

# Atlantic Richfield Company

**Shannon Couch**

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**RECEIVED**

*7:47 am, Jan 17, 2012*

Alameda County  
Environmental Health

January 9, 2012

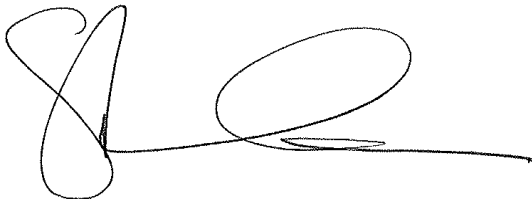
Mr. Paresh Khatri  
Alameda County Environmental Health Department  
1131 Harbor Bay Parkway  
Alameda, CA 94502-6577

**Re: Conceptual Site Model  
ARCO Station No. 2035  
1001 San Pablo Avenue  
Albany, California 94706  
Alameda County Environmental Health Case No. RO0000100**

Dear Mr. Khatri,

I declare that to the best of my knowledge at the present time, that the information and/or recommendations contained in the attached document are true and correct.

Regards,



Shannon Couch  
Remediation Management Project Manager  
Atlantic Richfield Company, a BP-affiliated company

Enclosure: Conceptual Site Model

cc: Mr. John Skance, ARC (electronic copy uploaded to ENFOS)  
Mr. Matt Herrick, Broadbent & Associates, Inc. (electronic copy)



January 9, 2012

Ms. Shannon Couch  
Atlantic Richfield Company  
P.O. Box 1257  
San Ramon, California 94583

**RE: CONCEPTUAL SITE MODEL  
ARCO Station No. 2035  
1001 San Pablo Avenue  
Albany, California 94706  
Alameda County Environmental Health Case No. RO0000100**

Dear Ms. Couch:

Closure Solutions, Incorporated (Closure Solutions) is submitting this *Conceptual Site Model* (CSM) for ARCO Station No. 2035, located at 1001 San Pablo Avenue in Albany, California (the Site, Figure 1 in Attachment A) for the purpose of documenting soil and groundwater conditions at the Site based on available environmental data prepared by Atlantic Richfield Company's (ARC's) current and former consultants.

## 1.0 SITE SUMMARY

### 1.1 Location and Setting

The Site is located on the southeastern corner of San Pablo Avenue and Marin Avenue in Albany, California (Figure 1 in Attachment A). The land use in the immediate vicinity of the Site is mixed commercial and residential. A Shell branded gasoline service station is located north of the Site across Marin Avenue. The topography of the Site is relatively flat with an approximate elevation of 42 feet above mean sea level (USGS, Richmond Quadrangle, California). The Assessor's Parcel Number is 65-2662-1.

### 1.2 Current Use

The Site is an active retail gasoline station and AM/PM mini-mart and currently maintains four double-walled fiberglass gasoline underground storage tanks (USTs) and associated double-walled product lines and dispensers (Figure 2 in Attachment A).

### 1.3 Regional Hydrogeology

The Site is located within the northwestern portion of the Berkeley Sub-Area of the San Francisco East Bay Plain Groundwater Basin<sup>1</sup>. The Berkeley Sub-Area contains a series of alluvial fans deposited on a west sloping bedrock surface. The alluvial deposits range in thickness from 10 to 300 feet and average 200 feet. The Regional Water Board reports that there is no evidence that groundwater resources in the area are sufficient for municipal use. In the Berkeley Sub-Area, particularly in West Berkeley, first encountered groundwater is frequently reported as being semi-confined.<sup>1</sup>

Throughout most of the Alameda County portion of the East Bay Plain, from Hayward north to Albany, water level contours show that the general groundwater flow direction is from east to west. East Bay Plain cities do not have "...any plans to develop local groundwater resources for drinking water purposes because of existing or potential saltwater intrusion, contamination, or poor or limited quantity<sup>1</sup>." The San Francisco Regional Water Quality Control Board (SFRWQCB) Basin Plan lists existing beneficial uses of site groundwater as municipal and domestic supply, industrial process supply, industrial service supply, and agricultural supply.

### 1.4 Site Geology

Based on previous investigations and the USGS<sup>2</sup>, the Site is underlain by Holocene and Pleistocene age<sup>3</sup> alluvium. The Holocene alluvium (recent alluvium) consists of beds and lenses of fine-grained sandy silt and clay, clayey and silty sand, and fine gravel from near surface to approximately 10 to 12 feet below ground surface (bgs). The Pleistocene alluvium (old alluvium) consists of beds and lenses of clayey to silty sand, sandy gravel, and clayey to gravelly sand from approximately 12 feet bgs to the total depth investigated (34.5 feet bgs). Geologic cross-sections are presented as Figures 1 through 4 and soil borings logs details are presented in Attachment B. Monitor/remediation well construction details are included on Table 1.

### 1.5 Local Hydrology

Boring logs and water level elevation data indicate that groundwater under confining conditions is typically encountered in the old alluvium hydrologic unit at about 18 to 20 feet bgs and that a separate, shallower water bearing zone is present at about 10 feet bgs. Water level elevation data and well construction details from well pairs MW-1/ MW-7 and MW-3/ MW-9 indicate a downward vertical hydraulic gradient exists between the two water bearing zones. Groundwater

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<sup>1</sup> *East Bay Plain Groundwater Basin Beneficial Use Evaluation Report* (California Regional Water Quality Control Board – San Francisco Bay Region [SFRWQCB], June 1999)

<sup>2</sup> Dibblee, T.W., 1980, Preliminary geologic map of the Richmond quadrangle, Alameda and Contra Costa Counties, California: USGS Open-File Report OF-80-1100

<sup>3</sup> The Holocene is the geologic time from of the end of Pleistocene glaciation and the ensuing raise in sea level that began 10,000 years before present. The Pleistocene spans about 2.5 million years of continental glacial advances and retreats.

elevation data for the two well pairs show seasonal head differentials ranging from about 0.5 to 2 feet, equivalent to gradients in the range of 0.04 to 0.17. A hydrograph supporting this observation is presented as Figures 5.

The confined groundwater exhibits a potentiometric surface of about 10 feet bgs and is inferred to flow in a general westerly direction under a hydraulic gradient of about 0.03 feet per foot (ft/ft). The confined groundwater bearing zone is recharged via subsurface inflow and flow through wells with screens that penetrate the intervening aquitard from the shallow water-bearing zone, and discharges via subsurface out flow.

Shallow groundwater in the recent alluvium is inferred to flow in a general westerly direction under a presumed hydraulic gradient of about 0.03 ft/ft. The shallow groundwater is recharged via subsurface inflow and infiltration of surface water, and is discharged via subsurface outflow, evapotranspiration, and presumed flow to the deeper water-bearing zones via monitor wells.

Shallow groundwater underlying the Site in both the recent alluvium and old alluvium hydrologic units is not used as a source of drinking water or for other beneficial uses. Local public utility companies supply local businesses and residences.

## 1.6 Sensitive Receptors

Closure Solutions performed a Sensitive Receptor Survey in October 2011 to identify the presence of water wells within a ½-mile radius of the Site. Based on a review of well completion reports furnished by the Department of Water Resources (DWR), no wells were identified within a ½-mile radius of the Site. The nearest surface water body is the San Francisco Bay, located approximately 3,500 feet west-northwest of the Site.

## 2.0 SUMMARY OF PREVIOUS INVESTIGATIONS

Based on various environmental documents prepared by ARC's current and former consultants, Closure Solutions has prepared the following summary of previous environmental corrective actions at the Site. While Closure Solutions does not have reason to believe that the information is incorrect, Closure Solutions has not independently verified this information for accuracy. It is our understanding that:

- August 1989: Applied GeoSystems performed a limited environmental assessment at the Site. A total of five soil borings (B-1 through B-5) were advanced to a maximum depth of 20.5 feet bgs near the vicinity of the existing gasoline USTs to evaluate potential hydrocarbon impacts to soil prior to removing and replacing the USTs. Total petroleum hydrocarbons as gasoline (TPHg) was identified at a depth of 10 feet bgs in borings B-1

and B-4 at a maximum concentration of 2,400 milligrams per kilogram (mg/kg [boring B-4]).

- June 1991: RESNA Environmental (RESNA) observed the advancement of soil borings B-6 and B-7 in the area of a proposed new UTS complex to evaluate for potential hydrocarbon impacts in soil. Analytical results from soil samples did not identify petroleum hydrocarbon constituents above laboratory reporting limits.
- July 1991: RESNA observed the excavation and removal of four existing USTs at the Site. Following removal, several of the tanks were reported to have visible holes. Based on the observations, approximately 350 cubic yards of hydrocarbon impacted soil to an average depth of 12 feet bgs were over-excavated from the UST pit and removed from the Site.
- October 1991: RESNA observed the installation of groundwater monitoring wells RW-1, MW-1, MW-2, and MW-3 to further evaluate the extent of petroleum hydrocarbons in soil and groundwater.
- November 1991: RESNA conducted a step-drawdown test in well RW-1 to determine the wells optimal pumping rate. Based on the step-drawdown results, an 18-hour pump and 6-hour recovery test were conducted on November 14 and 15, 1991. Wells MW-1, MW-2, and MW-3 were used as observation wells.
- August 1992: RESNA observed the advancement of eight soil borings (B-12 through B-19), six of which (B-14 through B-19) were converted into four-inch-diameter soil vapor extraction (SVE) wells (VW-1 through VW-6). Borings B-12 and B-13 were advanced in the vicinity of the of the former waste oil tank to evaluate impacts to soil from waste oil. Analytical results for collected samples from B-12 and B-13 reported low concentrations of ethylbenzene and xylenes at 9 feet bgs (B-12), TPH as diesel (TPHd) at maximum concentrations of 250 mg/kg at 9 feet bgs (B-12) and total oil and grease (TOG) at maximum concentrations of 1,800 mg/kg at 7.5 feet bgs (B-13). All other analyzed hydrocarbon constituents were below laboratory reporting limits.
- August 1992: RESNA performed a one-day SVE test to evaluate the feasibility of SVE as a remedial option. According to RESNA, based on results from the test, SVE was considered a viable remedial technology.
- November 1992: RESNA observed the installation of onsite wells MW-4 and MW-5 and offsite well MW-6 on the western side of San Pablo Avenue for the purpose of evaluating dissolved-phase gasoline constituents in the down-gradient groundwater flow direction.

Analytical results from collected soil samples did not identify petroleum hydrocarbon constituents above laboratory reporting limits.

- June 1993: RESNA observed the installation of SVE wells VW-7 through VW-9 and air sparge/SVE wells AS-1 and AS-2.
- August 1993: RESNA performed an air sparge/soil vapor extraction (AS/SVE) pilot test at the Site to evaluate the feasibility of utilizing air sparging in conjunction with SVE. Results of the test indicated air sparging was a viable option.
- November 1993: Construction of a groundwater extraction system (GWE) and an AS/SVE remediation system were completed at the Site. A total of nine vapor extraction wells (VW-1 through VW-9), one groundwater extraction well (RW-1), and two air sparge wells (AS-1 and AS-2) were connected to the system. The AS/SVE system was started in December 1993, however according to historical reports the GWE system was never operated. The AS/SVE system operated intermittently through February 2004, when it was shut down due to low influent concentrations. A reported 3,967 pounds of TPHg and 528 pounds of benzene were removed from beneath the Site during AS/SVE operation.
- March 2009: Broadbent & Associates, Inc. (BAI) observed the installation of wells MW-7 through MW-9 for the purpose of evaluating the remedial effectiveness of the AS/SVE system which operated between 1993 and 2004. Based on analytical data from collected soil and groundwater samples, remediation activities were deemed successful. BAI recommended the AS/SVE system be shut down permanently and that monitored natural attenuation be continued at the Site.
- March 2011: BAI, conducted a soil vapor intrusion assessment in the vicinity of the onsite building to evaluate the potential for a benzene vapor intrusion and possible vapor inhalation risk. Based on analytical data from collected soil vapor samples, BAI concluded vapor intrusion to indoor air was not a risk.

### 3.0 ENVIRONMENTAL CONDITIONS

#### 3.1 Extent of Groundwater Impact

Analytical data<sup>4</sup> suggest that the constituents of concern in soil and groundwater are gasoline range organics (GRO) and benzene. The maximum concentrations of constituents of concern are

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<sup>4</sup> BAI, *Second Quarter 2011 Semi-Annual Monitoring Report* (July 2011).

reported in groundwater samples obtained from wells RW-1, MW-8 and S-5<sup>5</sup>. The dissolved contaminant plume is adequately delineated by the existing well network and is defined in the down-gradient direction to below laboratory reporting limits for GRO, benzene, and MTBE by well MW-6. A regression analysis using GRO and benzene data from wells MW-8 and S-5 was performed to evaluate if a decreasing concentration trend with respect to time is present and if concentrations will reach Water Quality Objectives in a reasonable time. The analysis indicates reported constituent concentrations in groundwater samples from site monitor wells evaluated exhibit an overall decreasing trend and Water Quality Objectives for GRO and benzene will be achieved within a reasonable time frame. Regression analysis graphs are presented in Attachment F.

Based on the hydraulic gradient mentioned in Section 1.4, Site monitoring wells with screen intervals penetrating an aquitard present at about 12 to 18 feet bgs may likely facilitate the exchange of groundwater between the shallow and deeper water-bearing zones. Constituent concentrations in groundwater samples from wells screened into the deeper (old alluvium) water-bearing zones (e.g., wells MW-1, MW-2 and MW-3) generally report concentrations below laboratory reporting limits while the wells screened in the shallow zone report elevated concentrations (e.g., MW-7 and MW-8). A groundwater Elevation Contour and Analyses Map depicting the second quarter 2010 data for both the ARCO and Shell Sites is included as Figure 2 in Attachment A. Historical groundwater monitoring data is presented in Attachment C.

### 3.2 Extent of Soil Impact

Approximately 350 cubic yards of soil was excavated during dispenser and piping upgrades and UST replacement in 1991 and an additional 3,967 pounds of TPHg and 528 pounds of benzene were removed as soil vapor during AS/SVE remediation between 1993 and 2004.

Remaining soil impacts are limited to the locations of the former USTs, dispenser, and product piping that were present in the northern portion of the Site. Soil impacts appear to be adequately defined both laterally and vertically by up-gradient and cross-gradient borings and are limited to the depth range of approximately 10 to 15 feet bgs. Data indicate the affected soil is contained to the shallow recent alluvium hydrologic unit and adequately defined both laterally and vertically. Historical soil analytical data are presented in Tables 2 and 3. Soil sample locations are shown on Plate 3 in Attachment A.

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<sup>5</sup> S-5 is an off-Site Shell Branded groundwater monitoring well cross-gradient from ARCO Station No. 2035. Analytical data from the Shell-branded station reported GRO, benzene, toluene and ethylbenzene however, concentrations in the cross-gradient well and down-gradient wells for the ARCO Site exhibit an overall decreasing trend with respect to time.

## 4.0 EXPOSURE PATHWAY EVALUATION

Closure Solutions has prepared the following table to outline the potential human health exposure pathways, and evaluate whether such pathways are complete or significant.

Potential Exposure Medium	Potential Exposure Pathway	Pathway Evaluation
Groundwater	Ingestion	<b>Pathway Incomplete:</b> Impacted groundwater not reasonably expected to impact existing drinking water wells as no wells are identified within a ½-mile radius of the Site.
	Dermal Contact	
Subsurface Soil	Ingestion	<b>Pathway Incomplete:</b> Site is currently paved and current land use is not expected to change in foreseeable future.
	Dermal Contact	
Soil Vapor	Intrusion into Indoor Air	<b>Comparatively Insignificant:</b> Potential exposure to soil vapor likely insignificant when compared with exposure associated with current Site use as a retail gasoline service station.

### 4.1 Groundwater

The groundwater exposure pathway is considered incomplete. No supply wells were identified within a ½-mile radius of the Site. Shallow groundwater is not currently used as a source of drinking water or other beneficial use and it is unlikely to be use as such in the foreseeable future. Dermal contact with affected groundwater is unlikely given that the depth to groundwater is typically 10 feet bgs and the site and vicinity are paved.

Though dissolved-phase concentrations of gasoline constituents, including MTBE, currently exceed Water Quality Objectives in groundwater samples obtained from some site monitoring wells, when assessed in the context of site conditions, groundwater with these reported concentrations do not pose a significant threat to human health, safety, or the environment.

### 4.2 Subsurface Soil

The subsurface soil exposure pathway is considered incomplete based on soil concentrations, Site use, and the presence of asphalt or concrete covering the affected area. Constituents of concern reported in the soil samples (post AS/SVE remediation) collected in 2009 are below the SFRWQCB Environmental Screening Levels (ESLs) for Direct Exposure Soil Screening Levels for commercial/industrial (450 mg/kg for TPHg) and construction/trench workers (4,200 mg/kg



for TPHg [Tables K-2 and K-3]). Additionally, the land use is not expected to change in the foreseeable future and any current or future workers who perform construction related activities on gasoline service stations are required to have appropriate hazardous materials training, therefore appropriate protective measures would be in place prior to performing work. The SFRWQCB ESL tables are included as Attachment D.

### 4.3 Soil Vapor

This pathway is considered insignificant based on current groundwater concentrations at the Site. Benzene is considered the constituent to be of most concern to onsite workers as a potential threat to human health. A maximum reported benzene concentration of 290 micrograms per liter (ug/L) was reported for the recent groundwater sample obtained from well MW-8, near the northwest corner of the site. This concentration is at least one order of magnitude below the Regional Board's ESL for "Groundwater Evaluation for Potential Vapor Intrusions Concerns" for both commercial/industrial land use (1,800 ug/L). Additionally, a soil vapor intrusion assessment conducted in the vicinity of the onsite building by BAI in March, 2011, concluded vapor intrusion to indoor air was not a viable threat. Tabulated analytical data from the March 2011 soil vapor assessment are included in Attachment E and the SFRWQCB ESL tables are included in Attachment D.

## 5.0 OBSERVATIONS AND CONTENTIONS

Based on analytical data from Site investigations, groundwater monitoring and other environmental corrective actions performed at the Site to date, several key observations and contentions may be supported. The observations and contentions are presented below, along with the justification supporting each observation or contention.

***Residual contaminations remain localized to the areas of the USTs, dispensers, and product piping.*** Soil impacts are primarily located in fine-grained soil between approximately 10 to 15 feet bgs. As indicated by soil samples collected from borings MW-7 through MW-9 the residual hydrocarbons in on-site soil have significantly decreased since the operation of SVE system between 1997 and 2004<sup>6</sup>.

***At least two distinct hydrologic units exist beneath the Site, including an unconfined groundwater bearing zone at about 5 to 10 feet bgs, and a confined groundwater bearing zone at about 18 to 20 feet bgs.*** Logs of Site borings and water level elevation and water quality data support the hypothesis that two distinct water bearing zones are present at the Site.

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<sup>6</sup> Soil & Ground-Water Investigation Report, BAI, May 20, 2009

***There is little likelihood that the deeper confined groundwater encountered in the old alluvium will be materially affected by the remaining residual petroleum hydrocarbon release provided site wells are properly sealed.*** The potentiometric head for wells screened in the deeper zone is typically lower than the head for the shallower screened wells (i.e. MW-1 and MW-7).

***The shallow affected groundwater is not presently used as a source of drinking water or other beneficial use, and it is highly unlikely it will be used as such in the foreseeable future.*** The majority of the East Bay Plain cities do not have "...any plans to develop local groundwater resources for drinking water purposes because of existing or potential saltwater intrusion, contamination, or poor or limited quantity."<sup>7</sup> A 2011 sensitive receptor survey did not identify any water wells within a ½ mile of the Site.<sup>8</sup> Even if groundwater resources were to be developed at or in the vicinity of the site, well construction standards requiring a minimum 50 foot sanitary seal would serve to isolate the shallow affected groundwater from deeper groundwater production zones.

***Considering the geology, hydrology, and land use at and in the vicinity of the Site, the residual gasoline constituents remaining in fine-grained soil and shallow groundwater do not and will not threaten human health, safety, and environmental receptors.*** During the March 2011 soil vapor survey, analytical results of the two soil gas samples that were collected adjacent to the existing station building were lower than the ESLs indicating that the vapor intrusion to indoor air is not an issue of concern at the site.<sup>9</sup> The down-gradient extent of dissolved-phase gasoline constituents in shallow groundwater is defined to below laboratory reporting limits at the location of well MW-6. Dissolved-phase gasoline constituents are stable or exhibit decreasing trends in site wells.<sup>10</sup> The site and vicinity is paved with asphalt and concrete.

***The Site has been adequately characterized for the purpose of evaluating threats to human health and environmental receptors.*** Based on analytical results from the Second Quarter 2011 sampling event the down-gradient extent of dissolved-phase gasoline constituents does not extend to well MW-6 and GRO and BTEX constituents in all wells continue to show stable to decreasing trends. MTBE was not reported above Water Quality Objectives during the Second Quarter 2011 groundwater sampling event.

***Case closure would be consistent with State Water Board Resolution No. 92-49 and with the maximum benefit to the people of the state.*** Although groundwater in the immediate vicinity of

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<sup>7</sup> East Bay Plain Groundwater Basin Beneficial Use Evaluation Report, SFRWQCB, 1999

<sup>8</sup> Sensitive Receptor Survey, Closure Solutions, October 31, 2011

<sup>9</sup> Vapor Intrusion Assessment Report, BAI, June 13, 2011

<sup>10</sup> Second Quarter 2011 Semi-Annual Monitoring Report, BAI, July 29, 2011

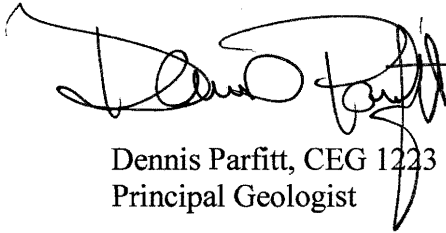
the former UST location and dispenser island may exceed Regional Board Basin Plan Water Quality Objectives, given the nature of the release and the site's geology and hydrology, Water Quality Objectives will be achieved in a reasonable period of time. Shallow affected site groundwater is not currently being used as a source of drinking water and it is highly unlikely that the water will be used as a source of drinking water in the future.

## 6.0 LIMITATIONS

This report is based on Site conditions, data, and other information available as of the date of the report, and the conclusions and recommendations herein are only applicable to the time frame in which the report was prepared. Background information used to prepare this report including, but not limited to, previous field measurements, analytical results, Site plans and other data have been furnished to Closure Solutions by ARC and their previous consultants. Closure Solutions has relied on this information as furnished, and is neither responsible for nor has confirmed the accuracy of this information.

If you have any questions regarding this submission, please feel free to contact Mr. Dennis Parfitt at (916) 760-7579 (dparfitt@closureolutions.com) or Ms. Kathleen Waldo at (916) 760-7025 (kwaldo@closureolutions.com).

Sincerely,  
**Closure Solutions, Inc.**



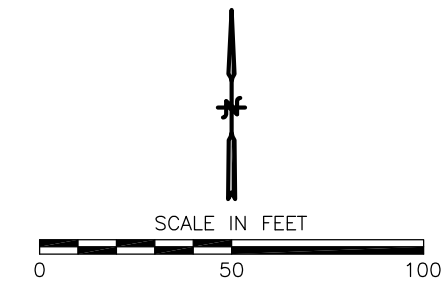
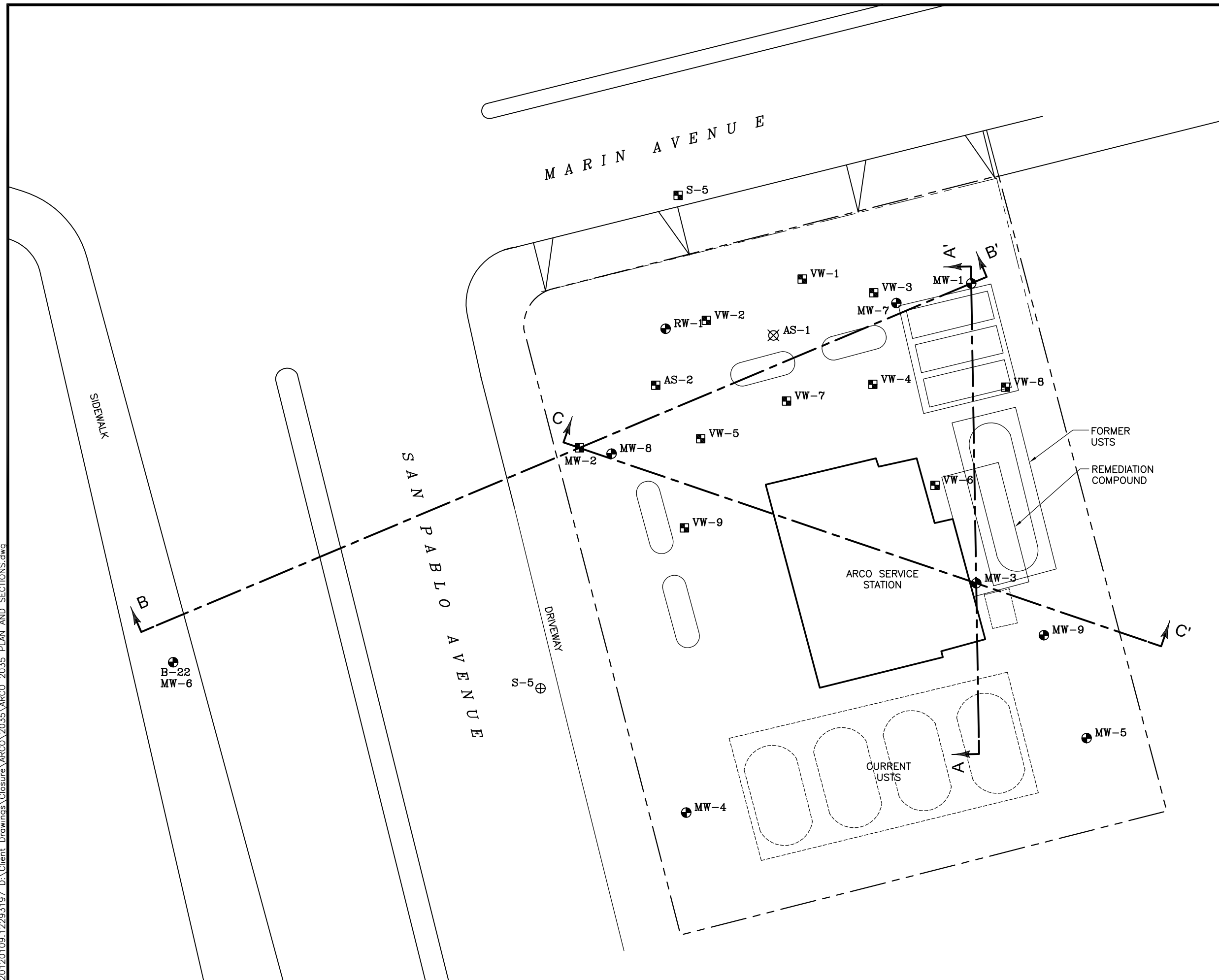
Dennis Parfitt, CEG 1223  
Principal Geologist



Attachments:

Figure 1	Site Map and Lines of Section
Figure 2	Geologic Cross-Section A – A'
Figure 3	Geologic Cross-Section B – B'
Figure 4	Geologic Cross-Section C – C'
Figure 5	Groundwater Elevation Graph
Table 1	Well Construction Details
Table 2	Historical Soil Analytical Data
Table 3	Additional Soil Analytical Data
Attachment A	Figures
Attachment B	Soil Boring Logs and Well Construction Details
Attachment C	Historical Groundwater Monitoring Data
Attachment D	SFRWQCB ESL Tables
Attachment E	Soil Vapor Analytical Data
Attachment F	Regression Analysis

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**LEGEND:**

- ⊕ (ARCO) MONITORING WELL
- (ARCO) VAPOR EXTRACTION WELL
- ⊗ (ARCO) AIR SPARGE WELL
- ⊕ (SHELL) MONITORING WELL
- A — A' GEOLOGIC CROSS SECTION LOCATION

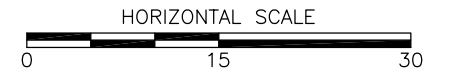
**FIGURE 1**  
**SITE MAP WITH CROSS SECTION LOCATIONS**

ARCO STATION NO. 2035  
 1001 SAN PABLO AVENUE  
 ALBANY, CALIFORNIA



4600 Northgate Boulevard • Suite 230  
 Sacramento • California • 95834  
 Phone: (800) 988-7880





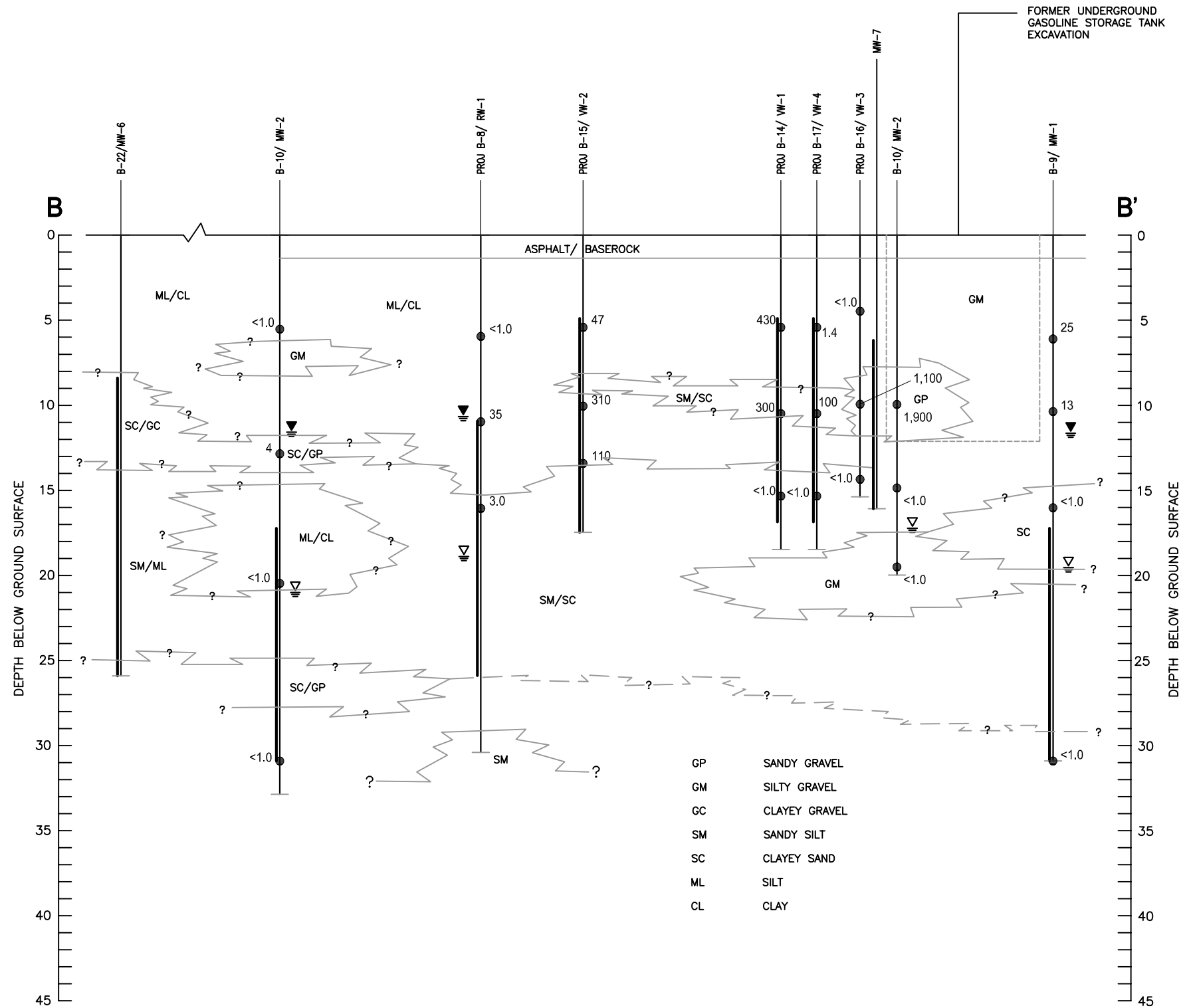
2X VERTICAL EXAGGERATION

**LEGEND:**

- <1.0 LABORATORY ANALYZED SOIL SAMPLE SHOWING CONCENTRATION OF TPHg (RED), TPHd (GREEN) AND TOG (BLUE) IN PPM
- 71
- 43
- WELL CASING
- WELL SCREEN
- ▽ INITIAL WATER LEVEL IN BORING
- ▽ STATIC WATER LEVEL IN WELL (2-22-93)
- T4S PROJECTED TANK PIT SAMPLE SHOWING CONCENTRATION OF TPHg IN PPM
- <1.0

**NOTES:**

CROSS-SECTION DETAILS AND ANALYTICAL ADAPTED FROM RESNA ENVIRONMENTAL 1992/1993



**FIGURE 3**

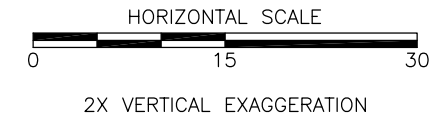
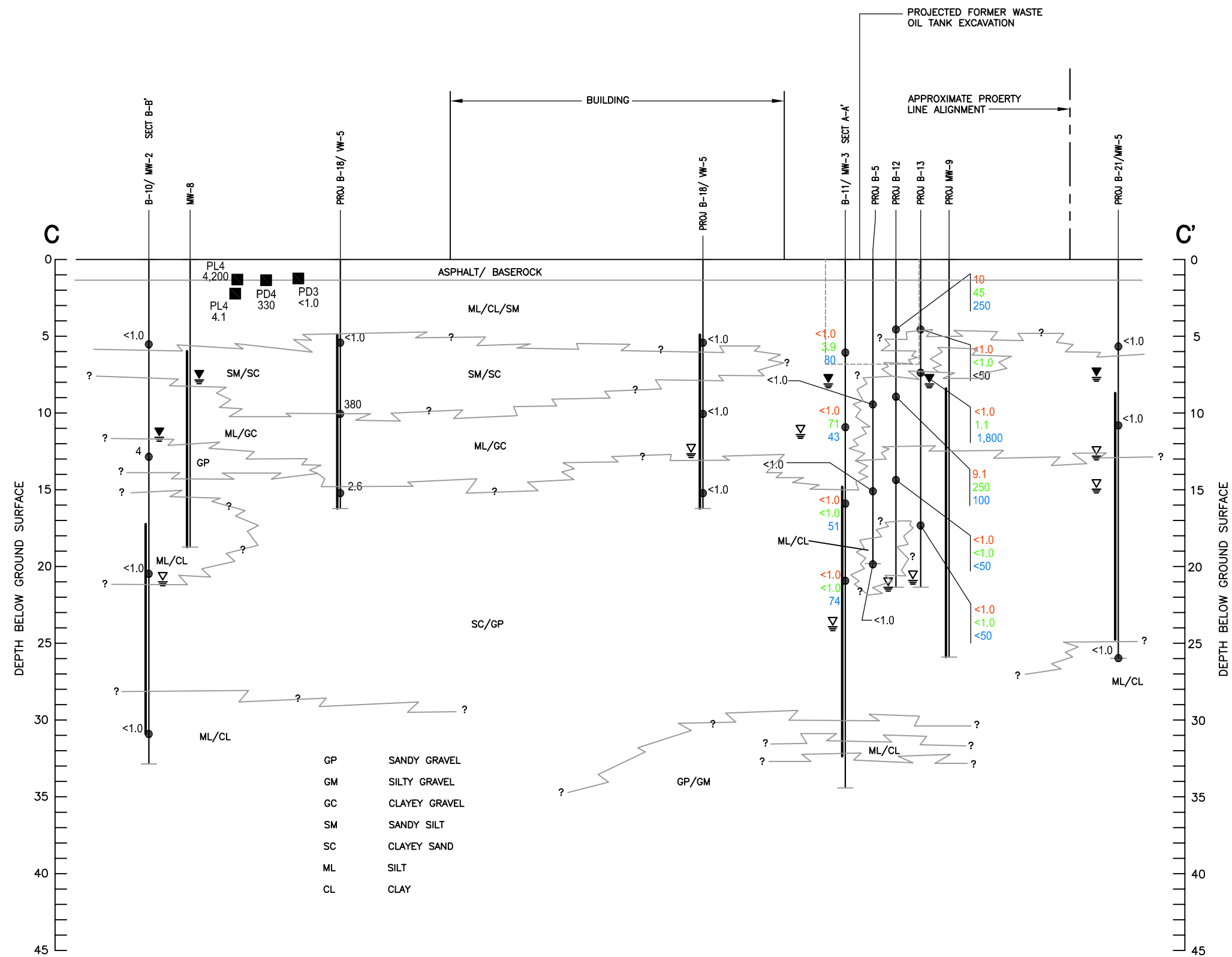
**GEOLOGIC CROSS SECTION B-B'**

ARCO STATION NO. 2035  
1001 SAN PABLO AVENUE  
ALBANY, CALIFORNIA



4600 Northgate Boulevard • Suite 230  
Sacramento • California • 95834  
Phone: (800) 988-7880

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- LEGEND:**
- <1.0 LABORATORY ANALYZED SOIL SAMPLE SHOWING CONCENTRATION OF TPHg (RED), TPHd (GREEN) AND TOG (BLUE) IN PPM
  - 71
  - 43
  - WELL CASING
  - WELL SCREEN
  - ▽ INITIAL WATER LEVEL IN BORING
  - ▽ STATIC WATER LEVEL IN WELL (2-22-93)
  - <1.0 PROJECTED TANK PIT SAMPLE SHOWING CONCENTRATION OF TPHg IN PPM

**NOTES:**  
 CROSS-SECTION DETAILS AND ANALYTICAL ADAPTED FROM RESNA ENVIRONMENTAL 1992/1993

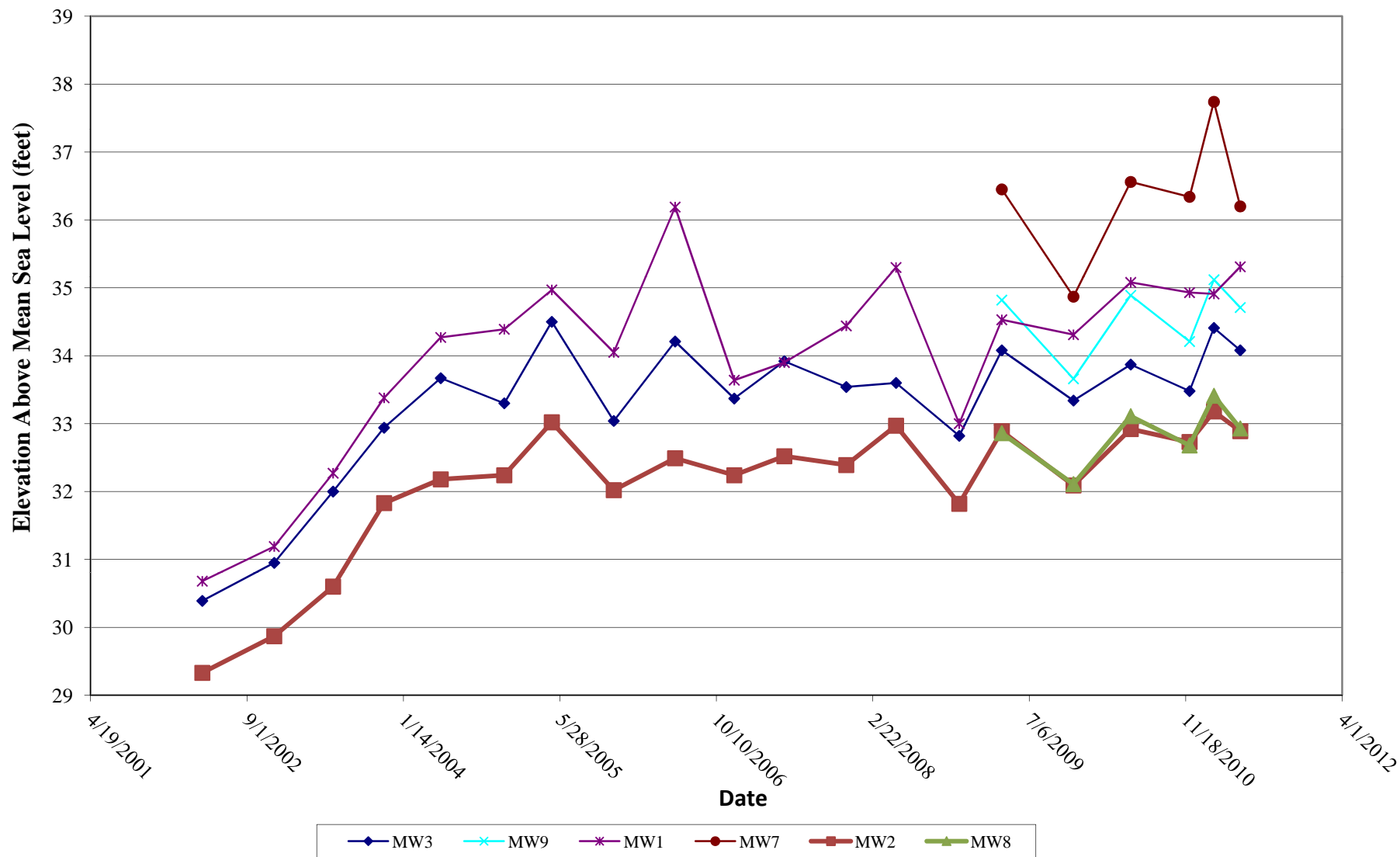
**FIGURE 4**  
**GEOLOGIC CROSS SECTION C-C'**

ARCO STATION NO. 2035  
 1001 SAN PABLO AVENUE  
 ALBANY, CALIFORNIA

4600 Northgate Boulevard • Suite 230  
 Sacramento • California • 95834  
 Phone: (800) 988-7880



**FIGURE 5**  
**Groundwater Elevation Graph**  
**ARCO Station No. 2035**  
**1001 San Pablo Avenue, Albany, California**



**Table 1**  
Well Construction Details

ARCO Service Station No. 2035  
1001 San Pablo Avenue  
Albany, California

Well ID	Well Diameter (inches)	Total Depth (feet bgs)	Screen Interval (feet bgs)	Screen Slot Size (inches)
MW-1	2	32	15-30	0.020
MW-2	2	33	20-29	0.020
MW-3	2	34.5	13-33	0.020
MW-4	2	29	9-26	0.020
MW-5	2	26.5	8-25	0.020
MW-6	2	26.5	8-25	0.020
MW-7	2	16	6-16	0.020
MW-8	2	19	6-19	0.020
MW-9	4	16	6-16	0.020
RW-1	4	30.5	11-26	0.020

bgs = below ground surface

**Table 2**  
Historical Soil Analytical Data

ARCO Service Station No. 2035  
1001 San Pablo Avenue  
Albany, California

Sample ID	Date Sampled	Depth (feet bgs)	TPHg (mg/kg)	TPHd (mg/kg)	B (mg/kg)	T (mg/kg)	E (mg/kg)	X (mg/kg)	1,2-DCA (mg/kg)	MTBE (mg/kg)	TBA (mg/kg)	Lead (mg/kg)
S-10-B1	Aug-89	10	<b>1,900</b>	--	ND<4	<b>15</b>	<b>8.0</b>	<b>53</b>	--	--	--	--
S-15-B1	Aug-89	15	ND<1.0	--	ND<0.005	<b>0.006</b>	ND<0.005	ND<0.005	--	--	--	--
S-19-1/2-B1	Aug-89	19.5	ND<1.0	--	ND<0.005	ND<0.005	ND<0.005	ND<0.005	--	--	--	--
S-10-B2	Aug-89	10	<b>51</b>	--	<b>1.9</b>	<b>0.35</b>	<b>0.81</b>	<b>4.0</b>	--	--	--	--
S-14-1/2-B2	Aug-89	14.5	ND<1.0	--	<b>0.063</b>	ND<0.005	ND<0.005	ND<0.005	--	--	--	--
S-20-B2	Aug-89	20	ND<1.0	--	<b>0.039</b>	<b>0.044</b>	<b>0.007</b>	<b>0.041</b>	--	--	--	--
S-10-B3	Aug-89	10	<b>75</b>	--	<b>3.1</b>	<b>8.2</b>	<b>1.8</b>	<b>11</b>	--	--	--	--
S-14-1/2-B3	Aug-89	14.5	ND<1.0	--	<b>0.21</b>	ND<0.025	ND<0.025	<b>0.039</b>	--	--	--	--
S-20-B3	Aug-89	20	ND<1.0	--	ND<0.005	ND<0.005	ND<0.005	ND<0.005	--	--	--	--
S-10-B4	Aug-89	10	<b>2,400</b>	--	<b>33</b>	<b>140</b>	<b>40</b>	<b>220</b>	--	--	--	--
S-15-B4	Aug-89	15	<b>520</b>	--	ND<1	<b>6.9</b>	<b>6.2</b>	<b>6.3</b>	--	--	--	--
S-19-B4	Aug-89	19	ND<1.0	--	ND<0.005	<b>0.007</b>	ND<0.005	ND<0.005	--	--	--	--
S-9-1/2-B5	Aug-89	9.5	ND<1.0	--	<b>0.007</b>	<b>0.006</b>	ND<0.005	ND<0.005	--	--	--	--
S-15-B5	Aug-89	15	ND<1.0	--	ND<0.005	<b>0.006</b>	ND<0.005	ND<0.005	--	--	--	--
S-20-B5	Aug-89	20	ND<1.0	--	ND<0.005	ND<0.005	ND<0.005	ND<0.005	--	--	--	--
S-51/2-B6	6/25/1991	5.5	ND<1.0	--	ND<0.0050	ND<0.0050	ND<0.0050	ND<0.0050	--	--	--	--
S-101/2-B6	6/25/1991	10.5	ND<1.0	--	ND<0.0050	ND<0.0050	ND<0.0050	ND<0.0050	--	--	--	--
S-151/2-B6	6/25/1991	15.5	ND<1.0	--	ND<0.0050	ND<0.0050	ND<0.0050	ND<0.0050	--	--	--	--
S-17-B6	6/25/1991	17	ND<1.0	--	ND<0.0050	ND<0.0050	ND<0.0050	ND<0.0050	--	--	--	--
S-51/2-B7	6/25/1991	5.5	ND<1.0	--	ND<0.0050	ND<0.0050	ND<0.0050	ND<0.0050	--	--	--	--
S-101/2-B7	6/25/1991	10.5	ND<1.0	--	ND<0.0050	ND<0.0050	ND<0.0050	ND<0.0050	--	--	--	--
S-151/2-B7	6/25/1991	15.5	ND<1.0	--	ND<0.0050	ND<0.0050	ND<0.0050	ND<0.0050	--	--	--	--
S-17-B7	6/25/1991	17	ND<1.0	--	ND<0.0050	ND<0.0050	ND<0.0050	ND<0.0050	--	--	--	--
S-181/2-B7	6/25/1991	18.5	ND<1.0	--	ND<0.0050	ND<0.0050	ND<0.0050	ND<0.0050	--	--	--	--

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Sample ID	Date Sampled	Depth (feet bgs)	TPHg (mg/kg)	TPHd (mg/kg)	B (mg/kg)	T (mg/kg)	E (mg/kg)	X (mg/kg)	1,2-DCA (mg/kg)	MTBE (mg/kg)	TBA (mg/kg)	Lead (mg/kg)
S-12-T1W	7/3/1991	12	ND<1.0	--	ND<0.0050	ND<0.0050	ND<0.0050	ND<0.0050	--	--	--	--
S-12-T1E	7/3/1991	12	ND<1.0	--	ND<0.0050	ND<0.0050	ND<0.0050	ND<0.0050	--	--	--	--
S-12-T2W	7/3/1991	12	ND<1.0	--	<b>0.031</b>	ND<0.0050	<b>0.0080</b>	ND<0.0050	--	--	--	--
S-12-T2E	7/3/1991	12	ND<1.0	--	<b>0.019</b>	ND<0.0050	ND<0.0050	ND<0.0050	--	--	--	--
S-12-T3W	7/3/1991	12	<b>48</b>	--	<b>1.2</b>	<b>2.4</b>	<b>1.0</b>	<b>3.8</b>	--	--	--	ND<0.05
S-12-T3E	7/3/1991	12	<b>65</b>	--	<b>0.2</b>	<b>0.51</b>	<b>0.97</b>	<b>3.9</b>	--	--	--	ND<0.05
S-13-T4N	7/3/1991	13	<b>6.2</b>	--	<b>0.45</b>	<b>0.039</b>	<b>0.18</b>	<b>0.33</b>	--	--	--	--
S-13-T4S	7/3/1991	13	ND<1.0	--	<b>0.061</b> <b>(0.160)</b>	<b>0.034</b>	<b>0.0080</b>	<b>0.15</b> <b>(0.430)</b>	--	--	--	--
S-0709-SP (A-D)	7/7/1991	unk	<b>200</b>	--	<b>0.16</b>	<b>0.76</b>	<b>0.051</b>	<b>7.8</b>	--	--	--	--
S-15-EWC	7/8/1991	15	ND<1.0	--	ND<0.0050	ND<0.0050	ND<0.0050	ND<0.0050	--	--	--	--
S-15-SE	7/8/1991	15	ND<1.0	--	ND<0.0050	ND<0.0050	ND<0.0050	ND<0.0050	--	--	--	--
S-16-SW1	7/8/1991	16	ND<1.0	--	ND<0.0050	ND<0.0050	ND<0.0050	ND<0.0050	--	--	--	--
S-15-SW	7/8/1991	15	ND<1.0	--	ND<0.0050	ND<0.0050	ND<0.0050	ND<0.0050	--	--	--	--
S-15-NWC	7/8/1991	15	ND<1.0	--	ND<0.0050	ND<0.0050	ND<0.0050	ND<0.0050	--	--	--	--
S-15-WWC	7/8/1991	15	ND<1.0	--	ND<0.0050	ND<0.0050	ND<0.0050	ND<0.0050	--	--	--	--
S-15-NWF	7/8/1991	15	ND<1.0	--	ND<0.0050	ND<0.0050	ND<0.0050	ND<0.0050	--	--	--	--
S-9-NNW	7/8/1991	9	ND<1.0	--	ND<0.0050	ND<0.0050	ND<0.0050	ND<0.0050	--	--	--	--
S-8-NW	7/8/1991	8	ND<1.0	--	ND<0.0050	ND<0.0050	ND<0.0050	ND<0.0050	--	--	--	--
S-15-NW	7/8/1991	15	ND<1.0	--	ND<0.0050	ND<0.0050	ND<0.0050	ND<0.0050	--	--	--	--

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S-0709-NP1 (10')	7/9/1991	10	ND<1.0	--	<b>0.025</b>	<b>0.027</b>	<b>0.0060</b>	<b>0.024</b>	--	--	--	--
S-0709-NP2 (14')	7/9/1991	14	ND<1.0	--	ND<0.0050	ND<0.0050	ND<0.0050	ND<0.0050	--	--	--	--
S-0709-NP3 (10')	7/9/1991	10	ND<1.0	--	ND<0.0050	<b>0.0050</b>	ND<0.0050	<b>0.018</b>	--	--	--	--
S-0709-NP4 (15')	7/9/1991	15	ND<1.0	--	<b>0.0050</b>	<b>0.0050</b>	ND<0.0050	ND<0.0050	--	--	--	--
S-0709-NP5 (5')	7/9/1991	5	ND<1.0	--	<b>0.012</b>	<b>0.013</b>	ND<0.0050	<b>0.0080</b>	--	--	--	--
S-0709-NP6 (15')	7/9/1991	15	ND<1.0	--	<b>0.017</b>	<b>0.021</b>	<b>0.014</b>	<b>0.056</b>	--	--	--	--
S-0709-NP7 (3')	7/9/1991	3	ND<1.0	--	0.0060	<b>0.0060</b>	ND<0.0050	ND<0.0050	--	--	--	--
S-0709-NP8 (14')	7/9/1991	14	ND<1.0	--	ND<0.0050	ND<0.0050	ND<0.0050	ND<0.0050	--	--	--	--
S-0709-NP9 (9')	7/9/1991	9	ND<1.0	--	ND<0.0050	ND<0.0050	ND<0.0050	ND<0.0050	--	--	--	--
S-0709-NP10 (10')	7/9/1991	10	ND<1.0	--	<b>0.0090</b>	<b>0.0060</b>	ND<0.0050	ND<0.0050	--	--	--	--
S-0709-NP11 (8')	7/9/1991	8	ND<1.0	--	ND<0.0050	ND<0.0050	ND<0.0050	ND<0.0050	--	--	--	--
S-0709-NP12 (14')	7/9/1991	14	ND<1.0	--	ND<0.0050	ND<0.0050	ND<0.0050	ND<0.0050	--	--	--	--
S-0709-NP13 (2')	7/9/1991	2	ND<1.0	--	ND<0.0050	ND<0.0050	ND<0.0050	ND<0.0050	--	--	--	--
S-0709-NP14 (6')	7/9/1991	6	ND<1.0	--	ND<0.0050	ND<0.0050	<b>0.0050</b>	<b>0.0080</b>	--	--	--	--
S-0709-NP15 (5')	7/9/1991	5	ND<1.0	--	ND<0.0050	ND<0.0050	ND<0.0050	<b>0.0060</b>	--	--	--	--
S-0709-NP16 (16')	7/9/1991	16	ND<1.0	--	ND<0.0050	ND<0.0050	<b>0.0050</b>	<b>0.0080</b>	--	--	--	--
S-0709-NP17 (10')	7/9/1991	10	ND<1.0	--	ND<0.0050	ND<0.0050	<b>0.0050</b>	<b>0.0080</b>	--	--	--	--
S-0709-NP18 (11')	7/9/1991	11	ND<1.0	--	ND<0.0050	ND<0.0050	<b>0.0050</b>	<b>0.0080</b>	--	--	--	--

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S-21/2-PL1	7/19/1991	2.5	ND<1.0	--	ND<0.005	ND<0.005	ND<0.005	ND<0.005	--	--	--	--
S-21/2-PL2	7/19/1991	2.5	ND<1.0	--	ND<0.005	ND<0.005	ND<0.005	ND<0.005	--	--	--	--
S-1-PL3	7/19/1991	1	<b>1.7</b>	--	<b>0.005</b>	<b>0.02</b>	<b>0.016</b>	<b>0.12</b>	--	--	--	--
S-1-PL4	7/19/1991	1	<b>4,200</b>	--	<b>36</b>	<b>320</b>	<b>100</b>	<b>640</b>	--	--	--	--
S-1-PL5	7/19/1991	1	ND<1.0	--	ND<0.005	ND<0.005	ND<0.005	ND<0.005	--	--	--	--
S-1-PL6	7/19/1991	1	ND<1.0	--	ND<0.005	ND<0.005	ND<0.005	ND<0.005	--	--	--	--
S-1-PL7	7/19/1991	1	<b>11</b>	--	<b>0.10</b>	<b>0.37</b>	<b>0.16</b>	<b>1.2</b>	--	--	--	--
S-1-PL8	7/19/1991	1	<b>1,900</b>	--	<b>3.6</b>	<b>28</b>	<b>29</b>	<b>200</b>	--	--	--	--
S-1-PL9	7/19/1991	1	<b>110</b>	--	<b>0.2</b>	<b>0.78</b>	<b>0.36</b>	<b>3.1</b>	--	--	--	--
S-1-PL10	7/19/1991	1	<b>84</b>	--	<b>0.09</b>	<b>0.43</b>	<b>0.72</b>	<b>2.8</b>	--	--	--	--
S-21/2-PD1	7/19/1991	2.5	ND<1.0	--	ND<0.005	ND<0.005	ND<0.005	ND<0.005	--	--	--	--
S-21/2-PD2	7/19/1991	2.5	ND<1.0	--	ND<0.005	ND<0.005	ND<0.005	ND<0.005	--	--	--	--
S-1-PD3	7/19/1991	1	ND<1.0	--	ND<0.005	ND<0.005	ND<0.005	ND<0.005	--	--	--	--
S-1-PD4	7/19/1991	1	<b>330</b>	--	ND<0.005	ND<0.005	ND<0.005	<b>12</b>	--	--	--	--
S-1-PD5	7/19/1991	1	ND<1.0	--	ND<0.005	ND<0.005	ND<0.005	ND<0.005	--	--	--	--
S-1-PD6	7/19/1991	1	<b>87</b>	--	<b>0.13</b>	<b>0.28</b>	<b>0.48</b>	<b>3.8</b>	--	--	--	--
S-1-PD7	7/19/1991	1	<b>1,000</b>	--	<b>0.35</b>	<b>2.1</b>	<b>1.1</b>	<b>47</b>	--	--	--	--
S-1-PD8	7/19/1991	1	ND<1.0	--	ND<0.005	ND<0.005	ND<0.005	ND<0.005	--	--	--	--

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S-0722-1 (a-d)	7/22/1991	unk	78	--	ND<0.0050	ND<0.0050	ND<0.0050	ND<0.0050	--	--	--	--
S-0722-2 (a-d)	7/22/1991	unk	81	--	<b>0.05</b>	<b>0.1</b>	<b>0.05</b>	<b>0.34</b>	--	--	--	--
S-0723-3 (a-d)	7/23/1991	unk	130	--	<b>0.032</b>	<b>0.035</b>	<b>0.045</b>	<b>0.17</b>	--	--	--	--
S-0723-4 (a-d)	7/23/1991	unk	31	--	ND<0.0050	ND<0.0050	ND<0.0050	<b>0.054</b>	--	--	--	ND<0.05
S-0725-3 (a-d)	7/25/1991	unk	31	--	<b>0.0080</b>	<b>0.0080</b>	<b>0.011</b>	<b>0.049</b>	--	--	--	--
S-0725-3 (a-d)	7/25/1991	unk	47	--	ND<0.0050	<b>0.0070</b>	ND<0.0050	<b>0.010</b>	--	--	--	--
S-0725-3 (a-d)	7/25/1991	unk	49	--	<b>0.0080</b>	<b>0.018</b>	<b>0.029</b>	<b>0.10</b>	--	--	--	--
S-0725-3 (a-d)	7/25/1991	unk	65	--	<b>0.013</b>	<b>0.018</b>	<b>0.032</b>	<b>0.22</b>	--	--	--	--
S-11/2-PL4	8/9/1991	1.5	<b>4.1</b>	--	<b>0.21</b>	<b>0.04</b>	<b>0.15</b>	<b>0.12</b>	--	--	--	--
S-6-B8	Oct-91	6	ND<1.0	--	ND<0.0050	ND<0.0050	ND<0.0050	ND<0.0050	--	--	--	--
S-11-B8	Oct-91	11	<b>35</b>	--	<b>1.2</b>	<b>1.7</b>	<b>0.42</b>	<b>2.0</b>	--	--	--	--
S-16-B8	Oct-91	16	<b>3.0</b>	--	<b>0.45</b>	<b>0.13</b>	<b>0.11</b>	<b>0.47</b>	--	--	--	--
*S-30-B8	Oct-91	30	<b>240</b>	--	<b>3.6</b>	<b>5</b>	<b>4.1</b>	<b>16</b>	--	--	--	--
S-6-B9	Oct-91	6	<b>25</b>	--	<b>0.60</b>	<b>0.58</b>	<b>0.44</b>	<b>1.8</b>	--	--	--	--
S-101/2-B9	Oct-91	10.5	<b>13</b>	--	<b>0.74</b>	<b>0.72</b>	<b>0.18</b>	<b>0.95</b>	--	--	--	--
S-16-B9	Oct-91	16	ND<1.0	--	<b>0.015</b>	ND<0.0050	ND<0.0050	ND<0.0050	--	--	--	--
S-31-B9	Oct-91	31	ND<1.0	--	ND<0.0050	ND<0.0050	ND<0.0050	ND<0.0050	--	--	--	--
S-51/2-B10	Oct-91	5.5	ND<1.0	--	ND<0.0050	ND<0.0050	ND<0.0050	ND<0.0050	--	--	--	--
S-13-B10	Oct-91	13	<b>4.0</b>	--	<b>0.13</b>	<b>0.15</b>	<b>0.041</b>	<b>0.16</b>	--	--	--	--
S-201/2-B10	Oct-91	20.5	ND<1.0	--	ND<0.0050	ND<0.0050	ND<0.0050	ND<0.0050	--	--	--	--
S-301/2-B10	Oct-91	30.5	ND<1.0	--	ND<0.0050	ND<0.0050	ND<0.0050	ND<0.0050	--	--	--	--
S-6-B11	Oct-91	6	ND<1.0	<b>3.9</b>	<b>0.010</b>	ND<0.0050	ND<0.0050	ND<0.0050	--	--	--	<b>7.7</b>
S-11-B11	Oct-91	11	<b>110</b>	<b>71</b>	ND<0.0050	ND<0.0050	ND<0.0050	<b>0.27</b>	--	--	--	<b>5.8</b>
S-16-B11	Oct-91	16	ND<1.0	ND<1.0	ND<0.0050	ND<0.0050	ND<0.0050	ND<0.0050	--	--	--	<b>7.5</b>
S-21-B11	Oct-91	21	ND<1.0	ND<1.0	ND<0.0050	ND<0.0050	ND<0.0050	ND<0.0050	--	--	--	<b>7.2</b>

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S-41/2-B12	Aug-92	4.5	<b>10</b>	<b>45</b>	ND<0.0050	ND<0.0050	<b>0.0070</b>	<b>0.050</b>	--	--	--	ND<5.0
S-9-B12	Aug-92	9	<b>9.1</b>	<b>250</b>	ND<0.0050	ND<0.0050	<b>0.0060</b>	<b>0.082</b>	--	--	--	ND<5.0
S-141/2-B12	Aug-92	14.5	ND<1.0	ND<1.0	ND<0.0050	ND<0.0050	ND<0.0050	ND<0.0050	--	--	--	<b>7.4</b>
S-41/2-B13	Aug-92	4.5	ND<1.0	ND<1.0	ND<0.0050	ND<0.0050	ND<0.0050	ND<0.0050	--	--	--	ND<5.0
S-71/2-B13	Aug-92	7.5	ND<1.0	<b>1.1</b>	ND<0.0050	ND<0.0050	ND<0.0050	ND<0.0050	--	--	--	ND<5.0
S-171/2-B13	Aug-92	17.5	ND<1.0	ND<1.0	ND<0.0050	ND<0.0050	ND<0.0050	ND<0.0050	--	--	--	<b>5.6</b>
S-51/2-B14	Aug-92	5.5	<b>430</b>	--	<b>4.0</b>	<b>16</b>	<b>7.3</b>	<b>42</b>	--	--	--	--
S-101/2-B14	Aug-92	10.5	<b>1,300</b>	--	<b>20</b>	<b>82</b>	<b>31</b>	<b>170</b>	--	--	--	--
S-151/2-B14	Aug-92	15.5	ND<1.0	--	<b>0.012</b>	<b>0.034</b>	<b>0.011</b>	<b>0.055</b>	--	--	--	--
S-51/2-B15	Aug-92	5.5	<b>47</b>	--	<b>0.22</b>	<b>0.56</b>	<b>0.76</b>	<b>4.3</b>	--	--	--	--
S-10-B15	Aug-92	10	<b>310</b>	--	<b>3.8</b>	<b>15</b>	<b>7.1</b>	<b>37</b>	--	--	--	--
S-131/2-B15	Aug-92	13.5	<b>110</b>	--	<b>1.5</b>	<b>4.3</b>	<b>2.1</b>	<b>12</b>	--	--	--	--
S-41/2-B16	Aug-92	4.5	ND<1.0	--	ND<0.0050	ND<0.0050	ND<0.0050	ND<0.0050	--	--	--	--
S-10-B16	Aug-92	10	<b>4,300</b>	--	<b>21</b>	<b>110</b>	<b>51</b>	<b>580</b>	--	--	--	--
S-141/2-B16	Aug-92	14.5	ND<1.0	--	<b>0.010</b>	<b>0.032</b>	<b>0.018</b>	<b>0.18</b>	--	--	--	--
S-51/2-B17	Aug-92	5.5	<b>1.4</b>	--	<b>0.045</b>	<b>0.0080</b>	ND<0.0050	<b>0.028</b>	--	--	--	--
S-101/2-B17	Aug-92	10.5	<b>1,100</b>	--	<b>16</b>	<b>71</b>	<b>27</b>	<b>140</b>	--	--	--	--
S-151/2-B17	Aug-92	15.5	<b>27</b>	--	<b>2.1</b>	<b>0.40</b>	<b>0.75</b>	<b>1.3</b>	--	--	--	--
S-51/2-B18	Aug-92	5.5	ND<1.0	--	ND<0.0050	ND<0.0050	ND<0.0050	ND<0.0050	--	--	--	--
S-101/2-B18	Aug-92	10.5	<b>380</b>	--	<b>4.8</b>	<b>21</b>	<b>8.7</b>	<b>46</b>	--	--	--	--
S-151/2-B18	Aug-92	15.5	<b>2.6</b>	--	<b>0.78</b>	<b>0.48</b>	<b>0.059</b>	<b>0.29</b>	--	--	--	--
S-51/2-B19	Aug-92	5.5	ND<1.0	--	<b>0.017</b>	<b>0.0090</b>	ND<0.0050	ND<0.0050	--	--	--	--
S-101/2-B19	Aug-92	10.5	ND<1.0	--	ND<0.0050	ND<0.0050	ND<0.0050	ND<0.0050	--	--	--	--
S-151/2-B19	Aug-92	15.5	ND<1.0	--	<b>0.15</b>	<b>0.012</b>	<b>0.029</b>	<b>0.032</b>	--	--	--	--
S-0821-SPAD	Aug-92	Soil Pile	550	--	<b>2.6</b>	<b>9.5</b>	<b>5.4</b>	<b>47</b>	--	--	--	--



**Table 2**  
Historical Soil Analytical Data

ARCO Service Station No. 2035  
1001 San Pablo Avenue  
Albany, California

Sample ID	Date Sampled	Depth (feet bgs)	TPHg (mg/kg)	TPHd (mg/kg)	B (mg/kg)	T (mg/kg)	E (mg/kg)	X (mg/kg)	1,2-DCA (mg/kg)	MTBE (mg/kg)	TBA (mg/kg)	Lead (mg/kg)
S-51/2-B20	Nov-92	5.5	ND<1.0	--	ND<0.0050	ND<0.0050	ND<0.0050	ND<0.0050	--	--	--	--
S-91/2-B20	Nov-92	9.5	ND<1.0	--	ND<0.0050	ND<0.0050	ND<0.0050	ND<0.0050	--	--	--	--
S-28-B20	Nov-92	28	ND<1.0	--	ND<0.0050	ND<0.0050	ND<0.0050	ND<0.0050	--	--	--	--
S-51/2-B21	Nov-92	5.5	ND<1.0	--	ND<0.0050	ND<0.0050	ND<0.0050	ND<0.0050	--	--	--	--
S-101/2-B21	Nov-92	10.5	ND<1.0	--	ND<0.0050	ND<0.0050	ND<0.0050	ND<0.0050	--	--	--	--
S-26-B21	Nov-92	26	ND<1.0	--	ND<0.0050	ND<0.0050	ND<0.0050	ND<0.0050	--	--	--	--
S-51/2-B22	Nov-92	5.5	ND<1.0	--	ND<0.0050	ND<0.0050	ND<0.0050	ND<0.0050	--	--	--	--
S-111/2-B22	Nov-92	11.5	ND<1.0	--	ND<0.0050	ND<0.0050	ND<0.0050	ND<0.0050	--	--	--	--
S-26-B22	Nov-92	26	ND<1.0	--	ND<0.0050	ND<0.0050	ND<0.0050	ND<0.0050	--	--	--	--
S-1125/SPA-D	Nov-92	Soil Pile	ND<1.0	--	ND<0.0050	ND<0.0050	ND<0.0050	ND<0.0050	--	--	--	--
S-5-B23	Jun-93	5	<b>20</b>	--	<b>0.22</b>	<b>0.45</b>	<b>0.20</b>	<b>0.76</b>	--	--	--	--
S-10-B23	Jun-93	10	<b>490</b>	--	<b>4.9</b>	<b>19</b>	<b>8.3</b>	<b>50</b>	--	--	--	--
S-15-B23	Jun-93	15	ND<1.0	--	<b>0.33</b>	<b>0.012</b>	<b>0.014</b>	<b>0.014</b>	--	--	--	--
S-6-B24	Jun-93	6	ND<1.0	--	ND<0.0050	ND<0.0050	ND<0.0050	ND<0.0050	--	--	--	--
S-101/2-B24	Jun-93	10.5	<b>310</b>	--	<b>3.8</b>	<b>15</b>	<b>6.6</b>	<b>38</b>	--	--	--	--
S-141/2-B24	Jun-93	14.5	ND<1.0	--	<b>0.014</b>	ND<0.0050	ND<0.0050	ND<0.0050	--	--	--	--
S-51/2-B25	Jun-93	5.5	<b>630</b>	--	<b>1.7</b>	<b>0.40</b>	<b>13</b>	<b>36</b>	--	--	--	--
S-91/2-B25	Jun-93	9.5	ND<1.0	--	ND<0.0050	ND<0.0050	ND<0.0050	ND<0.0050	--	--	--	--
S-15-B25	Jun-93	15	ND<1.0	--	<b>0.017</b>	<b>0.022</b>	ND<0.0050	<b>0.014</b>	--	--	--	--
S-5-B26	Jun-93	5	<b>1,600</b>	--	<b>7.7</b>	<b>45</b>	<b>28</b>	<b>170</b>	--	--	--	--
S-15-B26	Jun-93	15	ND<1.0	--	<b>0.18</b>	<b>0.019</b>	<b>0.015</b>	<b>0.047</b>	--	--	--	--
S-31-B26	Jun-93	31	ND<1.0	--	ND<0.0050	ND<0.0050	ND<0.0050	ND<0.0050	--	--	--	--
S-71/2-B27	Jun-93	7.5	<b>690</b>	--	<b>7.4</b>	<b>25</b>	<b>13</b>	<b>64</b>	--	--	--	--
S-12-B27	Jun-93	12	<b>660</b>	--	<b>8.8</b>	<b>33</b>	<b>14</b>	<b>76</b>	--	--	--	--
S-161/2-B27	Jun-93	16.5	ND<1.0	--	<b>0.061</b>	<b>0.040</b>	<b>0.0090</b>	<b>0.040</b>	--	--	--	--
S-191/2-B27	Jun-93	19.5	ND<1.0	--	ND<0.0050	ND<0.0050	ND<0.0050	ND<0.0050	--	--	--	--
S-31-B27	Jun-93	31	ND<1.0	--	ND<0.0050	ND<0.0050	ND<0.0050	ND<0.0050	--	--	--	--

**Table 2**  
Historical Soil Analytical Data

ARCO Service Station No. 2035  
1001 San Pablo Avenue  
Albany, California

Sample ID	Date Sampled	Depth (feet bgs)	TPHg (mg/kg)	TPHd (mg/kg)	B (mg/kg)	T (mg/kg)	E (mg/kg)	X (mg/kg)	1,2-DCA (mg/kg)	MTBE (mg/kg)	TBA (mg/kg)	Lead (mg/kg)
MW-7 8'	3/26/09	8	ND<0.50	--	ND<0.0010	ND<0.0010	ND<0.0010	ND<0.0010	ND<0.0010	ND<0.0010	ND<0.010	--
MW-7 13'	3/26/09	13	<b>200</b>	--	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<1.0	--
MW-7 14'	3/26/09	14	<b>860</b>	--	ND<0.10	ND<0.10	<b>1.9</b>	<b>0.10</b>	ND<0.10	ND<0.10	ND<1.0	--
MW-7 15'	3/26/09	15	<b>5.2</b>	--	ND<0.0010	ND<0.0010	<b>0.024</b>	<b>0.020</b>	ND<0.0010	ND<0.0010	ND<0.010	--
MW-8 11'	3/26/09	11	<b>4.1</b>	--	<b>0.51</b>	ND<0.10	<b>0.29</b>	<b>1.2</b>	ND<0.10	ND<0.10	ND<1.0	--
MW-8 13'	3/26/09	13	<b>74</b>	--	<b>1.8</b>	<b>1.7</b>	<b>4.3</b>	<b>20</b>	ND<0.10	ND<0.10	ND<1.0	--
MW-8 16'	3/26/09	16	ND<0.50	--	ND<0.0010	ND<0.0010	ND<0.0010	ND<0.0010	<b>0.0021</b>	<b>0.0013</b>	<b>0.068</b>	--
MW-8 19'	3/26/09	19	ND<0.50	--	<b>0.0011</b>	ND<0.0010	ND<0.0010	ND<0.0010	ND<0.0010	<b>0.0074</b>	<b>0.021</b>	--
MW-9 8'	3/26/09	8	<b>11</b>	--	ND<0.0010	ND<0.0010	ND<0.0010	ND<0.0010	ND<0.0010	ND<0.0010	ND<0.010	--
MW-9 9'	3/26/09	9	<b>110</b>	--	ND<0.0010	<b>0.0013</b>	ND<0.0010	<b>0.0010</b>	ND<0.0010	ND<0.0010	ND<0.010	--
MW-9 11'	3/26/09	11	<b>61</b>	--	ND<0.0010	ND<0.0010	ND<0.0010	ND<0.0010	ND<0.0010	ND<0.0010	ND<0.010	--
MW-9 13'	3/26/09	13	ND<0.50	--	ND<0.0010	ND<0.0010	ND<0.0010	ND<0.0010	ND<0.0010	ND<0.0010	ND<0.010	--

**Table 2**  
Historical Soil Analytical Data

ARCO Service Station No. 2035  
1001 San Pablo Avenue  
Albany, California

Sample ID	Date Sampled	Depth (feet bgs)	TPHg (mg/kg)	TPHd (mg/kg)	B (mg/kg)	T (mg/kg)	E (mg/kg)	X (mg/kg)	1,2-DCA (mg/kg)	MTBE (mg/kg)	TBA (mg/kg)	Lead (mg/kg)
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ABBREVIATIONS:

<b>Bold</b>	=	Detection above laboratory reporting limits
TPHg	=	Total petroleum hydrocarbons as gasoline by EPA Method 5030/8015/8020
TPHd	=	Total petroleum hydrocarbons as diesel by EPA Method 3550/8015
B	=	Benzene
T	=	Toluene
E	=	Ethylbenzene
X	=	Total xylenes
MTBE	=	Methyl tert-butyl ether by EPA Method 8020/8260
TBA	=	Tert-butyl alcohol
1,2-DCA	=	1,2-Dichloroethane
feet bgs	=	Feet below ground surface
mg/kg	=	Milligrams per kilogram (parts per million [ppm])
ND<	=	Not detected at or above reporting limit
ND	=	Detection limits varied for different compounds
--	=	Constituent not analyzed
*	=	Sample collected from the saturated zone, analyzed for site
( )	=	Results measured by EPA Method 8240
unk	=	Unknown

Background information, including but not limited to previous field measurements, analytical results, Site plans, and other data have been obtained from previous consultants, and/or third parties, in the preparation of this report. Closure Solutions has relied on this information as furnished. Closure Solutions is not responsible for, nor has it confirmed the accuracy of data collected or generated by others.

**Table 3**  
Additional Soil Analytical Data

ARCO Service Station No. 2035  
1001 San Pablo Avenue  
Albany, California

Sample ID	Date Sampled	Depth (feet bgs)	TOG (mg/kg)	VOCs (mg/kg)	SVOCs (mg/kg)	Cadmium (mg/kg)	Chromium (mg/kg)	Nickel (mg/kg)	Zinc (mg/kg)	PCBs (mg/kg)
S-13-T4S	7/3/1991	13	ND<30	ND	--	--	--	--	--	--
S-6-B11	Oct-91	6	<b>80</b>	ND	--	ND<0.50	<b>49</b>	<b>97</b>	<b>41</b>	--
S-11-B11	Oct-91	11	<b>43</b>	ND	--	ND<0.50	<b>80</b>	<b>77</b>	<b>69</b>	--
S-16-B11	Oct-91	16	<b>57</b>	ND	--	ND<0.50	<b>33</b>	<b>25</b>	<b>45</b>	--
S-21-B11	Oct-91	21	<b>74</b>	ND	--	ND<0.50	<b>39</b>	<b>32</b>	<b>56</b>	--
S-41/2-B12	Aug-92	4.5	<b>250</b>	ND	ND	ND<0.50	<b>59</b>	<b>58</b>	<b>40</b>	ND
S-9-B12	Aug-92	9	<b>100</b>	ND	ND	ND<0.50	<b>42</b>	<b>46</b>	<b>37</b>	ND
S-141/2-B12	Aug-92	14.5	ND<50	ND	ND	ND<0.50	<b>49</b>	<b>49</b>	<b>69</b>	ND
S-41/2-B13	Aug-92	4.5	ND<50	ND	ND	ND<0.50	<b>68</b>	<b>65</b>	<b>43</b>	ND
S-71/2-B13	Aug-92	7.5	<b>1,800</b>	ND	ND	ND<0.50	<b>51</b>	<b>81</b>	<b>46</b>	ND
S-171/2-B13	Aug-92	17.5	ND<50	ND	ND	ND<0.50	<b>43</b>	<b>51</b>	<b>69</b>	ND

**Table 3**  
Additional Soil Analytical Data

ARCO Service Station No. 2035  
1001 San Pablo Avenue  
Albany, California

Sample ID	Date Sampled	Depth (feet bgs)	TOG (mg/kg)	VOCs (mg/kg)	SVOCs (mg/kg)	Cadmium (mg/kg)	Chromium (mg/kg)	Nickel (mg/kg)	Zinc (mg/kg)	PCBs (mg/kg)
-----------	--------------	------------------	-------------	--------------	---------------	-----------------	------------------	----------------	--------------	--------------

ABBREVIATIONS:

<b>Bold</b>	=	Detection above laboratory reporting limits
TOG	=	Total Oil and Grease
VOCs	=	Volatile Organic Coumpounds
SVOCs	=	Semi-Volatile Organic Compounds
PCBs	=	Polychloro-biphenols
feet bgs	=	Feet below ground surface
mg/kg	=	Milligrams per kilogram (parts per million [ppm])
ND<	=	Not detected at or above various reporting limits
ND	=	Detection limits varied for different compunds
--	=	Constituent not analyzed

LIMITATIONS:

Background information, including but not limited to previous field measurements, analytical results, Site plans, and other data have been obtained from previous consultants, and/or third parties, in the preparation of this report. Closure Solutions has relied on this information as furnished. Closure Solutions is not responsible for, nor has it confirmed the accuracy of data collected or generated by others.

## **ATTACHMENT A**

### **Figures**



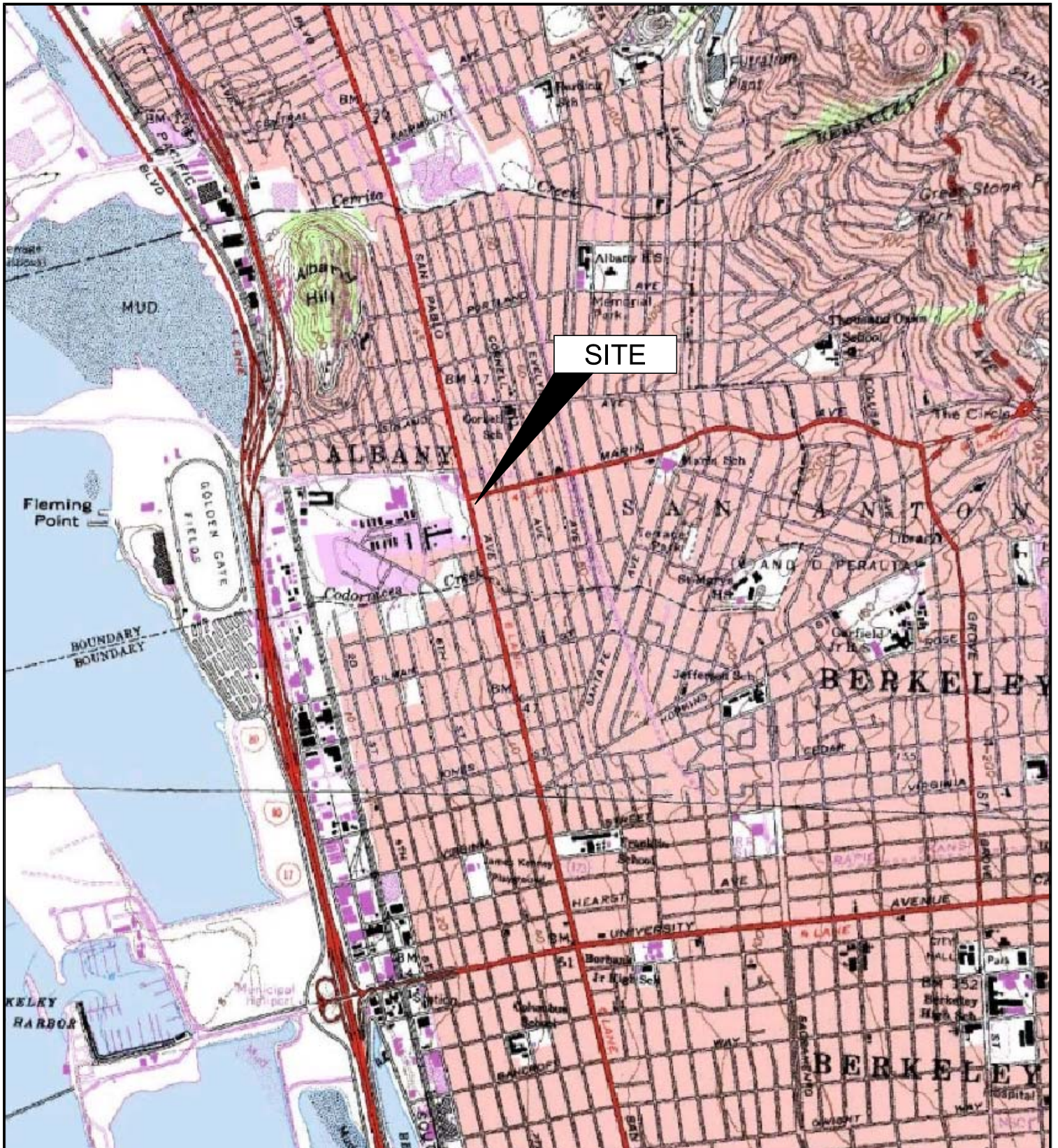
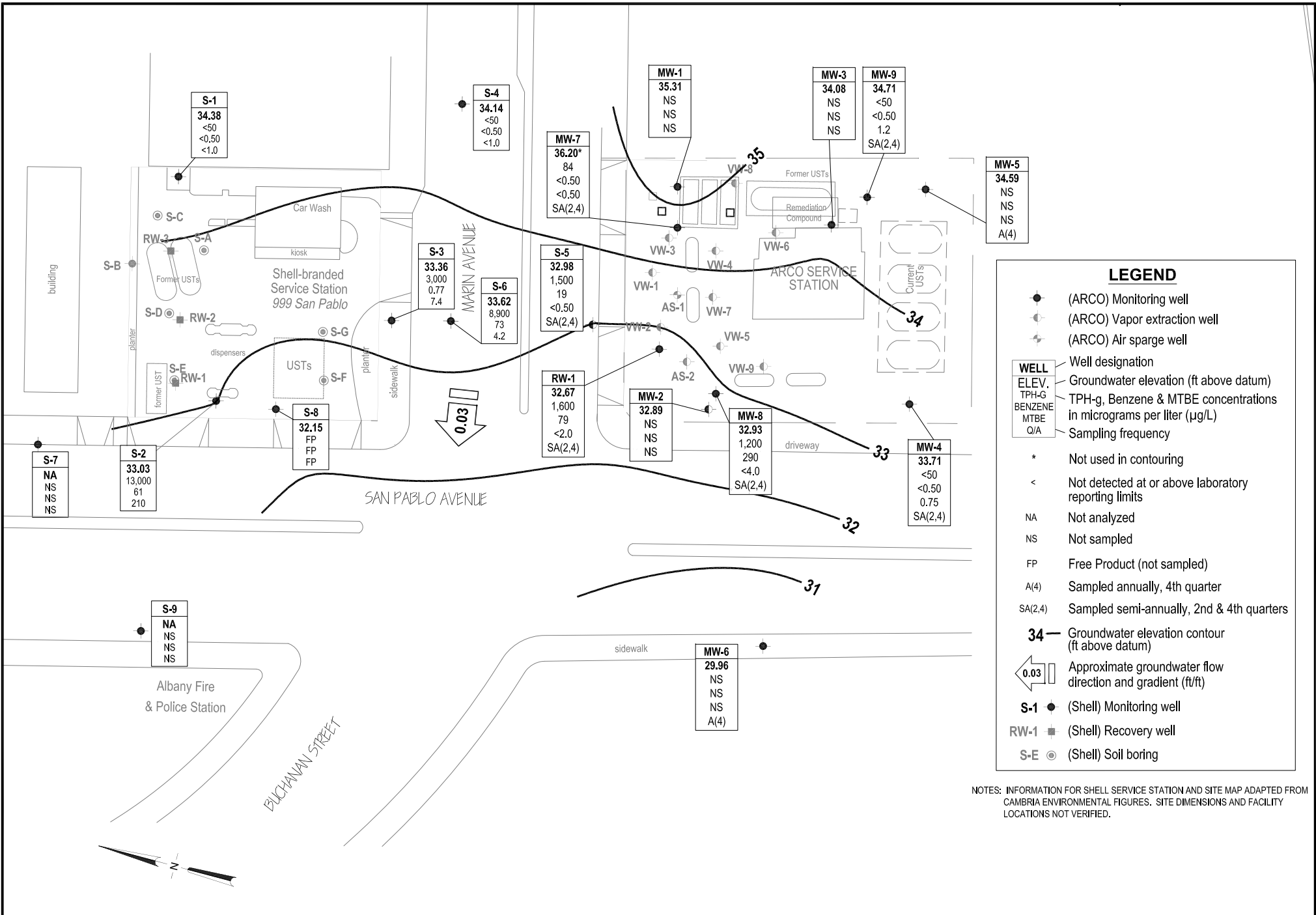


IMAGE SOURCE: USGS



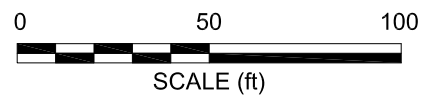


### LEGEND

- (ARCO) Monitoring well
- ◀ (ARCO) Vapor extraction well
- ⚡ (ARCO) Air sparge well

WELL	ELEV.	TPH-G	BENZENE	MTBE	Q/A
	Well designation				
	Groundwater elevation (ft above datum)				
	TPH-g, Benzene & MTBE concentrations in micrograms per liter (µg/L)				
	Sampling frequency				
*	Not used in contouring				
<	Not detected at or above laboratory reporting limits				
NA	Not analyzed				
NS	Not sampled				
FP	Free Product (not sampled)				
A(4)	Sampled annually, 4th quarter				
SA(2,4)	Sampled semi-annually, 2nd & 4th quarters				
34	Groundwater elevation contour (ft above datum)				
◀ 0.03	Approximate groundwater flow direction and gradient (ft/ft)				
S-1 ●	(Shell) Monitoring well				
RW-1 ■	(Shell) Recovery well				
S-E ○	(Shell) Soil boring				

NOTES: INFORMATION FOR SHELL SERVICE STATION AND SITE MAP ADAPTED FROM CAMBRIA ENVIRONMENTAL FIGURES. SITE DIMENSIONS AND FACILITY LOCATIONS NOT VERIFIED.

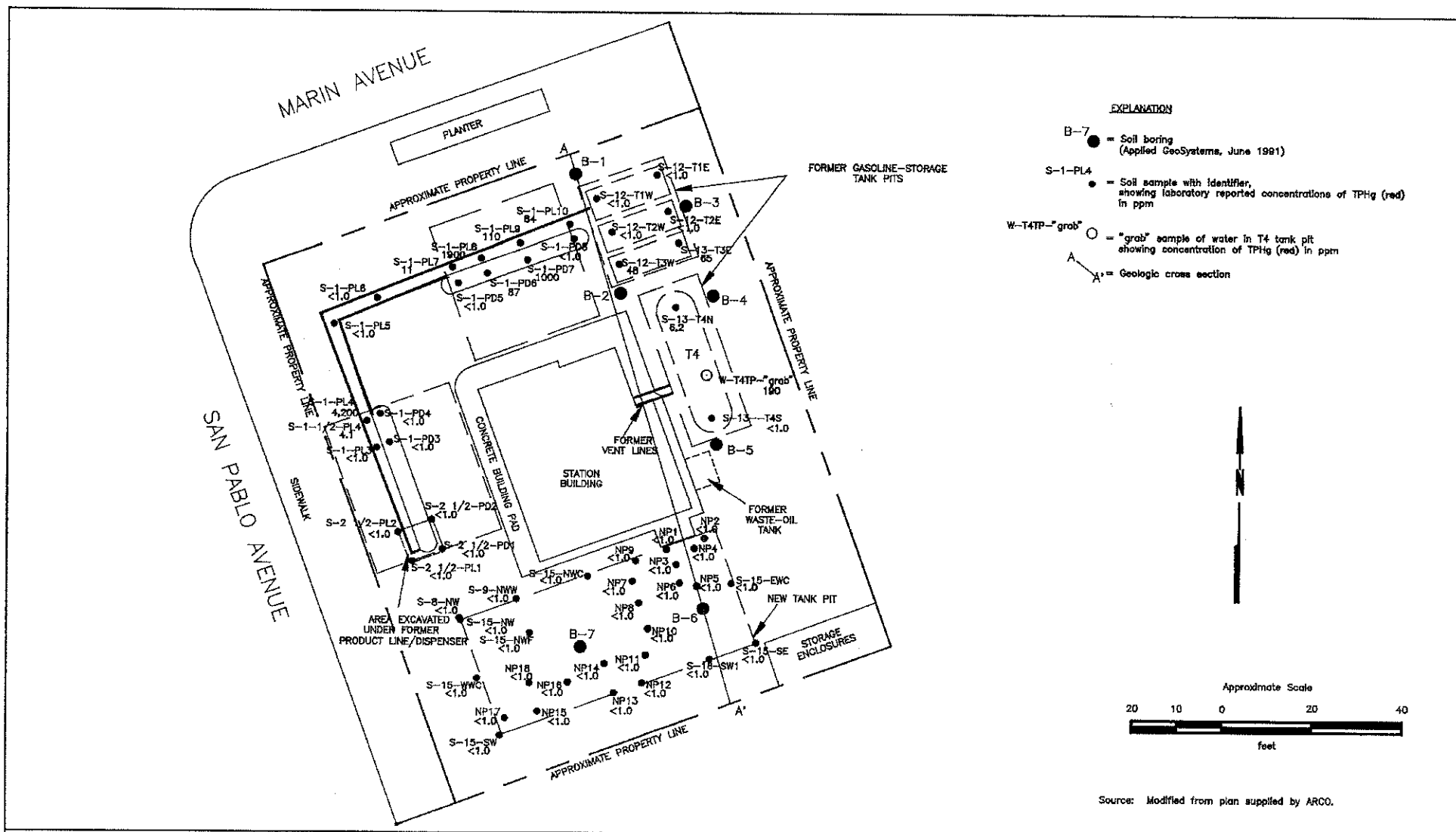


**BROADBENT & ASSOCIATES, INC.**  
 ENGINEERING, WATER RESOURCES & ENVIRONMENTAL  
 1324 Mangrove Ave., Suite 212 Chico 95926  
 Project No.: 06-88-610 Date: 7/11/2011

ARCO Service Station #2035  
 1001 San Pablo Avenue  
 Albany, California

Groundwater Elevation Contours  
 and Analytical Summary Map  
 11 May 2011



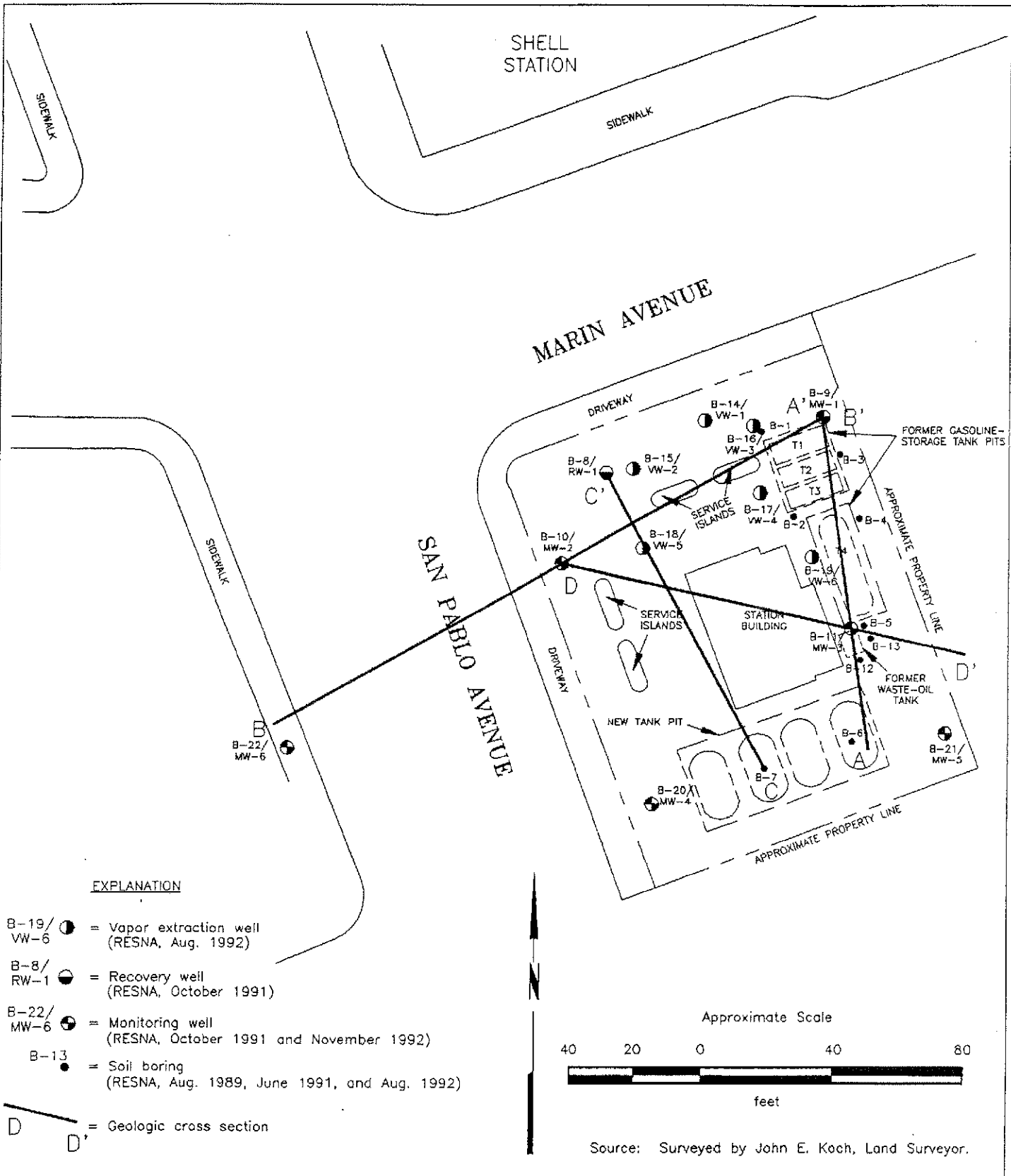


PROJECT 69036.03

SOIL SAMPLING  
ARCO Station 2035  
1001 San Pablo Avenue  
Albany, California

PLATE

3



**EXPLANATION**

- B-19/  
VW-6 = Vapor extraction well  
(RESNA, Aug. 1992)
- B-8/  
RW-1 = Recovery well  
(RESNA, October 1991)
- B-22/  
MW-6 = Monitoring well  
(RESNA, October 1991 and November 1992)
- B-13 = Soil boring  
(RESNA, Aug. 1989, June 1991, and Aug. 1992)
- D-D' = Geologic cross section

**RESNA**  
Working to Restore Nature

**PROJECT 69036.07**

Drawn: 3/5/J  
690367SP

**GENERALIZED SITE PLAN  
ARCO Station 2035  
1001 San Pablo Avenue  
Albany, California**













**PLATE  
3**

## **ATTACHMENT B**

### **Soil Boring Logs and Well Construction Details**

# UNIFIED SOIL CLASSIFICATION SYSTEM

MAJOR DIMENSIONS	LTR	DESCRIPTION	MAJOR DIMENSIONS	LTR	DESCRIPTION			
Coarse-grained soils	Gravel and gravelly soils	GW	Well-graded gravels of gravel-sand mixtures, little or no fines	Fine-grained soils	Silt and clays LL < 50	ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity	
		GP	Poorly-graded gravels or gravel-sand mixtures, little or no fines			CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays	
		GM	Silty gravels, gravel-sand-silt mixtures			OL	Organic silts and organic silt-clays of low plasticity	
		GC	Clayey gravels, gravel-sand-clay mixtures			MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils. Elastic silts	
	Sand and sandy soils	SW	Well-graded sand of gravelly sands, little or no fines		Silt and clays LL > 50	CH	Inorganic clays of high plasticity, fat clays	
		SP	Poorly-graded sands or gravelly sands, little or no fines			OH	Organic clays of medium to high plasticity, organic silts	
		SM	Silty sands, sand-silt mixtures			Highly organic soils	PT	Peat and other highly organic soils
		SC	Clayey sands, sand-clay mixtures					

- |   |  |   |                          |
|---|--|---|--------------------------|
|    | Depth through which sampler is driven  |    | Sand pack                |
|  | Relatively undisturbed sample          |  | Bentonite annular seal   |
|  | No sample recovered                    |  | Neat cement annular seal |
|  | Static water level observed in well    |  | Caved native soil        |
|  | Initial water level observed in boring |  | Blank PVC                |
|  |  |  | Machine-slotted PVC      |
| S-10  | Sample number                          | P.I.D.  | Photoionization detector |

BLOWS REPRESENT THE NUMBER OF BLOWS OF A 140-POUND HAMMER FALLING 30 INCHES TO DRIVE THE SAMPLER THROUGH EACH 6 INCHES OF AN 18-INCH PENETRATION.

DASHED LINES SEPARATING UNITS ON THE LOG REPRESENT APPROXIMATE BOUNDARIES ONLY. ACTUAL BOUNDARIES MAY BE GRADUAL LOGS REPRESENT SUBSURFACE CONDITIONS AT THE BORING LOCATION AT THE TIME OF DRILLING ONLY.



**UNIFIED SOIL CLASSIFICATION SYSTEM  
AND SYMBOL KEY**  
ARCO Service Station No. 2035  
Marin and San Pablo Avenues  
Albany, California

**PLATE  
P - 3**

**PROJECT NO. 69036-1**

**Total depth of boring:** 20 feet    **Diameter of boring:** 8 inches    **Date drilled:** 8-9-89  
**Casing diameter:** N/A    **Length:** N/A    **Slot size:** N/A  
**Screen diameter:** N/A    **Length:** N/A    **Material type:** N/A  
**Drilling Company:** Exploration Geoservices    **Drillers:** Mike & Kurt  
**Method Used:** Hollow-Stem Auger    **Field Geologist:** Steve Bittman

**Signature of Registered Professional:** \_\_\_\_\_  
**Registration No.:** \_\_\_\_\_    **State:** CA

Depth	Sample No.	Blows	P.L.D.	USCS Code	Description	Well Const.
0					Asphalt (6 inches) over baserock (6 inches).	▽▽▽▽
2	S-2	12 21 21	20	CH	Silty clay with occasional sand, brown, black and orange mottled, damp, hard, high plasticity, noticeable odor.	▽▽▽▽
4	S-5	16 35 50	30	CL	Gravelly clay with pebbles, brown, damp, hard, low plasticity, noticeable odor.	▽▽▽▽
8				GW	Sandy gravel with clay gravel, brown, moist, very dense, obvious odor.	▽▽▽▽
10	S-10	21 35 42	400			▽▽▽▽
12	S-11.5	22 34 47	50			▽▽▽▽
14	S-13	24 38 50	2	CH	Silty clay, slightly sand, light gray, orange and brown mottled, damp, hard, high plasticity, noticeable odor.	▽▽▽▽
16	S-15	12 16 21	0		Interbed with orange brown sandy silt, moist, hard, high plasticity.	▽▽▽▽
18				GM	Silty gravel with pebbles, orange-brown, wet, very dense, noticeable odor.	▽▽▽▽
20	S-19.5	25 50	12			▽▽▽▽
Total Depth = 20 feet.						



**PROJECT NO. 69036-1**

**LOG OF BORING B - 1**

**ARCO Service Station No. 2035**  
**Marin and San Pablo Avenues**  
**Albany, California**

**PLATE**

**P - 4**

**Total depth of boring:** 20-1/2 feet **Diameter of boring:** 8 inches **Date drilled:** 8-9-89  
**Casing diameter:** N/A **Length:** N/A **Slot size:** N/A  
**Screen diameter:** N/A **Length:** N/A **Material type:** N/A  
**Drilling Company:** Exploration Geoservices **Driller:** Mike & Kurt  
**Method Used:** Hollow-Stem Auger **Field Geologist:** Steve Bittman  
**Signature of Registered Professional:** \_\_\_\_\_  
**Registration No.:** \_\_\_\_\_ **State:** CA

Depth	Sample No.	Blows	P.L.D.	USCS Code	Description	Well Const.
0					Asphalt (6 inches) over baserack (6 inches).	
2	S-2	8 15 23	2	CH	Silty clay, brown, blue and green mottled, moist, hard, high plasticity, noticeable odor.	
4	S-5	10 25 36	175	CL	Gravelly clay with clayey sand interbed, brown, black mottled, damp, very dense, noticeable odor.	
10	S-10	15 36 40	450	GW	Sandy gravel with clay, brown and gray, moist, very dense, obvious odor.	
14	S-14.5	25 50	25	CL	Sandy clay with silty gravel, gray, brown mottled, damp, hard, low plasticity, noticeable odor.	
18				▽ GW		
20	S-20	27 50	5		Silty gravel with sand, brown and gray, wet, very dense, noticeable odor.	
Total Depth = 20-1/2 feet.						



**PROJECT NO. 69036-1**

**LOG OF BORING B - 2**  
**ARCO Service Station No. 2036**  
**Marin and San Pablo Avenues**  
**Albany, California**

**PLATE**  
**P - 5**

Total depth of boring: 20-1/2 feet Diameter of boring: 8 inches Date drilled: 8-9-89

Casing diameter: N/A Length: N/A Slot size: N/A

Screen diameter: N/A Length: N/A Material type: N/A

Drilling Company: Exploration Geoservices Driller: Mike & Kurt

Method Used: Hollow-Stem Auger Field Geologist: Steve Bittman

Signature of Registered Professional: \_\_\_\_\_

Registration No.: \_\_\_\_\_ State: CA

Depth	Sample No.	Blows	P.L.D.	USCS Code	Description	Well Const.
0					Asphalt ( 6 inches) over baserock (6 inches).	
2	S-2	9 15 18	8	CH	Silty clay with occasional small gravel, brown, gray mottled, damp, high plasticity, very stiff, noticeable odor.	
4		12 19		CL	Gravelly clay, brown, black mottled, damp, low plasticity, very stiff, noticeable odor.	
6	S-5	23	25			
8				SC	Clayey sand with gravel, gray, brown mottled, very dense, obvious odor.	
10	S-10	10 15 45	480			
14	S-14.5	44 50	75	CL	Sandy clay, brown, gray mottled, damp, hard, medium plasticity, noticeable odor.	
16				▽		
18				GM	Silty gravel, brown, wet, very dense.	
20	S-20	35 50	.3			
					Total Depth = 20-1/2 feet.	



PROJECT NO. 69036-1

**LOG OF BORING B - 3**  
**ARCO Service Station No. 2035**  
**Marin and San Pablo Avenues**  
**Albany, California**

PLATE  
**P - 6**

**Total depth of boring:** 19-1/2 feet **Diameter of boring:** 8 inches **Date drilled:** 8-9-89  
**Casing diameter:** N/A **Length:** N/A **Slot size:** N/A  
**Screen diameter:** N/A **Length:** N/A **Material type:** N/A  
**Drilling Company:** Exploration Geoservices **Drillers:** Mike & Kurt  
**Method Used:** Hollow-Stem Auger **Field Geologist:** Steve Bittman  
**Signature of Registered Professional:** \_\_\_\_\_  
**Registration No.:** \_\_\_\_\_ **State:** CA

Depth	Sample No.	Blows	P.L.D.	USCS Code	Description	Well Const.
0					Asphalt ( 6 inches) over baserock ( 6 inches).	
2	S-2	5 10 12	40	CH	Silty clay, gray, damp, high plasticity, very stiff, noticeable odor.	
4	S-5	10 26 8	100	CL	Gravelly clay, brown, damp, hard, medium plasticity, noticeable odor.	
8	S-10	11 27 39	540			
14	S-15	25 45 50	511	SM	Silty sand with gravel, brown and gray, damp, hard, low plasticity, obvious odor.	
18	S-19	50	1	SW	Gravelly sand with silt, brown, wet, very dense.	
20					Total Depth = 19-1/2 feet.	



**PROJECT NO. 69036-1**

**LOG OF BORING B - 4**  
**ARCO Service Station No. 2035**  
**Marin and San Pablo Avenues**  
**Albany, California**

**PLATE**  
**P - 7**



Total depth of boring: 20-1/2 feet Diameter of boring: 8 inches Date drilled: 8-9-89

Casing diameter: N/A Length: N/A Slot size: N/A

Screen diameter: N/A Length: N/A Material type: N/A

Drilling Company: Exploration Geoservices Driller: Mike & Kurt

Method Used: Hollow-Stem Auger Field Geologist: Steve Bittman

Signature of Registered Professional: \_\_\_\_\_

Registration No.: \_\_\_\_\_ State: CA

Depth	Sample No.	Blows	P.L.D.	USCS Code	Description	Well Const.
0					Asphalt (6 inches) over baserock (6 inches).	
2	S-2	8 12 15	1	CH	Silty clay with some sand, gray-brown, moist, high plasticity, very stiff, noticeable odor.	▽▽▽▽
4	S-5	13 45 50	15	CL	Gravelly clay with sand, yellow brown, damp, hard, low plasticity, noticeable odor.	▽▽▽▽
10	S-9.5	30 50	5	GW	Sandy gravel, clayey, yellow brown, moist, very dense, noticeable odor.	▽▽▽▽
14	S-15	36 36 43	0	SC	Clayey sand with gravel, yellow brown, damp, very dense.	▽▽▽▽
18						▽▽▽▽
20	S-20	30 40 50	0	CH	Silty clay, gray and brown, moist, hard, high plasticity.	▽▽▽▽
Total Depth = 20-1/2 feet.						



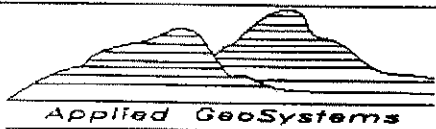
PROJECT NO. **69036-1**

**LOG OF BORING B - 5**  
**ARCO Service Station No. 2035**  
**Marin and San Pablo Avenues**  
**Albany, California**

**PLATE**  
**P - 8**

Depth of boring: 18 feet Diameter of boring: 8 inches Date drilled: 6-25-91  
 Well depth: NA Material type: NA Casing diameter: NA  
 Screen interval: NA Slot size: NA  
 Drilling Company: Exceltech Driller: Gene & Richard  
 Method Used: Hollow-Stem Auger Field Geologist: Joel Coffman  
 Signature of Registered Professional: \_\_\_\_\_  
 Registration No.: \_\_\_\_\_ State: \_\_\_\_\_

Depth	Sample No.	Blows	P.I.D.	USCS Code	Description	Well Const.
0					Asphalt.	
				SM	Silty sand, brown, dry, loose: fill.	▽▽▽▽
2				CL	Sandy clay, green-brown, dry to damp, medium plasticity soft.	▽▽▽▽
4						▽▽▽▽
6	S-5.5	14 23 30	0		Brown, low plasticity, stiff.	▽▽▽▽
8						▽▽▽▽
10	S-10.5	11 12 22	0		Color change to green-brown.	▽▽▽▽
12						▽▽▽▽
14						▽▽▽▽
16	S-15.5	12 15 33 30	0			▽▽▽▽
18	S-17	48 50	0	SC ▽	Clayey sand, brown, moist, medium dense. Wet.	▽▽▽▽
					Total Depth = 18 feet.	
20						



LOG OF BORING B-6  
 ARCO Station 2035  
 1001 San Pablo Avenue  
 Albany, California

PLATE  
 B2

PROJECT: 69036.03

Depth of boring: 19-1/2 feet Diameter of boring: 8 inches Date drilled: 6-25-91  
 Well depth: NA Material type: NA Casing diameter: NA  
 Screen interval: NA Slot size: NA  
 Drilling Company: Exceltech Driller: Gene & Richard  
 Method Used: Hollow-Stem Auger Field Geologist: Joel Coffman

Signature of Registered Professional: \_\_\_\_\_  
 Registration No.: \_\_\_\_\_ State: \_\_\_\_\_

Depth	Sample No.	Blows	P.I.D.	USCS Code	Description	Well Const.
0					Asphalt.	
				SM	Silty sand, brown, dry, loose: fill.	▽▽▽▽
2				CL	Sandy clay, dark brown, dry, medium plasticity, medium plasticity, soft.	▽▽▽▽
4					Old concrete slab, possible part of old foundation.	▽▽▽▽
	S-5.5	30	0	CL	Sandy clay, brown, dry to damp, low plasticity, very stiff.	▽▽▽▽
6		40				▽▽▽▽
		30				▽▽▽▽
8				GC	Clayey gravel, brown-gray, damp, dense.	▽▽▽▽
10	S-10.5	22	6.8	SC	Clayey sand, brown, damp, dense.	▽▽▽▽
		22				▽▽▽▽
		30				▽▽▽▽
12						▽▽▽▽
14				CL	Sandy clay, brown-olive, damp, low to medium plasticity, stiff.	▽▽▽▽
16	S-15.5	11	0			▽▽▽▽
		11				▽▽▽▽
		18				▽▽▽▽
	S-17	20	1.7			▽▽▽▽
		24				▽▽▽▽
18		25				▽▽▽▽
		25				▽▽▽▽
	S-18.5	40	0	SC	Clayey sand, brown, damp, dense.	▽▽▽▽
		50				▽▽▽▽
20					Total Depth = 18 feet.	



PROJECT: 69036.03

LOG OF BORING B-7  
 ARCO Station 2035  
 1001 San Pablo Avenue  
 Albany, California

PLATE  
 B3

Depth of boring: 30-1/2 feet Diameter of boring: 13 inches Date drilled: 10/15/91  
 Well depth: 29 feet Material type: Sch 80 PVC Casing diameter: 6 inches  
 Screen interval: 11 to 26 feet Slot size: 0.020-inch  
 Drilling Company: Exceltech Drilling Driller: Dan and Kenny  
 Method Used: Hollow-Stem Auger Field Geologist: Rob Campbell

Signature of Registered Professional: [Signature]  
 Registration No.: RCE 044600 State: CA

Depth	Sample No.	Blows	P.I.D.	USCS Code	Description	Well Const.
0					Paved area.	
					Asphalt (3 inches) and baserock (9 inches).	
2				CH	Silty clay, black, moist, high plasticity; obvious product odor, abundant organics.	
4					PID alarm at 4 feet.	
6	S-6	7 15 20	5681	CL	Silty clay, dark gray mottled with green, moist, medium plasticity, hard; obvious product odor.	
8					Gradational color change from gray to brown.	
10	S-11	11 11 11	*	ML	(10/29/91) Gravelly silt, brown mottled with green, damp, low plasticity, very stiff; obvious product odor. Large caliche clasts.	
16	S-16	15 21 28	*	SC	Clayey sand with some gravel, brown mottled with orange damp, dense; noticeable product odor.	
18					Encountered water at 19 feet (10/15/91). Increasing sand.	
20	S-21	19 32 45	0	SM	Silty sand with gravel, brown, damp, very dense.	
(Section continues downward,						

\*Hydrocarbon vapors overloaded OVM.

**RESNA**

LOG OF BORING B-8/RW-1

PLATE

ARCO Station 2035  
 1001 San Pablo Avenue  
 Albany, California

5

PROJECT: 69036.02

Depth	Sample No.	BLOWS	P.I.D.	USCS Code	Description	Well Const.
-22				SM	Silty sand with gravel, brown, damp, very dense.	
-24						
-26	S-26	11 18 25	10	CL	Silty clay, gray with brown streaks, damp to moist, medium, plasticity, hard; noticeable product odor.	
-28						
-30	S-30	30 50	0	SM	Silty sand with gravel, brown, damp to wet, very dense, no odor.	
-32					Total depth = 30-1/2 feet.	
-34						
-36						
-38						
-40						
-42						
-44						
-46						
-48						
-50						

**RESNA**

PROJECT 69036.02

LOG OF BORING B-8/RW-1  
 ARCO Station 2035  
 1001 San Pablo Avenue  
 Albany, California

PLATE  
 6

Depth of boring: 31-1/2 feet Diameter of boring: 13 inches Date drilled: 10/14/91  
 Well depth: 30 feet Material type: Sch 40 PVC Casing diameter: 4 inches  
 Screen interval: 15 to 30 feet Slot size: 0.020-inch  
 Drilling Company: Exceltech Drilling Driller: Don and Kenny  
 Method Used: Hollow-Stem Auger Field Geologist: Rob Campbell

Signature of Registered Professional: [Signature]  
 Registration No.: RCE 044600 State: CA

Depth	Sample No.	Blows	P.I.D.	USCS Code	Description	Well Const.
0					Paved.	
					Asphalt (3 inches) and baserock (9 inches).	
2			0.5	CH	Silty clay with gravel, black, moist, high plasticity, very stiff to hard.	
4				CL	Sandy clay, brown, moist, low to medium plasticity, hard; obvious product odor.	
6	S-6	11 15 30	3232		Iron oxide mottling.	
10	S-10.5	.8 13 19	725		(10/29/91). Color change to light gray mottled with brown, lower plasticity.	
16	S-16	19 35 50	NR	SC	Clayey sand, orange-brown, damp, very dense.	
20	S-20.5	14 19 22	NR	GM SC	Encountered water 10/14/91. Silty gravel, brown-orange, wet, dense; layer ~3 inches thick. Clayey sand, light gray mottled with orange-brown, moist to wet, dense.	

NR = No reading.

(Section continues downward)

**RESNA**

LOG OF BORING B-9/MW-1

PLATE

ARCO Station 2035  
 1001 San Pablo Avenue  
 Albany, California

7

PROJECT: 69036.02

Depth	Sample No.	BLOWS	P.I.D.	USCS Code	Description	Well Const.
-22				SC	Clayey sand, light gray mottled with orange-brown, moist to wet, dense.	
-24						
-26	S-26	19 35 40	NR		Alternating seams of wet and moist.	
-28						
-30	S-31	9 12 19	NR	CL	Smoother drilling at 29 feet. Silty clay, gray, damp, medium plasticity, very stiff.	
-32					Total depth = 31-1/2 feet. NR = No reading.	
-34						
-36						
-38						
-40						
-42						
-44						
-46						
-48						
-50						

**RESNA**

LOG OF BORING B-9/MW-1  
 ARCO Station 2035  
 1001 San Pablo Avenue  
 Albany, California

PLATE  
 8

PROJECT 69036.02

Depth of boring: 33 feet Diameter of boring: 10 inches Date drilled: 10/16/91  
 Well depth: 29 feet Material type: Sch 40 PVC Casing diameter: 4 inches  
 Screen interval: 20 to 29 feet Slot size: 0.020-inch  
 Drilling Company: Exceltech Drilling Driller: Don and Kenny  
 Method Used: Hollow-Stem Auger Field Geologist: Steve Strausz  
 Signature of Registered Professional: [Signature]  
 Registration No.: RCE 044600 State: CA

Depth	Sample No.	Blows	P.I.D.	USCS Code	Description	Well Const.
0					Asphalt surface.	
				CL	Asphalt (2 inches) and baserock (6 inches). Silty clay, dark brown, damp, medium plasticity, stiff.	
2					Color change to lighter gray at 3 feet.	
4					Very stiff.	
6	S-5.5	18 23 26	11.8	GM	Silty gravel with minor clay, fine gravel, dark blue-gray, damp, very dense; noticeable product odor.	
8				CL	Smooth drilling at 8 feet. Sandy clay, gray, damp to moist, medium plasticity, hard; minor fine gravel; noticeable product odor.	
10	S-10.5	9 13 19	73.4		(10/29/91).	
12	S-13	11 26 30	274	GP	Rougher drilling at 12 feet. Sandy gravel with clay, brown, moist, dense; obvious product odor.	
14				SC	Clayey sand, gray, moist, very dense.	
16	S-15.5	7 11 12	31.9	ML	Clayey silt, light brown, very moist, medium plasticity, very stiff; noticeable product odor.	
18						
20	S-20.5	8 12 17	2.3	SM	Encountered water 10/16/91. Silty sand, fine-grained, light gray, wet, dense.	

(Section continues downward)

**RESNA**

PROJECT: 69036.02

LOG OF BORING B-10/MW-2  
 ARCO Station 2035  
 1001 San Pablo Avenue  
 Albany, California

PLATE  
 9



Depth	Sample No.	BLOWS	P.I.D.	USCS Code	Description	Well Const.
-22				SM	Silty sand, fine-grained, light gray, wet, dense.	
-24						
-25	S-25.5	22 34 35	NR	SW	Gravelly sand with silt, rusty-brown, wet, very dense.	
-28					Smoother drilling at 28 feet.	
-30	S-30.5	9 17 29	NR	CL	Silty clay, light gray-brown, moist, medium plasticity, hard.	
-32		5 11 12			With some gravelly sand interbedded.	
-34					Total depth = 33 feet. NR = No reading.	
-36						
-38						
-40						
-42						
-44						
-46						
-48						
-50						

**RESNA**

PROJECT 69036.02

LOG OF BORING B-10/MW-2  
ARCO Station 2035  
1001 San Pablo Avenue  
Albany, California

PLATE  
10

Depth of boring: 34-1/2 feet Diameter of boring: 10 inches Date drilled: 10/16/91  
 Well depth: 32-1/2 feet Material type: Sch 40 PVC Casing diameter: 4 inches  
 Screen interval: 12-1/2 to 32-1/2 feet Slot size: 0.020-inch  
 Drilling Company: Exceltech Drilling Driller: Don and Kenny  
 Method Used: Hollow-Stem Auger Field Geologist: Rob Campbell

Signature of Registered Professional: [Signature]  
 Registration No.: RCE 044600 State: CA

Depth	Sample No.	Blows	P.I.D.	USCS Code	Description	Well Const.
0					Asphalt surface.	
0					Asphalt (3 inches) and baserock (9 inches).	
2				CH	Silty clay, black, moist, high plasticity, stiff to very stiff; noticeable product odor.	
4						
6	S-6	5 13 14	NR	CL	Silty clay with some gravel, brown with green mottling, moist, low to medium plasticity, very stiff; noticeable product odor.	
8						
10	S-11	6 8 10	NR	ML	(10/29/92). Clayey silt with medium-grained sand, brown with green mottling, moist, medium plasticity, very stiff, noticeable product odor.	
12						
14						
16	S-16	6 8 10	NR	SC	Clayey sand, gray with orange mottling, damp, medium dense, noticeable product odor.	
18						
20	S-21	8 11 23	NR			

(Section continues downward)

NR = No reading.

**RESNA**

PROJECT: 69036.02

LOG OF BORING B-11/MW-3

ARCO Station 2035  
 1001 San Pablo Avenue  
 Albany, California

PLATE

11

Depth	Sample No.	BLOWS	P.I.D.	USCS Code	Description	Well Const.
-22				SC	Clayey sand, gray with orange mottling, damp, medium dense, noticeable product odor.	
-24			▽		Encountered water 10/15/91.	
-26	S-26	7 8 12	NR			
-28						
-30	S-30	21 26	NR	GM	Silty gravel, brown, wet, dense.	
-32	S-32.5	17 11 19 28		CL	Minor interbedded silty clay, light brown, very moist, medium plasticity.	
-34	S-34	29 50/6"			Sandy gravel with silt, fine sand to fine gravel, brown, wet, very dense.	
-36					Total depth = 34-1/2 feet. NR = No reading.	
-38						
-40						
-42						
-44						
-46						
-48						
-50						

**RESNA**

PROJECT 69036.02

LOG OF BORING B-11/MW-3  
ARCO Station 2035  
1001 San Pablo Avenue  
Albany, California

PLATE  
12

Depth of boring: 21-1/2 feet Diameter of boring: 8 inches Date drilled: 08/20/92

Well depth: N/A Material type: N/A Casing diameter: N/A

Screen interval: N/A Slot size: N/A

Drilling Company: Bayland Drilling Driller: Frank and John

Method Used: Hollow-Stem Auger Field Geologist: Barbara Sieminski

Signature of Registered Professional: [Signature]

Registration No.: RCE 044600 State: CA

Depth	Sample No.	Blows	P.I.D.	USCS Code	Description	Well Const.
0					Asphalt-covered surface. Asphalt (4 inches).	
				GP	Sandy gravel, gray, damp, dense; baserock.	▽▽▽▽
2				CL	Sandy clay, dark brown, damp, medium plasticity, stiff.  Color change to brown.	▽▽▽▽
4	S-4.5	5 10 15	7.3			▽▽▽▽
6				GC	Clayey gravel with sand, brown, damp, medium dense.	▽▽▽▽
				CL	Sandy clay with fine gravel, brown, damp, medium plasticity, very stiff.	▽▽▽▽
8	S-7.5	11 12 13	44			▽▽▽▽
						▽▽▽▽
	S-9	4 5 10	86			▽▽▽▽
10						▽▽▽▽
12						▽▽▽▽
				SC	Clayey sand with gravel, fine-grained sand, light gray with orange mottling, moist, medium dense.	▽▽▽▽
14	S-14.5	7 11 13	4			▽▽▽▽
16						▽▽▽▽
18				ML	Sandy silt, orange-brown, moist, low plasticity, stiff.	▽▽▽▽
	S-19	3 6 10	0			▽▽▽▽
20	S-20.5	8 10 16	0		Increasing sand, moist.	▽▽▽▽
				▽ = SC	Clayey sand with gravel, olive-orange, very moist, medium dense.	▽▽▽▽
					Total depth = 21-1/2 feet.	▽▽▽▽



PROJECT 69036.05

LOG OF BORING B-12  
ARCO Station 2035  
1001 San Pablo Avenue  
Albany, California

PLATE  
4


Depth of boring: 21-1/2 feet Diameter of boring: 8 inches Date drilled: 08/19/92

Well depth: N/A Material type: N/A Casing diameter: N/A

Screen interval: N/A Slot size: N/A

Drilling Company: Bayland Drilling Driller: Frank and Robert

Method Used: Hollow-Stem Auger Field Geologist: Barbara Sieminski

Signature of Registered Professional: 

Registration No. RCE 044600 State: CA

Depth	Sample No.	Blows	P.I.D.	USCS Code	Description	Well Const.
0					Asphalt-covered surface. Asphalt (4 inches).	
				GP	Sandy gravel, gray, damp, dense; baserock.	▽▽▽▽
2				CH	Sandy clay, dark brown, damp, high plasticity, soft.	▽▽▽▽
				CL	Silty clay, brown, damp, medium plasticity, stiff.	▽▽▽▽
4	S-4.5	2 7 17	0			▽▽▽▽
				GC	Clayey gravel with sand, brown, damp, medium dense; noticeable product odor.	▽▽▽▽
6				CL	Sandy clay, brown, damp, medium plasticity, stiff; notice- able product odor.	▽▽▽▽
8	S-7.5	5 10 14	47			▽▽▽▽
				GC	Clayey gravel with sand, brown mottled gray, damp, medium dense.	▽▽▽▽
10	S-9	7 9 11	17			▽▽▽▽
				SC	Clayey sand with gravel, fine-grained sand, light gray with orange mottling, dense.	▽▽▽▽
12						▽▽▽▽
14	S-14.5	6 14 18	0			▽▽▽▽
						▽▽▽▽
16						▽▽▽▽
18	S-17.5	11 20 21	0		With sandy silt lenses.	▽▽▽▽
						▽▽▽▽
20	S-19	4 6	0		Increasing gravel.	▽▽▽▽
						▽▽▽▽
20	S-20	10 14 17 19	0		Decreasing clay, wet.	▽▽▽▽
						▽▽▽▽
Total depth = 21-1/2 feet.						



PROJECT 69036.05

LOG OF BORING B-13  
ARCO Station 2035  
1001 San Pablo Avenue  
Albany, California

PLATE

5


Depth of boring: 18-1/2 feet Diameter of boring: 10 inches Date drilled: 08/20/92

Well depth: 17 feet Material type: Sch 40 PVC Casing diameter: 4 inches

Screen interval: 5 to 17 feet Slot size: 0.100-inch

Drilling Company: Bayland Drilling Driller: Frank and John

Method Used: Hollow-Stem Auger Field Geologist: Barbara Sieminski

Signature of Registered Professional: 

Registration No.: RCE 044600 State: CA

Depth	Sample No.	Blows	P.I.D.	USCS Code	Description	Well Const.
0					Concrete.	
					Concrete (7 inches).	
			146	GP	Sandy gravel, gray, damp, dense; baserock.	
2				CH	Silty clay, dark brown, damp, high plasticity, soft; product odor.	
4				CL	Sandy clay, trace fine gravel, brown, damp, medium plasticity, very stiff; product odor.	
6	S-5.5	5 8 9	709			
10	S-10.5	5 5 5	576	SC	Clayey sand with gravel, fine- to coarse-grained sand, dark gray, damp, loose; obvious product odor.	
12				CL	Gravelly clay with sand, brown mottled gray, moist, low plasticity, stiff; product odor.	
16	S-15.5	2 4 8	59	SC/ML	Clayey sand, fine-grained, with clayey silt lenses, light gray mottled orange, moist, medium dense; noticeable product odor.	
18	S-17.5	7 24 26	12		With gravel, less clay, orange-brown.	
20					Total Depth = 18-1/2 feet.	

**RESNA**  
Working to Restore Nature

PROJECT 69036.05

LOG OF BORING B-14/VW-1  
ARCO Station 2035  
1001 San Pablo Avenue  
Albany, California

PLATE  
6

Depth of boring: 17-1/2 feet Diameter of boring: 10 inches Date drilled: 08/19/92

Well depth: 17 feet Material type: Sch 40 PVC Casing diameter: 4 inches

Screen interval: 5 to 17 feet Slot size: 0.100-inch

Drilling Company: Bayland Drilling Driller: Frank and Robert

Method Used: Hollow-Stem Auger Field Geologist: Barbara Sieminski

Signature of Registered Professional: [Signature]

Registration No.: RCE 044600 State: CA

Depth	Sample No.	Blows	P.I.D.	USCS Code	Description	Well Const.
0					Asphalt-covered surface.	
					Asphalt (4 inches).	
				GP	Sandy gravel, brown, damp, dense; baserock.	
2				CL/CH	Silty clay, black, damp, medium to high plasticity, stiff; product odor.	
4				CL	Silty clay with sand and fine gravel, brown mottled gray, damp, medium plasticity, very stiff; product odor.	
6	S-5.5	4 8 12	364			
8	S-8.5	8 10 12	522	SC	Clayey sand, fine- to coarse-grained, grayish-brown, moist, medium dense; product odor.	
10	S-10	5 7 11	726	ML	Gravelly silt with sand, brown, moist, low plasticity, very stiff; obvious product odor.	
12	S-12	5 20 14			Color change to brown mottled orange, damp.	
14	S-13.5	7 11 20	610	SC/ML	Clayey sand, fine-grained, with sandy silt lenses, greenish brown, moist, dense; product odor.	
16	S-15	7 19 20 11 19 24	65 94		Increasing sand, grayish-brown.	
18					Total depth = 17-1/2 feet.	
20						



LOG OF BORING B-15/VW-2  
 ARCO Station 2035  
 1001 San Pablo Avenue  
 Albany, California

PLATE

7

PROJECT 69036.05

Depth of boring: 15-1/2 feet Diameter of boring: 10 inches Date drilled: 08/19/92

Well depth: 9-1/2 feet Material type: Sch 40 PVC Casing diameter: 4 inches

Screen interval: 4-1/2 to 9-1/2 feet Slot size: 0.100-inch

Drilling Company: Bayland Drilling Driller: Frank and Robert

Method Used: Hollow-Stem Auger Field Geologist: Barbara Sieminski

Signature of Registered Professional: [Signature]

Registration No.: RCE 044600 State: CA

Depth	Sample No.	Blows	P.I.D.	USCS Code	Description	Well Const.
0					Asphalt-covered surface.	
				GP	Asphalt (4 inches).	
					Sandy gravel, gray, damp, dense: baserock.	
2				CL	Sandy clay, brown, moist, medium plasticity, very soft; product odor.	
4	S-4.5	1	74			
		1				
		1				
6						
8						
10	S-10	1	142	SM	Silty sand, fine-grained, dark gray, wet, very loose; product odor.	
		2				
12					Some gravel.	
14	S-14.5	2	7.7	CL	Silty clay with sand, light gray mottled orange, damp to moist, low plasticity, firm.	
		3				
		4				
16					Total depth = 15-1/2 feet.	
18						
20						



LOG OF BORING B-16/VW-3  
 ARCO Station 2035  
 1001 San Pablo Avenue  
 Albany, California

PLATE  
 8

PROJECT 69036.05



Depth of boring: 18-1/2 feet Diameter of boring: 10 inches Date drilled: 08/20/92

Well depth: 17 feet Material type: Sch 40 PVC Casing diameter: 4 inches

Screen interval: 5 to 17 feet Slot size: 0.100-inch

Drilling Company: Bayland Drilling Driller: Frank and John

Method Used: Hollow-Stem Auger Field Geologist: Barbara Sieminski

Signature of Registered Professional: [Signature]

Registration No.: RCE 044600 State: CA

Depth	Sample No.	Blows	P.I.D.	USCS Code	Description	Well Const.
0					Concrete.	
					Concrete (7 inches).	
				GP	Sandy gravel, brown, damp, dense; baserock.	
2				CH	Silty clay, dark brown, damp, high plasticity, firm.	
4				CL	Sandy clay, brown, damp, medium plasticity, very stiff; obvious product odor.	
6	S-5.5	5 10 14	592		Increasing sand, with fine gravel, grayish-brown.	
10	S-10.5	5 6 6	854	SC	Clayey sand, fine-grained, gray, damp to moist, medium dense; product odor.	
12				CL	Gravelly clay with sand, brown mottled gray, moist, low plasticity, stiff; product odor.	
16	S-15.5	6 8 10	80	SC/ML	Clayey sand, fine-grained, with clayey silt lenses, light gray mottled orange, moist, medium dense; noticeable product odor.	
18	S-17.5	1 18 30	225		Less clay, with gravel, orange-brown.	
20					Total depth = 18-1/2 feet.	



PROJECT 69036.05

LOG OF BORING B-17/VW-4  
 ARCO Station 2035  
 1001 San Pablo Avenue  
 Albany, California

PLATE  
 9

Depth of boring: 16-1/2 feet Diameter of boring: 10 inches Date drilled: 08/21/92  
 Well depth: 14-1/2 feet Material type: Sch 40 PVC Casing diameter: 4 inches  
 Screen interval: 4-1/2 to 14-1/2 feet Slot size: 0.100-inch  
 Drilling Company: Bayland Drilling Driller: Frank and John  
 Method Used: Hollow-Stem Auger Field Geologist: Barbara Sieminski

Signature of Registered Professional [Signature]  
 Registration No.: RCE 044600 State: CA

Depth	Sample No.	Blows	P.I.D.	USCS Code	Description	Well Const.
0					Asphalt-covered surface.	
				GP	Asphalt (4 inches).	
				CL/CH	Sandy gravel, gray, damp, dense; baserock.	
2				CL/CH	Silty clay, dark brown, damp, medium to high plasticity, firm.	
4				CL	Sandy clay, brown, damp, medium plasticity, stiff.	
6	S-5.5	7 12 12	39	GC	Clayey gravel with sand, grayish-brown, damp, medium dense.	
10	S-10.5	12 10 8	143		Increasing sand.	
12				CL	Gravelly clay with sand, grayish-brown, damp to moist, low plasticity, very stiff; product odor.	
16	S-15.5	18 12 18	896	SC	Clayey sand with gravel, fine-grained sand, light gray mottled orange, moist, medium dense; product odor.	
					Total depth = 16-1/2 feet.	



LOG OF BORING B-18/VW-5  
 ARCO Station 2035  
 1001 San Pablo Avenue  
 Albany, California

PLATE  
 10

PROJECT 69036.05

Depth of boring: 16-1/2 feet Diameter of boring: 10 inches Date drilled: 08/21/92  
 Well depth: 12-1/2 feet Material type: Sch 40 PVC Casing diameter: 4 inches  
 Screen interval: 5 to 12-1/2 feet Slot size: 0.100-inch  
 Drilling Company: Bayland Drilling Driller: Frank and John  
 Method Used: Hollow-Stem Auger Field Geologist: Barbara Sieminski

Signature of Registered Professional 

Registration No.: RCE 044600 State: CA

Depth	Sample No.	Blows	P.I.D.	USCS Code	Description	Well Const.
0					Asphalt-covered surface.	
				GP	Asphalt (4 inches).	
				GP	Sandy gravel, gray, damp, dense; baserock.	
2				CL/CH	Silty clay, black, damp, medium to high plasticity, stiff; product odor.	
4				CL	Silty clay, brownish-gray, moist, medium plasticity, very stiff; noticeable product odor.	
6	S-5.5	6 12 21	43	GC	Clayey gravel with sand, grayish-brown, moist, dense; noticeable product odor.	
8				CL	Silty clay, trace fine gravel, brown, damp, medium plasticity, stiff.	
10	S-10.5	3 6 9	0		With clayey sand lenses.	
12						
14				SC/CL	Clayey sand, fine-grained, with sandy clay lenses, brown, wet, medium dense.	
16	S-15.5	3 5 8	56			
18					Total depth = 16-1/2 feet.	
20						

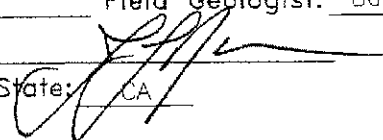


LOG OF BORING B-19/VW-6  
 ARCO Station 2035  
 1001 San Pablo Avenue  
 Albany, California

PLATE  
 11

PROJECT 69036.05

Depth of boring: 29 feet Diameter of boring: 10 inches Date drilled: 11/24/92  
 Well depth: 25-1/2 feet Material type: Sch 40 PVC Casing diameter: 4 inches  
 Screen interval: 8-1/2 to 25-1/2 feet Filter pack: #3 Sand Slot size: 0.020-inch  
 Drilling Company: Bayland Drilling Driller: John and Tom  
 Method Used: Hollow-Stem Auger Field Geologist: Barbara Sieminski

Signature of Registered Professional: 

Registration No.: CEG 1463 State: CA

Depth	Sample No.	Blows	P.I.D.	USCS Code	Description	Well Const.
0					Asphalt-covered surface.	
				GC	Asphalt (4 inches).	
				ML	Clayey gravel, brown, damp, dense; baserock.	
2					Sandy silt with clay, dark brown, damp, low plasticity, stiff.	
4				CL	Sandy clay, brown, damp, medium plasticity, very stiff.	
6	S-5.5	5 8 11	0	SC	Clayey sand, fine- to medium-grained, trace fine gravel, brown, damp, medium dense.	
8						
10	S-9.5	11 12 14	0		Increasing gravel.	
12	S-11	13 15 18	0	GC	Clayey gravel with sand, brown mottled orange and black, moist, medium dense.	
14						
16	S-15.5	5 8 10	0	SP=SC	Gravelly sand with clay, medium- to coarse-grained sand, brown, very moist to wet, medium dense.	
18	S-18.5	6 9 10	0	SM/ML	Silty sand, fine-grained, light gray mottled orange, wet, medium dense; interbedded with sandy silt and clay, light gray mottled orange, moist to wet, low plasticity, very stiff.	
20						

(Section continues downward)



PROJECT 69036.07

LOG OF BORING B-20/MW-4  
 ARCO Station 2035  
 1001 San Pablo Avenue  
 Albany, California

PLATE

5

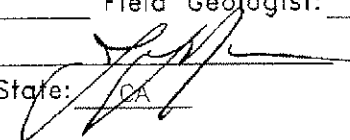
Depth	Sample No.	BLOWS	P.I.D.	USCS Code	Description	Well Const.
-22				SM/ML	Silty sand, fine-grained, light gray mottled orange, wet medium dense; interbedded with sandy silt and clay, light gray mottled orange, moist to wet, low plasticity, very stiff.	
-24	S-24.5	10 11 12	0		Increasing silt, moist.	
-26	S-26.5	8 15 25	0	ML	Clayey silt, light gray mottled orange, damp, low plasticity, very stiff.	
-28	S-28	10 25 50/6"	0	SP	Gravelly sand, fine- to medium-grained sand, orange-brown, damp, dense.	
-30					Total depth = 29 feet.	
-32						
-34						
-36						
-38						
-40						
-42						
-44						
-46						
-48						
-50						



PROJECT 69036.07

LOG OF BORING B-20/MW-4  
 ARCO Station 2035  
 1001 San Pablo Avenue  
 Albany, California

PLATE  
 6

Depth of boring: 26-1/2 feet    Diameter of boring: 10 inches    Date drilled: 11/24/92  
 Well depth: 25 feet    Material type: Sch 40 PVC    Casing diameter: 4 inches  
 Screen interval: 8-1/2 to 25 feet    Filter pack: #3 Sand    Slot size: 0.020-inch  
 Drilling Company: Bayland Drilling    Driller: John and Tom  
 Method Used: Hollow-Stem Auger    Field Geologist: Barbara Sieminski  
 Signature of Registered Professional:   
 Registration No.: CEG 1463    State: CA

Depth	Sample No.	Blows	P.I.D.	USCS Code	Description	Well Const.
0					Asphalt-covered surface.	
				GP	Asphalt (4 inches).	
				CL	Sandy gravel, gray, damp, dense; baserock.	
2					Sandy clay, dark brown, damp, medium plasticity, stiff.	
4					Color change to brown.	
6	S-5.5	4 6 9	0			
8				GC	Clayey gravel with sand, brown with black and orange mottling, damp, medium dense.	
10	S-10.5	9 10 14	0			
12						
14				SP=SC	Gravelly sand with clay, fine- to medium-grained sand, orange-brown, very moist to wet, medium dense.	
16	S-15.5	6 9 11	0			
18						
20	S-20.5	15 25 30	0			

(Section continues downward)



LOG OF BORING B-21/MW-5  
 ARCO Station 2035  
 1001 San Pablo Avenue  
 Albany, California

PLATE

7

PROJECT 69036.07

Depth	Sample No.	BLOWS	P.I.D.	USCS Code	Description	Well Const.
-22				SP-SC	Gravelly sand with clay, fine- to medium-grained sand, orange-brown, very moist to wet, medium dense.	
-24				SM/ML	Silty sand, fine-grained, light gray mottled orange, moist, medium dense; interbedded with sandy silt and clay, light gray mottled orange, damp, low plasticity, very stiff.	
-26	S-26	8 11 12	0	ML	Clayey silt, light gray mottled orange, damp, low plasticity, very stiff.	
-28	Total depth = 26-1/2 feet.					
-30						
-32						
-34						
-36						
-38						
-40						
-42						
-44						
-46						
-48						
-50						

**RESNA**  
Working to Restore Nature

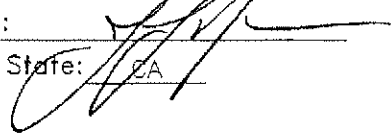
PROJECT 69036.07

LOG OF BORING B-21/MW-5  
ARCO Station 2035  
1001 San Pablo Avenue  
Albany, California

PLATE

8

Depth of boring: 26-1/2 feet Diameter of boring: 8 inches Date drilled: 11/25/92  
 Well depth: 25 feet Material type: Sch 40 PVC Casing diameter: 2 inches  
 Screen interval: 8 to 25 feet Filter pack: #3 Sand Slot size: 0.020-inch  
 Drilling Company: Bayland Drilling Driller: John and Tom  
 Method Used: Hollow-Stem Auger Field Geologist: Barbara Sieminski

Signature of Registered Professional:   
 Registration No.: CEG 1463 State: CA

Depth	Sample No.	Blows	P.I.D.	USCS Code	Description	Well Const.
0					Concrete surface.	
				GP	Concrete (2 inches).	
				ML	Sandy gravel, grayish-brown, damp, dense; baserock.	
2				CL	Sandy silt, dark brown, damp, low plasticity, stiff; with roots.	
4					Sandy clay, brown, damp, medium plasticity, very stiff; with roots.	
6	S-5.5	8 10 15	0			
8				SP-SC	Gravelly sand with clay, fine- to medium-grained sand, brown, damp, medium dense.	
10	S-9.5	8 15 11	0			
12	S-11.5	10 15 14	0	SC	Clayey sand, fine-grained, light brown, damp, medium dense.	
14				GC	Clayey gravel with sand, brown mottled orange, moist, medium dense.	
14				SP	Gravelly sand, medium-grained sand, brown, wet, medium dense.	
16	S-15.5	6 7 9	0	SM/ML	Silty sand, fine-grained, light gray mottled orange, wet, medium dense; interbedded with sandy silt and clay, light gray mottled orange, moist to wet, low plasticity, stiff.	
20	S-20.5	8 10 14	0			

(Section continues downward)



PROJECT 69036.07

LOG OF BORING B-22/MW-6  
 ARCO Station 2035  
 1001 San Pablo Avenue  
 Albany, California

PLATE  
 9



Depth	Sample No.	BLOWS	P.I.D.	USCS Code	Description	Well Const.
-22				SM/ML	Silty sand, fine-grained, light gray mottled orange, wet, medium dense; interbedded with sandy silt sand clay, light gray mottled orange, moist to wet, low plasticity, stiff. With gravel.	
-24						
-26	S-26	5 6 7	0	ML	Clayey silt, light gray mottled orange, damp to moist, low plasticity, stiff.	
-28					Total depth = 26-1/2 feet.	
-30						
-32						
-34						
-36						
-38						
-40						
-42						
-44						
-46						
-48						
-50						

**RESNA**  
Working to Restore Nature

PROJECT 69036.07

LOG OF BORING B-22/MW-6  
ARCO Station 2035  
1001 San Pablo Avenue  
Albany, California

PLATE  
10

Total depth of boring: 15-1/2 feet  
 Diameter of boring: 10 inches  
 Date drilled: 6-16-93  
 Drilling Company: Exploration Geoservices  
 Driller: Dave and Dennis  
 Drilling method: Hollow-Stem Auger

Casing diameter: 4 inches  
 Casing material: Sch 40 PVC  
 Slot size: 0.10-inch  
 Sand size: 3/8" pea gravel  
 Screen Interval: 6 feet to 15 feet  
 Field Geologist: Erin McLucas

Signature of Registered Professional: \_\_\_\_\_  
 Registration No.: CEG 1463 State: CA

Depth	Sample No.	Blows	P.I.D.	USCS Code	Description	Well Const.
2				CL	Concrete (7 inches). Silty clay, black, damp, medium plasticity, stiff.	
4	S-5			SC	Clayey sand, trace gravel, tan, damp, dense; abundant black rootlets.	
6				GP	Sandy gravel, tan to orange, damp, very dense.	
8				GC	Clayey gravel, olive, damp, very dense.	
10	S-10			CL	Sandy clay with silt, light gray to olive with orange mottling, damp, medium plasticity, hard; tan rootlets.	
12						
14	S-15					
16					Total Depth = 15-1/2 feet.	
18						
20						
22						
24						
26						
28						
30						
32						
34						
36						
38						
40						



LOG OF BORING B-23/VW-7  
 ARCO Station 2035  
 1001 San Pablo Avenue  
 Albany, California

PLATE  
 A-2

PROJECT: 69036.10

Total depth of boring: 15-1/2 feet  
 Diameter of boring: 10 inches  
 Date drilled: 6-15-93  
 Drilling Company: Exploration Geoservices  
 Driller: John and Dennis  
 Drilling method: Hollow-Stem Auger

Casing diameter: 4 inches  
 Casing material: Sch 40 PVC  
 Slot size: 0.10-inch  
 Sand size: 3/8" pea gravel  
 Screen Interval: 6 feet to 15 feet  
 Field Geologist: Erin McLucas

Signature of Registered Professional: \_\_\_\_\_  
 Registration No.: CEG 1463 State: CA

Depth	Sample No.	BLOWS	P.I.D.	USCS Code	Description	Well Const.
2				GP	Asphalt (4 inches).	
				CL	Sandy gravel, brown, damp, dense. Silty clay, dark brown to black, damp, medium plasticity, stiff.	
4				GC	Clayey gravel, fine, orange-brown, damp, very dense.	
6	S-6	14 50/8				
8						
10	S-10.5	10 14 30		CL	Silty clay, gray with orange mottling, damp, medium plasticity, hard. With sand.	
12						
14	S-15	13 48 40		GC	Clayey gravel, orange-brown, damp, very dense.	
16					Total Depth = 15 feet.	
18						
20						
22						
24						
26						
28						
30						
32						
34						
36						
38						
40						



LOG OF BORING B-24/VW-8  
 ARCO Station 2035  
 1001 San Pablo Avenue  
 Albany, California

PLATE  
 A-3

PROJECT: 69036.10

Total depth of boring: 15-1/2 feet  
 Diameter of boring: 10 inches  
 Date drilled: 6-21-93  
 Drilling Company: Exploration Geoservices  
 Driller: John and Dennis  
 Drilling method: Hollow-Stem Auger

Casing diameter: 4 inches  
 Casing material: Sch 40 PVC  
 Slot size: 0.10-inch  
 Sand size: 3/8" pea gravel  
 Screen Interval: 6 feet to 15 feet  
 Field Geologist: Erin McLucas

Signature of Registered Professional: \_\_\_\_\_  
 Registration No.: CEG 1463 State: CA

Depth	Sample No.	Blows	P.I.D.	USCS Code	Description	Well Const.
2				CL	Concrete (6-1/2 inches). Silty clay, dark brown to black, damp, medium plasticity, stiff.	
4				GP	Sandy to clayey gravel, fine grained, brown, damp, very dense.	
6	S-5.5					
8				CL	Silty clay, light gray to blue, damp, medium plasticity, hard.	
10	S-9.5			GP-GC	Sandy to clayey gravel, fine grained, brown to olive, damp, very dense.	
12						
14				CL	Silty clay, light gray to olive with orange and black mottling, damp, medium plasticity, hard.	
16	S-15					
16					Total Depth = 15-1/2 feet.	
18						
20						
22						
24						
26						
28						
30						
32						
34						
36						
38						
40						



PROJECT: 69036.10

LOG OF BORING B-25/VW-9  
 ARCO Station 2035  
 1001 San Pablo Avenue  
 Albany, California

PLATE  
 A-4

Total depth of boring: 32-1/2 feet  
 Diameter of boring: 12 inches  
 Date drilled: 6-16-93  
 Drilling Company: Exploration Geoservices  
 Driller: Dave and Dennis  
 Drilling method: Hollow-Stem Auger

Casing diameter: 2 inches  
 Casing material: Sch 40 PVC  
 Slot size: 0.10-inch/0.020-inch  
 Sand size: 3/8" Pea gravel/No. 3 Sand  
 Screen Interval: 5 to 15 feet/29 to 31 feet  
 Field Geologist: Erin McLucas

Signature of Registered Professional: \_\_\_\_\_  
 Registration No.: CEG 1463 State: CA

Depth	Sample No.	Blows	P.I.D.	USCS Code	Description	Well Const.
2				CL	Concrete (7 inches). Silty clay, black, damp, medium plasticity, stiff. Tan to olive.	
4	S-5			GP	Sandy gravel, orange-brown, damp, very dense.	
6				GP-GC	With clay.	
8				GP-GC	With clay.	
10	S-10			CL	Silty clay with fine sand, light gray, damp, medium plasticity, hard.	
12				CL	Silty clay with fine sand, light gray, damp, medium plasticity, hard.	
14	S-15			CL	Sandy clay, light gray with brown mottling, damp, medium plasticity, hard.	
16				GP-GC	Sandy gravel with clay, orange-brown, damp, very dense.	
18				▽	Wet.	
20	S-19			SM	Silty sand, fine to medium grained, tan to olive with orange mottling, wet, very dense.	
22				SM	Silty sand, fine to medium grained, tan to olive with orange mottling, wet, very dense.	
24	S-25			GP/GC	Sandy to clayey gravel, orange-brown, wet, very dense.	
26				GP/GC	Sandy to clayey gravel, orange-brown, wet, very dense.	
28				GP/GC	Sandy to clayey gravel, orange-brown, wet, very dense.	
30				GP/GC	Sandy to clayey gravel, orange-brown, wet, very dense.	
32	S-31			CL	Silty clay, gray with orange mottling, damp, medium plasticity, hard.	
34					Total Depth = 32-1/2 feet.	
36						
38						
40						



PROJECT: 69036.10

LOG OF BORING B-26/AS-1  
 ARCO Station 2035  
 1001 San Pablo Avenue  
 Albany, California

PLATE

A-5

Total depth of boring: 32 feet  
 Diameter of boring: 12 inches  
 Date drilled: 6-16-93  
 Drilling Company: Exploration Geoservices  
 Driller: John and Dennis  
 Drilling method: Hollow-Stem Auger

Casing diameter: 2 inches  
 Casing material: Sch 40 PVC  
 Slot size: 0.10-inch/0.020-inch  
 Sand size: 3/8" Pea gravel/No. 3 Sand  
 Screen Interval: 5 to 15 feet/29-1/2 to 31-1/2 feet  
 Field Geologist: Erin McLucas

Signature of Registered Professional: \_\_\_\_\_  
 Registration No.: CEG 1463 State: CA

Depth	Sample No.	Blows	P.I.D.	USCS Code	Description	Well Const.
2				GP/GW	Asphalt (4 inches).	
				CL	Sandy gravel, medium brown, damp, dense; baserock. Silty clay, brown to black, damp, medium plasticity, stiff.	
4						
6	S-5	21 40 29 24		SM	Brown to olive, trace sand and gravel, hard. Silty sand with gravel, brown to olive, damp, very dense.	
8	S-7.5	14 17 16 18 20 11		SP	Gravelly sand, coarse grained, gray to olive, damp, very dense.	
				SP	Sand, fine grained with gravel, brown to gray and olive, dense.	
10	S-10	15 14 9 18 24 10 11 16 13		GP	Sandy gravel, brown to olive damp, dense.	
				SM	Silty sand, olive with orange mottling, damp, dense.	
12	S-12	22 24 10 11 16 13		GP	Sandy gravel, orange brown, damp to wet; with product.	
14	S-15	50/6 22 50		CL	Silty clay, light gray to olive with orange mottling, damp, medium plasticity, very stiff.	
16	S-16.5	50/4 31 20		GP	Sandy gravel, orange-brown, damp, very dense.	
18		50/4			Trace silty clay. Moist. Wet.	
20	S-19.5	22 50/6 3 50/5				
22		24 50/3				
24	S-25	28 30 50/4 31 50/4				
26		26 50/6				
28		31 50/4				
30	S-31	50/6 27 50/6		CL	Silty clay, trace fine-grained sand, gray with orange mottling, damp, medium plasticity, hard.	
32					Total Depth = 32 feet.	
34						
36						
38						
40						



LOG OF BORING B-27/AS-2  
 ARCO Station 2035  
 1001 San Pablo Avenue  
 Albany, California

PLATE  
 A-6

PROJECT: 69036.10



**SOIL BORING LOG**

**Boring No. MW-8**

**Sheet: 1 of 1**

Client	ARCO 2035	Date	March 26, 2009
Address	1001 San Pablo Avenue Albany, CA	Drilling Co.	RSI Drilling rig type: CME-75
Project No.	E2035	Driller	Ramiro
Logged By:	Collin Fischer	Method	Hollow Stem Auger Hole Diameter: 10 inches
		Sampler:	18-inch length split spoon
Well Pack	sand: 4 ft. to 19 ft. bent.: 2 ft. to 4 ft. grout: 0 ft. to 2 ft.	Well Construction	Casing Material: Schedule 40 PVC Screen Interval: 6 ft. to 19 ft. Casing Diameter: 4 in. Screen Slot Size: 0.010-in. Depth to GW: ▽ first encountered: 16.5' bgs. static

Sample Type	Sample No.	Blow Count	Sample		Well Details	Depth Scale	Lithologic Column	Descriptions of Materials and Conditions	PID (PPM)
			Time	Recov.					
							Cleared to 6.5' bgs. with air knife		
S	MW-8 11'	4 7	0840	100			Sandy clay with gravel, CL, dark brown, moist, stiff, medium plasticity 75% clay, 30% medium to coarse grained sand	0	
		14 11					Clay, CL, dark grayish brown, moist, very stiff, medium plasticity 100% clay		
S	MW-8 13'	15 24	0845	100			Sandy clay with gravel, CL, dark grayish brown, moist, hard, low plasticity 50% clay, 30% coarse grained sand, 20% fine gravel	2158	
		13 14							
		17 21					Clay, CL, dark grayish brown, moist, hard, medium plasticity 100% clay	136	
S	MW-8 16'	21 13	0912	100			Sandy clay with gravel, CL, dark grayish brown, moist, hard, low plasticity 50% clay, 30% coarse grained sand, 20% fine gravel	85	
		14 16							
		6 9					Clayey sand, SC, dark yellowish brown, wet, medium dense 65% fine to medium grained sand, 35% clay	0	
S	MW-8 19'	13	0955	100			Sandy clay, CL, dark yellowish brown, moist to wet, very stiff medium plasticity, 60% clay, 40% fine to medium grained sand	0	

Recovery \_\_\_\_\_  
Sample \_\_\_\_\_

Comments:

*STRATUS*  
ENVIRONMENTAL, INC.





**SOIL BORING LOG**

**Boring No. MW-9**

**Sheet: 1 of 1**

Client	ARCO 2035	Date	March 26, 2009
Address	1001 San Pablo Avenue Albany, CA	Drilling Co.	RSI Drilling rig type: CME-75
Project No.	E2035	Driller	Ramiro
Logged By:	Collin Fischer	Method	Hollow Stem Auger Hole Diameter: 10 inches
		Sampler:	18-inch length split spoon
Well Pack	sand: 4 ft. to 16 ft. bent.: 2 ft. to 4 ft. grout: 0 ft. to 2 ft.	Well Construction	Casing Material: Schedule 40 PVC Screen Interval: 6 ft. to 16 ft. Casing Diameter: 4 in. Screen Slot Size: 0.010-in. Depth to GW: ▽ first encountered: 10' bgs. static ▼

Sample		Blow Count	Sample		Well Details	Depth Scale	Lithologic Column	Descriptions of Materials and Conditions	PID (PPM)
Type	No.		Time	Recov.					
								Cleared to 6.5' bgs. with air knife	
						1			
						2			
						3			
						4			
						5			
						6			
						7			
S	MW-9 8'	16	1510	100		8	CL	Sandy clay with gravel, CL, dark grayish brown, moist, hard, low plasticity 50% clay, 30% coarse grained sand, 20% fine gravel	149
		18				9		Clay, CL, dark grayish brown, moist, very stiff, medium plasticity 100% clay	
S	MW-9 9'	12	1520	100		10	▽	Sandy clay with gravel, CL, dark grayish brown, moist, hard, low plasticity 50% clay, 30% coarse grained sand, 20% fine gravel	55
		2				11			
S	MW-9 11'	4	1530	100		12	SM	Silty sand with clay, SM, dark grayish brown, wet, medium dense 70% medium grained sand, 20% silt, 10% clay	15
		12				13			
S	MW-9 13'	29	1540	100		14	CL	Sandy clay with gravel, CL, dark yellowish brown, dry to moist, hard medium plasticity, 50% clay, 30% coarse grained sand, 20% medium gravel	0
		34				15			0
		45				16		Sandy clay with gravel, CL, dark yellowish brown, dry to moist, hard medium plasticity, 50% clay, 30% coarse grained sand, 20% coarse gravel	0
		28				17			
		30				18			
		37				19			
						20			

Recovery \_\_\_\_\_  
Sample \_\_\_\_\_

Comments:



**ATTACHMENT C**

**Historical Groundwater Monitoring Data**

**Table 1. Summary of Groundwater Monitoring Data: Relative Water Elevations and Laboratory Analyses**  
**ARCO Service Station #2035, 1001 San Pablo Ave., Albany, CA**

Well and Sample Date	P/NP	TOC Elevation (feet)	Depth to Water (feet)	LNAPL Thickness (feet)	Water Level Elevation (feet)	Concentrations in (µg/L)						DO (mg/L)	pH	Footnote
						GRO/TPHg	Benzene	Toluene	Ethyl-Benzene	Total Xylenes	MTBE			
<b>MW-1</b>														
4/11/2002	P	41.41	10.73	0.00	30.68	800	360	<5.0	<5.0	<5.0	<50	--	--	
11/27/2002	P		10.22	0.00	31.19	<50	<0.50	<0.50	<0.50	<0.50	1.7	1.1	--	
6/3/2003	--		9.14	0.00	32.27	1,700	430	<5.0	24	11	8.6	1.7	--	
11/13/2003	P	43.55	10.17	0.00	33.38	<50	<0.50	<0.50	<0.50	<0.50	0.95	2.3	6.5	a
05/12/2004	P		9.28	0.00	34.27	120	7.2	<0.50	<0.50	<0.50	3.0	1.6	6.0	
12/01/2004	P		9.16	0.00	34.39	<50	0.94	<0.50	<0.50	1.1	2.4	5.2	6.6	
05/02/2005	P		8.58	0.00	34.97	1,300	390	<5.0	12	6.4	8.8	2.8	6.5	
11/16/2005	P		9.50	0.00	34.05	<50	<0.50	<0.50	<0.50	0.54	0.92	1.7	6.4	
5/31/2006	P		7.36	0.00	36.19	850	200	<2.5	5.4	<2.5	4.0	2.4	6.5	
12/6/2006	P		9.91	0.00	33.64	<50	0.52	<0.50	<0.50	<0.50	0.72	4.50	6.99	
5/15/2007	P		9.65	0.00	33.90	67	6.6	<0.50	<0.50	<0.50	1.8	2.43	6.96	
11/29/2007	P		9.11	0.00	34.44	<50	<0.50	<0.50	<0.50	<0.50	0.98	4.51	6.81	
5/6/2008	P		8.25	0.00	35.30	890	140	0.53	5.4	5.8	<0.50	1.89	6.61	
11/24/2008	P		10.55	0.00	33.00	<50	<0.50	<0.50	<0.50	<0.50	<0.50	1.83	6.67	
4/9/2009	--		9.02	0.00	34.53	--	--	--	--	--	--	--	--	d
11/24/2009	--		9.24	0.00	34.31	--	--	--	--	--	--	--	--	
5/26/2010	--		8.47	0.00	35.08	--	--	--	--	--	--	--	--	
11/30/2010	--		8.62	0.00	34.93	--	--	--	--	--	--	--	--	
2/16/2011	P		8.64	0.00	34.91	--	--	--	--	--	--	--	--	
<b>5/11/2011</b>	<b>--</b>		<b>8.24</b>	<b>0.00</b>	<b>35.31</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	
<b>MW-2</b>														
4/11/2002	P	40.38	11.05	0.00	29.33	<50	<0.50	<0.50	<0.50	<0.50	24	--	--	
11/27/2002	P		10.51	0.00	29.87	<50	<0.50	<0.50	<0.50	<0.50	5.4	2.6	--	
6/3/2003	--		9.78	0.00	30.60	<50	<0.50	<0.50	<0.50	<0.50	23	1.7	--	
11/13/2003	P	42.52	10.69	0.00	31.83	<50	<0.50	<0.50	<0.50	<0.50	9.5	2.3	6.5	a
05/12/2004	P		10.34	0.00	32.18	<250	<2.5	<2.5	<2.5	<2.5	27	2.2	6.6	
12/01/2004	P		10.28	0.00	32.24	<50	<0.50	<0.50	<0.50	0.70	17	3.9	6.6	
05/02/2005	P		9.50	0.00	33.02	<50	<0.50	<0.50	<0.50	<0.50	25	3.1	6.6	
11/16/2005	P		10.50	0.00	32.02	<50	<0.50	<0.50	<0.50	0.50	7.6	2.8	6.4	
5/31/2006	P		10.03	0.00	32.49	<50	<0.50	<0.50	<0.50	<0.50	24	2.0	6.6	

**Table 1. Summary of Groundwater Monitoring Data: Relative Water Elevations and Laboratory Analyses**  
**ARCO Service Station #2035, 1001 San Pablo Ave., Albany, CA**

Well and Sample Date	P/NP	TOC Elevation (feet)	Depth to Water (feet)	LNAPL Thickness (feet)	Water Level Elevation (feet)	Concentrations in (µg/L)						DO (mg/L)	pH	Footnote
						GRO/TPHg	Benzene	Toluene	Ethyl-Benzene	Total Xylenes	MTBE			
<b>MW-2 Cont.</b>														
12/6/2006	P	42.52	10.28	0.00	32.24	<50	<0.50	<0.50	<0.50	<0.50	1.6	3.72	6.91	
5/15/2007	P		10.00	0.00	32.52	<50	<0.50	<0.50	<0.50	<0.50	44	2.90	6.69	
11/29/2007	P		10.13	0.00	32.39	<50	<0.50	<0.50	<0.50	<0.50	1.9	4.83	6.89	
5/6/2008	P		9.55	0.00	32.97	<50	<0.50	<0.50	<0.50	<0.50	35	1.88	6.62	
11/24/2008	P		10.70	0.00	31.82	<50	<0.50	<0.50	<0.50	<0.50	4.3	1.83	6.74	
4/9/2009	--	42.57	9.68	0.00	32.89	--	--	--	--	--	--	--	--	d
11/24/2009	--		10.48	0.00	32.09	--	--	--	--	--	--	--	--	
5/26/2010	--		9.65	0.00	32.92	--	--	--	--	--	--	--	--	
11/30/2010	--		9.84	0.00	32.73	--	--	--	--	--	--	--	--	
2/16/2011	P		9.39	0.00	33.18	--	--	--	--	--	--	--	--	
<b>5/11/2011</b>	--		<b>9.68</b>	<b>0.00</b>	<b>32.89</b>	--	--	--	--	--	--	--	--	
<b>MW-3</b>														
4/11/2002	P	41.44	11.05	0.00	30.39	250	9.4	<0.50	<0.50	<0.50	120	--	--	
11/27/2002	P		10.49	0.00	30.95	<100	<1.0	<1.0	<1.0	2.5	56	2.2	--	
6/3/2003	--		9.44	0.00	32.00	130	<0.50	<0.50	<0.50	<0.50	47	4.1	--	
11/13/2003	P	43.62	10.68	0.00	32.94	53	<0.50	<0.50	<0.50	<0.50	36	3.8	6.8	a
05/12/2004	P		9.95	0.00	33.67	65	<0.50	<0.50	<0.50	<0.50	39	4.2	6.9	
12/01/2004	P		10.32	0.00	33.30	140	<0.50	<0.50	<0.50	<0.50	37	4.3	6.9	
05/02/2005	P		9.12	0.00	34.50	140	<0.50	<0.50	<0.50	<0.50	23	3.1	6.7	
11/16/2005	P		10.58	0.00	33.04	<50	<0.50	<0.50	<0.50	<0.50	32	4.1	6.5	
5/31/2006	P		9.41	0.00	34.21	<50	<0.50	<0.50	<0.50	<0.50	20	4.3	6.8	
12/6/2006	P		10.25	0.00	33.37	<50	<0.50	<0.50	<0.50	<0.50	20	2.71	7.00	
5/15/2007	P		9.70	0.00	33.92	<50	<0.50	<0.50	<0.50	<0.50	40	5.89	7.07	
11/29/2007	P		10.08	0.00	33.54	90	<0.50	<0.50	<0.50	<0.50	35	4.74	6.61	
5/6/2008	P		10.02	0.00	33.60	<50	<0.50	<0.50	<0.50	<0.50	14	2.05	6.61	
11/24/2008	P		10.80	0.00	32.82	<50	<1.0	<1.0	<1.0	<1.0	28	1.98	6.77	
4/9/2009	--	43.63	9.55	0.00	34.08	--	--	--	--	--	--	--	--	d
11/24/2009	--		10.29	0.00	33.34	--	--	--	--	--	--	--	--	
5/26/2010	--		9.76	0.00	33.87	--	--	--	--	--	--	--	--	
11/30/2010	--		10.15	0.00	33.48	--	--	--	--	--	--	--	--	

**Table 1. Summary of Groundwater Monitoring Data: Relative Water Elevations and Laboratory Analyses**  
**ARCO Service Station #2035, 1001 San Pablo Ave., Albany, CA**

Well and Sample Date	P/NP	TOC Elevation (feet)	Depth to Water (feet)	LNAPL Thickness (feet)	Water Level Elevation (feet)	Concentrations in (µg/L)						DO (mg/L)	pH	Footnote
						GRO/TPHg	Benzene	Toluene	Ethyl-Benzene	Total Xylenes	MTBE			
<b>MW-3 Cont.</b>														
2/16/2011	P	43.63	9.22	0.00	34.41	--	--	--	--	--	--	--	--	
<b>5/11/2011</b>	<b>--</b>		<b>9.55</b>	<b>0.00</b>	<b>34.08</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	
<b>MW-4</b>														
4/11/2002	NP	40.33	10.81	0.00	29.52	<50	<0.50	<0.50	<0.50	<0.50	11	--	--	
11/27/2002	NP		10.09	0.00	30.24	<50	<0.50	<0.50	<0.50	<0.50	6.5	1.8	--	
6/3/2003	--		8.62	0.00	31.71	<250	<2.5	<2.5	<2.5	<2.5	120	1.1	--	
11/13/2003	NP	42.48	9.98	0.00	32.50	<50	<0.50	<0.50	<0.50	<0.50	20	1.3	6.2	a
05/12/2004	P		9.48	0.00	33.00	<250	<2.5	<2.5	<2.5	<2.5	79	2.9	6.6	
12/01/2004	NP		9.60	0.00	32.88	<50	<0.50	<0.50	<0.50	<0.50	1.8	1.9	6.7	
05/02/2005	NP		8.67	0.00	33.81	<50	<0.50	<0.50	<0.50	<0.50	11	2.8	6.6	
11/16/2005	NP		10.00	0.00	32.48	<50	<0.50	<0.50	<0.50	<0.50	0.93	1.7	6.3	
5/31/2006	NP		8.52	0.00	33.96	<50	<0.50	<0.50	<0.50	<0.50	2.4	1.0	7.0	
12/6/2006	NP		9.90	0.00	32.58	<50	<0.50	<0.50	<0.50	<0.50	7.8	0.85	7.10	
5/15/2007	NP		9.18	0.00	33.30	<50	<0.50	<0.50	<0.50	<0.50	2.2	1.37	6.85	
11/29/2007	NP		9.10	0.00	33.38	<50	<0.50	<0.50	<0.50	<0.50	9.1	1.81	7.14	
5/6/2008	P		9.40	0.00	33.08	<50	<0.50	<0.50	<0.50	<0.50	10	2.61	6.91	
11/24/2008	NP		10.20	0.00	32.28	<50	<0.50	<0.50	<0.50	<0.50	<0.50	2.67	6.88	
4/9/2009	P	42.51	9.00	0.00	33.51	<50	<0.50	<0.50	<0.50	<0.50	12	2.51	7.11	d
11/24/2009	P		9.89	0.00	32.62	<50	<0.50	<0.50	<0.50	<0.50	1.7	0.80	6.58	
5/26/2010	P		8.79	0.00	33.72	<50	<0.50	<0.50	<0.50	<0.50	1.4	0.98	6.0	
11/30/2010	P		9.31	0.00	33.20	--	--	--	--	--	--	1.40	6.4	f
2/16/2011	P		8.50	0.00	34.01	<50	<0.50	<0.50	<0.50	<0.50	2.1	0.91	7.1	
<b>5/11/2011</b>	<b>P</b>		<b>8.80</b>	<b>0.00</b>	<b>33.71</b>	<b>&lt;50</b>	<b>&lt;0.50</b>	<b>&lt;0.50</b>	<b>&lt;0.50</b>	<b>&lt;0.50</b>	<b>0.75</b>	<b>1.43</b>	<b>6.8</b>	
<b>MW-5</b>														
4/11/2002	NP	41.84	10.63	0.00	31.21	<50	<0.50	<0.50	<0.50	<0.50	<5.0	--	--	
11/27/2002	NP		10.65	0.00	31.19	--	--	--	--	--	--	--	--	
6/3/2003	--		8.92	0.00	32.92	<50	<0.50	<0.50	<0.50	<0.50	<0.50	1.8	--	
11/13/2003	NP	44.03	10.58	0.00	33.45	<50	<0.50	<0.50	<0.50	<0.50	0.79	1.4	5.7	a
05/12/2004	--		9.95	0.00	34.08	--	--	--	--	--	--	--	--	

**Table 1. Summary of Groundwater Monitoring Data: Relative Water Elevations and Laboratory Analyses**  
**ARCO Service Station #2035, 1001 San Pablo Ave., Albany, CA**

Well and Sample Date	P/NP	TOC Elevation (feet)	Depth to Water (feet)	LNAPL Thickness (feet)	Water Level Elevation (feet)	Concentrations in (µg/L)						DO (mg/L)	pH	Footnote
						GRO/TPHg	Benzene	Toluene	Ethyl-Benzene	Total Xylenes	MTBE			
<b>MW-5 Cont.</b>														
12/01/2004	NP	44.03	10.05	0.00	33.98	<50	<0.50	<0.50	<0.50	<0.50	0.55	1.8	6.3	
05/02/2005	--		8.75	0.00	35.28	--	--	--	--	--	--	--	--	
11/16/2005	NP		10.37	0.00	33.66	<50	<0.50	<0.50	<0.50	<0.50	<0.50	1.3	6.2	
5/31/2006	--		9.07	0.00	34.96	--	--	--	--	--	--	--	--	
12/6/2006	NP		10.25	0.00	33.78	<50	<0.50	<0.50	<0.50	<0.50	0.99	1.24	6.88	
5/15/2007	--		9.51	0.00	34.52	--	--	--	--	--	--	--	--	
11/29/2007	NP		9.95	0.00	34.08	<50	<0.50	<0.50	<0.50	<0.50	<0.50	1.93	6.98	
5/6/2008	--		9.67	0.00	34.36	--	--	--	--	--	--	--	--	
11/24/2008	NP		10.62	0.00	33.41	<50	<0.50	<0.50	<0.50	<0.50	<0.50	2.43	6.52	
4/9/2009	--		12.00	0.00	32.03	--	--	--	--	--	--	--	--	d
11/24/2009	P		10.34	0.00	33.69	<50	<0.50	1.4	<0.50	<0.50	0.89	0.94	6.1	
5/26/2010	--		9.21	0.00	34.82	--	--	--	--	--	--	--	--	
11/30/2010	P		9.85	0.00	34.18	--	--	--	--	--	--	--	6.17	f
2/16/2011	P		9.01	0.00	35.02	<50	<0.50	<0.50	<0.50	<0.50	<0.50	1.23	6.9	
<b>5/11/2011</b>	<b>--</b>		<b>9.44</b>	<b>0.00</b>	<b>34.59</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	
<b>MW-6</b>														
4/11/2002	NP	40.13	11.42	0.00	28.71	<50	<0.50	<0.50	<0.50	<0.50	<5.0	--	--	
11/27/2002	NP		13.11	0.00	27.02	<50	<0.50	<0.50	<0.50	<0.50	<0.50	1.3	--	
6/3/2003	--		12.48	0.00	27.65	<50	<0.50	<0.50	<0.50	<0.50	<0.50	1.1	--	
11/13/2003	NP	42.26	13.11	0.00	29.15	<50	<0.50	<0.50	<0.50	<0.50	<0.50	1.2	6.8	a
05/12/2004	--		12.68	0.00	29.58	--	--	--	--	--	--	--	--	
12/01/2004	NP		12.68	0.00	29.58	<50	<0.50	<0.50	<0.50	<0.50	<0.50	1.7	7.3	
05/02/2005	--		12.25	0.00	30.01	--	--	--	--	--	--	--	--	
11/16/2005	NP		12.98	0.00	29.28	<50	<0.50	<0.50	<0.50	<0.50	<0.50	1.2	6.7	
5/31/2006	--		12.35	0.00	29.91	--	--	--	--	--	--	--	--	
12/6/2006	NP		12.98	0.00	29.28	<50	<0.50	<0.50	<0.50	<0.50	<0.50	1.24	6.86	
5/15/2007	--		12.55	0.00	29.71	--	--	--	--	--	--	--	--	
11/29/2007	NP		12.75	0.00	29.51	<50	<0.50	<0.50	<0.50	<0.50	<0.50	--	6.93	
5/6/2008	--		12.91	0.00	29.35	--	--	--	--	--	--	--	--	
11/24/2008	NP		13.20	0.00	29.06	<50	<0.50	<0.50	<0.50	<0.50	<0.50	2.28	7.25	

**Table 1. Summary of Groundwater Monitoring Data: Relative Water Elevations and Laboratory Analyses**  
**ARCO Service Station #2035, 1001 San Pablo Ave., Albany, CA**

Well and Sample Date	P/NP	TOC Elevation (feet)	Depth to Water (feet)	LNAPL Thickness (feet)	Water Level Elevation (feet)	Concentrations in (µg/L)						DO (mg/L)	pH	Footnote
						GRO/TPHg	Benzene	Toluene	Ethyl-Benzene	Total Xylenes	MTBE			
<b>MW-6 Cont.</b>														
4/9/2009	--	42.31	12.52	0.00	29.79	--	--	--	--	--	--	--	--	d
11/24/2009	P		12.90	0.00	29.41	<50	<0.50	<0.50	<0.50	<0.50	<0.50	0.83	6.59	
5/26/2010	--		12.17	0.00	30.14	--	--	--	--	--	--	--	--	
11/30/2010	P		12.45	0.00	29.86	--	--	--	--	--	--	1.20	7.2	f
2/16/2011	P		11.95	0.00	30.36	<50	<0.50	<0.50	<0.50	<0.50	<0.50	1.02	6.9	
<b>5/11/2011</b>	<b>--</b>		<b>12.35</b>	<b>0.00</b>	<b>29.96</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	
<b>MW-7</b>														
4/9/2009	P	43.18	6.73	0.00	36.45	4,100	5.2	1.7	21	21	<0.50	8.41	7.79	d
11/24/2009	P		8.31	0.00	34.87	2,700	4.1	1.1	3.3	3.0	<0.50	0.60	6.8	c
5/26/2010	P		6.62	0.00	36.56	1,800	1.2	0.53	2.2	0.84	<0.50	0.71	6.6	
11/30/2010	P		6.84	0.00	36.34	--	--	--	--	--	--	0.79	6.7	f
2/16/2011	P		5.44	0.00	37.74	2,000	1.4	0.84	8.0	1.4	<0.50	0.56	7.0	g
<b>5/11/2011</b>	<b>P</b>		<b>6.98</b>	<b>0.00</b>	<b>36.20</b>	<b>84</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>1.76</b>	<b>7.1</b>	<b>lw</b>
<b>MW-8</b>														
4/9/2009	P	42.36	9.50	0.00	32.86	4,300	940	260	150	590	110	2.09	7.62	d
11/24/2009	P		10.25	0.00	32.11	28,000	9,900	670	1,300	2,200	<100	0.64	6.48	c
5/26/2010	P		9.25	0.00	33.11	1,400	420	<10	21	<10	<10	0.78	6.6	
11/30/2010	P		9.68	0.00	32.68	--	--	--	--	--	--	2.26	6.6	f
2/16/2011	P		8.95	0.00	33.41	960	270	<5.0	50	<5.0	<5.0	3.35	6.9	g
<b>5/11/2011</b>	<b>P</b>		<b>9.43</b>	<b>0.00</b>	<b>32.93</b>	<b>1,200</b>	<b>290</b>	<b>&lt;4.0</b>	<b>57</b>	<b>4.5</b>	<b>&lt;4.0</b>	<b>0.94</b>	<b>7.2</b>	<b>lw</b>
<b>MW-9</b>														
4/9/2009	P	43.77	8.95	0.00	34.82	<50	<0.50	<0.50	<0.50	<0.50	2.1	2.81	7.58	d
11/24/2009	P		10.11	0.00	33.66	<50	<0.50	<0.50	<0.50	<0.50	3.8	--	6.3	
5/26/2010	P		8.88	0.00	34.89	<50	<0.50	<0.50	<0.50	<0.50	1.9	0.66	5.7	
11/30/2010	P		9.56	0.00	34.21	--	--	--	--	--	--	0.64	6.3	f
2/16/2011	P		8.65	0.00	35.12	<50	<0.50	<0.50	<0.50	<0.50	3.8	0.55	6.6	
<b>5/11/2011</b>	<b>P</b>		<b>9.06</b>	<b>0.00</b>	<b>34.71</b>	<b>&lt;50</b>	<b>&lt;0.50</b>	<b>&lt;0.50</b>	<b>&lt;0.50</b>	<b>&lt;0.50</b>	<b>1.2</b>	<b>1.22</b>	<b>6.6</b>	
<b>RW-1</b>														

**Table 1. Summary of Groundwater Monitoring Data: Relative Water Elevations and Laboratory Analyses**  
**ARCO Service Station #2035, 1001 San Pablo Ave., Albany, CA**

Well and Sample Date	P/NP	TOC Elevation (feet)	Depth to Water (feet)	LNAPL Thickness (feet)	Water Level Elevation (feet)	Concentrations in (µg/L)						DO (mg/L)	pH	Footnote
						GRO/TPHg	Benzene	Toluene	Ethyl-Benzene	Total Xylenes	MTBE			
<b>RW-1 Cont.</b>														
4/11/2002	P	40.33	9.20	0.00	31.13	15,000	750	2,000	380	2,000	1,500	--	--	
11/27/2002	P		10.31	0.00	30.02	<2,500	720	<25	<25	<25	<25	1.8	--	
6/3/2003	--		9.54	0.00	30.79	470	78	0.97	4.3	9	48	1.4	--	
11/13/2003	P	42.35	10.35	0.00	32.00	130	29	<0.50	<0.50	<0.50	44	1.3	6.6	a
05/12/2004	P		9.80	0.00	32.55	<250	66	<2.5	<2.5	<2.5	<2.5	1.9	6.9	
09/02/2004	--		10.42	0.00	31.93	--	--	--	--	--	--	--	--	
10/07/2004	--		10.36	0.00	31.99	--	--	--	--	--	--	--	--	
11/04/2004	--		9.93	0.00	32.42	--	--	--	--	--	--	--	--	
12/01/2004	P		10.02	0.00	32.33	<250	96	<2.5	<2.5	<2.5	16	1.8	6.7	
05/02/2005	P		9.20	0.00	33.15	230	100	<1.0	<1.0	<1.0	50	2.5	6.6	
11/16/2005	P		10.96	0.00	31.39	<100	28	<1.0	<1.0	<1.0	32	1.0	6.5	
5/31/2006	P		9.34	0.00	33.01	320	32	<0.50	<0.50	<0.50	28	1.3	6.8	
12/6/2006	P		10.10	0.00	32.25	50	27	<0.50	<0.50	<0.50	19	1.49	7.54	
5/15/2007	P		9.42	0.00	32.93	280	32	<0.50	<0.50	<0.50	18	2.61	7.10	
11/29/2007	P		9.75	0.00	32.60	<50	14	<0.50	<0.50	<0.50	18	4.86	8.14	
5/6/2008	P		9.71	0.00	32.64	610	110	<2.5	<2.5	<2.5	2.6	2.48	6.95	
11/24/2008	P		10.48	0.00	31.87	73	31	<0.50	<0.50	<0.50	11	2.53	6.88	
4/9/2009	P	42.23	9.46	0.00	32.77	720	36	<0.50	1.0	1.2	4.0	2.58	7.73	d
11/24/2009	P		10.15	0.00	32.08	<50	2.0	<0.50	<0.50	<0.50	6.5	0.85	6.6	
5/26/2010	P		9.12	0.00	33.11	90	11	<0.50	<0.50	<0.50	0.94	1.46	6.4	
11/30/2010	P		9.38	0.00	32.85	--	--	--	--	--	--	2.10	7.2	f
2/16/2011	P		9.15	0.00	33.08	1,600	370	2.9	2.6	2.9	1.3	0.76	7.0	
<b>5/11/2011</b>	<b>P</b>		<b>9.56</b>	<b>0.00</b>	<b>32.67</b>	<b>1,600</b>	<b>79</b>	<b>&lt;2.0</b>	<b>&lt;2.0</b>	<b>2.0</b>	<b>&lt;2.0</b>	<b>0.91</b>	<b>7.4</b>	<b>lw</b>
<b>S-5</b>														
4/11/2002	P	40.33	10.17	0.00	30.16	30,000	390	1,400	410	7,400	<500	--	--	
11/27/2002	P		9.77	0.00	30.56	55,000	1,300	450	1,400	13,000	<50	4.3	--	
6/3/2003	--		9.12	0.00	31.21	44,000	680	260	1,100	9,900	<25	1.9	--	
6/3/2003	--		9.03	0.00	31.30	44,000	680	260	1,100	9,900	<25	1.9	--	
6/3/2003	--		9.12	0.00	31.21	--	--	--	--	--	<25	1.4	--	
6/3/2003	--		9.03	0.00	31.30	--	--	--	--	--	<25	1.4	--	



**Table 1. Summary of Groundwater Monitoring Data: Relative Water Elevations and Laboratory Analyses**  
**ARCO Service Station #2035, 1001 San Pablo Ave., Albany, CA**

Well and Sample Date	P/NP	TOC Elevation (feet)	Depth to Water (feet)	LNAPL Thickness (feet)	Water Level Elevation (feet)	Concentrations in (µg/L)						DO (mg/L)	pH	Footnote
						GRO/TPHg	Benzene	Toluene	Ethyl-Benzene	Total Xylenes	MTBE			
<b>S-5 Cont.</b>														
11/13/2003	P	41.83	9.12	0.00	32.71	31,000	520	120	690	5,900	<50	1.4	6.5	a
05/12/2004	P		9.95	0.00	31.88	28,000	760	79	910	5,000	<50	1.9	6.6	
12/01/2004	P		9.61	0.00	32.22	26,000	1,500	64	1,400	4,000	<25	--	6.5	b
05/02/2005	P		8.80	0.00	33.03	13,000	700	18	260	1,300	<5.0	1.8	6.4	
11/16/2005	P		9.80	0.00	32.03	15,000	1,400	25	570	850	<5.0	1.1	6.3	
5/31/2006	P		8.89	0.00	32.94	9,800	170	<5.0	490	390	<5.0	1.4	6.6	
12/6/2006	P		9.65	0.00	32.18	16,000	1,100	<25	1,700	970	<25	1.23	6.95	
5/15/2007	P		8.89	0.00	32.94	10,000	140	<5.0	340	310	<5.0	3.63	7.10	
11/29/2007	P		9.48	0.00	32.35	13,000	770	8.6	500	360	<2.5	5.42	7.28	c (Benzene)
5/6/2008	P		9.30	0.00	32.53	7,400	320	2.8	580	130	<0.50	3.37	6.88	
11/24/2008	P		10.00	0.00	31.83	7,700	400	<10	390	14	<10	3.22	6.43	
4/9/2009	P		8.90	0.00	32.93	7,700	230	<10	370	35	<10	3.14	7.77	
11/24/2009	--		--	--	--	--	--	--	--	--	--	--	--	e
5/26/2010	--		--	--	--	--	--	--	--	--	--	--	--	e
11/30/2010	P		8.92	0.00	32.91	--	--	--	--	--	--	0.62	6.6	f
2/16/2011	P		8.57	0.00	33.26	2,700	26	<0.50	11	3.2	<0.50	1.34	7.5	
<b>5/11/2011</b>	<b>P</b>		<b>8.85</b>	<b>0.00</b>	<b>32.98</b>	<b>1,500</b>	<b>19</b>	<b>0.58</b>	<b>9.7</b>	<b>2.2</b>	<b>&lt;0.50</b>	<b>0.72</b>	<b>6.8</b>	<b>lw</b>

Symbols & Abbreviations:

-- = Not analyzed/applicable/measured/available  
< = Not detected at or above laboratory reporting limit  
ft bgs = Feet below ground surface  
BTEX = Benzene, toluene, ethylbenzene and xylenes  
DO = Dissolved oxygen  
DTW = Depth to water in ft bgs  
GRO = Gasoline range organics, range C4-C12  
GWE = Groundwater elevation measured in ft  
mg/L = Milligrams per liter  
MTBE = Methyl tert butyl ether  
NP = Not purged before sampling  
P = Purged before sampling  
TOC = Top of casing measured in ft  
TPH-g = Total petroleum hydrocarbons as gasoline, analyzed using EPA Method 8015, Modified  
µg/L = Micrograms per liter  
SEQ/SEQM = Sequoia Analytical/Sequoia Morgan Hill Laboratories

Footnotes:

a = Site resurveyed by URS on 10/15/03 to NAVD '88  
b = Sheen in well  
c = Sample taken from VOA vial with air bubble >6mm  
d = Well surveyed on 4/20/09  
e = Well not monitored or sampled due to traffic control safety concerns  
f = Samples were collected on 11/30/2010 but not able to be analyzed (frozen). Subsequent re-sampling could not occur in 4Q 2010  
g = Quantitation of unknown hydrocarbon(s) in sample based on gasoline  
lw = Quantitated against gasoline

Notes:

No sampling occurs at this site during the first and third quarters of each calendar year

TPH-g analyzed using EPA Method 8015, Modified and BTEX and MTBE by EPA method 8260B

Beginning in the fourth quarter 2003, the laboratory modified the reported analyte list. TPH-g was changed to GRO. The resulting data may be impacted by the potential of non-TPH-g analytes within the requested fuel range resulting in a higher concentration being reported

Beginning in the second quarter 2004, the carbon range for GRO was changed from C6-C10 to C4-C12

Values for DO and pH were obtained through field measurements

GRO analysis was completed by EPA method 8260B (C4-C12) for samples collected from the time period April 2006 through February 4, 2008. The analysis for GRO was changed to EPA method 8015B (C6-C12) for samples collected from the time period February 5, 2008 through the present

The data within this table collected prior to April 2006 was provided to Broadbent & Associates, Inc. by Atlantic Richfield Company and their previous consultants. Broadbent & Associates, Inc. has not verified the accuracy of this information

**Table 2. Summary of Fuel Additives Analytical Data**  
**ARCO Service Station #2035, 1001 San Pablo Ave., Albany, CA**

Well and Sample Date	Concentrations in (µg/L)								Footnote
	Ethanol	TBA	MTBE	DIPE	ETBE	TAME	1,2-DCA	EDB	
<b>MW-1</b>									
4/11/2002	--	--	<50	--	--	--	--	--	
11/27/2002	--	--	1.7	--	--	--	--	--	
6/3/2003	<1000	<200	8.6	<5.0	<5.0	<5.0	<5.0	<5.0	
11/13/2003	<100	<20	0.95	<0.50	<0.50	<0.50	--	--	
05/12/2004	<100	<20	3.0	<0.50	<0.50	<0.50	<0.50	<0.50	
12/01/2004	<100	<20	2.4	<0.50	<0.50	<0.50	<0.50	<0.50	
05/02/2005	<1,000	220	8.8	<5.0	<5.0	<5.0	<5.0	<5.0	
11/16/2005	<100	<20	0.92	<0.50	<0.50	<0.50	<0.50	<0.50	a
5/31/2006	<1,500	<100	4.0	<2.5	<2.5	<2.5	<2.5	<2.5	a
12/6/2006	<300	<20	0.72	<0.50	<0.50	<0.50	<0.50	<0.50	
5/15/2007	<300	<20	1.8	<0.50	<0.50	<0.50	<0.50	<0.50	
11/29/2007	<300	<20	0.98	<0.50	<0.50	<0.50	<0.50	<0.50	
5/6/2008	<300	<10	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
11/24/2008	<300	<10	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
<b>MW-2</b>									
4/11/2002	--	--	24	--	--	--	--	--	
11/27/2002	--	--	5.4	--	--	--	--	--	
6/3/2003	<100	<20	23	<0.50	<0.50	<0.50	0.94	<0.50	
11/13/2003	<100	<20	9.5	<0.50	<0.50	<0.50	--	--	
05/12/2004	<500	<100	27	<2.5	<2.5	<2.5	<2.5	<2.5	
12/01/2004	<100	<20	17	<0.50	<0.50	<0.50	0.74	<0.50	
05/02/2005	<100	75	25	<0.50	<0.50	<0.50	<0.50	<0.50	
11/16/2005	<100	<20	7.6	<0.50	<0.50	<0.50	0.79	<0.50	a
5/31/2006	<300	<20	24	<0.50	<0.50	<0.50	0.66	<0.50	a
12/6/2006	<300	<20	1.6	<0.50	<0.50	<0.50	<0.50	<0.50	a
5/15/2007	<300	<20	44	<0.50	<0.50	<0.50	1.2	<0.50	
11/29/2007	<300	<20	1.9	<0.50	<0.50	<0.50	<0.50	<0.50	
5/6/2008	<300	<10	35	<0.50	<0.50	<0.50	0.93	<0.50	
11/24/2008	<300	<10	4.3	<0.50	<0.50	<0.50	<0.50	<0.50	
<b>MW-3</b>									

**Table 2. Summary of Fuel Additives Analytical Data**  
**ARCO Service Station #2035, 1001 San Pablo Ave., Albany, CA**

Well and Sample Date	Concentrations in (µg/L)								Footnote
	Ethanol	TBA	MTBE	DIPE	ETBE	TAME	1,2-DCA	EDB	
<b>MW-3 Cont.</b>									
4/11/2002	--	--	120	--	--	--	--	--	
11/27/2002	--	--	56	--	--	--	--	--	
6/3/2003	<100	<20	47	<0.50	<0.50	<0.50	<0.50	<0.50	
11/13/2003	<100	<20	36	<0.50	<0.50	<0.50	--	--	
05/12/2004	<100	<20	39	<0.50	<0.50	<0.50	<0.50	<0.50	
12/01/2004	<100	<20	37	<0.50	<0.50	<0.50	<0.50	<0.50	
05/02/2005	<100	<20	23	<0.50	<0.50	<0.50	<0.50	<0.50	
11/16/2005	<100	<20	32	<0.50	<0.50	<0.50	<0.50	<0.50	a
5/31/2006	<300	<20	20	<0.50	<0.50	<0.50	<0.50	<0.50	a
12/6/2006	<300	<20	20	<0.50	<0.50	<0.50	<0.50	<0.50	a
5/15/2007	<300	<20	40	<0.50	<0.50	<0.50	<0.50	<0.50	
11/29/2007	<300	<20	35	<0.50	<0.50	<0.50	<0.50	<0.50	
5/6/2008	<300	<10	14	<0.50	<0.50	<0.50	<0.50	<0.50	
11/24/2008	<600	<20	28	<1.0	<1.0	<1.0	<1.0	<1.0	
<b>MW-4</b>									
4/11/2002	--	--	11	--	--	--	--	--	
11/27/2002	--	--	6.5	--	--	--	--	--	
6/3/2003	<500	<100	120	<2.5	<2.5	<2.5	<2.5	<2.5	
11/13/2003	<100	<20	20	<0.50	<0.50	<0.50	--	--	
05/12/2004	<500	<100	79	<2.5	<2.5	<2.5	<2.5	<2.5	
12/01/2004	<100	<20	1.8	<0.50	<0.50	<0.50	<0.50	<0.50	
05/02/2005	<100	75	11	<0.50	<0.50	<0.50	<0.50	<0.50	
11/16/2005	<100	<20	0.93	<0.50	<0.50	<0.50	<0.50	<0.50	a
5/31/2006	<300	<20	2.4	<0.50	<0.50	<0.50	<0.50	<0.50	a
12/6/2006	<300	<20	7.8	<0.50	<0.50	<0.50	<0.50	<0.50	a
5/15/2007	<300	<20	2.2	<0.50	<0.50	<0.50	<0.50	<0.50	
11/29/2007	<300	<20	9.1	<0.50	<0.50	<0.50	<0.50	<0.50	
5/6/2008	<300	<10	10	<0.50	<0.50	<0.50	<0.50	<0.50	
11/24/2008	<300	<10	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
4/9/2009	<300	<10	12	<0.50	<0.50	<0.50	<0.50	<0.50	
11/24/2009	<300	<10	1.7	<0.50	<0.50	<0.50	<0.50	<0.50	

**Table 2. Summary of Fuel Additives Analytical Data**  
**ARCO Service Station #2035, 1001 San Pablo Ave., Albany, CA**

Well and Sample Date	Concentrations in (µg/L)								Footnote
	Ethanol	TBA	MTBE	DIPE	ETBE	TAME	1,2-DCA	EDB	
<b>MW-4 Cont.</b>									
5/26/2010	<300	<10	1.4	<0.50	<0.50	<0.50	<0.50	<0.50	
2/16/2011	<300	<10	2.1	<0.50	<0.50	<0.50	<0.50	<0.50	
<b>5/11/2011</b>	<b>&lt;300</b>	<b>&lt;10</b>	<b>0.75</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>MW-5</b>									
4/11/2002	--	--	<5.0	--	--	--	--	--	
6/3/2003	<100	<20	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
11/13/2003	<100	<20	0.79	<0.50	<0.50	<0.50	--	--	
12/01/2004	<100	<20	0.55	<0.50	<0.50	<0.50	<0.50	<0.50	
11/16/2005	<100	<20	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	a
12/6/2006	<300	<20	0.99	<0.50	<0.50	<0.50	<0.50	<0.50	a
11/29/2007	<300	<20	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
11/24/2008	<300	<10	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
11/24/2009	<300	<10	0.89	<0.50	<0.50	<0.50	<0.50	<0.50	
2/16/2011	<300	<10	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
<b>MW-6</b>									
4/11/2002	--	--	<5.0	--	--	--	--	--	
11/27/2002	--	--	<0.50	--	--	--	--	--	
6/3/2003	<100	<20	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
11/13/2003	<100	<20	<0.50	<0.50	<0.50	<0.50	--	--	
12/01/2004	<100	<20	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
11/16/2005	<100	<20	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	a
12/6/2006	<300	<20	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	a
11/29/2007	<300	<20	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
11/24/2008	<300	<10	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
11/24/2009	<300	<10	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
2/16/2011	<300	<10	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
<b>MW-7</b>									
4/9/2009	<300	<10	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
11/24/2009	<300	<10	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	b
5/26/2010	<300	<10	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	

**Table 2. Summary of Fuel Additives Analytical Data**  
**ARCO Service Station #2035, 1001 San Pablo Ave., Albany, CA**

Well and Sample Date	Concentrations in (µg/L)								Footnote
	Ethanol	TBA	MTBE	DIPE	ETBE	TAME	1,2-DCA	EDB	
<b>MW-7 Cont.</b>									
2/16/2011	<300	<10	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
5/11/2011	<300	<10	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	c
<b>MW-8</b>									
4/9/2009	<300	330	110	5.5	<0.50	<0.50	34	<0.50	
11/24/2009	<60,000	<2,000	<100	<100	<100	<100	<100	<100	b
5/26/2010	<6,000	<200	<10	<10	<10	<10	<10	<10	
2/16/2011	<3,000	<100	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	
5/11/2011	<2,400	<80	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	c
<b>MW-9</b>									
4/9/2009	<300	<10	2.1	<0.50	<0.50	<0.50	<0.50	<0.50	
11/24/2009	<300	<10	3.8	<0.50	<0.50	<0.50	<0.50	<0.50	
5/26/2010	<300	<10	1.9	<0.50	<0.50	<0.50	<0.50	<0.50	
2/16/2011	<300	<10	3.8	<0.50	<0.50	<0.50	<0.50	<0.50	
5/11/2011	<300	<10	1.2	<0.50	<0.50	<0.50	<0.50	<0.50	
<b>RW-1</b>									
4/11/2002	--	--	1,500	--	--	--	--	--	
11/27/2002	--	--	<25	--	--	--	--	--	
6/3/2003	<100	22	48	<0.50	<0.50	<0.50	<0.50	<0.50	
11/13/2003	<100	<20	44	<0.50	<0.50	<0.50	--	--	
05/12/2004	<500	<100	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	
12/01/2004	<500	<100	16	<2.5	<2.5	<2.5	<2.5	<2.5	
05/02/2005	<200	<40	50	<1.0	<1.0	<1.0	<1.0	<1.0	
11/16/2005	<200	<40	32	<1.0	<1.0	<1.0	<1.0	<1.0	a
5/31/2006	<300	<20	28	<0.50	<0.50	<0.50	<0.50	<0.50	a
12/6/2006	<300	<20	19	<0.50	<0.50	<0.50	<0.50	<0.50	a
5/15/2007	<300	<20	18	<0.50	<0.50	<0.50	<0.50	<0.50	
11/29/2007	<300	<20	18	<0.50	<0.50	<0.50	<0.50	<0.50	
5/6/2008	<1,500	<50	2.6	<2.5	<2.5	<2.5	<2.5	<2.5	
11/24/2008	<300	<10	11	<0.50	<0.50	<0.50	<0.50	<0.50	
4/9/2009	<300	<10	4.0	<0.50	<0.50	<0.50	<0.50	<0.50	

**Table 2. Summary of Fuel Additives Analytical Data**  
**ARCO Service Station #2035, 1001 San Pablo Ave., Albany, CA**

Well and Sample Date	Concentrations in (µg/L)								Footnote
	Ethanol	TBA	MTBE	DIPE	ETBE	TAME	1,2-DCA	EDB	
<b>RW-1 Cont.</b>									
11/24/2009	<300	<10	6.5	<0.50	<0.50	<0.50	<0.50	<0.50	
5/26/2010	<300	<10	0.94	<0.50	<0.50	<0.50	<0.50	<0.50	
2/16/2011	<300	<10	1.3	<0.50	<0.50	<0.50	<0.50	<0.50	
<b>5/11/2011</b>	<b>&lt;1,200</b>	<b>&lt;40</b>	<b>&lt;2.0</b>	<b>&lt;2.0</b>	<b>&lt;2.0</b>	<b>&lt;2.0</b>	<b>&lt;2.0</b>	<b>&lt;2.0</b>	<b>c</b>
<b>S-5</b>									
4/11/2002	--	--	<500	--	--	--	--	--	
11/27/2002	--	--	<50	--	--	--	--	--	
6/3/2003	<5,000	<1,000	<25	<25	<25	<25	<25	<25	
6/3/2003	<5,000	<1,000	<25	<25	<25	<25	<25	<25	
6/3/2003	<5,000	<1,000	<25	<25	<25	<25	<25	<25	
6/3/2003	<5,000	<1,000	<25	<25	<25	<25	<25	<25	
11/13/2003	<10,000	<2,000	<50	<50	<50	<50	--	--	
05/12/2004	<10,000	<2,000	<50	<50	<50	<50	<50	<50	
12/01/2004	<5,000	<1,000	<25	<25	<25	<25	<25	<25	
05/02/2005	<1,000	<200	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	
11/16/2005	<1,000	<200	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	a
5/31/2006	<3,000	<200	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	a
12/6/2006	<15,000	<1,000	<25	<25	<25	<25	<25	<25	a
5/15/2007	<3,000	<200	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	
11/29/2007	<1,500	<100	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	
5/6/2008	<300	<10	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
11/24/2008	<6,000	<200	<10	<10	<10	<10	<10	<10	
4/9/2009	<6,000	<200	<10	<10	<10	<10	<10	<10	
2/16/2011	<300	<10	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
<b>5/11/2011</b>	<b>&lt;300</b>	<b>&lt;10</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>c</b>

Symbols & Abbreviations:

-- = Not analyzed/applicable/measured/available

< = Not detected at or above the laboratory reporting limit

1,2-DCA = 1,2-Dichloroethane

DIPE = Di-isopropyl ether

EDB = 1,2-Dibromoethane

ETBE = Ethyl tert-butyl ether

MTBE = Methyl tert-butyl ether

TAME = tert-Amyl methyl ether

TBA = tert-Butyl alcohol

µg/L = Micrograms per Liter

Footnote:

a = Calibration verification for ethanol was within method limits but outside contract limits

b = Sample taken from VOA vial with air bubble > 6mm diameter

c = LW Quantitated against gasoline

Notes:

All volatile organic compounds analyzed using EPA Method 8260B

The data within this table collected prior to April 2006 was provided to Broadbent & Associates, Inc. by Atlantic Richfield Company and their previous consultants. Broadbent & Associates, Inc. has not verified the accuracy of this information



**ATTACHMENT D**

**SFRWQCB ESL Tables**

**Table E-1. Groundwater Screening Levels  
for Evaluation of Potential Vapor Intrusion Concerns  
(volatile chemicals only)**

Chemical	Physical State		Residential Land Use	Commercial/Industrial Land Use
			(µg/L)	(µg/L)
Acenaphthene	V	S	4.2E+03	4.2E+03
Acenaphthylene	V	S	(Use soil gas)	(Use soil gas)
Acetone	V	L	5.3E+07	1.5E+08
Aldrin	NV	S		
Anthracene	V	S	4.3E+01	4.3E+01
Antimony	NV	S		
Arsenic	NV	S		
Barium	NV	S		
Benzene	V	L	5.4E+02	1.8E+03
Benzo(a)anthracene	NV	S		
Benzo(b)fluoranthene	NV	S		
Benzo(k)fluoranthene	NV	S		
Benzo(g,h,i)perylene	NV	S		
Benzo(a)pyrene	NV	S		
Beryllium	NV	S		
1,1-Biphenyl	V	S	(Use soil gas)	(Use soil gas)
Bis(2-chloroethyl) ether	V	L	6.5E+01	2.2E+02
Bis(2-chloroisopropyl) ether	V	L	(Use soil gas)	(Use soil gas)
Bis(2-ethylhexyl) phthalate	NV	S		
Boron	NV	S		
Bromodichloromethane	V	L	1.7E+02	5.6E+02
Bromoform (Tribromomethane)	NV	S		
Bromomethane	V	G	5.8E+02	1.6E+03
Cadmium	NV	S		
Carbon tetrachloride	V	L	9.3E+00	3.1E+01
Chlordane	NV	S		
p-Chloroaniline	NV	S		
Chlorobenzene	V	L	1.3E+04	3.7E+04
Chloroethane	V	G	8.2E+02	2.7E+03
Chloroform	V	L	3.3E+02	1.1E+03
Chloromethane	V	G	4.1E+01	1.4E+02
2-Chlorophenol	V	L	5.3E+03	1.5E+04
Chromium (total)	NV	S		
Chromium III	NV	S		
Chromium VI	NV	S		
Chrysene	NV	S	(Use soil gas)	(Use soil gas)
Cobalt	NV	S		
Copper	NV	S		
Cyanide	NV	S	(Use soil gas)	(Use soil gas)
Dibenz(a,h)anthracene	NV	S		
Dibromochloromethane	V	S	1.7E+02	5.7E+02
1,2-dibromo-3-chloropropane	V	L	(Use soil gas)	(Use soil gas)
1,2-Dibromoethane	V	S	1.5E+02	5.1E+02
1,2-Dichlorobenzene	V	L	7.7E+04	1.6E+05
1,3-Dichlorobenzene	V	L	(Use soil gas)	(Use soil gas)
1,4-Dichlorobenzene	V	S	3.4E+02	1.1E+03
3,3-Dichlorobenzidine	NV	S		
Dichlorodiphenyldichloroethane (DDD)	NV	S		
Dichlorodiphenyldichloroethene (DDE)	NV	S		
Dichlorodiphenyltrichloroethane (DDT)	NV	S		
1,1-Dichloroethane	V	L	1.0E+03	3.4E+03
1,2-Dichloroethane	V	L	2.0E+02	6.9E+02

**Table E-1. Groundwater Screening Levels  
for Evaluation of Potential Vapor Intrusion Concerns  
(volatile chemicals only)**

Chemical	Physical State		Residential Land Use	Commercial/Industrial Land Use
			(µg/L)	(µg/L)
1,1-Dichloroethene	V	L	6.3E+03	1.8E+04
<i>cis</i> -1,2-Dichloroethene	V	L	6.2E+03	1.7E+04
<i>trans</i> -1,2-Dichloroethene	V	L	6.7E+03	1.9E+04
2,4-Dichlorophenol	NV	S		
1,2-Dichloropropane	V	L	2.8E+02	9.3E+02
1,3-Dichloropropene	V	L	5.3E+01	1.8E+02
Dieldrin	NV	S		
Diethyl phthalate	NV	S		
Dimethyl phthalate	NV	S		
2,4-Dimethylphenol	V	S	2.5E+06	7.1E+06
2,4-Dinitrophenol	NV	S		
2,4-Dinitrotoluene	NV	S		
1,4-Dioxane	NV	L		
Dioxin (2,3,7,8-TCDD)	NV	S		
Endosulfan	NV	S		
Endrin	NV	S		
Ethylbenzene	V	L	1.7E+05	1.7E+05
Fluoranthene	NV	S		
Fluorene	V	S	1.9E+03	1.9E+03
Heptachlor	NV	S		
Heptachlor epoxide	NV	S		
Hexachlorobenzene	NV	S		
Hexachlorobutadiene	NV	S		
γ-Hexachlorocyclohexane (Lindane)	NV	S		
Hexachloroethane	NV	S		
Indeno(1,2,3-c,d)pyrene	NV	S		
Lead	NV	S		
Mercury (elemental)	V	S	(Use soil gas)	(Use soil gas)
Methoxychlor	NV	S		
Methylene chloride	V	L	2.4E+03	8.1E+03
Methyl ethyl ketone	V	L	2.4E+07	6.8E+07
Methyl isobutyl ketone	V	L	3.0E+06	8.4E+06
Methyl mercury	NV	S		
2-Methylnaphthalene	V	S	2.6E+04	2.6E+04
<i>tert</i> -Butyl methyl ether	V	L	2.4E+04	8.0E+04
Molybdenum	NV	S		
Naphthalene	V	S	3.2E+03	1.1E+04
Nickel	NV	S		
Pentachlorophenol	NV	S		
Perchlorate	NV	S		
Phenanthrene	V	S	(Use soil gas)	(Use soil gas)
Phenol	NV	S		
Polychlorinated biphenyls (PCBs)	NV	S		
Pyrene	V	S	1.4E+02	1.4E+02
Selenium	NV	S		
Silver	NV	S		
Styrene	V	L	3.1E+05	3.1E+05
<i>tert</i> -Butyl alcohol			(Use soil gas)	(Use soil gas)
1,1,1,2-Tetrachloroethane	V	L	(Use soil gas)	(Use soil gas)
1,1,2,2-Tetrachloroethane	V	L	1.9E+02	6.4E+02
Tetrachloroethene	V	L	1.2E+02	4.2E+02
Thallium	NV	S		

**Table E-1. Groundwater Screening Levels  
for Evaluation of Potential Vapor Intrusion Concerns  
(volatile chemicals only)**

Chemical	Physical State		Residential Land Use	Commercial/Industrial Land Use
			(µg/L)	(µg/L)
Toluene	V	L	3.8E+05	5.3E+05
Toxaphene	NV	S		
TPH (gasolines)	V	L	(Use soil gas)	(Use soil gas)
TPH (middle distillates)	V	L	(Use soil gas)	(Use soil gas)
TPH (residual fuels)	NV	L/S		
1,2,4-Trichlorobenzene	V	L	2.5E+03	7.1E+03
1,1,1-Trichloroethane	V	L	1.3E+05	3.6E+05
1,1,2-Trichloroethane	V	L	3.5E+02	1.2E+03
Trichloroethene	V	L	5.3E+02	1.8E+03
2,4,5-Trichlorophenol	V	S	8.3E+05	1.2E+06
2,4,6-Trichlorophenol	NV	S		
Vanadium	NV	S		
Vinyl chloride	V	G	3.8E+00	1.3E+01
Xylenes	V	L	1.6E+05	1.6E+05
Zinc	NV	S		

**Notes:**  
 High permeability soil: One meter dry sandy soil (92% sand, 5% silt, 3% clay) over one meter moist clayey loam (33% sand, 34% silt, 33% clay).  
 Screening levels calculated using spreadsheet provided with *User's Guide for the Johnson and Ettinger Indoor Air model (1991) for Subsurface Vapor Intrusion Into Buildings (USEPA 2003)*. Assumed vadose-zone thickness/depth to groundwater three meters.  
 Physical state of chemical at ambient conditions (V - volatile, NV - nonvolatile, S - solid, L - liquid, G - gas).  
 Chemical considered to be volatile if Henry's Law constant (atm m<sup>3</sup>/mole) >10<sup>-5</sup> and molecular weight <200.  
 Dibromochloromethane, dibromochloropropane and pyrene considered volatile for purposes of modeling (USEPA 2004).  
 Target cancer risk = 1E-06, Target Hazard Quotient = 0.2

**Table K-2. Direct Exposure Soil Screening Levels  
Commerical/Industrial Worker Exposure Scenario**

Chemical	Final Screening Level (mg/kg)	Basis	Carcinogens (Risk = 10 <sup>-6</sup> ) (mg/kg)	Noncarcinogens (HQ = 0.2) (mg/kg)	Noncarcinogens (HQ = 1.0) (mg/kg)	Saturation (mg/kg)
Acenaphthene	3.1E+03	noncarcinogenic effects	-	3.1E+03	1.6E+04	N/A
Acenaphthylene	3.3E+03	noncarcinogenic effects	-	3.3E+03	1.7E+04	N/A
Acetone	1.1E+04	noncarcinogenic effects	-	1.1E+04	5.3E+04	1.0E+05
Aldrin	1.3E-01	carcinogenic effects	1.3E-01	4.6E+00	2.3E+01	N/A
Anthracene	2.6E+04	noncarcinogenic effects	-	2.6E+04	1.3E+05	N/A
Antimony	8.2E+01	noncarcinogenic effects	-	8.2E+01	4.1E+02	N/A
Arsenic	1.6E+00	carcinogenic effects	1.6E+00	5.1E+01	2.6E+02	N/A
Barium	3.4E+04	noncarcinogenic effects	-	3.4E+04	1.7E+05	N/A
Benzene	2.7E-01	carcinogenic effects	2.7E-01	1.6E+01	8.2E+01	8.7E+02
Benzo(a)anthracene	1.3E+00	carcinogenic effects	1.3E+00	3.3E+03	1.7E+04	N/A
Benzo(b)fluoranthene	1.3E+00	carcinogenic effects	1.3E+00	3.3E+03	1.7E+04	N/A
Benzo(k)fluoranthene	1.3E+00	carcinogenic effects	1.3E+00	3.3E+03	1.7E+04	N/A
Benzo(g,h,i)perylene	3.3E+03	noncarcinogenic effects	-	3.3E+03	1.7E+04	N/A
Benzo(a)pyrene	1.3E-01	carcinogenic effects	1.3E-01	3.3E+03	1.7E+04	N/A
Beryllium	3.9E+02	noncarcinogenic effects	2.2E+03	3.9E+02	1.9E+03	N/A
1,1-Biphenyl	6.2E+03	noncarcinogenic effects	-	6.2E+03	3.1E+04	N/A
Bis(2-chloroethyl) ether	3.8E-01	carcinogenic effects	3.8E-01	-	-	9.6E+03
Bis(2-chloroisopropyl) ether	7.7E-02	carcinogenic effects	7.7E-02	5.5E+02	2.7E+03	7.9E+02
Bis(2-ethylhexyl) phthalate	1.2E+02	carcinogenic effects	1.2E+02	2.5E+03	1.2E+04	N/A
Boron	4.1E+04	noncarcinogenic effects	-	4.1E+04	2.0E+05	N/A
Bromodichloromethane	1.3E+00	carcinogenic effects	1.3E+00	1.1E+02	5.6E+02	3.0E+03
Bromoform (Tribromomethane)	3.6E+02	carcinogenic effects	3.6E+02	4.1E+03	2.0E+04	N/A
Bromomethane	2.3E+00	noncarcinogenic effects	-	2.3E+00	1.2E+01	3.1E+03
Cadmium	7.4E+00	carcinogenic effects	7.4E+00	1.0E+02	5.1E+02	N/A
Carbon tetrachloride	4.4E-02	carcinogenic effects	4.4E-02	1.5E+01	7.3E+01	1.1E+03
Chlordane	1.7E+00	carcinogenic effects	1.7E+00	8.1E+01	4.0E+02	N/A
p-Chloroaniline	8.2E+02	noncarcinogenic effects	-	8.2E+02	4.1E+03	N/A
Chlorobenzene	6.8E+02	saturation limit	-	8.5E+02	4.3E+03	6.8E+02
Chloroethane	3.4E+01	noncarcinogenic effects	9.9E+02	3.4E+01	1.7E+02	1.6E+03
Chloroform	1.5E+00	carcinogenic effects	1.5E+00	1.6E+02	7.8E+02	2.9E+03
Chloromethane	2.5E+01	noncarcinogenic effects	-	2.5E+01	1.3E+02	4.1E+03
2-Chlorophenol	2.7E+01	noncarcinogenic effects	-	2.7E+01	1.3E+02	5.5E+04
Chromium (total)	-	-	-	-	-	N/A

**Table K-2. Direct Exposure Soil Screening Levels  
Commerical/Industrial Worker Exposure Scenario**

Chemical	Final Screening Level (mg/kg)	Basis	Carcinogens (Risk = 10 <sup>-6</sup> ) (mg/kg)	Noncarcinogens (HQ = 0.2) (mg/kg)	Noncarcinogens (HQ = 1.0) (mg/kg)	Saturation (mg/kg)
Chromium III	3.1E+05	noncarcinogenic effects	-	3.1E+05	1.5E+06	N/A
Chromium VI	3.6E+01	carcinogenic effects	3.6E+01	3.6E+01	1.8E+02	N/A
Chrysene	2.1E+02	carcinogenic effects	2.1E+02	3.3E+03	1.7E+04	N/A
Cobalt	1.9E+03	carcinogenic effects	1.9E+03	2.7E+03	1.3E+04	N/A
Copper	8.2E+04	noncarcinogenic effects	-	8.2E+04	4.1E+05	N/A
Cyanide	1.2E+02	noncarcinogenic effects	-	1.2E+02	6.1E+02	N/A
Dibenz(a,h)anthracene	2.1E-01	carcinogenic effects	2.1E-01	3.3E+03	1.7E+04	N/A
Dibromochloromethane	3.4E+01	carcinogenic effects	3.4E+01	4.1E+03	2.0E+04	N/A
1,2-dibromo-3-chloropropane	4.1E-01	carcinogenic effects	4.1E-01	7.7E+04	3.8E+05	N/A
1,2-Dibromoethane	4.4E-02	carcinogenic effects	4.4E-02	1.8E+01	8.9E+01	N/A
1,2-Dichlorobenzene	4.6E+02	noncarcinogenic effects	-	4.6E+02	2.3E+03	6.0E+02
1,3-Dichlorobenzene	2.4E+02	noncarcinogenic effects	-	2.4E+02	1.2E+03	6.0E+02
1,4-Dichlorobenzene	2.6E+00	carcinogenic effects	2.6E+00	1.3E+03	6.6E+03	N/A
3,3-Dichlorobenzidine	2.4E+00	carcinogenic effects	2.4E+00	-	-	N/A
Dichlorodipenyldichloroethane (DDD)	1.0E+01	carcinogenic effects	1.0E+01	8.5E+01	4.3E+02	N/A
Dichlorodipenyldichloroethene (DDE)	7.0E+00	carcinogenic effects	7.0E+00	8.5E+01	4.3E+02	N/A
Dichlorodipenyltrichloroethane (DDT)	7.0E+00	carcinogenic effects	7.0E+00	8.5E+01	4.3E+02	N/A
1,1-Dichloroethane	4.7E+00	carcinogenic effects	4.7E+00	2.7E+02	1.3E+03	1.7E+03
1,2-Dichloroethane	4.8E-01	carcinogenic effects	4.8E-01	4.5E+00	2.2E+01	1.8E+03
1,1-Dichloroethene	6.5E+01	noncarcinogenic effects	-	6.5E+01	3.2E+02	1.5E+03
<i>cis</i> -1,2-Dichloroethene	2.2E+01	noncarcinogenic effects	-	2.2E+01	1.1E+02	1.2E+03
<i>trans</i> -1,2-Dichloroethene	3.4E+01	noncarcinogenic effects	-	3.4E+01	1.7E+02	3.1E+03
2,4-Dichlorophenol	6.1E+02	noncarcinogenic effects	-	6.1E+02	3.1E+03	N/A
1,2-Dichloropropane	1.0E+00	carcinogenic effects	1.0E+00	3.0E+00	1.5E+01	1.1E+03
1,3-Dichloropropene	3.6E-01	carcinogenic effects	3.6E-01	8.4E+00	4.2E+01	1.4E+03
Dieldrin	1.3E-01	carcinogenic effects	1.3E-01	7.7E+00	3.8E+01	N/A
Diethyl phthalate	9.8E+04	noncarcinogenic effects	-	9.8E+04	4.9E+05	N/A
Dimethyl phthalate	1.2E+06	noncarcinogenic effects	-	1.2E+06	6.2E+06	N/A
2,4-Dimethylphenol	4.1E+03	noncarcinogenic effects	-	4.1E+03	2.0E+04	N/A
2,4-Dinitrophenol	4.1E+03	noncarcinogenic effects	-	4.1E+03	2.0E+04	N/A
2,4-Dinitrotoluene	4.2E+00	carcinogenic effects	4.2E+00	4.1E+02	2.0E+03	N/A
1,4-Dioxane	1.1E+02	carcinogenic effects	1.1E+02	1.2E+09	5.8E+09	N/A
Dioxin (2,3,7,8-TCDD)	1.8E-05	carcinogenic effects	1.8E-05	-	-	N/A

**Table K-2. Direct Exposure Soil Screening Levels  
Commerical/Industrial Worker Exposure Scenario**

Chemical	Final Screening Level (mg/kg)	Basis	Carcinogens (Risk = 10 <sup>-6</sup> ) (mg/kg)	Noncarcinogens (HQ = 0.2) (mg/kg)	Noncarcinogens (HQ = 1.0) (mg/kg)	Saturation (mg/kg)
Endosulfan	9.2E+02	noncarcinogenic effects	-	9.2E+02	4.6E+03	N/A
Endrin	4.6E+01	noncarcinogenic effects	-	4.6E+01	2.3E+02	N/A
Ethylbenzene	5.0E+00	carcinogenic effects	5.0E+00	8.7E+02	4.3E+03	4.0E+02
Fluoranthene	4.4E+03	noncarcinogenic effects	-	4.4E+03	2.2E+04	N/A
Fluorene	2.8E+03	noncarcinogenic effects	-	2.8E+03	1.4E+04	N/A
Heptachlor	4.8E-01	carcinogenic effects	4.8E-01	7.7E+01	3.8E+02	N/A
Heptachlor epoxide	2.4E-01	carcinogenic effects	2.4E-01	2.0E+00	1.0E+01	N/A
Hexachlorobenzene	1.3E+00	carcinogenic effects	1.3E+00	1.2E+02	6.1E+02	N/A
Hexachlorobutadiene	3.7E+01	carcinogenic effects	3.7E+01	4.1E+01	2.0E+02	N/A
$\gamma$ -Hexachlorocyclohexane (Lindane)	4.6E+01	noncarcinogenic effects	-	4.6E+01	2.3E+02	N/A
Hexachloroethane	4.4E+01	carcinogenic effects	4.4E+01	1.2E+02	6.2E+02	N/A
Indeno(1,2,3-c,d)pyrene	2.1E+00	carcinogenic effects	2.1E+00	3.3E+03	1.7E+04	N/A
Lead	7.5E+02	noncarcinogenic effects	-	7.5E+02	7.5E+02	N/A
Mercury (elemental)	1.8E+01	noncarcinogenic effects	-	1.8E+01	8.8E+01	N/A
Methoxychlor	-	-	-	-	-	N/A
Methylene chloride	1.7E+01	carcinogenic effects	1.7E+01	2.4E+02	1.2E+03	2.4E+03
Methyl ethyl ketone	2.1E+04	noncarcinogenic effects	-	2.1E+04	1.1E+05	3.4E+04
Methyl isobutyl ketone	1.2E+04	noncarcinogenic effects	-	1.2E+04	6.1E+04	1.7E+04
Methyl mercury	1.2E+01	noncarcinogenic effects	-	1.2E+01	6.2E+01	N/A
2-Methylnaphthalene	4.4E+02	noncarcinogenic effects	-	4.4E+02	2.2E+03	N/A
<i>tert</i> -Butyl methyl ether	6.5E+01	carcinogenic effects	6.5E+01	3.7E+03	1.8E+04	2.1E+04
Molybdenum	1.0E+03	noncarcinogenic effects	-	1.0E+03	5.1E+03	N/A
Naphthalene	2.8E+00	carcinogenic effects	2.8E+00	2.0E+01	1.0E+02	N/A
Nickel	3.4E+03	noncarcinogenic effects	-	3.4E+03	1.7E+04	N/A
Pentachlorophenol	9.0E+00	carcinogenic effects	9.0E+00	2.3E+02	1.2E+03	N/A
Perchlorate	1.4E+02	noncarcinogenic effects	-	1.4E+02	7.2E+02	N/A
Phenanthrene	3.3E+03	noncarcinogenic effects	-	3.3E+03	1.7E+04	N/A
Phenol	6.1E+04	noncarcinogenic effects	-	6.1E+04	3.1E+05	N/A
Polychlorinated biphenyls (PCBs)	7.4E-01	carcinogenic effects	7.4E-01	2.1E+00	1.1E+01	N/A
Pyrene	6.6E+03	noncarcinogenic effects	-	6.6E+03	3.3E+04	N/A
Selenium	1.0E+03	noncarcinogenic effects	-	1.0E+03	5.1E+03	N/A
Silver	1.0E+03	noncarcinogenic effects	-	1.0E+03	5.1E+03	N/A
Styrene	1.5E+03	saturation limit	-	1.8E+03	9.2E+03	1.5E+03

**Table K-2. Direct Exposure Soil Screening Levels  
Commerical/Industrial Worker Exposure Scenario**

Chemical	Final Screening Level (mg/kg)	Basis	Carcinogens (Risk = 10 <sup>-6</sup> ) (mg/kg)	Noncarcinogens (HQ = 0.2) (mg/kg)	Noncarcinogens (HQ = 1.0) (mg/kg)	Saturation (mg/kg)
<i>tert</i> -Butyl alcohol	3.2E+05	saturation limit	-	-	-	3.2E+05
1,1,1,2-Tetrachloroethane	4.5E+00	carcinogenic effects	4.5E+00	6.1E+03	3.1E+04	2.0E+03
1,1,1,2-Tetrachloroethane	6.0E-01	carcinogenic effects	6.0E-01	5.2E+02	2.6E+03	2.0E+03
Tetrachloroethene	9.5E-01	carcinogenic effects	9.5E-01	1.8E+02	8.9E+02	2.3E+02
Thallium	1.6E+01	noncarcinogenic effects	-	1.6E+01	8.2E+01	N/A
Toluene	2.1E+02	noncarcinogenic effects	-	2.1E+02	1.1E+03	6.5E+02
Toxaphene	1.8E+00	carcinogenic effects	1.8E+00	-	-	N/A
TPH (gasolines)	4.5E+02	noncarcinogenic effects	-	4.5E+02	2.2E+03	4.5E+03
TPH (middle distillates)	4.5E+02	noncarcinogenic effects	-	4.5E+02	2.2E+03	N/A
TPH (residual fuels)	3.7E+03	noncarcinogenic effects	-	3.7E+03	1.8E+04	N/A
1,2,4-Trichlorobenzene	2.7E+01	noncarcinogenic effects	7.9E+02	2.7E+01	1.3E+02	N/A
1,1,1-Trichloroethane	9.5E+02	noncarcinogenic effects	-	9.5E+02	4.8E+03	1.2E+03
1,1,2-Trichloroethane	1.1E+00	carcinogenic effects	1.1E+00	1.8E+01	8.8E+01	1.8E+03
Trichloroethene	4.1E+00	carcinogenic effects	4.1E+00	5.2E+01	2.6E+02	1.3E+03
2,4,5-Trichlorophenol	1.6E+03	noncarcinogenic effects	-	1.6E+03	8.0E+03	N/A
2,4,6-Trichlorophenol	2.0E+01	noncarcinogenic effects	2.6E+02	2.0E+01	1.0E+02	N/A
Vanadium	2.0E+02	noncarcinogenic effects	-	2.0E+02	1.0E+03	N/A
Vinyl chloride	4.7E-02	carcinogenic effects	4.7E-02	2.6E+01	1.3E+02	1.2E+03
Xylenes	1.0E+02	noncarcinogenic effects	-	1.0E+02	5.1E+02	4.2E+02
Zinc	6.1E+04	noncarcinogenic effects	-	6.1E+04	3.1E+05	N/A

**Primary source:** USEPA Region 9 Preliminary Remediation Goals (PRGs, USEPA 2004), modified as noted below. See text for discussion.

**Notes:**  
 See text for equations and assumptions used in models.  
 Final screening level is lowest of individual screening levels for carcinogenic effects and noncarcinogenic effects (based on HQ=0.2)  
 Saturation limit used as upper limit for volatile organic compounds that are liquid at ambient conditions (see text).  
 Carcinogens: Based on target cancer risk of 10<sup>-6</sup>; modified with respect to CalEPA/OEHHA slope factors when available (marked by \*\*\*). Screening levels for PCBs based on updated USEPA slope factors as presented in USEPA Region IX Preliminary Remediation Goals document (USEPA 2004).  
 Noncarcinogens: Adjusted to target hazard quotient of 0.2 for use in tables for all chemicals. Screening levels based on hazard quotient of 1.0 provided for reference.  
 Saturation: Theoretical soil saturation level in the absence of free product; calculated for volatile organic compounds that are liquids under ambient conditions (refer to Table J).  
 TPH: Total Petroleum Hydrocarbons.  
 Direct-exposure screening level for lead from USEPA Region 9 Preliminary Remediation Goals document (USEPA 2004).



**Table K-3. Direct Exposure Soil Screening Levels  
Construction/Trench Worker Exposure Scenario**

Chemical	Final Screening Level (mg/kg)	Basis	Carcinogens (Risk = 10 <sup>-6</sup> ) (mg/kg)	Noncarcinogens HQ = 0.2 (mg/kg)	Noncarcinogens (HQ = 1.0) (mg/kg)	Saturation (mg/kg)
Acenaphthene	1.7E+04	noncarcinogenic effects	-	1.7E+04	8.3E+04	N/A
Acenaphthylene	1.1E+04	noncarcinogenic effects	-	1.1E+04	5.3E+04	N/A
Acetone	1.0E+05	saturation limit	-	1.2E+05	5.9E+05	1.0E+05
Aldrin	1.5E+00	carcinogenic effects	1.5E+00	1.6E+01	7.8E+01	N/A
Anthracene	1.0E+05	noncarcinogenic effects	-	1.0E+05	5.0E+05	N/A
Antimony	3.1E+02	noncarcinogenic effects	-	3.1E+02	1.5E+03	N/A
Arsenic	1.5E+01	carcinogenic effects	1.5E+01	1.8E+02	9.2E+02	N/A
Barium	2.6E+03	noncarcinogenic effects	-	2.6E+03	1.3E+04	N/A
Benzene	1.2E+01	carcinogenic effects	1.2E+01	1.9E+02	9.7E+02	8.7E+02
Benzo(a)anthracene	1.5E+01	carcinogenic effects	1.5E+01	1.1E+04	5.3E+04	N/A
Benzo(b)fluoranthene	1.5E+01	carcinogenic effects	1.5E+01	1.1E+04	5.3E+04	N/A
Benzo(k)fluoranthene	1.5E+01	carcinogenic effects	1.5E+01	1.1E+04	5.3E+04	N/A
Benzo(g,h,i)perylene	1.1E+04	noncarcinogenic effects	-	1.1E+04	5.3E+04	N/A
Benzo(a)pyrene	1.5E+00	carcinogenic effects	1.5E+00	1.1E+04	5.3E+04	N/A
Beryllium	9.8E+01	noncarcinogenic effects	1.1E+02	9.8E+01	4.9E+02	N/A
1,1-Biphenyl	2.0E+04	noncarcinogenic effects	-	2.0E+04	1.0E+05	N/A
Bis(2-chloroethyl) ether	1.3E+01	carcinogenic effects	1.3E+01	-	-	9.6E+03
Bis(2-chloroisopropyl) ether	3.0E+00	carcinogenic effects	3.0E+00	6.0E+03	3.0E+04	7.9E+02
Bis(2-ethylhexyl) phthalate	1.4E+03	carcinogenic effects	1.4E+03	8.0E+03	4.0E+04	N/A
Boron	6.3E+04	noncarcinogenic effects	-	6.3E+04	3.1E+05	N/A
Bromodichloromethane	5.3E+01	carcinogenic effects	5.3E+01	1.3E+03	6.5E+03	3.0E+03
Bromoform (Tribromomethane)	4.8E+03	carcinogenic effects	4.8E+03	1.5E+04	7.4E+04	N/A
Bromomethane	2.9E+01	noncarcinogenic effects	-	2.9E+01	1.4E+02	3.1E+03
Cadmium	3.9E+01	carcinogenic effects	3.9E+01	3.8E+02	1.9E+03	N/A
Carbon tetrachloride	1.9E+00	carcinogenic effects	1.9E+00	1.5E+02	7.4E+02	1.1E+03
Chlordane	2.1E+01	carcinogenic effects	2.1E+01	2.6E+02	1.3E+03	N/A
p-Chloroaniline	3.1E+03	noncarcinogenic effects	-	3.1E+03	1.5E+04	N/A
Chlorobenzene	6.8E+02	saturation limit	-	7.2E+03	3.6E+04	6.8E+02
Chloroethane	4.2E+02	noncarcinogenic effects	1.3E+04	4.2E+02	2.1E+03	1.6E+03
Chloroform	6.3E+01	carcinogenic effects	6.3E+01	1.7E+03	8.3E+03	2.9E+03
Chloromethane	3.1E+02	noncarcinogenic effects	-	3.1E+02	1.6E+03	4.1E+03
2-Chlorophenol	3.2E+02	noncarcinogenic effects	-	3.2E+02	1.6E+03	5.5E+04
Chromium (total)	-	-	-	-	-	N/A

**Table K-3. Direct Exposure Soil Screening Levels  
Construction/Trench Worker Exposure Scenario**

Chemical	Final Screening Level (mg/kg)	Basis	Carcinogens (Risk = 10 <sup>-6</sup> ) (mg/kg)	Noncarcinogens HQ = 0.2 (mg/kg)	Noncarcinogens (HQ = 1.0) (mg/kg)	Saturation (mg/kg)
Chromium III	1.2E+06	noncarcinogenic effects	-	1.2E+06	5.8E+06	N/A
Chromium VI	5.3E-01	noncarcinogenic effects	1.8E+00	5.3E-01	2.6E+00	N/A
Chrysene	2.4E+03	carcinogenic effects	2.4E+03	1.1E+04	5.3E+04	N/A
Cobalt	9.4E+01	carcinogenic effects	9.4E+01	1.0E+02	5.2E+02	N/A
Copper	3.1E+05	noncarcinogenic effects	-	3.1E+05	1.5E+06	N/A
Cyanide	1.3E+03	noncarcinogenic effects	-	1.3E+03	6.7E+03	N/A
Dibenz(a,h)anthracene	2.4E+00	carcinogenic effects	2.4E+00	1.1E+04	5.3E+04	N/A
Dibromochloromethane	4.6E+02	carcinogenic effects	4.6E+02	1.5E+04	7.7E+04	N/A
1,2-dibromo-3-chloropropane	5.3E+00	carcinogenic effects	5.3E+00	1.1E+03	5.3E+03	N/A
1,2-Dibromoethane	1.7E+00	carcinogenic effects	1.7E+00	2.2E+02	1.1E+03	N/A
1,2-Dichlorobenzene	6.0E+02	saturation limit	-	5.4E+03	2.7E+04	6.0E+02
1,3-Dichlorobenzene	6.0E+02	saturation limit	-	2.7E+03	1.4E+04	6.0E+02
1,4-Dichlorobenzene	1.1E+02	carcinogenic effects	1.1E+02	1.1E+04	5.5E+04	N/A
3,3-Dichlorobenzidine	3.1E+01	carcinogenic effects	3.1E+01	-	-	N/A
Dichlorodipenyldichloroethane (DDD)	1.2E+02	carcinogenic effects	1.2E+02	3.0E+02	1.5E+03	N/A
Dichlorodipenyldichloroethene (DDE)	8.7E+01	carcinogenic effects	8.7E+01	3.0E+02	1.5E+03	N/A
Dichlorodipenyiltrichloroethane (DDT)	8.7E+01	carcinogenic effects	8.7E+01	3.0E+02	1.5E+03	N/A
1,1-Dichloroethane	2.0E+02	carcinogenic effects	2.0E+02	3.2E+03	1.6E+04	1.7E+03
1,2-Dichloroethane	2.1E+01	carcinogenic effects	2.1E+01	5.6E+01	2.8E+02	1.8E+03
1,1-Dichloroethene	8.0E+02	noncarcinogenic effects	-	8.0E+02	4.0E+03	1.5E+03
<i>cis</i> -1,2-Dichloroethene	2.7E+02	noncarcinogenic effects	-	2.7E+02	1.3E+03	1.2E+03
<i>trans</i> -1,2-Dichloroethene	4.2E+02	noncarcinogenic effects	-	4.2E+02	2.1E+03	3.1E+03
2,4-Dichlorophenol	2.2E+03	noncarcinogenic effects	-	2.2E+03	1.1E+04	N/A
1,2-Dichloropropane	3.7E+01	noncarcinogenic effects	4.3E+01	3.7E+01	1.9E+02	1.1E+03
1,3-Dichloropropene	1.6E+01	carcinogenic effects	1.6E+01	1.0E+02	5.2E+02	1.4E+03
Dieldrin	1.6E+00	carcinogenic effects	1.6E+00	2.6E+01	1.3E+02	N/A
Diethyl phthalate	3.2E+05	noncarcinogenic effects	-	3.2E+05	1.6E+06	N/A
Dimethyl phthalate	4.0E+06	noncarcinogenic effects	-	4.0E+06	2.0E+07	N/A
2,4-Dimethylphenol	1.5E+04	noncarcinogenic effects	-	1.5E+04	7.7E+04	N/A
2,4-Dinitrophenol	1.1E+04	noncarcinogenic effects	-	1.1E+04	5.4E+04	N/A
2,4-Dinitrotoluene	5.6E+01	carcinogenic effects	5.6E+01	1.5E+03	7.4E+03	N/A
1,4-Dioxane	1.4E+03	carcinogenic effects	1.4E+03	1.6E+07	7.9E+07	N/A
Dioxin (2,3,7,8-TCDD)	2.3E-04	carcinogenic effects	2.3E-04	-	-	N/A

**Table K-3. Direct Exposure Soil Screening Levels  
Construction/Trench Worker Exposure Scenario**

Chemical	Final Screening Level (mg/kg)	Basis	Carcinogens (Risk = 10 <sup>-6</sup> ) (mg/kg)	Noncarcinogens HQ = 0.2 (mg/kg)	Noncarcinogens (HQ = 1.0) (mg/kg)	Saturation (mg/kg)
Endosulfan	3.1E+03	noncarcinogenic effects	-	3.1E+03	1.6E+04	N/A
Endrin	1.6E+02	noncarcinogenic effects	-	1.6E+02	7.8E+02	N/A
Ethylbenzene	2.1E+02	carcinogenic effects	2.1E+02	9.9E+03	4.9E+04	4.0E+02
Fluoranthene	1.4E+04	noncarcinogenic effects	-	1.4E+04	7.0E+04	N/A
Fluorene	1.2E+04	noncarcinogenic effects	-	1.2E+04	6.2E+04	N/A
Heptachlor	5.8E+00	carcinogenic effects	5.8E+00	2.6E+02	1.3E+03	N/A
Heptachlor epoxide	2.9E+00	carcinogenic effects	2.9E+00	6.8E+00	3.4E+01	N/A
Hexachlorobenzene	1.6E+01	carcinogenic effects	1.6E+01	4.2E+02	2.1E+03	N/A
Hexachlorobutadiene	1.5E+02	noncarcinogenic effects	4.8E+02	1.5E+02	7.4E+02	N/A
γ-Hexachlorocyclohexane (Lindane)	1.6E+02	noncarcinogenic effects	-	1.6E+02	8.0E+02	N/A
Hexachloroethane	4.0E+02	noncarcinogenic effects	5.1E+02	4.0E+02	2.0E+03	N/A
Indeno(1,2,3-c,d)pyrene	2.4E+01	carcinogenic effects	2.4E+01	1.1E+04	5.3E+04	N/A
Lead	7.5E+02	noncarcinogenic effects	-	7.5E+02	7.5E+02	N/A
Mercury (elemental)	5.8E+01	noncarcinogenic effects	-	5.8E+01	2.9E+02	N/A
Methoxychlor	-	-	-	-	-	N/A
Methylene chloride	6.3E+02	carcinogenic effects	6.3E+02	2.9E+03	1.4E+04	2.4E+03
Methyl ethyl ketone	3.4E+04	saturation limit	-	1.9E+05	9.5E+05	3.4E+04
Methyl isobutyl ketone	1.7E+04	saturation limit	-	1.3E+05	6.6E+05	1.7E+04
Methyl mercury	4.1E+01	noncarcinogenic effects	-	4.1E+01	2.0E+02	N/A
2-Methylnaphthalene	1.4E+03	noncarcinogenic effects	-	1.4E+03	7.2E+03	N/A
tert-Butyl methyl ether	2.8E+03	carcinogenic effects	2.8E+03	4.6E+04	2.3E+05	2.1E+04
Molybdenum	3.9E+03	noncarcinogenic effects	-	3.9E+03	1.9E+04	N/A
Naphthalene	1.3E+02	carcinogenic effects	1.3E+02	2.5E+02	1.2E+03	N/A
Nickel	2.6E+02	noncarcinogenic effects	-	2.6E+02	1.3E+03	N/A
Pentachlorophenol	9.9E+01	carcinogenic effects	9.9E+01	7.2E+02	3.6E+03	N/A
Perchlorate	5.4E+02	noncarcinogenic effects	-	5.4E+02	2.7E+03	N/A
Phenanthrene	1.1E+04	noncarcinogenic effects	-	1.1E+04	5.3E+04	N/A
Phenol	2.3E+05	noncarcinogenic effects	-	2.3E+05	1.2E+06	N/A
Polychlorinated biphenyls (PCBs)	6.7E+00	noncarcinogenic effects	8.4E+00	6.7E+00	3.4E+01	N/A
Pyrene	2.1E+04	noncarcinogenic effects	-	2.1E+04	1.0E+05	N/A
Selenium	3.9E+03	noncarcinogenic effects	-	3.9E+03	1.9E+04	N/A
Silver	3.9E+03	noncarcinogenic effects	-	3.9E+03	1.9E+04	N/A
Styrene	1.5E+03	saturation limit	-	2.1E+04	1.0E+05	1.5E+03

**Table K-3. Direct Exposure Soil Screening Levels  
Construction/Trench Worker Exposure Scenario**

Chemical	Final Screening Level (mg/kg)	Basis	Carcinogens (Risk = 10 <sup>-6</sup> ) (mg/kg)	Noncarcinogens HQ = 0.2 (mg/kg)	Noncarcinogens (HQ = 1.0) (mg/kg)	Saturation (mg/kg)
<i>tert</i> -Butyl alcohol	3.2E+05	saturation limit	-	-	-	3.2E+05
1,1,1,2-Tetrachloroethane	1.9E+02	carcinogenic effects	1.9E+02	2.3E+04	1.2E+05	2.0E+03
1,1,2,2-Tetrachloroethane	2.4E+01	carcinogenic effects	2.4E+01	5.9E+03	3.0E+04	2.0E+03
Tetrachloroethene	3.0E+01	carcinogenic effects	3.0E+01	1.8E+03	9.2E+03	2.3E+02
Thallium	6.2E+01	noncarcinogenic effects	-	6.2E+01	3.1E+02	N/A
Toluene	6.5E+02	saturation limit	-	2.6E+03	1.3E+04	6.5E+02
Toxaphene	2.2E+01	carcinogenic effects	2.2E+01	-	-	N/A
TPH (gasolines)	4.2E+03	noncarcinogenic effects	-	4.2E+03	2.1E+04	4.5E+03
TPH (middle distillates)	4.2E+03	noncarcinogenic effects	-	4.2E+03	2.1E+04	N/A
TPH (residual fuels)	1.2E+04	noncarcinogenic effects	-	1.2E+04	5.8E+04	N/A
1,2,4-Trichlorobenzene	3.2E+02	noncarcinogenic effects	1.1E+04	3.2E+02	1.6E+03	N/A
1,1,1-Trichloroethane	1.2E+03	saturation limit	-	1.1E+04	5.7E+04	1.2E+03
1,1,2-Trichloroethane	4.6E+01	carcinogenic effects	4.6E+01	2.1E+02	1.1E+03	1.8E+03
Trichloroethene	1.7E+02	carcinogenic effects	1.7E+02	2.2E+02	1.1E+03	1.3E+03
2,4,5-Trichlorophenol	1.7E+04	noncarcinogenic effects	-	1.7E+04	8.5E+04	N/A
2,4,6-Trichlorophenol	7.7E+01	noncarcinogenic effects	3.4E+03	7.7E+01	3.9E+02	N/A
Vanadium	7.7E+02	noncarcinogenic effects	-	7.7E+02	3.9E+03	N/A
Vinyl chloride	2.0E+00	carcinogenic effects	2.0E+00	3.0E+02	1.5E+03	1.2E+03
Xylenes	4.2E+02	saturation limit	-	1.3E+03	6.3E+03	4.2E+02
Zinc	2.3E+05	noncarcinogenic effects	-	2.3E+05	1.2E+06	N/A

**Primary source:** USEPA Region 9 Preliminary Remediation Goals (PRGs, USEPA 2004), modified as noted below. See text for discussion.

**Notes:**

See text for equations and assumptions used in models.

Final screening level is lowest of individual screening levels for carcinogenic effects and noncarcinogenic effects (based on HQ=0.2) or screening level for construction/trench workers if lower (see Table K-3). Saturation limit used as upper limit for volatile organic compounds that are liquid at ambient conditions (see text).

Carcinogens: Based on target cancer risk of 10<sup>-6</sup>; modified with respect to CalEPA/OEHHA slope factors when available (marked by "\*\*"). Screening levels for

PCBs based on updated USEPA slope factors as presented in USEPA Region 9 Preliminary Remediation Goals document (USEPA 2004).

Noncarcinogens: Adjusted to target hazard quotient of 0.2 for use in tables for all chemicals. Screening levels based on hazard quotient of 1.0 provided for reference

Saturation: Theoretical soil saturation level in the absence of free product; calculated for volatile organic compounds that are liquids under ambient conditions (refer to Table J).

TPH: Total Petroleum Hydrocarbons. See text for discussion of different TPH categories.

**ATTACHMENT E**

**Soil Vapor Analytical Data**

**Table 1 - Soil Vapor Sampling Field Data, 31 March 2011  
Station #2035, 1001 San Pablo Avenue, Albany, California**

Sample ID	COA# <sup>(1)</sup>	Can# <sup>(2)</sup>	Static Leak Test		Purging		Sampling				Helium Percent					
			Start Time	End Time	Start Vac.	End Vac.	cc	End Time	Start Time	End Time	Elapsed	Start Vac.	End Vac.	Low	High	Average
SG-1	A251	LC172	10:26	10:37	-16	-16	185	10:56	11:00	11:05	0:05	-31	-5	16.7	20	17.7
SG-2	A290	LC119	11:34	11:44	-15	-15	233	11:45	11:53	12:01	0:08	-30	-5	21	26	24.2
SG-3	Soil gas implant submerged - no sample collected															
SG-4	Soil gas implant submerged - no sample collected															
SG-5	A305	LC189	13:54	14:04	-15	-15	210	14:08	14:09	14:14	0:05	-30	-5	14	18	15.5
Ambient	A201	LC398	n/a	n/a	n/a	n/a	n/a	n/a	14:51	14:56	0:05	-31	-5	n/a	n/a	n/a

**Notes:**

- (1) COA# = Critical Orifice Assembly Number (Laboratory-supplied flow regulator; 0.0060 inch orifice, approximately 200 standard cubic centimeters per minute).
- (2) Can# = Laboratory-supplied 1-liter Summa canister tracking number.
- (3) Vacuums measured in inches Mercury.
- (4) n/a = Not applicable/not available; data not collected in the field.

**Table 2 - Soil Vapor Sampling Laboratory Analytical Results, 31 March 2011  
Station #2035, 1001 San Pablo Avenue, Albany, California**

Sample ID	GRO (C6-C12) (mg/m <sup>3</sup> )	Benzene (mg/m <sup>3</sup> )	Toluene (mg/m <sup>3</sup> )	Ethyl- benzene (mg/m <sup>3</sup> )	Total Xylenes (mg/m <sup>3</sup> )	MTBE (mg/m <sup>3</sup> )	ETBE (mg/m <sup>3</sup> )	DIPE (mg/m <sup>3</sup> )	TAME (mg/m <sup>3</sup> )	TBA (mg/m <sup>3</sup> )	Ethanol (mg/m <sup>3</sup> )	Oxygen +		Carbon	
												Helium (%)	Argon (%)	Dioxide (%)	Methane (%)
SG-1	<54	<b>0.0026</b>	<b>0.011</b>	<0.0030	<0.012	<0.010	<0.012	<0.012	<0.012	<0.0085	<0.013	<b>0.951</b>	5.38	6.65	<0.700
SG-2	<56	<0.0023	<0.0028	<0.0032	<0.013	<0.011	<0.012	<0.012	<0.012	<0.0089	<0.014	<b>0.0172</b>	11.8	5.46	<0.735
SG-5	<59	<0.0025	<b>0.0039</b>	<0.0034	<0.013	<0.011	<0.013	<0.013	<0.013	<0.0094	<0.015	<b>0.543</b>	5.12	5.89	<0.775
Ambient	<49	<0.0021	<b>0.0082</b>	<0.0028	<0.011	<0.0093	<0.011	<0.011	<0.011	<0.0078	<b>0.032</b>	<0.0129	20.6	<0.645	<0.645
ESL-Com.	29 mg/m <sup>3</sup>	0.280	180	3.30	58.0	31.0	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

**Notes:**

- (1) GRO analysis by EPA TO-3; Benzene through Ethanol analysis by EPA TO-15; He/Q+Ar/CO<sub>2</sub>/CH<sub>4</sub> analysis by ASTM D-1946.
- (2) <X = Not detected above the given laboratory reporting limit (X) in milligrams per cubic meter (mg/m<sup>3</sup>)
- (3) ESL-Com = Environmental Screening Level for shallow soil gas (commercial or industrial land use); from California Regional Water Quality Control Board, San Francisco Bay Region (SFBRWQCB), May 2008.
- (4) n/a = ESL not available or not applicable.

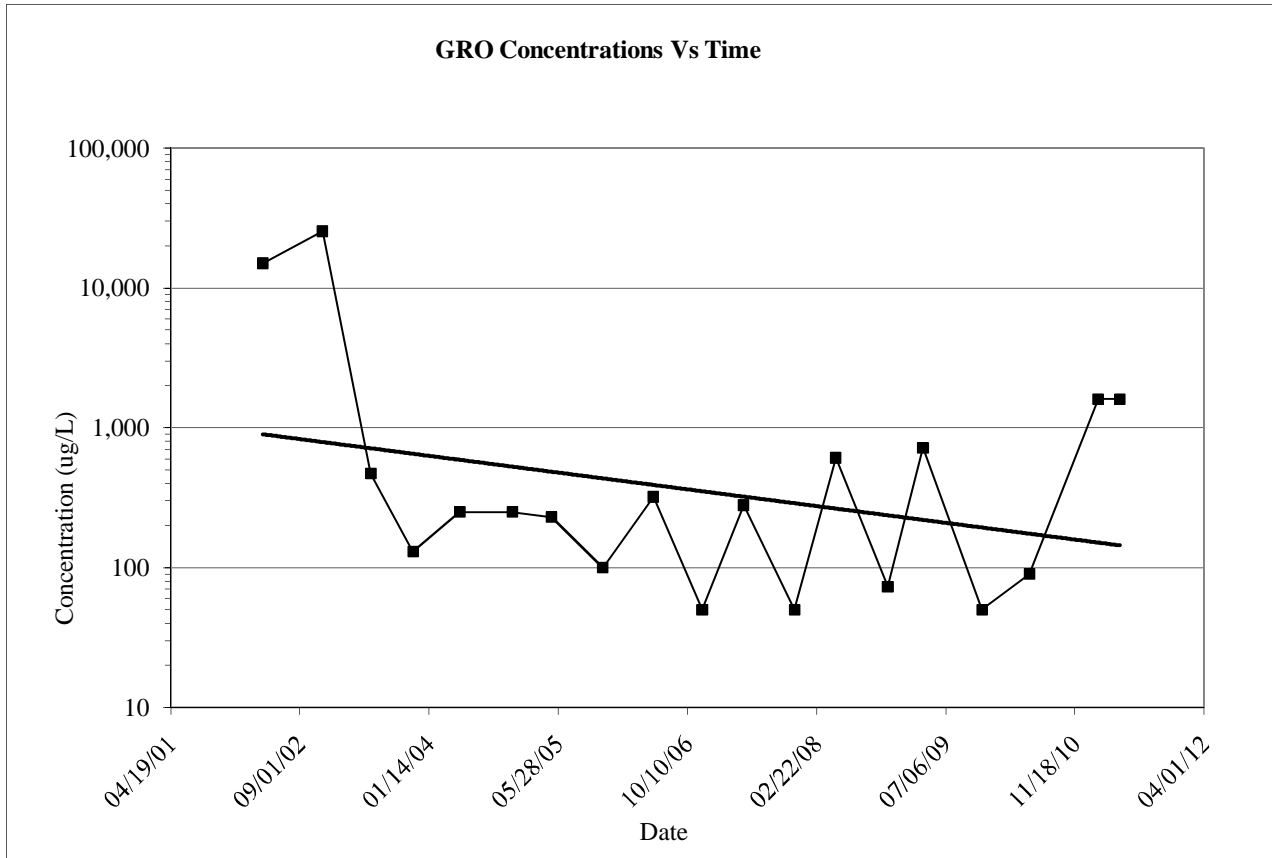
## **ATTACHMENT F**

### **Regression Analysis**

# Estimated Time to Reach Water Quality Objective

ARCO Service Station No. 2035

Well ID: RW-1  
Constituent: GRO

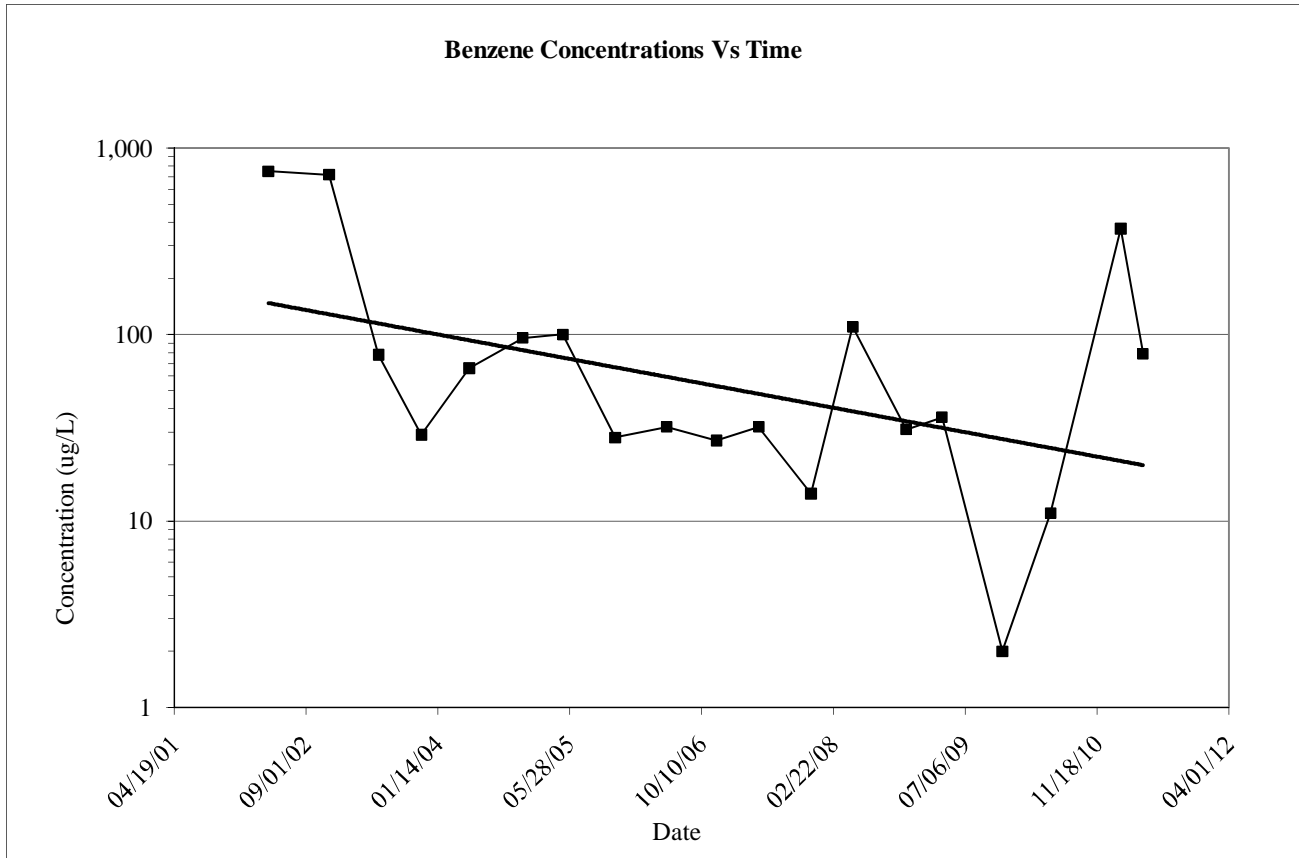




# Estimated Time to Reach Water Quality Objective

ARCO Service Station No. 2035

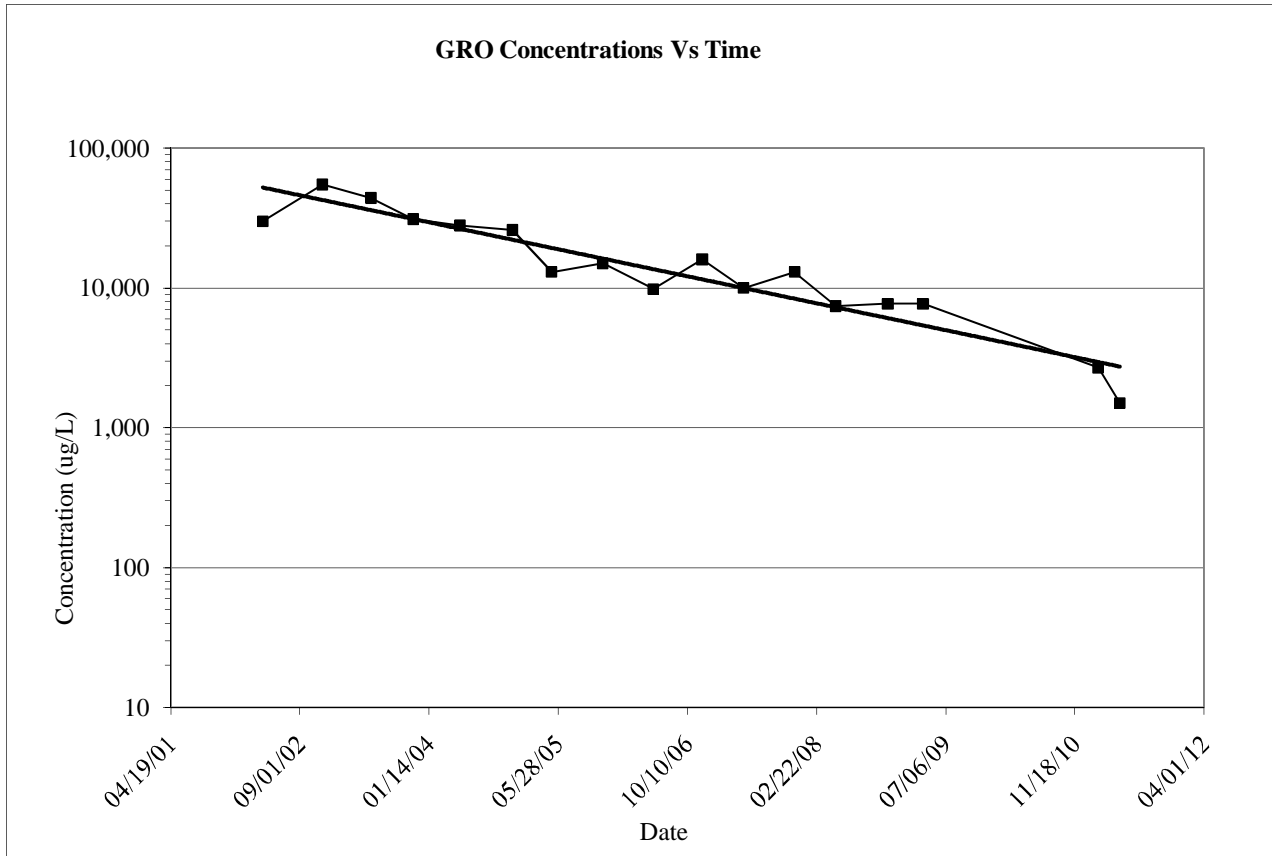
Well ID: RW-1  
Constituent: Benzene



# Estimated Time to Reach Water Quality Objective

ARCO Service Station No. 2035

Well ID: S-5  
Constituent: GRO



# Estimated Time to Reach Water Quality Objective

ARCO Service Station No. 2035

Well ID: S-5  
Constituent: Benzene

