



January 30, 2014

Jillian Holloway
Project Manager
Marketing Business Unit

**Chevron Environmental
Management Company**
6101 Bollinger Canyon Road
San Ramon, CA 94583
Tel (925) 790-3513
JillianHolloway@chevron.com

RECEIVED

By Alameda County Environmental Health at 4:54 pm, Feb 11, 2014

Mr. Keith Nowell
Alameda County Health Care Services
1131 Harbor Bay Parkway, Suite 250
Alameda, California 94502

RE: Conceptual Site Model and Request for Low-Threat Closure Addendum

2445 Castro Valley Boulevard, Castro Valley, California
Fuel Leak Case No.: RO0002968

Dear Mr. Nowell,

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

If you have any questions or need additional information, please contact me at (925) 790-3513 or by e-mail me at JillianHolloway@chevron.com.

Sincerely,

A handwritten signature in black ink that reads "Jillian Holloway".

Jillian Holloway
Union Oil of California – Project Manager

Attachment

Conceptual Site Model and Request for Low-Threat Closure Addendum

**Chevron Environmental Management
Company**

**Conceptual Site Model and
Request for Low-Threat Closure
Addendum**

76 Service Station
No. 3072
2445 Castro Valley Boulevard
Castro Valley, California
ACEH CASE No. RO#0002968

January 30, 2014



Katherine Brandt

Katherine Brandt
Certified Project Manager

DS

David W. Lay, P.G., C.P.G
Principal Geologist



**Conceptual Site Model and
Request for Low-Threat
Closure Addendum**

76 Service Station
No. 3072
2445 Castro Valley Boulevard
Castro Valley, California
ACEH CASE No. RO#0002968

Prepared for:
Chevron Environmental Management
Company

Prepared by:
2000 Powell Street
7th Floor
Emeryville
California 94608
Tel 510.652.4500
Fax 510.652.4906

Our Ref.:
B0047335.2013

Date:
January 30, 2014

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Acronyms and Abbreviations

ACDEH	Alameda County Department of Environmental Health
Addendum	Conceptual Site Model and Request for Low-Threat Closure Report Addendum
ARCADIS	ARCADIS U.S., Inc.
bgs	below ground surface
BTEX	benzene, toluene, ethylbenzene, and xylenes
COPC	constituent of potential concern
CPT	cone penetrometer test
CSM	conceptual site model
Delta	Delta Consultants
EBMUD	East Bay Municipal Utility District
G-R	Gettler-Ryan, Inc.
KEI	Kaprealian Engineering Inc.
L/kg	liters per kilogram
Low-Threat Closure Policy	Low-Threat Underground Storage Tank Case Closure Policy
LRL	laboratory reporting limit
MCL	California Department of Public Health's Maximum Contaminant Level
mg/kg	milligrams per kilogram
MTBE	methyl tertiary-butyl ether
PAHs	polycyclic aromatic hydrocarbons
RWQCB	California Regional Water Quality Control Board
SCS	Site Closure Summary
SFRWQCB	San Francisco Regional Water Quality Control Board

site	76 Service Station No. 3072 located at 2445 Castro Valley Boulevard in Castro Valley, California
SWRCB	State Water Resources Control Board
TBA	tertiary-butyl ether
TPH-d	total petroleum hydrocarbons as diesel
TPH-g	total petroleum hydrocarbons as gasoline
TPPH	total purgeable petroleum hydrocarbons
µg/L	micrograms per liter
UST	underground storage tank
WQO	water quality objective

1. Introduction

ARCADIS U.S., Inc. (ARCADIS) has prepared this Conceptual Site Model and Request for Low-Threat Closure Report Addendum (Addendum) as a revision to the Conceptual Site Model and Request for Low-Threat Closure Report for 76 Service Station No. 3072 located at 2445 Castro Valley Boulevard in Castro Valley, California (site; Figure 1) submitted on December 24, 2012. This Addendum was prepared to address agency comments from the December 16, 2013 meeting between the Alameda County Environmental Health Services (ACEHS), Chevron, and ARCADIS. This Addendum presents an evaluation of site conditions for low-threat closure under the State Water Resources Control Board's (SWRCB's) resolution 2012-0016, adopted on May 1, 2012, and effective on August 17, 2012, otherwise known as the Low-Threat Underground Storage Tank Case Closure Policy (Low-Threat Closure Policy; SWRCB 2012b). A completed Low-Threat Closure Checklist is included as Appendix A. In addition, details regarding the benzene concentration in well EB-5 and total petroleum hydrocarbons as diesel (TPH-d) concentrations site-wide are presented in this Addendum.

This Addendum includes a comprehensive site assessment and remediation history, regional and site-specific geology and hydrogeology, review of the soil and groundwater conditions at the site (including the distribution of constituents of potential concern [COPCs]), and evaluation of human health exposure from site-related COPCs. Based on the information provided in the following sections, the site meets General and Media-Specific Criteria of the Low-Threat Closure Policy; therefore, ARCADIS requests that the site be considered for low-threat closure.

This Addendum includes the following sections, in addition to this introductory section:

- Section 2 – A detailed site description.
- Section 3 – A conceptual site model (CSM).
- Section 4 – A detailed evaluation of current site conditions compared against closure criteria set forth in the newly adopted Low-Threat Closure Policy.
- Section 5 – Recommendations and conclusions.
- Section 6 – References.

2. Site Description

The site is an operating 76-branded service station located at 2445 Castro Valley Boulevard, on the southern corner of the intersection of Castro Valley Boulevard and Strobridge Avenue (Figure 1). The site is bordered by the intersection of Castro Valley Boulevard and Strobridge Avenue. The site borders commercial property to the southwest; residential property to the southeast; Castro Valley Boulevard, Foothill Boulevard, grassy areas and a parking lot to the northwest; and Strobridge Avenue and commercial property to the northeast. The site has been an operating service station since at least 1968.

Aboveground facilities at the site include a station building, an auto service building, and three fuel dispenser islands. Belowground facilities at the site include two 12,000-gallon and one 10,000-gallon gasoline underground storage tank (UST) located near the northern corner of the site. One 550-gallon waste-oil UST is located at the site, southeast of the station building. A site plan is presented on Figure 2.

3. Conceptual Site Model

The following sections summarize the CSM, including a summary of site geology and hydrogeology, previous work, distribution of fuel hydrocarbons and oxygenates in the subsurface, and an evaluation of risks to human health and the environment.

3.1 Site Geology and Hydrogeology

The site is located in the Castro Valley Groundwater Basin (CVGWB). The CVGWB is a dogleg shaped intermontane valley that encompasses approximately 3 square miles. The CVGWB is bounded to the west by the Hayward Fault, by San Lorenzo Creek to the east, by Lake Chabot to the north, and by the intersection of Jackson Street and Highway 238 to the south. The site area is underlain by Pleistocene alluvium consisting of unconsolidated clay, silt, sand and gravel. The alluvium varies with a maximum thickness of 80 feet. Consolidated, non-water bearing Jurassic age rock underlies the Pleistocene alluvium. Groundwater should generally be used for non-potable purposes and not as a drinking water source (California Department of Water Resources 2004).

Previous subsurface investigations at the site indicate that site soil conditions predominantly consist of clay, silty clay, sandy clay, and clayey gravel to approximately 20 feet below ground surface (bgs). Bedrock was encountered at depths ranging from approximately 7 to 50 feet bgs, the maximum depth explored (Delta Consultants [Delta] 2010). Copies of available boring logs are provided in Appendix B.

Depth to water in monitoring wells at the site have historically ranged from approximately 4.56 to 9.69 feet bgs. Historical groundwater data indicates a groundwater flow direction predominantly to the northeast. Current groundwater data is not available as site monitoring wells were destroyed in 1993. While drilling soil borings in 2005, groundwater was encountered up to depths of 23 feet bgs. Historical groundwater elevations at monitoring wells are included in Appendix C.

3.2 Summary of Previous Work

This section summarizes previous work, including site assessment and release history, and site remediation activities. Available boring logs and monitoring well construction diagrams are included as Appendix B. Historical soil data are included in Appendix D, historical soil sampling locations are included in Appendix E, and historical groundwater analytical results are included in Appendix F. Soil sample locations and excavation areas are shown on Figure 3.

3.2.1 Site Assessment and Release History

In November 1989, three 10,000-gallon gasoline USTs, one 55-gallon waste-oil UST, and associated product piping were removed and replaced. During removal activities, two small holes were observed in one of the unleaded gasoline tanks. Approximately 2,430 cubic yards of impacted soil was over-excavated and removed from the site from November 1989 through February 1990 (Kaprealian Engineering Inc. [KEI] 1990a).

When the USTs were removed, six soil samples were collected from beneath the gasoline USTs (A1, A2, B1, B2, C1, and C2) and one soil sample was collected from beneath the waste-oil UST (WO1). The samples from beneath the gasoline USTs were collected at 13.5 feet bgs, and the sample from beneath the waste-oil UST was collected at 10.5 feet bgs. Total petroleum hydrocarbons as gasoline (TPH-g) were detected in five of the six soil samples collected at concentrations ranging from 1.9 (milligrams per kilogram [mg/kg]) at B-1 to 11 mg/kg at B-2. TPH-d and benzene, toluene, ethylbenzene, and total xylenes (BTEX, collectively) were not detected above their respective laboratory reporting limits (LRLs) in any of the soil samples collected. The soil sample collected from the waste-oil UST only detected TPH-g at a concentration of 5.9 mg/kg. All other analytes were not detected above their respective LRL in the soil sample collected from WO-1 (KEI 1990a).

In addition, six soil samples were collected from the sidewalls of the UST excavation pit (SW-1 through SW-6) at depths ranging from 9.5 to 10.5 feet bgs. TPH-d was only detected in SW-4 at a concentration of 24 mg/kg. TPH-g and BTEX were only detected

in the soil samples collected from SW-1 and SW-4 through SW-6. The maximum concentrations of TPH-g and BTEX were detected in SW-4 at concentrations of 160, 0.33, 6.4, 30, and 9.4 mg/kg, respectively. A grab groundwater sample (W-1) was collected from the UST excavation area. The grab groundwater sample contained concentrations of TPH-d (11,000 micrograms per liter [$\mu\text{g/L}$]), TPH-g (26,000 $\mu\text{g/L}$), benzene (670 $\mu\text{g/L}$), toluene (1,100 $\mu\text{g/L}$), ethylbenzene (120 $\mu\text{g/L}$), and total xylenes (9,100 $\mu\text{g/L}$) (KEI 1990a).

In December 1989, after additional excavation, KEI collected 8 soil samples from the excavation pit. Soil samples were collected at depths ranging from approximately 9 to 11 feet bgs. TPH-g was detected in all eight samples and ranged from 3 mg/kg (SW9) to 1,900 mg/kg (SW1). Benzene, toluene, and total xylenes were detected in all samples and concentrations ranged from 0.2 to 17 mg/kg, 0.1 to 33 mg/kg, and 0.1 to 120 mg/kg, respectively. Ethylbenzene was detected in seven of the samples and concentrations ranged from 3.8 to 28 mg/kg (KEI 1990b).

In January 1990, three onsite monitoring wells were installed (MW-1 through MW-3) to depths of 22 to 30 feet bgs in order to establish groundwater flow direction. Thirteen soil samples were collected during monitoring well installation activities at depths ranging from 5 to 20 feet bgs. TPH-g, benzene, and ethylbenzene were only detected in the soil sample collected from MW-1 at a depth of 5 feet bgs at concentration of 2.8, 0.051, and 0.11 mg/kg, respectively. All other samples did not have concentrations of TPH-g or BTEX that were detected above their LRL. In addition, groundwater samples were collected from these monitoring wells in March 1990. TPH-g, benzene, ethylbenzene, and total xylenes were detected in the sample collected from MW-1 at concentrations of 32, 4.2, 0.36, and 1.1 $\mu\text{g/L}$, respectively. All other groundwater samples did not detect TPH-g or BTEX above their respective LRLs (KEI 1990c).

In February 1990, three soil samples (P-1 through P-3) were collected from the product piping trenches at depths ranging from 2.5 to 4 feet bgs. TPH-g was detected in all three soil samples collected at concentrations ranging from 6.0 mg/kg (P-2) to 87 mg/kg (P-1). Benzene was detected in all three soil samples collected at concentrations ranging from 0.23 mg/kg (P-2) to 0.47 mg/kg (P-3). Toluene was detected in two of the soil samples collected at concentrations ranging from 0.11 mg/kg (P-3) to 0.17 mg/kg (P-1). Ethylbenzene was detected in all three soil samples collected at concentrations ranging from 0.11 mg/kg (P-2) to 2.3 mg/kg (P-1). Total xylenes were detected in all three soil samples collected at concentrations ranging from 0.33 mg/kg (P-2) to 10 mg/kg (P-1) (KEI 1990c).

In March 1990, three sidewall samples (SWB, SWC, and SWD) were collected from the waste-oil UST excavation area at depths ranging from 8 to 9 feet bgs. TPH-g and BTEX were detected in the soil sample collected from SWB at concentrations of 37, 0.10, 0.10, 0.25, and 0.74 mg/kg. TPH-d was not detected in any of the soil samples collected. TPH-g and BTEX were not detected above their respective LRL in soil samples collected from SWC and SWD (KEI 1990c).

In April 1990, eight soil borings (EB-1 through EB-8) were advanced at depths ranging from 10.5 to 15 feet bgs. Nineteen soil samples were collected during soil boring advancement activities. TPH-g was detected in five of the soil samples collected, with concentrations ranging from 1.7 mg/kg (EB-4 at 14 feet bgs) to 5.0 mg/kg (EB-6 at 5 feet bgs). Benzene was detected in every soil sample collected at concentrations ranging from 0.0053 mg/kg (EB-2 at 5 feet bgs) to 0.066 mg/kg (EB-6 at 5 feet bgs). Toluene was detected in every soil sample collected at concentrations ranging from 0.015 mg/kg (EB-5 at 5 feet bgs) to 0.43 mg/kg (EB-4 at 14 feet bgs). Ethylbenzene was detected in 10 of the soil samples collected at concentrations ranging from 0.0050 mg/kg (EB-2 at 10 feet bgs and EB-8 at 10 feet bgs) to 0.034 mg/kg (EB-7 at 5 feet bgs). Total xylenes were detected in 13 of the soil samples collected at concentrations ranging from 0.011 mg/kg (EB-1 at 5 feet bgs) to 0.24 mg/kg (EB-6 at 13 feet bgs) (KEI 1990c). On April 25, 1990, a groundwater sample was collected from EB-5 and TPH-g and BTEX was detected at 5,900, 840, 34, 100, and 73 µg/L (KEI 1990c).

In August 1990, two monitoring wells (MW-4 and MW-5) were installed to depths of 23.5 and 24 feet bgs. Three soil samples were collected during monitoring well installation activities ranging in depth from 5 to 13.5 feet bgs. TPH-g and BTEX were not detected above LRLs in any of the soil samples collected. Groundwater samples were collected from monitoring wells MW-1 through MW-5 in August 1990. Benzene was detected in three of the groundwater samples collected at concentrations ranging from 0.34 µg/L in MW-4 to 3.2 µg/L in MW-1. Toluene, ethylbenzene, and total xylenes were detected in MW-3 at concentrations of 0.50, 0.54, and 0.89 µg/L. TPH-g was not detected above the LRL in any of the groundwater sample collected (KEI 1990c).

Groundwater samples were collected quarterly through 1991 and in June 1992. Groundwater analytical results may be found in Appendix F.

In a letter dated April 15, 1993 from the California Regional Water Quality Control Board (RWQCB), the RWQCB corroborated the closure requested by the ACEHS. As a result, monitoring wells MW-1 through MW-5 were destroyed in June 1993 (Delta 2010).

In November 1995, a leaking diesel fuel dispenser was reported at the site. The release occurred at one of the connections in the diesel dispenser system. KEI conducted a limited subsurface soil investigation in February 1996. A total of 1 cubic yard was excavated. Upon completion of the excavation, one soil sample was collected at a depth of 3.5 ft bgs. The soil samples had a TPH-d concentration of 20 mg/kg (KEI 1996).

In June 2001, one of the hydraulic hoists from inside the station building was removed. During its removal, one soil sample was collected from the excavation area at 8.5 feet bgs. Total petroleum hydrocarbons as hydraulic fluid was detected at a concentration of 1,200 mg/kg, and total oil and grease was detected at a concentration of 210 mg/kg. BTEX was not detected above LRLs in the soil sample collected. Approximately, 1 cubic yard of excavated soil was removed during hoist removal activities (Gettler-Ryan, Inc. [G-R] 2001).

In January 2005, a leak was discovered on site and the case was re-opened. The follow-on investigation advanced six soil borings to depths ranging from 18 to 50 feet bgs (SB-1 through SB-6). A total of 10 soil samples and four grab groundwater samples were collected during these site investigation activities. TPH-d was detected in two of the soil samples collected at concentrations ranging from 2.1 mg/kg (SB-5 at 23 feet bgs) to 25 mg/kg (SB-4 at 8 feet bgs). Total purgeable petroleum hydrocarbons (TPPH) were detected in two of the soil samples collected at concentrations of 470 mg/kg (SB-4 at 8 feet bgs) and 480 mg/kg (SB-1 at 8 feet bgs). Ethylbenzene was detected in two of the soil samples collected at concentrations of 0.043 mg/kg (SB-2 at 12 feet bgs) and 1.1 mg/kg (SB-1 at 8 feet bgs). Total xylenes were detected in three of the soil samples collected at concentrations ranging from 0.011 mg/kg (SB-2 at 24 feet bgs) to 1.1 mg/kg (SB-1 at 8 feet bgs). Methyl tertiary-butyl ether (MTBE) was detected in two of the soil samples collected at concentrations of 0.074 mg/kg (SB-1 at 25.5 feet bgs) and 0.11 mg/kg (SB-3 at 18 feet bgs). Tertiary-butyl alcohol (TBA) was detected in two of the soil samples collected at concentrations of 0.013 mg/kg (SB-1 at 25.5 feet bgs) and 0.014 mg/kg (SB-2 at 12 feet bgs). Benzene, toluene, and other fuel oxygenates were not detected above their respective LRL in any of the soil samples collected (TRC 2005).

Four grab groundwater samples collected during this 2005 investigation. Out of the four samples collected, there contained a single detection of ethylbenzene (0.77 µg/L from SB-1) and total xylenes (1.2 µg/L from SB-2). MTBE was detected in three of the four groundwater samples collected at concentrations ranging from 0.68 µg/L (SB-2) to 87 µg/L (SB-1). All other groundwater samples did not detect TPH-d, TPPH, benzene, toluene, TBA, or other fuel oxygenates above their respective LRL (TRC 2005).

In order to further characterize the extent of impacted media in the shallow water-bearing zone, cone penetrometer tests (CPTs) were advanced at four locations onsite (CPT-1, CPT-2, CPT-4, and CPT-5). CPT-3 was not advanced as originally planned due to the presence of an underground utility. Four grab groundwater samples were collected during CPT activities. Grab groundwater samples from CPT-2 and CPT-5 were collected from the shallow water-bearing zone (approximately 14 to 40 feet bgs), and grab groundwater samples from CPT-1 and CPT-4 were collected from the deeper water-bearing zone (approximately 45 to 55 feet bgs). TPH-d was detected in all four grab groundwater samples collected, at concentrations ranging from 280 µg/L (CPT-5) to 800 µg/L (CPT-4). MTBE was detected in three of the groundwater samples collected at concentrations ranging from 5.2 µg/L (CPT-5) to 10 µg/L (CPT-4). TBA was only detected in one groundwater sample collected (54 µg/L from CPT-2). TPPH, BTEX, and other fuel oxygenates were not detected above their respective LRL in any of the grab groundwater samples collected (TRC 2007).

3.2.2 Sensitive Receptor Survey

A sensitive receptor survey was conducted in 2006 in order to identify public and municipal water wells within a 0.5-mile radius of the site. Three water supply wells are located within a 0.5-mile radius of the site. Two of the wells are located near Eden Hospital, are presumed to be associated with the facility, and are located approximately 1,980 feet north-northeast of the site (crossgradient). The first well is listed as a domestic well and the second as a cooling system return. The third well, also a domestic well, is located approximately 1,584 feet to the east of the site (crossgradient). As indicated above in section 3.1, the CVGWB has limited unconfined groundwater not suitable as a drinking water source. Furthermore, the Eden Hospital wells are located at a higher elevation than the site while the other well is located on the opposite side of a geographical high. In addition to the well survey, the nearest surface-water bodies were identified. An unidentified creek is located approximately 1,425 feet east (crossgradient) of the site and South Reservoir is located approximately 1,950 feet southeast (crossgradient) of the site. The South Reservoir is currently under construction to be replaced by a partially buried 8.5 million gallon water storage tank within the footprint of the existing reservoir. The new South Reservoir construction began in 2011 and will be completed in 2015. The bottom of the tank is estimated to be the same elevation as the site.

While sensitive receptors were identified, each of the receptors are greater than 1,000 feet and crossgradient from the site. Therefore, the site's hydrocarbon plume (if present) does not impact any of the identified receptors (TRC 2006).

3.2.3 Remediation History

As discussed in Section 3.2.1 of this Addendum, approximately 2,430 cubic yards of impacted soil was over-excavated and removed from the site from November 1989 through February 1990 during site upgrade activities (KEI 1990a).

In response to the diesel dispenser release in 1995, an additional one cubic yard of impacted soil was removed, at which point ACEHS determined no further action was required (ACEHS 1996).

3.3 Current and Historical Distribution of Residual Hydrocarbons and Oxygenates

The current distribution of residual petroleum hydrocarbons and fuel oxygenates in soil, groundwater, and soil gas are described in the following sections.

3.3.1 Soil

A total of 73 soil samples have been collected at the site at depths ranging from 2.5 to 50 feet bgs to characterize concentrations of fuel hydrocarbons and oxygenates in site soils (Appendix D). Soil sample locations are presented on Appendix E. A summary of historical soil TPH-d and benzene data are presented in Table 1. Note that soil samples collected below approximately 10 feet bgs may represent saturated soil conditions and, therefore, may not accurately represent vadose zone soil conditions due to potential interactions with groundwater. Generally, the highest concentrations of COPCs in soil were found near the UST area on the northern portion of the site at depths of approximately 10 feet bgs. The majority of soil samples at the site were collected prior to the site closure in 1993 by the California Regional Water Quality Control Board (RWQCB) and the Alameda County Department of Environmental Health (ACDEH).

Maximum concentrations of fuel hydrocarbons and oxygenates from 0 to 5 feet bgs are summarized below:

TPH-d was detected at a maximum concentration of 20 mg/kg in the soil sample D (below the diesel dispenser) at 3.5 feet bgs. TPH-g was detected at a maximum concentration of 87 mg/kg in the soil sample collected from P-1 at 4 feet bgs. Benzene was detected at a maximum concentration of 0.47 mg/kg in the soil sample collected from P-3 at 3 feet bgs. Toluene, ethylbenzene, and total xylenes were detected at a maximum concentration of 0.17, 2.3, and 10 mg/kg,

respectively, in the soil sample collected from P-1 at 4 feet bgs. TPH-d and MTBE were not detected in any of the soil samples collected from 0 to 5 feet bgs.

Maximum concentrations of fuel hydrocarbons and oxygenates in soils from 5 to 10 feet bgs are summarized below:

TPH-d was detected at a maximum concentration of 25 mg/kg in the soil sample collected from SB-4 at 8 feet bgs. TPH-g and BTEX were detected at a maximum concentration of 1,700 mg/kg, 16 mg/kg, 33 mg/kg, 26 mg/kg, and 110 mg/kg, respectively, in the soil sample collected from SW-7 at 9 feet bgs. TPH-d was detected at a maximum concentration of 25 mg/kg in the soil sample collected from SB-4 at 8 feet bgs. MTBE was not detected in any of the soil samples collected from 5 to 10 feet bgs.

Maximum concentrations of fuel hydrocarbons and oxygenates in soil samples greater than 10 feet bgs are summarized below:

TPH-d was detected at a maximum concentration of 2.1 mg/kg in the soil sample collected from SB-5 at 23 feet bgs. TPH-g, ethylbenzene, and total xylenes were detected at a maximum concentration of 1,900 mg/kg, 28 mg/kg, and 120 mg/kg, respectively, in the soil sample collected from SW-1 (17) at 11 feet bgs. Benzene and toluene were detected at a maximum concentration of 17 mg/kg and 29 mg/kg, respectively, in the soil sample collected from SW-2 (17) at 11 feet bgs. TPH-d was detected at a maximum concentration of 2.1 mg/kg in the soil sample collected from SB-5 at 23 feet bgs. MTBE was detected at a maximum concentration of 0.11 mg/kg in the soil sample collected from SB-3 at 18 feet bgs. COPC concentrations located in the saturated zone may not be representative of vadose zone impacts and are likely affected by dissolved-phase concentrations.

3.3.2 Non-Aqueous Phase Liquid

There is no evidence of non-aqueous phase liquid (NAPL) at the site. In addition, ARCADIS reviewed available site boring logs and found no reference to petroleum hydrocarbon impacts.

3.3.3 Groundwater

COPCs in site groundwater were monitored quarterly from 1990 to 1991 and in June 1992. Site then received closure by ACEHS on January 4, 1993 and the wells were decommissioned. The monitoring well network consisted of five wells (MW-1 through

MW-5). The historical monitoring well groundwater analytical results are available in Appendix F. A summary of historical groundwater TPH-d and benzene data are presented in Table 2.

Due to the reported leak in 2005, grab groundwater samples were collected during site investigation activities in 2005 and 2007. Analytical data from these grab groundwater samples are available in Appendix F.

Dissolved-phase concentrations in grab groundwater samples collected in 2005 and 2007 indicate the following:

- **TPH-d.** TPH-d concentrations at the site ranged from less than the LRL (50 µg/L) to 800 µg/L in the grab groundwater sample collected from CPT-4. The historical maximum concentration for TPH-d was 800 µg/L in the grab groundwater sample collected from CPT-4 on May 2, 2007.
- **TPH-g.** TPH-g concentrations at the site were not detected above their LRLs in grab groundwater samples collected in 2005 and 2007. The historical maximum concentration for TPH-g was 5,900 µg/L in the grab groundwater sample collected from EB-5 on April 25, 1990.
- **Benzene.** Benzene concentrations at the site were not detected above the LRL of 0.50 µg/L in grab groundwater samples collected in 2005 and 2007. The historical maximum concentration for benzene was 840 µg/L in the grab groundwater sample collected from EB-5 on April 25, 1990.
- **Ethylbenzene.** Ethylbenzene concentrations at the site ranged from less than the LRL of 0.50 µg/L to 0.77 µg/L in the grab groundwater sample collected from SB-1. The historical maximum concentration for ethylbenzene was 100 µg/L in the grab groundwater sample collected from EB-5 on April 25, 1990.
- **Toluene.** Toluene concentrations at the site were not detected above the LRL of 0.50 µg/L in grab groundwater samples collected in 2005 and 2007. The historical maximum concentration for toluene was 34 µg/L in the grab groundwater sample collected from EB-5 on April 25, 1990.
- **Total xylenes:** Total xylenes concentrations at the site ranged from less than the LRL of 1.0 µg/L to 1.2 µg/L in the grab groundwater sample collected from SB-2. The historical maximum concentration for total xylenes was 73 µg/L in the grab groundwater sample collected from EB-5 on April 25, 1990.

- **MTBE.** MTBE concentrations at the site ranged from less than the LRL of 0.50 µg/L to 87 µg/L in the grab groundwater sample collected from SB-1. The historical maximum concentration for MTBE was 87 µg/L in the grab groundwater sample collected from SB-1 on January 24, 2005.

Groundwater samples analyzed in 2007 contained detections ranging from 280 to 800 µg/L for TPH-d. The SFRWQCB WQO for TPH-d is 640 µg/L. TPH-d is generally less mobile than other dissolved hydrocarbon compounds. For example, the distribution coefficient for benzene is 59 liters per kilogram (L/kg; EPA 2002) while the distribution coefficient for TPH-d is closer to 2,500 L/kg (Department of Toxic Substances Control 2009). A higher distribution coefficient correlates to a larger retardation factor and slower migration through soil. Furthermore, the solubility of TPH-d (#2 Diesel) is 3-5 milligrams per liter (mg/L) as compared to automotive gasoline which exceeds 100 mg/L (California State Water Resource Control Board 2012). With regards to the distribution coefficients for TPH-d and benzene, monitoring wells downgradient of the site at the Mobil / Jiffy Lube station located at 2492 Castro Valley Boulevard did not contain TPH-d or benzene (Appendix G). The lack of benzene in the Mobil / Jiffy Lube sites wells, which would be an indication of TPH-d migration, suggests TPH-d has not migrated off site. Further evidence of the lack of TPH-d migration offsite is the low solubility of TPH-d, especially since the only evidence of a TPH-d release from the site is a surface release. Assuming the surface release is the cause of 2007 detection of TPH-d in groundwater, the low solubility of TPH-d prevents extensive migration in groundwater.

The benzene sample collected in 1990 from EB-5 exceeds the water quality objective (WQO) of 1 µg/L by two orders of magnitude. The soil located upgradient of EB-5 was excavated in 1989 and 1990. Source removal and over 20 years of natural attenuation suggests that benzene concentrations have decreased in the area and benzene is no longer a risk.

3.3.4 Soil Gas

No soil gas activities have been performed at this site.

3.4 Assessment of Impacts of Residual COPCs on Public Health and the Environment

Based on the assessment of data presented in this CSM and Closure Report, the residual concentrations of COPCs in site environmental media are unlikely to pose adverse effects to human health and the environment. This section summarizes

sensitive receptors observed near the site, as well as the results of a water supply well survey, and an evaluation of potential exposure pathways.

3.4.1 Sensitive Receptors and Water Supply Well Survey

A sensitive receptor survey was conducted in 2006 in order to identify public and municipal water wells within a 0.5-mile radius of the site. Three water supply wells are located within a 0.5-mile radius of the site. Two of the wells are listed as domestic wells and are approximately 1,584 feet east and 1,980 feet north of the site. The third well is listed as a Cooling System Return and is approximately 1,980 feet north of the site. In addition to the well survey, the nearest surface-water bodies were identified. An unidentified creek is located approximately 1,425 feet east of the site, and South Reservoir is located approximately 1,950 feet southeast of the site. While sensitive receptors were identified, because each of the receptors was greater than 1,000 feet from the site, it is unlikely that these potential receptors are impacted from the site's hydrocarbon plume (TRC 2006).

A 2008 well survey obtained from the SWRCB GeoTracker website for a site located at 2492 Castro Valley Boulevard (closed in February 2011), approximately 300 feet to the northeast of the site, identified one domestic well which is approximately 1,400 feet to the east-southeast of the site (ETIC, 2009).

The site is located in the East Bay Plain Sub-basin of the Santa Clara Valley Groundwater Basin and is located within the service area of the East Bay Municipal Utility District (EBMUD) public water system. Ninety percent of water within the EBMUD public water system, which includes drinking water at the site, is supplied by the Mokelumne Watershed. Local runoff stored in reservoirs supplements that supply, and water from the Sacramento River is available, when needed, during dry years (EBMUD 2011).

Based on a review of the GeoTracker Groundwater Ambient Monitoring and Assessment database, the closest water supply well is located more than 4 miles southwest of the site.

3.4.2 Potential Transport and Release Mechanisms and Receptors

This section discusses the potential transport and release mechanisms and receptors at the site. Because the site had been granted closure in 1993 from the RWQCB and the ACDEH, analytical data after 1993 was used in the determination of the following release mechanisms and receptors.

3.4.2.1 Volatilization

A potential release mechanism at the site may include the volatilization of COPCs in the subsurface soil to indoor air of current and future onsite commercial buildings, outdoor air, or air within a trench used by a future onsite utility worker. Another potential release mechanism at the site may include volatilization of COPCs in groundwater to indoor air of current and future on and offsite residences, offsite commercial buildings, outdoor air, or air within a trench used by a future onsite utility worker.

In general, exposure to petroleum vapors migrating from soil or groundwater to indoor air may pose unacceptable human health risks. However, in many petroleum release cases, potential human exposures to vapors are mitigated by bioattenuation processes as vapors migrate toward the ground surface. However, to support risk-based decision making for the site, it is assumed that COPCs in groundwater may volatilize into commercial buildings.

3.4.3 Leaching to Groundwater

The release of petroleum hydrocarbons from former USTs, dispenser islands, and associated piping also can leach from soil to groundwater. This release mechanism is likely responsible for the majority of historical groundwater impacts. However, this release mechanism has been mitigated through source zone removal, weathering and natural attenuation.

3.4.4 Direct Contact with Groundwater

As described in Section 3.4.1, groundwater at the site is currently not used as a potable source and is not expected to be used as a drinking water source in the future (EBMUD 2011). Drinking water is municipally supplied to the site. Therefore, potential direct contact exposures to COPCs in groundwater, such as tap water ingestion, dermal contact with tap water, and inhalation of volatile organic compounds released from tap water, are not expected to occur for current and future onsite and offsite receptors.

In the future, onsite construction workers may be directly exposed to groundwater while performing routine utility activities in subsurface trenches. Typically, utility trenches are located at a depth of no greater than 8 feet bgs. Historically, based on data collected from monitoring wells at the site from 1990 to 1993, the depth to groundwater has been measured at a minimum of approximately 4.56 feet below top of casing. Typically, at

construction/excavation sites when groundwater is exposed, dewatering occurs, or workers are not required to work in standing water. Thus, it is unlikely that future onsite utility workers will be directly exposed to COPCs in groundwater, as they will dewater trenches or excavations if standing water is observed or they will not work in standing water.

3.4.5 Direct Contact with Soil

Given that the site is completely covered with buildings, concrete, asphalt paving, and perimeter landscaping, it is anticipated that current and future on and offsite commercial workers will not be exposed to constituents in soil via direct contact exposure pathways (i.e., incidental ingestion, dermal contact, and inhalation of particulates). Based on historical site soil data, most COPCs were not detected in samples collected within the top 5 feet of soil. Therefore, direct contact with shallow soil exposure pathways are not expected to be complete for current and future onsite workers. However, potential receptors, including future onsite construction/utility trench workers, may be directly exposed to COPCs in subsurface soil via incidental ingestion, dermal contact, and inhalation of vapor and dust particles in trench air.

Constituents adhered onto dust particles may migrate from exposed subsurface soil by wind erosion to outdoor air and be inhaled by potential on and offsite receptors. This transport mechanism is unlikely given that redevelopment of the site is not planned; the site is covered with a building, landscaping, concrete, or asphalt pavement; and soil is not exposed at the surface.

3.4.6 Potential Ecological Receptors

The nearest surface-water bodies are an unidentified creek located approximately 1,425 feet east of the site and South Reservoir located approximately 1,950 feet southeast of the site. The site is devoid of ecological habitat and surface water; therefore, it is anticipated that ecological receptors are absent from the site. It is expected that the site will remain a gasoline service station in the future. Given these features at the site, potential exposure pathways for current ecological receptors are incomplete.

Because the site is devoid of ecological habitat and surface water is absent, it is reasonable to assume that ecological receptors are absent from the site and will not be present in the future. In addition, no surface water is located near the site. Based on this information, potential exposure pathways for future ecological receptors are incomplete.

3.5 Summary of Potential Exposure Pathways

Potential receptors were identified based on current and future land use(s) at the site. As discussed previously, current and reasonably anticipated future land use at the site is commercial. Potential current and future human receptors at the site include current and future commercial workers and current and future onsite utility and construction trench workers. In addition, offsite commercial workers and residents could be exposed to COPCs volatilizing from groundwater and migrating into offsite buildings. The sources, release mechanisms, exposure media, and exposure pathways for these receptors are shown on Figure 4.

Based on the information presented in the previous sections, the following potential exposure pathways may be complete for the site:

Current and Future Onsite Commercial Workers

- Inhalation of vapors migrating from the subsurface and into buildings.

Current and Future Offsite Commercial Workers and Residents

- Inhalation of vapors migrating from the subsurface into buildings.

Current and Future Onsite Utility and Construction Trench Workers

- Inhalation (outdoor air) of vapors.
- Inhalation (outdoor air) of dust particles.
- Incidental ingestion and dermal contact of surface and subsurface soil.
- Incidental ingestion, dermal contact, and inhalation with groundwater.

4. Assessment of Site Conditions Relative to Low-Threat Closure Policy

On July 31, 2012, the Low-Threat Closure Policy issued by the SWRCB was adopted by the Office of Administrative Law. This policy outlines eight General Criteria to assess whether sites are candidates for low-threat case closure and three categories of Media-Specific Criteria that also must be met. Current site conditions provided herein are evaluated against the corresponding General Criteria and Media-Specific

Criteria. Based on this evaluation, ARCADIS concludes that the site meets the requirements for low-threat case closure.

4.1 Evaluation of Low-Threat Closure: General Criteria

4.1.1 Criteria a - The unauthorized release is located within the service area of a public water system

As discussed in Section 3.4.1, the site lies within the East Bay Plain Sub-basin and is located within the service area of the EBMUD public water system. Ninety percent of water within the EBMUD public water system, which includes drinking water at the site, is supplied by the Mokelumne Watershed. Local runoff stored in reservoirs supplements that supply, and water from the Sacramento River is available when needed during dry years (EBMUD 2011).

4.1.2 Criteria b - The unauthorized release consists only of petroleum

In 1989, a release of petroleum hydrocarbons was identified during station upgrade activities. The site was granted closure in 1993 from the RWQCB and the ACDEH. In 2001, additional site characterization activities were carried out as part of the hoist removal in the station building and the site was re-opened. No other releases (petroleum or non-petroleum) have been reported. COPCs at the site include TPH-d, TPH-g, BTEX, and fuel oxygenates, including MTBE.

4.1.3 Criteria c - The unauthorized ("primary") release from the UST system has been stopped

In 1989, a release of petroleum hydrocarbons was identified during station upgrade activities. The site was granted closure in 1993 from the RWQCB and the ACDEH. In 2001, additional site characterization activities were carried out as part of the hoist removal in the station building and the site was re-opened. The unauthorized release ceased with the removal of this infrastructure.

4.1.4 Criteria d - Free product has been removed to the maximum extent practicable

As described in Section 3.3.2, free product has not been observed in monitoring wells onsite. ARCADIS reviewed site boring logs and found no reference to petroleum hydrocarbon impact.

4.1.5 Criteria e - A conceptual site model that assesses the nature, extent, and mobility of the release has been developed

A CSM that includes a comprehensive site assessment and remediation history, regional and site-specific geology and hydrogeology, review of the soil and groundwater conditions at the site, and evaluation of human health exposure from site-related COPCs is presented in Sections 3.1 through 3.5 of this Addendum.

4.1.6 Criteria f - Secondary source has been removed to the extent practicable

Secondary source removal has been addressed through soil excavation. Approximately 2,430 cubic yards of impacted soil was over-excavated and removed from the site from November 1989 through February 1990 (KEI 1990a). In 1996, during the limited subsurface investigation, approximately 1 cubic yard of soil was removed (KEI 1996). In addition, in 2001 during hoist removal activities, approximately 1 cubic yard of soil was removed from the site (G-R 2001).

4.1.7 Criteria g - Soil and groundwater have been tested for MTBE and results reported in accordance with Health and Safety Code Section 25296.15

MTBE was analyzed in soil samples collected in 2005 (Appendix D) and in grab groundwater samples collected during site investigation activities in 2005 and 2007 (Appendix F).

During the 2005 site assessment, MTBE was detected in two soil samples collected with a maximum concentration of 0.11 mg/kg (SB-3 at a depth of 18 feet bgs) and in three of the four grab groundwater samples collected with a maximum concentration of 87 µg/L (SB-1). In 2007, MTBE was detected in three of four grab groundwater samples collected with a maximum concentration of 10 µg/L (CPT-4).

4.1.8 Criteria h - Nuisance as defined by Water Code Section 13050 does not exist at the site

No nuisance exists at the site, as defined by Water Code Section 13050. Site conditions and the treatment and disposal of site wastes are not injurious to health, indecent or offensive to the senses, and do not obstruct free use of property or interfere with the comfortable enjoyment of life or property. Site conditions and the treatment and disposal of site wastes do not affect an entire community or neighborhood or any considerable number of persons. Site impacts are restricted to the subsurface, and are present in a limited area that does not adversely affect the community at large.

4.2 Evaluation of Low-Threat Closure: Media-Specific Criteria

4.2.1 Groundwater

Groundwater at the site does not currently pose a risk to existing or anticipated future beneficial uses of groundwater and meets the groundwater-specific criteria as outlined by the Low-Threat Closure Policy. The Low-Threat Closure Policy states that “the contaminant plume that exceeds water quality objectives must be stable or decreasing in areal extent, and meet all of the additional characteristics of one of the five classes of sites.”

WQOs used in this analysis are presented in Table A.

Table A. Summary of WQOs

COPC	WQO	Source
TPH-d	640 µg/L	SFRWQCB
TPH-g	500 µg/L	SFRWQCB
Benzene	1 µg/L	MCL
MTBE	13 µg/L	MCL
TBA	18,000 µg/L	SFRWQCB

Notes:

MCL = California Department of Public Health’s Maximum Contaminant Level
SFRWQCB = San Francisco Regional Water Quality Control Board

The WQO for benzene and MTBE are the established MCLs (California Department of Public Health 2011). An MCL has not been established for TPH-d, TPH-g or TBA. The environmental screening level established by SFRWQCB for groundwater that is not a current or potential drinking water resource (Table F-1b; SFRWQCB 2013) was utilized as the TPH-d, TPH-g and TBA WQO for this evaluation of groundwater plume stability.

4.2.1.1 Plume Stability

According to the Technical Justification for Groundwater Media-Specific Criteria (SWRCB 2012a), plume stability can be demonstrated in two ways:

- 1) “Routinely observed non-detect values for groundwater parameters in down-gradient wells.”
- 2) “Stable or decreasing concentration levels in down-gradient wells.”

Monitoring wells at the site were decommissioned in 1993 when the site was granted closure from the RWQCB and the ACDEH. Since then, grab groundwater samples have been collected in 2005 and 2007. The grab groundwater samples collected were analyzed for TPH-d, TPPH, BTEX, MTBE, TBA, and other fuel oxygenates. The 2005 grab groundwater samples did not contain any COPCs that were detected above WQOs, with the exception of MTBE (87 µg/L from SB-1) located west-adjacent to the northwestern dispenser island. The 2007 grab groundwater samples detected one concentration of TBA above its WQO at CPT-2 (54 µg/L) located east-adjacent to the northwestern dispenser island. TPH-d was detected above its WQO in the grab groundwater sample collected from CPT-4 in 2007, with a concentration of 800 µg/L in CPT-4 (which is east-adjacent to the southeastern dispenser island).

Should a release be occurring during the grab groundwater sample collection in 2005 and 2007, it would be expected that the concentrations of TPH-d and other petroleum hydrocarbons would be much higher than detected. In addition, grab groundwater samples typically result in greater concentrations that are actually present due to the disturbance of soil, and may not be representative of actual groundwater concentrations at the site. Furthermore, silica gel clean-up was likely not utilized during the analysis of the 2007 grab groundwater samples leading to the possibility of polar non-hydrocarbon compounds being included in the diesel results. Given that the groundwater samples collected are not at levels that would indicate an active release, the samples were collected near key site features and that the concentrations reported from the grab groundwater samples are likely greater than actual concentrations in groundwater beneath the site, the plume is likely stable and not increasing or migrating offsite.

4.2.1.2 Additional Groundwater-Specific Criteria

As described in the Low-Threat Closure Policy, a site can meet the groundwater Media-Specific Criteria through one of five main classes. ARCADIS is of the opinion this site falls into Class 1 as described in detail below.

Class 2

2a. The contaminant plume that exceeds WQOs is less than 250 feet in length

The lack of current groundwater monitoring wells and data does not exclude the estimation of plume length and stability. Since previous monitoring well data and more current (2005 and 2007) investigations concluded that the TPH-g, benzene, and MTBE were not present in concentrations over WQOs, those COCs are not considered in the determination of plume length. However, 2007 grab groundwater samples did indicate

the presence of TPH-d and, as previously discussed, TPH-d has a much lower solubility (3-5 mg/L) than automotive gasoline (>100 mg/L). As per the Technical Justification for Groundwater Plume Lengths, Indicator Constituents, Concentrations, and Buffer Distances to Receptors (Technical Justification) indicates, for any hydrocarbon release, TPH-g is sufficient to represent the dissolved hydrocarbons present, even for TPH-d. However, 2007 analytical data only suggests the presence of TPH-d in groundwater at the site. Though TPH-g is not present in groundwater; therefore, can't be used directly to quantify the TPH-d plume, the Technical Justification does present an average plume length for TPH-g of 248 feet. Therefore, based on the known magnitude of the TPH-d release (1996 surface release) and low solubility of diesel, a conservative estimate of the TPH-d plume length (if present) is less than the average plume length for TPH-g.

- The TPH-d plume, exceeding 640 µg/L is estimated to be less than 248 feet based on one exceedance at CPT-4 of 800 µg/L.
- MTBE concentrations did not exceed the WQO of 13 µg/L in either the shallow or deep groundwater zones.

2b. There is no free product

- There is no free product currently present in site monitoring wells, as detailed in General Criteria (d) and Section 3.3.2.

2c. The nearest existing water supply well or surface-water body is greater than 1,000 feet from the defined plume boundary

- As described in Section 3.4.1, no water supply wells were identified within 1,000 feet from the defined plume boundary at site.
- The nearest surface-water bodies are an unidentified creek located approximately 1,425 feet east of the site and South Reservoir located approximately 1,950 feet southeast of the site (Section 3.4.1).

2d. The dissolved concentration of benzene is less than 3,000 µg/L, and the dissolved concentration of MTBE is less than 1,000 µg/L

During the grab groundwater monitoring events in 2005 and 2007, benzene was not detected above its LRL in any of the grab groundwater samples collected. MTBE was detected at a maximum concentration of 87 µg/L (SB-1 in 2005). Thus, concentrations of benzene and MTBE fall far below the 3,000 and 1,000 µg/L criteria, respectively.

4.2.2 Petroleum Vapor Intrusion to Indoor Air

As described in the Low-Threat Closure Policy, satisfaction of the Media-Specific Criteria for petroleum vapor intrusion to indoor air is not required at active commercial petroleum fueling facilities where there are no site-specific characteristics that would pose an unacceptable health risk. The site is an active commercial petroleum fueling facility with no unacceptable risk characteristics and there are no plans for redevelopment; therefore, the site is exempt from this media-specific criterion.

As described in the Low-Threat Closure Policy, satisfaction of the Media-Specific Criteria for petroleum vapor intrusion to indoor air is not required for sites where there are: 1) no existing buildings currently occupied or that may be occupied in the future and 2) no buildings for human occupancy expected to be constructed in the future above the plume. The TPH-d plume exceeding 640 µg/L most likely does not extend offsite. If present, the plume only extends beneath roads and/or parking lots, adjacent to the site, and not beneath buildings or other structures. Therefore, the offsite portions of the plume are subject to the stated exception to this media-specific criterion.

4.2.3 Direct Contact and Outdoor Air Exposure

As described in the Low-Threat Closure Policy, sites will meet the Media-Specific Criteria for direct contact with contaminated soil or inhalation of contaminants volatilized to outdoor air if:

- 1) The maximum concentrations of COPCs in soil are less than or equal to those listed in Table 1 of the Low-Threat Closure Policy.
- 2) A site-specific risk assessment shows that COPCs present in soil will not adversely affect human health.
- 3) Exposure to COPCs is mitigated through engineering controls.

This site meets the first criteria as summarized below:

- Because the site is completely covered with a building and pavement, there is little or no potential for direct human contact with site soils or for offsite wind dispersion of soils. Therefore, direct contact exposure pathways (i.e., ingestion, dermal contact, and inhalation of particulates) with soils are considered incomplete or insignificant and are expected to remain the same in the future.

- Historical soil data are included in Appendix D. Benzene and ethylbenzene concentrations were evaluated using concentrations for commercial/industrial exposure because the site is not anticipated to be developed for residential use.

Soil samples collected in 1989 beneath the former waste-oil UST indicated low concentrations of TPH-g, likely related to the fuel USTs and/or associated piping. At the time the waste oil UST was removed, naphthalene and polycyclic aromatic hydrocarbons (PAHs) were not analyzed in soil samples collected nor were they required to be analyzed. Soil excavation activities that were performed following the removal of the waste oil UST in November 1989 through February 1990 appeared to have largely removed potentially impacted soil. Therefore, should waste oil impacted soil have existed at the Site, it was likely removed during the waste oil UST excavation. Since there is no data that suggests a release occurred from the waste oil UST, the absence of this data does not pose a data gap.

Table B. Comparison of Maximum Concentrations of Benzene and Ethylbenzene in Soil against the No Significant Risk Values

Chemical	Commercial/Industrial				Utility Worker	
	0 to 5 feet bgs mg/kg		Volatilization to outdoor air (5 to 10 feet bgs) mg/kg		0 to 10 feet bgs mg/kg	
	Low-Threat Closure Policy Table 1	Site Maximum	Low-Threat Closure Policy Table 1	Site Maximum	Low-Threat Closure Policy Table 1	Site Maximum
Benzene	8.2	--	12	<0.005	14	<0.005
Ethylbenzene	89	--	134	1.1	314	1.1

As shown in Table B above, the maximum benzene and ethylbenzene concentrations from 2005 are below the Low-Threat Closure Policy Table 1 values for Commercial/Industrial direct contact and volatilization to outdoor air and Utility Worker direct contact in soil samples collected from 0 to 10 feet bgs (Table 1, SWRCB 2012b). Chemical concentrations from 1989 and 1990 data, prior to excavation and the 1993 site closure, exceed the LTC policy Table 1 for benzene. The maximum concentration of benzene was 16 mg/kg in the soil sample collected from SW-7 at 9 feet bgs in December 1989. SW-7 was collected in the northern corner of the site, under a paved portion of the site. In addition, because the site is an active service station, it is unlikely that this elevated concentration of benzene will affect outdoor air concentrations. While utility workers may be exposed to soil at these depths, the soil sample from SW-7 is over 20 years old. It is likely that natural degradation of petroleum hydrocarbons would

indicate that current concentrations of benzene in this area are likely significantly lower. This sample may be located in the saturated zone and may not be representative of vadose zone impacts and are likely affected by dissolved-phase concentrations. Furthermore, the locations where the elevated benzene concentration was observed were in a location with little or no potential for direct human contact with soil or for offsite wind dispersion of soil.

5. Conclusions and Recommendations

Site conditions meet all the General and Media-Specific Criteria established in the UST Low-Threat Closure Policy, and therefore, pose a low-threat to human health, safety, and the environment, and satisfy the case-closure requirements of Health and Safety Code Section 25296.10. Case closure is consistent with Resolution 92-49, which requires that cleanup goals be met within a reasonable timeframe. ARCADIS respectfully requests that the ACDEH grant low-threat site closure, as site conditions meet all General and Media-Specific Criteria established in the Low-Threat Closure Policy (SWRCB 2012b).

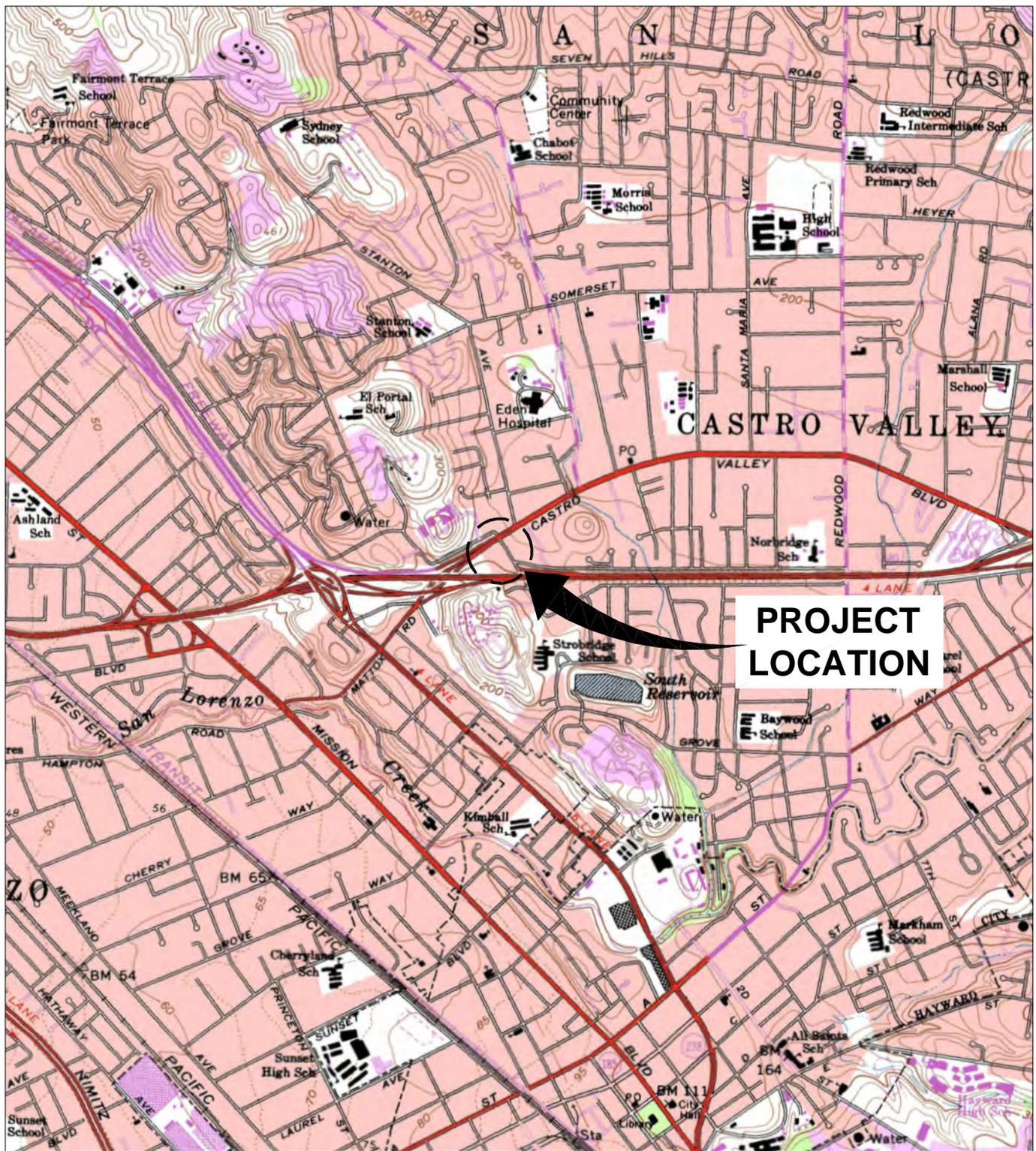
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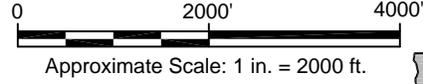
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Figures

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UNION OIL
STATION NO. 3072
2445 CASTRO VALLEY BOULEVARD
CASTRO VALLEY, CALIFORNIA

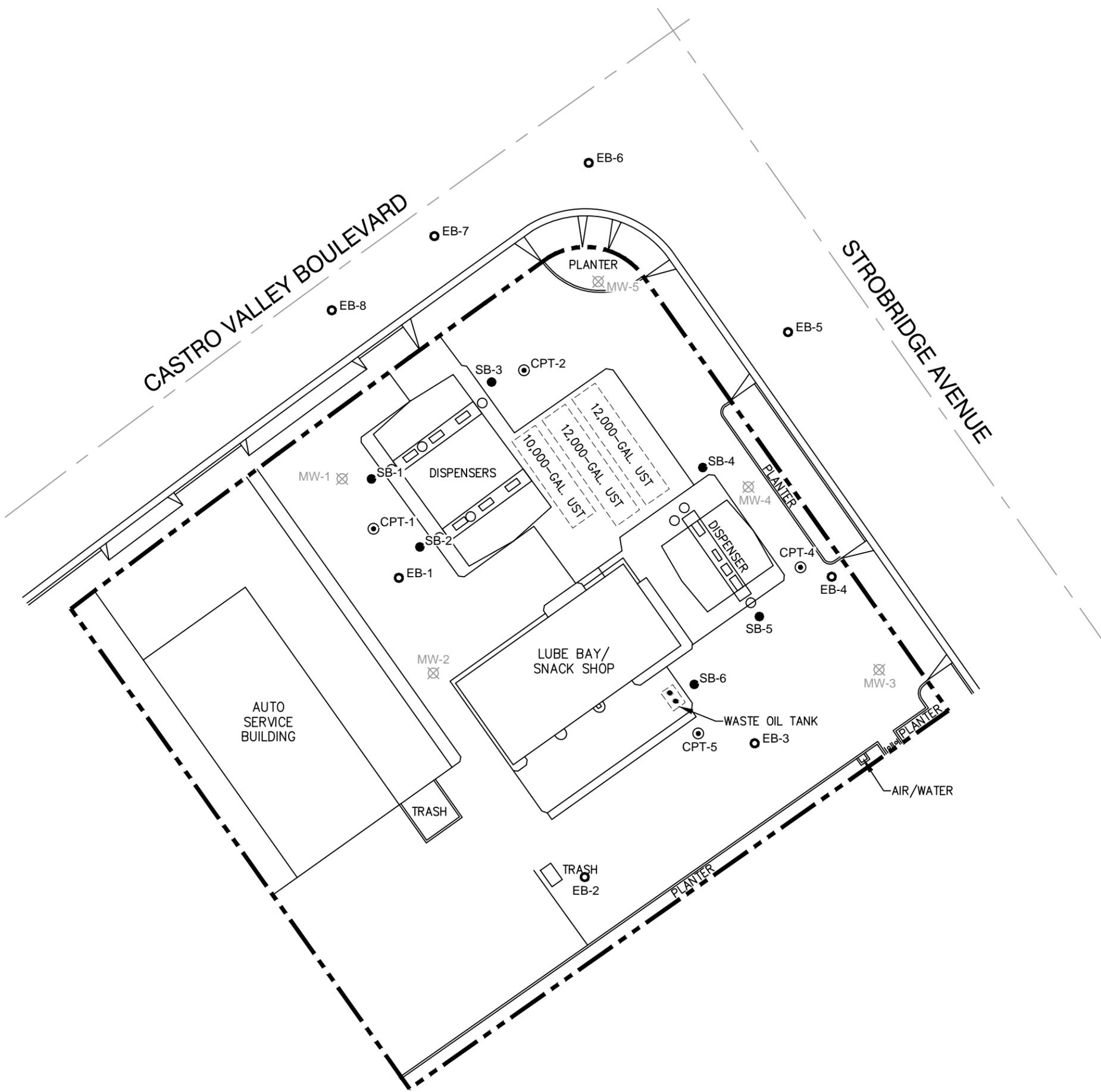
SITE LOCATION MAP

	<p>FIGURE 1</p>
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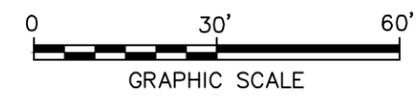
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- LEGEND**
- PROPERTY BOUNDARY
 - MW-1 ☒ DESTROYED MONITORING WELL
 - SB-1 ● SOIL BORING
 - CPT-1 ⊙ CPT BORING
 - EB-1 ○ EXPLORATORY BORING (KAPREALIAN 1990)

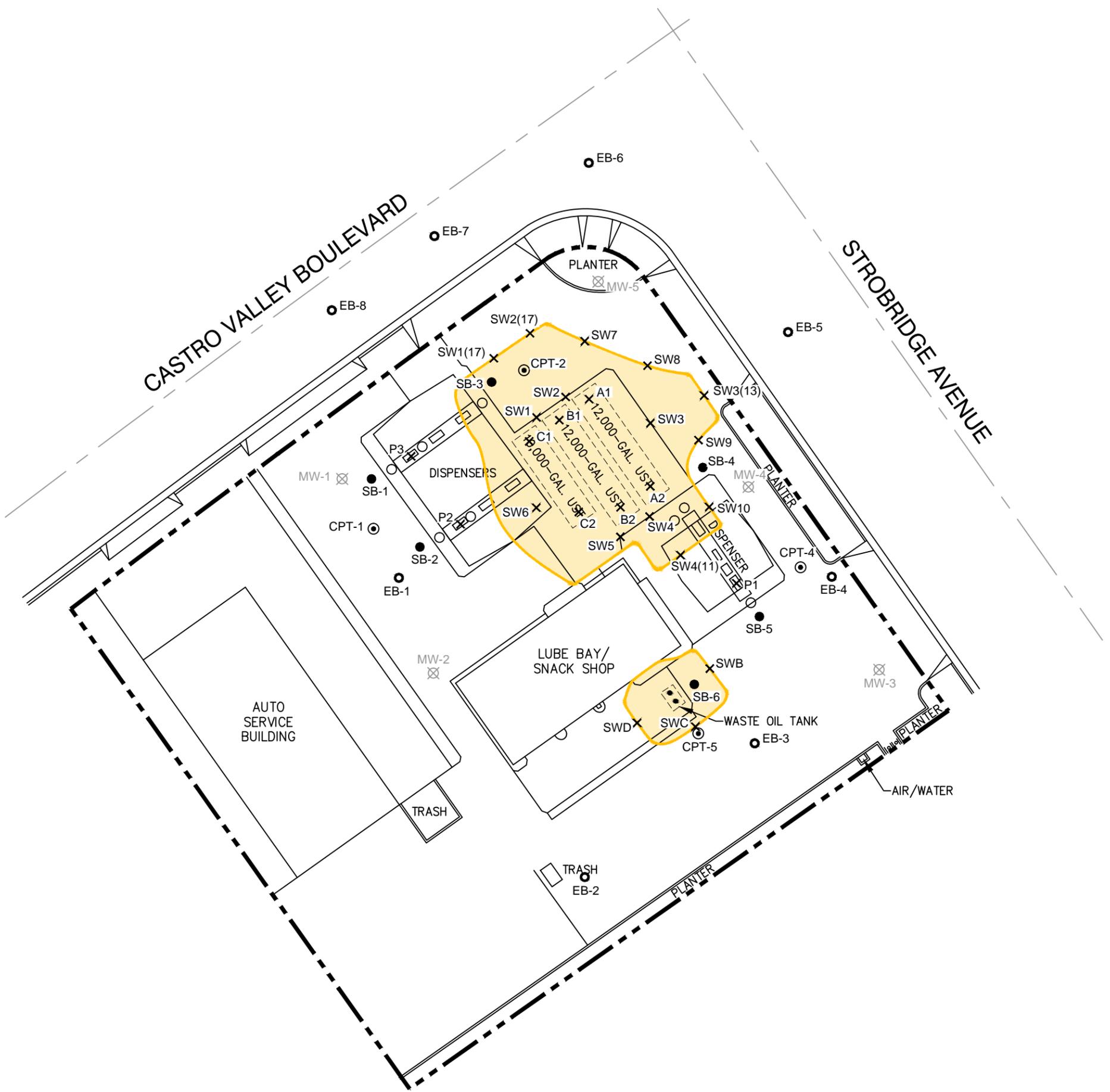


- NOTES:**
1. BASE MAP DIGITIZED FROM A FIGURE PDF PROVIDED BY DELTA, DATED 01/14/09, AT A SCALE OF 1"=30'.
 2. ALL SITE FEATURES AND LOCATIONS ARE APPROXIMATE.



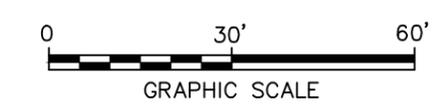
UNION OIL STATION NO. 3072 2445 CASTRO VALLEY BOULEVARD CASTRO VALLEY, CALIFORNIA	
SITE PLAN	
	FIGURE 2

CITY: PETALUMA, CA DIV/GROUP: ENV DB: J. HARRIS
 C:\Users\jharris\Desktop\ENVCAD\B0047335\2013\100001\DWG\17335B02.dwg LAYOUT: 3 SAVED: 1/9/2014 7:15 AM ACADVER: 18.1S (LMS TECH) PAGES: 3 PLOTTED: 1/9/2014 7:16 AM BY: HARRIS, JESSICA
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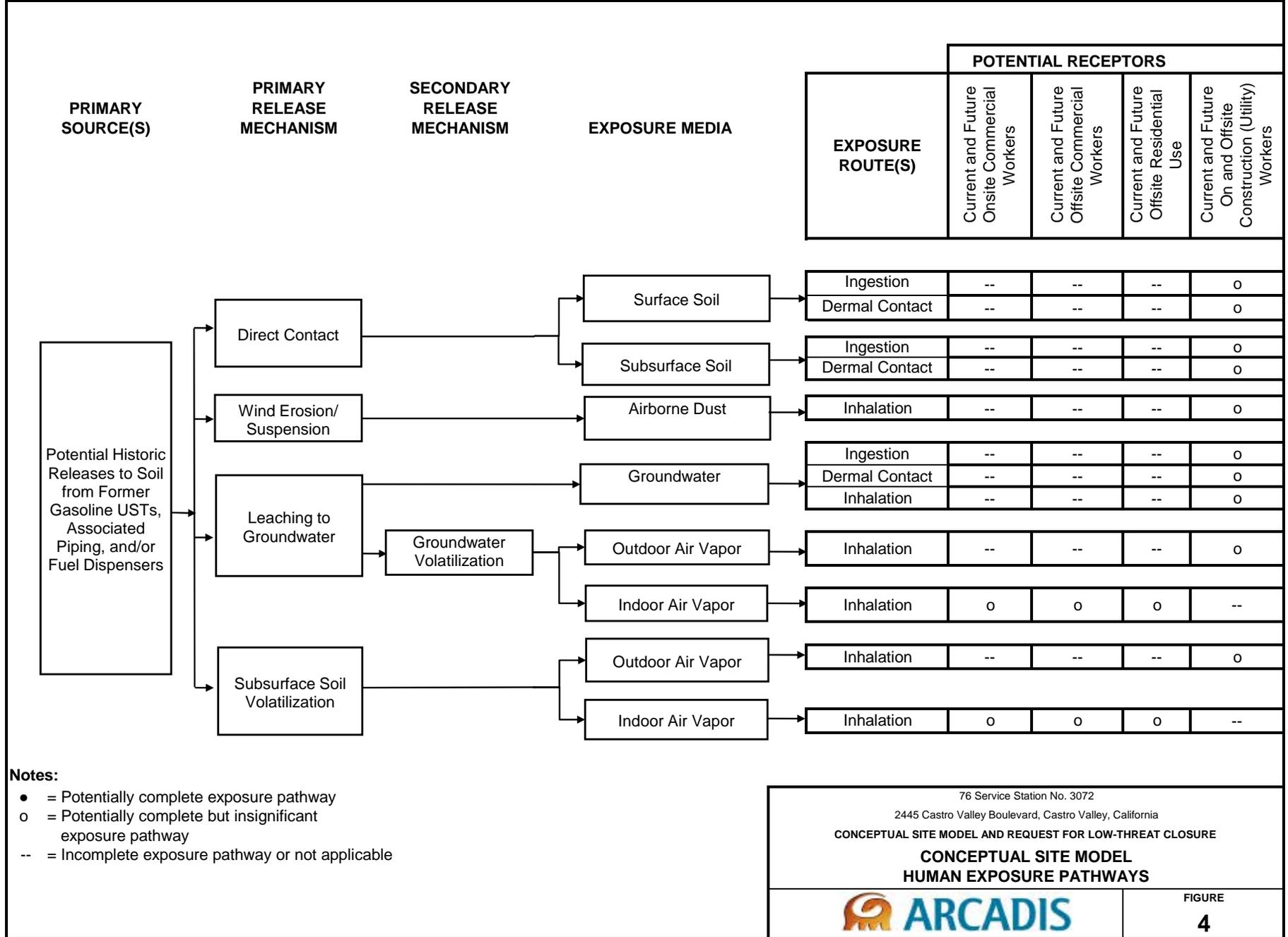


- LEGEND**
- PROPERTY BOUNDARY
 - MW-1 ☒ DESTROYED MONITORING WELL
 - SB-1 ● SOIL BORING
 - CPT-1 ⊙ CPT BORING
 - EB-1 ⊙ EXPLORATORY BORING (KAPREALIAN 1990)
 - SW1 × SAMPLE POINT (KAPREALIAN 1990)
 - EXCAVATION AREA

- NOTES:**
1. BASE MAP DIGITIZED FROM A FIGURE PDF PROVIDED BY DELTA, DATED 01/14/09, AT A SCALE OF 1"=30'.
 2. ALL SITE FEATURES AND LOCATIONS ARE APPROXIMATE.



UNION OIL STATION NO. 3072 2445 CASTRO VALLEY BOULEVARD CASTRO VALLEY, CALIFORNIA	
SOIL SAMPLE LOCATIONS AND EXCAVATION AREAS	
	FIGURE 3





Tables

Table 1
Summary of Historical Soil TPH-d and Benzene Data
Chevron Site ID 351813
2445 Castro Valley, Castro Valley, California

Date Collected	Sample	Depth (feet)	TPH-d (mg/kg)	Benzene (mg/kg)
11/14/1989	A1	13.5	ND	ND
11/14/1989	A2	13.5	ND	ND
11/14/1989	B1	13.5	--	ND
11/14/1989	B2	13.5	--	ND
11/14/1989	C1	13.5	--	ND
11/14/1989	C2	13.5	--	ND
11/14/1989	SW1	10.5	--	0.31
11/14/1989	SW2	10.5	ND	ND
11/14/1989	SW3	10.5	ND	ND
11/14/1989	SW4	9.5	24	0.33
11/14/1989	SW5	9.5	--	0.06
11/14/1989	SW6	10	--	0.12
11/14/1989	WO1	11	ND	ND
12/22/1989	SW1(17)	11	ND	14
12/22/1989	SW1(17)	11	ND	17
12/22/1989	SW7	9	ND	16
12/22/1989	SW8	9	ND	2.6
12/22/1989	SW3(13)	9	ND	11
12/22/1989	SW9	9	ND	0.2
12/22/1989	SW10	9	ND	4
12/22/1989	SW4(11)	9	ND	2.7
1/18/1990	MW1(5)	5	--	0.051
1/18/1990	MW1(6.5)	6.5	--	ND
1/18/1990	MW1(10.0)	10	--	ND
1/18/1990	MW2(5)	5	--	ND
1/18/1990	MW2(6.5)	6.5	--	ND
1/18/1990	MW2(9.0)	9	--	ND
1/18/1990	MW2(10)	10	--	ND
1/18/1990	MW2(15)	15	--	ND
1/18/1990	MW2(16.5)	16.5	--	ND
1/18/1990	MW2(20)	20	--	ND
1/18/1990	MW3(5)	5	--	ND
1/18/1990	MW3(6.5)	6.5	--	ND
1/18/1990	MW3(9)	9	--	ND
2/14/1990	P1	4	--	0.33
2/14/1990	P2	2.5	--	0.23
2/14/1990	P3	3	--	0.47
3/9/1990	SWB	8	<10	0.1
3/9/1990	SWC	9	ND	ND
3/9/1990	SWD	9	<10	ND
4/24/1990	EB1(5)	5	--	0.0063
4/24/1990	EB1(9.5)	9.5	--	0.0078

Table 1
Summary of Historical Soil TPH-d and Benzene Data
Chevron Site ID 351813
2445 Castro Valley, Castro Valley, California

Date Collected	Sample	Depth (feet)	TPH-d (mg/kg)	Benzene (mg/kg)
4/24/1990	EB1(13.5)	13.5	--	0.0087
4/24/1990	EB2(5)	5	--	0.0053
4/24/1990	EB2(10)	10	--	0.0059
4/24/1990	EB3(5)	5	--	0.0069
4/24/1990	EB3(9)	9	--	0.0093
4/24/1990	EB4(5)	5	--	0.0091
4/24/1990	EB4(10)	10	--	0.009
4/24/1990	EB4(14)	14	--	0.0079
4/24/1990	EB5(5)	5	--	0.0095
4/24/1990	EB6(5)	5	--	0.066
4/24/1990	EB6(10)	10	--	0.0086
4/24/1990	EB6(13)	13	--	0.008
4/24/1990	EB7(5)	5	--	0.04
4/24/1990	EB7(9.5)	9.5	--	0.0081
4/24/1990	EB7(13.5)	13.5	--	0.0054
4/24/1990	EB8(5)	5	--	0.023
4/24/1990	EB8(10)	10	--	0.0072
8/13/1990	MW4(5)	5	--	ND
8/13/1990	MW5(9.5)	9.5	--	ND
8/13/1990	MW5(13.5)	13.5	--	ND
2/8/1996	D(3.5)	3.5	20	--
1/24/2005	SB-1 @ 8'	8	--	<0.50
1/24/2005	SB-1 @ 25.5'	25.5	--	<0.0050
1/24/2005	SB-2 @ 12'	12	--	<0.0050
1/24/2005	SB-2 @ 24'	24	--	<0.0050
1/25/2005	SB-3 @ 18'	18	<1.0	<0.0050
1/25/2005	SB-4 @ 8'	8	25	<0.50
1/25/2005	SB-4 @ 50'	50	--	<0.0050
1/31/2005	SB-5 @ 23'	23	2.1	<0.0050

Notes:

TPH-d = total petroleum hydrocarbons as diesel

mg/kg = milligrams per kilogram

ND = value was non-detectable

< = indicates values was less than reporting limit

-- = indicates the analysis was not performed

Table 2
Summary of Historical Groundwater TPH-d and Benzene Data
Chevron Site ID 351813
2445 Castro Valley, Castro Valley, California

Date Collected	Location	TPH-d (µg/L)	Benzene (µg/L)	Comments
3/22/1990	MW1	--	4.2	
3/22/1990	MW2	--	ND	
3/22/1990	MW3	--	ND	
3/22/1990	MW4	--	ND	MW2 duplicate sample
4/25/1990	EB5	--	840	Grab groundwater sample; mislabeled as EB6 in original report
8/27/1990	MW1	--	3.2	
8/27/1990	MW2	--	ND	
8/27/1990	MW3	--	1.1	
8/27/1990	MW4	--	0.34	
8/27/1990	MW5	--	ND	
12/12/1990	MW1	--	1.6	
12/12/1990	MW2	--	ND	
12/12/1990	MW3	--	ND	
12/12/1990	MW4	--	0.73	
12/12/1990	MW5	--	ND	
3/11/1991	MW1	--	0.9	
3/11/1991	MW2	--	ND	
3/11/1991	MW3	--	ND	
3/11/1991	MW4	--	0.74	
3/11/1991	MW5	--	ND	
6/12/1991	MW1	--	0.66	
6/12/1991	MW2	--	ND	
6/12/1991	MW3	--	ND	
6/12/1991	MW4	--	ND	
6/12/1991	MW5	--	ND	
9/25/1991	MW1	--	ND	
9/25/1991	MW2	--	ND	
9/25/1991	MW3	--	ND	
9/25/1991	MW4	ND	ND	
9/25/1991	MW5	ND	ND	
12/20/1991	MW1	--	ND	
12/20/1991	MW2	--	ND	
12/20/1991	MW3	--	ND	
12/20/1991	MW4	ND	ND	
12/20/1991	MW5	ND	ND	
6/18/1992	MW1	--	ND	
6/18/1992	MW2	--	ND	
6/18/1992	MW3	--	ND	
6/18/1992	MW4	ND	ND	
6/18/1992	MW5	ND	ND	
1/24/2005	SB-1	--	<0.50	Grab groundwater sample

Table 2
Summary of Historical Groundwater TPH-d and Benzene Data
Chevron Site ID 351813
2445 Castro Valley, Castro Valley, California

Date Collected	Location	TPH-d (µg/L)	Benzene (µg/L)	Comments
1/24/2005	SB-2	--	<0.50	Grab groundwater sample
1/25/2005	SB-3	<50	<0.50	Grab groundwater sample
1/25/2005	SB-4	--	<0.50	Grab groundwater sample
5/3/2007	CPT-1	490	<0.50	Grab groundwater sample
5/3/2007	CPT-2	500	<0.50	Grab groundwater sample
5/3/2007	CPT-4	800	<0.50	Grab groundwater sample
5/3/2007	CPT-5	280	<0.50	Grab groundwater sample

Notes:

TPH-d = total petroleum hydrocarbons as diesel

µg/L = micrograms per liter

ND = value was non-detectable

-- = indicates the analysis was not performed



Appendix A

Low-Threat Closure Checklist

Site Name:
Site Address:

Site meets the criteria of the Low-Threat Underground Storage Tank (UST) Case Closure Policy as described below.¹

<p><u>General Criteria</u> General criteria that must be satisfied by all candidate sites:</p> <p>Is the unauthorized release located within the service area of a public water system?</p> <p>Does the unauthorized release consist only of petroleum?</p> <p>Has the unauthorized (“primary”) release from the UST system been stopped?</p> <p>Has free product been removed to the maximum extent practicable?</p> <p>Has a conceptual site model that assesses the nature, extent, and mobility of the release been developed?</p> <p>Has secondary source been removed to the extent practicable?</p> <p>Has soil or groundwater been tested for MTBE and results reported in accordance with Health and Safety Code Section 25296.15?</p> <p>Does nuisance as defined by Water Code section 13050 exist at the site?</p> <p>Are there unique site attributes or site-specific conditions that demonstrably increase the risk associated with residual petroleum constituents?</p>	<p><input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p><input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p><input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p><input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA</p> <p><input type="checkbox"/> Yes <input type="checkbox"/> No</p>
<p><u>Media-Specific Criteria</u> Candidate sites must satisfy all three of these media-specific criteria:</p> <p>1. Groundwater: To satisfy the media-specific criteria for groundwater, the contaminant plume that exceeds water quality objectives must be stable or decreasing in areal extent, and meet all of the additional characteristics of one of the five classes of sites:</p> <p>Is the contaminant plume that exceeds water quality objectives stable or decreasing in areal extent?</p> <p>Does the contaminant plume that exceeds water quality objectives meet all of the additional characteristics of one of the five classes of sites?</p> <p>If YES, check applicable class: <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5</p>	<p><input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA</p> <p><input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA</p>

¹ Refer to the Low-Threat Underground Storage Tank Case Closure Policy for closure criteria for low-threat petroleum UST sites.

Site Name:
 Site Address:

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



Appendix B

Boring Logs/Well Construction
Diagrams

B O R I N G L O G

Project No. KEI-P89-1106	Boring & Casing Diameter 9" 2"	Logged By D.L. <i>J.R. Brown</i>
Project Name Unocal Castro Valley	Well Head Elevation N/A	Date Drilled 1/18/90
Boring No. MW1	Drilling Method Hollow-stem Auger	Drilling Company EGI

Penetration blows/6"	G. W. level	Depth (ft) Samples	Strati- graphy USCS	Description
		0		A.C. Pavement Clay, sand, and gravel: fill
			CH	Clay, high plasticity, stiff, moist, black.
5/7/14		5		Color change at 5 feet to dark gray 10-15% sand.
			N/A	Shale bedrock, weathered, locally hard, fractured, slightly moist, olive brown, clayey inside fractures.
16/33/43				
		10		
22/46/ 50-5"				Shale bedrock at 13 feet, as above, wet.
		15		
				Color change at 20 feet to very dark gray.
		20		

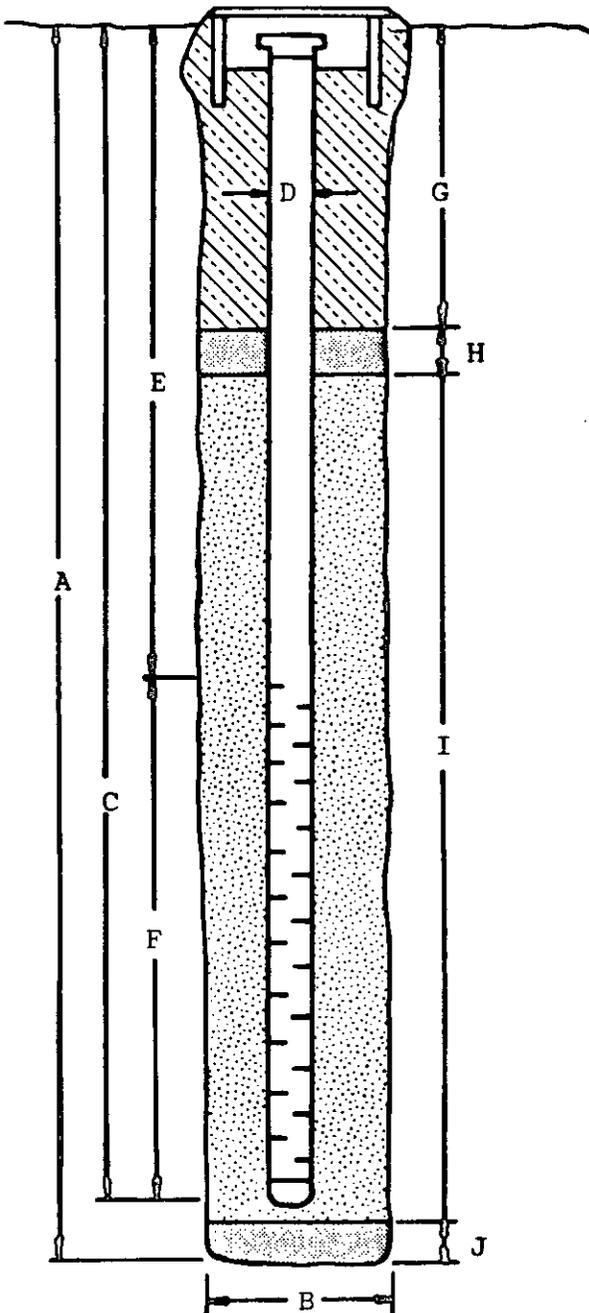
W E L L C O M P L E T I O N D I A G R A M

PROJECT NAME: Unocal - Castro Valley BORING/WELL NO. MW1

PROJECT NUMBER: KEI-P89-1106

WELL PERMIT NO.: _____

Flush-mounted Well Cover



A. Total Depth: 25.5'

B. Boring Diameter*: 9"

Drilling Method: Hollow Stem Auger

C. Casing Length: 25.5'

Material: Schedule 40 PVC

D. Casing Diameter: OD = 2.375"
ID = 2.067"

E. Depth to Perforations: 8'

F. Perforated Length: 17.5'

Perforation Type: Machined Slot

Perforation Size: 0.020"

G. Surface Seal: 4'

Seal Material: Concrete

H. Seal: 2'

Seal Material: Bentonite

I. Gravel Pack: 19.5'

Pack Material: RMC Lonestar Sand

Size: #3

J. Bottom Seal: None

Seal Material: N/A

*Boring diameter can vary from 8-1/4" to 9" depending on bit wear.

B O R I N G L O G

Project No. KEI-P89-1106	Boring & Casing Diameter 9" 2"	Logged By D.L. <i>D. L. Brown</i>
Project Name Unocal Castro Valley	Well Head Elevation N/A	Date Drilled 1/18/90
Boring No. MW2	Drilling Method Hollow-stem Auger	Drilling Company EGI

Penetration blows/6"	G. W. level	Depth (ft) Samples	Strati- graphy USCS	Description
		0		A.C. Pavement
				Silty clay, high plasticity, stiff, moist, very dark gray, locally gravelly, gravel to 1/2".
6/8/10		5	CH	Clay, high plasticity, with silt, 10-15% sand, stiff, moist, dark greenish gray, locally cemented, with gravel below 6 feet.
16/25/26			GC	Clayey gravel with sand, dense, moist, dark greenish gray, mottled with olive brown below 7.5 feet.
4/7/13		10	CH	Sandy clay, moderate to high plasticity, 10-15% gravel, stiff, friable, moist, yellowish brown.
8/11/15				Very stiff at 12 feet, occasional gravel, gravel is olive brown shale.
7/13/22				
13/20/28		15		
10/19/21			GC	Clayey gravel with sand, dense, moist, yellowish brown, gravel is shale, dark brown within clay.
13/19/23 50-2"	▼	20		At 20 feet, varied gravel, some serpentine. No recovery at 20.5 feet

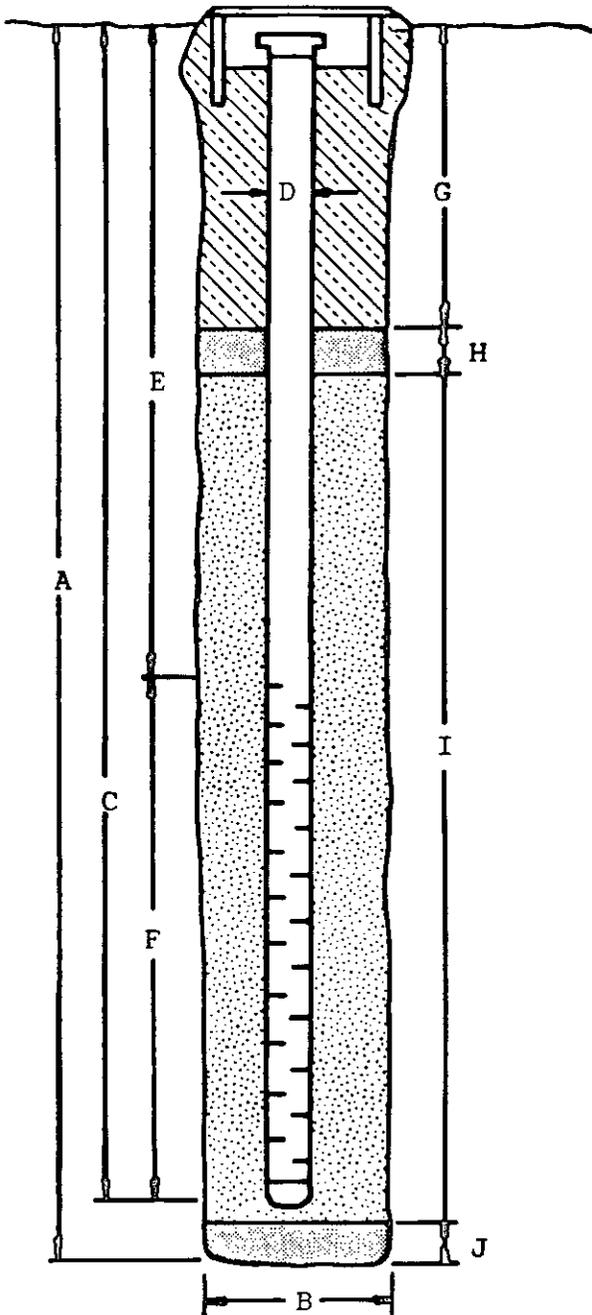
W E L L C O M P L E T I O N D I A G R A M

PROJECT NAME: Unocal - Castro Valley BORING/WELL NO. MW2

PROJECT NUMBER: KEI-P89-1106

WELL PERMIT NO.: _____

Flush-mounted Well Cover



- A. Total Depth: 30'
- B. Boring Diameter*: 9"
Drilling Method: Hollow Stem Auger
- C. Casing Length: 25'
Material: Schedule 40 PVC
- D. Casing Diameter: OD = 2.375"
ID = 2.067"
- E. Depth to Perforations: 5'
- F. Perforated Length: 20'
Perforation Type: Machined Slot
Perforation Size: 0.020"
- G. Surface Seal: 2'
Seal Material: Concrete
- H. Seal: 2'
Seal Material: Bentonite
- I. Gravel Pack: 26'
Pack Material: RMC Lonestar Sand
Size: #3
- J. Bottom Seal: None
Seal Material: N/A

*Boring diameter can vary from 8-1/4" to 9" depending on bit wear.

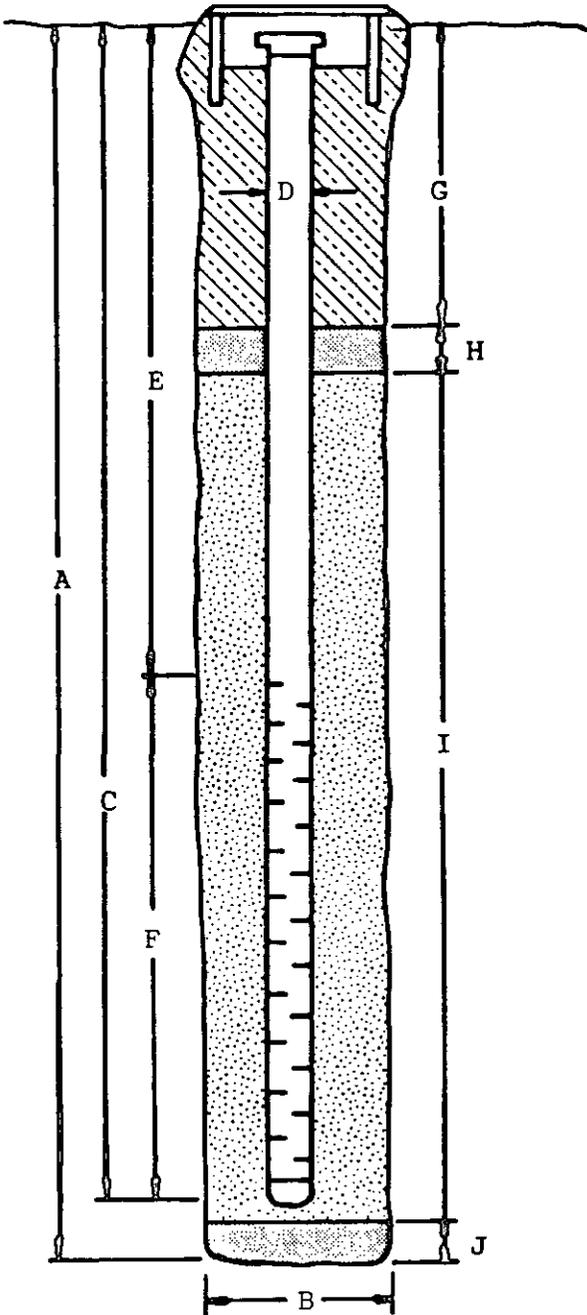
W E L L C O M P L E T I O N D I A G R A M

PROJECT NAME: Unocal - Castro Valley BORING/WELL NO. MW3

PROJECT NUMBER: KEI-P89-1106

WELL PERMIT NO.: _____

Flush-mounted Well Cover



A. Total Depth: 22'

B. Boring Diameter*: 9"

Drilling Method: Hollow Stem Auger

C. Casing Length: 22'

Material: Schedule 40 PVC

D. Casing Diameter: OD = 2.375"

ID = 2.067"

E. Depth to Perforations: 5'

F. Perforated Length: 17'

Perforation Type: Machined Slot

Perforation Size: 0.020"

G. Surface Seal: 2'

Seal Material: Concrete

H. Seal: 18'

Seal Material: Bentonite

I. Gravel Pack: _____

Pack Material: RMC Lonestar Sand

Size: #3

J. Bottom Seal: None

Seal Material: N/A

*Boring diameter can vary from 8-1/4" to 9" depending on bit wear.

B O R I N G L O G

Project No. KEI-P89-1106	Boring & Casing Diameter 9" 2"	Logged By W.W. <i>ORB</i>
Project Name Unocal-Castro Valley	Well Head Elevation N/A	Date Drilled 8/13/90
Boring No. MW4	Drilling Method Hollow-stem Auger	Drilling Company EGI

Penetration blows/6"	G. W. level	Depth (feet) Samples	Stratigraphy USCS	Description
		0		Asphalt concrete over clayey sand and gravel base
			CH	Clay, trace to 5% coarse-grained sand trace of gravel to 1/2 inch dia. moist, hard, dark gray, 5% orangish brown banding
6/11/24		5	CL/CH	Clay, trace to 5% sand, trace to 10% caliche, light dive gray to greenish gray, moist, hard
				----- Bedrock -----
50		10	N/A	Shale, moderately hard, fractured, very weathered, decomposed and clayey, wet below 10', olive brown
		15		
22/50-5"		20		Shale, moist, clayey, moderately hard, medium gray to olive gray

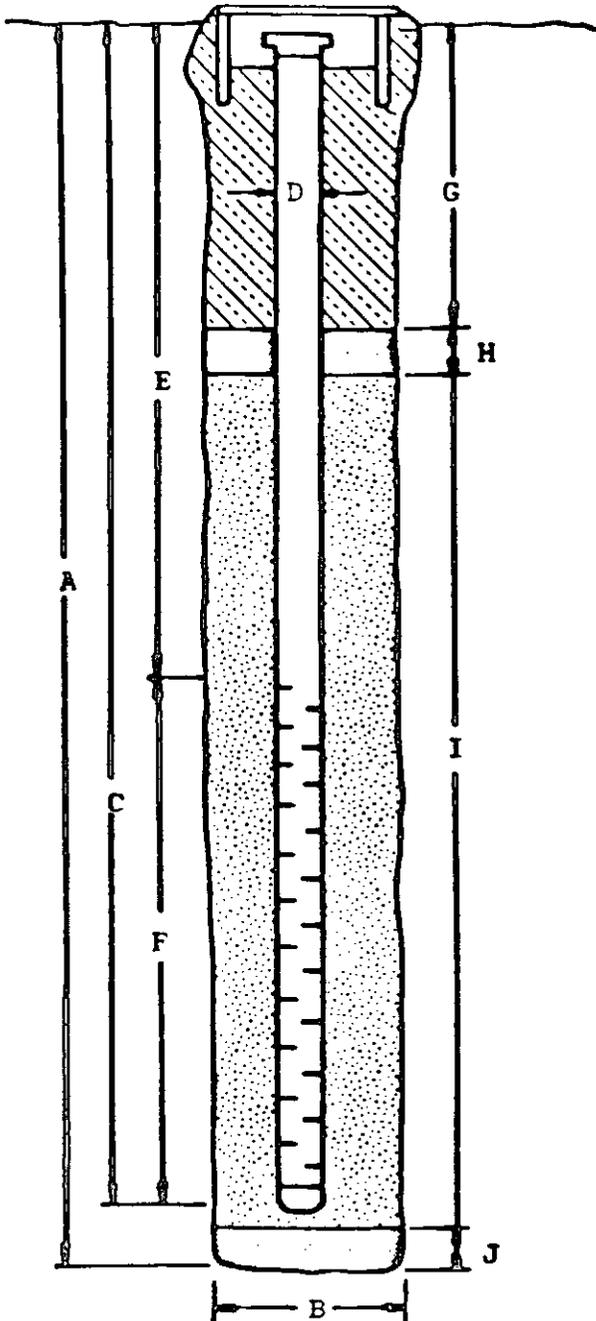
W E L L C O M P L E T I O N D I A G R A M

PROJECT NAME: Unocal Castro Valley BORING/WELL NO. MW4

PROJECT NUMBER: KEI-P89-1106

WELL PERMIT NO.: _____

Flush-mounted Well Cover



- A. Total Depth: 23.5'
- B. Boring Diameter*: 9"
Drilling Method: Hollow Stem Auger
- C. Casing Length: 21'
Material: Schedule 40 PVC
- D. Casing Diameter: OD = 2.375"
ID = 2.067"
- E. Depth to Perforations: 6'
- F. Perforated Length: 15'
Perforation Type: Machined Slot
Perforation Size: 0.020"
- G. Surface Seal: 4'
Seal Material: Concrete
- H. Seal: 18'
Seal Material: Bentonite
- I. Gravel Pack: 17'
Pack Material: RMC Lonestar Sand
Size: #3
- J. Bottom Seal: None
Seal Material: N/A

*Boring diameter can vary from 8-1/4" to 9" depending on bit wear.

B O R I N G L O G

Project No. KEI-P89-1106	Boring & Casing Diameter 9" 2"	Logged By W.W. <i>DRB</i>
Project Name Unocal Castro Valley	Well Head Elevation N/A	Date Drilled 8/13/90
Boring No. MW5	Drilling Method Hollow-stem Auger	Drilling Company EGI

Penetration blows/6"	G. W. level	Depth (feet) Samples	Strati- graphy USCS	Description
		0		A.C. Pavement over clayey sand and and gravel base
			CL/ CH	Clay with gravel, gravel angular to 1 1/8 dia., trace sand and caliche, moist, firm, greenish gray.
				Clay, trace sand, moist, firm, very dark gray.
7/14/15		5		Clay, trace fine sand, moist, very stiff, light olive gray to greenish gray trace to 10% caliche with nodules to 1/2 dia.
			N/A	Bedrock
50				Clayey shale, trace caliche(?), moist, olive gray, orangish brown, trace greenish gray (clay) highly weather- ed, decomposed
16/24/30		10		
				Clayey shale, trace organic matter, moist, olive gray to olive brown with trace of orange-brown, moderately hard, less weathered than above
36/40/45				
				Clayey shale, slightly weathered and decomposed, saturated, moderately hard, olive gray
35/50		15		
40/50-5"		20		

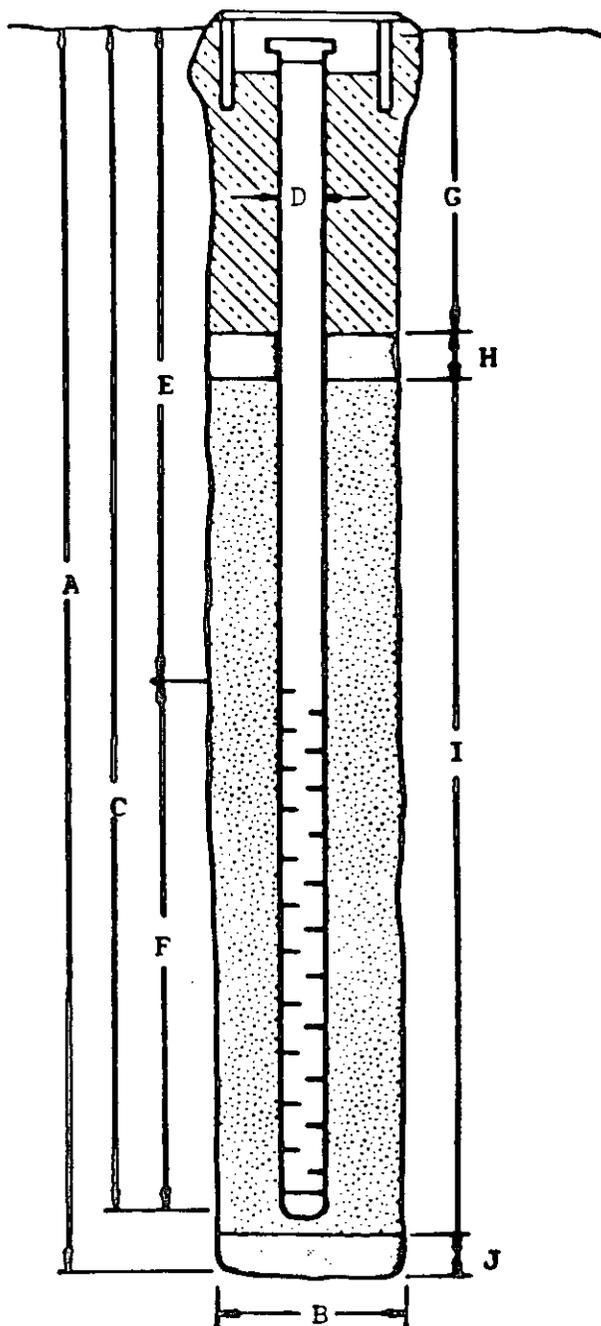
W E L L C O M P L E T I O N D I A G R A M

PROJECT NAME: Unocal-Castro Valley 2445 C.V. Blvd. BORING/WELL NO. MW5

PROJECT NUMBER: KEI-P89-1106

WELL PERMIT NO.: _____

Flush-mounted Well Cover



A. Total Depth: 24'

B. Boring Diameter*: 9"

Drilling Method: Hollow Stem Auger

C. Casing Length: 23.5'

Material: Schedule 40 PVC

D. Casing Diameter: OD = 2.375"

ID = 2.067"

E. Depth to Perforations: 8.5'

F. Perforated Length: 15'

Perforation Type: Machined Slot

Perforation Size: 0.020"

G. Surface Seal: 6.5'

Seal Material: Concrete

H. Seal: 1'

Seal Material: Bentonite

I. Gravel Pack: 16.5'

Pack Material: RMC Lonestar Sand

Size: #3

J. Bottom Seal: None

Seal Material: N/A

*Boring diameter can vary from 8-1/4" to 9" depending on bit wear.

BORING LOG

Project No. KEI-P89-1106		Boring Diameter 8"		Logged By D.L. <i>DRB</i>	
Project Name Unocal Castro Valley		Well Head Elevation N/A		Date Drilled 4/25/90	
Boring No. EB1		Drilling Method Hollow-stem Auger		Drilling Company EGI	
Penetration blows/6"	G. W. level	Depth (feet) Samples	Strati- graphy USCS	Description	
		0		A. C. Pavement over fill consisting of clay, sand, and gravel, moist.	
				Fill is very moist at 3.5 feet.	
14/24/37		5	CL/ CH	Gravelly clay, gravel consisting of shale fragments to 1-1/2" diameter, hard, moist, dark greenish gray and olive, cementation.	
				————— BEDROCK —————	
19/24/34		10	N/A	Shale, moderately hard, fractured, very weathered, decomposed and clayey moist, olive.	
27/45/50-4"				Shale, as above, less weathered, becoming harder with depth.	
27/36/50-2 1/2"	▼	15		Wet at 14 feet.	
		20			
				TOTAL DEPTH DRILLED: 13.5' TOTAL DEPTH SAMPLED: 15'	

B O R I N G L O G

Project No. KEI-P89-1106		Boring Diameter 8"		Logged By D.L. <i>DLB</i>	
Project Name Unocal Castro Valley		Well Head Elevation N/A		Date Drilled 4/25/90	
Boring No. EB2		Drilling Method	Hollow-stem Auger	Drilling Company EGI	
Penetration blows/6"	G. W. level	Depth (feet) Samples	Strati- graphy USCS	Description	
		0		A. C. Pavement underlain by fill consisting of clay, sand and gravel.	
			CL/ CH	Gravelly clay, very stiff, moist, very dark gray, gravel consists entirely of shale fragments.	
21/42/50		5	N/A		
				— BEDROCK —	
				Shale, hard, slightly moist, fractured decomposed and clayey in fractures, dark yellowish brown.	
16/32/29	▼	10		Shale, as above, moist to wet, less weathered than above.	
19/27/39					
		15			
		20			
				TOTAL DEPTH DRILLED: 12' TOTAL DEPTH SAMPLED: 13.5'	

BORING LOG

Project No. KEI-P89-1106	Boring Diameter 8"	Logged By D.L. <i>DRB</i>
Project Name Unocal Castro Valley	Well Head Elevation N/A	Date Drilled 4/25/90
Boring No. EB3	Drilling Method Hollow-stem Auger	Drilling Company EGI

Penetration blows/6"	G. W. level	Depth (feet) Samples	Strati- graphy USCS	Description
		0		A. C. Pavement underlain by fill consisting of clay, sand and gravel.
		5	CL/ CH	Clay, 10-15% silt, 5% sand and gravel to 1/8" diameter, stiff, moist, very dark gray.
5/26/30		5	GC	Clayey gravel with sand, very dense, moist, olive brown, gravel is mostly angular shale fragments, trace serpentine?.
		10	CL/ CH	Clay, 5-10% sand, very stiff, moist, black.
	▼	10	GC	Clayey gravel with sand, very dense, very moist to wet, yellowish brown.
15/21/32		15		
		20		
				TOTAL DEPTH DRILLED: 9' TOTAL DEPTH SAMPLED: 10.5'

B O R I N G L O G

Project No. KEI-P89-1106		Boring Diameter 8"		Logged By D.L. <i>DRB</i>	
Project Name Unocal Castro Valley		Well Head Elevation N/A		Date Drilled 4/24/90	
Boring No. EB4		Drilling Method Hollow-stem Auger		Drilling Company EGI	
Penetration blows/6"	G. W. level	Depth (feet) Samples	Stratigraphy USCS	Description	
	N O T	0		A. C. Pavement underlain by fill consisting of clay, sand and gravel.	
	E N C O U N T E R E D		CL/ CH	Clay, with sand, very stiff, moist, very dark grayish brown to black.	
15/23/46		5	GC	Clayey gravel with sand, very dense, moist, olive brown, gravel is entirely shale, maybe bedrock weathered to soil.	
	D U R I N G			—BEDROCK—	
49/50-3" 50-5 3/4"		10		Shale, hard, slightly moist, fractured weathered with clay-lined fractures, olive.	
	D R I L L I N G			Color change at 12 feet to olive gray, hardness increasing with depth.	
25/41/50-5 1/2"				Difficult drilling at 14 feet.	
50-2"		15			
		20			
				TOTAL DEPTH DRILLED: 14'	
				TOTAL DEPTH SAMPLED: 14.5'	

BORING LOG

Project No. KEI-P89-1106	Boring Diameter 8"	Logged By D.L. <i>DLB</i>
Project Name Unocal Castro Valley	Well Head Elevation N/A	Date Drilled 4/25/90
Boring No. EB5	Drilling Method Hollow-stem Auger	Drilling Company EGI

Penetration blows/6"	G. W. level	Depth (feet) Samples	Strati- graphy USCS	Description
		0		A. C. Pavement
		5	GP/ SP	Gravel and sand fill, 5-10% fines, road and utility trench backfill.
10/10/11				
10/9/8				
7/6/8				
	▽	10	N/A	Base of Fill Materials
12/33/50				BEDROCK Shale, moderately hard, moist, fractured, decomposed with clay-lined fractures, olive to olive gray.
		15		
		20		
				TOTAL DEPTH DRILLED: 9.5' TOTAL DEPTH SAMPLED: 11'

BORING LOG

Project No. KEI-P89-1106		Boring Diameter 8"		Logged By D.L. <i>DLB</i>	
Project Name Unocal Castro Valley		Well Head Elevation N/A		Date Drilled 4/24/90	
Boring No. EB6		Drilling Method Hollow-stem Auger		Drilling Company EGI	
Penetration blows/6"	G. W. level	Depth (feet) Samples	Strati- graphy USCS	Description	
		0		A. C. Pavement underlain by fill consisting of sand and gravel.	
7/11/15		5	CL/ CH	Clay, 5-10% sand, 5-10% gravel to 3/4" diameter, very stiff, moist, black.	
		10	N/A		
21/33/45		10	N/A	BEDROCK	
45/50-4"	▼			Shale, hard, slightly moist to moist, fractured, weathered with clay-lined fractures, olive brown.	
50-3 1/4"		15		Shale, as above, less weathered than above, hardness increasing with depth	
		20		TOTAL DEPTH DRILLED: 14' TOTAL DEPTH SAMPLED: 14.5'	

BORING LOG

Project No. KEI-P89-1106		Boring Diameter 8"		Logged By D.L. <i>DRB</i>	
Project Name Unocal Castro Valley		Well Head Elevation N/A		Date Drilled 4/24/90	
Boring No. EB7		Drilling Method Hollow-stem Auger		Drilling Company EGI	
Penetration blows/6"	G. W. level	Depth (feet) Samples	Strati- graphy USCS	Description	
		0		A. C. Pavement underlain by sand and gravel baserock.	
6/12/21		5	CL/ CH	Clay, 5-10% sand and gravel to 3/8" diameter, very stiff, moist, black, lensed with greenish gray partially cemented layers below 5 feet, cemented layers have blocky texture (caliche?).	
5/50		10	N/A		
30/49/50-5"				BEDROCK	
50-5 1/2"				Shale, hard, slightly moist to moist, fractured, weathered with clay-lined fractures, olive brown.	
50-5"	▽				
		15			
		20			
				TOTAL DEPTH DRILLED: 13.5' TOTAL DEPTH SAMPLED: 14'	

BORING LOG

Project No. KEI-P89-1106	Boring Diameter 8"	Logged By D.L. <i>DRB</i>
Project Name Unocal Castro Valley	Well Head Elevation N/A	Date Drilled
Boring No. EB8	Drilling Method Hollow-stem Auger	Drilling Company EGI

Penetration blows/6"	G. W. level	Depth (feet) Samples	Strati- graphy USCS	Description
		0		A. C. Pavement underlain by sand and gravel baserock.
11/13/20		5	CL/ CH	Clay, 10-20% sand and gravel to 3/8" diameter, very stiff, moist, black. At 5 feet, black and greenish gray, with locally strong cementation, blocky texture, greenish gray below 6 feet.
				Color change at approximately 8.5 feet to black.
11/25/40		10	N/A	— BEDROCK — Shale, moderately hard, moist, very weathered, fractured, clay-lined fractures, olive to olive brown.
30/41/47	▼			
		15		
		20		
				TOTAL DEPTH DRILLED: 12' TOTAL DEPTH SAMPLED: 13.5'

PROJECT NO.: 42-0187-01	DATE DRILLED: 1/24/05	NORTHING: NOT SURVEYED
LOCATION: 76 Station #3072	LOGGED BY: R. Dunn	EASTING: NOT SURVEYED
2445 Castro Valley Blvd.	APPROVED BY: K. Woodburne, RG	GROUND SURFACE ELEVATION: NOT SURVEYED
Castro Valley, California	DRILLING CO.: Woodward Drilling	

PID/FID (ppm)	BLOWS PER 6 INCHES	RECOVERY	SAMPLE	DEPTH (feet below grade)	DRILLING METHOD: 2-inch Diameter Direct-Push SAMPLER TYPE: 4-foot Continuous-Core Barrel TOTAL DEPTH: 25.5 feet DEPTH TO WATER: 23.5 feet	USCS	LITHOLOGY	BORING BACKFILL DETAIL
					DESCRIPTION			
				0	Vacuum clearance to 5'.			
34.0	3.0/ 3.0			5	SAND (SP): Gray (10YR 6/1), 10% fines, 90% fine- to medium-grained sand, dense, dry, hydrocarbon odor. - @ 8': color change to grayish brown (10YR 5/2), slight odor. - @ 12': color change to brown (10YR 4/3), no odor.	SP		Grout to Surface
5.0	4.0/ 4.0			10				
1.0	3.0/ 3.0			15	No recovery.			
1.2	2.0/ 2.0			20				
1.5	3.0/ 3.0			25	SAND (SP): same as above. - @ 21.5': color change to dark gray (10YR 4/1). - @ 24': color change to grayish brown (10YR 5/2), wet.	SP		
1.4	2.5/ 2.5			30				
				35				
				40				



LOG OF EXPLORATORY BORING

PROJECT NO.: 42-0187-01	DATE DRILLED: 1/24/05	NORTHING: NOT SURVEYED
LOCATION: 76 Station #3072	LOGGED BY: R. Dunn	EASTING: NOT SURVEYED
2445 Castro Valley Blvd.	APPROVED BY: K. Woodburne, RG	GROUND SURFACE ELEVATION: NOT SURVEYED
Castro Valley, California	DRILLING CO.: Woodward Drilling	

PID/FID (ppm)	BLOWS PER 6 INCHES	RECOVERY	SAMPLE	DEPTH (feet below grade)	DRILLING METHOD: 2-inch Diameter Direct-Push SAMPLER TYPE: 4-foot Continuous-Core Barrel TOTAL DEPTH: 24.0 feet DEPTH TO WATER: 23.0 feet	USCS	LITHOLOGY	BORING BACKFILL DETAIL
					DESCRIPTION			
				0	Vacuum clearance to 5'.			0
0.6	3.0/3.0			5	SAND (SP): Brown (10YR 4/3), 10% fines, 90% fine-grained sand, loose, dry.			5
7.1	4.0/4.0			10				10
2.8	3.0/3.0			15	- @ 15': fine- to medium-grained sand.	SP		15
2.1	1.0/1.0			17.5	- @ 17.5': color change to dark grayish brown (10YR 4/2), dense.			17.5
2.0	1.5/1.5			20				20
1.9	2.0/2.0			23	SILTY CLAY (CL): Gray (10YR 5/1), 95% fines, 5% fine-grained sand, medium plasticity, soft, wet.	CL		23
2.1	1.5/1.5			25				25
1.6	3.0/3.0			30				30
				35				35
				40				40



LOG OF EXPLORATORY BORING

PROJECT NO.: 42-0187-01
 LOCATION: 76 Station #3072
 2445 Castro Valley Blvd.
 Castro Valley, California

DATE DRILLED: 1/25/05
 LOGGED BY: R. Dunn
 APPROVED BY: K. Woodburne, RG
 DRILLING CO.: Woodward Drilling

NORTHING: NOT SURVEYED
 EASTING: NOT SURVEYED
 GROUND SURFACE ELEVATION: NOT SURVEYED

PID/FID (ppm)	BLOWS PER 6 INCHES	RECOVERY	SAMPLE	DEPTH (feet below grade)	DRILLING METHOD: 2-inch Diameter Direct-Push SAMPLER TYPE: 4-foot Continuous-Core Barrel TOTAL DEPTH: 18.0 feet DEPTH TO WATER: 15.0 feet		USCS	LITHOLOGY	BORING BACKFILL DETAIL
					DESCRIPTION				
1.4		0.0/ 3.0		0	Vacuum clearance to 5'.				0
				5	No recovery.				
		0.0/ 4.0		10					10
		1.0/ 3.5		15	PEA GRAVEL: wet.		GW	[Cross-hatched pattern]	15
		2.5/ 2.5			SAND (GW): Brown (10YR 4/3), 5% fines, 95% fine- to medium-grained sand, loose, wet.				
				20					20
				25					25
				30					30
				35					35
				40					40



LOG OF EXPLORATORY BORING

PROJECT NO.: 42-0187-01	DATE DRILLED: 1/25/05	NORTHING: NOT SURVEYED
LOCATION: 76 Station #3072	LOGGED BY: R. Dunn	EASTING: NOT SURVEYED
2445 Castro Valley Blvd.	APPROVED BY: K. Woodburne, RG	GROUND SURFACE ELEVATION: NOT SURVEYED
Castro Valley, California	DRILLING CO.: Woodward Drilling	

PID/FID (ppm)	BLOWS PER 6 INCHES	RECOVERY	SAMPLE	DEPTH (feet below grade)	DRILLING METHOD: 2-inch Diameter Direct-Push SAMPLER TYPE: 4-foot Continuous-Core Barrel TOTAL DEPTH: 50.0 feet DEPTH TO WATER: 49.0 feet	USCS	LITHOLOGY	BORING BACKFILL DETAIL	
					DESCRIPTION				
				0	Vacuum clearance to 5'.			0	
44.0		3.0/3.0		5	SILTY CLAY (CL): Greenish gray (GLEYS 1 5/10Y), 90% fines, 10% fine-grained sand, medium plastic, soft, moist, hydrocarbon odor.	CL		5	Grout to Surface
1.3		4.0/4.0		8.5	- @ 8.5': stiff.				
1.7		2.0/4.0		13	SAND (SP): Grayish brown (10YR 5/2), 10% fines, 90% fine-grained sand, dense, no odor.	SP		13	
2.0		3.0/3.0		13.5	- @ 13': color change to brown (10YR 5/3).				
0.9		1.0/1.0		18	- @ 13.5': color change to very dark gray (10YR 3/1).				
1.5		3.0/3.0		20	- @ 18': color change to dark grayish brown (10YR 4/2).				
2.0		1.0/1.0		25	Difficult drilling conditions; augers used; no samples collected.				
				30					
				35					
				40					

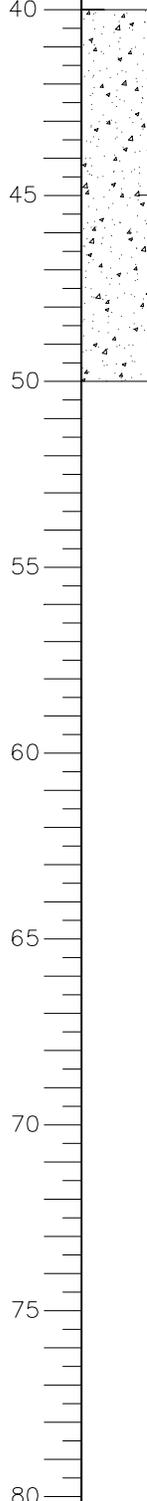


LOG OF EXPLORATORY BORING

PROJECT NO.: 42-0187-01
 LOCATION: 76 Station #3072
 2445 Castro Valley Blvd.
 Castro Valley, California

DATE DRILLED: 1/25/05
 LOGGED BY: R. Dunn
 APPROVED BY: K. Woodburne, RG
 DRILLING CO.: Woodward Drilling

NORTHING: NOT SURVEYED
 EASTING: NOT SURVEYED
 GROUND SURFACE ELEVATION: NOT SURVEYED

PID/FID (ppm)	BLOWS PER 6 INCHES	RECOVERY	SAMPLE	DEPTH (feet below grade)	DRILLING METHOD: 2-inch Diameter Direct-Push SAMPLER TYPE: 4-foot Continuous-Core Barrel TOTAL DEPTH: 50.0 feet DEPTH TO WATER: 49.0 feet	USCS	LITHOLOGY	BORING BACKFILL DETAIL
					DESCRIPTION			
1.2			1.0/ 1.0	40	Difficult drilling conditions.			 <p>Grout to Surface</p>
				50				
				55				
				60				
				65				
				70				
				75				
				80				



LOG OF EXPLORATORY BORING

PROJECT NO.: 42-0187-01	DATE DRILLED: 1/31/05	NORTHING: NOT SURVEYED
LOCATION: 76 Station #3072	LOGGED BY: R. Dunn	EASTING: NOT SURVEYED
2445 Castro Valley Blvd.	APPROVED BY: K. Woodburne, RG	GROUND SURFACE ELEVATION: NOT SURVEYED
Castro Valley, California	DRILLING CO.: Woodward Drilling	

PID/FID (ppm)	BLOWS PER 6 INCHES	RECOVERY	SAMPLE	DEPTH (feet below grade)	DRILLING METHOD: 2-inch Diameter Direct-Push SAMPLER TYPE: 4-foot Continuous-Core Barrel TOTAL DEPTH: 23.0 feet DEPTH TO WATER: Not Encountered	USCS	LITHOLOGY	BORING BACKFILL DETAIL
					DESCRIPTION			
				0	Vacuum clearance to 5'.			0
0.2	3.0/3.0			5	SILT (ML): Light yellowish brown (10YR 6/4), 90% fines, 10% fine-grained sand, nonplastic, stiff, dry.	ML		5
0.4	4.0/4.0			10	SAND (SP): Brown (10YR 5/3), 10% fines, 90% fine- to medium-grained sand, dense, dry.			10
1.2	4.0/4.0			15				15
1.2	2.0/2.0			17.5	- @ 17.5': color change to gray (10YR 5/11), fine-grained sand, loose.	SP		17.5
1.8	2.0/2.0			20				20
2.5	2.0/2.0			25				25
2.0	1.0/1.0			30				30
				35				35
				40				40



LOG OF EXPLORATORY BORING

PROJECT NO.: 42-0187-01	DATE DRILLED: 1/31/05	NORTHING: NOT SURVEYED
LOCATION: 76 Station #3072	LOGGED BY: R. Dunn	EASTING: NOT SURVEYED
2445 Castro Valley Blvd.	APPROVED BY: K. Woodburne, RG	GROUND SURFACE ELEVATION: NOT SURVEYED
Castro Valley, California	DRILLING CO.: Woodward Drilling	

PID/FID (ppm)	BLOWS PER 6 INCHES	RECOVERY	SAMPLE	DEPTH (feet below grade)	DRILLING METHOD: 2-inch Diameter Direct-Push SAMPLER TYPE: 4-foot Continuous-Core Barrel TOTAL DEPTH: 50.0 feet DEPTH TO WATER: 47.0 feet	USCS	LITHOLOGY	BORING BACKFILL DETAIL
					DESCRIPTION			
				0	Vacuum clearance to 5'.			0
24.6	3.0/3.0			5	SILT (ML): Greenish gray (GLE Y1 5/10Y), 90% fines, 10% fine- to medium-grained sand, low plasticity, soft, moist.	ML		5
190.1	2.0/2.0			10	SAND (SP): Pale brown (10YR 6/3), 15% fines, 85% fine-grained sand, dry.			10
60.1	2.0/2.0			12.5	- @ 12.5': color change to yellowish brown (10YR 5/4).			12.5
2.2	1.0/1.0			15	- @ 15.5': medium-grained sand, slight hydrocarbon odor.	SP		15
6.7	3.0/3.0			20	- @ 20': no odor.			20
7.1	3.0/3.0			25				25
6.8	2.0/2.0			30				30
				35				35
				40	Difficult drilling conditions; augers used; no samples collected.			40



LOG OF EXPLORATORY BORING

PROJECT NO.: 42-0187-01	DATE DRILLED: 1/31/05	NORTHING: NOT SURVEYED
LOCATION: 76 Station #3072	LOGGED BY: R. Dunn	EASTING: NOT SURVEYED
2445 Castro Valley Blvd.	APPROVED BY: K. Woodburne, RG	GROUND SURFACE ELEVATION: NOT SURVEYED
Castro Valley, California	DRILLING CO.: Woodward Drilling	

PID/FID (ppm)	BLOWS PER 6 INCHES	RECOVERY	SAMPLE	DEPTH (feet below grade)	DRILLING METHOD: 2-inch Diameter Direct-Push SAMPLER TYPE: 4-foot Continuous-Core Barrel TOTAL DEPTH: 50.0 feet DEPTH TO WATER: 47.0 feet	USCS	LITHOLOGY	BORING BACKFILL DETAIL
					DESCRIPTION			
				40	Difficult drilling conditions.			40
				45				45
		3.0/ 3.0		50	SANDY SILT (ML): Gray (10YR 5/1), 90% fines, 10% fine-grained sand, low plasticity, soft, wet. SAND (SP): Gray (10YR 6/1), 10% fines, 90% fine-grained sand, dense, dry.	ML SP		50
				55				55
				60				60
				65				65
				70				70
				75				75
				80				80



LOG OF EXPLORATORY BORING



Appendix C

Historical Groundwater Elevations

KEI-P89-1106.QR1
 January 21, 1991

TABLE 1

SUMMARY OF MONITORING DATA

<u>Date</u>	<u>Well No.</u>	<u>Ground Water Elevation (feet)</u>	<u>Depth to Water (feet)</u>	<u>Product Thickness</u>	<u>Sheen</u>	<u>Water Bailed (gallons)</u>
12/12/90	MW1	171.78	9.29	0	None	15
	MW2	172.77	9.51	0	None	15
	MW3	171.42	7.09	0	None	15
	MW4	172.21	7.04	0	None	14
	MW5	171.73	7.29	0	None	15
11/13/90	MW1	171.68	9.39	0	None	0
	MW2	172.89	9.39	0	None	0
	MW3	171.51	7.00	0	None	0
	MW4	172.20	7.05	0	None	0
	MW5	171.72	7.30	0	None	0
10/11/90	MW1	171.79	9.28	0	None	0
	MW2	172.88	9.40	0	None	0
	MW3	171.71	6.80	0	None	0
	MW4	172.02	7.23	0	None	0
	MW5	171.33	7.69	0	None	0

<u>Well #</u>	<u>Surface Elevation* (feet)</u>
MW1	181.07
MW2	182.28
MW3	178.51
MW4	179.25
MW5	179.02

* Elevation of top of well covers surveyed to Mean Sea Level (MSL)

KEI-P89-1106.QR2
 April 15, 1991

TABLE 1
 SUMMARY OF MONITORING DATA

<u>Date</u>	<u>Well No.</u>	<u>Ground Water Elevation (feet)</u>	<u>Depth to Water (feet)</u>	<u>Product Thickness</u>	<u>Sheen</u>	<u>Water Bailed (gallons)</u>	
3/11/91	MW1	172.50	8.57	0	None	15	
	MW2	173.42	8.86	0	None	15	
	MW3	172.43	6.08	0	None	15	
	MW4	172.70	6.55	0	None	15	
	MW5	171.89	7.13	0	None	15	
2/11/91	MW1	172.22	8.85	0	None	0	
	MW2	173.16	9.12	0	None	0	
	MW3	NOT ACCESSIBLE DUE TO A PARKED CAR ABOVE WELL COVER					
	MW4	172.42	6.83	0	None	0	
	MW5	171.62	7.40	0	None	0	
1/11/91	MW1	172.04	9.03	0	None	0	
	MW2	172.97	9.31	0	None	0	
	MW3	171.65	6.86	0	None	0	
	MW4	172.33	6.92	0	None	0	
	MW5	171.36	7.66	0	None	0	

<u>Well #</u>	<u>Surface Elevation* (feet)</u>
MW1	181.07
MW2	182.28
MW3	178.51
MW4	179.25
MW5	179.02

* Elevation of top of well covers surveyed to Mean Sea Level (MSL).

KEI-P89-1106.QR3
 July 15, 1991

TABLE 1
 SUMMARY OF MONITORING DATA

<u>Well No.</u>	<u>Ground Water Elevation (feet)</u>	<u>Depth to Water (feet)</u>	<u>Product Thickness (feet)</u>	<u>Sheen</u>	<u>Water Purged (gallons)</u>	<u>Product Purged</u>
(Monitored and Sampled on June 12, 1991)						
MW1	172.41	8.66	0	No	15	0
MW2	173.95	8.33	0	No	15	0
MW3	172.17	6.34	0	No	15	0
MW4	172.62	6.63	0	No	15	0
MW5	172.40	6.62	0	No	15	0
(Monitored on May 10, 1991)						
MW1	172.62	8.45	0	No	0	0
MW2	173.55	8.73	0	No	0	0
MW3	172.57	5.94	0	No	0	0
MW4	172.84	6.41	0	No	0	0
MW5	172.01	7.01	0	No	0	0
(Monitored on April 11, 1991)						
MW1	172.89	8.18	0	No	0	0
MW2	174.38	7.90	0	No	0	0
MW3	172.74	5.77	0	No	0	0
MW4	173.04	6.21	0	No	0	0
MW5	172.06	6.96	0	No	0	0

<u>Well #</u>	<u>Surface Elevation* (feet)</u>
MW1	181.07
MW2	182.28
MW3	178.51
MW4	179.25
MW5	179.02

* Elevation of top of well covers surveyed to Mean Sea Level (MSL).

KEI-P89-1106.QR4
October 31, 1991

TABLE 1

SUMMARY OF MONITORING DATA

<u>Well No.</u>	<u>Ground Water Elevation (feet)</u>	<u>Depth to Water (feet)</u>	<u>Product Thickness (feet)</u>	<u>Sheen</u>	<u>Water Purged (gallons)</u>
-----------------	--	--------------------------------------	---	--------------	---------------------------------------

(Monitored and Sampled on September 25, 1991)

MW1	172.04	9.03	0	No	12
MW2	173.53	8.75	0	No	11
MW3	171.94	6.57	0	No	10
MW4	172.80	6.45	0	No	10
MW5	171.35	7.67	0	No	12

(Monitored on August 21, 1991)

MW1	172.28	8.79	0	No	0
MW2	173.28	9.00	0	No	0
MW3	171.99	6.52	0	No	0
MW4	172.70	6.55	0	No	0
MW5	171.63	7.39	0	No	0

(Monitored on July 11, 1991)

MW1	172.35	8.72	0	No	0
MW2	173.31	8.97	0	No	0
MW3	172.11	6.40	0	No	0
MW4	172.73	6.52	0	No	0
MW5	171.87	7.15	0	No	0

<u>Well #</u>	<u>Surface Elevation* (feet)</u>
MW1	181.07
MW2	182.28
MW3	178.51
MW4	179.25
MW5	179.02

* Elevation of top of well covers surveyed to Mean Sea Level (MSL).

KEI-P89-1106.QR5
January 20, 1992

TABLE 1

SUMMARY OF MONITORING DATA

<u>Well No.</u>	<u>Ground Water Elevation (feet)</u>	<u>Depth to Water (feet)</u>	<u>Product Thickness (feet)</u>	<u>Sheen</u>	<u>Water Purged (gallons)</u>
-----------------	--	--------------------------------------	---	--------------	---------------------------------------

(Monitored and Sampled on December 20, 1991)

MW1	172.08	8.99	0	No	11
MW2	172.59	9.69	0	No	10
MW3	172.47	6.04	0	No	10
MW4	172.78	6.47	0	No	10
MW5	172.19	6.83	0	No	12

(Monitored on November 20, 1991)

MW1	172.31	8.76	0	--	0
MW2	173.67	8.61	0	--	0
MW3	172.22	6.29	0	--	0
MW4	172.71	6.54	0	--	0
MW5	172.29	6.73	0	--	0

(Monitored on October 22, 1991)

MW1	171.89	9.18	0	--	0
MW2	173.46	8.82	0	--	0
MW3	171.92	6.59	0	--	0
MW4	172.75	6.50	0	--	0
MW5	171.87	7.15	0	--	0

<u>Well #</u>	<u>Surface Elevation* (feet)</u>
MW1	181.07
MW2	182.28
MW3	178.51
MW4	179.25
MW5	179.02

-- Sheen determination not performed.

* The elevation of the top of the well covers have been surveyed to Mean Sea Level (MSL).

KEI-P89-1106.QR6
July 23, 1992

TABLE 1

SUMMARY OF MONITORING DATA

<u>Well No.</u>	<u>Ground Water Elevation (feet)</u>	<u>Depth to Water (feet)</u>	<u>Product Thickness (feet)</u>	<u>Sheen</u>	<u>Water Purged (gallons)</u>
-----------------	--	--------------------------------------	---	--------------	---------------------------------------

(Monitored and Sampled on June 18, 1992)

MW1	172.32	8.81	0	No	11
MW2	174.05	9.36	0	No	11
MW3	172.27	6.35	0	No	10
MW4	172.53	6.84	0	No	10
MW5	172.16	6.97	0	No	12

(Monitored on March 19, 1992)

MW1	174.22	6.91	0	--	0
MW2	175.88	6.53	0	--	0
MW3	174.06	4.56	0	--	0
MW4	174.45	4.92	0	--	0
MW5	173.38	5.75	0	--	0

(Monitored on January 20, 1992)

MW1	172.36	8.77	0	--	0
MW2	174.01	8.40	0	--	0
MW3	172.52	6.10	0	--	0
MW4	172.76	6.61	0	--	0
MW5	171.98	7.15	0	--	0

<u>Well #</u>	<u>Surface Elevation* (feet)</u>
MW1	181.13
MW2	182.41
MW3	178.62
MW4	179.37
MW5	179.13

-- Sheen determination was not performed.

* The elevations of the top of the well covers have been surveyed to Mean Sea Level, per Caltrans Monument "Stro-Nor" PK Nail.



Appendix D

Historical Soil Results

KEI-J89-1106.R5
 March 6, 1990

TABLE 1

SUMMARY OF LABORATORY ANALYSES
 SOIL

(Samples collected on November 14 & 16, 1989)

<u>Sample</u>	<u>Depth (feet)</u>	<u>TPH as Diesel</u>	<u>TPH as Gasoline</u>	<u>Benzene</u>	<u>Toluene</u>	<u>Xylenes</u>	<u>Ethyl- benzene</u>
A1	13.5	ND	2.4	ND	ND	ND	ND
A2	13.5	ND	ND	ND	ND	ND	ND
B1	13.5	--	1.9	ND	ND	ND	ND
B2	13.5	--	11	ND	ND	ND	ND
C1	13.5	--	1.5	ND	ND	ND	ND
C2	13.5	--	7.5	ND	ND	ND	ND
SW1	10.5	--	140	0.31	0.12	3.0	0.88
SW2	10.5	ND	ND	ND	ND	ND	ND
SW3	10.5	ND	ND	ND	ND	ND	ND
SW4	9.5	24	160	0.33	6.4	30	9.4
SW5	9.5	--	3.5	0.06	0.27	0.76	0.19
SW6	10	--	29	0.12	0.21	2.0	0.58
WO1(11)*	11	ND	5.9	ND	ND	ND	ND
Detection Limits		1.0	1.0	0.05	0.1	0.1	0.1

* TOG and all 8270 constituents were non-detectable. All 8010 constituents were non-detectable except 1,1-dichloroethene at 55 ppb. Metals concentrations were as follows: cadmium 2.5 ppm, chromium 39 ppm, lead 1.1 ppm, and zinc 45 ppm.

ND = Non-detectable.

Results in parts per million (ppm), unless otherwise indicated.

KEI-J89-1106.R5
March 6, 1990

TABLE 3

SUMMARY OF LABORATORY ANALYSES
SOIL

(Samples collected on December 22, 1989)

<u>Sample</u>	<u>Depth (feet)</u>	<u>TPH as Diesel</u>	<u>TPH as Gasoline</u>	<u>Benzene</u>	<u>Toluene</u>	<u>Xylenes</u>	<u>Ethyl- benzene</u>
SW1(17)	11	ND	1,900	14	24	120	28
SW2(17)	11	ND	1,500	17	29	92	23
SW7	9	ND	1,700	16	33	110	26
SW8	9	ND	200	2.6	0.9	7.7	5.0
SW3(13)	9	ND	690	11	11	28	11
SW9	9	ND	3.0	0.2	0.1	0.1	ND
SW10	9	ND	500	4.0	5.9	22	6.9
SW4(11)	9	ND	410	2.7	3.9	19	3.8
Detection Limits		1.0	1.0	0.1	0.1	0.1	0.1

ND = Non-detectable.

Results in parts per million (ppm), unless otherwise indicated.

KEI-J89-1106.R9
September 28, 1990

TABLE 9

SUMMARY OF LABORATORY ANALYSES
SOIL

(Collected on January 18, 1990)

<u>Sample Number</u>	<u>Depth (feet)</u>	<u>TPH as Gasoline</u>	<u>Benzene</u>	<u>Toluene</u>	<u>Xylenes</u>	<u>Ethylbenzene</u>
MW1 (5)	5.0	2.8	0.051	ND	ND	0.11
MW1 (6.5)	6.5	ND	ND	ND	ND	ND
MW1 (10.0)	10.0	ND	ND	ND	ND	ND
MW2 (5)	5.0	ND	ND	ND	ND	ND
MW2 (6.5)	6.5	ND	ND	ND	ND	ND
MW2 (9.0)	9.0	ND	ND	ND	ND	ND
MW2 (10)	10.0	ND	ND	ND	ND	ND
MW2 (15)	15.0	ND	ND	ND	ND	ND
MW2 (16.5)	16.5	ND	ND	ND	ND	ND
MW2 (20)	20.0	ND	ND	ND	ND	ND
MW3 (5)	5.0	ND	ND	ND	ND	ND
MW3 (6.5)	6.5	ND	ND	ND	ND	ND
MW3 (9)	9.0	ND	ND	ND	ND	ND
Detection Limits		1.0	0.05	0.1	0.1	0.1

ND = Non-detectable.

Results in parts per million (ppm), unless otherwise indicated.

KEI-J89-1106.R5
March 6, 1990

TABLE 4

SUMMARY OF LABORATORY ANALYSES

(Samples collected on February 14, 1990)

<u>Sample</u>	<u>Depth (feet)</u>	<u>TPH as Gasoline</u>	<u>Benzene</u>	<u>Toluene</u>	<u>Xylenes</u>	<u>Ethylbenzene</u>
P1	4.0	87	0.33	0.17	10	2.3
P2	2.5	6.0	0.23	ND	0.33	0.11
P3	3.0	10	0.47	0.11	1.1	0.32
Detection Limits		1.0	0.05	0.1	0.1	0.1

ND = Non-detectable.

Results in parts per million (ppm), unless otherwise indicated.

KEI-J89-1106.R9
September 28, 1990

TABLE 8
SUMMARY OF LABORATORY ANALYSES
SOIL

(Collected on March 9, 1990)

<u>Sample</u>	<u>Depth (feet)</u>	<u>TPH as Diesel</u>	<u>TPH as Gasoline</u>	<u>Benzene</u>	<u>Toluene</u>	<u>Xylenes</u>	<u>Ethyl- benzene</u>
SWB*	8.0	<10	37	0.10	0.10	0.74	0.25
SWC*	9.0	ND	ND	ND	ND	ND	ND
SWD*	9.0	<10	ND	ND	ND	ND	ND
Detection Limits		1.0	1.0	0.05	0.1	0.1	0.1

* TOG and all EPA 8010 constituents were non-detectable.

ND = Non-detectable.

Results in parts per million (ppm), unless otherwise indicated.

KEI-J89-1106.R9
September 28, 1990

TABLE 4

SUMMARY OF LABORATORY ANALYSES
SOIL

(Collected on April 24 and 25, 1990)

<u>Sample Number</u>	<u>TPH as Gasoline</u>	<u>Benzene</u>	<u>Toluene</u>	<u>Xylenes</u>	<u>Ethylbenzene</u>
EB1(5)	ND	0.0063	0.042	0.011	ND
EB1(9.5)	4.9	0.0078	0.24	0.11	0.028
EB1(13.5)	ND	0.0087	0.048	ND	ND
EB2(5)	ND	0.0053	0.020	0.013	0.0068
EB2(10)	ND	0.0059	0.026	0.013	0.0050
EB3(5)	ND	0.0069	0.031	0.017	ND
EB3(9)	ND	0.0093	0.023	ND	ND
EB4(5)	ND	0.0091	0.034	ND	ND
EB4(10)	ND	0.0090	0.27	ND	ND
EB4(14)	1.7	0.0079	0.43	ND	ND
EB5(5)	ND	0.0095	0.015	ND	ND
EB6(5)	5.0	0.066	0.021	0.11	0.032
EB6(10)	ND	0.0086	0.060	0.014	0.0052
EB6(13)	ND	0.0080	0.16	0.24	0.0092
EB7(5)	3.0	0.040	0.056	0.073	0.034
EB7(9.5)	ND	0.0081	0.078	0.025	0.015
EB7(13.5)	ND	0.0054	0.085	0.012	ND
EB8(5)	2.7	0.023	0.067	0.078	0.013
EB8(10)	ND	0.0072	0.056	0.019	0.0050
Detection Limits	1.0	0.0050	0.0050	0.0050	0.0050

ND = Non-detectable.

Results in parts per million (ppm), unless otherwise indicated.

KEI-P89-1106.R9
September 28, 1990

TABLE 2

SUMMARY OF LABORATORY ANALYSES
SOIL

(Collected on August 13, 1990)

<u>Sample Number</u>	<u>Depth (feet)</u>	<u>TPH as Gasoline</u>	<u>Benzene</u>	<u>Toluene</u>	<u>Xylenes</u>	<u>Ethyl-benzene</u>
MW4(5)	5	ND	ND	ND	ND	ND
MW5(9.5)	9.5	ND	ND	ND	ND	ND
MW5(13.5)	13.5	ND	ND	ND	ND	ND
Detection Limits		1.0	0.0050	0.0050	0.0050	0.0050

ND = Non-detectable.

Results in parts per million (ppm), unless otherwise indicated.

KEI-P89-1106.R13
February 27, 1996

TABLE 1
SUMMARY OF LABORATORY ANALYSES

<u>Date</u>	<u>Sample</u>	<u>Depth (feet)</u>	<u>TPH as Diesel</u>	<u>Benzene</u>	<u>Toluene</u>	<u>Ethyl- benzene</u>	<u>Xylenes</u>
2/08/96	Comp D	N/A	1,400	ND	ND	ND	ND
	D(3.5)	3.5	20	--	--	--	--

ND = Non-detectable.

N/A = Not applicable (stockpiled soil).

-- Indicates analysis was not performed.

Results are in milligrams per kilogram (mg/kg), unless otherwise indicated.

TABLE 1 - SOIL CHEMICAL ANALYTICAL DATA

Tosco (Unocal) Service Station No.3072

2445 Castro Valley Boulevard

Castro Valley, California

Sample No.	Sample Date	Sample Depth (Feet)	TPHhf (ppm)	Benzene (ppm)	Toluene (ppm)	Ethylbenzene (ppm)	Total Xylenes (ppm)	TOG (ppm)
H1(8.5)	6/7/01	8.5	1200 ¹	NA	NA	NA	NA	210
Comp-1(A,B,C,D) ⁴	6/7/01	-	74 ²	0.15 ³	0.035 ³	0.017 ³	0.029 ⁴	NA

EXPLANATION:

ppm = parts per million
NA= Not Analyzed

ANALYTICAL LABORATORY:

Sequoia Analytical Walnut Creek (ELAP #1271)
(see laboratory reports for detection limits)

ANALYTICAL METHODS:

TPHhf = Total Petroleum Hydrocarbons as hydraulic Fluid by DHS-LUFT

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

TOG= Total Oil and Grease by EPA Method 5520E/F

¹ = Chromatogram Pattern: Unidentified Hydrocarbon >C16

² = Chromatogram Pattern: Hydraulic Oil C16-C40

³ = Chromatogram Pattern: Gasoline C6-C12 + Unidentified Hydrocarbons >C10

⁴ = Sample Comp-1(A,B,C,D) also contained: Mercury at 0.093 ppm, Barium at 160 ppm, Chromium at 30 ppm, Cobalt at 12 ppm, Copper at 32 ppm, Lead at 7.6 ppm, Nickel at 36 ppm, Vanadium at 51 and Zinc at 88 ppm. All other CAM 17 Metals were not detected.

Table 1

RESULTS OF LABORATORY ANALYSIS OF SOIL SAMPLES
76 Station # 3072
2445 Castro Valley Blvd, Castro Valley, California

Sample Number	Sample Date	Depth (fbg)	TPH-D	TPPH	Benzene	Toluene	Ethyl-benzene	Total Xylenes	TBA	MTBE	DIPE	ETBE	TAME	1, 2-DCA	EDB	Ethanol	Total Lead	Oil & Grease
			(mg/kg) EPA 8015	(mg/kg) EPA 8260B	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
SB-1 @ 8'	1/24/2005	8.0	--	480	<0.50	<0.50	1.1	1.1	<2.5	<0.50	<1.0	<0.50	<0.50	<0.50	<0.50	<25	--	--
SB-1 @ 25.5'	1/24/2005	25.5	--	<1.0	<0.0050	<0.0050	<0.0050	<0.0050	0.013	0.074	<0.010	<0.0050	<0.0050	<0.0050	<0.0050	<0.1	--	--
SB-2 @ 12'	1/24/2005	12.0	--	<1.0	<0.0050	<0.0050	0.043	0.021	0.014	<0.0050	<0.010	<0.0050	<0.0050	<0.0050	<0.0050	<0.1	--	--
SB-2 @ 24'	1/24/2005	24.0	--	<1.0	<0.0050	<0.0050	<0.0050	0.011	<0.010	<0.0050	<0.010	<0.0050	<0.0050	<0.0050	<0.0050	<0.1	--	--
SB-3 @ 18'	1/25/2005	18.0	<1.0	<1.0	<0.0050	<0.0050	<0.0050	<0.0050	<0.010	0.11	<0.010	<0.0050	<0.0050	<0.0050	<0.0050	<0.1	--	--
SB-4 @ 8'	1/25/2005	8.0	25	470	<0.50	<0.50	<0.50	<0.50	<2.5	<0.50	<1.0	<0.50	<0.50	<0.50	<0.50	<25	--	--
SB-4 @ 50'	1/25/2005	50.0	--	<1.0	<0.0050	<0.0050	<0.0050	<0.0050	<0.010	<0.0050	<0.010	<0.0050	<0.0050	<0.0050	<0.0050	<0.1	--	--
SB-5 @ 23'	1/31/2005	23.0	2.1	<1.0	<0.0050	<0.0050	<0.0050	<0.0050	<0.010	<0.0050	<0.010	<0.0050	<0.0050	<0.0050	<0.0050	<0.1	--	--
SB-6 @ 10'	1/31/2005	10.0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3.4	670
SB-6 @ 50'	1/31/2005	50.0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	4.7	<50
Composite	1/25/2005	na	5.0	<1.0	<0.0050	<0.0050	<0.0050	<0.0050	<0.010	<0.0050	<0.010	<0.0050	<0.0050	<0.0050	<0.0050	<0.1	7.5	

Notes:

TPH-D	= total petroleum hydrocarbon as diesel	1,2 DCA	= 1,2-dichloroethane
TPPH	= total purgeable petroleum hydrocarbons	EDB	= ethylene dibromide
TBA	= tertiary butyl alcohol	fbg	= feet below grade
MTBE	= methyl tertiary butyl ether	mg/kg	= milligrams per kilogram
DIPE	= di-isopropyl ether	--	= not analyzed, measured, or collected
ETBE	= ethyl tertiary butyl ether	na	= not applicable
TAME	= tertiary amyl methyl ether		



Appendix E

Soil Sample Locations

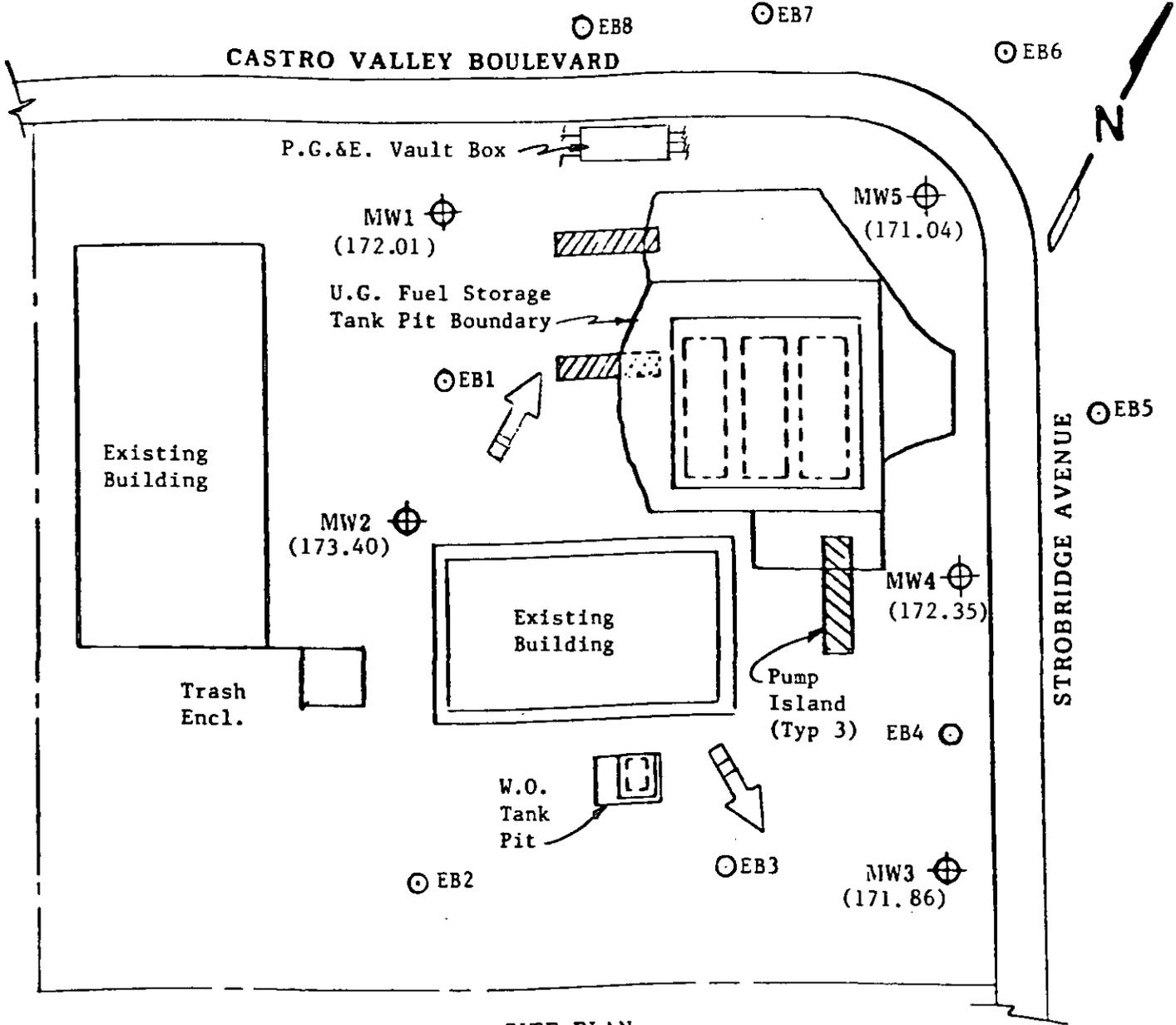


KAPREALIAN ENGINEERING, INC.

Consulting Engineers

P.O. BOX 996 • BENICIA, CA 94510

(707) 746-6915 • (707) 746-6916 • FAX: (707) 746-5581

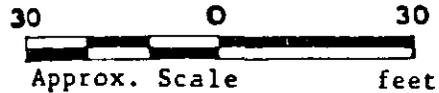


SITE PLAN

Figure 1

LEGEND

-  Monitoring Well (Existing)
-  Exploratory Boring
-  Ground Water Flow Direction
- () Ground Water Elevation in feet (above MSL) on 8/20/90

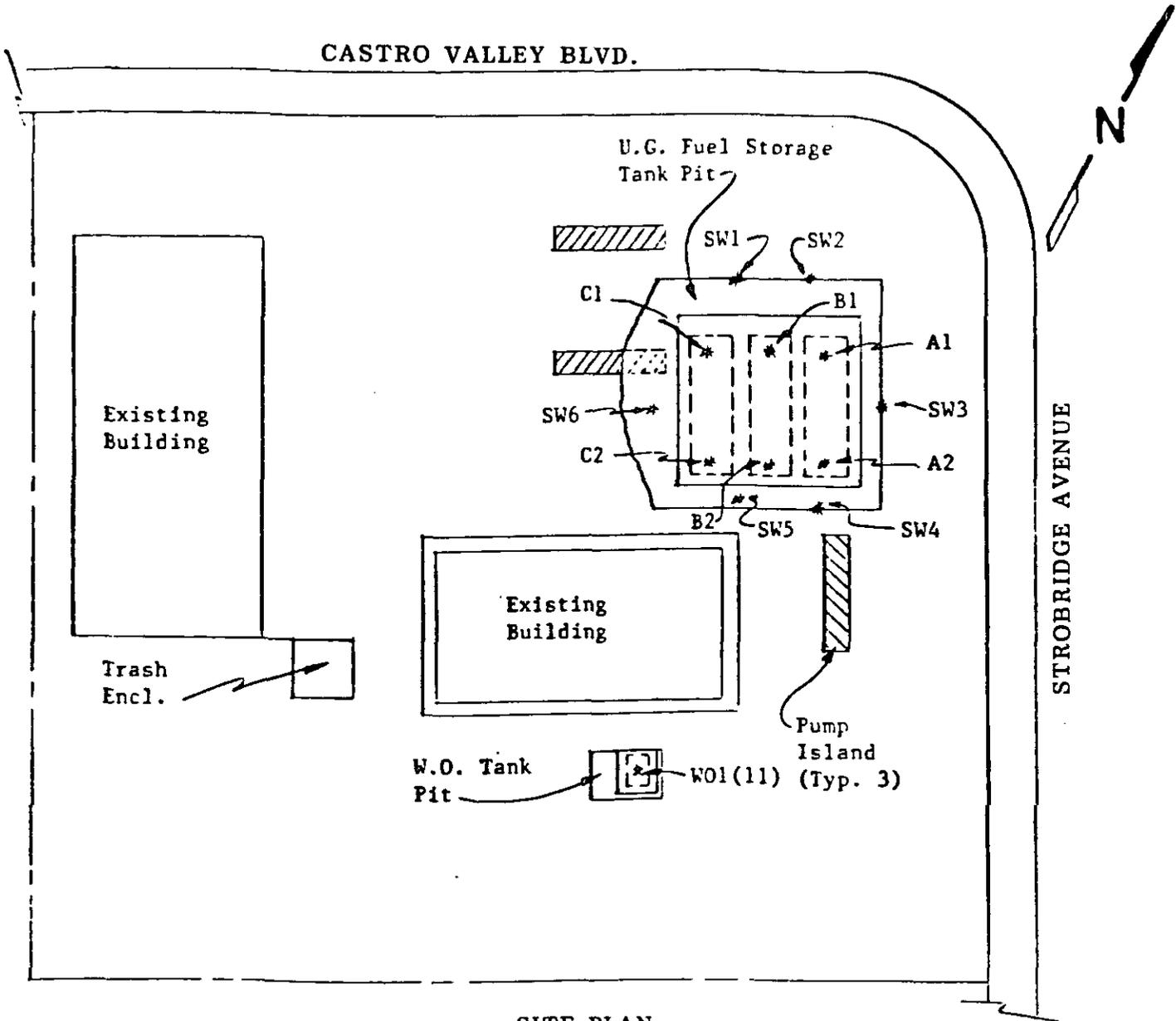


Unocal S/S #3072
 2445 Castro Valley Blvd.
 Castro Valley, CA

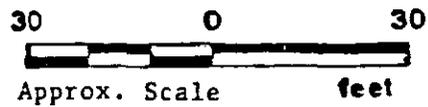


KAPREALIAN ENGINEERING, INC.
Consulting Engineers

P.O. BOX 996 • BENICIA, CA 94510
(707) 746-6915 • (707) 746-6916 • FAX: (707) 746-5581



SITE PLAN
Figure 2



LEGEND

* Sample Point Location

Unocal S/S #3072
2445 Castro Valley Blvd.
Castro Valley, CA

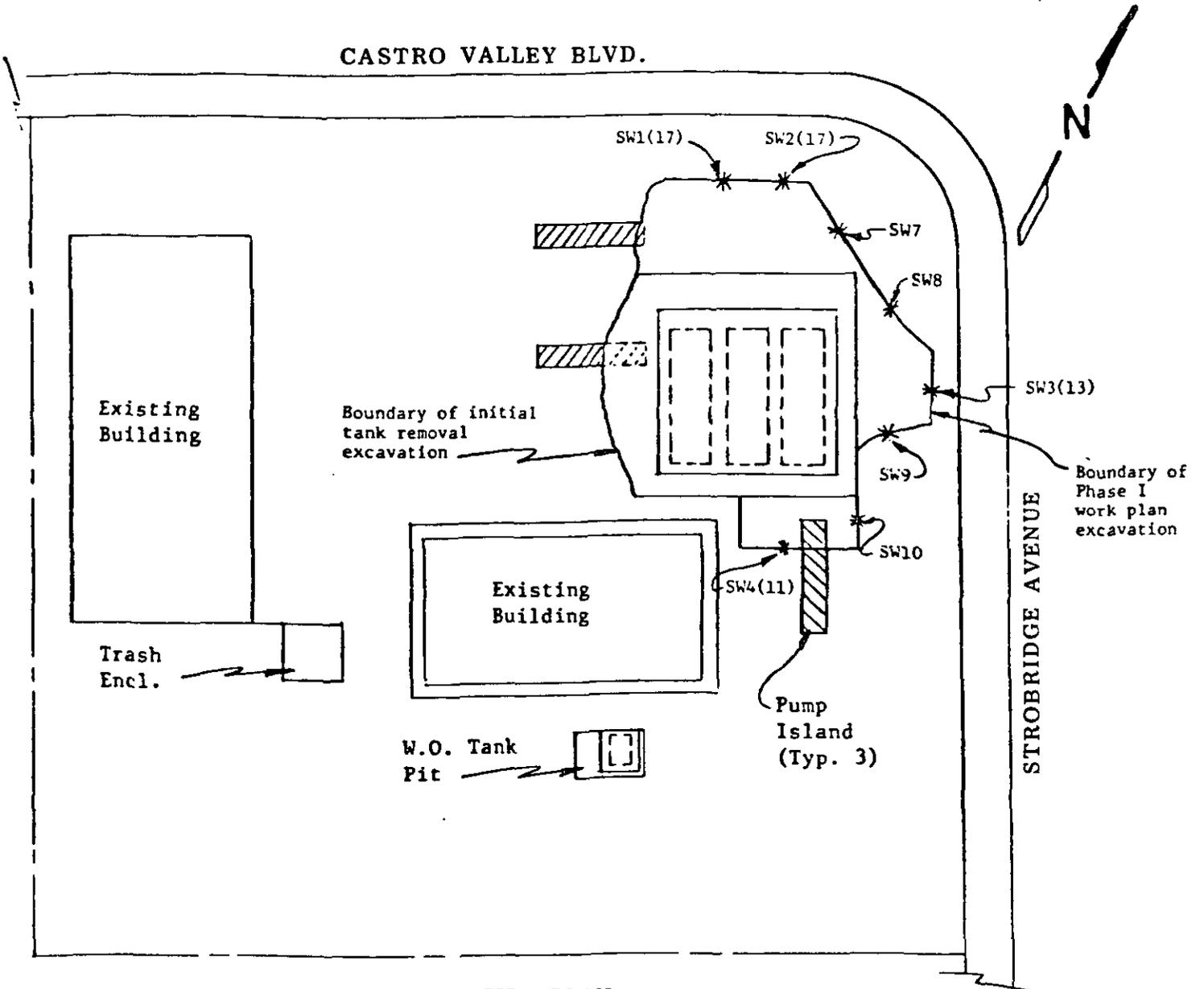


KAPREALIAN ENGINEERING, INC.

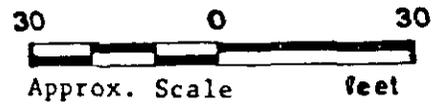
Consulting Engineers

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SITE PLAN
Figure 3



LEGEND

* Sample Point Location

Unocal S/S #3072
2445 Castro Valley Blvd.
Castro Valley, CA

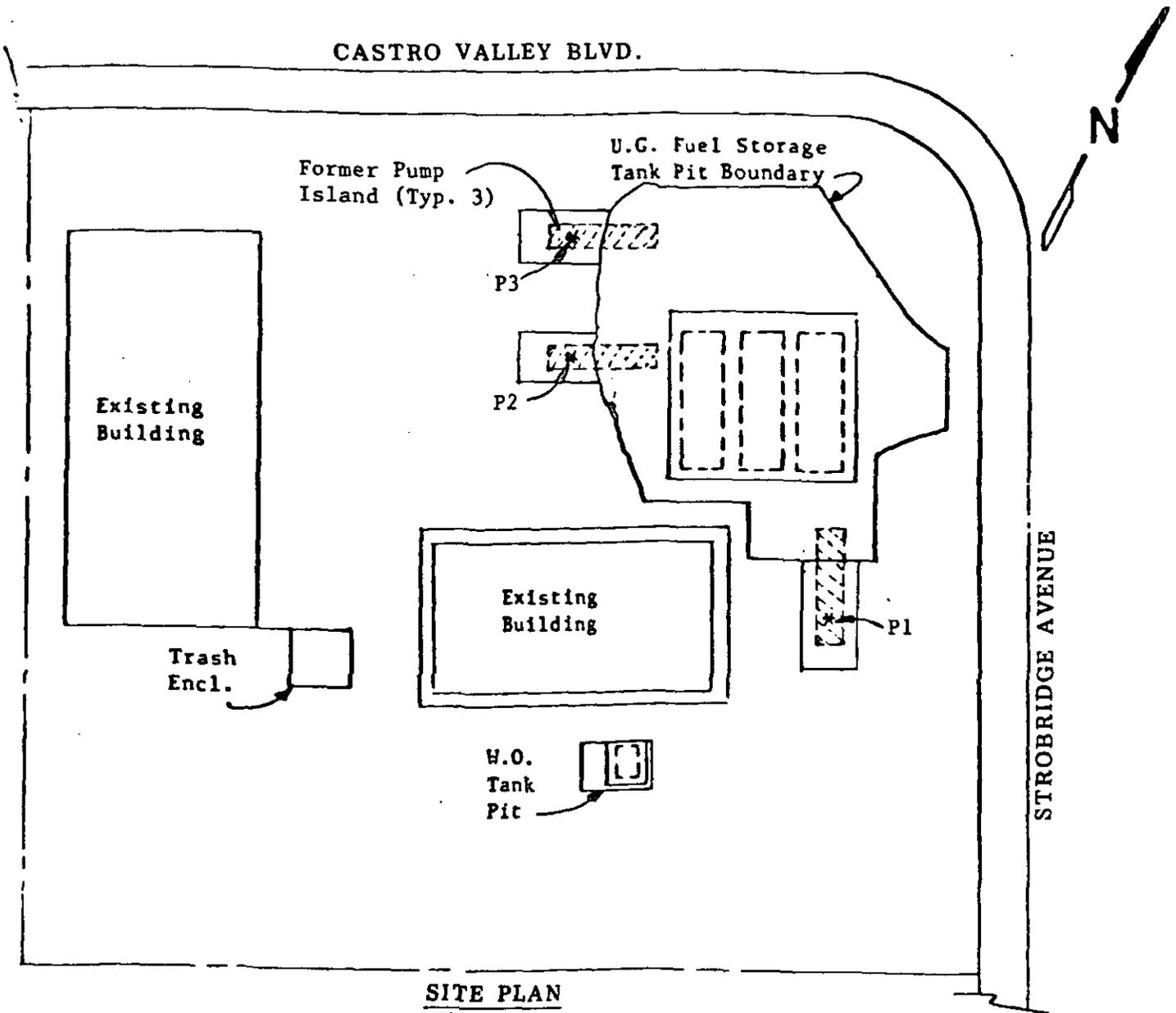


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Consulting Engineers

P.O. BOX 996 • BENICIA, CA 94510

(707) 746-6915 • (707) 746-6916 • FAX: (707) 746-5581

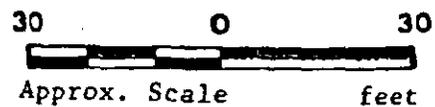


SITE PLAN

Figure 4

LEGEND

* Sample Point Location



Unocal S/S #3072
2445 Castro Valley Blvd.
Castro Valley, CA

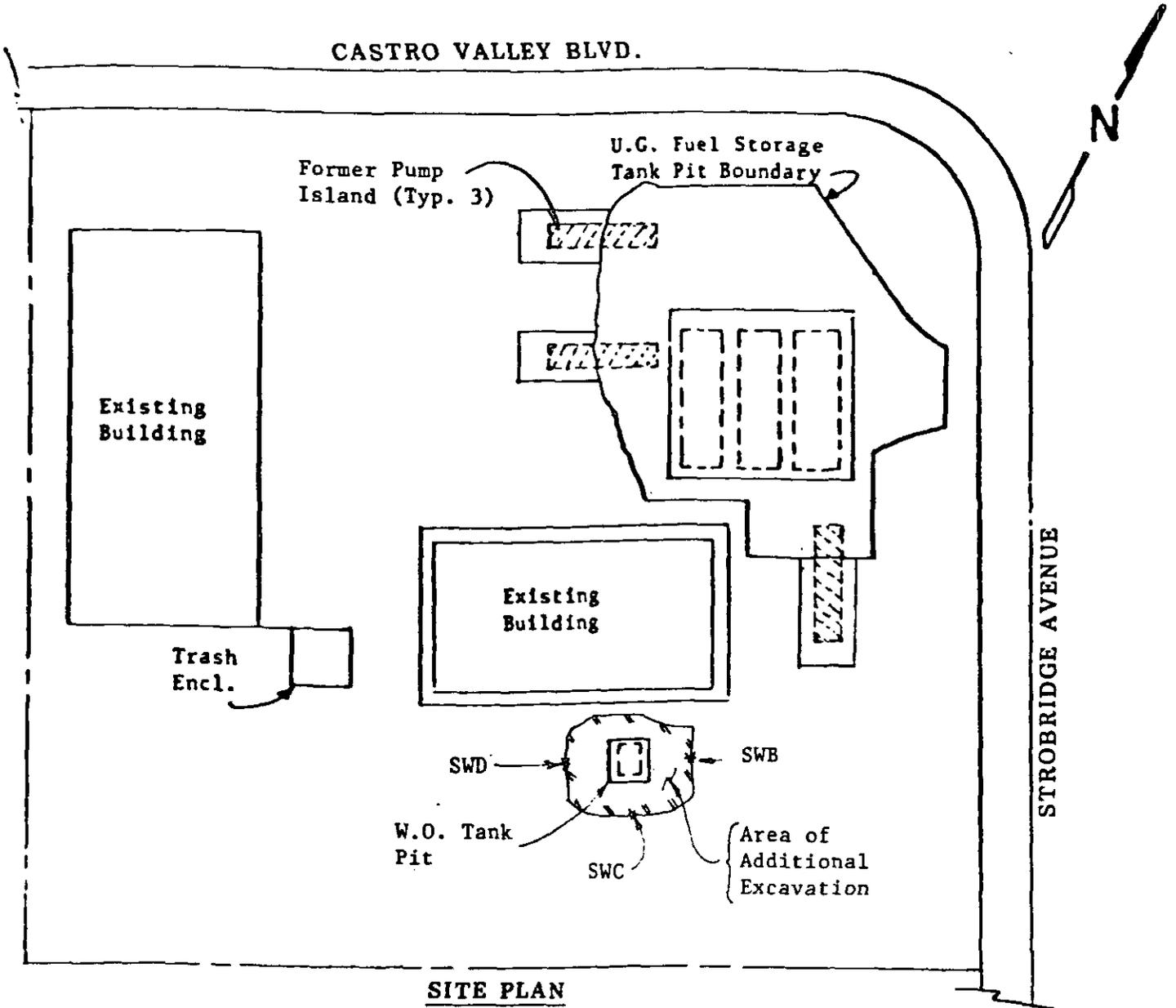


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SITE PLAN

Figure 5

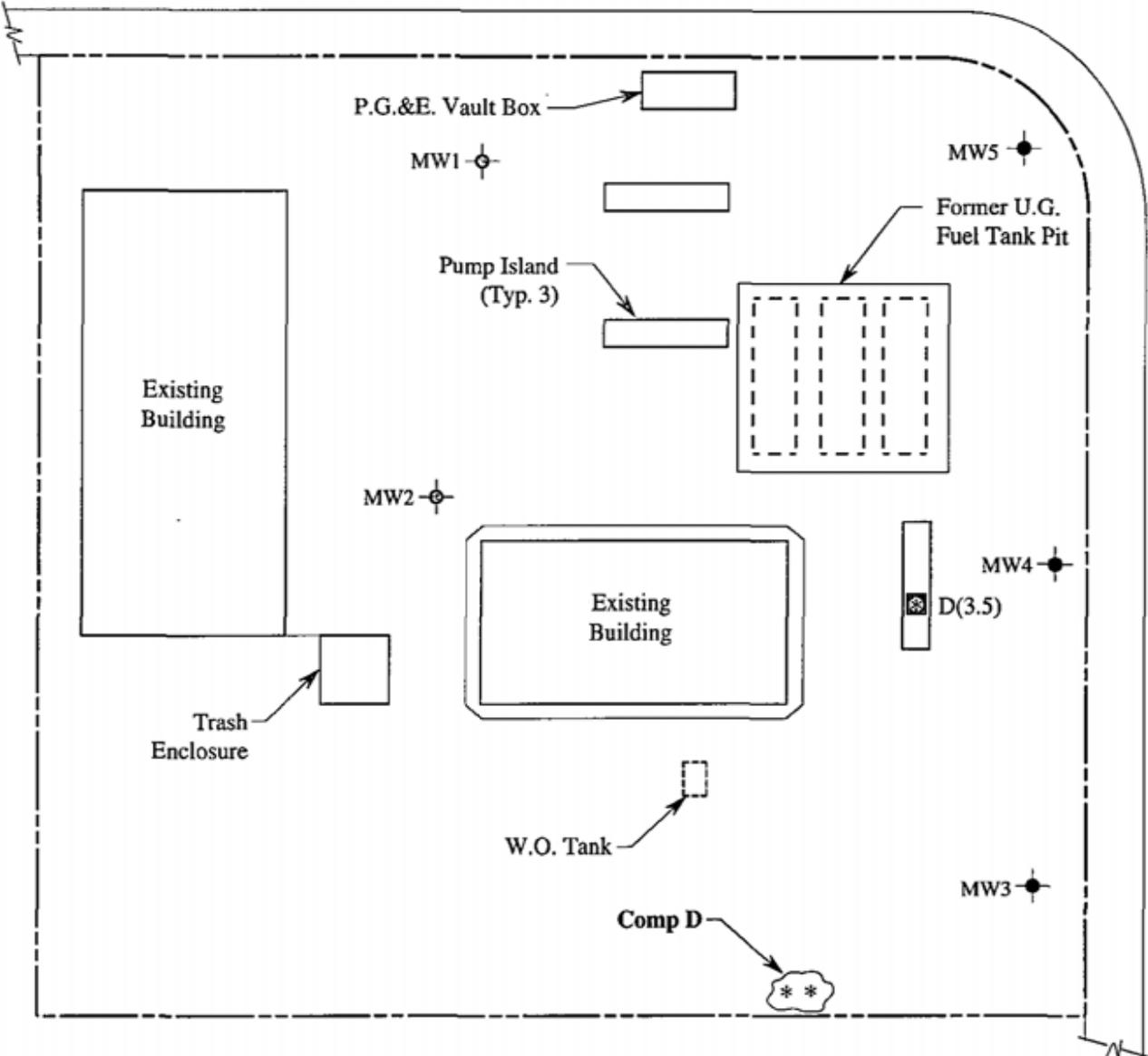
LEGEND

* Sample Point Location



Unocal S/S #3072
2445 Castro Valley Blvd.
Castro Valley, CA

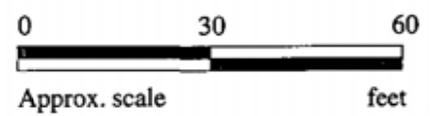
CASTRO VALLEY BOULEVARD



STROBRIDGE AVENUE

LEGEND

-  Former monitoring well (destroyed on 6/15/93)
-  Area beneath diesel dispenser excavated to a depth of 3.5 feet below grade
-  Sample point location
-  Stockpiled soil (not to scale)



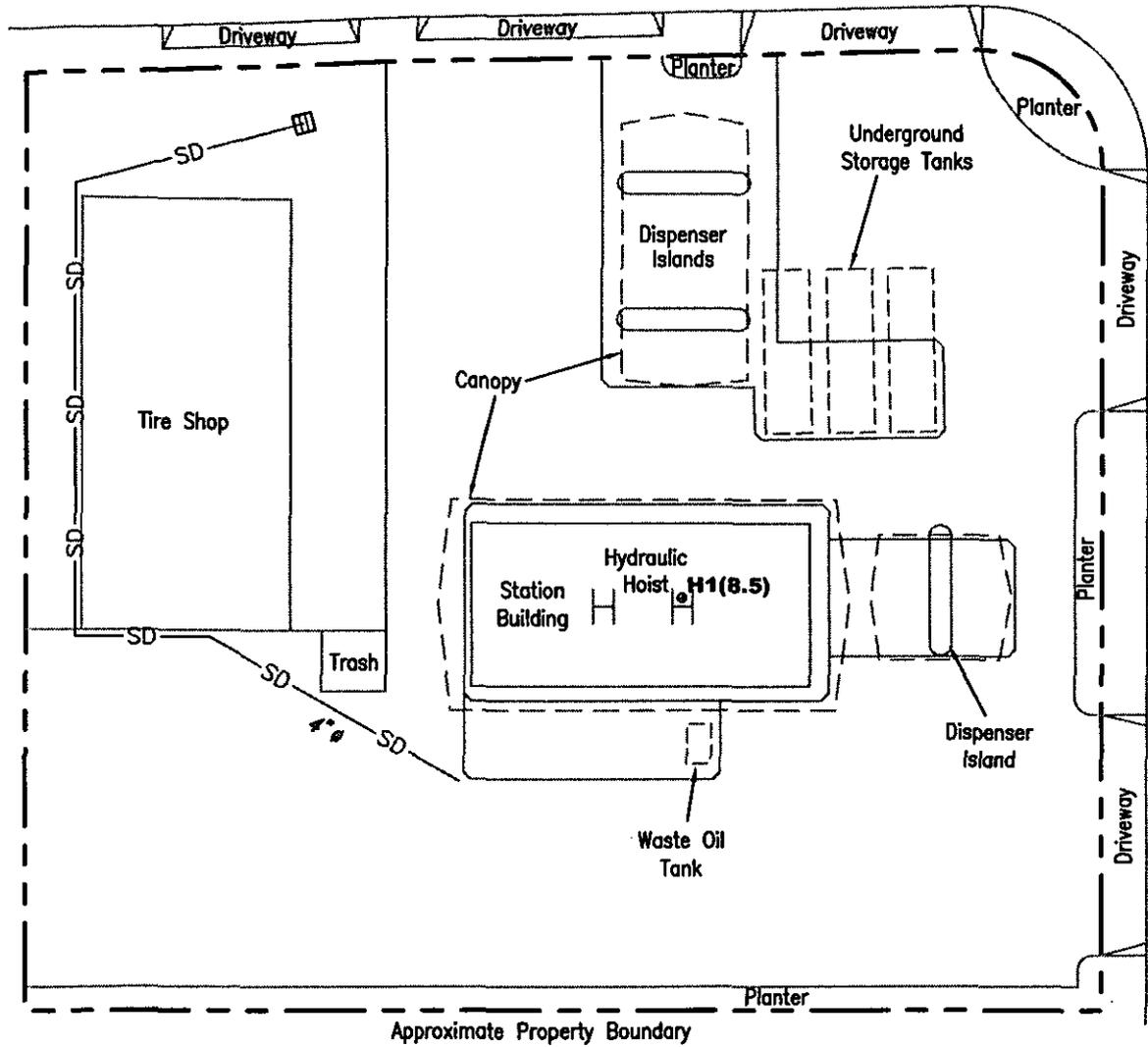
SITE PLAN



**UNOCAL SERVICE STATION #3072
2445 CASTRO VALLEY BLVD.
CASTRO VALLEY, CALIFORNIA**

**FIGURE
1**

CASTRO VALLEY BOULEVARD



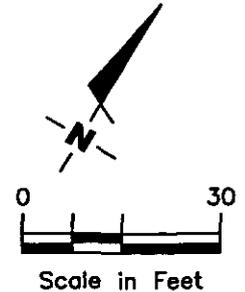
EXPLANATION

- Soil sample location
- ▣ Storm drain

UNDERGROUND UTILITIES

—SD— Storm drain

STROBRIDGE AVENUE



Source: Figure modified from drawing provided by Unocal.

GETTLER - RYAN INC.
 6747 Sierra Ct., Suite J
 Dublin, CA 94568 (925) 551-7555

SITE PLAN
 Tosco (76) Service Station No. 3072
 2445 Castro Valley Boulevard
 Castro Valley, California

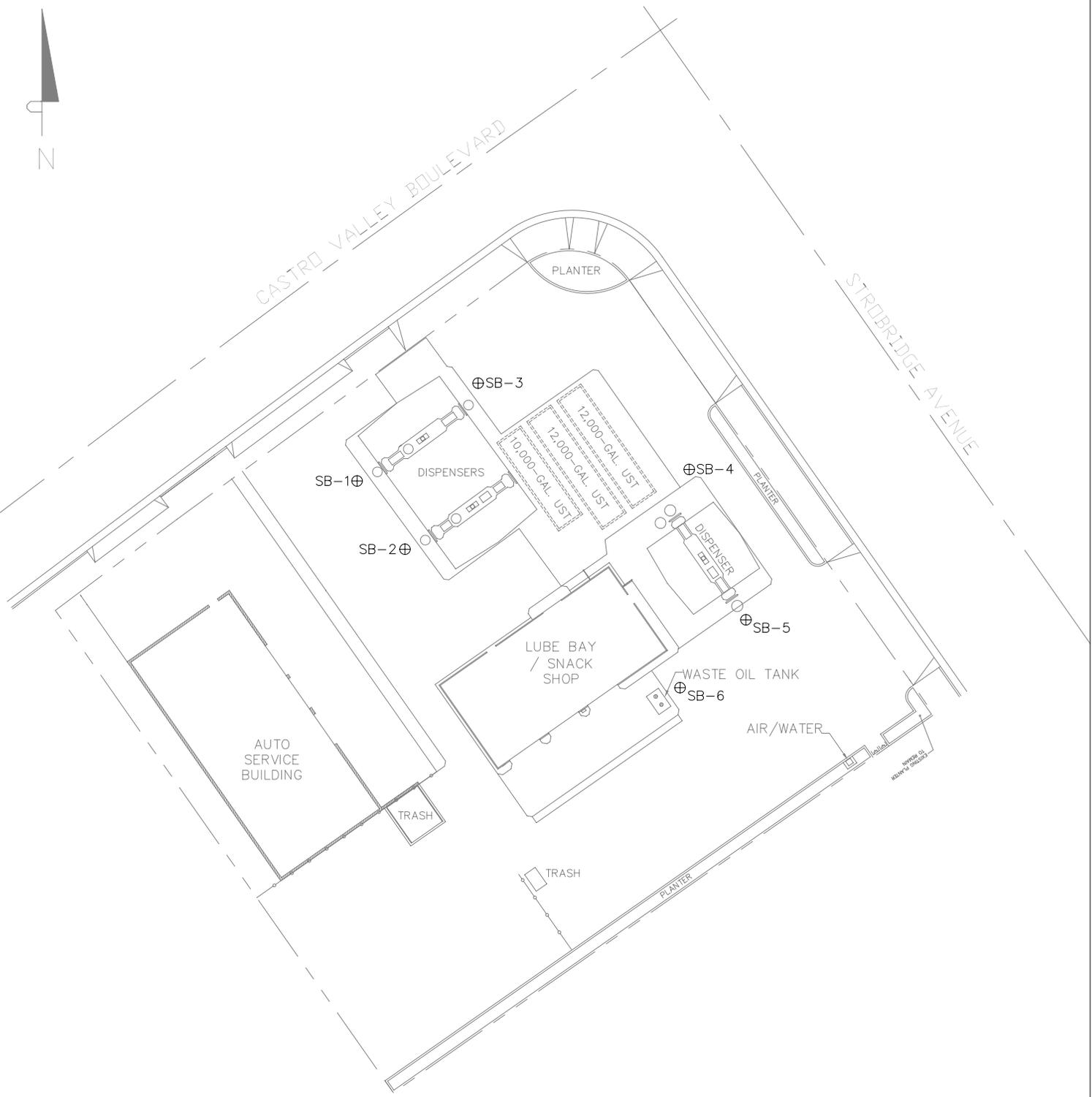
FIGURE
1

PROJECT NUMBER 140176	REVIEWED BY	DATE 7/01	REVISED DATE
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CASTRO VALLEY BOULEVARD

STROBRIDGE AVENUE



APPROXIMATE SCALE (FEET)



LEGEND

- Property Boundary
- o-o-o-o- Fence
- ⊕ SB-4 Soil Boring

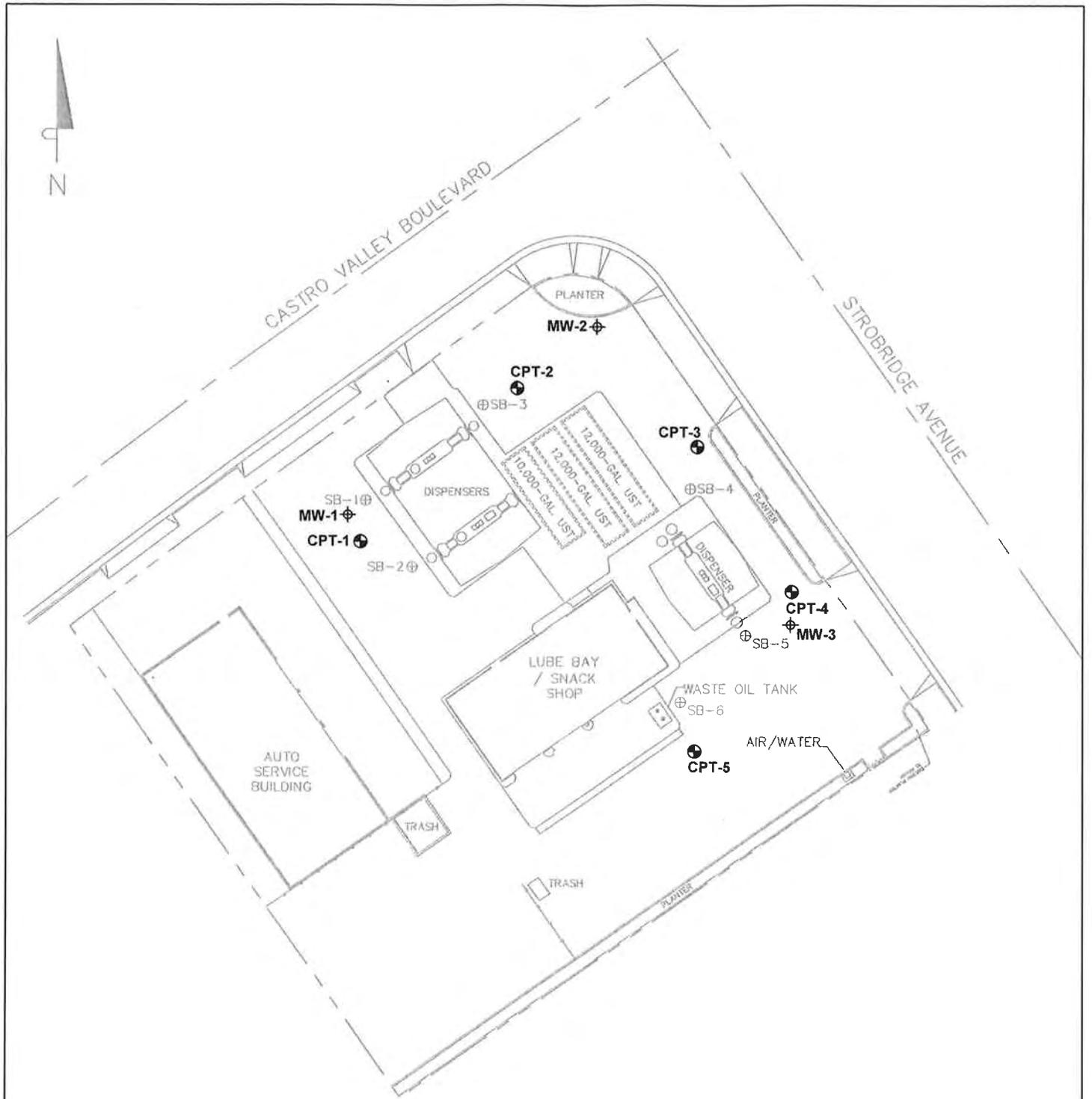
SITE PLAN

76 Service Station #3072
2445 Castro Valley Boulevard
Castro Valley, California

SOURCE: Client-provided site plan prepared by A&S Engineering, October 1997.



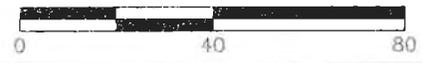
FIGURE 2



CASTRO VALLEY BOULEVARD

STROBRIDGE AVENUE

APPROXIMATE SCALE (FEET)



LEGEND	
	Property Boundary
	Fence
	Previous Soil Boring
	CPT Hydropunch Location
	Proposed Monitoring Well Locations

SITE PLAN SHOWING CPT HYDROPUNCH & PROPOSED MONITORING WELL LOCATIONS

76 Service Station #3072
 2445 Castro Valley Boulevard
 Castro Valley, California



FIGURE 2

SOURCE: Client-provided site plan prepared by A&S Engineering, October 1997.



Appendix F

Historical GW Analytical Results

KEI-P89-1106.0R6
 July 23, 1992

TABLE 2

SUMMARY OF LABORATORY ANALYSES
 WATER

<u>Date</u>	<u>Sample Number</u>	<u>TPH as Diesel</u>	<u>TPH as Gasoline</u>	<u>Benzene</u>	<u>Toluene</u>	<u>Xylenes</u>	<u>Ethyl-benzene</u>
6/18/92	MW1	--	ND	ND	ND	ND	ND
	MW2	---	ND	ND	ND	ND	ND
	MW3	---	ND	ND	ND	ND	ND
	MW4	ND	ND	ND	ND	ND	ND
	MW5	ND	ND	ND	ND	ND	ND
12/20/91	MW1	--	ND	ND	ND	ND	ND
	MW2	--	ND	ND	ND	ND	ND
	MW3	---	ND	ND	ND	ND	ND
	MW4	ND	ND	ND	ND	ND	ND
	MW5	ND	ND	ND	ND	ND	ND
9/25/91	MW1	--	ND	ND	ND	ND	ND
	MW2	---	ND	ND	ND	ND	ND
	MW3	---	ND	ND	ND	ND	ND
	MW4	ND	ND	ND	ND	ND	ND
	MW5	ND	ND	ND	ND	ND	ND
6/12/91	MW1	---	ND	0.66	ND	ND	ND
	MW2	---	ND	ND	0.46	0.44	ND
	MW3	---	ND	ND	ND	ND	ND
	MW4	---	ND	ND	ND	0.48	ND
	MW5	--	ND	ND	ND	0.32	ND
3/11/91	MW1	--	ND	0.90	ND	ND	ND
	MW2	---	ND	ND	ND	ND	ND
	MW3	---	ND	ND	ND	ND	ND
	MW4	---	44	0.74	ND	0.15	3.2
	MW5	--	ND	ND	ND	ND	ND
12/12/90	MW1	--	34	1.6	ND	ND	ND
	MW2	---	ND	ND	ND	ND	ND
	MW3	---	ND	ND	ND	ND	ND
	MW4	---	ND	0.73	ND	ND	ND
	MW5	---	ND	ND	ND	ND	ND
8/27/90	MW1	---	ND	3.2	ND	ND	ND
	MW2	---	ND	ND	ND	ND	ND
	MW3	---	ND	1.1	0.50	0.89	0.54
	MW4	---	ND	0.34	ND	ND	ND
	MW5	---	ND	ND	ND	ND	ND

KEI-P89-1106.QR6
July 23, 1992

TABLE 2 (Continued)

SUMMARY OF LABORATORY ANALYSES
WATER

<u>Date</u>	<u>Sample Number</u>	<u>TPH as Diesel</u>	<u>TPH as Gasoline</u>	<u>Benzene</u>	<u>Toluene</u>	<u>Xylenes</u>	<u>Ethyl-benzene</u>
3/22/90	MW1	--	32	4.2	ND	1.1	0.36
	MW2	--	ND	ND	ND	ND	ND
	MW3	--	ND	ND	ND	ND	ND
	MW4*	--	ND	ND	ND	ND	ND

-- Indicates analysis was not performed.

ND = Non-detectable.

* Sample MW4 is a duplicate of sample MW2. (only on the date indicated).

Results in parts per billion (ppb), unless otherwise indicated.

KEI-J89-1106.R9
September 28, 1990

TABLE 10

SUMMARY OF LABORATORY ANALYSES
WATER

(Collected on April 25, 1990)

<u>Sample Number</u>	<u>TPH as Gasoline</u>	<u>Benzene</u>	<u>Toluene</u>	<u>Xylenes</u>	<u>Ethylbenzene</u>
EB6	5,900	840	34	73	100
Detection Limits	30	0.3	0.3	0.3	0.3

Results in parts per billion (ppb), unless otherwise indicated.

NOTE: Water samples were collected during drilling. The results of the analyses may not be representative of formation water, they should be used for information only.

Table 1
GRAB GROUNDWATER ANALYTICAL RESULTS
76 Service Station #3072
2445 Castro Valley Boulevard, Castro Valley, CA

Sample ID	Date Sampled	Sample Depth (fbg)	TPH-d	TPPH	Benzene	Toluene	Ethyl- benzene	Total Xylenes	MTBE	TAME	TBA	DIPE	EDB	ETBE	1,2-DCA	Ethanol
			EPA 8015	EPA Method 8260B												
Concentrations in micrograms per liter (µg/L)																
Shallow Water-Bearing Zone																
CPT-2	5/3/2007	36	500	<50	<0.50	<0.50	<0.50	<0.50	6.3	<0.50	54	<0.50	<0.50	<0.50	<0.50	<250
CPT-5	5/3/2007	22	280	<50	<0.50	<0.50	<0.50	<0.50	5.2	<0.50	<10	<0.50	<0.50	<0.50	<0.50	<250
Deeper Water-Bearing Zone																
CPT-1	5/2/2007	55	490	<50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<10	<0.50	<0.50	<0.50	<0.50	<250
CPT-4	5/2/2007	51	800	<50	<0.50	<0.50	<0.50	<0.50	10	<0.50	<10	<0.50	<0.50	<0.50	<0.50	<250
Notes:																
TPH-d = total petroleum hydrocarbons as diesel (C12-C24)									EDB = 1,2-dibromoethane							
TPPH = total purgable petroleum hydrocarbons (C6-C12)									ETBE = ethyl tertiary butyl ether							
MTBE = methyl tertiary butyl ether									1,2-DCA = 1,2-dichloroethane							
TAME = tertiary amyl methyl ether									fbg = feet below grade							
TBA = tertiary butyl alcohol									-- = not analysed							
DIPE = di-isopropyl ether									N/A = not applicable							