CAMBRIA

July 13, 2006

Mr. Steven Plunkett, Hazardous Materials Specialist
Alameda County Health Care Services Agency, Environmental Health Services
1131 Harbor Bay Parkway, Suite 250
Alameda, California 94502
510/383-1767

Re: **Site Conceptual Model and Offsite Work Plan**
Former Exxon Service Station
3055 35th Avenue, Oakland, California
Fuel Leak Case No. RO0000271
Cambria Project No. 130-0105

Dear Mr. Plunkett,

On behalf of Mr. Lynn Worthington of Golden Empire Properties, Cambria Environmental Technology, Inc. (Cambria) is pleased to present this *Site Conceptual Model and Offsite Work Plan* for the above referenced site. This is in response to your May 16, 2006 letter.

Please call me at (510) 420-3307 or Ron Scheele at (510) 420-3327, if you have any questions regarding this report or the project.

Sincerely,
Cambria Environmental Technology, Inc.

Mark Jonas, P.G.
Senior Project Manager

Attachment: *Site Conceptual Model and Offsite Work Plan*

cc: Mr. Lynn Worthington, Golden Empire Properties, Inc. 5942 MacArthur Blvd., Suite B, Oakland, CA 94605
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SITE CONCEPTUAL MODEL AND OFFSITE WORK PLAN

Former Exxon Service Station
3055 35th Avenue, Oakland, California
Fuel Leak Case No. RO0000271
Cambria Project No. 130-0105

July 13, 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
Emeryville, California 94608

I declare, under penalty of perjury, that the information and/or recommendations contained in the attached document or report is true and correct to the best of my knowledge.

Mark Jonas, P.G.
Senior Project Manager

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SITE CONCEPTUAL MODEL AND OFFSITE WORK PLAN

Former Exxon Service Station
3055 35th Avenue, Oakland, California

TABLE OF CONTENTS

FIGURES

TABLES

APPENDICES

CAMBRIA

SITE CONCEPTUAL MODEL AND OFFSITE WORK PLAN

Former Exxon Service Station
3055 35th Avenue, Oakland, California
Fuel Leak Case No. RO0000271
Cambria Project No. 130-0105

July 13, 2006

1.0 INTRODUCTION

On behalf of Mr. Lynn Worthington of Golden Empire Properties, Inc., Cambria Environmental Technology, Inc. (Cambria) is pleased to submit this *Site Conceptual Model and Offsite Work Plan (SCM & Work Plan)* for the above referenced site. This report is in response to a Alameda County Health Care Services Agency, Environmental Health Services (ACEH) letter from Mr. Steven Plunkett dated May 16, 2006 (Appendix A). ACEH is the lead agency for this site. Presented in this *SCM & Work Plan* are the site background, site characterization, remediation, assessment of risk, identification of potential data gaps, a proposed scope for offsite work, quarterly groundwater monitoring, and a quality assurance project plan.

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). The address of the site is 3055 35th Avenue, with APN No. 027-0890-006-02. The site was reportedly built as a gas station in 1970. The underground storage tanks (USTs) were removed in 1991. Currently, the site is an unpaved vacant lot situated within a mixed commercial and residential setting. The topography in the area slopes generally westward towards the Oakland Inner Harbor and San Francisco Bay.

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. Previous Investigations and Activities

Environmental investigations have been performed at the site since 1990. Previous reports are identified in the reference section. The following provides a synopsis of previous environmental investigations and activities:

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

January 1991 Tank Removal: In January 1991, apparently Pacific Excavators removed two 4,000-gallon USTs, two 6,000-gallon gasoline USTs, and one 500-gallon waste oil UST from the site. Figure 2 identifies excavation locations. According to a September 24, 1992 report prepared by Consolidated Technologies (CT) of San Jose, California, soil samples were collected during the removal of the USTs, but were apparently not analyzed or reported by Pacific Excavators (Consolidated Technologies 1992).

November 1991 Subsurface Investigation: In November 1991, CT drilled twelve soil borings (B-1 to B-12) and sampled from depths of 15 to 35 ft below ground surface (bgs). Total petroleum hydrocarbons as gasoline (TPHg) concentrations were detected in soil samples collected from eleven of the twelve soil borings, up to 2,100 milligrams per kilogram (mg/kg). Elevated concentrations of benzene, toluene, ethylbenzene, and xylenes (BTEX) were also detected. Most of elevated concentrations of TPHg and BTEX were detected from samples collected at 15 and 20 feet bgs. No total petroleum hydrocarbons as diesel (TPHd), oil and grease (O&G), volatile organic compounds except for BTEX (Method 8010 VOCs), and semivolatile volatile organics (Method 8270 SVOCs) concentrations were detected in samples collected from 15 feet bgs from Boring B7, located down gradient of the former waste oil tank. Table 1 presents soil sampling results. Figure 2 identifies sampling locations.

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, TPHd, and benzene concentrations were detected in May 1994 groundwater samples at maximum concentrations of 120,000, 25,000, and 22,000 micrograms per liter (ug/l), respectively, from monitoring well MW-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. 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. 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 would

apparently 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. From the boring, TPHg was detected in soil at a maximum concentration of 530 mg/kg at 15 ft bgs. TPHg, TPHd, and benzene concentrations were detected in groundwater from samples collected in March 1997 at concentrations of 47,000, 3,100, and 11,000 ug/l, respectively.

August 1998 Remediation Well Installation: In August 1998, Cambria installed ten dual-phase extraction (DPE) remediation wells onsite, identified as RW-5 through RW-14. Additionally, two soil geoprobe 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 hydrocarbon odors were noticed. No soil samples were collected from the remediation well and geoprobe borings.

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 monitoring and remediation wells. Dissolved oxygen (DO) concentrations in groundwater beneath the site did not significantly vary as a result of H_2O_2 injection. No apparent 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 fourteen monitoring and 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 with granulated activated carbon vessels. Treated water was discharged to 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 DPE 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 and recent groundwater analytical data are presented in Table 2.

3.0 SITE CHARACTERIZATION

3.1. Geology and Hydrogeology

3.1.1. Regional and Local Geology

The site is located in the Coast Range Physiographic Province, characterized by northwest-southeast trending valleys and ridges. This region lies between the Pacific Ocean to the west and the Great Valley to the east. The oldest known bedrock in the Coast Range Province is marine sedimentary and volcanic rocks that form the Franciscan Assemblage. Geologic formations in the San Francisco Bay Region range in age from Jurassic to Recent Holocene.

The site is located to the west of the Oakland-Berkeley Hills on the East Bay Plain, which slopes gently to the west towards San Francisco Bay. The San Francisco Bay is located in a broad depression in the Franciscan bedrock resulting from an east-west expansion between the San Andreas and Hayward fault systems. Unconsolidated sediments in the East Bay Plain varying in thickness, with some areas up 1,000 feet thick. From oldest to youngest, the unconsolidated sediments are 1/ Santa Clara Formation, 2/ Alameda Formation, 3/ Temescal Formation, and 4/ artificial fill. The Early Pleistocene Santa Clara Formation consists of alluvial fan deposits inter-fingered with lake, swamp, river channel, and flood plain deposits, ranging from 300 to 600 feet thick. The Late Pleistocene Alameda Formation was deposited primarily in an estuarine environment and consists of alluvial fan deposits bound by mud deposits on the top and bottom of the formation. The Alameda Formation ranges from 26 to 245 feet thick and is subdivided into the Yerba Buena Mud, San Antinio, Merritt, and Young Bay Mud Members. The Early Holocene Temescal Formation is an alluvial fan deposit consisting primarily of silts and clays with some gravel layers. The Temescal Formation ranges from 1 to 50 feet thick, thinning toward the bay. Below any sub-base and fill, shallow sand, silt, and clay at the site most likely are Temescal Formation.

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 35 feet. The clayey soils are generally stiff and very plastic. Base-rock backfill is apparently present in excavations associated with USTs and pump islands. Figure 3 and 4 present cross-sections of site lithology. Because of lithologic heterogeneity due to its alluvial origin, correlations between borings of individual units could not be made, except that the lithology is apparently low to moderate permeability soils. Soil boring and monitoring well logs are provided in Appendix B.

3.1.2. Regional and Local Hydrogeology

The site is located in the East Bay Plain Subbasin, Groundwater Basin No. 2-9.04 (DWR 2003). The East Bay Plain Subbasin is a northwest trending alluvial basin, bounded on the north by San Pablo Bay, on the east by the contact with Franciscan basement rock, and on the south by the Nile Cone Groundwater Basin. The East Bay Plain Subbasin extends beneath the San Francisco Bay to the west. The East Bay Plain Subbasin aquifer system consists of unconsolidated sediments of Quaternary age. These include the Santa Clara Formation, Alameda Formation, Temescal Formation, and artificial fill. In the project area most rainfall occurs between November and March. The average annual rainfall is approximately 23 inches.

Throughout most of the East Bay Plain in the region of the site, water level contours show that the direction of groundwater flow is east to west, towards San Francisco Bay. Groundwater flow direction typically correlates to topography.

From 1860 to 1930 groundwater from the East Bay Plain was the major water supply of the East Bay, before Sierra water was imported into the area. By the late 1920's the groundwater supply was too small to meet the growing population and the wells often became contaminated by seepage or saltwater intrusion. By 1929, East Bay Municipal Utility District (EBMUD) provided imported water to East Bay communities via the Mokelumne Aqueduct. This high-quality, reliable supply soon eliminated the need for local groundwater wells. In 1996, the Regional Board reviewed General Plans for Oakland and other communities. They found that Oakland and most other cities did not have any plans to develop local groundwater resources for drinking water, due to existing or potential saltwater intrusion, contamination, or poor or limited quality (Regional Board 1999).

First water in various borings was encountered from approximately 12 to 28 feet bgs. Groundwater levels in monitoring wells (excluding MW-1 and MW-2) have historically ranged from approximately 6 to 19 ft bgs. Water depths for MW-1 and MW-2 are not reflective of groundwater levels down from the surface due to their high casing elevations within monument well boxes. Groundwater beneath the site flows primarily towards the west. Figure 6 presents the groundwater gradient and a frequency rose diagram for gradients from 1996 through 2006. Any vertical hydraulic gradients are currently undefined.

3.2. Hydrocarbon Distribution

3.2.1. Hydrocarbons in Soil

Gasoline-range hydrocarbons were detected in a majority of the onsite borings drilled during previous investigations. The highest known hydrocarbon concentrations in soil are present in the vicinity

southwest of the former underground gasoline storage tanks and the southern pump island. Based on soil boring observations and analytical data, hydrocarbon-impacted soil may be present within a zone extending from 8 to 25 feet bgs, with the highest hydrocarbon concentrations at approximately 15 to 20 feet bgs. Analytical soil data have only been collected from soil depths of 10 to 35 feet bgs. Hydrocarbons concentrations in soil are presented on Figure 5. Table 1 provides soil analytical data.

3.2.2. Hydrocarbons in Groundwater

Gasoline-range hydrocarbons have been previously detected in the four onsite monitoring wells and all of the remediation wells. The highest known hydrocarbon concentrations in groundwater are present, primarily in the vicinity west to southwest of the former underground gasoline storage tanks and the southern pump island. The extent of downgradient groundwater concentrations has not been defined. This *Site Conceptual Model and Offsite Work Plan* proposes to address this issue with offsite characterization of groundwater.

Figure 6 presents recent groundwater elevations and hydrocarbons concentrations with isoconcentrations. Table 2 presents time series groundwater elevations and analytical data. Appendix C presents graphics with time series groundwater trends. Generally, concentrations appear to be decreasing with time. A rebound occurred after the DPE system stopped in September 2004. But, subsequent concentrations are exhibiting a downward trend.

4.0 REMEDIATION

In July 1996, a series of feasibility tests were performed involving soil vapor extraction combined with air sparging. The conclusion was that this approach would not be effective due to shallow groundwater and low permeability of the soil. In August 1999, a 7.5% hydrogen peroxide solution was added to the fourteen monitoring and remediation wells. No reduction in dissolved phase hydrocarbon concentrations was observed as a result of hydrogen peroxide injection. In September 2000, a dual-phase extraction remediation system incorporating all fourteen wells was installed and implemented. The DPE system simultaneous extracts liquid/dissolved-phase and vapor phase hydrocarbons from the subsurface. In August 2002 the DPE system was upgraded. In September 2004 the DPE system was shut down due to low hydrocarbon removal rates. Between September 2000 and 2004 approximately 6,545 pounds of vapor-phase hydrocarbons and eleven pounds of dissolved-phase hydrocarbons were removed. On January 22, 2005 Cambria submitted a *Remediation Work Plan* recommending in-situ chemical oxidation (ISCO) using ozone as an interim remedial effort to remediate the remaining hydrocarbons beneath the site. This was followed by the January 30, 2006 *Revised Remediation Work Plan* and a June 6, 2006 letter submitted to ACEH. The ISCO system using ozone has yet to be installed.

5.0 WELL AND SENSITIVE RECEPTOR SURVEY

A potential sensitive receptor survey was performed to identifying any supply wells, schools, churches, hospitals, and known daycare facilities within a 2,000-foot radius of the subject site. Only wells, schools, and churches were found within the search criteria. The identified features are shown on Figure 7. The site is located in a mixed commercial/residential area. None of these potential sensitive receptors are known to be impacted by the site.

5.1. Supply Wells

In June and July 2006, California Department of Water Resources (DWR) and Alameda County Public Work Department (ACPWA) identified wells within a 2,000-foot radius of the site. Table 3 presents a summary of the findings. Within this search radius, no water supply wells and only three irrigation wells were identified. The closest irrigation well 2S/3W-4D3 (Map Location #1) is located at 3397 Arkansas Street, approximately 740 feet north of the site. The boring log for this well is provided in Appendix D. The well was installed in 1977 and is reportedly 62 feet deep. Typical groundwater gradients at the site are generally toward the west (see Figure 6 for historic groundwater gradients). Therefore, it is unlikely that this well would be impacted by groundwater contamination associated with the site. None of the other wells are located west of the site and therefore are not likely to be impacted.

5.2. Surface Water Bodies

The nearest surface water is Peralta Creek, located approximately 0.1 miles north of the site. The topography and drainage is generally westward towards the Oakland Inner Harbor and San Francisco Bay. Peralta Creek flows into San Francisco Bay. Currently, the downgradient extent of any groundwater contamination is undefined. But, based on proximity to the site, the relatively low transmissivity of site lithology, and a westerly groundwater gradient, it is unlikely that Peralta Creek would be impacted.

5.3. Other Potential Sensitive Receptors

Figure 7 presents schools, churches, and recreation area within a 2,000-foot radius of the subject site. Since the groundwater gradient is in a westerly direction, none of these potential sensitive receptors are likely to be impacted. It is possible that the hydrocarbon plume may extend beneath neighboring residences. Vapor intrusion into indoor air is a potential exposure pathway that appears to require further evaluation (see Section 7).

6.0 ASSESSMENT OF RISK

This section presents a preliminary evaluation of potential risk. The overall objective for assessing risk is to be protective of human health and the environment. The following approach identifies potential exposure routes to receptors possibly impacted by concentrations in soil and ground water, defines chemicals of potential concern, and applies applicable screening criteria. This level of risk assessment is defined as Tier 1, based on the use of "lookup tables" for screening criteria, specifically Regional Water Quality Control Board – San Francisco Bay Region (Regional Board) *Environmental Screening Levels* (Regional Board, 2005). A Tier 1 risk assessment can be overly conservative and the actually impact to a potential receptor may be less.

6.1. Potential Exposure Routes

The identification of potential exposure routes provides a basis for assessing risk. For an initial evaluation, potential exposure routes are identified and evaluated with respect to chemicals of potential concern and ESLs to determine if a potential risk exists.

Currently there are no known complete exposure pathways at the site: no buildings exist on the property and groundwater is currently not used for drinking water. Figure 8 presents an evaluation of exposure pathways. But, there may be potential exposure pathways under future land use conditions or based on future characterization, including:

- Vapor Intrusion, and
- Ground Water as a Drinking Water Resource.

6.2. Chemicals of Potential Concern

Based on characterization of the site, following are chemicals of potential concern for soil and ground water.

Chemicals of potential concern in soil:

TPHg, TPHd, benzene, toluene, ethylbenzene, xylenes, and MTBE.

Chemical of potential concern in ground water:

TPHg, TPHd, benzene, toluene, ethylbenzene, xylenes, and MTBE.

6.3. Tier 1 Risk Assessment

This Tier 1 risk analysis is performed by comparing soil and ground water concentrations to various Regional Board (2005) ESLs.

6.3.1. Summary of Soil Results and Environmental Screening Levels

Soil samples were collected between 1991 to 1997. Since then a significant amount of remediation has taken place. Therefore, current concentrations are probably lower. Only deep (>3 m) soil samples were able to be compared to ESLs as analytical results for shallow (< 3 m) soil were not available. In addition, the Regional Board (2005) in their ESL guidance states that "*soil refers to any unlithified material in the unsaturated zone that is situated above the capillary fringe of the shallowest saturated unit.*" As stated previously, first water in various borings was encountered from 12 to 28 feet bgs and groundwater levels in monitoring wells have historically ranged from approximately 6 to 19 ft bgs. Therefore deep soil samples may have been collected from the saturated zone and therefore ESLs may not apply. Summaries of soil analytical results and potential ESLs are presented below:

Chemicals of Potential Concern in Soil and Environmental Screening Levels

The following Table 6-1 presents deep soil >3 m bgs results and ESLs for chemicals of potential concern (COPC):

Table 6-1
Chemicals of Potential Concern in Deep Soil >3 m bgs and Environmental Screening Levels

COPC In Soil	Frequency of Detected Concentrations	Highest Concentration (mg/kg)	Deep Soil Residential ESL D.W. Resource[1] (mg/kg)	Residential ESL Vapor Intrusion Into Building[2] (mg/kg)	Commercial ESL Vapor Intrusion Into Building[3] (mg/kg)
TPHg	36/51 (71%)	2,900 (15')	100	NA[5]	NA[6]
TPHd	15/17 (88%)	620 (16')	100 / 1,000[4]	NA[5]	NA[6]
Benzene	25/51 (49%)	56 (20')	0.044	0.18	0.51
Toluene	36/51 (71%)	100 (15')	2.9	130	310
Ethylbenzene	34/51 (67%)	38 (15')	3.3	390	390
Xylenes	39/51 (76%)	290 (15')	2.3	310	420
MTBE	13/16 (81%)	54 (16')	0.023	2.0	5.6

notes: ESL = Environmental Screening Level; D.W. = Drinking Water; ND = Not Detected; NA = Not Available
1 = Table C (RWQCB 2005), ESL, >3 m bgs, commercial land use, current or potential drinking water source.
2 = Table C-1 (RWQCB 2005), ESL, >3 m bgs, residential land use, vapor intrusion into building.
3 = Table C-2 (RWQCB 2005), ESL, >3 m bgs, commercial land use, vapor intrusion into building.
4 = TPH (middle distillates) / TPH (residual fuels)
5 = Recommends using soil gas. TPHg and TPHd (middle distillates) residential indoor screening level is 26 ug/m³ (Table E).
6 = Recommends using soil gas. TPHg and TPHd (middle distillates) commercial indoor screening level is 36 ug/m³ (Table E).

Highest concentrations of TPHg, TPHd, benzene, and MTBE exceed drinking water resource ESLs. Highest concentrations of benzene and MTBE exceed residential and commercial ESLs for vapor intrusion. As stated previously, these results may not represent actual risk because current concentrations are probably less and deep soil samples may have been collected under saturated conditions and therefore soil ESLs would not apply. Collection of soil-gas samples would better characterize potential risk associated with vapor intrusion.

6.3.2. Summary of GW Results and Environmental Screening Levels

Groundwater has been sampled and analyzed since 1994 through 2006. To represent relatively recent and post-remediation conditions, only groundwater samples from 2005 through 2006 are considered for comparison with ESLs. DPE remediation ceased in September 2004. Summaries of ground water analytical results and potential ESLs are presented below:

Chemicals of Potential Concern in Groundwater and Environmental Screening Levels

The following Table 6-2 presents groundwater results and ESLs for chemicals of potential concern.

Table 6-2
Chemicals of Potential Concern in Ground Water and Environmental Screening Levels

COPC In GW	Frequency of Detection 2005-2006	Highest Concentration 2005-2006 (ug/L)	ESL D.W. Resource[1] (ug/L)	CAL DHS Primary MCL[2] (ug/L)	Risk-Based Goal/Drinking Water Toxicity[2] (ug/L)	Res. / Com. Vapor Intrusion[3] (ug/L)
TPHg	30/30 (100%)	45,000	100[5]	NA	210	NA[8] / NA[9]
TPHd	30/30 (100%)	49,000	100[5]	NA	210[6] / 210[7]	NA[8] / NA[9]
Benzene	30/30 (100%)	6,100	1.0	1.0	0.35	1,900 / 6,400
Toluene	30/30 (100%)	2,100	40[5]	150	1,400	530,000res./com.
Ethylbenzene	30/30 (100%)	1,300	30[5]	700	700	170,000res./com.
Xylenes	30/30 (100%)	7,400	20[5]	1,800	1,400	160,000res./com.
MTBE	5/30 (17%)	1,200	5[5]	NA	190	45,000 / 150,000

notes: ESL = Environmental Screening Level; D.W. = Drinking Water; ND = Not Detected; NA = Not Available
CAL DHS MCL = California EPA Department of Health Services - Maximum Concentration Level
1 = Table F-1a (RWQCB 2005), ESL, ground water screening level, current or potential drinking water source.
2 = Table F-3 (RWQCB 2005), ESL, drinking water screening levels for human toxicity.
3 = Table E-1a (RWQCB 2005), ESL, ground water screening level, potential vapor intrusion, indoor air; low/moderate permeability soil, residential /commercial.
4 = Table F-2c (RWQCB 2005), ESL, surface water screening level, estuary habitats
5 = (RWQCB 2005) Based on Taste and Odor Threshold (Table I-1)
6 = TPH (middle distillates)
7 = TPH (residual fuel)
8 = Recommends using soil gas. TPHg and TPHd (middle distillates) residential indoor screening level is 26 ug/m³ (Table E).
9 = Recommends using soil gas. TPHg and TPHd (middle distillates) commercial indoor screening level is 36 ug/m³ (Table E).

Highest concentrations of TPHg, TPHd, benzene, toluene, ethylbenzene, xylenes, and MTBE exceed ESLs for groundwater as a drinking water resource. Only benzene exceeds the vapor intrusion ESL and only for residential. Apparently impacted groundwater is not currently used as a source of drinking water. Drinking water is currently supplied to the City of Oakland by EBMUD via the Mokelumne Aquifer. A more representative characterization of the vapor intrusion risk could be determined with soil-gas samples (see Section 7 *Potential Data Gaps).*

7.0 POTENTIAL DATA GAPS

Determining potential risk associated with possible vapor intrusion is a data gap. Soil gas samples can be collected on-site along the southwest fence line. The results can be used with Tier 1 Environmental

Screening Levels and possible Tier 2 gas intrusion modeling (Johnson & Ettinger) to evaluate potential vapor intrusion risk.

Shallow soil, less than ten feet bgs, has not been analyzed for the constituents of potential concern. Therefore, this is also a data gap. Direct exposure and vapor intrusion pathways could not be evaluated with respect to shallow soil. The vapor intrusion pathway can be evaluated with the results from soil gas samples. Shallow (< 10 feet bgs) soil samples could be collected from some of the borings for the soil gas samples and adjacent to the former southeast pump island.

8.0 PROPOSED OFFSITE SCOPE OF WORK

This section presents the scope of work for offsite investigation of soil and groundwater. In summary, it is currently anticipated that six (6) borings will be used to collect soil and groundwater samples downgradient of the site. Figure 9 presents the proposed offsite borehole sampling locations

8.1. Sampling Rationale

During previous investigations no soil or groundwater samples were collected offsite and downgradient of the property. Soil samples B-1 and B-2 were collected offsite and upgradient (see Figure 2). In the May 16, 2006 letter, ACEH recommended that an offsite investigation be conducted to attempt to determine the potential downgradient hydrocarbon plume.

8.2. Pre-Sampling Preparations

Prior to performing on-site sampling activities, regulatory approval will be received for the proposed sampling approach, a site-specific Health and Safety Plan will be prepared, utility clearance will be performed, and a boring and encroachment permits will be submitted (if necessary) and approved.

8.2.1. Regulatory Approval of Sampling Approach

This scope of work presents the proposed scope of work for the sampling approach. The scope of work shall be approved by the Alameda County Health Agency prior to initiating field activities.

8.2.2. Health and Safety Plan

A site-specific Health and Safety Plan (HSP) will be prepared for the proposed field activities. The HSP will be maintained on-site during field work.

8.2.3. Utility Clearance

Prior to boring, the proposed boring locations will be marked with white paint and Underground Service Alert (USA) will be notified to perform a utility survey of USA members. Because of the

limits of the USA survey, a utility locating service will be subcontracted to also perform additional utility survey of those areas proposed for borehole sampling. This will help to identify subsurface utilities at boring locations. In addition, during borings a hand auger may be used to clear to a reasonable depth and to collect shallow soil samples.

8.2.4. Permits

Based on regulatory requirements of the local agency, a soil boring permit will be obtained from Alameda County Public Works Agency. An encroachment permit will also probably be required for the offsite borings.

8.3. Boring and Sampling Procedures

Proposed boring locations are presented in Figure 9 *Proposed Sampling Locations*. Actual boring locations may be modified based on subsurface utilities or obstructions. The section presents proposed boring and sampling procedures.

8.3.1. Equipment Decontamination

Prior to use and between sampling events, all downhole and sampling equipment will be cleaned with Alconox, or an appropriate alternative, and deionized or distilled water.

8.3.2. Boring Procedures

After pre-sampling preparations are complete, a field program using a C-57 drilling contractor will be implemented. It is currently anticipated that six (6) boreholes will be drilled to four (4) feet below first encountered groundwater or thirty (30) feet bgs, whichever is less. A grab groundwater sample will be collected from the borehole between first groundwater and the four (4) additional feet in borehole depth. A hand auger then a geoprobe will be used to collect lithologic and analytical samples. If groundwater is encountered, a groundwater sample will be collected from each borehole, prior to properly closing the borehole.

Standard field procedures for hand auger soil borings and geoprobes are presented in Appendix E *Standard Field Procedures*. These procedures provide general field guidance. After sampling activities are complete the boring will be properly closed with grout and capped with like material as the existing surface.

8.3.3. Soil Sampling Procedures

At each boring, soils will be examined for staining and odor and screened using a photoionization detector (PID). Soil samples will be collected from any interval where staining, odor, or elevated PID readings are observed. If no staining, odor, or elevated PID readings are observed, soil samples will

not be collected (per. comm. Steven Plunkett). Soil samples will be collected using the general protocol presented in Appendix E *Standard Field Procedures*. Soil samples will be collected in polyethene or brass tubes, or glass sampling containers with no head-space remaining. Samples will be labeled, placed in a cold iced insulated container for transport to the laboratory under a chain-of-custody record.

8.3.4. Groundwater Sampling Procedures

Grab groundwater samples will be collected from each borehole, if possible. The protocols presented in Appendix E *Standard Field Procedures* provide general guidance for collecting the grab groundwater sample.

8.3.5. Sample Documentation

Sampling containers will be labeled in the field with the job number, sampling location, date and time of sample, and requested analysis. A chain-of-custody record will be initiated and updated throughout handling of the samples and will accompany the samples to the laboratory.

8.4. Soil and Groundwater Analysis

Soil and groundwater samples will be analyzed by a California-certified laboratory for the analytes presented below:

8.4.1. Soil Analysis

Soil samples will be analyzed for TPHg, BTEX, and fuel oxygenates (MTBE, TAME, DIPE, TBA, EtOH). The following Table 8-1 presents soil analysis, sampling containers, preservation, detection limit, and holding time:

Table 8-1
Soil Analysis, Sampling Containers, Preservatives, Detection Limits, and Holding Times

Analysis and Method	Sampling Containers	Preservatives	Detection Limit	Holding Times
TPHg (EPA Method 8015M)	Glass or Tube	Cold	1.0 mg/kg	14 days
BTEX (EPA Method 8021)	Glass or Tube	Cold	0.005 mg/kg	14 days
Fuel Oxygenates - MTBE, TAME, DIPE, TBA, EtOH (EPA Method 8260B)	Glass or Tube	Cold	0.005 mg/kg TBE 0.05 mg/kg EtOH 0.25 mg/kg	14 days

8.4.2. Groundwater Analysis

Groundwater samples will be analyzed for TPHg, BTEX, and fuel oxygenates (MTBE, TAME, DIPE, TBA, EtOH). The following Table 8-2 presents groundwater analysis, sampling containers, preservation, detection limit, and holding time:

Table 8-2
Groundwater Analysis, Sampling Containers, Preservatives, Detection Limits, and Holding Times

Analysis and Method	Sampling Containers	Preservatives	Detection Limit	Holding Times
TPHg (EPA Method 8015M)	3 VOAs	HCl	50 ug/L	14 days
BTEX (EPA Method 8021)		HCl	0.5 ug/L	14 days
Fuel Oxygenates - MTBE, TAME, DIPE, TBA, EtOH (EPA Method 8260B)	2 VOAs	HCl	0.5 ug/L TBE 5 ug/L EtOH 50 ug/L	14 days

8.5. Investigation Derived Waste

All investigation derived waste (IDW) will be temporarily stored on-site in sealed DOT-approved drums or other appropriate container(s). The drums will be labeled with the appropriate boring(s) identification number(s), date of collection, and nature of contents. All drummed IDW will be properly disposed of by the client.

8.6. Borehole Locations

Following borehole sampling, sampling locations will be defined based on field measurements from existing structures. Borehole sampling locations will be identified on a scaled figure.

8.7. Report

After receiving analytical results from the laboratory, an *Offsite Characterization Report* or other appropriate report will be provided with sampling methods, results, and conclusions.

9.0 QUARTERLY GROUNDWATER MONITORINGS

On a quarterly basis, Cambria will gauge the site wells, check the wells for SPH, and collect groundwater samples from monitoring wells MW-1 through MW-4, RW-5, and RW-9. Groundwater samples will be analyzed for TPHg and TPHd with silica gel clean-up by Modified EPA Method SW8015C; and for BTEX and MTBE by EPA Method SW8021B. Cambria will summarize groundwater monitoring activities and results in groundwater monitoring reports.

10.0 QUALITY ASSURANCE PROJECT PLAN

This Quality Assurance Project Plan (QAPP) is intended to define procedures to facilitate the acquisition of accurate and reliable data.

10.1. Project Organization

Mr. Lynn Worthington, with Golden Empire Properties, Inc., is currently responsible for the site. Cambria works for this client to provide consulting and sampling services. Subcontractors would be used for drilling, soil and groundwater analysis, and independent utility clearance. It is currently anticipated that California-certified McCampbell Analytical Inc. (DHS License #1644) will provide analytical services. Alameda County Health Agency is the lead agency and will provide oversight for sampling activities. Documents will be sent to the client and the lead agency for their consideration. Underground Service Alert (USA) will be contacted prior to performing any subsurface activities.

Following are principal contacts for organization currently associated with the project:

Client
Mr. Lynn Worthington
510/562-8600 x-12; 510/562-4012 fax
caferealty@aol.com
Golden Empire Properties, Inc.
5942 MacArthur Blvd., Suite B
Oakland, CA 94605

Alameda County Health Agency
Mr. Steven Plunkett
510/383-1767; 510/337-9335
Steven.Plunkett@acgov.org
1131 Harbor Bay Parkway, 2nd Floor
Oakland, California 94502-6577

McCampbell Analytical Inc.
Ms. Angela Rydelius
877/798-1620; 925/768-1622 fax
main@mccampbell.com
1534 Willowpass Road
Pittsburg, California 94565

Cambria Environmental Technology, Inc.
Mark Jonas, R.G
510/420-3307; 510/420-9170 fax
510/385-0020 mobile
mjonas@cambria-env.com
5900 Hollis Street, Suite A
Emeryville, CA 94608

Alameda County Public Works Agency
James Yoo (for Drilling Permit)
510/670-6633; 510/782-1939 fax
Jamesy@acpwa.org
399 Elmhurst Street, Hayward, CA 94544

Underground Service Alert
1-800/227-2600

10.2. Quality Assurance Objectives

The overall quality assurance objective is to develop and implement procedures for field sampling, chain-of-custody, laboratory analysis, and reporting that will provide results that are defensible and reliable. Quality assurance objectives for accuracy, precision, and method detection limits are discuss as follows:

Accuracy

The criterion for accuracy is a measurement of bias that exists in a measurement system. It refers to the degree of agreement of a measurement, X, with an accepted reference or true value, T, usually expressed as the difference between the two values, X-T. Accuracy can also be assessed by using percent bias and percent recovery information. Accuracy is difficult to measure for the entire data collection activity and specifically the sampling component. The criteria for accuracy is best addressed using laboratory matrix spikes.

Precision

The criterion for precision is a measure of the reproducibility of replicate analyses made under a given set of conditions. Specifically, it is a quantitative measure of the variability of a group of measurements as compared to their average value. The overall precision of each data collection activity should take into account both field sampling precision and analytical precision. The specific criterion for precision for each parameter is detailed within the individual analytical test method. If groundwater is sampled, a blind duplicate ground water sample will be collected and assessed as a means of assessing both sampling and analytical reproducibility and as a measure of the data collection activity's precision. The duplicate sample will be analyzed for the same suite of analyses as the original sample. All results will be included in a report.

Method Detection Limits

Anticipated method detection limits are based on a relatively standard sample with a manageable amount of interference. The specific character of a sample with respect to high concentrations of multiple contaminants can increase the actual detection limit above the anticipated method detection limit.

10.3. Sampling Procedures

Sampling procedures are presented in Section 8 *Proposed Scope of Work.*

10.4. Sample Custody Procedures and Documentation

Chain-of-custody procedures and documentation are covered in Section 8 *Proposed Scope of Work.*

10.5. Field and Laboratory Calibration Procedures

Field Calibration Procedures

If a photoionization detector (PID) is used, it will be calibrated in the office or at an equipment supplier, prior to use in the field.

Laboratory Calibration Procedures

The analytical laboratory has calibration procedures as required by the current EPA Standard Methods and their own laboratory Quality Assurance/Quality Control (QA/QC) plan. The details associated with all the specific laboratory calibration procedures are available from the laboratory upon request.

10.6. Analytical Procedures

Analytical methods to be used are presented in Section 8 *Proposed Scope of Work.* Specific laboratory procedures associated with each method are available upon request.

10.7. Certified Analytical Laboratory

Pursuant to Health and Safety Code Section 25198, a state-certified laboratory will perform analytical services. For this project it is anticipated that McCampbell Analytical Inc., a California-certified laboratory with DHS License #1644, will perform analytical services.

10.8. Data Assessment and Corrective Actions

Data Assessment

Data assessment within the analytical laboratory is defined by the specific requirements of the standard analytical method and the laboratory's QA/QC program. Procedures for analytical accuracy, precision, and completeness are in laboratory documents, available upon request. Accuracy and precision are also discussed in Section 10.2 "Quality Assurance Objectives." Completeness of analytical data is a measure of the amount of valid data obtained from the measurement system compared with the amount that was expected under normal conditions.

The analytical laboratory McCampbell Analytical will submit QC documentation with the analytical results. QC documentation includes a case narrative describing conformance; surrogate recoveries; spike amount(s), control limits, accuracy, and precision; calibration summaries; and a GC/MS internal standard summary.

Field data and analytical results will be evaluated by a Professional Geologist.

Corrective Actions

Unacceptable conditions or data, nonconformance with the QA procedures, or other deficiency may require corrective actions. A corrective action may be necessary if the nonconformance is of program significance. If required, the action to correct the nonconformance will be developed, initiated, and implemented.

Corrective action(s) may include:

- Reanalyzing the samples, if holding time permits.
- Resampling and reanalyzing.
- Evaluating and amending the sampling and analytical procedures.
- Accepting the data and acknowledging its level of uncertainty.

Necessary corrective actions will be documented.

10.9. Reporting Procedures

Reporting procedures for measurement of system performance and data quality are part of the laboratory's operating procedures and documentation is available upon request. Quality control documentation will be presented with analytical results from the laboratory.

10.10. Data Management

Laboratory data management, data reduction, and reporting requirements are in the laboratory's QA/QC program and operating procedures. Documentation from the laboratory is available upon request. Independent third-party (outside of McCampbell Analytical) validation will not be performed. McCampbell Analytical does perform an internal review of analytical and QC results prior to release of a data package signed by a laboratory representative.

Laboratory results and associated quality control documentation will be presented in a report following field activities and sample analysis.

10.11. Internal Quality Control

Quality control is defined as the routine application of procedures for obtaining prescribed standards of performance. The procedures used for field work are discussed throughout this report, under Section 8 *Proposed Scope of Work.* Standards of performance are discussed in this section of the Work Plan. Laboratory documentation on standard analytical methods and the laboratory's QA/QC program is available upon request.

11.0 REFERENCES

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FIGURES

07/11/06

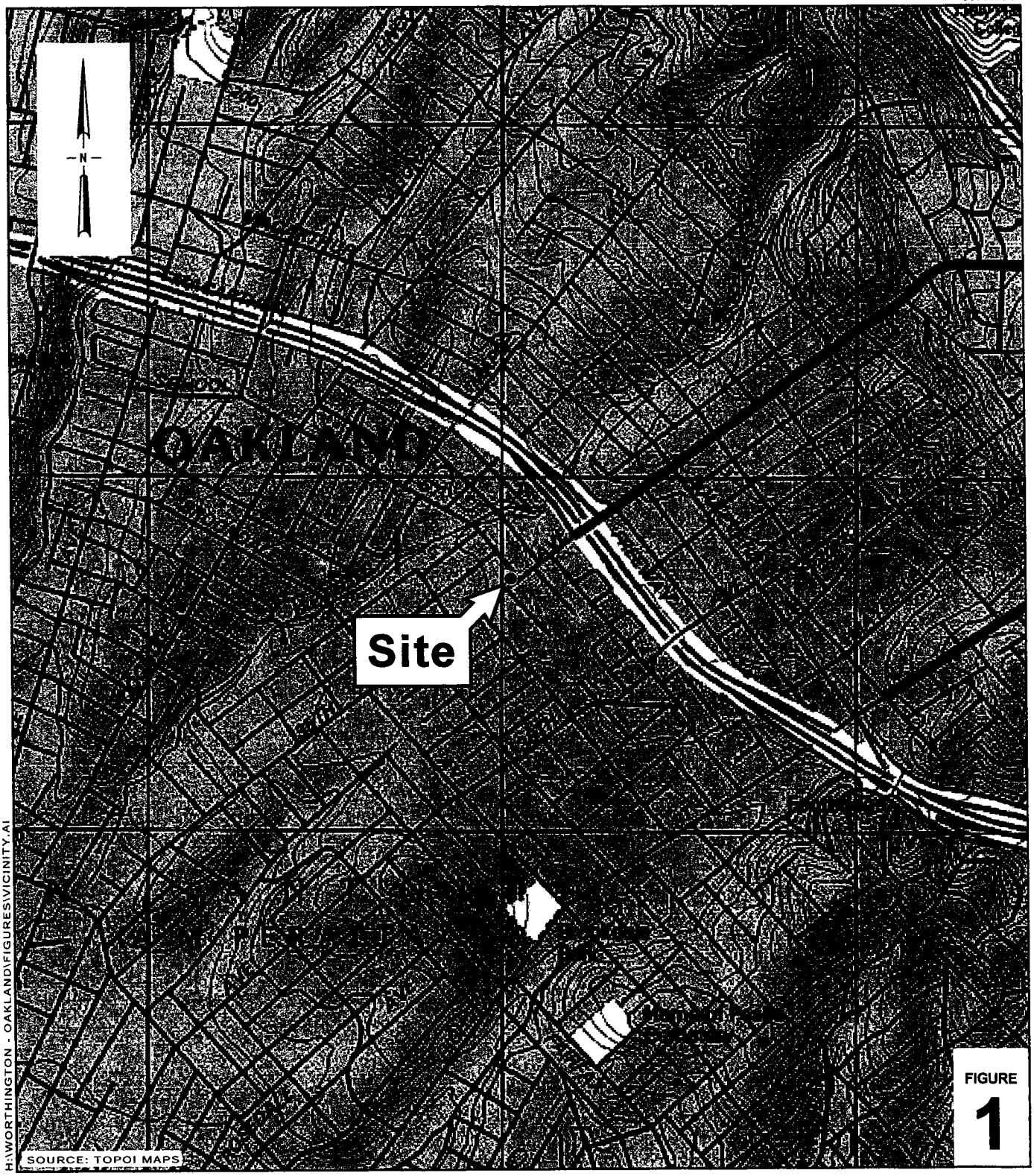

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FIGURE
1

0 1/8 1/4 1/2 1

SCALE : 1" = 1/4 MILE

Former Exxon Station

3035 35th Avenue

Oakland, California

CAMBRIA

Vicinity Map

06/20/08

Site Plan

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

B-3

SB-E

B-5

SB-A

A'

B-2

Former Pump Island

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

B

RW-9

MW-1 (SB-G)

B-11

B-7

B-9

RW-12

RW-8

RW-11

driveway

SB-B

MW-4

B-8

RW-7

SB-D

MW-3 (SB-C)

RW-6

RW-5

B-12

B'

A

building

Residence

35th AVENUE

0 15 30 60

Scale (ft)

Source: Virgil Chavez Land Surveying

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FIGURE

2

Former Exxon Station

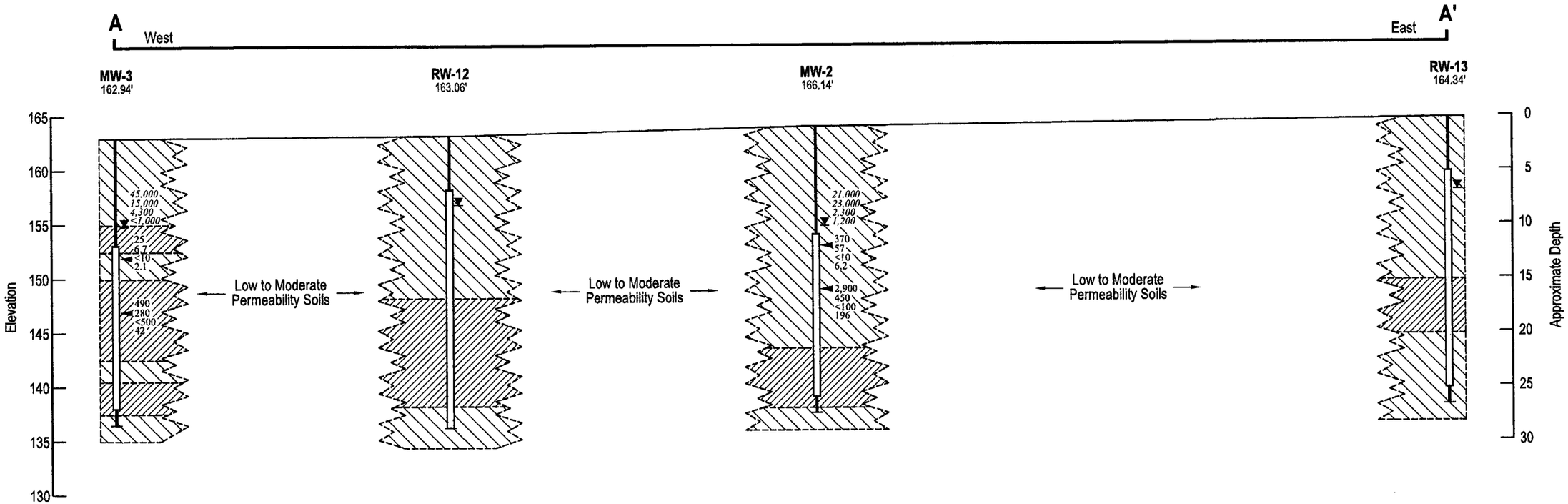
3055 35th Avenue

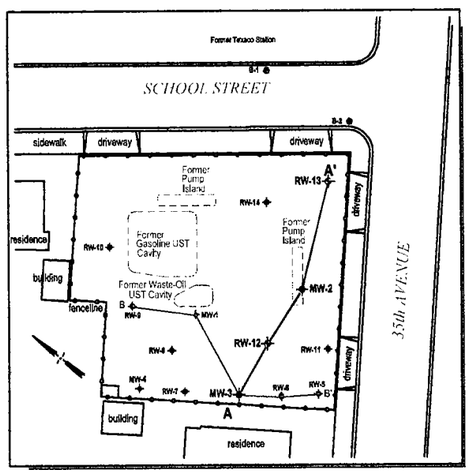
Oakland, California

CAMBRIA

07/12/08

Geologic Cross Section A-A'





EXPLANATION

- = Low Permeability Soils
- = Moderate Permeability Soils
- = High Permeability Soils
- Approximate sample location
- TPHg, TPHd, Benzene, MTBE — Hydrocarbon concentrations in Soil, in parts per million
- Well ID — Well Designation
- Elev. (offset) — Top of Casing Elevation
- Groundwater Monitoring Well
- Well Screen Interval
- Bottom of boring
- Depth of Groundwater - 03/22/06 (unless otherwise noted)
- *TPHg, TPHd, Benzene, MTBE* — Hydrocarbon concentrations in Groundwater, in parts per billion

10
Scale (ft)
0
10

FIGURE
3

Former Exxon Station
3055 35th Avenue
Oakland, California

CAMBRIA

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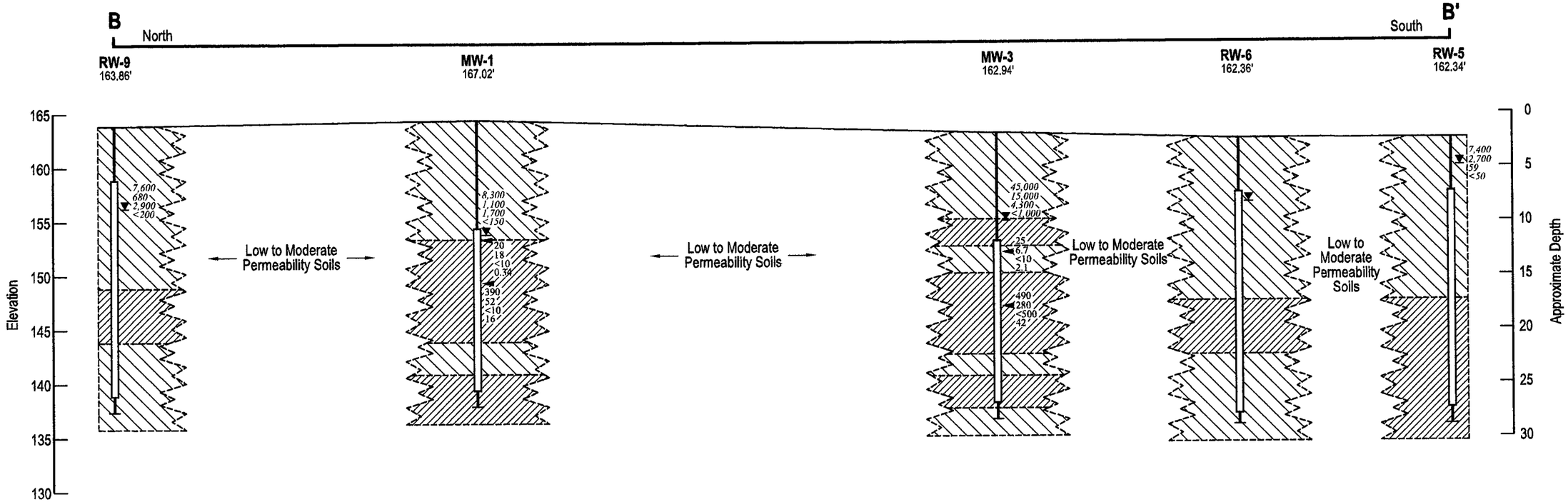
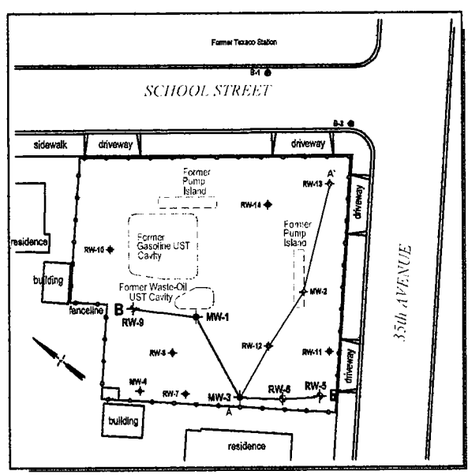
07/12/08

Geologic Cross Section B-B'





EXPLANATION

= Low Permeability Soils

= Moderate Permeability Soils

= High Permeability Soils

Approximate sample location

TPHg, TPHd, Benzene, MTBE — Hydrocarbon concentrations in Soil, in parts per million

Well ID — Well Designation
Elev. — Top of Casing Elevation
(offset)

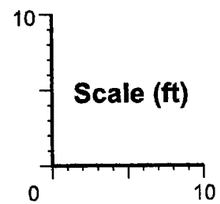
Groundwater Monitoring Well

Well Screen Interval

Bottom of boring

Depth of Groundwater - 03/22/06 (unless otherwise noted)

TPHg, TPHd, Benzene, MTBE — Hydrocarbon concentrations in Groundwater, in parts per billion



FIGURE

4

Former Exxon Station
3055 35th Avenue
Oakland, California

CAMBRIA

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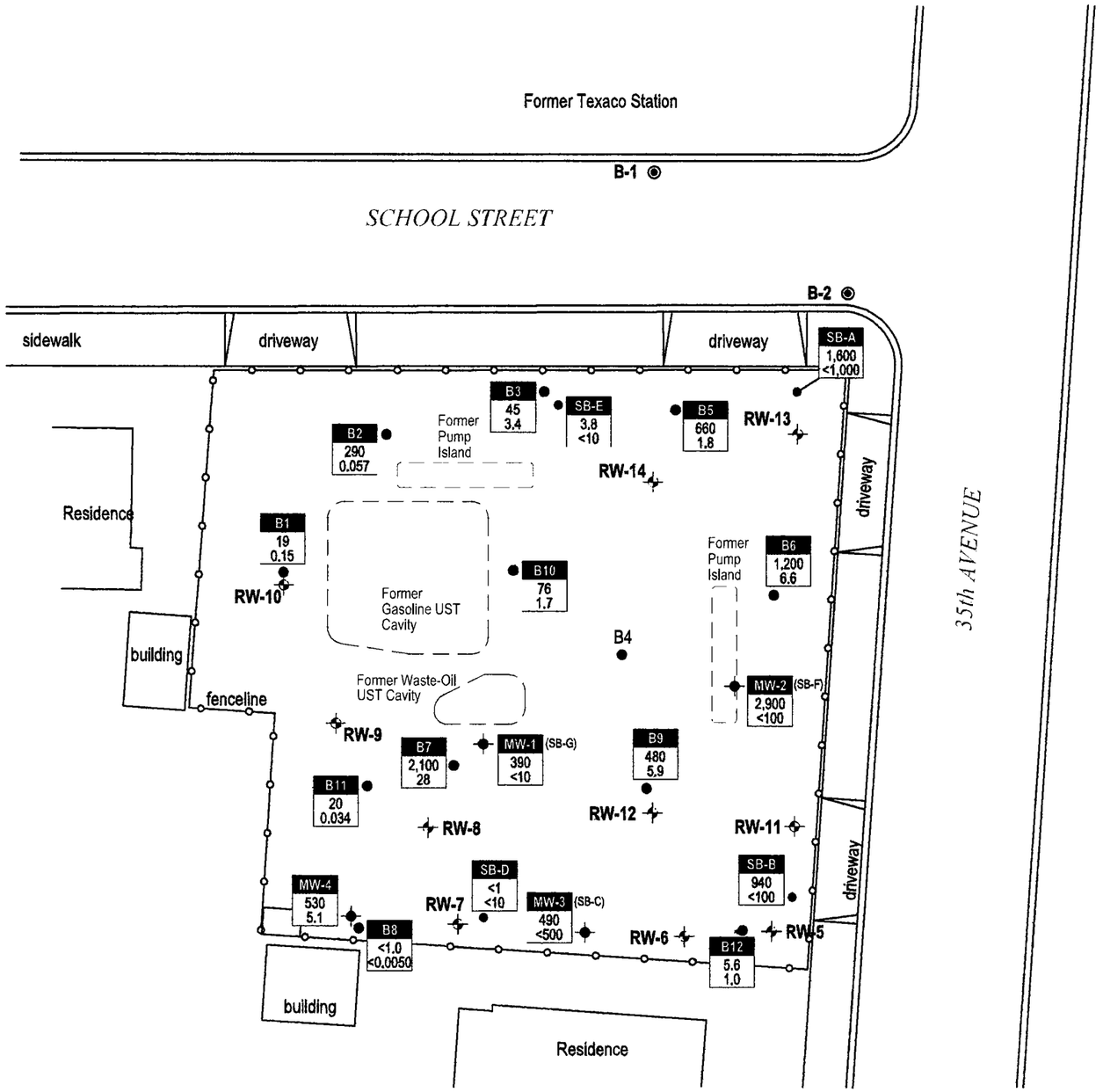
Hydrocarbon Concentrations in Soil

15 and 16 Feet Below Ground Surface

EXPLANATION

- MW-1 — Monitoring well location
- RW-6 — Remediation well location
- B1 — Soil Boring Location
- B-1 — Soil Boring Location (1998)
- Boring / TPHg / BENZ — Well/Boring designation; TPHg concentration, in mg/kg; Benzene concentration, in mg/kg



0 15 30 60

Scale (ft)

Source: Virgil Chavez Land Surveying

FIGURE

5

Former Exxon Station
3055 35th Avenue
Oakland, California

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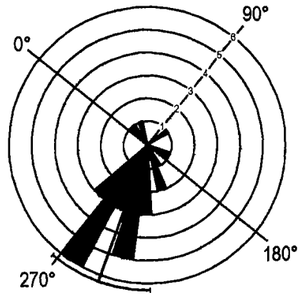
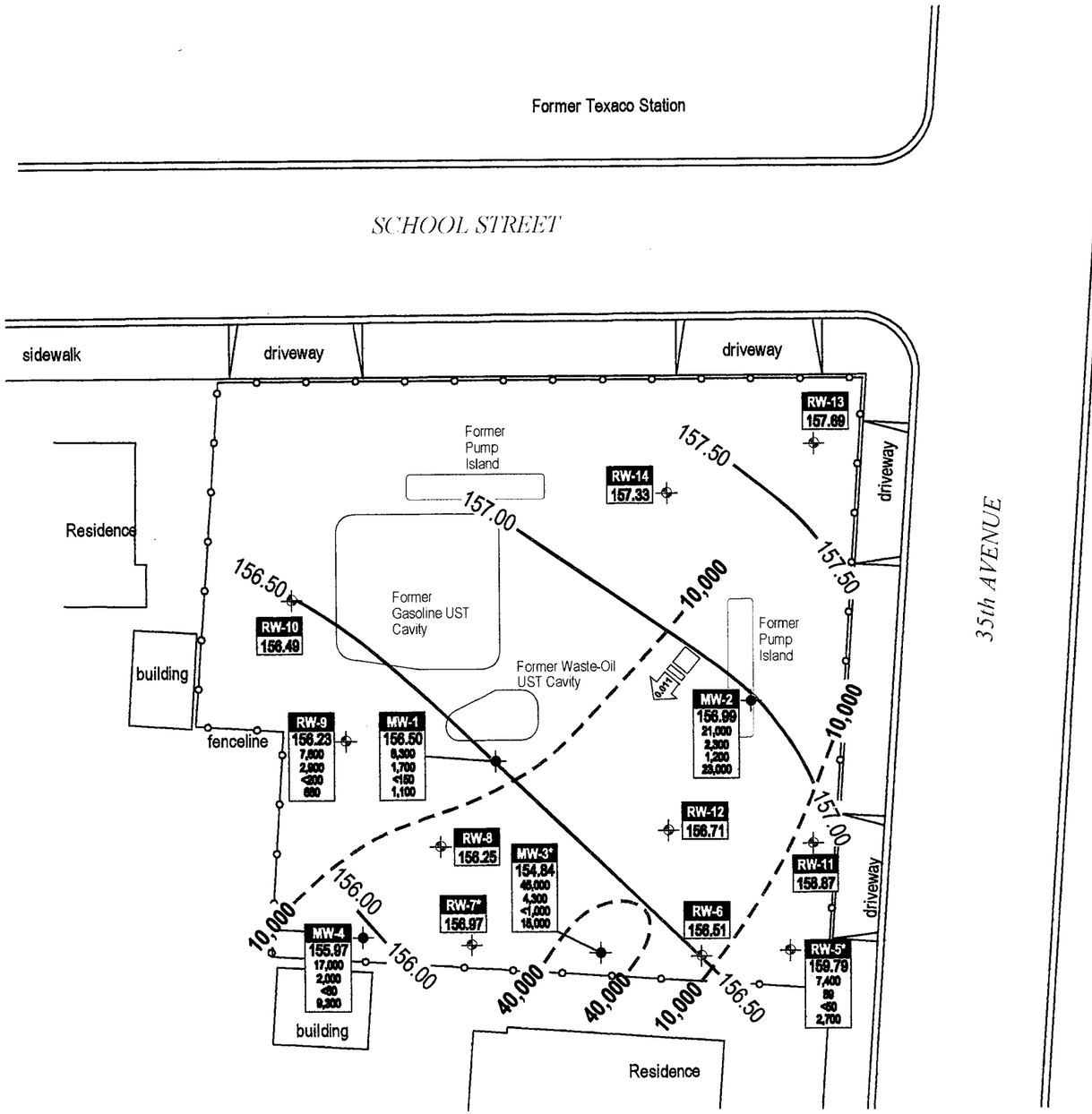
H:\WORTHINGTON\FIGURES\2005\WORTHINGTON_HC-SOIL.DWG

08/21/06



Historical Groundwater Gradient Directions
1996 to 2006



EXPLANATION

- MW-1 — Monitoring well location
- RW-6 — Remediation well location
- 157.00 — Groundwater elevation contour, in feet above mean sea level (msl), dashed where inferred
- Groundwater flow direction and gradient
- 10,000 — TPHg isoconcentration contour, in micrograms per liter (µg/L), dashed where inferred
- Well ID / ELEV / TPHg / Benzene / MTBE / TPHd — Well designation; Groundwater elevation (msl); Hydrocarbon concentrations in groundwater, in micrograms per liter (µg/L)
- * Groundwater elevation anomalous, not used in contouring

0 15 30 60

Scale (ft)

Source: Virgil Chavez Land Surveying

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FIGURE

6

Groundwater Elevation and Hydrocarbon Concentration Map

March 22, 2006

CAMBRIA

Former Exxon Station

3055 35th Avenue

Oakland, California

07/11/06

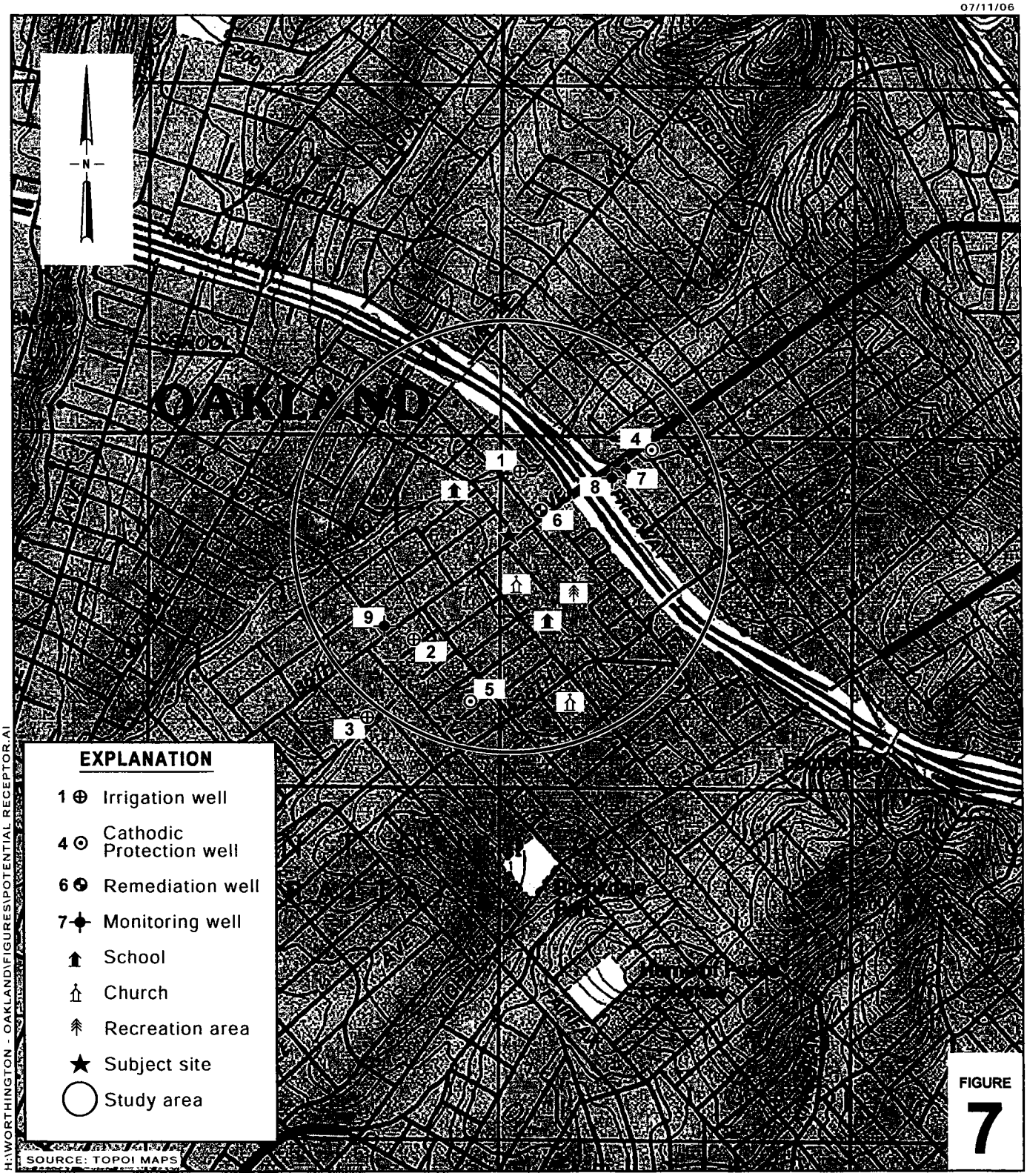

FIGURE 7

Former Exxon Station
3035 35th Avenue
Oakland, California

CAMBRIA

Potential Receptor Survey Map
(2,000 Foot Radius)

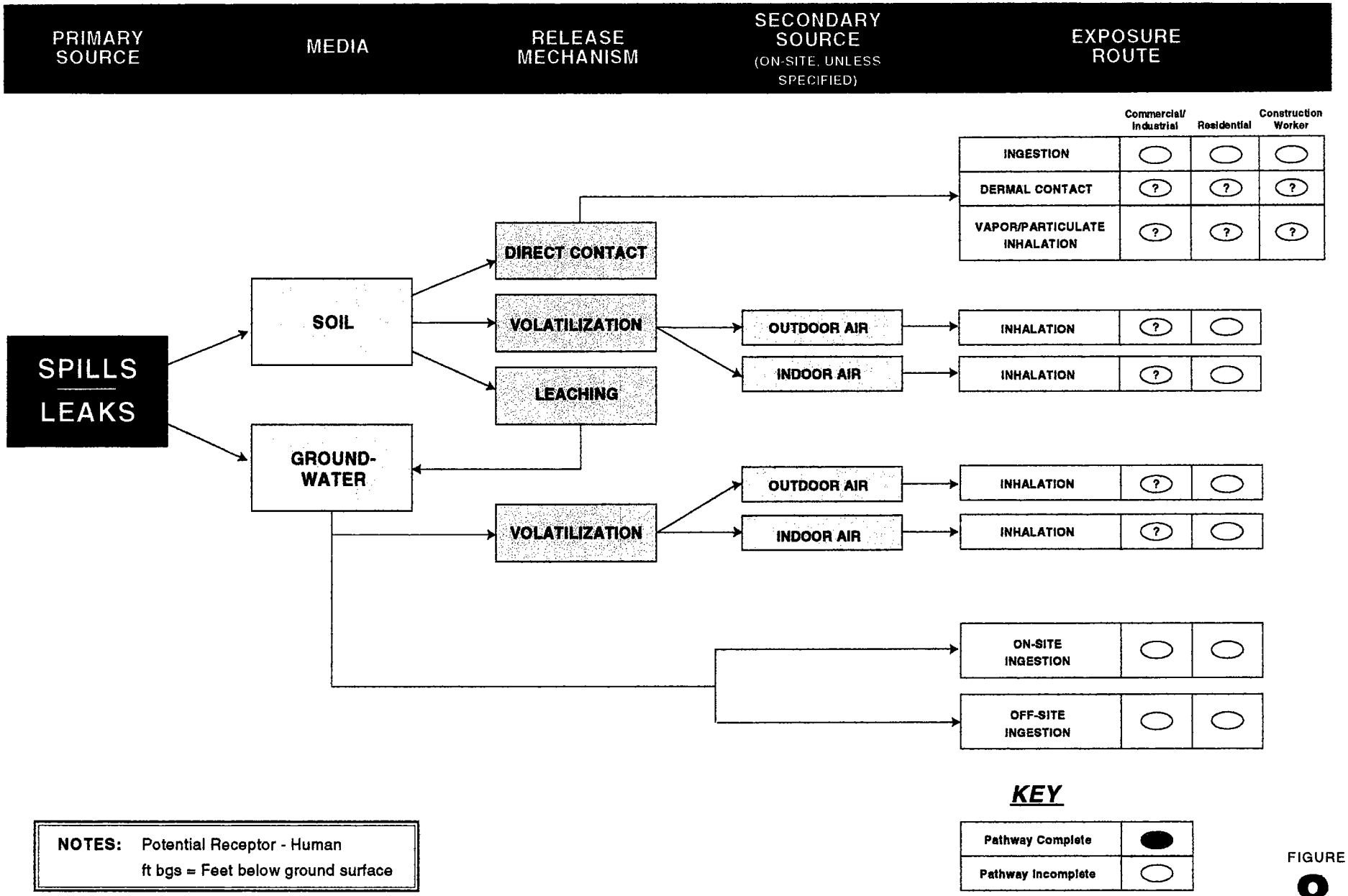

FIGURE
8

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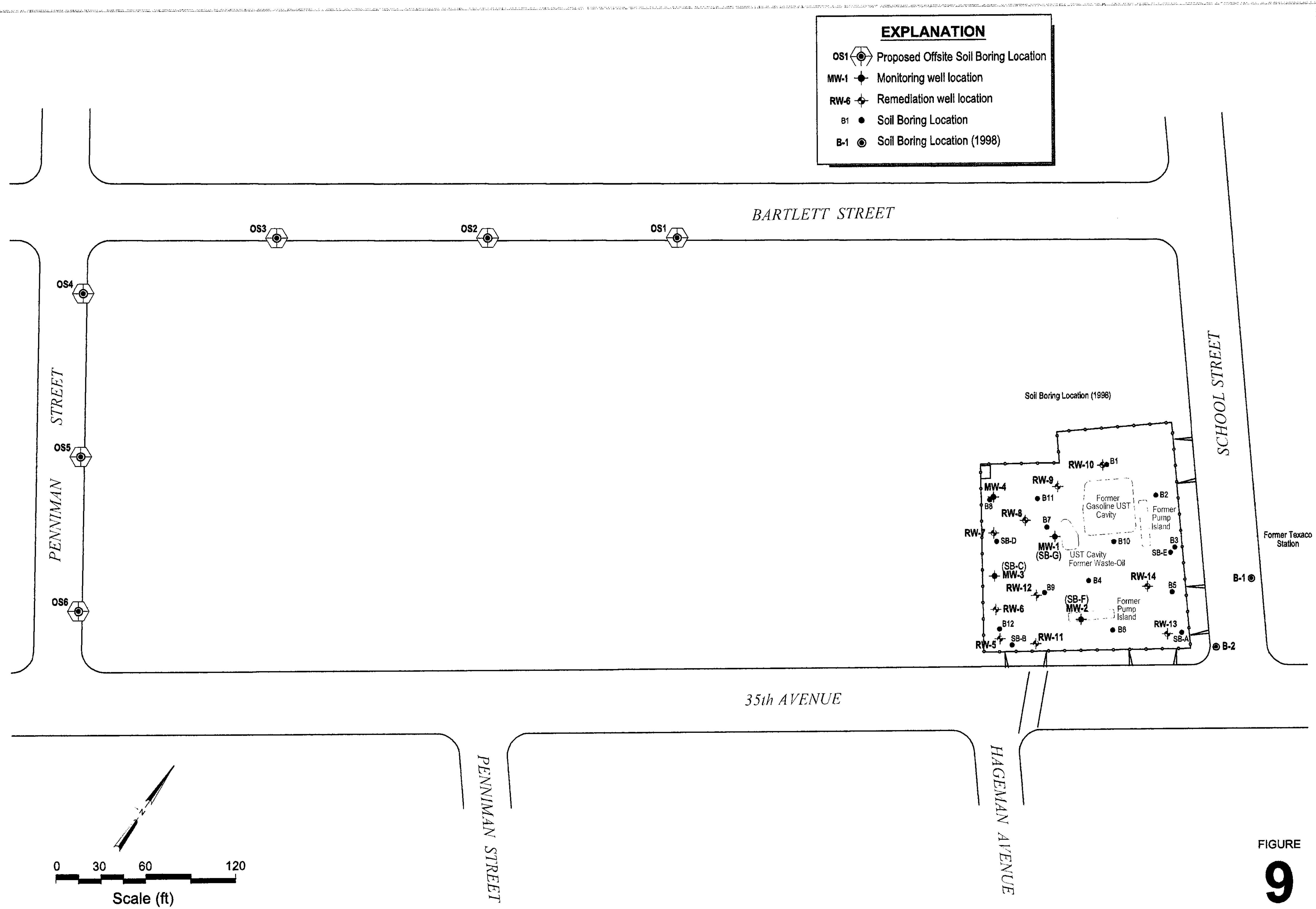
Former Exxon Station
3055 35th Avenue
Oakland, California

CAMBRIA

Site Conceptual Model
Exposure Pathways

07/12/06



Proposed Offsite Sampling Locations

CAMBRIA

FIGURE
9

Former Exxon Station
3055 35th Avenue
Oakland, California

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	11/5/1991	15	---	19	---	0.15	0.34	0.14	1.6	---	
B1	11/5/1991	20	---	1500	---	56	44	24	140	---	
B1	11/5/1991	30	---	<1.0	---	0.013	0.013	0.013	0.015	---	
B1	11/5/1991	35	---	<1.0	---	0.015	<0.0050	<0.0050	0.026	---	
B2	11/5/1991	15	---	290	---	0.057	1.3	3.8	17	---	
B2	11/5/1991	25	---	4.7	---	<0.0050	<0.0050	<0.0050	0.12	---	
B2	11/5/1991	35	---	<1.0	---	<0.0050	<0.0050	<0.0050	<0.0050	---	
B3	11/6/1991	15	---	45	---	3.4	3.6	1.2	7.5	---	
B3	11/6/1991	20	---	130	---	1.9	4.7	2.4	19	---	
B3	11/6/1991	25	---	<1.0	---	<0.0050	<0.0050	<0.0050	<0.0050	---	
B4	11/6/1991	25	---	1.0	---	0.27	0.18	0.018	0.17	---	
B4	11/6/1991	30	---	<1.0	---	<0.0050	0.0083	<0.0050	0.038	---	
B4	11/6/1991	35	---	<1.0	---	<0.0050	<0.0050	<0.0050	<0.0050	---	
B5	11/6/1991	15	---	660	---	1.8	4.1	8.9	29	---	
B5	11/6/1991	20	---	97	---	3.2	1.2	1.7	4.6	---	
B5	11/6/1991	25	---	<1.0	---	<0.0050	<0.0050	<0.0050	<0.0050	---	
B6	11/6/1991	15	---	1200	---	6.6	21	18	98	---	
B6	11/6/1991	20	---	7.3	---	1.5	1.5	0.36	1.8	---	
B6	11/6/1991	25	---	1.7	---	0.13	0.22	0.066	0.43	---	
B7	11/6/1991	15	---	2100	<1.0	28	100	38	290	---	ND VOCs/SVOCs
B7	11/6/1991	25	---	1.0	---	0.03	0.018	0.0058	0.06	---	
B7	11/6/1991	30	---	<1.0	---	<0.0050	<0.0050	<0.0050	<0.0050	---	
B8	11/6/1991	15	---	<1.0	---	<0.0050	<0.0050	<0.0050	<0.0050	---	
B8	11/6/1991	25	---	<1.0	---	<0.0050	<0.0050	<0.0050	<0.0050	---	
B9	11/6/1991	15	---	480	---	5.9	23	8.9	72	---	
B10	11/6/1991	15	---	76	---	1.7	5.1	1.3	13	---	
B10	11/6/1991	20	---	260	---	7.3	21	6.6	54	---	
B10	11/6/1991	25	---	1.0	---	0.037	0.059	0.0089	0.064	---	
B10	11/6/1991	30	---	1.0	---	0.022	0.017	<0.0050	0.011	---	
B11	11/6/1991	15	---	20	---	0.034	0.033	0.55	1.0	---	
B11	11/6/1991	20	---	11	---	1.4	0.15	0.68	1.8	---	
B11	11/6/1991	25	---	<1.0	---	<0.0050	<0.0050	<0.0050	<0.0050	---	
B12	11/6/1991	15	---	5.6	---	1.0	0.75	0.11	0.91	---	
B12	11/6/1991	25	---	<1.0	---	<0.0050	<0.0050	<0.0050	<0.0050	---	
B12	11/6/1991	30	---	<1.0	---	<0.0050	<0.0050	<0.0050	<0.0050	---	

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 ---------->							
SB-A	5/5/94	11	14.5	3.4	4.2	<10	0.0072	0.0015	0.015	0.031	a
SB-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
SB-B	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	
SB-D	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
SB-E	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

mg/kg = milligrams per kilogram

< or ND: Not detected above detection limit.

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

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)

B7-15 Metals: Cadmium 3.51 mg/kg, Chromium 25.1 mg/kg, Lead 3.19 mg/kg, Zinc 47.7 mg/kg, Nickel 34.3 mg/kg

B7-15 Oil & Grease: ND (10 mg/kg)

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

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	9/3/2003	24.16	---	76.69	14,000[d]	36,000[e,f]	---	300	50	33	480	<50	---	Operating
Continued	12/2/2003	24.12	---	76.73	7,100[d,g]	9,300[e,f,g]	---	1,400	230	160	820	<100	---	Operating
167.02	3/18/2004	17.70	---	83.15	3,600[d]	1,100[e,f]	---	650	59	38	370	<90	---	Operating
(Monument	6/16/2004	19.20	---	147.82	8,100[d]	2,300[e,f]	---	1,500	69	22	1,000	<100	---	Not operating
Well box)	9/27/2004	23.07	---	143.95	7,800[d]	1,700[e]	---	1,800	110	120	670	<180	0.28	Not operating
	12/27/2004	17.04	---	149.98	10,000[d]	1,400[e]	---	2,400	170	170	1,500	<120	0.41	Not operating
	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
	3/22/2006	**10.52**	**---**	**156.50**	**8,300[d]**	**1,100[e,f,k]**	**---**	**1,700**	**100**	**190**	**660**	**<150**	**0.84**	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	

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-2	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
Continued	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
	3/11/2002	16.95	---	83.05	4,700[d]	590[e]	---	1,200	150	30	310	<50	0.24	Operating
	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
	3/22/2006	**9.15**	**---**	**156.99**	**21,000 [d, g]**	**23,000 [e, f, k, g]**	**---**	**2,300**	**200**	**550**	**2,800**	**1,200**	**0.91**	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	

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-3	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	
Continued	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	
	9/28/1999	15.99	---	80.88	60,000[d]	7,800[e]	---	9,400	9,200	1,000	9,900	200	0.53	
	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
	3/22/2006	**8.10**	**---**	**154.84**	**45,000[d, g]**	**15,000[e, f, k, g]**	**---**	**4,300**	**390**	**1,100**	**5,300**	**<1,000**	**0.88**	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
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	---	
	9/7/2000	16.40	---	80.94	43,000[d]	5,900[e]	---	10,000	1,100	1,100	3,400	<450	1.04	
	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
	3/22/2006	**7.52**	**---**	**155.97**	**17,000 [d, g]**	**9,300 [e, f, k, g]**	**---**	**2,000**	**230**	**150**	**1,900**	**<50**	**0.80**	Not 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	TPHd	TPHmo	Benzene	Toluene	Ethylbenzene	Xylenes	MTBE	DO (mg/L)	TPE System Status
					<---------- Concentrations in micrograms per liter (µg/L) ---------->									
RW-5	1/13/2003	10.20	---	---	14,000	3,000	---	2,100	750	300	1,800	950	0.17	
162.34	3/18/2003	14.48	---	---	12,000	--	---	2,000	380	190	1,500	830	---	
	6/16/2004	14.73	---	147.61	---	---	---	---	---	---	---	---	---	Not operating
	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
	3/22/2006	**2.55**	**---**	**159.79**	**7,400** [d]	**2,700** [e, f, k]	**---**	**59**	**76**	**20**	**120**	**<50**	**1.10**	Not operating
RW-6	3/11/2002	--	---	---	14,000	3,100	---	970	520	170	2,200	<130	---	
162.36	1/13/2003	10.35	---	---	15,000	2,900	---	2,200	1,200	130	2,200	440	0.24	
	3/18/2004	11.47	---	---	8,500	---	---	1,300	260	71	990	1,300	--	
	6/16/2004	14.80	---	147.56	---	---	---	---	---	---	---	---	---	Not operating
	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
	3/22/2006	**5.85**	**---**	**156.51**	**---**	**---**	**---**	**---**	**---**	**---**	**---**	**---**	**---**	Not operating
RW-7	3/11/2002	---	---	---	<50	<50	---	<0.5	<0.5	<0.5	<0.5	<5.0	---	
162.72	1/13/2003	10.95	---	---	<50	67	---	<0.5	<0.5	<0.5	<0.5	<5.0	0.22	
	3/18/2004	15.33	---	---	250	---	---	66	4.8	3.2	10	<15	--	
	6/16/2004	15.22	---	147.50	---	---	---	---	---	---	---	---	---	Not operating
	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
	3/22/2006	**5.75**	**---**	**156.97**	**---**	**---**	**---**	**---**	**---**	**---**	**---**	**---**	**---**	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-8	3/11/2002	---	---	---	1,300	80	---	620	11	15	14	<60	---	
164.13	1/13/2003	12.80	---	---	390	56	---	150	11	4.1	4.1	13	0.31	
	3/18/2004	15.34	---	---	760	---	---	310	9.9	11	16	<25	---	
	6/16/2004	16.41	---	147.72	---	---	---	---	---	---	---	---	---	Not operating
	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
	3/22/2006	**7.88**	**---**	**156.25**	---	---	---	---	---	---	---	---	---	Not operating
RW-9	3/11/2002	---	---	---	12000	880	---	3,400	230	78	1,300	<240	---	
163.86	1/13/2003	11.85	---	---	23000	2000	---	7,700	610	310	310	<500	0.39	
	3/18/2004	13.69	---	---	2300	---	---	770	32	15	200	<50	---	
	6/16/2004	16.03	---	147.83	---	---	---	---	---	---	---	---	---	Not operating
	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
	3/22/2006	**7.63**	**---**	**156.23**	**7,600[d]**	**680[e]**	**---**	**2,900**	**59**	**190**	**310**	**<200**	**0.95**	Not operating
RW-10	3/11/2002	---	---	---	12,000	740	---	3,900	150	110	1,100	<270	---	
163.02	1/13/2003	10.75	---	---	4,300	330	---	1,500	43	98	98	<100	0.41	
	3/18/2004	13.13	---	---	5,800	---	---	2,400	11	<10	110	<300	---	
	6/16/2004	15.03	---	147.99	---	---	---	---	---	---	---	---	---	Not operating
	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
	3/22/2006	**6.53**	**---**	**156.49**	**---**	**---**	**---**	**---**	**---**	**---**	**---**	**---**	**---**	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-11	3/11/2002	---	---	---	260	<50	---	34	5.3	8.1	48	<5.0	---	
162.57	1/13/2003	9.80	---	---	5,300	2,700	---	490	110	120	120	180	0.24	
	3/18/2004	12.45	---	---	9,300	---	---	980	120	180	770	2,000	---	
	6/16/2004	14.75	---	147.82	---	---	---	---	---	---	---	---	---	Not operating
	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
	3/22/2006	**5.70**	**---**	**156.87**	**---**	**---**	**---**	**---**	**---**	**---**	**---**	**---**	**---**	Not operating
RW-12	3/11/2002	---	---	---	13,000	900	---	4,500	130	130	270	<5.0	---	
163.06	1/13/2003	10.90	---	---	4,100	1,800	---	1,000	130	99	99	<100	0.21	
	3/18/2004	13.63	---	---	17,000	---	---	2,700	960	230	1,500	1,400	---	
	6/16/2004	15.30	---	147.76	---	---	---	---	---	---	---	---	---	Not operating
	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
	3/22/2006	**6.35**	**---**	**156.71**	**---**	**---**	**---**	**---**	**---**	**---**	**---**	**---**	**---**	Not operating
RW-13	3/11/2002	---	---	---	830	79	---	190	13	13	34	<5.0	---	
164.34	1/13/2003	11.20	---	---	210	92	---	54	2.0	2.7	2.7	<5.0	0.35	
	3/18/2004	13.45	---	---	150	---	---	47	1.0	2.1	1.5	<5.0	---	
	6/16/2004	15.83	---	148.51	---	---	---	---	---	---	---	---	---	Not operating
	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
	3/22/2006	**6.65**	**---**	**157.69**	**---**	**---**	**---**	**---**	**---**	**---**	**---**	**---**	**---**	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-14	3/11/2002	---	---	---	270	82	---	44	0.99	<0.5	4.2	<5.0	---	
163.76	1/13/2003	11.00	---	---	3700	6800	---	230	77	91	91	<50	0.38	
	3/18/2004	12.81	---	---	220	---	---	42	1.4	0.99	5.2	<5.0	---	
	6/16/2004	15.41	---	148.35	---	---	---	---	---	---	---	---	---	Not operating
	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
	3/22/2006	**6.43**	**---**	**157.33**	**---**	**---**	**---**	**---**	**---**	**---**	**---**	**---**	**---**	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	---	

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

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

* = 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

--- = Not observed/not analyzed

Table 3. 2,000 Foot Radius DWR and ACPWA Well Survey Summary - Former Exxon Station, 3035 35th Avenue, Oakland, California

Map Location	State Well No. (DWR)	Owner/Site Name	Well Location	Installation Date	Well Type	Current Well Use	Total Well Depth (ft bgs)	Screened Interval (ft bgs)	Seal Interval (ft bgs)	Approximate Distance from Former USTs (ft)
1	2S/3W-4D3	Arthur Smith	3397 Arkansas Street	08/15/77	Irrigation	Exists (7/30/84)	62	20-62	0-20	740 north
2	2S/3W-5H1	C. Gravahlo	2719 Octavia Street	NA	Irrigation	Exists (7/30/84)	60	NA	NA	1,118 southwest
3	2S/3W-5H2	Barroera	2545 Harrington Avenue	1941	Irrigation	Exists (7/30/84)	115	NA	NA	2,000 southwest
4	2S/3W-4C	Pacific Gas & Electric Co.	Redding Street, 35 ft east of 35th Avenue	05/18/73	Cathodic	Exists (7/30/84)	120	95-120	0-95	1,630 northeast
5	2S/3W-4E1	Pacific Gas & Electric Co.	Allendale Avenue & Viola Street	02/03/75	Cathodic	Exists (12/13/84)	120	95-120	0-95	1,375 south
6	2S/3W-4D7	BP Oil Company	3201 35th Avenue	01/29/90	Remediation	Active (3/22/91)	40	20-40	0-8	520 northeast
6	2S/3W-4D4	Mobil Oil Corporation	3201 35th Avenue	07/30/86	Monitoring	Active (10/6/86)	45*	NA	NA	520 northeast
6	2S/3W-4D5	Mobil Oil Corporation	3201 35th Avenue	07/31/86	Monitoring	Active (10/6/86)	35*	NA	NA	520 northeast
6	2S/3W-4D6	Mobil Oil Corporation	3201 35th Avenue	07/31/86	Monitoring	Active (10/6/86)	35*	NA	NA	520 northeast
6	2S/3W-4D8	BP Oil Company	3201 35th Avenue	01/29/90	Monitoring	Active (3/22/91)	40	10-40	0-8	520 northeast
6	2S/3W-4D9	BP Oil Company	3201 35th Avenue	02/01/90	Monitoring	Active (3/22/91)	35	10-35	0-8	520 northeast
6	2S/3W-4D10	BP Oil Company	3201 35th Avenue	02/01/90	Monitoring	Active (3/22/91)	35	15-35	0-8	520 northeast

Table 3. 2,000 Foot Radius DWR and ACPWA Well Survey Summary - Former Exxon Station, 3035 35th Avenue, Oakland, California

Map Location	State Well No. (DWR)	Owner/Site Name	Well Location	Installation Date	Well Type	Current Well Use	Total Well Depth (ft bgs)	Screened Interval (ft bgs)	Seal Interval (ft bgs)	Approximate Distance from Former USTs (ft)
6	2S/3W-4D11	BP Oil Company	3201 35th Avenue	02/01/90	Monitoring	Active (3/22/91)	35	17-35	0-8	520 northeast
6	2S/3W-4D12	BP Oil Company	3201 35th Avenue	02/25/91	Monitoring	Active (8/1/91)	40	20-40	0-18	520 northeast
6	2S/3W-4D13	BP Oil Company	3201 35th Avenue	02/26/91	Monitoring	Active (8/1/91)	35	15-35	0-13	520 northeast
6	2S/3W-4D14	BP Oil Company	3201 35th Avenue	02/27/91	Monitoring	Active (8/1/91)	35	20-35	0-18	520 northeast
7	2S/3W-4C2	Texaco Station #6248000193	3450 35th Avenue	6/88	Monitoring	Active (12/16/88)	25	NA	NA	1,340 northeast
7	2S/3W-4C3	Texaco Station #6248000193	3450 35th Avenue	6/88	Monitoring	Active (12/16/88)	25	NA	NA	1,340 northeast
7	2S/3W-4D15	Exxon Co.	3450 35th Avenue	07/15/92	Monitoring	Active (7/27/93)	45	25-45	0-23	1,300 northeast
7	2S/3W-4D16	Exxon Co.	3450 35th Avenue	07/15/92	Monitoring	Active (7/27/93)	45	25-45	0-23	1,300 northeast
7	2S/3W-4D17	Exxon Co.	3450 35th Avenue	7/15/92	Monitoring	Active (7/27/93)	45	25-45	0-23	1,300 northeast
7	2S/3W-4D18	Exxon Co.	3450 35th Avenue	10/94	Monitoring	Active (7/24/97)	14	NA	NA	1,300 northeast
8	2S/3W-4C4	Unocal Corp.	3420 35th Avenue	12/13/89	Monitoring	Active (5/30/90)	44	24-44	0-22	1,214 northeast
8	2S/3W-4C5	Unocal Corp.	3420 35th Avenue	12/13/89	Monitoring	Active (5/30/90)	44	24-44	0-22	1,214 northeast
8	2S/3W-4C6	Unocal Corp.	3420 35th Avenue	12/13/89	Monitoring	Active (5/30/90)	43	23-43	0-21	1,214 northeast

Table 3. 2,000 Foot Radius DWR and ACPWA Well Survey Summary - Former Exxon Station, 3035 35th Avenue, Oakland, California

Map Location	State Well No. (DWR)	Owner/Site Name	Well Location	Installation Date	Well Type	Current Well Use	Total Well Depth (ft bgs)	Screened Interval (ft bgs)	Seal Interval (ft bgs)	Approximate Distance from Former USTs (ft)
9	2S/3W-5H3	SAAB Saver	2601 35th Avenue	12/95	Monitoring	Active (3/12/98)	25	NA	NA	1,300 southwest
9	2S/3W-5H4	SAAB Saver	2601 35th Avenue	12/95	Monitoring	Active (3/12/98)	23	NA	NA	1,300 southwest
9	2S/3W-5H5	SAAB Saver	2601 35th Avenue	12/95	Monitoring	Active (3/12/98)	25	NA	NA	1,300 southwest

Notes and Abbreviations:

Well information provided by the State of California Department of Water Resources (DWR) and Alameda County Public Works Agency (ACPWA) in June/July 2006.

Location = Column number refers to map location on Figure 1.

Well ID = California State well identification number as recorded by the Department of Water Resources in Sacramento, California.

Well Type = stated well use from DWR well drillers report and maps provided by ACPWA

ft bgs = feet below grade surface

NA = Not available

(x/xx/xx) = Date ACPWA confirmed the current well use.

* = Assumed total well depth is same as total boring depth on DWR well completion report. Well construction details were not provided on DWR well completion reports.

Location of wells are based on street addresses and DWR well completion reports and ACPWA data.

APPENDIX A

Agency Correspondence

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

May 16, 2006

Mr. Lynn Worthington
Golden Empire Properties, Inc.
5942 MacArthur Blvd. Suite B
Oakland, CA 94605

Subject: Fuel Leak Case No. RO0000271, Exxon Service Station, 3055 35th Avenue, Oakland, California.

Dear Mr. Worthington:

Please be advised that I have taken over the above referenced site from Mr, Amir Ghloami. Alameda County Environmental Health Department (ACEH) staff have reviewed the case file and a recently revised work plan received in February 2006 and entitled, "Revised Remediation Work Plan" prepared on your behalf by Cambria Environmental Technology. This letter is in response to the revised work plan. In addition to the report requested below, a Site Conceptual Model (SCM) should be prepared to summarize the site background, history, geology, hydrogeology, and investigation results to date for the site. The SCM also presents conclusions and recommendations for future actions. Lastly, ACEH request that the Corrective Action Plan (CAP) originally prepared in April 1998 be updated to reflect all site remediation activities.

Elevated concentrations of fuel hydrocarbons continue to be detected in groundwater in on-site monitoring wells, of particular concern are benzene concentrations in onsite monitoring wells. It also appears that the fuel hydrocarbon plume has not been adequately defined off site and the trajectory of the plume may be in the path of nearby residences. No monitoring wells or soil boring data exists off-site or downgradient of monitoring wells MW-3, MW-4 or RW-5. In order to assess the extent of dissolved fuel hydrocarbons in soil and groundwater, we request that you prepare a Work Plan to collect soil and groundwater samples offsite along the plume axis to define the extent of contamination in the downgradient direction.

Based on ACEH staff review of the case file, we request that you address the following technical comments and prepare a work plan detailing work to be performed, and send us the reports described below. Please provide 72-hour advance written notification to this office (e-mail preferred to steven.plunkett@acgov.org) prior to the start of field activities.

TECHNICAL COMMENTS

1. **Proposed Interim Remedial Alternative.** In-situ Chemical Oxidation (ISOC) has been proposed as the most cost effective technique to address the remediation goals at the subject site. Previously, Dual Phase Vapor Extraction (DPE) was implemented as the interim remedial alternative. The results of the interim DPE indicate that soils at the site have low permeability to air and groundwater flow, which limits the effectiveness of in-situ remedial technologies. Given hydrogeologic conditions at the site, ACEH is concerned that ISOC using ozone may not have a significant impact because the technique may have limited distribution due to low permability soils. Additionally, several remedial alternatives have been used at the site with varying degrees of success. Please discuss specific soil characteristics, in particular

site with varying degrees of success. Please discuss specific soil characteristics, in particular soil permability, and how these qualities will allow the effective distribution of ISOC using ozone in the subsurface. In addition, please elaborate on the rational for your decisions regarding sparge point screen intervals and linear distances. Please present your conclusion in the revised work plan presented below.

Furthermore, ACEH recommends updating the Corrective Action Plan (CAP) prepared in April 1998 to reflect all remediation activities that have occurred at the site, as ISOC and ozone sparging was not a recommended remedial alternative in the original CAP. The updated CAP should recommend several technically and economically feasible methods to meet cleanup objective leading to site closure. The CAP must also discuss monitoring and evaluation of remedial alternatives in order to demonstrate the efficacy of the chosen remediation method leading to the completion of corrective actions. Please see 23 CCR Section 2726 for CAP preparation guidelines. Please propose a schedule for implementing the corrective action plan in the work plan requested below.

2. **Preparation of Site Conceptual Model**. The SCM for this project is to incorporate, but not be limited to, the following:

   A. A concise narrative discussion of the regional geologic and hydrogeologic setting. Include a list of technical references you reviewed.

   B. A concise discussion of the on-site and off-site geology, hydrogeology, release source and history, secondary source areas, remediation status, risk assessment, plume migration, attenuation mechanisms, preferential pathways, and potential threat to downgradient receptors. The SCM shall include an analysis of the hydraulic flow system at and downgradient from the site, including potential vertical hydraulic gradients.

   C. Local and regional maps showing location of sources, extent of soil and groundwater contamination for appropriate depth intervals (i.e., an interpretive drawings and isoconcentration maps—not a plot of laboratory results), rose diagram of recent and historical groundwater gradients, and locations of receptors. "Receptors" include, but are not limited to, all supply wells and surface water bodies within 2,000 feet of the source area, and all potentially impacted schools, hospitals, daycare facilities, residences, and other areas of heightened concern for vapor impact.

   D. Geologic cross-sections, which include an interpretive drawing of the vertical extent of soil and groundwater contamination (i.e., an interpretive drawing—not a plot of laboratory results). The SCM report requested below is to include one cross section parallel and one cross section perpendicular to the contaminant plume axis. Each cross section should include, but not be restricted to, the following:

      1. Subsurface geologic features, depth to groundwater and man-made conduits.
      2. Surface topography. The cross sections should be extended off-site where necessary to show significant breaks in slope.
      3. Soil descriptions for all borings and wells along the line of section.
      4. Screen and filter pack intervals for each monitoring well.
      5. Sampling locations and results for soil and grab groundwater samples.
      6. Site features such as the tank pit, dispensers, etc.
      7. Where appropriate, monitoring well location and soil boring locations will be projected back to the strike of the cross section line.

E. Temporal changes in the plume location and concentrations are also a key element of the SCM. In addition to providing a measure of the magnitude of the problem, these data are often useful to confirm details of the flow system inferred from the hydraulic head measurements.

F. Exposure evaluation flowchart (similar to Figure 2 in ASTM's Standard Guide for Risk-Based Corrective Action Applied at Petroleum Release Sites) and/or a graphical SCM (similar to Figure 1 in the Central Valley Regional Water Quality Control Board's Appendix A – Reports, Tri - Regional Board Staff Recommendations For Preliminary Investigation And Evaluation Of Underground Tank Sites, 16 April 2004).

G. Plots of chemical concentrations vs. time and vs. distance from the source. Plots should be shown for each monitoring well, which has had detectable levels of contaminants.

H. Summary tables of chemical concentrations in each historically sampled media (including soil, groundwater and soil vapor).

I. Boring and well logs (including construction/screening), and a summary table indicating construction specifications for each monitoring and extraction well.

J. Identification and listing of specific data gaps that require further investigation during subsequent phases of work.

Please prepare and present the SCM in the report requested below.

3. **Proposed activities to investigate and fill data gaps identified above.**

4. **Off Site Investigation and Soil and Groundwater Sampling.** During previous investigations it appears that no soil or groundwater samples were collected off site. ACEH recommends that an off site investigation be conducted to determine the extent of pollution in both soil and groundwater. Given the groundwater flow direction as determined by Cambria, it appears that the contamination plume is migrating in the direction of near by residences. Consequently, ACEH requests Cambria investigate the extent of off site soil and groundwater contamination to ascertain the extent of off site contamination plume migration.

   ACEH requests soil and groundwater samples be collected off site and down gradient of the site on 35th Avenue. All soils from the boreholes are to be examined for staining and odor and are to be screened using a PID. Soil samples are to be collected from any interval where staining, odor, or elevated PID readings are observed. If no staining, odor, or elevated PID readings are observed, soil sample are to be collected from each boring at the capillary fringe, where groundwater is first encountered and at five foot intervals until total depth of the boring is reached. After soil sampling has been completed grab groundwater samples should be collected from the soil boring. All soil and groundwater samples are to be analyzed for TPHg, BTEX, and fuel oxygenates including TAME, ETBE, DIPE, TBA AND EtOH using EPA methods 8015M and 8260B, respectively. Please prepare a work plan detailing the proposed investigation and requested below.

   remove this requirement per. comm. S. Plunkett 7/12/06

   MTBE per. comm. S. Plunkett 6/15/06

5. **Quarterly Groundwater Monitoring**. ACEH recommends sampling wells MW-1 through MW-4 and recovery wells RW-5 through RW-9, RW-11 and RW-12 on a quarterly basis after interim remediation and off site investigation. However, should contamination remain at levels currently detected on site, groundwater monitoring may need to continue into the future and

other forms of remediation may need to be considered to reduce the concentrations of dissolved petroleum hydrocarbon in the subsurface.

TECHNICAL REPORT REQUEST

Please submit technical reports to Alameda County Environmental Health (Attention: Mr. Steven Plunkett), according to the following schedule:

- **June 15, 2006** – Updated Corrective Action Plan
- **June 30, 2006** – Revised ISOC and Ozone Sparging Interim Remediation Work Plan Report
- **July 15, 2006** – Offsite Soil and Groundwater Investigation Work Plan/SCM Report
- **September 15, 2006** – Quarterly Groundwater Monitoring Report Third Quarter 2006
- **December 15, 2006** – Quarterly Groundwater Monitoring Report Fourth Quarter 2006

These reports are being requested pursuant to California Health and Safety Code Section 25296.10. 23 CCR Sections 2652 through 2654, and 2721 through 2728 outline the responsibilities of a responsible party in response to an unauthorized release from a petroleum UST system, and require your compliance with this request.

ELECTRONIC SUBMITTAL OF REPORTS

The Alameda County Environmental Cleanup Oversight Programs (LOP and SLIC) require submission of all reports in electronic form to the county's ftp site. Paper copies of reports will no longer be accepted. The electronic copy replaces the paper copy and will be used for all public information requests, regulatory review, and compliance/enforcement activities. Instructions for submission of electronic documents to the Alameda County Environmental Cleanup Oversight Program ftp site are provided on the attached "Electronic Report Upload (ftp) Instructions." Please do not submit reports as attachments to electronic mail.

Submission of reports to the Alameda County ftp site is an addition to existing requirements for electronic submittal of information to the State Water Resources Control Board (SWRCB) Geotracker website. Submission of reports to the Geotracker website does not fulfill the requirement to submit documents to the Alameda County ftp site. In September 2004, the SWRCB adopted regulations that require electronic submittal of information for groundwater cleanup programs. For several years, responsible parties for cleanup of leaks from underground storage tanks (USTs) have been required to submit groundwater analytical data, surveyed locations of monitor wells, and other data to the Geotracker database over the Internet. Beginning July 1, 2005, electronic submittal of a complete copy of all necessary reports was required in Geotracker (in PDF format). Please visit the SWRCB website for more information on these requirements (http://www.swrcb.ca.gov/ust/cleanup/electronic_reporting).

PERJURY STATEMENT

All work plans, technical reports, or technical documents submitted to ACEH must be accompanied by a cover letter from the responsible party that states, at a minimum, the following: "I declare, under penalty of perjury, that the information and/or recommendations contained in the attached document or report is true and correct to the best of my knowledge." This letter must be signed by an officer or legally authorized representative of your company. Please include a cover letter satisfying these requirements with all future reports and technical documents submitted for this fuel leak case.

PROFESSIONAL CERTIFICATION & CONCLUSIONS/RECOMMENDATIONS

The California Business and Professions Code (Sections 6735, 6835, and 7835.1) requires that work plans and technical or implementation reports containing geologic or engineering evaluations and/or judgments be performed under the direction of an appropriately registered or certified professional. For your submittal to be considered a valid technical report, you are to present site specific data, data interpretations, and recommendations prepared by an appropriately licensed professional and include the professional registration stamp, signature, and statement of professional certification. Please ensure all that all technical reports submitted for this fuel leak case meet this requirement.

UNDERGROUND STORAGE TANK CLEANUP FUND

Please note that delays in investigation, later reports, or enforcement actions may result in your becoming ineligible to receive grant money from the state's Underground Storage Tank Cleanup Fund (Senate Bill 2004) to reimburse you for the cost of cleanup.

AGENCY OVERSIGHT

If it appears as though significant delays are occurring or reports are not submitted as requested, we will consider referring your case to the Regional Board or other appropriate agency, including the County District Attorney, for possible enforcement actions. California Health and Safety Code, Section 25299.76 authorizes enforcement including administrative action or monetary penalties of up to $10,000 per day for each day of violation.

If you have any questions, please call me at (510) 383-1767.

Sincerely,

Steven Plunkett
Hazardous Materials Specialist

cc: Mr. Subbarao Nagulapaty
Cambria Environmental Technology, Inc.
5900 Hollis Street, Suite A
Emeryville, Ca 94608

Donna Drogos, ACEH
Steven Plunkett, ACEH
File

APPENDIX B

Boring Logs

DRILLING LOG

Client: Lynn Worthington

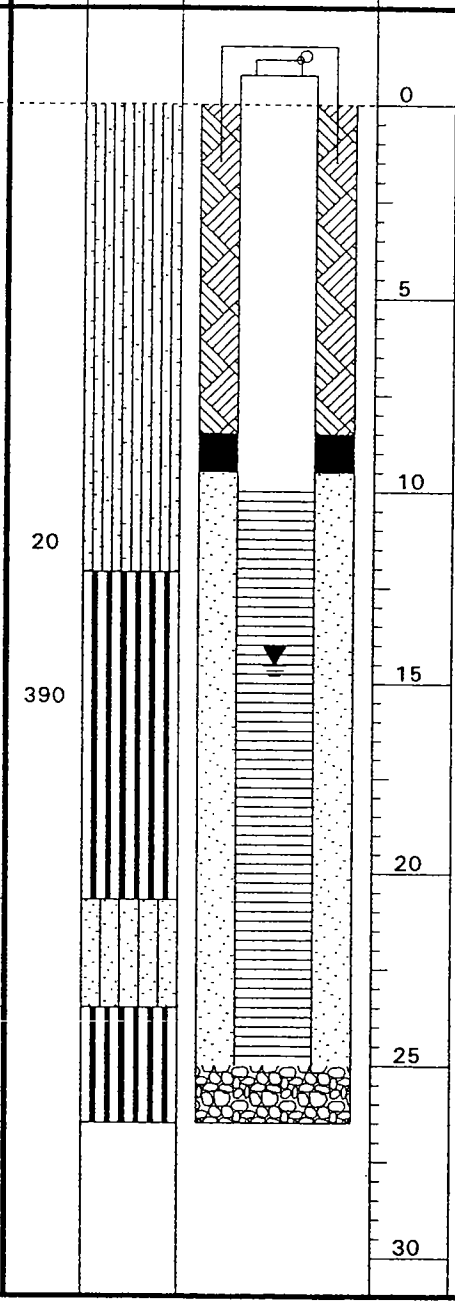
Project No: 20-105-20 Phase 4 Task 4

Boring ID SB-G Well ID MW-1

Location 3055 35th Ave, Oakland

Surface Elev. --- ft, Page 1 of 1

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			



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**

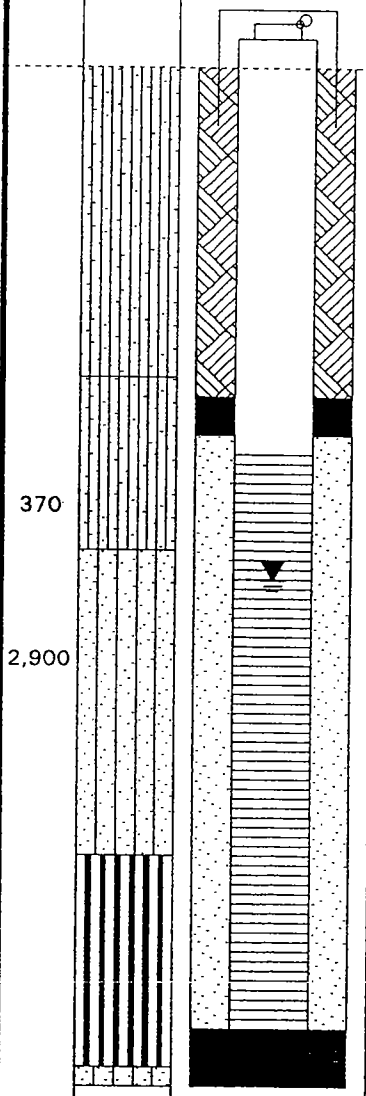
Location **3055 35th Ave, Oakland**

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			
				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			
				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			
20	7 10 11			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			
				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): 370; 2,900

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
5	
10	
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:

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**

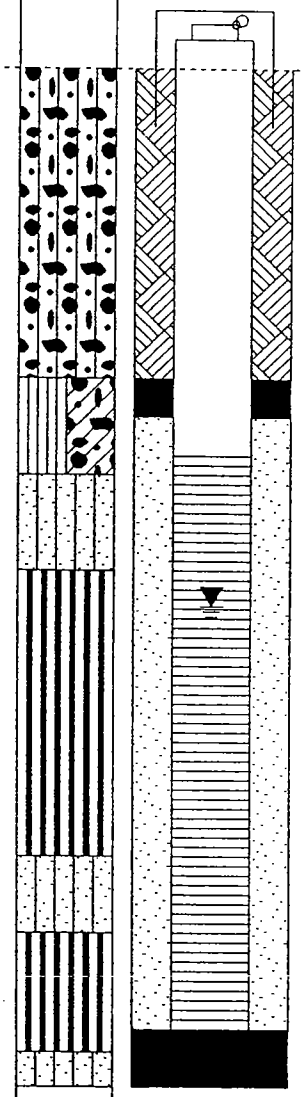
Location **3055 35th Ave, Oakland**

Surface Elev. --- ft,

Depth Feet	Blow Count	Sample	Interval	Lithologic Description
0	Ground Surface			
5	25 23 31	X		**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.
10	11 18 35	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.
15	7 10 16	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.
20	7 11 20	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.
25	N/A	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.
				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.
30				**Silty SAND** Brown; very stiff; wet; <5% clay, 20% silt, 60% sand, 20%

Continued Next Page

TPHg (ppm): 25, 490



Depth Feet	Well Construction Details
0	T.O.C. Elev. 96.87
	Locking well plug and above-grade steel stovepipe
5	
10	
15	
20	
25	
30	

Driller **Soils Exploration**

Logged By **N. Scott MacLeod**

Drilling Started **5/6/94**

Drilling Completed **5/6/94**

Construction Completed **5/9/94**

Development Completed **5/17/94**

Water Bearing Zones **20.5 to 26.5 ft**

Development Yield **N/A**

Well Casing **2** Dia. **0** to **10**

Casing Type **Schedule 40 PVC**

Well Screen **2** 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 to 9 ft**

Sand Pack **Monterey sand**

Sand Pack Type **#2/16**

Static Water Level **13.93** 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	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 Task150

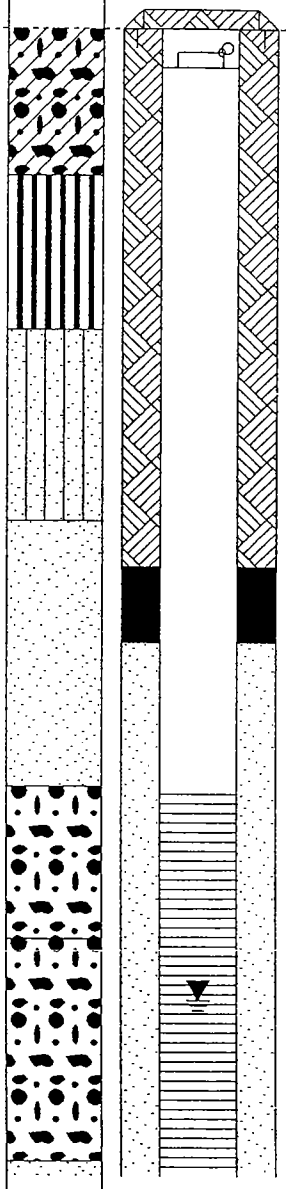
Well ID MW-4 Boring ID MW-4

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.
				Gravelly Silty SAND; (SP); brown; damp; 30% silt, 50% sand, 20% 0.5"-diameter gravel; no plasticity; medium to high estimated permeability.
				20% silt, 50% sand, 30% 0.25"- to 0.5"-diameter gravel, increasing gravel content
10				**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.
				10% clay, 20% silt, 30% sand, 40% gravel; low to medium plasticity
15				Continued Next Page

TPHg (ppm): 64.0



Depth (feet): 0, 5, 10, 15

Well Construction Details: T.O.C. Elev.; 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	

Cambria Environmental Technology, Inc.

DRILLING LOG

Client: Lynn Worthington

Project No: 13-105 Phase Task150

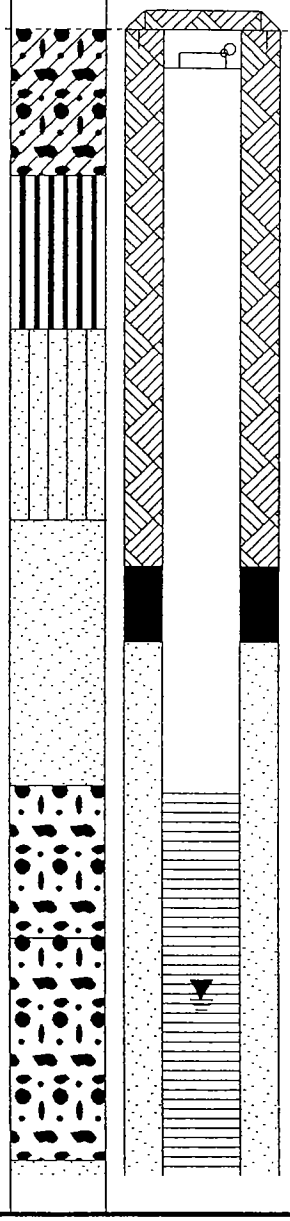
Well ID MW-4 Boring ID MW-4

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.
				20% silt, 50% sand, 30% 0.25"- to 0.5"-diameter gravel, increasing gravel content
10				
		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.
				10% clay, 20% silt, 30% sand, 40% gravel; low to medium plasticity
15				
				Continued Next Page

TPHg (ppm): 64.0



Well Construction Graphics

Depth (feet): 0, 5, 10, 15

Well Construction Details:

T.O.C. Elev.

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	

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
				Continued from previous page
15				**Silty SAND**; (SP); brown-green; damp; 5% clay, 30% silt, 60% sand, 5% gravel; low plasticity; moderate estimated permeability.
				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.
				Sandy Clayey SILT; (MH); wet; 25% clay, 50% silt, 25% sand; medium to high plasticity; low to moderate estimated permeabilty.
25				25% clay, 60% silt, 15% fine to medium sand
30				
35				

TPHg (ppm)	Graphic Log	Well Construction Graphics	Depth (feet)	Well Construction Details
530.0			15	
			20	
			25	Water first encountered @ 23 ft.
			30	Bottom of boring @ 30 ft.
			35	

WELL 20105 5/27/97

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**

BORING LOG

Client: **Lynn Worthington**

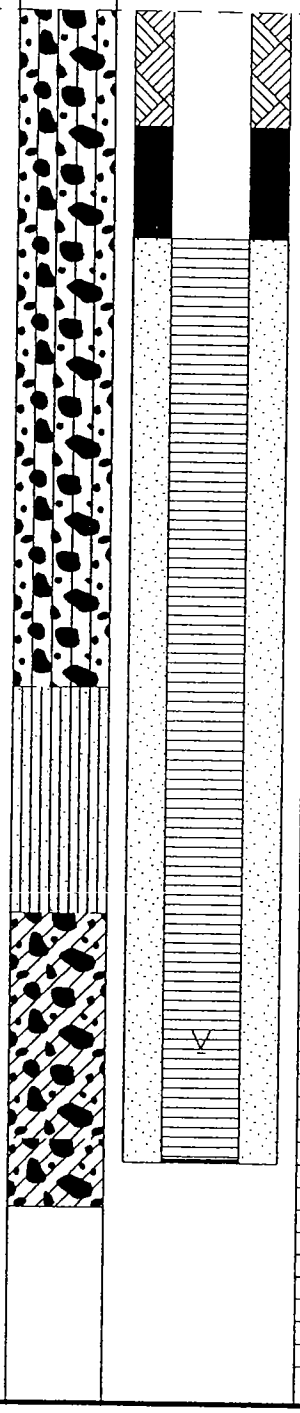
Project No: **130-0105** Phase Task **201**

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	X	100%	
	50	X	100%	
10	12	X	100%	
	21	X	100%	
	38	X	100%	
15	8	X	100%	**Sandy Silt**; (MLS); brown; stiff; dry; 30% clay, 50% silt, 20% sand; moderate plasticity; nlow estimated permeability.
	10	X	100%	
	12	X	100%	
20	12	X	100%	**Clayey GRAVEL**; (GC); brown with green mottling; hard; damp; 20% clay, 20% silt, 30% sand, 30% gravel; low plasticity; low estimated permeability.
	24	X	100%	
	37	X	100%	
25	17	X	100%	15% clay, 10% silt, 15% sand, 60% gravel; wet.
	20	X	100%	
	31	X	100%	
30				



Additional Comments
No chemical odor.
Strong hydrocarbon odor.
No chemical odor.
Moderate to strong hydrocarbon odor.
No chemical odor. Bottom of well @ 25.5 ft.

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
0	Ground Surface			
				Clayey GRAVEL; orange-brown; dense; dry; 15% clay, 20% silt, 25% sand, 40% gravel; low plasticity; low estimated permeability.
5	14	X	100%	
	30	X	100%	
	31	X	100%	
10	15	X	100%	Brown with green mottling; damp.
	28	X	100%	
	30	X	100%	
15	14	X	100%	**Sandy CLAY**; (CLS); brown with green mottling; hard; damp; 40% clay, 20% silt, 25% sand, 15% gravel; low plasticity; low estimated permeability.
	15	X	100%	
	20	X	100%	
20	11	X	100%	
	18	X	100%	
	20	X	100%	
25	8	X	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	X	100%	
	11	X	100%	
30				

Continued Next Page

TPHg (ppm) | Graphic Log | Boring Completion Graphics

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
				Continued from previous page
30				
	10		100%	Fine to medium sand.
	14		100%	
	15		100%	
35				
40				
45				
50				
55				
60				

TPHg (ppm)	Graphic Log	Boring Completion Graphics	Depth (feet)	Additional Comments
			30	Bottom of well @ 29.5 ft. No chemical odor.
			35	
			40	
			45	
			50	
			55	
			60	

BORING LOG

Client: **Lynn Worthington**

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

Boring ID **RW-8**

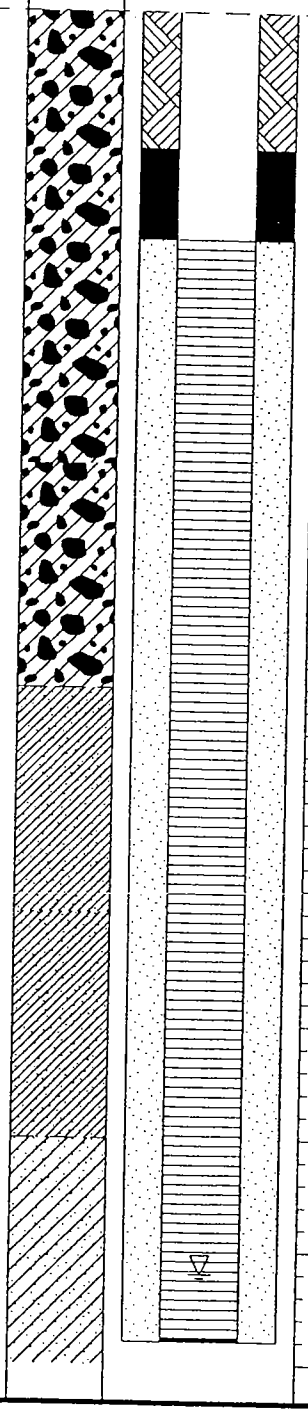
Location **3055 35th Ave., Oakland**

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		100%	
	50		100%	
10	8		100%	Brown with green mottling; damp.
	19		100%	
	24		100%	
15	11		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		100%	
	15		100%	
20	12		100%	Hard.
	19		100%	
	20		100%	
25	7		100%	**CLAY**; (CL); brown; stiff; damp; 80% clay, 10% silt, 10% fine sand; low plasticity; low estimated permeability.
	9		100%	
	10		100%	
30				

Continued Next Page

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.
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**

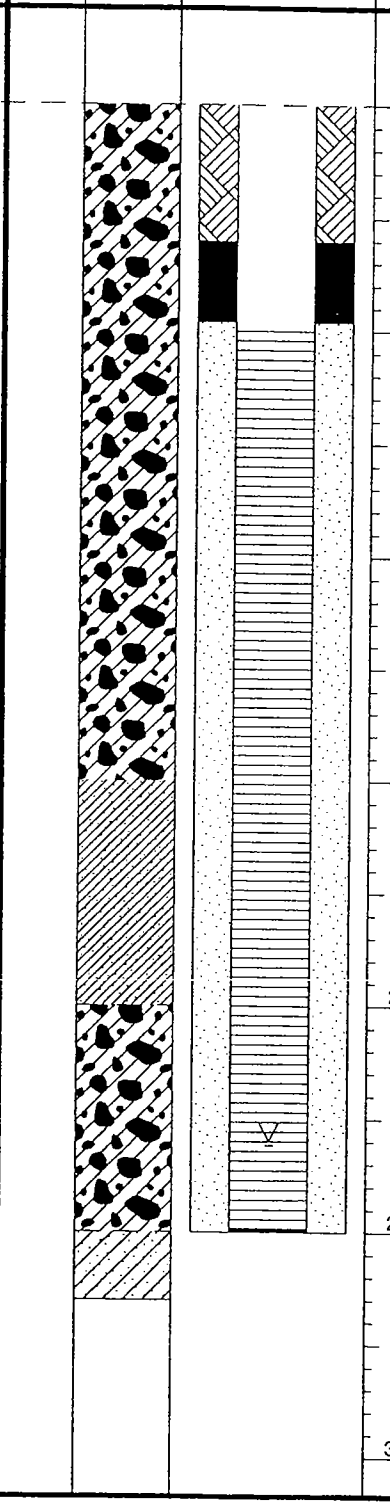
Boring ID **RW-9**

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

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

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

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				



Additional Comments
No odor.
Strong hydrocarbon odor.
Strong hydrocarbon odor.
Strong hydrocarbon odor.
Slight hydrocarbon odor. Bottom of well and boring @ 25.0 ft.

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**

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**

BOR BORLOGS.GPJ 9/16/98

Cambria Environmental Technology, Inc.

BORING LOG

Client: **Lynn Worthington**

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

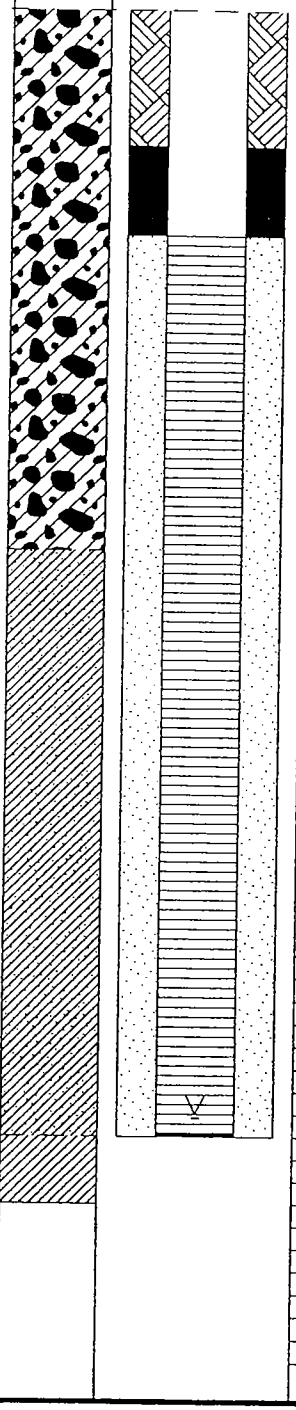
Boring ID **RW-11**

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.
10				**Sandy CLAY**; (CLS); brown with green mottling; hard; damp; 40% clay, 25% silt, 20% sand, 15% gravel; low plasticity; low estimated permeability.
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**

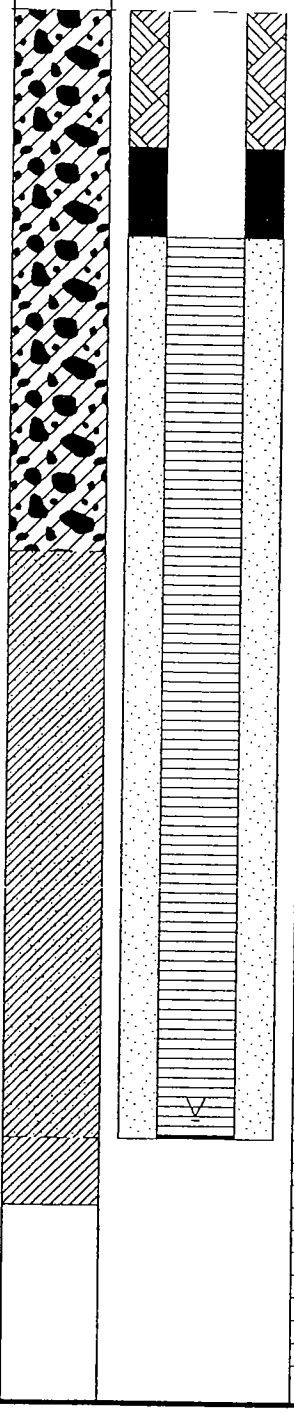
Boring ID **RW-11**

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.
10				**Sandy CLAY**; (CLS); brown with green mottling; hard; damp; 40% clay, 25% silt, 20% sand, 15% gravel; low plasticity; low estimated permeability.
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**

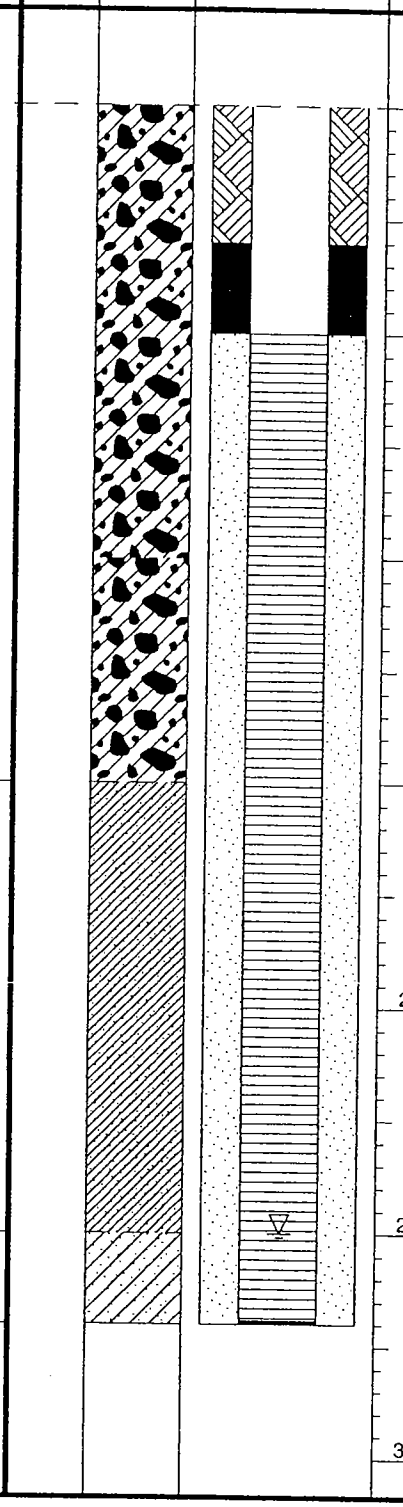
Project No: **130-0105** Phase Task **201**

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			
				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				



Additional Comments

- No chemical odor.
- Strong hydrocarbon odor.
- Slight hydrocarbon odor.
- Bottom of well @ 27.0 ft.

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**

BORING LOG

Client: **Lynn Worthington**

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

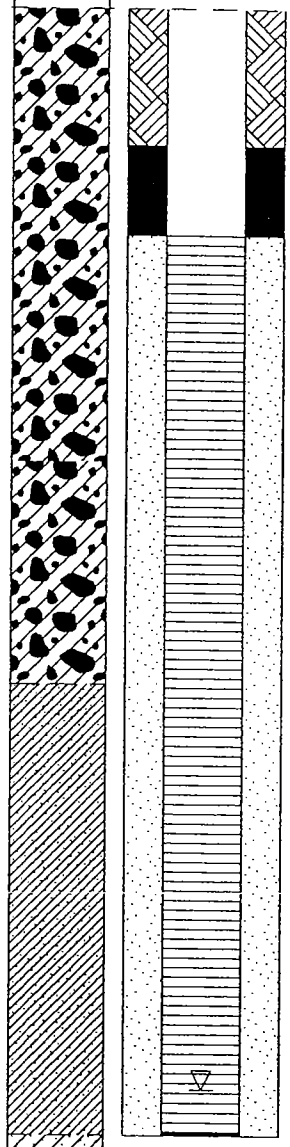
Boring ID **RW-14**

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**

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
0	Ground Surface			
5	9 21 25			**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.
10	5 10 25			**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.
15	6 9 10			**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.
20	10 15 18			**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.
25	11 18 20			No hydrocarbon odor
30				

TPHg (ppm): 3; 1,600

Graphic Log

Boring Completion Graphics

Additional Comments: Bottom of boring

Driller **Soils Exploration**	Drilling Started **5/5/94**	Notes:
Logged By **N. Scott MacLeod**	Drilling Completed **5/5/94**	
Water-Bearing Zones **12 to 18 ft**	Grout Type **Portland cement**	

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,**

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	
				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	6 15 34	X						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	
				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	11 18 16	X						20	
25	8 15 21	X						25	
									Bottom of boring
30								30	

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,

Depth Feet	Blow Count	Sample Interval	Lithologic Description	TPHg (ppm)	Graphic Log	Boring Completion Graphics	Depth Feet	Additional Comments
0	Ground Surface						0	
			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.					
5	13 19 21						5	
			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.					
10	11 21 31			<1			10	
			Silty SAND Brown; hard; moist; <5% clay, 40% silt, 55% sand, <5% gravel; low plasticity; low estimated hydraulic conductivity. Very strong weathered gasoline odor.					
15	11 13 22			<1			15	
			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.					
20							20	Bottom of boring
25							25	
30							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

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	
			Slight weathered gasoline odor.					
20	3 7 9						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.

Project: 35th and School (Oakland)

Project No.: AC10C7-1.27

Field Geologist: Cherven/Marty

Drilling Co.: K L Drilling

Auger Type: 8" Hollow Stem

Geological Audit Services, Inc.
Yorba Linda - Stockton

BORING LOG

Boring: B-1

Date: 5 November 1991

Depth (feet)	Sample Identification	OV Reading (PPM)	Blow Counts	Group Symbol	Soil Description
					Clayey, silty, sandy, gravelly; may be backfill material in upper 2 feet. Moderate odor.
				ML	Well graded pebbly, sandy, clayey silt
10	B1-10	44	5 10 15		Yellow-brown, slightly damp, medium dense, clayey-pebbly sand moderate hydrocarbon odor
	B1-15	117	4 16 26	SC	
20	B1-20	525	5 11 14		sandy clay to clayey sand moderate hydrocarbon odor
	B1-25	0	6 12 14		clayey sand to slightlly clayey coarse grained sand
30	B1-30	12	7 21 35		Light brown, dry to slightly moist, dense, slightly clayey coarse grained sand slight hydrocarbon odor driller reports water at 34 feet
	B1-35	3	4 17 23	SM-SC	Reddish brown,moist, medium dense, medium to coarse grained sand strongly mottled
40					Total Depth of Boring 35 feet

REGISTERED GEOLOGIST
VICTOR B. CHERVEN
No. 3475
STATE OF CALIFORNIA

Project: 35th and School (Oakland)

Project No.: AC10C7-1.27

Field Geologist: Cherven/Marty

Drilling Co.: K L Drilling

Auger Type: 8" Hollow Stem

Geological Audit Services, Inc.
Yorba Linda - Stockton

BORING LOG

Boring: B-2

Date: 5 November 1991

Depth (feet)	Sample Identification	OV Reading (PPM)	Blow Counts	Group Symbol	Soil Description
					Yellow-brown clayey, pebbly, coarse sand
10	B2-10	177	6 12 13	SC	Light yellow-brown, medium dense, clayey fine sand some oxidation and mottling
				ML	Slightly moist, very sticky, fine grained silty clay; slight hydrocarbon odor
	B2-15	119	13 19 26	SW	Yellow green, slightly clayey, very coarse gravelly sand
	B2-18.5	0	8 7	GC	Slightly damp, medium dense, clayey gravel clasts to 1" in diameter
20			16		slight hydrocarbon odor
	B2-25	0	3 11 13	ML	Light yellow to tan, very stiff, sandy silt or silty sand
					Moist gravelly clay
30	B2-30	2	9 36 45	GC	Yellow-reddish clayey gravel reddish mottles
	B2-35	0	4 10 22	SC	Yellow, moist, clayey coarse sand no hydrocarbon odor
					Total Depth of Boring 35 feet
40					

REGISTERED GEOLOGIST
VICTOR B. CHERVEN
No. 3475
STATE OF CALIFORNIA

Project: 35th and School (Oakland)

Project No.: AC10C7-1.27

Field Geologist: Cherven/Marty

Drilling Co.: K L Drilling

Auger Type: 8" Hollow Stem

Geological Audit Services, Inc.

Yorba Linda - Stockton

BORING LOG

Boring: B-3

Date: 6 November 1991

Depth (feet)	Sample Identification	OV Reading (PPM)	Blow Counts	Group Symbol	Soil Description
10					
	B3-15		7 18 26	SC	Light yellow-brown, dense, clayey sand and gravel strong hydrocarbon odor
20	B3-20		5 10 15		Greenish-brown, medium dense, clayey sand little weathering strong hydrocarbon odor
	B3-24		8 15 16	SC-GC	Moist to very moist, dense, gravelly, clayey sand no odor; driller reports water at 24'
30					
40					

REGISTERED G
VICTOR B. C.
No. 34?8
STATE OF CA

Project: 35th and School (Oakland)

Project No.: AC10C7-1.27

Field Geologist: Cherven

Drilling Co.: S E S

Auger Type: 8" Hollow Stem

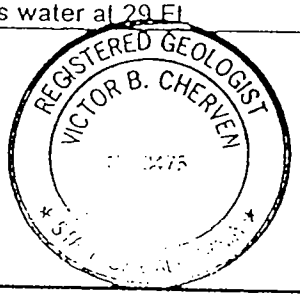
Geological Audit Services, Inc.
Yorba Linda - Stockton

BORING LOG

Boring: B-4

Date: 6 November 1991

Depth (feet)	Sample Identification	OV Reading (PPM)	Blow Counts	Group Symbol	Soil Description
				SC	Clayey sand, no odor
				GC	Clayey, pebbly gravel
10				SM-MH	Silty sand with some clay; few pebbles
				SW	Medium brown, slightly clayey sand; few pebbles, no odor
				GP	Medium brown to grey, well sorted pea gravel; some clay
	B4-15	463	6 12 18	SC	Yellow brown, moist, medium dense, clayey sand moderate hydrocarbon odor
20	B4-20	544	6 12 18	SC-CL	Yellow brown, moist, medium dense, clayey coarse sand slight hydrocarbon odor
	B4-25		2 4 10	ML	Yellow orange, moist, stiff, clayey-silty sand; abundant oxidation, no odor
30	B4-30		4 9 14	CH-SW	Damp, sandy clay with saturated gravel lenses no odor
	B4-35		11 17 23	GC	Saturated, dense, clayey, sandy gravel oxidized, no odor driller reports water at 29 Ft
40					Bottom of Boring 35 feet



Project: 35th and School (Oakland)

Project No.: AC10C7-1.27

Field Geologist: Cherven

Drilling Co.: S E S

Auger Type: 8" Hollow Stem

Geological Audit Services, Inc.
Yorba Linda - Stockton

BORING LOG

Boring: B-5

Date: 6 November 1991

Depth (feet)	Sample Identification	OV Reading (PPM)	Blow Counts	Group Symbol	Soil Description
10					
	B5-15			SC	Greenish-brown, very moist, loose, very coarse clayey sand; strong hydrocarbon odor
			15		
20	B5-20		16 30	GC	Green, moist, dense, clayey, gravelly sand moderate to strong hydrocarbon odor
			7		
	B5-25		9	ML	Yellow brown, wet, very stiff, clayey fine sand no odor
			9		
					Bottom of Boring 25 feet
30					
40					

REGISTERED GEOLOGIST
VICTOR B. CHERVEN
No. 3475
STATE OF CALIFORNIA

Project: 35th and School (Oakland)

Project No.: AC10C7-1.27

Field Geologist: Cherven

Drilling Co.: S E S

Auger Type: 8" Hollow Stem

Geological Audit Services, Inc.
Yorba Linda - Stockton

BORING LOG

Boring: B-6

Date: 6 November 1991

Depth (feet)	Sample Identification	OV Reading (PPM)	Blow Counts	Group Symbol	Soil Description
10					
	B6-15		3 14 10	SW	Medium brown, dry, medium dense, clayey, gravelly sand greenish mottling moderate hydrocarbon odor
20	B6-20			SC	Reddish-yellow, slightly moist, clayey fine sand slight odor
	B6-25		9 10 12	ML	Light yellow-brown, moist, very stiff,clayey, silty fine sand
				SP	Well-sorted coarse sand, saturated
30					Bottom of Boring 25.5 feet
40					

REGISTERED GEOLOGIST
VICTOR B. CHERVEN
No. 3475
STATE OF CALIFORNIA

Project: 35th and School (Oakland)

Project No.: AC10C7-1.27

Field Geologist: Cherven

Drilling Co.: S E S

Auger Type: 8" Hollow Stem

Geological Audit Services, Inc.
Yorba Linda - Stockton

BORING LOG

Boring: B-7

Date: 6 November 1991

Depth (feet)	Sample Identification	OV Reading (PPM)	Blow Counts	Group Symbol	Soil Description
	B7-5		8 18 26	SW	Black, dense, gravelly sand; organic at the top clasts to 2"; no odor
10	B7-10		11 25 32		25% recovery; very gravelly; no sample for description
	B7-15		7 12 14	SW- SC	Light brown, moist, medium dense, clayey, gravelly sand moderate odor
20	B7-20		2 5 10		Greenish brown to yellow-brown, moist, medium dense, clayey gravelly sand moderate to strong odor
	B7-25		3 10 18	ML	Light yellow-brown, very stiff, clayey fine sand no odor
30	B7-30		12 18 26	SC	Yellow-brown, moist, dense, coarse to very coarse clayey sand no odor
					Bottom of Boring 30 feet
40					

REGISTERED GEOLOGIST
VICTOR B. CHERVEN
No. 3475
STATE OF CALIFORNIA

Project: 35th and School (Oakland)

Project No.: AC10C7-1.27

Field Geologist: Cherven

Drilling Co.: S E S

Auger Type: 8" Hollow Stem

Geological Audit Services, Inc.
Yorba Linda - Stockton

BORING LOG

Boring: B-8

Date: 6 November 1991

Depth (feet)	Sample Identification	OV Reading (PPM)	Blow Counts	Group Symbol	Soil Description
10					
	B8-15		3 7 12	GC	Yellow-brown, medium dense, clayey gravel blue-green mottling
20	B8-20		2 11 16	SC	Light brown, moist, mdium dense, medium to coarse clayey sand no odor
	B8-25		2 5 9	SL-ML	Light yellow-brown, stiff, slightly sandy clay no odor
30	B8-30		2 10 12		
				SW	Driller reports water at 33 feet
	B8-35		20 50		Liight brown, saturated, clayey gravelly sand no odor
40					Bottom of Boring 35 feet

REGISTERED GEOLOGIST
VICTOR B. CHERVEN
No. 3475
STATE OF CALIFORNIA

BORING LOG

Geological Audit Services, Inc.

Project: 35th and School (Oakland)

Project Number: AC 10C7-1.27

Drilling Co.: Soils Exploration Service

Date : 5/11/91

Field Geologist: Cherven

Auger Type: 8" Hollow Stem

Boring: B-9

DEPTH (FEET)	SAMPLE IDENTIFICATION	OV READING (PPM)	BLOW CNTS.	GROUP SYMBL	SOIL DESCRIPTION
10	SB9-15		3 9 14	SC- SP	Light yellow brown, clayey, medium- to coarse-grained sand, grading down to very coarse, pebbly, loose, very moist sand; sharp contact in lower 2 inches with medium brown to greenish black, very clayey sand; strong odor
20					Terminated boring and moved back to edge of property to drill B-12
30					
40					

REGISTERED GEOLOGIST
VICTOR B. CHERVEN
No. 3475
STATE OF CALIFORNIA

Project: 35th and School (Oakland)

Project No.: AC10C7-1.27

Field Geologist: Cherven

Drilling Co.: S E S

Auger Type: 8" Hollow Stem

Geological Audit Services, Inc.
Yorba Linda - Stockton

BORING LOG

Boring: B-10

Date: 6 November 1991

Depth (feet)	Sample Identification	OV Reading (PPM)	Blow Counts	Group Symbol	Soil Description
10					
	B10-15		7 11 13	GC- SC	Yellow-brown, moist, medium dense, clayey-gravelly sand very strong odor
20	B10-20		5 13 20		Yellow-brown, medium dense, clayey medium-to-coarse sand with dark brown clay lenses strong odor
	B10-25		3 8 11	SC- OH	Light-yellow to brown, medium dense, clayey medium-grained sand with black clay leses no odor
30	B10-30				Water at 28 feet; saturated clayey coarse sand
					Bottom of boring 30 feet — oil sheen no sample
40					

REGISTERED GEOLOGIST
VICTOR B. CHERVEN
No. 3475
STATE OF CALIFORNIA

Project: 35th and School (Oakland)

Project No.: AC10C7-1.27

Field Geologist: Cherven

Drilling Co.: S E S

Auger Type: 8" Hollow Stem

Geological Audit Services, Inc.
Yorba Linda - Stockton

BORING LOG

Boring: B-11

Date: 6 November 1991

Depth (feet)	Sample Identification	OV Reading (PPM)	Blow Counts	Group Symbol	Soil Description
10					
	B11-14		4 10 15	SW- GP	Medium-brown, medium dense, slightly clayey sand with gravel to 3/4"; sharp contact with light-green fine to medium sand for 2"; grades down to gravel with 2" clasts moderate to strong odor
20	B11-20		8 15 18	SP- SC	Reddish-brown, slightly moist, medium dense, coarse sand moderate odor
	B11-25		4 6 8	SC	Yellow brown, damp, medium dense, clayey-fine sand no odor
30					Bottom of boring 27 feet
40					

REGISTERED GEOLOGIST
VICTOR B. CHERVEN
No. 3475
STATE OF CALIFORNIA

Project: 35th and School (Oakland)

Project No.: AC10C7-1.27

Field Geologist: Cherven

Drilling Co.: S E S

Auger Type: 8" Hollow Stem

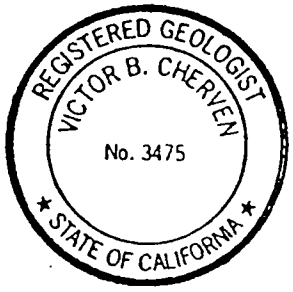
Geological Audit Services, Inc.

Yorba Linda - Stockton

BORING LOG

Boring: B-12

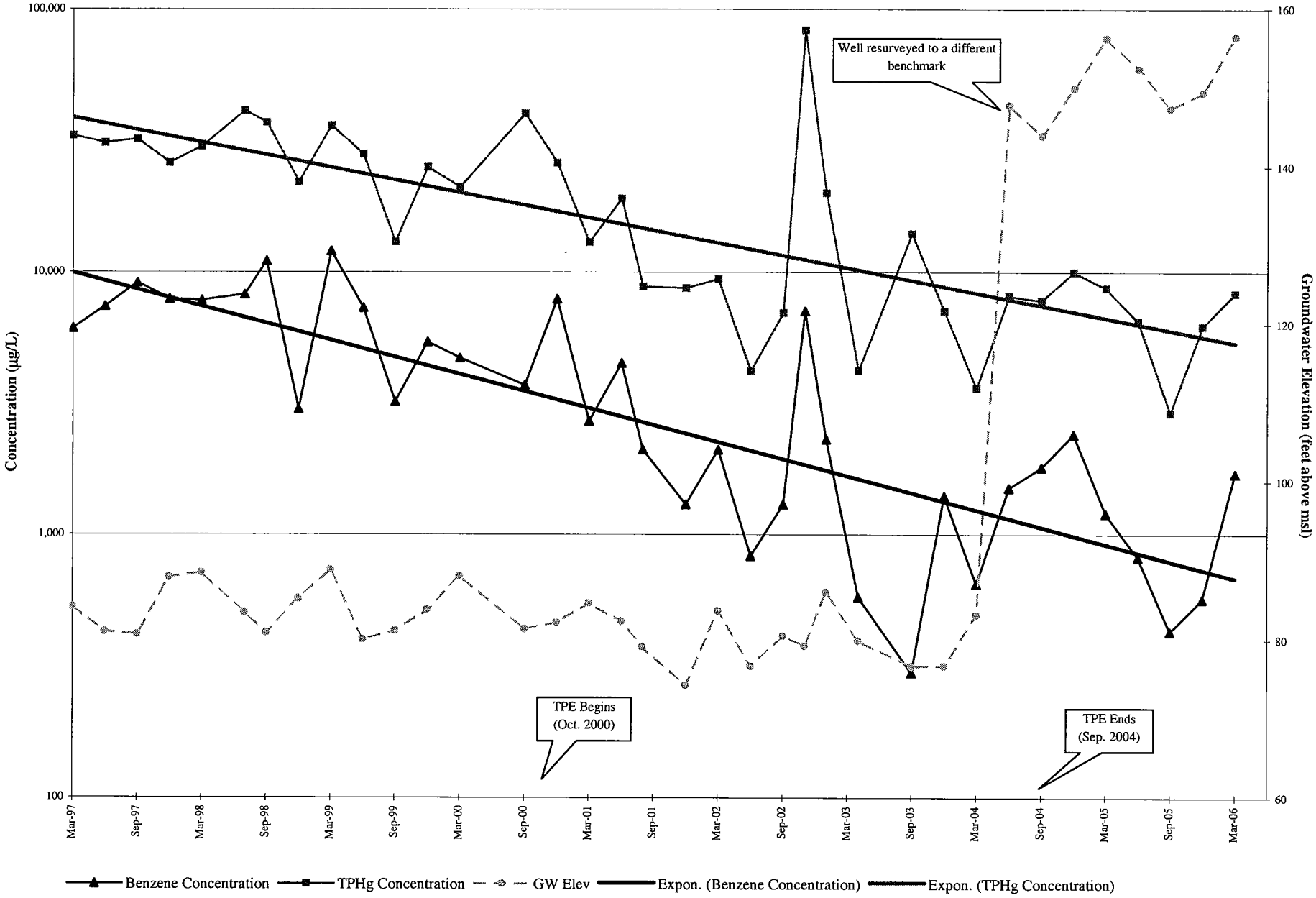
Date: 6 November 1991

Depth (feet)	Sample Identification	OV Reading (PPM)	Blow Counts	Group Symbol	Soil Description
					
10					
	B12-15		9 15 23	SC-SW	Yellow-brown, dry, dense, clayey, gravelly, very coarse sand moderate odor
20	B12-20		4 7 12		moderate to strong odor
	B12-25		2 7 15	ML	Yellow-brown, dry, medium dense, clayey fine silty sand no odor
30	B12-30		5 18 42	SW-SC	Saturated, dense, clayey gravelly sand slight odor driller reports water at 30 feet
	B12-35		8 14 20	SC-GC	no odor
					Bottom of boring 35 feet
40					

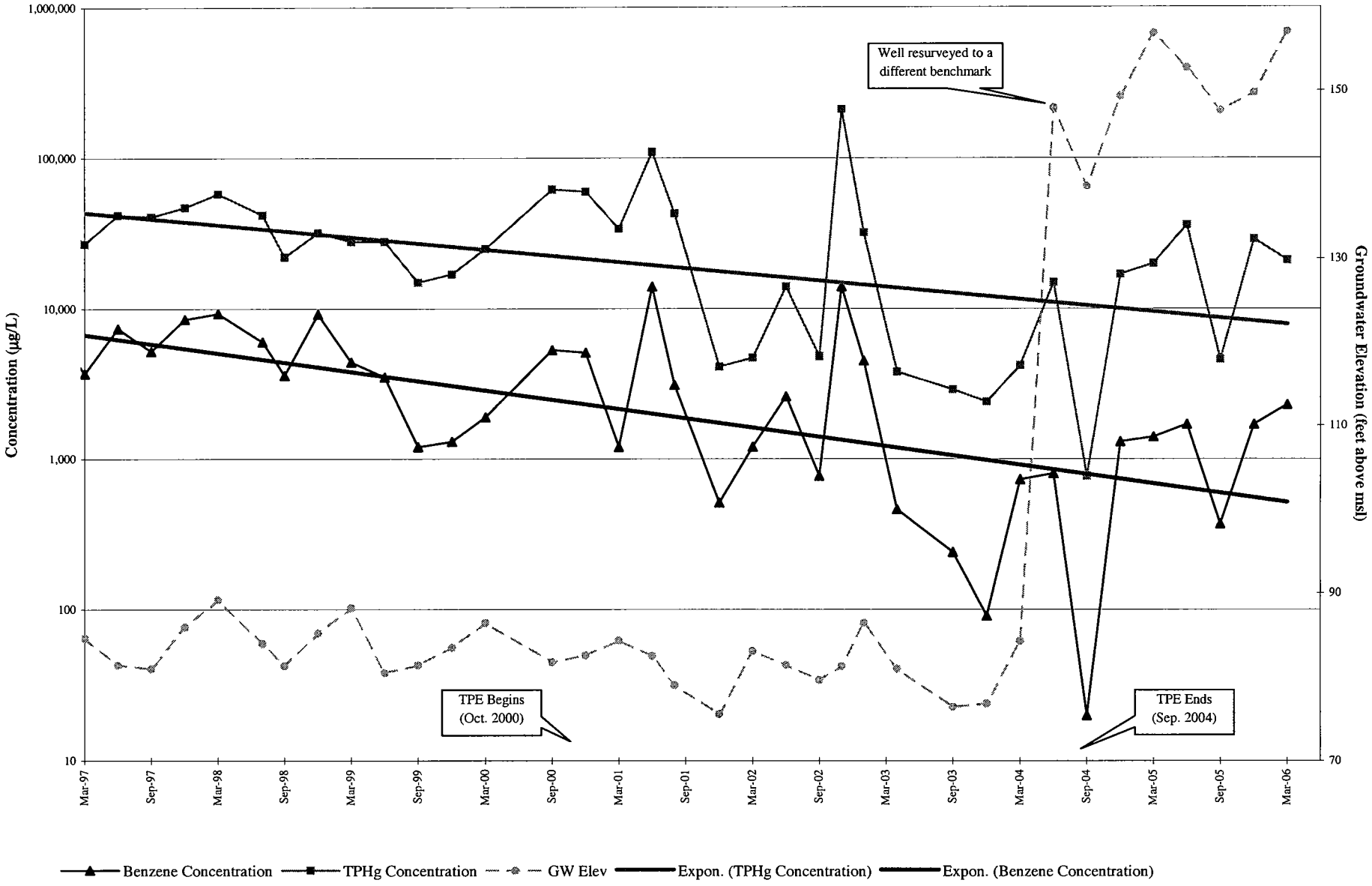
APPENDIX C

Time Series Groundwater Trends

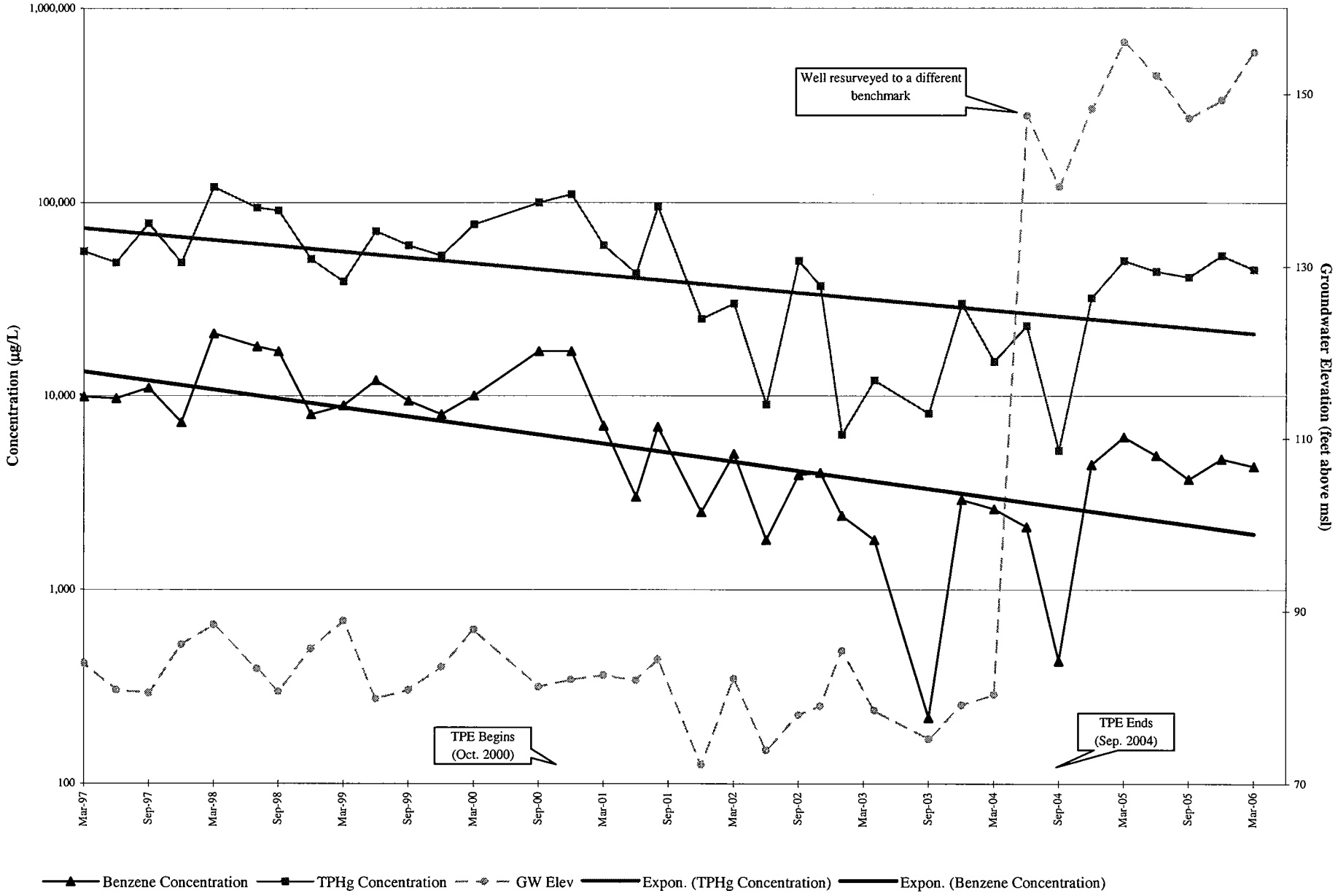
TPHg and Benzene Concentration Trends
Well MW-1 (March 1997 to Present)



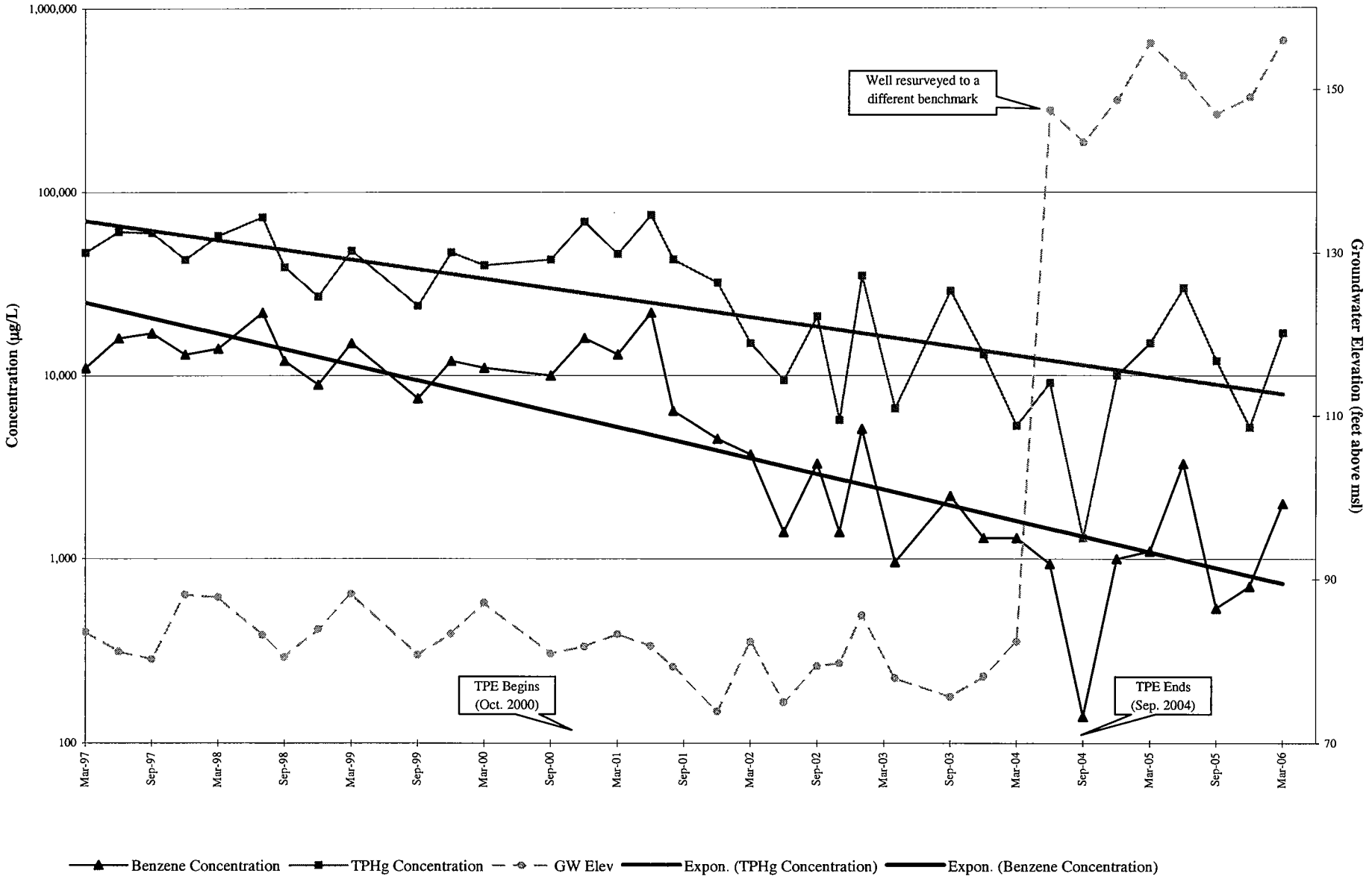
TPHg and Benzene Concentration Trends
Well MW-2 (March 1997 to Present)



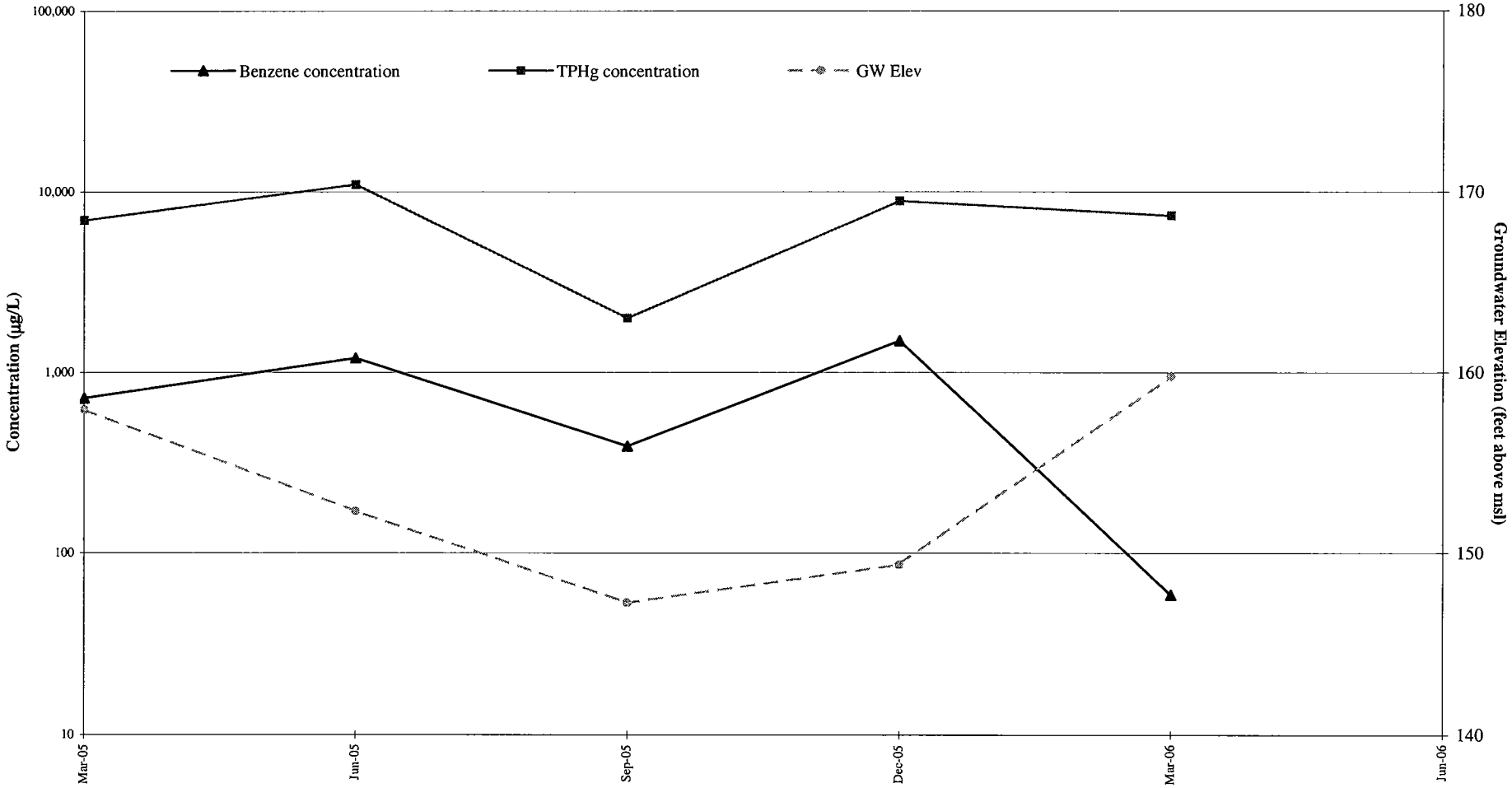
TPHg and Benzene Concentration Trends
Well MW-3 (March 1997 to Present)



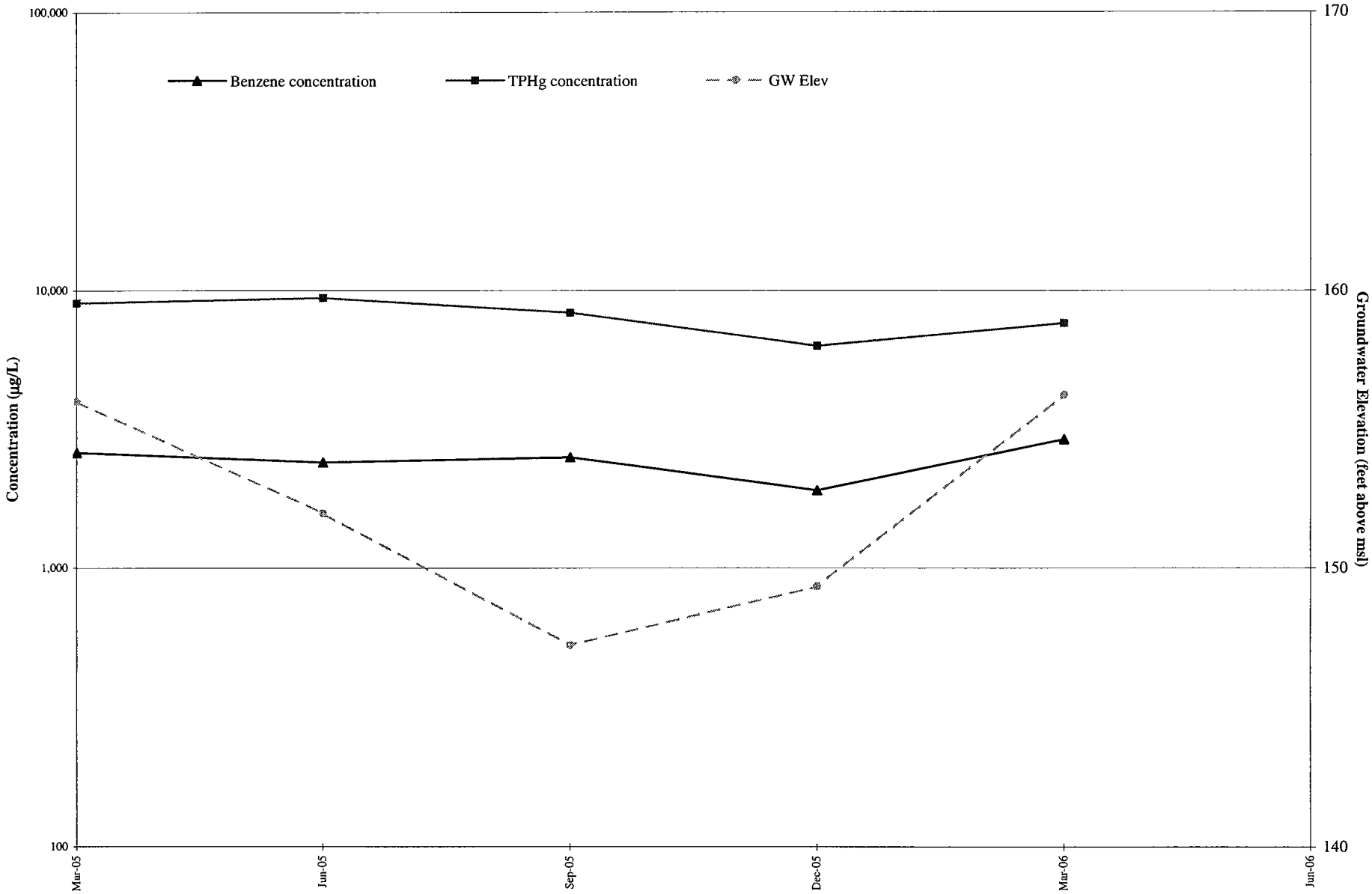
TPHg and Benzene Concentration Trends
Well MW-4 (March 1997 to Present)



TPHg and Benzene Concentration Trends
Well RW-5 (March 2005 to Present)



TPHg and Benzene Concentration Trends
Well RW-9 (March 2005 to Present)



APPENDIX D

Irrigation Well Log

ORIGINAL

File with DWR

STATE OF CALIFORNIA
THE RESOURCES AGENCY
DEPARTMENT OF WATER RESOURCES
WATER WELL DRILLERS REPORT

730' NN 5 1RR

Do not fill in

No. 33272

State Well No. 2S/3W 4D3

Other Well No. ______

Notice of Intent No. 77633

Local Permit No. or Date 8-15-77

(1) OWNER: Name Arthur Smith

Address 3397 Arkansas Street

City Oakland, Ca. Zip ______

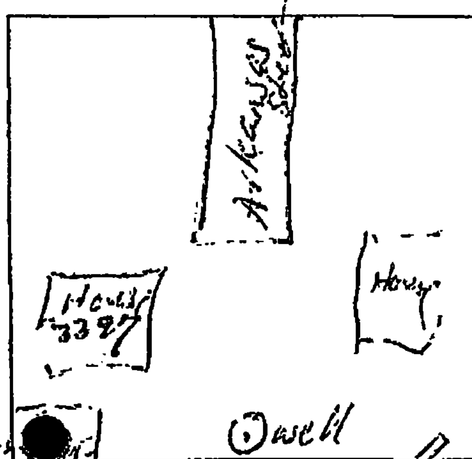
(2) LOCATION OF WELL (See instructions):

County Alameda Owner's Well Number ______

Well address if different from above ______

Township ______ Range ______ Section ______

Distance from cities, roads, railroads, fences, etc. ______



WELL LOCATION SKETCH

(3) TYPE OF WORK:
New Well ☒ Deepening ☐
Reconstruction ☐
Reconditioning ☐
Horizontal Well ☐
Destruction ☐ (Describe destruction materials and procedures in Item 12)

(4) PROPOSED USE:
Domestic ☒
Irrigation ☒
Industrial ☐
Test Well ☐
Stock ☒
Municipal ☐
Other ☐

(5) EQUIPMENT:
Rotary ☐ Reverse ☐
Cable ☐ Air ☐
Other ☒ Bucket ☐

(6) GRAVEL PACK:
Yes ☒ No ☐ Size ______
Diameter of bore ______
Packed from 20 to 62 ft.

(7) CASING INSTALLED:
Steel ☐ Plastic ☒ Concrete ☐

(8) PERFORATIONS:
Type of perforation or size of screen ______

From ft.	To ft.	Dia. in.	Gage or Wall	From ft.	To ft.	Slot size
0	62	6"	[illegible]	22	62	[illegible]

(9) WELL SEAL:
Was surface sanitary seal provided? Yes ☒ No ☐ If yes, to depth 20' ft.
Were strata sealed against pollution? Yes ☐ No ☐ Interval ______ ft.
Method of sealing Cement & Sand

(10) WATER LEVELS:
Depth of first water, if known 27' ft.
Standing level after well completion 18' ft.

(11) WELL TESTS:
Was well test made? Yes ☐ No ☒ If yes, by whom? ______
Type of test Pump ☐ Bailer ☐ Air lift ☐
Depth to water at start of test ______ ft. At end of test ______ ft.
Discharge ______ gal/min after ______ hours Water temperature ______
Chemical analysis made? Yes ☐ No ☐ If yes, by whom? ______
Electric log made? Yes ☐ No ☐ If yes, attach copy to this report

(12) WELL LOG: Total depth 62 ft. Depth of completed well 62 ft.

from ft. to ft. Formation (Describe by color, character, size or material)

0 - 2 Stiff Dry Dk. Brownish Gray Silty Clay w/ Scattered Rock Frags.

2 - 5 Very Stiff Damp Dk. Gray Brown Silty Clay w/ Gravel

5 - 20 Very Stiff Moist Brown Silty Clay w/ fine Gravel

20 - 30 Stiff Moist Brown Silty Clay w/ Trace of Gravel

30 - 40 Stiff Soft Brown Gravelly Clay

40 - 60 Hard Soft Brown Gravelly Clay

60 - 62 Hard Brown [illegible] Sandy Clay w/ [illegible] Gravel

62 Bottom of Hole

Work started 8-16- 1977 Completed 8-17 1977

WELL DRILLER'S STATEMENT:
This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

SIGNED Robert G. [illegible]
(Well Driller)

NAME AAA Drilling Service
(Person, firm, or corporation) (Typed or printed)

Address 158 Middle Lane

City Hayward Zip 94545

License No. 235117 Date of this report 8-21-77

DWR 188 (REV. 7-76) IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM

APPENDIX E

Standard Field Procedures

CAMBRIA

STANDARD FIELD PROCEDURES FOR SOIL BORING AND MONITORING WELL INSTALLATIONS

This document presents standard field methods for drilling and sampling soil borings and installing, developing and sampling groundwater monitoring wells. These procedures are designed to comply with Federal, State and local regulatory guidelines. Specific field procedures are summarized below.

SOIL BORINGS

Objectives

Soil samples are collected to characterize subsurface lithology, assess whether the soils exhibit obvious hydrocarbon or other compound vapor or staining, and to collect samples for analysis at a State-certified laboratory. All borings are logged using the Unified Soil Classification System by a trained geologist working under the supervision of a California Registered Geologist (RG).

Soil Boring and Sampling

Soil borings are typically drilled using hollow-stem augers or direct-push technologies such as the Geoprobe®. Soil samples are collected at least every five ft to characterize the subsurface sediments and for possible chemical analysis. Additional soil samples are collected near the water table and at lithologic changes. Samples are collected using lined split-barrel or equivalent samplers driven into undisturbed sediments at the bottom of the borehole.

Drilling and sampling equipment is steam-cleaned prior to drilling and between borings to prevent cross-contamination. Sampling equipment is washed between samples with trisodium phosphate or an equivalent EPA-approved detergent.

Sample Analysis

Sampling tubes chosen for analysis are trimmed of excess soil and capped with Teflon tape and plastic end caps. Soil samples are labeled and stored at or below 4° C on either crushed or dry ice, depending upon local regulations. Samples are transported under chain-of-custody to a State-certified analytic laboratory.

Field Screening

One of the remaining tubes is partially emptied leaving about one-third of the soil in the tube. The tube is capped with plastic end caps and set aside to allow hydrocarbons to volatilize from the soil. After ten to fifteen minutes, a portable volatile vapor analyzer measures volatile hydrocarbon vapor concentrations in the tube headspace, extracting the vapor through a slit in the cap. Volatile vapor analyzer measurements are used along with the field observations, odors, stratigraphy and groundwater depth to select soil samples for analysis.

Water Sampling

Water samples, if they are collected from the boring, are either collected using a driven Hydropunch® type sampler or are collected from the open borehole using bailers. The groundwater samples are decanted into the appropriate containers supplied by the analytic laboratory. Samples are labeled, placed in protective foam sleeves, stored on crushed ice at or below 4°C, and transported under chain-of-custody to the laboratory. Laboratory-supplied trip blanks accompany the samples and are analyzed to check for cross-contamination. An equipment blank may be analyzed if non-dedicated sampling equipment is used.

Grouting

If the borings are not completed as wells, the borings are filled to the ground surface with cement grout poured or pumped through a tremie pipe.

MONITORING WELL INSTALLATION, DEVELOPMENT AND SAMPLING

Well Construction and Surveying

Groundwater monitoring wells are installed to monitor groundwater quality and determine the groundwater elevation, flow direction and gradient. Well depths and screen lengths are based on groundwater depth, occurrence of hydrocarbons or other compounds in the borehole, stratigraphy and State and local regulatory guidelines. Well screens typically extend 10 to 15 ft below and 5 ft above the static water level at the time of drilling. However, the well screen will generally not extend into or through a clay layer that is at least three ft thick.

Well casing and screen are flush-threaded, Schedule 40 PVC. Screen slot size varies according to the sediments screened, but slots are generally 0.010 or 0.020 inches wide. A rinsed and graded sand occupies the annular space between the boring and the well screen to about one to two ft above the well screen. A two ft thick hydrated bentonite seal separates the sand from the overlying sanitary surface seal composed of Portland type I,II cement.

Well-heads are secured by locking well-caps inside traffic-rated vaults finished flush with the ground surface. A stovepipe may be installed between the well-head and the vault cap for additional security.

The well top-of-casing elevation is surveyed with respect to mean sea level and the well is surveyed for horizontal location with respect to an onsite or nearby offsite landmark.

Well Development

Wells are generally developed using a combination of groundwater surging and extraction. Surging agitates the groundwater and dislodges fine sediments from the sand pack. After about ten minutes of surging, groundwater is extracted from the well using bailing, pumping and/or reverse air-lifting through an eductor pipe to remove the sediments from the well. Surging and extraction continue until at least ten well-casing volumes of groundwater are extracted and the sediment volume in the groundwater is negligible. This process usually occurs prior to installing the sanitary surface seal to ensure sand pack stabilization. If development occurs after surface seal installation, then development occurs 24 to 72 hours after seal installation to ensure that the Portland cement has set up correctly.

All equipment is steam-cleaned prior to use and air used for air-lifting is filtered to prevent oil entrained in the compressed air from entering the well. Wells that are developed using air-lift evacuation are not sampled until at least 24 hours after they are developed.

Groundwater Sampling

Depending on local regulatory guidelines, three to four well-casing volumes of groundwater are purged prior to sampling. Purging continues until groundwater pH, conductivity, and temperature have stabilized. Groundwater samples are collected using bailers or pumps and are decanted into the appropriate containers supplied by the analytic laboratory. Samples are labeled, placed in protective foam sleeves, stored on crushed ice at or below 4°C, and transported under chain-of-custody to the laboratory. Laboratory-supplied trip blanks accompany the samples and are analyzed to check for cross-contamination. An equipment blank may be analyzed if non-dedicated sampling equipment is used.

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CAMBRIA

STANDARD FIELD PROCEDURES FOR GEOPROBE® SAMPLING

This document describes Cambria Environmental Technology's standard field methods for GeoProbe® soil and ground water sampling. These procedures are designed to comply with Federal, State and local regulatory guidelines. Specific field procedures are summarized below.

Objectives

Soil samples are collected to characterize subsurface lithology, assess whether the soils exhibit obvious hydrocarbon or other compound vapor odor or staining, estimate ground water depth and quality and to submit samples for chemical analysis.

Soil Classification/Logging

All soil samples are classified according to the Unified Soil Classification System by a trained geologist or engineer working under the supervision of a California Registered Geologist (RG) or a Certified Engineering Geologist (CEG). The following soil properties are noted for each soil sample:

- Principal and secondary grain size category (i.e., sand, silt, clay or gravel)
- Approximate percentage of each grain size category,
- Color,
- Approximate water or separate-phase hydrocarbon saturation percentage,
- Observed odor and/or discoloration,
- Other significant observations (i.e., cementation, presence of marker horizons, mineralogy), and
- Estimated permeability.

Soil Sampling

GeoProbe® soil samples are collected from borings driven using hydraulic push technologies. A minimum of one and one half ft of the soil column is collected for every five ft of drilled depth. Additional soil samples can be collected near the water table and at lithologic changes. Samples are collected using samplers lined with polyethylene or brass tubes driven into undisturbed sediments at the bottom of the borehole. The ground surface immediately adjacent to the boring is used as a datum to measure sample depth. The horizontal location of each boring is measured in the field relative to a permanent on-site reference using a measuring wheel or tape measure.

Drilling and sampling equipment is steam-cleaned or washed prior to drilling and between borings to prevent cross-contamination. Sampling equipment is washed between samples with trisodium phosphate or an equivalent EPA-approved detergent.

Sample Storage, Handling and Transport

Sampling tubes chosen for analysis are trimmed of excess soil and capped with Teflon® tape and plastic end caps. Soil samples are labeled and stored at or below 4°C on either crushed or dry ice, depending upon local regulations. Samples are transported under chain-of-custody to a State-certified analytic laboratory.

Grab Ground Water Sampling

Ground water samples are collected from the open borehole using bailers, advancing disposable Tygon® tubing into the borehole and extracting ground water using a diaphragm pump, or using a hydro-punch style sampler with a bailer or tubing. The ground water samples are decanted into the appropriate containers supplied by the analytic laboratory. Samples are labeled, placed in protective foam sleeves, stored on crushed ice at or below 4° C, and transported under chain-of-custody to the laboratory.

Grouting

If the borings are not completed as wells, the borings are filled to the ground surface with cement grout poured or pumped through a tremie pipe.

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