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Date: August 14, 2015 Reference No.: 240467  
 To: Keith Nowell  
 Alameda County Environmental Health  
 1131 Harbor Bay Parkway, Suite 250  
 Alameda, California 94502-6577  
 Subject: Shell-branded Service Station, 1601 Webster Street, Alameda, California

No. of Copies	Description/Title	Drawing No./ Document Ref.	Issue
1	Updated Site Conceptual Model and Closure Request		

Issued for:  Your information  As requested  Construction  Quotation  
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Remarks:  
 If you have any questions regarding the contents of this document, please call the GHD project manager Peter Schaefer at (510) 420-3319 or the Shell program manager Perry Pineda at (425) 413-1164.

Copy to: Perry Pineda, Shell Oil Products US

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James C. Kirschner, ATC Associates, Inc.

Ed C. Ralston, ConocoPhillips Company (electronic copy)

Completed by: Peter Schaefer  
 [Please Print]

Signed: *Peter Schaefer*

Filing: Correspondence File



Mr. Keith Nowell  
Alameda County Environmental Health  
1131 Harbor Bay Parkway, Suite 250  
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Re: **1601 Webster Street, Alameda, California**  
**PlaNet Site ID 10007774**  
**PlaNet Project ID 33072**  
**Agency No. RO0002745**

Dear Mr. Nowell:

The attached document is provided for your review and comment. Upon information and belief, I declare, under penalty of perjury, that the information contained in the attached document is true and correct.

As always, please feel free to contact me directly at (425) 413-1164 with any questions or concerns.

Sincerely,  
Shell Oil Products US

A handwritten signature in black ink, appearing to read "Perry Pineda", is located below the typed name.

Perry Pineda  
Senior Environmental Program Manager



# Updated Site Conceptual Model and Closure Request

## Shell-branded Service Station 1601 Webster Street Alameda, California

PlaNNet Site ID	10007774
PlaNNet Project ID	33072
Agency No.	RO0002745

Shell Oil Products US

August 14, 2015  
5900 Hollis Street Suite A Emeryville California 94608 USA  
240467 | 15.10 | Report No 16

# Executive Summary

- This updated SCM and closure request was prepared to demonstrate that site data meet State Water Regulatory Control Board's (SWRCB's) *Low-Threat Underground Storage Tank Case Closure Policy*.
- The site has been adequately investigated and remediated.
- Historical groundwater monitoring data adequately define TPHg, BTEX, and MTBE impacts horizontally and vertically in groundwater to below applicable RWQCB ESLs, demonstrating that the plume is not migrating and that COC trends are declining.
- Site data satisfy all general criteria in the Policy. Two irrigation wells located 525 and 800 feet northwest of the site are the only identified potential receptors.
- Groundwater conditions satisfy Class 1 of the Policy media-specific requirements. The TPHg and BTEX plume exceeding ESLs is less than 100 feet long when measured from the UST complex. The irrigation wells discussed above are more than 250 feet from the plume boundary. The maximum MTBE concentration during the last groundwater sampling event in March 2013 was 1.4 µg/L, so there is no MTBE plume exceeding ESLs and there is no significant comingling of the Shell plume with the plume from the former Unocal station located north of the site.
- The site is an active fueling facility, and there is no reasonable concern that subsurface contamination poses unacceptable indoor vapor inhalation health risk.
- Soil data meet the Policy media-specific direct contact and outdoor air exposure criteria. No benzene or ethylbenzene has been detected in soil samples collected at a depth less than 5 fbg and soil samples collected from 5 to 10 fbg have contained up to 2.4 mg/kg benzene and 90 mg/kg ethylbenzene and meet the criteria for scenario 1 in the Policy.
- On behalf of Shell, we respectfully request closure of this case. GHD requests that SCCDEH suspend the groundwater monitoring program during the closure review.

# Table of Contents

1.	Introduction.....	1
2.	Updated Site Conceptual Model (SCM).....	1
3.	Low-Threat Closure Evaluation.....	7
3.1	General Criteria.....	7
3.1.1	The Unauthorized Release is Located within the Service Area of a Public Water System .....	7
3.1.2	The Unauthorized Release Consists only of Petroleum.....	7
3.1.3	The Unauthorized (“Primary”) Release from the UST System Has Been Stopped .....	7
3.1.4	Free Product Has Been Removed to the Maximum Extent Practicable.....	7
3.1.5	A Conceptual Site Model that Assesses the Nature, Extent, and Mobility of the Release Has Been Developed .....	7
3.1.6	Secondary Source Has Been Removed to the Extent Practicable .....	7
3.1.7	Soil and Groundwater Has Been Tested for MTBE.....	7
3.1.8	Nuisance as Defined by Water Code Section 13050 Does Not Exist at the Site.....	8
3.2	Media-Specific Criteria.....	8
3.2.1	Groundwater .....	8
3.2.2	Vapor .....	8
3.2.3	Direct Contact and Outdoor Air Exposure .....	8
4.	Closure Request.....	9

# Figure Index

Figure 1	Vicinity Map
Figure 2	Site Plan
Figure 3	Groundwater Contour and Chemical Concentration Map
Figure 4	S-6: TPHg and Benzene Concentrations and Groundwater Elevations vs. Time
Figure 5	S-7: TPHg and Benzene Concentrations and Groundwater Elevations vs. Time
Figure 6	S-8: TPHg and Benzene Concentrations and Groundwater Elevations vs. Time
Figure 7	S-9: TPHg and Benzene Concentrations and Groundwater Elevations vs. Time
Figure 8	TBW-N: TPHg and Benzene Concentrations and Groundwater Elevations vs. Time
Figure 9	TBW-N: Ethylbenzene and Total Xylenes Concentrations and Groundwater Elevations vs. Time

# Table Index

Table 1	Historical Soil Analytical Data
Table 2	Groundwater Data
Table 3	Historical Grab Groundwater Analytical Data

# Appendices

Appendix A	Site History
Appendix B	Groundwater and Product Removal Data
Appendix C	Groundwater Data for Environmental Case RO0001042
Appendix D	Arcadis U.S., Inc. – 2014 Joint Investigation Data
Appendix E	Boring Logs
Appendix F	Well Survey Results
Appendix G	Low-Threat Closure Checklist

# 1. Introduction

GHD Services Inc. (GHD) prepared this request on behalf of Equilon Enterprises LLC dba Shell Oil Products US (Shell) to demonstrate that this site meets the criteria in State Water Resources Control Board’s (SWRCB’s) *Low-Threat Underground Storage Tank Case Closure Policy* (the Policy).

The site is a Shell-branded service station located on the northwestern corner of Webster Street and Lincoln Avenue in a mixed commercial and residential area of Alameda, California (Figure 1). The site layout includes a station building, three gasoline underground storage tanks (USTs), and two dispenser islands (Figure 2).

A summary of previous work performed at the site is contained in Appendix A.

# 2. Updated Site Conceptual Model (SCM)

Item	Evaluation Criteria	Comments/Discussion
<b>2.1</b>	<b>Hydrocarbon Source</b>	
2.1.1	Identify/Describe Release Source and Volume (if known)	During station upgrades in August 2004, a net loss of 2,084 gallons of gasoline was discovered by manual tank gauging following re-installation of a fuel pump into a 10,000-gallon UST.
2.1.2	Discuss Steps Taken to Stop Release	Following the August 2004 product release, remaining fuel was removed from the damaged UST, and groundwater extraction (GWE) was conducted from the northernmost tank backfill well (TBW-N). From August 2004 through February 2006, approximately 196,130 gallons of groundwater were removed by GWE along with an estimated 1,982 gallons of separate-phase hydrocarbons (SPHs) and 21.7 gallons of dissolved total petroleum hydrocarbons as gasoline (TPHg), resulting in the recovery of 96 percent (%) of the product released. Appendix B presents GWE data. During UST and dispenser replacement in 2014, approximately 225,000 tons of soil and pea gravel and approximately 28,850 gallons of groundwater were removed from the excavation for off-site disposal. In addition, the second-generation waste oil UST was removed in May 2006.
<b>2.2</b>	<b>Site Characterization</b>	
2.2.1	Current Site Use/Status	The site is a Shell-branded service station.
2.2.2	Soil Definition Status	For the current environmental case opened in August 2004, 18 vadose zone (less than 5 feet below grade [fbg], depth to groundwater is typically 5 to 8 fbg) soil samples have been collected. All detections of TPHg, benzene, toluene, ethylbenzene, and total xylenes (BTEX), and methyl tertiary-butyl ether (MTBE) in these soil samples are below the San Francisco Bay Regional Water

Item	Evaluation Criteria	Comments/Discussion
		<p>Quality Control Board (RWQCB) environmental screening level (ESL)<sup>1</sup> for soils at sites with commercial land use, where groundwater is a potential source of drinking water, with the exception of 1,300 milligrams per kilogram (mg/kg) TPHg and 49 mg/kg total xylenes in 2004 soil sample P-3 at 3 fbg.</p> <p>Vadose-zone soil impacts are defined horizontally by the 17 other soil samples.</p> <p>Table 1 presents historical soil data.</p>
2.2.3	SPH Definition Status	SPHs have not been observed since November 2007.
2.2.4	Groundwater Definition Status (TPHg/BTEX)	<p>For this environmental case, groundwater has been monitored at the site since the fourth quarter of 2004.</p> <p>TPHg and BTEX concentrations in the shallow zone are defined on-site down gradient by wells S-2 through S-5 and vertically by well S-4B.</p> <p>The first quarter 2013 groundwater contour and chemical concentration map is included as Figure 3. Historical monitoring well groundwater data for the current environmental case (Alameda County Environmental Health [ACEH] No. RO0002745) are included in Table 2, and grab groundwater sampling data are presented in Table 3. Groundwater monitoring data from the previous environmental case (ACEH No. RO0001042) are included in Appendix C.</p>
2.2.5	TPHg/BTEX Plume Stability and Concentration Trends	Groundwater monitoring data indicate that constituent of concern (COC) concentrations are declining. Trend graphs for COCs presented on Figures 4 through 9 predict that all COCs will reach ESLs by 2031.
2.2.6	Groundwater Definition Status (Oxygenates)	<p>Fuel oxygenates were not detected at concentrations above ESLs in groundwater samples collected from on-site groundwater monitoring wells in first quarter 2013. The maximum MTBE concentration during the last groundwater sampling event in March 2013 was 1.4 micrograms per liter (µg/L), so there is no MTBE plume exceeding ESLs and there is no significant comingling of the Shell plume with the plume from the former Unocal station located north of the site.</p> <p>Off-site grab groundwater samples for a joint investigation conducted by Shell and former Unocal Station No. 0843 located at 1629 Webster Street, Alameda, California in September and November 2014 contained up to 450 µg/L MTBE. Grab groundwater data from this investigation adequately defined the extent of MTBE in groundwater horizontally and vertically. The grab groundwater result from CPT-1 represents a</p>

<sup>1</sup> User's Guide: Derivation and Application of Environmental Screening Levels, RWQCB, Interim Final 2013.



Item	Evaluation Criteria	Comments/Discussion
		detached plume separated from the former Unocal MTBE plume. This separation is demonstrated by data from Unocal's down-gradient wells MW-6 and MW-8. Sampling locations, an analytical data table, and available boring logs from this investigation are presented in Appendix D.
2.2.7	Oxygenate Plume Stability and Concentration Trends	Oxygenates are consistently not detected or detected at concentrations below ESLs in on-site wells.
2.2.8	Groundwater Flow Direction, Depth Trends and Gradient	Static groundwater depth has ranged from 3.49 to 9.20 fbg. Groundwater flow direction is generally northerly with a variable but generally shallow groundwater gradient. Groundwater depths are presented in the historical groundwater monitoring data table (Table 2).
2.2.9	Stratigraphy and Hydrogeology	Based on 34 site borings, the site is underlain by up to 3 feet of variable fill below which is predominately clayey sand, silty sand, sand with gravel, and sand with occasional, minor (up to 3-feet-thick) silt and clay lenses, to a depth of approximately 40 fbg. Site boring logs are presented in Appendix E.
2.2.10	Preferential Pathways Analysis	<p>In November 2004, Cambria Environmental Technology, Inc. (Cambria) submitted a preferential pathway analysis in their November 30, 2004 <i>Soil &amp; Groundwater Investigation Work Plan and Agency Response</i>. Cambria reviewed:</p> <ul style="list-style-type: none"> <li>• City of Alameda Public Works sanitary sewer and storm drain maps,</li> <li>• Alameda Power &amp; Telecom electricity and telephone utility maps, and</li> <li>• East Bay Municipal Utility District (EBMUD) water mains maps.</li> </ul> <p>Several utility lines were noted in the area of the site at depths of up to 9 fbg. Currently known or identified utilities are shown on Figure 2.</p> <p>Based on the available utility information, Cambria concluded that due to the range of historical groundwater depths, the potential exists for the water table to rise into certain sanitary sewer, storm drain and water main piping trenches. They noted that it appears that the north-flowing 8-inch sanitary sewer beneath Webster Street, adjacent to the site, is likely regularly submerged and that groundwater flow might be affected by the trench for this pipe. In addition, Cambria observed that during very high groundwater episodes, groundwater could rise into trenches for other sanitary sewers, storm drains, and water mains. As a result, they stated that there is a potential that the identified utilities may act occasionally as preferential pathways for groundwater flow.</p> <p>Grab groundwater data from subsequent borings SB-12 through SB-14 defined the petroleum hydrocarbon plume to the east and the southeastern edge of the MTBE plume. As stated above,</p>

Item	Evaluation Criteria	Comments/Discussion
		groundwater grab sampling data from the Shell's joint investigation with the adjacent former Unocal station (Appendix D) defines the down-gradient extent of the detached MTBE plume.
2.2.11	Other Pertinent Issues	<p>In November 2004, Cambria conducted a sensitive receptor survey (SRS). The SRS targeted the following as potential sensitive receptors: basements within 200 feet, surface water and sensitive habitats within 500 feet, hospitals, educational, residential care and childcare facilities within 1,000 feet, and water-producing wells within one-half mile. Two possible partial basements were visually observed at residences at 628 Lincoln Avenue (across Lincoln Avenue, southwest of the site) and 632 Pacific Avenue (northwest of the site) at a distance of approximately 200 feet from the site. Cambria stated that the basements did not appear to be finished for living space, but rather may be used for storage or utility space. The existence of basements was not confirmed by contacting the residents. No surface waters or sensitive habitats were observed within 500 feet. No hospitals, schools, or childcare facilities were observed within 1,000 feet; however, one residential nursing home (Elders Inn) was identified at 1721 Webster Street, approximately 350 feet from the site.</p>
<b>2.3</b>	<b>Remediation Status</b>	
2.3.1	Remedial Actions Taken	<p>From March 1995 until March 1996 groundwater was remediated by injecting air into MW-2.</p> <p>Following the August 2004 product release, remaining fuel was removed from the damaged UST and GWE was conducted from the northern-most tank backfill well (TBW-N). Initially, groundwater was extracted several times per day from August 19 until August 23, 2004. Then, daily GWE was conducted from August 24 until September 10, 2004. From September 13 through November 16, 2004, GWE was conducted weekly and GWE was subsequently conducted monthly through February 2006. Approximately 196,130 gallons of groundwater were removed by GWE along with an estimated 1,982 gallons of SPHs and 21.7 gallons of dissolved TPHg. Appendix B presents GWE data.</p> <p>During UST and dispenser replacement in 2014, approximately 225,000 tons of soil and pea gravel and approximately 28,850 gallons of groundwater were removed from the excavation for off-site disposal.</p> <p>In addition, the dispensers and product piping were upgraded in August 1997, and the site's waste oil system was upgraded in November 1998 and subsequently removed in May 2006.</p>

Item	Evaluation Criteria	Comments/Discussion
2.3.2	Area Remediated	The area south of the dispensers and the UST complex.
2.3.3	Remediation Effectiveness	A reported volume of 2,084 gallons of product was released during the August 2004 spill. An estimated 2,004 gallons of product were recovered through remedial extraction efforts. Following this source removal, the plume is shrinking and declining trends are demonstrated for COCs. Excavation during UST replacement provided additional secondary source removal.
<b>2.4</b>	<b>Well and Sensitive Receptor Survey</b>	
2.4.1	Designated Beneficial Water Use	The SWRCB's Geotracker website file for the environmental case at this site states that the "Groundwater at the site is considered suitable, or potentially suitable for municipal and domestic water supply (MUN) as designated in the San Francisco Bay Region Water Quality Control Board Basin Plan. However, the municipal and domestic water supply beneficial use is not currently being utilized in the area of the site." Groundwater in this area cannot be precluded from being a potential future source of drinking water.
2.4.2	Well Survey Results	In March 2004, Cambria performed a search of California Department of Water Resources (DWR) records and the SWRCB's Geotracker database to identify water-producing wells within one-half mile of the site. No public water-supply wells were identified from DWR records or the Geotracker database. Cambria found DWR records for one domestic well, four agricultural wells, one industrial well, and one well of unknown use within one-half mile of the site. The nearest identified well was located by address approximately 150 feet south of the site. The DWR well record was undated and did not record the well's intended use. The address is currently occupied by a café, and Cambria could not find the well; therefore, the well is presumed to be destroyed or abandoned. The next closest wells, irrigation wells installed in 1977, are estimated to be about 525 and 800 feet northwest of the site, and drilled to 25 and 32 fbg, respectively. Cambria concluded that since groundwater is known to flow generally northward, these wells are cross gradient from the site and are therefore unlikely to be affected by impacted groundwater from the site. All other identified wells were located more than 1,000 feet to the southeast, south, and southwest (up gradient) of the site. The locations of the identified wells are shown on Figure 1, and well details are presented in Appendix F.
2.4.3	Likelihood of Impact to Wells	Due to the distance and direction to the identified water-producing wells and declining trends observed for COCs, it is unlikely they would be impacted by residual hydrocarbons from the site.

Item	Evaluation Criteria	Comments/Discussion
2.4.4	Likelihood of Impact to Surface Water	San Francisco Bay is located approximately 2,100 feet southwest. Due to the distance and up-gradient direction to the bay, it is unlikely that surface water would be impacted.
<b>2.5</b>	<b>Risk Assessment</b>	
2.5.1	Site Conceptual Exposure Model (current and future uses)	The site is an active Shell-branded service. The site is surrounded by mixed residential and commercial properties.
2.5.2	Exposure Pathways	<p>Potential exposure pathways include ingestion of impacted groundwater, exposure of on-site workers to impacted shallow soils, and intrusion of vapor to indoor air.</p> <p>Groundwater ingestion does not appear to be a completed pathway because there are no down-gradient water-producing wells or surface water in close proximity to the site.</p> <p>As discussed above, impacted soil is limited on site. Any work at this site would require contractors to have appropriate health and safety training. Workers doing trenching or excavating at an active gasoline station would be properly trained and prepared for encountering potentially impacted soil, and would follow appropriate safety procedures. Therefore, the residual impacted soils do not appear to pose a significant threat to construction workers who may occasionally come in contact with any residual impacted soils on site. At this time, no further investigation associated with the residual soil impact is recommended.</p> <p>Furthermore, the site is an active fueling facility, and there is no reasonable concern that subsurface contamination poses unacceptable indoor inhalation health risk.</p>
2.5.3	Risk Assessment Status	Cambria's May 17, 2006 <i>Risk Evaluation and Work Plan</i> evaluated potential risks to human health or the environment posed by impacted soil and groundwater beneath the site. Cambria concluded that the residual impacts do not pose a risk to human health or the environment and will not in the foreseeable future.
2.5.4	Identified Human Exceedances	None
2.2.5	Identified Ecological Exceedances	None
<b>2.6</b>	<b>Additional Recommended Data or Tasks</b>	
2.6.1	Case Closure and Well Destructions	

### 3. Low-Threat Closure Evaluation

Site data demonstrate that the site conditions meet the low threat UST case closure criteria outlined in the SWRCB's *Low-Threat Underground Storage Tank Case Closure Policy* (the Policy). These criteria are addressed below.

#### 3.1 General Criteria

##### 3.1.1 The Unauthorized Release is Located within the Service Area of a Public Water System

East Bay Municipal Utility District is the public water system for the site and the surrounding area.

##### 3.1.2 The Unauthorized Release Consists only of Petroleum

The site is Shell-branded service station. Soil and groundwater impacts identified in site investigations since 2004 consist only of petroleum hydrocarbons and fuel additives.

##### 3.1.3 The Unauthorized ("Primary") Release from the UST System Has Been Stopped

As stated above, a gasoline UST was repaired during station upgrades in August 2004, USTs and dispensers were replaced in 2014, and the site's waste oil system was removed in May 2006.

##### 3.1.4 Free Product Has Been Removed to the Maximum Extent Practicable

Remedial efforts were successful in recovering 96% of the product released in August 2004. No SPHs have been detected in site groundwater monitoring wells since November 2007.

##### 3.1.5 A Conceptual Site Model that Assesses the Nature, Extent, and Mobility of the Release Has Been Developed

An SCM, which identifies potential receptors, is presented in Section 2 above.

##### 3.1.6 Secondary Source Has Been Removed to the Extent Practicable

As stated above, GWE removed approximately 1,982 gallons of SPHs and 22.7 gallons of dissolved TPHg. Appendix B presents GWE data. In addition, during UST and dispenser replacement in 2014, approximately 225,000 tons of soil and pea gravel and approximately 28,850 gallons of groundwater were removed from the excavation for off-site disposal.

##### 3.1.7 Soil and Groundwater Has Been Tested for MTBE

Soil samples have been analyzed for MTBE in all investigations from August 1997 to the present. Groundwater samples have been analyzed for MTBE since April 1996. Analytical data have been reported to ACEH in investigation reports and periodic groundwater monitoring reports.

### 3.1.8 Nuisance as Defined by Water Code Section 13050 Does Not Exist at the Site

Site conditions do not interfere with enjoyment of life or property, affect an entire community or neighborhood, or present a nuisance during or as a result of the treatment or disposal of wastes.

## 3.2 Media-Specific Criteria

### 3.2.1 Groundwater

The contaminant plume that exceeds water quality objectives is stable or decreasing in areal extent and this site meets the groundwater requirements specified for class 1 in the Policy:

- *The plume is less than 100 feet long:* The north-south length of the plume is less than 90 feet. As discussed above, there is no significant MTBE plume from the Shell site, so there is no comingling with the Unocal MTBE plume or the detached MTBE plume identified during the joint off-site investigation. Data from wells S-2, S-3, and S-4 demonstrate that the Shell's TPHg and BTEX plume is also separate from the Unocal plume, so on-site data for these COCs are used for calculating the plume length.
- *There is no free product:* As stated above, no free product has been observed in site groundwater monitoring wells since November 2007.
- *The nearest existing water supply well or surface water body is greater than 250 feet from the defined plume boundary:* As stated above, the nearest water-supply wells that appear to currently exist are at least 525 feet northwest of the site.

### 3.2.2 Vapor

The site is an active fueling facility, and there is no reasonable concern that subsurface contamination poses unacceptable indoor inhalation health risk.

### 3.2.3 Direct Contact and Outdoor Air Exposure

This site meets the direct contact and outdoor air requirements for benzene and ethylbenzene in commercial soil specified in scenario 1 in the Policy:

- *Benzene and ethylbenzene concentrations at 0 to 5 fbg are less than 8.2 mg/kg and 89 mg/kg, respectively:* No benzene or ethylbenzene has been detected in soil samples collected at a depth less than 5 fbg. Note that samples listed at 5 fbg in Table 1 were collected from 5 to 5.5 fbg and are considered below.
- *Benzene and ethylbenzene concentrations at 5 to 10 fbg are less than 12 mg/kg and 134 mg/kg, respectively:* Soil samples collected from 5 to 10 fbg have contained up to 2.4 mg/kg benzene and 90 mg/kg ethylbenzene. Soil sample D-2 collected at 5 fbg in 1997 is not considered because this location was subsequently excavated, so these detections do not represent residual soil conditions.

## 4. Closure Request

This site has been adequately assessed and remediation has been effective in reducing COC concentrations. Given the concentrations of COCs in site soil and groundwater compared Policy criteria as presented above, GHD concludes that the residual petroleum and fuel oxygenate impacts at this site pose very little or no risk to human health or the environment.

This site meets the SWRCB's Policy requirements. Therefore, on behalf of Shell, we respectfully request closure of this case. A Policy checklist is included in Appendix G. GHD requests that ACEH suspend the groundwater monitoring program requirement during the closure review.

All of Which is Respectfully Submitted,

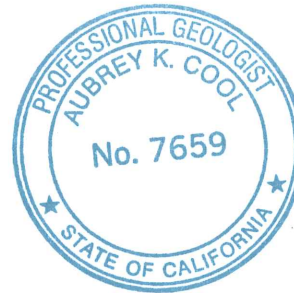
GHD



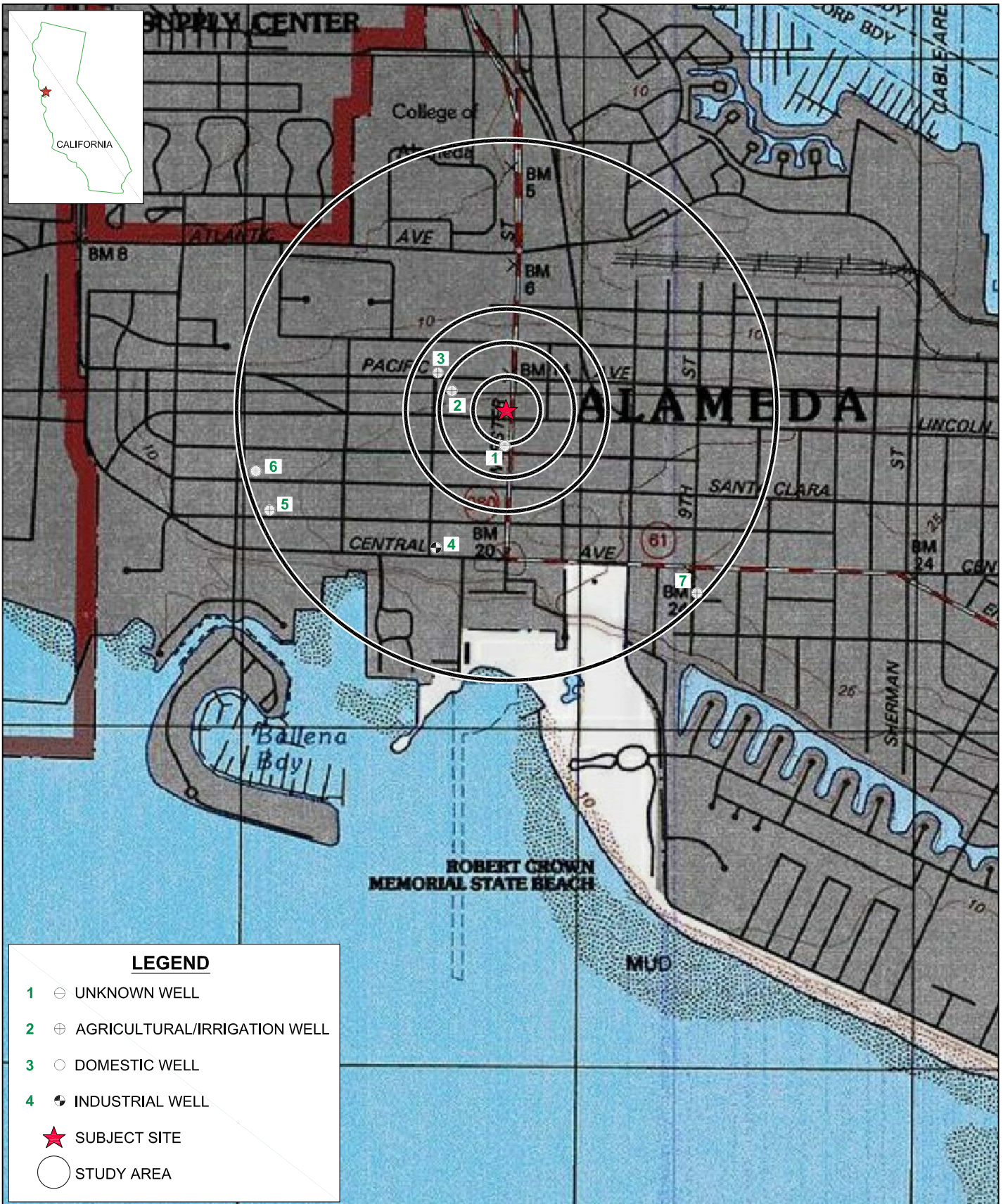
Peter Schaefer, CEG, CHG



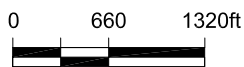
Aubrey K. Cool, PG







Source: TOPOI MAPS



SHELL-BRANDED SERVICE STATION  
 1601 WEBSTER STREET  
 SAN FRANCISCO, CALIFORNIA

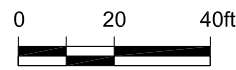
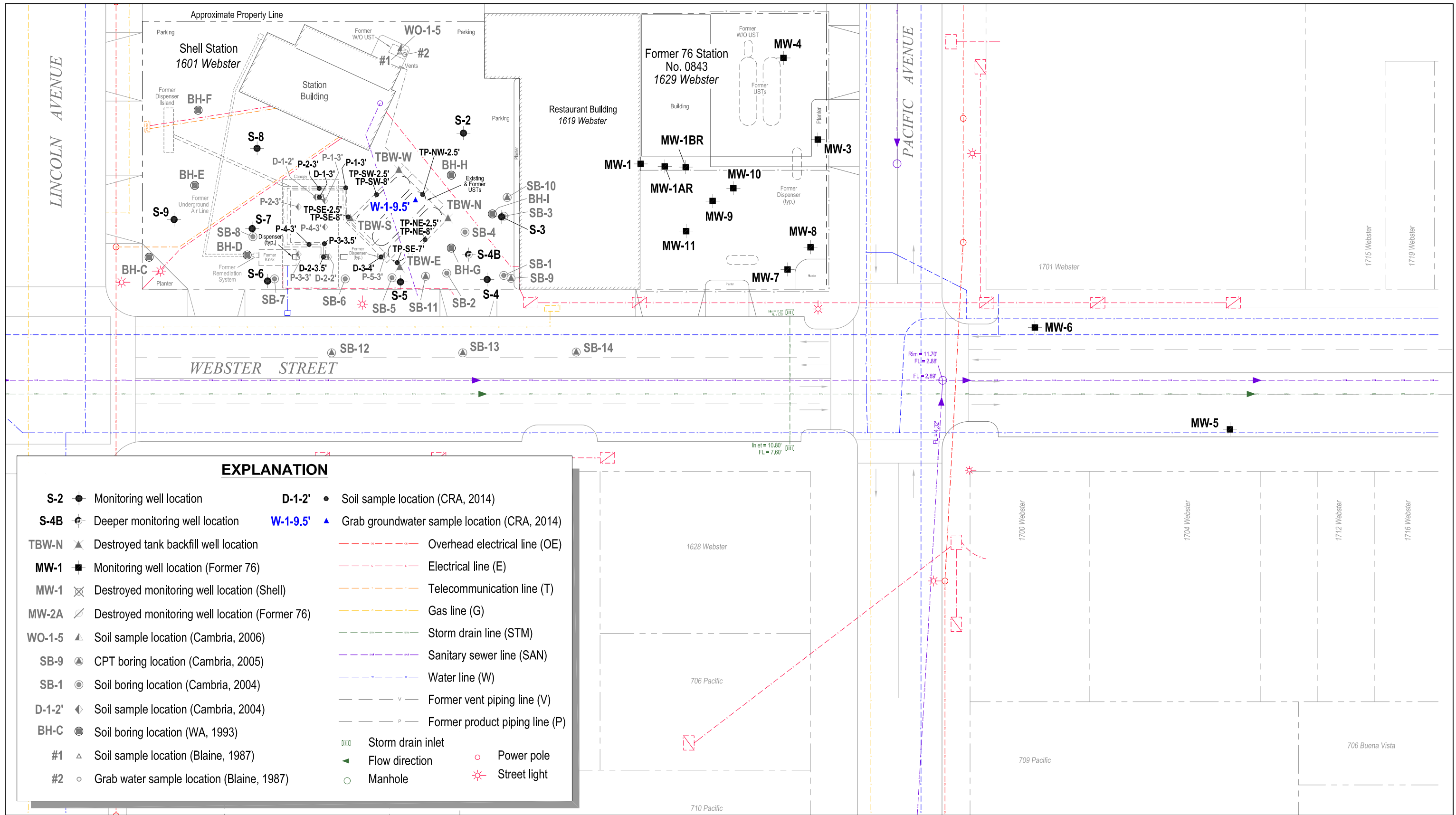
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Jul 20, 2015

VICINITY MAP

FIGURE 1





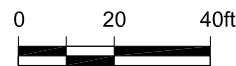
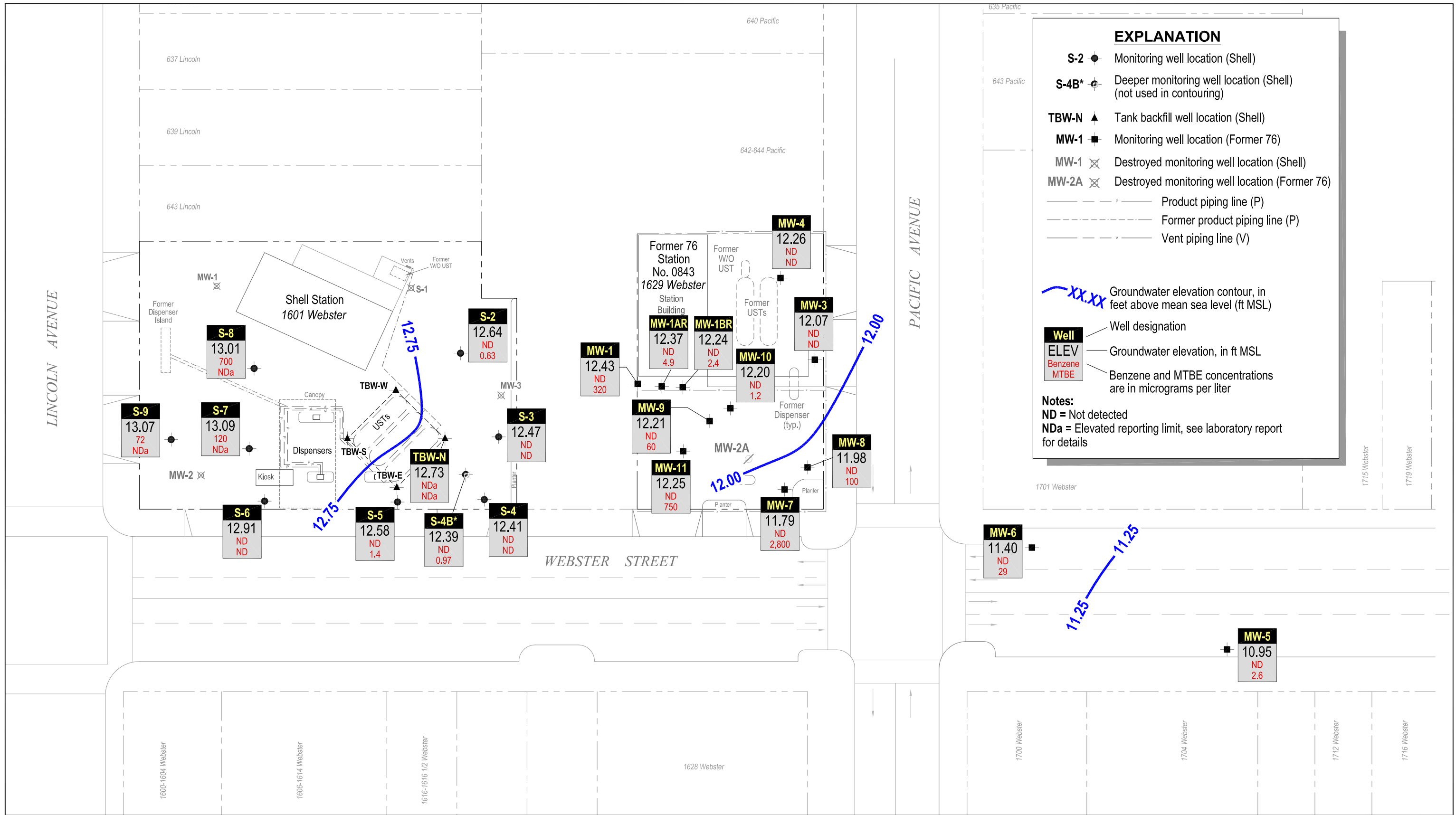
SHELL-BRANDED SERVICE STATION  
1601 WEBSTER STREET  
ALAMEDA, CALIFORNIA

SITE PLAN

240467-15.10

Jul 20, 2015

FIGURE 2



SHELL-BRANDED SERVICE STATION  
 1601 WEBSTER STREET  
 ALAMEDA, CALIFORNIA  
 GROUNDWATER CONTOUR AND  
 CHEMICAL CONCENTRATION MAP - MARCH 5, 2013

240467-15.10  
 Jul 20, 2015

FIGURE 3

**Figure 4: Predicted Time to Water Quality Objectives in Well S-6**  
**Shell-branded Service Station, 1601 Webster Street, Alameda, California**

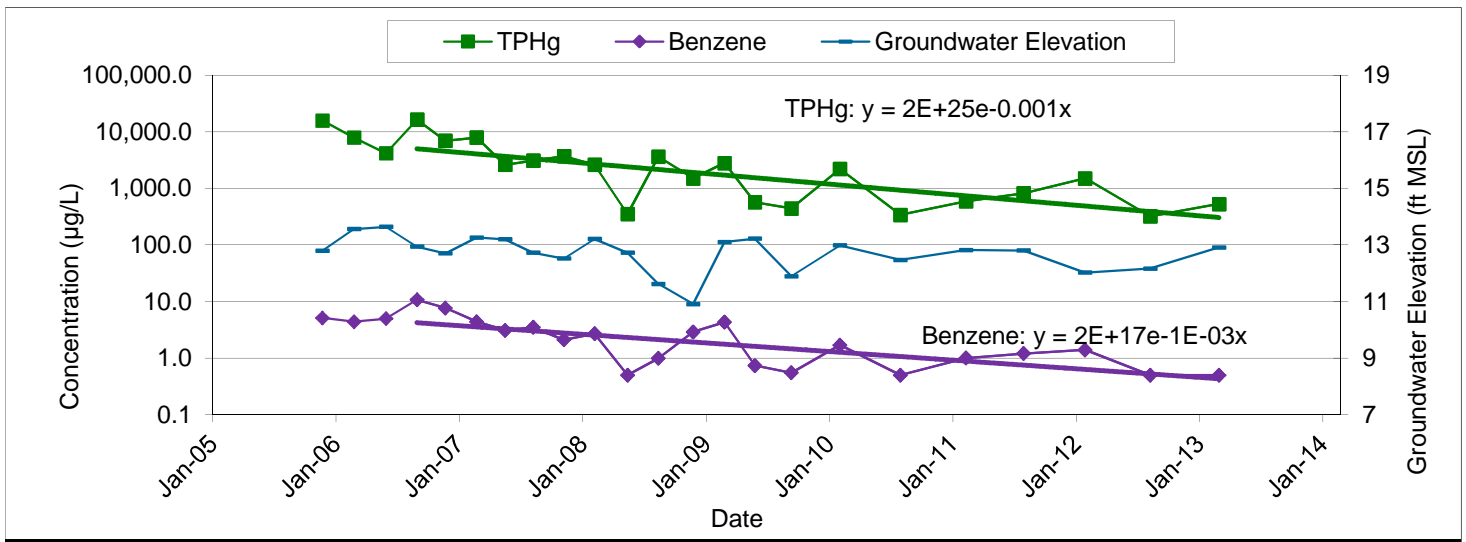
$$y = b e^{ax} \quad \implies \quad x = \ln(y/b) / a$$

where:  $y$  = concentration in  $\mu\text{g/L}$        $a$  = decay constant  
 $b$  = concentration at time (x)       $x$  = time (x) in days

Given	Constituent	Total Petroleum Hydrocarbons as Gasoline (TPHg)	Benzene
		Water Quality Objective (WQO):	$y$
Constant:	$b$	$1.76\text{E}+25$	$2.01\text{E}+17$
Constant:	$a$	$-1.27\text{E}-03$	$-9.85\text{E}-04$
Starting date for current trend:		8/30/2006	8/30/2006

Calculate		TPHg	Benzene
Attenuation Half Life (years):	$(-\ln(2)/a)/365.25$	1.49	1.93
Estimated Date to Reach WQO:	$(x = \ln(y/b) / a)$	Mar 2015	Sep 2010



Shell-branded Service Station  
 1601 Webster Street  
 Alameda, California



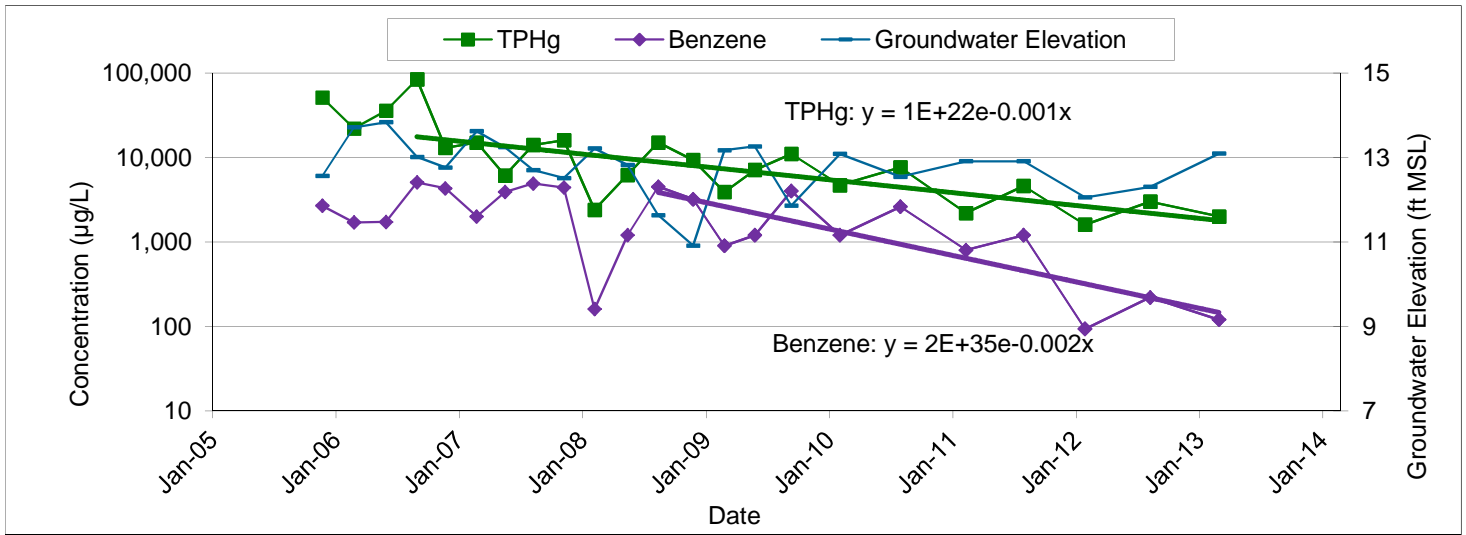
**S-6:**  
 TPHg and Benzene Concentrations  
 and Groundwater Elevation vs. Time

**Figure 5: Predicted Time to Water Quality Objectives in Well S-7**  
**Shell-branded Service Station, 1601 Webster Street, Alameda, California**

$$y = b e^{ax} \quad \implies \quad x = \ln(y/b) / a$$

where:  $y$  = concentration in  $\mu\text{g/L}$        $a$  = decay constant  
 $b$  = concentration at time ( $x$ )       $x$  = time ( $x$ ) in days

	Constituent	Total Petroleum Hydrocarbons as Gasoline (TPHg)	Benzene
<b>Given</b>			
Water Quality Objective (WQO):	$y$	100	1.0
Constant:	$b$	1.30E+22	2.28E+35
Constant:	$a$	-1.05E-03	-1.85E-03
Starting date for current trend:		8/30/2006	8/15/2008
<b>Calculate</b>			
Attenuation Half Life (years):	$(-\ln(2)/a)/365.25$	1.80	1.03
Estimated Date to Reach WQO:	$(x = \ln(y/b) / a)$	Mar 2020	Oct 2020



Shell-branded Service Station  
 1601 Webster Street  
 Alameda, California



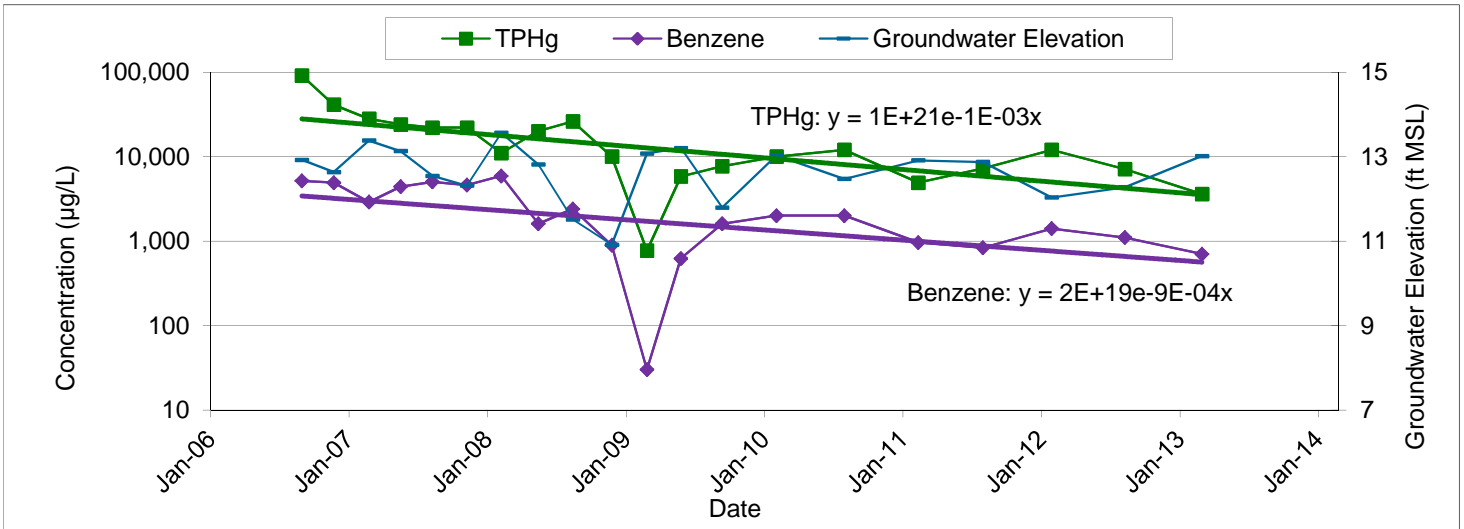
**S-7:**  
 TPHg and Benzene Concentrations  
 and Groundwater Elevation vs. Time

**Figure 6: Predicted Time to Water Quality Objectives in Well S-8**  
**Shell-branded Service Station, 1601 Webster Street, Alameda, California**

$y = b e^{ax}$	====>	$x = \ln(y/b) / a$
where: y = concentration in $\mu\text{g/L}$ b = concentration at time (x)		a = decay constant x = time (x) in days

	Constituent	Total Petroleum Hydrocarbons as Gasoline (TPHg)	Benzene
Given			
Water Quality Objective (WQO):	y	100	1.0
Constant:	b	$1.48\text{E}+21$	$1.73\text{E}+19$
Constant:	a	$-9.87\text{E}-04$	$-9.26\text{E}-04$
Starting date for current trend:		8/30/2006	8/30/2006

Calculate			
Attenuation Half Life (years):	$(-\ln(2)/a)/365.25$	1.92	2.05
Estimated Date to Reach WQO:	$(x = \ln(y/b) / a)$	Jun 2022	Jan 2031



Shell-branded Service Station  
 1601 Webster Street  
 Alameda, California



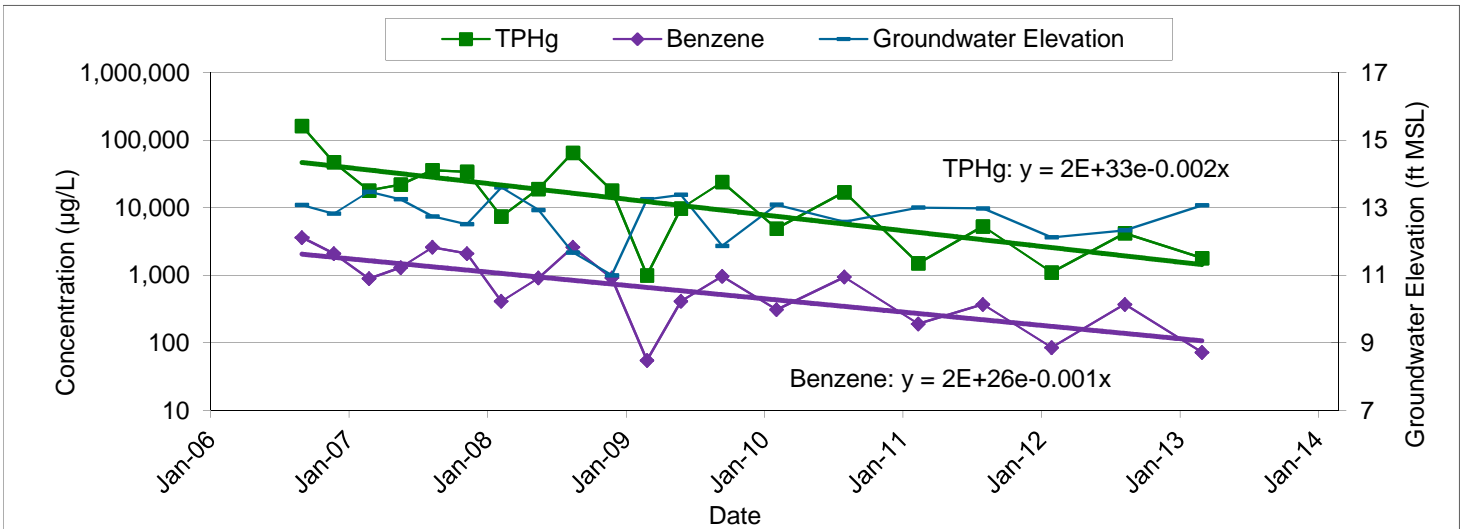
**S-8:**  
 TPHg and Benzene Concentrations  
 and Groundwater Elevation vs. Time

**Figure 7: Predicted Time to Water Quality Objectives in Well S-9**  
**Shell-branded Service Station, 1601 Webster Street, Alameda, California**

$$y = b e^{ax} \quad \implies \quad x = \ln(y/b) / a$$

where:  $y$  = concentration in  $\mu\text{g/L}$   $a$  = decay constant  
 $b$  = concentration at time ( $x$ )  $x$  = time ( $x$ ) in days

		Constituent	Total Petroleum Hydrocarbons as Gasoline (TPHg)	Benzene
Given	Water Quality Objective (WQO):	$y$	100	1.0
	Constant:	$b$	$2.18\text{E}+33$	$1.99\text{E}+26$
	Constant:	$a$	$-1.69\text{E}-03$	$-1.36\text{E}-03$
	Starting date for current trend:		8/30/2006	8/30/2006
Calculate	Attenuation Half Life (years):	$(-\ln(2)/a)/365.25$	1.12	1.40
	Estimated Date to Reach WQO:	$(x = \ln(y/b) / a)$	Oct 2016	Mar 2022



Shell-branded Service Station  
 1601 Webster Street  
 Alameda, California



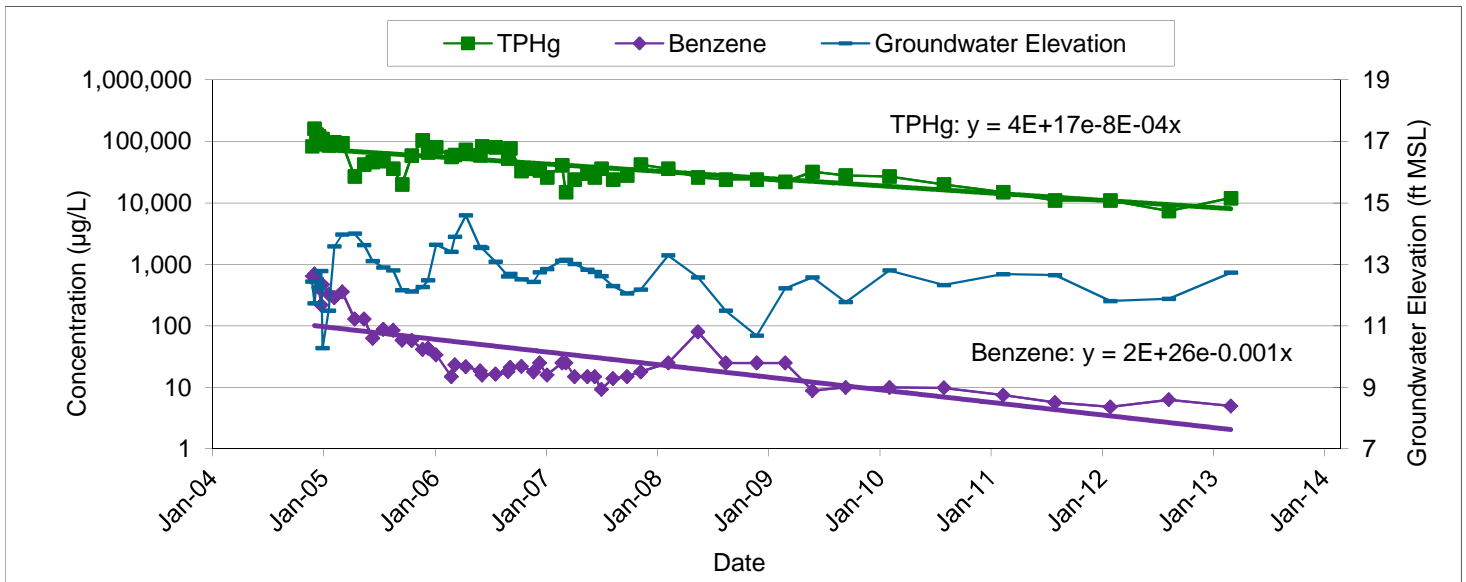
**S-9:**  
 TPHg and Benzene Concentrations  
 and Groundwater Elevation vs. Time

**Figure 8: Predicted Time to Water Quality Objectives in Well TBW-N**  
**Shell-branded Service Station, 1601 Webster Street, Alameda, California**

$$y = b e^{ax} \quad \implies \quad x = \ln(y/b) / a$$

where: y = concentration in µg/L      a = decay constant  
 b = concentration at time (x)      x = time (x) in days

	Constituent	Total Petroleum Hydrocarbons as Gasoline (TPHg)	Benzene
<b>Given</b>			
Water Quality Objective (WQO):	y	100	1.0
Constant:	b	3.57E+17	1.77E+26
Constant:	a	-7.61E-04	-1.45E-03
Starting date for current trend:		12/1/2004	12/1/2004
<b>Calculate</b>			
Attenuation Half Life (years):	$(-\ln(2)/a)/365.25$	2.49	1.30
Estimated Date to Reach WQO:	$(x = \ln(y/b) / a)$	Oct 2028	Oct 2013



Shell-branded Service Station  
 1601 Webster Street  
 Alameda, California



**TBW-N:**  
 TPHg and Benzene Concentrations  
 and Groundwater Elevation vs. Time









**Table 1**  
**Historical Soil Analytical Data**  
**Shell-branded Service Station**  
**1601 Webster Street, Alameda, California**

Sample ID	Date	Depth (fbg)	O&G (mg/kg)	Non-Polar O&G (mg/kg)	TPHmo (mg/kg)	TPHd (mg/kg)	TPHg (mg/kg)	TPH Jet Fuel (mg/kg)	B (mg/kg)	T (mg/kg)	E (mg/kg)	X (mg/kg)	MTBE (mg/kg)	TBA (mg/kg)	DIPE (mg/kg)	ETBE (mg/kg)	TAME (mg/kg)	1,2-DCA (mg/kg)	EDB (mg/kg)	Ethanol (mg/kg)	1,1,1-Trichloroethane (mg/kg)	VOCs (mg/kg)	HVOCs (mg/kg)	Chlorinated Hydrocarbons (mg/kg)	Cd (mg/kg)	Cr (mg/kg)	Pb (mg/kg)	Ni (mg/kg)	Zn (mg/kg)	PNAs (mg/kg)	PCP (mg/kg)	Creosote (mg/kg)	PCBs (mg/kg)		
S-4B-19.5	07/17/2006	19.5	---	---	---	---	<1.0	---	<0.0050	<0.0050	<0.0050	<0.010	<b>0.31 m</b>	<b>0.13 m</b>	<0.010	<0.0050	<0.0050	<0.0050	<0.0050	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
S-8-8.0	07/17/2006	8	---	---	---	---	<b>3,700</b>	---	<b>1.0</b>	<0.25	<b>90</b>	<b>310 m</b>	<0.25	<2.5	<0.50	<0.25	<0.25	<0.25	<0.25	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
S-8-11.5	07/17/2006	11.5	---	---	---	---	<50	---	<0.25	<0.25	0.89	<b>2.5</b>	<0.25	<2.5	<0.50	<0.25	<0.25	<0.25	<0.25	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
S-9-5.0	07/17/2006	5	---	---	---	---	110	---	<0.25	<0.25	2.0	<b>3.5</b>	<0.25	<2.5	<0.50	<0.25	<0.25	<0.25	<0.25	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
S-9-11.5	07/17/2006	11.5	---	---	---	---	<1.0	---	<0.0050	<0.0050	<0.0050	0.010	<0.0050	<0.0050	<0.010	<0.0050	<0.0050	<0.0050	<0.0050	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
TP-NE-2.5	05/16/2014	2.5	---	---	---	---	<0.10	---	<0.0010	<0.0010	<0.0010	<0.0020	<0.0020	<0.050	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
TP-NE-8	05/16/2014	8	---	---	---	---	<0.10	---	<0.0010	<0.0010	<0.0010	<0.0020	<0.0020	<0.050	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
TP-NW-2.5	05/16/2014	2.5	---	---	---	---	<0.10	---	<0.0010	<0.0010	<0.0010	<0.0020	<0.0020	<0.050	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
TP-SW-2.5	05/16/2014	2.5	---	---	---	---	<0.10	---	<0.0010	<0.0010	<0.0010	<0.0020	<0.0020	<0.050	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
TP-SW-8	05/16/2014	8	---	---	---	---	<0.099	---	<0.00099	<0.00099	<0.00099	<0.0020	<0.0020	<0.050	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
TP-SE-2.5	05/16/2014	2.5	---	---	---	---	<0.10	---	<0.0010	<0.0010	<0.0010	<0.0020	<0.0020	<0.050	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
TP-SE-7	05/16/2014	7	---	---	---	---	<0.099	---	<0.00099	<0.00099	<0.00099	<0.0020	<0.0020	<0.050	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
TP-SE-8	05/16/2014	8	---	---	---	---	<0.10	---	<0.0010	<0.0010	<0.0010	<0.0020	<0.0020	<0.050	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
P-1-3	05/16/2014	3	---	---	---	---	<0.10	---	<0.0010	<0.0010	<0.0010	<0.0020	<0.0020	<0.050	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
P-2-3	05/16/2014	3	---	---	---	---	<0.099	---	<0.00099	<0.00099	<0.00099	<0.0020	<0.0020	<0.050	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
P-3-3.5	05/16/2014	3.5	---	---	---	---	<0.099	---	<0.00099	<0.00099	<0.00099	<0.0020	<0.0020	<0.050	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
P-4-3	05/16/2014	3	---	---	---	---	<0.099	---	<0.00099	<0.00099	<0.00099	<0.0020	<0.0020	<0.050	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
D-1-3	05/16/2014	3	---	---	---	---	<0.099	---	<0.00099	<0.00099	<0.00099	<0.0020	<0.0020	<0.050	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
D-2-3.5	05/16/2014	3.5	---	---	---	---	<0.10	---	<0.0010	<0.0010	<0.0010	<0.0020	<0.0020	<0.050	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
D-3-4	05/16/2014	4	---	---	---	---	<0.10	---	<0.0010	<0.0010	<0.0010	<0.0020	<0.0020	<0.050	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
<b>Shallow Soil (≤10 fbg) ESL<sup>n</sup>:</b>			NA	NA	500	110	500	NA	0.044	2.9	3.3	2.3	0.023	0.075	NA	NA	NA	0.0045	0.00033	NA	7.8	Various	Various	Various	12	2,500	320	150	600	Various	5.0	NA	0.74		
<b>Deep Soil (&gt;10 fbg) ESL<sup>n</sup>:</b>			NA	NA	1,000	110	770	NA	0.044	2.9	3.3	2.3	0.023	0.075	NA	NA	NA	0.0045	0.00033	NA	7.8	Various	Various	Various	1,000	5,000	320	5,000	5,000	Various	9.0	NA	0.74		

**Notes:**  
O&G = Total oil and grease analyzed by EPA Method 3550 unless otherwise noted  
TPHd = Total petroleum hydrocarbons as diesel analyzed by EPA Method 8015 unless otherwise noted  
TPHmo = Total petroleum hydrocarbons as oil analyzed by EPA Method 3550 unless otherwise noted  
TPHg = Total petroleum hydrocarbons as gasoline analyzed by EPA Method 8260B; before 8/10/2004, analyzed by EPA Method 8015 unless otherwise noted.  
TPH Jet Fuel = Total petroleum hydrocarbons as jet fuel analyzed by EPA Method 8015  
BTEX = Benzene, toluene, ethylbenzene, and total xylenes analyzed by EPA Method 8260B; before 8/10/2004, analyzed by EPA Method 8020 unless otherwise noted  
MTBE = Methyl tertiary-butyl ether analyzed by EPA Method 8260B; before 8/10/2004, analyzed by EPA Method 8020.  
TBA = Tertiary-butyl alcohol analyzed by EPA Method 8260B  
DIPE = Di-isopropyl ether analyzed by EPA Method 8260B  
ETBE = Ethyl tertiary-butyl ether analyzed by EPA Method 8260B  
TAME = Tertiary-amyl methyl ether analyzed by EPA Method 8260B  
1,2-DCA = 1,2-Dichloroethane analyzed by EPA Method 8260B unless otherwise noted.  
EDB = 1,2-Dibromoethane analyzed by EPA Method 8260B  
Ethanol by EPA Method 6010B  
1,1,1-Trichloroethane analyzed by EPA Method 8010  
VOCs = Volatile organic compounds. See analytical report for specific constituents. Analytical method unknown.  
HVOCs = Halogenated volatile organic compounds analyzed by EPA Method 8010. See analytical report for specific constituents. All detections noted.  
Chlorinated hydrocarbons analyzed by EPA Method 8010 unless otherwise noted. See analytical report for specific constituents. All detections tabulated.  
Cd = Cadmium analyzed by EPA Method 6010B  
Cr = Chromium analyzed by EPA Method 6010B  
Pb = Lead analyzed by EPA Method 6010B  
Ni = Nickel analyzed by EPA Method 6010B  
Zn = Zinc analyzed by EPA Method 6010B  
PNAs = Polynuclear aromatics analyzed by EPA Method 8270C; see laboratory analytical report for a complete list of specific constituents  
PCP = Pentachlorophenol analyzed by EPA Method 8270C

Table 1

Historical Soil Analytical Data  
 Shell-branded Service Station  
 1601 Webster Street, Alameda, California

Sample ID	Date	Depth (fbg)	O&G (mg/kg)	Non-Polar O&G (mg/kg)	TPHmo (mg/kg)	TPHd (mg/kg)	TPHg (mg/kg)	TPH Jet Fuel (mg/kg)	B (mg/kg)	T (mg/kg)	E (mg/kg)	X (mg/kg)	MTBE (mg/kg)	TBA (mg/kg)	DIPE (mg/kg)	ETBE (mg/kg)	TAME (mg/kg)	1,2-DCA (mg/kg)	EDB (mg/kg)	Ethanol (mg/kg)	1,1,1-Trichloroethane (mg/kg)	VOCs (mg/kg)	HVOCs (mg/kg)	Chlorinated Hydrocarbons (mg/kg)	Cd (mg/kg)	Cr (mg/kg)	Pb (mg/kg)	Ni (mg/kg)	Zn (mg/kg)	PNAs (mg/kg)	PCP (mg/kg)	Creosote (mg/kg)	PCBs (mg/kg)
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Creosote analyzed by EPA Method 8270C. It is reported as a combination of naphthalene, acenaphthylene, fluorene, phenanthrene, anthracene, fluoranthene, pyrene, 1-methylnaphthalene, and 2-methylnaphthalene.

PCBs = Polychlorinated biphenyls analyzed by EPA Method 8082; see laboratory analytical report for a complete list of specific constituents

- fbg = Feet below grade
- mg/kg = Milligrams per kilogram
- <x = Not detected at reporting limit x
- = Not analyzed
- ND = Not detected
- ESL = Environmental screening level
- NA = No applicable ESL

Results in **bold** equal or exceed applicable ESL

Shading indicates that soil sample location was subsequently excavated; results are not representative of residual soil.

- a = Analyzed by EPA Method 8015
- b = Analytical method unknown
- c = Analyzed by EPA Method 3550
- d = Analyzed by APHA Standard Method 503 D&E
- e = Methylene chloride detected at 0.0017 mg/kg. No other constituents detected.
- f = Methylene chloride detected at 0.0072 mg/kg. No other constituents detected.
- g = Methylene chloride detected at 0.070 mg/kg. No other constituents detected.
- h = Only chlorobenzene, 1,2-dichlorobenzene, 1,3-dichlorobenzene, and 1,4-dichlorobenzene analyzed.
- i = Analyzed by EPA Method 8020
- j = Analyzed by EPA Method 1664 A (Modified)
- k = Hydrocarbons reported as TPHd do not exhibit a typical Diesel chromatographic pattern. These hydrocarbons are higher boiling than typical diesel fuel.
- l = Analyzed by EPA Method 8260B
- m = The concentration indicated for this analyte is an estimated value above the calibration range on the instrument.
- n = San Francisco Bay Regional Water Quality Control Board (RWQCB) commercial/industrial ESL for soil where groundwater is a potential source of drinking water (Tables A and C of *User's Guide: Derivation and Application of Environmental Screening Levels*, RWQCB, Interim Final - 2013).

Table 2

**Groundwater Data**  
**Shell-branded Service Station**  
**1601 Webster Street, Alameda, California**

Well ID	Date	TPHg (µg/L)	B (µg/L)	T (µg/L)	E (µg/L)	X (µg/L)	MTBE (µg/L)	TBA (µg/L)	DIPE (µg/L)	ETBE (µg/L)	TAME (µg/L)	1,2- DCA (µg/L)	EDB (µg/L)	Ethanol (µg/L)	TOC (ft MSL)	Depth to Water (ft TOC)	SPH Thickness (ft)	GW Elevation (ft MSL)
S-2	11/14/2005	---	---	---	---	---	---	---	---	---	---	---	---	---	19.73	7.60	---	12.13
S-2	11/22/2005	996	0.630	0.500	0.500	3.10	406	18.0	<0.500	<0.500	0.570	---	---	---	19.73	7.70	---	12.03
S-2	02/24/2006	<50 b	<0.50	<0.50	<0.50	<0.50	2.0	<5.0	<0.50	<0.50	<0.50	---	---	---	19.73	6.29	---	13.44
S-2	05/30/2006	<50.0	<0.500	<0.500	<0.500	<0.500	<0.500	<10.0	<0.500	<0.500	<0.500	---	---	---	19.73	6.14	---	13.59
S-2	08/30/2006	420	<0.500	<0.500	<0.500	<0.500	4.42	<10.0	<0.500	<0.500	<0.500	---	---	---	19.73	7.18	---	12.55
S-2	11/22/2006	110	<0.50	<0.50	<0.50	<1.0	62	<5.0	<2.0	<2.0	<2.0	---	---	---	19.73	7.55	---	12.18
S-2	02/23/2007	140	<0.50	<0.50	<0.50	<1.0	110	<5.0	<2.0	<2.0	<2.0	---	---	---	19.73	6.77	---	12.96
S-2	05/18/2007	<50 h	<0.50	<1.0	<1.0	<1.0	18	<10	<2.0	<2.0	<2.0	---	---	---	19.73	7.02	---	12.71
S-2	08/10/2007	<50 h	<0.50	<1.0	<1.0	<1.0	40	<10	<2.0	<2.0	<2.0	---	---	---	19.73	7.65	---	12.08
S-2	11/09/2007	130 h,i	<0.50	<1.0	<1.0	<1.0	190	<10	<2.0	<2.0	<2.0	---	---	---	19.73	7.87	---	11.86
S-2	02/08/2008	83 h,i	<1.0	<2.0	<2.0	<2.0	180	<20	<4.0	<4.0	<4.0	---	---	---	19.73	6.52	---	13.21
S-2	05/16/2008	<50	<0.50	<1.0	<1.0	<1.0	<1.0	<10	<2.0	<2.0	<2.0	---	---	---	19.73	7.30	---	12.43
S-2	08/15/2008	<50	<0.50	<1.0	<1.0	<1.0	7.1	<10	<2.0	<2.0	<2.0	---	---	---	19.73	8.38	---	11.35
S-2	11/26/2008	<50	<0.50	<1.0	<1.0	<1.0	32	<10	<2.0	<2.0	<2.0	---	---	---	19.73	9.13	---	10.60
S-2	02/27/2009	90	<0.50	<1.0	<1.0	<1.0	85	<10	<2.0	<2.0	<2.0	---	---	---	19.73	7.05	---	12.68
S-2	05/28/2009	<50	<0.50	<1.0	<1.0	<1.0	8.0	<10	<2.0	<2.0	<2.0	---	---	---	19.73	6.93	---	12.80
S-2	09/14/2009	<50	<0.50	<1.0	<1.0	<1.0	17	<10	<2.0	<2.0	<2.0	---	---	---	19.73	8.20	---	11.53
S-2	02/05/2010	68	<0.50	<1.0	<1.0	<1.0	52	<10	<2.0	<2.0	<2.0	---	---	---	19.73	7.12	---	12.61
S-2	08/03/2010	<50	<0.50	<1.0	<1.0	<1.0	1.7	<10	<2.0	<2.0	<2.0	---	---	---	19.73	7.59	---	12.14
S-2	02/14/2011	<50	2.6	3.5	1.2	5.7	<1.0	<10	<1.0	<1.0	<1.0	---	---	---	19.73	7.16	---	12.57
S-2	08/04/2011	<50	<0.50	<0.50	<0.50	<1.0	<1.0	<10	<1.0	<1.0	<1.0	---	---	---	19.73	7.20	---	12.53
S-2	02/02/2012	<50	<0.50	<0.50	<0.50	<1.0	3.8	<10	<0.50	<0.50	<0.50	<0.50	<0.50	---	19.73	8.00	---	11.73
S-2	08/13/2012	<50	<0.50	<0.50	<0.50	<1.0	1.1	<10	---	---	---	---	---	---	19.73	7.85	---	11.88
<b>S-2</b>	<b>03/05/2013</b>	<b>&lt;50</b>	<b>&lt;0.50</b>	<b>&lt;0.50</b>	<b>&lt;0.50</b>	<b>&lt;1.0</b>	<b>0.63</b>	<b>&lt;10</b>	---	---	---	---	---	---	<b>19.73</b>	<b>7.09</b>	---	<b>12.64</b>
S-3	11/14/2005	---	---	---	---	---	---	---	---	---	---	---	---	---	19.14	7.01	---	12.13
S-3	11/22/2005	3,900	<0.500	<0.500	<0.500	0.900	3,730	26.0	<0.500	<0.500	3.44	---	---	---	19.14	7.15	---	11.99
S-3	02/24/2006	580 b	<0.50	<0.50	<0.50	<0.50	360	<5.0	<0.50	<0.50	<0.50	---	---	---	19.14	5.95	---	13.19
S-3	05/30/2006	<50.0	<0.500	<0.500	<0.500	0.510	52.2	<10.0	<0.500	<0.500	<0.500	---	---	---	19.14	5.85	---	13.29
S-3	08/30/2006	2,910	<0.500	<0.500	<0.500	<0.500	882	<10.0	<0.500	<0.500	<0.500	---	---	---	19.14	6.71	---	12.43
S-3	11/22/2006	240	<0.50	<0.50	<0.50	<1.0	150	30	<2.0	<2.0	<2.0	---	---	---	19.14	7.05	---	12.09
S-3	02/23/2007	78	<0.50	<0.50	<0.50	<1.0	78	5.4	<2.0	<2.0	<2.0	---	---	---	19.14	6.30	---	12.84
S-3	05/18/2007	120 h,i	<0.50	<1.0	<1.0	<1.0	150	73	<2.0	<2.0	<2.0	---	---	---	19.14	6.58	---	12.56

Table 2

**Groundwater Data**  
**Shell-branded Service Station**  
**1601 Webster Street, Alameda, California**

Well ID	Date	TPHg (µg/L)	B (µg/L)	T (µg/L)	E (µg/L)	X (µg/L)	MTBE (µg/L)	TBA (µg/L)	DIPE (µg/L)	ETBE (µg/L)	TAME (µg/L)	1,2- DCA (µg/L)	EDB (µg/L)	Ethanol (µg/L)	TOC (ft MSL)	Depth to Water (ft TOC)	SPH Thickness (ft)	GW Elevation (ft MSL)
S-3	08/10/2007	<50 h	<1.0	<2.0	<2.0	<2.0	200	21	<4.0	<4.0	<4.0	---	---	---	19.14	7.09	---	12.05
S-3	11/09/2007	69 h,i	<0.50	<1.0	<1.0	<1.0	100	<10	<2.0	<2.0	<2.0	---	---	---	19.14	7.28	---	11.86
S-3	02/08/2008	<50 h	<0.50	<1.0	<1.0	<1.0	8.5	<10	<2.0	<2.0	<2.0	---	---	---	19.14	6.06	---	13.08
S-3	05/16/2008	71	<0.50	<1.0	<1.0	<1.0	100	<10	<2.0	<2.0	<2.0	---	---	---	19.14	6.84	---	12.30
S-3	08/15/2008	<50	<0.50	<1.0	<1.0	<1.0	9.0	<10	<2.0	<2.0	<2.0	---	---	---	19.14	7.83	---	11.31
S-3	11/26/2008	<50	0.53	<1.0	<1.0	1.5	12	<10	<2.0	<2.0	<2.0	---	---	---	19.14	8.70	---	10.44
S-3	02/27/2009	<50	<0.50	<1.0	<1.0	<1.0	3.2	<10	<2.0	<2.0	<2.0	---	---	---	19.14	6.97	---	12.17
S-3	05/28/2009	<50	<0.50	<1.0	<1.0	<1.0	<1.0	<10	<2.0	<2.0	<2.0	---	---	---	19.14	6.41	---	12.73
S-3	09/14/2009	<50	<0.50	<1.0	<1.0	<1.0	6.1	<10	<2.0	<2.0	<2.0	---	---	---	19.14	7.60	---	11.54
S-3	02/05/2010	<50	<0.50	<1.0	<1.0	<1.0	1.8	<10	<2.0	<2.0	<2.0	---	---	---	19.14	6.63	---	12.51
S-3	08/03/2010	<50	<0.50	<1.0	<1.0	<1.0	5.4	<10	<2.0	<2.0	<2.0	---	---	---	19.14	7.05	---	12.09
S-3	02/14/2011	<50	1.7	2.6	0.95	4.6	<1.0	<10	<1.0	<1.0	<1.0	---	---	---	19.14	6.71	---	12.43
S-3	08/04/2011	<50	<0.50	<0.50	<0.50	<1.0	<1.0	<10	<1.0	<1.0	<1.0	---	---	---	19.14	6.75	---	12.39
S-3	02/02/2012	<50	<0.50	<0.50	<0.50	<1.0	<0.50	<10	<0.50	<0.50	<0.50	<0.50	<0.50	---	19.14	7.53	---	11.61
S-3	08/13/2012	<50	<0.50	<0.50	<0.50	<1.0	0.51	<10	---	---	---	---	---	---	19.14	7.35	---	11.79
<b>S-3</b>	<b>03/05/2013</b>	<b>&lt;50</b>	<b>&lt;0.50</b>	<b>&lt;0.50</b>	<b>&lt;0.50</b>	<b>&lt;1.0</b>	<b>&lt;0.50</b>	<b>&lt;10</b>	---	---	---	---	---	---	<b>19.14</b>	<b>6.67</b>	---	<b>12.47</b>
S-4	11/14/2005	---	---	---	---	---	---	---	---	---	---	---	---	---	18.16	6.00	---	12.16
S-4	11/22/2005	4,570	<0.500	<0.500	<0.500	0.660	3,450	26.0	<0.500	<0.500	3.57	---	---	---	18.16	6.10	---	12.06
S-4	02/24/2006	2,200 b	<0.50	<0.50	<0.50	<0.50	1,400	13 c	<0.50	<0.50	1.4	---	---	---	18.16	5.09	---	13.07
S-4	05/30/2006	1,100	<0.500	<0.500	<0.500	<0.500	1,060	87.5	<0.500	<0.500	1.04	---	---	---	18.16	5.00	---	13.16
S-4	08/30/2006	3,170	<0.500	<0.500	<0.500	<0.500	1,000	120	<0.500	<0.500	0.850	---	---	---	18.16	5.81	---	12.35
S-4	11/22/2006	520	<0.50	<0.50	<0.50	<1.0	480	5.2	<2.0	<2.0	<2.0	---	---	---	18.16	5.93	---	12.23
S-4	02/23/2007	180	<0.50	<0.50	<0.50	<1.0	130	9.6	<2.0	<2.0	<2.0	---	---	---	18.16	5.40	---	12.76
S-4	05/18/2007	220 h,i	<2.5	<5.0	<5.0	2.5 j	420	<50	<10	<10	<10	---	---	---	18.16	5.62	---	12.54
S-4	08/10/2007	98 h,i	<2.5	<5.0	<5.0	<5.0	540	29 j	<10	<10	<10	---	---	---	18.16	6.00	---	12.16
S-4	11/09/2007	190 h,i	<2.5	<5.0	<5.0	<5.0	350	<50	<10	<10	<10	---	---	---	18.16	6.20	---	11.96
S-4	02/08/2008	<50 h	<0.50	<1.0	<1.0	<1.0	13	<10	<2.0	<2.0	<2.0	---	---	---	18.16	5.47	---	12.69
S-4	05/16/2008	87	<0.50	<1.0	<1.0	<1.0	120	<10	<2.0	<2.0	<2.0	---	---	---	18.16	6.00	---	12.16
S-4	08/15/2008	<50	<0.50	<1.0	<1.0	<1.0	42	<10	<2.0	<2.0	<2.0	---	---	---	18.16	6.85	---	11.31
S-4	11/26/2008	140	<0.50	<1.0	<1.0	<1.0	140	<10	<2.0	<2.0	<2.0	---	---	---	18.16	7.62	---	10.54
S-4	02/27/2009	56	<0.50	<1.0	<1.0	<1.0	43	<10	<2.0	<2.0	<2.0	---	---	---	18.16	5.35	---	12.81
S-4	05/28/2009	<50	<0.50	<1.0	<1.0	<1.0	12	<10	<2.0	<2.0	<2.0	---	---	---	18.16	5.40	---	12.76

Table 2

**Groundwater Data  
Shell-branded Service Station  
1601 Webster Street, Alameda, California**

Well ID	Date	TPHg (µg/L)	B (µg/L)	T (µg/L)	E (µg/L)	X (µg/L)	MTBE (µg/L)	TBA (µg/L)	DIPE (µg/L)	ETBE (µg/L)	TAME (µg/L)	1,2- DCA (µg/L)	EDB (µg/L)	Ethanol (µg/L)	TOC (ft MSL)	Depth to Water (ft TOC)	SPH Thickness (ft)	GW Elevation (ft MSL)
S-4	09/14/2009	<50	<0.50	<1.0	<1.0	<1.0	6.7	<10	<2.0	<2.0	<2.0	---	---	---	18.16	6.55	---	11.61
S-4	02/05/2010	<50	<0.50	<1.0	<1.0	<1.0	4.3	<10	<2.0	<2.0	<2.0	---	---	---	18.16	5.62	---	12.54
S-4	08/03/2010	<50	<0.50	<1.0	<1.0	<1.0	10	<10	<2.0	<2.0	<2.0	---	---	---	18.16	6.09	---	12.07
S-4	02/14/2011	<50	1.3	2.2	0.91	4.4	1.6	<10	<1.0	<1.0	<1.0	---	---	---	18.16	5.80	---	12.36
S-4	08/04/2011	<50	<0.50	<0.50	<0.50	<1.0	<1.0	<10	<1.0	<1.0	<1.0	---	---	---	18.16	5.79	---	12.37
S-4	02/02/2012	<50	<0.50	<0.50	<0.50	<1.0	<0.50	<10	<0.50	<0.50	<0.50	<0.50	<0.50	---	18.16	6.56	---	11.60
S-4	08/13/2012	<50	<0.50	<0.50	<0.50	<1.0	0.68	<10	<0.50	<0.50	<0.50	---	---	---	18.16	6.35	---	11.81
<b>S-4</b>	<b>03/05/2013</b>	<b>&lt;50</b>	<b>&lt;0.50</b>	<b>&lt;0.50</b>	<b>&lt;0.50</b>	<b>&lt;1.0</b>	<b>&lt;0.50</b>	<b>&lt;10</b>	<b>---</b>	<b>---</b>	<b>---</b>	<b>---</b>	<b>---</b>	<b>---</b>	<b>18.16</b>	<b>5.75</b>	<b>---</b>	<b>12.41</b>
S-4B	08/21/2006	---	---	---	---	---	---	---	---	---	---	---	---	---	18.78	6.14	---	12.64
S-4B	08/30/2006	3,630	<0.500	<0.500	5.32	<0.500	1,130	643	<0.500	<0.500	1.47	---	---	---	18.78	6.32	---	12.46
S-4B	11/22/2006	620	<0.50	<0.50	0.66	<1.0	580	680	<2.0	<2.0	<2.0	---	---	---	18.78	6.46	---	12.32
S-4B	02/23/2007	230	<1.0	<1.0	<1.0	<2.0	190	450	<4.0	<4.0	<4.0	---	---	---	18.78	6.64	---	12.14
S-4B	05/18/2007	200 h	<0.50	<1.0	<1.0	<1.0	130	360	<2.0	<2.0	<2.0	---	---	---	18.78	6.19	---	12.59
S-4B	08/10/2007	150 h	0.47 j	<1.0	<1.0	<1.0	67	230	<2.0	<2.0	<2.0	---	---	---	18.78	6.48	---	12.30
S-4B	11/09/2007	<50 h	<0.50	<1.0	<1.0	<1.0	32	67	<2.0	<2.0	<2.0	---	---	---	18.78	6.59	---	12.19
S-4B	02/08/2008	<50 h	<0.50	<1.0	<1.0	<1.0	5.3	<10	<2.0	<2.0	<2.0	---	---	---	18.78	6.12	---	12.66
S-4B	05/16/2008	<50	<0.50	<1.0	<1.0	<1.0	2.2	15	<2.0	<2.0	<2.0	---	---	---	18.78	6.45	---	12.33
S-4B	08/15/2008	<50	<0.50	<1.0	<1.0	<1.0	1.4	<10	<2.0	<2.0	<2.0	---	---	---	18.78	6.90	---	11.88
S-4B	11/26/2008	<50	<0.50	<1.0	<1.0	<1.0	2.5	<10	<2.0	<2.0	<2.0	---	---	---	18.78	8.19	---	10.59
S-4B	02/27/2009	<50	<0.50	<1.0	<1.0	<1.0	1.4	<10	<2.0	<2.0	<2.0	---	---	---	18.78	6.03	---	12.75
S-4B	05/28/2009	<50	<0.50	<1.0	<1.0	<1.0	2.0	<10	<2.0	<2.0	<2.0	---	---	---	18.78	6.01	---	12.77
S-4B	09/14/2009	<50	<0.50	<1.0	<1.0	<1.0	3.7	<10	<2.0	<2.0	<2.0	---	---	---	18.78	6.90	---	11.88
S-4B	02/05/2010	<50	<0.50	<1.0	<1.0	<1.0	2.0	<10	<2.0	<2.0	<2.0	---	---	---	18.78	7.23	---	11.55
S-4B	08/03/2010	<50	<0.50	<1.0	<1.0	<1.0	1.2	25	<2.0	<2.0	<2.0	---	---	---	18.78	6.64	---	12.14
S-4B	02/14/2011	<50	1.3	2.1	0.82	3.9	<1.0	<10	<1.0	<1.0	<1.0	---	---	---	18.78	6.70	---	12.08
S-4B	08/04/2011	<50	<0.50	<0.50	<0.50	<1.0	1.1	22	<1.0	<1.0	<1.0	---	---	---	18.78	7.13	---	11.65
S-4B	02/02/2012	<50	<0.50	<0.50	<0.50	<1.0	1.1	<10	<0.50	<0.50	<0.50	<0.50	<0.50	---	18.78	6.57	---	12.21
S-4B	08/13/2012	<50	<0.50	<0.50	<0.50	<1.0	0.95	<10	---	---	---	---	---	---	18.78	7.83	---	10.95
<b>S-4B</b>	<b>03/05/2013</b>	<b>&lt;50</b>	<b>&lt;0.50</b>	<b>&lt;0.50</b>	<b>&lt;0.50</b>	<b>&lt;1.0</b>	<b>0.97</b>	<b>&lt;10</b>	<b>---</b>	<b>---</b>	<b>---</b>	<b>---</b>	<b>---</b>	<b>---</b>	<b>18.78</b>	<b>6.39</b>	<b>---</b>	<b>12.39</b>
S-5	11/14/2005	---	---	---	---	---	---	---	---	---	---	---	---	---	18.68	6.33	---	12.35
S-5	11/22/2005	1,010	0.900	<0.500	1.79	4.91	302	397	<0.500	<0.500	<0.500	---	---	---	18.68	6.44	---	12.24

Table 2

**Groundwater Data  
Shell-branded Service Station  
1601 Webster Street, Alameda, California**

Well ID	Date	TPHg (µg/L)	B (µg/L)	T (µg/L)	E (µg/L)	X (µg/L)	MTBE (µg/L)	TBA (µg/L)	DIPE (µg/L)	ETBE (µg/L)	TAME (µg/L)	1,2- DCA (µg/L)	EDB (µg/L)	Ethanol (µg/L)	TOC (ft MSL)	Depth to Water (ft TOC)	SPH Thickness (ft)	GW Elevation (ft MSL)
S-5	02/24/2006	<50 b	<0.50	<0.50	<0.50	<0.50	19	<5.0	<0.50	<0.50	<0.50	---	---	---	18.68	5.44	---	13.24
S-5	05/30/2006	2,000	4.13	0.670	<0.500	3.28	143	<10.0	<0.500	<0.500	<0.500	---	---	---	18.68	5.33	---	13.35
S-5	08/30/2006	1,380	<0.500	<0.500	1.43	<0.500	211	106	<0.500	<0.500	<0.500	---	---	---	18.68	6.16	---	12.52
S-5	11/22/2006	82	<0.50	<0.50	<0.50	<1.0	28	13	<2.0	<2.0	<2.0	---	---	---	18.68	6.28	---	12.40
S-5	02/23/2007	<50	<0.50	<0.50	<0.50	<1.0	1.2	<5.0	<2.0	<2.0	<2.0	---	---	---	18.68	5.68	---	13.00
S-5	05/18/2007	<50 h,i	<0.50	<1.0	<1.0	<1.0	2.6	<10	<2.0	<2.0	<2.0	---	---	---	18.68	5.91	---	12.77
S-5	08/10/2007	<50 h	<0.50	<1.0	<1.0	<1.0	1.0	<10	<2.0	<2.0	<2.0	---	---	---	18.68	6.36	---	12.32
S-5	11/09/2007	<50 h	<0.50	<1.0	<1.0	<1.0	<10	<10	<2.0	<2.0	<2.0	---	---	---	18.68	6.47	---	12.21
S-5	02/08/2008	<50 h	<0.50	<1.0	<1.0	<1.0	<1.0	<10	<2.0	<2.0	<2.0	---	---	---	18.68	5.52	---	13.16
S-5	05/16/2008	<50	<0.50	<1.0	<1.0	<1.0	<1.0	<10	<2.0	<2.0	<2.0	---	---	---	18.68	6.22	---	12.46
S-5	08/15/2008	<50	<0.50	<1.0	<1.0	<1.0	<1.0	<10	<2.0	<2.0	<2.0	---	---	---	18.68	7.26	---	11.42
S-5	11/26/2008	<50	<0.50	<1.0	<1.0	<1.0	<1.0	<10	<2.0	<2.0	<2.0	---	---	---	18.68	8.03	---	10.65
S-5	02/27/2009	<50	<0.50	<1.0	<1.0	<1.0	<1.0	<10	<2.0	<2.0	<2.0	---	---	---	18.68	5.83	---	12.85
S-5	05/28/2009	<50	<0.50	<1.0	<1.0	<1.0	<1.0	<10	<2.0	<2.0	<2.0	---	---	---	18.68	5.73	---	12.95
S-5	09/14/2009	<50	<0.50	<1.0	<1.0	<1.0	<1.0	<10	<2.0	<2.0	<2.0	---	---	---	18.68	6.95	---	11.73
S-5	02/05/2010	<50	<0.50	<1.0	<1.0	<1.0	<1.0	<10	<2.0	<2.0	<2.0	---	---	---	18.68	6.01	---	12.67
S-5	08/03/2010	<50	<0.50	<1.0	<1.0	<1.0	<1.0	<10	<2.0	<2.0	<2.0	---	---	---	18.68	6.46	---	12.22
S-5	02/14/2011	<50	3.9	3.8	1.2	5.3	1.8	<10	<1.0	<1.0	<1.0	---	---	---	18.68	6.20	---	12.48
S-5	08/04/2011	<50	<0.50	<0.50	<0.50	<1.0	1.8	<10	<1.0	<1.0	<1.0	---	---	---	18.68	6.15	---	12.53
S-5	02/02/2012	<50	<0.50	<0.50	<0.50	<1.0	0.75	<10	<0.50	<0.50	<0.50	<0.50	<0.50	---	18.68	6.87	---	11.81
S-5	08/13/2012	<50	<0.50	<0.50	<0.50	<1.0	<0.50	<10	---	---	---	---	---	---	18.68	6.70	---	11.98
<b>S-5</b>	<b>03/05/2013</b>	<b>&lt;50</b>	<b>&lt;0.50</b>	<b>&lt;0.50</b>	<b>&lt;0.50</b>	<b>&lt;1.0</b>	<b>1.4</b>	<b>&lt;10</b>	<b>---</b>	<b>---</b>	<b>---</b>	<b>---</b>	<b>---</b>	<b>---</b>	<b>18.68</b>	<b>6.10</b>	<b>---</b>	<b>12.58</b>
S-6	11/14/2005	---	---	---	---	---	---	---	---	---	---	---	---	---	19.32	6.36	---	12.96
S-6	11/22/2005	15,800	5.14	0.690	32.1	934	<0.500	14.2	<0.500	<0.500	<0.500	---	---	---	19.32	6.53	---	12.79
S-6	01/19/2006	---	---	---	---	---	---	---	---	---	---	---	---	---	19.32	5.50	---	13.82
S-6	02/24/2006	7,900 b	4.4	<1.5	260	380	<1.5	<7.0	<1.5	<1.5	<1.5	---	---	---	19.32	5.76	---	13.56
S-6	05/30/2006	4,170	4.98	<0.500	76.6	44.2	<0.500	<10.0	<0.500	<0.500	<0.500	---	---	---	19.32	5.68	---	13.64
S-6	08/30/2006	16,400	10.7	<0.500	353	292	<0.500	<10.0	<0.500	<0.500	<0.500	---	---	---	19.32	6.38	---	12.94
S-6	11/22/2006	6,900	7.7	<2.5	250	450	<2.5	<25	<10	<10	<10	---	---	---	19.32	6.62	---	12.70
S-6	02/23/2007	7,900	4.4	<2.5	400	940	<2.5	<25	<10	<10	<10	---	---	---	19.32	6.06	---	13.26
S-6	05/18/2007	2,600 h	3.1	<1.0	85	147.3	<1.0	<10	<2.0	<2.0	<2.0	---	---	---	19.32	6.12	---	13.20
S-6	08/10/2007	3,100 h	3.5	0.28 j	110	202	<1.0	<10	<2.0	<2.0	<2.0	---	---	---	19.32	6.60	---	12.72



Table 2

**Groundwater Data  
Shell-branded Service Station  
1601 Webster Street, Alameda, California**

Well ID	Date	TPHg (µg/L)	B (µg/L)	T (µg/L)	E (µg/L)	X (µg/L)	MTBE (µg/L)	TBA (µg/L)	DIPE (µg/L)	ETBE (µg/L)	TAME (µg/L)	1,2- DCA (µg/L)	EDB (µg/L)	Ethanol (µg/L)	TOC (ft MSL)	Depth to Water (ft TOC)	SPH Thickness (ft)	GW Elevation (ft MSL)
S-6	11/09/2007	3,700 h	2.1	0.34 j	160	335	<1.0	<10	<2.0	<2.0	<2.0	---	---	---	19.32	6.80	---	12.52
S-6	02/08/2008	2,600 h	2.7	<1.0	72	156.0	<1.0	<10	<2.0	<2.0	<2.0	---	---	---	19.32	6.11	---	13.21
S-6	05/16/2008	350	<0.50	<1.0	8.4	5.3	<1.0	<10	<2.0	<2.0	<2.0	---	---	---	19.32	6.60	---	12.72
S-6	08/15/2008	3,600	0.99	<1.0	100	164.9	<1.0	<10	<2.0	<2.0	<2.0	---	---	---	19.32	7.70	---	11.62
S-6	11/26/2008	1,500	2.9	<1.0	13	3.1	<1.0	<10	<2.0	<2.0	<2.0	---	---	---	19.32	8.41	---	10.91
S-6	02/27/2009	2,800	4.3	<1.0	17	23	<1.0	<10	<2.0	<2.0	<2.0	---	---	---	19.32	6.22	---	13.10
S-6	05/28/2009	570	0.74	<1.0	3.1	1.3	<1.0	<10	<2.0	<2.0	<2.0	---	---	---	19.32	6.10	---	13.22
S-6	09/14/2009	440	0.55	<1.0	1.5	2.3	<1.0	<10	<2.0	<2.0	<2.0	---	---	---	19.32	7.43	---	11.89
S-6	02/05/2010	2,200	1.7	<1.0	5.2	8.3	<1.0	<10	<2.0	<2.0	<2.0	---	---	---	19.32	6.34	---	12.98
S-6	08/03/2010	340	<0.50	<1.0	<1.0	1.0	<1.0	<10	<2.0	<2.0	<2.0	---	---	---	19.32	6.85	---	12.47
S-6	02/14/2011	590	1.0	1.0	1.4	3.7	<1.0	<10	<1.0	<1.0	<1.0	---	---	---	19.32	6.50	---	12.82
S-6	08/04/2011	820	1.2	<0.50	1.7	1.2	<1.0	<10	<1.0	<1.0	<1.0	---	---	---	19.32	6.52	---	12.80
S-6	02/02/2012	1,500	1.4	<0.50	2.4	1.4	<0.50	<10	<0.50	<0.50	<0.50	<0.50	<0.50	---	19.32	7.30	---	12.02
S-6	08/13/2012	320	<0.50	<0.50	<0.50	<1.0	<0.50	<10	---	---	---	---	---	---	19.32	7.16	---	12.16
<b>S-6</b>	<b>03/05/2013</b>	<b>530</b>	<b>&lt;0.50</b>	<b>&lt;0.50</b>	<b>&lt;0.50</b>	<b>&lt;1.0</b>	<b>&lt;0.50</b>	<b>&lt;10</b>	---	---	---	---	---	---	<b>19.32</b>	<b>6.41</b>	---	<b>12.91</b>
S-7	11/14/2005	---	---	---	---	---	---	---	---	---	---	---	---	---	19.44	6.76	---	12.68
S-7	11/22/2005	51,100	2,680	2,980	969	6,360	1.49	53.3	<0.500	<0.500	<0.500	---	---	---	19.44	6.88	---	12.56
S-7	02/24/2006	22,000 b/25,000 d	1,700	1,200	1,200	2,800	<2.5	58	<2.5	<2.5	<2.5	---	---	---	19.44	5.73	---	13.71
S-7	05/30/2006	35,600	1,720	641	1,600	3,630	2.83	<10.0	<0.500	<0.500	<0.500	---	---	---	19.44	5.61	---	13.83
S-7	08/30/2006	83,900	5,060	62.5	1,640	4,010	2.38	43.4	<0.500	<0.500	<0.500	---	---	---	19.44	6.43	---	13.01
S-7	11/22/2006	13,000	4,300	27	710	1,900	<2.5	54	<10	<10	<10	---	---	---	19.44	6.68	---	12.76
S-7	02/23/2007	15,000	2,000	43	1,100	3,300	<12	<120	<50	<50	<50	---	---	---	19.44	5.82	---	13.62
S-7	05/18/2007	6,100 h	3,900	22 j	520	2,010	<50	<500	<100	<100	<100	---	---	---	19.44	6.20	---	13.24
S-7	08/10/2007	14,000 h	4,900	19 j	670	2,046 j	<50	<500	<100	<100	<100	---	---	---	19.44	6.74	---	12.70
S-7	11/09/2007	16,000 h	4,400	21 j	550	2,052	<50	<500	<100	<100	<100	---	---	---	19.44	6.93	---	12.51
S-7	02/08/2008	2,400 h	160	<2.0	70	160	<2.0	<20	<4.0	<4.0	<4.0	---	---	---	19.44	6.23	---	13.21
S-7	05/16/2008	6,200	1,200	21	320	736.9	<2.0	<20	<4.0	<4.0	<4.0	---	---	---	19.44	6.62	---	12.82
S-7	08/15/2008	15,000	4,500	19	450	1,300	<10	<100	<20	<20	<20	---	---	---	19.44	7.81	---	11.63
S-7	11/26/2008	9,300	3,200	<25	77	250	<25	<250	<50	<50	<50	---	---	---	19.44	8.53	---	10.91
S-7	02/27/2009	3,900	900	<25	49	160	<25	<250	<50	<50	<50	---	---	---	19.44	6.27	---	13.17
S-7	05/28/2009	7,100	1,200	<10	81	600	<10	<100	<20	<20	<20	---	---	---	19.44	6.18	---	13.26
S-7	09/14/2009	11,000	4,000	19	73	66	<10	<100	<20	<20	<20	---	---	---	19.44	7.58	---	11.86

Table 2

**Groundwater Data**  
**Shell-branded Service Station**  
**1601 Webster Street, Alameda, California**

Well ID	Date	TPHg (µg/L)	B (µg/L)	T (µg/L)	E (µg/L)	X (µg/L)	MTBE (µg/L)	TBA (µg/L)	DIPE (µg/L)	ETBE (µg/L)	TAME (µg/L)	1,2- DCA (µg/L)	EDB (µg/L)	Ethanol (µg/L)	TOC (ft MSL)	Depth to Water (ft TOC)	SPH Thickness (ft)	GW Elevation (ft MSL)
S-7	02/05/2010	4,700	1,200	<10	33	17	<10	<100	<20	<20	<20	---	---	---	19.44	6.36	---	13.08
S-7	08/03/2010	7,600	2,600	14	15	10	<10	<100	<20	<20	<20	---	---	---	19.44	6.90	---	12.54
S-7	02/14/2011	2,200	800	<10	<10	<20	<20	<200	<20	<20	<20	---	---	---	19.44	6.53	---	12.91
S-7	08/04/2011	4,600	1,200	16	<10	<20	<20	<200	<20	<20	<20	---	---	---	19.44	6.53	---	12.91
S-7	02/02/2012	1,600	93	4.7	4.0	7.4	<1.0	<20	<1.0	<1.0	<1.0	<1.0	<1.0	---	19.44	7.39	---	12.05
S-7	08/13/2012	3,000	220	14	8.9	15	<2.0	<40	<2.0	<2.0	<2.0	---	---	---	19.44	7.14	---	12.30
<b>S-7</b>	<b>03/05/2013</b>	<b>2,000</b>	<b>120</b>	<b>6.2</b>	<b>6.1</b>	<b>10</b>	<b>&lt;1.0</b>	<b>&lt;20</b>	<b>---</b>	<b>---</b>	<b>---</b>	<b>---</b>	<b>---</b>	<b>---</b>	<b>19.44</b>	<b>6.35</b>	<b>---</b>	<b>13.09</b>
S-8	08/21/2006	---	---	---	---	---	---	---	---	---	---	---	---	---	20.11	7.02	---	13.09
S-8	08/30/2006	90,600	5,150	28.2	3,230	4,450	4.30	<10.0	<0.500	<0.500	<0.500	---	---	---	20.11	7.19	---	12.92
S-8	11/22/2006	41,000	4,900	58	3,300	7,200	2.6	<25	<10	<10	<10	---	---	---	20.11	7.48	---	12.63
S-8	02/23/2007	28,000	2,900	28	2,900	4,900	<25	<250	<100	<100	<100	---	---	---	20.11	6.73	---	13.38
S-8	05/18/2007	24,000 h	4,400	33 j	3,800	4,470	<50	<500	<100	<100	<100	---	---	---	20.11	6.98	---	13.13
S-8	08/10/2007	22,000 h	5,000	30 j	3,100	3,660	<50	<500	<100	<100	<100	---	---	---	20.11	7.57	---	12.54
S-8	11/09/2007	22,000 h	4,600	24 j	3,000	2,770	<50	<500	<100	<100	<100	---	---	---	20.11	7.80	---	12.31
S-8	02/08/2008	11,000 h	5,900	<50	410	310	<50	<500	<100	<100	<100	---	---	---	20.11	6.55	---	13.56
S-8	05/16/2008	20,000	1,600	32	2,300	2,136	<20	<200	<40	<40	<40	---	---	---	20.11	7.30	---	12.81
S-8	08/15/2008	26,000	2,400	20	4,900	2,432	<20	<200	<40	<40	<40	---	---	---	20.11	8.60	---	11.51
S-8	11/26/2008	10,000	890	6.6	790	302	<5.0	<50	<10	<10	<10	---	---	---	20.11	9.20	---	10.91
S-8	02/27/2009	770	30	<1.0	9.9	6.0	<1.0	12	<2.0	<2.0	<2.0	---	---	---	20.11	7.04	---	13.07
S-8	05/28/2009	5,800	620	3.1	390	380	<1.0	40	<2.0	<2.0	<2.0	---	---	---	20.11	6.91	---	13.20
S-8	09/14/2009	7,700	1,600	<10	110	750	<10	<100	<20	<20	<20	---	---	---	20.11	8.32	---	11.79
S-8	02/05/2010	10,000	2,000	<10	150	260	<10	<100	<20	<20	<20	---	---	---	20.11	7.08	---	13.03
S-8	08/03/2010	12,000	2,000	<20	47	82	<20	<200	<40	<40	<40	---	---	---	20.11	7.64	---	12.47
S-8	02/14/2011	4,900	960	<10	89	78	<20	<200	<20	<20	<20	---	---	---	20.11	7.20	---	12.91
S-8	08/04/2011	7,200	830	<5.0	26	13	<10	<100	<10	<10	<10	---	---	---	20.11	7.24	---	12.87
S-8	02/02/2012	12,000	1,400	4.0	29	9.8	<2.5	<50	<2.5	<2.5	<2.5	<2.5	<2.5	---	20.11	8.08	---	12.03
S-8	08/13/2012	7,100	1,100	<5.0	55	21	<5.0	<100	<5.0	<5.0	<5.0	---	---	---	20.11	7.84	---	12.27
<b>S-8</b>	<b>03/05/2013</b>	<b>3,600</b>	<b>700</b>	<b>&lt;5.0</b>	<b>18</b>	<b>&lt;10</b>	<b>&lt;5.0</b>	<b>&lt;100</b>	<b>---</b>	<b>---</b>	<b>---</b>	<b>---</b>	<b>---</b>	<b>---</b>	<b>20.11</b>	<b>7.10</b>	<b>---</b>	<b>13.01</b>
S-9	08/21/2006	---	---	---	---	---	---	---	---	---	---	---	---	---	19.60	6.93	---	12.67
S-9	08/30/2006	162,000	3,620	5,040	3,810	22,500	<0.500	<10.0	<0.500	<0.500	<0.500	---	---	---	19.60	6.52	---	13.08
S-9	11/22/2006	47,000	2,100	840	3,000	12,000	<2.5	<25	<10	<10	<10	---	---	---	19.60	6.78	---	12.82

Table 2

**Groundwater Data  
Shell-branded Service Station  
1601 Webster Street, Alameda, California**

Well ID	Date	TPHg (µg/L)	B (µg/L)	T (µg/L)	E (µg/L)	X (µg/L)	MTBE (µg/L)	TBA (µg/L)	DIPE (µg/L)	ETBE (µg/L)	TAME (µg/L)	1,2- DCA (µg/L)	EDB (µg/L)	Ethanol (µg/L)	TOC (ft MSL)	Depth to Water (ft TOC)	SPH Thickness (ft)	GW Elevation (ft MSL)
S-9	02/23/2007	18,000	890	120	1,800	3,600	<12	<120	<50	<50	<50	---	---	---	19.60	6.13	---	13.47
S-9	05/18/2007	22,000 h	1,300	630	2,400	7,300	<50	<500	<100	<100	<100	---	---	---	19.60	6.35	---	13.25
S-9	08/10/2007	36,000 h	2,600	920	4,200	14,900	<50	<500	<100	<100	<100	---	---	---	19.60	6.86	---	12.74
S-9	11/09/2007	34,000 h	2,100	320	3,700	12,000	<50	<500	<100	<100	<100	---	---	---	19.60	7.09	---	12.51
S-9	02/08/2008	7,400 h	410	51	1,100	1,620	<10	<100	<20	<20	<20	---	---	---	19.60	6.00	---	13.60
S-9	05/16/2008	19,000	910	230	1,600	4,200	<10	<100	<20	<20	<20	---	---	---	19.60	6.67	---	12.93
S-9	08/15/2008	65,000	2,600	540	5,200	19,000	<10	<100	<20	<20	<20	---	---	---	19.60	7.93	---	11.67
S-9	11/26/2008	18,000	910	<100	2,000	3,340	<100	<1,000	<200	<200	<200	---	---	---	19.60	8.60	---	11.00
S-9	02/27/2009	1,000	55	2.3	100	61	<1.0	<10	<2.0	<2.0	<2.0	---	---	---	19.60	6.35	---	13.25
S-9	05/28/2009	9,700	410	120	810	1,400	<10	<100	<20	<20	<20	---	---	---	19.60	6.22	---	13.38
S-9	09/14/2009	24,000	960	120	2,200	6,500	<5.0	<50	<10	<10	<10	---	---	---	19.60	7.73	---	11.87
S-9	02/05/2010	4,900	310	6.2	180	240	<5.0	<50	<10	<10	<10	---	---	---	19.60	6.51	---	13.09
S-9	08/03/2010	17,000	940	25	500	2,800	<2.0	29	<4.0	<4.0	<4.0	---	---	---	19.60	7.02	---	12.58
S-9	02/14/2011	1,500	190	3.6	11	38	<4.0	<40	<4.0	<4.0	<4.0	---	---	---	19.60	6.60	---	13.00
S-9	08/04/2011	5,300	370	18	53	370	<5.0	<50	<5.0	<5.0	<5.0	---	---	---	19.60	6.62	---	12.98
S-9	02/02/2012	1,100	85	2.1	3.4	2.9	<1.0	<20	<1.0	<1.0	<1.0	<1.0	<1.0	---	19.60	7.48	---	12.12
S-9	08/13/2012	4,200	370	18	48	66	<2.5	<50	---	---	---	---	---	---	19.60	7.27	---	12.33
<b>S-9</b>	<b>03/05/2013</b>	<b>1,800</b>	<b>72</b>	<b>2.8</b>	<b>4.9</b>	<b>6.4</b>	<b>&lt;1.0</b>	<b>&lt;20</b>	---	---	---	---	---	---	<b>19.60</b>	<b>6.53</b>	---	<b>13.07</b>
TBW-E	11/23/2004	---	---	---	---	---	---	---	---	---	---	---	---	---	---	6.31	---	---
TBW-E	12/01/2004	---	---	---	---	---	---	---	---	---	---	---	---	---	---	7.01	---	---
TBW-E	12/07/2004	---	---	---	---	---	---	---	---	---	---	---	---	---	---	6.32	---	---
TBW-E	12/15/2004	---	---	---	---	---	---	---	---	---	---	---	---	---	---	6.55	---	---
TBW-E	12/23/2004	---	---	---	---	---	---	---	---	---	---	---	---	---	---	5.95	---	---
TBW-E	12/27/2004	---	---	---	---	---	---	---	---	---	---	---	---	---	---	8.47	---	---
TBW-N	11/23/2004	83,000	640	27,000	1,700	20,000	2,300	1,300	<400	<400	<400	<100	<100	<10,000	---	5.64	---	---
TBW-N	12/01/2004	160,000	700	31,000	2,300	24,000	2,900	1,200	<400	<400	<400	<100	<100	<10,000	---	6.35	---	---
TBW-N	12/07/2004	130,000	590	29,000	2,300	24,000	2,700	1,300	<400	<400	<400	<100	<100	<10,000	---	5.65	---	---
TBW-N	12/15/2004	120,000	420	26,000	2,000	22,000	3,300	<1,000	<400	<400	<400	<100	<100	<10,000	---	5.85	---	---
TBW-N	12/23/2004	100,000	220	23,000	1,900	20,000	1,900	<1,000	<400	<400	<400	<100	<100	<10,000	---	5.30	---	---
TBW-N	12/27/2004	110,000	470	26,000	2,300	22,000	1,800	<1,000	<400	<400	<400	<100	<100	<10,000	---	7.80	---	---
TBW-N	01/17/2005	86,000	330	22,000	2,200	21,000	1,600	1,600	<400	<400	<400	<100	<100	<10,000	---	6.59	---	---

Table 2

**Groundwater Data  
Shell-branded Service Station  
1601 Webster Street, Alameda, California**

Well ID	Date	TPHg (µg/L)	B (µg/L)	T (µg/L)	E (µg/L)	X (µg/L)	MTBE (µg/L)	TBA (µg/L)	DIPE (µg/L)	ETBE (µg/L)	TAME (µg/L)	1,2- DCA (µg/L)	EDB (µg/L)	Ethanol (µg/L)	TOC (ft MSL)	Depth to Water (ft TOC)	SPH Thickness (ft)	GW Elevation (ft MSL)
TBW-N	02/04/2005	97,000	290	23,000	1,800	20,000	1,900	<1,000	<400	<400	<400	<100	<100	<10,000	---	4.50	---	---
TBW-N	03/02/2005	94,000	360	24,000	2,000	19,000	1,200	<1,000	<400	<400	<400	<100	<100	<10,000	---	4.11	---	---
TBW-N	04/12/2005	27,000	130	9,300	1,100	8,700	1,400	390	<100	<100	<20	<25	<25	<2,500	---	4.08	---	---
TBW-N	05/13/2005	42,000	130	8,700	1,500	12,000	1,400	440	<100	<100	<100	<25	<25	<2,500	---	4.45	---	---
TBW-N	06/10/2005	46,000	63	5,500	1,300	11,000	500	<250	<100	<100	<100	<25	<25	<2,500	---	4.97	---	---
TBW-N	07/15/2005	48,000	88	8,400	1,300	9,500	660	310	<100	<100	<100	<25	<25	<2,500	---	5.18	---	---
TBW-N	08/17/2005	36,000 a	85 a	8,500 a	1,200 a	11,000 a	510 a	<500 a	<200 a	<200 a	<200 a	<50 a	<50 a	<5,000 a	18.08	5.28	---	12.80
TBW-N	09/15/2005	20,000	59	2,400	730	9,300	600	500	<40	<40	<40	---	---	<1,000	18.08	5.92	---	12.16
TBW-N	10/17/2005	59,000	58	4,900	1,200	16,000	490	<250	<100	<100	<100	<25	<25	<2,500	18.08	5.96	---	12.12
TBW-N	11/22/2005	105,000	41.3	8,750	1,550	18,300	443	248	<0.500	<0.500	<0.500	<0.500	<0.500	<50.0	18.08	5.82	---	12.26
TBW-N	12/09/2005	65,900	43.4	5,110	1,110	13,500	493	259	<0.500	<0.500	<0.500	<0.500	<0.500	<50.0	18.08	5.60	---	12.48
TBW-N	01/05/2006	80,100	33.8	4,910	1,620	19,400	410	<10.0	<0.500	<0.500	<0.500	<0.500	<0.500	<50.0	18.08	4.44	---	13.64
TBW-N	02/24/2006	56,000 b/60,000 d	15	2,700	1,000	12,000	270	180	<15	<15	<15	<15	<15	<150	18.08	4.67	---	13.41
TBW-N	03/08/2006	60,200	23.4	3,820	1,370	16,500	293	93.8	<0.500	<0.500	<0.500	<0.500	<0.500	<50.0	18.08	4.18	---	13.90
TBW-N	04/13/2006	73,000	21.8	2,900	1,220	14,600	277	68.5	<0.500	<0.500	<0.500	<0.500	<0.500	<500	18.08	3.49	---	14.59
TBW-N	05/30/2006	59,300	18.7	1,170	1,800	10,200	119 e	<10.0	<0.500	<0.500	<0.500	0.860	<0.500	<50.0	18.08	4.52	---	13.56
TBW-N	06/05/2006	83,700	16.0	1,510	2,090	11,400	146 e	<10.0	<0.500	<0.500	<0.500	<0.500	<0.500	<50.0	18.08	4.55	---	13.53
TBW-N	07/19/2006	80,100	16.4	632	1,550	13,900	85.7	<10.0	<0.500	<0.500	<0.500	<0.500	<0.500	<50.0	18.08	4.99	---	13.09
TBW-N	08/30/2006	52,700	18.2	747	1,900	13,400	82.9	<100	<5.00	<5.00	<5.00	<5.00	<5.00	<500	18.08	5.47	---	12.61
TBW-N	09/06/2006	77,500	21.3	1,100	1,650	11,800	116	12.4	<0.500	<0.500	<0.500	<0.500	<0.500	<50.0	18.08	5.39	---	12.69
TBW-N	10/13/2006	33,000	22	1,300	1,700	27,000	160	<50	<20	<20	<20	<5.0	<5.0	<500	18.08	5.57	---	12.51
TBW-N	11/22/2006	36,000	18	680	1,200	14,000	110	<50	<20	<20	<20	<5.0	<5.0	<500	18.08	5.65	---	12.43
TBW-N	12/12/2006	34,000	<25	330	1,400	11,000	89	<1,000	<25	<25	<25	<25	<25	<5,000	18.08	5.34	---	12.74
TBW-N	01/05/2007	26,000 g	16	450	1,400	13,000 f	96	<50	<20	<20	<20	<5.0	<5.0	<500	18.08	5.23	---	12.85
TBW-N	02/23/2007	41,000	<25	400	1,500	15,000	120	<250	<100	<100	<100	<25	<25	<2,500	18.08	4.96	---	13.12
TBW-N	03/08/2007	15,000	<25	320	1,300	15,000	110	<250	<100	<100	<100	<25	<25	<2,500	18.08	4.93	---	13.15
TBW-N	04/06/2007	24,000 h	15	360	1,100	12,300	130	<50	<10	<10	<10	<2.5	---	<500	18.08	5.07	---	13.01
TBW-N	05/18/2007	30,000 h	15 j	140	1,100	9,960	100	<50	<100	<100	<100	<25	<50	<5,000	18.08	5.25	---	12.83
TBW-N	06/11/2007	26,000 h	15 j	160	1,300	9,150	120	<500	<100	<100	<100	<25	<50	<5,000	18.08	5.33	---	12.75
TBW-N	07/03/2007	36,000 h	9.3 j	150	990	8,400	130	<500	<100	<100	<100	<25	<50	<5,000	18.08	5.46	---	12.62
TBW-N	08/10/2007	24,000 h	14	200	1,200	5,240	120	<200	<40	<40	<40	<10	<20	<2,000	18.08	5.78	---	12.30
TBW-N	09/25/2007	28,000 h	15	560	1,400	7,600	<20	160 j	<40	<40	<40	<10	<20	<2,000	18.08	6.02	---	12.06
TBW-N	11/09/2007	42,000 h	18	610	1,700	14,500	140	<250	<50	<50	<50	<12	<25	<2,500	18.08	5.91	0.01	12.18

**Groundwater Data  
Shell-branded Service Station  
1601 Webster Street, Alameda, California**

Well ID	Date	TPHg (µg/L)	B (µg/L)	T (µg/L)	E (µg/L)	X (µg/L)	MTBE (µg/L)	TBA (µg/L)	DIPE (µg/L)	ETBE (µg/L)	TAME (µg/L)	1,2- DCA (µg/L)	EDB (µg/L)	Ethanol (µg/L)	TOC (ft MSL)	Depth to Water (ft TOC)	SPH Thickness (ft)	GW Elevation (ft MSL)
TBW-N	02/08/2008	36,000 h	<25	450	1,400	15,100	97	<500	<100	<100	<100	<25	<50	<5,000	18.08	4.79	---	13.29
TBW-N	05/16/2008	26,000	80	99	970	5,130	130	<500	<100	<100	<100	---	---	---	18.08	5.50	---	12.58
TBW-N	08/15/2008	24,000	<25	1,300	1,300	2,400	90	<500	<100	<100	<100	<25	<50	<5,000	18.08	6.59	---	11.49
TBW-N	11/26/2008	24,000	<25	140	810	5,580	52	<500	<100	<100	<100	<25	<50	<5,000	18.08	7.40	---	10.68
TBW-N	02/27/2009	22,000	<25	110	520	5,000	<50	<500	<100	<100	<100	<25	<50	<5,000	18.08	5.86	---	12.22
TBW-N	05/28/2009	32,000	8.9	160	860	5,600	53	160	<10	<10	<10	---	---	---	18.08	5.50	---	12.58
TBW-N	09/14/2009	28,000	10	110	890	4,700	60	<200	<40	<40	<40	<10	<20	<2000	18.08	6.31	---	11.77
TBW-N	02/05/2010	27,000	<10	71	630	4,900	28	<200	<40	<40	<40	<10	<20	<2000	18.08	5.28	---	12.80
TBW-N	08/03/2010	20,000	9.8	46	130	890	64	<100	<20	<20	<20	<5.0	<10	<1000	18.08	5.75	---	12.33
TBW-N	02/14/2011	15,000	7.5	38	320	1,800	18	<10	<10	<10	<10	<5.0	<5.0	<1500	18.08	5.40	---	12.68
TBW-N	08/04/2011	11,000	5.7	26	77	120	21	12	<1.0	<1.0	<1.0	<0.50	<0.50	<150	18.08	5.43	---	12.65
TBW-N	02/02/2012	11,000	4.8	15	150	200	<0.50	<10	<0.50	<0.50	<0.50	<0.50	<0.50	<150	18.08	6.27	---	11.81
TBW-N	08/13/2012	7,400	6.3	8.5	100	65	<0.50	17	---	---	---	<0.50	<0.50	<150	18.08	6.20	---	11.88
<b>TBW-N</b>	<b>03/05/2013</b>	<b>12,000</b>	<b>&lt;5.0</b>	<b>9.0</b>	<b>130</b>	<b>260</b>	<b>&lt;5.0</b>	<b>&lt;100</b>	<b>---</b>	<b>---</b>	<b>---</b>	<b>&lt;5.0</b>	<b>&lt;5.0</b>	<b>&lt;1,500</b>	<b>18.08</b>	<b>5.35</b>	<b>---</b>	<b>12.73</b>
TBW-S	11/23/2004	---	---	---	---	---	---	---	---	---	---	---	---	---	---	6.18	---	---
TBW-S	12/01/2004	---	---	---	---	---	---	---	---	---	---	---	---	---	---	6.87	---	---
TBW-S	12/07/2004	---	---	---	---	---	---	---	---	---	---	---	---	---	---	6.15	---	---
TBW-S	12/15/2004	---	---	---	---	---	---	---	---	---	---	---	---	---	---	6.38	---	---
TBW-S	12/23/2004	---	---	---	---	---	---	---	---	---	---	---	---	---	---	5.81	---	---
TBW-S	12/27/2004	---	---	---	---	---	---	---	---	---	---	---	---	---	---	8.35	---	---
TBW-W	11/23/2004	---	---	---	---	---	---	---	---	---	---	---	---	---	---	6.14	---	---
TBW-W	12/01/2004	---	---	---	---	---	---	---	---	---	---	---	---	---	---	6.86	---	---
TBW-W	12/07/2004	---	---	---	---	---	---	---	---	---	---	---	---	---	---	6.13	---	---
TBW-W	12/15/2004	---	---	---	---	---	---	---	---	---	---	---	---	---	---	6.37	---	---
TBW-W	12/23/2004	---	---	---	---	---	---	---	---	---	---	---	---	---	---	5.79	---	---
TBW-W	12/27/2004	---	---	---	---	---	---	---	---	---	---	---	---	---	---	8.32	---	---

Notes:

TPHg = Total petroleum hydrocarbons as gasoline analyzed by EPA Method 8260B unless otherwise noted.

BTEX = Benzene, toluene, ethylbenzene, and total xylenes analyzed by EPA Method 8260B

MTBE = Methyl tertiary-butyl ether analyzed by EPA Method 8260B

**Groundwater Data  
Shell-branded Service Station  
1601 Webster Street, Alameda, California**

Well ID	Date	TPHg (µg/L)	B (µg/L)	T (µg/L)	E (µg/L)	X (µg/L)	MTBE (µg/L)	TBA (µg/L)	DIPE (µg/L)	ETBE (µg/L)	TAME (µg/L)	1,2-DCA (µg/L)	EDB (µg/L)	Ethanol (µg/L)	TOC (ft MSL)	Depth to Water (ft TOC)	SPH Thickness (ft)	GW Elevation (ft MSL)
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TBA = Tertiary-butyl alcohol analyzed by EPA Method 8260B

DIPE = Di-isopropyl ether analyzed by EPA Method 8260B

ETBE = Ethyl tertiary-butyl ether analyzed by EPA Method 8260B

TAME = Tertiary-amyl methyl ether analyzed by EPA Method 8260B

1,2-DCA = 1,2-Dichloroethane analyzed by EPA Method 8260B

EDB = Ethylene dibromide analyzed by EPA Method 8260B

Ethanol analyzed by EPA Method 8260B

TOC = Top of casing elevation, in feet relative to mean sea level

SPH = Separate-phase hydrocarbon

GW = Groundwater

µg/L = Micrograms per liter

<x = Not detected at reporting limit x

--- = Not analyzed or available

a = Extracted out of holding time.

b = Result with a carbon range of C4-C12.

c = Result may be biased slightly high. See lab report case narrative.

d = Result with a carbon range of C6-C12.

e = Secondary ion abundances were outside method requirements. Identification based on analytical judgment.

f = Concentration estimated. Analyte exceeded calibration range. Reanalysis not performed due to holding time requirements.

g = Laboratory Control Sample and/or Laboratory Control Sample Duplicate recovery was below the acceptance limits. A low bias to sample results is indicated.

h = Analyzed by EPA Method 8015B (M).

i = The sample chromatographic pattern for TPH does not match the chromatographic pattern of the specified standard.

Quantitation of the unknown hydrocarbon(s) in the sample was based upon the specified standard.

j = Analyte was detected at a concentration below the reporting limit and above the laboratory method detection limit. Reported value is estimated.

Well TBW-N surveyed September 1, 2005 by Virgil Chavez Land Surveying

Wells S-2 through S-7 surveyed on November 30, 2005 by Virgil Chavez Land Surveying

Wells S-4B and S-7 through S-9 surveyed on August 17, 2006 by Virgil Chavez Land Surveying

Table 3

**Historical Grab Groundwater Analytical Data  
Shell-branded Service Station  
1601 Webster Street, Alameda, California**

Sample ID	Date	Depth (fbg)	Total O&G (µg/L)	TPHd (µg/L)	TPHg (µg/L)	TPH (µg/L)	B (µg/L)	T (µg/L)	E (µg/L)	X (µg/L)	MTBE (µg/L)	TBA (µg/L)	DIPE (µg/L)	ETBE (µg/L)	TAME (µg/L)	1,2-DCA (µg/L)	EDB (µg/L)	Ethanol (µg/L)	1,1,1-Trichloro-	Methylene	HVOCs (µg/L)	Chlorinated	PNAs (µg/L)	PCP (µg/L)	Creosote (µg/L)	PCBs (µg/L)
																			ethane (µg/L)	Chloride (µg/L)		Hydro-carbons (µg/L)				
#2	06/26/1987	9.75	244,000	---	1,600	132,000	3.7	45	---	200	---	---	---	---	---	---	---	---	10,550	58,730	---	---	---	---	---	---
BH-C	10/12/1992	9.5	---	---	74	---	0.5	<0.5	<0.5	<0.5	---	---	---	---	---	---	---	---	---	---	ND	---	---	---	---	---
BH-D	10/12/1992	9.5	---	---	24,000	---	4,200	<0.5	4,400	2,800	---	---	---	---	---	---	---	---	---	---	ND	---	---	---	---	---
BH-E	10/22/1992	10	<7,000	---	26,000	---	6,900	13,000	2,200	12,000	---	---	---	---	---	---	---	---	---	---	ND	---	---	---	---	---
BH-F	10/22/1992	10.5	<14,000	---	3,100	---	170	110	310	550	---	---	---	---	---	---	---	---	---	---	ND	---	---	---	---	---
BH-G	10/22/1992	10.5	<6,000	---	150	---	3.9	9.8	3.8	13	---	---	---	---	---	---	---	---	---	---	ND	---	---	---	---	---
BH-H	10/22/1992	10.5	<6,000	---	26,000	---	1,600	280	1,900	2,800	---	---	---	---	---	---	---	---	---	---	ND	---	---	---	---	---
BH-I	10/22/1992	10.5	<6,000	---	53	---	1.4	1.3	3.1	3	---	---	---	---	---	---	---	---	---	---	ND	---	---	---	---	---
SB-1W	11/30/2004	6.51 c	---	---	<2,500	---	<25	<25	<25	<50	6,000	<250	<100	<100	<100	<25	<25	<2,500	---	---	---	---	---	---	---	---
SB-1W-10'	11/30/2004	10	---	---	<250	---	<2.5	<2.5	<2.5	<5.0	300	<25	<10	<10	<10	<2.5	<2.5	<250	---	---	---	---	---	---	---	---
SB-1W-15'	11/30/2004	15	---	---	<13,000	---	<130	<130	<130	<250	24,000	1,700	<500	<500	<500	<130	<130	<13,000	---	---	---	---	---	---	---	---
SB-2W	12/01/2004	6.95 c	---	---	<1,000	---	<10	<10	<10	<20	3,000	500	<40	<40	<40	<10	<10	<1,000	---	---	---	---	---	---	---	---
SB-2W-15'	12/01/2004	15	---	---	<1,300	---	<13	<13	<13	<25	2,000	420	<50	<50	<50	<13	<13	<13,000	---	---	---	---	---	---	---	---
SB-3W	12/01/2004	7.01 c	---	---	<5,000	---	<50	<50	<50	<100	9,000	<500	<200	<200	<200	<50	<50	<5,000	---	---	---	---	---	---	---	---
SB-4W	12/02/2004	7.85 c	---	---	<500	---	<5.0	<5.0	<5.0	<10	4,400	1,100	<20	<20	<20	<5.0	<5.0	<500	---	---	---	---	---	---	---	---
SB-4W-15'	12/02/2004	15	---	---	520	---	1.7	5.3	14	62	2,900	2,000	<2.0	<2.0	4.0	<0.50	<0.50	<50	---	---	---	---	---	---	---	---
SB-5W	11/30/2004	7.21 c	---	---	<1,000	---	<10	<10	<10	<20	1,900	190	<40	<40	<40	<10	<10	<1,000	---	---	---	---	---	---	---	---
SB-5W-15'	11/30/2004	15	---	---	<1,000	---	<10	<10	<10	<20	2,000	340	<40	<40	<40	<10	<10	<1,000	---	---	---	---	---	---	---	---
SB-6W	11/30/2004	7.01 c	---	---	2,000	---	0.61	0.88	59	57	14	5.5	<2.0	<2.0	<2.0	<0.50	<0.50	<50	---	---	---	---	---	---	---	---
SB-6W-15'	11/30/2004	15	---	---	<250	---	<2.5	<2.5	<2.5	<5.0	540	92	<10	<10	<10	<2.5	<2.5	<250	---	---	---	---	---	---	---	---
SB-7W	11/30/2004	8.0 c	---	---	<500	---	<5.0	<5.0	<5.0	<10	990	180	<20	<20	<20	<5.0	<5.0	<500	---	---	---	---	---	---	---	---
SB-7W-15'	11/30/2004	15	---	---	920	---	0.54	1.1	28	19	13	<5.0	<2.0	<2.0	<2.0	<0.50	<0.50	<50	---	---	---	---	---	---	---	---
SB-8W	12/02/2004	7.09 c	---	---	17,000	---	250	660	840	3,700	<10	<100	<40	<40	<40	<10	<10	<1,000	---	---	---	---	---	---	---	---
SB-8W-15'	12/02/2004	15	---	---	270	---	5.3	13	12	47	11	<5.0	<2.0	<2.0	<2.0	<0.50	<0.50	<50	---	---	---	---	---	---	---	---
SB-9-6.5W	11/03/2005	6-10	---	---	<1,300	---	<13	<13	<13	<25	3,500	<130	<50	<50	<50	---	---	---	---	---	---	---	---	---	---	---
SB-9-15W	11/03/2005	14-18	---	---	<2,500	---	<25	<25	<25	<50	9,200	<250	<100	<100	<100	---	---	---	---	---	---	---	---	---	---	---

Table 3

**Historical Grab Groundwater Analytical Data  
Shell-branded Service Station  
1601 Webster Street, Alameda, California**

Sample ID	Date	Depth (fbg)	Total O&G (µg/L)	TPHd (µg/L)	TPHg (µg/L)	TPH (µg/L)	B (µg/L)	T (µg/L)	E (µg/L)	X (µg/L)	MTBE (µg/L)	TBA (µg/L)	DIPE (µg/L)	ETBE (µg/L)	TAME (µg/L)	1,2-DCA (µg/L)	EDB (µg/L)	Ethanol (µg/L)	1,1,1-Trichloro-ethane (µg/L)	Methylene Chloride (µg/L)	HVOCs (µg/L)	Chlorinated Hydrocarbons (µg/L)	PNAs (µg/L)	PCP (µg/L)	Creosote (µg/L)	PCBs (µg/L)	
SB-9-27W	11/03/2005	24-28	---	---	<2,500	---	<25	<25	<25	<50	<b>7,800</b>	<250	<100	<100	<100	---	---	---	---	---	---	---	---	---	---	---	---
SB-9-36W	11/03/2005	35-39	---	---	<50	---	<0.50	<0.50	<0.50	<1.0	<b>87</b>	<b>21</b>	<2.0	<2.0	<2.0	---	---	---	---	---	---	---	---	---	---	---	---
SB-10-7W	11/02/2005	6-10	---	---	53	---	<0.50	<0.50	<0.50	<1.0	<b>3,000</b>	<b>1,300</b>	<2.0	<2.0	3.7	---	---	---	---	---	---	---	---	---	---	---	---
SB-10-15W	11/02/2005	14-18	---	---	<b>500</b>	---	<5.0	<5.0	<5.0	<10	<b>690</b>	<b>2,200</b>	<20	<20	<20	---	---	---	---	---	---	---	---	---	---	---	---
SB-10-25W	11/02/2005	24-28	---	---	<1,300	---	<13	<13	<13	<25	<b>2,700</b>	<130	<50	<50	<50	---	---	---	---	---	---	---	---	---	---	---	---
SB-10-36W	11/02/2005	35-39	---	---	70	---	<0.50	<0.50	<0.50	<1.0	<b>76</b>	<b>68</b>	<2.0	<2.0	<2.0	---	---	---	---	---	---	---	---	---	---	---	---
SB-11-7W	11/03/2005	7-11	---	---	<1,300	---	<13	<13	<13	<25	<b>4,800</b>	<b>290</b>	<50	<50	<50	---	---	---	---	---	---	---	---	---	---	---	---
SB-11-15W	11/03/2005	14-18	---	---	<2,000	---	<20	<20	<20	<40	<b>2,200</b>	<b>740</b>	<80	<80	<80	---	---	---	---	---	---	---	---	---	---	---	---
SB-11-27W	11/03/2005	24-28	---	---	<1,000	---	<10	<10	<10	<20	<b>2,300</b>	<100	<40	<40	<40	<10	<10	<1,000	---	---	---	---	---	---	---	---	---
SB-11-36W	11/03/2005	35-39	---	---	67	---	<0.50	<0.50	<0.50	<1.0	<b>23</b>	<b>22</b>	<2.0	<2.0	<2.0	---	---	---	---	---	---	---	---	---	---	---	---
SB-12-6.5W	11/02/2005	6-10	---	---	<50	---	<0.50	<0.50	<0.50	<1.0	0.55	<5.0	<2.0	<2.0	<2.0	---	---	---	---	---	---	---	---	---	---	---	---
SB-12-15W	11/02/2005	14-18	---	---	<50	---	<0.50	<0.50	<0.50	<1.0	<0.50	<5.0	<2.0	<2.0	<2.0	---	---	---	---	---	---	---	---	---	---	---	---
SB-12-25W	11/02/2005	24-28	---	---	<50	---	<0.50	<0.50	<0.50	<1.0	<0.50	<5.0	<2.0	<2.0	<2.0	---	---	---	---	---	---	---	---	---	---	---	---
SB-12-36W	11/02/2005	35-39	---	---	<50	---	<0.50	<0.50	<0.50	<1.0	<0.50	<5.0	<2.0	<2.0	<2.0	---	---	---	---	---	---	---	---	---	---	---	---
SB-13-6.25W	11/02/2005	6-10	---	---	<2,500	---	<25	<25	<25	<50	<b>4,100</b>	<250	<100	<100	<100	---	---	---	---	---	---	---	---	---	---	---	---
SB-13-15W	11/02/2005	14-18	---	---	<50	---	<0.50	<0.50	<0.50	<1.0	4.6	<5.0	<2.0	<2.0	<2.0	---	---	---	---	---	---	---	---	---	---	---	---
SB-13-25W	11/02/2005	24-28	---	---	<50	---	<0.50	<0.50	<0.50	<1.0	1.1	<5.0	<2.0	<2.0	<2.0	---	---	---	---	---	---	---	---	---	---	---	---
SB-13-36W	11/02/2005	35-39	---	---	64	---	<0.50	<0.50	<0.50	<1.0	1.0	<5.0	<2.0	<2.0	<2.0	---	---	---	---	---	---	---	---	---	---	---	---
SB-14-5.75W	11/03/2005	6-10	---	---	<1,300	---	<13	<13	<13	<25	<b>2,700</b>	<130	<50	<50	<50	---	---	---	---	---	---	---	---	---	---	---	---
SB-14-15W	11/03/2005	14-18	---	---	<2,500	---	<25	<25	<25	<50	<b>5,900</b>	<250	<100	<100	<100	---	---	---	---	---	---	---	---	---	---	---	---
SB-14-27W	11/03/2005	24-28	---	---	<50	---	<0.50	<0.50	<0.50	<1.0	2.5	<5.0	<2.0	<2.0	<2.0	---	---	---	---	---	---	---	---	---	---	---	---
SB-14-36W	11/03/2005	35-39	---	---	<50	---	<0.50	<0.50	<0.50	<1.0	3.7	<5.0	<2.0	<2.0	<2.0	---	---	---	---	---	---	---	---	---	---	---	---
WO-1-5	05/25/2006	5	2,600 d	<b>350 e</b>	<50	---	<0.50	<0.50	<0.50	<0.50	<0.50	<5.0	<0.50	<0.50	<0.50	<0.50	<0.50	---	---	---	---	ND	ND	<10	<10	<1.0	
W-1-9,5'	05/16/2014	9.5	---	---	<b>8,400</b>	---	<b>35</b>	<b>650</b>	<b>100</b>	<b>1,100</b>	<5.0	<100	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
<b>Groundwater ESL<sup>f</sup>:</b>			<b>NA</b>	<b>100</b>	<b>100</b>	<b>NA</b>	<b>1.0</b>	<b>40</b>	<b>30</b>	<b>20</b>	<b>5.0</b>	<b>12</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>0.50</b>	<b>0.050</b>	<b>NA</b>	<b>62</b>	<b>5.0</b>	<b>Various</b>	<b>Various</b>	<b>Various</b>	<b>1</b>	<b>NA</b>	<b>0.014</b>	

**Notes:**  
 Total O&G = Total oil and grease analyzed by EPA Method 3550 unless otherwise noted  
 TPHd = Total petroleum hydrocarbons as diesel analyzed by EPA Method 8015 (Modified)  
 TPHg = Total petroleum hydrocarbons as gasoline analyzed by EPA Method 8260B; before 11/30/2004, analyzed by EPA Method 8015B unless otherwise indicated  
 TPH = Total petroleum hydrocarbons. Analytical method unknown  
 BTEX = Benzene, toluene, ethylbenzene, and total xylenes analyzed by EPA Method 8260B; before 11/30/2004, analyzed by EPA Method 8020 unless otherwise indicated  
 MTBE = Methyl tertiary-butyl ether analyzed by EPA Method 8260B  
 TBA = Tertiary-butyl alcohol analyzed by EPA Method 8260B



Table 3

**Historical Grab Groundwater Analytical Data  
Shell-branded Service Station  
1601 Webster Street, Alameda, California**

Sample ID	Date	Depth (fbg)	Total O&G (µg/L)	TPHd (µg/L)	TPHg (µg/L)	TPH (µg/L)	B (µg/L)	T (µg/L)	E (µg/L)	X (µg/L)	MTBE (µg/L)	TBA (µg/L)	DIPE (µg/L)	ETBE (µg/L)	TAME (µg/L)	1,2-DCA (µg/L)	EDB (µg/L)	Ethanol (µg/L)	1,1,1-Trichloro-ethane (µg/L)	Methylene Chloride (µg/L)	HVOCs (µg/L)	Chlorinated Hydrocarbons (µg/L)	PNAs (µg/L)	PCP (µg/L)	Creosote (µg/L)	PCBs (µg/L)
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DIPE = Di-isopropyl ether analyzed by EPA Method 8260B

ETBE = Ethyl tertiary-butyl ether analyzed by EPA Method 8260B

TAME = Tertiary-amyl methyl ether analyzed by EPA Method 8260B

1,2-DCA = 1,2-Dichloroethane analyzed by EPA Method 8260B

EDB = 1,2-Dibromoethane analyzed by EPA Method 8260B

Ethanol analyzed by EPA Method 6010B

1,1,1-Trichloroethane and methylene chloride analyzed by EPA Method 601

HVOCs = Halogenated volatile organic compounds analyzed by EPA Method 8010. See analytical report for specific constituents. All detections noted.

Chlorinated hydrocarbons by EPA Method 8260B; see laboratory analytical report for a complete list of specific constituents

PNAs = Polynuclear aromatics by EPA Method 8270C; see laboratory analytical report for a complete list of specific constituents

PCP = Pentachlorophenol by EPA Method 8270C

Creosote analyzed by EPA Method 8270C. It is reported as a combination of naphthalene, acenaphthylene, fluorene, phenanthrene, anthracene, fluoranthene, pyrene, 1-methylnaphthalene, and 2-methylnaphthalene.

PCBs = Polychlorinated biphenyls analyzed by EPA Method 8082; see laboratory analytical report for a complete list of specific constituents

fbg = Feet below grade

µg/L = Micrograms per liter

<x = Not detected at reporting limit x

--- = Not analyzed

ND = Not detected

ESL =

NA = No applicable ESL

Results in bold equal or exceed applicable ESL

a = Analyzed by EPA Method 602

b = Analyzed by APHA Standard Method 5030D&E

c = Sample collected at first-encountered groundwater/piezometric surface

d = Analyzed by EPA Method 1664 A (Modified)

e = Hydrocarbons reported as TPHd do not exhibit a typical diesel chromatographic pattern. These hydrocarbons are higher boiling than typical diesel fuel.

f = San Francisco Bay Regional Water Quality Control Board (RWQCB) ESL for groundwater where groundwater is a source of drinking water (Tables A and C of User's Guide: Derivation and Application of Environmental Screening Levels, RWQCB, Interim Final - 2013).

# Appendix A Site History

## **Site History**

**1987 Waste Oil Underground Storage Tank (UST) Removal:** In June 1987, a 550-gallon waste oil UST that was installed in 1962 was removed. Blaine Tech Services, Inc. (Blaine) of San Jose, California observed more than 77 holes in the tank and noted hydrocarbon sheen on the water in the excavation. Soil samples collected from 9.5 feet below grade (fbg) in the excavation contained 133 milligrams per kilogram (mg/kg) total oil and grease (O&G), 14 mg/kg total petroleum hydrocarbons (TPH), and 0.0294 mg/kg 1,1,1-trichloroethane (TCA). A grab water sample collected from the water surface at about 12.5 fbg contained 244,000 micrograms per liter ( $\mu\text{g/L}$ ) O&G, 132,000  $\mu\text{g/L}$  TPH, 1,600  $\mu\text{g/L}$  total petroleum hydrocarbons as gasoline (TPHg), 3.7  $\mu\text{g/L}$  benzene, 45  $\mu\text{g/L}$  toluene, 200  $\mu\text{g/L}$  total xylenes, 10.55  $\mu\text{g/L}$  TCA, and 58.73  $\mu\text{g/L}$  methyl chloride. These results are reported in Blaine's July 16, 1987 *Field Sampling at Shell Station* letter report and in Blaine's June 26, 1989 letter report summarizing previously unpublished notes.

**1987 Subsurface Investigation:** In September 1987, Pacific Environmental Group (PEG) of Santa Clara, California installed one groundwater monitoring well (S-1) immediately down gradient of the former waste oil tank. Soil samples collected from the well boring contained up to 130 mg/kg O&G and 50 mg/kg total petroleum hydrocarbons as oil. PEG's October 23, 1987 letter report presents investigation results.

**1990 Subsurface Investigation:** In April 1990, Weiss Associates (WA) of Emeryville, California installed two groundwater monitoring wells (MW-1 [BH-A] and MW-2 [BH-B]). Soil samples from the well borings contained up to 32 mg/kg TPHg, 0.53 mg/kg benzene, 3.8 mg/kg toluene, 0.75 mg/kg ethylbenzene, and 4.0 mg/kg total xylenes. WA's July 6, 1990 *Subsurface Investigation at Shell Service Station* report presents investigation details.

**1992-1993 Subsurface Investigation:** In October 1992 and February 1993, WA drilled eight soil borings (BH-C through BH-J) and one groundwater monitoring well (MW-3). Soil samples from the borings contained up to 110 mg/kg O&G, 170 mg/kg TPHg, 0.11 mg/kg benzene, 3.0 mg/kg toluene, 3.6 mg/kg ethylbenzene, and 22 mg/kg total xylenes. Grab groundwater samples contained up to 26,000  $\mu\text{g/L}$  TPHg, 6,900  $\mu\text{g/L}$  benzene, 13,000  $\mu\text{g/L}$  toluene, 4,400  $\mu\text{g/L}$  ethylbenzene, and 12,000  $\mu\text{g/L}$  total xylenes. WA's April 16, 1993 *Subsurface Investigation Report* provides investigation details.

**1995 and 1996 Groundwater Remediation:** From March 1995 until March 1996 groundwater was remediated by injecting air into MW-2.

**1997 Piping and Dispenser Upgrades:** In August 1997, Cambria Environmental Technology, Inc. (Cambria) of Oakland, California conducted soil sampling under the product piping and below dispenser locations approximately 5 fbg. The soil samples contained up to 11,000 mg/kg TPHg, 6.3 mg/kg benzene, 7.8 mg/kg toluene, 96 mg/kg ethylbenzene and 700 mg/kg total xylenes. Cambria's October 8, 1997 *Pipeline and Dispenser Soil Sampling Report* presents the soil sampling results.

**1998 Waste Oil Remote Fill Pipe Removal:** In November 1998, Paradiso Mechanical Inc. (Paradiso) of San Leandro, California upgraded the site's waste oil system and removed the remote fill pipe associated with the waste oil tank. No soil samples were collected. Cambria's December 1, 1998 *1998 Upgrade Site Inspection Report* presented the findings.

**1999 Monitoring Well Destruction and Case Closure:** In January 1999, Cambria oversaw the destruction of all four on-site monitoring wells (S-1 and MW-1 through MW-3) as a condition of case closure. Cambria's February 26, 1999 *Monitoring Well Abandonment Report* documents the well destructions. Alameda County Environmental Health's (ACEH's) March 15, 1999 *Remedial Action Completion Certification and Fuel Leak Site Case Closure* letter confirmed completion of site investigation and remedial action and granted leaking UST case closure for the site.

**2004 Well Survey:** In March 2004, Cambria performed a search of California Department of Water Resources (DWR) records and the California State Water Resources Control Board's Geotracker database for water-producing wells within one-half mile of the site. No public water supply wells were identified from DWR records or from the Geotracker database. Cambria found DWR records for one domestic well, four agricultural wells, one industrial well, and one well of unknown use within one-half mile of the site.

The nearest identified well was located by address approximately 150 feet south of the site. The DWR well record was undated, and did not record the well's intended use. The address is currently occupied by a café, and Cambria could not field-verify the presence of the well; therefore, the well is presumed to be abandoned. The next closest wells, irrigation wells installed in 1977, are estimated to be about 525 and 800 feet northwest of the site, and drilled to 25 and 32 fbg, respectively. Since groundwater is known to flow generally northward, these wells are cross gradient from the site, and are therefore unlikely to be affected by impacted groundwater from the site. All other identified wells are located more than 1,000 feet to the southeast, south, and southwest (up gradient) of the site and therefore would not likely be affected by impacted groundwater from the site.

**2004 Fuel System Upgrades:** In August 2004, S.J. Weaver Contracting, Inc. (Weaver) of Signal Hill, California upgraded the station's fuel dispensers, piping, and vapor recovery system. Due to the high water table, groundwater from the UST excavation was pumped into a storage tank periodically and off-hauled as non-hazardous waste to Shell's Martinez refinery for treatment. Cambria collected soil samples beneath removed dispensers and piping. Soil sample P-3-3' contained 1,300 mg/kg TPHg and 49 mg/kg total xylenes, and soil sample P-5-3' contained 0.045 mg/kg total xylenes. Based on these concentrations, Equilon Enterprises LLC dba Shell Oil Products US (Shell) submitted an Underground Storage Tank Unauthorized Release (Leak)/Site Contamination Report (Unauthorized Release Report) on August 11, 2004.

Following re-installation of a fuel pump into a 10,000-gallon UST, Weaver identified a product loss in one 10,000-gallon UST by manual tank gauging. This loss was estimated to be a volume of 2,084 gallons. Weaver pumped water from the tank excavation into an open-top storage tank on site. As fuel had leaked out of the damaged UST, the pumped water contained free product. The resulting gasoline vapor concentrations warranted site evacuation, cessation of work, and emergency response. As a result, Shell's contractors conducted emergency response and remediation. The remaining fuel in the damaged UST was removed by a tanker truck. As detailed below, Cambria initiated groundwater extraction (GWE) from tank backfill well TBW-N. The product loss, emergency response activities, and emergency remediation efforts associated with this event are presented in further detail in Cambria's November 30, 2004 *Soil & Groundwater Investigation Work Plan and Agency Response*. As a result of the product loss, Shell filed a second Unauthorized Release Report on August 19, 2004. In addition, the Alameda Fire Department filed a report with the California Governor's Office of Emergency Services. ACEH subsequently opened a new environmental case for the site on September 3, 2004.

**2004-2006 GWE:** Following the August 2004 product release at the site, Cambria initiated GWE from the northern-most tank backfill well (TBW-N) initially by pumping to a Baker tank and later using a vacuum truck. Groundwater was extracted several times per day from August 19 until August 23, 2004. Then, daily GWE was conducted from August 24 until September 10, 2004. GWE was conducted weekly from September 13 through November 16, 2004, and GWE was subsequently conducted monthly through February 2006. Approximately 196,130 gallons of groundwater were removed by GWE along with an estimated 1,982 gallons of separate-phase hydrocarbons and 21.7 gallons of dissolved TPHg. Product removal and GWE data are also presented in Cambria's November 30, 2004 *Soil & Groundwater Investigation Work Plan and Agency Response*. GWE was discontinued in February 2006.

**2004 Subsurface Investigation:** In November and December 2004, Cambria drilled eight soil borings (SB-1 through SB-8) to further assess the impacts of the August 2004 product loss event. Soil samples from the borings contained up to 740 mg/kg TPHg, 5.9 mg/kg toluene, 17 mg/kg ethylbenzene, 83 mg/kg total xylenes, 1.2 mg/kg methyl tertiary-butyl ether (MTBE), and 53 mg/kg ethanol. Grab groundwater samples from the borings contained up to 17,000 µg/L TPHg, 250 µg/L benzene, 660 µg/L toluene, 840 µg/L ethylbenzene, 3,700 µg/L total xylenes, 24,000 µg/L MTBE, 2,000 µg/L tertiary-butyl alcohol (TBA), and 4.0 µg/L tertiary-amyl methyl ether (TAME). Cambria's February 18, 2005 *Soil and Groundwater Investigation Report* provides investigation details.

**2005 Subsurface Investigation:** In October and November 2005 Cambria installed six wells (S-2 through S-7) and drilled six cone penetrometer testing (CPT) borings (SB-9 through SB-14). The only constituent of concern detected in soil samples collected from the wells and soil borings was 0.0080 mg/kg total xylenes in boring SB-13 at 5 fbg. Four grab groundwater samples were collected from each of the CPT borings. The grab groundwater samples contained up to 500g/L TPHg, 9,200 µg/L MTBE, 2,200 µg/L TBA and 3.7 µg/L TAME. The results from this investigation are presented in Cambria's January 31, 2006 *Soil and Groundwater Investigation Report*.

**2006 Risk Evaluation:** Cambria's May 17, 2006 *Risk Evaluation and Work Plan* evaluated potential risks to human health or the environment posed by impacted soil and groundwater beneath the site. Cambria concluded that the residual impacts do not pose a risk to human health or the environment currently and will not in the foreseeable future, particularly given that the property use is anticipated to remain as a retail gasoline service station.

**2006 Waste Oil UST Removal:** In May 2006, Wayne Perry, Inc. (Wayne Perry) of Sacramento, California removed one 550-gallon dual-wall fiberglass waste oil UST. Cambria observed no cracks, holes, or corrosion in the UST upon removal. Cambria collected a soil sample (WO-1-5) from the sidewall of the UST excavation and a grab groundwater sample from the base of the excavation. The soil sample contained 61 mg/kg oil and grease, 5.4 mg/kg TPH as diesel (TPHd), 26.4 mg/kg chromium, 2.24 mg/kg lead, 18.1 mg/kg nickel, and 16.6 mg/kg zinc. The grab groundwater sample contained 2,600 µg/L O&G and 350 µg/L TPHd. Based on these concentrations, Shell submitted an Unauthorized Release Report on June 6, 2006. Cambria's August 2, 2006 *Underground Storage Tank Removal Report* provides the waste oil UST removal details.

**2006 Subsurface Investigation:** In July 2006, Cambria installed three groundwater monitoring wells (S-4B, S-8, and S-9). Soil samples collected from the well borings contained up to 3,700 mg/kg TPHg, 1.0 mg/kg benzene, 90 mg/kg ethylbenzene, 310 mg/kg total xylenes, 0.31 mg/kg MTBE, and 0.56 mg/kg TBA. Cambria's October 6, 2006 *Site Investigation Report* provides well installation details.

**2014 UST Removal:** In May 2014, Paradiso removed three 10,000-gallon gasoline USTs, product dispensers, and piping. CRA observed no cracks, holes, or corrosion in the USTs upon removal. CRA collected eight soil samples from the sidewalls of the UST excavation at depths of 2.5 to 8 fbg and one grab groundwater sample from the water in the excavation. No constituents of concern were detected in soil or pea gravel samples.

The grab groundwater sample from the UST excavation contained 8,400 µg/L TPHg, 35 µg/L benzene, 650 µg/L toluene, 100 µg/L ethylbenzene, and 1,100 µg/L total xylenes. No MTBE or TBA was detected in the grab groundwater sample. Approximately 225,000 tons of soil and pea gravel and approximately 28,850 gallons of groundwater were removed from the excavation for off-site disposal. CRA's October 1, 2014 *Underground Storage Tank Removal Report* provides UST removal and sampling details.

**2014 Subsurface Investigation:** In September and November 2014, Arcadis U.S., Inc. (Arcadis) drilled six off-site down-gradient soil borings (CPT-1 through CPT-4, CPT-6, and CPT-7) to collect grab groundwater samples for a joint investigation conducted by Shell and former Unocal Station No. 0843 located at 1629 Webster Street, Alameda, California. Grab groundwater samples contained up to 290 µg/L TPHg, 0.62 µg/L benzene, 1.0 µg/L toluene, and 450 µg/L MTBE. Grab groundwater data from this investigation adequately defined the extent of MTBE in groundwater horizontally and vertically in the area down gradient from the Shell and former Unocal sites. Arcadis's December 29, 2014 *Off-site Groundwater Investigation Report* presents results from the investigation.

**Groundwater Monitoring:** Groundwater was monitored in well S-1 starting in September 1987 and later from wells MW-1 through MW-3 until April 1998 when ACEH granted case closure. For the current environmental case, groundwater has been monitored since October 2005. Groundwater gradient is consistently north-northwesterly to north-easterly. Depth to water has ranged from approximately 4.5 to 10.5 fbg at the site.

# Appendix B

## Groundwater and Product Removal Data

Table 4. Groundwater and Product Removal Data, Shell-branded Service Station, 1601 Webster Street, Alameda, California.

Date	Total Volume Hauled (gals)	Cumulative Volume (gals)	Measured Product Thickness in Vacuum Truck (ft)	Dissolved TPHg Conc. (ppm)	Est pounds TPHg removed in Dissolved Phase (lbs)	Estimated Volume of Product Removed as SPH (gal)	Estimated Volume of Product Removed as dissolved phase (gal)	Comments
								FUEL RELEASE ESTIMATE: UST gaging by SJ Weaver on 8/18 read 71.5 inches = 8,340 gallons, per tank chart. On 8/19 gaging by SJ Weaver read 55 inches = 6,256 gallons, per tank chart. Net est. Loss = 8,340-6,256 = 2,084 gallons.
8/19/2004	2,168	2,168	NM	120	2.17		0.36	Pumped from well into open Baker tank. Then tank emptied by PSC vacuum truck
8/19/2004	2,535	4,703	NM	120	2.54	915	0.42	Pumped from well into open Baker tank. Also pumped directly into Vacuum Truck. Then open Baker tank emptied by PSC
8/20/2004	0	4,703	NM	120	0.00	--	0.00	Pumped into closed Baker tank - none hauled.
8/21/2004	4,369	9,072	NM	120	4.37	50	0.72	Pumped into closed Baker tank, then began emptying closed tank by vacuum truck. Estimated SPH volume from similar data.
8/21/2004	3,654	12,726	0.67	120	3.66	773	0.60	From closed Baker tank and well. Volumes based on verbal report - missing bills of lading
8/21/2004	2,091	14,817	0.04	120	2.09	57	0.34	From well and baker tank. Volumes based on verbal report - missing bills of lading
8/22/2004	319	15,136	NM	120	0.32	NM	0.05	Baker Tank cleaning water.
8/22/2004	2,285	17,421	0.11	120	2.29	150	0.38	
8/23/2004	1,947	19,368	0.01	120	1.95	13	0.32	
8/24/2004	1,013	20,381	0.01	120	1.01	12	0.17	
8/25/2004	4,026	24,407		120	4.03		0.66	
8/26/2004	3,839	28,246		82	2.63		0.43	
8/27/2004	3,882	32,128		82	2.66		0.44	
8/28/2004	2,770	34,898		100	2.31		0.38	
8/29/2004	3,834	38,732		100	3.20		0.53	
8/30/2004	3,376	42,108		91	2.56	12	0.42	Half UST cleaning water and half groundwater from well. SPH amount estimated from 0.02' SPH in UST gaged on 8/21/04
8/31/2004	3,249	45,357		91	2.47		0.41	
9/1/2004	3,832	49,189		110	3.52		0.58	
9/2/2004	2,151	51,340		110	1.97		0.32	
9/3/2004	3,136	54,476		99	2.59		0.43	
9/4/2004	3,671	58,147		99	3.03		0.50	
9/5/2004	3,395	61,542		66	1.87		0.31	
9/6/2004	2,948	64,490		66	1.62		0.27	
9/7/2004	3,285	67,775		66	1.81		0.30	
9/8/2004	3,128	70,903		66	1.72		0.28	
9/9/2004	3,902	74,805		67	2.18		0.36	water from TBW-N, TBW-S, & TBW-E
9/10/2004	2,989	77,794		67	1.67		0.27	water from TBW-N, TBW-S, & TBW-E
9/13/2004	2,807	80,601		61	1.43		0.23	70-barrel truck
9/20/2004	4,266	84,867		120	4.27		0.70	
9/28/2004	4,691	89,558		99	3.88		0.64	
10/4/2004	4,050	93,608		80	2.70		0.44	
10/11/2004	3,121	96,729		57	1.48		0.24	
10/18/2004	3,597	100,326		68	2.04		0.34	
10/25/2004	4,127	104,453		81	2.79			2,641 additional gallons from tank cleaning were disposed of on 10/25/04
11/1/2004	5,047	109,500		86	3.62		0.59	
11/8/2004	2,178	111,678		100	1.82		0.30	
11/16/2004	4,891	116,569		83	3.39		0.56	concentration based on 11/23/04 sample
11/29/2004	4,531	121,100		160	6.05		0.99	concentration based on 11/30/04 sample
12/13/2004	5,208	126,308		120	5.21		0.86	concentration based on 12/15/04 sample
12/27/2004	4,800	131,108		100	4.01		0.66	concentration based on 12/27/04 sample
1/17/2005	3,580	134,688		86	2.57		0.42	concentration based on 1/17/05 sample
2/7/2005	2,389	137,077		97	1.93		0.32	concentration based on 2/4/05 sample
3/8/2005	4,843	141,920		94	3.80		0.62	concentration based on 3/3/05 sample
4/6/2005	4,711	146,631		27	1.06		0.17	concentration based on 4/12/05 sample
5/2/2005	4,706	151,337		42	1.65		0.27	concentration based on 5/13/05 sample
6/6/2005	5,011	156,348		46	1.92		0.32	concentration based on 6/10/05 sample
7/11/2005	4,627	160,975		48	1.85		0.30	concentration based on 7/15/05 sample
8/8/2005	4,785	165,760		36	1.44		0.24	concentration based on 8/17/05 sample
9/12/2005	4,992	170,752		20	0.83		0.14	concentration based on 9/15/05 sample
10/10/2005	5,181	175,933		59	2.55		0.42	concentration based on 10/17/05 sample
11/7/2005	4,821	180,754		105	4.22		0.69	concentration based on 11/22/05 sample

TOTALS 180,754

(gallons)  
Total  
Estimated  
Volume  
of Liquid  
Removed

128.8

(pounds) Total  
estimated  
mass based  
on dissolved  
TPHg  
concentrations

1,982.1

(gallons) Total  
Estimated  
Volume  
accounted for  
as liquid SPH

20.7

(gallons) Total  
estimated  
equivalent  
volume based  
on dissolved  
TPHg  
concentrations

NOTES:

Mass removal values are approximate only.

Pounds of TPHg/benzene/MTBE removal based on the calculation: (TPHg/benzene/MTBE concentration\* (ppb) x gallons pumped x (8.3x10<sup>-9</sup> (liters/galxppm/μg))



Appendix C  
Groundwater Data for Environmental Case  
R00001042

**Table 1. Ground Water Elevations - Shell Service Station WIC #204-0072-0403, 1601 Webster Street, Alameda, California**

Well ID	Date	Top-of-Casing Elevation (ft above msl)	Depth to Water (ft below TOC)	Ground Water Elevation (ft above msl)	
MW-1	04/11/90	13.80	8.22	5.58	
	07/18/90		9.14	4.66	
	10/18/90		10.37	3.43	
	01/25/91		10.41	3.39	
	04/11/91		7.37	6.43	
	07/18/91		8.86	4.94	
	10/17/91		10.47	3.33	
	01/24/92		9.18	4.62	
	04/23/92		6.95	6.85	
	07/22/92		8.01	5.79	
	10/02/92		9.81	3.99	
	01/05/93		7.26	6.54	
	04/08/93		13.80 <sup>a</sup>	5.85	7.95
	07/20/93			6.83	6.97
	10/15/93	8.07		5.73	
	01/07/94	7.82		5.98	
	04/13/94	6.91		6.89	
	07/26/94	7.51		6.29	
	10/06/94	8.71		5.09	
	01/26/95	5.43		8.37	
	04/20/95	5.50		8.30	
	07/12/95	6.48		7.32	
	10/12/95	7.44		6.36	
	01/11/96	6.95		6.85	
	04/10/96	5.78		8.02	
	07/12/96	6.65		7.15	
	10/17/96	7.48	6.32		
	04/08/97	6.16	7.64		
10/16/97	8.56	5.24			
<b>04/17/98</b>		<b>5.10</b>	<b>8.70</b>		
MW-2	04/11/90	13.20	7.69	5.51	
	07/18/90		8.56	4.64	
	10/18/90		9.76	3.44	
	01/25/91		9.78	3.42	
	04/11/91		6.87	6.33	
	07/18/91		8.27	4.93	
	10/17/91		9.89	3.31	
	01/24/92		8.60	4.60	
	04/23/92		6.48	6.72	
	07/02/92		7.37	5.83	
	10/02/92		9.20	4.00	
	01/05/93		6.80	6.40	
	04/08/93		13.20 <sup>a</sup>	5.40	7.80

**Table 1. Ground Water Elevations - Shell Service Station WIC #204-0072-0403, 1601 Webster Street, Alameda, California (continued)**

Well ID	Date	Top-of-Casing Elevation (ft above msl)	Depth to Water (ft below TOC)	Ground Water Elevation (ft above msl)
	07/20/93		6.05	7.15
	10/15/93		7.04	6.16
	01/07/94		6.99	6.21
	04/13/94		6.20	7.00
	07/26/94		6.63	6.57
	10/06/94		7.75	5.45
	01/26/95		4.49	8.71
	04/20/95		5.28	7.92
	07/12/95		5.84	7.36
	10/12/95		6.68	6.52
	01/11/96		6.29	6.91
	04/10/96		5.48	7.72
	07/12/96		6.02	7.18
	10/17/96		6.95	6.25
	04/08/97		5.83	7.37
	10/16/97		7.98	5.22
	<b>04/17/98</b>		<b>4.71</b>	<b>8.49</b>
MW-3	04/08/93	12.80	5.48	7.32
	07/20/93		6.38	6.42
	10/15/93		7.53	5.27
	01/07/94		7.38	5.42
	04/13/94		6.50	6.30
	07/26/94		7.00	5.80
	10/06/94		8.10	4.70
	01/26/95		5.00	7.80
	04/20/95		5.24	7.56
	07/12/95		6.10	6.70
	10/12/95		6.98	5.82
	01/11/96		6.48	6.32
	04/10/96		5.57	7.23
	07/12/96		6.23	6.57
	10/17/96		7.18	5.62
	04/08/97		5.75	7.05
	10/16/97		7.76	5.04
	<b>04/17/98</b>		<b>4.47</b>	<b>8.33</b>
S-1	09/11/89	13.77	9.82	3.95
	04/11/90		8.41	5.36
	07/18/90		9.31	4.46
	10/18/90		10.43	3.34
	01/25/91		10.49	3.28
	04/11/91		7.68	6.09
	07/18/91		8.95	4.82

**Table 1. Ground Water Elevations - Shell Service Station WIC #204-0072-0403, 1601 Webster Street, Alameda, California (continued)**

Well ID	Date	Top-of-Casing Elevation (ft above msl)	Depth to Water (ft below TOC)	Ground Water Elevation (ft above msl)
	10/17/91		10.62	3.15
	01/24/92		9.32	4.45
	04/23/92		7.27	6.50
	07/02/92		8.19	5.58
	10/02/92		9.95	3.82
	01/05/93		7.64	6.13
	04/08/93	13.74 <sup>a</sup>	6.10	7.64
	07/20/93		7.18	6.56
	10/15/93		8.39	5.35
	01/07/94		8.19	5.55
	04/13/94		7.22	6.52
	07/26/94		7.82	5.92
	10/06/94		9.01	4.73
	01/26/95		5.65	8.09
	04/20/95		6.82	6.92
	07/12/95		6.74	7.00
	10/12/95		7.76	5.98
	01/11/96		7.24	6.50
	04/10/96		5.80	7.94
	07/12/96		6.60	7.14
	10/17/96		7.63	6.11
	04/08/97		6.00	7.74
	10/16/97		8.28	5.46
	<b>04/17/98</b>		<b>4.62</b>	<b>9.12</b>

**Abbreviations and Notes:**

a = Top of casing resurveyed on March 30, 1993  
ft = Feet  
msl = Mean sea level  
TOC= Top-of-casing

**Table 2. Analytical Results for Ground Water - Shell Service Station, WIC #204-0072-0403, 1601 Webster Street, Alameda, California**

Well ID (Sampling Frequency)	Date Sampled	Depth to Water (ft)	TPH-G ←	TPH-D	B	T	E	X	c-1,2- DCE	1,2- DCA	TOG	MTBE	DO (mg/L)
MW-1 (2nd Qtr)	04/11/90	8.22	<50	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<10,000	---	---
	07/18/90	9.14	<50	---	<0.5	<0.5	<0.5	<0.5	3	<0.5	<5,000	---	---
	10/18/90	10.37	<50	---	<0.5	<0.5	<0.5	<0.5	7.9	<0.5	<5,000	---	---
	01/25/91	10.41	<50	---	<0.5	<0.5	<0.5	<0.5	5.6	<0.5	---	---	---
	04/11/91	7.37	<50	---	<0.5	<0.5	<0.5	<0.5	0.9	<0.5	---	---	---
	07/18/91	8.86	<50	---	<0.5	<0.5	<0.5	<0.5	4.4	<0.5	---	---	---
	10/17/91	10.47	<50	---	<0.5	<0.5	<0.5	<0.5	7.2	<0.5	---	---	---
	01/24/92	9.18	<50	---	<0.5	<0.5	<0.5	<0.5	1.4	<0.5	---	---	---
	04/23/92	6.95	<50	---	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	---	---	---
	07/02/92	8.01	<50	---	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	---	---	---
	10/02/92	9.81	<50	---	<0.5	<0.5	<0.5	<0.5	2	<0.5	---	---	---
	01/05/93	7.26	<50	---	<0.5	<0.5	<0.5	<0.5	2	<0.5	---	---	---
	04/08/93 <sup>a</sup>	5.85	<50	---	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	---	---	---
	07/20/93 <sup>b</sup>	6.83	<50	---	<0.5	<0.5	<0.5	<0.5	0.76	<0.5	---	---	---
	10/15/93	8.07	<50	---	<0.5	<0.5	<0.5	<0.5	0.71	<0.5	---	---	---
	01/07/94	7.82	<50	---	<0.5	<0.5	<0.5	<0.5	3.1	0.85	---	---	5.5
	04/13/94	6.91	<50	---	<0.5	<0.5	<0.5	<0.5	3.6	0.95	---	---	---
	07/26/94	7.51	<50	---	<0.5	<0.5	<0.5	<0.5	<0.4	<0.4	---	---	2.8
	10/06/94 <sup>c</sup>	8.71	<50	---	<0.5	<0.5	<0.5	<0.5	<0.4	<0.4	---	---	4.0
	04/20/95	5.50	<50	---	<0.5	<0.5	<0.5	<0.5	<0.4	<0.4	---	---	---
	04/10/96	5.78	<50	---	<0.5	<0.5	<0.5	<0.5	---	---	---	<2.5	---
	07/12/96	6.65	---	---	---	---	---	---	---	---	---	---	---
	10/17/96	7.48	---	---	---	---	---	---	---	---	---	---	---
04/08/97	6.16	<1,000	---	<10	<10	<10	<10	<1.2	<1.2	---	3,000	2.6	
<b>04/17/98</b>	<b>5.10</b>	<b>&lt;50</b>	<b>---</b>	<b>&lt;0.50</b>	<b>&lt;0.50</b>	<b>&lt;0.50</b>	<b>1.3</b>	<b>&lt;0.50</b>	<b>&lt;0.50</b>	<b>---</b>	<b>&lt;2.5(&lt;2.0)</b>	<b>7.8</b>	
MW-2 (2nd & 4th Qtr)	04/11/90	7.69	580	430	20	4.9	1.2	73	<0.5	1.1	<10,000	---	---
	07/18/90	8.56	1,400	---	110	310	71	310	<0.5	0.7	<5,000	---	---
	10/18/90	9.76	1,900	1,300 <sup>d</sup>	110	470	89	400	<0.5	0.9	<5,000	---	---
	01/25/91	9.78	8,100	---	430	1,200	480	2,600	<0.5	0.8	---	---	---
	04/11/91	6.87	2,600	---	130	150	250	330	<0.5	<0.5	---	---	---
	07/15/91	8.27	1,300	---	100	59	84	120	<0.5	0.8	---	---	---
	10/17/91	9.89	2,100	---	180	260	150	520	<0.5	0.6	---	---	---
	01/24/92	8.60	7,100	---	450	450	960	1,600	110	<0.5	---	---	---
	04/23/92	6.48	16,000	---	320	740	650	2,600	<2.5	<2.5	---	---	---
07/02/92	7.37	33,000	---	2,500	3,700	2,000	9,600	<50	<50	---	---	---	

**Table 2. Analytical Results for Ground Water - Shell Service Station, WIC #204-0072-0403, 1601 Webster Street, Alameda, California (continued)**

Well ID (Sampling Frequency)	Date Sampled	Depth to Water (ft)	TPH-G ←	TPH-D	B	T	E	X	c-1,2- DCE	1,2- DCA	TOG	MTBE	DO (mg/L)
(Concentrations in µg/L)													
→													
	10/02/92	9.20	7,000	---	960	650	570	1,200	<50	<50	---	---	---
	01/05/93	6.80	8,900	---	550	500	600	1,900	<2	<2	---	---	---
	04/08/93	5.40	13,000	---	670	580	900	2,900	0.68	<0.5	---	---	---
	04/08/93 <sup>dup</sup>	5.40	13,000	---	830	740	1,100	3,700	0.64	<0.5	---	---	---
	07/20/93	6.05	10,000	---	1,200	630	1,100	4,000	0.87	<0.5	---	---	---
	07/20/93 <sup>dup</sup>	6.05	12,000	---	1,200	600	1,100	3,800	0.80	<0.5	---	---	---
	10/15/93	7.04	24,000	---	1,400	3,400	1,200	5,200	<0.5	<0.5	---	---	---
	10/15/93 <sup>dup</sup>	7.04	19,000	---	1,200	2,800	1,000	4,400	<0.5	<0.5	---	---	---
	01/07/94	6.99	27,000	---	1,300	2,700	1,900	7,900	<10	<10	---	---	3.6
	01/07/94 <sup>dup</sup>	6.99	33,000	---	1,100	2,300	1,700	6,900	<10	<10	---	---	3.6
	04/13/94	6.20	16,000	---	460	93	820	2,700	<25	<25	---	---	---
	04/13/94 <sup>dup</sup>	6.20	18,000	---	500	100	880	3,000	<25	<25	---	---	---
	07/26/94	6.63	25,000	---	1,600	1,500	1,500	6,800	<0.4	<0.4	---	---	3.2
	07/26/94 <sup>dup</sup>	6.63	28,000	---	1,700	1,600	1,600	7,300	<0.4	<0.4	---	---	3.2
	10/06/94	7.75	15,000	---	850	650	1,000	4,000	<0.4	<0.4	---	---	2.4
	10/06/94 <sup>dup</sup>	7.75	17,000	---	1000	630	1,200	4,500	<0.4	<0.4	---	---	2.4
	01/26/95	4.49	3,200	---	63	14	300	1,000	<0.4	<0.4	---	---	1.6
	01/26/95 <sup>dup</sup>	4.49	3,100	---	31	13	140	820	<0.4	<0.4	---	---	1.6
	04/20/95	5.28	<50	---	4.4	<0.5	1.3	3.3	<0.4	<0.4	---	---	---
	04/20/95 <sup>dup</sup>	5.28	<50	---	0.5	<0.5	0.6	3.3	<0.4	<0.4	---	---	---
	07/12/95	5.84	<50	---	1.1	1.1	<0.5	<0.5	---	---	---	---	10.4
	07/12/95 <sup>dup</sup>	5.84	<50	---	0.9	0.8	<0.5	<0.5	---	---	---	---	10.4
	10/12/95	6.68	370	---	20	3.0	8.2	92	<0.5	<0.4	---	---	6.4
	01/11/96	6.29	90	---	3.8	<0.5	3.5	3.0	0.6	<0.4	---	---	5.8
	04/10/96	5.48	61	---	9.9	<0.5	3.6	1.8	---	---	---	<2.5	---
	04/10/96 <sup>dup</sup>	5.48	54	---	10	<0.5	4.0	1.7	---	---	---	<2.5	---
	07/12/96	6.02	510	---	25	1.9	39	61	<1.0	<1.0	---	3.3	2.3
	07/12/96 <sup>dup</sup>	6.02	510	---	24	2.0	38	59	<1.0	<1.0	---	5.5	2.3
	10/17/96	6.95	4,100	---	130	13	280	590	0.52	<0.5	---	26	2.2
	10/17/96 <sup>dup</sup>	6.95	3,500	---	120	12	230	510	0.58	<0.5	---	(<20)	2.2
	04/08/97	5.83	1,500	---	77	19	120	32	0.59	<0.50	---	5.7	2.6
	10/16/97	7.98	4,000	---	160	<5.0	250	140	<2.5	<2.5	---	44	2.4
	10/16/97 <sup>dup</sup>	7.98	4,000	---	170	<5.0	270	98	<1.0	<1.0	---	<2.5	2.4

**Table 2. Analytical Results for Ground Water - Shell Service Station, WIC #204-0072-0403, 1601 Webster Street, Alameda, California (continued)**

Well ID (Sampling Frequency)	Date Sampled	Depth to Water (ft)	TPH-G ←	TPH-D	B	T	E	X	c-1,2- DCE	1,2- DCA	TOG	MTBE	DO (mg/L)
(Concentrations in µg/L)													
	<b>04/17/98</b>	<b>4.71</b>	<b>3,800</b>	<b>---</b>	<b>190</b>	<b>5.0<sup>j</sup></b>	<b>260</b>	<b>340</b>	<b>&lt;0.50</b>	<b>&lt;0.50</b>	<b>---</b>	<b>&lt;25(8.3)</b>	<b>1.8</b>
	<b>04/17/98<sup>dup</sup></b>	<b>4.71</b>	<b>310</b>	<b>---</b>	<b>16</b>	<b>&lt;0.50</b>	<b>&lt;0.50</b>	<b>7.4</b>	<b>---</b>	<b>---</b>	<b>---</b>	<b>&lt;2.5</b>	<b>1.8</b>
MW-3 (2nd & 4th Qtr)	02/25/93	5.37	58	140	<0.5	<0.5	2.5	6.4	<0.5	1.5	<5,000	---	---
	04/08/93	5.48	<50	---	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	---	---	---
	07/20/93 <sup>e</sup>	6.38	<50	---	1.2	<0.5	<0.5	<0.5	<0.5	2.8	---	---	---
	10/15/93 <sup>f</sup>	7.53	60	---	<0.5	<0.5	<0.5	<0.5	<0.5	0.55	---	---	---
	01/07/94	7.38	74	---	<0.5	<0.5	<0.5	0.76	<0.5	0.91	---	---	4.6
	04/13/94	6.50	<50	---	<0.5	<0.5	<0.5	<0.5	<1.3	<1.3	---	---	---
	07/26/94	7.00	750 <sup>g</sup>	---	<0.5	<0.5	<0.5	<0.5	<0.4	<0.4	---	---	1.7
	10/06/94	8.10	1,900 <sup>g</sup>	---	<0.5	<0.5	<0.5	<0.5	<0.4	<0.4	---	---	3.0
	01/26/95	5.00	580 <sup>g</sup>	---	<0.5	<0.5	<0.5	1.3	<0.4	<0.4	---	---	1.3
	04/20/95	5.24	<50	---	<0.5	<0.5	<0.5	<0.5	<0.4	<0.4	---	---	---
	07/12/95	6.10	50	---	4.2	2.9	<0.5	0.9	---	---	---	---	7.2
	10/12/95	6.98	<50	---	<0.5	<0.5	<0.5	<0.5	<0.5	<0.4	---	---	7.1
	10/12/95 <sup>dup</sup>	6.98	<50	---	<0.5	<0.5	<0.5	<0.5	<0.5	<0.4	---	---	7.1
	01/11/96	6.48	50	---	<0.5	<0.5	<0.5	<0.5	<0.5	<0.4	---	---	6.4
	01/11/96 <sup>dup</sup>	6.48	50	---	<0.5	<0.5	<0.5	<0.5	<0.5	<0.4	---	---	---
	04/10/96	5.57	200	---	<2.0	<2.0	<2.0	<2.0	---	---	---	670	---
	07/12/96	6.23	<50	---	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	---	230	3.5
	10/17/96	7.18	<50	---	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	---	<2.5	3.0
	04/08/97	5.75	<50	---	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	---	240	3.0
	10/16/97	7.76	<50	---	<0.50	<0.50	<0.50	<0.50	<1.0	<1.0	---	100	2.2
	<b>04/17/98</b>	<b>4.47</b>	<b>&lt;50</b>	<b>---</b>	<b>&lt;0.50</b>	<b>&lt;0.50</b>	<b>&lt;0.50</b>	<b>&lt;0.50</b>	<b>&lt;0.50</b>	<b>&lt;0.50</b>	<b>---</b>	<b>&lt;2.5</b>	<b>6.4</b>
S-1 (2nd Qtr)	09/04/87 <sup>h</sup>	---	---	---	<5	<5	<5	<5	<0.5	<0.5	---	---	---
	09/11/89 <sup>i</sup>	9.82	<50	<100	<0.5	<1	<1	<3	<0.5	<0.5	<1,000	---	---
	04/11/90	8.41	<50	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<10,000	---	---
	07/18/90	9.31	<50	---	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5,000	---	---
	10/18/90	10.43	<50	---	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5,000	---	---
	01/25/91	10.49	<50	---	<0.5	<0.5	<0.5	<0.5	---	---	---	---	---
	04/11/91	7.68	<50	---	<0.5	<0.5	<0.5	<0.5	---	---	---	---	---
	07/18/91	8.95	<50	---	<0.5	<0.5	<0.5	<0.5	---	---	---	---	---
	10/17/91	10.62	<50	---	<0.5	<0.5	<0.5	<5	---	---	---	---	---

**Table 2. Analytical Results for Ground Water - Shell Service Station, WIC #204-0072-0403, 1601 Webster Street, Alameda, California (continued)**

Well ID (Sampling Frequency)	Date Sampled	Depth to Water (ft)	TPH-G ←	TPH-D	B	T	E	X	c-1,2- DCE	1,2- DCA	TOG	MTBE	DO (mg/L)
(Concentrations in µg/L)													
	01/24/92	9.32	<50	---	<0.5	<0.5	<0.5	<0.5	---	---	---	---	---
	04/23/92	7.27	<50	---	<0.5	<0.5	<0.5	<0.5	---	---	---	---	---
	07/02/92	8.19	<50	---	<0.5	<0.5	<0.5	<0.5	---	---	---	---	---
	10/02/92	9.95	<50	---	<0.5	<0.5	<0.5	<0.5	---	---	---	---	---
	01/05/93	7.64	<50	---	<0.5	<0.5	<0.5	<0.5	---	---	---	---	---
	04/08/93	6.10	<50	---	<0.5	<0.5	<0.5	<0.5	---	---	---	---	---
	07/20/93	7.18	<50	---	<0.5	<0.5	<0.5	<0.5	---	---	---	---	---
	10/15/93	8.39	<50	---	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	---	---	---
	01/07/94	8.19	<50	---	<0.5	<0.5	<0.5	<0.5	---	---	---	---	6.8
	04/13/94	7.22	<50	---	<0.5	<0.5	<0.5	<0.5	---	---	---	---	---
	07/26/94	7.82	<50	---	<0.5	<0.5	<0.5	<0.5	---	---	---	---	2.6
	10/06/94	9.01	<50	---	<0.5	<0.5	<0.5	<0.5	<0.4	<0.4	---	---	6.0
	04/20/95	6.82	<50	---	<0.5	<0.5	<0.5	<0.5	---	---	---	---	---
	04/10/96	5.80	<50	---	<0.5	<0.5	<0.5	<0.5	---	---	---	<2.5	---
	07/12/96	6.60	---	---	---	---	---	---	---	---	---	---	---
	10/17/96	7.63	---	---	---	---	---	---	---	---	---	---	---
	04/08/97	6.00	<50	---	0.73	<0.50	<0.50	1.7	---	---	---	3.8	2.8
	04/08/97 <sup>dup</sup>	6.00	<50	---	1.0	0.64	0.65	2.4	---	---	---	<2.5	2.8
	<b>04/17/98</b>	<b>4.62</b>	<b>86</b>	---	<b>3.2</b>	<b>3.8<sup>j</sup></b>	<b>2.0</b>	<b>13</b>	---	---	---	<b>&lt;2.5</b>	<b>7.1</b>
Trip	07/18/90		<50	---	<0.5	<0.5	<0.5	<0.5	---	---	---	---	---
Blank	10/18/90		<50	---	<0.5	<0.5	<0.5	<0.5	---	---	---	---	---
	01/25/91		<50	---	<0.5	<0.5	<0.5	0.8	---	---	---	---	---
	04/11/91		<50	---	<0.5	<0.5	<0.5	<0.5	---	---	---	---	---
	07/18/91		<50	---	<0.5	<0.5	<0.5	<0.5	---	---	---	---	---
	10/17/91		<50	---	<0.5	<0.5	<0.5	<0.5	---	---	---	---	---
	01/24/92		<50	---	<0.5	<0.5	<0.5	<0.5	---	---	---	---	---
	04/23/92		<50	---	<0.5	<0.5	<0.5	<0.5	---	---	---	---	---
	07/02/92		<50	---	<0.5	<0.5	<0.5	<0.5	---	---	---	---	---
	10/02/92		<50	---	<0.5	<0.5	<0.5	<0.5	---	---	---	---	---
	01/05/93		<50	---	<0.5	<0.5	<0.5	<0.5	---	---	---	---	---
	04/08/93		<50	---	<0.5	<0.5	<0.5	<0.5	---	---	---	---	---
	07/20/93		<50	---	<0.5	<0.5	<0.5	<0.5	---	---	---	---	---
	10/15/93		<50	---	<0.5	<0.5	<0.5	<0.5	---	---	---	---	---
	01/07/94		<50	---	<0.5	<0.5	<0.5	<0.5	---	---	---	---	---



**Table 2. Analytical Results for Ground Water - Shell Service Station, WIC #204-0072-0403, 1601 Webster Street, Alameda, California (continued)**

Well ID (Sampling Frequency)	Date Sampled	Depth to Water (ft)	TPH-G ←	TPH-D	B	T	E	X	c-1,2- DCE	1,2- DCA	TOG	MTBE	DO (mg/L)
			(Concentrations in µg/L)										→
	04/13/94		<50	---	<0.5	<0.5	<0.5	<0.5	---	---	---	---	---
	07/26/94		<50	---	<0.5	<0.5	<0.5	<0.5	---	---	---	---	---
	10/06/94		<50	---	<0.5	<0.5	<0.5	<0.5	---	---	---	---	---
	01/26/95		<50	---	<0.5	<0.5	<0.5	<0.5	---	---	---	---	---
	04/20/95		<50	---	<0.5	<0.5	<0.5	<0.5	---	---	---	---	---
	07/12/95		<50	---	<0.5	<0.5	<0.5	<0.5	---	---	---	---	---
	10/12/95		<50	---	<0.5	<0.5	<0.5	---	---	---	---	---	---
	07/12/96		<50	---	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	---	<2.5	---
	10/17/96		<50	---	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	---	<2.5	---
MCLs			NE	NE	1	150	700	1,750	6.0	0.5	NE	NE	

**Abbreviations:**

TPH-G = Total petroleum hydrocarbons as gasoline by modified EPA Method 8015  
 TPH-D = Total petroleum hydrocarbons as diesel by modified EPA Method 8015  
 B = Benzene by EPA Method 8020  
 T = Toluene by EPA Method 8020  
 E = Ethylbenzene by EPA Method 8020  
 X = Xylenes by EPA Method 8020  
 c-1,2-DCE = cis-1,2-dichloroethene by EPA Method 601  
 1,2-DCA = 1,2-dichloroethane by EPA Method 601  
 TOG = Total non-polar oil and grease by American Public Health Association Standard Method 503E  
 MTBE = Methyl tert-butyl ether by EPA Method 8020. Result in parentheses indicates MTBE by EPA Method 8260  
 DO = Dissolved oxygen  
 dup = Duplicate sample  
 ft = Feet  
 µg/L = Micrograms per liter  
 mg/L = Milligrams per liter  
 MCLs = California primary maximum contaminant level for drinking water (22 CCR 64444)  
 NE = MCLs not established

**Notes:**

a = Chloroform detected at 0.71 µg/L by EPA Method 8010  
 b = Chloroform detected at 1.1 µg/L by EPA Method 8010  
 c = Trichloroethylene detected at 1.7 µg/L  
 d = Compounds detected and calculated as diesel appear to be the less volatile constituents of gasoline  
 e = Chloroform detected at 1.5 µg/L by EPA Method 8010  
 f = Chloroform detected at 3.6 µg/L by EPA Method 8010  
 g = The result for gasoline is an unknown hydrocarbon which consists of a single peak  
 h = 0.12 mg/L acetone detected by EPA Method 624; no other volatile organic compounds detected  
 i = Metals detected by EPA Method 6010; 0.020 mg/L chromium, 0.060 mg/L lead and 0.030 mg/L zinc; no cadmium detected above detection limit of 0.010 mg/L; no PCBs or semi-volatile compounds detected by EPA Method 625  
 j = 0.51 µg/L toluene detected in equipment blank  
 <n = Not detected at detection limit of n µg/L  
 --- = Not analyzed/measured

# Appendix D

## Arcadis U.S., Inc. – 2015 Joint Investigation Data

**Table 1**  
**CPT Groundwater Grab Sample Analytical Results**  
 Unocal Service Station No. 0843  
 1629 Webster Street  
 Alameda, California

Well ID	Date Sampled	Screen Interval (feet bgs)	TPPH (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethyl-benzene (µg/L)	Total Xylenes (µg/L)	MTBE (µg/L)	TBA (µg/L)	Comments
ESL			100*	1	40	30	20	5	12	
CPT-01	9/24/2014	25-29	54	<0.50	<0.50	<0.50	<1.0	450	<10	
CPT-01	9/24/2014	30-34	76	0.62	<0.50	<0.50	<1.0	6.4	<10	
CPT-01	9/24/2014	35-39	290	<0.50	<0.50	<0.50	<1.0	9.7	<10	Chromatograph is dominated by a single peak at about 3.5 minutes which is atypical of gasoline.
CPT-01	9/24/2014	40-44	<50	<0.50	<0.50	<0.50	<1.0	0.56	<10	
CPT-02	9/25/2014	25-29	<50	<0.50	<0.50	<0.50	<1.0	<0.50	<10	
CPT-02	9/25/2014	30-34	<50	<0.50	<0.50	<0.50	<1.0	<0.50	<10	
CPT-02	9/25/2014	35-39	<50	<0.50	<0.50	<0.50	<1.0	<0.50	<10	
CPT-02	9/25/2014	40-44	<50	<0.50	<0.50	<0.50	<1.0	<0.50	<10	
CPT-03	9/25/2014	25-29	<50	<0.50	<0.50	<0.50	<1.0	<0.50	<10	
CPT-03	9/25/2014	40-44	<50	<0.50	<0.50	<0.50	<1.0	<0.50	<10	
CPT-04	9/22/2014	25-29	<50	<0.50	<0.50	<0.50	<1.0	0.69	<10	
CPT-04	9/22/2014	30-34	<50	<0.50	<0.50	<0.50	<1.0	<0.50	<10	
CPT-04	9/22/2014	35-39	<50	<0.50	<0.50	<0.50	<1.0	<0.50	<10	
CPT-04	9/22/2014	40-44	<50	<0.50	<0.50	<0.50	<1.0	<0.50	<10	
CPT-05	Not installed. Not needed based on Phase 1 data									
CPT-06	11/7/2014	25-28	<50	<0.50	<0.50	<0.50	<1.0	0.82	<10	
CPT-06-D	11/7/2014	25-28	<50	<0.50	<0.50	<0.50	<1.0	0.88	<10	Blind Duplicate
CPT-06	11/7/2014	30-33	0.6	<0.0050	<0.0050	<0.0050	<0.010	<0.0050	<0.050	Ran as soil due to the presence of silt in the VOAs. Data in mg/kg
CPT-06	11/7/2014	35-39	140	<0.50	<0.50	<0.50	<1.0	<0.50	<10	
CPT-07	11/17/2014	25-29	<50	<0.50	<0.50	<0.50	<1.0	0.69	<10	
CPT-07	11/17/2014	30-34	<50	<0.50	<0.50	<0.50	<1.0	<0.50	<10	
CPT-07	11/17/2014	35-39	<50	<0.50	<0.50	<0.50	<1.0	<0.50	<10	
CPT-07	11/17/2014	40-44	<50	<0.50	<0.50	<0.50	<1.0	<0.50	<10	
EB-1	9/25/2014	--	<50	<0.50	0.97	<0.50	<1.0	<0.50	<10	
TB-1	9/25/2014	--	<50	<0.50	1.0	<0.50	<1.0	<0.50	<10	
TB-1	11/7/2014	--	<50	<0.50	<0.50	<0.50	<1.0	<0.50	<10	

**Standard Abbreviations**

- \* ESL is for total petroleum hydrocarbons as gasoline
- not applicable
- < not detected at or above laboratory detection limit
- µg/L micrograms per liter (approx. equivalent to parts per billion, ppb)
- bgs feet below ground surface
- ESL San Francisco Regional Water Quality Control Board's Environmental Screening Limit (December 2013)
- MTBE methyl tertiary butyl ether
- TBA tertiary butyl alcohol

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 BP #1104 Rose Diagram.jpg  
 Chevron 9-0290 Rose Diagram.jpg  
 Chevron Alameda Rose Diagram.jpg

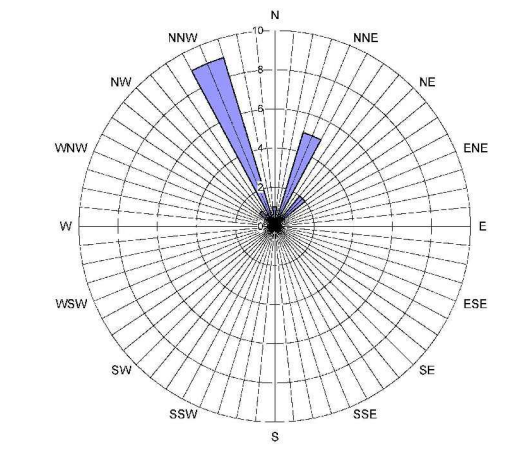
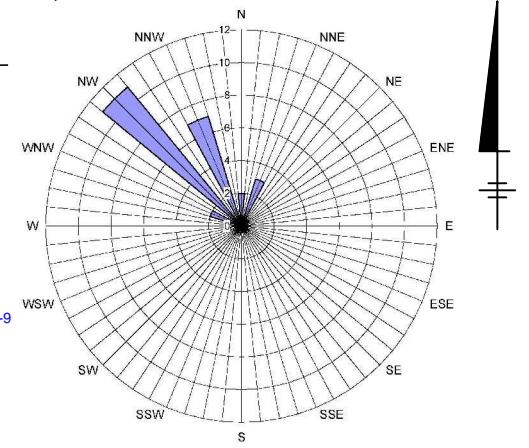
CPT-03				
Date	Depth	MTBE	B	TPPH
9/25/2014	25-29	<0.50	<0.50	<50
9/25/2014	40-44	<0.50	<0.50	<50

CPT-04				
Date	Depth	MTBE	B	TPPH
9/22/2014	25-29	0.69	<0.50	<50
9/22/2014	30-34	<0.50	<0.50	<50
9/22/2014	35-39	<0.50	<0.50	<50
9/22/2014	40-44	<0.50	<0.50	<50

CPT-06				
Date	Depth	MTBE	B	TPPH
11/7/2014	25-28	0.82	<0.50	<50
11/7/2014	25-28	0.88	<0.50	<50
11/7/2014	30-33	<0.0050	<0.0050	0.6
11/7/2014	35-39	<0.50	<0.50	140

CPT-07				
Date	Depth	MTBE	B	TPPH
11/17/2014	25-29	0.69	<0.50	<50
11/17/2014	30-34	<0.50	<0.50	<50
11/17/2014	35-39	<0.50	<0.50	<50
11/17/2014	40-44	<0.50	<0.50	<50

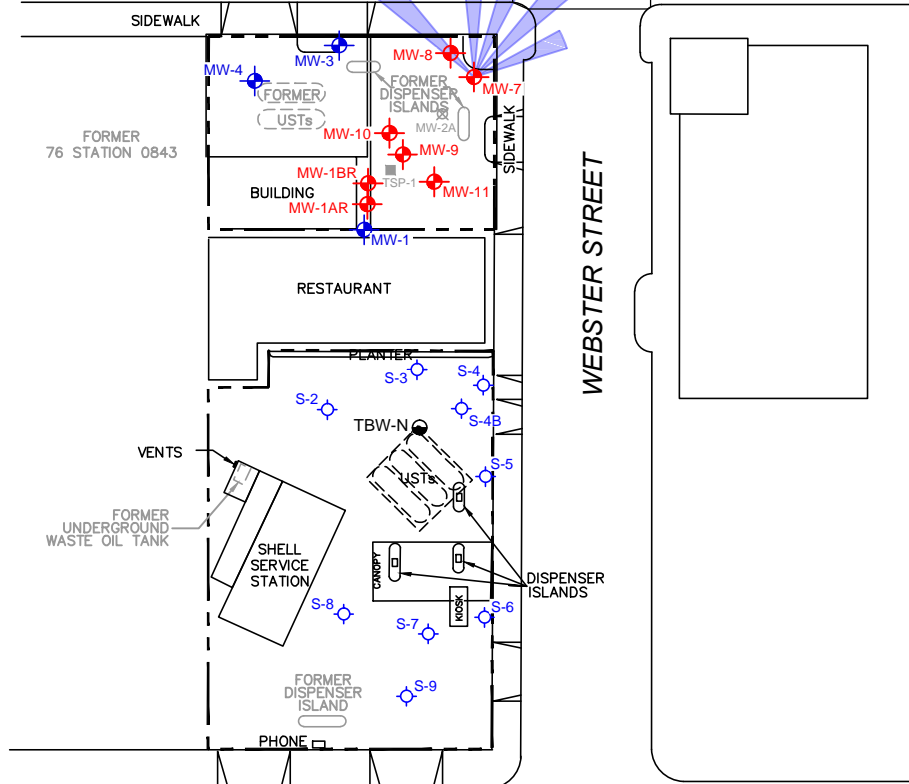
CPT-02				
Date	Depth	MTBE	B	TPPH
9/25/2014	25-29	<0.50	<0.50	<50
9/25/2014	30-34	<0.50	<0.50	<50
9/25/2014	35-39	<0.50	<0.50	<50
9/25/2014	40-44	<0.50	<0.50	<50



BUENA VISTA AVENUE

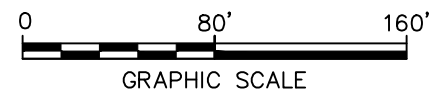
PACIFIC AVENUE

WEBSTER STREET



NOTES:

1. BASE MAP PROVIDED BY TRC, DATED AUGUST 2010, AT A SCALE OF 1"=60'. SHELL SERVICE STATION DATA PROVIDED BY CRA.
2. ALL SITE FEATURES AND LOCATIONS ARE APPROXIMATE. SOURCE: GOOGLE MAP DATED 2012.
3. SHALLOW AND DEEP ZONES FOR GROUNDWATER RANGE FROM 0 TO 20 FEET BGS AND 20 TO 40 FEET BGS, RESPECTIVELY. IDENTIFICATION OF A MONITORING WELL AS EITHER SHALLOW OR DEEP IS BASED ON THE SCREEN INTERVAL
4. FT BGS = FEET BELOW GROUND SURFACE
5. PHASE 2 CPT BORINGS WERE INSTALLED IF GROUNDWATER CONCENTRATIONS IN PHASE 1 CPT BORINGS INDICATED ADDITIONAL INVESTIGATIONAL BORINGS WERE NEEDED.
6. GROUNDWATER FLOW DIRECTION DATA FOR CHEVRON SERVICE STATION 9-0290 BASED ON 25 MONITORING EVENTS FROM MAY 2005 THROUGH MAY 2012.
7. GROUNDWATER FLOW DIRECTION DATA FOR BP SERVICE STATION #1104 BASED ON 18 MONITORING EVENTS FROM SEPTEMBER 2005 THROUGH OCTOBER 2013.
8. SITE GROUNDWATER FLOW DIRECTION DATA IS BASED ON APPROXIMATELY 60 MONITORING EVENTS FROM 1999 THROUGH 2014.



UNION OIL COMPANY OF CALIFORNIA  
 FORMER FACILITY NO. 0843  
 1629 WEBSTER STREET  
 ALAMEDA, CALIFORNIA

CPT BORING LOCATIONS AND GROUNDWATER ANALYTICAL DATA

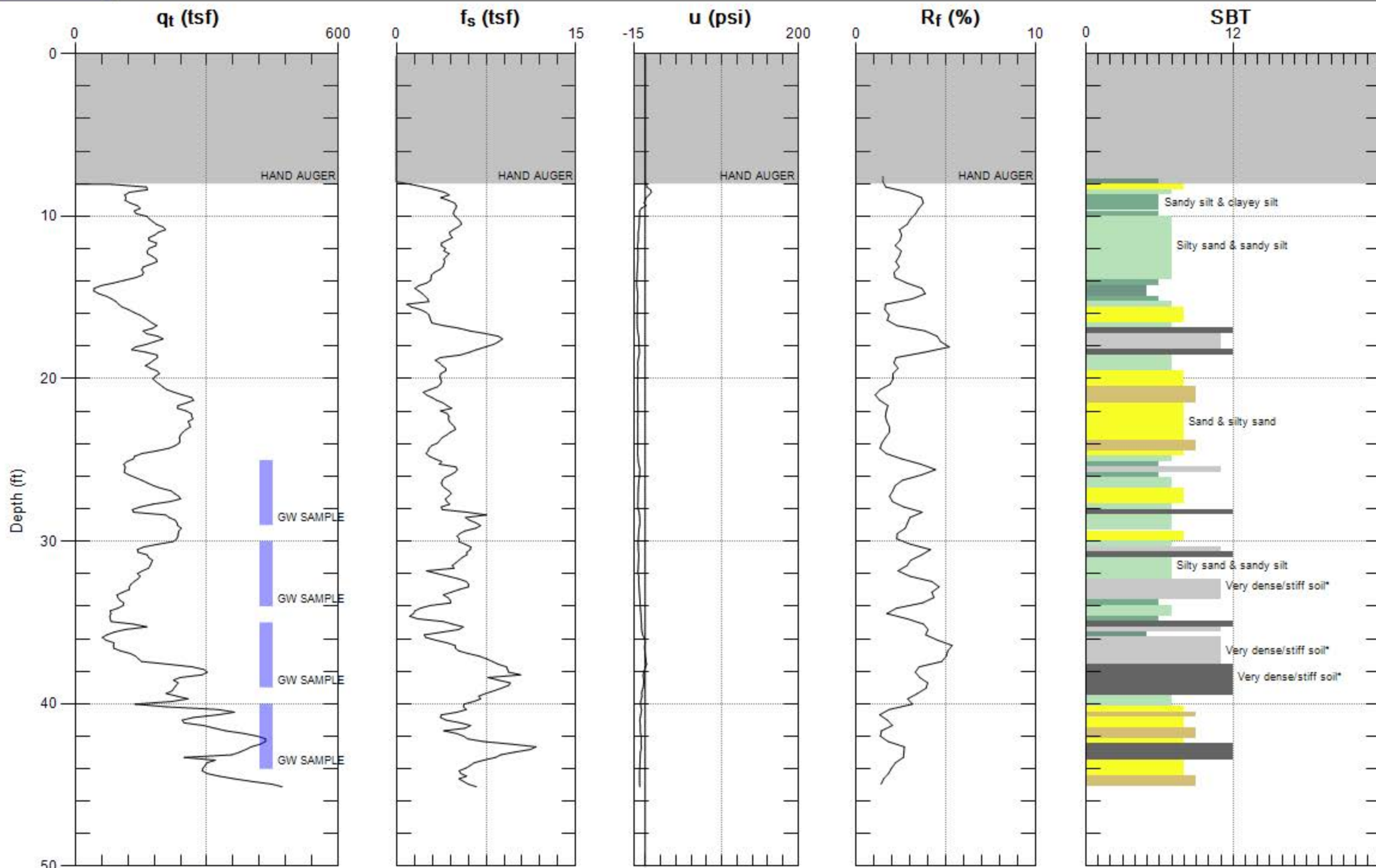


FIGURE

2

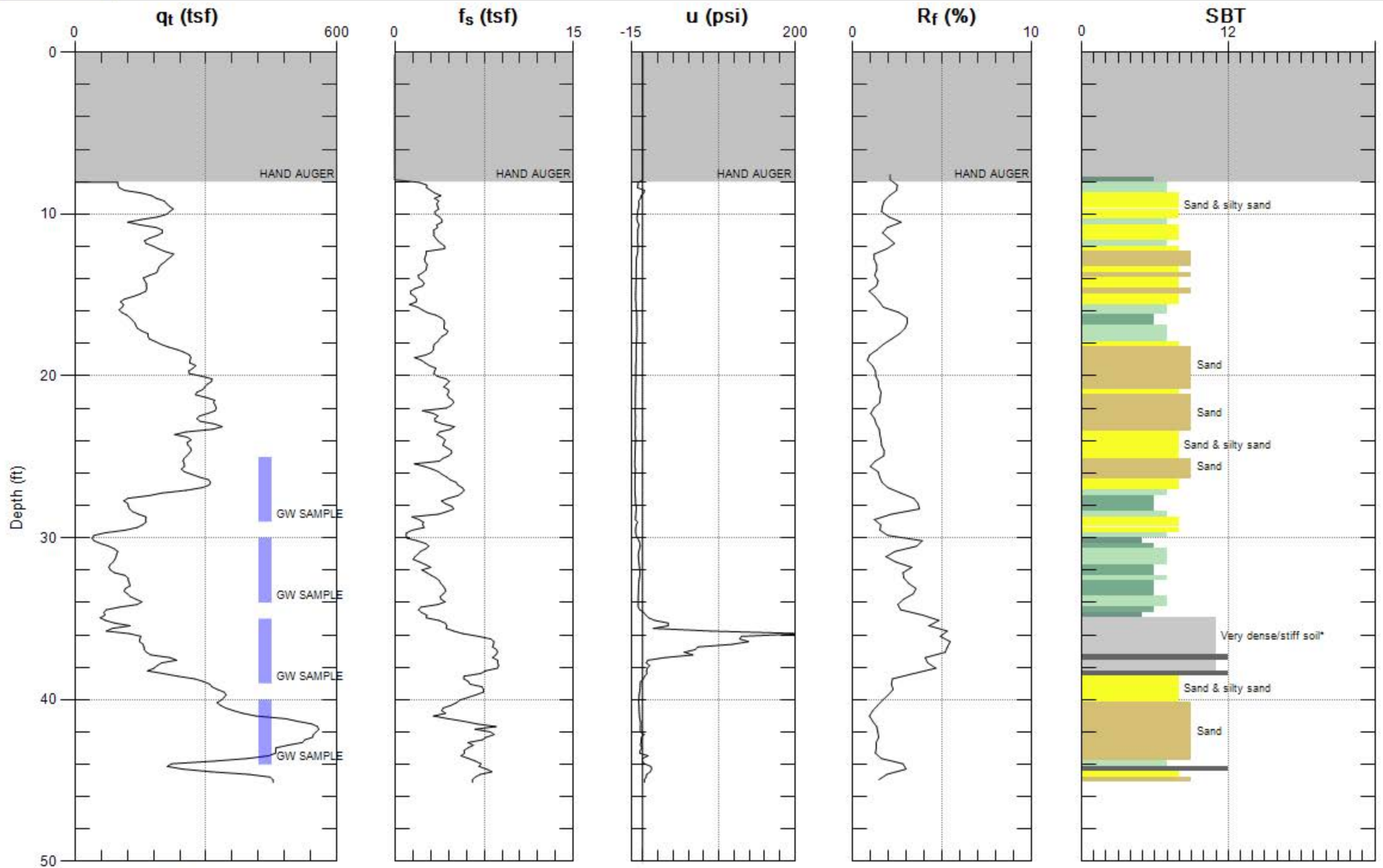
LEGEND

- PROPERTY BOUNDARY
- MW-1 (blue square with cross) SITE MONITORING WELL (SHALLOW)
- MW-1 (red square with cross) SITE MONITORING WELL (DEEP)
- TSP-1 (black square) SPARGE WELL
- S-9 (blue square with cross) SHELL SERVICE STATION MONITORING WELL (SHALLOW)
- B-1 (blue square) CHEVRON SERVICE STATION MONITORING WELL (SHALLOW)
- MW-1 (blue square) BP SERVICE STATION MONITORING WELL (SHALLOW)
- TBW-N (black circle) SHELL TANK BACKFILL MONITORING WELL
- MW-2A (black square with X) ABANDONED WELL
- CPT-01 (green circle) PHASE 1 CPT BORING LOCATION
- CPT-04 (green circle) PHASE 2 CPT BORING LOCATION
- CPT-05 (green circle with X) BORING LOCATION NOT INSTALLED
- (527) (green circle) RADIAL DISTANCE OF PROPOSED CPT BORING LOCATION FROM SITE MONITORING WELL MW-7
- (blue arrow) GROUNDWATER FLOW DIRECTION
- MTBE METHYL TERTIARY BUTYL ETHER
- B BENZENE
- TPPH TOTAL PURGEABLE PETROLEUM HYDROCARBONS
- < LESS THAN LABORATORY REPORTING LIMIT SHOWN
- NOT APPLICABLE
- DEPTHS ARE IN FEET BELOW GROUND SURFACE (FT BGS)
- ALL ANALYTICAL RESULTS ARE IN MICROGRAMS PER LITER (µg/L)



Max. Depth: 45.112 (ft)  
Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)

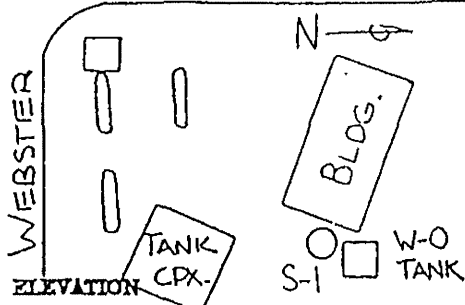


Max. Depth: 45.112 (ft)  
Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)

# Appendix E Boring Logs



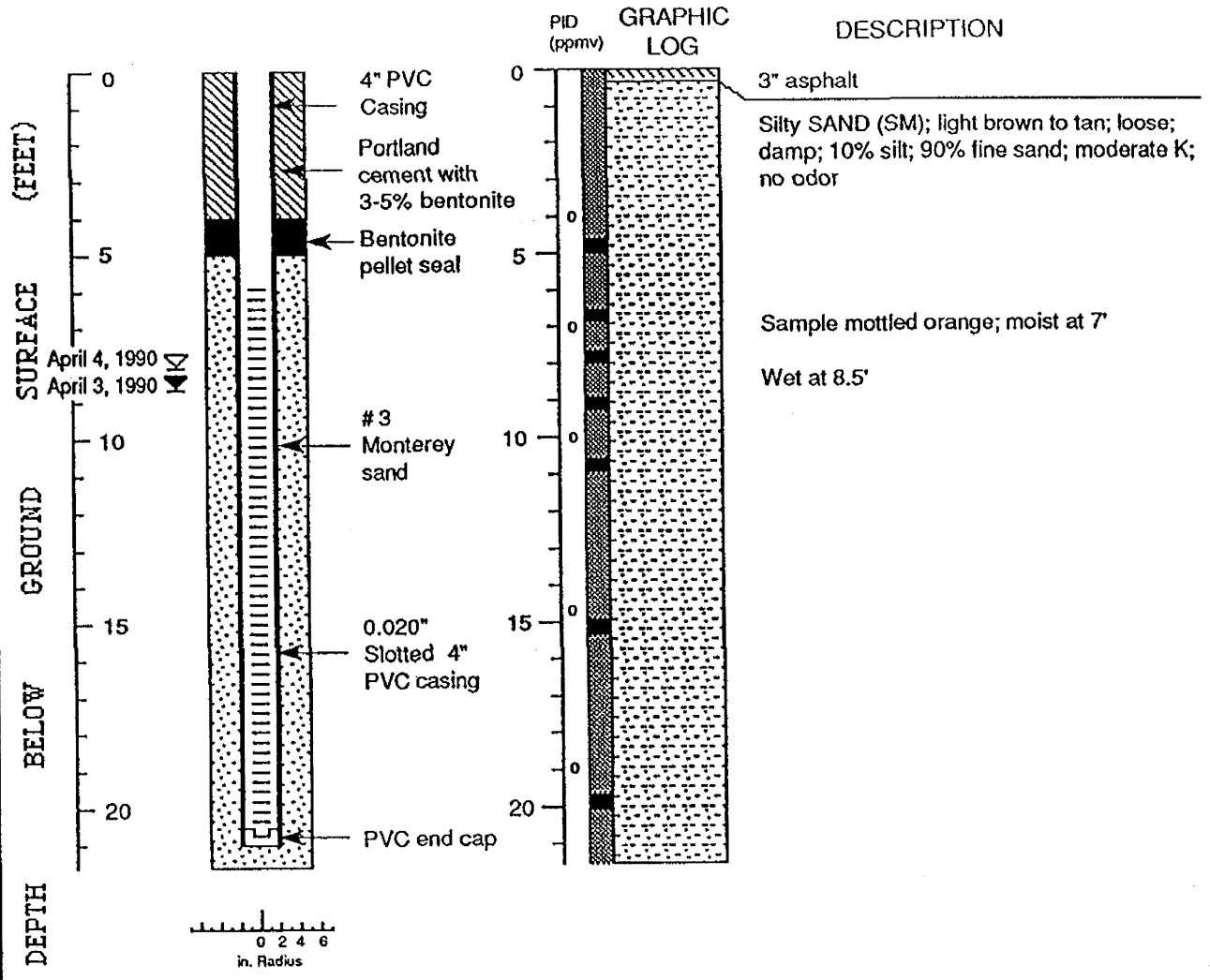


WELL/BORING NO. S-1  
 LOGGED BY: E.L.  
 DRILLED BY: BAYLAND  
 DRILLING METHOD: HSA  
 SAMPLING METHOD: CAL MOD  
 CASING TYPE: SCH 40 PVC  
 WELL DEPTH: 20'  
 PROJECT NO. 100-84-01  
 CLIENT: G.R. SHELL  
 DATE DRILLED: 9-4-87  
 LOCATION: WEBSTER: LINCOLN  
 HOLE DIAMETER: 8"  
 HOLE DEPTH: 20 1/2'  
 BLANK INTERVAL: 0-5' GRAVEL PACK: 12x20 SEAL: BENT-CONC.  
 SCREEN INTERVAL: 5-20' SCREEN DIAMETER: 3" SLOT SIZE: 0.020"

DEPTH	GRAVEL PACK	DEPTH	SAMPLE RECOVERY	GRAPHIC	SOL. TYPE	LITHOLOGY / REMARKS	WELL COMPLETION
2					CL	ASPHALT; GRAVEL-FILL	
4					SM	CLAY-FILL; MODERATE PLASTICITY; 20-30% FINE SAND TO FINE GRAVEL; NPO.	
6						SILTY SAND; DARK BROWN; 15-20% SILTY FINES; FINE GRAINED; NPO.	
8						e 3 1/2': AS ABOVE; NPO.	
10					CL	e 8 1/2': DRILLER FELT CONTACT WITH CLAY.	
12					SC-SP	CLAY; YELLOWISH BROWN; LOW PLASTICITY; 20-30% FINE TO MEDIUM SAND; NPO.	
14						CLAYEY SAND TO SAND; REDDISH BROWN; 10-15% L.P. FINES; FINE TO MEDIUM GRAINED; FeO STAINING; NPO.	
16						e 14': AS ABOVE; MOTTLED GREY; NPO.	
18					SP	SAND; REDDISH BROWN; 5-10% L.P. FINES; FINE TO MEDIUM GRAINED; NPO.	
20							
22							
24							
26							
28							
30							
32							
34							
36							
38							
40							
						BOTTOM OF BORING AT 20 1/2 FEET.	



### WELL MW-1 (BH-A)



#### EXPLANATION

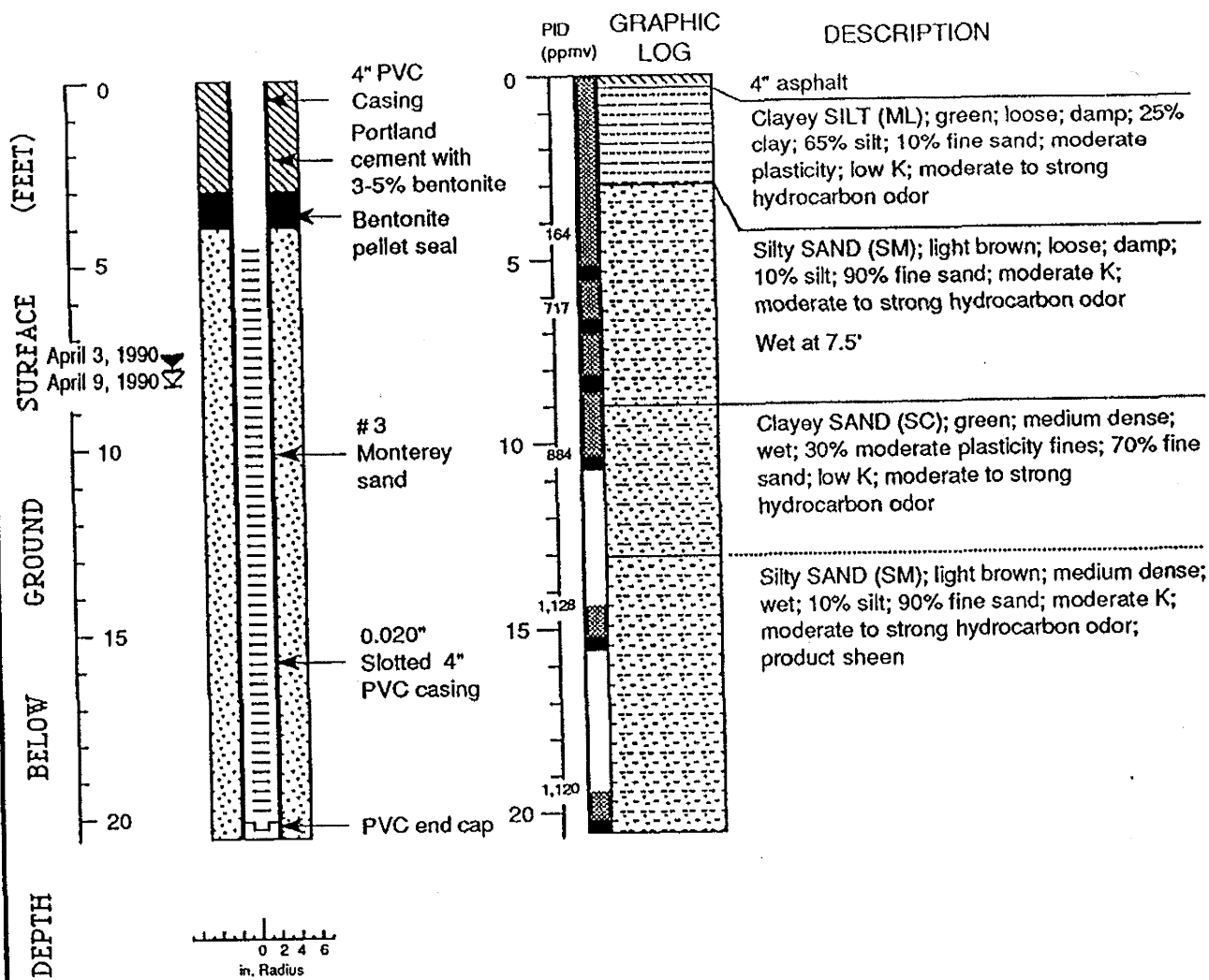
- Water level during drilling (date)
- Water level (date)
- Contact (dotted where approx.)
- Uncertain contact
- Location of recovered drive sample
- Location of drive sample sealed for chemical analysis
- Cutting sample
- K = Estimated hydraulic conductivity

Logged by: Robert Kitay  
 Supervisor: Richard Weiss; EG 1112  
 Drilling Company: Soils Exploration Services, Vacaville, CA  
 Driller: Russ Ellis  
 Drilling Method: Hollow stem auger  
 Date Drilled: April 3, 1990  
 Well Head Completion: 4" Locking well plug, traffic-rated  
 Type of sampler: Split-barrel (2")  
 Ground Surface Elevation: 14.15 ft above msl

Well Construction and Boring Log - Well MW-1 (BH-A)

Shell Service Station  
 1601 Webster Street  
 Alameda, California

### WELL MW-2 (BH-B)



#### EXPLANATION

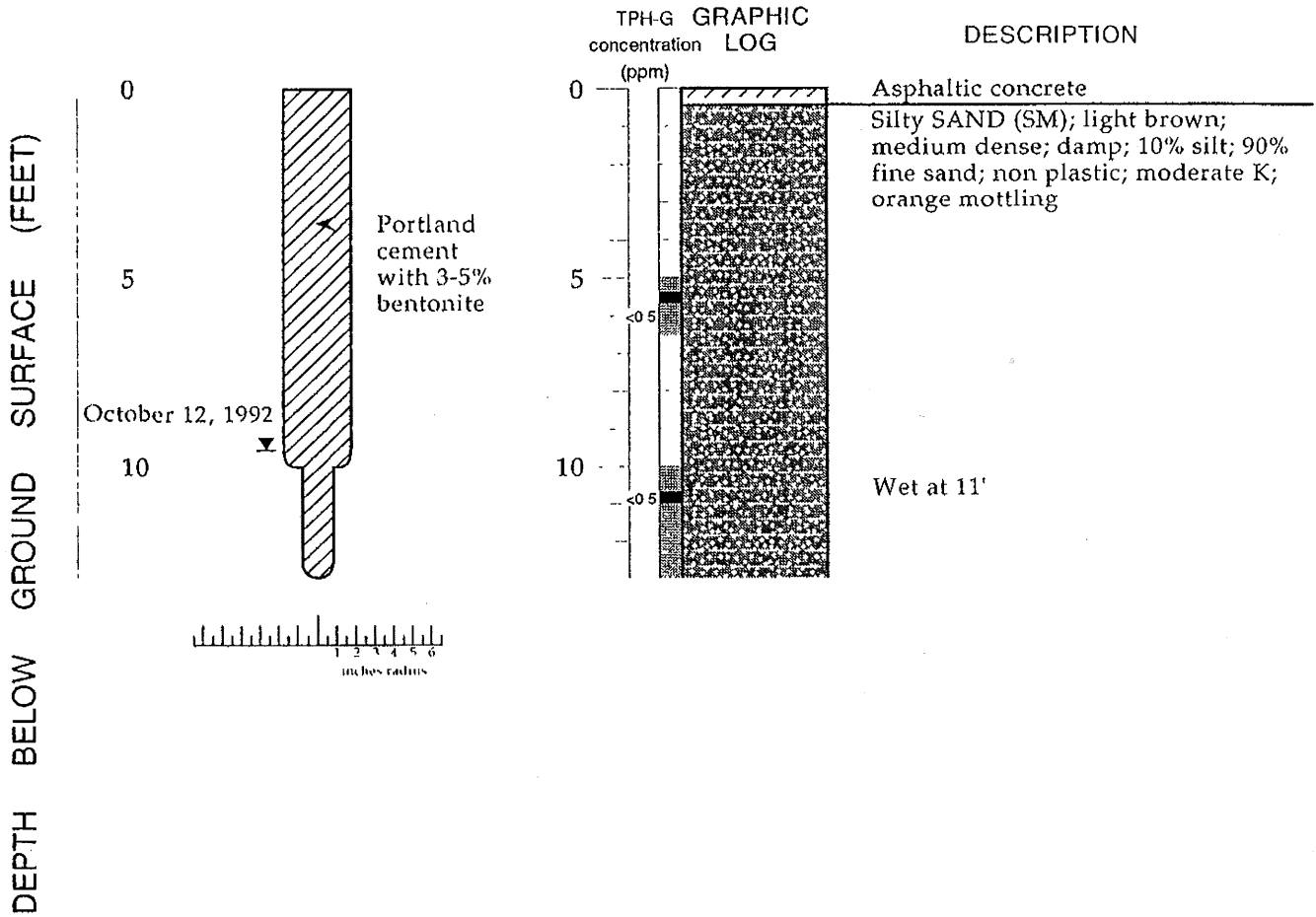
- Water level during drilling (date)
- Water level (date)
- Contact (dotted where approx.)
- Uncertain contact
- Location of recovered drive sample
- Location of drive sample sealed for chemical analysis
- Cutting sample
- $K$  = Estimated hydraulic conductivity

Logged by: Robert Kitay  
 Supervisor: Richard Weiss; EG 1112  
 Drilling Company: Soils Exploration Services, Vacaville, CA  
 Driller: Russ Ellis  
 Drilling Method: Hollow stem auger  
 Date Drilled: April 3, 1990  
 Well Head Completion: 4" Locking well plug, traffic-rated vault  
 Type of sampler: Split-barrel (2.0")  
 Ground Surface Elevation: 13.61 ft above msl

Well Construction and Boring Log - Well MW-2 (BH-B)

Shell Service Station  
 1601 Webster Street  
 Alameda, California

# BORING BH-C



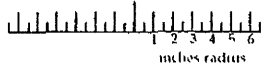
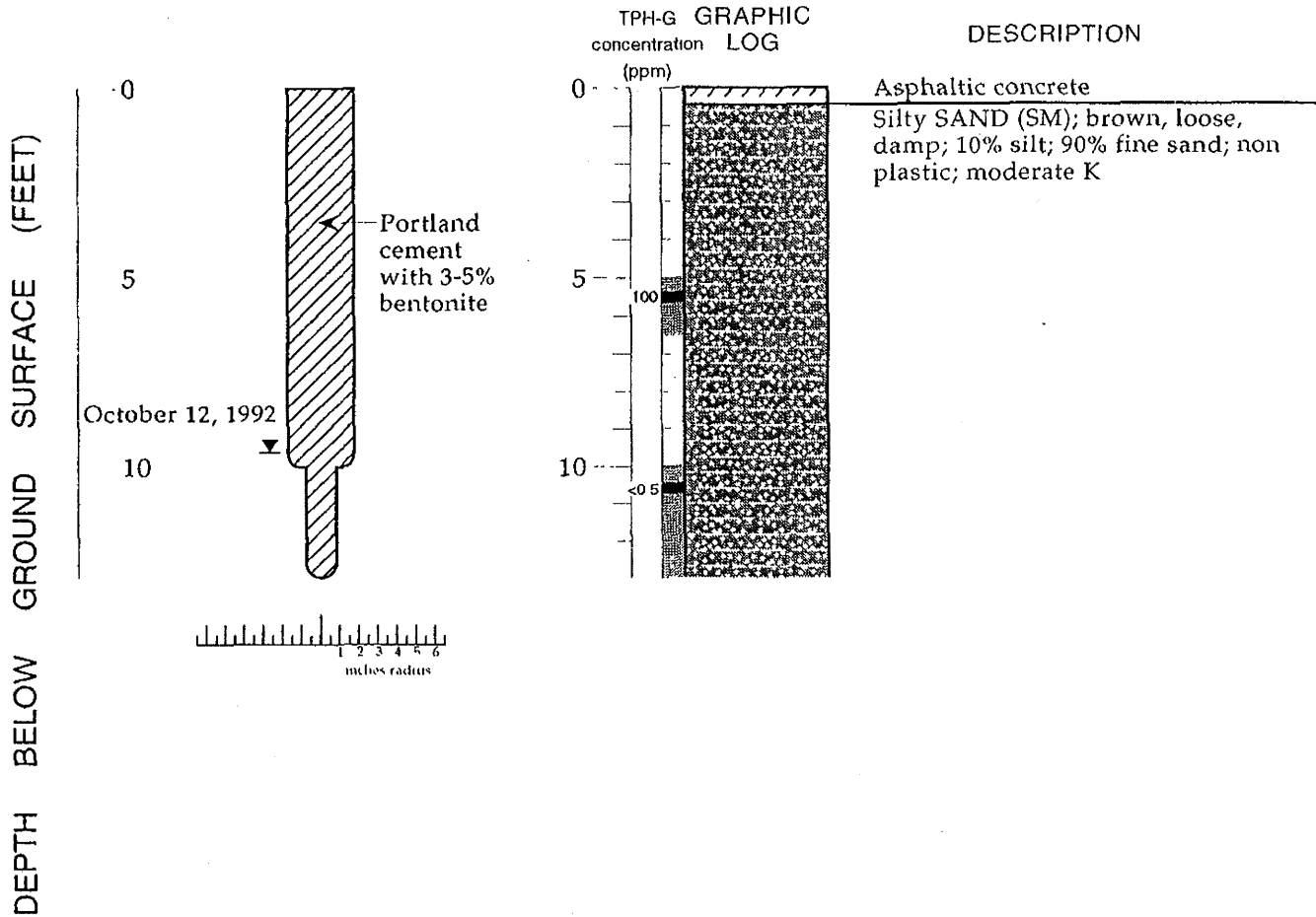
## EXPLANATION

- |   |   |
|---|---|
| <ul style="list-style-type: none"> <li>▼ Water level during drilling (date)</li> <li>▽ Water level (date)</li> <li>..... Contact (dotted where approximate)</li> <li>-?-?-? Uncertain contact</li> <li>//// Gradational contact</li> <li>□ Location of recovered drive sample</li> <li>■ Location of drive sample sealed for chemical analysis</li> <li>▣ Cutting sample</li> <li>K = Estimated hydraulic conductivity</li> </ul> | <ul style="list-style-type: none"> <li>Logged By: Joyce E. Fremstad</li> <li>Supervisor: N. Scott MacLeod</li> <li>Drilling Company: Soils Exploration Drilling, Vacaville, CA</li> <li>License Number: C57-582696</li> <li>Driller: Scott Fitchie &amp; Chad Little</li> <li>Drilling Method: Cuttingless system</li> <li>Date Drilled: October 12, 1992</li> <li>Type of Sampler: Split barrel (2" ID)</li> <li>TPH-G: Total petroleum hydrocarbon as gasoline in soil by modified EPA Method 8015</li> </ul> |
|---|---|

Boring Log and Well Construction Details - Boring BH-C - Shell Service Station WIC #204-0072-0403, 1601 Webster Street, Alameda, California



# BORING BH-D



## EXPLANATION

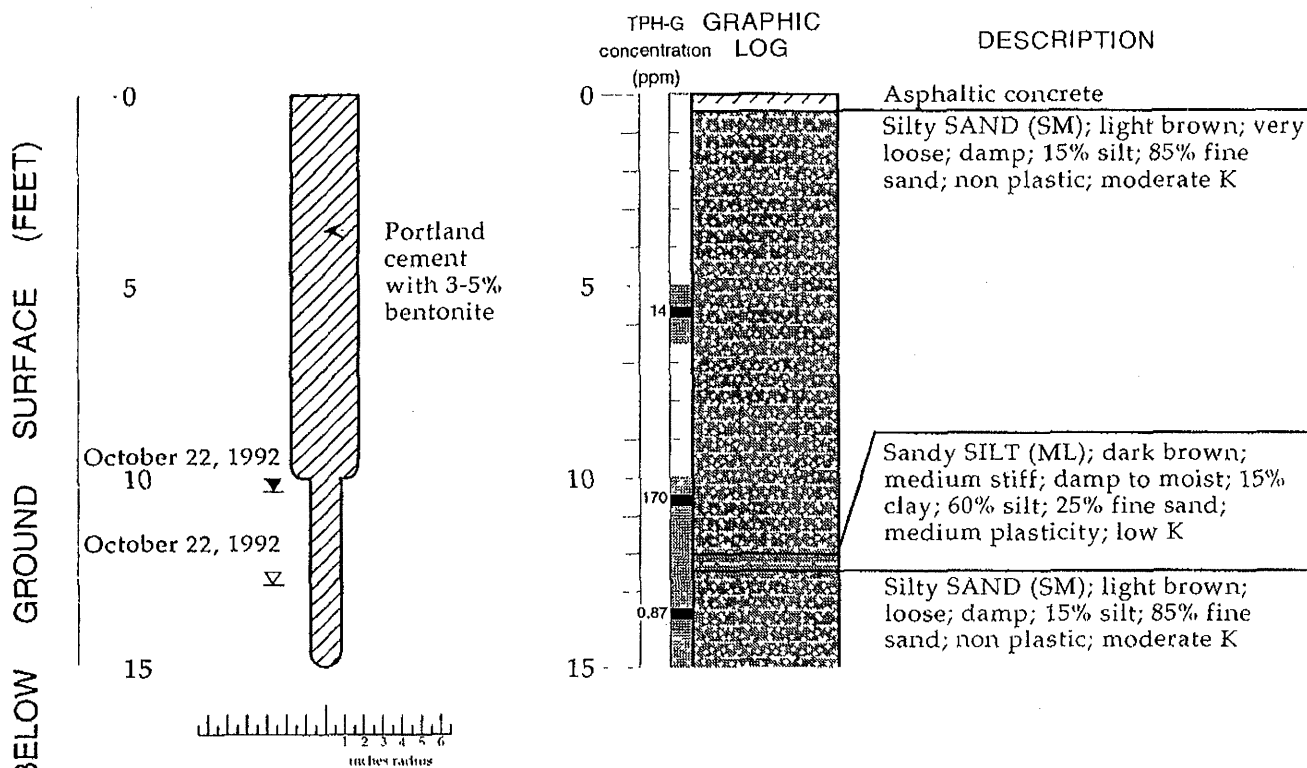
- ▼ Water level during drilling (date)
- ▽ Water level (date)
- Contact (dotted where approximate)
- ?-?-? Uncertain contact
- //// Gradational contact
- ▒ Location of recovered drive sample
- Location of drive sample sealed for chemical analysis
- ▣ Cutting sample
- K = Estimated hydraulic conductivity

Logged By: Joyce E. Fremstad  
 Supervisor: N. Scott MacLeod  
 Drilling Company: Soils Exploration Drilling, Vacaville, CA  
 License Number: C57-582696  
 Driller: Scott Fitchie & Chad Little  
 Drilling Method: Cuttingless system  
 Date Drilled: October 12, 1992  
 Type of Sampler: Split barrel (2" ID)  
 TPH-G: Total petroleum hydrocarbon as gasoline in soil by modified EPA Method 8015

Boring Log and Well Construction Details - Boring BH-D - Shell Service Station WIC #204-0072-0403, 1601 Webster Street, Alameda, California



# BORING BH-E



## EXPLANATION

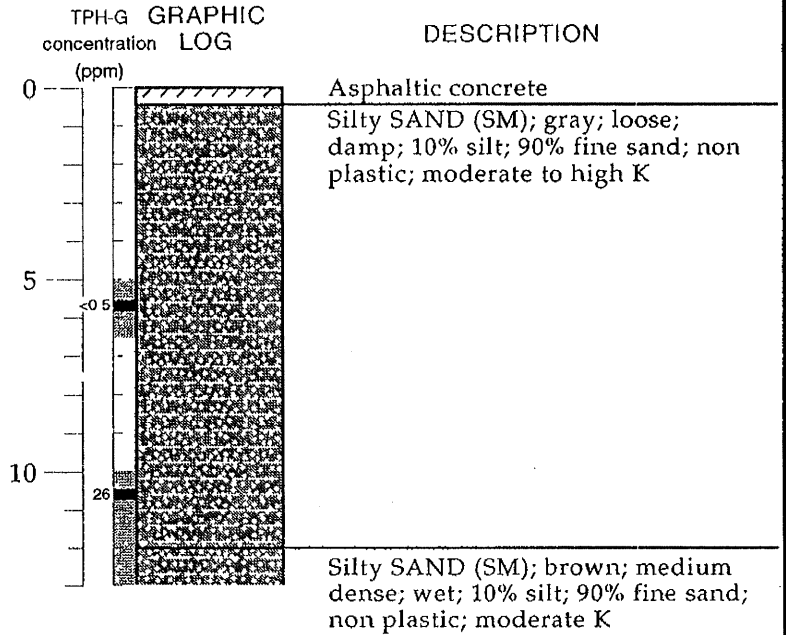
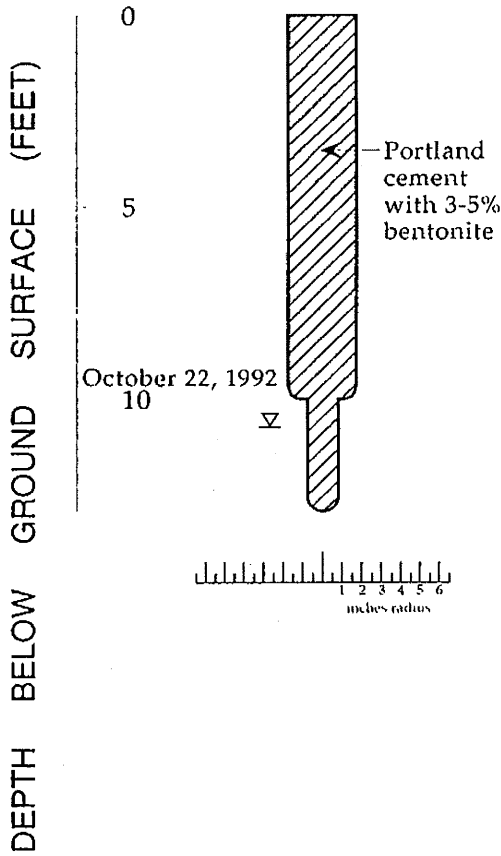
- ▼ Water level during drilling (date)
- ▽ Water level (date)
- Contact (dotted where approximate)
- ?-?-? Uncertain contact
- //// Gradational contact
- Location of recovered drive sample
- Location of drive sample sealed for chemical analysis
- Cutting sample
- K = Estimated hydraulic conductivity

Logged By: Joyce E. Fremstad  
 Supervisor: N. Scott MacLeod.  
 Drilling Company: Soils Exploration Drilling, Vacaville, CA  
 License Number: C57-582696  
 Driller: Mike Duffy & John Sousa  
 Drilling Method: Cuttingless system  
 Date Drilled: October 22, 1992  
 Type of Sampler: Split barrel (2" ID)  
 TPH-G: Total petroleum hydrocarbon as gasoline in soil by modified EPA Method 8015

Boring Log and Well Construction Details - Boring BH-E - Shell Service Station WIC #204-0072-0403, 1601 Webster Street, Alameda, California



# BORING BH-F



## EXPLANATION

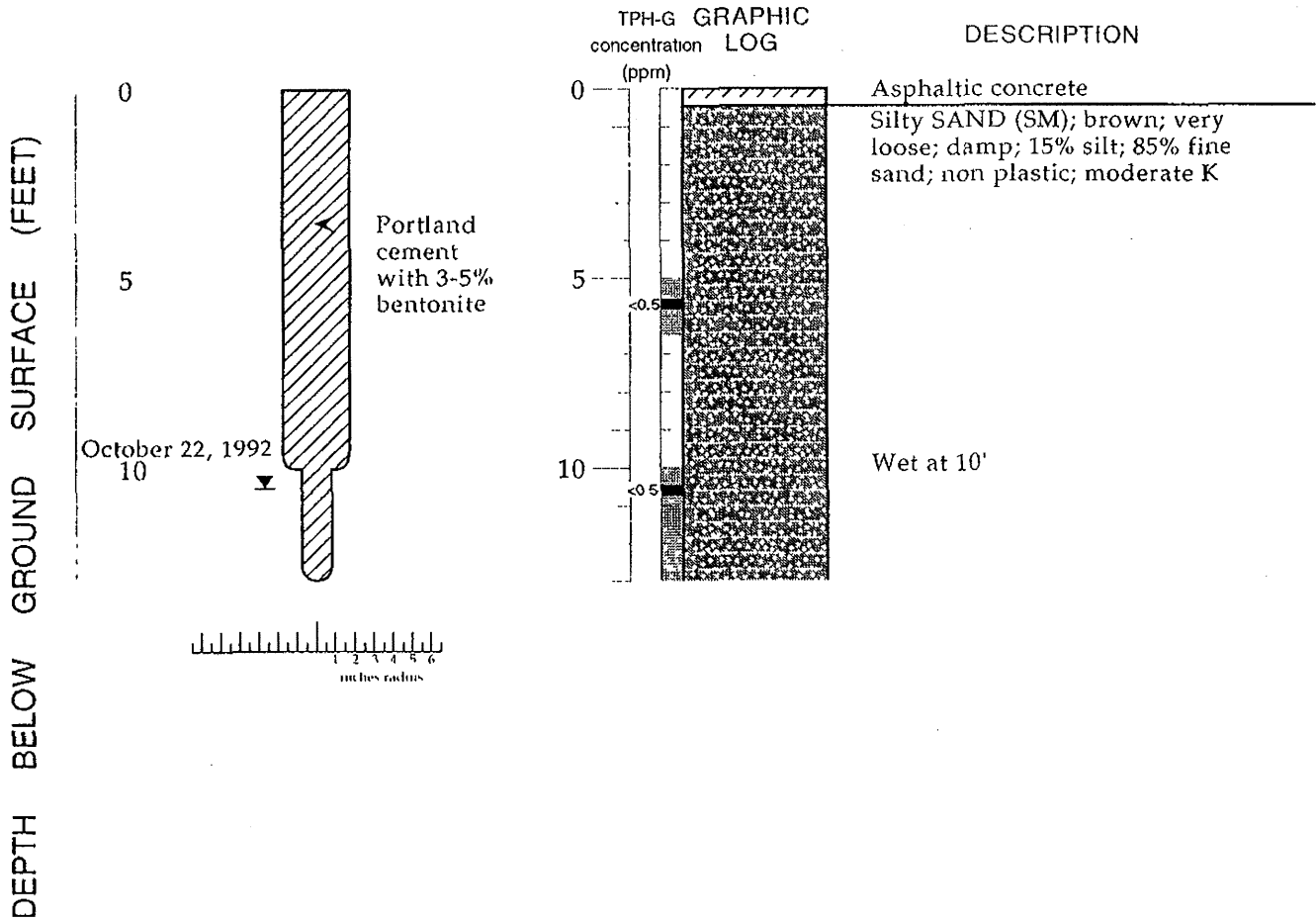
- ▽ Water level during drilling (date)
- ▽ Water level (date)
- Contact (dotted where approximate)
- ?-?-? Uncertain contact
- ////// Gradational contact
- Location of recovered drive sample
- Location of drive sample sealed for chemical analysis
- ▣ Cutting sample
- K = Estimated hydraulic conductivity

Logged By: Joyce E. Fremstad  
 Supervisor: N. Scott MacLeod  
 Drilling Company: Soils Exploration Drilling, Vacaville, CA  
 License Number: C57-582696  
 Driller: Mike Duffy & John Sousa  
 Drilling Method: Cuttingless system  
 Date Drilled: October 22, 1992  
 Type of Sampler: Split barrel (2" ID)  
 TPH-G: Total petroleum hydrocarbon as gasoline in soil by modified EPA Method 8015

Boring Log and Well Construction Details - Boring BH-F - Shell Service Station WIC #204-0072-0403, 1601 Webster Street, Alameda, California



# BORING BH-G



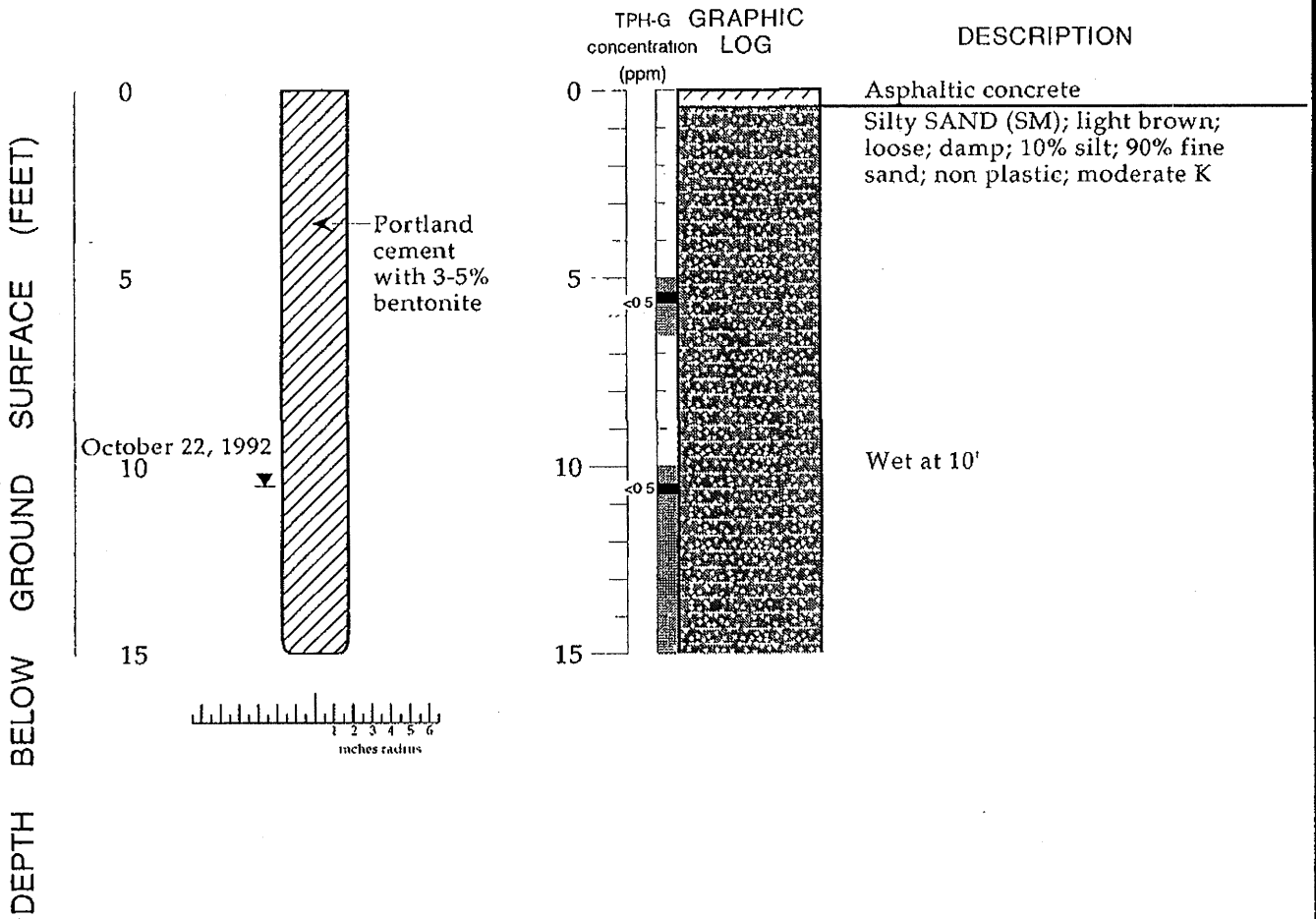
## EXPLANATION

- ▼ Water level during drilling (date)
- ▽ Water level (date)
- Contact (dotted where approximate)
- ?-?-? Uncertain contact
- //// Gradational contact
- □ □ □ Location of recovered drive sample
- Location of drive sample sealed for chemical analysis
- □ □ □ Cutting sample
- K = Estimated hydraulic conductivity

Logged By: Joyce E. Fremstad  
 Supervisor: N. Scott MacLeod  
 Drilling Company: Soils Exploration Drilling, Vacaville, CA  
 License Number: C57-582696  
 Driller: Mike Duffy & John Sousa  
 Drilling Method: Solid flight auger  
 Date Drilled: October 22, 1992  
 Type of Sampler: Split barrel (2" ID)  
 TPH-G: Total petroleum hydrocarbon as gasoline in soil by modified EPA Method 8015

Boring Log and Well Construction Details - Boring BH-G - Shell Service Station WIC #204-0072-0403, 1601 Webster Street, Alameda, California

# BORING BH-H



## EXPLANATION

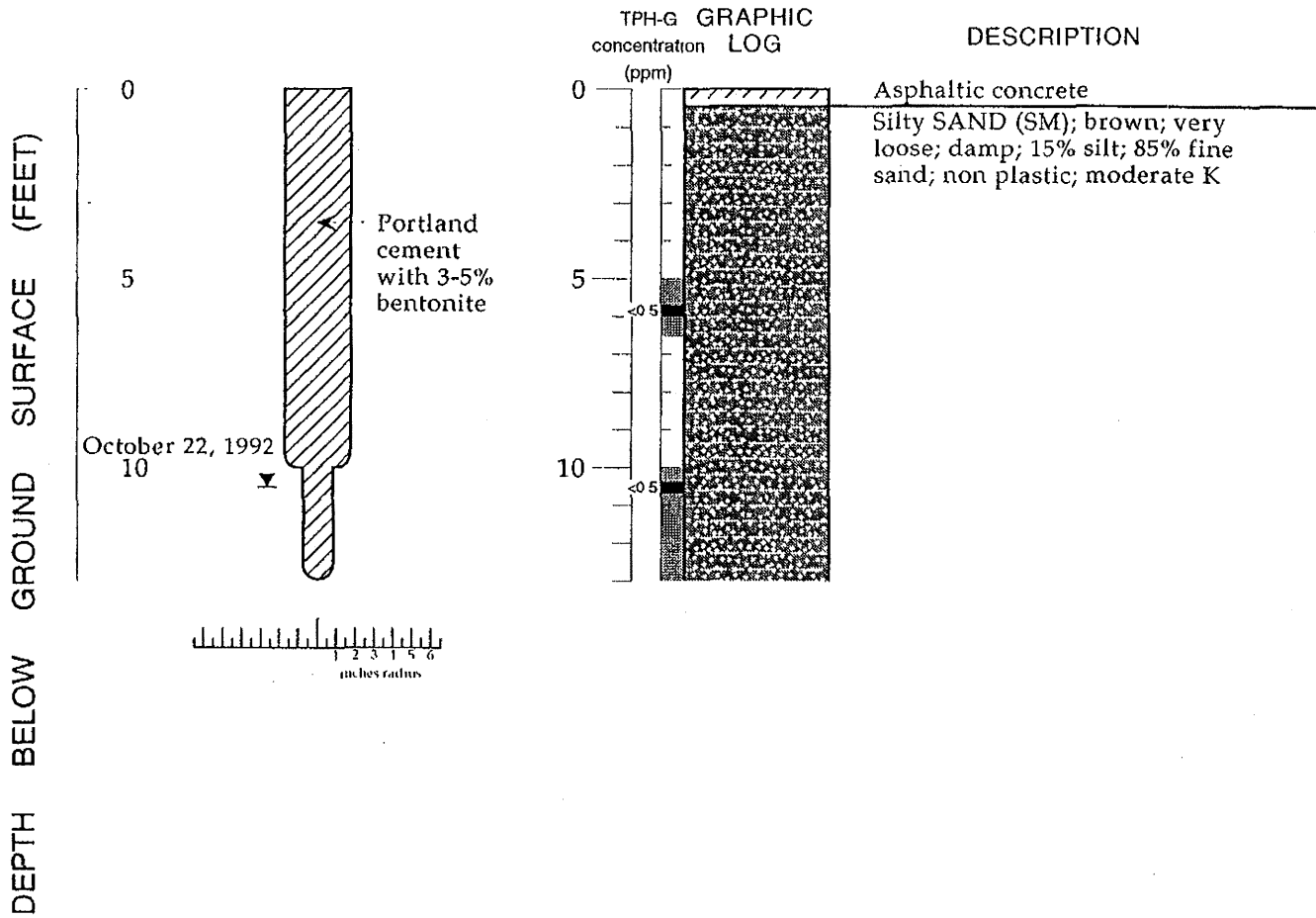
- ▼ Water level during drilling (date)
- ▽ Water level (date)
- ..... Contact (dotted where approximate)
- ?-?-? Uncertain contact
- //// Gradational contact
- ▒ Location of recovered drive sample
- Location of drive sample sealed for chemical analysis
- ▣ Cutting sample
- K = Estimated hydraulic conductivity

Logged By: Joyce E. Fremstad  
 Supervisor: N. Scott MacLeod  
 Drilling Company: Soils Exploration Drilling, Vacaville, CA  
 License Number: C57-582696  
 Driller: Mike Duffy & John Sousa  
 Drilling Method: Solid flight auguer  
 Date Drilled: October 22, 1992  
 Type of Sampler: Split barrel (2" ID)  
 TPH-G: Total petroleum hydrocarbon as gasoline in soil by modified EPA Method 8015

Boring Log and Well Construction Details - Boring BH-H - Shell Service Station WIC #204-0072-0403, 1601 Webster Street, Alameda, California



# BORING BH-1



## EXPLANATION

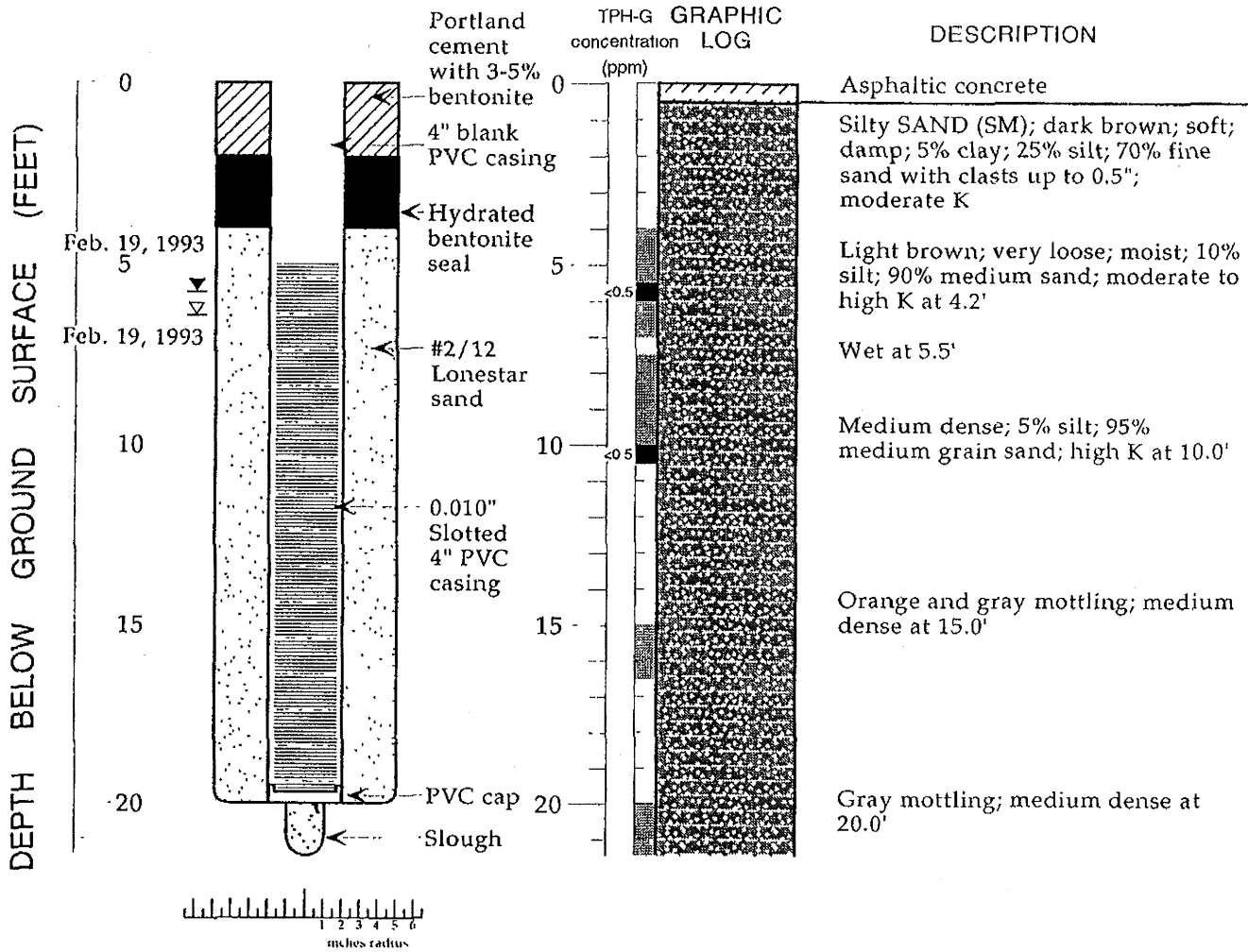
- ▼ Water level during drilling (date)
- ▽ Water level (date)
- Contact (dotted where approximate)
- ?-?-? Uncertain contact
- //// Gradational contact
- ▨ Location of recovered drive sample
- Location of drive sample sealed for chemical analysis
- ▩ Cutting sample
- K = Estimated hydraulic conductivity

Logged By: Joyce E. Fremstad  
 Supervisor: N. Scott MacLeod  
 Drilling Company: Soils Exploration Drilling, Vacaville, CA  
 License Number: C57-582696  
 Driller: Mike Duffy & John Sousa  
 Drilling Method: Solid flight auger  
 Date Drilled: October 22, 1992  
 Type of Sampler: Split barrel (2" ID)  
 TPH-G: Total petroleum hydrocarbon as gasoline in soil by modified EPA Method 8015

Boring Log and Well Construction Details - Boring BH-1 - Shell Service Station WIC #204-0072-0403, 1601 Webster Street, Alameda, California



# WELL MW-3 (BH-J)



## EXPLANATION

- |   |  |
|---|--|
| <ul style="list-style-type: none"> <li>▼ Water level during drilling (date)</li> <li>▽ Water level (date)</li> <li>----- Contact (dotted where approximate)</li> <li>-?-?-? Uncertain contact</li> <li>//// Gradational contact</li> <li>▨ Location of recovered drive sample</li> <li>■ Location of drive sample sealed for chemical analysis</li> <li>▩ Cutting sample</li> <li>K = Estimated hydraulic conductivity</li> </ul> | <ul style="list-style-type: none"> <li>Logged By: Joyce Fremstad</li> <li>Supervisor: N. Scott MacLeod; RG 5747</li> <li>Drilling Company: Soils Exploration Services, Vacaville, CA</li> <li>License Number: Lic. #C57-582696</li> <li>Driller: Mike Duffy</li> <li>Drilling Method: Hollow-stem auger</li> <li>Date Drilled: February 19, 1993</li> <li>Well Head Completion: 4" locking well-plug, traffic-rated vault</li> <li>Type of Sampler: Split barrel (2" ID)</li> <li>Ground Surface Elevation: feet above mean sea level</li> <li>TPH-G: Total petroleum hydrocarbon as gasoline in soil by modified EPA Method 8015</li> </ul> |
|---|--|

Boring Log and Well Construction Details - Well MW-3 (BH-J) - Shell Service Station WIC #204-0072-0403, 1601 Webster Street, Alameda, California



<b>CLIENT NAME</b>	Shell Oil Products US	<b>BORING/WELL NAME</b>	SB-1
<b>JOB/SITE NAME</b>	Shell-branded Service Station	<b>DRILLING STARTED</b>	30-Nov-04
<b>LOCATION</b>	1601 Webster Street, Alameda, California	<b>DRILLING COMPLETED</b>	30-Nov-04
<b>PROJECT NUMBER</b>	246-0467-007	<b>WELL DEVELOPMENT DATE (YIELD)</b>	NA
<b>DRILLER</b>	Vironex	<b>GROUND SURFACE ELEVATION</b>	
<b>DRILLING METHOD</b>	Hydraulic push	<b>TOP OF CASING ELEVATION</b>	NA
<b>BORING DIAMETER</b>	3.25"	<b>SCREENED INTERVAL</b>	NA
<b>LOGGED BY</b>	Stewart A. Dalie IV	<b>DEPTH TO WATER (First Encountered)</b>	6.5 ft (30-Nov-04)
<b>REVIEWED BY</b>	Matthew W. Derby P.E. C55475	<b>DEPTH TO WATER (Static)</b>	NA
<b>REMARKS</b>	Hand augered to 5 fbg.		

PID (ppm)	TPHg (ppm)	BLOW COUNTS	SAMPLE ID	EXTENT	DEPTH (ft bgs)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH (ft bgs)	WELL DIAGRAM
								<b>Asphalt</b>	0.8	
						GW		<b>Well Graded GRAVEL with Sand:</b> (GW); Black to gray; loose; dry; 60% gravel, 40% sand. Base rock and fill material.	1.5	
								<b>Very Fine, Poorly Graded SAND:</b> (SP); Brown; loose; damp; 100% sand.		
								Reddish brown.		
								Two other attempts for SB-1. Refusal encountered at approximately 1.5 to 2.5 fbg.		
0.4			SB-1-5'		5			Poorly graded Sand with some fines; damp to moist; 10% silt, 90% sand.		
0.6			SB-1-6.5'							
0.6			SB-1-W			SP				
			SB-1-W10'		10			Medium dense; wet.		
			SB-1-W15'		15			Coarse Poorly Graded Sand; 100% sand.	15.0	Bottom of Boring @ 15 ft



Cambria Environmental Technology, Inc.  
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 Emeryville, CA 94608  
 Telephone: (510) 420-0700  
 Fax: (510) 420-9170

# BORING/WELL LOG

<b>CLIENT NAME</b>	Shell Oil Products US	<b>BORING/WELL NAME</b>	SB-2
<b>JOB/SITE NAME</b>	Shell-branded Service Station	<b>DRILLING STARTED</b>	01-Dec-04
<b>LOCATION</b>	1601 Webster Street, Alameda, California	<b>DRILLING COMPLETED</b>	01-Dec-04
<b>PROJECT NUMBER</b>	246-0467-007	<b>WELL DEVELOPMENT DATE (YIELD)</b>	NA
<b>DRILLER</b>	Vironex	<b>GROUND SURFACE ELEVATION</b>	
<b>DRILLING METHOD</b>	Hydraulic push	<b>TOP OF CASING ELEVATION</b>	NA
<b>BORING DIAMETER</b>	3.25"	<b>SCREENED INTERVAL</b>	NA
<b>LOGGED BY</b>	Stewart A. Dalie IV	<b>DEPTH TO WATER (First Encountered)</b>	7.0 ft (01-Dec-04)
<b>REVIEWED BY</b>	Matthew W. Derby P.E. C55475	<b>DEPTH TO WATER (Static)</b>	NA
<b>REMARKS</b>	Hand augered to 5 fbg.		

PID (ppm)	TPHg (ppm)	BLOW COUNTS	SAMPLE ID	EXTENT	DEPTH (ft bgs)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH (ft bgs)	WELL DIAGRAM
					0.8			<b>Asphalt</b>	0.8	
					1.7	GW		<b>Well Graded GRAVEL with Sand:</b> (GW); Gray; loose; dry; 75% gravel, 25% sand. Baserock, fill material.	1.7	
								<b>Very fine Poorly Graded SAND:</b> (SP); Brown; loose; dry; 95% sand, 5% silt. Medium grained sand with fines and gravel, 85% sand, 10% silt, 5% gravel.		
0.5			SB-2-5'		5			One other attempt for SB-2. Refusal encountered at approximately 1 to 2 fbg.		
0.4			SB-2-6.5' SB-2-W			SP		Sand with silt; light brownish gray with reddish mottling; moist to wet; <15% silt, +85% sand.		
					10			NR = No water sample recovery, attempted hydropunch location.		
			SB-2-W15'		15			Light gray with brown mottling to reddish brown; wet; 100% sand.	15.0	Bottom of Boring @ 15 ft

WELL LOG (PID/TPHG) G:\ALAMEDA\1601 WEBSTER\GINT\ALAMEDA.GPJ DEFAULT.GDT 2/7/05



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# BORING/WELL LOG

<b>CLIENT NAME</b>	Shell Oil Products US	<b>BORING/WELL NAME</b>	SB-3
<b>JOB/SITE NAME</b>	Shell-branded Service Station	<b>DRILLING STARTED</b>	01-Dec-04
<b>LOCATION</b>	1601 Webster Street, Alameda, California	<b>DRILLING COMPLETED</b>	01-Dec-04
<b>PROJECT NUMBER</b>	246-0467-007	<b>WELL DEVELOPMENT DATE (YIELD)</b>	NA
<b>DRILLER</b>	Vironex	<b>GROUND SURFACE ELEVATION</b>	
<b>DRILLING METHOD</b>	Hydraulic push	<b>TOP OF CASING ELEVATION</b>	NA
<b>BORING DIAMETER</b>	3.25"	<b>SCREENED INTERVAL</b>	NA
<b>LOGGED BY</b>	Stewart A. Dalie IV	<b>DEPTH TO WATER (First Encountered)</b>	7.0 ft (01-Dec-04)
<b>REVIEWED BY</b>	Matthew W. Derby P.E. C55475	<b>DEPTH TO WATER (Static)</b>	NA
<b>REMARKS</b>	Hand augered to 5 fbg.		

PID (ppm)	TPHg (ppm)	BLOW COUNTS	SAMPLE ID	EXTENT	DEPTH (ft bgs)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH (ft bgs)	WELL DIAGRAM
								<b>Asphalt</b>	0.8	
						GW		<b>Well Graded GRAVEL with Sand and Concrete Debris:</b> (GW); Grayish brown; loose; damp; 75% gravel, 15% sand, 10% silt. Baserock, fill material.	3.0	
0.6			SB-3-5'		5			<b>Poorly Graded Fine SAND:</b> (SP); Brown; loose; damp; 95% sand, 5% silt.  Three other attempts for SB-3. Refusal encountered at approximately 2 to 3 fbg.		
0.5			SB-3-6.5' SB-3-W					Sand with silt; light grayish brown; medium dense; moist to wet; 85% sand, 15% silt.		
						SP				
			NR		10			NR = No water sample recovery, attempted hydropunch location.		
			NR		15			Coarse sand, 100%. NR = No water sample recovery, attempted hydropunch location.	15.0	

WELL LOG (PID/TPHG) G:\ALAMEDA\1601 WEBSTER\GINT\ALAMEDA.GPJ DEFAULT.GDT 2/7/05



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 Emeryville, CA 94608  
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# BORING/WELL LOG

<b>CLIENT NAME</b>	Shell Oil Products US	<b>BORING/WELL NAME</b>	SB-4
<b>JOB/SITE NAME</b>	Shell-branded Service Station	<b>DRILLING STARTED</b>	02-Dec-04
<b>LOCATION</b>	1601 Webster Street, Alameda, California	<b>DRILLING COMPLETED</b>	02-Dec-04
<b>PROJECT NUMBER</b>	246-0467-007	<b>WELL DEVELOPMENT DATE (YIELD)</b>	NA
<b>DRILLER</b>	Vironex	<b>GROUND SURFACE ELEVATION</b>	
<b>DRILLING METHOD</b>	Hydraulic push	<b>TOP OF CASING ELEVATION</b>	NA
<b>BORING DIAMETER</b>	3.25"	<b>SCREENED INTERVAL</b>	NA
<b>LOGGED BY</b>	Stewart A. Dalie IV	<b>DEPTH TO WATER (First Encountered)</b>	7.9 ft (02-Dec-04)
<b>REVIEWED BY</b>	Matthew W. Derby P.E. C55475	<b>DEPTH TO WATER (Static)</b>	NA
<b>REMARKS</b>	Hand augered to 5 fbg.		

PID (ppm)	TPHg (ppm)	BLOW COUNTS	SAMPLE ID	EXTENT	DEPTH (ft bgs)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH (ft bgs)	WELL DIAGRAM
								<b>Asphalt</b>	0.8	
						GW		<b>Well graded GRAVEL with Sand:</b> (GW); Black; loose; dry; 10% silt, 10% sand, 10% gravel. Baserock, fill material.	1.7	
								<b>Poorly Graded Fine SAND:</b> (SP); Brown; loose; dry; 100% sand.		
0.8			SB-4-5'		5			Three other attempts for SB-4. Refusal encountered at approximately 1 to 2 fbg. Medium dense; damp, 90% sand, 10% silt.		
0.4			SB-4-6.5'							
			SB-4-W			SP				Portland Type III Cement
			NR		10			NR = No water sample recovery, attempted hydropunch location.		
			SB-4-W15					Grayish brown; loose; wet; 100% coarse sand.		
					15				15.0	Bottom of Boring @ 15 ft

WELL LOG (PID/TPHG) G:\ALAMEDA\1601 WEBSTER\GINT\ALAMEDA.GPJ DEFAULT.GDT 2/7/05



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# BORING/WELL LOG

<b>CLIENT NAME</b>	Shell Oil Products US	<b>BORING/WELL NAME</b>	SB-5
<b>JOB/SITE NAME</b>	Shell-branded Service Station	<b>DRILLING STARTED</b>	30-Nov-04
<b>LOCATION</b>	1601 Webster Street, Alameda, California	<b>DRILLING COMPLETED</b>	30-Nov-04
<b>PROJECT NUMBER</b>	246-0467-007	<b>WELL DEVELOPMENT DATE (YIELD)</b>	NA
<b>DRILLER</b>	Vironex	<b>GROUND SURFACE ELEVATION</b>	
<b>DRILLING METHOD</b>	Hydraulic push	<b>TOP OF CASING ELEVATION</b>	NA
<b>BORING DIAMETER</b>	3.25"	<b>SCREENED INTERVAL</b>	NA
<b>LOGGED BY</b>	Stewart A. Dalie IV	<b>DEPTH TO WATER (First Encountered)</b>	7.2 ft (30-Nov-04)
<b>REVIEWED BY</b>	Matthew W. Derby P.E. C55475	<b>DEPTH TO WATER (Static)</b>	NA
<b>REMARKS</b>	Hand augered to 5 fbg.		

PID (ppm)	TPHg (ppm)	BLOW COUNTS	SAMPLE ID	EXTENT	DEPTH (ft bgs)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH (ft bgs)	WELL DIAGRAM	
								<b>Concrete</b>	1.0		
						GW		<b>Well Graded GRAVEL with Silt and Sand:</b> (GW); Gray; loose; dry; 70% gravel, 15% silt, 15% sand. Baserock and fill material.	2.1		
								<b>Poorly Graded fine SAND:</b> (SP); Brown; loose; damp; 90% sand, 10% silt.			
0.4			SB-5-5'		5			Sand with silt, brown; medium dense; moist to wet; 85% sand, 15% silt.			
1.5			SB-5-6.5'								
			SB-5-W								
			NR		10				NR = No water sample recovery, attempted hydropunch location.		
			SB-5-W15'					Coarse sand; grayish brown; loose; wet; 100% sand.			
					15				15.0	Bottom of Boring @ 15 ft	

WELL LOG (PID/TPHG) G:\ALAMEDA 1601 WEBSTER\GINT\ALAMEDA.GPJ DEFAULT.GDT 2/7/05



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 Fax: (510) 420-9170

# BORING/WELL LOG

<b>CLIENT NAME</b>	Shell Oil Products US	<b>BORING/WELL NAME</b>	SB-6
<b>JOB/SITE NAME</b>	Shell-branded Service Station	<b>DRILLING STARTED</b>	30-Nov-04
<b>LOCATION</b>	1601 Webster Street, Alameda, California	<b>DRILLING COMPLETED</b>	30-Nov-04
<b>PROJECT NUMBER</b>	246-0467-007	<b>WELL DEVELOPMENT DATE (YIELD)</b>	NA
<b>DRILLER</b>	Vironex	<b>GROUND SURFACE ELEVATION</b>	
<b>DRILLING METHOD</b>	Hydraulic push	<b>TOP OF CASING ELEVATION</b>	NA
<b>BORING DIAMETER</b>	3.25"	<b>SCREENED INTERVAL</b>	NA
<b>LOGGED BY</b>	Stewart A. Dalie IV	<b>DEPTH TO WATER (First Encountered)</b>	7.0 ft (30-Nov-04)
<b>REVIEWED BY</b>	Matthew W. Derby P.E. C55475	<b>DEPTH TO WATER (Static)</b>	NA
<b>REMARKS</b>	Hand augered to 5 fbg.		

PID (ppm)	TPHg (ppm)	BLOW COUNTS	SAMPLE ID	EXTENT	DEPTH (ft bgs)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH (ft bgs)	WELL DIAGRAM
								<b>Concrete</b>	1.0	<p>Portland Type III Cement</p> <p>Bottom of Boring @ 15 ft</p>
						GW	<b>Well Graded GRAVEL with Silt and Sand:</b> (GW); Black, loose; dry; 80% gravel, 10% silt, 10% sand. Baserock and fill material.	2.2		
							<b>Poorly Graded SAND:</b> (SP); Brown; loose; dry; 100% sand.			
0.8			SB-6-5'		5					
1.2			SB-6-6.5' SB-6-W			SP	Reddish brown; medium dense; moist; 95% sand, 5% silt.			
								Olive gray; slight odor; dense; wet; 90% sand, 10% silt. NR = No water sample recovery, attempted hydropunch location.		
			SB-6-W15'					Coarse sand; grayish brown; loose; wet; 100% sand.		
					15				15.0	

WELL LOG (PID/TPHG) G:\ALAMEDA 1601 WEBSTER\GINT\ALAMEDA.GPJ DEFAULT.GDT 2/7/05





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# BORING/WELL LOG

<b>CLIENT NAME</b>	Shell Oil Products US	<b>BORING/WELL NAME</b>	SB-7
<b>JOB/SITE NAME</b>	Shell-branded Service Station	<b>DRILLING STARTED</b>	30-Nov-04
<b>LOCATION</b>	1601 Webster Street, Alameda, California	<b>DRILLING COMPLETED</b>	30-Nov-04
<b>PROJECT NUMBER</b>	246-0467-007	<b>WELL DEVELOPMENT DATE (YIELD)</b>	NA
<b>DRILLER</b>	Vironex	<b>GROUND SURFACE ELEVATION</b>	
<b>DRILLING METHOD</b>	Hydraulic push	<b>TOP OF CASING ELEVATION</b>	NA
<b>BORING DIAMETER</b>	3.25"	<b>SCREENED INTERVAL</b>	NA
<b>LOGGED BY</b>	Stewart A. Dalie IV	<b>DEPTH TO WATER (First Encountered)</b>	8.0 ft (30-Nov-04)
<b>REVIEWED BY</b>	Matthew W. Derby P.E. C55475	<b>DEPTH TO WATER (Static)</b>	NA
<b>REMARKS</b>	Hand augered to 5 fbg.		

PID (ppm)	TPHg (ppm)	BLOW COUNTS	SAMPLE ID	EXTENT	DEPTH (ft bgs)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH (ft bgs)	WELL DIAGRAM
								<b>Concrete</b>	1.0	
						GW		<b>Well Graded GRAVEL with Silt:</b> (GW); Black, loose; dry; 85% gravel, 15% silt. <b>Baserock and fill material.</b>	1.8	
								<b>Poorly Graded fine SAND:</b> (SP); Brownish gray; loose; dry; 100% sand.		
0.2			SB-7-5"		5			Sand with silt; reddish brown; moist to wet; medium dense; 90% sand, 10% silt.		
0.2			SB-7-6.5"			SP				
			SB-7-W							
			NR		10			NR = No water sample recovery, attempted hydropunch location.		
			SB-7-W15					Coarse sand; olive gray; loose; wet; 100% sand.		
					15				15.0	Bottom of Boring @ 15 ft

WELL LOG (PID/TPHG) G:\ALAMEDA\1601 WEBSTER\GINT\ALAMEDA.GPJ DEFAULT.GDT 2/7/05



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# BORING/WELL LOG

<b>CLIENT NAME</b>	Shell Oil Products US	<b>BORING/WELL NAME</b>	SB-8
<b>JOB/SITE NAME</b>	Shell-branded Service Station	<b>DRILLING STARTED</b>	02-Dec-04
<b>LOCATION</b>	1601 Webster Street, Alameda, California	<b>DRILLING COMPLETED</b>	02-Dec-04
<b>PROJECT NUMBER</b>	246-0467-007	<b>WELL DEVELOPMENT DATE (YIELD)</b>	NA
<b>DRILLER</b>	Vironex	<b>GROUND SURFACE ELEVATION</b>	
<b>DRILLING METHOD</b>	Hydraulic push	<b>TOP OF CASING ELEVATION</b>	NA
<b>BORING DIAMETER</b>	3.25"	<b>SCREENED INTERVAL</b>	NA
<b>LOGGED BY</b>	Stewart A. Dalie IV	<b>DEPTH TO WATER (First Encountered)</b>	7.1 ft (02-Dec-04)
<b>REVIEWED BY</b>	Matthew W. Derby P.E. C55475	<b>DEPTH TO WATER (Static)</b>	NA
<b>REMARKS</b>	Hand augered to 5 fbg.		

PID (ppm)	TPHg (ppm)	BLOW COUNTS	SAMPLE ID	EXTENT	DEPTH (ft bgs)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH (ft bgs)	WELL DIAGRAM
					0.9			<b>Asphalt</b>	0.9	
					2.8	GW		<b>Well Graded GRAVEL with Silt and Sand:</b> (GW); Black; loose; dry; 70% gravel, 15% silt, 15% sand. Baserock and fill material.	2.8	
					5			<b>Poorly Graded SAND:</b> (SP); Brown; medium dense; damp; 90% sand, 10% silt.  One other attempt for SB-8. Refusal encountered at approximately 1 to 2 fbg.		
0.5			SB-8-5'					Sand with silt, olive gray, hydrocarbon odor; moist to wet; <15% silt, +85% sand.		
859			SB-8-6.5' SB-8-W			SP		Olive gray; coarse sand; medium dense to loose; wet; slight hydrocarbon odor; 100% sand.		
					10			NR = No water sample recovery, attempted hydropunch location.		
			SB-8-W15'		15				15.0	Bottom of Boring @ 15 ft

WELL LOG (PID/TPHG) G:\ALAMEDA\1601 WEBSTER\GINT\ALAMEDA.GPJ DEFAULT.GDT 2/7/05

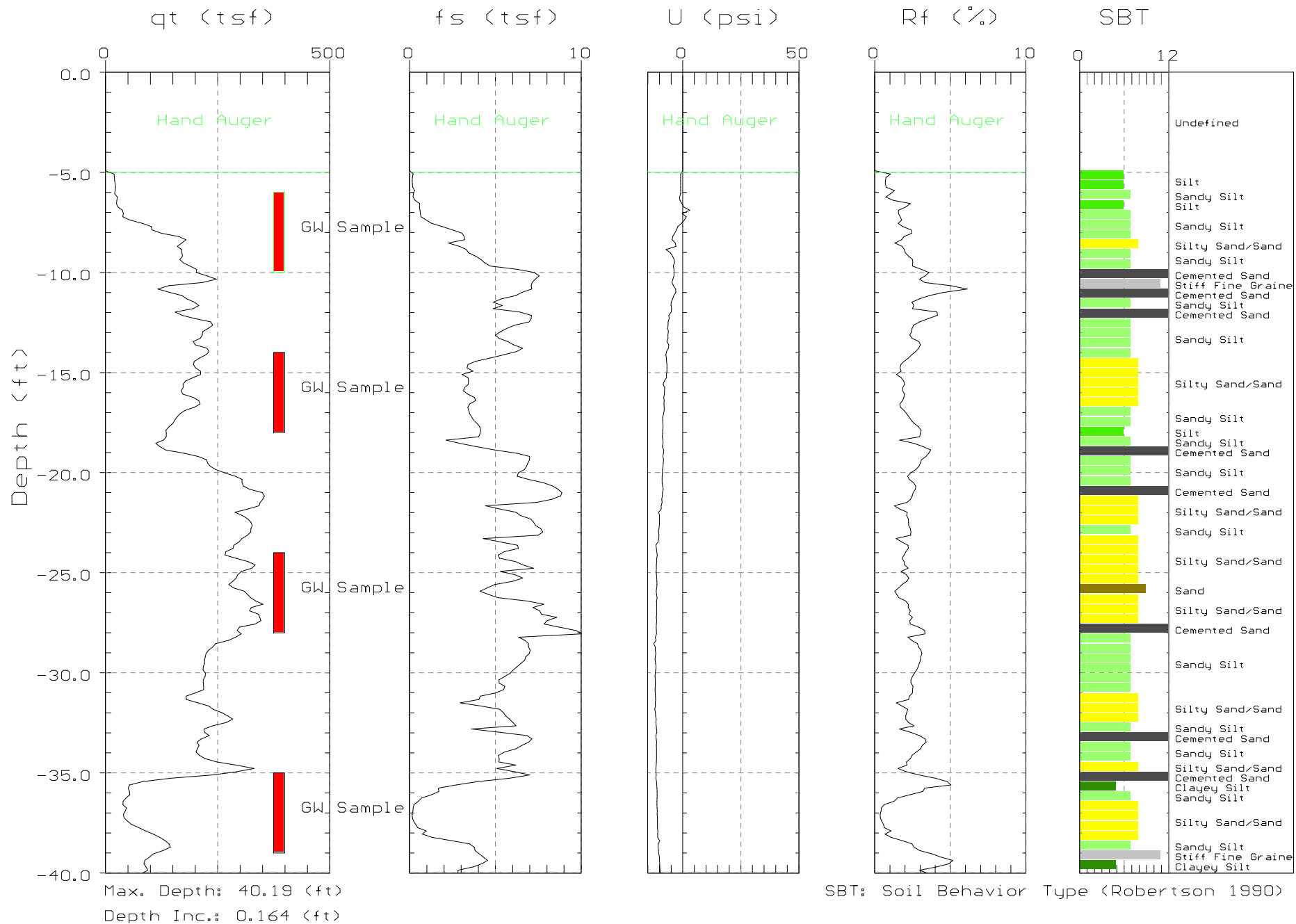




# CAMBRIA

Site: 1601 WEBSTER ST.  
Location: CPT-SB10

Engineer: S. DALIEY  
Date: 11:02:05 16:24

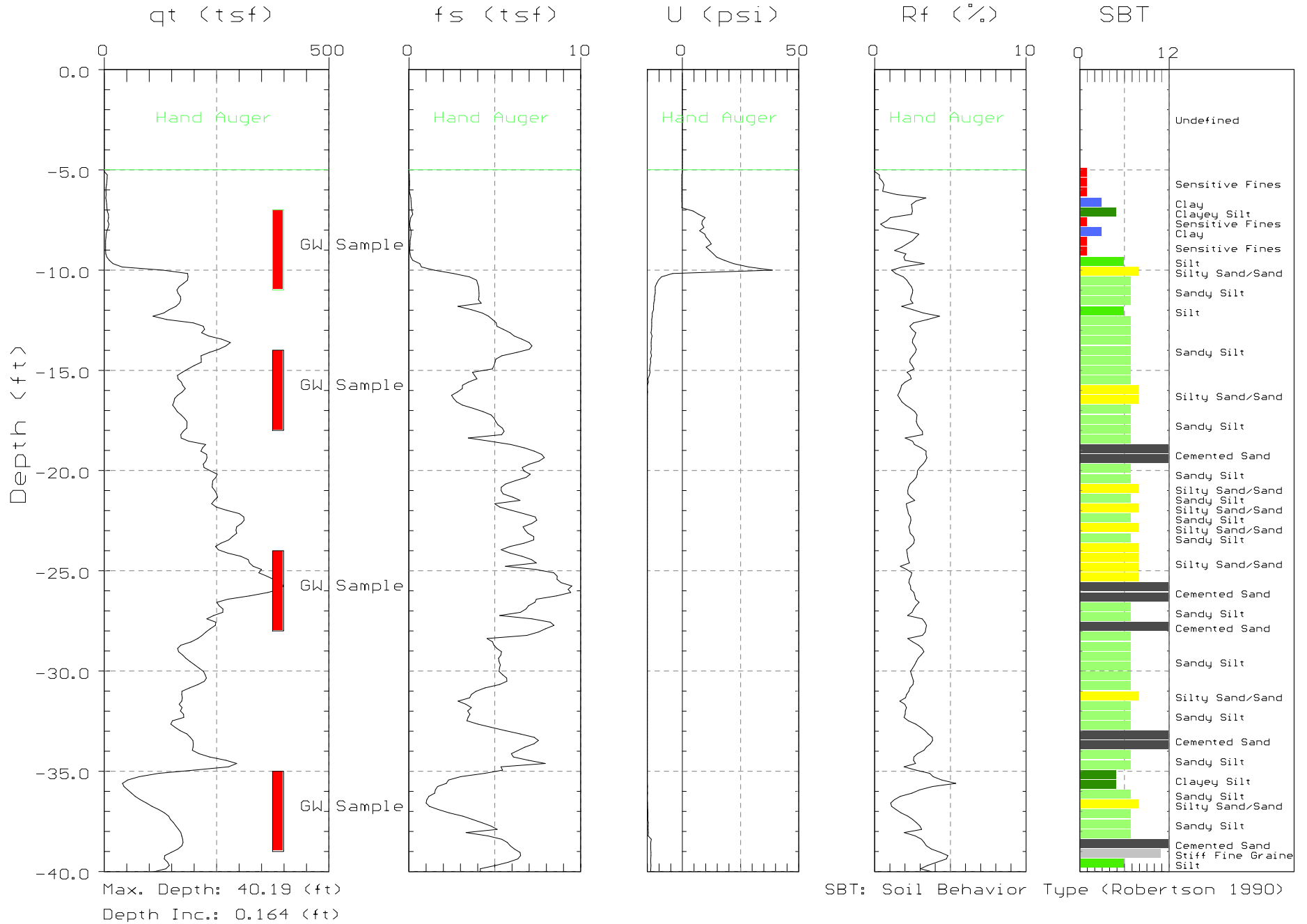




# CAMBRIA

Site: 1601 WEBSTER ST.  
Location: CPT-SB11

Engineer: S. DALIEY  
Date: 11:03:05 14:22

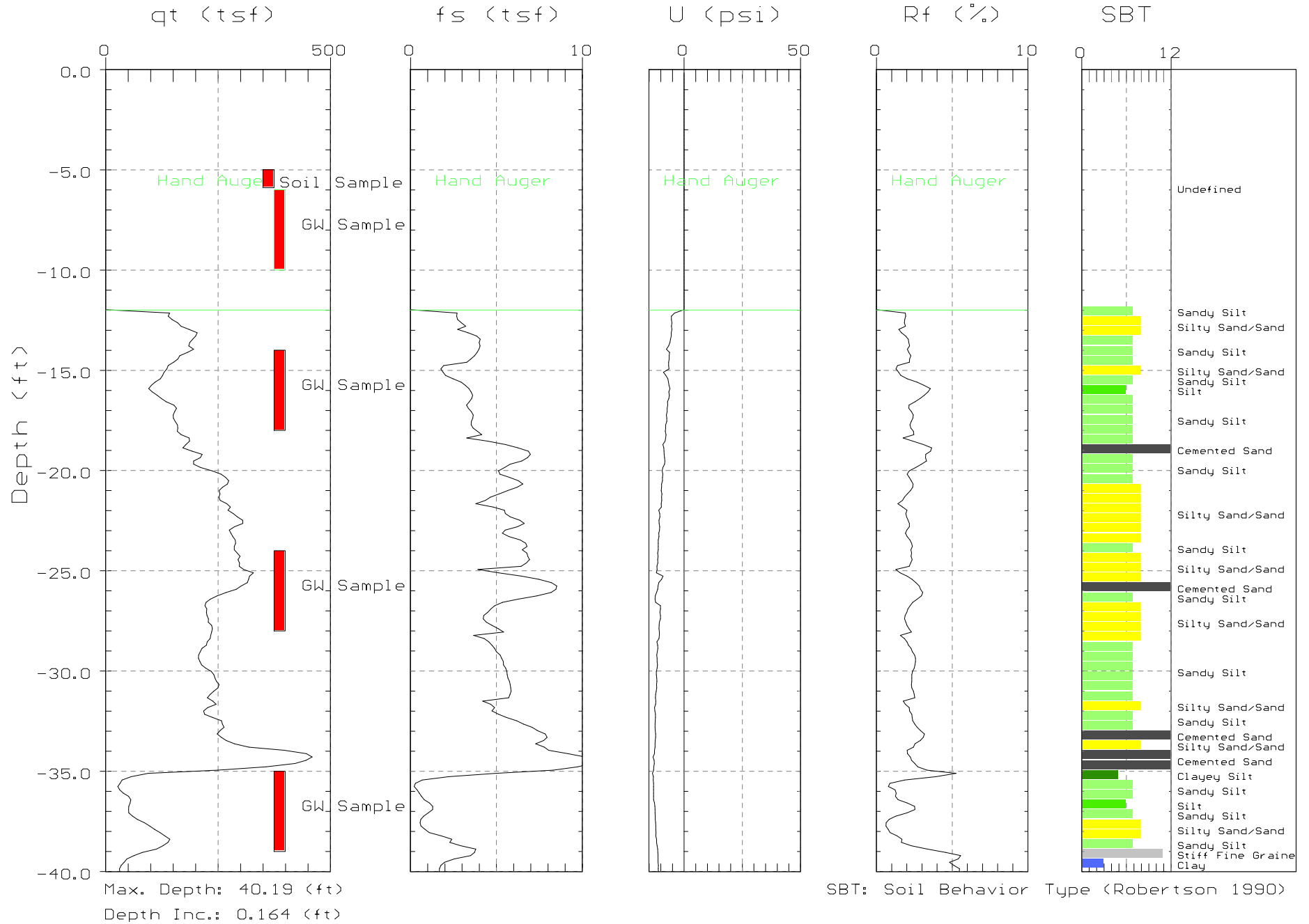




# CAMBRIA

Site: 1601 WEBSTER ST.  
Location: CPT-SB12

Engineer: S.DALIEY  
Date: 11:02:05 13:59

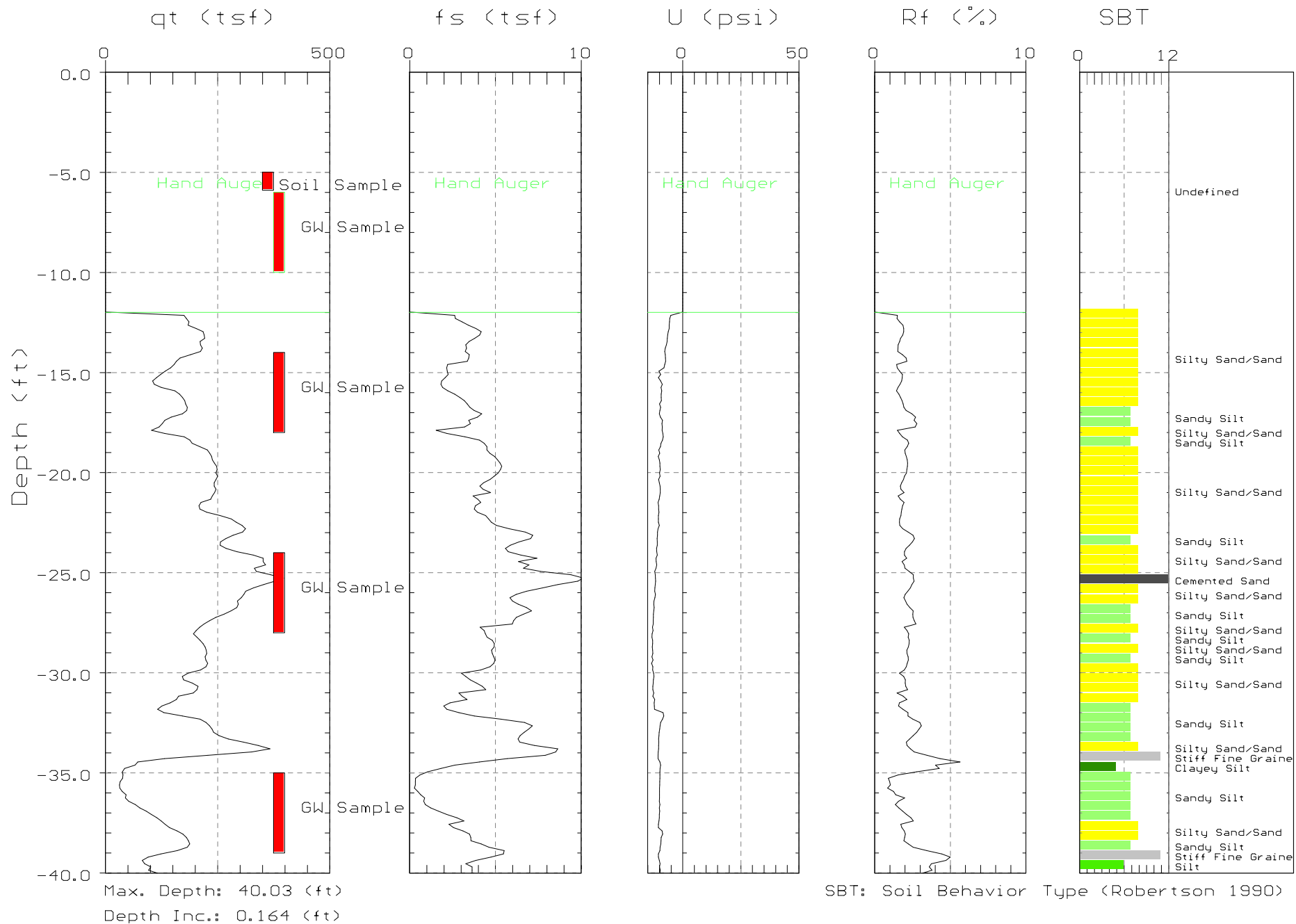




# CAMBRIA

Site: 1601 WEBSTER ST.  
Location: CPT-SB13

Engineer: S.DALIEY  
Date: 11:02:05 11:20

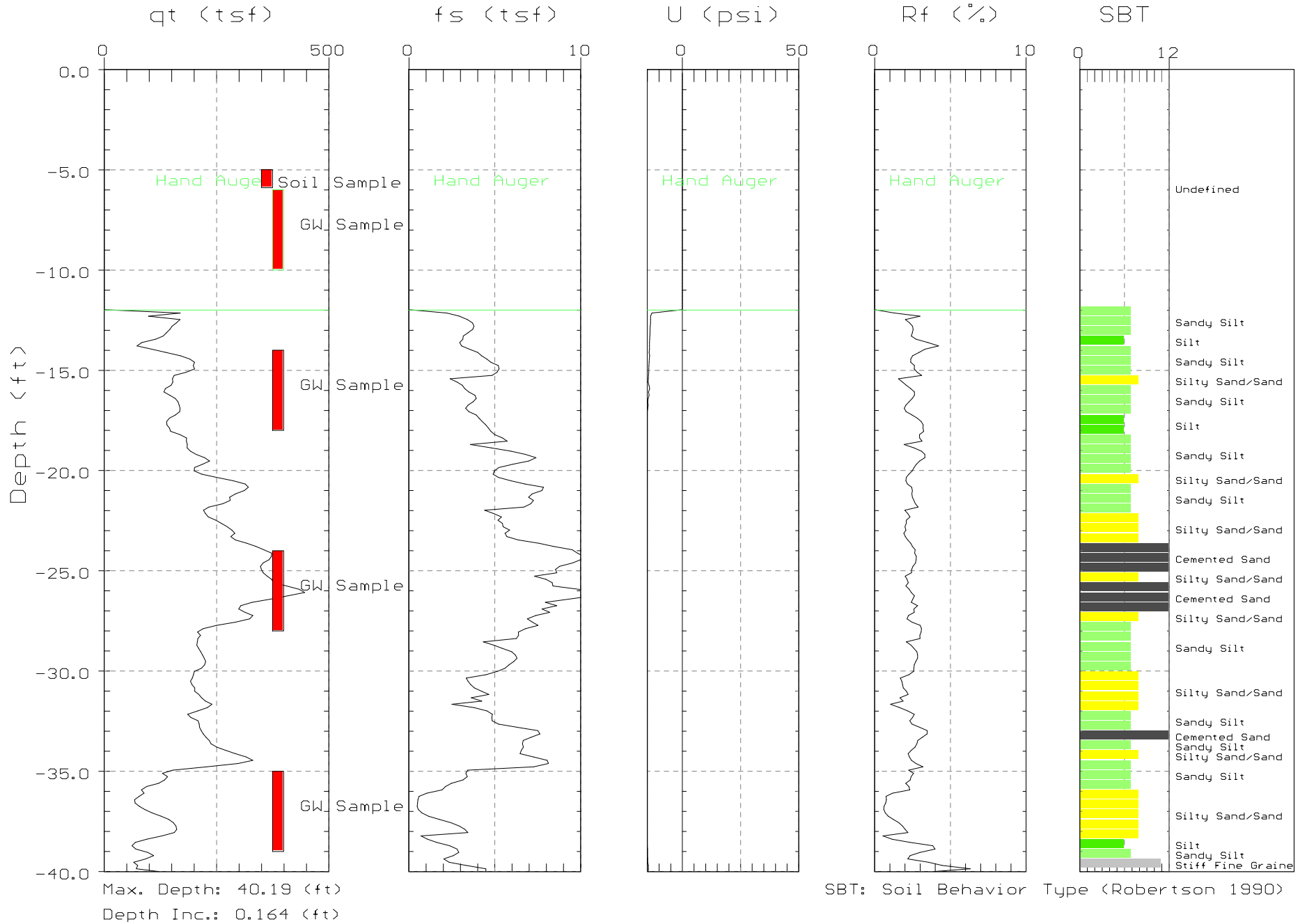




# CAMBRIA

Site: 1601 WEBSTER ST.  
Location: CPT-SB14

Engineer: S. DALIEY  
Date: 11:03:05 09:49







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# BORING/WELL LOG

**CLIENT NAME** Shell Oil Products US      **BORING/WELL NAME** S-2  
**JOB/SITE NAME** Shell-branded Service Station      **DRILLING STARTED** 31-Oct-05  
**LOCATION** 1601 Webster Street, Alameda, California      **DRILLING COMPLETED** 01-Nov-05  
**PROJECT NUMBER** 0467      **WELL DEVELOPMENT DATE (YIELD)** 14-Nov-05 (26 gallons)  
**DRILLER** Gregg Drilling      **GROUND SURFACE ELEVATION** 19.99 ft above msl  
**DRILLING METHOD** Hollow-stem auger      **TOP OF CASING ELEVATION** 19.73 ft above msl  
**BORING DIAMETER** 10"      **SCREENED INTERVAL** 4 to 12 fbg  
**LOGGED BY** Stewart A. Dalie IV      **DEPTH TO WATER (First Encountered)** 6.0 ft (01-Nov-05) ∇  
**REVIEWED BY** Ana Friel      **DEPTH TO WATER (Static)** 7.70 ft (22-Nov-05) ▼  
**REMARKS** Air knifed to 5 fbg.

PID (ppm)	BLOW COUNTS	SAMPLE ID	EXTENT	DEPTH (fbg)	U.S.C.S.	GRAPHIC LOG	SOIL DESCRIPTION	CONTACT DEPTH (fbg)	WELL DIAGRAM
							<b>ASPHALT</b>	0.6	<p>           Portland Type I/II            Bentonite Seal            Monterey Sand #2/12            4"-diam., 0.020" Slotted Schedule 40 PVC            Bottom of Boring @ 12 ft         </p>
					SC		<b>Clayey SAND (SC)</b> ; brown (7.5YR 5/3); loose; moist; 15% clay, 85% fine sand; low plasticity.	2.0	
							<b>SAND (SP)</b> ; light brown (7.5YR 6/3); loose; moist; 100% fine sand.		
0		S-2-5.0		5			@ 8.5'- dark brown (7.5YR 3/3).	∇	
0					SP			▼	
0									
0				10					
0								12.0	

WELL LOG (PID) I:\ALAMEDA-1\GINTALAMEDA.GPJ\_DEFAULT.GDT 12/19/05



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# BORING/WELL LOG

**CLIENT NAME** Shell Oil Products US      **BORING/WELL NAME** S-3  
**JOB/SITE NAME** Shell-branded Service Station      **DRILLING STARTED** 31-Oct-05  
**LOCATION** 1601 Webster Street, Alameda, California      **DRILLING COMPLETED** 01-Nov-05  
**PROJECT NUMBER** 0467      **WELL DEVELOPMENT DATE (YIELD)** 14-Nov-05 (30 gallons)  
**DRILLER** Gregg Drilling      **GROUND SURFACE ELEVATION** 19.43 ft above msl  
**DRILLING METHOD** Hollow-stem auger      **TOP OF CASING ELEVATION** 19.14 ft above msl  
**BORING DIAMETER** 10"      **SCREENED INTERVAL** 4 to 12 fbg  
**LOGGED BY** Stewart A. Dalie IV      **DEPTH TO WATER (First Encountered)** 6.2 ft (01-Nov-05) ▽  
**REVIEWED BY** Ana Friel      **DEPTH TO WATER (Static)** 7.15 ft (22-Nov-05) ▽  
**REMARKS** Air knifed to 5 fbg.

PID (ppm)	BLOW COUNTS	SAMPLE ID	EXTENT DEPTH (fbg)	U.S.C.S.	GRAPHIC LOG	SOIL DESCRIPTION	CONTACT DEPTH (fbg)	WELL DIAGRAM
						<b>ASPHALT</b>	0.8	<p>           Portland Type I/II            Bentonite Seal            Monterey Sand #2/12            4"-diam., 0.020" Slotted Schedule 40 PVC            Bottom of Boring @ 12 ft         </p>
						<b>FILL</b> ; brown (7.5YR 4/3); loose; moist; 50% silt, 20% sand, 30% gravel; misc brick & debris.	1.5	
						<b>SAND (SP)</b> ; light brown (7.5YR 3/2); loose; moist; 10% clay, 90% fine sand.		
0		S-3-5.0	5					
0				SP				
0.8								
1.0								
0.8							12.0	

WELL LOG (PID) I:\ALAMEDA-1\GINT\ALAMEDA.GPJ\_DEFAULT.GDT 12/19/05



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# BORING/WELL LOG

<b>CLIENT NAME</b>	Shell Oil Products US	<b>BORING/WELL NAME</b>	S-4
<b>JOB/SITE NAME</b>	Shell-branded Service Station	<b>DRILLING STARTED</b>	31-Oct-05
<b>LOCATION</b>	1601 Webster Street, Alameda, California	<b>DRILLING COMPLETED</b>	01-Nov-05
<b>PROJECT NUMBER</b>	0467	<b>WELL DEVELOPMENT DATE (YIELD)</b>	14-Nov-05 (35 gallons)
<b>DRILLER</b>	Gregg Drilling	<b>GROUND SURFACE ELEVATION</b>	18.94 ft above msl
<b>DRILLING METHOD</b>	Hollow-stem auger	<b>TOP OF CASING ELEVATION</b>	18.16 ft above msl
<b>BORING DIAMETER</b>	10"	<b>SCREENED INTERVAL</b>	4 to 12 fbg
<b>LOGGED BY</b>	Stewart A. Dalie IV	<b>DEPTH TO WATER (First Encountered)</b>	6.0 ft (01-Nov-05)
<b>REVIEWED BY</b>	Ana Friel	<b>DEPTH TO WATER (Static)</b>	6.10 ft (22-Nov-05)
<b>REMARKS</b>	Air knifed to 5 fbg.		

PID (ppm)	BLOW COUNTS	SAMPLE ID	EXTENT DEPTH (fbg)	U.S.C.S.	GRAPHIC LOG	SOIL DESCRIPTION	CONTACT DEPTH (fbg)	WELL DIAGRAM
0		S-4-5.0	5	SP		<b>ASPHALT SAND (SP)</b> ; dark brown (7.5YR 2.5/3); loose; moist; 10% clay, 90% fine sand  @ 7' - 100% fine sand.	0.6	<ul style="list-style-type: none"> <li>Portland Type I/II</li> <li>Bentonite Seal</li> <li>Monterey Sand #2/12</li> <li>4"-diam., 0.020" Slotted Schedule 40 PVC</li> </ul> Bottom of Boring @ 12 ft
0								
0.1								
0.8								

WELL LOG (PID) I:\ALAMEDA-1\GINTALAMEDA.GPJ DEFAULT.GDT 1/26/06



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# BORING/WELL LOG

<b>CLIENT NAME</b>	Shell Oil Products US	<b>BORING/WELL NAME</b>	S-5
<b>JOB/SITE NAME</b>	Shell-branded Service Station	<b>DRILLING STARTED</b>	31-Oct-05
<b>LOCATION</b>	1601 Webster Street, Alameda, California	<b>DRILLING COMPLETED</b>	01-Nov-05
<b>PROJECT NUMBER</b>	0467	<b>WELL DEVELOPMENT DATE (YIELD)</b>	14-Nov-05 (28.8 gallons)
<b>DRILLER</b>	Gregg Drilling	<b>GROUND SURFACE ELEVATION</b>	19.17 ft above msl
<b>DRILLING METHOD</b>	Hollow-stem auger	<b>TOP OF CASING ELEVATION</b>	18.68 ft above msl
<b>BORING DIAMETER</b>	10"	<b>SCREENED INTERVAL</b>	4 to 12 fbg
<b>LOGGED BY</b>	Stewart A. Dalie IV	<b>DEPTH TO WATER (First Encountered)</b>	5.8 ft (01-Nov-05)
<b>REVIEWED BY</b>	Ana Friel	<b>DEPTH TO WATER (Static)</b>	6.44 ft (22-Nov-05)
<b>REMARKS</b>	Air knifed to 10 fbg.		

PID (ppm)	BLOW COUNTS	SAMPLE ID	EXTENT DEPTH (fbg)	U.S.C.S.	GRAPHIC LOG	SOIL DESCRIPTION	CONTACT DEPTH (fbg)	WELL DIAGRAM
0		S-5-5.0	0 - 5	SP		<b>CONCRETE</b> <b>SAND (SP)</b> ; dark brown (7.5YR 4/3); loose; moist; 10% clay, 90% fine sand.	0.6	<ul style="list-style-type: none"> <li>▶ Portland Type I/II</li> <li>▶ Bentonite Seal</li> <li>▶ Monterey Sand #2/12</li> <li>▶ 4"-diam., 0.020" Slotted Schedule 40 PVC</li> <li>▶ Bottom of Boring @ 12 ft</li> </ul>
1.0 1.5			5 - 12			@ 11' - 100% fine sand.	12.0	

WELL LOG (PID) I:\ALAMEDA-1\GINTALAMEDA.GPJ DEFAULT.GDT 1/26/06



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# BORING/WELL LOG

<b>CLIENT NAME</b>	Shell Oil Products US	<b>BORING/WELL NAME</b>	S-6
<b>JOB/SITE NAME</b>	Shell-branded Service Station	<b>DRILLING STARTED</b>	31-Oct-05
<b>LOCATION</b>	1601 Webster Street, Alameda, California	<b>DRILLING COMPLETED</b>	28-Nov-05
<b>PROJECT NUMBER</b>	0467	<b>WELL DEVELOPMENT DATE (YIELD)</b>	19-Jan-06 (24 gallons)
<b>DRILLER</b>	Gregg Drilling	<b>GROUND SURFACE ELEVATION</b>	19.56 ft above msl
<b>DRILLING METHOD</b>	Hollow-stem auger	<b>TOP OF CASING ELEVATION</b>	19.32 ft above msl
<b>BORING DIAMETER</b>	10"	<b>SCREENED INTERVAL</b>	4 to 12 fbg
<b>LOGGED BY</b>	Stewart A. Dalie IV	<b>DEPTH TO WATER (First Encountered)</b>	6.8 ft (01-Nov-05)
<b>REVIEWED BY</b>	Ana Friel	<b>DEPTH TO WATER (Static)</b>	5.50 ft (19-Jan-06)
<b>REMARKS</b>	Air knifed to 5 fbg. Well S-6 initially installed on 11/1/05, found damaged. Replaced on 11/28/05.		

PID (ppm)	BLOW COUNTS	SAMPLE ID	EXTENT	DEPTH (fbg)	U.S.C.S.	GRAPHIC LOG	SOIL DESCRIPTION	CONTACT DEPTH (fbg)	WELL DIAGRAM
				0.4	SC		<b>ASPHALT</b>	0.4	<p>Portland Type I/II            Bentonite Seal            Monterey Sand #2/12            4"-diam., 0.020" Slotted Schedule 40 PVC            Bottom of Boring @ 12 ft</p>
				1.5			<b>Clayey SAND (SC)</b> ; light brown (10YR 4/3); loose; moist; 15% clay; 85% fine to coarse sand.	1.5	
1.2		S-6-5.0		5			<b>SAND (SP)</b> ; light brown (10YR 4/3); loose; moist; 10% clay, 90% fine sand.		
0.8				8	SP		@ 8' - grayish brown (10YR 5/2); 100% fine sand; odor.		
31				11			@ 11' - dark gray (7.5YR 4/1); wet; 100% fine sand.	12.0	

WELL LOG (PID) I:\ALAMEDA-1\GINTALAMEDA.GPJ DEFAULT.GDT 1/26/06



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# BORING/WELL LOG

<b>CLIENT NAME</b>	Shell Oil Products US	<b>BORING/WELL NAME</b>	S-7
<b>JOB/SITE NAME</b>	Shell-branded Service Station	<b>DRILLING STARTED</b>	31-Oct-05
<b>LOCATION</b>	1601 Webster Street, Alameda, California	<b>DRILLING COMPLETED</b>	01-Nov-05
<b>PROJECT NUMBER</b>	0467	<b>WELL DEVELOPMENT DATE (YIELD)</b>	14-Nov-05 (19 gallons)
<b>DRILLER</b>	Gregg Drilling	<b>GROUND SURFACE ELEVATION</b>	19.90 ft above msl
<b>DRILLING METHOD</b>	Hollow-stem auger	<b>TOP OF CASING ELEVATION</b>	19.44 ft above msl
<b>BORING DIAMETER</b>	10"	<b>SCREENED INTERVAL</b>	4 to 12 fbq
<b>LOGGED BY</b>	Stewart A. Dalie IV	<b>DEPTH TO WATER (First Encountered)</b>	7.0 ft (01-Nov-05)
<b>REVIEWED BY</b>	Ana Friel	<b>DEPTH TO WATER (Static)</b>	6.88 ft (22-Nov-05)
<b>REMARKS</b>	Air knifed to 5 fbq.		

PID (ppm)	BLOW COUNTS	SAMPLE ID	EXTENT	DEPTH (fbg)	U.S.C.S.	GRAPHIC LOG	SOIL DESCRIPTION	CONTACT DEPTH (fbg)	WELL DIAGRAM
20		S-7-5.0		5	SP		<b>ASPHALT SAND (SP)</b> ; greenish gray (5GY 5/1); loose; moist; 5% clay, 5% silt, 90% fine sand.	0.6	<p>           Portland Type I/II            Bentonite Seal            Monterey Sand #2/12            4"-diam., 0.020" Slotted Schedule 40 PVC            Bottom of Boring @ 12 ft         </p>
203									
94				10					
415								12.0	

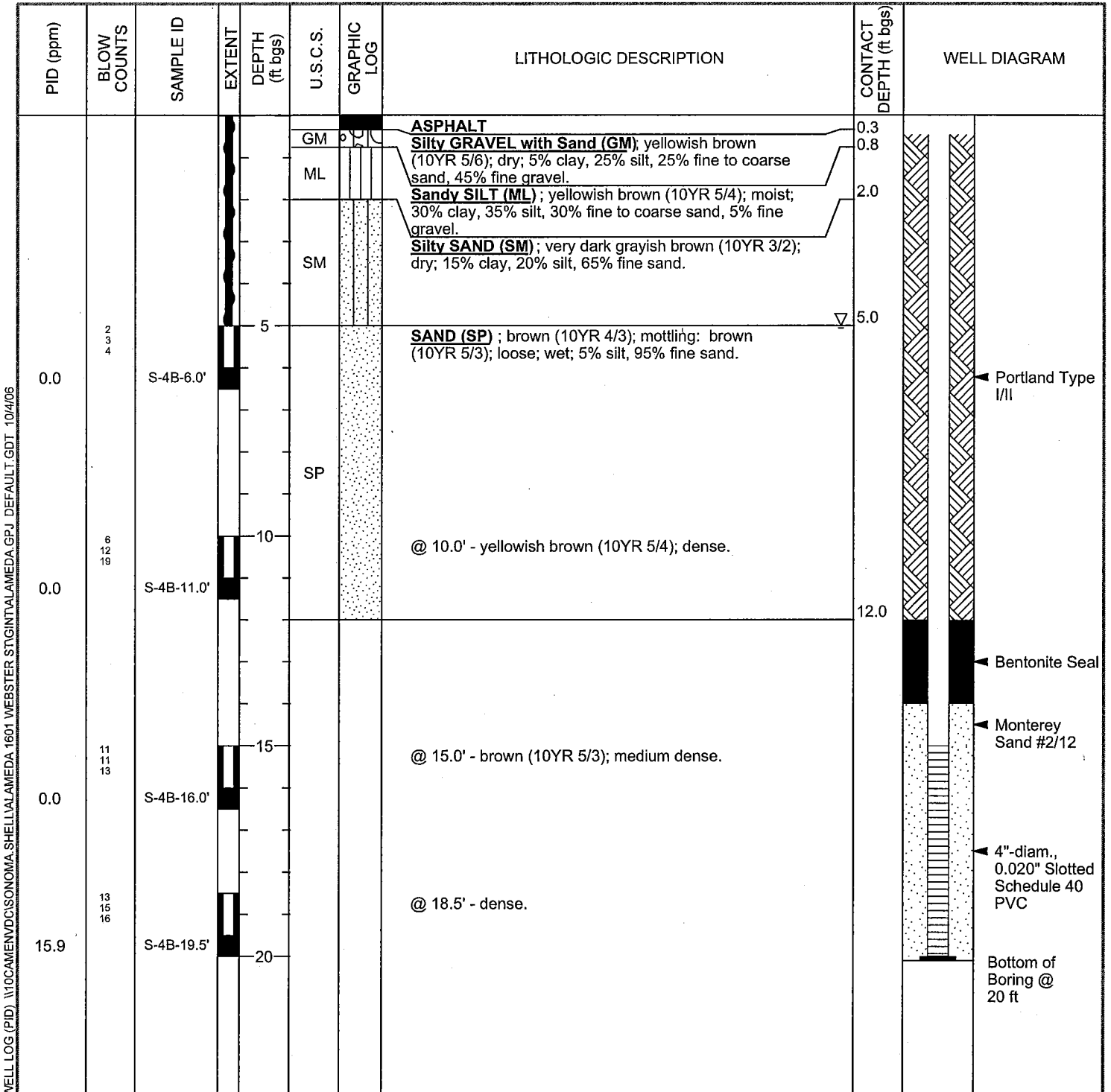
WELL LOG (PID) I:\ALAMEDA-1\GINTALAMEDA.GPJ DEFAULT.GDT 1/26/06



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# BORING/WELL LOG

<b>CLIENT NAME</b>	Shell Oil Products US	<b>BORING/WELL NAME</b>	S-4B/S-4B
<b>JOB/SITE NAME</b>	Shell-branded Service Station	<b>DRILLING STARTED</b>	17-Jul-06
<b>LOCATION</b>	1601 Webster Street, Alameda, California	<b>DRILLING COMPLETED</b>	17-Jul-06
<b>PROJECT NUMBER</b>	0467	<b>WELL DEVELOPMENT DATE (YIELD)</b>	NA
<b>DRILLER</b>	Gregg Drilling	<b>GROUND SURFACE ELEVATION</b>	Not Surveyed
<b>DRILLING METHOD</b>	Hollow-stem auger	<b>TOP OF CASING ELEVATION</b>	NA
<b>BORING DIAMETER</b>	10"	<b>SCREENED INTERVAL</b>	15 to 20 ft bgs
<b>LOGGED BY</b>	J. Gerbrandt	<b>DEPTH TO WATER (First Encountered)</b>	5.0 ft (17-Jul-06)
<b>REVIEWED BY</b>	A. Friel, PG 6452	<b>DEPTH TO WATER (Static)</b>	NA
<b>REMARKS</b>	Air knifed to 5 fbg.		





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# BORING/WELL LOG

<b>CLIENT NAME</b>	Shell Oil Products US	<b>BORING/WELL NAME</b>	S-8/S-8
<b>JOB/SITE NAME</b>	Shell-branded Service Station	<b>DRILLING STARTED</b>	17-Jul-06
<b>LOCATION</b>	1601 Webster Street, Alameda, California	<b>DRILLING COMPLETED</b>	17-Jul-06
<b>PROJECT NUMBER</b>	0467	<b>WELL DEVELOPMENT DATE (YIELD)</b>	NA
<b>DRILLER</b>	Gregg Drilling	<b>GROUND SURFACE ELEVATION</b>	Not Surveyed
<b>DRILLING METHOD</b>	Hollow-stem auger	<b>TOP OF CASING ELEVATION</b>	NA
<b>BORING DIAMETER</b>	10"	<b>SCREENED INTERVAL</b>	4 to 12 ft bgs
<b>LOGGED BY</b>	J. Gerbrandt	<b>DEPTH TO WATER (First Encountered)</b>	7.0 ft (17-Jul-06)
<b>REVIEWED BY</b>	A. Friel, PG 6452	<b>DEPTH TO WATER (Static)</b>	NA
<b>REMARKS</b>	Air knifed to 7 fbg.		

PID (ppm)	BLOW COUNTS	SAMPLE ID	EXTENT	DEPTH (ft bgs)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH (ft bgs)	WELL DIAGRAM
							<b>ASPHALT</b>	0.4	
					GM		<b>Silty GRAVEL with Sand (GM)</b> ; dark yellowish brown (10YR 4/4); dry; 5% clay, 15% silt, 20% fine to coarse sand, 60% fine gravel.	0.8	Portland Type I/II
					ML		<b>Sandy SILT (ML)</b> ; greenish gray (10Y 5/1); moist; 30% clay, 35% silt, 30% fine to coarse sand, 5% fine gravel.		Bentonite Seal
							<b>SAND (SP)</b> ; dark greenish gray (10Y 4/1); moist; 5% silt, 95% fine sand.	3.0	Monterey Sand #2/12
				5	SP				
1,032	3 12						@ 7.0' - wet.	7.8	
324		S-8-8.0'			ML		<b>Sandy SILT (ML)</b> ; dark greenish gray (5GY 4/1); very stiff; wet; 25% clay, 35% silt, 40% fine sand.	9.5	4"-diam., 0.020" Slotted Schedule 40 PVC
				10					
15.9	12 19 15	S-8-11.5'			SM		<b>Silty SAND (SM)</b> ; dark greenish gray (5GY 4/1); dense; wet; 20% silt, 80% fine sand.	12.0	Bottom of Boring @ 12 ft

WELL LOG (PID) \\10CAMEN\DC\SONOMA-SHELL\ALAMEDA 1601 WEBSTER ST\GINTALAMEDA.GPJ DEFAULT.GDT 10/4/06





<b>CLIENT NAME</b>	Shell Oil Products US	<b>BORING/WELL NAME</b>	S-9/S-9
<b>JOB/SITE NAME</b>	Shell-branded Service Station	<b>DRILLING STARTED</b>	17-Jul-06
<b>LOCATION</b>	1601 Webster Street, Alameda, California	<b>DRILLING COMPLETED</b>	17-Jul-06
<b>PROJECT NUMBER</b>	0467	<b>WELL DEVELOPMENT DATE (YIELD)</b>	NA
<b>DRILLER</b>	Gregg Drilling	<b>GROUND SURFACE ELEVATION</b>	Not Surveyed
<b>DRILLING METHOD</b>	Hollow-stem auger	<b>TOP OF CASING ELEVATION</b>	NA
<b>BORING DIAMETER</b>	10"	<b>SCREENED INTERVAL</b>	4 to 12 ft bgs
<b>LOGGED BY</b>	J. Gerbrandt	<b>DEPTH TO WATER (First Encountered)</b>	10.5 ft (17-Jul-06)
<b>REVIEWED BY</b>	A. Friel, PG 6452	<b>DEPTH TO WATER (Static)</b>	NA
<b>REMARKS</b>	Air knifed to 5 fbg.		

PID (ppm)	BLOW COUNTS	SAMPLE ID	EXTENT	DEPTH (ft bgs)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH (ft bgs)	WELL DIAGRAM
0.0					GM		<b>ASPHALT</b>	0.3	<p>Portland Type I/II</p> <p>Bentonite Seal</p> <p>Monterey Sand #2/12</p> <p>4"-diam., 0.020" Slotted Schedule 40 PVC</p> <p>Bottom of Boring @ 12 ft</p>
					ML		<b>Silty GRAVEL with Sand (GM)</b> ; yellowish brown (10YR 5/6); dry; 5% clay, 25% silt, 25% fine to coarse sand, 45% fine gravel. <b>Sandy SILT (ML)</b> ; yellowish brown (10YR 5/4); moist; 30% clay, 35% silt, 30% fine to coarse sand, 5% fine gravel.	0.8	
					SM		<b>Silty SAND (SM)</b> ; very dark grayish brown (10YR 3/2); dry; 15% clay, 20% silt, 65% fine sand.  @ 3.0 - 5.0' - bricks present.	2.0	
0.0	1 5	S-9-5.0'		5	SP		<b>SAND with Gravel (SP)</b> ; very dark gray (2.5Y 3/1); loose; dry; 5% silt, 85% fine to medium sand, 5% fine gravel.	5.0	
197.7	6 11	S-9-11.5'			SM		<b>Silty SAND (SM)</b> ; dark yellowish brown (10YR 4/4); medium dense; wet; 30% silt, 70% fine sand.	8.0	
0.0								12.0	

WELL LOG (PID) \\10CAMEN\DC\SONOMA-SHELL\ALAMEDA 1601 WEBSTER ST\GINTALAMEDA.GPJ DEFAULT.GDT 10/4/06

# Appendix F

## Well Survey Results

**Table 1. Well Survey Results - Shell-branded Service Station, 1601 Webster Street, Alameda, California**

Map ID	State Well ID	Owner Well ID	Distance from Site (feet)	Direction From Site	Use	Well Status	Installation Date	Depth (fbg)	Screened Interval (fbg)	Sealed Interval (fbg)	Comments
1	02S/04W-011M01		150	S	Unk*	Unknown	UNK	200	150-200	NA	*No well found during site recon - destroyed
2	02S/04W-011E01		525	NW	AG	Unknown	6/19/1977	25	15-25	3 inches	
3	02S/04W-011D01		800	NW	AG	Unknown	7/11/1977	32	16-31	0-10	
4	02S/04W-011M01		1,450	SW	IND	Unknown	10/26/1977	88	40-84	0-28	
5	02S/04W-010H01		2,450	SW	AG	Unknown	5/12/1977	35.8	20.8-35.8	0-21	
6	02S/04W-010H02		2,475	SW	DOM	Unknown	5/1/1977	30	23-30	0-20	
7	02S/04W-011M02		2,500	SE	AG	Unknown	10/19/1987	70	24-70	0-20	

Notes and Abbreviations:

Well information provided by the California Department of Water Resources (DWR).

Map ID number refers to map location on Figure 1.

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

Well locations are approximate and have not been field verified unless otherwise noted. The well locations are plotted on Figure 1 based on the information provided on the DWR form.

Well use is based on the information on the DWR form. This information may not be current. Unless otherwise noted, this information has not been confirmed by a field visit.

Monitoring wells were not included in the table or mapped.

fbg = feet below grade

AG = Agricultural

DOM = Domestic

GEO = Geotechnical

IND = Industrial

UNK = Unknown

NA = Not Available

G:\Alameda 1601 Webster\2004 Investigation\2004 Investigation Workplan\Tables\[Well Survey Template - v4.xls]Well Survey Table

# Appendix G

## Low-Threat Site Closure Checklist

## APPENDIX G: COMPLIANCE WITH STATE WATER BOARD POLICIES AND STATE LAW

The site complies with the State Water Resources Control Board policies and state law. Section 25296.10 of the Health and Safety Code requires that sites be cleaned up to protect human health, safety, and the environment. Based on available information, any residual petroleum constituents at the site do not pose significant risk to human health, safety, or the environment.

The site complies with the requirements of the Low-Threat Underground Storage Tank (UST) Case Closure Policy as described below.

<p><b>Is corrective action consistent with Chapter 6.7 of the Health and Safety Code and implementing regulations?</b> The corrective action provisions contained in Chapter 6.7 of the Health and Safety Code and the implementing regulations govern the entire corrective action process at leaking UST site. If it is determined, at any stage in the corrective action process, that UST case closure is appropriate, further compliance with corrective action requirements is not necessary. Corrective action at this site has been consistent with Chapter 6.7 of the Health and Safety Code and implementing regulations and, since this case meets applicable case-closure requirements, further corrective action is not necessary, unless the activity is necessary for case closure.</p>	<p><input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</p>
<p><b>Have waste discharge requirements or any other orders issued pursuant to Division 7 of the Water Code been issued at this site?</b></p>	<p><input type="checkbox"/> Yes <input checked="" type="checkbox"/> No</p>
<p><b>If so, was the corrective action performed consistent with any order?</b> There was an order issued for this site. The corrective action performed in the past is consistent with that order. Since this case meets applicable case-closure requirements, further corrective action under the order that is not necessary, unless the activity is necessary for case closure.</p>	<p><input type="checkbox"/> Yes <input type="checkbox"/> No</p>
<p><b>General Criteria</b> General criteria that must be satisfied by all candidate sites:</p> <p><b>Is the unauthorized release located within the service area of a public water system?</b></p> <p><b>Does the unauthorized release consist only of petroleum?</b></p> <p><b>Has the unauthorized ("primary") release from the UST system been stopped?</b></p> <p><b>Has free product been removed to the maximum extent practicable?</b></p> <p><b>Has a conceptual site model that assesses the nature, extent, and mobility of the release been developed?</b></p> <p><b>Has secondary source been removed to the extent practicable?</b></p> <p><b>Has the soil or groundwater been tested for MTBE and results reported in accordance with Health and Safety Code section 25296.15?</b></p> <p><b>Nuisance as defined by Water Code section 13050 does not exist at the site?</b></p> <p><b>Are there unique site attributes or site-specific conditions that demonstrably increase the risk associated with residual petroleum constituents?</b></p>	<p><input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</p> <p><input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</p> <p><input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</p> <p><input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</p> <p><input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</p> <p><input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</p> <p><input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</p> <p><input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</p> <p><input type="checkbox"/> Yes <input checked="" type="checkbox"/> No</p>
<p><b>Media-Specific Criteria</b> Candidate sites must satisfy all three of these media-specific criteria:</p> <p><b>1. Groundwater</b> To satisfy the media-specific criteria for groundwater, the contaminant plume that exceeds water quality objectives must be stable or decreasing in areal extent, and meet all of the additional characteristics of one of the five classes of sites:</p> <p><b>Is the contaminant plume that exceeds water quality objectives stable or decreasing in areal extent?</b></p>	<p><input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA</p>
<p><b>Does the contaminant plume that exceeds water quality objectives meet all of the additional characteristics of one of the five classes of sites?</b></p>	<p><input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA</p>

<p>If YES, check applicable class: <input checked="" type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <b>Do</b>  <b>site soils contain insufficient mobile constituents (leachate, vapors, or light non-aqueous phase liquids) to threaten groundwater?</b></p>	<p><input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> NA</p>
<p><b>2. Petroleum Vapor Intrusion to Indoor Air:</b>                  The site considered low-threat for vapor intrusion to indoor air if site-specific conditions satisfy all of the characteristics of one of the three classes of sites (a through c) or if the exception for active commercial fueling facilities applies.  <b>Is the site an active commercial petroleum fueling facility?</b>                  Exception: Satisfaction of the media-specific criteria for petroleum vapor intrusion to indoor air is not required at active commercial petroleum fueling facilities, except in cases where release characteristics can be reasonably believed to pose an unacceptable health risk.</p>	<p><input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</p>
<p><b>a. Do site-specific conditions at the release site satisfy all of the applicable characteristics and criteria of scenarios 1 through 3 or all of applicable characteristics and criteria of scenario 4?</b>                  If YES, check applicable scenarios: <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4</p>	<p><input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> NA</p>
<p><b>b. Has a site-specific risk assessment for the vapor intrusion pathway been conducted and demonstrates that human health is protected to the satisfaction of the regulatory agency?</b></p>	<p><input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> NA</p>
<p><b>c. As a result of controlling exposure through the use of mitigation measures or through the use of institutional or engineering controls, has the regulatory agency determined that petroleum vapors migrating from soil or groundwater will have no significant risk of adversely affecting human health?</b></p>	<p><input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> NA</p>
<p><b>3. Direct Contact and Outdoor Air Exposure:</b>                  The site is considered low-threat for direct contact and outdoor air exposure if site-specific conditions satisfy one of the three classes of sites (a through c).  <b>a. Are maximum concentrations of petroleum constituents in soil less than or equal to those listed in Table 1 for the specified depth below ground surface (bgs)?</b>  <b>b. Are maximum concentrations of petroleum constituents in soil less than levels that a site specific risk assessment demonstrates will have no significant risk of adversely affecting human health?</b>  <b>c. As a result of controlling exposure through the use of mitigation measures or through the use of institutional or engineering controls, has the regulatory agency determined that petroleum constituents in soil will have no significant risk of adversely affecting human health?</b></p>	<p><input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA</p> <p><input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> NA</p> <p><input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> NA</p>