ft)	<---------- Concentrations in micrograms per liter (µg/L) ---------->								(mg/L)	Status
RW-12	6/16/2004	15.30	---	147.76	---	---	---	---	---	---	---	---	---	Not operating
163.06	9/27/2004	19.09	---	143.97	---	---	---	---	---	---	---	---	---	Not operating
	12/27/2004	10.85	---	152.21	---	---	---	---	---	---	---	---	---	Not operating
	3/7/2005	6.59	---	156.47	---	---	---	---	---	---	---	---	---	Not operating
	6/21/2005	10.58	---	152.48	---	---	---	---	---	---	---	---	---	Not operating
	9/21/2005	15.63	---	147.43	---	---	---	---	---	---	---	---	---	Not operating
	12/14/2005	**13.43**	---	**149.63**	---	---	---	---	---	---	---	---	---	Not operating
RW-13	6/16/2004	15.83	---	148.51	---	---	---	---	---	---	---	---	---	Not operating
164.34	9/27/2004	19.55	---	144.79	---	---	---	---	---	---	---	---	---	Not operating
	12/27/2004	18.12	---	146.22	---	---	---	---	---	---	---	---	---	Not operating
	3/7/2005	6.90	---	157.44	---	---	---	---	---	---	---	---	---	Not operating
	6/21/2005	11.05	---	153.29	---	---	---	---	---	---	---	---	---	Not operating
	9/21/2005	16.20	---	148.14	---	---	---	---	---	---	---	---	---	Not operating
	12/14/2005	**14.11**	---	**150.23**	---	---	---	---	---	---	---	---	---	Not operating
RW-14	6/16/2004	15.41	---	148.35	---	---	---	---	---	---	---	---	---	Not operating
163.76	9/27/2004	19.20	---	144.56	---	---	---	---	---	---	---	---	---	Not operating
	12/27/2004	12.62	---	151.14	---	---	---	---	---	---	---	---	---	Not operating
	3/7/2005	6.61	---	157.15	---	---	---	---	---	---	---	---	---	Not operating
	6/21/2005	10.80	---	152.96	---	---	---	---	---	---	---	---	---	Not operating
	9/21/2005	15.82	---	147.94	---	---	---	---	---	---	---	---	---	Not operating
	12/14/2005	**13.73**	---	**150.03**	---	---	---	---	---	---	---	---	---	Not operating
Trip Blank	7/14/1998	---	---	---	<50	<50	---	<0.5	<0.5	<0.5	<0.5	<5.0	---	
	9/30/1998	---	---	---	<50	<50	---	<0.5	<0.5	<0.5	<0.5	<5.0	---	
	12/8/1998	---	---	---	<50	---	---	<0.5	<0.5	<0.5	<0.5	<5.0	---	
	3/29/1999	---	---	---	<50	---	---	<0.5	<0.5	<0.5	<0.5	<5.0	---	
	6/29/1999	---	---	---	<50	---	---	<0.5	<0.5	<0.5	<0.5	<5.0	---	
	3/23/2000	---	---	---	<50	---	---	<0.5	<0.5	<0.5	<0.5	<5.0	---	
	9/7/2000	---	---	---	<50	---	---	<0.5	1.1	<0.5	1.1	<5.0	---	

Table 2. Groundwater Elevations and Analytical Data - Former Exxon Service Station, 3055 35th Avenue, Oakland, California

Well ID	Date	GW	SPH	GW	TPHg	TPHd	TPHmo	Benzene	Toluene	Ethylbenzene	Xylenes	MTBE	DO	TPE System
TOC		Depth (ft)	(ft)	Elev. (ft)	<---------- Concentrations in micrograms per liter (µg/L) ---------->								(mg/L)	Status

Methods and Abbreviations:

TOC = Top of casing elevation measured in feet relative to surveyor's datum.

All site wells were re-surveyed by Virgil Chavez Land Surveying on June 2, 2004 to the CA State Coordinate System, Zone III (NAD83). Benchmark elevation = 177.397 feet (NGVD 29)

GW Depth = Groundwater depth measured in feet below TOC.

GW Elev. = Groundwater elevation measured in feet above mean sea level.

ft = Measured in feet

SPH = Separate-phase hydrocarbons depth measured from TOC.

TPHg = Total petroleum hydrocarbons as gasoline by modified EPA Method SW8015C

TPHd = Total petroleum hydrocarbons as diesel by modified EPA Method SW8015C

TPHmo = Total petroleum hydrocarbons as motor oil by modified EPA Method SW8015C

Benzene, Toluene, Ethylbenzene, and Xylenes by EPA Method SW8021B

MTBE = Methyl tertiary-butyl ether by EPA Method SW8021B

DO = Dissolved oxygen

µg/L = Micrograms per liter, equivalent to parts per billion in water

mg/L = Milligrams per liter, equivalent to parts per million in water

TPE = Two-phase extraction

--- = Not observed/not analyzed

* = Well inaccessible during site visit

** = No water in well due to system operating in well, value reflects total well depth.

= abnormally high reading due to added hydrogen peroxide

Notes:

a = Result has an atypical pattern for diesel analysis

b = Result appears to be a lighter hydrocarbon than diesel

c = There is a >40% difference between primary and confirmation analysis

d = Unmodified or weakly modified gasoline is significant

e = Gasoline range compounds are significant

f = Diesel range compounds are significant; no recognizable pattern

g = Lighter than water immiscible sheen is present

h = One to a few isolated peaks present

i = Medium boiling point pattern does not match diesel (stoddard solvent)

j = Aged diesel is significant

k = Oil range compounds are significant

Appendix A

Agency Correspondence

Nagulapaty, Subbarao

From: Gholami, Amir, Env. Health [amir.gholami@acgov.org]
Sent: Thursday, October 06, 2005 5:01 PM
To: Nagulapaty, Subbarao
Subject: Former Exxon 3055 35th Ave, Oak

Hi Subbarao:

Per our discussion your workplan does not include feasibility studies of alternative methods, please modify and resubmit workplan as discussed. This workplan can not be approved as it stands.

Thanks

Amir

ALAMEDA COUNTY
HEALTH CARE SERVICES
AGENCY
DAVID J. KEARS, Agency Director

ENVIRONMENTAL HEALTH SERVICES
ENVIRONMENTAL PROTECTION
1131 Harbor Bay Parkway, Suite 250
Alameda, CA 94502-6577
(510) 567-6700
FAX (510) 337-9335

December 8, 2004

Lynn Worthington
Golden Empire Properties, Inc.
5942 MacArthur Boulevard, Suite B
Oakland, California 94605-1653

Dear Mr. Worthington:

Subject: Fuel Leak Case No. RO0000271; Exxon Station, 3055 35th Ave., Oakland, CA

Alameda County Environmental Health staff has reviewed "Remediation System Shutdown Notification" dated September 30, 2004 by Cambria Environmental Technology, Inc. This letter asks for a request to prepare a work plan to implement an alternative remedial technique from the Corrective Action Plan (CAP) dated April 8, 1998 by Cambria Environmental Technology, Inc.

TECHNICAL COMMENTS

Work plan to implement an alternative remedial technique - Please submit.

TECHNICAL REPORT REQUEST

Please submit the following technical reports to Alameda County Environmental Health (Attention: Don Hwang), according to the following schedule:

Work plan – February 8, 2004

If you have any questions, please call me at (510) 567-6746.

Sincerely,

Don Hwang
Hazardous Materials Specialist
Local Oversight Program

C: Subbarao Nagulapaty, Cambria Environmental Technology, Inc., 5900 Hollis St., Suite A, Emeryville, CA *94608*
Donna Drogos
Files

Appendix B

Soil Boring Logs

BORING LOG

Client: **Lynn Worthington**

Project No: **20-105-20** Phase **4** Task **4**

Boring ID **SB-A**

Location **3055 35th Ave, Oakland**

Surface Elev. **N/A ft,**

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

Depth Feet	Blow Count	Sample	Interval	Lithologic Description	TPHg (ppm)
0	Ground Surface				
				Silty GRAVEL Orange-brown; hard; damp; 5% clay, 30% silt, 20% sand, 45% angular gravel to 1" diam.; no to low plasticity; low estimated hydraulic conductivity.	
5	9 21 25	X			
				Sandy to Clayey SILT Brown with green mottling; hard; damp; 20% clay, 50% silt, 20% sand, 10% gravel; medium to high plasticity; very low to low estimated hydraulic conductivity. Strong weathered gasoline odor.	3
10	5 10 25	X			
				Silty SAND Brownish green; very stiff; moist; <5% clay, 40% silt, 55% sand, <5% gravel; low plasticity; low estimated hydraulic conductivity. Very strong weathered gasoline odor.	1,600
15	6 9 10	X			
				Clayey to Sandy SILT Dark green to brown; hard; damp; 15% clay, 45% silt, 30% sand, 10% gravel; medium plasticity, low estimated hydraulic conductivity. Slight to moderate weathered gasoline odor.	
20	10 15 18	X			
				No hydrocarbon odor	
25	11 18 20	X			
30					

Graphic Log

Boring Completion Graphics

Depth Feet	Additional Comments
0	
5	
10	
15	
20	
25	Bottom of boring
30	

Driller **Soils Exploration**

Logged By **N. Scott MacLeod**

Water-Bearing Zones **12 to 18 ft**

Drilling Started **5/5/94**

Drilling Completed **5/5/94**

Grout Type **Portland cement**

Notes:

BOR 20105 6/27/94

Cambria Environmental Technology, Inc.

BORING LOG

Client: **Lynn Worthington**

Project No: **20-105-20** Phase **4** Task **4**

Boring ID **SB-B**

Location **3055 35th Ave, Oakland**

Surface Elev. **N/A ft,**

Depth Feet	Blow Count	Sample	Interval	Lithologic Description	TPHg (ppm)	Graphic Log	Boring Completion Graphics	Depth Feet	Additional Comments
0	Ground Surface							0	
5	6 15 34	X		**Sandy to gravelly SILT** Brown with green mottled fractures; hard; damp; 5-10% clay, 50-55% silt, 15-20% sand, 10-20% angular gravel to 1.5" diam.; no to low plasticity; low to moderate estimated hydraulic conductivity. No hydrocarbon odor.				5	
10	10 15 24	X		Strong weathered gasoline odor.	170			10	
15	15 16 18	X		Strong, fresh to slightly weathered gasoline odor.	940			15	
20	11 18 16	X		**Silty SAND** Brown; hard; wet; 40% silt, 50% sand, 10% gravel; no plasticity, moderate estimated hydraulic conductivity. Strong, fresh to slightly weathered gasoline odor				20	
25	8 15 21	X						25	
30								30	Bottom of boring

Driller **Soils Exploration**

Logged By **N. Scott MacLeod**

Water-Bearing Zones **17 to 26.5 ft**

Drilling Started **5/6/94**

Drilling Completed **5/6/94**

Grout Type **Portland cement**

Notes:

BOR 20105 6/27/94

Cambria Environmental Technology, Inc.

BORING LOG

Client: **Lynn Worthington**

Project No: **20-105-20** Phase **4** Task **4**

Boring ID **SB-D**

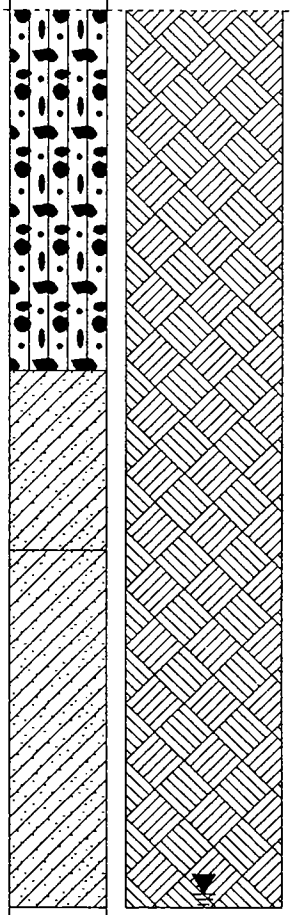
Location **3055 35th Ave, Oakland**

Surface Elev. **N/A ft,**

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

Depth Feet	Blow Count	Sample	Interval	Lithologic Description	TPHg (ppm)
0	Ground Surface				
5	13 19 21	X		**Silty GRAVEL** Tan to brown; hard; damp; <5% clay, 40% silt, 20% sand, 40% angular gravel to 1" diam.; no plasticity; moderate estimated hydraulic conductivity. No hydrocarbon odor.	
10	11 21 31	X		**Clayey to Silty SAND** Light brown; hard; damp; 10-20% clay, 20-30% silt, 40% sand, 10% gravel; medium plasticity; low estimated hydraulic conductivity. No hydrocarbon odor.	<1
15	11 13 22	X		**Silty SAND** Brown; hard; moist; <5% clay, 40% silt, 55% sand, <5% gravel; low plasticity; low estimated hydraulic conductivity. Very strong weathered gasoline odor.	<1
20				**Clayey to Sandy SILT** Dark green to brown; hard; wet; 15% clay, 30% silt, 45% sand, 10% gravel; medium plasticity, low estimated hydraulic conductivity. No hydrocarbon odor.	
25					
30					

Graphic Log



Boring Completion Graphics

Depth Feet	Additional Comments
0	
5	
10	
15	
20	Bottom of boring
25	
30	

Driller **Soils Exploration**

Logged By **N. Scott MacLeod**

Water-Bearing Zones **N/A**

Drilling Started **5/6/94**

Drilling Completed **5/6/94**

Grout Type **Portland cement**

Notes: **Boring did not recharge overnight**

BOR 20105 6/27/94

Cambria Environmental Technology, Inc.

BORING LOG

Client: **Lynn Worthington**

Project No: **20-105-20** Phase **4** Task **4**

Boring ID **SB-E**

Location **3055 35th Ave, Oakland**

Surface Elev. **N/A ft,** Page **1** of **1**

Depth Feet	Blow Count	Sample	Interval	Lithologic Description	TPHg (ppm)	Graphic Log	Boring Completion Graphics	Depth Feet	Additional Comments
0	Ground Surface							0	
				Gravelly SILT Greenish brown; hard; damp; 10% clay, 45% silt, 20% sand, 25% angular gravel to 1.2" diam.; medium plasticity; low to moderate estimated hydraulic conductivity. No hydrocarbon odor.					
5	10 15 23							5	
				Clayey SILT Brown with orange and green mottling; very stiff; damp; 30% clay, 60% silt, 10% sand; high plasticity; very low estimated hydraulic conductivity. Moderate weathered gasoline odor, especially from green mottled areas.	220				
10	5 8 14							10	
				Slight weathered gasoline odor.	4				
15	5 20 30							15	
20	3 7 9			Slight weathered gasoline odor.				20	
									Bottom of boring
25								25	
30								30	

Driller **Soils Exploration**

Logged By **N. Scott MacLeod**

Water-Bearing Zones **Dry boring**

Drilling Started **5/9/94**

Drilling Completed **5/9/94**

Grout Type **Portland cement**

Notes: **Dry boring**

BOR 20105 6/27/94

Cambria Environmental Technology, Inc.

DRILLING LOG

Client: **Lynn Worthington**

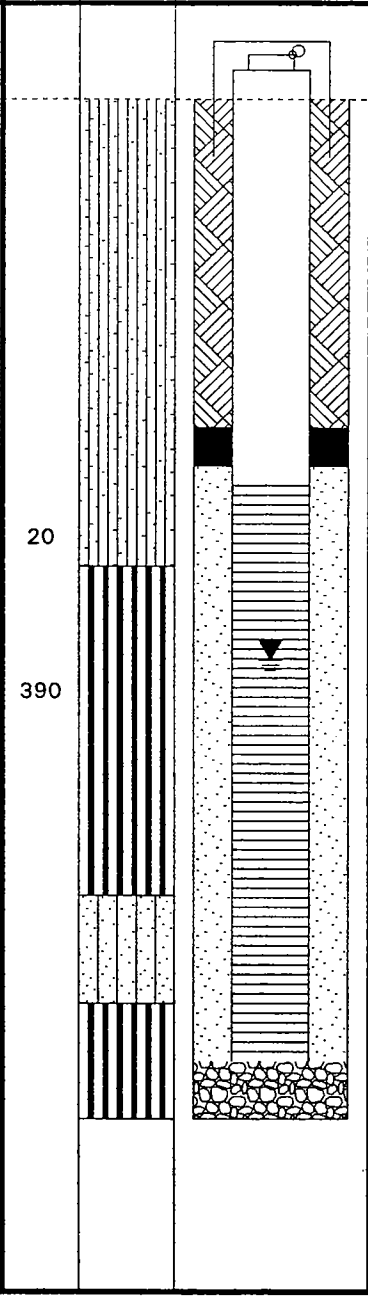
Project No: **20-105-20** Phase **4** Task **4**

Boring ID **SB-G** Well ID **MW-1**

Location **3055 35th Ave, Oakland**

Surface Elev. --- ft,

Depth Feet	Blow Count	Sample	Interval	Lithologic Description
0	Ground Surface			
				Sandy SILT Brown; hard; damp; 10% clay, 60% silt, 20% sand, 10% angular gravel to 1" diam.; low to medium plasticity; low to moderate estimated hydraulic conductivity. No hydrocarbon odor.
5	10 20 32			
10	9 16 18			Strong weathered gasoline odor.
				Clayey SILT Brown; very stiff; damp to moist; 40% clay, 55% silt, 5% sand; high plasticity; very low estimated hydraulic conductivity. Moderate weathered gasoline odor.
15	5 9 15			
20	6 13 20			Moderate gasoline odor.
				Silty SAND Dark green; very stiff; moist; 30% clay, 60% silt, 10% sand; no plasticity; moderate to high estimated hydraulic conductivity. Moderate to strong weathered gasoline odor.
25	5 7 12			**Clayey SILT** Brown mottled green; very stiff; moist; 40% clay, 55% silt, 5% sand; high plasticity; very low estimated hydraulic conductivity. No odor to very slight weathered gasoline odor.
30				



Well Construction Details

T.O.C. Elev. 100.85

Locking well plug and above-grade steel stovepipe

Driller	**Soils Exploration**	Development Yield	**N/A**	Bentonite Seal	**7.5 to 9.5 ft**
Logged By	**N. Scott MacLeod**	Well Casing	**4** Dia. **0** to **10**	Sand Pack	**Monterey sand**
Drilling Started	**5/9/94**	Casing Type	**Schedule 40 PVC**	Sand Pack Type	**#2/16**
Drilling Completed	**5/9/94**	Well Screen	**4** Dia. **10** to **25**	Static Water Level	**14.53** ft Depth
Construction Completed	**5/9/94**	Screen Type	**Schedule 40 PVC**	Date	**5/25/94**
Development Completed	**5/17/94**	Slot Size	**0.010-inch**	Notes:	
Water Bearing Zones	**21 to 23.5 ft**	Drilling Mud	**N/A**		
		Grout Type	**Portland cement**		

WELL 20105 6/27/94

Cambria Environmental Technology, Inc.

DRILLING LOG

Client: **Lynn Worthington**

Project No: **20-105-20** Phase **4** Task **4**

Boring ID **SB-F** Well ID **MW-2**

Location **3055 35th Ave, Oakland**

Surface Elev. --- ft,

Depth Feet	Blow Count	Sample	Interval	Lithologic Description
0	Ground Surface			
				Clayey to Sandy SILT Orange brown; hard; damp; 15% clay, 60% silt, 15% sand, 10% angular gravel to 1" diam.; medium plasticity; low to moderate estimated hydraulic conductivity. No hydrocarbon odor.
5	8 15 27	X		
				Sandy SILT Grey green; hard; damp; 5% clay, 55% silt, 30% sand, 10% gravel; no to low plasticity; moderate estimated hydraulic conductivity. Strong weathered gasoline odor.
10	7 17 22	X		
				Silty SAND Brownish green; hard; wet; 30% silt, 50% sand, 10% angular gravel to 0.4"; no plasticity; moderate to high estimated hydraulic conductivity. Very strong fresh gasoline odor. Hydrocarbon sheen on soil samples.
15	9 13 21	X		
20	7 10 11	X		Moderate gasoline odor. **Clayey SILT** Brown; very stiff; moist; 30% clay, 60% silt, 10% sand; high plasticity; very low estimated hydraulic conductivity. Very strong fresh gasoline odor. Hydrocarbon sheen on soil samples.
25	10 18 19	X		**Silty SAND** Brownish; hard; wet; 30% silt, 50% sand, 20% angular gravel to 1"; no plasticity; moderate to high estimated hydraulic conductivity. no hydrocarbon odor.
30				

TPHg (ppm)	Graphic Log	Well Construction Graphics	Depth Feet	Well Construction Details
			0	T.O.C. Elev. 100.00
				Locking well plug and above-grade steel stovepipe
370			10	
2,900			15	
			20	
			25	
			30	

Driller **Soils Exploration**

Logged By **N. Scott MacLeod**

Drilling Started **5/9/94**

Drilling Completed **5/9/94**

Construction Completed **5/9/94**

Development Completed **5/17/94**

Water Bearing Zones **13 to 20.5 ft**

Development Yield **N/A**

Well Casing **4** Dia. **0** to **10**

Casing Type **Schedule 40 PVC**

Well Screen **4** Dia. **10** to **25**

Screen Type **Schedule 40 PVC**

Slot Size **0.010-inch**

Drilling Mud **N/A**

Grout Type **Portland cement**

Bentonite Seal **7.5 to 8.5 ft**

Sand Pack **Monterey sand**

Sand Pack Type **#2/16**

Static Water Level **13.29** ft Depth

Date **5/25/94**

Notes:

WELL 20105 6/27/94

Cambria Environmental Technology, Inc.

DRILLING LOG

Client: **Lynn Worthington**

Project No: **20-105-20** Phase **4** Task **4**

Boring ID **SB-C** Well ID **MW-3**

Location **3055 35th Ave, Oakland**

Surface Elev. --- ft,

Depth Feet	Blow Count	Sample	Interval	Lithologic Description
0	Ground Surface			
				Silty GRAVEL Light brown; hard; damp; 5% clay, 40% silt, 15% sand, 40% angular gravel to 1" diam.; low to moderate plasticity; moderate estimated hydraulic conductivity. No hydrocarbon odor.
5	25 23 31	X		
				Clayey to Gravelly SILT Rust brown with green mottling; hard; moist; 30% clay, 30% silt, 10% sand, 30% gravel; high plasticity; low estimated hydraulic conductivity. Moderate weathered gasoline odor.
10	11 18 35	X		
				Silty SAND Brownish-green; hard; moist; <5% clay, 35% silt, 40% sand, 15% gravel; no plasticity; moderate estimated hydraulic conductivity. Very strong fresh to weathered gasoline odor.
15	7 10 16	X		
				Sandy to Clayey SILT Brown; very stiff; wet; 20% clay, 50% silt, 20% sand, 10% gravel; medium to high plasticity; low estimated hydraulic conductivity. Very strong fresh gasoline odor. Hydrocarbon sheen on soil samples.
20	7 11 20	X		
				Silty SAND Brown; very stiff; wet; 5% clay, 35% silt, 60% sand, 10% gravel; no to low plasticity; moderate estimated hydraulic conductivity. Very strong fresh gasoline odor. Hydrocarbon sheen on soil samples.
25	N/A	X		
				Clayey SILT Brown; very stiff; wet; 25% clay, 60% silt, 15% sand; high plasticity; very low estimated hydraulic conductivity. Very strong fresh gasoline odor. Hydrocarbon sheen on soil samples.
				Silty SAND Brown; very stiff; wet; <5% clay, 20% silt, 60% sand, 20%
30				

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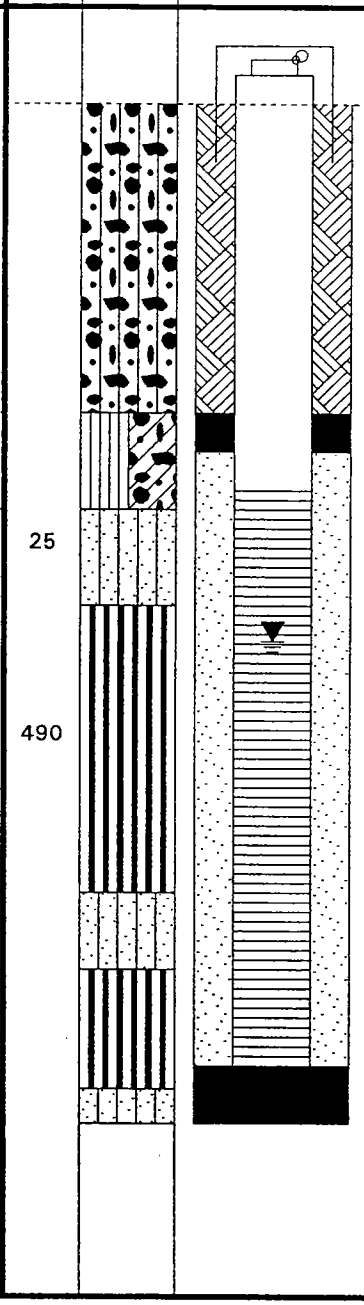


T.O.C. Elev. 96.87

Locking well plug and above-grade steel stovepipe

Driller	Soils Exploration	Development Yield	N/A	Bentonite Seal	7 to 9 ft
Logged By	N. Scott MacLeod	Well Casing	2 Dia. 0 to 10	Sand Pack	Monterey sand
Drilling Started	5/6/94	Casing Type	Schedule 40 PVC	Sand Pack Type	#2/16
Drilling Completed	5/6/94	Well Screen	2 Dia. 10 to 25	Static Water Level	13.93 ft Depth
Construction Completed	5/9/94	Screen Type	Schedule 40 PVC	Date	5/25/94
Development Completed	5/17/94	Slot Size	0.010-inch	Notes:	
Water Bearing Zones	20.5 to 26.5 ft	Drilling Mud	N/A		
		Grout Type	Portland cement		

Cambria Environmental Technology, Inc.

DRILLING LOG

Client: Lynn Worthington

Project No: 20-105-20 Phase 4 Task 4

Boring ID SB-C Well ID MW-3

Location 3055 35th Ave, Oakland

Surface Elev. --- ft,

Depth Feet	Blow Count	Sample	Interval	Lithologic Description	TPHg (ppm)	Graphic Log	Well Construction Graphics	Depth Feet	Well Construction Details
30				Continued from previous page				30	
				gravel; no plasticity; moderate to high estimated hydraulic conductivity. Very strong fresh gasoline odor. Hydrocarbon sheen on soil samples.					
35								35	
40								40	
45								45	
50								50	
55								55	
60								60	
65								65	
70								70	

DRILLING LOG

Client: **Lynn Worthington**

Project No: **13-105** Phase Task **150**

Well ID **MW-4** Boring ID **MW-4**

Location **3055 35th Ave, Oakland**

Surface Elev. **NA ft,**

Depth (feet)	Blow Count	Sample	Interval	Lithologic Description
0	Ground Surface			
				Clayey Silty GRAVEL; (GC); light brown; damp; 20% clay, 30% silt, 50% 0.25"- to 0.5"-diameter gravel; low to medium plasticity; low to moderate estimated permeability.
				Clayey SILT; (MH); light to dark brown; damp; 40% clay, 60% silt; medium to high plasticity; low to moderate estimated permeability.
5				**Silty SAND**; (SM); light brown with black mottling; 5% clay, 40% silt, 50% fine to medium sand, 5% gravel.
		X		
				Gravelly Silty SAND; (SP); brown; damp; 30% silt, 50% sand, 20% 0.5"-diameter gravel; no plasticity; medium to high estimated permeability.
10				20% silt, 50% sand, 30% 0.25"- to 0.5"-diameter gravel, increasing gravel content
		X		**Sandy GRAVEL**; (GP); light brown; damp; 5% clay, 10% silt, 30% sand, 55% 1"-diameter gravel; no plasticity; moderate to high estimated permeability.
				Silty Sandy GRAVEL; (GP); brown-green; damp; 5% clay, 15% silt, 15% sand, 65% gravel, increasing clay content; low plasticity; moderate estimated permeability.
15				10% clay, 20% silt, 30% sand, 40% gravel; low to medium plasticity
				Continued Next Page

TPHg (ppm)	Graphic Log	Well Construction Graphics	Depth (feet)	Well Construction Details
				T.O.C. Elev.
			0	
			5	
64.0			10	
			15	Static water level @ 12.7 ft.

Driller **Gregg Drilling**	Development Yield **NA**	Bentonite Seal **7' to 8'**
Logged By **SR**	Well Casing **2"** Dia. **0** to **10'**	Sand Pack **8' to 30'**
Drilling Started **2/26/97**	Casing Type **Schedule 40 PVC**	Sand Pack Type **#2/16 Sand**
Drilling Completed **2/26/97**	Well Screen **2"** Dia. **10'** to **30'**	Static Water Level **12.70** ft Depth
Construction Completed **2/26/97**	Screen Type **Schedule 40 PVC**	Date **2/26/97**
Development Completed **3/20/97**	Slot Size **0.010"**	Notes: **In north-west corner of site.**
Water Bearing Zones **NA**	Drilling Mud **NA**	
	Grout Type **Portland Type I/II**	

WELL 20105 5/27/97

Cambria Environmental Technology, Inc.

DRILLING LOG

Client: **Lynn Worthington**

Project No: **13-105** Phase Task**150**

Well ID **MW-4** Boring ID **MW-4**

Location **3055 35th Ave, Oakland**

Surface Elev. **NA ft,**

Depth (feet)	Blow Count	Sample	Interval	Lithologic Description	TPHg (ppm)	Graphic Log	Well Construction Graphics	Depth (feet)	Well Construction Details
				Continued from previous page					
15				**Silty SAND**; (SP); brown-green; damp; 5% clay, 30% silt, 60% sand, 5% gravel; low plasticity; moderate estimated permeability.	530.0			15	
				Silty Sandy GRAVEL; (GP); brown-green; damp; 5% clay, 20% silt, 35% sand, 40% 1"-round gravel, increasing gravel content; low plasticity; moderate to high estimated permeability.					
				Silty Gravelly SAND; (SP); brown-green; moist; 10% clay, 20% silt, 40% sand, 30% gravel; low plasticity; moderate to high estimated permeability.					
20				**Clayey Silty Gravelly SAND**; (SP); moist; 15% clay, 15% silt, 50% sand, 20% medium gravel; low to medium plasticity; moderate estimated permeability.				20	
				Sandy Clayey SILT; (MH); wet; 25% clay, 50% silt, 25% sand; medium to high plasticity; low to moderate estimated permeabilty.					Water first encountered @ 23 ft.
25				25% clay, 60% silt, 15% fine to medium sand				25	
30								30	Bottom of boring @ 30 ft.
35								35	

WELL 20105 5/27/97

Cambria Environmental Technology, Inc.

BORING LOG

Client: **Lynn Worthington**

Project No: **130-0105** Phase Task **201**

Boring ID **RW-5**

Location **3055 35th Ave., Oakland**

Surface Elev. **ft, 160 - 170 above msl**

Depth (feet)	Blow Count	Sample	Interval	Lithologic Description
0	Ground Surface			
				Gravely SILT; (MLG); brown with green mottling; hard; damp; 15% clay, 50% silt, 20% sand, 15% angular gravel; low plasticity; low estimated permeability.
5	9	⧓	100%	
	21	⧓	100%	
	30	⧓	100%	
10	9	⧓	100%	**Silty SAND**; (SM); brown; dense; damp; 5% clay, 30% silt, 60% sand, 5% gravel; no plasiticity; low estimated permeability.
	18	⧓	100%	
	20	⧓	100%	
15	10	⧓	100%	**Clayey SAND**; (SC); brown with green mottling; medium dense; damp; 25% clay, 25% silt, 50% sand; low plasticity; low estimated permeability.
	11	⧓	100%	
	11	⧓	100%	
20	10	⧓	100%	35% clay, 40 % silt, 25% sand.
	11	⧓	100%	
	17	⧓	100%	
25	8	⧓	100%	**Silty CLAY;** (CL-ML); brown with green mottling; medium dense; wet; 50% clay, 35% silt, <5% sand, 10% gravel; low plasticity; low estimated permeability.
	9	⧓	100%	
	15	⧓	100%	
30				

TPHg (ppm) | Graphic Log | Boring Completion Graphics

Depth (feet)	Additional Comments
0	
5	No chemical odor.
10	Strong hydrocarbon odor.
15	Strong hydrocarbon odor.
20	Strong hydrocarbon odor.
25	Strong hydrocarbon odor. Bottom of well @ 25.7 ft.
30	

Driller **V&W Drilling**

Logged By **R.W. Schultz**

Water-Bearing Zones

Drilling Started **8/5/98**

Drilling Completed **8/5/98**

Grout Type **Portland Type I/II Cement**

Notes: **southwest corner of lot**

BOR BORLOGS.GPJ 9/16/98

Cambria Environmental Technology, Inc.

BORING LOG

Client: **Lynn Worthington**

Project No: **130-0105** Phase Task **201**

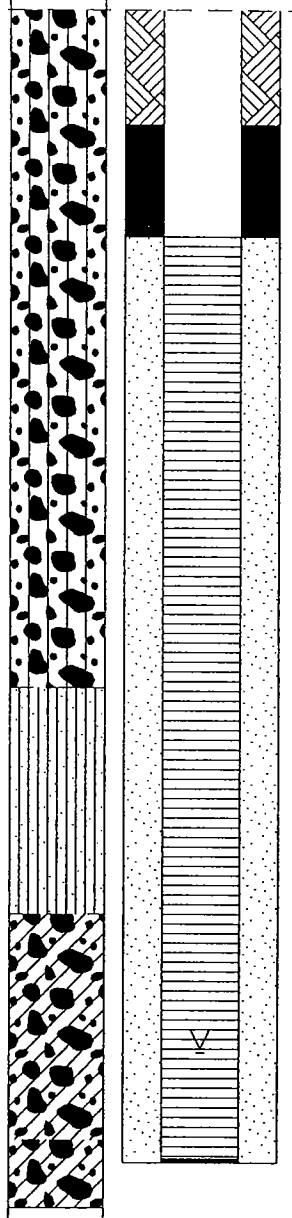
Boring ID **RW-6**

Location **3055 35th Ave., Oakland**

Surface Elev. **ft, 160 - 170 above msl**

Depth (feet)	Blow Count	Sample	Interval	Lithologic Description
0	Ground Surface			
				Silty GRAVEL; (GM); orange-brown; very dense; dry; 5% clay, 20% silt, 30% sand, 45% gravel; angular gravel to >2" diameter; low plasticity; low estimated permeability.
5	10		100%	
	50		100%	
10	12		100%	
	21		100%	
	38		100%	
15	8		100%	**Sandy Silt**; (MLS); brown; stiff; dry; 30% clay, 50% silt, 20% sand; moderate plasticity; nlow estimated permeability.
	10		100%	
	12		100%	
20	12		100%	**Clayey GRAVEL**; (GC); brown with green mottling; hard; damp; 20% clay, 20% silt, 30% sand, 30% gravel; low plasticity; low estimated permeability.
	24		100%	
	37		100%	
25	17		100%	15% clay, 10% silt, 15% sand, 60% gravel; wet.
	20		100%	
	31		100%	
30				

TPHg (ppm) | Graphic Log | Boring Completion Graphics



Depth (feet)	Additional Comments
0	
5	No chemical odor.
10	Strong hydrocarbon odor.
15	No chemical odor.
20	Moderate to strong hydrocarbon odor.
25	No chemical odor. Bottom of well @ 25.5 ft.
30	

Driller **V&W Drilling**

Logged By **R.W. Schultz**

Water-Bearing Zones

Drilling Started **8/5/98**

Drilling Completed **8/5/98**

Grout Type **Portland Type I/II Cement**

Notes: **western border of site**

BOR BORLOGS.GPJ 9/16/98

Cambria Environmental Technology, Inc.

BORING LOG

Client: **Lynn Worthington**

Project No: **130-0105** Phase Task **201**

Boring ID **RW-7**

Location **3055 35th Ave., Oakland**

Surface Elev. **ft, 160 - 170 above msl**

Depth (feet)	Blow Count	Sample	Interval	Lithologic Description
0	Ground Surface			
				Clayey GRAVEL; orange-brown; dense; dry; 15% clay, 20% silt, 25% sand, 40% gravel; low plasticity; low estimated permeability.
5	14	⊠	100%	
	30	⊠	100%	
	31	⊠	100%	
10	15	⊠	100%	Brown with green mottling; damp.
	28	⊠	100%	
	30	⊠	100%	
15	14	⊠	100%	**Sandy CLAY**; (CLS); brown with green mottling; hard; damp; 40% clay, 20% silt, 25% sand, 15% gravel; low plasticity; low estimated permeability.
	15	⊠	100%	
	20	⊠	100%	
20	11	⊠	100%	
	18	⊠	100%	
	20	⊠	100%	
25	8	⊠	100%	**Clayey SAND;** (SC); brown with grey mottling; medium dense; damp; 30% clay, 10% silt, 50% coarse sand, 10% gravel; low plasticity; low estimated permeability.
	9	⊠	100%	
	11	⊠	100%	
30				

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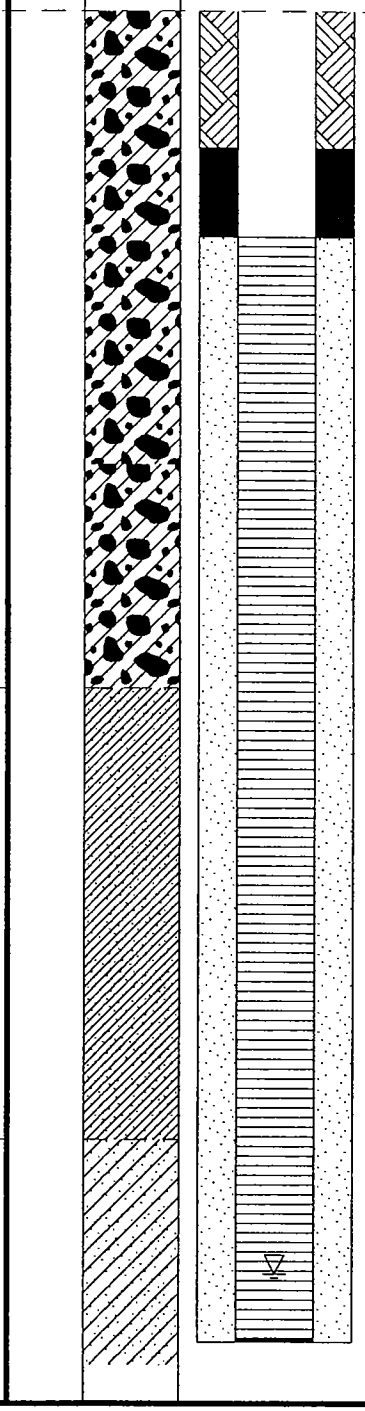

Depth (feet)	Additional Comments
0	
5	No chemical odor.
10	No chemical odor.
15	Moderate hydrocarbon odor.
20	Moderate hydrocarbon odor.
25	No chemical odor.
30	

Driller **V&W Drilling**

Logged By **R.W. Schultz**

Water-Bearing Zones

Drilling Started **8/5/98**

Drilling Completed **8/5/98**

Grout Type **Portland Type I/II Cement**

Notes: **western border of site**

Cambria Environmental Technology, Inc.

BORING LOG

Client: **Lynn Worthington**

Project No: **130-0105** Phase Task **201**

Boring ID **RW-7**

Location **3055 35th Ave., Oakland**

Surface Elev. **ft, 160 - 170 above msl**

Depth (feet)	Blow Count	Sample	Interval	Lithologic Description	TPHg (ppm)	Graphic Log	Boring Completion Graphics	Depth (feet)	Additional Comments
				Continued from previous page					
30								30	
	10		100%	Fine to medium sand.					Bottom of well @ 29.5 ft.
	14		100%						No chemical odor.
	15		100%						
35								35	
40								40	
45								45	
50								50	
55								55	
60								60	

BORING LOG

Client: **Lynn Worthington**

Project No: **130-0105** Phase Task **201**

Boring ID **RW-8**

Location **3055 35th Ave., Oakland**

Surface Elev. **ft, 160 - 170 above msl**

Depth (feet)	Blow Count	Sample	Interval	Lithologic Description
0	Ground Surface			
				Clayey GRAVEL; orange-brown; very dense; dry; 15% clay, 20% silt, 25% sand, 40% gravel; low plasticity; low estimated permeability.
5	30	X	100%	
	50	X	100%	
10	8	X	100%	Brown with green mottling; damp.
	19	X	100%	
	24	X	100%	
15	11	X	100%	**Sandy CLAY**; (CLS); brown with green mottling; very stiff; damp; 40% clay, 20% silt, 25% sand, 15% gravel; coarse sand; low plasticity; low estimated permeability.
	15	X	100%	
	15	X	100%	
20	12	X	100%	Hard.
	19	X	100%	
	20	X	100%	
25	7	X	100%	**CLAY**; (CL); brown; stiff; damp; 80% clay, 10% silt, 10% fine sand; low plasticity; low estimated permeability.
	9	X	100%	
	10	X	100%	
30				

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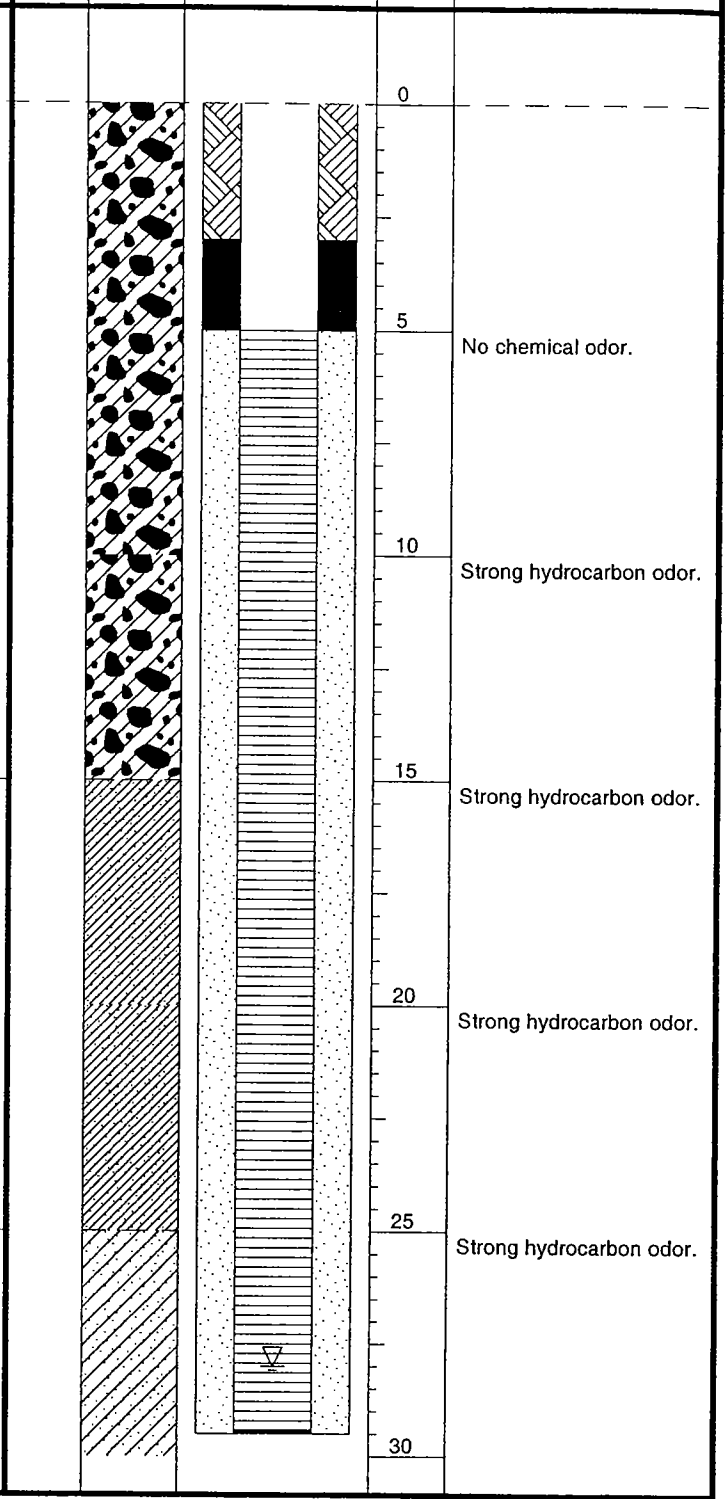


Depth (feet)	Additional Comments
0	
5	No chemical odor.
10	Strong hydrocarbon odor.
15	Strong hydrocarbon odor.
20	Strong hydrocarbon odor.
25	Strong hydrocarbon odor.
30	

Driller **V&W Drilling**

Logged By **R.W. Schultz**

Water-Bearing Zones

Drilling Started **8/5/98**

Drilling Completed **8/5/98**

Grout Type **Portland Type I/II Cement**

Notes: **northwest quadrant of site**

Cambria Environmental Technology, Inc.

BORING LOG

Client: **Lynn Worthington**

Project No: **130-0105** Phase Task **201**

Boring ID **RW-8**

Location **3055 35th Ave., Oakland**

Surface Elev. **ft, 160 - 170 above msl**

Depth (feet)	Blow Count	Sample	Interval	Lithologic Description	TPHg (ppm)	Graphic Log	Boring Completion Graphics	Depth (feet)	Additional Comments
				Continued from previous page					
30								30	
	7		100%	70% clay, 15% silt, 15% sand.					Bottom of well @ 29.5 ft.
	9		100%						Slight hydrocarbon odor.
	15		100%						
35								35	
40								40	
45								45	
50								50	
55								55	
60								60	

BORING LOG

Client: **Lynn Worthington**

Project No: **130-0105** Phase Task **201**

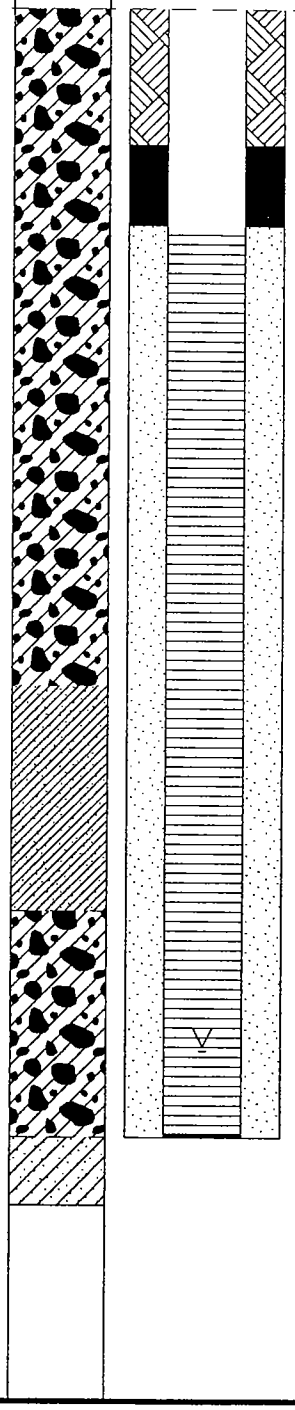
Boring ID **RW-9**

Location **3055 35th Ave., Oakland**

Surface Elev. **ft, 160 - 170 above msl**

Depth (feet)	Blow Count	Sample	Interval	Lithologic Description
0	Ground Surface			
				Clayey GRAVEL; brown with green mottling; very dense; dry; 15% clay, 15% silt, 30% sand, 40% angular gravel; low plasticity; low estimated permeability.
5	25	X	100%	
	28	X	100%	
	30	X	100%	
10	24	X	100%	
	29	X	100%	
	36	X	100%	
15	19	X	100%	**Sandy CLAY**; brown with green mottling; hard; damp; 40% clay, 20% silt, 25% sand, 15% gravel; low plasticity; low estimated permeability.
	30	X	100%	
	36	X	100%	
20	25	X	100%	**Clayey GRAVEL**; (GC); brown with green mottling; very dense; damp; 15% clay, 15% silt, 30% sand, 40% gravel; low plasticity; low estimated permeability.
	36	X	100%	
	40	X	100%	
25	13	X	100%	**Clayey SAND**; (SC); brown with green mottling; dense; wet; 30% clay, 10% silt, 50% sand, 10% gravel; low plasticity; low estimated permeability.
	19	X	100%	
	25	X	100%	
30				

TPHg (ppm) | Graphic Log | Boring Completion Graphics



Depth (feet)	Additional Comments
0	
5	No odor.
10	Strong hydrocarbon odor.
15	Strong hydrocarbon odor.
20	Strong hydrocarbon odor.
25	Slight hydrocarbon odor. Bottom of well and boring @ 25.0 ft.
30	

Driller **V&W Drilling**

Logged By **R.W. Schultz**

Water-Bearing Zones

Drilling Started **8/6/98**

Drilling Completed **8/6/98**

Grout Type **Portland Type I/II Cement**

Notes: **northwest quadrant of site**

Cambria Environmental Technology, Inc.

BORING LOG

Client: **Lynn Worthington**

Project No: **130-0105** Phase Task **201**

Boring ID **RW-10**

Location **3055 35th Ave., Oakland**

Surface Elev. **ft, 160 - 170 above msl**

Depth (feet)	Blow Count	Sample	Interval	Lithologic Description
0	Ground Surface			
				Clayey GRAVEL; (GC); brown; very dense; dry; 15% clay, 15% silt, 30% sand, 40% angular gravel; low plasticity; low estimated permeability.
10				**Sandy CLAY**; (CLS); brown; very stiff; damp; 40% clay, 20% silt, 25% sand, 15% gravel; low plasticity; low estimated permeability.
15				Brown with green mottling.
25	8		100%	Some gravel, poorly sorted sands.
	12		100%	
	24		100%	
30				

TPHg (ppm) | Graphic Log | Boring Completion Graphics

Depth (feet)	Additional Comments
0	
5	No chemical odor.
10	Strong hydrocarbon odor.
15	
20	
25	No chemical odor. Bottom of well @ 25.0 ft.
30	

Driller **V&W Drilling**

Logged By **R.W. Schultz**

Water-Bearing Zones

Drilling Started **8/6/98**

Drilling Completed **8/6/98**

Grout Type **Portland Type I/II Cement**

Notes: **northeast quadrant of site**

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Cambria Environmental Technology, Inc.

BORING LOG

Client: **Lynn Worthington**

Project No: **130-0105** Phase Task **201**

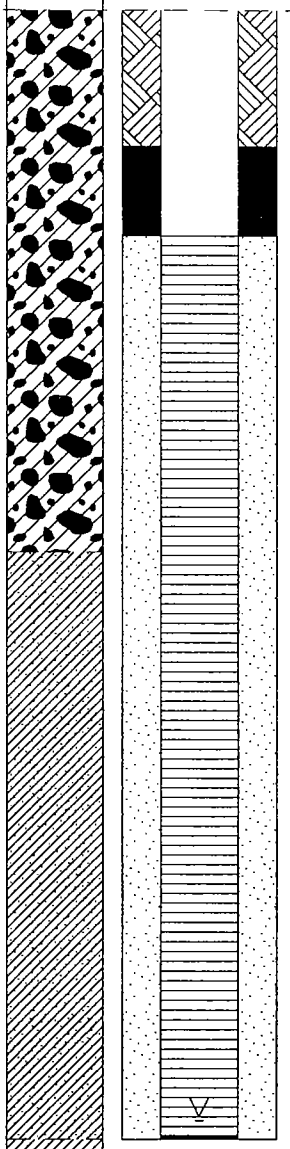
Boring ID **RW-11**

Location **3055 35th Ave., Oakland**

Surface Elev. **ft, 160 - 170 above msl**

Depth (feet)	Blow Count	Sample	Interval	Lithologic Description
0	Ground Surface			
				Clayey GRAVEL; brown with green mottling; very dense; dry; 15% clay, 15% silt, 30% sand, 40% angular gravel; low plasticity; low estimated permeability.
5				
10				
				Sandy CLAY; (CLS); brown with green mottling; hard; damp; 40% clay, 25% silt, 20% sand, 15% gravel; low plasticity; low estimated permeability.
15				
20				
25				
	12		100%	**Clayey SAND**; (SC); brown; very dense; wet; 30% clay, 10% silt, 50% sand, 10% gravel; low plasticity; low estimated permeability.
	37		100%	
	42		100%	
30				

TPHg (ppm) | Graphic Log | Boring Completion Graphics



Depth (feet)	Additional Comments
0	
5	No chemical odor.
10	Strong hydrocarbon odor.
15	
20	
25	Strong hydrocarbon odor. Bottom of well @ 25.0 ft.
30	

Driller **V&W Drilling**

Logged By **R.W. Schultz**

Water-Bearing Zones

Drilling Started **8/6/98**

Drilling Completed **8/6/98**

Grout Type **Portland Type I/II Cement**

Notes: **southwest quadrant of site**

Cambria Environmental Technology, Inc.

BORING LOG

Client: **Lynn Worthington**

Project No: **130-0105** Phase Task **201**

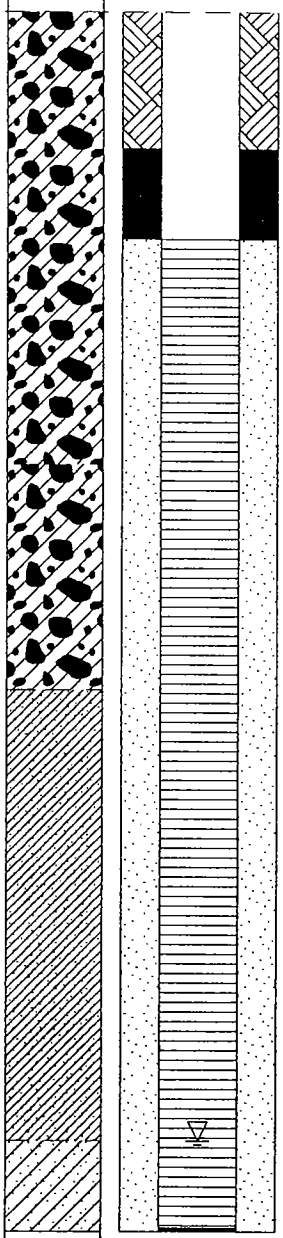
Boring ID **RW-12**

Location **3055 35th Ave., Oakland**

Surface Elev. **ft, 160 - 170 above msl**

Depth (feet)	Blow Count	Sample	Interval	Lithologic Description
0	Ground Surface			
0				**Clayey GRAVEL**; (GC); brown; dense; dry; 15% clay, 15% silt, 30% sand, 40% gravel; low plasticity; low estimate permeability.
10				Damp; 15% clay; 25% silt; 30% sand; 40% gravel.
15				**Sandy CLAY**; (CLS); brown; very stiff; damp; 40% clay, 25% silt, 20% sand, 15% gravel; low plasticity; low estimated permeability.
25	10		100%	**Clayey SAND**; (SC); brown; dense; wet; 30% clay; 10% silt; 50% sand; 10% gravel; low plasticity; low estimated permeability.
	12		100%	
	30		100%	
30				

TPHg (ppm) | Graphic Log | Boring Completion Graphics



Depth (feet)	Additional Comments
0	
5	No chemical odor.
10	Strong hydrocarbon odor.
15	
20	
25	Slight hydrocarbon odor.
	Bottom of well @ 27.0 ft.
30	

Driller **V&W Drilling**

Logged By **R.W. Schultz**

Water-Bearing Zones

Drilling Started **8/6/98**

Drilling Completed **8/6/98**

Grout Type **Portland Type I/II Cement**

Notes: **southwest quadrant of site**

Cambria Environmental Technology, Inc.

BORING LOG

Client: **Lynn Worthington**

Project No: **130-0105** Phase Task **201**

Boring ID **RW-13**

Location **3055 35th Ave., Oakland**

Surface Elev. **ft, 160 - 170 above msl**

Depth (feet)	Blow Count	Sample	Interval	Lithologic Description
0	Ground Surface			
				Clayey GRAVEL; (GC); brown; dense; dry; 15% clay, 15% silt, 30% sand, 40% gravel; low plasticity; low estimate permeability.
5				
10				Damp.
15				
				Sandy CLAY; (CLS); brown; hard; damp; 40% clay, 25% silt, 20% sand, 15% gravel; low plasticity; low estimated permeability.
20				
				Clayey SAND; (SC); brown with green mottling; very dense; damp; 30% clay; 10% silt; 50% sand; 10% gravel; low plasticity; low estimated permeability.
25	15		100%	Wet.
	32		100%	
	30		100%	
30				

TPHg (ppm) | Graphic Log | Boring Completion Graphics

Depth (feet)	Additional Comments
0	
5	No chemical odor.
10	
15	Strong hydrocarbon odor.
20	
25	Strong hydrocarbon odor. Bottom of well @ 25.0 ft.
30	

Driller **V&W Drilling**

Logged By **R.W. Schultz**

Water-Bearing Zones

Drilling Started **8/6/98**

Drilling Completed **8/6/98**

Grout Type **Portland Type I/II Cement**

Notes: **southeast corner of site**

Cambria Environmental Technology, Inc.

BORING LOG

Client: **Lynn Worthington**

Project No: **130-0105** Phase Task **201**

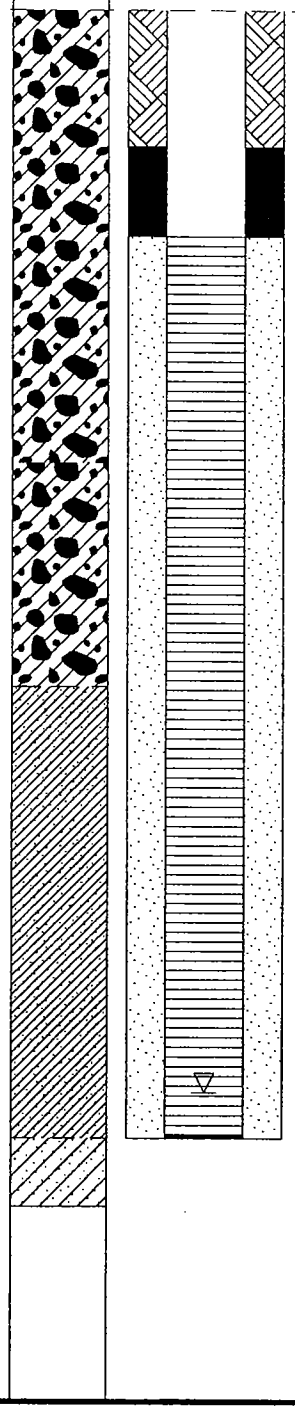
Boring ID **RW-14**

Location **3055 35th Ave., Oakland**

Surface Elev. **ft, 160 - 170 above msl**

Depth (feet)	Blow Count	Sample	Interval	Lithologic Description
0	Ground Surface			
				Clayey GRAVEL; (GC); brown; dense; dry; 15% clay, 15% silt, 30% sand, 40% gravel; low plasticity; low estimate permeability.
5				
10				Damp.
15				**Sandy CLAY**; (CLS); brown; very stiff; damp; 40% clay, 25% silt, 20% sand, 15% gravel; low plasticity; low estimated permeability.
20				
25	6		100%	**Clayey SAND**; (SC); brown; medium dense; wet; 30% clay; 10% silt; 50% sand; 10% gravel; low plasticity; low estimated permeability.
	12		100%	
	20		100%	
30				

TPHg (ppm) | Graphic Log | Boring Completion Graphics



Depth (feet)	Additional Comments
0	
5	No chemical odor.
10	Strong hydrocarbon odor.
15	
20	
25	Slight hydrocarbon odor. Bottom of well @ 25.0 ft.
30	

Driller **V&W Drilling**

Logged By **R.W. Schultz**

Water-Bearing Zones

Drilling Started **8/6/98**

Drilling Completed **8/6/98**

Grout Type **Portland Type I/II Cement**

Notes: **southeast quadrant of site**

Cambria Environmental Technology, Inc.