Atlantic Richfield Company

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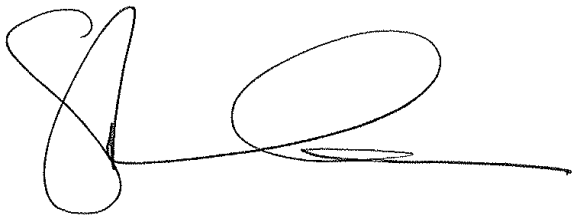
RECEIVED
By Alameda County Environmental Health at 8:48 am, May 31, 2013

May 29, 2013

Re: Conceptual Site Model and Work Plan for Soil and Groundwater Investigation
Atlantic Richfield Company Station #771
899 Rincon Avenue
Livermore, California
ACEH Case RO0000200

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

Submitted by,



Shannon Couch
Project Manager

Attachment

Conceptual Site Model and Work Plan for Soil and Groundwater Investigation

Atlantic Richfield Company Station No. 771
899 Rincon Avenue, Livermore, California
ACEH Fuel Leak Case No. RO0000200

Prepared for

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

Prepared by

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May 29, 2013

Project No. 06-82-608

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CREATING SOLUTIONS. BUILDING TRUST.

May 29, 2013

Project No. 06-82-608

Atlantic Richfield Company
P.O. Box 1257
San Ramon, CA 94583
Submitted via ENFOS

Attn.: Ms. Shannon Couch

Re: Conceptual Site Model and Work Plan for Soil and Groundwater Investigation, Atlantic Richfield Company Station No.771, 899 Rincon Avenue, Livermore, California; ACEH Case No.RO0000200

Dear Ms. Couch:

Broadbent & Associates, Inc. (Broadbent) is pleased to submit this *Conceptual Site Model and Work Plan for Soil and Groundwater Investigation* (CSM and Work Plan) for Atlantic Richfield Company Station No. 771 (herein referred to as Station No. 771) located at 899 Rincon Avenue, Livermore, California (Site). This CSM and Work Plan has been prepared in response to a request from the Alameda County Environmental Health Agency (ACEH) in a letter dated March 18, 2013.

Should you have questions or require additional information, please do not hesitate to contact us at (707) 455-7290 or (530) 566-1400.

Sincerely,
BROADBENT & ASSOCIATES, INC.

Kristene Tidwell, P.G., C.Hg.
Senior Geologist

PROFESSIONAL GEOLOGIST
KRISTENE TIDWELL
No. 969
CERTIFIED HYDRO GEOLOGIST
STATE OF CALIFORNIA

Jason Duda
Project Scientist

cc: Mr. Jerry Wickham, Alameda County Environmental Health (Submitted via ACEH ftp site)
Electronic copy uploaded to GeoTracker

CONCEPTUAL SITE MODEL AND
WORK PLAN FOR SOIL AND GROUNDWATER INVESTIGATION
Atlantic Richfield Company Station No. 771
899 Rincon Avenue, Livermore, California
Fuel Leak Case No. RO0000200

TABLE OF CONTENTS

DRAWINGS

TABLES

APPENDICES

CONCEPTUAL SITE MODEL AND
WORK PLAN FOR SOIL AND GROUNDWATER INVESTIGATION
Atlantic Richfield Company Station No. 771
899 Rincon Avenue, Livermore, California
Fuel Leak Case No. RO0000200

1.0 INTRODUCTION

On behalf of the Atlantic Richfield Company, RM – a BP affiliated company; Broadbent & Associates, Inc. (Broadbent) has prepared this *Conceptual Site Model and Work Plan for Soil and Groundwater Investigation* (CSM and Work Plan) for the Atlantic Richfield Company (ARC) Station No. 771, located at 899 Rincon Avenue, Livermore, California (Site). This Work Plan was prepared in response to a request from the Alameda County Environmental Health Agency (ACEH) in a letter dated March 18, 2013. This letter requested that additional investigation be performed at the Site in order to close data gaps identified by the ACEH. The purpose of this Work Plan is to summarize current Site conditions and close the data gaps identified by the ACEH, as well as enhance overall Site understanding. This Work Plan includes discussions on the site background and previous investigations, and the proposed scope of work. The Conceptual Site Model (CSM) prepared is included as Table 1.

2.0 SITE BACKGROUND

The Site is located at 899 Rincon Avenue, on the southwest corner of Rincon Avenue and Pine Street in Livermore, California. The latitude and longitude of the center of the Site is approximately 37°41'17.33"N, 121°47'1.22"W (37.688147°, -121.783673°). The Site property is recognized by the Alameda County Assessor's Office as Assessor's Parcel Number 98-351-5. The approximate ground surface elevation at the Site is approximately 455 feet above mean sea level. A Site Location Map is provided as Drawing 1.

The land use in the immediate area is mixed residential and commercial. The adjacent property to the west is a shopping complex with various restaurants. The property to the south is May Nissen Community Park and Swim Center and Rincon Library. Across Pine Street to the north of the Site is the Livermore-Pleasanton Fire Department Fire Station No.7. Residential homes reside to the northeast across the intersection of Pine Street and Rincon Avenue and east of the Site across Rincon Avenue. A Site Map is included as Drawing 2. A Site Map depicting current groundwater elevation and analytical date is presented as Drawing 3.

2.1 Conceptual Site Model

A conceptual site model (CSM) has been prepared to aid in understanding of Site conditions and to identify any additional data gaps. This CSM is presented as Table 1. This CSM includes the following:

- Regional and Site Geology
- Extent of ligh, non-aqueous phase liquid (LNAPL), gasoline range organics (GRO), benzene, and methyl tertiary butyl ether (MTBE) in groundwater
- Release mechanisms
- Nature and extent of constituents of concern in soil, groundwater, and soil vapor
- On- and offsite receptors
- Identified data gaps

This CSM discusses many of the items identified by the ACEH March 18, 2013 letter including variability in groundwater monitoring data (Item 4; ACEH, 2013), hydraulic gradient (Item 5; ACEH, 2013), and potential perched groundwater (Item 6; ACEH, 2013). Additionally, results from a recently-performed

Sensitive Receptor Survey (SRS) are included in Section 3.0 below, and are additionally summarized in the CSM (Table 1). Recent regulator correspondence is presented in Appendix A.

2.2 Previous Site Investigations

In August 1987, a waste-oil tank was removed from the Site. A soil sample (AL-1) was collected at 10 feet below ground surface (ft bgs) and analyzed for halogenated volatile compounds (HVC), polychlorinated byphenyls (PCB's), total petroleum fuel hydrocarbons (TPFH), and benzene, toluene, and xylenes (BTX). Results indicated TPFH at a concentration of 378 milligrams per kilogram (mg/kg). The excavation was deepened and a second sample (AL-2) was collected from 12 feet bgs. No analytes (HVC, PCB's, TPFH, and BTX) were detected above laboratory reporting limits in the deeper sample. Summarized analytical results are provided within Appendix B. It is important to note that a waste-oil tank removal report summarizing work activities could not be located. The data discussed above and analytical results and drawing also included in Appendix B were taken from the 1990 Applied GeoSystems (AGS) report titled Limited Subsurface Environmental Assessment (AGS, 1990).

In February 1990, AGS conducted a limited onsite subsurface environmental assessment to evaluate the presence of gasoline hydrocarbons in the subsurface soil in the area adjacent to the four gasoline underground storage tanks (USTs) prior to their planned removal. Three exploratory soil borings (B-1, B-2, and B-3) were drilled and soil samples were collected from each boring. Groundwater was encountered in soil boring B-1 at approximately 33 ft bgs. Soil borings B-2 and B-3 were terminated prior to encountering groundwater. Soil samples were analyzed for total petroleum hydrocarbons as gasoline (TPHg) and benzene, toluene, ethylbenzene, and total xylenes (BTEX). Results indicated petroleum hydrocarbon impacted soil (TPHg) in excess of 100 mg/kg in one of the soil samples from boring B-3 at a depth of 32 ft bgs. A grab groundwater sample was obtained from soil boring B-1 for visual inspection. Approximately 1/8-inch of floating product was present (AGS, 1990).

In December 1990, a supplemental subsurface investigation was initiated by AGS to evaluate the lateral and vertical extent of petroleum hydrocarbons in soil and groundwater near the onsite gasoline USTs. This investigation included drilling three soil borings (B-4, B-5, and B-6), converting the borings to monitoring wells (MW-1, MW-2, and MW-3, respectively), and collecting and analyzing soil and groundwater samples. Groundwater was encountered in each of the soil borings at approximately 37 ft bgs during this investigation. A sheen of light, non-aqueous phase liquid (LNAPL) was observed in well MW-1 and 0.16 feet of LNAPL was measured in well MW-2. Sixteen soil samples and one groundwater sample (MW-3) were submitted for analysis of TPHg and BTEX. Results indicated impacted soil (TPHg) in excess of 100 mg/kg in two of the soil samples collected from boring B-4. Groundwater results indicated TPHg at 230 µg/L in MW-3 (AGS, 1991).

In June and July 1991, an additional subsurface investigation was conducted by RESNA to further evaluate the lateral and vertical extent of impacted soil and groundwater and to confirm the vertical extent of hydrocarbons in the area of the former waste-oil tank. This investigation included advancing five soil borings (B-7 through B-11), converting four of the borings (B-7 through B-10) to monitoring wells (MW-4 through MW-7), and collecting and analyzing soil and groundwater samples. Soil boring B-11 was drilled in the area of the former waste-oil tank. Groundwater was encountered in borings B-7 through B-10 at depths of approximately 35.5 to 37 ft bgs. A total of 33 soil samples collected at various depths were submitted for analysis of TPHg and BTEX. Soil samples from boring B-11 were also analyzed for total petroleum hydrocarbons as diesel (TPHd) and total oil and grease (TOG). Groundwater samples

were collected from wells MW-3 through MW-7 and analyzed for TPHg and BTEX. Samples were not collected for laboratory analysis from wells MW-1 and MW-2 as LNAPL was observed in the wells. Soil analytical results indicated impacted soil (TPHg) in excess of 100 mg/kg in three of the soil samples. No analytes were detected above the laboratory reporting limits in the soil samples from boring B-11. Groundwater analytical results showed impacted groundwater in each of the monitor wells sampled (RESNA, 1991). Summarized analytical results are provided within Appendix B. Soil boring and monitoring well construction logs are provided in Appendix C.

In December 1991, RESNA conducted a vapor extraction test from wells MW-1, MW-2, MW-4, MW-5, and MW-7. Test results showed that vapor extraction was an effective method to remediate subsurface soils at the Site (RESNA, 1992). Vapor extraction test monitoring data and summarized analytical results are provided in Appendix B.

Between December 30, 1991 and January 3, 1992, four USTs, with the following capacities: one 10,000 gallon, one 6,000 gallon, and two 4,000 gallon, were removed from the Site (Roux, 1992). Initially, two soil samples were collected from underneath each tank for a total of eight soil samples at depths ranging from 14 to 16 ft bgs. Soil samples were analyzed for TPHg and BTEX. Results showed petroleum impacted soil (TPHg) in excess of 100 mg/kg below three of the four tanks. Additional excavation and sampling occurred on January 21, 1992. Six soil samples were collected at a depth of 18 feet and additionally analyzed for Organic Lead. Two of the samples indicated TPHg at or above 100 mg/kg. Product line replacement was conducted in February 1992. Ten soil samples from various depths within the product line trenches were collected and analyzed for TPHg and BTEX, with select samples additionally analyzed for Organic Lead. Results showed TPHg impacted soil exceeding 100 mg/kg in two of the samples collected within the product line trenches (Roux, 1992). Approximately 1,100 cubic yards of soil were produced during removal of the USTs and product lines. The soil was disposed of at the Browning Ferris Industries' Class III landfill in Livermore, California. Historic sample locations and a table of analytical results are contained within Appendix B.

In April 1992 and January 1993, RESNA conducted an additional onsite and initial offsite subsurface investigation. This investigation included drilling four offsite soil borings (B-12 through B-15) and two onsite soil borings (B-16 and B-17), converting borings B-12 through B-15 to monitoring wells MW-8 through MW-11, converting boring B-16 to a vapor extraction well (VW-1), and boring B-17 to a recovery well (RW-1; Drawing 2). Monitoring wells MW-8 through MW- 10 were originally proposed to be located on the immediate adjacent property south and west of the Site. After repeated attempts by RESNA and ARCO, the owner of the adjacent property refused to allow installation of the wells. These locations were then changed to northeast, east, and southeast of the Site along Rincon Avenue and were installed in January 1993 (RESNA, 1993). Groundwater and soil samples were collected and submitted for analysis of TPHg and BTEX. Three of the eight soil samples from onsite borings B-16 and B-17 contained slight detections of various analytes. No analytes were detected above laboratory reporting limits in any of the offsite soil or groundwater samples. Onsite well RW-1 contained significant TPHg and BTEX concentrations (RESNA, 1993). Summarized analytical results are provided within Appendix B. Soil boring and monitor well construction logs are provided in Appendix C.

In March 1993, EMCON completed construction of a Soil Vapor Extraction (SVE) system to extract vapors from wells VW-1, MW-1, MW-2, MW-4, MW-5, and MW-7. Initial startup of the remediation system was postponed due to heavy rain, which caused water levels at the Site to rise and submerge the screen intervals within the remediation wells. The SVE system was initially activated on December 20, 1994,

extracting from wells VW-1 and MW-4. The other SVE wells had submerged screen intervals. Influent samples showed detectable concentrations of TPHg and total xylenes (EMCON, 1995). The system was shut down on January 17, 1995 due to re-submergence of the well screen intervals. During the First Quarter 1995, modifications were completed to the SVE system to facilitate in-well air bubbling in conjunction with SVE. On July 12, 1995, the system was restarted in conjunction with air-bubbling in wells VW-1, MW-1, MW-2, MW-4, MW-5, MW-7, and RW-1. The SVE system was shut down on October 10, 1995 due to low hydrocarbon concentrations in extracted soil vapor. Review of historic reports did not indicate when air-bubbling was discontinued. During operation of the SVE system, a total of 56.9 pounds of hydrocarbons were removed from the subsurface (EMCON, 1996). Historic data associated with operation of the SVE system are provided in Appendix B.

In June 2001, Cambria Environmental Technology, Inc. (Cambria) supervised the removal of the dispensers and product piping by Paradiso Construction and performed compliance sampling activities (Cambria, 2001). Soil sampling was performed beneath each dispenser unit, at each piping elbow joint, and along the product piping. Four soil samples were submitted for analysis of TPHg, BTEX, and MTBE. Minor concentrations of TPHg, toluene, total xylenes, and MTBE were detected in two of the soil samples. Summarized analytical results are provided in Appendix B.

In 2006, URS installed an Air Diffusion (AD) Treatment system for remediation of dissolved phase hydrocarbons. A 1.5 horsepower single-phase air sparge compressor was installed in the existing remediation system compound at the Site. Air bubblers were affixed to onsite wells MW-2, MW-4, MW-5, MW-6, and MW-7. Air bubbling activities with the new system began in 2006 and were discontinued in March 2010.

On March 25, 2011, Broadbent field personnel observed RSI advance two off-site soil borings (SB-2 and SB-3; Drawing 2) on the adjacent property to the south and west of the Site in the cross- and upgradient directions. RSI utilized a hollow stem auger drill rig to advance the soil borings to a maximum depth of 35 ft bgs. Physical soil samples were collected at approximate five foot intervals during soil boring activities. Following completion of soil boring advancement, a grab groundwater sample was collected from each boring within the augers utilizing a stainless-steel bailer between approximately 30 and 35 ft bgs. Select samples were submitted to the laboratory for analysis. Laboratory analytical results for the soil samples submitted from this investigation were below laboratory reporting limits for each constituent analyzed. GRO and MTBE were detected above laboratory reporting limits in the groundwater sample collected from boring SB-3 at concentrations of 81 micrograms per liter (µg/L) and 3.8 µg/L, respectively (Broadbent, 2011). The remaining analytes were not detected above laboratory reporting limits in the two groundwater samples collected. Summarized analytical data is provided in Appendix B.

Groundwater monitoring and sampling was initiated during the First Quarter 1992. Drawings 4 through 6 present contaminant Isoconcentration maps for GRO, benzene, and MTBE, respectively, for the most recent monitoring and sampling results (First Quarter 2013). Sampling of the following wells were discontinued following the respective sampling event: MW-10 – Second Quarter 1999, MW-8 and MW-9 – First Quarter 2000, and MW-1 and MW-3– Second Quarter 2000. Historic groundwater elevation and laboratory analytical results are included in Table 2 and Appendix B. During the Third Quarter 2012, LNAPL was observed in well MW-7, when it had not been noted during prior sampling events. Tables 2 and 3 summarize the historical groundwater monitoring and sampling data. As noted in Table 2, groundwater elevations during the Third Quarter were at their lowest level since monitoring

was initiated in well MW-7. Based on that observation, the presence of this LNAPL may be related to groundwater elevation. During the most recent groundwater monitoring event, water levels rebounded by almost 10 ft bgs, and no LNAPL was noted in this well. Per directions by the ACEH in the March 18, 2013 letter, Broadbent will continue to monitor the presence of this LNAPL.

Recent quarterly groundwater elevation and laboratory analytical results are provided in Drawing 3 and in Tables 2 and 3. Historical groundwater flow directions and gradients are presented in Table 4. The most recent groundwater monitoring results are presented in Broadbent's *First Quarter 2013 Groundwater Monitoring Report* dated April 30, 2013 (Broadbent, 2013).

3.0 SENSITIVE RECEPTOR SURVEY

The March 18, 2013 ACEH letter requested that an updated SRS be performed for the Site. This survey was carried out in March and April 2013, and the results are presented as follows.

This SRS was conducted within a 2,000-foot radius of the Site. The initial stage of the survey consisted of a well search implemented through the Department of Water Resources - Northern Region (DWR) and Zone 7 Water Agency (Zone 7). Contact was also made with the local water purveyor, California Water Service Company (Cal Water), to assist with locating other potential water supply wells within the search radius.

An underground utilities survey was not conducted as part of this SRS. Due to the depth to water historically observed at the Site, which has ranged from approximately nine to 24 ft bgs, it is not anticipated that underground conduits and/or trenches may act as preferential contaminant migration pathways.

3.1 Water Supply Well Search

Broadbent requested a well search through DWR and Zone 7 databases and conducted a telephone interview with the local water purveyor in the area to determine the locations and quantities of wells located within a 2,000 foot radius. DWR and Zone 7 provided an extensive list of well completion reports including water supply and groundwater monitoring wells.

Well Driller's Reports obtained from the DWR and Zone 7 were reviewed and efforts were made to determine if any well was located within the 2,000 foot search radius. Numerous monitoring wells were identified during the well search; however, these wells were not considered sensitive receptors and have been disregarded in this report. One domestic well (1,700 ft south of Site) and three municipal wells (1,075 ft North-Northeast, 1,840 ft East, and 1,920 ft South of the Site) were identified within the search radius. The location of wells identified in the DWR and Zone 7 well searches are depicted on Drawing 7 and a basic summary of the Well Driller's Reports is provided in Appendix D (Table D-1). Copies of Well Driller's Reports are confidential and are not provided in this report.

3.2 Surface Water Bodies

Surface water bodies were located using satellite images available on Google Maps, USGS topographic maps, and field surveys. The nearest potential surface water bodies appear to be two creeks, Arroyo Mocho and Arroyo Las Positas, both are located outside of the 2,000 foot search radius. Arroyo Mocho is located approximately 3,600 feet to the southwest of the Site, in a general upgradient direction.

Arroyo Las Positas is located approximately 3,600 feet to the north of the Site, in a general downgradient direction. Although Arroyo Las Positas is located in the general downgradient direction it is located outside the 2,000 foot search radius of this survey.

3.3 Ecological Receptors

The Site is located within the City of Livermore commercial and residential corridor approximately ½ mile south of Interstate 580. Accordingly, areas surrounding the Site are developed, paved, and/or occupied by structures/buildings with limited areas of landscaping. There are no apparent riparian habitats within a 2,000-foot radius of the Site.

Burrowing mammals typically burrow at depths up to 6.5 feet bgs and may have the potential to encounter localized contaminated media; however, based on the current use of the property and surrounding area, the presence of burrowing animals is expected to be minimal to non-existent. No protected species of flora or fauna are known or expected to be present in the developed or disturbed areas within the City of Livermore. Areas not paved or occupied by site structures in the immediate area are typically landscaped or remain undeveloped and cleared of vegetation.

Broadbent performed a search for protected species within the Livermore quadrangle on the Department of Fish and Game, California Natural Diversity Database Website (http://www.dfg.ca.gov/biogeodata/cnddb/mapsanddata.asp). The database search results were generated using the Quad Viewer application on the Web site and are presented in Appendix D (Table D-3). The results of the database search indicate 5 different species that have special status; however, impacts associated with Station #771 are not expected to affect these protected species.

3.4 Schools and Hospitals

One school was identified within the 2,000 foot search radius of the Site:

- Marylin Avenue Elementary School, located approximately 1,450 feet to the South-Southwest of the Site.

There are no apparent hospitals, medical centers or health clinics immediately identified within the 2,000-foot search radius of the Site. The location of the school within the search radius is provided in Drawing 7 and a sensitive receptor summary is presented in Appendix D as Table D-2.

3.5 Sensitive Receptor Survey Conclusions

The following conclusions are based on the data available at the time that this survey was performed and Broadbent's general knowledge of existing conditions at the Site.

- Groundwater contamination at the Site has previously been identified at concentrations above water quality objectives.

- One domestic and three municipal wells were identified within the 2,000 foot search radius.

- One school was identified within the search area.

The potential impact to municipal and domestic wells within the search radius is possible; however, the Coon domestic well (Drawing 7 ID#3), if present, and one of the three municipal wells (Drawing 7 ID#5) are both located in a general upgradient direction from the Site, while another of the three municipal wells (Drawing 7 ID#4) is located in a general crossgradient direction. The final municipal well (Drawing 7 ID#1) is located to the Northeast of the Site in a general downgradient direction. Previous groundwater sampling results from well MW-8, downgradient of the Site, showed petroleum impacts were not migrating offsite and this downgradient municipal well would not have been a potential receptor. However, since hydrocarbon concentrations in source-area well MW-7 have recently increased and LNAPL has recently been intermittently observed, well MW-8 has not been sampled. Well MW-8 was removed from the sampling program in 2000. Due to the recent increases in onsite wells, downgradient wells should be sampled to ensure petroleum hydrocarbons are not migrating to this downgradient supply well. This additional sampling was requested by the ACEH in their March 18, 2013 letter.

The one school identified during this survey is not expected to be impacted from Site activities. Marylin Avenue Elementary School (Drawing 7 ID#2) is located in the upgradient direction from the Site.

Data collected from the SRS and Site groundwater observations indicates a minimal threat to receptors, with the exception of the downgradient municipal supply well. In order to close this data gap, we recommend sampling wells MW-3 and MW-8 during the next two routine monitoring and sampling events and obtaining additional information pertaining to the use and construction specifications of the downgradient municipal well. Details for the proposed additional sampling are presented in Section 4.6 below.

4.0 PROPOSED SCOPE OF WORK

The purpose of the proposed soil and groundwater investigation is to define the downgradient vertical extent of petroleum hydrocarbons in groundwater, and to provide a better understanding of lithologic conditions in the subsurface. The proposed investigation is related to:

- Potential perched-groundwater zones
- A possible lithologic ridge/mound near well VW-1
- Presence of a sandy clay layer and how it is possibly related to changing groundwater levels and variability in petroleum concentrations, and the recent LNAPL presence in well MW-7

The attached CSM (Table 1) describes these conditions and data gaps in detail. Additionally, many of these were identified as a data gap by the ACEH in their March 18, 2013 letter (ACEH, 2013). In order to evaluate these identified data gaps, Broadbent is proposing to advance a total of four (4) cone penetration (CPT) borings at the locations shown in Drawings 2, 8, and 9. As indicated in these drawings, three of the proposed CPT borings (B-1 through B-3) are located onsite near and downgradient of the source area and the current UST's. The remaining CPT boring (B-4) is proposed west of borings B-1 through B-3. Boring B-4 is being proposed to determine if the presence of a potential ridge of higher sandy clay (See Table 1) in well VW-1 extends laterally onsite to the west. Because access at the Site is limited due to its size and the presence of Site features (USTs, dispenser island, station building), additional boring locations are not possible. Additionally, a limited access CPT rig will be used to advance the proposed borings. Advancing CPT borings will allow for a better lithologic understanding in this area as well as enable the collection of several discrete-depth groundwater samples. If additional locations and/or procedures are determined to be necessary to carry out this

investigation, internal ARC procedures including Management of Change (MOC) will be necessary prior to the initiation of work activities. If required, these procedures may cause some unforeseen project delays.

4.1 Preliminary Activities

Broadbent will obtain the necessary drilling permits from Zone 7, prepare a site health and safety plan (HASP) for the proposed work, clear the Site for subsurface utilities, and provide 72-hour advance notification to ACEH prior to start of field activities. The utility clearance will include notifying Underground Service Alert (USA) of the pending work a minimum of 48 hours prior to initiating the field investigation, and securing the services of a private utility locating company to confirm the absence of underground utilities at each boring location. The boreholes will be physically cleared to six and a half feet bgs using air knife methods.

The Site-specific HASP will be prepared for use by personnel implementing the work plan. A copy of the HASP will be available onsite during work. The subcontractor(s) performing field activities will be provided with a copy of the HASP prior to initiating work. A safety tailgate meeting will also be conducted daily to review potential hazards and scope of work.

4.2 CPT Borings

A log based on CPT measurements will be created for each boring. Metal rods equipped with a cone penetrometer (cone) will be advanced into the subsurface at each proposed location. This cone will measure parameters in the subsurface. These parameters include tip friction, sleeve friction, and pore pressure. The CPT will measure these parameters in real time with depth, allowing for a vertical soil profile to be created based on these measurements. Depth to groundwater measurements will also be calculated using CPT technology by performing pore dissipation tests (PDTs). A PDT is conducted when the cone is halted at specific intervals. The variation in the penetration pore pressure with time is measured behind the tip of the cone. These logs will be created by the contractor and used in determining groundwater collection intervals. Soil borings will be completed under the supervision of a Broadbent field geologist.

CPT borings will be advanced to a depth of approximately 60 feet bgs, barring limitations of the selected drill rig. This depth has been proposed to determine if the sandy clay layer (ACEH, 2013) where soil impacts were noted can be evaluated. Saturated intervals for first-encountered groundwater and for deeper groundwater potentially in the sandy clay at approximately 45 feet bgs will be targeted for grab-groundwater sampling. Groundwater samples will also be collected at any perched intervals between approximately 20 and 28 feet bgs, as groundwater data from well VW-1 indicates may be present. If lithology indicates that the subsurface is predominately highly permeable (i.e. gravels and clean sands), discrete-depth groundwater samples will be collected at approximate 5 to 10-foot intervals for vertical characterization within the continuous water-bearing zone. Additionally, one groundwater sample will be collected just above the sandy clay layer noted at approximately 36 to 42 feet bgs (ACEH, 2013) from each boring in order to determine if groundwater samples are being influenced by residual hydrocarbons trapped in this finer-grained unit and may potentially be the cause of the LNAPL recently measured in well MW-7. At the time that LNAPL was measured in this well, groundwater levels had declined to depths near this sandy clay interval.

Up to one shallow soil sample may be collected if site conditions warrant. Additionally, one soil sample will be collected from each boring at the top of the sandy clay layer.

4.3 Grab-Groundwater Sampling

Two to three groundwater samples will be collected from each boring at the approximate intervals as described above. These intervals have not been explicitly predetermined and will be selected based on observed lithology in CPT logs and PDTs.

Groundwater samples will be collected using a Hydropunch-type sampler equipped with a retrievable stainless steel or disposable PVC screen with an expendable tip. The groundwater sampler operates by advancing a 1 ¾ - inch hollow-push rod with the filter tip in a closed configuration to the base of the desired sampling interval. Once at the desired depth, the push rods are retracted, exposing the encased filter screen allowing groundwater to infiltrate hydrostatically from the formation to the inlet screen. A small diameter bailer is lowered through the push rod into the screen section for sample collection. Groundwater samples will be decanted into laboratory-supplied containers.

4.4 Sample Handling and Analytical

All collected soil and groundwater samples will be submitted under chain-of-custody protocol to Test America Laboratories, Inc. of Irvine, California, a state certified environmental laboratory. Soil and groundwater samples will be analyzed for GRO by EPA Method 8015B, and BTEX, MTBE, naphthalene,and fuel oxygenates by EPA Method 8260B.

4.5 Investigation-Derived Residuals

Investigation-derived residuals will be temporarily accumulated onsite in 55-gallon, DOT-approved drums, pending characterization for proper management. Broadbent will coordinate the removal and transportation of surplus soils and liquids to appropriate California-regulated facilities.

4.6 Additional Monitoring Well Sampling

As recommended in Section 3.4 above and requested by the ACEH, groundwater samples will be collected from wells MW-3 and MW-8 during the next two scheduled groundwater sampling events in order to determine the current downgradient petroleum impacts. These wells will be analyzed for GRO, BTEX, MTBE, and fuel oxygenates, consistent with the current sampling program. It is additionally recommended that all onsite wells be sampled to confirm the continued absence of petroleum compounds in these wells. This sampling will be conducted for the next two routine sampling events (third quarter 2013 and first quarter 2014) at which time the necessity of continued sampling of these wells will be evaluated.

5.0 GROUNDWATER INVESTIGATION REPORT AND UPDATED CSM

Upon completion of field activities, Broadbent will prepare a Groundwater Investigation Report and Updated CSM. The report will document the results of the investigation, field activities, copies of required permit(s), copies of field notes, soil boring and well logs, discussion of findings, and conclusions. Deviations from the Work Plan or data inconsistencies will be discussed in the report. An update to the CSM (Table 1) will also be included.

6.0 PROPOSED SCHEDULE

The schedule for the above-noted work shall proceed as follows:

- Groundwater Investigation – Upon approval of this CSM and Work Plan and obtaining the necessary permits; and
- Groundwater Investigation Report and Updated CSM – Within 60 days following completion of fieldwork.

7.0 LIMITATIONS

The findings presented in this document are based upon: observation of field personnel from previous consultants, the points investigated, and results of laboratory tests performed by various laboratories. Our services were performed in accordance with the generally accepted standard of practice at the time this document was written. No other warranty, expressed or implied was made. This report has been prepared for the exclusive use of Atlantic Richfield Company. It is possible that variations in soil or ground-water conditions could exist beyond points explored in this investigation. Also changes in site conditions could occur in the future due to variations in rainfall, temperature, regional water usage, or other factors.

8.0 REFERENCES

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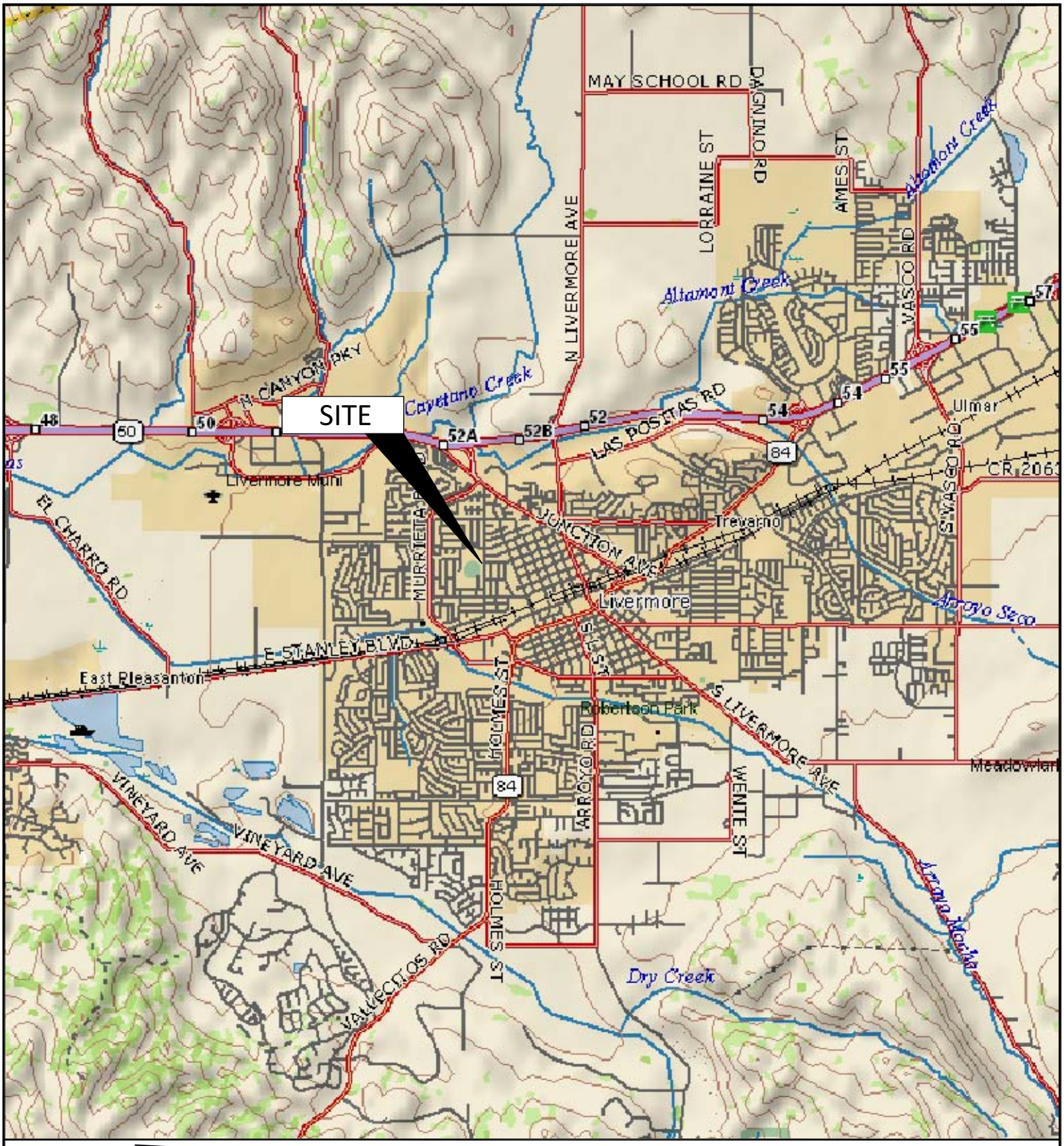
DRAWINGS



0 1 2

APPROXIMATE SCALE (mi)

IMAGE SOURCE: DELORME TOPO USA 7.0

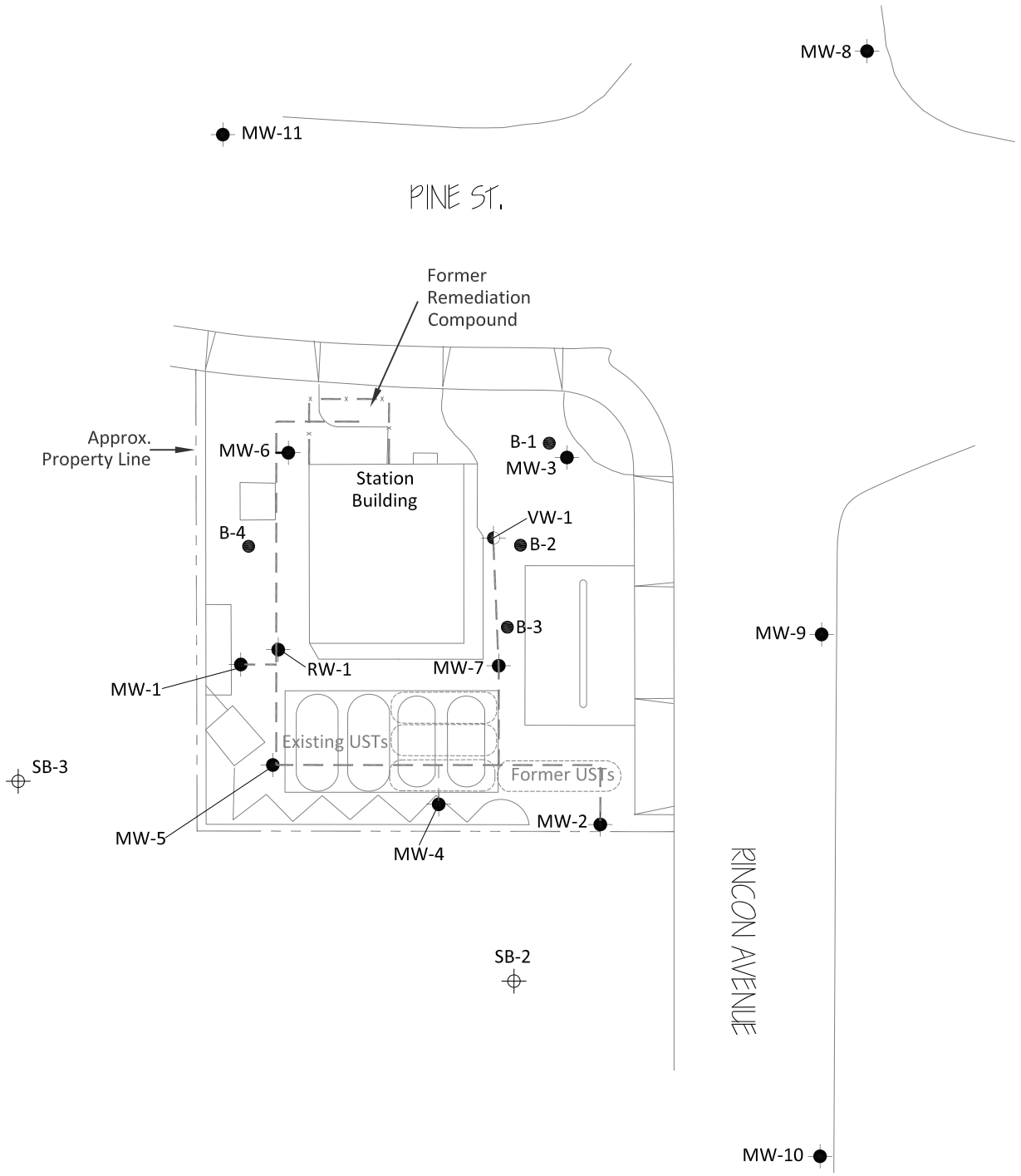
BROADBENT
1370 Ridgewood Dr., Suite 5
Chico, California 95973

Project No.: 06-82-608 Date: 5/13/2013

Station #771
899 Rincon Avenue
Livermore, California

Site Location Map

Drawing
1



LEGEND

- Monitoring Well Location
- Vapor Extraction Well Location
- Proposed CPT Boring Locations
- Soil Boring Locations
- Remediation Piping

N

0 40 80

SCALE (ft)

NOTE: SITE MAP ADAPTED FROM URS FIGURES. SITE DIMENSIONS AND FACILITY LOCATIONS NOT VERIFIED.

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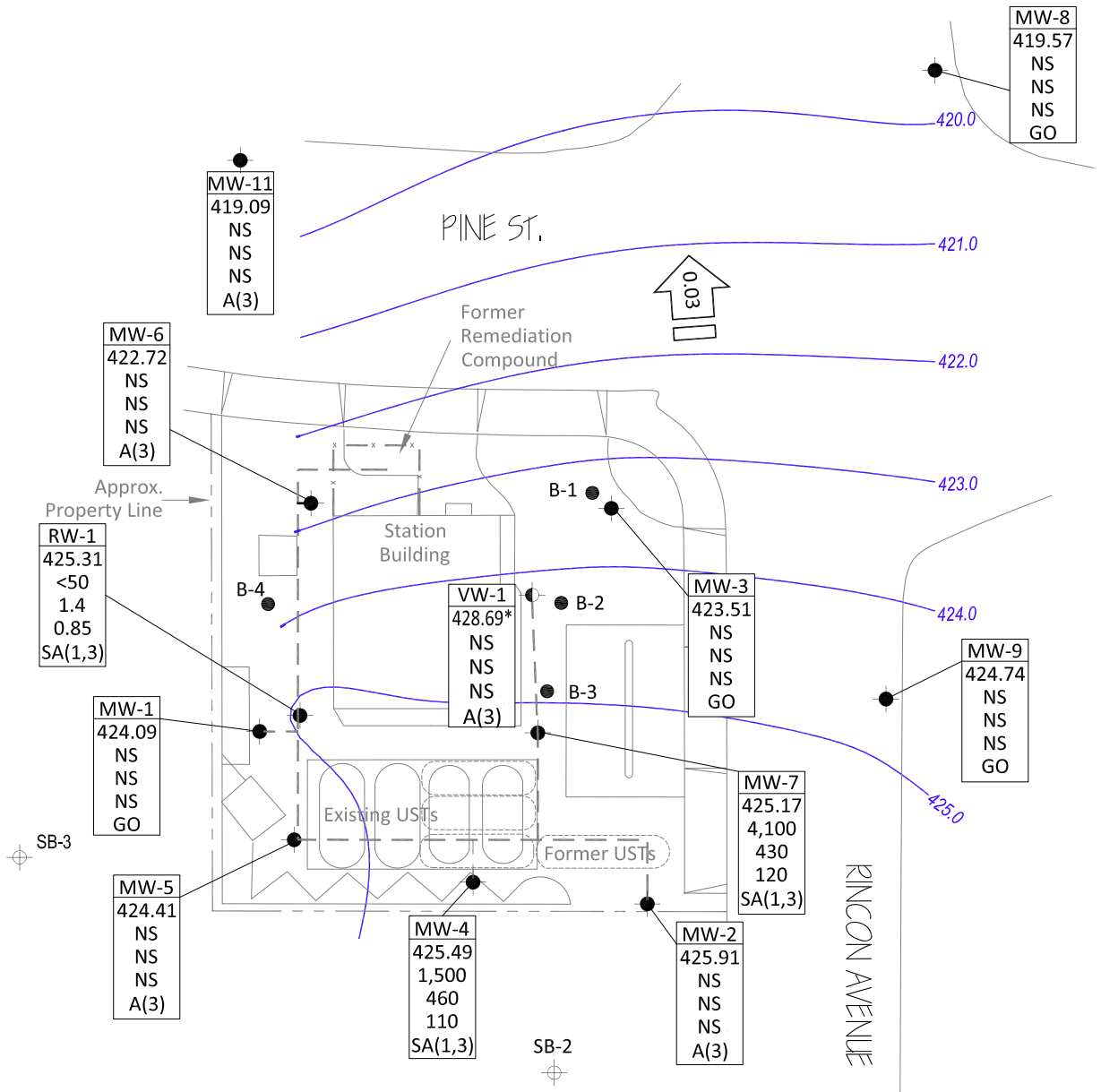
Project No.: 06-82-608 Date: 5/17/2013

Station #771
899 Rincon Avenue
Livermore, California

Site Map with Current Monitoring Well and Proposed CPT Boring Locations

Drawing
2



LEGEND

- Monitoring Well Location
- Vapor Extraction Well Location
- Proposed CPT Boring Locations
- Soil Boring Locations
- Groundwater Elevation Contour (Feet Above Site Datum)
- 0.03 Groundwater Gradient (ft/ft)
- < Not Detected at or Above Laboratory Limits
- Remediation Piping

A(3)	Sampled Annually - Third Quarter
SA(1,3)	Sampled Semi-Annually - First and Third Quarter

WELL	Well Designation
ELEV	Groundwater Elevation (ft)
GRO BZ MTBE	GRO, Benzene, and MTBE Concentrations (µg/L)
SA or A	Sampling Frequency

NM	Not Monitored
NS	Not Sampled
GO	Not Sampled, Guaged Only

N

0 40 80

SCALE (ft)

NOTE: SITE MAP ADAPTED FROM URS FIGURES. SITE DIMENSIONS AND FACILITY LOCATIONS NOT VERIFIED.

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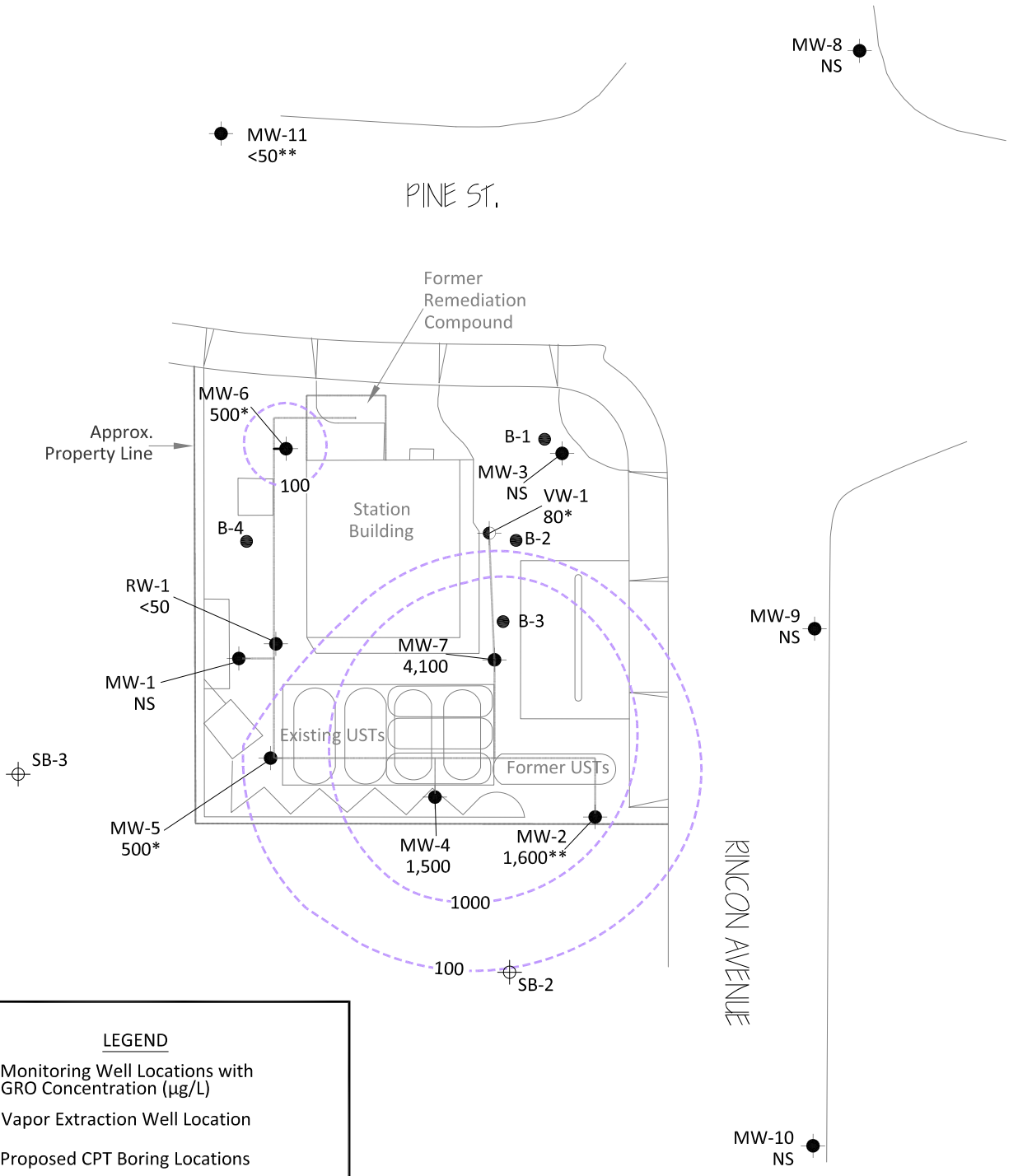
Project No.: 06-82-608 Date: 5/17/2013

Station #771
899 Rincon Avenue
Livermore, California

Groundwater Elevation Contour and Analytical Summary Map
January 17, 2013

Drawing
3



LEGEND

- Monitoring Well Locations with GRO Concentration (µg/L)
- Vapor Extraction Well Location
- Proposed CPT Boring Locations
- Soil Boring Locations
- GRO Isoconcentration Contour (µg/L)
- * Sampled Third Quarter 2012
- ** Sampled Third Quarter 2011
- < Not Detected at or Above Laboratory Reporting Limits
- Remediation Piping
- MW-1, MW-3, MW-8, MW-9 and MW-10 Not Sampled for Over 10 Years

N

0 40 80

SCALE (ft)

NOTE: SITE MAP ADAPTED FROM URS FIGURES. SITE DIMENSIONS AND FACILITY LOCATIONS NOT VERIFIED.

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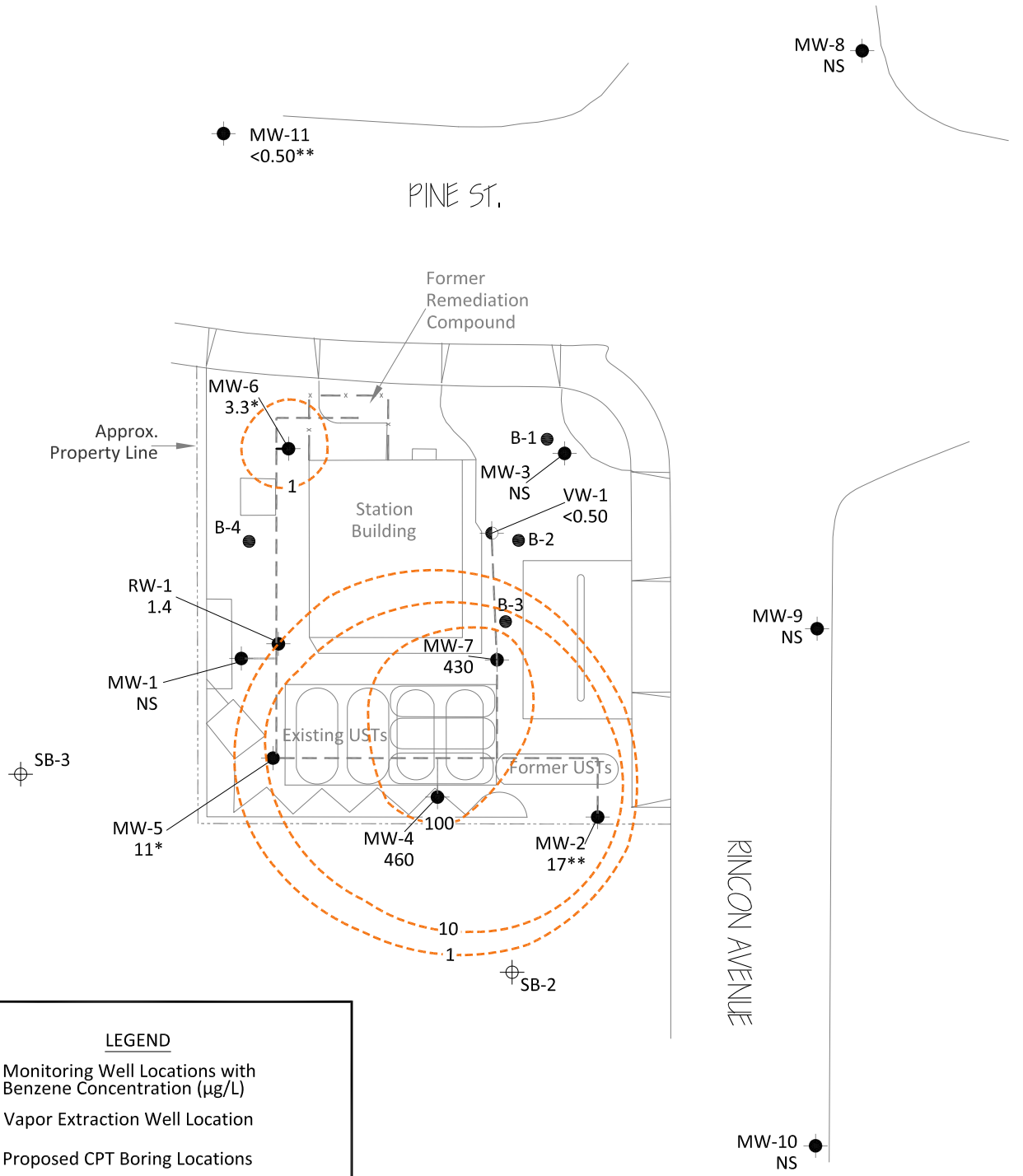
Project No.: 06-82-608 Date: 5/17/2013

Station #771
899 Rincon Avenue
Livermore, California

GRO Isoconcentration Contour Map
January 17, 2013

Drawing
4



NOTE: SITE MAP ADAPTED FROM URS FIGURES. SITE DIMENSIONS AND FACILITY LOCATIONS NOT VERIFIED.

BROADBENT
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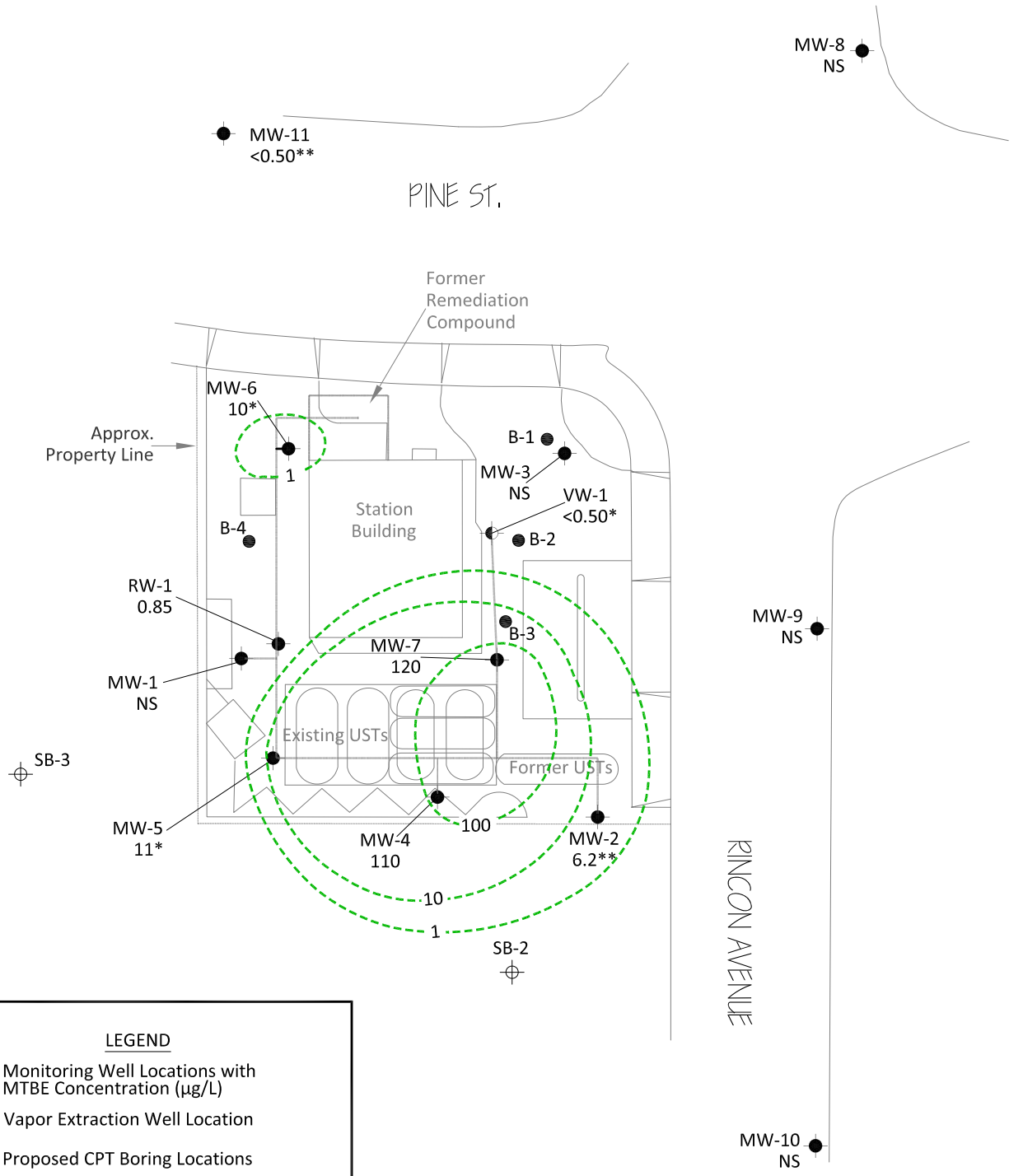
Project No.: 06-82-608 Date: 5/23/2013

Station #771
899 Rincon Avenue
Livermore, California

Benzene Isoconcentration Contour Map
January 17, 2013

Drawing
5



LEGEND

- Monitoring Well Locations with MTBE Concentration (µg/L)
- Vapor Extraction Well Location
- Proposed CPT Boring Locations
- Soil Boring Locations
- MTBE Isoconcentration Contour (µg/L)
- * Sampled Third Quarter 2012
- ** Sampled Third Quarter 2011
- < Not Detected at or Above Laboratory Reporting Limits
- Remediation Piping
- MW-1, MW-3, MW-8, MW-9 and MW-10 Not Sampled for Over 10 Years

NOTE: SITE MAP ADAPTED FROM URS FIGURES. SITE DIMENSIONS AND FACILITY LOCATIONS NOT VERIFIED.

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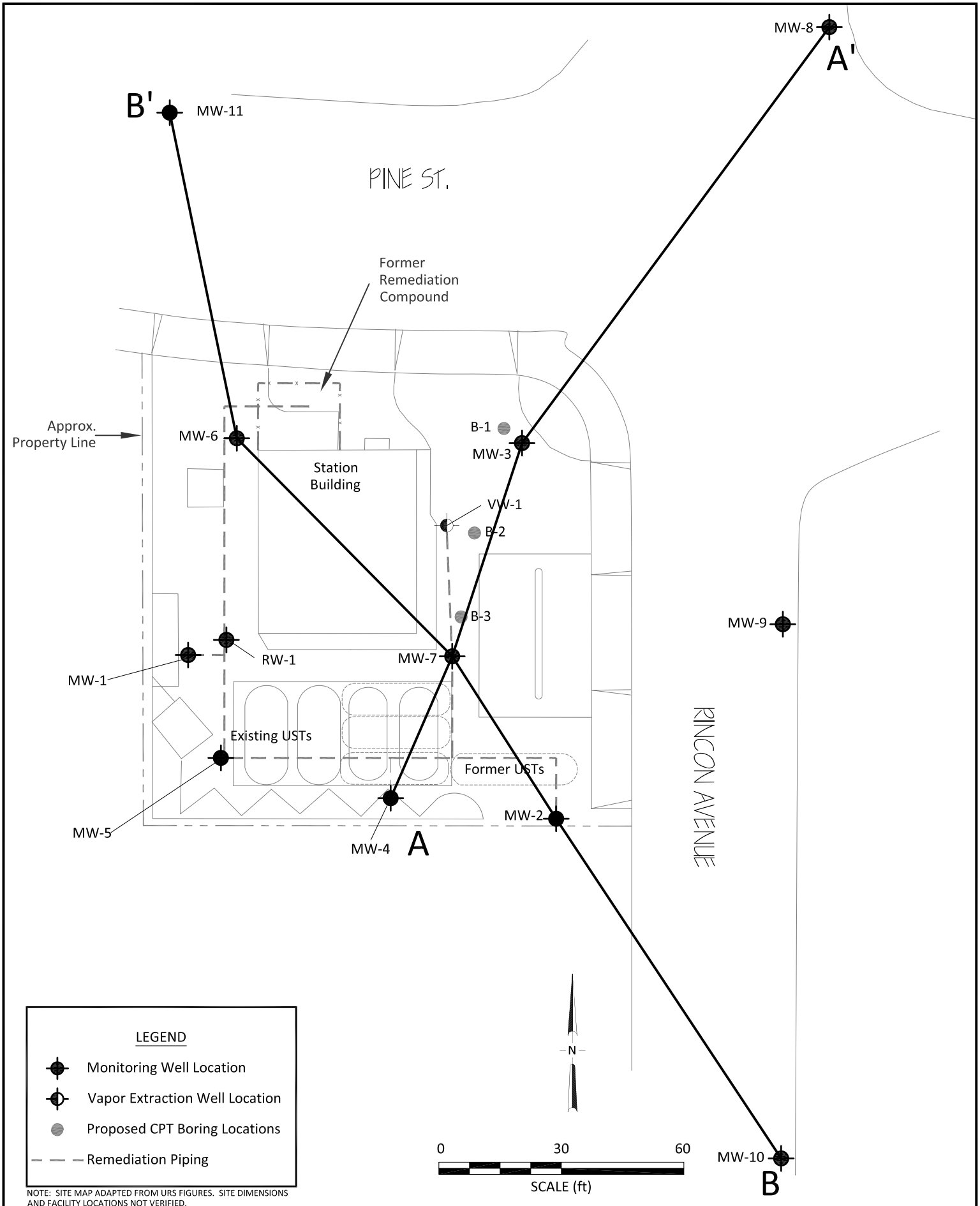
Project No.: 06-82-608 Date: 5/23/2013

Station #771
899 Rincon Avenue
Livermore, California

MTBE Isoconcentration Contour Map
January 17, 2013

Drawing
6

Drawing removed due to confidential content



NOTE: SITE MAP ADAPTED FROM URS FIGURES. SITE DIMENSIONS AND FACILITY LOCATIONS NOT VERIFIED.

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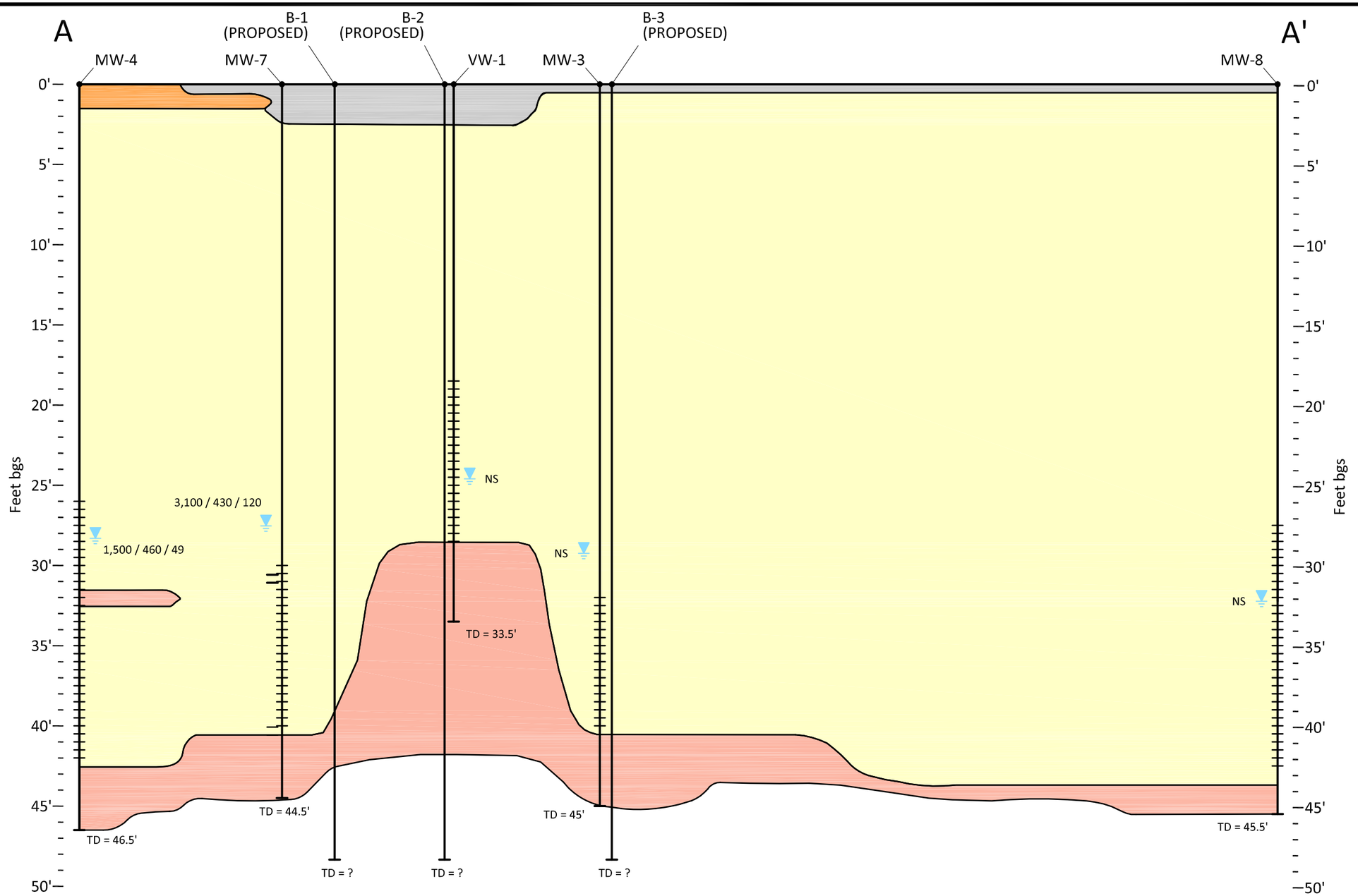
Project No.: 06-82-608 Date: 5/17/2013

Station #771
899 Rincon Avenue
Livermore, California

Site Map with Cross Section Locations

Drawing
8



Asphalt/Backfill

Gravels

Well Graded Sands

Clayey Silts, Sandy Silts

Groundwater Elevation (January 17, 2013)	
1,500 / 460 / 49	GRO, Benzene, and MTBE Concentrations in µg/L (January 17, 2013)
GRO	Gasoline Range Organics
NS	Not Sampled
µg/L	Micrograms per Liter

Boring ID

Extent of Boring

Extent of Well Screen

TD = Total Depth (feet)

0 20 40

HORIZONTAL SCALE (ft)
VERTICAL EXAGGERATION 3:1

Drawing 6

Geologic Cross Section A - A'

Station #771
899 Rincon Avenue
Livermore, California

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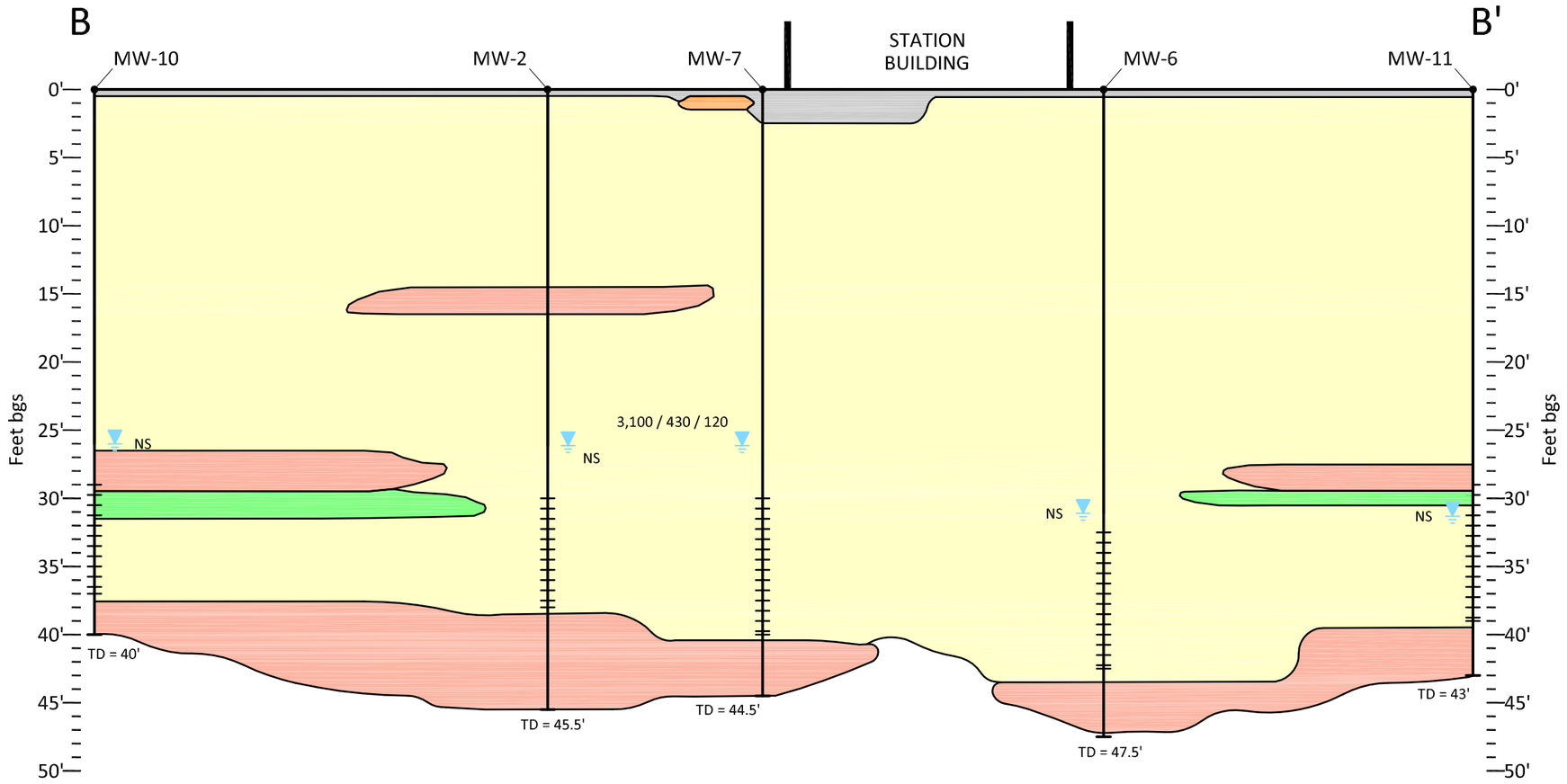
1370 Ridgewood Dr., Suite 5
Chico, California 95973

Project No.: 06-88-608 Date: 5/17/2013



Asphalt/Backfill

Gravels

Well Graded Sands

Clayey Silts, Sandy Silts

Clayey Silts, Sandy Silts

▽	Groundwater Elevation (January 17, 2013)
3,100 / 430 / 120	GRO, Benzene, and MTBE Concentrations in µg/L (January 17, 2013)
GRO	Gasoline Range Organics
NS	Not Sampled
µg/L	Micrograms per Liter

Boring ID

Extent of Boring

Extent of Well Screen

TD = Total Depth (feet)

0 30 60

HORIZONTAL SCALE (ft)
VERTICAL EXAGGERATION 3:1

Drawing 10

Geologic Cross Section B - B'

Station #771
899 Rincon Avenue
Livermore, California

BROADBENT
1370 Ridgewood Dr., Suite 5
Chico, California 95973

Project No.: 06-88-608 Date: 5/17/2013

TABLES

TABLE 1

CONCEPTUAL SITE MODEL
Atlantic Richfield Company Station 771
899 Rincon Avenue
Livermore, California

CSM Element	CSM Sub-Element	Description	Data Gap Y/N	Data Gap Detail
Geology and Hydrogeology	Regional	The Site is located in the north-central portion of the Livermore Valley, an east-west trending structural trough surrounded by north-south trending faults and hills of the Diablo Range. The valley extends approximately 14 miles in an east-west direction and varies from three to six miles in width. The valley floor slopes gently west and southwest and is a part of the Livermore Valley groundwater basin. The groundwater basin is bounded by and crossed by several faults. These faults act as barriers to the lateral movement of groundwater and divide the groundwater basin into several subbasins. The water-bearing materials in the groundwater basin include Holocene age surficial valley-fill alluvial sediments overlying the Plio-Pleistocene Livermore Formation. The Livermore Formation consists of unconsolidated to semi-consolidated beds of gravel, sand, silt, and clay of varying permeabilities (California Department of Water Resources, 2003). Natural recharge occurs primarily along the uplands and edges of the Livermore Valley groundwater basin, through the arroyos during periods of precipitation and winter flow, by underground flow, and by applied irrigation water seeping into the ground. The basin is also recharged by controlled releases from the South Bay Aqueduct along with local surface water stored at Del Valle reservoir into Arroyo Valle and Arroyo Mocho. Sections of these arroyos contain creek bottoms that are very porous, allowing the water to quickly seep into the ground. Mine quarrying pits on the west side of the Livermore Valley are currently being used for storm water collection to assist in recharge of groundwater in the basin (Zone 7 Water Agency, 2005). The basins' groundwater system is a multi-layered system with an unconfined upper aquifer overlying deeper semi-confined to confined aquifers separated by clay aquitards. These clay aquitards impede the vertical movement of groundwater	N	NA

TABLE 1

CONCEPTUAL SITE MODEL
Atlantic Richfield Company Station 771
899 Rincon Avenue
Livermore, California

CSM Element	CSM Sub-Element	Description	Data Gap Y/N	Data Gap Detail
Geology and Hydrogeology (Continued)	Regional (Continued)	between the upper and deeper aquifers. Most of the water for municipal and agricultural use is pumped from the deeper aquifers. Groundwater flow in the basin generally flows toward the west central portions of the valley and generally moves east to west within Livermore Valley. Groundwater near the center of Livermore Valley flows toward a cone of depression located west of the city of Livermore near gravel mining areas. The groundwater depression is thought to have been created by extraction of groundwater for municipal and agricultural use and dewatering for gravel quarrying (Zone 7 Water Agency, 2005). The extraction of groundwater is ongoing but has lessened over the years due to usage of water from the State Water Project. Surface drainage features include four major seasonal streams (Arroyo Valle, Arroyo Mocho, Arroyo las Positas, and Arroyo de la Laguna) and several quarry ponds (mining area). The four major streams converge on the southwest side of the basin to form the main basin outlet, Arroyo de la Laguna, which flows south and joins Alameda Creek in Sunol Valley. These natural drainages are located approximately 0.7 miles (Arroyo las Positas) north, 0.75 miles south-southwest (Arroyo Mocho), and 2.75 miles southwest (Arroyo Valle) of the Site.		
Geology and Hydrogeology	Site	Depth to groundwater varies across the Site and through time from approximately 16.03 to 43.25 ft bgs. Resulting groundwater elevations have varied from approximately 408.12 ft to 433.18 ft. Since March of 1995 the groundwater flow direction was been predominately toward the north. However, on occasion a southwesterly flow direction has been observed. During this same time period the gradient magnitude has varied from 0.009 to 0.071. Groundwater flow direction and gradient data from the time period March 1995 through the present are provided in Table 4. Groundwater flow direction and gradient are generally consistent with	Y	1) Variations in Localized Groundwater Flow Patterns as Related to Nearby Municipal Pumping is not Known

TABLE 1

CONCEPTUAL SITE MODEL
Atlantic Richfield Company Station 771
899 Rincon Avenue
Livermore, California

CSM Element	CSM Sub-Element	Description	Data Gap Y/N	Data Gap Detail
Geology and Hydrogeology (Continued)	Site (Continued)	regional conditions, which do not account for localized variations due to slight local variations in lithology, differences in well screens, and local water withdrawals and surface infiltrations which include, but are not limited to, groundwater pumping. It is beyond the scope of any one Site to determine the causes of slight variations in groundwater gradient and direction, particularly when the general overall direction and gradient are consistent with regional conditions. Nearby municipal pumping rates and seasonal pumping variations may be useful in determining the apparent variations in the overall local groundwater flow direction at the Site. Soil underlying the Site has been consistently characterized as primarily clayey to sandy gravel interbedded with some silty sand and sandy silt to clay. A four and a half to five foot layer of moist sandy clay is encountered at varying depths ranging from 37 to 42.5 feet bgs. In well VW-1, a similar layer is present at approximately 30 feet bgs extending to the bottom of the well at 33.5 ft bgs. It is unclear whether this lithology connects to the deeper layer noted in other Site boring logs, or if it is a separate layer. Based on available data, it appears most likely that this sandy clay layer in well VW-1 does connect to the deeper clay intervals noted in other wells, and this may be causing the higher groundwater elevations. A clay mound or ridge could be present. Higher groundwater elevations could occur in this area when groundwater flow through the adjacent permeable gravels encounters this less permeable mound/ridge consisting of the sandy clay. Lithologic cross-sections are presented as Drawings 8 through 10. Available lithologic soil boring logs and well construction details are provided in Appendix C.		2) Unsure if Sandy Clay in Well VW-1 is Separate Formation or Same as Deeper Sandy Clay Layer Noted in Other Site Well Logs

TABLE 1

CONCEPTUAL SITE MODEL
Atlantic Richfield Company Station 771
899 Rincon Avenue
Livermore, California

CSM Element	CSM Sub-Element	Description	Data Gap Y/N	Data Gap Detail
Surface Water Bodies		Surface drainage features include four major seasonal streams (Arroyo Valle, Arroyo Mocho, Arroyo las Positas, and Arroyo de la Laguna) and several quarry ponds (mining area). The four major streams converge on the southwest side of the basin to form the main basin outlet, Arroyo de la Laguna, which flows south and joins Alameda Creek in Sunol Valley. These natural drainages are located approximately 0.7 miles (Arroyo las Positas) north, 0.75 miles south-southwest (Arroyo Mocho), and 2.75 miles southwest (Arroyo Valle) of the Site.	N	NA
Nearby Wells		A water well survey was conducted by URS in September 2003. A more recent survey has recently been conducted in 2013. The 2003 survey concluded that four water wells were located within 2,640 feet (0.5 miles) of the Site. Two were water supply wells located approximately 2,500 feet and 2,300 feet crossgradient of the Site. The other two wells were of unknown use and were reported as being located approximately 240 feet cross-gradient and 2,300 feet up-gradient of the Site. Upon further review of the well logs, the well of unknown use that was believed to be located approximately 240 feet crossgradient from the Site was incorrectly located by URS. The correct location of the well is 450 feet downgradient of the Site (across Pine Street and on the north side of the fire station). During the recent well survey (Section 3.0 of the Work Plan) a total of three municipal supply wells and one domestic well were identified within 2,000 feet of the Site. Potential impact to these municipal and domestic wells within the search radius is possible; however, the Coon domestic well (Drawing 4 ID#3), if present, and one of the three municipal wells (Drawing 4 ID#4) are both located in a general upgradient direction from the Site, while another of the three municipal wells (Drawing 4 ID#4) is located in a general cross-gradient direction. The final municipal well (Drawing 4 ID#1) is located to the Northeast of the Site in a general downgradient direction. Offsite	Y	1) Current Analytical Data from Monitoring Well MW-8 Between Downgradient Municipal Well and Site is not Available 2) More Information Regarding the Downgradient Well's Use and Construction is Needed

TABLE 1

CONCEPTUAL SITE MODEL
Atlantic Richfield Company Station 771
899 Rincon Avenue
Livermore, California

CSM Element	CSM Sub-Element	Description	Data Gap Y/N	Data Gap Detail
Nearby Wells		monitoring well MW-8 is located downgradient of the Site, between the Site and the downgradient municipal well. Well MW-8 only contained very sporadic and low petroleum concentrations during the Site's monitoring history and most recently did not contain hydrocarbons. However, MW-8 has not been sampled for over ten years. It is unclear if petroleum compounds are migrating from the Site to the municipal well (ID#1) based on the lack of current downgradient (well MW-8) analytical data. Furthermore, it is unclear the extent to which the municipal well (ID#1) is used and the sanitary seal depth. These data would be beneficial in determining the potential risk to this municipal well (ID#1) being impacted by petroleum compounds potentially migrating from the Site. Potable water is provided to residences and businesses in the general area by Cal Water.		
Constituents of Concern	Light-Non Aqueous Phase Liquids (LNAPL)	LNAPL was first detected in onsite soil boring B-1 (0.01 ft) during a limited subsurface assessment on February 1, 1990. LNAPL in monitoring wells was first observed in MW-1 (0.10 ft) on July 25, 1991, in MW-2 (0.16 ft) on January 15, 1991, and in MW-5 (0.03 ft) on August 13, 1991. Passive skimmers were installed in these three wells. Approximately 3.06 gallons of LNAPL were recovered in 1991 and 1992. LNAPL had not been observed in any of the monitoring wells since November 1992 until recently. Historic LNAPL measurements and removal volumes are summarized in Appendix B. During the Third Quarter 2012, LNAPL was reported in well MW-7 for the first time during its monitoring history. This measurement coincided with the lowest groundwater level ever noted in this well. No LNAPL was noted during the First Quarter 2013 event, after groundwater levels had rebounded. The origin and extent of this recent LNAPL remains unclear, but may be related to depressed groundwater elevations.	Y	1) Evaluate Presence of LNAPL in MW-7 during GWM events

TABLE 1

CONCEPTUAL SITE MODEL
Atlantic Richfield Company Station 771
899 Rincon Avenue
Livermore, California

CSM Element	CSM Sub-Element	Description	Data Gap Y/N	Data Gap Detail
Constituents of Concern	Gasoline Range Organics (GRO)	GRO has been detected in onsite wells MW-1 through MW-7, RW-1, and VW-1. Since 1995 concentrations of GRO have ranged from 90,000 µg/L in well MW-1 (1995) to below laboratory reporting limits in wells MW-1 through MW-6, RW-1, and VW-1. GRO concentrations in RW-1 and VW-1 have remained below laboratory detection limits since Third Quarter 2007. GRO has significantly decreased over time in all onsite wells. However, recently GRO has increased in concentration in well MW-7, but significant increases have not been noted in other Site wells. It is unclear if this apparent increase is the result of fluctuating groundwater levels or a new release mechanism. The relatively lower GRO concentration (80 µg/L) in well VW-1 indicates that the plume terminates between MW-7 and VW-1. However, as noted above, it is not clear as to whether groundwater in VW-1 represents a perched zone, or represents a groundwater mound in the same water-bearing zone that is the result of a lithologic feature. Drawing 4 presents a GRO isoconcentration contour map for the First Quarter 2013. GRO has not been detected in offsite wells MW-8 through MW-11, although a number of these wells have not been sampled for over ten years.	Y	1) Recent increase in GRO in well MW-7 is not well understood 2) No Recent Analytical Data from Many Site Wells
Constituents of Concern	Benzene	Benzene has been detected in all onsite wells MW-1 through MW-7, RW-1, and VW-1. Since 1995, concentrations of benzene have ranged from 4,000 µg/L in well MW-1 (1995) to non-detect. Maximum current benzene concentrations are present in wells MW-4 and MW-7 at concentrations slightly above 400 µg/L, a decrease of one order of magnitude from the historic maximum. Benzene is currently non-detect in wells MW-11 and VW-1. Concentrations in wells MW-1, MW-2, MW-3, MW-8, and MW-9 are not currently known due to lack of sampling data from these wells for over 10 years. Available benzene analytical data from more current sampling (last two years) indicates that the majority of benzene concentrations are present near the former	Y	1) No Recent Analytical Data from Many Site Wells

TABLE 1

CONCEPTUAL SITE MODEL
Atlantic Richfield Company Station 771
899 Rincon Avenue
Livermore, California

CSM Element	CSM Sub-Element	Description	Data Gap Y/N	Data Gap Detail
Constituents of Concern (Continued)	Benzene (Continued)	USTs, with lower to non-detect concentrations in the northern (downgradient direction). The lack of benzene impacts in well VW-1 indicate that the plume terminates between MW-7 and VW-1. However, as noted above, it is not clear as to whether groundwater in VW-1 represents a perched zone, or represents a groundwater mound in the same water-bearing zone that is the result of a lithologic feature. A benzene isoconcentration contour map is presented as Drawing 5. With the exception of the occasional detection, benzene has not been observed in offsite wells MW-8 through MW-11. However, no sampling has been conducted at these wells for over 10 years, with the exception of MW-11, which is currently sampled on an annual basis.		
Constituents of Concern	MTBE	MTBE has been detected at relatively low concentrations in onsite wells MW-1, MW-2, MW-4 through MW-7, and RW-1. Since 1995, maximum concentrations of MTBE have been recorded at 270 µg/L in MW-1 (1999), 130 µg/L in MW-2 (1998), 360 µg/L in MW-4 (2001), 330 µg/L in MW-5 (2001), 57.1 µg/L in MW-6 (2001), 350 µg/L in MW-7 (1995), and 530 µg/L in RW-1 (1999). MTBE concentrations have generally decreased over time and are currently near or below detection limits in wells MW-5, MW-6, RW-1, and VW-1. The lack of MTBE impacts in well VW-1 indicates that the plume terminates between MW-7 and VW-1. However, as noted above, it is not clear as to whether groundwater in VW-1 represents a perched zone, or represents a groundwater mound in the same water-bearing zone that is the result of a lithologic feature. An MTBE isoconcentration contour map is presented as Drawing 6. MTBE has not been detected in offsite wells MW-8 through MW-11, however, wells MW-8 through MW-10 have not been sampled for over 10 years.	Y	1) No Recent Analytical Data from Many Site Wells

TABLE 1

CONCEPTUAL SITE MODEL
Atlantic Richfield Company Station 771
899 Rincon Avenue
Livermore, California

CSM Element	CSM Sub-Element	Description	Data Gap Y/N	Data Gap Detail
Potential Sources	Onsite	The exact source and volume released is unknown. However, based on historic reports and observed contaminant concentrations, the source area is suspected to be the former UST complex located in the southern portion of the Site. However, concentrations of petroleum hydrocarbons were also observed in shallow soils beneath the dispenser pump islands while trenching to replace the product lines. Due to the area and predominant depth of first detected impacted soil in the vicinity of the UST complex, it appears that the majority of the release occurred beneath the former USTs.	N	NA
Potential Sources	Offsite	No offsite sources have been identified.	N	NA
Nature and Extent of Environmental Impacts	Extent in Soil	Overexcavation in the former UST area was completed to a depth of 18 feet. Two soil samples from this depth showed detections of TPHg at or in excess of 100 mg/kg. Overexcavation was conducted to a depth of five feet in the product line area. One soil sample from this depth showed a detection of TPHg at 91 mg/kg. An unknown amount of petroleum hydrocarbon may be presently bound within the soil matrix within these areas. A fluctuating groundwater table has also likely "smeared" contaminants in soils up to the high water mark. Sorbed hydrocarbon mass may also be present in finer-grained soils noted at approximately 42 feet bgs in most borings and wells at the Site, as noted in the cross-section drawings (Drawings 9 and 10).	N	NA
Nature and Extent of Environmental Impacts	Extent in Shallow Groundwater	During the First Quarter 2013 monitoring event, the maximum GRO and MTBE concentrations were detected in well MW-7 at 4,100 ug/L and 120 ug/L, respectively. The maximum benzene concentration was detected in MW-4 at 460 ug/L. The highest concentrations of petroleum hydrocarbons in Site groundwater are consistently reported in these two wells, which is consistent with their locations adjacent to the former USTs.	Y	1) No Recent Analytical Data from Many Site Wells

TABLE 1

CONCEPTUAL SITE MODEL
Atlantic Richfield Company Station 771
899 Rincon Avenue
Livermore, California

CSM Element	CSM Sub-Element	Description	Data Gap Y/N	Data Gap Detail
Nature and Extent of Environmental Impacts (Continued)	Extent in Shallow Groundwater (Continued)	Petroleum hydrocarbon impacts are defined in the downgradient and crossgradient directions by wells MW-8 through MW-11, although none of these wells with the exception of MW-11 have been sampled in over 10 years. Petroleum hydrocarbons are defined in the upgradient direction by borings SB-2 and SB-3 (Drawing 2), advanced in 2011. GRO and MTBE were detected in the groundwater samples collected from SB-2 and SB-3, however these concentrations were significantly lower than in onsite wells, and below CRWQCB ESLs (CRWQCB, 2013). No other hydrocarbons were detected. Therefore, the plume is considered defined in the upgradient direction. Isoconcentration maps for the most recent groundwater monitoring and sampling event (1Q13) for GRO, benzene, and MTBE are included as Drawings 4 through 6, respectively. Based on these drawings, the extent of petroleum compounds is well defined in all directions, and is predominately limited to onsite. Additional groundwater sampling at all Site monitoring wells would confirm the definition of hydrocarbons at the Site.		
Nature and Extent of Environmental Impacts	Extent in Deeper Groundwater	The extent of deeper groundwater has not been defined. Additional depth discrete-groundwater sampling will need to be performed to understand potential vertical extent of hydrocarbons in groundwater.	Y	1) No Vertical Groundwater Characterization
Migration Pathways	Potential Conduits	Broadbent has no record of a formal utility survey of the Site and surrounding area. Soil excavation conducted during tank removal activities was completed to a depth of 18 feet bgs and groundwater underneath the Site, at its shallowest, has been 16.03 feet bgs. Therefore, it is unlikely that utility trenches within and near the Site could be serving as preferential pathways for contaminant migration above or below the groundwater table.	N	NA

TABLE 1

CONCEPTUAL SITE MODEL
Atlantic Richfield Company Station 771
899 Rincon Avenue
Livermore, California

CSM Element	CSM Sub-Element	Description	Data Gap Y/N	Data Gap Detail
Potential Receptors	Onsite	No onsite water supply wells or surface water exists. The only potential onsite receptor would be onsite workers exposed to gasoline vapors. However, the exposure from current fueling operations for onsite workers represents a greater risk than any associated with potential groundwater or soil vapor exposure (SWRCB, 2012).	N	NA
Potential Receptors	Offsite	Recent sensitive receptor survey activities identified three nearby municipal supply wells and one domestic well. However, only one of these wells is located in the downgradient direction. This downgradient well (Drawing 4, ID#1) is located approximately 1,075 feet downgradient of the Site. Currently, the presence of the well (ID#1) has been confirmed via a telephone conversation to Cal Water (the well owner and water service provider), but sanitary seal specifications or use are not known. Additionally, downgradient Site monitoring well MW-8, which appears to be located between the Site plume and the municipal well, has not been sampled for over 10 years. This municipal supply well needs further evaluation to determine if there is a risk from petroleum hydrocarbons migrating from the Site.	Y	1) Current Analytical Data from Monitoring Well Between Downgradient Municipal Well and Site is not Available 2) More Information Regarding the Downgradient Well's Use and Construction is Needed

Notes:

bgs = below ground surface
TPHg = Total Petroleum Hydrocarbons as Gasoline
GRO = Gasoline Range Organics
DRO = Diesel Range Organics
MTBE = Methyl tert-butyl Ether
All report references are included in Section 3 of the preceding report
MTBE = Methyl tert-butyl Ether
BTEX = benzene, toluene, ethylbenzene, xylenes
µg/L = micrograms per liter
mg/Kg = milligrams per kilogram
ESLs = Environmental Screening Levels

Table 2. Summary of Groundwater Monitoring Data: Relative Water Elevations and Laboratory Analyses

ARCO Service Station #0771, 899 Rincon Ave., Livermore, CA

Well ID and Date Monitored	P/NP	TOC (feet)	Top of Screen (ft bgs)	Bottom of Screen (ft bgs)	DTW (feet)	Water Level Elevation (feet)	Concentrations in µg/L						DO (mg/L)	pH	Footnote
							GRO/ TPHg	Benzene	Toluene	Ethyl-Benzene	Total Xylenes	MTBE			
MW-1															
3/20/1995	--	451.73	32.00	41.00	24.50	427.23	90,000	1,800	1,100	1,000	5,600	--	--	--	
6/2/1995	--		32.00	41.00	25.60	426.13	81,000	2,000	1,400	990	4,600	--	--	--	
8/23/1995	--		32.00	41.00	29.04	422.69	44,000	2,400	1,900	670	3,800	<300	--	--	
12/4/1995	--		32.00	41.00	31.31	420.42	22,000	870	660	390	2,200	--	--	--	
2/20/1996	--		32.00	41.00	22.26	429.47	21,000	1,500	1,200	650	3,500	<300	--	--	
5/15/1996	--		32.00	41.00	23.42	428.31	36,000	3,000	2,500	960	5,700	<250	--	--	
8/13/1996	--		32.00	41.00	26.83	424.90	19,000	730	580	450	2,500	<200	--	--	
11/13/1996	--		32.00	41.00	31.05	420.68	6,600	47	16	74	160	<30	--	--	
3/26/1997	--		32.00	41.00	26.29	425.44	1,900	100	55	37	200	<30	--	--	
5/15/1997	--		32.00	41.00	28.65	423.08	16,000	490	250	250	1,100	<120	--	--	
8/26/1997	--		32.00	41.00	31.53	420.20	190	6.7	3	6.3	25	<3	--	--	
11/5/1997	--		32.00	41.00	33.93	417.80	63	0.5	<0.5	0.8	2.4	29	--	--	
2/18/1998	--		32.00	41.00	20.46	431.27	23,000	1,500	610	550	3,000	<120	--	--	
5/20/1998	--		32.00	41.00	23.84	427.89	50,000	4,400	1,900	1,400	80,000	<300	--	--	
7/30/1998	P		32.00	41.00	26.94	424.79	150	<0.5	<0.5	<0.5	1.6	<3	8.74	--	
10/29/1998	NP		32.00	41.00	32.58	419.15	<50	<0.5	<0.5	<0.5	1.8	<3	2.0	--	
3/16/1999	P		32.00	41.00	26.20	425.53	3,200	160	32	89	390	270	2.0	--	
5/5/1999	P		32.00	41.00	27.57	424.16	3,600	140	46	76	290	170	11.65	--	
8/26/1999	P		32.00	41.00	30.25	421.48	3,200	210	29	100	220	120	1.43	--	
12/3/1999	NP		32.00	41.00	32.70	419.03	53	<0.5	<0.5	<0.5	1	<3	2.12	--	
3/13/2000	P		32.00	41.00	24.45	427.28	<50	<0.5	<0.5	<0.5	<1	<3	5.81	--	
6/20/2000	--		32.00	41.00	27.79	423.94	67.4	3.88	<0.500	1.78	1.48	<2.50	--	--	b
6/20/2000	P		32.00	41.00	27.79	423.94	356	40.1	7.17	11.9	22.7	<2.50	5.1	--	
8/31/2000	--		32.00	41.00	30.35	421.38	--	--	--	--	--	--	--	--	
2/9/2001	--		32.00	41.00	30.95	420.78	--	--	--	--	--	--	--	--	
9/17/2001	--		32.00	41.00	30.85	420.88	--	--	--	--	--	--	--	--	
1/21/2002	--		32.00	41.00	30.61	421.12	--	--	--	--	--	--	--	--	
7/19/2002	--		32.00	41.00	31.55	420.18	--	--	--	--	--	--	--	--	
1/15/2003	--		32.00	41.00	22.99	428.74	--	--	--	--	--	--	--	--	
7/9/2003	--		32.00	41.00	30.35	421.38	--	--	--	--	--	--	--	--	

Table 2. Summary of Groundwater Monitoring Data: Relative Water Elevations and Laboratory Analyses

ARCO Service Station #0771, 899 Rincon Ave., Livermore, CA

Well ID and Date Monitored	P/NP	TOC (feet)	Top of Screen (ft bgs)	Bottom of Screen (ft bgs)	DTW (feet)	Water Level Elevation (feet)	Concentrations in µg/L							pH	Footnote
							GRO/ TPHg	Benzene	Toluene	Ethyl-Benzene	Total Xylenes	MTBE	DO (mg/L)		
MW-1 Cont.															
02/19/2004	--	451.73	32.00	41.00	26.24	425.49	--	--	--	--	--	--	--	--	
08/04/2004	--	454.23	32.00	41.00	26.36	427.87	--	--	--	--	--	--	--	--	
01/18/2005	--		32.00	41.00	24.47	429.76	--	--	--	--	--	--	--	--	
07/15/2005	--		32.00	41.00	29.44	424.79	--	--	--	--	--	--	--	--	
01/10/2006	--		32.00	41.00	22.58	431.65	--	--	--	--	--	--	--	--	
7/21/2006	--		32.00	41.00	20.73	433.50	--	--	--	--	--	--	--	--	
1/17/2007	--		32.00	41.00	31.88	422.35	--	--	--	--	--	--	--	--	
7/18/2007	--		32.00	41.00	32.85	421.38	--	--	--	--	--	--	--	--	
1/15/2008	--		32.00	41.00	28.76	425.47	--	--	--	--	--	--	--	--	
7/7/2008	--		32.00	41.00	35.56	418.67	--	--	--	--	--	--	--	--	
1/7/2009	--		32.00	41.00	34.07	420.16	--	--	--	--	--	--	--	--	
7/22/2009	--		32.00	41.00	--	--	--	--	--	--	--	--	--	--	Dry
3/12/2010	--		32.00	41.00	27.61	426.62	--	--	--	--	--	--	--	--	
9/9/2010	--		32.00	41.00	31.72	422.51	--	--	--	--	--	--	--	--	
2/17/2011	--		32.00	41.00	32.11	422.12	--	--	--	--	--	--	--	--	
7/7/2011	--		32.00	41.00	31.12	423.11	--	--	--	--	--	--	--	--	
1/23/2012	--		32.00	41.00	34.34	419.89	--	--	--	--	--	--	--	--	
7/25/2012	--		32.00	41.00	--	--	--	--	--	--	--	--	--	--	Dry
1/17/2013	**--**		**32.00**	**41.00**	**30.14**	**424.09**	**--**	**--**	**--**	**--**	**--**	**--**	**--**	**--**	
MW-2															
3/20/1995	--	449.49	30.00	38.00	20.27	429.22	54,000	2,600	1,600	1,200	7,600	--	--	--	
6/2/1995	--		30.00	38.00	22.32	427.17	37,000	2,200	800	980	4,800	--	--	--	
8/23/1995	--		30.00	38.00	25.69	423.80	65,000	1,100	310	840	3,000	<500	--	--	
12/4/1995	--		30.00	38.00	28.52	420.97	19,000	680	150	410	1,600	--	--	--	
2/20/1996	--		30.00	38.00	19.00	430.49	22,000	1,200	240	590	2,200	<300	--	--	
5/15/1996	--		30.00	38.00	20.03	429.46	25,000	1,200	240	610	2,100	<300	--	--	
8/13/1996	--		30.00	38.00	24.44	425.05	19,000	640	110	420	1,200	<300	--	--	
11/13/1996	--		30.00	38.00	28.42	421.07	15,000	260	52	220	640	<200	--	--	
3/26/1997	--		30.00	38.00	22.98	426.51	17,000	580	120	360	980	<120	--	--	
5/15/1997	--		30.00	38.00	25.40	424.09	18,000	420	63	340	730	<120	--	--	

Table 2. Summary of Groundwater Monitoring Data: Relative Water Elevations and Laboratory Analyses

ARCO Service Station #0771, 899 Rincon Ave., Livermore, CA

Well ID and Date Monitored	P/NP	TOC (feet)	Top of Screen (ft bgs)	Bottom of Screen (ft bgs)	DTW (feet)	Water Level Elevation (feet)	Concentrations in µg/L						DO (mg/L)	pH	Footnote
							GRO/ TPHg	Benzene	Toluene	Ethyl-Benzene	Total Xylenes	MTBE			
MW-2 Cont.															
8/26/1997	--	449.49	30.00	38.00	28.38	421.11	5,300	210	26	140	270	<120	--	--	
11/5/1997	--		30.00	38.00	31.93	417.56	560	42	2.6	7	9	<40	--	--	
2/18/1998	--		30.00	38.00	16.87	432.62	18,000	710	120	480	1,100	130	--	--	
5/20/1998	--		30.00	38.00	20.29	429.20	16,000	480	72	440	1,100	<120	--	--	
7/30/1998	P		30.00	38.00	23.51	425.98	9,700	240	33	210	490	<120	9.21	--	
10/29/1998	NP		30.00	38.00	30.08	419.41	58	<0.5	<0.5	<0.5	1.2	<3	1.0	--	
3/16/1999	P		30.00	38.00	23.22	426.27	4,700	120	13	90	220	60	2.0	--	
5/5/1999	P		30.00	38.00	24.05	425.44	5,500	58	7.1	58	98	17	9.09	--	
8/26/1999	P		30.00	38.00	26.44	423.05	3,700	55	11	60	64	26	1.9	--	
12/3/1999	NP		30.00	38.00	30.15	419.34	130	<0.5	<0.5	0.7	1.8	<3	1.96	--	
3/13/2000	P		30.00	38.00	20.68	428.81	<50	<0.5	<0.5	<0.5	<1	<3	--	--	
6/20/2000	P		30.00	38.00	23.08	426.41	226	2.2	<0.500	4.83	7.88	<2.50	4.9	--	
8/31/2000	P		30.00	38.00	26.71	422.78	87.1	1.78	<0.500	1.33	1.15	<2.50	1.59	--	
2/9/2001	--		30.00	38.00	29.65	419.84	--	--	--	--	--	--	--	--	
9/17/2001	P		30.00	38.00	27.62	421.87	3,100	300	12	8.8	18	120	1.7	--	
1/21/2002	--		30.00	38.00	27.09	422.40	--	--	--	--	--	--	--	--	
7/19/2002	P		30.00	38.00	27.82	421.67	4,700	280	13	120	19	16	0.8	7.4	a
1/15/2003	--		30.00	38.00	22.18	427.31	--	--	--	--	--	--	--	--	
7/9/2003	--		30.00	38.00	26.40	423.09	3,900	170	<5.0	100	19	39	2.5	7.0	
02/19/2004	--		30.00	38.00	23.85	425.64	--	--	--	--	--	--	--	--	
08/04/2004	P	452.05	30.00	38.00	24.71	427.34	5,400	650	21	160	56	78	0.8	7.2	
01/18/2005	--		30.00	38.00	20.86	431.19	--	--	--	--	--	--	--	--	
07/15/2005	P		30.00	38.00	25.92	426.13	5,200	160	5.3	56	10	46	3.1	6.9	
01/10/2006	--		30.00	38.00	19.25	432.80	--	--	--	--	--	--	--	--	
7/21/2006	P		30.00	38.00	25.73	426.32	120	0.90	<0.50	<0.50	<0.50	<0.50	6.08	8.3	
1/17/2007	--		30.00	38.00	28.70	423.35	--	--	--	--	--	--	--	--	
7/18/2007	P		30.00	38.00	29.07	422.98	2,300	58	2.4	9.5	3.5	45	1.19	7.51	
1/15/2008	--		30.00	38.00	24.65	427.40	--	--	--	--	--	--	--	--	
7/7/2008	NP		30.00	38.00	32.41	419.64	3,600	28	<5.0	<5.0	<5.0	19	2.81	7.24	
1/7/2009	--		30.00	38.00	31.67	420.38	--	--	--	--	--	--	--	--	

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ARCO Service Station #0771, 899 Rincon Ave., Livermore, CA

Well ID and Date Monitored	P/NP	TOC (feet)	Top of Screen (ft bgs)	Bottom of Screen (ft bgs)	DTW (feet)	Water Level Elevation (feet)	Concentrations in µg/L						DO (mg/L)	pH	Footnote
							GRO/ TPHg	Benzene	Toluene	Ethyl-Benzene	Total Xylenes	MTBE			
MW-2 Cont.															
7/22/2009	--	452.05	30.00	38.00	33.48	418.57	--	--	--	--	--	--	--	--	
3/12/2010	--		30.00	38.00	23.84	428.21	--	--	--	--	--	--	--	--	
9/9/2010	P		30.00	38.00	27.84	424.21	6,200	53	3.8	18	9.5	13	--	6.8	
2/17/2011	--		30.00	38.00	27.52	424.53	--	--	--	--	--	--	--	--	
7/7/2011	P		30.00	38.00	26.62	425.43	1,600	17	0.76	1.2	1.5	6.2	1.02	7.1	g (GRO)
1/23/2012	--		30.00	38.00	32.32	419.73	--	--	--	--	--	--	--	--	
7/25/2012	--		30.00	38.00	34.10	417.95	--	--	--	--	--	--	--	--	h
8/31/2012	--		30.00	38.00	--	--	--	--	--	--	--	--	--	--	Dry
1/17/2013	**--**		**30.00**	**38.00**	**26.14**	**425.91**	**--**	**--**	**--**	**--**	**--**	**--**	**--**	**--**	
MW-3															
3/20/1995	--	450.28	32.00	40.00	22.19	428.09	94	<0.5	<0.5	<0.5	<0.5	--	--	--	
6/2/1995	--		32.00	40.00	23.28	427.00	72	<0.5	<0.5	<0.5	<0.5	--	--	--	
8/23/1995	--		32.00	40.00	26.55	423.73	98	<0.5	<0.5	<0.6	0.5	<3	--	--	
12/4/1995	--		32.00	40.00	29.52	420.76	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	
2/20/1996	--		32.00	40.00	19.83	430.45	130	<0.5	<0.5	<0.5	<0.5	<3	--	--	
5/15/1996	--		32.00	40.00	21.03	429.25	120	<0.5	<0.5	<0.5	<0.5	<0.5	--	--	
8/13/1996	--		32.00	40.00	25.67	424.61	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--	
11/13/1996	--		32.00	40.00	21.57	428.71	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--	
3/26/1997	--		32.00	40.00	24.15	426.13	<50	1.1	<0.5	<0.5	<0.5	<3	--	--	
5/15/1997	--		32.00	40.00	26.85	423.43	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--	
8/26/1997	--		32.00	40.00	30.07	420.21	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--	
11/5/1997	--		32.00	40.00	32.46	417.82	<50	<0.5	0.7	<0.5	<0.5	<3	--	--	
2/18/1998	--		32.00	40.00	17.82	432.46	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--	
5/20/1998	--		32.00	40.00	21.41	428.87	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--	
7/30/1998	P		32.00	40.00	26.41	423.87	<50	<0.5	<0.5	<0.5	<0.5	<3	9.56	--	
10/29/1998	P		32.00	40.00	31.33	418.95	<50	<0.5	<0.5	<0.5	<0.5	<3	1.0	--	
3/16/1999	P		32.00	40.00	24.61	425.67	<50	<0.5	<0.5	<0.5	<0.5	<3	1.0	--	
5/5/1999	P		32.00	40.00	25.75	424.53	140	<0.5	<0.5	0.6	<0.5	<3	4.43	--	
8/26/1999	P		32.00	40.00	28.49	421.79	80	0.6	0.6	0.6	1	<3	1.69	--	
12/3/1999	P		32.00	40.00	31.45	418.83	<50	<0.5	<0.5	<0.5	<1	<3	2.26	--	

Table 2. Summary of Groundwater Monitoring Data: Relative Water Elevations and Laboratory Analyses

ARCO Service Station #0771, 899 Rincon Ave., Livermore, CA

Well ID and Date Monitored	P/NP	TOC (feet)	Top of Screen (ft bgs)	Bottom of Screen (ft bgs)	DTW (feet)	Water Level Elevation (feet)	Concentrations in µg/L						DO (mg/L)	pH	Footnote
							GRO/ TPHg	Benzene	Toluene	Ethyl-Benzene	Total Xylenes	MTBE			
MW-3 Cont.															
3/13/2000	P	450.28	32.00	40.00	22.18	428.10	<50	<0.5	<0.5	<0.5	<1	<3	4.41	--	
6/20/2000	P		32.00	40.00	26.03	424.25	<50.0	<0.500	<0.500	<0.500	<0.500	<2.50	2.3	--	
8/31/2000	--		32.00	40.00	28.75	421.53	--	--	--	--	--	--	--	--	
2/9/2001	--		32.00	40.00	31.04	419.24	--	--	--	--	--	--	--	--	
9/17/2001	--		32.00	40.00	29.04	421.24	--	--	--	--	--	--	--	--	
1/21/2002	--		32.00	40.00	28.81	421.47	--	--	--	--	--	--	--	--	
7/19/2002	--		32.00	40.00	28.92	421.36	--	--	--	--	--	--	--	--	
1/15/2003	--		32.00	40.00	22.88	427.40	--	--	--	--	--	--	--	--	
7/9/2003	--		32.00	40.00	28.00	422.28	--	--	--	--	--	--	--	--	
02/19/2004	--		32.00	40.00	25.29	424.99	--	--	--	--	--	--	--	--	
08/04/2004	--	452.75	32.00	40.00	27.40	425.35	--	--	--	--	--	--	--	--	
01/18/2005	--		32.00	40.00	22.76	429.99	--	--	--	--	--	--	--	--	
07/15/2005	--		32.00	40.00	25.95	426.80	--	--	--	--	--	--	--	--	
01/10/2006	--		32.00	40.00	21.18	431.57	--	--	--	--	--	--	--	--	
7/21/2006	--		32.00	40.00	25.73	427.02	--	--	--	--	--	--	--	--	
1/17/2007	--		32.00	40.00	30.51	422.24	--	--	--	--	--	--	--	--	
7/18/2007	--		32.00	40.00	29.53	423.22	--	--	--	--	--	--	--	--	
1/15/2008	--		32.00	40.00	27.65	425.10	--	--	--	--	--	--	--	--	
7/7/2008	--		32.00	40.00	33.38	419.37	--	--	--	--	--	--	--	--	
1/7/2009	--		32.00	40.00	34.09	418.66	--	--	--	--	--	--	--	--	
7/22/2009	--		32.00	40.00	34.98	417.77	--	--	--	--	--	--	--	--	
3/12/2010	--		32.00	40.00	25.89	426.86	--	--	--	--	--	--	--	--	
9/9/2010	--		32.00	40.00	31.13	421.62	--	--	--	--	--	--	--	--	
2/17/2011	--		32.00	40.00	30.28	422.47	--	--	--	--	--	--	--	--	
7/7/2011	--		32.00	40.00	30.48	422.27	--	--	--	--	--	--	--	--	
1/23/2012	--		32.00	40.00	34.29	418.46	--	--	--	--	--	--	--	--	
7/25/2012	--		32.00	40.00	37.39	415.36	--	--	--	--	--	--	--	--	
1/17/2013	**--**		**32.00**	**40.00**	**29.24**	**423.51**	**--**	**--**	**--**	**--**	**--**	**--**	**--**	**--**	
MW-4															
3/20/1995	--	451.09	26.00	42.00	22.68	428.41	12,000	1,000	100	450	700	--	--	--	

Table 2. Summary of Groundwater Monitoring Data: Relative Water Elevations and Laboratory Analyses

ARCO Service Station #0771, 899 Rincon Ave., Livermore, CA

Well ID and Date Monitored	P/NP	TOC (feet)	Top of Screen (ft bgs)	Bottom of Screen (ft bgs)	DTW (feet)	Water Level Elevation (feet)	Concentrations in µg/L						DO (mg/L)	pH	Footnote
							GRO/ TPHg	Benzene	Toluene	Ethyl-Benzene	Total Xylenes	MTBE			
MW-4 Cont.															
6/2/1995	--	451.09	26.00	42.00	24.41	426.68	9,000	850	56	380	430	--	--	--	
8/23/1995	--		26.00	42.00	27.72	423.37	5,300	400	25	240	170	<100	--	--	
12/4/1995	--		26.00	42.00	29.85	421.24	6,700	100	<10	90	38	--	--	--	
2/20/1996	--		26.00	42.00	21.16	429.93	7,000	360	22	180	160	<70	--	--	
5/15/1996	--		26.00	42.00	22.18	428.91	--	--	--	--	--	--	--	--	
8/13/1996	--		26.00	42.00	26.20	424.89	--	--	--	--	--	--	--	--	
11/13/1996	--		26.00	42.00	29.72	421.37	--	--	--	--	--	--	--	--	
3/26/1997	--		26.00	42.00	21.86	429.23	8,900	390	33	200	250	<70	--	--	
5/15/1997	--		26.00	42.00	26.92	424.17	--	--	--	--	--	--	--	--	
8/26/1997	--		26.00	42.00	29.30	421.79	--	--	--	--	--	--	--	--	
11/5/1997	--		26.00	42.00	32.14	418.95	--	--	--	--	--	--	--	--	
2/18/1998	--		26.00	42.00	19.30	431.79	5,300	220	19	160	130	120	--	--	
5/20/1998	--		26.00	42.00	22.40	428.69	--	--	--	--	--	--	--	--	
7/30/1998	--		26.00	42.00	25.74	425.35	--	--	--	--	--	--	--	--	
10/29/1998	--		26.00	42.00	31.26	419.83	--	--	--	--	--	--	--	--	
3/16/1999	P		26.00	42.00	25.05	426.04	1,900	49	<5	43	<5	82	1.5	--	
5/5/1999	--		26.00	42.00	26.15	424.94	--	--	--	--	--	--	--	--	
8/26/1999	--		26.00	42.00	28.60	422.49	--	--	--	--	--	--	1.43	--	
12/3/1999	--		26.00	42.00	31.53	419.56	--	--	--	--	--	--	--	--	
3/13/2000	P		26.00	42.00	23.61	427.48	<50	<0.5	<0.5	<0.5	<1	<3	3.82	--	
6/20/2000	--		26.00	42.00	26.38	424.71	--	--	--	--	--	--	0.4	--	
8/31/2000	NP		26.00	42.00	29.55	421.54	<50.0	<0.500	<0.500	<0.500	<0.500	<2.50	1.04	--	
2/9/2001	NP		26.00	42.00	30.30	420.79	<50.0	<0.500	<0.500	<0.500	<0.500	<2.50	1.39	--	
9/17/2001	NP		26.00	42.00	29.90	421.19	3,400	51	<5.0	16	23	360	0.92	--	
1/21/2002	NP		26.00	42.00	29.51	421.58	1,900	140	12	27	48	300	1.03	--	
7/19/2002	NP		26.00	42.00	30.77	420.32	2,700	150	9.9	<5.0	<5.0	130	1.0	7.3	a
1/15/2003	--		26.00	42.00	23.56	427.53	4,800	150	5.3	28	46	150	1.3	7.0	a
7/9/2003	--		26.00	42.00	29.50	421.59	3,000	210	9.4	6	20	150	2.0	6.9	
02/19/2004	P		26.00	42.00	26.35	424.74	4,800	270	11	25	19	180	1.8	6.2	c
08/04/2004	NP	453.80	26.00	42.00	26.48	427.32	4,200	410	13	49	59	300	0.7	6.7	

Table 2. Summary of Groundwater Monitoring Data: Relative Water Elevations and Laboratory Analyses

ARCO Service Station #0771, 899 Rincon Ave., Livermore, CA

Well ID and Date Monitored	P/NP	TOC (feet)	Top of Screen (ft bgs)	Bottom of Screen (ft bgs)	DTW (feet)	Water Level Elevation (feet)	Concentrations in µg/L						DO (mg/L)	pH	Footnote
							GRO/ TPHg	Benzene	Toluene	Ethyl-Benzene	Total Xylenes	MTBE			
MW-4 Cont.															
01/18/2005	P	453.80	26.00	42.00	23.15	430.65	4,500	250	9.5	62	22	160	1.2	6.9	
07/15/2005	NP		26.00	42.00	28.13	425.67	3,500	230	6.1	19	15	230	0.5	7.0	
01/10/2006	P		26.00	42.00	21.49	432.31	5,500	250	7.6	37	25	190	1.3	7.1	
7/21/2006	NP		26.00	42.00	28.88	424.92	66	0.60	<0.50	0.52	0.82	3.1	4.75	8.3	
1/17/2007	NP		26.00	42.00	30.80	423.00	<50	<0.50	<0.50	<0.50	<0.50	11	6.19	8.03	
7/18/2007	NP		26.00	42.00	32.00	421.80	2,400	140	6.8	1.3	4.1	74	5.03	7.12	
1/15/2008	NP		26.00	42.00	27.30	426.50	220	1.2	<0.50	<0.50	0.50	61	3.29	6.94	f (MTBE)
7/7/2008	NP		26.00	42.00	34.78	419.02	<50	3.1	<0.50	<0.50	0.66	17	4.03	7.26	
1/7/2009	NP		26.00	42.00	32.59	421.21	110	1.1	<0.50	<0.50	<0.50	37	2.79	7.26	
7/22/2009	NP		26.00	42.00	36.77	417.03	3,000	320	7.8	5.3	16	63	10.82	7.45	
3/12/2010	NP		26.00	42.00	26.38	427.42	1,700	150	4.6	8.3	2.3	43	1.14	7.08	
9/9/2010	NP		26.00	42.00	28.20	425.60	3,300	70	<2.5	3.6	3.6	51	--	6.8	
2/17/2011	NP		26.00	42.00	30.62	423.18	2,300	59	2.2	2.2	5.0	33	1.03	7.8	g (GRO)
7/7/2011	NP		26.00	42.00	27.98	425.82	2,000	79	2.7	<2.5	3.3	57	0.70	6.9	g (GRO)
1/23/2012	P		26.00	42.00	33.57	420.23	980	51	2.4	<2.0	<2.0	44	1.14	6.89	g (GRO)
7/25/2012	P		26.00	42.00	35.81	417.99	1,700	86	4.1	1.1	4.6	49	3.45	7.23	
8/31/2012	--		26.00	42.00	36.53	417.27	--	--	--	--	--	--	--	--	
1/17/2013	**P**		**26.00**	**42.00**	**28.31**	**425.49**	**1,500**	**460**	**12**	**8.0**	**<5.0**	**110**	**1.16**	**7.62**	
MW-5															
3/20/1995	--	451.40	31.50	41.00	23.20	428.20	26,000	1,300	180	890	2,900	--	--	--	
6/2/1995	--		31.50	41.00	24.80	426.60	39,000	940	160	740	1,900	--	--	--	
8/23/1995	--		31.50	41.00	28.10	423.30	14,000	490	74	250	890	<300	--	--	
12/4/1995	--		31.50	41.00	29.83	421.57	7,600	230	13	61	80	--	--	--	
2/20/1996	--		31.50	41.00	21.63	429.77	4,300	220	12	45	130	<50	--	--	
5/15/1996	--		31.50	41.00	22.87	428.53	2,200	380	17	58	84	<40	--	--	
8/13/1996	--		31.50	41.00	26.48	424.92	1,700	150	16	24	35	47	--	--	
11/13/1996	--		31.50	41.00	29.68	421.72	850	150	11	19	37	66	--	--	
3/26/1997	--		31.50	41.00	25.14	426.26	2,400	440	21	79	210	68	--	--	
5/15/1997	--		31.50	41.00	27.38	424.02	3,900	510	19	140	240	48	--	--	
8/26/1997	--		31.50	41.00	29.89	421.51	76	4.9	<0.5	1.5	2	9	--	--	

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ARCO Service Station #0771, 899 Rincon Ave., Livermore, CA

Well ID and Date Monitored	P/NP	TOC (feet)	Top of Screen (ft bgs)	Bottom of Screen (ft bgs)	DTW (feet)	Water Level Elevation (feet)	Concentrations in µg/L							pH	Footnote
							GRO/ TPHg	Benzene	Toluene	Ethyl-Benzene	Total Xylenes	MTBE	DO (mg/L)		
MW-5 Cont.															
11/5/1997	--	451.40	31.50	41.00	32.57	418.83	63	0.8	<0.5	<0.5	1.2	34	--	--	
2/18/1998	--		31.50	41.00	19.99	431.41	6,200	630	70	320	640	320	--	--	
5/20/1998	--		31.50	41.00	23.21	428.19	2,300	340	21	110	140	62	--	--	
7/30/1998	P		31.50	41.00	26.19	425.21	<50	0.8	<0.5	0.6	0.9	<3	8.83	--	
10/29/1998	NP		31.50	41.00	31.92	419.48	<50	<0.5	<0.5	<0.5	<0.5	<3	2.0	--	
3/16/1999	P		31.50	41.00	25.80	425.60	1,300	170	8	59	65	120	2.0	--	
5/5/1999	P		31.50	41.00	27.09	424.31	320	31	1.1	13	13	19	12.09	--	
8/26/1999	P		31.50	41.00	29.67	421.73	260	13	1.7	4.2	6.3	150	1.31	--	
12/3/1999	--		31.50	41.00	--	--	--	--	--	--	--	--	--	--	d
3/13/2000	P		31.50	41.00	24.51	426.89	<50	<0.5	<0.5	<0.5	<1	<3	4.41	--	
6/20/2000	P		31.50	41.00	27.37	424.03	60.8	4.84	<0.500	1.9	1.59	<2.50	5.3	--	
8/31/2000	P		31.50	41.00	30.21	421.19	<50.0	1.18	<0.500	<0.500	<0.500	3.83	0.97	--	
2/9/2001	--		31.50	41.00	30.19	421.21	--	--	--	--	--	--	--	--	
9/17/2001	P		31.50	41.00	30.71	420.69	2,700	120	10	90	77	330	0.81	--	
1/21/2002	--		31.50	41.00	30.40	421.00	--	--	--	--	--	--	--	--	
7/19/2002	P		31.50	41.00	31.93	419.47	1,600	170	7	120	<5.0	180	1.7	7.2	a
1/15/2003	--		31.50	41.00	23.12	428.28	--	--	--	--	--	--	--	--	
7/9/2003	--		31.50	41.00	30.95	420.45	2,000	160	5.7	67	27	260	1.5	6.9	
02/19/2004	--		31.50	41.00	26.73	424.67	--	--	--	--	--	--	--	--	
08/04/2004	P	453.52	31.50	41.00	26.61	426.91	2,100	250	5.3	73	22	250	2.7	7.0	
01/18/2005	--		31.50	41.00	24.10	429.42	--	--	--	--	--	--	--	--	
07/15/2005	P		31.50	41.00	29.27	424.25	1,600	61	<5.0	8.7	<5.0	270	2.1	6.9	
01/10/2006	--		31.50	41.00	22.19	431.33	--	--	--	--	--	--	--	--	
7/21/2006	P		31.50	41.00	30.36	423.16	2,100	29	<5.0	7.5	11	14	2.98	7.1	
1/17/2007	--		31.50	41.00	31.77	421.75	--	--	--	--	--	--	--	--	
7/18/2007	NP		31.50	41.00	33.42	420.10	470	36	0.84	0.97	2.2	110	1.73	7.50	
1/15/2008	--		31.50	41.00	28.60	424.92	--	--	--	--	--	--	--	--	
7/7/2008	NP		31.50	41.00	35.80	417.72	<50	<0.50	<0.50	<0.50	<0.50	<0.50	7.55	7.79	
1/7/2009	--		31.50	41.00	33.14	420.38	--	--	--	--	--	--	--	--	
7/22/2009	NP		31.50	41.00	37.84	415.68	100	3.0	<0.50	<0.50	<0.50	12	12.34	7.24	

Table 2. Summary of Groundwater Monitoring Data: Relative Water Elevations and Laboratory Analyses

ARCO Service Station #0771, 899 Rincon Ave., Livermore, CA

Well ID and Date Monitored	P/NP	TOC (feet)	Top of Screen (ft bgs)	Bottom of Screen (ft bgs)	DTW (feet)	Water Level Elevation (feet)	Concentrations in µg/L						DO (mg/L)	pH	Footnote
							GRO/ TPHg	Benzene	Toluene	Ethyl-Benzene	Total Xylenes	MTBE			
MW-5 Cont.															
3/12/2010	--	453.52	31.50	41.00	27.29	426.23	--	--	--	--	--	--	--	--	
9/9/2010	P		31.50	41.00	28.96	424.56	1,000	18	1.4	0.55	3.2	10	--	6.9	
2/17/2011	--		31.50	41.00	31.49	422.03	--	--	--	--	--	--	--	--	
7/7/2011	P		31.50	41.00	28.72	424.80	620	9.0	0.60	<0.50	0.61	4.6	1.60	7.0	g (GRO)
1/23/2012	--		31.50	41.00	33.27	420.25	--	--	--	--	--	--	--	--	
7/25/2012	P		31.50	41.00	36.29	417.23	500	11	1.1	<0.50	2.6	11	3.07	7.23	
1/17/2013	**--**		**31.50**	**41.00**	**29.11**	**424.41**	**--**	**--**	**--**	**--**	**--**	**--**	**--**	**--**	
MW-6															
3/20/1995	--	451.37	32.00	42.00	25.19	426.18	2,600	210	87	82	140	--	--	--	
6/2/1995	--		32.00	42.00	25.75	425.62	1,600	55	7.9	40	26	--	--	--	
8/23/1995	--		32.00	42.00	29.53	421.84	1,400	42	2.5	36	13	<20	--	--	
12/4/1995	--		32.00	42.00	32.28	419.09	2,500	52	5.8	59	13	--	--	--	
2/20/1996	--		32.00	42.00	22.27	429.10	2,500	120	16	73	12	<30	--	--	
5/15/1996	--		32.00	42.00	23.86	427.51	2,000	71	6.4	47	25	<15	--	--	
8/13/1996	--		32.00	42.00	28.55	422.82	3,800	91	8.2	69	25	<20	--	--	
11/13/1996	--		32.00	42.00	32.04	419.33	1,900	55	3.3	55	8.5	16	--	--	
3/26/1997	--		32.00	42.00	26.84	424.53	1,800	51	5	32	15	<30	--	--	
5/15/1997	--		32.00	42.00	29.58	421.79	2,400	46	3	29	9	<12	--	--	
8/26/1997	--		32.00	42.00	32.67	418.70	1,400	61	6	33	10	<12	--	--	
11/5/1997	--		32.00	42.00	34.62	416.75	690	29	2.7	18	3.4	9	--	--	
2/18/1998	--		32.00	42.00	20.09	431.28	1,800	74	5	24	12	19	--	--	
5/20/1998	--		32.00	42.00	24.05	427.32	1,900	280	4	31	16	9	--	--	
7/30/1998	P		32.00	42.00	28.72	422.65	2,300	110	7	36	20	<15	--	--	
10/29/1998	P		32.00	42.00	32.77	418.60	2,500	14	13	17	12	<12	1.0	--	
3/16/1999	P		32.00	42.00	26.45	424.92	1,200	65	4	27	13	18	0.5	--	
5/5/1999	P		32.00	42.00	27.86	423.51	2,200	53	4	26	6	25	5.59	--	
8/26/1999	P		32.00	42.00	30.49	420.88	1,100	11	6	10	4	13	2.35	--	
12/3/1999	P		32.00	42.00	32.35	419.02	370	<0.5	<0.5	0.8	<1	4	2.36	--	
3/13/2000	P		32.00	42.00	28.36	423.01	54	2.1	0.5	0.9	1.4	<3	4.22	--	
6/20/2000	P		32.00	42.00	28.35	423.02	195	1.83	<0.500	0.528	<0.500	<2.50	3.5	--	

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Well ID and Date Monitored	P/NP	TOC (feet)	Top of Screen (ft bgs)	Bottom of Screen (ft bgs)	DTW (feet)	Water Level Elevation (feet)	Concentrations in µg/L						DO (mg/L)	pH	Footnote
							GRO/ TPHg	Benzene	Toluene	Ethyl-Benzene	Total Xylenes	MTBE			
MW-6 Cont.															
8/31/2000	P	451.37	32.00	42.00	30.20	421.17	276	3.52	0.788	1.15	0.621	8.73	7.0	--	
2/9/2001	--		32.00	42.00	30.70	420.67	222	4.49	2.73	0.579	0.523	57.1	--	--	b
2/9/2001	P		32.00	42.00	30.70	420.67	253	5.44	2.93	0.924	0.977	48.9	0.59	--	
9/17/2001	P		32.00	42.00	30.94	420.43	<50	<0.50	<0.50	<0.50	<0.50	<2.5	2.79	--	
9/17/2001	--		32.00	42.00	30.94	420.43	<50	<0.50	<0.50	<0.50	<0.50	<2.5	--	--	b
1/21/2002	P		32.00	42.00	30.55	420.82	<50	<0.50	<0.50	<0.50	<0.50	<5.0	1.9	--	
7/19/2002	P		32.00	42.00	30.27	421.10	60	2	<0.50	<0.50	<0.50	<0.50	3.5	7.9	a
1/15/2003	--		32.00	42.00	22.86	428.51	83	9.1	<0.50	3.4	4.6	1	2.5	7.2	a
7/9/2003	P		32.00	42.00	29.41	421.96	110	<0.50	<0.50	<0.50	<0.50	0.98	2.6	7.1	
02/19/2004	--		32.00	42.00	43.25	408.12	--	--	--	--	--	--	--	--	
08/04/2004	P	453.83	32.00	42.00	27.71	426.12	540	36	3.8	17	24	5.2	3.5	7.1	
01/18/2005	--		32.00	42.00	24.56	429.27	--	--	--	--	--	--	--	--	
07/15/2005	P		32.00	42.00	27.61	426.22	4,600	210	44	150	670	32	3.5	7.1	
01/10/2006	--		32.00	42.00	23.75	430.08	--	--	--	--	--	--	--	--	
7/21/2006	P		32.00	42.00	27.96	425.87	260	<0.50	<0.50	<0.50	0.86	5.1	2.60	7.2	
1/17/2007	--		32.00	42.00	30.57	423.26	--	--	--	--	--	--	--	--	
7/18/2007	P		32.00	42.00	30.96	422.87	<50	<0.50	<0.50	<0.50	<0.50	<0.50	4.95	7.57	
1/15/2008	--		32.00	42.00	28.89	424.94	--	--	--	--	--	--	--	--	
7/7/2008	NP		32.00	42.00	34.57	419.26	<50	<0.50	<0.50	<0.50	<0.50	<0.50	6.00	7.19	
1/7/2009	--		32.00	42.00	34.75	419.08	--	--	--	--	--	--	--	--	
7/22/2009	NP		32.00	42.00	35.84	417.99	<50	<0.50	<0.50	<0.50	<0.50	<0.50	16.67	7.68	
3/12/2010	--		32.00	42.00	27.89	425.94	--	--	--	--	--	--	--	--	
9/9/2010	NP		32.00	42.00	33.06	420.77	<50	<0.50	<0.50	<0.50	<0.50	<0.50	--	7.2	
2/17/2011	--		32.00	42.00	32.60	421.23	--	--	--	--	--	--	--	--	
7/7/2011	NP		32.00	42.00	32.72	421.11	430	<0.50	<0.50	<0.50	<0.50	8.0	2.04	7.1	g (GRO)
1/23/2012	--		32.00	42.00	35.61	418.22	--	--	--	--	--	--	--	--	
7/25/2012	P		32.00	42.00	38.78	415.05	500	3.3	<0.50	<0.50	1.7	10	3.07	7.45	
1/17/2013	**--**		**32.00**	**42.00**	**31.11**	**422.72**	**--**	**--**	**--**	**--**	**--**	**--**	**--**	**--**	
MW-7															
3/20/1995	--	450.33	30.00	40.00	22.07	428.26	31,000	2,300	400	620	2,900	--	--	--	

Table 2. Summary of Groundwater Monitoring Data: Relative Water Elevations and Laboratory Analyses

ARCO Service Station #0771, 899 Rincon Ave., Livermore, CA

Well ID and Date Monitored	P/NP	TOC (feet)	Top of Screen (ft bgs)	Bottom of Screen (ft bgs)	DTW (feet)	Water Level Elevation (feet)	Concentrations in µg/L						DO (mg/L)	pH	Footnote
							GRO/ TPHg	Benzene	Toluene	Ethyl-Benzene	Total Xylenes	MTBE			
MW-7 Cont.															
6/2/1995	--	450.33	30.00	40.00	23.42	426.91	40,000	1,400	280	610	2,400	--	--	--	
8/23/1995	--		30.00	40.00	27.13	423.20	25,000	1,400	200	600	1,600	350	--	--	
12/4/1995	--		30.00	40.00	29.45	420.88	23,000	1,100	74	490	720	--	--	--	
2/20/1996	--		30.00	40.00	20.25	430.08	39,000	1,200	140	640	1,800	<400	--	--	
5/15/1996	--		30.00	40.00	21.38	428.95	--	--	--	--	--	--	--	--	
8/13/1996	--		30.00	40.00	25.52	424.81	--	--	--	--	--	--	--	--	
11/13/1996	--		30.00	40.00	29.38	420.95	--	--	--	--	--	--	--	--	
3/26/1997	--		30.00	40.00	24.36	425.97	35,000	1,100	180	460	1,700	<300	--	--	
5/15/1997	--		30.00	40.00	26.90	423.43	--	--	--	--	--	--	--	--	
8/26/1997	--		30.00	40.00	30.21	420.12	--	--	--	--	--	--	--	--	
11/5/1997	--		30.00	40.00	32.49	417.84	--	--	--	--	--	--	--	--	
2/18/1998	--		30.00	40.00	18.10	432.23	19,000	1,100	120	460	1,700	240	--	--	
5/20/1998	--		30.00	40.00	21.68	428.65	--	--	--	--	--	--	--	--	
7/30/1998	--		30.00	40.00	26.07	424.26	--	--	--	--	--	--	--	--	
10/29/1998	--		30.00	40.00	31.13	419.20	--	--	--	--	--	--	--	--	
3/16/1999	P		30.00	40.00	24.45	425.88	8,600	430	51	200	680	<120	1.5	--	
5/5/1999	--		30.00	40.00	25.84	424.49	--	--	--	--	--	--	--	--	
8/26/1999	--		30.00	40.00	28.28	422.05	--	--	--	--	--	--	1.51	--	
12/3/1999	--		30.00	40.00	31.57	418.76	--	--	--	--	--	--	--	--	
3/13/2000	--		30.00	40.00	--	--	--	--	--	--	--	--	--	--	d
6/20/2000	--		30.00	40.00	25.91	424.42	--	--	--	--	--	--	5.4	--	
8/31/2000	--		30.00	40.00	28.40	421.93	8,410	344	58.9	276	581	202	0.09	--	
2/9/2001	--		30.00	40.00	30.04	420.29	2,030	203	12	17.9	49.4	128	1.55	--	
9/17/2001	P		30.00	40.00	29.03	421.30	4,800	200	14	9.9	27	160	0.29	--	
1/21/2002	--		30.00	40.00	28.98	421.35	2,600	280	17	41	50	97	--	--	b
1/21/2002	P		30.00	40.00	28.98	421.35	4,200	350	20	52	63	99	0.81	--	
7/19/2002	P		30.00	40.00	28.70	421.63	5,700	630	31	330	160	64	0.7	7.3	a
1/15/2003	--		30.00	40.00	21.91	428.42	12,000	470	19	340	310	91	1.5	7.0	a
7/9/2003	P		30.00	40.00	27.88	422.45	6,700	590	23	280	92	110	1.0	6.9	
02/19/2004	P		30.00	40.00	25.12	425.21	8,900	670	24	470	120	100	0.8	6.6	c

Table 2. Summary of Groundwater Monitoring Data: Relative Water Elevations and Laboratory Analyses

ARCO Service Station #0771, 899 Rincon Ave., Livermore, CA

Well ID and Date Monitored	P/NP	TOC (feet)	Top of Screen (ft bgs)	Bottom of Screen (ft bgs)	DTW (feet)	Water Level Elevation (feet)	Concentrations in µg/L						DO (mg/L)	pH	Footnote
							GRO/ TPHg	Benzene	Toluene	Ethyl-Benzene	Total Xylenes	MTBE			
MW-7 Cont.															
08/04/2004	P	452.70	30.00	40.00	25.92	426.78	9,100	930	29	460	130	140	0.6	7.2	
01/18/2005	P		30.00	40.00	22.31	430.39	16,000	770	33	590	220	87	1.0	6.9	
07/15/2005	P		30.00	40.00	27.20	425.50	12,000	1,000	38	490	220	150	1.5	6.9	
01/10/2006	P		30.00	40.00	20.61	432.09	13,000	1,200	50	760	330	120	0.8	7.1	
7/21/2006	P		30.00	40.00	28.10	424.60	8,000	110	<50	380	180	54	3.20	7.8	
1/17/2007	P		30.00	40.00	29.70	423.00	5,600	16	<2.5	26	12	3.1	1.08	7.83	
7/18/2007	P		30.00	40.00	29.73	422.97	2,400	140	2.8	9.1	7.3	67	4.86	7.67	
1/15/2008	P		30.00	40.00	26.18	426.52	3,500	120	3.6	9.0	29	26	3.16	7.07	
7/7/2008	NP		30.00	40.00	33.10	419.60	70	0.76	<0.50	<0.50	<0.50	0.69	7.81	8.24	
1/7/2009	NP		30.00	40.00	33.21	419.49	<50	1.5	<0.50	<0.50	<0.50	<0.50	3.00	7.73	
7/22/2009	NP		30.00	40.00	34.54	418.16	<50	<0.50	<0.50	<0.50	<0.50	0.53	11.95	7.65	
3/12/2010	P		30.00	40.00	25.46	427.24	2,600	36	1.0	14	9.1	11	0.42	8.07	
9/9/2010	NP		30.00	40.00	30.10	422.60	2,800	430	11	32	46	110	--	--	
2/17/2011	--		30.00	40.00	29.71	422.99	--	--	--	--	--	--	--	--	
7/7/2011	NP		30.00	40.00	29.68	423.02	2,600	310	8.3	7.5	46	150	0.77	6.9	g (GRO)
1/23/2012	P		30.00	40.00	34.59	418.11	2,100	330	9.4	10	24	150	0.86	6.76	
7/25/2012	--		30.00	40.00	36.16	416.54	--	--	--	--	--	--	3.67	7.09	i
8/31/2012	P		30.00	40.00	37.08	415.62	15,000	650	16	31	51	120	2.52	7.42	k
1/17/2013	**P**		**30.00**	**40.00**	**27.53**	**425.17**	**3,100**	**430**	**10**	**10**	**42**	**120**	**1.21**	**7.58**	
MW-8															
3/20/1995	--	449.43	27.50	42.50	24.75	424.68	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	
6/2/1995	--		27.50	42.50	24.95	424.48	--	--	--	--	--	--	--	--	
8/23/1995	--		27.50	42.50	30.94	418.49	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--	
12/4/1995	--		27.50	42.50	31.99	417.44	--	--	--	--	--	--	--	--	
2/20/1996	--		27.50	42.50	21.13	428.30	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--	
5/15/1996	--		27.50	42.50	21.96	427.47	--	--	--	--	--	--	--	--	
8/13/1996	--		27.50	42.50	30.20	419.23	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--	
11/13/1996	--		27.50	42.50	33.24	416.19	--	--	--	--	--	--	--	--	
3/26/1997	--		27.50	42.50	26.85	422.58	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--	
5/15/1997	--		27.50	42.50	29.69	419.74	--	--	--	--	--	--	--	--	

Table 2. Summary of Groundwater Monitoring Data: Relative Water Elevations and Laboratory Analyses

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Well ID and Date Monitored	P/NP	TOC (feet)	Top of Screen (ft bgs)	Bottom of Screen (ft bgs)	DTW (feet)	Water Level Elevation (feet)	Concentrations in µg/L						DO (mg/L)	pH	Footnote
							GRO/ TPHg	Benzene	Toluene	Ethyl-Benzene	Total Xylenes	MTBE			
MW-8 Cont.															
8/26/1997	--	449.43	27.50	42.50	34.00	415.43	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--	
11/5/1997	--		27.50	42.50	35.94	413.49	--	--	--	--	--	--	--	--	
2/18/1998	--		27.50	42.50	18.18	431.25	<50	0.6	0.6	<0.5	1.1	<3	--	--	
5/20/1998	--		27.50	42.50	22.85	426.58	--	--	--	--	--	--	--	--	
7/30/1998	NP		27.50	42.50	30.31	419.12	<50	<0.5	<0.5	<0.5	<0.5	<3	8.21	--	
10/29/1998	--		27.50	42.50	35.88	413.55	--	--	--	--	--	--	--	--	
3/16/1999	NP		27.50	42.50	28.50	420.93	<50	<0.5	<0.5	<0.5	<0.5	<3	1.0	--	
5/5/1999	--		27.50	42.50	29.76	419.67	--	--	--	--	--	--	--	--	
8/26/1999	P		27.50	42.50	33.51	415.92	<50	<0.5	<0.5	<0.5	<0.5	<3	4.93	--	
12/3/1999	--		27.50	42.50	35.83	413.60	--	--	--	--	--	--	--	--	
3/13/2000	P		27.50	42.50	26.12	423.31	<50	<0.5	<0.5	<0.5	<1	<3	2.81	--	
6/20/2000	--		27.50	42.50	30.91	418.52	--	--	--	--	--	--	5.8	--	
8/31/2000	--		27.50	42.50	33.70	415.73	--	--	--	--	--	--	--	--	
2/9/2001	--		27.50	42.50	30.90	418.53	--	--	--	--	--	--	--	--	
9/17/2001	--		27.50	42.50	33.95	415.48	--	--	--	--	--	--	--	--	
1/21/2002	--		27.50	42.50	33.71	415.72	--	--	--	--	--	--	--	--	
7/19/2002	--		27.50	42.50	35.30	414.13	--	--	--	--	--	--	--	--	
1/15/2003	--		27.50	42.50	27.10	422.33	--	--	--	--	--	--	--	--	
7/9/2003	--		27.50	42.50	33.10	416.33	--	--	--	--	--	--	--	--	
02/19/2004	--		27.50	42.50	28.92	420.51	--	--	--	--	--	--	--	--	
08/04/2004	--	451.80	27.50	42.50	34.28	417.52	--	--	--	--	--	--	--	--	
01/18/2005	--		27.50	42.50	26.76	425.04	--	--	--	--	--	--	--	--	
07/15/2005	--		27.50	42.50	31.14	420.66	--	--	--	--	--	--	--	--	
01/10/2006	--		27.50	42.50	22.88	428.92	--	--	--	--	--	--	--	--	
7/21/2006	--		27.50	42.50	30.84	420.96	--	--	--	--	--	--	--	--	
1/17/2007	--		27.50	42.50	33.20	418.60	--	--	--	--	--	--	--	--	
7/18/2007	--		27.50	42.50	31.92	419.88	--	--	--	--	--	--	--	--	
1/15/2008	--		27.50	42.50	31.52	420.28	--	--	--	--	--	--	--	--	
7/7/2008	--		27.50	42.50	36.32	415.48	--	--	--	--	--	--	--	--	
1/7/2009	--		27.50	42.50	40.52	411.28	--	--	--	--	--	--	--	--	

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ARCO Service Station #0771, 899 Rincon Ave., Livermore, CA

Well ID and Date Monitored	P/NP	TOC (feet)	Top of Screen (ft bgs)	Bottom of Screen (ft bgs)	DTW (feet)	Water Level Elevation (feet)	Concentrations in µg/L							pH	Footnote
							GRO/ TPHg	Benzene	Toluene	Ethyl-Benzene	Total Xylenes	MTBE	DO (mg/L)		
MW-8 Cont.															
7/22/2009	--	451.80	27.50	42.50	40.38	411.42	--	--	--	--	--	--	--	--	
3/12/2010	--		27.50	42.50	31.48	420.32	--	--	--	--	--	--	--	--	
9/9/2010	--		27.50	42.50	35.28	416.52	--	--	--	--	--	--	--	--	
2/17/2011	--		27.50	42.50	33.49	418.31	--	--	--	--	--	--	--	--	
7/7/2011	--		27.50	42.50	32.74	419.06	--	--	--	--	--	--	--	--	
1/23/2012	--		27.50	42.50	32.11	419.69	--	--	--	--	--	--	--	--	
7/25/2012	--		27.50	42.50	40.00	411.80	--	--	--	--	--	--	--	--	
1/17/2013	**--**		**27.50**	**42.50**	**32.23**	**419.57**	**--**	**--**	**--**	**--**	**--**	**--**	**--**	**--**	
MW-9															
3/20/1995	--	449.21	29.50	39.50	19.11	430.10	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	
6/2/1995	--		29.50	39.50	21.23	427.98	--	--	--	--	--	--	--	--	
8/23/1995	--		29.50	39.50	24.33	424.88	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--	
12/4/1995	--		29.50	39.50	27.90	421.31	--	--	--	--	--	--	--	--	
2/20/1996	--		29.50	39.50	17.86	431.35	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--	
5/15/1996	--		29.50	39.50	18.69	430.52	--	--	--	--	--	--	--	--	
8/13/1996	--		29.50	39.50	24.17	425.04	--	--	--	--	--	--	--	--	
11/13/1996	--		29.50	39.50	28.01	421.20	--	--	--	--	--	--	--	--	
3/26/1997	--		29.50	39.50	22.58	426.63	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--	
5/15/1997	--		29.50	39.50	25.12	424.09	--	--	--	--	--	--	--	--	
8/26/1997	--		29.50	39.50	28.28	420.93	--	--	--	--	--	--	--	--	
11/5/1997	--		29.50	39.50	31.18	418.03	--	--	--	--	--	--	--	--	
2/18/1998	--		29.50	39.50	16.03	433.18	<50	0.6	0.5	<0.5	1	<3	--	--	
5/20/1998	--		29.50	39.50	19.31	429.90	--	--	--	--	--	--	--	--	
7/30/1998	--		29.50	39.50	24.90	424.31	--	--	--	--	--	--	--	--	
10/29/1998	--		29.50	39.50	30.08	419.13	--	--	--	--	--	--	--	--	
3/16/1999	P		29.50	39.50	22.68	426.53	<50	<0.5	<0.5	<0.5	<0.5	<3	1.0	--	
5/5/1999	--		29.50	39.50	23.82	425.39	--	--	--	--	--	--	--	--	
8/26/1999	--		29.50	39.50	26.57	422.64	--	--	--	--	--	--	5.08	--	
12/3/1999	--		29.50	39.50	--	--	--	--	--	--	--	--	--	--	d
3/13/2000	P		29.50	39.50	25.62	423.59	<50	<0.5	<0.5	<0.5	<1	<3	5.43	--	

Table 2. Summary of Groundwater Monitoring Data: Relative Water Elevations and Laboratory Analyses

ARCO Service Station #0771, 899 Rincon Ave., Livermore, CA

Well ID and Date Monitored	P/NP	TOC (feet)	Top of Screen (ft bgs)	Bottom of Screen (ft bgs)	DTW (feet)	Water Level Elevation (feet)	Concentrations in µg/L						DO (mg/L)	pH	Footnote
							GRO/ TPHg	Benzene	Toluene	Ethyl-Benzene	Total Xylenes	MTBE			
MW-9 Cont.															
6/20/2000	--	449.21	29.50	39.50	23.55	425.66	--	--	--	--	--	--	6.2	--	
8/31/2000	--		29.50	39.50	27.39	421.82	--	--	--	--	--	--	--	--	
2/9/2001	--		29.50	39.50	28.65	420.56	--	--	--	--	--	--	--	--	
9/17/2001	--		29.50	39.50	27.51	421.70	--	--	--	--	--	--	--	--	
1/21/2002	--		29.50	39.50	27.09	422.12	--	--	--	--	--	--	--	--	
7/19/2002	--		29.50	39.50	27.06	422.15	--	--	--	--	--	--	--	--	
1/15/2003	--		29.50	39.50	21.78	427.43	--	--	--	--	--	--	--	--	
7/9/2003	--		29.50	39.50	26.18	423.03	--	--	--	--	--	--	--	--	
02/19/2004	--		29.50	39.50	23.45	425.76	--	--	--	--	--	--	--	--	
08/04/2004	--	451.63	29.50	39.50	29.24	422.39	--	--	--	--	--	--	--	--	
01/18/2005	--		29.50	39.50	20.64	430.99	--	--	--	--	--	--	--	--	
07/15/2005	--		29.50	39.50	25.72	425.91	--	--	--	--	--	--	--	--	
01/10/2006	--		29.50	39.50	18.86	432.77	--	--	--	--	--	--	--	--	
7/21/2006	--		29.50	39.50	25.58	426.05	--	--	--	--	--	--	--	--	
1/17/2007	--		29.50	39.50	29.11	422.52	--	--	--	--	--	--	--	--	
7/18/2007	--		29.50	39.50	--	--	--	--	--	--	--	--	--	--	d
1/15/2008	--		29.50	39.50	24.89	426.74	--	--	--	--	--	--	--	--	
7/7/2008	--		29.50	39.50	32.06	419.57	--	--	--	--	--	--	--	--	
1/7/2009	--		29.50	39.50	32.65	418.98	--	--	--	--	--	--	--	--	
7/22/2009	--		29.50	39.50	33.74	417.89	--	--	--	--	--	--	--	--	
3/12/2010	--		29.50	39.50	23.44	428.19	--	--	--	--	--	--	--	--	
9/9/2010	--		29.50	39.50	29.56	422.07	--	--	--	--	--	--	--	--	
2/17/2011	--		29.50	39.50	27.18	424.45	--	--	--	--	--	--	--	--	
7/7/2011	--		29.50	39.50	27.71	423.92	--	--	--	--	--	--	--	--	
1/23/2012	--		29.50	39.50	32.04	419.59	--	--	--	--	--	--	--	--	
7/25/2012	--		29.50	39.50	35.37	416.26	--	--	--	--	--	--	--	--	
1/17/2013	**--**		**29.50**	**39.50**	**26.89**	**424.74**	**--**	**--**	**--**	**--**	**--**	**--**	**--**	**--**	
MW-10															
3/20/1995	--	449.22	29.00	37.00	20.96	428.26	--	--	--	--	--	--	--	--	
6/2/1995	--		29.00	37.00	22.15	427.07	--	--	--	--	--	--	--	--	

Table 2. Summary of Groundwater Monitoring Data: Relative Water Elevations and Laboratory Analyses

ARCO Service Station #0771, 899 Rincon Ave., Livermore, CA

Well ID and Date Monitored	P/NP	TOC (feet)	Top of Screen (ft bgs)	Bottom of Screen (ft bgs)	DTW (feet)	Water Level Elevation (feet)	Concentrations in µg/L						DO (mg/L)	pH	Footnote
							GRO/ TPHg	Benzene	Toluene	Ethyl-Benzene	Total Xylenes	MTBE			
MW-10 Cont.															
8/23/1995	--	449.22	29.00	37.00	24.47	424.75	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--	
12/4/1995	--		29.00	37.00	26.97	422.25	--	--	--	--	--	--	--	--	
2/20/1996	--		29.00	37.00	18.40	430.82	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--	
5/15/1996	--		29.00	37.00	--	--	--	--	--	--	--	--	--	--	d
8/13/1996	--		29.00	37.00	23.70	425.52	--	--	--	--	--	--	--	--	
11/13/1996	--		29.00	37.00	27.15	422.07	--	--	--	--	--	--	--	--	
3/26/1997	--		29.00	37.00	22.23	426.99	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--	
5/15/1997	--		29.00	37.00	24.57	424.65	--	--	--	--	--	--	--	--	
8/26/1997	--		29.00	37.00	27.62	421.60	--	--	--	--	--	--	--	--	
11/5/1997	--		29.00	37.00	30.79	418.43	--	--	--	--	--	--	--	--	
2/18/1998	--		29.00	37.00	--	--	--	--	--	--	--	--	--	--	d
5/20/1998	--		29.00	37.00	--	--	--	--	--	--	--	--	--	--	
7/30/1998	--		29.00	37.00	23.90	425.32	--	--	--	--	--	--	--	--	
10/29/1998	--		29.00	37.00	30.55	418.67	--	--	--	--	--	--	--	--	
3/16/1999	P		29.00	37.00	23.05	426.17	<50	<0.5	<0.5	<0.5	<0.5	<3	1.0	--	
5/5/1999	--		29.00	37.00	24.00	425.22	--	--	--	--	--	--	--	--	
8/26/1999	--		29.00	37.00	26.50	422.72	--	--	--	--	--	--	5.15	--	
12/3/1999	--		29.00	37.00	30.80	418.42	--	--	--	--	--	--	--	--	
3/13/2000	--		29.00	37.00	26.21	423.01	--	--	--	--	--	--	--	--	d
6/20/2000	--		29.00	37.00	23.52	425.70	--	--	--	--	--	--	5.5	--	
8/31/2000	--		29.00	37.00	27.52	421.70	--	--	--	--	--	--	--	--	
2/9/2001	--		29.00	37.00	28.71	420.51	--	--	--	--	--	--	--	--	
9/17/2001	--		29.00	37.00	27.94	421.28	--	--	--	--	--	--	--	--	
1/21/2002	--		29.00	37.00	27.44	421.78	--	--	--	--	--	--	--	--	
7/19/2002	--		29.00	37.00	27.80	421.42	--	--	--	--	--	--	--	--	
1/15/2003	--		29.00	37.00	23.09	426.13	--	--	--	--	--	--	--	--	
7/9/2003	--		29.00	37.00	26.87	422.35	--	--	--	--	--	--	--	--	
02/19/2004	--		29.00	37.00	23.39	425.83	--	--	--	--	--	--	--	--	
01/18/2005	--	451.65	29.00	37.00	21.40	430.25	--	--	--	--	--	--	--	--	
07/15/2005	--		29.00	37.00	25.37	426.28	--	--	--	--	--	--	--	--	

Table 2. Summary of Groundwater Monitoring Data: Relative Water Elevations and Laboratory Analyses

ARCO Service Station #0771, 899 Rincon Ave., Livermore, CA

Well ID and Date Monitored	P/NP	TOC (feet)	Top of Screen (ft bgs)	Bottom of Screen (ft bgs)	DTW (feet)	Water Level Elevation (feet)	Concentrations in µg/L								Footnote
							GRO/ TPHg	Benzene	Toluene	Ethyl-Benzene	Total Xylenes	MTBE	DO (mg/L)	pH	
MW-10 Cont.															
01/10/2006	--	451.65	29.00	37.00	19.81	431.84	--	--	--	--	--	--	--	--	
7/21/2006	--		29.00	37.00	25.16	426.49	--	--	--	--	--	--	--	--	
1/17/2007	--		29.00	37.00	28.95	422.70	--	--	--	--	--	--	--	--	
7/18/2007	--		29.00	37.00	--	--	--	--	--	--	--	--	--	--	d
1/15/2008	--		29.00	37.00	24.62	427.03	--	--	--	--	--	--	--	--	
7/7/2008	--		29.00	37.00	--	--	--	--	--	--	--	--	--	--	d
1/7/2009	--		29.00	37.00	--	--	--	--	--	--	--	--	--	--	d
7/22/2009	--		29.00	37.00	--	--	--	--	--	--	--	--	--	--	Dry
3/12/2010	--		29.00	37.00	24.13	427.52	--	--	--	--	--	--	--	--	
9/9/2010	--		29.00	37.00	27.91	423.74	--	--	--	--	--	--	--	--	
2/17/2011	--		29.00	37.00	27.16	424.49	--	--	--	--	--	--	--	--	
7/7/2011	--		29.00	37.00	26.38	425.27	--	--	--	--	--	--	--	--	
1/23/2012	--		29.00	37.00	31.25	420.40	--	--	--	--	--	--	--	--	
7/25/2012	--		29.00	37.00	--	--	--	--	--	--	--	--	--	--	Dry
1/17/2013	**--**		**29.00**	**37.00**	**26.00**	**425.65**	**--**	**--**	**--**	**--**	**--**	**--**	**--**	**--**	
MW-11															
3/20/1995	--	448.02	29.00	39.00	25.02	423.00	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	
6/2/1995	--		29.00	39.00	23.82	424.20	--	--	--	--	--	--	--	--	
8/23/1995	--		29.00	39.00	30.15	417.87	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--	
12/4/1995	--		29.00	39.00	31.63	416.39	--	--	--	--	--	--	--	--	
2/20/1996	--		29.00	39.00	20.94	427.08	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--	
5/15/1996	--		29.00	39.00	23.03	424.99	--	--	--	--	--	--	--	--	
8/13/1996	--		29.00	39.00	29.19	418.83	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--	
11/13/1996	--		29.00	39.00	31.96	416.06	--	--	--	--	--	--	--	--	
3/26/1997	--		29.00	39.00	26.61	421.41	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--	
5/15/1997	--		29.00	39.00	29.39	418.63	--	--	--	--	--	--	--	--	
8/26/1997	--		29.00	39.00	33.47	414.55	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--	
11/5/1997	--		29.00	39.00	35.12	412.90	--	--	--	--	--	--	--	--	
2/18/1998	--		29.00	39.00	18.03	429.99	<50	<0.5	<0.5	<0.5	1	<3	--	--	
5/20/1998	--		29.00	39.00	23.00	425.02	--	--	--	--	--	--	--	--	

Table 2. Summary of Groundwater Monitoring Data: Relative Water Elevations and Laboratory Analyses

ARCO Service Station #0771, 899 Rincon Ave., Livermore, CA

Well ID and Date Monitored	P/NP	TOC (feet)	Top of Screen (ft bgs)	Bottom of Screen (ft bgs)	DTW (feet)	Water Level Elevation (feet)	Concentrations in µg/L								
							GRO/ TPHg	Benzene	Toluene	Ethyl-Benzene	Total Xylenes	MTBE	DO (mg/L)	pH	Footnote
MW-11 Cont.															
7/30/1998	P	448.02	29.00	39.00	29.30	418.72	<50	<0.5	<0.5	<0.5	<0.5	<3	5.59	--	
10/29/1998	--		29.00	39.00	34.47	413.55	--	--	--	--	--	--	--	--	
3/16/1999	P		29.00	39.00	27.88	420.14	<50	<0.5	<0.5	<0.5	<0.5	<3	1.0	--	
5/5/1999	--		29.00	39.00	26.85	421.17	--	--	--	--	--	--	--	--	
8/26/1999	P		29.00	39.00	32.74	415.28	<50	<0.5	<0.5	<0.5	<0.5	<3	4.59	--	
12/3/1999	--		29.00	39.00	34.70	413.32	--	--	--	--	--	--	--	--	
3/13/2000	P		29.00	39.00	25.94	422.08	<50	<0.5	<0.5	<0.5	<1	<3	3.21	--	
6/20/2000	--		29.00	39.00	30.40	417.62	--	--	--	--	--	--	3.3	--	
8/31/2000	--		29.00	39.00	32.68	415.34	<50.0	<0.500	<0.500	<0.500	<0.500	<2.50	--	--	b
8/31/2000	NP		29.00	39.00	32.68	415.34	<50.0	<0.500	<0.500	<0.500	<0.500	<2.50	0.4	--	
2/9/2001	--		29.00	39.00	31.17	416.85	--	--	--	--	--	--	--	--	
9/17/2001	NP		29.00	39.00	32.98	415.04	<50	<0.50	<0.50	<0.50	<0.50	<2.5	0.62	--	
1/21/2002	--		29.00	39.00	31.05	416.97	--	--	--	--	--	--	--	--	
7/19/2002	P		29.00	39.00	31.67	416.35	<50	<0.50	<0.50	<0.50	<0.50	<0.50	3.7	7.7	
1/15/2003	--		29.00	39.00	23.75	424.27	--	--	--	--	--	--	--	--	
7/9/2003	P		29.00	39.00	31.06	416.96	<50	<0.50	<0.50	<0.50	<0.50	<0.50	2.4	6.6	
02/19/2004	--		29.00	39.00	27.21	420.81	--	--	--	--	--	--	--	--	
08/04/2004	P	450.41	29.00	39.00	31.71	418.70	<50	<0.50	<0.50	<0.50	<0.50	<0.50	3.3	7.1	
01/18/2005	--		29.00	39.00	24.80	425.61	--	--	--	--	--	--	--	--	
07/15/2005	P		29.00	39.00	29.15	421.26	<50	<0.50	<0.50	<0.50	<0.50	<0.50	2.7	7.1	
01/10/2006	--		29.00	39.00	20.87	429.54	--	--	--	--	--	--	--	--	
7/21/2006	P		29.00	39.00	29.30	421.11	<50	<0.50	<0.50	<0.50	<0.50	<0.50	2.7	7.2	
1/17/2007	--		29.00	39.00	31.59	418.82	--	--	--	--	--	--	--	--	
7/18/2007	NP		29.00	39.00	29.22	421.19	<50	<0.50	<0.50	<0.50	<0.50	<0.50	5.35	7.12	
1/15/2008	--		29.00	39.00	29.12	421.29	--	--	--	--	--	--	--	--	
7/7/2008	NP		29.00	39.00	34.21	416.20	<50	<0.50	<0.50	<0.50	<0.50	<0.50	4.08	7.94	
1/7/2009	--		29.00	39.00	37.45	412.96	--	--	--	--	--	--	--	--	
7/22/2009	NP		29.00	39.00	37.33	413.08	<50	<0.50	<0.50	<0.50	<0.50	<0.50	15.97	7.81	
3/12/2010	--		29.00	39.00	28.47	421.94	--	--	--	--	--	--	--	--	
9/9/2010	NP		29.00	39.00	33.03	417.38	<50	<0.50	<0.50	<0.50	<0.50	<0.50	--	7.2	

Table 2. Summary of Groundwater Monitoring Data: Relative Water Elevations and Laboratory Analyses

ARCO Service Station #0771, 899 Rincon Ave., Livermore, CA

Well ID and Date Monitored	P/NP	TOC (feet)	Top of Screen (ft bgs)	Bottom of Screen (ft bgs)	DTW (feet)	Water Level Elevation (feet)	Concentrations in µg/L								Footnote
							GRO/ TPHg	Benzene	Toluene	Ethyl-Benzene	Total Xylenes	MTBE	DO (mg/L)	pH	
MW-11 Cont.															
2/17/2011	--	450.41	29.00	39.00	31.70	418.71	--	--	--	--	--	--	--	--	
7/7/2011	NP		29.00	39.00	31.44	418.97	<50	<0.50	<0.50	<0.50	<0.50	<0.50	3.65	7.1	
1/23/2012	--		29.00	39.00	34.55	415.86	--	--	--	--	--	--	--	--	
7/25/2012	--		29.00	39.00	38.00	412.41	--	--	--	--	--	--	--	--	h
1/17/2013	**--**		**29.00**	**39.00**	**31.32**	**419.09**	**--**	**--**	**--**	**--**	**--**	**--**	**--**	**--**	
RW-1															
3/20/1995	--	451.67	25.50	40.50	23.76	427.91	15,000	1,000	140	310	950	--	--	--	
6/2/1995	--		25.50	40.50	25.12	426.55	12,000	1,300	280	420	1,100	--	--	--	
8/23/1995	--		25.50	40.50	28.80	422.87	8,200	520	190	240	610	<50	--	--	
12/4/1995	--		25.50	40.50	31.15	420.52	2,600	140	59	83	210	--	--	--	
2/20/1996	--		25.50	40.50	21.45	430.22	6,300	410	160	180	650	<40	--	--	
5/15/1996	--		25.50	40.50	22.97	428.70	--	--	--	--	--	--	--	--	
8/13/1996	--		25.50	40.50	24.74	426.93	--	--	--	--	--	--	--	--	
11/13/1996	--		25.50	40.50	30.69	420.98	--	--	--	--	--	--	--	--	
3/26/1997	--		25.50	40.50	25.69	425.98	500	57	3	6.4	18	54	--	--	
5/15/1997	--		25.50	40.50	28.19	423.48	--	--	--	--	--	--	--	--	
8/26/1997	--		25.50	40.50	31.21	420.46	--	--	--	--	--	--	--	--	
11/5/1997	--		25.50	40.50	33.67	418.00	--	--	--	--	--	--	--	--	
2/18/1998	--		25.50	40.50	20.14	431.53	9,400	200	70	190	710	<60	--	--	
5/20/1998	--		25.50	40.50	23.43	428.24	--	--	--	--	--	--	--	--	
7/30/1998	--		25.50	40.50	27.42	424.25	--	--	--	--	--	--	--	--	
10/29/1998	--		25.50	40.50	32.47	419.20	--	--	--	--	--	--	--	--	
3/16/1999	NP		25.50	40.50	25.45	426.22	1,100	140	19	45	83	530	1.0	--	
5/5/1999	--		25.50	40.50	27.23	424.44	--	--	--	--	--	--	--	--	
8/26/1999	--		25.50	40.50	29.98	421.69	--	--	--	--	--	--	1.39	--	
12/3/1999	--		25.50	40.50	32.38	419.29	--	--	--	--	--	--	--	--	
3/13/2000	NP		25.50	40.50	25.53	426.14	1,100	130	3.5	0.7	95	230	4.43	--	
6/20/2000	--		25.50	40.50	28.31	423.36	--	--	--	--	--	--	1.9	--	
8/31/2000	NP		25.50	40.50	30.61	421.06	<50.0	<0.500	<0.500	<0.500	<0.500	82.5	3.21	--	
2/9/2001	NP		25.50	40.50	31.14	420.53	<50.0	<0.500	<0.500	<0.500	<0.500	<2.50	0.84	--	

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Well ID and Date Monitored	P/NP	TOC (feet)	Top of Screen (ft bgs)	Bottom of Screen (ft bgs)	DTW (feet)	Water Level Elevation (feet)	Concentrations in µg/L						DO (mg/L)	pH	Footnote
							GRO/ TPHg	Benzene	Toluene	Ethyl-Benzene	Total Xylenes	MTBE			
RW-1 Cont.															
9/17/2001	NP	451.67	25.50	40.50	31.70	419.97	<50	<0.50	<0.50	<0.50	<0.50	<2.5	1.51	--	
1/21/2002	NP		25.50	40.50	30.15	421.52	<50	7.7	<0.50	<0.50	1.5	18	0.63	--	
7/19/2002	NP		25.50	40.50	31.15	420.52	<50	<0.50	<0.50	<0.50	<0.50	13	1.4	6.6	
1/15/2003	--		25.50	40.50	22.20	429.47	860	9	1.6	17	42	1.5	2.8	7.2	a
7/9/2003	--		25.50	40.50	29.56	422.11	<50	<0.50	<0.50	<0.50	<0.50	<0.50	1.8	7.1	
02/19/2004	NP		25.50	40.50	23.53	428.14	<50	<0.50	<0.50	<0.50	<0.50	<0.50	2.4	6.7	c
08/04/2004	P	454.11	25.50	40.50	22.45	431.66	600	<0.50	<0.50	3.3	3.4	<0.50	4.4	7.2	
01/18/2005	P		25.50	40.50	23.57	430.54	1,400	8.0	1.9	22	68	<0.50	3.6	6.9	
07/15/2005	NP		25.50	40.50	29.02	425.09	<50	<0.50	<0.50	<0.50	<0.50	2.0	1.1	7.8	
01/10/2006	P		25.50	40.50	21.88	432.23	480	4.3	0.67	8.3	18	0.54	4.4	7.1	
7/21/2006	--		25.50	40.50	--	--	--	--	--	--	--	--	--	--	d
1/17/2007	P		25.50	40.50	31.48	422.63	6,900	17	2.8	22	31	2.6	4.08	7.74	
7/18/2007	NP		25.50	40.50	32.45	421.66	<50	<0.50	<0.50	<0.50	<0.50	<0.50	1.33	7.48	
1/15/2008	NP		25.50	40.50	28.39	425.72	<50	<0.50	<0.50	<0.50	<0.50	8.3	2.73	6.87	
7/7/2008	NP		25.50	40.50	35.19	418.92	<50	<0.50	<0.50	<0.50	<0.50	0.53	2.51	7.05	
1/7/2009	NP		25.50	40.50	33.31	420.80	120	0.96	<0.50	<0.50	<0.50	1.6	2.13	6.84	
7/22/2009	NP		25.50	40.50	36.15	417.96	<50	<0.50	<0.50	<0.50	<0.50	0.84	10.39	7.40	
3/12/2010	P		25.50	40.50	25.01	429.10	240	15	<0.50	<0.50	<0.50	2.7	0.78	7.06	
9/9/2010	NP		25.50	40.50	31.01	423.10	440	<0.50	<0.50	<0.50	0.53	1.9	--	7.3	
2/17/2011	NP		25.50	40.50	26.45	427.66	500	1.5	<0.50	<0.50	0.55	<0.50	0.98	8.0	g (GRO)
7/7/2011	NP		25.50	40.50	30.42	423.69	750	2.4	<0.50	0.64	2.2	2.2	0.82	6.7	g (GRO)
1/23/2012	P		25.50	40.50	29.13	424.98	430	13	<0.50	<0.50	2.4	1.8	0.43	6.61	g (GRO)
7/25/2012	P		25.50	40.50	36.50	417.61	<50	<0.50	<0.50	<0.50	<1.0	<0.50	2.21	6.93	
1/17/2013	**P**		**25.50**	**40.50**	**28.80**	**425.31**	**<50**	**1.4**	**<0.50**	**<0.50**	**<1.0**	**0.85**	**1.49**	**7.65**	
VW-1															
8/31/2000	P	NS	18.50	28.50	20.61	--	<50.0	<0.500	<0.500	<0.500	<0.500	<2.50	10.08	--	
2/9/2001	P		18.50	28.50	22.10	--	<50.0	<0.500	<0.500	<0.500	<0.500	<2.50	0.53	--	
9/17/2001	P		18.50	28.50	21.99	--	<50	<0.50	<0.50	<0.50	<0.50	<2.5	6.59	--	
1/21/2002	P		18.50	28.50	21.50	--	<50	<0.50	<0.50	<0.50	<0.50	<5.0	0.7	--	
7/19/2002	P		18.50	28.50	22.42	--	<50	<0.50	<0.50	<0.50	<0.50	<0.50	4.9	7.1	

Table 2. Summary of Groundwater Monitoring Data: Relative Water Elevations and Laboratory Analyses

ARCO Service Station #0771, 899 Rincon Ave., Livermore, CA

Well ID and Date Monitored	P/NP	TOC (feet)	Top of Screen (ft bgs)	Bottom of Screen (ft bgs)	DTW (feet)	Water Level Elevation (feet)	Concentrations in µg/L						DO (mg/L)	pH	Footnote
							GRO/ TPHg	Benzene	Toluene	Ethyl-Benzene	Total Xylenes	MTBE			
VW-1 Cont.															
1/15/2003	--	NS	18.50	28.50	22.59	--	<50	<0.50	<0.50	0.63	1.7	<0.50	5.4	7.2	
7/9/2003	--		18.50	28.50	22.50	--	<50	<0.50	<0.50	<0.50	0.61	<0.50	2.0	7.0	
02/19/2004	--		18.50	28.50	21.04	--	--	--	--	--	--	--	--	--	
08/04/2004	P	453.29	18.50	28.50	20.48	432.81	<50	<0.50	<0.50	<0.50	<0.50	<0.50	5.7	7.0	
01/18/2005	--		18.50	28.50	21.72	431.57	--	--	--	--	--	--	--	--	
07/15/2005	P		18.50	28.50	22.50	430.79	<50	<0.50	<0.50	<0.50	<0.50	<0.50	5.1	7.4	
01/10/2006	--		18.50	28.50	20.17	433.12	--	--	--	--	--	--	--	--	
7/21/2006	P		18.50	28.50	22.50	430.79	220	<0.50	<0.50	<0.50	<0.50	<0.50	5.91	7.3	e
1/17/2007	--		18.50	28.50	21.67	431.62	--	--	--	--	--	--	--	--	
7/18/2007	NP		18.50	28.50	23.58	429.71	<50	<0.50	<0.50	<0.50	<0.50	<0.50	6.45	8.52	
1/15/2008	--		18.50	28.50	21.87	431.42	--	--	--	--	--	--	--	--	
7/7/2008	NP		18.50	28.50	23.70	429.59	<50	<0.50	<0.50	<0.50	<0.50	<0.50	7.54	8.46	
1/7/2009	--		18.50	28.50	22.00	431.29	--	--	--	--	--	--	--	--	
7/22/2009	NP		18.50	28.50	23.95	429.34	<50	<0.50	<0.50	<0.50	<0.50	<0.50	10.12	7.66	
3/12/2010	--		18.50	28.50	21.85	431.44	--	--	--	--	--	--	--	--	
9/9/2010	NP		18.50	28.50	23.65	429.64	<50	<0.50	<0.50	<0.50	<0.50	<0.50	--	6.93	
2/17/2011	NP		18.50	28.50	23.83	429.46	<50	<0.50	<0.50	<0.50	<0.50	<0.50	4.57	7.9	
7/7/2011	NP		18.50	28.50	25.17	428.12	<50	<0.50	<0.50	<0.50	<0.50	<0.50	3.85	7.2	
1/23/2012	--		18.50	28.50	27.40	425.89	--	--	--	--	--	--	--	--	
7/25/2012	NP		18.50	28.50	27.40	425.89	80	<0.50	<0.50	<0.50	<1.0	<0.50	5.12	7.39	j
8/31/2012	--		18.50	28.50	28.03	425.26	--	--	--	--	--	--	--	--	
1/17/2013	**--**		**18.50**	**28.50**	**24.60**	**428.69**	**--**	**--**	**--**	**--**	**--**	**--**	**--**	**--**	

Symbols & Abbreviations:
--/- - = Not analyzed/applicable/sampled/measured
< = Not detected at or above specified laboratory reporting limit
DO = Dissolved oxygen
DTW = Depth to water in ft bgs
ft bgs = Feet below ground surface
ft MSL = Feet above mean sea level
GRO = Gasoline range organics, range C4-C12
GWE = Groundwater elevation in ft MSL
g/L = Micrograms per liter
mg/L = Milligrams per liter
MTBE = Methyl tert-butyl ether
NP = Not purged before sampling
P = Purged before sampling
TPH-g = Total petroleum hydrocarbons as gasoline
TOC = Top of casing elevation in ft MSL

Footnotes:
a = Chromatogram Pattern: Gasoline C6-C10
b = Duplicate sample
c = GRO analyzed by EPA Method 8015B modified
d = Well inaccessible
e = Hydrocarbon result partly due to individ. peak(s) in quant. range
f = Sample > 4x spike concentration
g = Quantitated against gasoline
h = Insufficient water within well to collect sample
i = Well not sampled due to the presence of Light Non-Aqueous Phase Liquid (LNAPL)
j = Insufficient water within well to purge prior to sample collection
k = Sample collected following removal of approximately 1.5 gallson of LNAPL/water mixture from well

Notes:
For previous historical GWE and analytical data please refer to Fourth Quarter 1995 Groundwater Monitoring Program Results and Remediation System Performance Evaluation Report, ARCO Service Station 771, Livermore, California, (EMCON, March 1, 1996)

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

All analytes unless otherwise notes utilized EPA Method 8260B, EPA method 8015B modified prior to 1/15/03, and EPA method 8020 prior to 12/03/99

Site wells were resurveyed to NAVD '88 datum on March 8, 2004

Top of screen and bottom of screen depths for MW-3 and MW-6 are estimated from cross-sections

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

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

Table 3. Summary of Fuel Additives Analytical Data

ARCO Service Station #0771, 899 Rincon Ave., Livermore, CA

Well ID and Date Monitored	Concentrations in µg/L								Footnote
	Ethanol	TBA	MTBE	DIPE	ETBE	TAME	1,2-DCA	EDB	
MW-1									
8/23/1995	--	--	<300	--	--	--	--	--	
2/20/1996	--	--	<300	--	--	--	--	--	
5/15/1996	--	--	<250	--	--	--	--	--	
8/13/1996	--	--	<200	--	--	--	--	--	
11/13/1996	--	--	<30	--	--	--	--	--	
3/26/1997	--	--	<30	--	--	--	--	--	
5/15/1997	--	--	<120	--	--	--	--	--	
8/26/1997	--	--	<3	--	--	--	--	--	
11/5/1997	--	--	29	--	--	--	--	--	
2/18/1998	--	--	<120	--	--	--	--	--	
5/20/1998	--	--	<300	--	--	--	--	--	
7/30/1998	--	--	<3	--	--	--	--	--	
10/29/1998	--	--	<3	--	--	--	--	--	
3/16/1999	--	--	270	--	--	--	--	--	
5/5/1999	--	--	170	--	--	--	--	--	
8/26/1999	--	--	120	--	--	--	--	--	
12/3/1999	--	--	<3	--	--	--	--	--	
3/13/2000	--	--	<3	--	--	--	--	--	
6/20/2000	--	--	<2.50	--	--	--	--	--	
6/20/2000	--	--	<2.50	--	--	--	--	--	
MW-2									
8/23/1995	--	--	<500	--	--	--	--	--	
2/20/1996	--	--	<300	--	--	--	--	--	
5/15/1996	--	--	<300	--	--	--	--	--	
8/13/1996	--	--	<300	--	--	--	--	--	
11/13/1996	--	--	<200	--	--	--	--	--	
3/26/1997	--	--	<120	--	--	--	--	--	
5/15/1997	--	--	<120	--	--	--	--	--	
8/26/1997	--	--	<120	--	--	--	--	--	
11/5/1997	--	--	<40	--	--	--	--	--	
2/18/1998	--	--	130	--	--	--	--	--	

Table 3. Summary of Fuel Additives Analytical Data

ARCO Service Station #0771, 899 Rincon Ave., Livermore, CA

Well ID and Date Monitored	Concentrations in µg/L								Footnote
	Ethanol	TBA	MTBE	DIPE	ETBE	TAME	1,2-DCA	EDB	
MW-2 Cont.									
5/20/1998	--	--	<120	--	--	--	--	--	
7/30/1998	--	--	<120	--	--	--	--	--	
10/29/1998	--	--	<3	--	--	--	--	--	
3/16/1999	--	--	60	--	--	--	--	--	
5/5/1999	--	--	17	--	--	--	--	--	
8/26/1999	--	--	26	--	--	--	--	--	
12/3/1999	--	--	<3	--	--	--	--	--	
3/13/2000	--	--	<3	--	--	--	--	--	
6/20/2000	--	--	<2.50	--	--	--	--	--	
8/31/2000	--	--	<2.50	--	--	--	--	--	
9/17/2001	--	--	120	--	--	--	--	--	
7/19/2002	--	--	16	--	--	--	--	--	
7/9/2003	<1,000	<200	39	<5.0	<5.0	<5.0	<5.0	<5.0	
08/04/2004	<2,000	<400	78	<10	<10	<10	<10	<10	
07/15/2005	<500	120	46	<2.5	<2.5	<2.5	<2.5	<2.5	
7/21/2006	<300	<20	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
7/18/2007	<600	89	45	<1.0	<1.0	<1.0	<1.0	<1.0	
7/7/2008	--	<100	19	<5.0	<5.0	<5.0	<5.0	--	
9/9/2010	<600	41	13	<1.0	<1.0	<1.0	<1.0	<1.0	
7/7/2011	<300	<10	6.2	<0.50	<0.50	<0.50	<0.50	<0.50	
MW-3									
8/23/1995	--	--	<3	--	--	--	--	--	
2/20/1996	--	--	<3	--	--	--	--	--	
5/15/1996	--	--	<0.5	--	--	--	--	--	
8/13/1996	--	--	<3	--	--	--	--	--	
11/13/1996	--	--	<3	--	--	--	--	--	
3/26/1997	--	--	<3	--	--	--	--	--	
5/15/1997	--	--	<3	--	--	--	--	--	
8/26/1997	--	--	<3	--	--	--	--	--	
11/5/1997	--	--	<3	--	--	--	--	--	
2/18/1998	--	--	<3	--	--	--	--	--	

Table 3. Summary of Fuel Additives Analytical Data

ARCO Service Station #0771, 899 Rincon Ave., Livermore, CA

Well ID and Date Monitored	Concentrations in µg/L								Footnote
	Ethanol	TBA	MTBE	DIPE	ETBE	TAME	1,2-DCA	EDB	
MW-3 Cont.									
5/20/1998	--	--	<3	--	--	--	--	--	
7/30/1998	--	--	<3	--	--	--	--	--	
10/29/1998	--	--	<3	--	--	--	--	--	
3/16/1999	--	--	<3	--	--	--	--	--	
5/5/1999	--	--	<3	--	--	--	--	--	
8/26/1999	--	--	<3	--	--	--	--	--	
12/3/1999	--	--	<3	--	--	--	--	--	
3/13/2000	--	--	<3	--	--	--	--	--	
6/20/2000	--	--	<2.50	--	--	--	--	--	
MW-4									
8/23/1995	--	--	<100	--	--	--	--	--	
2/20/1996	--	--	<70	--	--	--	--	--	
3/26/1997	--	--	<70	--	--	--	--	--	
2/18/1998	--	--	120	--	--	--	--	--	
3/16/1999	--	--	82	--	--	--	--	--	
3/13/2000	--	--	<3	--	--	--	--	--	
8/31/2000	--	--	<2.50	--	--	--	--	--	
2/9/2001	--	--	<2.50	--	--	--	--	--	
9/17/2001	--	--	360	--	--	--	--	--	
1/21/2002	--	--	300	--	--	--	--	--	
7/19/2002	--	--	130	--	--	--	--	--	
1/15/2003	--	--	150	--	--	--	--	--	
7/9/2003	<1,000	750	150	<5.0	<5.0	<5.0	<5.0	<5.0	
02/19/2004	<1,000	630	180	<10	<10	<10	<5.0	<5.0	
08/04/2004	<2,000	1,300	300	<10	<10	<10	<10	<10	
01/18/2005	<1,000	630	160	<5.0	<5.0	<5.0	<5.0	<5.0	a
07/15/2005	<1,000	850	230	<5.0	<5.0	<5.0	<5.0	<5.0	
01/10/2006	<1,500	810	190	<2.5	<2.5	<2.5	<2.5	<2.5	
7/21/2006	<300	35	3.1	<0.50	<0.50	<0.50	<0.50	<0.50	
1/17/2007	<300	<20	11	<0.50	<0.50	<0.50	<0.50	<0.50	
7/18/2007	<300	830	74	<0.50	<0.50	<0.50	0.76	<0.50	

Table 3. Summary of Fuel Additives Analytical Data

ARCO Service Station #0771, 899 Rincon Ave., Livermore, CA

Well ID and Date Monitored	Concentrations in µg/L								Footnote
	Ethanol	TBA	MTBE	DIPE	ETBE	TAME	1,2-DCA	EDB	
MW-4 Cont.									
1/15/2008	<300	280	61	<0.50	<0.50	<0.50	<0.50	<0.50	b (MTBE)
7/7/2008	--	19	17	<0.50	<0.50	<0.50	<0.50	--	
1/7/2009	--	74	37	<0.50	<0.50	<0.50	<0.50	<0.50	
7/22/2009	<300	580	63	0.85	<0.50	<0.50	<0.50	<0.50	
3/12/2010	<300	460	43	<0.50	<0.50	<0.50	<0.50	<0.50	
9/9/2010	<1,500	880	51	<2.5	<2.5	<2.5	<2.5	<2.5	
2/17/2011	<1200	430	33	<2.0	<2.0	<2.0	<2.0	<2.0	
7/7/2011	<1,500	580	57	<2.5	<2.5	<2.5	<2.5	<2.5	
1/23/2012	<1,200	620	44	<2.0	<2.0	<2.0	<2.0	<2.0	
7/25/2012	<150	990	49	<0.50	<0.50	<0.50	<0.50	<0.50	
1/17/2013	**<750**	**590**	**110**	**<2.5**	**<2.5**	**<2.5**	**<2.5**	**<2.5**	
MW-5									
8/23/1995	--	--	<300	--	--	--	--	--	
2/20/1996	--	--	<50	--	--	--	--	--	
5/15/1996	--	--	<40	--	--	--	--	--	
8/13/1996	--	--	47	--	--	--	--	--	
11/13/1996	--	--	66	--	--	--	--	--	
3/26/1997	--	--	68	--	--	--	--	--	
5/15/1997	--	--	48	--	--	--	--	--	
8/26/1997	--	--	9	--	--	--	--	--	
11/5/1997	--	--	34	--	--	--	--	--	
2/18/1998	--	--	320	--	--	--	--	--	
5/20/1998	--	--	62	--	--	--	--	--	
7/30/1998	--	--	<3	--	--	--	--	--	
10/29/1998	--	--	<3	--	--	--	--	--	
3/16/1999	--	--	120	--	--	--	--	--	
5/5/1999	--	--	19	--	--	--	--	--	
8/26/1999	--	--	150	--	--	--	--	--	
3/13/2000	--	--	<3	--	--	--	--	--	
6/20/2000	--	--	<2.50	--	--	--	--	--	
8/31/2000	--	--	3.83	--	--	--	--	--	

Table 3. Summary of Fuel Additives Analytical Data

ARCO Service Station #0771, 899 Rincon Ave., Livermore, CA

Well ID and Date Monitored	Concentrations in µg/L								Footnote
	Ethanol	TBA	MTBE	DIPE	ETBE	TAME	1,2-DCA	EDB	
MW-5 Cont.									
9/17/2001	--	--	330	--	--	--	--	--	
7/19/2002	--	--	180	--	--	--	--	--	
7/9/2003	<1,000	1,100	260	<5.0	<5.0	<5.0	<5.0	<5.0	
08/04/2004	<1,000	850	250	<5.0	<5.0	<5.0	<5.0	<5.0	
07/15/2005	<1,000	720	270	<5.0	<5.0	<5.0	<5.0	<5.0	
7/21/2006	<3,000	<200	14	<5.0	<5.0	<5.0	<5.0	<5.0	
7/18/2007	<300	260	110	<0.50	<0.50	<0.50	<0.50	<0.50	
7/7/2008	--	<10	<0.50	<0.50	<0.50	<0.50	<0.50	--	
7/22/2009	<300	11	12	<0.50	<0.50	<0.50	<0.50	<0.50	
9/9/2010	<300	420	10	<0.50	<0.50	<0.50	<0.50	<0.50	
7/7/2011	<300	350	4.6	<0.50	<0.50	<0.50	<0.50	<0.50	
7/25/2012	<150	480	11	<0.50	<0.50	<0.50	<0.50	<0.50	
MW-6									
8/23/1995	--	--	<20	--	--	--	--	--	
2/20/1996	--	--	<30	--	--	--	--	--	
5/15/1996	--	--	<15	--	--	--	--	--	
8/13/1996	--	--	<20	--	--	--	--	--	
11/13/1996	--	--	16	--	--	--	--	--	
3/26/1997	--	--	<30	--	--	--	--	--	
5/15/1997	--	--	<12	--	--	--	--	--	
8/26/1997	--	--	<12	--	--	--	--	--	
11/5/1997	--	--	9	--	--	--	--	--	
2/18/1998	--	--	19	--	--	--	--	--	
5/20/1998	--	--	9	--	--	--	--	--	
7/30/1998	--	--	<15	--	--	--	--	--	
10/29/1998	--	--	<12	--	--	--	--	--	
3/16/1999	--	--	18	--	--	--	--	--	
5/5/1999	--	--	25	--	--	--	--	--	
8/26/1999	--	--	13	--	--	--	--	--	
12/3/1999	--	--	4	--	--	--	--	--	
3/13/2000	--	--	<3	--	--	--	--	--	

Table 3. Summary of Fuel Additives Analytical Data

ARCO Service Station #0771, 899 Rincon Ave., Livermore, CA

Well ID and Date Monitored	Concentrations in µg/L								Footnote
	Ethanol	TBA	MTBE	DIPE	ETBE	TAME	1,2-DCA	EDB	
MW-6 Cont.									
6/20/2000	--	--	<2.50	--	--	--	--	--	
8/31/2000	--	--	8.73	--	--	--	--	--	
2/9/2001	--	--	57.1	--	--	--	--	--	
2/9/2001	--	--	48.9	--	--	--	--	--	
9/17/2001	--	--	<2.5	--	--	--	--	--	
9/17/2001	--	--	<2.5	--	--	--	--	--	
1/21/2002	--	--	<5.0	--	--	--	--	--	
7/19/2002	--	--	<0.50	--	--	--	--	--	
1/15/2003	--	--	1	--	--	--	--	--	
7/9/2003	<100	<20	0.98	<0.50	<0.50	<0.50	<0.50	<0.50	
08/04/2004	<100	<20	5.2	<0.50	<0.50	<0.50	<0.50	<0.50	
07/15/2005	<500	110	32	<2.5	<2.5	<2.5	<2.5	<2.5	
7/21/2006	<300	<20	5.1	<0.50	<0.50	<0.50	<0.50	<0.50	
7/18/2007	<300	<20	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
7/7/2008	--	<10	<0.50	<0.50	<0.50	<0.50	<0.50	--	
7/22/2009	<300	<10	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
9/9/2010	<300	<10	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
7/7/2011	<300	19	8.0	<0.50	<0.50	<0.50	<0.50	<0.50	
7/25/2012	<150	22	10	<0.50	<0.50	<0.50	<0.50	<0.50	
MW-7									
8/23/1995	--	--	350	--	--	--	--	--	
2/20/1996	--	--	<400	--	--	--	--	--	
3/26/1997	--	--	<300	--	--	--	--	--	
2/18/1998	--	--	240	--	--	--	--	--	
3/16/1999	--	--	<120	--	--	--	--	--	
8/31/2000	--	--	202	--	--	--	--	--	
2/9/2001	--	--	128	--	--	--	--	--	
9/17/2001	--	--	160	--	--	--	--	--	
1/21/2002	--	--	97	--	--	--	--	--	
1/21/2002	--	--	99	--	--	--	--	--	
7/19/2002	--	--	64	--	--	--	--	--	

Table 3. Summary of Fuel Additives Analytical Data

ARCO Service Station #0771, 899 Rincon Ave., Livermore, CA

Well ID and Date Monitored	Concentrations in µg/L								Footnote
	Ethanol	TBA	MTBE	DIPE	ETBE	TAME	1,2-DCA	EDB	
MW-7 Cont.									
1/15/2003	--	--	91	--	--	--	--	--	
7/9/2003	<1,000	350	110	<5.0	<5.0	<5.0	<5.0	<5.0	
02/19/2004	<1,000	420	100	<10	<10	<10	<5.0	<5.0	
08/04/2004	<5,000	<1,000	140	<25	<25	<25	<25	<25	
01/18/2005	<1,000	260	87	<5.0	<5.0	<5.0	<5.0	<5.0	a
07/15/2005	<5,000	<1,000	150	<25	<25	<25	<25	<25	
01/10/2006	<30,000	<2,000	120	<50	<50	<50	<50	<50	
7/21/2006	<30,000	<2,000	54	<50	<50	<50	<50	<50	
1/17/2007	<1,500	<100	3.1	<2.5	<2.5	<2.5	<2.5	<2.5	
7/18/2007	<600	220	67	<1.0	<1.0	<1.0	<1.0	<1.0	
1/15/2008	<1,500	<100	26	<2.5	<2.5	<2.5	<2.5	<2.5	
7/7/2008	--	<10	0.69	<0.50	<0.50	<0.50	<0.50	--	
1/7/2009	--	<10	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
7/22/2009	<300	<10	0.53	<0.50	<0.50	<0.50	<0.50	<0.50	
3/12/2010	<300	51	11	<0.50	<0.50	<0.50	<0.50	<0.50	
9/9/2010	<300	180	110	<0.50	<0.50	<0.50	<0.50	<0.50	
7/7/2011	<3,000	390	150	<5.0	<5.0	<5.0	<5.0	<5.0	
1/23/2012	<3,000	510	150	<5.0	<5.0	<5.0	<5.0	<5.0	
8/31/2012	<3,000	510	120	<10	<10	<10	<10	<10	
1/17/2013	**<750**	**340**	**120**	**<2.5**	**<2.5**	**<2.5**	**<2.5**	**<2.5**	
MW-8									
8/23/1995	--	--	<3	--	--	--	--	--	
2/20/1996	--	--	<3	--	--	--	--	--	
8/13/1996	--	--	<3	--	--	--	--	--	
3/26/1997	--	--	<3	--	--	--	--	--	
8/26/1997	--	--	<3	--	--	--	--	--	
2/18/1998	--	--	<3	--	--	--	--	--	
7/30/1998	--	--	<3	--	--	--	--	--	
3/16/1999	--	--	<3	--	--	--	--	--	
8/26/1999	--	--	<3	--	--	--	--	--	
3/13/2000	--	--	<3	--	--	--	--	--	

Table 3. Summary of Fuel Additives Analytical Data

ARCO Service Station #0771, 899 Rincon Ave., Livermore, CA

Well ID and Date Monitored	Concentrations in µg/L								Footnote
	Ethanol	TBA	MTBE	DIPE	ETBE	TAME	1,2-DCA	EDB	
MW-9									
8/23/1995	--	--	<3	--	--	--	--	--	
2/20/1996	--	--	<3	--	--	--	--	--	
3/26/1997	--	--	<3	--	--	--	--	--	
2/18/1998	--	--	<3	--	--	--	--	--	
3/16/1999	--	--	<3	--	--	--	--	--	
3/13/2000	--	--	<3	--	--	--	--	--	
MW-10									
8/23/1995	--	--	<3	--	--	--	--	--	
2/20/1996	--	--	<3	--	--	--	--	--	
3/26/1997	--	--	<3	--	--	--	--	--	
3/16/1999	--	--	<3	--	--	--	--	--	
MW-11									
8/23/1995	--	--	<3	--	--	--	--	--	
2/20/1996	--	--	<3	--	--	--	--	--	
8/13/1996	--	--	<3	--	--	--	--	--	
3/26/1997	--	--	<3	--	--	--	--	--	
8/26/1997	--	--	<3	--	--	--	--	--	
2/18/1998	--	--	<3	--	--	--	--	--	
7/30/1998	--	--	<3	--	--	--	--	--	
3/16/1999	--	--	<3	--	--	--	--	--	
8/26/1999	--	--	<3	--	--	--	--	--	
3/13/2000	--	--	<3	--	--	--	--	--	
8/31/2000	--	--	<2.50	--	--	--	--	--	
8/31/2000	--	--	<2.50	--	--	--	--	--	
9/17/2001	--	--	<2.5	--	--	--	--	--	
7/19/2002	--	--	<0.50	--	--	--	--	--	
7/9/2003	<100	<20	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
08/04/2004	<100	<20	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
07/15/2005	<100	<20	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
7/21/2006	<300	<20	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	

Table 3. Summary of Fuel Additives Analytical Data

ARCO Service Station #0771, 899 Rincon Ave., Livermore, CA

Well ID and Date Monitored	Concentrations in µg/L								Footnote
	Ethanol	TBA	MTBE	DIPE	ETBE	TAME	1,2-DCA	EDB	
MW-11 Cont.									
7/18/2007	<300	<20	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
7/7/2008	--	<10	<0.50	<0.50	<0.50	<0.50	<0.50	--	
7/22/2009	<300	<10	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
9/9/2010	<300	<10	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
7/7/2011	<300	<10	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
RW-1									
8/23/1995	--	--	<50	--	--	--	--	--	
2/20/1996	--	--	<40	--	--	--	--	--	
3/26/1997	--	--	54	--	--	--	--	--	
2/18/1998	--	--	<60	--	--	--	--	--	
3/16/1999	--	--	530	--	--	--	--	--	
3/13/2000	--	--	230	--	--	--	--	--	
8/31/2000	--	--	82.5	--	--	--	--	--	
2/9/2001	--	--	<2.50	--	--	--	--	--	
9/17/2001	--	--	<2.5	--	--	--	--	--	
1/21/2002	--	--	18	--	--	--	--	--	
7/19/2002	--	--	13	--	--	--	--	--	
1/15/2003	--	--	1.5	--	--	--	--	--	
7/9/2003	<100	<20	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
02/19/2004	<100	<20	<0.50	<1.0	<1.0	<1.0	<0.50	<0.50	
08/04/2004	<100	<20	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
01/18/2005	<100	<20	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	a
07/15/2005	<100	<20	2.0	<0.50	<0.50	<0.50	<0.50	<0.50	
01/10/2006	<300	<20	0.54	<0.50	<0.50	<0.50	<0.50	<0.50	
1/17/2007	<1,500	<100	2.6	<2.5	<2.5	<2.5	<2.5	<2.5	
7/18/2007	<300	<20	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
1/15/2008	<300	<20	8.3	<0.50	<0.50	<0.50	<0.50	<0.50	
7/7/2008	--	<10	0.53	<0.50	<0.50	<0.50	<0.50	--	
1/7/2009	--	<10	1.6	<0.50	<0.50	<0.50	<0.50	<0.50	
7/22/2009	<300	12	0.84	<0.50	<0.50	<0.50	<0.50	<0.50	
3/12/2010	<300	13	2.7	<0.50	<0.50	<0.50	<0.50	<0.50	

Table 3. Summary of Fuel Additives Analytical Data

ARCO Service Station #0771, 899 Rincon Ave., Livermore, CA

Well ID and Date Monitored	Concentrations in µg/L								Footnote
	Ethanol	TBA	MTBE	DIPE	ETBE	TAME	1,2-DCA	EDB	
RW-1 Cont.									
9/9/2010	<300	<10	1.9	<0.50	<0.50	<0.50	<0.50	<0.50	
2/17/2011	<300	<10	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
7/7/2011	<300	<10	2.2	<0.50	<0.50	<0.50	<0.50	<0.50	
1/23/2012	<300	<10	1.8	<0.50	<0.50	<0.50	<0.50	<0.50	
7/25/2012	<150	19	<0.50	<0.50	<0.50	0.50	<0.50	<0.50	
1/17/2013	**<150**	**<10**	**0.85**	**<0.50**	**<0.50**	**<0.50**	**<0.50**	**<0.50**	
VW-1									
8/31/2000	--	--	<2.50	--	--	--	--	--	
2/9/2001	--	--	<2.50	--	--	--	--	--	
9/17/2001	--	--	<2.5	--	--	--	--	--	
1/21/2002	--	--	<5.0	--	--	--	--	--	
7/19/2002	--	--	<0.50	--	--	--	--	--	
1/15/2003	--	--	<0.50	--	--	--	--	--	
7/9/2003	<100	<20	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
08/04/2004	<100	<20	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
07/15/2005	<100	<20	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
7/21/2006	<300	<20	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
7/18/2007	<300	<20	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
7/7/2008	--	<10	<0.50	<0.50	<0.50	<0.50	<0.50	--	
7/22/2009	<300	<10	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
9/9/2010	<300	<10	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
2/17/2011	<300	<10	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
7/7/2011	<300	<10	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
7/25/2012	<150	<10	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	

Symbols & Abbreviations:
-- = Not analyzed/sampled
< = Not detected at or above specified laboratory reporting limit
1,2-DCA = 1,2-Dichloroethane
DIPE = Diisopropyl ether
EDB = 1,2-Dibromoethane
ETBE = Ethyl tert-butyl ether
MTBE = Methyl tert-butyl ether
µg/L = Micrograms per liter
TAME = tert-Amyl methyl ether
TBA = tert-Butyl alcohol

Footnotes:
a = Calibration verification was within the method limits but outside the contract limits for ethanol
b = Sample >4x spike concentration

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

Table 4. Historical Groundwater Gradient - Direction and Magnitude

ARCO Service Station #0771, 899 Rincon Ave., Livermore, CA

Date Measured	Approximate Gradient Direction	Approximate Gradient Magnitude (ft/ft)
3/20/1995	Northwest	0.030
6/2/1995	North-Northwest	0.014
8/23/1995	North-Northwest	0.030
12/4/1995	North-Northwest	0.030
2/20/1996	Northwest	0.016
5/15/1996	Northwest	0.024
8/13/1996	North-Northwest	0.030
11/13/1996	North-Northwest	0.031
3/26/1997	North-Northwest	0.044
5/15/1997	North-Northwest	0.031
8/26/1997	North-Northwest	0.042
11/5/1997	North-Northwest	0.030
2/18/1998	Northwest	0.010
5/20/1998	Northwest	0.030
7/30/1998	North	0.040
10/29/1998	North	0.005
3/16/1999	North-Northwest	0.030
5/5/1999	North	0.040
8/26/1999	North-Northwest	0.050
12/3/1999	North-Northeast	0.060
3/13/2000	North-Northwest	0.066
6/20/2000	North-Northwest	0.050
8/31/2000	North-Northwest	0.062
2/9/2001	North-Northeast	0.014
9/17/2001	North-Northwest	0.061
1/21/2002	North-Northwest	0.050
7/19/2002	North-Northwest	0.044
1/15/2003	Northeast to Southeast	0.038 - 0.016
7/9/2003	Northwest to North-Northwest	0.009 - 0.063
2/19/2004	North	0.044
8/4/2004	Northeast	0.071
1/18/2005	North-Northeast	0.04
7/15/2005	Northeast and Southwest	0.05 and 0.02
1/10/2006	North	0.02
7/21/2006	North and Southwest	0.05 and 0.02
1/17/2007	North-Northeast and Southwest	0.03 and 0.02
7/18/2007	North-Northeast to Southwest	0.03 and 0.04
1/15/2008	North	0.04
7/7/2008	North	0.03
1/7/2009	North	0.06
7/22/2009	North	0.04
3/12/2010	North	0.05
9/9/2010	North	0.04
2/17/2011	North	0.03
7/7/2011	North	0.04

Table 4. Historical Groundwater Gradient - Direction and Magnitude

ARCO Service Station #0771, 899 Rincon Ave., Livermore, CA

Date Measured	Approximate Gradient Direction	Approximate Gradient Magnitude (ft/ft)
1/23/2012	Northwest	0.02
7/25/2012	North	0.03
1/17/2013	**North**	**0.03**

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

APPENDICES

APPENDIX A

RECENT REGULATORY CORRESPONDENCE

ALAMEDA COUNTY
HEALTH CARE SERVICES
AGENCY
ALEX BRISCOE, Director

ENVIRONMENTAL HEALTH SERVICES
ENVIRONMENTAL PROTECTION
1131 Harbor Bay Parkway, Suite 250
Alameda, CA 94502-6577
(510) 567-6700
FAX (510) 337-93

March 18, 2012

Shannon Couch
Atlantic Richfield Company
PO Box 1257
San Ramon, CA 94583
(*Sent via E-mail to: shannon.couch@bp.com*)

Subject: Case File Review for Fuel Leak Case No. RO0000200 and GeoTracker Global ID T0600100113, ARCO #00771, 899 Rincon Avenue, Livermore, CA 94550

Dear Ms. Couch:

Alameda County Environmental Health (ACEH) staff has reviewed the fuel leak case file for the above-referenced site. The most recent document in the case file is a report entitled, "*Fourth Quarter 2012 Status Report*," dated January 11, 2013 (Status Report). The Status Report, which was prepared on behalf of Atlantic Richfield Company by Broadbent & Associates, Inc., anticipates that the site will be re-evaluated in the near future. A technical report entitled, "*Case Evaluation and Justification for No Further Action*," dated January 5, 2012 (NFA Request) previously requested that the site be considered for case closure. However, the NFA Request was retracted in correspondence from Atlantic Richfield Company dated September 12, 2012.

Based on our review of the case file, we concur that the site should be re-evaluated. Therefore, we request that you prepare a Conceptual Site Model (CSM) and Work Plan that addresses the technical comments below. Please submit the CSM and Work Plan **no later than May 29, 2013**.

TECHNICAL COMMENTS

1. **Free Product in Well MW-7.** Light non-aqueous phase liquid (LNAPL) was observed within well MW-7 on July 25, 2012. LNAPL was also measured at a thickness of 0.01 feet during a site visit on August 31, 2012. The Status Report recommends continued monitoring for the presence on LNAPL within MW-7 on a quarterly basis. We have no objection to this proposal.

2. **Municipal Water Supply Well.** A "*Water Well Survey*," dated September 17, 2003, was completed for the site by URS. The 2003 water well survey was referenced in the "*Case Evaluation and Justification for No Further Action*," dated January 5, 2012 and the "*Initial Site Conceptual Model and Soil and Groundwater Investigation Work Plan,*" dated February 10, 2009. These documents do not appear to include references to a municipal supply well CWS-10, which is located approximately 850 feet northeast of the site. We concur with the recommendation in the "*Fourth Quarter 2012 Status Report*," dated January 11, 2013 to complete a new Sensitive Receptor Survey for the site. Please include the results of the Sensitive Receptor Survey in the CSM and Work Plan requested below.

3. **Site Geology and Vertical Extent of Contamination.** Site geology consists of coarse-grained soils typically described as sandy to clayey gravels to a depth of approximately 36 to 42 feet bgs. A sandy clay layer was encountered in each soil boring extended to these depths. Borings for the monitoring wells were generally extended into the sandy clay layer and then backfilled to the top of the sandy

clay for well construction. The bottoms of the well screens for monitoring wells MW-1 through MW-11 appear to be immediately above the top of the sandy clay layer. Analytical data from the monitoring well soil borings indicates that the highest concentrations of TPHg were detected in soil samples collected from the sandy clay layer. Only one soil sample (S-45.5-B4) appears to have been collected below the sandy clay layer. Soil sample S-45.4-B4, apparently collected from a clayey sand layer below the sandy clay, contained 5.5 mg/kg of TPHg and 0.16 mg/kg of benzene. Within boring B4, the sandy clay layer appeared to be approximately 5 feet thick. These limited results suggest that the sandy clay may act to limit downward migration of contamination. However, no groundwater samples have been collected below the sandy clay layer to confirm that groundwater contamination does not extend below the sandy clay layer. It is also unknown whether there is a downward vertical hydraulic gradient that could cause contamination to migrate downward through the sandy clay layer. Please review the vertical extent of contamination in the CSM and Work Plan requested below and propose a scope of work as appropriate to assess whether the sandy clay layer is a barrier to vertical migration or whether groundwater contamination has migrated downward through the sandy clay layer. A transect of soil borings with multi-level groundwater sampling is likely to provide sufficient information to make this evaluation.

4. **Variability in Groundwater Monitoring Data.** Groundwater monitoring data for several wells exhibit significant variability between sampling events. Examples include TPHg groundwater concentrations in well MW-4, which were below reporting limits for three consecutive events in 2000 and 2001 but increased to 3,400 µg/L on 9/17/2011. Please consider this variability in the CSM and Work Plan requested below.

5. **Hydraulic Gradient.** The "*Initial Site Conceptual Model and Soil and Groundwater Investigation Work Plan,*" dated February 10, 2009 includes a table of "Historical Groundwater flow Direction and Gradient." Thank you for including this compilation and please update this summary table for the CSM and Work Plan requested below. Based on review of data from other fuel leak cases in the area and regional groundwater elevation contour maps by the Zone 7 Water Agency, the regional hydraulic gradient in the area is to the west northwest. Groundwater elevation contour maps for the site typically show a hydraulic gradient to the north or north northwest. During several groundwater monitoring events, the apparent hydraulic gradient was to the north northeast, which is in the direction of the municipal water supply well discussed in technical comment 2. As shown on Table 3 of the 2009 SCM and Work Plan, the hydraulic gradient for the site is typically 0.02 to 0.05 but ranges from 0.01 to 0.07. The regional hydraulic gradient in the area of the site is on the order of 0.01. The cause for the apparent differences between the flow direction and hydraulic gradient for the site and the regional flow direction and hydraulic gradient is not obvious. The possibility that flow direction and hydraulic gradient for the site could be affected by local such as groundwater water withdrawal by the municipal well should be considered din the CSM and Work Plan requested below.

6. **Shallow Groundwater and Well Screens.** Well VW-1 is screened within a shallower stratigraphic interval between 18.5 and 28.5 feet bgs than the other 11 monitoring wells at the site. Water levels measured in well VW-1 are typically 5 to 10 feet higher than water levels in the deeper monitoring wells, which suggests that well VW-1 intersects a shallower water-bearing zone. A sandy silt with fine gravel layer appears to have been encountered at a depth of 28 feet bgs in the VW-1 boring but is not shown on cross sections for the site. It is not clear whether the sandy silt layer encountered in the

VW-1 boring is the base of a water-bearing layer. We request that you prepare more detailed cross sections through VW-1 in the CSM and Work Plan requested below.

7. **Reports Not in Case File**. The following reports have been referenced in various technical reports but are not in the ACEH case file. Please submit these documents to the ACEH ftp site and GeoTracker:
    - Broadbent and Associates, Inc.,"*Off-site Soil & Groundwater Investigation Report*," April 29, 2011.
    - RESNA, "*Letter Report of Vapor Extraction Test Performed*," January 3, 1992.

8. **Groundwater Monitoring.** We note that groundwater monitoring well was suspended in 2000 for the two downgradient monitoring wells MW-3 and MW-8, presumably due to minimal or no detections in groundwater samples from the wells. Given that these two wells are the two wells that would provide evidence of plume migration towards the municipal supply well to the northeast, we request that wells MW-3 and AMW-8 be sampled during the second quarter 2013 groundwater monitoring event. Please present the results in the groundwater monitoring report requested below.

TECHNICAL REPORT REQUEST

Please upload technical reports to the ACEH ftp site (Attention: Jerry Wickham), and to the State Water Resources Control Board's GeoTracker website according to the following schedule and file-naming convention:

- **May 29, 2013** – Conceptual Site Model and Work Plan
  File to be named: SCM_WP_R_yyyy-mm-dd RO200

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

If you have any questions, please call me at (510) 567-6791 or send me an electronic mail message at jerry.wickham@acgov.org. Case files can be reviewed online at the following website: http://www.acgov.org/aceh/index.htm.

Sincerely,

Jerry Wickham, California PG 3766, CEG 1177, and CHG 297
Senior Hazardous Materials Specialist

Attachments: Responsible Party(ies) Legal Requirements/Obligations

Enclosure: ACEH Electronic Report Upload (ftp) Instructions

cc: Danielle Stefani, Livermore Pleasanton Fire Department, 3560 Nevada St, Pleasanton, CA 94566 (*Sent via E-mail to: dstefani@lpfire.org*)

Colleen Winey (QIC 8021), Zone 7 Water Agency, 100 North Canyons Pkwy, Livermore, CA 94551 (*Sent via E-mail to: cwiney@zone7water.com*)

Matt Herrick, Broadbent & Associates, Inc., 1324 Mangrove Avenue, Suite 212, Chico, CA 95926 (*Sent via E-mail to: mherrick@broadbentinc.com*)

Donna Drogos, ACEH (*Sent via E-mail to: donna.drogos@acgov.org*)
Jerry Wickham, ACEH (*Sent via E-mail to: jerry.wickham@acgov.org*)

GeoTracker, eFile

Attachment 1

Responsible Party(ies) Legal Requirements/Obligations

REPORT/DATA REQUESTS

These reports/data are being requested pursuant to Division 7 of the California Water Code (Water Quality), Chapter 6.7 of Division 20 of the California Health and Safety Code (Underground Storage of Hazardous Substances), and Chapter 16 of Division 3 of Title 23 of the California Code of Regulations (Underground Storage Tank Regulations).

ELECTRONIC SUBMITTAL OF REPORTS

ACEH's Environmental Cleanup Oversight Programs (Local Oversight Program [LOP] for unauthorized releases from petroleum Underground Storage Tanks [USTs], and Site Cleanup Program [SCP] for unauthorized releases of non-petroleum hazardous substances) require submission of reports in electronic format pursuant to Chapter 3 of Division 7, Sections 13195 and 13197.5 of the California Water Code, and Chapter 30, Articles 1 and 2, Sections 3890 to 3895 of Division 3 of Title 23 of the California Code of Regulations (23 CCR). Instructions for submission of electronic documents to the ACEH FTP site are provided on the attached "Electronic Report Upload Instructions."

Submission of reports to the ACEH FTP site is in addition to requirements for electronic submittal of information (ESI) to the State Water Resources Control Board's (SWRCB) Geotracker website. In April 2001, the SWRCB adopted 23 CCR, Division 3, Chapter 16, Article 12, Sections 2729 and 2729.1 (Electronic Submission of Laboratory Data for UST Reports). Article 12 required electronic submittal of analytical laboratory data submitted in a report to a regulatory agency (effective September 1, 2001), and surveyed locations (latitude, longitude and elevation) of groundwater monitoring wells (effective January 1, 2002) in Electronic Deliverable Format (EDF) to Geotracker. Article 12 was subsequently repealed in 2004 and replaced with Article 30 (Electronic Submittal of Information) which expanded the ESI requirements to include electronic submittal of any report or data required by a regulatory agency from a cleanup site. The expanded ESI submittal requirements for petroleum UST sites subject to the requirements of 23 CCR, Division, 3, Chapter 16, Article 11, became effective December 16, 2004. All other electronic submittals required pursuant to Chapter 30 became effective January 1, 2005. Please visit the SWRCB website for more information on these requirements. (http://www.waterboards.ca.gov/water_issues/programs/ust/electronic_submittal/)

PERJURY STATEMENT

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

PROFESSIONAL CERTIFICATION & CONCLUSIONS/RECOMMENDATIONS

The California Business and Professions Code (Sections 6735, 7835, and 7835.1) requires that work plans and technical or implementation reports containing geologic or engineering evaluations and/or judgments be performed under the direction of an appropriately registered or certified professional. For your submittal to be considered a valid technical report, you are to present site specific data, data interpretations, and recommendations prepared by an appropriately licensed professional and include the professional registration stamp, signature, and statement of professional certification. Please ensure all that all technical reports submitted for this fuel leak case meet this requirement.

UNDERGROUND STORAGE TANK CLEANUP FUND

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

AGENCY OVERSIGHT

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

Alameda County Environmental Cleanup Oversight Programs (LOP and SCP)	**REVISION DATE:** July 25, 2012
	ISSUE DATE: July 5, 2005
	PREVIOUS REVISIONS: October 31, 2005; December 16, 2005; March 27, 2009; July 8, 2010
SECTION: Miscellaneous Administrative Topics & Procedures	**SUBJECT:** Electronic Report Upload (ftp) Instructions

The Alameda County Environmental Cleanup Oversight Programs (petroleum UST and SCP) require submission of all reports in electronic form to the county's FTP site. Paper copies of reports will no longer be accepted. The electronic copy replaces the paper copy and will be used for all public information requests, regulatory review, and compliance/enforcement activities.

REQUIREMENTS

- **Please do not submit reports as attachments to electronic mail.**
- Entire report including cover letter must be submitted to the ftp site as **a single Portable Document Format (PDF) with no password protection**.
- It is **preferable** that reports be converted to PDF format from their original format, (e.g., Microsoft Word) rather than scanned.
- **Signature pages and perjury statements must be included and have either original or electronic signature.**
- **Do not password protect the document**. Once indexed and inserted into the correct electronic case file, the document will be secured in compliance with the County's current security standards and a password. **Documents with password protection will not be accepted**.
- Each page in the PDF document should be rotated in the direction that will make it easiest to read on a computer monitor.
- Reports must be named and saved using the following naming convention:

  RO#_Report Name_Year-Month-Date (e.g., RO#5555_WorkPlan_2005-06-14)

Submission Instructions

1) Obtain User Name and Password
   a) Contact the Alameda County Environmental Health Department to obtain a User Name and Password to upload files to the ftp site.
      i) Send an e-mail to .loptoxic@acgov.org
   b) In the subject line of your request, be sure to include **"ftp PASSWORD REQUEST"** and in the body of your request, include the **Contact Information, Site Addresses**, and the **Case Numbers (RO# available in Geotracker) you will be posting for**.

2) Upload Files to the ftp Site
   a) Using Internet Explorer (IE4+), go to ://alcoftp1.acgov.org
      (i) Note: Netscape, Safari, and Firefox browsers will not open the FTP site as they are NOT being supported at this time.
   b) Click on Page located on the Command bar on upper right side of window, and then scroll down to Open FTP Site in Windows Explorer.
   c) Enter your User Name and Password. (Note: Both are Case Sensitive.)
   d) Open "My Computer" on your computer and navigate to the file(s) you wish to upload to the ftp site.
   e) With both "My Computer" and the ftp site open in separate windows, drag and drop the file(s) from "My Computer" to the ftp window.

3) Send E-mail Notifications to the Environmental Cleanup Oversight Programs
   a) Send email to .loptoxic@acgov.org notify us that you have placed a report on our ftp site.
   b) Copy your Caseworker on the e-mail. Your Caseworker's e-mail address is the entire first name then a period and entire last name @acgov.org. (e.g., firstname.lastname@acgov.org)
   c) The subject line of the e-mail must start with the RO# followed by **Report Upload**. (e.g., Subject: RO1234 Report Upload) If site is a new case without an RO#, use the street address instead.
   d) If your document meets the above requirements and you follow the submission instructions, you will receive a notification by email indicating that your document was successfully uploaded to the ftp site.

APPENDIX B

HISTORIC SITE DATA

TABLE 1
ANALYTICAL RESULTS OF SOIL AND SLUDGE SAMPLES
BY BROWN AND CALDWELL
ARCO Station 771
899 Rincon Avenue
Livermore, California
August 25, 1987

Sample Identification	HVC	TPFH	B	T	X	PCBs
AL-1	ND	378	ND	ND	ND	ND
AL-2	ND	ND	ND	ND	ND	ND
LS-1	ND	3,779	ND	0.009	0.05	ND
LS-2	ND	808	ND	0.011	0.06	ND
WO-1	ND	256,508	ND	2.920	0.128	ND

Results in milligrams per kilogram (mg/kg) or parts per million (ppm).
HVC: Halogenated volatile compounds by EPA Method 8010.
TPFH: Total petroleum fuel hydrocarbons by modified EPA Method 8015.
B: Benzene by EPA Method 8020.
T: Toluene by EPA Method 8020.
X: Total xylene isomers by EPA Method 8020.
PCBs: Polychlorinated biphenyls (PCBs) by EPA Method 8080.
ND: Below laboratory reported detection concentration.

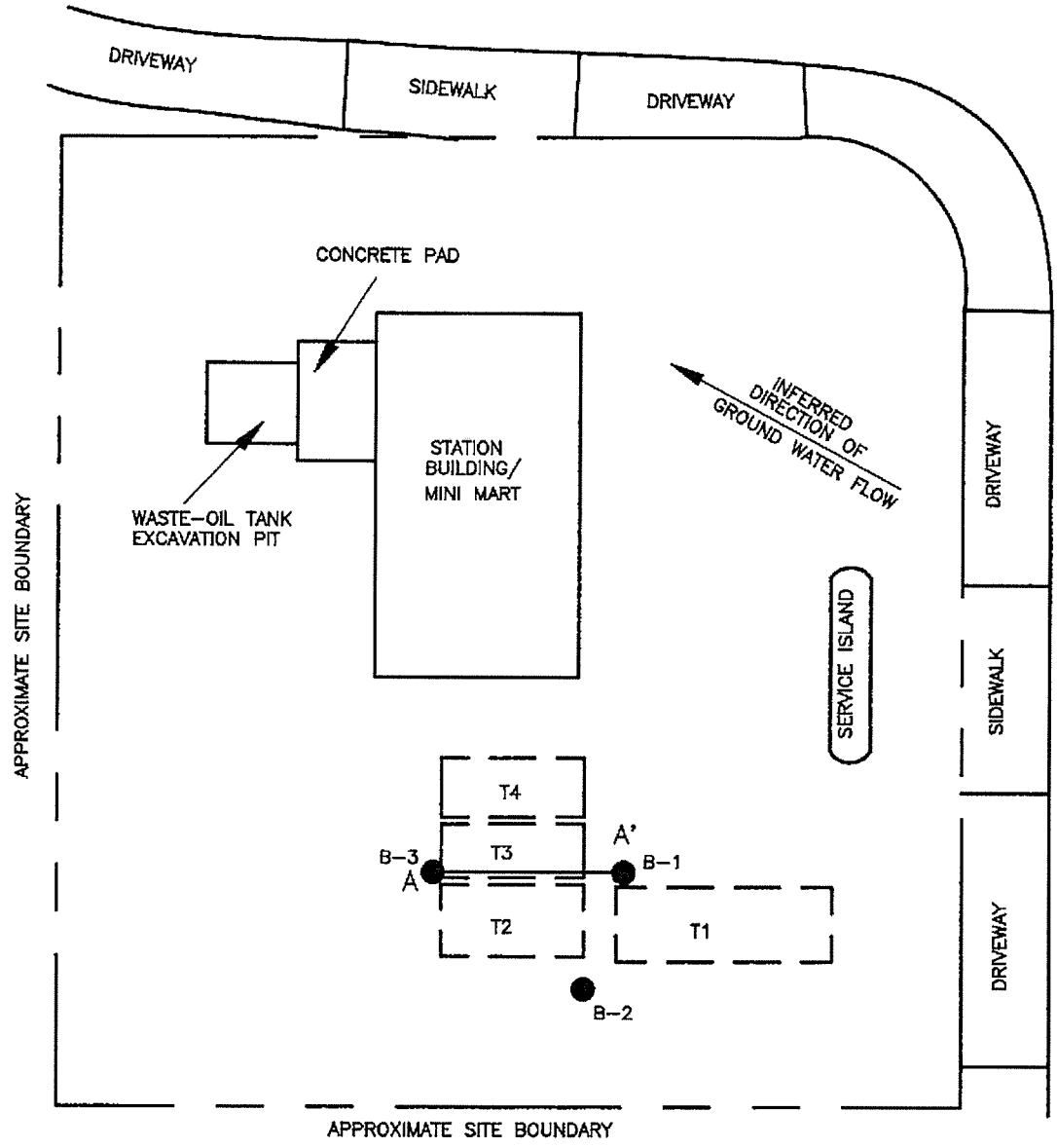
Sample designation: LS-2
Sample number
AL = Soil sample
LS = Stockpile sample
WO = Waste oil sample

TABLE 2
RESULTS OF LABORATORY ANALYSES
OF SOIL SAMPLES
ARCO Station 771
899 Rincon Avenue
Livermore, California

Sample Identification	Date	TPHg	Benzene	Toluene	Ethyl-benzene	Total Xylenes
S-10-B1	2/1/90	<1.0	<0.005	<0.005	<0.005	<0.005
S-19.5-B1	2/1/90	<1.0	0.022	0.024	<0.005	0.022
S-24.5-B1	2/1/90	<1.0	0.022	0.015	0.010	0.048
S-29.5-B1	2/1/90	<1.0	<0.005	<0.005	<0.005	<0.005
S-10-B2	2/1/90	<1.0	<0.005	<0.005	<0.005	<0.005
S-20-B2	2/1/90	<1.0	0.016	0.020	<0.005	0.025
S-25-B2	2/1/90	1.4	<0.01	<0.01	<0.01	0.018
S-31-B2	2/1/90	<1.0	<0.005	<0.005	<0.005	<0.005
S-10-B3	2/2/90	<1.0	<0.005	<0.005	<0.005	<0.005
S-19.5-B3	2/2/90	<1.0	0.028	<0.005	<0.005	0.017
S-25-B3	2/2/90	4.5	0.047	<0.01	0.011	0.038
S-32-B3	2/2/90	190	<1.0	<1.0	<1.0	1.7

Results in parts per million (ppm)
TPHg = Total Petroleum Hydrocarbons as gasoline
< = Indicates less than the detection limit for the specified method of analysis.

S-25-B2
- S: Soil sample
- 25: Approximate sample depth
- B2: Boring number



EXPLANATION

B-3 ● = Soil boring

A ——— A' = Cross section

T4 = Underground gasoline-storage tank

Approximate Scale

20 10 0 20 40

feet

Source: Modified from plan supplied by ARCO.

Applied GeoSystems

PROJECT 60000-1

GENERALIZED SITE PLAN
ARCO Station 771
899 Rincon Avenue
Livermore, California

PLATE 2

TABLE 2
CUMULATIVE RESULTS OF LABORATORY ANALYSES OF SOIL SAMPLES
ARCO Station 771
Livermore, California
(Page 1 of 4)

Sample Identification	TPHg	TPHd	B	T	E	X	TOG
February 1990							
S-10-B1	<1.0	NA	<0.005	<0.005	<0.005	<0.005	NA
S-19.5-B1	<1.0	NA	0.022	0.024	<0.005	0.022	NA
S-24.5-B1	<1.0	NA	0.022	0.015	0.010	0.048	NA
S-29.5-B1	<1.0	NA	<0.005	<0.005	<0.005	<0.005	NA
S-10-B2	<1.0	NA	<0.005	<0.005	<0.005	<0.005	NA
S-20-B2	<1.0	NA	0.016	0.020	<0.005	0.025	NA
S-25-B2	1.4	NA	<0.01	<0.01	<0.01	0.018	NA
S-31-B2	<1.0	NA	<0.005	<0.005	<0.005	<0.005	NA
S-10-B3	<1.0	NA	<0.005	<0.005	<0.005	<0.005	NA
S-19.5-B3	<1.0	NA	0.028	<0.005	<0.005	0.017	NA
S-25-B3	4.5	NA	0.047	<0.01	0.011	0.038	NA
S-32.5-B3	190	NA	<1.0	<1.0	<1.0	1.7	NA
December 1990							
S-20-B4	<1.0	NA	0.006	<0.005	<0.005	<0.005	NA
S-30-B4	<1.0	NA	<0.005	<0.005	<0.005	<0.005	NA
S-32.5-B4	<1.0	NA	<0.005	<0.005	<0.005	<0.005	NA
S-36.5-B4	140	NA	<0.15	0.80	1.7	4.2	NA
S-43-B4	3,800	NA	<1.5	130	50	280	NA
S-45.5-B4	5.5	NA	0.16	0.51	0.11	0.82	NA
S-20-B5	<1.0	NA	0.068	0.013	0.009	0.026	NA
S-30-B5	<1.0	NA	<0.005	<0.005	<0.005	<0.005	NA
S-34.5-B5	97	NA	<0.005	0.13	0.087	0.22	NA
S-39.5-B5	13	NA	0.15	0.66	0.16	1.5	NA
S-45-B5	<1.0	NA	<0.005	0.006	<0.005	0.009	NA
S-20-B6	<1.0	NA	<0.005	<0.005	<0.005	<0.005	NA
S-30-B6	<1.0	NA	<0.005	<0.005	<0.005	<0.005	NA
S-36.5-B6	<1.0	NA	<0.005	<0.005	<0.005	0.006	NA
S-41-B6	<1.0	NA	<0.005	<0.005	<0.005	<0.005	NA
S-44.5-B6	<1.0	NA	<0.005	<0.005	<0.005	<0.005	NA
S-011591-1ABCD*	31	NA	0.25	0.67	0.34	2.8	NA
June, July 1991							
S-10-B7	<1.0	NA	<0.005	<0.005	<0.005	<0.005	NA
S-20-B7	2.2	NA	0.074	0.12	0.061	0.43	NA
S-25-B7	<1.0	NA	<0.005	<0.005	<0.005	<0.005	NA
S-30-B7	48	NA	0.064	0.15	0.41	1.9	NA

See notes on page 4 of 4.

TABLE 2
CUMULATIVE RESULTS OF LABORATORY ANALYSES OF SOIL SAMPLES
ARCO Station 771
Livermore, California
(Page 2 of 4)

Sample Identification	TPHg	TPHd	B	T	E	X	TOG
June, July 1991 cont.							
S-33-B7	<1.0	NA	<0.005	0.006	<0.005	0.010	NA
S-40-B7	19	NA	0.019	0.059	0.14	0.74	NA
S-44-B7	<1.0	NA	0.049	0.020	0.021	0.024	NA
S-10.5-B8	<1.0	NA	<0.005	<0.005	<0.005	<0.005	NA
S-20.5-B8	<1.0	NA	0.013	<0.005	<0.005	<0.005	NA
S-25.5-B8	3.5	NA	<0.005	0.007	0.015	0.028	NA
S-34.5-B8	210	NA	0.27	1.0	2.0	12	NA
S-41-B8	3,200	NA	10	70	37	170	NA
S-43-B8	4.9	NA	0.26	1.2	0.13	0.67	NA
S-10.5-B9	<1.0	NA	<0.005	<0.005	<0.005	<0.005	NA
S-15.5-B9	<1.0	NA	<0.005	<0.005	<0.005	<0.005	NA
S-25.5-B9	<1.0	NA	<0.005	<0.005	<0.005	<0.005	NA
S-34.5-B9	<1.0	NA	<0.005	<0.005	<0.005	<0.005	NA
S-36-B9	<1.0	NA	<0.005	<0.005	<0.005	<0.005	NA
S-42-B9	1.8	NA	0.049	0.006	0.020	0.030	NA
S-45-B9	<1.0	NA	<0.005	<0.005	<0.005	<0.005	NA
S-10.5-B10	<1.0	NA	<0.005	<0.005	<0.005	<0.005	NA
S-20.5-B10	<1.0	NA	0.042	<0.005	0.007	<0.005	NA
S-25.5-B10	27	NA	0.44	0.74	0.36	2.0	NA
S-34.5-10	88	NA	0.20	0.50	0.84	0.96	NA
S-36-B10	110	NA	0.28	0.51	0.86	2.7	NA
S-42-B10	<1.0	NA	0.008	<0.005	<0.005	0.021	NA
S-7-B11	<1.0	<1.0	<0.005	<0.005	<0.005	<0.005	<30
S-8.5-B11	<1.0	<1.0	<0.005	<0.005	<0.005	<0.005	<30
S-15.5-B11	<1.0	<1.0	<0.005	<0.005	<0.005	<0.005	<30
S-20.5-B11	<1.0	<1.0	<0.005	<0.005	<0.005	<0.005	<30
S-25.5-B11	<1.0	<1.0	<0.005	<0.005	<0.005	<0.005	<30
S-35.5-B11	<1.0	<1.0	<0.005	<0.005	<0.005	<0.005	<30
S-40-B11	<1.0	<1.0	<0.005	<0.005	<0.005	<0.005	<30
August 12, 1991							
SP1-ABCD*	<1.0	NA	<0.005	<0.005	<0.005	<0.005	NA
April 1992							
S-10.5-B15	<1.0	NA	<0.0050	<0.0050	<0.0050	<0.0050	NA
S-20.5-B15	<1.0	NA	<0.0050	<0.0050	<0.0050	<0.0050	NA
S-28.5-B15	<1.0	NA	<0.0050	<0.0050	<0.0050	<0.0050	NA
S-41-B15	<1.0	NA	<0.0050	<0.0050	<0.0050	<0.0050	NA

See notes on page 4 of 4.

TABLE 2
CUMULATIVE RESULTS OF LABORATORY ANALYSES OF SOIL SAMPLES
ARCO Station 771
Livermore, California
(Page 3 of 4)

Sample Identification	TPHg	TPHd	B	T	E	X	TOG
April 1992 cont.							
S-11-B16	<1.0	NA	<0.0050	<0.0050	<0.0050	<0.0050	NA
S-21-B16	<1.0	NA	0.0080	<0.0050	<0.0050	<0.0050	NA
S-31-B16	<1.0	NA	<0.0050	<0.0050	<0.0050	<0.0050	NA
S-11-B17	<1.0	NA	<0.0050	<0.0050	<0.0050	<0.0050	NA
S-21-B17	<1.0	NA	0.021	<0.0050	0.017	0.0080	NA
S-30.5-B17	<1.0	NA	<0.0050	<0.0050	<0.0050	<0.0050	NA
S-33-B17	<1.0	NA	<0.0050	<0.0050	<0.0050	<0.0050	NA
S-43-B17	7.0	NA	0.30	0.77	0.15	1.1	NA
S-0409-SP1-A-D*	<1.0	NA	<0.0050	<0.0050	<0.0050	<0.0050	NA
S-0409-SP2-A-D*	6.4	NA	0.0070	0.015	0.020	0.12	
January 1993							
S-9-B12	<1.0	NA	<0.0050	<0.0050	<0.0050	<0.0050	NA
S-17-B12	<1.0	NA	<0.0050	<0.0050	<0.0050	<0.0050	NA
S-26-B12	<1.0	NA	<0.0050	<0.0050	<0.0050	<0.0050	NA
S-43.5-B12	<1.0	NA	<0.0050	<0.0050	<0.0050	<0.0050	NA
S-9.5-B13	<1.0	NA	<0.0050	<0.0050	<0.0050	<0.0050	NA
S-14.5-B13	<1.0	NA	<0.0050	<0.0050	<0.0050	<0.0050	NA
S-26-B13	<1.0	NA	<0.0050	<0.0050	<0.0050	<0.0050	NA
S-40-B13	<1.0	NA	<0.0050	<0.0050	<0.0050	<0.0050	NA
S-9.5-B14	<1.0	NA	<0.0050	<0.0050	<0.0050	<0.0050	NA
S-17-B14	<1.0	NA	<0.0050	<0.0050	<0.0050	<0.0050	NA
S-27.5-B14	<1.0	NA	<0.0050	<0.0050	<0.0050	<0.0050	NA
S-38-B14	<1.0	NA	<0.0050	<0.0050	<0.0050	<0.0050	NA
S-0115-SP-A-D**	<1.0 [<0.050]	NA [NA]	<0.0050 [0.00050]	<0.0050 [0.00050]	<0.0050 [0.00050]	<0.0050 [0.00050]	NA [NA]

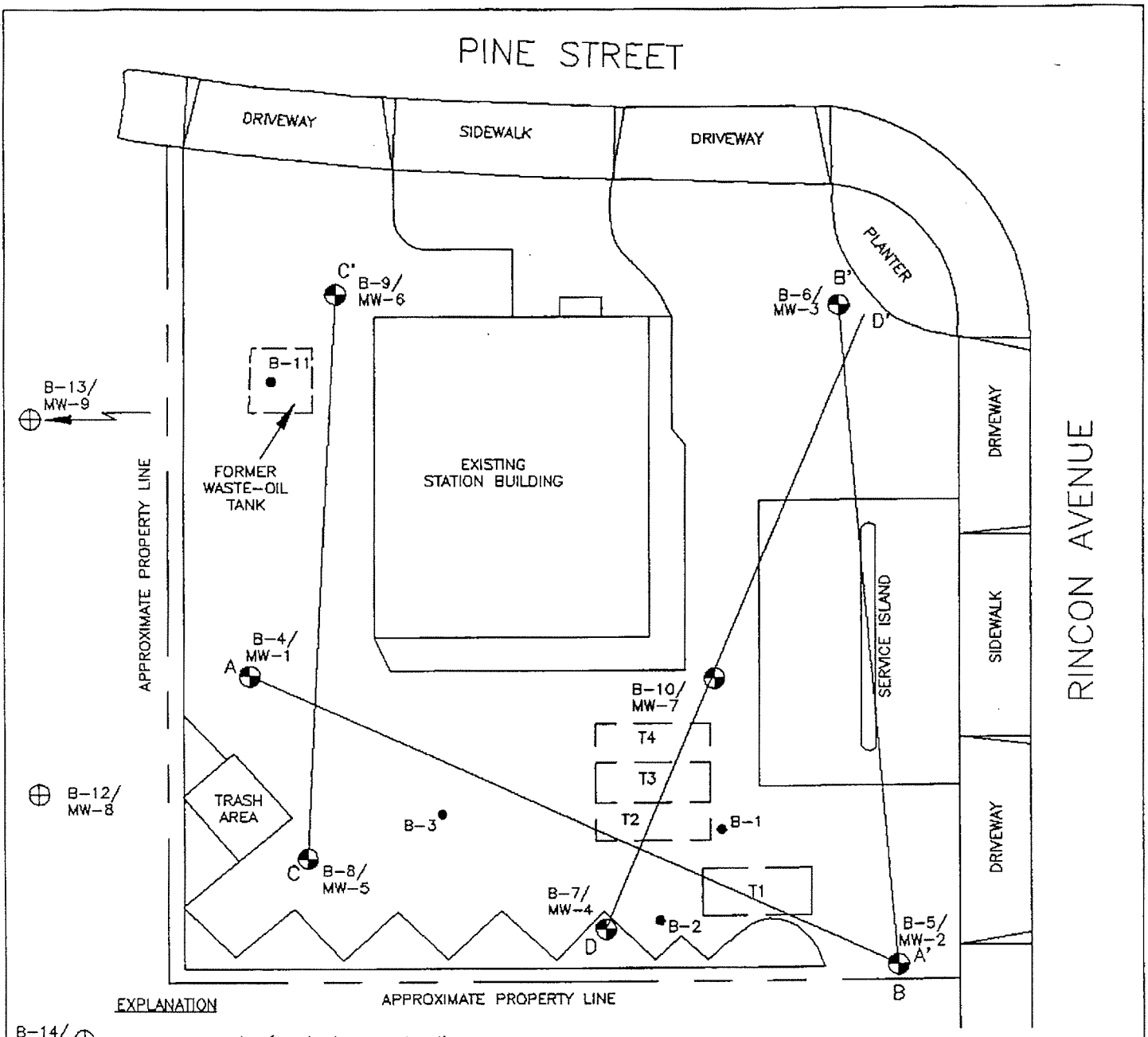
See notes on page 4 of 4.

TABLE 2
CUMULATIVE RESULTS OF LABORATORY ANALYSES OF SOIL SAMPLES
ARCO Station 771
Livermore, California
(Page 4 of 4)

Sample Identification	TPHg	TPHd	B	T	E	X	TOG

Results measured in part per million (ppm).
TPHg: Total petroleum hydrocarbons as gasoline (analyzed by EPA Method 5030/8015/8020).
TPHd: Total petroleum hydrocarbons as diesel (analyzed by EPA Method 5030/8015).
B: benzene; T: toluene; E: ethylbenzene; X: xylenes.
BTEX: Analyzed by EPA Method 5030/8015/8020.
TOG: Total oil and grease (analyzed by Standard Method 5520 E&F (Gravimetric).
*: Composite sample of four soil samples obtained from stockpiled soil.
<: Less than the laboratory detection limit.
NA: Sample not analyzed.
*: Sample was also analyzed for:
STLC lead by EPA Method 7421 - < 0.10 ppm;
corrosivity by EPA Method 9045 - pH = 7.1;
ignitability by EPA Method 1010 - flashpoint >100°C;
and reactivity by EPA Methods 9030, 9010 and 9045 - sulfide <10 ppm,
cyanide <0.50 ppm,reaction with water - negative.
[]: TPHg and BTEX analyzed by EPA Method 5030/8015/8020 TCLP extract of soil.

Sample Identification: S-43-B17
- S: Soil sample
- 43: Depth of boring in feet
- B17: Boring number



Source: Surveyed by John Koch, Licensed Land Surveyor.

RESNA	**PROPOSED BORING/ MONITORING WELL LOCATIONS ARCO Station 771 899 Rincon Avenue Livermore, California**	**PLATE A**
PROJECT 60000.06		

Table 1. Soil Sample Analytical Results
ARCO Facility No. 771, Livermore, California

Sample Designation	Date	Depth (feet bgs)	TPH-G (1)	BTEX Distinction (1)				Organic Lead (2)
				Benzene	Toluene	Ethylbenzene	Xylenes	
Former Tank Cavity								
T1A	12/30/91	15	**1,500**	1.3	28	24	210	NA
T1B	12/30/91	15	1.4	0.019	0.015	0.0089	0.2	NA
T2A	12/30/91	16	**1,900**	1.3	9.4	8.6	94	NA
T2B	12/30/91	16	ND	ND	ND	ND	ND	NA
T3A	12/30/91	14	**45**	0.089	1.2	0.52	4.7	NA
T3B	12/30/91	14	1.3	0.0097	0.045	0.023	0.24	NA
T4A	12/30/91	14	**4,600**	28	470	170	1,100	NA
T4B	12/30/91	14	2.4	0.0095	0.050	0.041	0.33	NA
New Tank Cavity								
TP-1	1/21/92	18	**100**	ND	0.059	ND	1.4	ND
TP-2	1/21/92	18	2.6	0.0057	0.012	0.012	0.12	ND
TP-3	1/21/92	18	1.8	0.0058	0.011	0.0071	0.053	ND
TP-4	1/21/92	18	1.4	0.0052	0.02	0.0094	0.092	ND
TP-5	1/21/92	18	1.5	0.0062	0.036	0.016	0.14	ND
TP-6	1/21/92	18	**830**	ND	2.5	1.5	47	ND
Product Line Trenches								
L1	2/7/92	1.5	ND	ND	0.035	ND	ND	ND
L2	2/7/92	1.5	**750**	0.35	30	26	200	ND
L3	2/7/92	0.5	41	0.091	0.28	0.1	0.93	ND
L4	2/7/92	1.5	2.2	0.0093	0.52	0.011	0.061	ND
L5	2/7/92	1.5	ND	ND	ND	ND	ND	ND
L6	2/7/92	1.5	ND	ND	ND	ND	ND	ND
L7	2/7/92	**0.5**	**600**	ND	0.21	ND	26	ND
L8	2/7/92	1.5	1.2	ND	0.027	ND	0.0068	ND
L2B	2/18/92	**5**	**91**	ND	ND	ND	2.4	NA
L7B	2/18/92	**5**	**ND**	ND	ND	ND	ND	NA

FOOTNOTES

(1) = Concentrations reported in mg/kg (= parts per million).

(2) = Concentrations reported in mg/L (= parts per million).

TPH-G = Total Petroleum Fuel Hydrocarbons as Low/Medium Boiling Point Hydrocarbons (USEPA Method 8015).

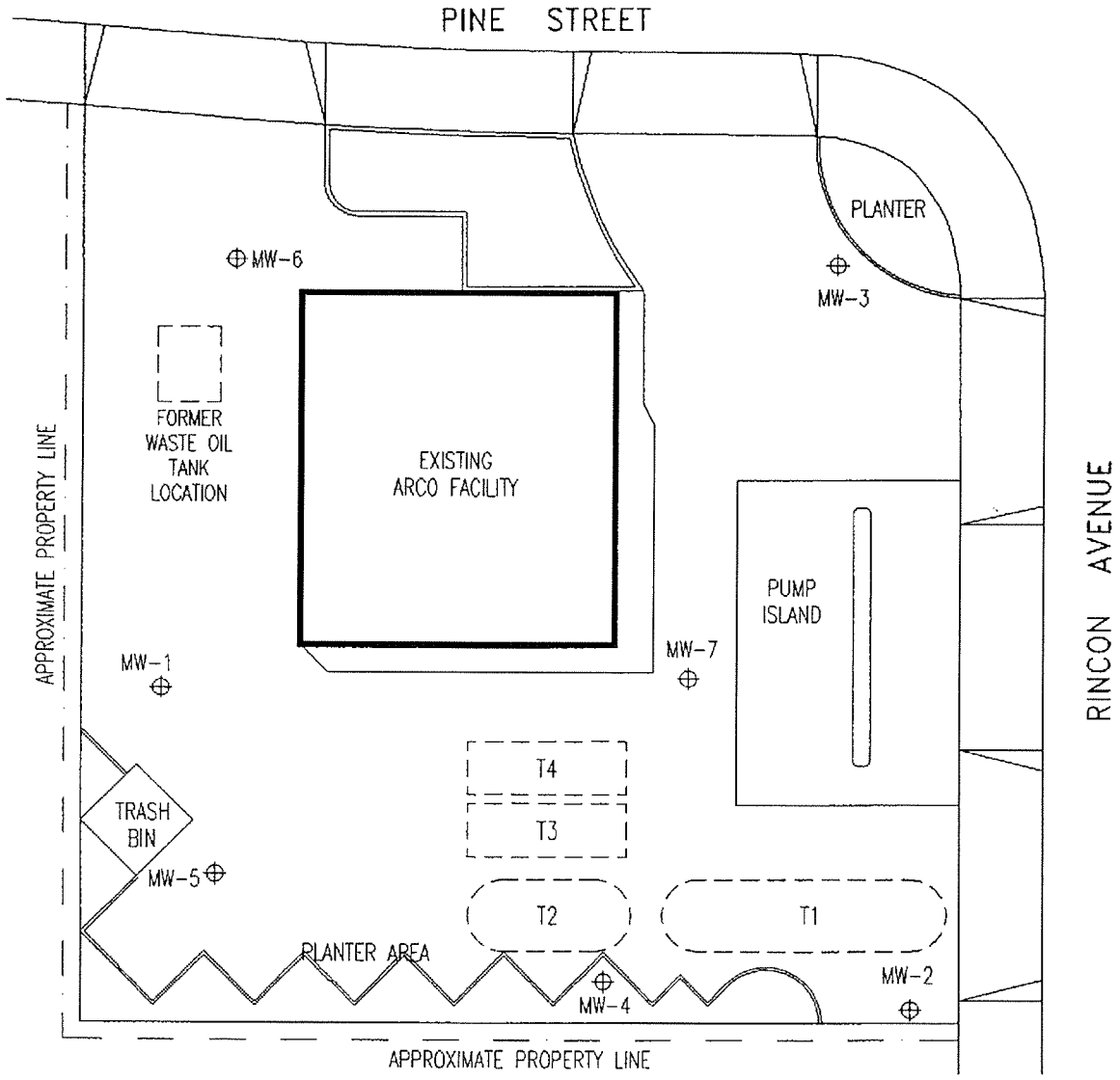
BTEX Distinction (USEPA Method 8020).

Organic Lead by method described in California LUFT Manual 12/87.

ND = Not detected.

NA = Not analyzed.

bgs = below ground surface.



EXPLANATION

⊕MW-5 MONITORING WELL LOCATION AND DESIGNATION

FORMER LOCATION OF UNDERGROUND STORAGE TANKS.

T1	10,000 GAL. SUPER UNLEADED.
T2	6,000 GAL. REGULAR.
T3	4,000 GAL. UNLEADED.
T4	4,000 GAL. UNLEADED.

N

0' 20' 40'

APPROXIMATE SCALE

SOURCE:

MAP MODIFIED FROM
RESNA CONSULTANTS, 1991.

ROUX ASSOCIATES
ENVIRONMENTAL CONSULTING & MANAGEMENT

COMPILED BY:	G.M.
PREPARED BY:	R.P.
PROJECT MNGR.	G.M.
DATE:	01/92
SCALE:	AS SHOWN
PROJECT NO.	A135W01
FILE NAME:	AR_771XX

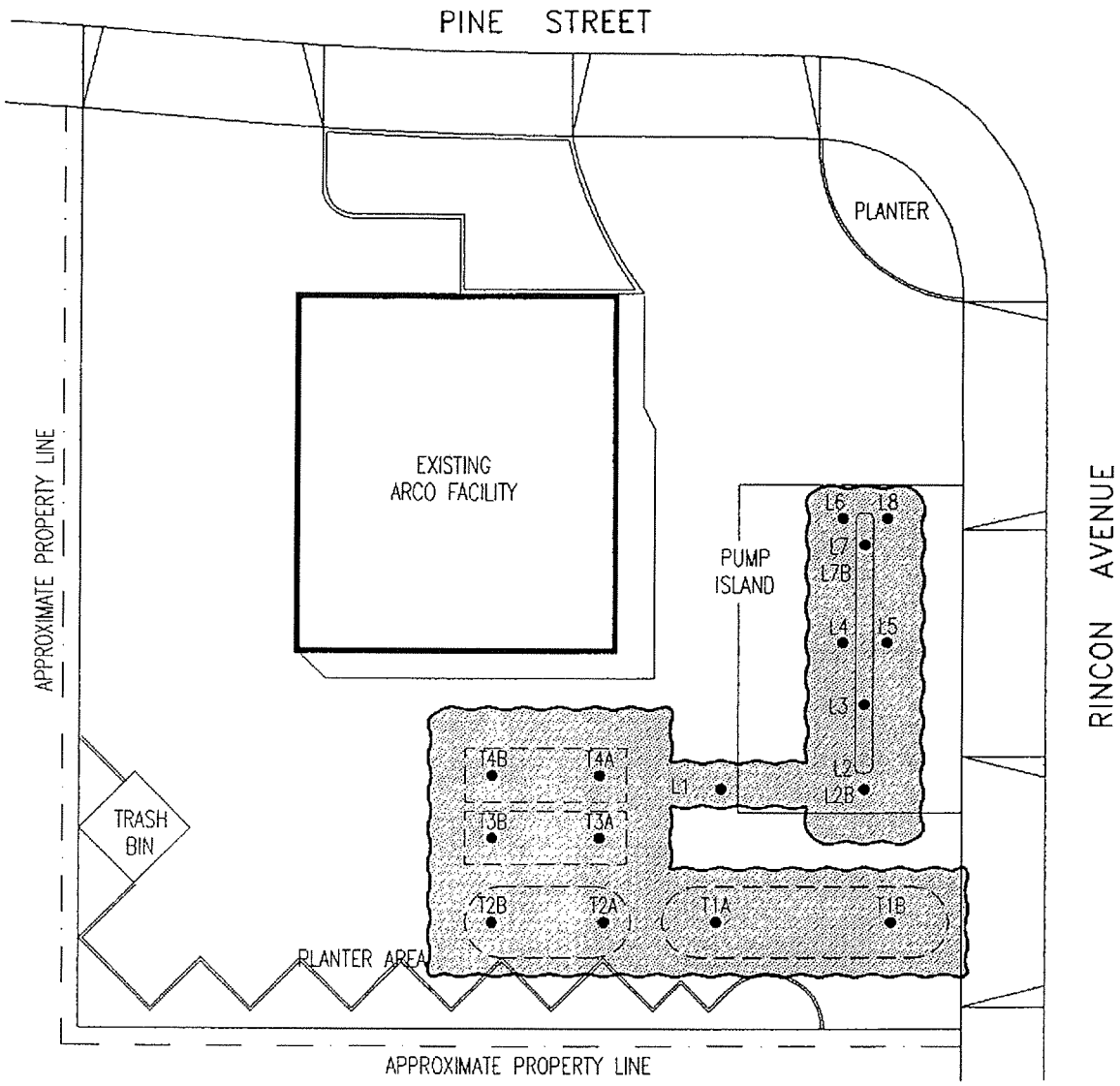
PREPARED FOR: ARCO PRODUCTS COMPANY

TITLE:

SITE PLAN

ARCO FACILITY NO. 771

FIGURE 2



EXPLANATION

FORMER LOCATION OF UNDERGROUND STORAGE TANKS.

EXCAVATED AREAS.

●T4A SOIL SAMPLE LOCATION AND DESIGNATION.

N

0' 20' 40'

APPROXIMATE SCALE

SOURCE:

MAP MODIFIED FROM
RESNA CONSULTANTS, 1991.

ROUX ASSOCIATES
ENVIRONMENTAL CONSULTING & MANAGEMENT

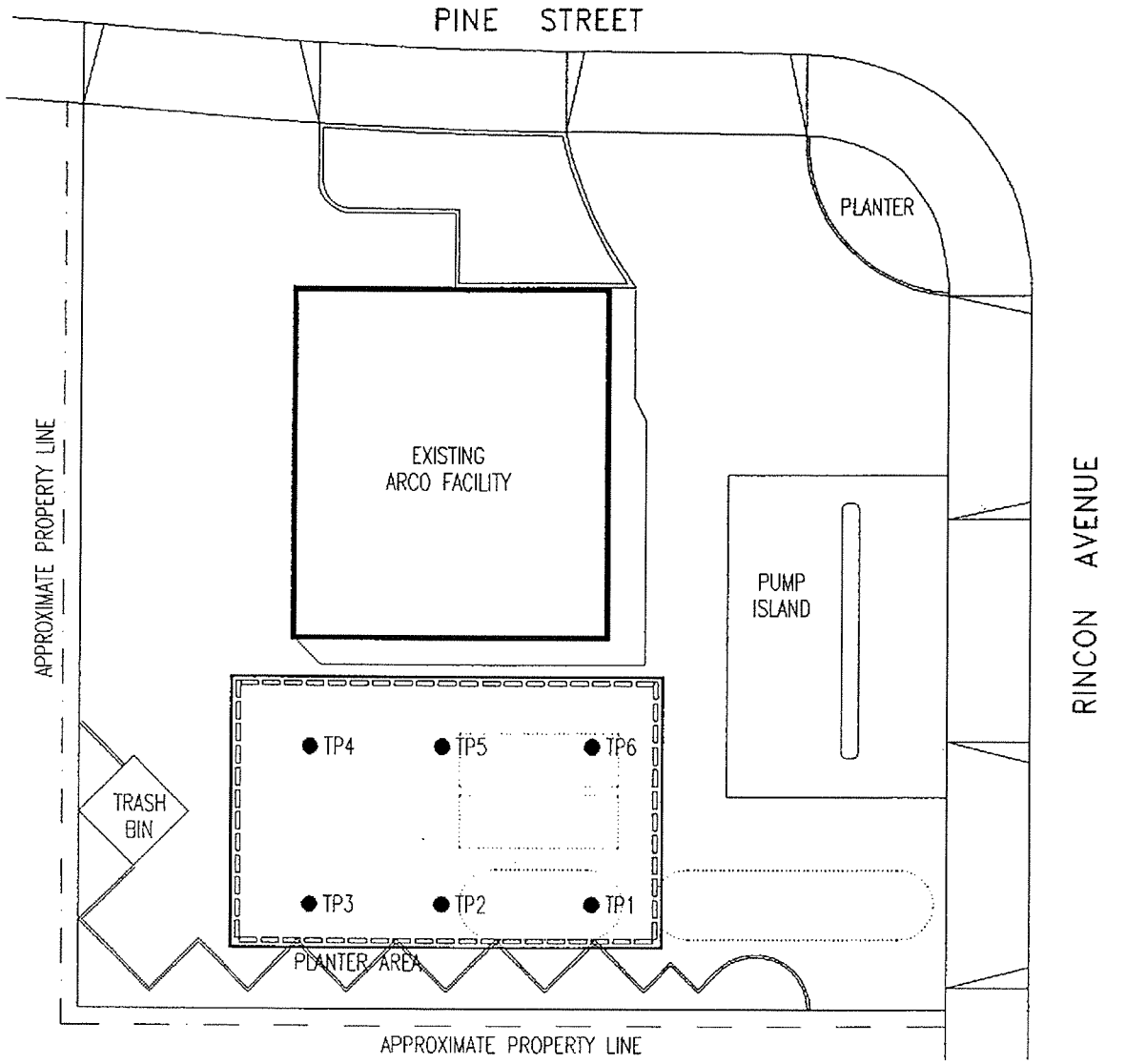
COMPILED BY:	T.R.
PREPARED BY:	R.P.
PROJECT MNGR.	G.M.
DATE:	04/92
SCALE:	AS SHOWN
PROJECT NO.	A135W01
FILE NAME:	AR_771XX

PREPARED FOR: ARCO PRODUCTS COMPANY

TITLE: LOCATION OF TANK CAVITY AND PRODUCT LINE TRENCH SOIL SAMPLES

ARCO FACILITY NO. 771

FIGURE 3



EXPLANATION

SHEET PILES AT LIMITS OF NEW TANK EXCAVATION.

● TP4 SOIL SAMPLE LOCATION AND DESIGNATION.

N

0' 20' 40'

APPROXIMATE SCALE

SOURCE:

MAP MODIFIED FROM
RESNA CONSULTANTS, 1991.

ROUX ASSOCIATES
ENVIRONMENTAL CONSULTING & MANAGEMENT

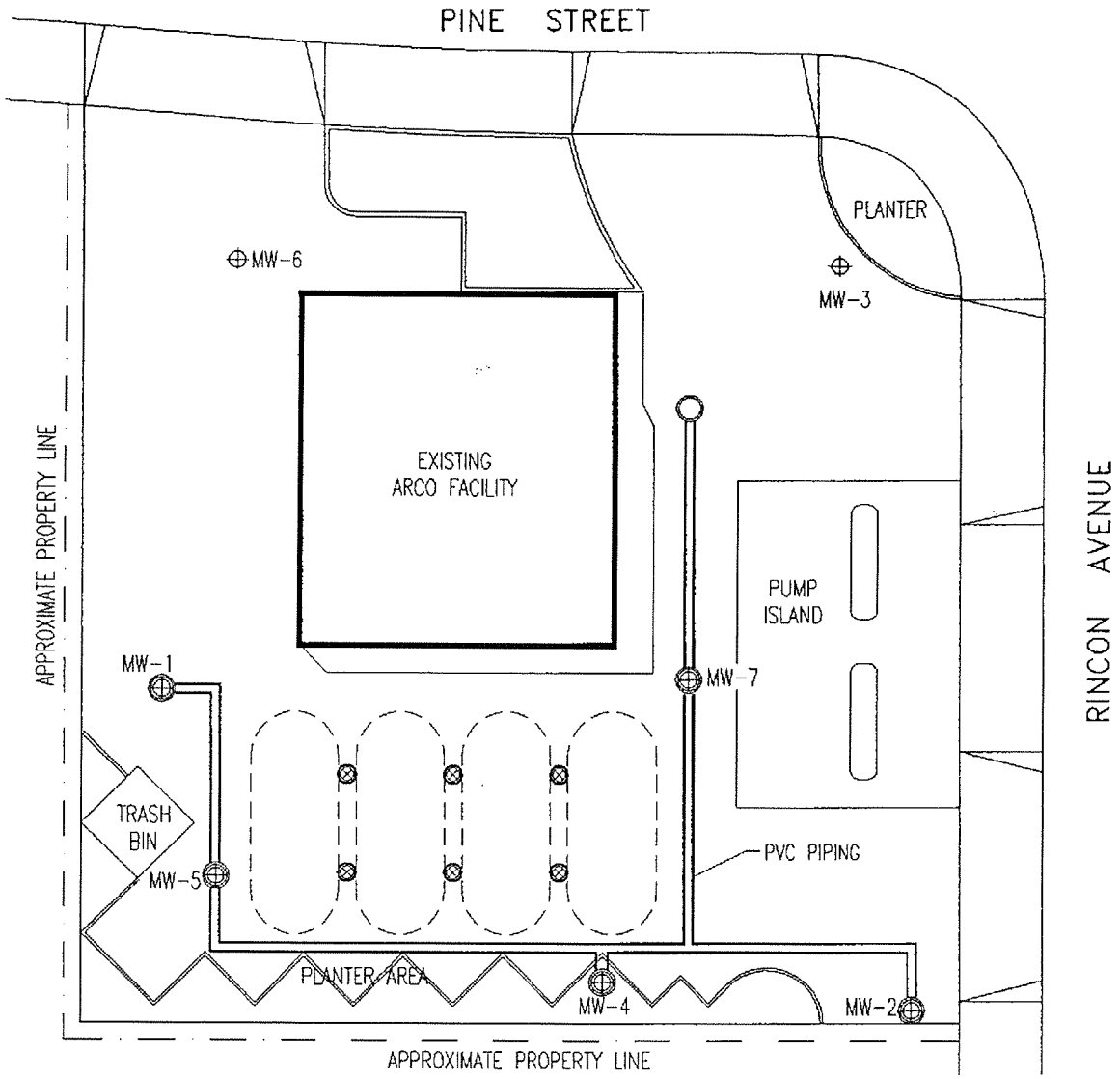
COMPILED BY:	G.M.
PREPARED BY:	R.P.
PROJECT MNGR.	G.M.
DATE:	01/92
SCALE:	AS SHOWN
PROJECT NO.	A135W01
FILE NAME:	AR_771XX

PREPARED FOR: ARCO PRODUCTS COMPANY

TITLE: LOCATION OF NEW TANK EXCAVATION AND SOIL SAMPLES

ARCO FACILITY NO. 771

FIGURE 4



EXPLANATION

- ⊕MW-5 MONITORING WELL LOCATION AND DESIGNATION
- LOCATION OF NEW UNDERGROUND STORAGE TANKS.
- LOCATION OF VAULT BOX.
- LOCATION OF CONDUCTOR CASING.
- PVC PIPING.

N

0' 20' 40'

APPROXIMATE SCALE

SOURCE:

MAP MODIFIED FROM
RESNA CONSULTANTS, 1991.

ROUX
ROUX ASSOCIATES
ENVIRONMENTAL CONSULTING & MANAGEMENT

COMPILED BY:	G.M.
PREPARED BY:	R.P.
PROJECT MNGR.	G.M.
DATE:	01/92
SCALE:	AS SHOWN
PROJECT NO.	A135W01
FILE NAME:	AR_771XX

PREPARED FOR: ARCO PRODUCTS COMPANY

TITLE: LOCATION OF WELLS, VAULT BOXES, AND PVC PIPING

ARCO FACILITY NO. 771

FIGURE 5

Table 1
Product Piping Removal Compliance Sampling Results

June 15, 2001

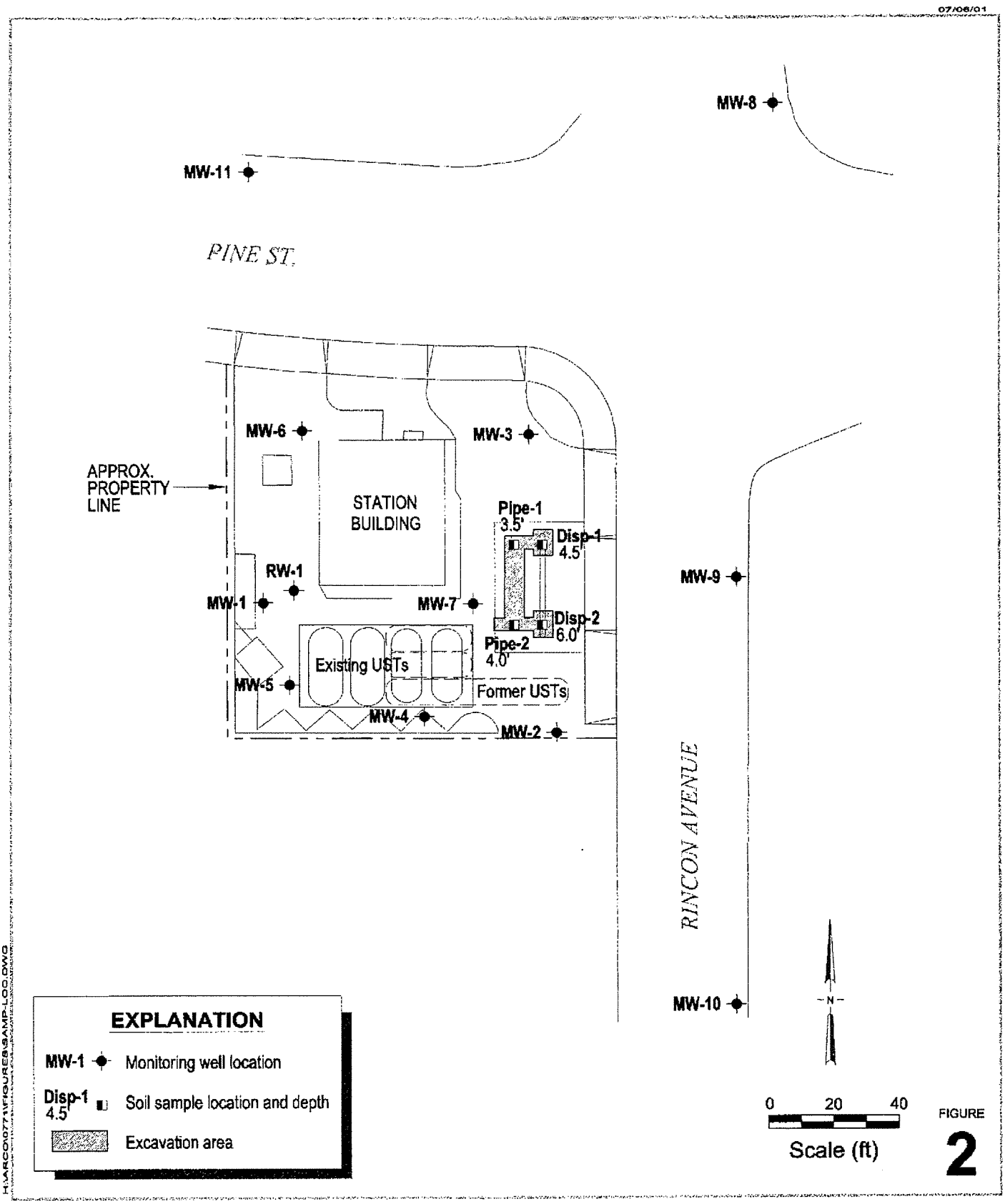
ARCO Service Station 0771
899 Rincon Ave, Livermore, California

Sample ID	Depth Sampled (fbg)	TPHg (mg/kg)	Benzene (mg/kg)	Toulene (mg/kg)	Ethyl-benzene (mg/kg)	Xylene (mg/kg)	MTBE (mg/kg)
Disp-1-4.5	4.5	<1.0	<0.0050	**0.017**	<0.0050	**0.019**	**0.78**
Disp-2-6	6.0	**1.0**	<0.0050	**0.017**	<0.0050	**0.049**	**2.1**
Pipe-1-3.5	3.5	<1.0	<0.0050	<0.0050	<0.0050	<0.0050	<0.050
Pipe-2-4	4.0	<1.0	<0.0050	<0.0050	<0.0050	<0.0050	<0.050

Notes

fbg = feet below grade
mg/kg = milligrams per kilogram

TPHg = total petroluem hydrocarbons as gasoline
MTBE = methyl tert butyl ether



ARCO Service Station 0771

899 Rincon Avenue

Livermore, California

CAMBRIA

Site Plan and Soil Sampling Locations

Table 1. Summary of Soil Sample Analytical Data
Station #771, 899 Rincon Avenue, Livermore, California

Soil Boring Identification*	Sample ID	Date Collected	GRO mg/kg	Benzene mg/kg	Toluene mg/kg	Ethylbenzene mg/kg	Xylenes mg/kg	MTBE mg/kg	Comments
SB-2									
	SB-2-10'	3/25/2011	<0.50	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	
	SB-2-30'	3/25/2011	<0.50	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	
SB-3									
	SB-3-10'	3/25/2011	<0.50	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	
	SB-3-30'	3/25/2011	<0.50	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	
ESLs	--	--	83	0.044	2.9	3.3	2.3	0.023	

Abbreviations & Symbols:

* = See Drawing 2 for soil boring locations.

GRO: Gasoline range organics.

Calscience Environmental Laboratories, Inc.: GRO (C6-C12)

GRO analyzed using EPA method 8015B

Benzene, Toluene, Ethylbenzene, Total Xylenes, and MTBE analyzed using EPA method 8260B.

mg/kg = Milligrams per kilogram.

ESLs = Environmental Screening Levels for deep soil (>3 meters bgs) where groundwater is a current or potential source of drinking water (San Francisco Bay Regional Water Quality Control Board, 2008).

bgs = Below ground surface

Notes:

1,2-dibromoethane (EDB), 1,2-dichloroethane (1,2 DCA), tert-butyl alcohol (TBA), Di-isopropyl ether (DIPE), ethyl tert-butyl ether (ETBE), ter-amyl methyl ether (TAME), and ethanol were not detected at or above their respective laboratory reporting limit.

The last number in each Sample ID denotes the depth at which the sample was collected in feet bgs (i.e., SB-2 10' was collected at a depth of 10 feet bgs)

Table 2
Historical Groundwater Elevation Data
Summary Report

ARCO Service Station 771
899 Rincon Avenue, Livermore, California

Date: 03-07-95
Project Number: 0805-122.01

Well Desig-nation	Water Level Field Date	TOC Elevation	Depth to Water	Ground-Water Elevation	Floating Product Thickness	Ground-Water Flow Direction	Hydraulic Gradient
		ft-MSL	feet	ft-MSL	feet	MWN	foot/foot
MW-1	01-15-91	451.80	32.77	419.03	Sheen	NR	NR
MW-1	02-27-91	451.80	32.23	419.57	ND	NR	NR
MW-1	03-20-91	451.80	27.38	424.42	Sheen	NR	NR
MW-1	04-10-91	451.80	26.49	425.31	ND	NR	NR
MW-1	05-20-91	451.80	Not surveyed: interface probe failure				
MW-1	06-20-91	451.80	33.95	417.85	Sheen	NR	NR
MW-1	07-25-91	451.80	^36.59	^415.21	0.10	NR	NR
MW-1	08-13-91	451.80	^37.72	^414.08	0.20	NR	NR
MW-1	09-12-91	451.80	^39.25	^412.55	0.23	NR	NR
MW-1	10-30-91	451.80	^39.14	^412.66	0.20	NR	NR
MW-1	11-13-91	451.80	DRY	DRY	ND	NR	NR
MW-1	12-26-91	451.80	^39.30	^412.50	0.01	NR	NR
MW-1	01-18-92	NR	37.81	NR	Skimmer	NR	NR
MW-1	02-21-92	NR	Not surveyed: well inaccessible due to construction				
MW-1	03-31-92	NR	31.90	NR	Skimmer	NR	NR
MW-1	04-24-92	451.42	Not surveyed: well inaccessible due to construction				
MW-1	05-20-92	451.42	33.00	418.42	Skimmer	NR	NR
MW-1	06-12-92	451.42	33.25	418.17	0.02	NR	NR
MW-1	07-28-92	451.42	32.31	419.11	ND	NR	NR
MW-1	08-24-92	451.42	30.87	420.55	ND	NR	NR
MW-1	09-15-92	451.42	^32.24	^419.18	0.01	NR	NR
MW-1	10-29-92	451.42	32.29	419.13	ND	NR	NR
MW-1	11-25-92	451.73	32.15	419.58	ND*	NR	NR
MW-1	12-14-92	451.73	30.54	421.19	ND	NR	NR
MW-1	01-29-93	451.73	23.49	428.24	ND	NR	NR
MW-1	02-26-93	451.73	25.23	426.50	ND	NR	NR
MW-1	03-29-93	451.73	25.66	426.07	ND	NR	NR
MW-1	04-27-93	451.73	28.02	423.71	ND	NR	NR
MW-1	05-10-93	451.73	30.38	421.35	ND	NR	NR
MW-1	06-17-93	451.73	30.81	420.92	ND	NR	NR
MW-1	07-27-93	451.73	Not surveyed: vehicle parked on well				
MW-1	08-26-93	451.73	31.23	420.50	ND	NR	NR
MW-1	09-14-93	451.73	32.59	419.14	ND	NR	NR
MW-1	11-05-93	451.73	32.13	419.60	ND	NR	NR
MW-1	03-26-94	451.73	28.22	423.51	ND	NR	NR
MW-1	06-13-94	451.73	29.86	421.87	ND	NR	NR
MW-1	09-22-94	451.73	31.61	420.12	ND	NNE	0.056
MW-1	11-25-94	451.73	29.76	421.97	ND	N	0.06

Table 2
Historical Groundwater Elevation Data
Summary Report

ARCO Service Station 771
899 Rincon Avenue, Livermore, California

Date: 03-07-95
Project Number: 0805-122.01

Well Designation	Water Level Field Date	TOC Elevation	Depth to Water	Ground-Water Elevation	Floating Product Thickness	Ground-Water Flow Direction	Hydraulic Gradient
		ft-MSL	feet	ft-MSL	feet	MWN	foot/foot
MW-2	01-15-91	449.52	^30.89	^418.63	0.16	NR	NR
MW-2	02-27-91	449.52	^29.11	^420.41	0.02	NR	NR
MW-2	03-20-91	449.52	^24.57	^424.95	0.02	NR	NR
MW-2	04-10-91	449.52	^22.85	^426.67	0.05	NR	NR
MW-2	05-20-91	449.51	Not surveyed:				
MW-2	06-20-91	449.51	^31.42	^418.09	0.15	NR	NR
MW-2	07-25-91	449.51	^33.69	^415.82	0.49	NR	NR
MW-2	08-13-91	449.51	^34.80	^414.71	0.47	NR	NR
MW-2	09-12-91	449.51	^36.39	^413.12	0.45	NR	NR
MW-2	10-30-91	449.51	DRY	DRY	ND	NR	NR
MW-2	11-13-91	449.51	DRY	DRY	ND	NR	NR
MW-2	12-26-91	449.51	36.45	413.06	Sheen	NR	NR
MW-2	01-18-92	449.51	Not surveyed: well inaccessible due to construction				
MW-2	02-21-92	449.51	26.27	NR	Skimmer	NR	NR
MW-2	03-31-92	449.51	28.85	NR	Skimmer	NR	NR
MW-2	04-24-92	449.51	30.95	418.56	Skimmer	NR	NR
MW-2	05-20-92	449.51	30.69	418.82	Skimmer	NR	NR
MW-2	06-12-92	449.51	31.25	418.26	ND	NR	NR
MW-2	07-28-92	449.51	30.31	419.20	ND	NR	NR
MW-2	08-24-92	449.51	29.83	419.68	ND	NR	NR
MW-2	09-15-92	449.51	30.06	419.45	Sheen	NR	NR
MW-2	10-29-92	449.51	30.90	418.61	ND	NR	NR
MW-2	11-25-92	449.49	31.13	418.36	ND*	NR	NR
MW-2	12-14-92	449.49	29.24	420.25	ND	NR	NR
MW-2	01-29-93	449.49	20.12	429.37	ND	NR	NR
MW-2	02-26-93	449.49	22.59	426.90	ND	NR	NR
MW-2	03-29-93	449.49	22.83	426.66	ND	NR	NR
MW-2	04-27-93	449.49	25.10	424.39	ND	NR	NR
MW-2	05-10-93	449.49	27.23	422.26	ND	NR	NR
MW-2	06-17-93	449.49	28.26	421.23	ND	NR	NR
MW-2	07-27-93	449.49	29.50	419.99	ND	NR	NR
MW-2	08-26-93	449.49	29.85	419.64	ND	NR	NR
MW-2	09-14-93	449.49	30.43	419.06	ND	NR	NR
MW-2	11-05-93	449.49	30.20	419.29	ND	NR	NR
MW-2	03-26-94	449.49	25.30	424.19	ND	NR	NR
MW-2	06-13-94	449.49	27.28	422.21	ND	NR	NR
MW-2	09-22-94	449.49	29.54	419.95	ND	NNE	0.056
MW-2	11-25-94	449.49	27.85	421.64	ND	N	0.06

Table 2
Historical Groundwater Elevation Data
Summary Report

ARCO Service Station 771
899 Rincon Avenue, Livermore, California

Date: 03-07-95
Project Number: 0805-122.01

Well Designation	Water Level Field Date	TOC Elevation	Depth to Water	Ground-Water Elevation	Floating Product Thickness	Ground-Water Flow Direction	Hydraulic Gradient
		ft-MSL	feet	ft-MSL	feet	MWN	foot/foot
MW-3	01-15-91	450.29	32.34	417.95	ND	NR	NR
MW-3	02-27-91	450.29	31.78	418.51	ND	NR	NR
MW-3	03-20-91	450.29	27.74	422.55	ND	NR	NR
MW-3	04-10-91	450.29	25.05	425.24	ND	NR	NR
MW-3	05-20-91	450.28	27.06	423.22	ND	NR	NR
MW-3	06-20-91	450.28	32.35	417.93	ND	NR	NR
MW-3	07-25-91	450.28	35.02	415.26	ND	NR	NR
MW-3	08-13-91	450.28	36.50	413.78	ND	NR	NR
MW-3	09-12-91	450.28	38.47	411.81	ND	NR	NR
MW-3	10-30-91	450.28	DRY	DRY	ND	NR	NR
MW-3	11-13-91	450.28	DRY	DRY	ND	NR	NR
MW-3	12-26-91	450.28	38.53	411.75	ND	NR	NR
MW-3	01-18-92	450.28	Not surveyed: well inaccessible due to construction				
MW-3	02-21-92	450.28	Not surveyed: well inaccessible due to construction				
MW-3	03-31-92	450.28	30.61	NR	ND	NR	NR
MW-3	04-24-92	450.28	32.83	417.45	ND	NR	NR
MW-3	05-20-92	450.28	33.85	416.43	ND	NR	NR
MW-3	06-12-92	450.28	34.51	415.77	ND	NR	NR
MW-3	07-28-92	450.28	34.42	415.86	ND	NR	NR
MW-3	08-24-92	450.28	32.46	417.82	ND	NR	NR
MW-3	09-15-92	450.28	34.29	415.99	ND	NR	NR
MW-3	10-29-92	450.28	33.40	416.88	ND	NR	NR
MW-3	11-25-92	450.28	33.67	416.61	ND	NR	NR
MW-3	12-14-92	450.28	34.26	416.02	ND	NR	NR
MW-3	01-29-93	450.28	21.88	428.40	ND	NR	NR
MW-3	02-26-93	450.28	24.71	425.57	ND	NR	NR
MW-3	03-29-93	450.28	24.74	425.54	ND	NR	NR
MW-3	04-27-93	450.28	25.96	424.32	ND	NR	NR
MW-3	05-10-93	450.28	27.61	422.67	ND	NR	NR
MW-3	06-17-93	450.28	28.73	421.55	ND	NR	NR
MW-3	07-27-93	450.28	30.37	419.91	ND	NR	NR
MW-3	08-26-93	450.28	30.94	419.34	ND	NR	NR
MW-3	09-14-93	450.28	31.84	418.44	ND	NR	NR
MW-3	11-05-93	450.28	33.22	417.06	ND	NR	NR
MW-3	03-26-94	450.28	26.97	423.31	ND	NR	NR
MW-3	06-13-94	450.28	28.71	421.57	ND	NR	NR
MW-3	09-22-94	450.28	32.34	417.94	ND	NNE	0.056
MW-3	11-25-94	450.28	30.76	419.52	ND	N	0.06

Table 2
Historical Groundwater Elevation Data
Summary Report

ARCO Service Station 771
899 Rincon Avenue, Livermore, California

Date: 03-07-95
Project Number: 0805-122.01

Well Designation	Water Level Field Date	TOC Elevation ft-MSL	Depth to Water feet	Ground-Water Elevation ft-MSL	Floating Product Thickness feet	Ground-Water Flow Direction MWN	Hydraulic Gradient foot/foot
MW-4	07-25-91	451.56	36.07	415.49	ND	NR	NR
MW-4	08-13-91	451.56	37.54	414.02	ND	NR	NR
MW-4	09-12-91	451.56	38.73	412.83	ND	NR	NR
MW-4	10-30-91	451.56	39.90	411.66	ND	NR	NR
MW-4	11-13-91	451.56	40.56	411.00	ND	NR	NR
MW-4	12-26-91	450.99	38.78	412.21	ND	NR	NR
MW-4	01-18-92	450.99	38.71	NR	ND	NR	NR
MW-4	02-21-92	450.99	31.91	NR	ND	NR	NR
MW-4	03-31-92	450.99	30.36	NR	ND	NR	NR
MW-4	04-24-92	450.99	32.65	418.34	ND	NR	NR
MW-4	05-20-92	450.99	32.62	418.37	ND	NR	NR
MW-4	06-12-92	450.99	32.73	418.26	ND	NR	NR
MW-4	07-28-92	450.99	31.48	419.51	ND	NR	NR
MW-4	08-24-92	450.99	32.84	418.15	ND	NR	NR
MW-4	09-15-92	450.99	31.37	419.62	ND	NR	NR
MW-4	10-29-92	450.99	32.58	418.41	ND	NR	NR
MW-4	11-25-92	451.09	32.37	418.72	ND	NR	NR
MW-4	12-14-92	451.09	30.99	420.10	ND	NR	NR
MW-4	01-29-93	451.09	22.30	428.79	ND	NR	NR
MW-4	02-26-93	451.09	24.47	426.62	ND	NR	NR
MW-4	03-29-93	451.09	24.67	426.42	ND	NR	NR
MW-4	04-27-93	451.09	26.68	424.41	ND	NR	NR
MW-4	05-10-93	451.09	28.64	422.45	ND	NR	NR
MW-4	06-17-93	451.09	29.28	421.81	ND	NR	NR
MW-4	07-27-93	451.09	31.14	419.95	ND	NR	NR
MW-4	08-26-93	451.09	31.38	419.71	ND	NR	NR
MW-4	09-14-93	451.09	32.00	419.09	ND	NR	NR
MW-4	11-05-93	451.09	31.16	419.93	ND	NR	NR
MW-4	03-26-94	451.09	26.94	424.15	ND	NR	NR
MW-4	06-13-94	451.09	28.88	422.21	ND	NR	NR
MW-4	09-22-94	451.09	30.98	420.11	ND	NNE	0.056
MW-4	11-25-94	451.09	29.08	422.01	ND	N	0.06

Table 2
Historical Groundwater Elevation Data
Summary Report

ARCO Service Station 771
899 Rincon Avenue, Livermore, California

Date: 03-07-95
Project Number: 0805-122.01

Well Designation	Water Level Field Date	TOC Elevation	Depth to Water	Ground-Water Elevation	Floating Product Thickness	Ground-Water Flow Direction	Hydraulic Gradient
		ft-MSL	feet	ft-MSL	feet	MWN	foot/foot
MW-5	07-25-91	451.41	36.67	414.74	Sheen	NR	NR
MW-5	08-13-91	451.41	^37.98	^413.43	0.01	NR	NR
MW-5	09-12-91	451.41	^39.01	^412.40	0.05	NR	NR
MW-5	10-30-91	451.41	38.28	413.13	Sheen	NR	NR
MW-5	11-13-91	451.41	39.24	412.17	Sheen	NR	NR
MW-5	12-26-91	451.41	39.11	412.30	Sheen	NR	NR
MW-5	01-18-92	451.41	38.15	NR	Skimmer	NR	NR
MW-5	02-21-92	451.41	30.59	NR	Skimmer	NR	NR
MW-5	03-18-92	451.41	30.84	NR	Skimmer	NR	NR
MW-5	04-24-92	451.40	33.00	418.40	Skimmer	NR	NR
MW-5	05-20-92	451.40	32.86	418.54	Skimmer	NR	NR
MW-5	06-12-92	451.40	33.03	418.37	ND	NR	NR
MW-5	07-28-92	451.40	31.92	419.48	ND	NR	NR
MW-5	08-24-92	451.40	32.17	419.23	ND	NR	NR
MW-5	09-15-92	451.40	31.90	419.50	ND	NR	NR
MW-5	10-29-92	451.40	32.94	418.46	ND	NR	NR
MW-5	11-25-92	451.40 Not surveyed: new wellhead prevented measurement					
MW-5	12-14-92	451.40	30.90	NR	ND	NR	NR
MW-5	01-29-93	451.40	23.25	NR	ND	NR	NR
MW-5	02-26-93	451.40	25.02	NR	ND	NR	NR
MW-5	03-29-93	451.40	24.72	NR	ND	NR	NR
MW-5	04-27-93	451.40	27.11	NR	ND	NR	NR
MW-5	05-10-93	451.40	29.04	NR	ND	NR	NR
MW-5	06-17-93	451.40	29.33	NR	ND	NR	NR
MW-5	07-27-93	451.40	31.12	420.28	ND	NR	NR
MW-5	08-26-93	451.40	31.37	420.03	ND	NR	NR
MW-5	09-14-93	451.40	31.96	419.44	ND	NR	NR
MW-5	11-05-93	451.40	31.03	420.37	ND	NR	NR
MW-5	03-26-94	451.40	27.41	423.99	ND	NR	NR
MW-5	06-13-94	451.40	29.29	422.11	ND	NR	NR
MW-5	09-22-94	451.40 Not surveyed: vehicle was parked on well					
MW-5	11-25-94	451.40	29.76	421.64	ND	N	0.06

Table 2
Historical Groundwater Elevation Data
Summary Report

ARCO Service Station 771
899 Rincon Avenue, Livermore, California

Date: 03-07-95
Project Number: 0805-122.01

Well Designation	Water Level Field Date	TOC Elevation	Depth to Water	Ground-Water Elevation	Floating Product Thickness	Ground-Water Flow Direction	Hydraulic Gradient
		ft-MSL	feet	ft-MSL	feet	MWN	foot/foot
MW-6	07-25-91	451.38	37.68	413.70	ND	NR	NR
MW-6	08-13-91	451.38	39.17	412.21	ND	NR	NR
MW-6	09-12-91	451.38	41.14	410.24	ND	NR	NR
MW-6	10-30-91	451.38	42.10	409.28	ND	NR	NR
MW-6	11-13-91	451.38	41.45	409.93	ND	NR	NR
MW-6	12-26-91	451.38	41.23	410.15	ND	NR	NR
MW-6	01-18-92	451.38	38.23	NR	ND	NR	NR
MW-6	02-21-92	451.37	35.21	NR	ND	NR	NR
MW-6	03-31-92	451.37	32.26	NR	ND	NR	NR
MW-6	04-24-92	451.37	33.24	418.13	ND	NR	NR
MW-6	05-20-92	451.37	33.14	418.23	ND	NR	NR
MW-6	06-12-92	451.37	33.43	417.94	ND	NR	NR
MW-6	07-28-92	451.37	32.52	418.85	ND	NR	NR
MW-6	08-24-92	451.37	32.57	418.80	ND	NR	NR
MW-6	09-15-92	451.37	32.58	418.79	ND	NR	NR
MW-6	10-29-92	451.37	32.33	419.04	ND	NR	NR
MW-6	11-25-92	451.37	32.43	418.94	ND	NR	NR
MW-6	12-14-92	451.37	31.52	419.85	ND	NR	NR
MW-6	01-29-93	451.37	23.70	427.67	ND	NR	NR
MW-6	02-26-93	451.37	26.22	425.15	ND	NR	NR
MW-6	03-29-93	451.37	26.13	425.24	ND	NR	NR
MW-6	04-27-93	451.37	27.27	424.10	ND	NR	NR
MW-6	05-10-93	451.37	29.74	421.63	ND	NR	NR
MW-6	06-17-93	451.37	30.92	420.45	ND	NR	NR
MW-6	07-27-93	451.37	30.90	420.47	ND	NR	NR
MW-6	08-26-93	451.37	31.18	420.19	ND	NR	NR
MW-6	09-14-93	451.37	31.70	419.67	ND	NR	NR
MW-6	11-05-93	451.37	31.83	419.54	ND	NR	NR
MW-6	03-26-94	451.37	28.24	423.13	ND	NR	NR
MW-6	06-13-94	451.37	29.20	422.17	ND	NR	NR
MW-6	09-22-94	451.37	30.37	421.00	ND	NNE	0.056
MW-6	11-25-94	451.37	29.88	421.49	ND	N	0.06

Table 2
Historical Groundwater Elevation Data
Summary Report

ARCO Service Station 771
899 Rincon Avenue, Livermore, California

Date: 03-07-95
Project Number: 0805-122.01

Well Desig-nation	Water Level Field Date	TOC Elevation	Depth to Water	Ground-Water Elevation	Floating Product Thickness	Ground-Water Flow Direction	Hydraulic Gradient
		ft-MSL	feet	ft-MSL	feet	MWN	foot/foot
MW-7	07-25-91	450.65	34.88	415.77	Sheen	NR	NR
MW-7	08-13-91	450.65	36.17	414.48	ND	NR	NR
MW-7	09-12-91	450.65	37.81	412.84	ND	NR	NR
MW-7	10-30-91	450.65	38.50	412.15	ND	NR	NR
MW-7	11-13-91	450.65	38.31	412.34	ND	NR	NR
MW-7	12-26-91	450.65	37.90	412.75	ND	NR	NR
MW-7	01-18-92	450.65	Not surveyed: well inaccessible due to construction				
MW-7	02-21-92	450.65	31.50	NR	ND	NR	NR
MW-7	03-31-92	450.65	29.40	NR	ND	NR	NR
MW-7	04-24-92	450.63	32.14	418.49	ND	NR	NR
MW-7	05-20-92	450.63	32.51	418.12	ND	NR	NR
MW-7	06-12-92	450.63	32.45	418.18	ND	NR	NR
MW-7	07-28-92	450.63	32.08	418.55	ND	NR	NR
MW-7	08-24-92	450.63	32.29	418.34	ND	NR	NR
MW-7	09-15-92	450.63	31.93	418.70	ND	NR	NR
MW-7	10-29-92	450.63	32.37	418.26	ND	NR	NR
MW-7	11-25-92	450.33	31.80	418.53	ND	NR	NR
MW-7	12-14-92	450.33	30.44	419.89	ND	NR	NR
MW-7	01-29-93	450.33	21.76	428.57	ND	NR	NR
MW-7	02-26-93	450.33	24.16	426.17	ND	NR	NR
MW-7	03-29-93	450.33	24.32	426.01	ND	NR	NR
MW-7	04-27-93	450.33	25.44	424.89	ND	NR	NR
MW-7	05-10-93	450.33	27.40	422.93	ND	NR	NR
MW-7	06-17-93	450.33	28.80	421.53	ND	NR	NR
MW-7	07-27-93	450.33	29.89	420.44	ND	NR	NR
MW-7	08-26-93	450.33	30.52	419.81	ND	NR	NR
MW-7	09-14-93	450.33	31.09	419.24	ND	NR	NR
MW-7	11-05-93	450.33	31.42	418.91	ND	NR	NR
MW-7	03-26-94	450.33	26.03	424.30	ND	NR	NR
MW-7	06-13-94	450.33	27.94	422.39	ND	NR	NR
MW-7	09-22-94	450.33	30.46	419.87	ND	NNE	0.056
MW-7	11-25-94	450.33	28.30	422.03	ND	N	0.06

Table 2
Historical Groundwater Elevation Data
Summary Report

ARCO Service Station 771
899 Rincon Avenue, Livermore, California

Date: 03-07-95
Project Number: 0805-122.01

Well Desig-nation	Water Level Field Date	TOC Elevation	Depth to Water	Ground-Water Elevation	Floating Product Thickness	Ground-Water Flow Direction	Hydraulic Gradient
		ft-MSL	feet	ft-MSL	feet	MWN	foot/foot
MW-8	01-29-93	449.43	23.23	426.20	ND	NR	NR
MW-8	02-26-93	449.43	29.20	420.23	ND	NR	NR
MW-8	03-29-93	449.43	29.77	419.66	ND	NR	NR
MW-8	04-27-93	449.43	31.52	417.91	ND	NR	NR
MW-8	05-10-93	449.43	33.88	415.55	ND	NR	NR
MW-8	06-17-93	449.43	35.25	414.18	ND	NR	NR
MW-8	07-27-93	449.43	36.61	412.82	ND	NR	NR
MW-8	08-26-93	449.43	37.71	411.72	ND	NR	NR
MW-8	09-14-93	449.43	38.78	410.65	ND	NR	NR
MW-8	11-05-93	449.43	39.01	410.42	ND	NR	NR
MW-8	03-26-94	449.43	31.40	418.03	ND	NR	NR
MW-8	06-13-94	449.43	35.10	414.33	ND	NR	NR
MW-8	09-22-94	449.43	38.77	410.66	ND	NNE	0.056
MW-8	11-25-94	449.43	36.46	412.97	ND	N	0.06
MW-9	01-29-93	449.21	18.91	430.30	ND	NR	NR
MW-9	02-26-93	449.21	21.35	427.86	ND	NR	NR
MW-9	03-29-93	449.21	21.78	427.43	ND	NR	NR
MW-9	04-27-93	449.21	24.70	424.51	ND	NR	NR
MW-9	05-10-93	449.21	26.19	423.02	ND	NR	NR
MW-9	06-17-93	449.21	27.50	421.71	ND	NR	NR
MW-9	07-27-93	449.21	29.11	420.10	ND	NR	NR
MW-9	08-26-93	449.21	29.55	419.66	ND	NR	NR
MW-9	09-14-93	449.21	30.65	418.56	ND	NR	NR
MW-9	11-05-93	449.21	32.24	416.97	ND	NR	NR
MW-9	03-26-94	449.21	25.68	423.53	ND	NR	NR
MW-9	06-13-94	449.21	27.69	421.52	ND	NR	NR
MW-9	09-22-94	449.21	31.36	417.85	ND	NNE	0.056
MW-9	11-25-94	449.21	29.84	419.37	ND	N	0.06

Table 2
Historical Groundwater Elevation Data
Summary Report

ARCO Service Station 771
899 Rincon Avenue, Livermore, California

Date: 03-07-95
Project Number: 0805-122.01

Well Designation	Water Level Field Date	TOC Elevation	Depth to Water	Ground-Water Elevation	Floating Product Thickness	Ground-Water Flow Direction	Hydraulic Gradient
		ft-MSL	feet	ft-MSL	feet	MWN	foot/foot
MW-10	01-29-93	449.22	19.27	429.95	ND	NR	NR
MW-10	02-26-93	449.22	21.34	427.88	ND	NR	NR
MW-10	03-29-93	449.22	20.89	428.33	ND	NR	NR
MW-10	04-27-93	449.22	25.40	423.82	ND	NR	NR
MW-10	05-10-93	449.22	26.77	422.45	ND	NR	NR
MW-10	06-17-93	449.22	26.80	422.42	ND	NR	NR
MW-10	07-27-93	449.22	29.87	419.35	ND	NR	NR
MW-10	08-26-93	449.22	29.67	419.55	ND	NR	NR
MW-10	09-14-93	449.22	31.07	418.15	ND	NR	NR
MW-10	11-05-93	449.22	30.42	418.80	ND	NR	NR
MW-10	03-26-94	449.22	26.20	423.02	ND	NR	NR
MW-10	06-13-94	449.22	28.23	420.99	ND	NR	NR
MW-10	09-22-94	449.22	31.79	417.43	ND	NNE	0.056
MW-10	11-25-94	449.22	30.30	418.92	ND	N	0.06
MW-11	04-24-92	448.02	35.06	412.96	ND	NR	NR
MW-11	05-20-92	448.02	34.10	413.92	ND	NR	NR
MW-11	06-12-92	448.02	34.48	413.54	ND	NR	NR
MW-11	07-28-92	448.02	35.13	412.89	ND	NR	NR
MW-11	08-24-92	448.02	33.32	414.70	ND	NR	NR
MW-11	09-15-92	448.02	35.72	412.30	ND	NR	NR
MW-11	10-29-92	448.02	35.26	412.76	ND	NR	NR
MW-11	11-25-92	448.02	36.44	411.58	ND	NR	NR
MW-11	12-14-92	448.02	33.18	414.84	ND	NR	NR
MW-11	01-29-93	448.02	23.89	424.13	ND	NR	NR
MW-11	02-26-93	448.02	27.31	420.71	ND	NR	NR
MW-11	03-29-93	448.02	27.27	420.75	ND	NR	NR
MW-11	04-27-93	448.02	30.61	417.41	ND	NR	NR
MW-11	05-10-93	448.02	32.78	415.24	ND	NR	NR
MW-11	06-17-93	448.02	33.25	414.77	ND	NR	NR
MW-11	07-27-93	448.02	34.49	413.53	ND	NR	NR
MW-11	08-26-93	448.02	35.44	412.58	ND	NR	NR
MW-11	09-14-93	448.02	36.62	411.40	ND	NR	NR
MW-11	11-05-93	448.02	36.68	411.34	ND	NR	NR
MW-11	03-26-94	448.02	30.20	417.82	ND	NR	NR
MW-11	06-13-94	448.02	33.39	414.63	ND	NR	NR
MW-11	09-22-94	448.02	34.75	413.27	ND	NNE	0.056
MW-11	11-25-94	448.02	33.84	414.18	ND	N	0.06

Table 2
Historical Groundwater Elevation Data
Summary Report

ARCO Service Station 771
899 Rincon Avenue, Livermore, California

Date: 03-07-95
Project Number: 0805-122.01

Well Desig-nation	Water Level Field Date	TOC Elevation	Depth to Water	Ground-Water Elevation	Floating Product Thickness	Ground-Water Flow Direction	Hydraulic Gradient
		ft-MSL	feet	ft-MSL	feet	MWN	foot/foot
RW-1	04-24-92	451.44	32.85	418.59	ND	NR	NR
RW-1	05-20-92	451.44	32.60	418.84	ND	NR	NR
RW-1	06-12-92	451.44	32.72	418.72	ND	NR	NR
RW-1	07-28-92	451.44	31.94	419.50	ND	NR	NR
RW-1	08-24-92	451.44	31.73	419.71	ND	NR	NR
RW-1	09-15-92	451.44	31.94	419.50	ND	NR	NR
RW-1	10-29-92	451.44	32.15	419.29	ND	NR	NR
RW-1	11-25-92	451.67	32.21	419.46	ND	NR	NR
RW-1	12-14-92	451.67	30.58	421.09	ND	NR	NR
RW-1	01-29-93	451.67	22.89	428.78	ND	NR	NR
RW-1	02-26-93	451.67	23.97	427.70	ND	NR	NR
RW-1	03-29-93	451.67	23.98	427.69	ND	NR	NR
RW-1	04-27-93	451.67	27.26	424.41	ND	NR	NR
RW-1	05-10-93	451.67	29.64	422.03	ND	NR	NR
RW-1	06-17-93	451.67	30.18	421.49	ND	NR	NR
RW-1	07-27-93	451.67	31.55	420.12	ND	NR	NR
RW-1	08-26-93	451.67	31.82	419.85	ND	NR	NR
RW-1	09-14-93	451.67	32.32	419.35	ND	NR	NR
RW-1	11-05-93	451.67	31.91	419.76	ND	NR	NR
RW-1	03-26-94	451.67	27.78	423.89	ND	NR	NR
RW-1	06-13-94	451.67	29.48	422.19	ND	NR	NR
RW-1	09-22-94	451.67	30.52	421.15	ND	NNE	0.056
RW-1	11-25-94	451.67	30.89	420.78	ND	N	0.06

TOC = Top of casing
ft-MSL = Elevation in feet, relative to mean sea level
MWN = Ground-water flow direction and gradient apply to the entire monitoring well network
NR = Not reported; data not available
ND = None detected
^ = Groundwater elevation (GWE) and depth to water (DTW) adjusted to include 80 percent of the floating product thickness (FPT):
[GWE = (TOC - DTW) + (FPT x 0.8)]
* = Floating product was not initially detected, but entered the well during purging
NNE = North-northeast
N = North

Table 3
Historical Groundwater Analytical Data
Summary Report

ARCO Service Station 771
899 Rincon Avenue, Livermore, California

Date: 03-07-95
Project Number: 0805-122.01

Well Designation	Water Sample Field Date	TPHG	Benzene	Toluene	Ethyl-benzene	Total Xylenes	TPHD	TOG
		ppb	ppb	ppb	ppb	ppb	ppb	ppm
MW-1	01-15-91	Not sampled: well contained floating product						
MW-1	04-10-91	98000	11000	18000	2800	20000	NA	NA
MW-1	07-25-91	Not sampled: well contained floating product						
MW-1	10-30-91	Not sampled: well contained floating product						
MW-1	03-31-92	Not sampled: well contained floating product						
MW-1	06-12-92	Not sampled: well contained floating product						
MW-1	09-16-92	Not sampled: well contained floating product						
MW-1	11-25-92	Not sampled: well contained floating product						
MW-1	01-29-93	360000	2500	9300	5100	41000	NA	NA
MW-1	05-10-93	1900000	4100	15000	21000	140000	NA	NA
MW-1	09-16-93	1800000	6400	21000	19000	140000	NA	NA
MW-1	11-05-93	700000	3000	7600	8600	65000	NA	NA
MW-1	03-26-94	29000	1000	290	610	3300	NA	NA
MW-1	06-13-94	25000	600	160	500	2500	NA	NA
MW-1	09-22-94	51000	1400	280	570	2800	NA	NA
MW-1	11-25-94	170000	990	1000	1700	9400	NA	NA
MW-2	01-15-91	Not sampled: well contained floating product						
MW-2	04-10-91	Not sampled: well contained floating product						
MW-2	07-25-91	Not sampled: well contained floating product						
MW-2	10-30-91	Not sampled: well contained floating product						
MW-2	03-31-92	270000	7000	12000	4400	40000	NA	NA
MW-2	06-12-92	110000	8900	13000	2800	16000	NA	NA
MW-2	09-16-92	Not sampled: well contained floating product						
MW-2	11-25-92	Not sampled: well contained floating product						
MW-2	01-29-93	89000	4600	5700	1800	15000	NA	NA
MW-2	05-10-93	440000	3900	4300	4400	36000	NA	NA
MW-2	09-16-93	200000	5500	4300	2300	19000	NA	NA
MW-2	11-05-93	250000	7800	8400	3100	24000	NA	NA
MW-2	03-26-94	22000	1100	1400	190	3700	NA	NA
MW-2	06-13-94	71000	4100	4600	1700	9900	NA	NA
MW-2	09-22-94	42000	1200	620	710	2000	NA	NA
MW-2	11-25-94	60000	3900	4100	1400	7400	NA	NA

Table 3
Historical Groundwater Analytical Data
Summary Report

ARCO Service Station 771
899 Rincon Avenue, Livermore, California

Date: 03-07-95
Project Number: 0805-122.01

Well Designation	Water Sample Field Date	TPHG	Benzene	Toluene	Ethyl-benzene	Total Xylenes	TPHD	TOG
		ppb	ppb	ppb	ppb	ppb	ppb	ppm
MW-3	01-15-91	230	<0.5	<0.5	2.2	2.1	NA	NA
MW-3	04-10-91	530	12	8.4	4	7	NA	NA
MW-3	07-25-91	110	0.32	0.75	1.2	1	NA	NA
MW-3	10-30-91	Not sampled: dry well						
MW-3	03-31-92	670	12	1.1	7.4	27	NA	NA
MW-3	06-12-92	280	<0.5	<0.5	2.1	2	NA	NA
MW-3	09-15-92	<50	<0.5	<0.5	<0.5	<0.5	NA	NA
MW-3	11-25-92	220	1	<0.5	4.9	1.2	NA	NA
MW-3	01-29-93	380*	0.8	0.6	2.1	2	NA	NA
MW-3	05-10-93	170	<0.5	<0.5	2	0.6	NA	NA
MW-3	09-15-93	120	<0.5	<0.5	<0.5	<0.5	NA	NA
MW-3	11-05-93	110	<0.5	<0.5	<0.5	<0.5	NA	NA
MW-3	03-26-94	54	<0.5	<0.5	<0.5	<0.5	NA	NA
MW-3	06-13-94	<50	<0.5	<0.5	<0.5	<0.5	NA	NA
MW-3	09-22-94	<50	<0.5	<0.5	<0.5	<0.5	NA	NA
MW-3	11-25-94	54	<0.5	<0.5	<0.5	<0.5	NA	NA
MW-4	07-25-91	23000	590	730	360	3500	NA	NA
MW-4	10-30-91	19000	320	340	230	180	NA	NA
MW-4	03-31-92	30000	1300	740	770	4800	NA	NA
MW-4	06-12-92	28000	990	440	550	3200	NA	NA
MW-4	09-16-92	21000	740	240	350	1300	NA	NA
MW-4	11-25-92	26000	1200	300	350	730	NA	NA
MW-4	01-29-93	23000	2000	580	770	2500	NA	NA
MW-4	05-10-93	74000	2200	890	1400	4000	NA	NA
MW-4	09-16-93	43000	640	90	360	690	NA	NA
MW-4	11-05-93	30000	1000	240	390	1300	NA	NA
MW-4	03-26-94	27000	1800	830	1300	2900	NA	NA
MW-4	06-13-94	17000	1300	620	670	1600	NA	NA
MW-4	09-22-94	10000	700	61	420	570	NA	NA
MW-4	11-25-94	13000	1400	250	490	1200	NA	NA

Table 3
Historical Groundwater Analytical Data
Summary Report

ARCO Service Station 771
899 Rincon Avenue, Livermore, California

Date: 03-07-95
Project Number: 0805-122.01

Well Designation	Water Sample Field Date	TPHG	Benzene	Toluene	Ethyl-benzene	Total Xylenes	TPHD	TOG
		ppb	ppb	ppb	ppb	ppb	ppb	ppm
MW-5	07-25-91	57000	2300	4200	77	14000	NA	NA
MW-5	10-30-91	Not sampled: well contained floating product						
MW-5	03-31-92	80000	7100	9100	2000	16000	NA	NA
MW-5	06-12-92	69000	4000	5300	2200	12000	NA	NA
MW-5	09-16-92	65000	2300	2600	1700	9900	NA	NA
MW-5	11-25-92	Not sampled: new wellhead made casing inaccessible for sampling						
MW-5	01-29-93	Not sampled: new wellhead made casing inaccessible for sampling						
MW-5	05-10-93	220000	3900	3700	3400	15000	NA	NA
MW-5	09-16-93	180000	3500	3300	2700	10000	NA	NA
MW-5	11-05-93	66000	3000	2300	1700	6200	NA	NA
MW-5	03-26-94	39000	4000	2300	1600	6200	NA	NA
MW-5	06-13-94	28000	2500	1700	1100	3900	NA	NA
MW-5	09-22-94	Not sampled: vehicle was parked on well						
MW-5	11-25-94	31000	2400	1100	1100	4400	NA	NA
MW-6	07-25-91	10000	3000	200	340	1000	NA	NA
MW-6	10-30-91	970	150	4.4	4.9	6.6	NA	NA
MW-6	03-31-92	16000	3600	1500	660	1700	2400*	2.5(a), 4.0(b)
MW-6	06-12-92	2900	480	17	190	170	1100*	1.2(c)
MW-6	09-16-92	2300	220	<5	92	43	810*	1.5(d)
MW-6	11-25-92	2700	240	11	103	32	720*	1.6(a), 1.8(b)
MW-6	01-29-93	20000	1800	1700	490	2600	2300*	3.6(a), 4.0(b)
MW-6	05-10-93	43000	3000	1700	1100	4800	3900*	16(a), 110(b)
MW-6	09-15-93	3500	300	10	100	180	1100*	1.0(a), 1.0(b)
MW-6	11-05-93	1100	140	<5	35	23	290	1.0(a), 1.0(b)
MW-6	03-26-94	3100	350	99	130	340	880	1.5(d)
MW-6	06-13-94	2300	250	12	130	31	350*	0.80(d)
MW-6	09-22-94	73	2.6	<0.5	1.7	0.7	<50	<0.5(a)
MW-6	11-25-94	1100	78	<2.5	46	17	<50	<0.5(d)

Table 3
Historical Groundwater Analytical Data
Summary Report

ARCO Service Station 771
899 Rincon Avenue, Livermore, California

Date: 03-07-95
Project Number: 0805-122.01

Well Designation	Water Sample Field Date	TPHG ppb	Benzene ppb	Toluene ppb	Ethyl-benzene ppb	Total Xylenes ppb	TPHD ppb	TOG ppm
MW-7	07-25-91	45000	1500	2700	1200	9200	NA	NA
MW-7	10-30-91	93000	1800	770	780	6700	NA	NA
MW-7	03-31-92	35000	960	350	300	5900	NA	NA
MW-7	06-12-92	27000	900	270	340	4800	NA	NA
MW-7	09-16-92	39000	1900	410	470	5000	NA	NA
MW-7	11-25-92	49000	2900	810	750	5300	NA	NA
MW-7	01-29-93	38000	3200	1100	740	4300	NA	NA
MW-7	05-10-93	54000	1600	160	560	3100	NA	NA
MW-7	09-16-93	37000	1400	170	560	2700	NA	NA
MW-7	11-05-93	40000	1900	210	570	2900	NA	NA
MW-7	03-26-94	22000	2700	280	500	2600	NA	NA
MW-7	06-13-94	21000	1500	180	360	1900	NA	NA
MW-7	09-22-94	22000	1800	240	430	1900	NA	NA
MW-7	11-25-94	29000	2600	380	640	3300	NA	NA
MW-8	01-29-93	<50	<0.5	<0.5	<0.5	<0.5	NA	NA
MW-8	05-10-93	<50	<0.5	<0.5	<0.5	<0.5	NA	NA
MW-8	09-15-93	<50	<0.5	<0.5	<0.5	<0.5	NA	NA
MW-8	11-05-93	<50	<0.5	<0.5	<0.5	<0.5	NA	NA
MW-8	03-26-94	<50	<0.5	<0.5	<0.5	<0.5	NA	NA
MW-8	06-13-94	<50	<0.5	<0.5	<0.5	<0.5	NA	NA
MW-8	09-22-94	<50	<0.5	<0.5	<0.5	<0.5	NA	NA
MW-8	11-25-94	<50	<0.5	<0.5	<0.5	<0.5	NA	NA
MW-9	01-29-93	<50	<0.5	<0.5	<0.5	<0.5	NA	NA
MW-9	05-10-93	<50	<0.5	<0.5	<0.5	<0.5	NA	NA
MW-9	09-15-93	<50	<0.5	<0.5	<0.5	<0.5	NA	NA
MW-9	11-05-93	<50	<0.5	<0.5	<0.5	<0.5	NA	NA
MW-9	03-26-94	<50	<0.5	<0.5	<0.5	<0.5	NA	NA
MW-9	06-13-94	<50	<0.5	<0.5	<0.5	<0.5	NA	NA
MW-9	09-22-94	<50	<0.5	<0.5	<0.5	<0.5	NA	NA
MW-9	11-25-94	<50	<0.5	<0.5	<0.5	<0.5	NA	NA

Table 3
Historical Groundwater Analytical Data
Summary Report

ARCO Service Station 771
899 Rincon Avenue, Livermore, California

Date: 03-07-95
Project Number: 0805-122.01

Well Designation	Water Sample Field Date	TPHG	Benzene	Toluene	Ethyl-benzene	Total Xylenes	TPHD	TOG
		ppb	ppb	ppb	ppb	ppb	ppb	ppm
MW-10	01-29-93	<50	<0.5	<0.5	<0.5	<0.5	NA	NA
MW-10	05-10-93	<50	<0.5	<0.5	<0.5	<0.5	NA	NA
MW-10	09-15-93	<50	<0.5	<0.5	<0.5	<0.5	NA	NA
MW-10	11-05-93	<50	<0.5	<0.5	<0.5	<0.5	NA	NA
MW-10	03-26-94	<50	<0.5	<0.5	<0.5	<0.5	NA	NA
MW-10	06-13-94	<50	<0.5	<0.5	<0.5	<0.5	NA	NA
MW-10	09-22-94	<50	<0.5	<0.5	<0.5	<0.5	NA	NA
MW-10	11-25-94	<50	<0.5	<0.5	<0.5	<0.5	NA	NA
MW-11	06-12-92	<50	<0.5	<0.5	<0.5	<0.5	NA	NA
MW-11	09-15-92	<50	<0.5	<0.5	<0.5	<0.5	NA	NA
MW-11	11-25-92	<50	<0.5	<0.5	<0.5	<0.5	NA	NA
MW-11	01-29-93	<50	<0.5	<0.5	<0.5	<0.5	NA	NA
MW-11	05-10-93	<50	<0.5	<0.5	<0.5	<0.5	NA	NA
MW-11	09-15-93	<50	<0.5	<0.5	<0.5	<0.5	NA	NA
MW-11	11-05-93	<50	<0.5	<0.5	<0.5	<0.5	NA	NA
MW-11	03-26-94	<50	<0.5	<0.5	<0.5	<0.5	NA	NA
MW-11	06-13-94	<50	<0.5	<0.5	<0.5	<0.5	NA	NA
MW-11	09-22-94	<50	<0.5	<0.5	<0.5	<0.5	NA	NA
MW-11	11-25-94	<50	<0.5	<0.5	<0.5	<0.5	NA	NA
RW-1	06-12-92	54000	2300	4400	1200	12000	NA	NA
RW-1	09-15-92	49000	1500	2200	870	6900	NA	NA
RW-1	11-25-92	32000	1500	2500	1000	5500	NA	NA
RW-1	01-29-93	43000	3100	2500	990	7400	NA	NA
RW-1	05-10-93	30000	2900	1100	690	4300	NA	NA
RW-1	09-16-93	20000	1800	580	620	2300	NA	NA
RW-1	11-05-93	25000	1800	250	740	1300	NA	NA
RW-1	03-26-94	8100	780	100	360	340	NA	NA
RW-1	06-13-94	4900	510	32	150	170	NA	NA
RW-1	09-22-94	4900	390	30	190	210	NA	NA
RW-1	11-25-94	4900	550	68	200	230	NA	NA

TPHG = Total petroleum hydrocarbons as gasoline
TPHD = Total petroleum hydrocarbons as diesel
TOG = Total oil and grease/petroleum hydrocarbons using method: (a) 5520F-IR, (b) 5520C, (c) 413.2, or (d) 418.1
ppb = Parts per billion or micrograms per liter (µg/l)
ppm = Parts per million or milligrams per liter (mg/l); TOG only
NA = Not analyzed
* = Chromatogram does not match the typical fingerprint for gasoline or diesel

Table 4
Approximate Cumulative Floating Product Recovered
Summary Report

ARCO Service Station 771
899 Rincon Avenue, Livermore, California

Date: 02-09-95
Project Number: 0805-122.01

Well Designation	Date	Floating Product Recovered gallons
MW-1, MW-2, and MW-5	1991	2.77
MW-1, MW-2, and MW-5	1992	0.29
MW-1, MW-2, and MW-5	1993	0.00
	1994 to Date:	
MW-1	11-25-94	0.00
MW-2	11-25-94	0.00
MW-5	11-25-94	0.00
	1994 Total:	0.00
	1991 to 1994 Total:	3.06

TABLE 1
VAPOR-EXTRACTION TEST MONITORING DATA
ARCO Station 771
Livermore, California

Influent Air Stream					Observation Wells			
Flow	Concentration	Applied Vacuum	Temp.	Elapsed Time (min)	MW-2 Induced Vacuum	MW-5 Induced Vacuum	MW-7 Induced Vacuum	MW-1 Induced Vacuum
53.4	NM	39	50	0	1.0	0.8	0.7	NM
87.2	>10,000	>100	55	30	4.3	5.8	3.7	NM
89.4	>10,000	98	57	60	4.8	6.9	5.0	NM
91.6	>10,000	105	57	90	4.9	7.2	5.7	NM
91.6	>10,000	105	60	120	4.9	7.3	6.0	NM
91.6	>10,000	105	60	150	4.9	7.3	6.0	NM
63.2	>10,000	49	64	30	4.8	5.0	5.1	NM
63.2	>10,000	49	63	60	4.8	5.0	5.1	>3
				Distance from extraction well MW-4 (feet):	40.0	40.0	35.0	60.0

Influent Air Stream					Observation Wells			
Flow	Concentration	Applied Vacuum	Temp.	Elapsed Time (min)	MW-1 Induced Vacuum	MW-4 Induced Vacuum	MW-2 Induced Vacuum	MW-7 Induced Vacuum
81.6	>10,000	96	56	0	2.0	0.9	0.04	0.0
81.6	>10,000	81.8	55	30	5.0	3.3	0.5	1.1
				Distance from extraction well MW-5 (feet):	30.0	40.0	80.0	60.0

Influent Air Stream					Observation Wells		
Flow	Concentration	Applied Vacuum	Temp.	Elapsed Time (min)	MW-2 Induced Vacuum	MW-4 Induced Vacuum	MW-5 Induced Vacuum
82.8	>10,000	95	57	0	2.0	2.0	1.2
82.8	>10,000	100	54	30	2.0	2.3	1.3
				Distance from extraction well MW-7 (feet):	44.0	35.0	57.0

Flow measured in cubic feet per minute (CFM).
Concentration measured in parts per million by volume (ppmv) on Lower Explosion Level (LEL) Meter.
Vacuum measured in inches of water column vacuum.
Temperature measured in degrees Fahrenheit.
NM = Not Measured.

TABLE 2
LABORATORY ANALYSIS OF AIR SAMPLES
ARCO Station 771
Livermore, California

Sample ID	Sample Location	Elapsed Time of Sample	TPHg	B	T	E	X
60000.07-AS1	MW-4	30	62,000	1200	150	28	48
60000.07-AS2	MW-4	150	58,000	1100	180	43	86
effluent	Outlet*	30	1,000	19	14	6.4	18
60000.07-AS3	MW-4	30	14,000	180	23	<12	<12
60000.07-AS4	MW-7	30	30,000	740	150	15	87
60000.07-AS5	MW-5	30	8,600	220	<12	<12	<12

Concentrations reported in milligrams per cubic meter (mg/m^3)
< : Below the minimum laboratory detection limit for air.
NA: Not analyzed.
TPHg: Total petroleum hydrocarbons as gasoline (analyzed by EPA Methods 8015 and 8020).
B: benzene, T: toluene, E: ethylbenzene, X: total xylene isomers
BTEX: Analyzed by EPA Methods 8015 and 8020
*: Outlet effluent vapors sampled after abatement by the internal combustion engine.

TABLE 1
LABORATORY ANALYTICAL RESULTS OF AIR SAMPLES
SVE STARTUP AND PERFORMANCE TEST

ARCO Station 771
899 Rincon Avenue, Livermore, California

Sample Location	Date	Sample ID	Concentration in air (mg/m³)				
			Benzene	Toluene	Ethylbenzene	Total Xylenes	TPHG
Detection Limit			0.5	0.5	0.5	1.0	60
Well Field Influent (before dilution)	12/20/94	I-1	<0.5	<0.5	<0.5	7.1	300
Influent to System (after dilution)	12/20/94	I-2	<0.5	<0.5	<0.5	1.9	<60
Effluent (stack exhaust)	12/20/94	E-1	<0.5	0.7	<0.5	2.5	<60

Notes:
mg/m³: Milligrams per cubic meter
TPHG: Total Petroleum Hydrocarbons as Gasoline
Analysis Method: Modified EPA 8015/8020

TABLE 2
HYDROCARBON REMOVAL AND EMISSION RATES
SVE STARTUP AND PERFORMANCE TEST

ARCO Station 771
899 Rincon Avenue, Livermore, California

Date	Compound	Concentration (mg/m^3)		Flow Rate	Mass Removal	Mass Emisson	Destruction
		Influent(I-2)	Effluent (E-1)	(scfm or ft^3/min)	Rate (lbs/day)	Rate (lbs/day)	Efficiency (%)
12/20/94	Benzene	<0.5	<0.5	130	<0.0058	<0.0058	NC
12/20/94	TPHG	<60	<60	130	<0.7	<0.7	NC

Notes:

mg/m^3:	milligrams per cubic meter
scfm:	standard cubic feet per minute
ft^3/min:	cubic feet per minute
TPHG:	Total Petroleum Hydrocarbons as Gasoline
lbs/day:	pouinds per day
NC:	Not calculated

Sample Calculation:

TPHG removal rate:

inf.conc. (mg TPHG/m^3 air) x flow rate(ft^3 air/min) x 1 lb/454,000 mg x 0.0283 m^3/ft^3 x 1440 min/day = lbs TPHG /day

Table 5
Soil-Vapor Extraction System
Operation and Performance Data

Facility Number: 771
Location: 899 Rincon Avenue
Livermore, California

Consultant: EMCON
1921 Ringwood Avenue
San Jose, California

Vapor Treatment Unit: King Buck / 200 cfm
Model MMC-6A/E
catalytic oxidizer

Start-Up Date: 12-20-94
Reporting Period From: 12-01-94
To: 04-01-96
System was shut down on 10-10-95.

Date Begin:	12-01-94	01-01-95	02-01-95	07-01-95	08-01-95
Date End:	01-01-95	02-01-95	07-01-95	08-01-95	09-01-95
Mode of Oxidation:	Catalytic	Catalytic	Catalytic	Catalytic	Catalytic
Days of Operation:	11	11	0	8	14
Days of Downtime:	20	20	150	23	17
Average Vapor Concentrations (1)					
Well Field Influent: ppmv (2) as gasoline	100	<15	NA	54	33
mg/m3 (3) as gasoline	300	<60	NA	218	120
ppmv as benzene	<0.1	<0.1	NA	1.2	0.4
mg/m3 as benzene	<0.5	<0.5	NA	3.6	1.2
System Influent: ppmv as gasoline	<15	NA	NA	48	24
mg/m3 as gasoline	<60	NA	NA	200	87
ppmv as benzene	<0.1	NA	NA	1.2	0.3
mg/m3 as benzene	<0.5	NA	NA	3.8	0.8
System Effluent: ppmv as gasoline	<15	NA	NA	<15	<15
mg/m3 as gasoline	<60	NA	NA	<60	<60
ppmv as benzene	<0.1	NA	NA	<0.1	<0.1
mg/m3 as benzene	<0.5	NA	NA	<0.5	<0.5
Average Well Field Flow Rate (4), scfm (5):	27.3	13.0	0.0	83.3	104.3
Average System Influent Flow Rate (4), scfm:	201.7	180.7	0.0	163.4	170.9
Average Destruction Efficiency (6), percent (7):	NA (13)	NA	NA	70.0 (14)	31.0 (14)
Average Emission Rates (8), pounds per day (9)					
Gasoline:	1.09	0.97	0.00	0.88	0.92
Benzene:	0.01	0.01	0.00	0.01	0.01
Operating Hours This Period:	275.50	269.23	0.00	195.40	342.12
Operating Hours To Date:	275.5	544.7	544.7	740.1	1082.3
Pounds/ Hour Removal Rate, as gasoline (10):	0.03	0.00	0.00	0.07	0.05
Pounds Removed This Period, as gasoline (11):	8.4	0.8	0.0	13.3	16.0
Pounds Removed To Date, as gasoline:	8.4	9.2	9.2	22.5	38.5
Gallons Removed This Period, as gasoline (12):	1.4	0.1	0.0	2.1	2.6
Gallons Removed To Date, as gasoline:	1.4	1.5	1.5	3.6	6.2

Table 5
Soil-Vapor Extraction System
Operation and Performance Data

Facility Number: 771
Location: 899 Rincon Avenue
Livermore, California

Consultant: EMCON
1921 Ringwood Avenue
San Jose, California

Vapor Treatment Unit: King Buck / 200 cfm
Model MMC-6A/E
catalytic oxidizer

Start-Up Date: 12-20-94
Reporting Period From: 12-01-94
To: 04-01-96
System was shut down on 10-10-95.

Date Begin:		09-01-95	10-01-95	01-01-96
Date End:		10-01-95	01-01-96	04-01-96
Mode of Oxidation:		Catalytic	Catalytic	Catalytic
Days of Operation:		27	0	0
Days of Downtime:		3	92	91
Average Vapor Concentrations (1)				
Well Field Influent:	ppmv (2) as gasoline	20	NA	NA
	mg/m3 (3) as gasoline	89	NA	NA
	ppmv as benzene	<0.1	NA	NA
	mg/m3 as benzene	<0.5	NA	NA
System Influent:	ppmv as gasoline	18	NA	NA
	mg/m3 as gasoline	79	NA	NA
	ppmv as benzene	<0.1	NA	NA
	mg/m3 as benzene	<0.5	NA	NA
System Effluent:	ppmv as gasoline	<15	NA	NA
	mg/m3 as gasoline	<60	NA	NA
	ppmv as benzene	<0.1	NA	NA
	mg/m3 as benzene	<0.5	NA	NA
Average Well Field Flow Rate (4), scfm (5):		84.0	0.0	0.0
Average System Influent Flow Rate (4), scfm:		84.0	0.0	0.0
Average Destruction Efficiency (6), percent (7):		24.1 (14)	NA	NA
Average Emission Rates (8), pounds per day (9)				
Gasoline:		0.45	0.00	0.00
Benzene:		0.00	0.00	0.00
Operating Hours This Period:		654.88	0.00	0.40
Operating Hours To Date:		1737.1	1737.1	1737.5
Pounds/ Hour Removal Rate, as gasoline (10):		0.03	0.00	0.00
Pounds Removed This Period, as gasoline (11):		18.3	0.0	0.0
Pounds Removed To Date, as gasoline:		56.9	56.9	56.9
Gallons Removed This Period, as gasoline (12):		3.0	0.0	0.0
Gallons Removed To Date, as gasoline:		9.2	9.2	9.2

Table 5
Soil-Vapor Extraction System
Operation and Performance Data

Facility Number: 771	Vapor Treatment Unit: King Buck / 200 cfm
Location: 899 Rincon Avenue	Model MMC-6A/E
Livermore, California	catalytic oxidizer
Consultant: EMCON	Start-Up Date: 12-20-94
1921 Ringwood Avenue	Reporting Period From: 12-01-94
San Jose, California	To: 04-01-96
	System was shut down on 10-10-95.

CURRENT REPORTING PERIOD:	01-01-96	to	04-01-96
DAYS / HOURS IN PERIOD:	91	2184.0	
DAYS / HOURS OF OPERATION:	0	0.0	
DAYS / HOURS OF DOWN TIME:	91	2184.0	
PERCENT OPERATIONAL:		0.0	%
PERIOD POUNDS REMOVED:	9.2		
PERIOD GALLONS REMOVED:	0.0		
AVERAGE SYSTEM INFLUENT FLOW RATE (scfm):		0.0	

1. Average concentrations are based on discrete sample results reported during the month; refer to Appendix C for discrete sample results.
2. ppmv: parts per million by volume
3. mg/m3: milligrams per cubic meter
4. Average flow rates (time weighted average) are based on instantaneous flow rates recorded during the month; refer to Appendix C for instantaneous flow data.
5. scfm: flow in standard cubic feet per minute at one atmosphere and 70 degrees Fahrenheit
6. Average destruction efficiencies are calculated using monthly average concentrations; refer to Appendix C for instantaneous destruction efficiency data.
7. destruction efficiency, percent = ([system influent concentration (as gasoline in mg/m3) - system effluent concentration (as gasoline in mg/m3)] / system influent concentration (as gasoline in mg/m3)) x 100 percent
8. Average emission rates are calculated using monthly average concentrations and flow rates; refer to Appendix C for instantaneous emission rate data.
9. emission rates (pounds per day) = system effluent concentration (as gasoline or benzene in mg/m3) x system influent flow rate (scfm) x 0.02832 m3/ft3 x 1440 minutes/day x 1 pound/454,000 mg
10. pounds/ hour removal rate (as gasoline) = well field influent concentration (as gasoline in mg/m3) x well field influent flow rate (scfm) x 0.02832 m3/ft3 x 60 minutes/hour x 1 pound/454,000 mg
11. pounds removed this period (as gasoline) = pounds/ hour removal rate x hours of operation
12. gallons removed this period (as gasoline) = pounds removed this period (as gasoline) x 0.1613 gallons/pound of gasoline
13. NA: not analyzed, not available, or not applicable
14. Although the destruction efficiency appeared to be less than 90 percent, laboratory analytical results collected during this period indicate the effluent TVHG and benzene concentrations in off-gas discharged to the atmosphere were below laboratory detection limits, indicating compliance with BAAQMD discharge requirements.

Table 6
Soil-Vapor Extraction Well Data

ARCO Service Station 771
899 Rincon Avenue, Livermore, California

Date: 04-11-96

Date	Well Identification											
	VW-1			MW-1			MW-2			MW-4		
	Valve Position	TVHG ppmv	Vacuum Response in-H2O	Valve Position	TVHG ppmv	Vacuum Response in-H2O	Valve Position	TVHG ppmv	Vacuum Response in-H2O	Valve Position	TVHG ppmv	Vacuum Response in-H2O
12-20-94	open	177 LAB	32.5	passive	NA	NA	passive	NA	NA	open	53 LAB	25.0
01-17-95	System shut down											
07-12-95	System was restarted											
07-12-95	open	NA	NA	open	NA	NA	open	NA	NA	open	NA	NA
08-01-95	open	NA	NA	open	NA	NA	open	NA	NA	open	NA	NA
08-29-95	open	NA	NA	open	NA	NA	open	NA	NA	open	NA	NA
09-18-95	open	44.8 PID	53.7	open	10.7 PID	56.9	open	12.0 PID	52.8	open	13.3 PID	54.7
09-18-95	open (b)	66.8 PID	56.0	open (b)	113 PID	58.2	open (b)	25.9 PID	55.1	open (b)	21.8 PID	56.9
10-10-95	open	NA	NA	open	NA	NA	open	NA	NA	open	NA	NA
10-10-95	System shut down											
12-19-95	closed (b)	NA	NA	closed (b)	NA	NA	closed (b)	NA	NA	closed (b)	NA	NA
02-08-96	closed (b)	NA	NA	closed (b)	NA	NA	closed (b)	NA	NA	closed (b)	NA	NA
02-14-96	closed (b)	NA	NA	closed (b)	NA	NA	closed (b)	NA	NA	closed (b)	NA	NA
03-22-96	closed (b)	NA	NA	closed (b)	NA	NA	closed (b)	NA	NA	closed (b)	NA	NA

TVHG: concentration of total volatile hydrocarbons as gasoline
ppmv: parts per million by volume
in-H2O: inches of water
open: open to the system
open (b): open to the system and bubbling air at 1 scfm per well
passive: open to the atmosphere
closed: closed to the system and atmosphere
closed (b): closed to the system and atmosphere, but bubbling air at 1 scfm per well
NA: not analyzed or not measured
FID: TVHG concentration was measured with a portable flame ionization detector
LAB: TVHG concentration was analyzed in the laboratory

Table 6
Soil-Vapor Extraction Well Data

ARCO Service Station 771
899 Rincon Avenue, Livermore, California

Date: 04-11-96

Date	Well Identification							
	MW-5			MW-7			Bubbler-Only Well	
	Valve Position	TVHG ppmv	Vacuum Response in-H2O	Valve Position	TVHG ppmv	Vacuum Response in-H2O	RW-1	
12-20-94	passive	NA	NA	passive	NA	NA		
01-17-95	System shut down							
07-12-95	System was restarted							
07-12-95	open	NA	NA	open	NA	NA		
08-01-95	open	NA	NA	open	NA	NA		
08-29-95	open	NA	NA	open	NA	NA		
09-18-95	open	11.2 PID	55.9	open	19.0 PID	53.9		
09-18-95	open (b)	117 PID	58.0	open (b)	20.0 PID	56.2		
10-10-95	open	NA	NA	open	NA	NA		
10-10-95	System shut down							
12-19-96	closed (b)	NA	NA	closed (b)	NA	NA		
02-08-96	closed (b)	NA	NA	closed (b)	NA	NA	bubbling	
02-14-96	closed (b)	NA	NA	closed (b)	NA	NA	bubbling	
03-22-96	closed (b)	NA	NA	closed (b)	NA	NA	bubbling	

TVHG: concentration of total volatile hydrocarbons as gasoline
ppmv: parts per million by volume
in-H2O: inches of water
open: open to the system
open (b): open to the system and bubbling air at 1 scfm per well
passive: open to the atmosphere
closed: closed to the system and atmosphere
closed (b): closed to the system and atmosphere, but bubbling air at 1 scfm per well
NA: not analyzed or not measured
FID: TVHG concentration was measured with a portable flame ionization detector
LAB: TVHG concentration was analyzed in the laboratory

APPENDIX C

SOIL BORING AND WELL CONSTRUCTION LOGS

Total depth of boring: 35 feet **Diameter of boring:** 6 inches **Date drilled:** 2/1/90

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

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

Drilling Company: Bakersfield Well & Pump **Driller:** Sid & Tom

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

Signature of Registered Professional:

Registration No.: **State:** CA

Depth	Sample No.	Blows	P.I.D.	USCS Code	Description	Well Const.
0						
					Asphalt (6 inches).	
2				GW	Sandy gravel with clay, brown, damp, dense with subrounded gravel.	
4		7				
		10				
6	S-5	19	0			
8						
		16				
10		27				
	S-10	39	2.4		Moist, very dense, noticeable odor.	
12						
14		27				
	S-14.5	45	20			
16						
18						
		31			Obvious odor.	
20	S-19.5	50+	200			
					(Section continues downward)	

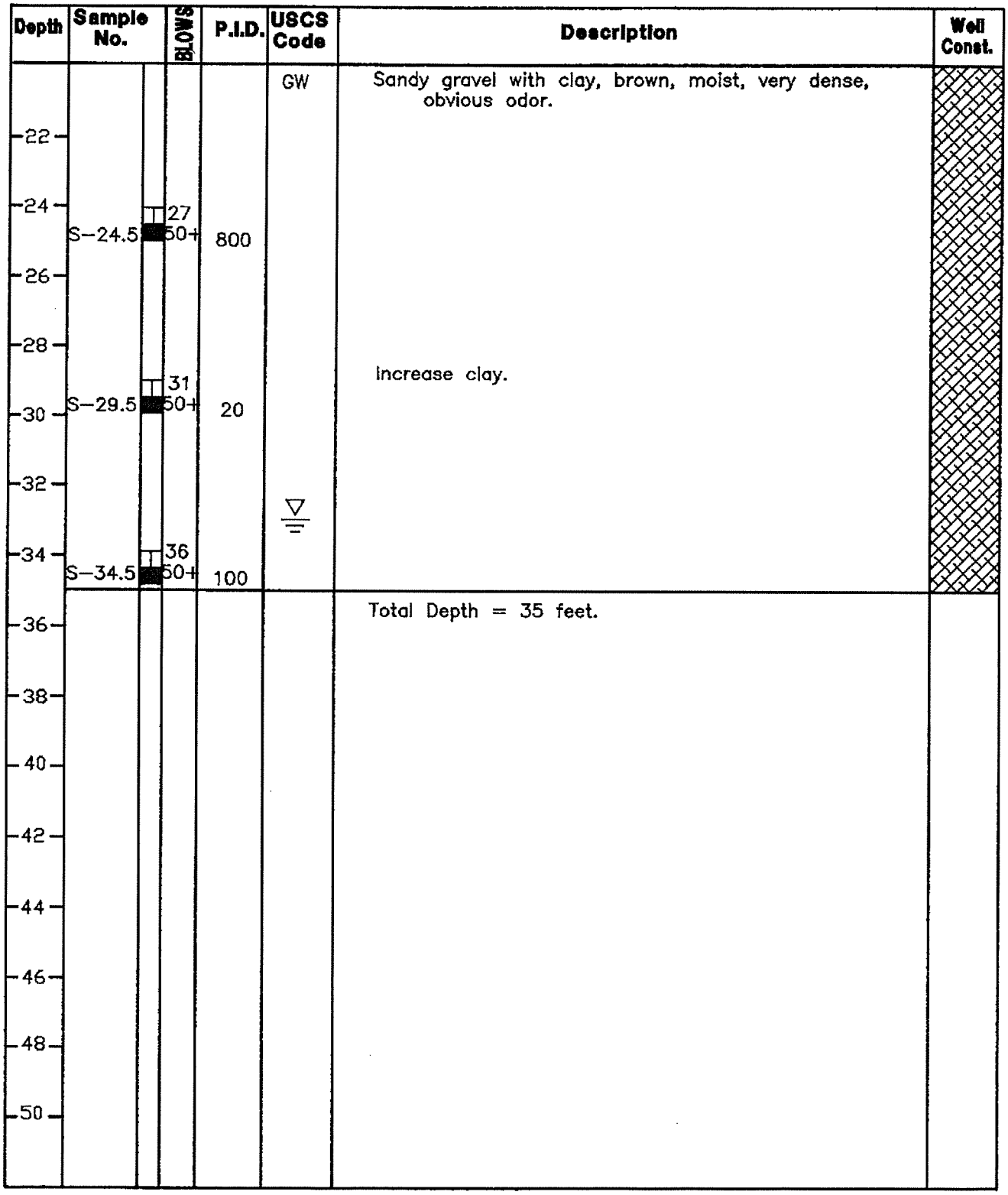
Applied GeoSystems

PROJECT 60000-1

LOG OF BORING B - 1

ARCO Station 771
899 Rincon Avenue
Livermore, California

PLATE 4



Applied GeoSystems

PROJECT 60000-1

LOG OF BORING B - 1

ARCO Station 771
899 Rincon Avenue
Livermore, California

PLATE 5

Total depth of boring: 31.5 feet **Diameter of boring:** 6 inches **Date drilled:** 2/1/90

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

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

Drilling Company: Bakersfield Well & Pump **Driller:** Sid & Tom

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

Signature of Registered Professional:

Registration No.: **State:** CA

Depth	Sample No.	Blows	P.I.D.	USCS Code	Description	Well Const.
0					Asphalt (6 inches).	
2				GW	Sandy gravel with clay, brown, damp, dense with subrounded gravel.	
4		10 17				
6	S-5	20	5		Noticeable odor.	
8						
10	S-10	11 17 29	0			
12						
14		17 20	10		Gray.	
16	S-15	15				
18				CL	Sandy clay, gray, moist, low to medium plasticity, stiff, noticeable odor.	
20	S-20	20 41 50+	210	GC	Clayey gravel with sand, gray-brown, moist, very dense with subangular gravel, obvious odor.	

(Section continues downward)

Applied GeoSystems

PROJECT 60000-1

LOG OF BORING B - 2

ARCO Station 771
899 Rincon Avenue
Livermore, California

PLATE 6

Depth	Sample No.	BLOWS	P.I.D.	USCS Code	Description	Well Const.
22				GC	Clayey gravel with sand, gray–brown, moist, very dense with subangular gravel, obvious odor.	
24		21				
		37				
	S–25	50+	35			
26						
28						
30		7				
		15		CL	Gravelly clay, brown, moist, subangular gravel, medium plasticity, hard.	
	S–31	40	2			
32					Total Depth = 31–1/2 feet.	
34						
36						
38						
40						
42						
44						
46						
48						
50						

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PROJECT 60000-1

LOG OF BORING B - 2

ARCO Station 771
899 Rincon Avenue
Livermore, California

PLATE 7

Total depth of boring: 32.5 feet **Diameter of boring:** 6 inches **Date drilled:** 2/1/90

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

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

Drilling Company: Bakersfield Well & Pump **Driller:** Sid & Tom

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

Signature of Registered Professional:

Registration No.: **State:** CA

Depth	Sample No.	Blows	P.I.D.	USCS Code	Description	Well Const.
0					Asphalt (6 inches).	
2				GW	Sandy gravel with clay, brown, damp, medium dense with subrounded gravel.	
4		6 8				
6	S-5	9	0			
8						
10		24 37				
12	S-10	25	0		Very dense.	
14		41				
16	S-14.5	50+	2		Moist.	
18						
20		27		GC	Clayey gravel with sand, gray-brown, moist, very dense with subangular gravel, noticeable odor.	
	S-19.5	50+	110		(Section continues downward)	

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PROJECT 60000-1

LOG OF BORING B - 3

ARCO Station 771
899 Rincon Avenue
Livermore, California

PLATE 8

Depth	Sample No.	BLOWS	P.I.D.	USCS Code	Description	Well Const.
22				GC	Clayey gravel with sand, gray–brown, moist, very dense with subangular gravel, noticeable odor.	
24		25				
26	S–25	50+	240		Obvious odor.	
28						
30		24 45 45				
	S–30	30	700			
32	S–32	41 50	720		Obvious odor.	
					Total Depth = 32–1/2 feet.	
34						
36						
38						
40						
42						
44						
46						
48						
50						

Applied GeoSystems

PROJECT 60000-1

LOG OF BORING B - 3

ARCO Station 771
899 Rincon Avenue
Livermore, California

PLATE 9

Depth of boring: 46-1/2 feet Diameter of boring: 10 inches Date drilled: 12-10-90

Well depth: 41 feet Material type: Sch 40 PVC Casing diameter: 4 inches

Screen interval: 32 to 41 feet Slot size: 0.020-inch

Drilling Company: Kvilhaug Drilling Co. Driller: Rod and Brian

Method Used: Hollow-Stem Auger Field Geologist: Mike Barminski

Signature of Registered Professional: _____

Registration No.: CE 044600 State: CA

Depth	Sample No.	Blows	P.I.D.	USCS Code	Description	Well Const.
0					Asphalt (4 inches).	
2				CL	Gravelly clay with sand, dark brown, moist, low to medium plasticity, hard.	
4	S-5	12 18 27	6.5			
6						
8				GW	Sandy gravel with clay, brown, moist, very dense.	
10	S-10	7 22 40	0			
12						
14						
16	S-15	25 50	0			
18						
20	S-20	30 50	4.2		Noticeable product odor.	
					(Section continues downward)	

Applied GeoSystems

PROJECT: 60000-4

LOG OF BORING B-4/MW-1

ARCO Station 771
899 Rincon Avenue
Livermore, California

PLATE 5

Depth	Sample No.	BLOWS	P.I.D.	USCS Code	Description	Well Const.
22				GW	Sandy gravel with clay, brown, moist, very dense; noticeable product odor.	
24	S-25					
26	S-26.5	30 50 50	4.6			
28						
30	S-30	30 50 50	0	GC	Clayey gravel with sand, brown, moist, very dense.	
32	S-32.5	30				
	S-33	50 50	2.8		12/12/90	
34	S-35	50 50	0		Very moist.	
36	S-36.5	40 50 50	0			
	S-37.5	40				
38	S-38	50 50	2669	GW	Sandy gravel with clay, brown, moist, very dense; obvious product odor.	
40	S-40					
42	S-43	15 20 30	187.8	CL	Sandy clay, brown, moist, medium to low plasticity, hard; obvious product odor.	
44					Damp, noticeable product odor.	
46	S-45.5	15 25				
	S-46	35	27.1	SC	Clayey sand with pebbles to 1/8", brown, moist, very dense	
48					Total Depth = 46-1/2 feet.	
50						

Applied GeoSystems

PROJECT 60000-4

LOG OF BORING B-4/MW-1
ARCO Station 771
899 Rincon Avenue
Livermore, California

PLATE 6

Depth of boring: 45-1/2 feet Diameter of boring: 10 inches Date drilled: 12-10-90

Well depth: 38 feet Material type: Sch 40 PVC Casing diameter: 4 inches

Screen interval: 30 to 38 feet Slot size: 0.020-inch

Drilling Company: Kvilhaug Drilling Co. Driller: Rod and Brian

Method Used: Hollow-Stem Auger Field Geologist: Mike Barminski

Signature of Registered Professional: _____

Registration No.: CE 044600 State: CA

Depth	Sample No.	Blows	P.I.D.	USCS Code	Description	Well Const.
0					Asphalt (4 inches).	
2				GW	Sandy gravel with clay, brown, damp, dense.	
4	S-5	10 38 50	0		Very dense.	
6						
8						
10	S-10	50 50	0.9		Moist.	
12	S-11.5	50 50	0			
14					Smoother drilling at 14 feet.	
16	S-15	35 50 50	0	CL	Sandy clay, gray, very moist, low to medium plasticity, hard. Rougher drilling at 16 feet.	
18				GW	Sandy gravel with clay, brown, very moist, very dense; noticeable product odor?	
20	S-20	30 50 50	4.6		(Section continues downward)	

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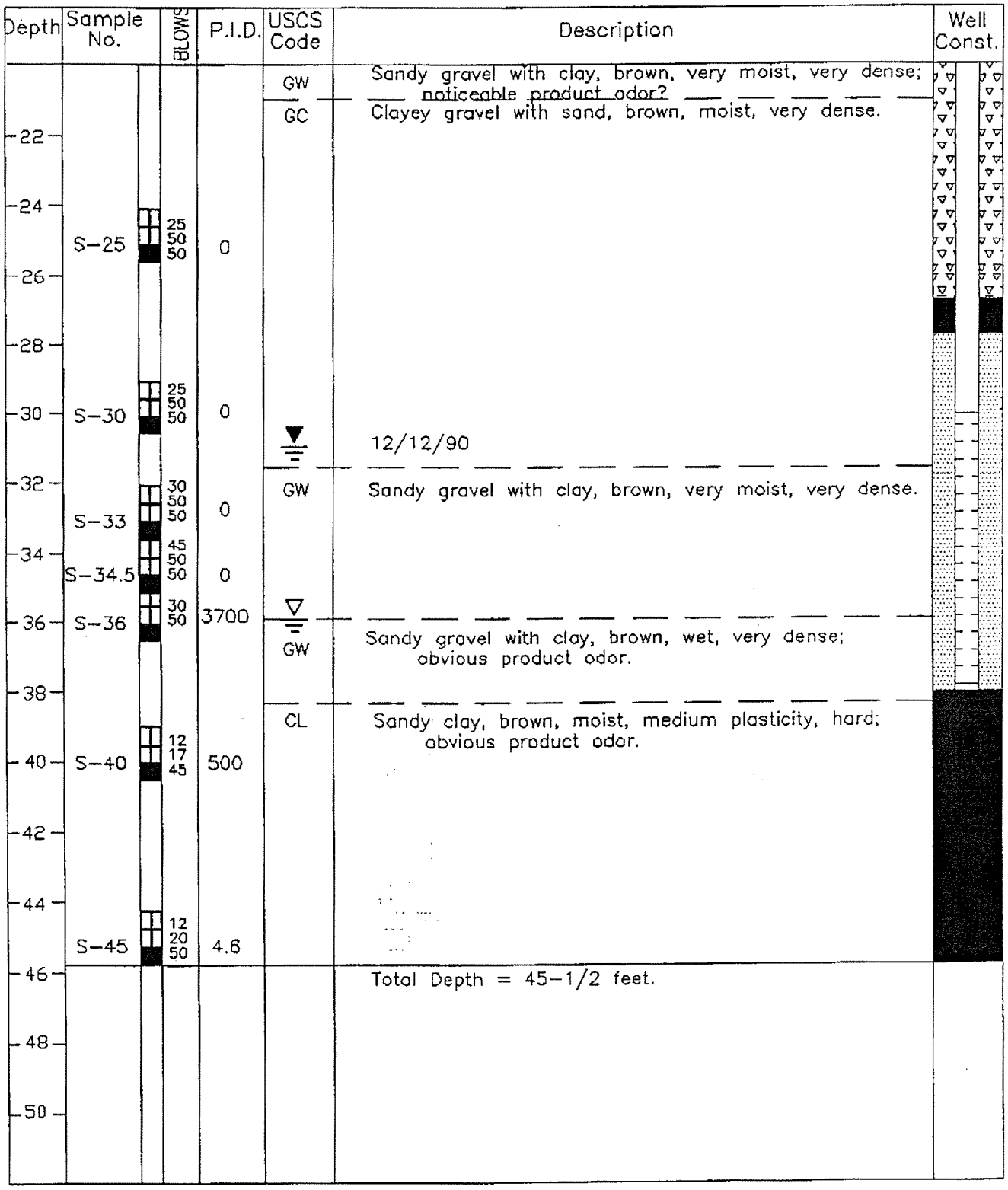
PROJECT: 60000-4

LOG OF BORING B-5/MW-2

ARCO Station 771
899 Rincon Avenue
Livemore, California

PLATE 7



Applied GeoSystems

PROJECT 60000-4

LOG OF BORING B-5/MW-2
ARCO Station 771
899 Rincon Avenue
Livermore, California

PLATE
8

Depth of boring: 45 feet Diameter of boring: 10 inches Date drilled: 12-11-90

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

Screen interval: 32 to 40 feet Slot size: 0.020-inch

Drilling Company: Kvilhaug Drilling Co. Driller: Rod and Brian

Method Used: Hollow-Stem Auger Field Geologist: Mike Barminski

Signature of Registered Professional: _____

Registration No.: CE 044600 State: CA

Depth	Sample No.	Blows	P.I.D.	USCS Code	Description	Well Const.
0					Asphalt (4 inches).	
				GC	Clayey gravel with sand, brown, damp, very dense.	
2						
4	S-5	30 30 45	0			
6						
8						
10	S-10	50 50	0		Moist.	
12				GW	Sandy gravel with clay, brown, moist, very dense.	
14						
	S-15	45 50	0			
16						
18						
20	S-20	25 40	0			

(Section continues downward)

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PROJECT: 60000-4

LOG OF BORING B-6/MW-3

ARCO Station 771
899 Rincon Avenue
Livermore, California

PLATE 9

Depth	Sample No.	BLOWS	P.I.D.	USCS Code	Description	Well Const.
22				GW	Sandy gravel with clay, brown, moist, very dense.	
24	S-25	35 50	6.8		Clayier.	
26						
28				GC	Clayey gravel with sand, brown, moist, very dense.	
30	S-29.5 S-30	35 35 35	4.2			
32					12/12/90	
34	S-34.5	50 50	2.8	GW	Sandy gravel with clay, brown, moist, very dense.	
36	S-36.5	14 35 50	3.1			
38	S-38	20 50 50	?		Wet.	
40	S-40.5 S-41	12 15 20	2.8	CL	Sandy clay, brown, moist, low to medium plasticity, hard.	
42						
44	S-44.5	10 18 20	3.2			
46					Total Depth = 45 feet.	
48						
50						

Applied GeoSystems

PROJECT 60000-4

LOG OF BORING B-6/MW-3
ARCO Station 771
899 Rincon Avenue
Livermore, California

PLATE
10

Depth of boring: 46-1/2 feet Diameter of boring: 10 inches Date drilled: 6-28-91

Well depth: 42 feet Material type: Sch 40 PVC Casing diameter: 4 inches

Screen interval: 26 to 42 feet Slot size: 0.020-inch

Drilling Company: Exceltech Driller: Don & Kenny

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

Signature of Registered Professional:

Registration No.: CE044600 State: CA

Depth	Sample No.	Blows	P.I.D.	USCS Code	Description	Well Const.
0						
				SW	Sand, with small gravel, yellow, damp, loose: fill.	
2				GW	Sandy gravel with cobbles, brown, damp, medium dense: fill.	
				GW	Sandy gravel with clay, brown, damp, medium dense.	
4		3				
	S-5.5	4	0			
6		10				
8						
		18				
10	S-10	16	0		Moist, dense.	
		21				
12						
14		18				
	S-15	21	0		Gray, very moist.	
		28				
16					Noticeable product odor.	
18						
		18				
20	S-20	26	82		Very dense.	
		35			(Section continues downward)	

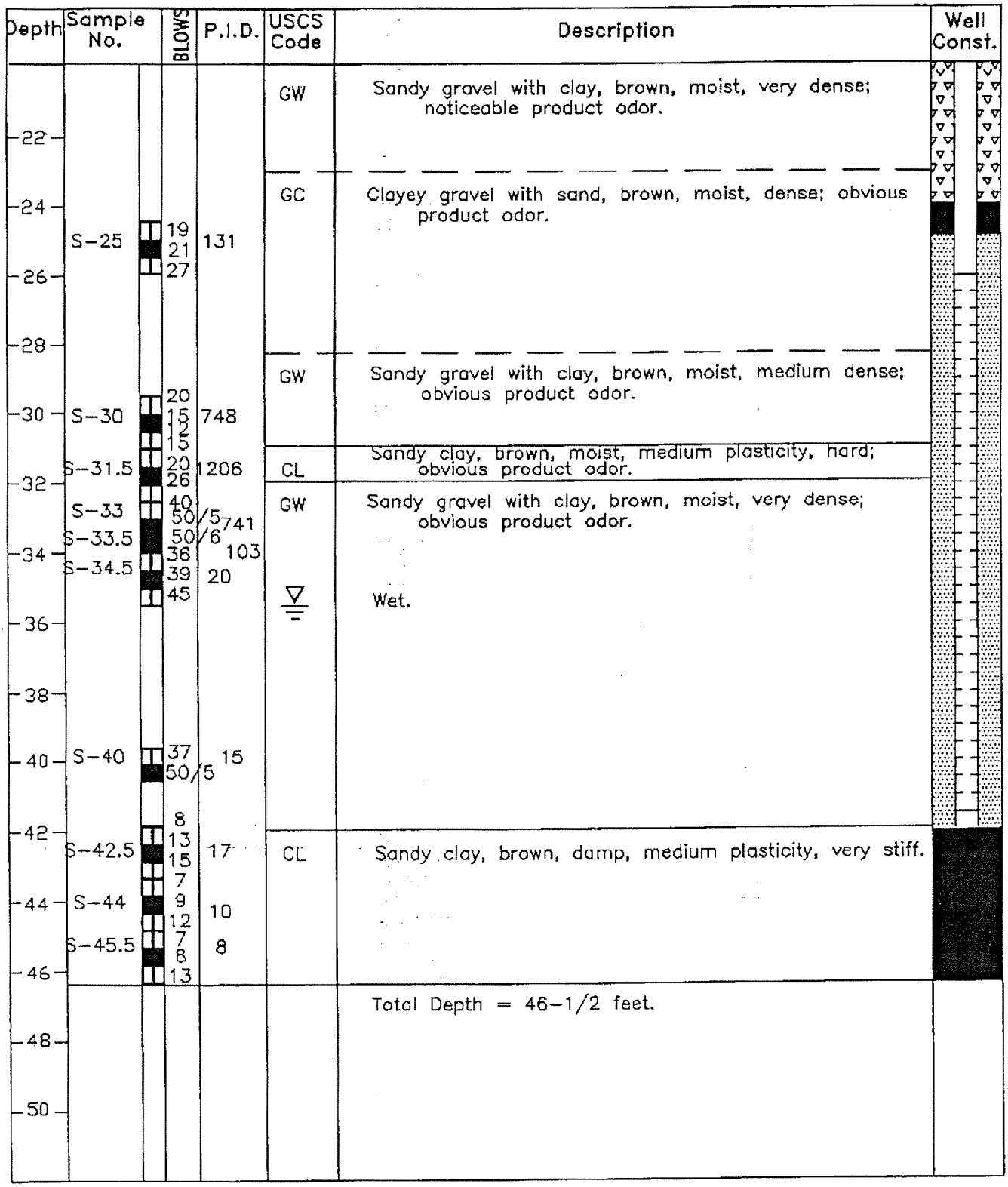
RESNA

PROJECT: 60000.06

LOG OF BORING B-7/MW-4

ARCO Station 771
899 Rincon Avenue
Livermore, California

PLATE 4



RESNA

PROJECT 60000.06

LOG OF BORING B-7/MW-4

ARCO Station 771
899 Rincon Avenue
Livermore, California

PLATE 5

Depth of boring: 45–1/2 feet Diameter of boring: 10 inches Date drilled: 7–2–91

Well depth: 41 feet Material type: Sch 40 PVC Casing diameter: 4 inches

Screen interval: 31–1/2 to 41 feet Slot size: 0.020–inch

Drilling Company: Exceltech Driller: Dan, Kenny, and Adam

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

Signature of Registered Professional:

Registration No.: CE 044600 State: CA

Depth	Sample No.	Blows	P.I.D.	USCS Code	Description	Well Const.
0					Asphalt (4 inches).	
2				GW	Sandy gravel, dark brown, damp, medium dense; fill.	
4				GW	Sandy gravel with clay, brown, damp, medium dense; gravel up to 3–inches diameter.	
6	S–5.5	7 8 13	3.4			
8						
10	S–10.5	12 30 37	9.6		More sand, moist, very dense.	
12						
14						
16	S–15.5	12 13 20	0		Dense.	
18						
20	S–20.5	18 19 22	34		More clay.	

(Section continues downward)

RESNA

PROJECT: 60000.06

LOG OF BORING B–8/MW–5

ARCO Station 771
899 Rincon Avenue
Livermore, California

PLATE 6

Depth	Sample No.	BLOWS	P.I.D.	USCS Code	Description	Well Const.
22				GW	Sandy gravel with clay, brown, moist, dense.	
24				GC	Clayey gravel with sand, brown, moist, very dense.	
26	S-25.5	20 30 30	37			
28						
30	S-30.5	5 6 11	0	CL	Sandy clay with small gravel, brown, moist, medium plasticity, very stiff.	
32				SC	Clayey sand with small gravel, brown, moist, medium dense.	
34	S-34.5	35 30	364	GW	Sandy gravel with clay, brown, moist, very dense; obvious product odor.	
36	S-36	40 25 39	35		Noticeable product odor. Wet.	
38		26 17 29 33	27			
40						
42	S-41	11 12 18	305	CL	Sandy clay, brown, moist, medium plasticity, very stiff; obvious product odor.	
44	S-43	8 9 13 5 8 13	49			
46					Total Depth = 45-1/2 feet.	
48						
50						

RESNA

PROJECT 60000.06

LOG OF BORING B-8/MW-5

ARCO Station 771
899 Rincon Avenue
Livermore, California

PLATE 7

Depth of boring: 47-1/2 feet Diameter of boring: 10 inches Date drilled: 7-1-91

Well depth: 42-1/2 feet Material type: Sch 40 PVC Casing diameter: 4 inches

Screen interval: 32-1/2 to 42-1/2 feet Slot size: 0.020-inch

Drilling Company: Exceltech Driller: Don & Kenny

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

Signature of Registered Professional:

Registration No.: CE 044600 State: CA

Depth	Sample No.	Blows	P.I.D.	USCS Code	Description	Well Const.
0					Asphalt (4 inches).	
				GW	Sandy gravel, brown, dry, loose: fill.	
2				GC	Clayey gravel with sand, dark brown, damp, dense.	
4				GW	Sandy gravel with clay, brown, damp, dense; gravel up to 2-inches diameter.	
6	S-5.5	10 17 15	0			
8						
10	S-10.5	20 36 45	0		Very dense.	
12						
14						
16	S-15.5	15 16 16	0		Moist, dense.	
18						
20	S-20	17 50/1	0		Gravel up to 3-inches diameter.	
					(Section continues downward)	

RESNA

PROJECT: 60000.06

LOG OF BORING B-9/MW-6

ARCO Station 771
899 Rincon Avenue
Livermore, California

PLATE 8

Depth	Sample No.	BLOWS	P.I.D.	USCS Code	Description	Well Const.
22				GW	Sandy gravel with clay, brown, dense; gravel up to 3-inches diameter.	
24					More clay.	
26	S-25.5	18 27 50/1	0			
28				GC	Clayey gravel with sand, brown, moist, dense.	
30	S-30.5	15 34 28	0	GW	Sandy gravel with clay, brown, moist, very dense.	
32						
34	S-34.5	32 44 50	0			
36	S-36	36 49 40	0	▽	Wet.	
38		19 18 30	0			
40	S-40.5	30 33 28	0			
42	S-42	10 16 8	19			
44	S-43.5	4 6 9	0	CL	Sandy clay, brown, moist, medium plasticity, stiff.	
46	S-45	6 11 14	0			
48		6 11 13	0		Total Depth = 47-1/2 feet.	
50						

RESNA

PROJECT 60000.06

LOG OF BORING B-9/MW-6

ARCO Station 771
899 Rincon Avenue
Livermore, California

PLATE 9

Depth of boring: 44-1/2 feet Diameter of boring: 10 inches Date drilled: 7-2-91

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

Screen interval: 30 to 40 feet Slot size: 0.020-inch

Drilling Company: Exceltech Driller: Don, Kenny, and Adam

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

Signature of Registered Professional: /E Dawson

Registration No.: CE 044600 State: CA

Depth	Sample No.	Blows	P.I.D.	USCS Code	Description	Well Const.
0						
					Asphalt (4 inches).	
2				GW	Sandy gravel, dark brown, damp, medium dense: fill.	
4				GW	Sandy gravel with clay, brown, damp, medium dense; gravel up to 3-inches diameter.	
6	S-5.5	6 7 8	0			
8						
10	S-10.5	19 20 29	0		Moist, dense.	
12						
14						
16		35 50/1				
18						
20	S-20.5	17 35 43	152		Very dense; obvious product odor.	
					(Section continues downward)	

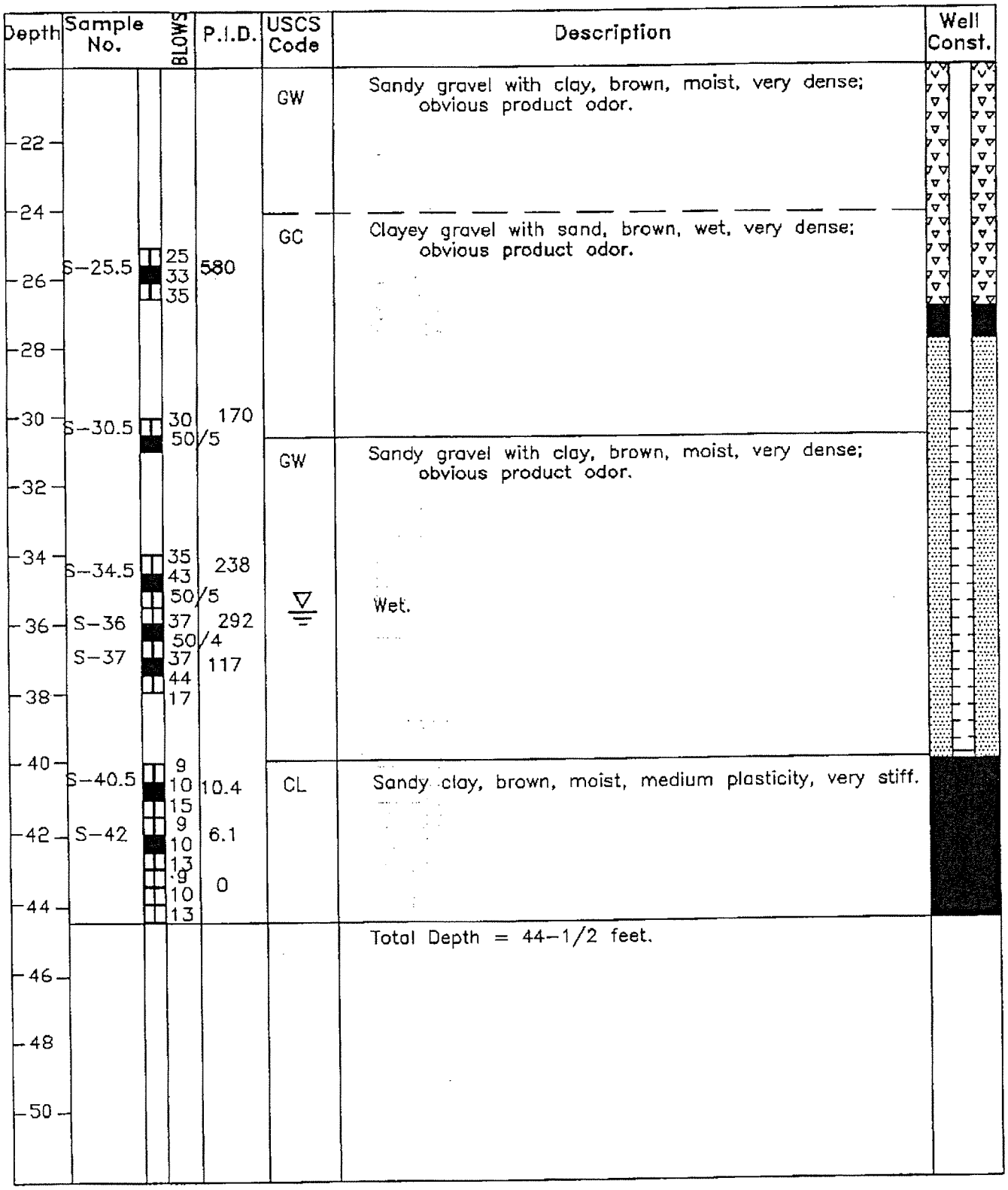
RESNA

PROJECT: 60000.06

LOG OF BORING B-10/MW-7

ARCO Station 771
899 Rincon Avenue
Livermore, California

PLATE 10



RESNA

PROJECT 60000.06

LOG OF BORING B-10/MW-7

ARCO Station 771
899 Rincon Avenue
Livermore, California

PLATE 11

Depth of boring: 40-1/2 feet Diameter of boring: 8 inches Date drilled: 7-1-91

Well depth: NA Material type: NA Casing diameter: NA

Screen interval: NA Slot size: NA

Drilling Company: Exceltech Driller: Don, Kenny

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

Signature of Registered Professional: _____

Registration No.: _____ State: _____

Depth	Sample No.	Blows	P.I.D.	USCS Code	Description	Well Const.
0					Asphalt (4 inches).	
2				GW	Sandy gravel, dark brown, damp, medium dense: fill.	
4						
6	S-7	12 17	0		With clay, brown, dense.	
8		17 16				
	S-8.5	12 26	0			
10		15 26	0		Very dense.	
12		50 50/3				
14				GW	Sandy gravel with clay, brown, damp, dense.	
	S-15.5	32 36			Moist.	
16		36	0			
18						
20	S-20.5	23 30	0			
		33			(Section continues downward)	

RESNA

PROJECT: 60000.06

LOG OF BORING B-11

ARCO Station 771
899 Rincon Avenue
Livermore, California

PLATE 12

Depth	Sample No.	BLOWS	P.I.D.	USCS Code	Description	Well Const.
22				GW	Sandy gravel with clay, brown, moist, very dense.	
24						
26	S-25	25 50/5	3.4		More clay.	
28				GC	Clayey gravel with sand, brown, moist, dense.	
30	S-30.5	14 10 10	0			
32				GW	Sandy gravel with clay, brown, moist, medium dense.	
34						
36	S-35.5	40 50/5	0		Very dense.	
38				▽	Wet.	
40	S-40	50/5	0			
42					Total Depth = 40-1/2 feet.	
44						
46						
48						
50						

RESNA

PROJECT 60000.06

LOG OF BORING B-11

ARCO Station 771
899 Rincon Avenue
Livermore, California

PLATE 13

Depth of boring: 45 1/2 feet Diameter of boring: 8 inches Date drilled: 01/15/93

Well depth: 42 1/2 feet Material type: Sch 40 PVC Casing diameter: 2 inches

Screen interval: 27 1/2 to 42 1/2 feet Slot size: 0.020-inch

Drilling Company: Exploration GeoServices Driller: John and Mike

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

Signature of Registered Professional:

Registration No.: CEG 1463 State: CA

Depth	Sample No.	Blows	P.I.D.	USCS Code	Description	Well Const.
0					Asphalt (4 inches).	
				GP	Sandy gravel, gray, damp, dense; baserock.	
2				GW	Sandy gravel, brown, damp, very dense; fine- to coarse-grained sand.	
4	S-4.5	26 38 50/6"	0			
6						
8						
	S-9	50/5"	0			
10						
12						
14	S-14.5	27 50/6"	0		Becoming very moist.	
16				GC	Clayey gravel with sand, brown, damp, very dense	
	S-17	50/6"	0			
18						
	S-19.5	48 39 37	0		Becoming moist	
20						

(Section continues downward)

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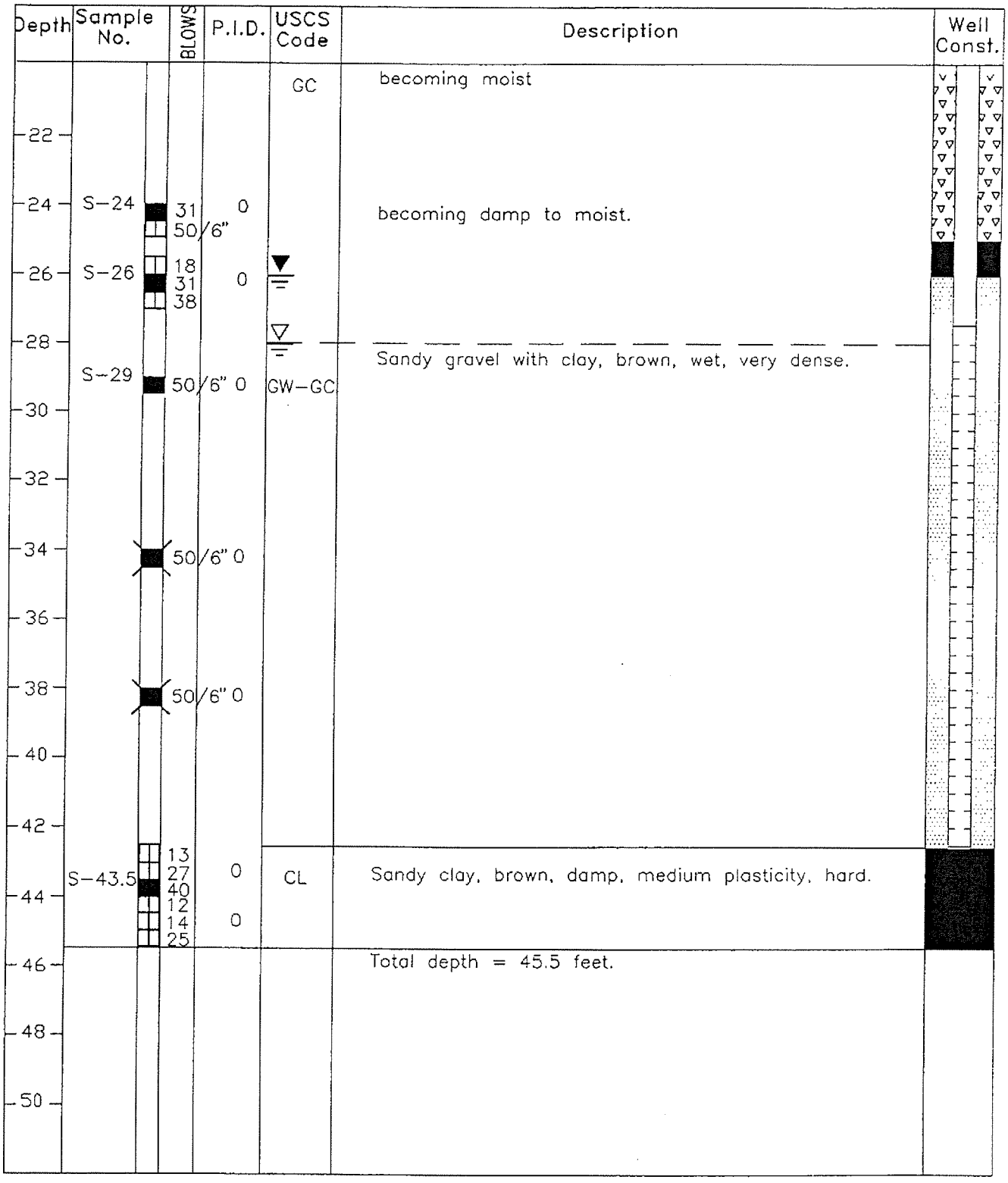
PROJECT: 60000.09

LOG OF BORING B-12/MW-8
ARCO Station 771
899 Rincon Avenue
Livermore, California

PLATE
4



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PROJECT 60000.09

LOG OF BORING B-12/MW-8
ARCO Station 771
899 Rincon Avenue
Livermore, California

PLATE
5

Depth of boring: 42 feet Diameter of boring: 8 inches Date drilled: 01/14/93

Well depth: 39 1/2 feet Material type: Sch 40 PVC Casing diameter: 2 inches

Screen interval: 29 1/2 to 39 1/2 feet Slot size: 0.020-inch

Drilling Company: Exploration GeoServices Driller: John and Mike

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

Signature of Registered Professional:

Registration No.: CEG 1463 State: CA

Depth	Sample No.	Blows	P.I.D.	USCS Code	Description	Well Const.
0						
					Asphalt (4 inches).	
				GP	Sandy gravel, gray, damp, dense; baserock.	
				GW	Sandy gravel, brown, moist, dense; fine- to coarse-grained sand.	
2						
4	S-4.5	10 13 34	0			
6						
8						
10	S-9.5	34 50/3"	0		Very dense, gravel up to 3" diameter with cobbles	
12						
14	S-14.5	35 50/5"	0		with clay becoming very moist.	
16						
18					Trace water at 18.5'	
	S-19	50/6"	0			
20				GC	Clayey gravel with sand, brown, moist to wet, very dense.	

(Section continues downward)

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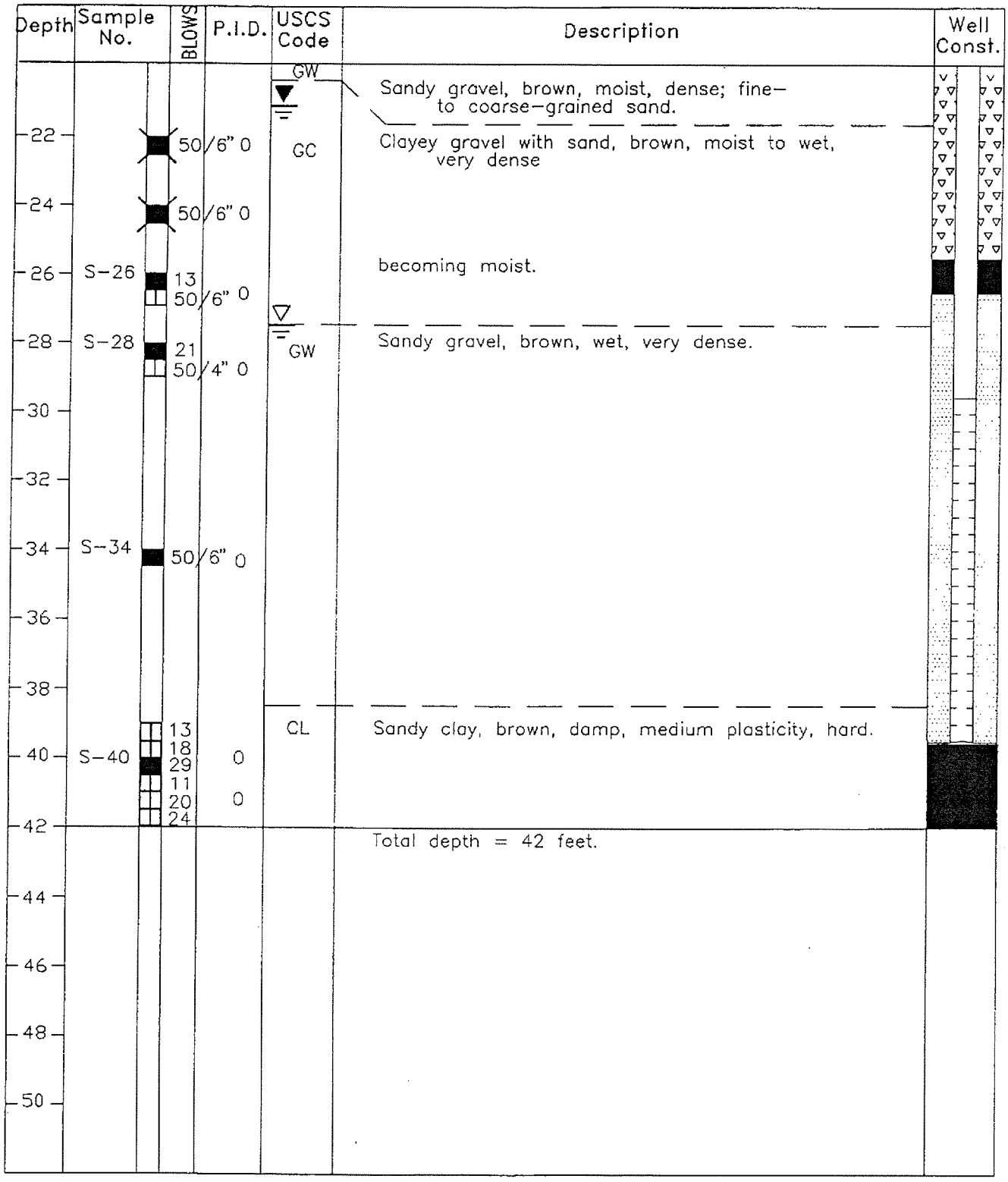
PROJECT: 60000.09

LOG OF BORING B-13/MW-9
ARCO Station 771
899 Rincon Avenue
Livermore, California

PLATE
6



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LOG OF BORING B-13/MW-9
ARCO Station 771
899 Rincon Avenue
Livermore, California

PLATE
7

Depth of boring: 40 feet Diameter of boring: 8 inches Date drilled: 01/14/93

Well depth: 37 feet Material type: Sch 40 PVC Casing diameter: 2 inches

Screen interval: 29 to 37 feet Slot size: 0.020-inch

Drilling Company: Exploration GeoServices Driller: John and Mike

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

Signature of Registered Professional:

Registration No.: CEG 1463 State: CA

Depth	Sample No.	Blows	P.I.D.	USCS Code	Description	Well Const.
0					Asphalt (4 inches).	
				GP	Sandy gravel, gray, damp, dense; baserock.	
2				GW	Sandy gravel, brown, damp, very dense; fine- to coarse-grained sand; gravel up to 3" diameter; roots.	
4	S-4.5	26 28 50/5"	0			
6						
8						
10	S-9.5	28 50/2"	0			
12						
14	S-14.5	27 50/5"	0		With clay, becoming moist.	
16						
16	S-17	50/5"	0			
18					Trace water at 17.5'	
				GC	Clayey gravel with sand, brown, moist to wet, very dense.	
20	S-19	50/5"	0			

(Section continues downward)

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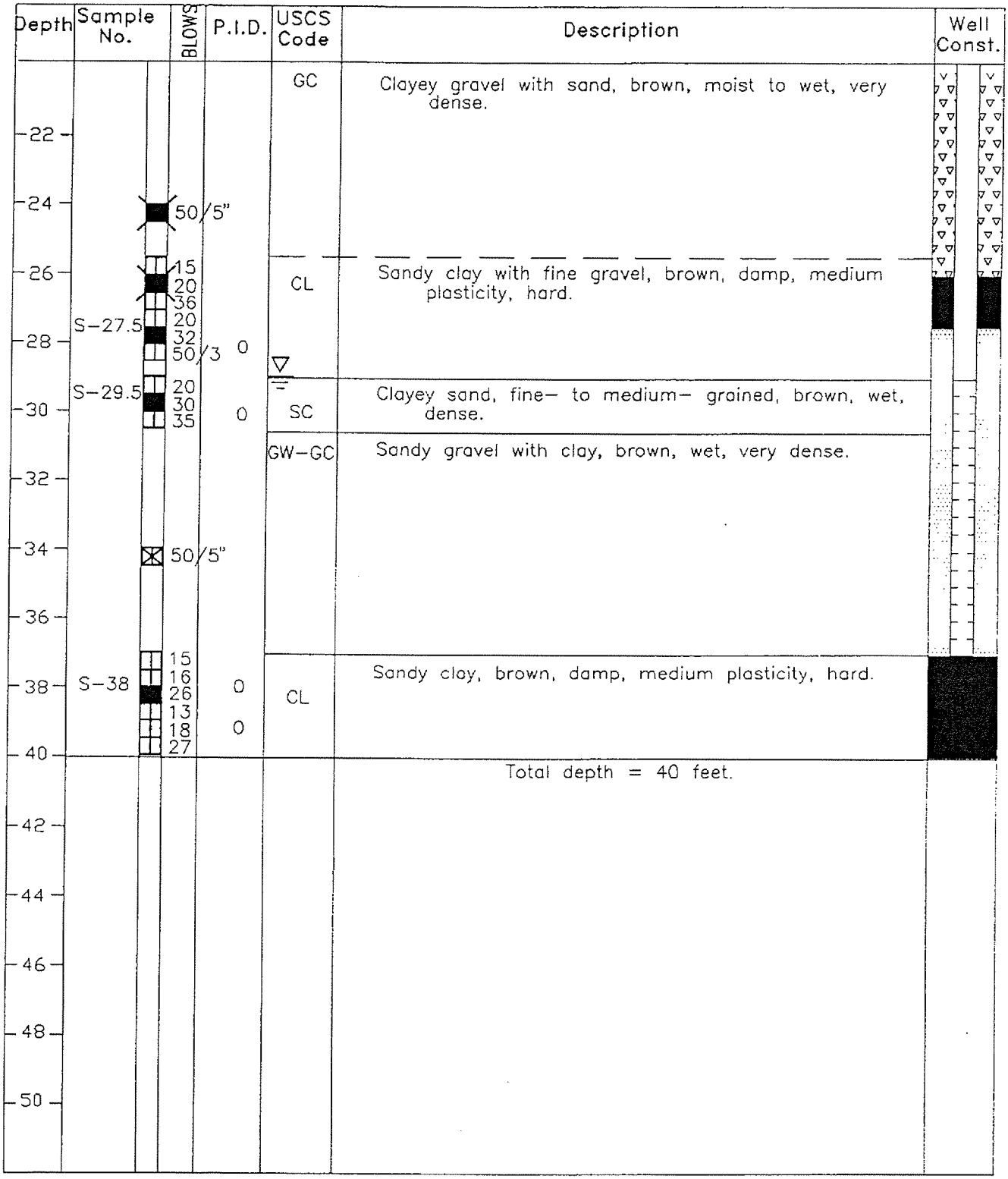
PROJECT: 60000.09

LOG OF BORING B-14/MW-10

ARCO Station 771
899 Rincon Avenue
Livermore, California

PLATE 8



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LOG OF BORING B-14/MW-10
ARCO Station 771
899 Rincon Avenue
Livermore, California

PLATE
9

Depth of boring: 43 feet Diameter of boring: 8 inches Date drilled: 04/09/92

Well depth: 39 feet Material type: Sch 40 PVC Casing diameter: 2 inches

Screen interval: 29 to 39 feet Slot size: 0.020-inch

Drilling Company: HEW Drilling Driller: Phil and Perfecto

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

Signature of Registered Professional:

Registration No.: CEG 1463 State: CA

Depth	Sample No.	Blows	P.I.D.	USCS Code	Description	Well Const.
					Asphalt-covered surface.	
0					Asphalt (4 inches).	
				GW	Sandy gravel, dark brown, damp, medium dense: fill.	
2				GW-GC	Sandy gravel with clay, brown, damp, dense; gravel up to 3" diameter.	
4						
6	S-5.5	17 17 39	0			
8						
10	S-10.5	24 34 50	0		Becoming moist, very dense.	
12						
14						
	S-15	50/6"	0		Increasing clay.	
16						
18						
20	S-20.5	30 38 40	0			

(Section continues downward)

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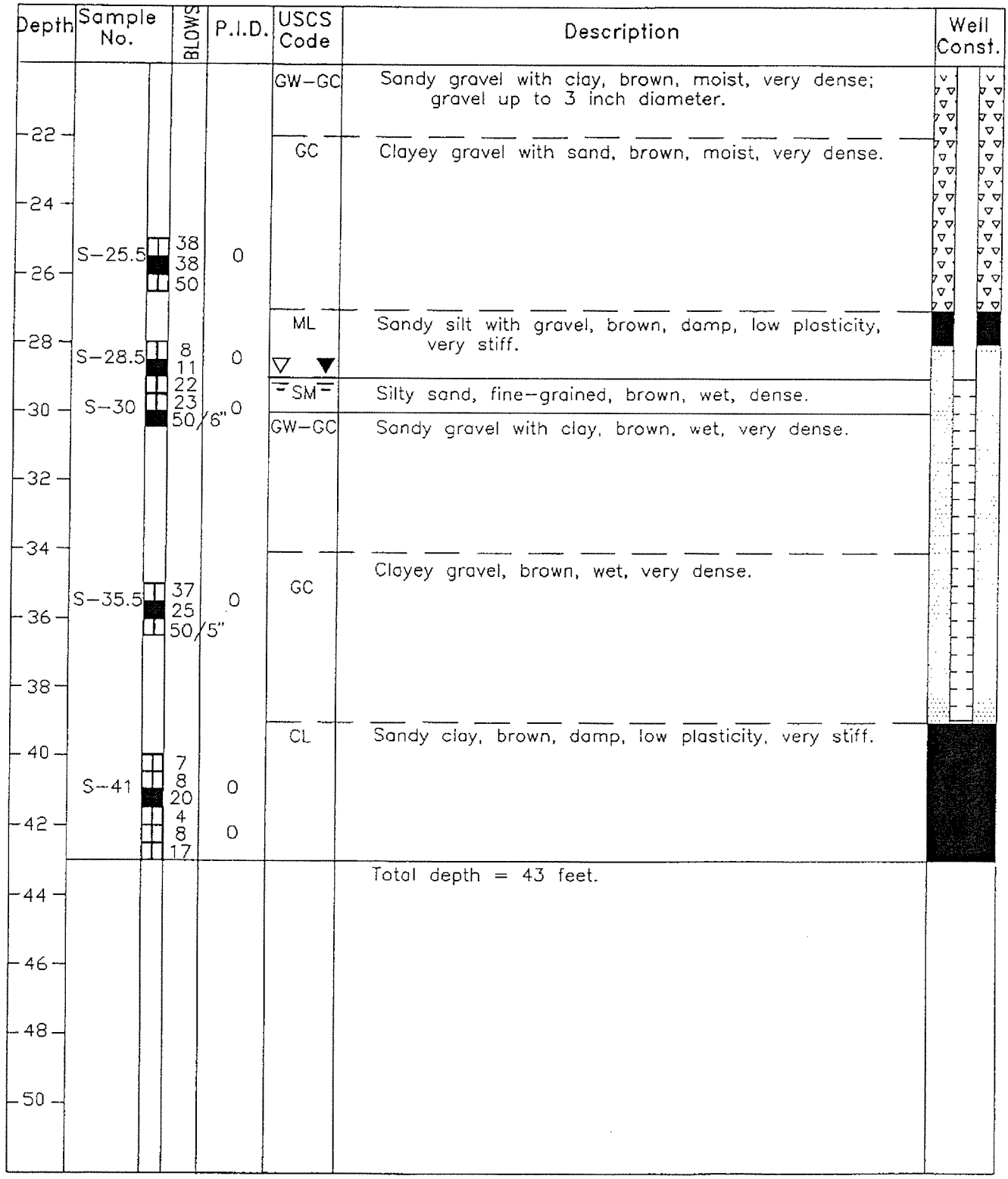
PROJECT: 60000.09

LOG OF BORING B-15/MW-11
ARCO Station 771
899 Rincon Avenue
Livermore, California

PLATE
10



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LOG OF BORING B-15/MW-11

ARCO Station 771
899 Rincon Avenue
Livermore, California

PLATE
11

Depth of boring: 33–1/2 feet Diameter of boring: 12 inches Date drilled: 04/08/92

Well depth: 28–1/2 feet Material type: Sch 40 PVC Casing diameter: 4 inches

Screen interval: 18–1/2 to 28–1/2 feet Slot size: 0.100–inch

Drilling Company: HEW Drilling Driller: Phil and Perfecto

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

Signature of Registered Professional:

Registration No.: CEG 1463 State: CA

Depth	Sample No.	Blows	P.I.D.	USCS Code	Description	Well Const.
					Asphalt–covered surface.	
0					Asphalt (4 inches).	
					Sump.	
2						
				GW–GC	Sandy gravel with clay, brown, moist, medium dense.	
4						
6	S–6	9 10 17	0			
8						
10						
	S–11	24 30 26	0		Becoming damp to moist, very dense.	
12						
14						
					Increasing clay, becoming moist to wet.	
16	S–16	12 10 21	0			
				GC	Clayey gravel with sand, brown, moist, dense.	
18				GW	Sandy gravel, brown, moist, very dense; gravel up to 3" diameter.	
20						
	S–21	13 30 28	120		Product odor at 21 feet. Color change to gray at 21–1/2 feet.	

(Section continues downward)

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LOG OF BORING B–16/VW–1

ARCO Station 771
899 Rincon Avenue
Livermore, California

PLATE 12

Depth	Sample No.	BLOWS	P.I.D.	USCS Code	Description	Well Const.
22				GW	Sandy gravel, gray, moist, very dense; gravel up to 3" diameter. Product odor at 21 feet.	
24				GC	Clayey gravel with sand, brown, moist, very dense.	
26	S-26	11 25 27	320		Product odor at 26 feet.	
28				ML	Sandy silt with fine gravel, brown, damp, low plasticity, very stiff.	
30	S-29.5	7 11 16	58		Product odor at 30 feet.	
	S-31	11 13 15	33		Increasing sand, becoming moist.	
32	S-32.5	14 30 30	34▽			
				GW-GC	Sandy gravel with clay, brown, wet, very dense.	
34					Total depth = 33-1/2 feet.	
36						
38						
40						
42						
44						
46						
48						
50						

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Working to Restore Nature

PROJECT 60000.09

LOG OF BORING B-16/VW-1

ARCO Station 771
899 Rincon Avenue
Livermore, California

PLATE 13

Depth of boring: 45 feet Diameter of boring: 12 inches Date drilled: 04/08/92

Well depth: 40 1/2 feet Material type: Sch 80 PVC/Steel Casing diameter: 6 inches

Screen interval: 25 1/2 to 40 1/2 feet Slot size: 0.020-inch

Drilling Company: HEW Drilling Driller: Phil and Perfecto

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

Signature of Registered Professional:

Registration No.: CEG 1463 State: CA

Depth	Sample No.	Blows	P.I.D.	USCS Code	Description	Well Const.
					Asphalt-covered surface.	
0					Asphalt (4 inches).	
				SP	Gravelly sand, gray, damp, medium dense: fill.	
2				GC	Clayey gravel with sand, dark brown, damp, medium dense.	
4						
6	S-6	6 8 8	0			
				GW-GC	Sandy gravel with clay, brown, damp, medium dense; gravel up to 3" diameter.	
8						
10						
	S-11	11 16 17	0		Becoming dense, damp to moist, with increasing clay.	
12						
14						
16		50/6"			Large cobble	
18						
20						
	S-21	38 31 30	105		Color change to gray, moist; product odor at 21 feet.	

(Section continues downward)

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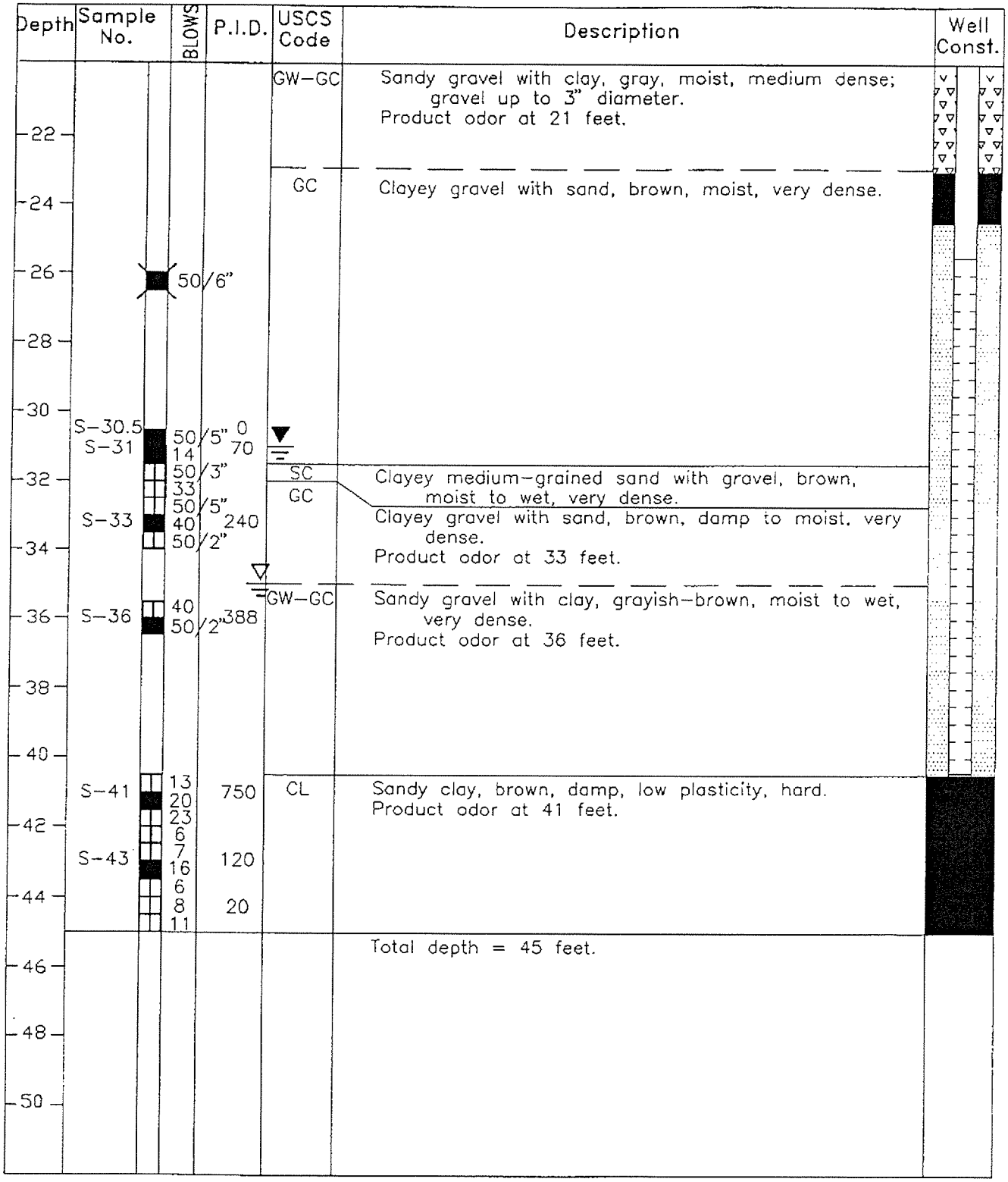
PROJECT: 60000.09

LOG OF BORING B-17/RW-1

ARCO Station 771
899 Rincon Avenue
Livermore, California

PLATE 14



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Working to Restore Nature

PROJECT 60000.09

LOG OF BORING B-17/RW-1

ARCO Station 771
899 Rincon Avenue
Livermore, California

PLATE 15

BROADBENT & ASSOCIATES, INC.
ENGINEERING, WATER RESOURCES & ENVIRONMENTAL

LITHOLOGIC AND SOIL BORING LOG

PROJECT NAME: BP/ARCO 771 | SITE ADDRESS: 899 Rincon Ave., Livermore, CA

PROJECT NUMBER: 06-82-608 | LEGAL DESC: | APN:

LOGGED BY: Sam Barkley | FACILITY ID OR WAIVER: | NOI NUMBER:

DATE: 3/25/11 | START: 1245 | DRILLING COMPANY: RSI | DRILLER: Jorge Morales

WELL ID: SB-2 | STOP: 1335 | DRILLING METHOD: HSA | SAMPLE METHOD: Core Barrel

DEPTH (FEET)	Soil Boring	SAMPLE ID	PID	MOISTURE	COLOR	CONSISTENCY	GRAIN SIZE	CLASSIFICATION	ODORS
2–6	GROUT								
6–8				Dry	Lt. brown	Loose			
10		SB-2-10'	0.0 ppm	Slightly moist					None
14		SB-2-15'	0.0 ppm						None
16–18							Gravelly sand with silt - 35% gravel, 45% sand and 20% fines; sub-rounded gravel up to 3 inches.	GM	
20		SB-2-20'	0.0 ppm						None
22				Moist					
24		SB-2-25'	0.0 ppm						None
28				Moist	Lt. brown	Soft	Silty clay about 3 inches thick	CL	
30		SB-2-30'	0.0 ppm		Lt. brown	Loose	Gravelly sand with silt - 35% gravel, 45% sand and 20% fines; sub-rounded gravel up to 3 inches.	GM	
32–34		SB-2-33'	0.0 ppm	Wet			Gravelly sand with silt - 10% gravel, 60% sand and 30% fines; gravel up to $\frac{1}{2}$ inch.		
36–40									

TOTAL BORING DEPTH: 35.0' | PAGE NO: 1 OF 1 | ESTIMATED GROUNDWATER DEPTH: 33'

BROADBENT & ASSOCIATES, INC.
ENGINEERING, WATER RESOURCES & ENVIRONMENTAL

LITHOLOGIC AND SOIL BORING LOG

PROJECT NAME: BP/ARCO 771 | SITE ADDRESS: 899 Rincon Ave., Livermore, CA

PROJECT NUMBER: 06-82-608 | LEGAL DESC: | APN:

LOGGED BY: Sam Barkley | FACILITY ID OR WAIVER: | NOI NUMBER:

DATE: 3/25/11 | START: 0930 | DRILLING COMPANY: RSI | DRILLER: Jorge Morales

WELL ID: SB-3 | STOP: 1035 | DRILLING METHOD: HSA | SAMPLE METHOD: Core Barrel

DEPTH (FEET)	Soil Boring	SAMPLE ID	PID	MOISTURE	COLOR	CONSISTENCY	GRAIN SIZE / CLASSIFICATION	CLASS	ODORS
2–6	GROUT								
8				Dry	Lt. brown	Loose	Gravelly sand with silt - 35% gravel, 40% sand and 25% fines; sub-rounded gravel up to 3 inches.		
10		SB-3-10'	0.0 ppm						None
12–14				Slightly moist					
14		SB-3-15'	0.0 ppm						None
16–18									
20		SB-3-20'	0.0 ppm				Gravelly sand with silt - 35% gravel, 35% sand and 30% fines; gravel up to 3 inches.	GM	None
22–24				Moist					
24		SB-3-25'	0.0 ppm						None
26–28									
30		SB-3-30'	0.0 ppm						None
32				Wet					
34			0.0 ppm						None
36–40									

TOTAL BORING DEPTH: 35.0' | PAGE NO: 1 OF 1 | ESTIMATED GROUNDWATER DEPTH: 31'

APPENDIX D

SENSITIVE RECEPTOR SURVEY DATA

Tables removed due to confidential content

Table D-3. California Natural Diversity Database Results - Livermore Quadrangle
BP Station #771
899 Rincon Ave., Livermore, Alameda County, California

Record	QUADNAME	ELMCODE	SCINAME	COMNAME	FEDSTATUS	CALSTATUS	DFGSTATUS	CNPSLIST
1	Livermore	AAAAA01180	Ambystoma californiense	California tiger salamander	Threatened	Threatened	SSC	
2	Livermore	AAABH01022	Rana draytonii	California red-legged frog	Threatened	None	SSC	
3	Livermore	AAABH01050	Rana boylii	foothill yellow-legged frog	None	None	SSC	
4	Livermore	ABNKC06010	Elanus leucurus	white-tailed kite	None	None	FP	
5	Livermore	ABNKC19120	Buteo regalis	ferruginous hawk	None	None	WL	
6	Livermore	ABNSB10010	Athene cunicularia	burrowing owl	None	None	SSC	
7	Livermore	ABPAT02011	Eremophila alpestris actia	California horned lark	None	None	WL	
8	Livermore	ABPBXB0020	Agelaius tricolor	tricolored blackbird	None	None	SSC	
9	Livermore	AMACC05030	Lasiurus cinereus	hoary bat	None	None		
10	Livermore	AMACC08010	Corynorhinus townsendii	Townsend's big-eared bat	None	None	SSC	
11	Livermore	AMAJA03041	Vulpes macrotis mutica	San Joaquin kit fox	Endangered	Threatened		
12	Livermore	AMAJF04010	Taxidea taxus	American badger	None	None	SSC	
13	Livermore	ARAAD02030	Emys marmorata	western pond turtle	None	None	SSC	
14	Livermore	CTT36210CA	Valley Sink Scrub	Valley Sink Scrub	None	None		
15	Livermore	CTT62100CA	Sycamore Alluvial Woodland	Sycamore Alluvial Woodland	None	None		
16	Livermore	ICBRA03030	Branchinecta lynchi	vernal pool fairy shrimp	Threatened	None		
17	Livermore	ICBRA06010	Linderiella occidentalis	California linderiella	None	None		
18	Livermore	PDAST4R0P1	Centromadia parryi ssp. congdonii	Congdon's tarplant	None	None		1B.2
19	Livermore	PDBOR0V0B0	Plagiobothrys glaber	hairless popcornflower	None	None		1A
20	Livermore	PDBRA2R010	Tropidocarpum capparideum	caper-fruited tropidocarpum	None	None		1B.1
21	Livermore	PDCHE040B0	Atriplex cordulata var. cordulata	heartscale	None	None		1B.2
22	Livermore	PDCHE041F3	Atriplex joaquinana	San Joaquin spearscale	None	None		1B.2
23	Livermore	PDCHE042L0	Atriplex depressa	brittlescale	None	None		1B.2
24	Livermore	PDCHE042M0	Atriplex minuscula	lesser saltscale	None	None		1B.1
25	Livermore	PDFAB400R5	Trifolium hydrophilum	saline clover	None	None		1B.2
26	Livermore	PDPLM0C0Q0	Navarretia prostrata	prostrate vernal pool navarretia	None	None		1B.1
27	Livermore	PDSCR0J0J0	Chloropyron palmatum	palmate-bracted bird's-beak	Endangered	Endangered		1B.1