



Remediation Management Services Company



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Date: March 11, 2016

To: Ms. Karel Detterman, PG, Alameda County Environmental Health

Re: Addendum Conceptual Site Model and Case Closure Request
Former Richfield Oil Company Station #402
1450 Fruitvale Avenue, Oakland, California
ACEH Case #RO0000307

Dear:

I am writing you on behalf of Atlantic Richfield Company related to Former Richfield Oil Company Station #402. "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."

Sincerely,

A handwritten signature in black ink, appearing to be 'Chuck Carmel', enclosed within a large, loopy oval shape.

Chuck Carmel
Operations Project Manager
Remediation Management Services Company
An affiliate of Atlantic Richfield Company

**ADDENDUM CONCEPTUAL SITE MODEL
AND CASE CLOSURE REQUEST**
Former Richfield Oil Company Station No.402
1450 Fruitvale Avenue, Oakland, California
ACEH Case No. RO0000307

Prepared for

Mr. Charles Carmel
Operations Project Manager
Atlantic Richfield Company
4 Centerpointe Drive, Suite 200
La Palma, California 90623

Prepared by



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March 11, 2016

Project No. 08-88-602



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March 11, 2016

Project No. 08-88-602

Atlantic Richfield Company
4 Centerpointe Drive, Suite 200
La Palma, California 90623
Submitted via ENFOS

Attn.: Mr. Charles Carmel

Re: Addendum Conceptual Site Model and Case Closure Request, Former Richfield Oil Company Station No.402, 1450 Fruitvale Avenue, Oakland, California; ACEH Case No. RO0000307

Dear Mr. Carmel:

Broadbent & Associates, Inc. (Broadbent) is pleased to submit this *Addendum Conceptual Site Model and Case Closure Request* for Former Richfield Oil Company Station No.402 located at 1450 Fruitvale Boulevard, Oakland, California (Site). This document was prepared in order to evaluate this Site for case closure under the *Low Threat Underground Storage Tank Case Closure Policy* (LTCP; CSWRCB, 2012). After completion of the Conceptual Site Model and comparing the current Site conditions to the LTCP, case closure is recommended.

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

Sincerely,
BROADBENT & ASSOCIATES, INC.

Digitally signed by Jason Duda
DN: cn=Jason Duda, o=Broadbent
& Associates, Inc., ou
email=jduda@broadbentinc.com,
c=US
Date: 2016.03.11 14:04:13 -08'00'

Jason Duda
Senior Scientist

Matt Herrick, PG, CHG, CEM
Associate Hydrogeologist



Attachment

cc: Ms. Karel Detterman, PG, Alameda County Environmental Health (Submitted via ACEH ftp site)
Mr. Bill Phua, Fruitvale-Farnum Associates, LLC, 638 Webster St. #300, Oakland, CA 94607
Mr. Hugh K. Phares, III, Attorney at Law, 911 Paru St, Alameda, CA 94501-4033
Electronic copy uploaded to GeoTracker

ADDENDUM CONCEPTUAL SITE MODEL AND CASE CLOSURE REQUEST

Former Richfield Company Station No. 402
1450 Fruitvale Avenue, Oakland, California
Fuel Leak Case No. RO0000307

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ADDENDUM CONCEPTUAL SITE MODEL AND CASE CLOSURE REQUEST

Former Richfield Company Station No. 402
1450 Fruitvale Avenue, Oakland, California
Fuel Leak Case No. RO0000307

1.0 INTRODUCTION

On behalf of the Atlantic Richfield Company– (ARC, a BP affiliated company) Broadbent & Associates, Inc. (Broadbent) has prepared this *Addendum Conceptual Site Model and Case Closure Request (CSM and CCR)* for the Former Richfield Oil Company (ROC) Station No.402, located at 1450 Fruitvale Avenue, Oakland, California (Site). This CSM and CCR was prepared in order to evaluate the Site’s eligibility to be closed under the California State Water Resources Control Board’s (CSWRCB) *Low Threat Underground Storage Tank Case Closure Policy* (LTCP; CSWRCB, 2012). This CSM and CCR includes discussions on the Site background and previous environmental activities, regional and Site geology and hydrogeology, and justification for Case Closure.

1.1 Site Setting

The location of Former Atlantic Richfield Station No. 402 is currently occupied by a multi-story commercial retail/office building located at the northeast corner of Fruitvale Avenue and Farnam Street in an area of mixed residential and commercial land use. The elevation of the site is approximately 49 feet (ft) above mean sea level (msl) with local topography sloping gently to the south-southwest (United States Geological Survey [USGS]), Oakland East Quadrangle, California). Surrounding land use is primarily single- and multi-family residences with commercial buildings to the north, west, and south; and residential buildings to the east. The Assessor’s Parcel Number is 33-2121-22.

The adjacent property to the north is a community center. Across Farnam Street to the south of the Site is an empty lot adjacent to commercial buildings. Across Fruitvale Avenue to the west of the Site are commercial stores and restaurants. To the east of the Site are single- and multi-family residential buildings.

Alameda County Assessors records indicate the Site is situated on a 0.27 acre parcel. The Site is located in Section 16, Township 2 South, Range 3 West, relative to the Mount Diablo Baseline and Meridian of Northern California, and the Site can be located on the Oakland East, California 7½-minute topographic quadrangle map of the United States Geological Survey (USGS). A Site Location Map is presented as Drawing 1. A Site Map depicting current and former Site features is presented as Drawing 2.

1.2 Site Background

The Site was reportedly developed and operated as a gas station between 1950 and at least until 1983 by Richfield Oil Company. Four underground storage tanks (USTs) were formerly located at the Site. The fuel dispenser island was located on the northwestern portion of the west parking lot. AEI Consultants (AEI) conducted research at the City of Oakland Fire and Building Departments for records relating to the location of the USTs and associated piping. Although formal UST removal records were not located, available records indicated that USTs were formerly located along Farnam Street, as indicated on Drawing 2 (AEI, 1999). A detailed Site history and summary of previous investigations is included in Appendix A and historic site data is provided in Appendix B.

1.3 Document Purpose and Organization

The purpose of this document is to summarize and present current Site conditions in the form of a CSM and evaluate these conditions and data gathered for Site closure based on the LTCP. The following section presents the results of a Sensitive Receptor Survey followed by Section 3.0, which presents justification for case closure based on the CSM. The CSM is presented as Table 1. Table 2 and Table 3 present historical and current groundwater analytical data. Table 4 summarizes historical and current potentiometric groundwater gradient magnitude and direction.

In order to evaluate Site condition against the LTCP, each category in the policy has been individually evaluated using the data presented in the CSM (Table 1). These evaluations are presented in Section 3.0.

2.0 SENSITIVE RECEPTOR SURVEY

A Sensitive Receptor Survey (SRS) was performed by Broadbent to identify the presence of water wells, surface water bodies, and ecological receptors within the vicinity of the Site.

A formal underground utility survey was not conducted as part of this SRS. However, Norcal Geophysical Consultants were contracted to perform a utility survey in 2013, drawings of the survey are presented in Appendix C. Due to the depth to water historically observed at the Site, which has ranged from approximately 10 ft below ground surface (bgs) to 16 ft-bgs, it is not anticipated that underground conduits and/or trenches may act as preferential contaminant migration pathways.

2.1 Water Supply Well Search

Broadbent requested a well search through Alameda County Environmental Health (ACEH) and the East Bay Municipal Utility District (EBMUD) databases and conducted a telephone interview with the local water purveyor, EBMUD, in the area to determine the locations and quantities of wells located within a 2,000 foot radius. An extensive list of well completion reports including domestic, irrigation, municipal, industrial, cathodic and monitoring wells was obtained.

Numerous monitoring wells were identified during the well search; however, these wells were not considered sensitive receptors and have been disregarded in this report. Appendix D provides a table of the identified applicable wells in the SRS and an aerial map of the site and surrounding wells within the 2,000 foot radius. There were four wells (three industrial and one irrigation) identified within the 2,000 foot search radius. The closest well to the Site is an irrigation well located approximately 700 feet to the east. Three additional irrigation wells were also identified but determined to be located outside of the 2,000 foot radius.

2.2 Surface Water Bodies

Surface water bodies were located using satellite images available on Google Maps and USGS topographic maps. The nearest potential surface water bodies appear to be two creeks, Peralta and Sausal. Sausal creek is located approximately 800 feet northwest of the Site in the general upgradient direction and Peralta Creek is located southeast of the Site in a general downgradient direction approximately 2,350 feet from the Site. Although Peralta Creek is located in the general downgradient direction, it is located outside of the 2,000 foot radius and not considered a potential receptor.

2.3 Ecological Receptors

The Site is located within the City of Oakland commercial and residential corridor approximately ½ mile east of Interstate 880. Accordingly, areas surrounding the Site are developed, paved, and/or occupied by structures/buildings with limited areas of landscaping. The closest riparian habitat appears to be located approximately 700 feet northwest 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 Oakland. 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 Oakland East 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. The results of the database search indicate 86 different species that have special status; however, impacts associated with Former Service Station #402 are not expected to affect these species.

2.4 Schools and Hospitals

Six schools were identified within the approximate 2,000 foot search radius of the Site:

- Lazear Elementary School, located approximately 2,100 feet to the southwest of the Site
- Arise High School, located approximately 895 feet to the south of the Site
- St. Elizabeth High School, located approximately 800 feet to the southeast of the Site
- Urban Promise Academy, located approximately 1,355 feet to the northeast of the Site
- Think College Now, located approximately 1,570 feet to the west of the Site
- Ascened Elementary School, located approximately 2,000 feet to the south of the Site

There are no apparent hospitals or medical centers identified within the 2,000 foot search radius. The medical clinic La Clinica De La Raza is located approximately 1,080 feet to the west-southwest of the Site. The locations of the schools within the search radius are provided in Appendix D.

2.5 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 irrigation and three industrial wells have been identified within the 2,000 foot search radius.
- Six schools were identified within the search radius.

The potential impact to industrial and irrigation wells within the search radius is possible; however, the three irrigation wells on 29th Avenue (Appendix D) are located in a general cross-gradient direction from the Site, while the one irrigation well on 34th Avenue (Appendix D) is located in a general downgradient direction. Based on the relatively low petroleum hydrocarbon impacts observed within downgradient well MW-7 onsite, it is unlikely that this irrigation well located approximately 700 feet downgradient would be impacted by Site activities. Additionally, the constructed depth of this irrigation well is 200 feet and is likely screened at a much greater depth than the shallow groundwater impacted at the Site. The distance from the site and total depth of the irrigation well provides a nice buffer to protect potential impact from the Site.

The six schools identified during this survey are not expected to be impacted from Site activities. Think College Now, Lazear Elementary School, Urban Promise Academy, Arise High School and Ascend Elementary School are located either upgradient or cross-gradient of the Site. St. Elizabeth High School is located downgradient of the Site but appears to be at minimal risk.

Data collected from the SRS and Site groundwater observations indicates minimal threat to receptors. No additional assessments are needed for offsite receptors.

3.0 JUSTIFICATION FOR SITE CLOSURE – LOW THREAT UST CLOSURE POLICY

As indicated in Section 1.3 above, the Site was evaluated for Closure based on comparing data presented in the CSM (Table 1) against the LTCP. Closure Criteria in the Low Threat UST Closure Policy are organized into the following categories:

- General Criteria
- Media Specific Criteria-Groundwater
- Media Specific Criteria – Petroleum Vapor Intrusion to Indoor Air
- Media Specific Criteria – Direct Contact and Outdoor Air Exposure
- Additional Criteria

The following sections present the details of the evaluation.

3.1 General Criteria

The general criteria relate to the Site use, presence of free product, sources, and completeness of the Site understanding. As evidenced in the data presented in the CSM, a sufficiently good understanding of Site conditions, on- and offsite receptors, and Site history has been established. These general criteria and a discussion as to how the Site is consistent with these criteria are presented below.

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

The Site is located within the East Bay Municipal Utilities District service area.

The unauthorized release consists only of petroleum

The release at the Site is believed to have occurred in the area of the original UST as well as the two excavation pits near former well location MW-1 in front of the current building. These have been the locations with the highest concentrations of petroleum hydrocarbons. Current evidence of maximum petroleum concentrations are noted in MW-4, in the vicinity of the USTs and excavation pits (Tables 2 & 3). In addition, there is no knowledge or evidence that other activities occurred at the Site that may have caused non-petroleum releases.

The unauthorized release has been stopped

The USTs, product piping and dispensers, the suspected sources of release, have been removed along with additional soil from the downgradient excavation pits, thereby removing the leak sources (Table 1).

Free product has been removed to the extent possible

No free product has been measured at the Site since environmental investigations began in 1998.

A conceptual site model (CSM) that assesses the nature, extent, and mobility of the release has been developed

A conceptual site model has been prepared for this Site and is summarized in Table 1.

Secondary source has been removed to the extent practical

Excavation activities were conducted in 1999 mainly to locate the USTs and a waste oil tank that could have potentially still been present beneath the Site. Based on the report from this work, excavated soils were used as backfill and it is unknown whether soil was removed from the Site for disposal. However, soil samples and one groundwater sample collected during this investigation indicated very minor petroleum impacts and additional secondary source removal was not warranted (All Environmental, Inc., 1999).

Soil and groundwater have been tested for MTBE and results reported in accordance with Health and Safety Code 25296.15

Soil samples collected during investigative work at the Site were analyzed for MTBE. MTBE was detected in one soil sample AEI-10-15 at a concentration of 0.071 mg/kg. Groundwater samples collected from Site monitoring wells have been routinely analyzed for MTBE. MTBE has been detected in recently installed wells MW-5 and MW-6. Historical MTBE analytical data are included in Table 2 and Table 3. It should be noted that ARC operated this station until approximately 1983, prior to the use of MTBE as a gasoline additive.

Nuisance as defined by the Water Code section 13050 does not exist at this site

A nuisance as defined by the Water Code does not exist at this Site.

3.2 Media-Specific Criteria – Groundwater

The LTCP lists five scenarios for groundwater plumes. According to the petroleum plume sizes indicated in Drawings 4 and 5, the plume is currently greater than 100 feet but less than 250 feet in length. Low concentrations of MTBE were detected in the most recent groundwater monitoring event (1Q15) in wells MW-5 (0.50 µg/L) and MW-6 (5.0 µg/L). However, based on the minimal observed MTBE concentrations, an iso-concentration map for MTBE was not generated. Drawing 4 depicts the GRO plume from the 1Q15 event. GRO concentrations are above the Tier 1 Environmental Screening Level (ESL) of 100 µg/L in well MW-4 and downgradient well MW-7. Drawing 5 depicts the benzene plume from the 1Q15 event which shows concentrations exceeding the Tier 1 ESL of 1 µg/L in wells MW-4 and MW-7 at 85 µg/L and 59 µg/L, respectively. Hydrocarbon concentrations for benzene and MTBE do not exceed maximum levels listed within the LTCP. Free product has not been observed at the Site. A Sensitive Receptor Survey indicated that no domestic or water supply wells were located within a 2,000 foot radius of the Site, as presented in the CSM (Table 1). The closest surface water is Sausal Creek, located approximately 800 feet to the northwest of the Site (Table 1). The LTCP groundwater Category 2 criteria are met with the exception of distance to nearest surface water body. Although Sausal Creek is within 1,000 feet from the defined plume boundary it is not considered a potential receptor as it is

located upgradient from the direction of groundwater flow at the Site.

3.3 Media Specific Criteria – Petroleum Vapor Intrusion to Indoor Air

The Site is not an active service station and it does not apply to the active fueling station exemption in the LTCP, which considers that petroleum vapors from onsite fueling activities are a far greater risk than those associated with exposure to vapors from historic petroleum releases. During well installation activities in 2013, three nested soil vapor probes were also installed at the Site. Soil vapor analytical results indicated that GRO, benzene, toluene, ethylbenzene, xylenes, MTBE, and naphthalene were not detected in any of the six soil vapor samples collected, with the exception of GRO in probe SG-1B, which was below the Tier 1 ESL. Soil vapor analytical results are included in Appendix E. The characteristics and criteria of the LTCP scenario 4 for petroleum vapor intrusion to indoor air are satisfied. As a result, petroleum vapor intrusion to indoor air is considered low threat at the Site.

3.4 Media Specific Criteria – Direct Contact and Outdoor Air Exposure

For the direct contact and outdoor air exposure, all soil data was considered. During well installation activities in 2013, soil samples were collected from each new well location. A soil sample collected from MW-4 at 3.5 feet bgs was below laboratory detection limits for each constituent analyzed. Additionally, the soil sample collected from MW-4 at 7.5 feet bgs contained minor concentrations of benzene and ethylbenzene at concentrations of 0.0095 mg/kg and 0.26 mg/kg, respectively. Naphthalene was detected at a concentration of 0.21 mg/kg in the soil sample collected from MW-4 at 7.5 feet bgs. Concentrations for benzene, ethylbenzene and naphthalene were all detected below the LTCP criteria. Based on the data presented herein and in Appendices B and E, remaining petroleum concentrations in soil appear to be within acceptable levels for closure under the LTCP.

Table A: Representative Maximum Concentrations of Benzene and Ethylbenzene in Soil Samples – 0-5 feet bgs and 5 to 10 feet bgs

Sample Identification and Depth	Sample Date	Benzene (mg/kg)	Ethylbenzene (mg/kg)	Naphthalene (mg/kg)
MW-4 @ 3.5'	11/14/2013	<0.001	<0.001	<0.002
MW-4 @ 7.5'	11/19/2013	0.0095	0.26	0.21
LTCP Maximum* - 0-5/5-10		8.2/12	89/134	45/45

*Under a commercial/industrial exposure setting
mg/kg = milligrams per kilogram

3.5 Recommendation for Case Closure

As presented above and in the attached CSM table (Table 1), this Site appears to meet all applicable criteria for case closure under the Low Threat Closure Policy. Concentrations detected in soil vapor samples collected in 2013 were below the LTCP criteria. Minor MTBE concentrations have been detected in wells MW-5 and MW-6, which have also been below the LTCP criteria. Other fuel oxygenates have not been observed in Site wells. Primarily, GRO have been detected in groundwater at the site with observed concentrations from the most recent sampling event conducted on March 12, 2015 in two well locations above the ESL of 100 µg/L. Adequate Site characterization, evaluation of receptors, historical descriptions, and technical analysis have been performed at the Site and presented in this document to support a recommendation for case closure. The Site does not pose a reasonable risk to the environmental or public health. We hereby recommend that a determination of No Further Action be

made for this Site. Upon concurrence of this recommendation from the ACEH, closure activities including well decommissioning should be carried.

4.0 REFERENCES

All Environmental, Inc. , July 6, 1999. *Subsurface Investigation*. 1450 Fruitvale Avenue, Oakland, CA.

All Environmental, Inc. , October 11, 1999. Phase II *Subsurface Investigation*. 1450 Fruitvale Avenue, Oakland, CA.

All Environmental, Inc. , October 9, 2002. *Site Summary and Risk Evaluation Report*. 1450 Fruitvale Avenue, Oakland, CA.

State Water Resources Control Board, 2012. Low-Threat Underground Storage Tank Case Closure Policy, August 17.

DRAWINGS

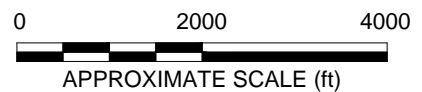
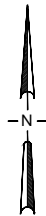
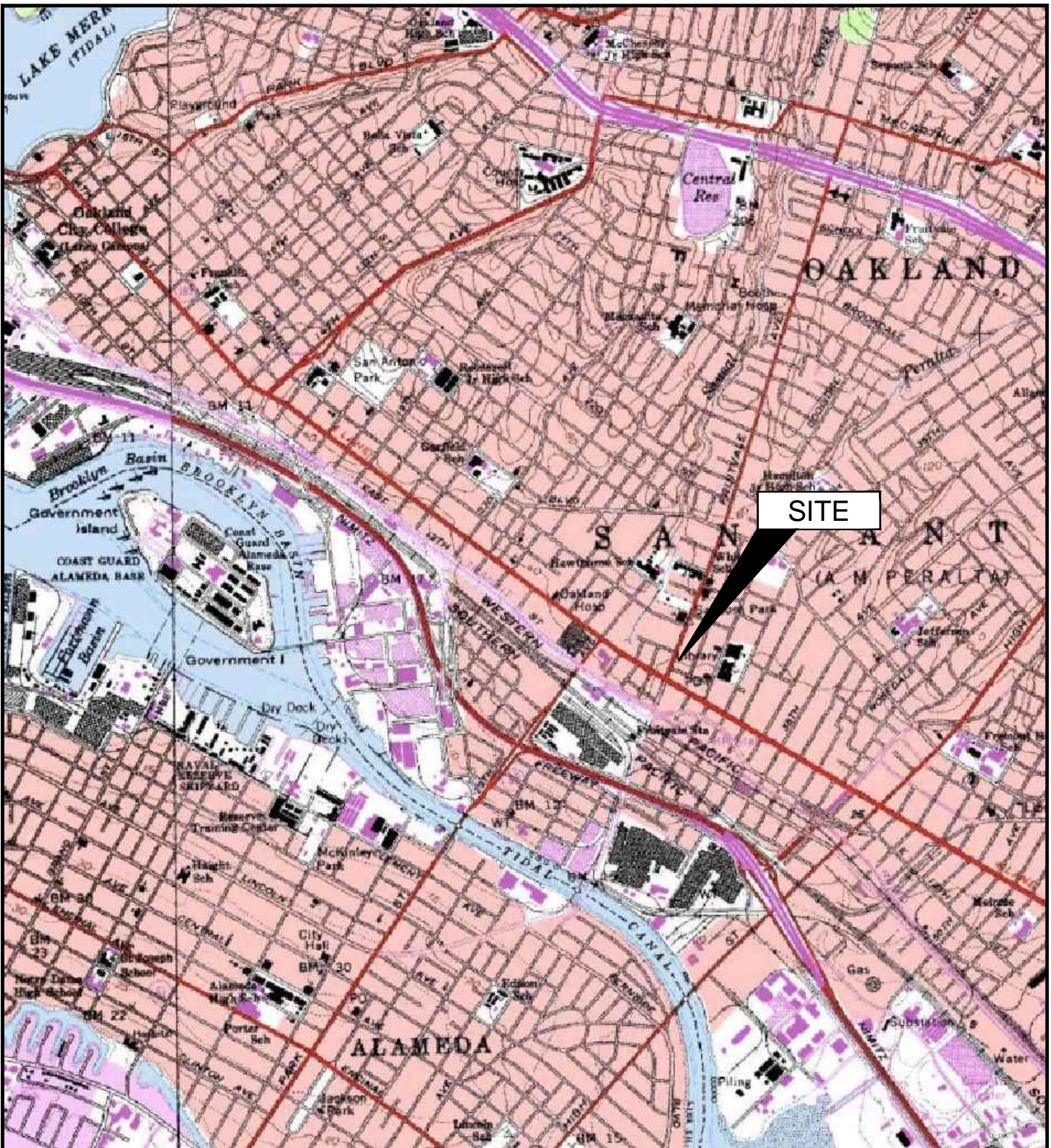









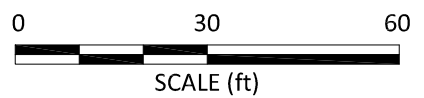
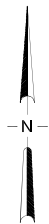
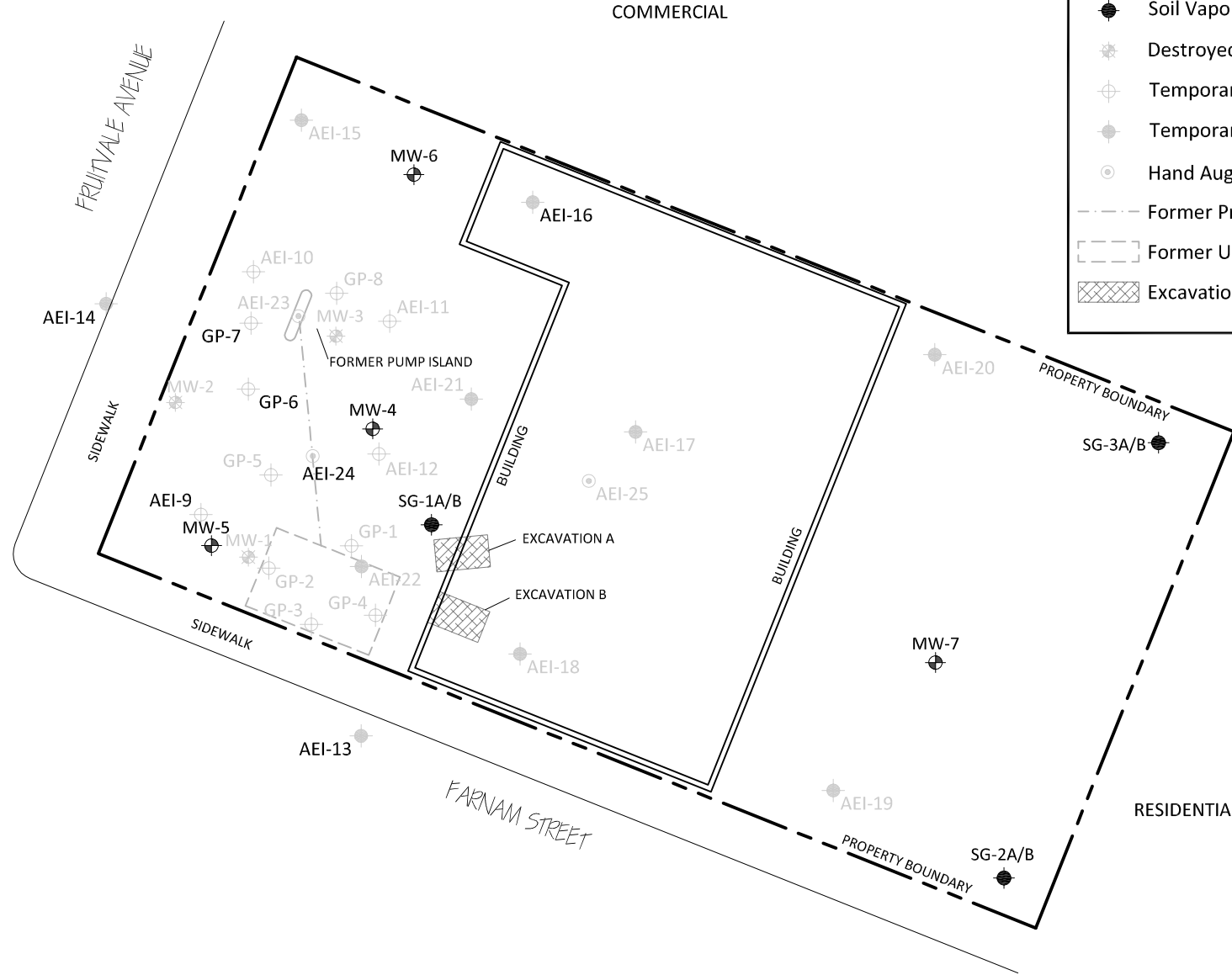


IMAGE SOURCE: USGS

LEGEND

-  Monitoring Well Location
-  Soil Vapor Probe Location
-  Destroyed Monitoring Well Location
-  Temporary Boring Locations: 1998-1999
-  Temporary Boring Locations: June 2002
-  Hand Auger Boring Location: September 2002
-  Former Product Lines
-  Former UST Basin
-  Excavation

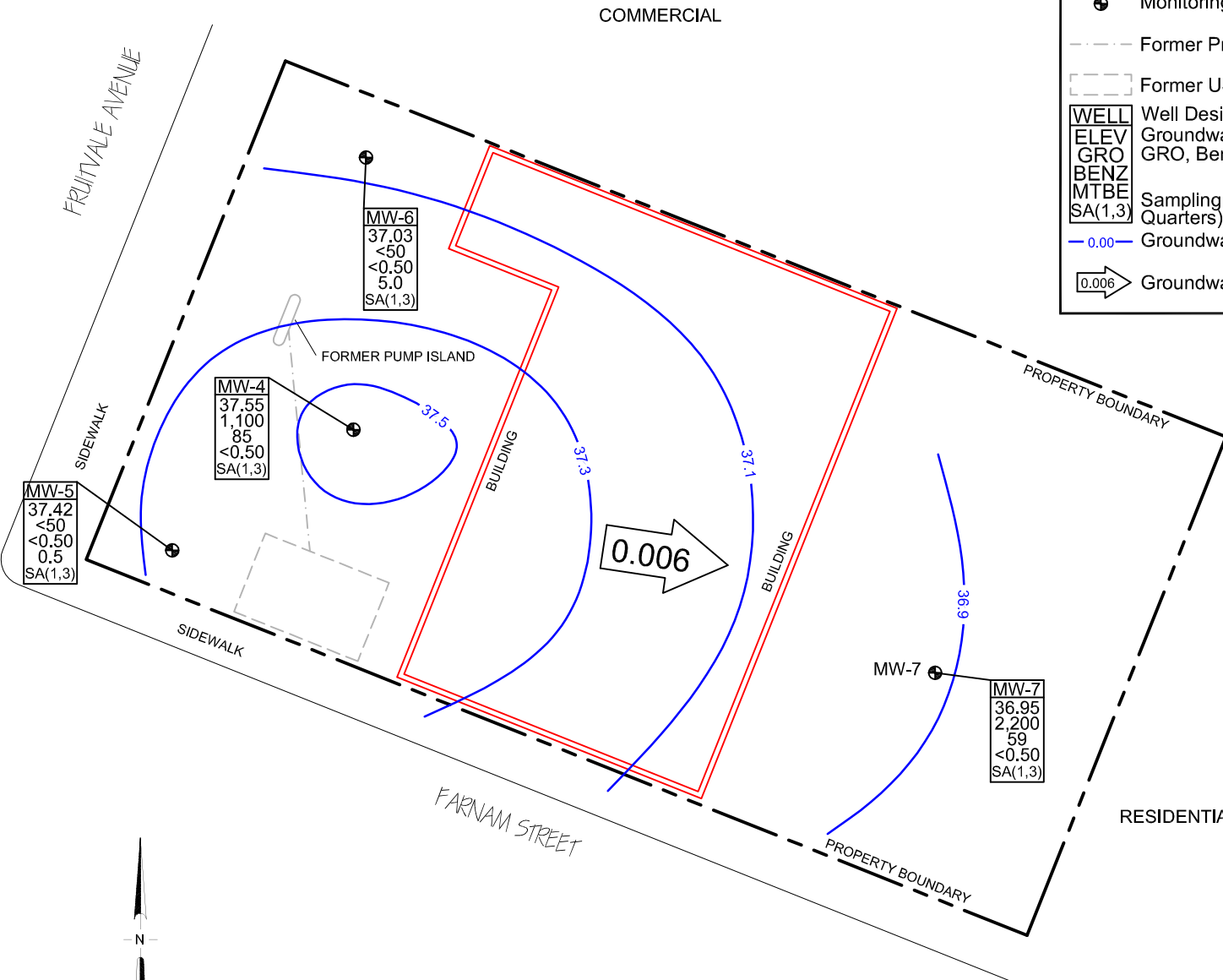
NOTE: SITE MAP ADAPTED FROM AEI CONSULTANTS FIGURES
SITE DIMENSIONS AND FACILITY LOCATIONS NOT VERIFIED.



BROADBENT
875 Cotting Lane, Suite G
Vacaville, California 95688
Project No.: 08-88-602 Date: 01/20/2014

ARCO Former Station No 402
1450 Fruitvale Avenue
Oakland, California

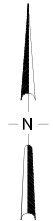
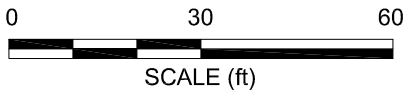
Site Map with Former and
Current Site Features



LEGEND

- Monitoring Well Location
- Former Product Lines
- Former UST Basin
- | | |
|---------|--|
| WELL | Well Designation |
| ELEV | Groundwater Elevation (ft above msl) |
| GRO | GRO, Benzene, and MTBE Concentrations (ug/L) |
| BENZ | |
| MTBE | |
| SA(1,3) | Sampling Frequency (Semi-Annually, 1st and 3rd Quarters) |
- 0.00 Groundwater Elevation Contour (ft above msl)
- 0.006 Groundwater Flow Direction and Gradient (ft/ft)

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








BROADBENT & ASSOCIATES, INC.
ENGINEERING, WATER RESOURCES & ENVIRONMENTAL
4820 Business Center Drive, Suite 110, Fairfield, CA 94534
Project No.: 08-88-602 Date: 4/30/2015

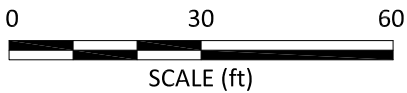
Former Station #402
1450 Fruitvale Avenue
Oakland, California

Groundwater Elevation Contour
and Analytical Summary Map,
March 12, 2015

LEGEND

-  Monitoring Well Location
-  Former Product Lines
- 1,100 GRO Concentration in $\mu\text{g/L}$
-  GRO Isoconcentration Contour
-  Former UST Basin
-  Excavation

NOTE: SITE MAP ADAPTED FROM AEI CONSULTANTS. FIGURES, SITE DIMENSIONS AND FACILITY LOCATIONS NOT VERIFIED.








BROADBENT
 1370 Ridgewood Drive, Suite 5
 Chico, CA 95973
 Project No.: 08-88-602 Date: 3/9/2016

ARCO Former Station No 402
 1450 Fruitvale Avenue
 Oakland, California

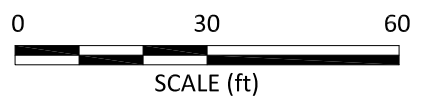
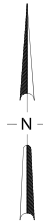
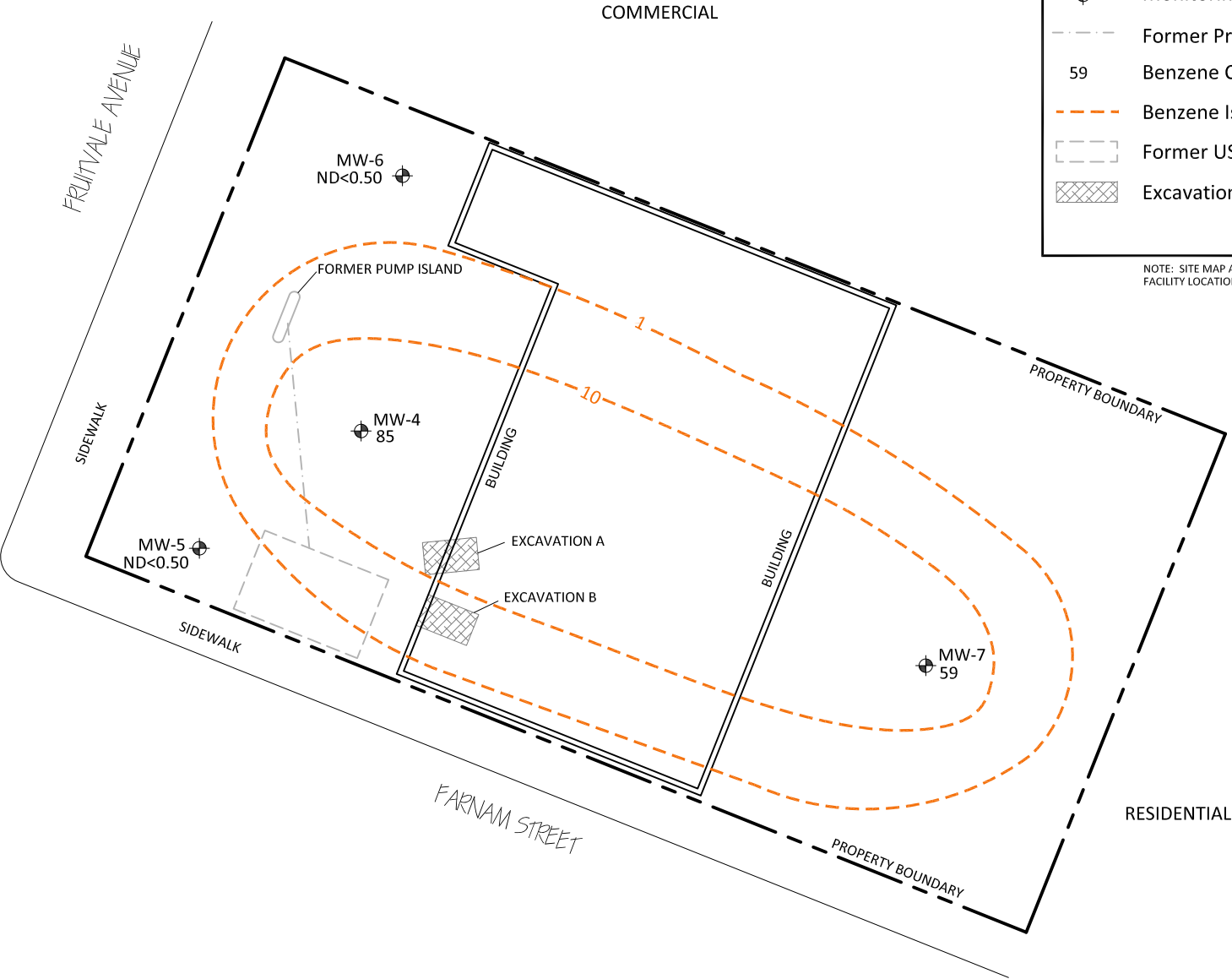
GRO Isoconcentration Contour Map
 March 12, 2016

Drawing
4

LEGEND

-  Monitoring Well Location
-  Former Product Lines
- 59 Benzene Concentration in $\mu\text{g/L}$
-  Benzene Isoconcentration Contour
-  Former UST Basin
-  Excavation

NOTE: SITE MAP ADAPTED FROM AEI CONSULTANTS. FIGURES, SITE DIMENSIONS AND FACILITY LOCATIONS NOT VERIFIED.



BROADBENT
 1370 Ridgewood Drive, Suite 5
 Chico, CA 99573
 Project No.: 08-88-602 Date: 3/9/2016

ARCO Former Station No 402
 1450 Fruitvale Avenue
 Oakland, California

Benzene Isoconcentration Contour Map
 March 12, 2016

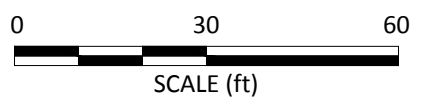
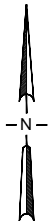
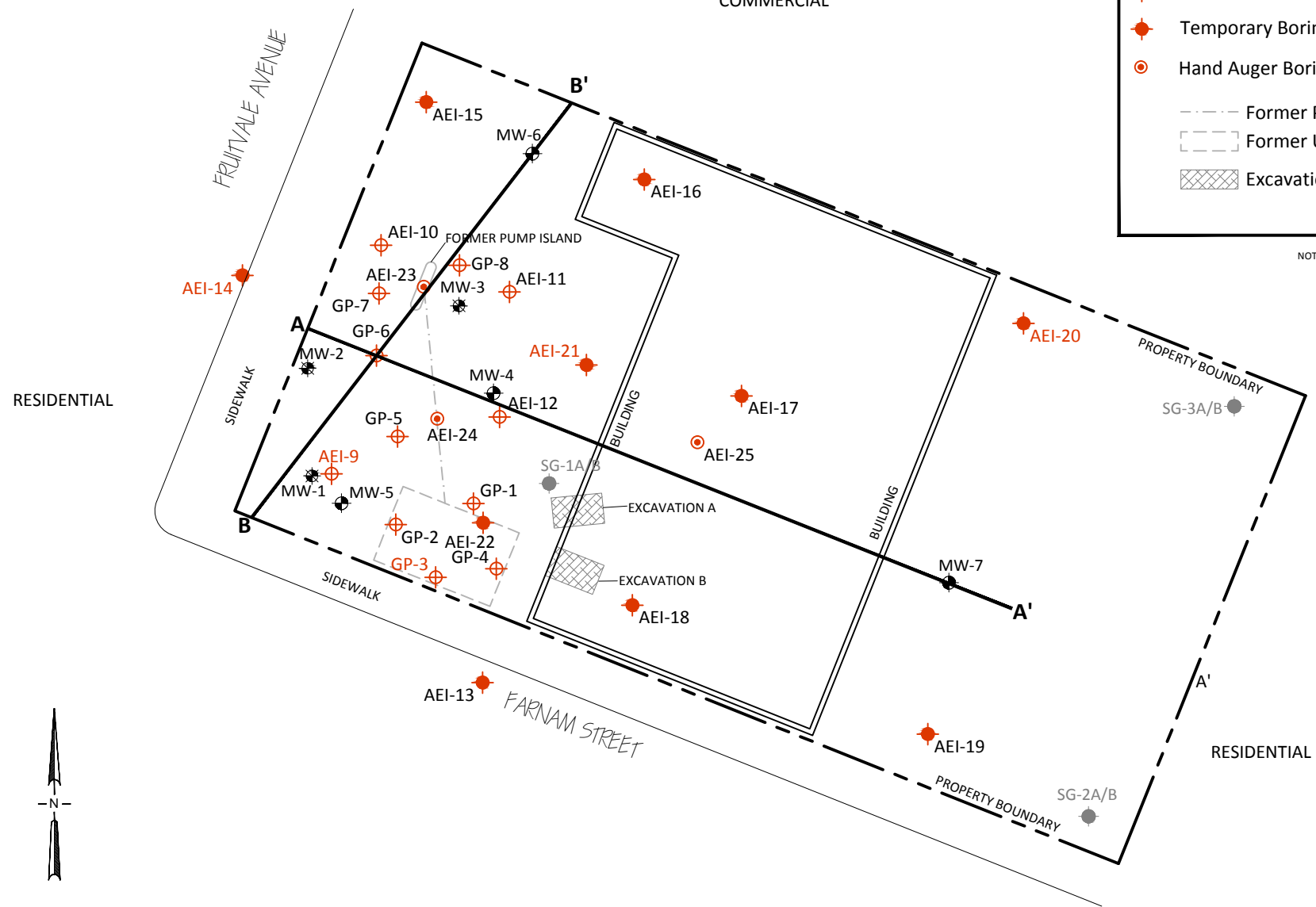
Drawing
5

LEGEND

- Monitoring Well Location
- Soil Vapor Probe Location
- ✱ Destroyed Monitoring Well Location
- ⊕ Temporary Boring Locations: 1998-1999
- Temporary Boring Locations: June 2002
- ⊙ Hand Auger Boring Location: September 2002

- - - Former Product Lines
- - - Former UST Basin
- ▨ Excavation

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

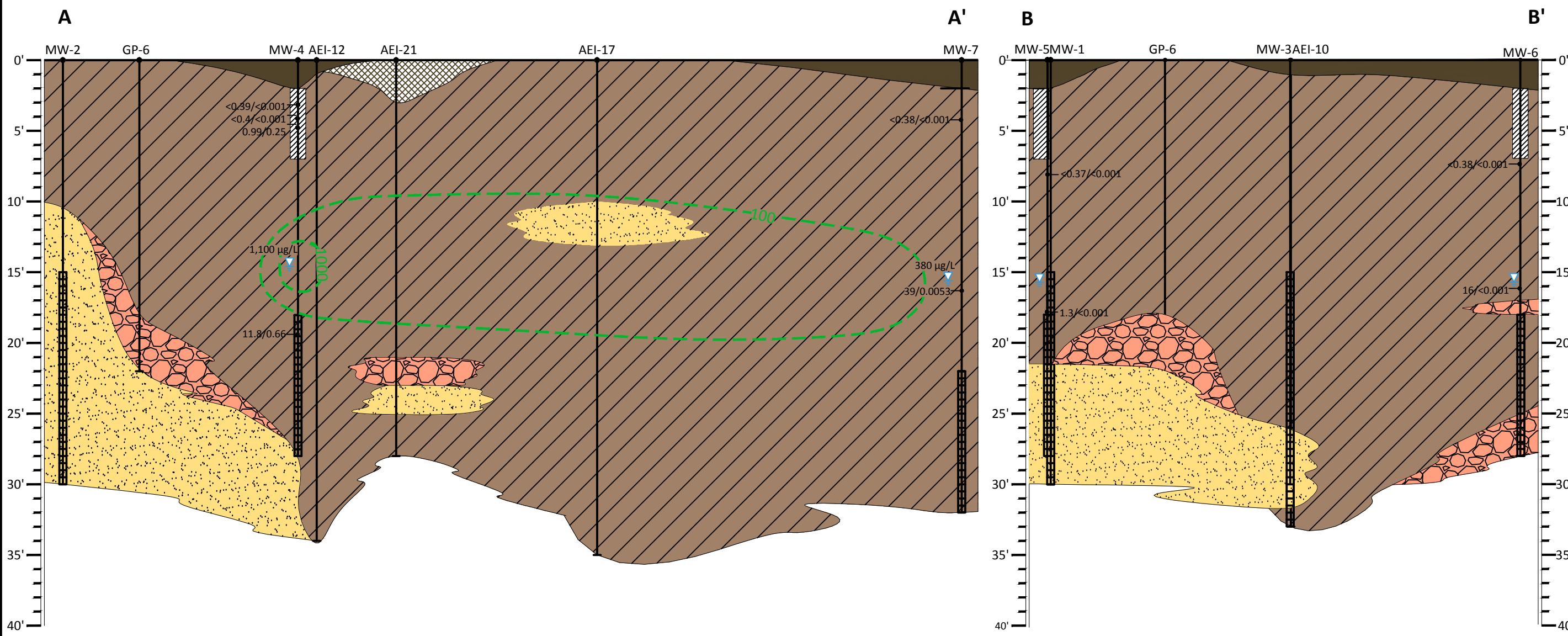


BROADBENT
4820 Business Center Drive, Suite 110
Fairfield, CA 94534
Project No.: 08-88-602 Date: 01/26/2015

ARCO Former Station No. 402
1450 Fruitvale Avenue
Oakland, California

Cross Section Location Map

Drawing
6

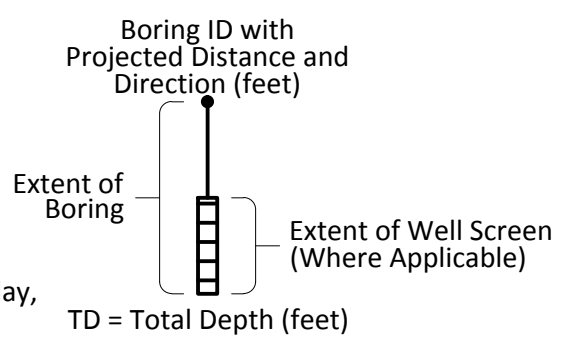


Geologic Cross Sections A - A' & B-B'

ARCO Former Station № 402
1450 Fruitvale Avenue
Oakland, California

BROADBENT
220 Business Center Drive, Suite 110
Fairfield, CA 94534
Project No.: 08-88-602 Date: 01/26/2015

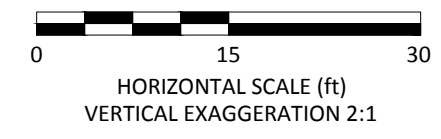
- Concrete
- Fill
- Unknown - Air Knife
- Sands
- Clay, Sandy/Gravelly Clay, Silty Clay
- Gravels



380 µg/L
Static Groundwater Elevation and GRO Concentration (µg/L)
(November 19, 2013)

<0.38/<0.001
GRO/Ethylbenzene Concentration(mg/kg)
November 18, 2013

GRO Isoconcentration Contour



TABLES

TABLE 1**CONCEPTUAL SITE MODEL**

Former Richfield Oil Company Station No. 402
 1450 Fruitvale Avenue
 Oakland, California

CSM Element	CSM Sub-Element	Description	Data Gap	How to Address
Geology and Hydrogeology	Regional	<p>According to the <i>East Bay Plain Groundwater Basin Beneficial Use Evaluation Report</i> (California Regional Water Quality Control Board – San Francisco Bay Region/SFRWQCB, June 1999), the Site is located within the Oakland Sub-Area of the East Bay Plain of the San Francisco Basin. The Oakland Sub-Area contains a sequence of alluvial fans. The alluvial fill thickness ranges from 300 to 700 feet deep. There are no well-defined aquitards such as estuarine muds. The largest and deepest wells in this sub-area historically pumped one to two million gallons per day at depths greater than 200 feet. Overall, sustainable yields are low due in part to low recharge potential. The Merrit sand in West Oakland was an important part of the early water supply for the City of Oakland. It is shallow (up to 60 feet), but before the turn of the last century, septic systems contaminated the water supply wells.</p> <p>Throughout most of the Alameda County portion of the East Bay Plain, from Hayward north to Albany, water level contours show that the general direction of groundwater flow is from east to west or from the Hayward Fault to the San Francisco Bay. Groundwater flow direction generally correlates to topography. Flow direction and velocity are also influenced by buried stream channels that typically are oriented in an east to west direction.</p>	None	NA
	Site	<p>The Site is underlain with silts and clays to approximately 16 feet bgs which transitions into sands, clayey gravels and gravels to approximately 32 feet bgs. The Site elevation is approximately 49 ft above msl. The water table fluctuates seasonally and over time. During the most recent monitoring period (2013-2015), depth-to-water measurements have ranged from approximately 10 to 16 feet below ground surface (bgs). During First Quarter 2015, the groundwater depths ranged from 10.20 (MW-5) and 11.86 (MW-6). Groundwater flow direction during the First Quarter 2015 monitoring event was to the east at a magnitude of approximately 0.006 ft/ft.</p> <p>The groundwater gradient direction has fluctuated slightly since groundwater monitoring activities were initiated at the Site in 2013. However, as noted in Table 4, the predominant direction is generally towards the southeast, in the direction of well MW-7. In Second Quarter 2014, the gradient was towards the south. However, the gradient for that and every other event has been fairly flat, making minor anomalies in well elevations potentially seem more significant than they may actually be. The direction noted during Second Quarter 2014 was largely due to the elevation in well MW-5. The majority of the data suggests a predominate gradient direction towards the southeast.</p>	None	NA

TABLE 1**CONCEPTUAL SITE MODEL**

Former Richfield Oil Company Station No. 402
 1450 Fruitvale Avenue
 Oakland, California

CSM Element	CSM Sub-Element	Description	Data Gap	How to Address
Surface Water Bodies		Sausal Creek is located approximately 800 feet to the northwest of the Site. The creek abruptly ends at International Boulevard after draining from the Oakland Hills. Peralta Creek is located approximately 2,350 feet to the southeast of the Site. Like Sausal Creek, Peralta Creek ends at Foothill Blvd.	None	NA
Nearby Wells		In 2015, a Sensitive Receptor Survey (SRS) was carried out to identify the presence of water wells with a 2,000 foot radius of the Site. Based on the review, four wells were identified within the 2,000 foot radius of the Site: three industrial wells and one irrigation well. The three industrial wells are located approximately 1,750 feet southwest of the Site. The irrigation well is located approximately 700 feet east of the Site. An additional three irrigation wells were identified outside of the 2,000 foot radius. Based on current data, distance from the Site, and well construction details, these wells are unlikely to be impacted by Site activities.	None	NA
Constituents of Concern	Light-Non Aqueous Phase Liquids (LNAPL)	LNAPL has not been observed at this Site.	None	NA
	Gasoline Range Organics (GRO)	GRO has been detected in 3 of the 4 monitoring wells at the Site (MW- 4, MW-5, and MW-7). GRO has generally decreased by an order of magnitude in the downgradient direction from well MW-4 to MW-7. However, during First Quarter 2015, the GRO concentration in MW-7 (2,200 µg/L) was observed to be greater than in well MW-4 (1,000 µg/L). This spike in GRO concentration in well MW-7 appears to be anomalous based on previous data. Drawing 4 presents isoconcentration contours for the most recent groundwater monitoring and sampling event (1Q15). Additionally, during the soil investigation and monitoring well installation conducted in Fourth Quarter 2013, GRO was detected in the soil samples collected from each monitoring well location. Well MW-7 yielded the highest residual concentration of 39 mg/kg at 15.5 ft bgs while MW-4 had the lowest concentration of 0.99 mg/kg at 7.5 ft bgs. Soil analytical results for the 4Q13 investigation can be found in Appendix E. GRO impacts to groundwater appear to be isolated onsite and mainly confined to the source area.	None	NA
	Benzene	Benzene has been detected in 2 of the 4 monitoring wells (MW- 4 and MW-7) since 2013. Benzene decreases in the downgradient direction from 85 µg/L in MW-4 to 59 µg/L in well MW-7. Drawing 5 presents isoconcentration contours of benzene in groundwater during the most recent groundwater monitoring event (1Q15). Benzene impacts to groundwater are limited in extent and largely confined to the source area.	None	NA

TABLE 1**CONCEPTUAL SITE MODEL**

Former Richfield Oil Company Station No. 402
 1450 Fruitvale Avenue
 Oakland, California

CSM Element	CSM Sub-Element	Description	Data Gap	How to Address
Constituents of Concern (Cont.)	MTBE	Methyl tert butyl ether (MTBE) has been detected in wells MW-5 and MW-6. The highest historic concentration (2013 to 2015) of MTBE was reported in well MW-6 in 2Q14 at 14 µg/L. MTBE impacts to groundwater are limited and largely confined to the source area. Overall, the presence of MTBE in well MW-6 appears to be decreasing.	None	NA
Potential Sources	Offsite	No offsite sources have been identified.	None	NA
	Onsite	The main sources of contamination onsite appear to be the former USTs, fuel dispensers, and product lines. It is unclear what date the tanks and associated piping and dispensers were removed. In July 1998, a Phase I/II Environmental Site Assessment (ESA) was performed by Glenfos, Inc. The report indicated inconclusively that the Underground Storage Tanks (USTs) may still be present at the Site. Eight soil borings advanced to depths between 15 and 30 ft during the ESA found concentrations of TPH(g) up to 190 mg/kg in the soil samples and 20,000 µg/l in the groundwater samples. The highest concentrations of contaminants were located in the former locations of fuel dispensers and product lines. In May 1999, a subsurface investigation was performed by All Environmental, Inc. (AEI). AEI excavated at three locations: two excavations at a suspected former location of a waste oil tank and one excavation at the suspected location of the USTs. No USTs were found during these activities. Six soil samples and one groundwater sample were taken from the excavations and analyzed by McCampbell Analytical, Inc. Contaminants were found in the soil samples collected from the former UST location at maximum concentrations of 11mg/kg TPH(g) and 0.059 mg/kg Toluene. Overall site data indicates the residual petroleum impacts are limited in extent and largely found in the former source area.	None	NA

TABLE 1**CONCEPTUAL SITE MODEL**

Former Richfield Oil Company Station No. 402
 1450 Fruitvale Avenue
 Oakland, California

CSM Element	CSM Sub-Element	Description	Data Gap	How to Address
Migration Pathways	Potential Conduits	<p>Maps of underground utilities including electrical, storm drain, and unidentified utilities are included in Appendix C. The storm drain manhole entry way is exposed at the surface and is approximately 1-2 ft bgs. Electrical conduits are around the perimeter of the Site on the Fruitvale Avenue side. Since historical and current depth to groundwater measurements are typically between 10-16 ft bgs, the potential for any deeper utilities to act as a preferential pathway for contaminant migration is unlikely. The mapped underground utility locate maps indicate no potential pathways in the downgradient direction.</p> <p>The groundwater gradient for the Site has generally been towards the southeast. Two neighboring residences adjacent to the Site are located in the downgradient direction on 33rd Street. Based on the underground utility maps provided by NorCal Geophysical (NorCal), a storm drain is running North to South leading out to Farnam Avenue. No other utilities were mapped in the downgradient direction and the soil gas data for soil vapor probes SG-3A/B measured no detectable GRO and benzene during a soil vapor survey event conducted during 4Q13; this indicates that a preferential pathway for contaminant migration is unlikely.</p>	None	NA
Potential Receptors	Onsite	<p>No onsite water supply wells or surface water exists. The only potential onsite receptor would be onsite workers exposed to gasoline vapors. However, current concentrations of contaminants in soil and groundwater indicate that vapor intrusion is not a risk to onsite workers and tenants. Additionally, Broadbent & Associates, Inc. (Broadbent) conducted a soil vapor sampling event during 4Q13. The analysis indicated that soil vapor probe SG-1B, (downgradient of the former UST basin) sampled from 5-5.5 feet bgs yielded concentrations of GRO at 46,000 µg/m³. The concentration of GRO was below the ESL of 2,500,000 µg/m³. No other contaminants of concern were detected during the investigation.</p>	None	NA
	Offsite	<p>As discussed above, the residences southeast of the Site are located downgradient and are considered a potential offsite receptor. Although the concentrations of GRO and Benzene in groundwater were recently detected in well MW-7, the concentrations appear to be isolated onsite and the soil vapor survey results for SG-2A/B & SG-3A/B indicated that GRO and benzene were not reported above laboratory detection limits. These two soil vapor probe locations are also further downgradient from well MW-7.</p>	None	NA

TABLE 1**CONCEPTUAL SITE MODEL**

Former Richfield Oil Company Station No. 402
 1450 Fruitvale Avenue
 Oakland, California

CSM Element	CSM Sub-Element	Description	Data Gap	How to Address
Nature and Extent of Environmental Impacts	Extent in Soil	A soil investigation was conducted during 4Q13 (November) prior to the installation of the soil gas and monitoring wells at the Site. Analytical results of the sampling event indicate that five of the 11 soil samples contained detectable GRO concentrations; concentrations of BTEX at the 7.5 ft-bgs interval were observed at the location of well MW-4. Concentrations of GRO in each well location and BTEX for the specified MW-4 interval were all below the LTCP criteria (SWRCB, 2012).	None	NA
	Extent in Shallow Groundwater	The groundwater monitoring network at the Site include four wells (MW-4 through MW-7); upgradient well MW-5; downgradient wells MW-4, MW-6 and MW-7. Isoconcentration Drawings 4 and 5 from the 1Q15 groundwater monitoring and sampling event show the extent of GRO and Benzene, respectively. Based on these drawings and continued sampling of the well network, the extent of the residual petroleum compounds is predominantly limited around the former dispenser island and excavations pits. The GRO plume, however, does extend downgradient to well MW-7. Although the groundwater gradient has occasionally been noted in a direction other than southeast, the gradient appears to be predominately towards the southeast. Therefore, well MW-7 serves as the downgradient well. Soil vapor samples collected adjacent to the offsite property indicated that vapor intrusion to indoor air is not a concern offsite. Therefore, the petroleum plume in shallow groundwater is adequately defined. Additionally, LNAPL is not present at the Site.	None	NA
Nature and Extent of Environmental Impacts	Extent in Deeper Groundwater	Soil Borings GP-1 through GP-8 were advanced to depths between 12-30 ft bgs, borings AEI-9 through AEI-22 were advanced to depths between 26-35 ft bgs and destroyed monitoring wells MW-1 through MW-3 were advanced to 30 ft bgs. Based on the results of these boring logs, petroleum compounds in groundwater appear to be vertically defined between 12 to 20 ft bgs. Residual petroleum hydrocarbons do not appear to have penetrated the deeper groundwater zone. Based on the information from soil boring log GP-6, the logger noted that groundwater was encountered at 20 ft bgs and later rose to 9 ft bgs, an indication that groundwater is consistent in shallow depths. Although groundwater was first encountered at certain depths in other soil borings greater than 20 ft bgs per AEI Consultants (2000-2002), current groundwater conditions show that water levels do not exceed greater than 16.50 ft bgs during the drier sampling events.	None	NA

TABLE 1

CONCEPTUAL SITE MODEL

Former Richfield Oil Company Station No. 402
1450 Fruitvale Avenue
Oakland, California

Notes:

bgs = below ground surface

GRO = Gasoline Range Organics

DRO = Diesel Range Organics

MTBE = Methyl tert-butyl Ether

BTEX = benzene, toluene, ethylbenzene, xylenes

$\mu\text{g/L}$ = micrograms per liter

mg/Kg = milligrams per kilogram

ESLs = Tier 1 Environmental Screening Levels

$\mu\text{g/m}^3$ = micrograms per cubic meter

LTCP = Low Threat Closure Policy

SWRCB = State Water Regional Control Board

Table 2. Summary of Groundwater Monitoring Data: Water Elevations and Laboratory Analyses
Former BP Station #402, 1450 Fruitvale Avenue, Oakland, California

Well ID and Date Monitored	P/NP	TOC Elevation (feet)	Depth to Water (feet)	Water Level Elevation (feet)	Concentrations in µg/L						DO (mg/L)	Footnote
					GRO/TPHg	Benzene	Toluene	Ethyl-Benzene	Total Xylenes	MTBE		
MW-4												
12/2/2013	P	48.18	14.06	34.12	810	38	0.71	57	15	<0.50	1.60	a
3/18/2014	P		10.72	37.46	600	28	<0.50	20	4.8	<0.50	1.64	
6/26/2014	P		13.54	34.64	1,300	51	0.76	32	1.7	<0.50	1.58	
9/17/2014	P		15.37	32.81	1,100	41	<0.50	6.6	<1.0	<0.50	0.57	
3/12/2015	P		10.63	37.55	1,100	85	0.69	2.5	1.6	<0.50	1.78	
MW-5												
12/2/2013	P	47.62	13.67	33.95	<50	<0.50	<0.50	<0.50	<1.0	0.69	4.70	a
3/18/2014	P		10.91	36.71	<50	<0.50	<0.50	<0.50	<1.0	<0.50	3.03	
6/26/2014	P		12.52	35.10	<50	<0.50	<0.50	<0.50	<1.0	<0.50	0.76	
9/17/2014	P		14.44	33.18	58	<0.50	<0.50	<0.50	<1.0	<0.50	0.66	
3/12/2015	P		10.20	37.42	<50	<0.50	<0.50	<0.50	<1.0	0.50	2.00	
MW-6												
12/2/2013	P	48.89	15.07	33.82	<50	<0.50	<0.50	<0.50	<1.0	10	1.25	a
3/18/2014	P		11.72	37.17	<50	<0.50	<0.50	<0.50	<1.0	14	1.94	
6/26/2014	P		14.20	34.69	<50	<0.50	<0.50	<0.50	<1.0	13	0.47	
9/17/2014	P		16.10	32.79	<50	<0.50	<0.50	<0.50	<1.0	7.2	0.71	
3/12/2015	P		11.86	37.03	<50	<0.50	<0.50	<0.50	<1.0	5.0	1.66	
MW-7												
12/2/2013	P	48.28	15.35	32.93	96	<0.50	<0.50	1.5	<1.0	<0.50	5.35	a
3/18/2014	P		11.25	37.03	190	2.3	<0.50	2.2	<1.0	<0.50	2.63	
6/26/2014	P		13.44	34.84	530	5.0	0.63	1.9	<1.0	<0.50	1.14	
9/17/2014	P		15.75	32.53	360	2.5	<0.50	<0.50	<1.0	<0.50	0.63	
3/12/2015	P		11.33	36.95	2,200	59	9.8	87	54	<0.50	1.62	

Symbols & Abbreviations:

-- = Not analyzed/applicable/sampled/measured

< = Not detected at or above specified laboratory reporting limit

TOC = Top of casing measured in ft

NS = Well not surveyed

DO = Dissolved oxygen

GRO = Gasoline range organics

TPHg = Total petroleum hydrocarbons as gasoline

µg/L = Micrograms per liter

mg/L = Milligrams per liter

MTBE = Methyl tert-butyl ether

NP = Not purged before sampling

P = Purged before sampling

Footnotes:

a = Well surveyed 12/17/2013

Table 3. Summary of Fuel Additives Analytical Data
Former BP Station #402, 1450 Fruitvale Avenue, Oakland, California

Well ID and Date Monitored	Concentrations in µg/L								Footnote
	Ethanol	TBA	MTBE	DIPE	ETBE	TAME	1,2-DCA	EDB	
MW-4									
12/2/2013	--	<10	<0.50	1.7	<0.50	<0.50	--	--	
3/18/2014	<150	<10	<0.50	1.8	<0.50	<0.50	<0.50	<0.50	
6/26/2014	<150	<10	<0.50	1.9	<0.50	<0.50	<0.50	<0.50	
9/17/2014	<150	<10	<0.50	2.3	<0.50	<0.50	<0.50	<0.50	
3/12/2015	<150	<10	<0.50	2.1	<0.50	<0.50	<0.50	<0.50	
MW-5									
12/2/2013	--	<10	0.69	<0.50	<0.50	<0.50	--	--	
3/18/2014	<150	<10	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
6/26/2014	<150	<10	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
9/17/2014	<150	<10	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
3/12/2015	<150	<10	0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
MW-6									
12/2/2013	--	<10	10	<0.50	<0.50	<0.50	--	--	
3/18/2014	<150	<10	14	<0.50	<0.50	<0.50	<0.50	<0.50	
6/26/2014	<150	<10	13	<0.50	<0.50	<0.50	<0.50	<0.50	
9/17/2014	<150	<10	7.2	<0.50	<0.50	<0.50	<0.50	<0.50	
3/12/2015	<150	<10	5.0	<0.50	<0.50	<0.50	<0.50	<0.50	
MW-7									
12/2/2013	--	<10	<0.50	<0.50	<0.50	<0.50	--	--	
3/18/2014	<150	<10	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
6/26/2014	<150	<10	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
9/17/2014	<150	<10	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
3/12/2015	<150	<10	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	

Symbols & Abbreviations:

TBA = Tert-butyl alcohol

MTBE = Methyl tert-butyl ether

DIPE = Diisopropyl ether

ETBE = Ethyl tert-butyl ether

TAME = Tert-amyl methyl ether

1,2-DCA = 1,2-Dichloroethane

EDB = Ethylene dibromide

ug/L = Micrograms per liter

< = Below given laboratory detection limit

-- = Not measured or analyzed

**Table 4. Summary of Groundwater Gradient - Direction and Magnitude
Former BP Station #402, 1450 Fruitvale Avenue, Oakland, California**

Date Measured	Approximate Gradient Direction	Approximate Gradient Magnitude (ft/ft)
12/2/2013	East-Southeast	0.01
3/18/2014	Southeast	0.01
6/26/2014	South	0.01
9/17/2014	East-Northeast	0.01
3/12/2015	East	0.006

APPENDIX A

Summary of Previous Investigations

Atlantic Richfield Station No. 402 opened in 1950 and operated until an unknown time between 1983 when it was sold to Curtis L. Thomas. The Site continued to be used as a gas station for an uncertain amount of time. The Site was then used for numerous business purposes, including an auto supply store, a garage, and a tire store, through 1999.

In July 1998 a Phase I/II Environmental Site Assessment (ESA) was performed by Glenfos, Inc. The report indicated inconclusively that the Underground Storage Tanks (USTs) may still be present at the Site. Eight soil borings advanced to depths between 15 and 30 ft during the ESA found concentrations of TPH(g) of 190 mg/kg in the soil samples and 20,000 µg/L in the groundwater samples. Highest concentrations of contaminants were located in the former locations of fuel dispensers and product lines.

In May 1999, a subsurface investigation was performed by All Environmental, Inc. (AEI). AEI excavated at three locations: two excavations at a suspected former location of a waste oil tank and one excavation at the suspected location of the USTs. No USTs were found during these activities. Six soil samples and one groundwater sample were taken from the excavations and analyzed by McCampbell Analytical, Inc. Contaminants were found in the soil samples taken from the former UST location: 11mg/kg of TPH(g) and 0.059 mg/kg of Toluene. Elevated concentrations of lead were found in all samples, up to 80mg/kg in the soil samples and 20 µg/L in the groundwater sample. These results are included in Appendix A.

In August 1999 AEI advanced four soil borings were advanced to depths of 34 ft and collected several soil samples and one groundwater sample. These samples were analyzed for TPH(g), BTEX, and MTBE by McCampbell Analytical, Inc. One soil sample contained 21 mg/kg of TPH(g) at a depth of 15 ft. No concentrations of BTEX or MTBE were detected in the soil samples. The groundwater sample contained 690 µg/L of TPH(g), 72 µg/L of Benzene, and 3.8 µg/l of MTBE.

In September 2000 AEI installed three additional monitoring wells (MW-1 through MW-3) and obtained two soil samples from each boring. Groundwater from these wells was sampled in October 2000. Groundwater levels were also taken and they suggest a gradient of 0.116 toward the southeast. All samples were analyzed by McCampbell Analytical, Inc. for TPH(g), MTBE, and BTEX. Soil sample analytical results are shown below for samples which contained hydrocarbons:

Sample ID	TPH(g) mg/kg	MTBE mg/kg	Benzene mg/kg	Toluene mg/kg	Ethyl- Benzene mg/kg	Xylenes mg/kg
MW-1, 11.5 ft	15	ND	ND	0.31	ND	0.011
MW-2, 11 ft	73.0	ND	ND	0.044	0.0080	0.040
MW-3, 16 FT	360.0	ND	0.42	2.1	6.5	11.0

Groundwater sample analytical results are shown below:

Sample ID	TPH(g) µg/L	MTBE µg/L	Benzene µg/L	Toluene µg/L	Ethyl- Benzene µg/L	Xylenes µg/L
MW-1	4,500	ND	560	14	53	62
MW-2	4,600	ND	380	3.8	95	33
MW-3	12,000	ND	570	32	680	1,200

The highest concentration of TPH(g) in either soil or groundwater is found at MW-3, which is located at the former location of the pump island dispensers. MW-1 through MW-3 was located nearest to the former USTs, and samples taken from this well contain the lowest concentration of TPH(g).

In April 2002 AEI submitted a Quarterly Monitoring Report. A gradient of 0.032 ft/ft toward the northwest was observed during the quarter, which is the opposite direction of the historically measured gradient. TPH(g) was observed again in all of the wells, with the highest concentration in MW-3 (29,000 µg/L) and lowest in MW-1 (7,100 µg/L). Benzene concentration was highest in MW-3 (2,100 µg/L) and lowest in MW-1 (2,100 µg/L). Toluene concentration was highest in MW-3 (57 µg/L) and lowest in MW-2 (11 µg/L). Ethyl-benzene concentration was highest in MW-3 (2,500 µg/L) and lowest in MW-2 (220 µg/L). Xylenes were highest in MW-3 (1,700 µg/L) and lowest in MW-2 (39 µg/L).

In July 2002 AEI submitted a Groundwater Investigation Report which describes the results of another soil and water sampling event. TPH(g) and BTEX analytical results were within the ranges found during the previous sampling events. MTBE was found during this sampling event. The highest concentration was found in well MW-2 at 23 µg/L and boring AEI-15 at 14 µg/L. Other parameters were within the same ranges as the sampling event in April of 2002. AEI-15 is located at the northwestern corner of the Site and MW-2 is located on the western edge of the Site. The groundwater gradient during this event was 0.04 to the southwest.

In October 2002 AEI submitted a Site Summary and Risk Evaluation Report determining that the plume is relatively well-contained due to the subsurface geology. AEI claimed that the Site's clayey soils result in both slow natural attenuation and high containment, as well as the observed unstable groundwater gradient. Citing the age of the plume (>20 years) and the low risk of adverse environmental or health effects, AEI requested a consideration for Site closure from Alameda County Environmental Health. This request was denied.

In March 2005 AEI submitted a work plan to construct five additional monitoring wells (MW-4 through MW-7) in order to better delineate the extents of the contaminant plume. ACEH conditionally approved in June 2006, and they required one additional well to be constructed. In July 2006, AEI requested a deadline extension to October 3, 2006 to construct the wells and submit all required reporting. After this, there are no obtainable public records detailing the completed work or subsequent sampling data until 2009.

In January 2009 Broadbent and Associates, Inc. (BAI) submitted a Fourth Quarter Quarterly Status Report (QSR) stating that there was no environmental work completed at the Site and summarizing recent correspondence with ACEH and the other Responsible Parties (RPs). Attempts were made to involve the other RPs in the cleanup efforts with little success until an access agreement was reached during the fourth quarter of 2011.

During the first quarter of 2012, BAI determined that the monitoring wells previously installed at the Site are no longer present nor accessible. It appears that they were destroyed without permits, guidance, or oversight from the Alameda County Public Works Agency. BAI then submitted a work plan to install four new groundwater monitoring wells during June 2012, which was then retracted and resubmitted during October 2012 in order to include a soil gas vapor intrusion assessment in the scope of work. A revised work plan was submitted during May 2013 and implemented during November 2013.

Three sampling events have taken place since the new well installations. The highest levels of petroleum hydrocarbons were noted in MW-4, which is located in the center of the Site between the former pump island and UST locations. Generally, decreasing petroleum hydrocarbon concentrations were noted in each well with the exception of MW-4. Petroleum impacts are understood to be small and limited primarily to the former source area, near MW-4.

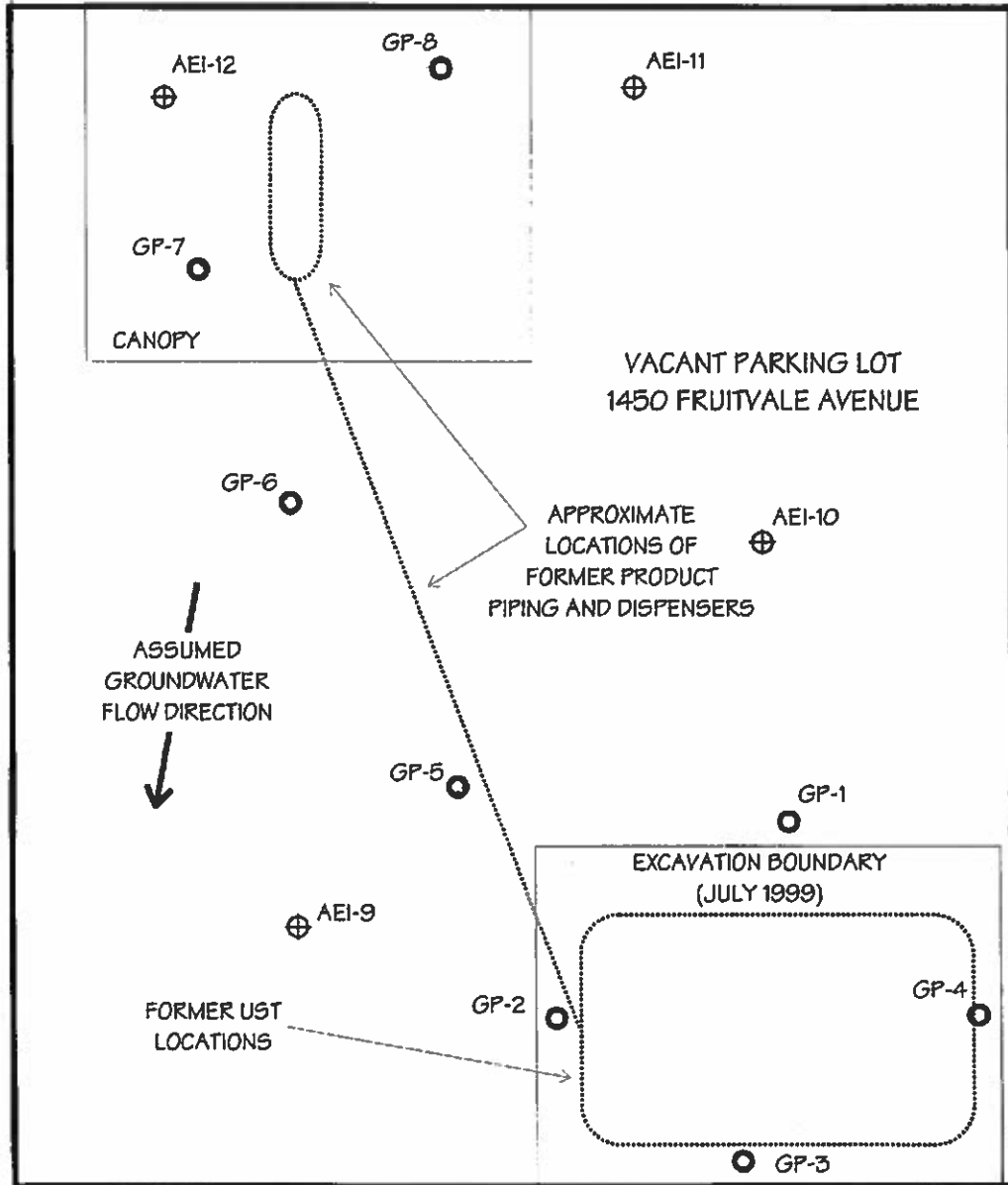
APPENDIX B

Historic Site Data

FRUITVALE AVENUE

SIDEWALK

BUILDING



BUILDING

SIDEWALK

FARNAM STREET

KEY

- ⊕ BORING LOCATIONS PERFORMED BY AEI AUGUST 24, 1999
- APPROXIMATE LOCATIONS OF SAMPLING PERFORMED BY GLENFOS; JULY, 1998

SCALE: 1" = 10'



AEI CONSULTANTS
 901 MORAGA ROAD, SUITE C, LAFAYETTE, CA

SOIL BORING LOCATIONS

1450 FRUITVALE AVENUE
 OAKLAND, CALIFORNIA

FIGURE 2

**Table 1:
Soil Sample Analytical Results**

Sample ID	Consultant	Sample Date	TPH-g mg/kg	MTBE mg/kg	Benzene mg/kg	Toluene mg/kg	Ethyl Benzene mg/kg	Xylenes mg/kg	Total Lead mg/kg
GP-1 10'	Glenfos	7/9/98	10	-	<0.005	0.022	0.015	<0.01	-
GP-2 10'	Glenfos	7/9/98	1.5	-	0.017	<0.005	<0.005	<0.01	-
GP-2 15'	Glenfos	7/9/98	27	-	0.017	0.056	0.052	0.51	-
GP-2 30'	Glenfos	7/9/98	2.5	-	<0.005	<0.005	<0.005	<0.01	-
GP-3 10'	Glenfos	7/9/98	95	-	0.59	0.42	1.1	1.5	7.3
GP-3 15'	Glenfos	7/9/98	2.5	-	0.055	0.018	0.055	0.26	-
GP-3 20'	Glenfos	7/9/98	1.6	-	0.02	<0.005	0.02	0.032	-
GP-3 25'	Glenfos	7/9/98	<1	-	<0.005	<0.005	<0.005	<0.01	-
GP-4 10'	Glenfos	7/9/98	2.5	-	0.017	<0.005	0.003	0.021	4.1
GP-5 10'	Glenfos	7/9/98	6.5	-	<0.005	0.022	0.018	0.041	-
GP-5 15'	Glenfos	7/9/98	19	-	0.077	0.016	0.43	0.49	-
GP-5 20'	Glenfos	7/9/98	<1	-	<0.005	<0.005	<0.005	<0.01	-
GP-6 5'	Glenfos	7/9/98	<1	-	<0.005	<0.005	<0.005	<0.01	-
GP-6 10'	Glenfos	7/9/98	7.7	-	0.008	0.015	0.012	0.047	6.2
GP-6 15'	Glenfos	7/9/98	190	-	0.34	0.53	2.3	4.7	-
GP-6 20'	Glenfos	7/9/98	28	-	0.083	0.081	0.052	0.19	-
GP-7 10'	Glenfos	7/9/98	86	-	<0.005	0.088	0.09	0.5	-
GP-7 15'	Glenfos	7/9/98	2.7	-	0.008	0.012	<0.005	0.031	-
GP-8 10'	Glenfos	7/9/98	24	-	0.022	0.061	0.071	0.45	-
GP-8 15'	Glenfos	7/9/98	5.8	-	0.021	0.014	0.022	0.06	-
GP-8 20'	Glenfos	8/23/99	<1	-	<0.005	<0.005	<0.005	<0.01	-
AEI-9 10'	AEI	8/23/99	<1	<0.05	<0.005	<0.005	<0.005	<0.005	-
AEI-9 20'	AEI	8/23/99	<1	<0.05	<0.005	<0.005	<0.005	<0.005	-
AEI-10 10'	AEI	8/23/99	77	<0.05	<0.005	<0.005	0.078	<0.005	-
AEI-10 15'	AEI	8/23/99	69	0.071	0.1	0.21	0.23	<0.005	-
AEI-11 10'	AEI	8/23/99	<1	<0.05	<0.005	<0.005	<0.005	<0.005	-
AEI-11 15'	AEI	8/23/99	210	<0.40	<0.020	1.1	1.2	2.4	-
AEI-12 10'	AEI	8/23/99	24	<0.05	<0.005	0.12	<0.005	<0.005	-
AEI-12 15'	AEI	8/23/99	120	<0.40	<0.020	<0.020	1.6	1.6	-
MDL			1.0	0.05	0.005	0.005	0.005	0.005	

- St. Header
- Red Header
- Mid Header
- St. Header
- Red Header

MDL = Method Detection Limit
 mg/kg = milligrams per kilogram (ppm)
 - Sample not analyzed for this chemical
 TPH-g = Total petroleum hydrocarbons as gasoline

**Table 2:
Groundwater Sample Analytical Results**

Sample ID	Consultant	Sample Date	TPH-g µg/L	MTBE µg/L	Benzene µg/L	Toluene µg/L	Ethyl- Benzene µg/L	Xylenes µg/L	Lead µg/L
GP 1	Glenfos	7/9/98	170	-	0.53	<0.5	1.2	2.0	-
GP 4	Glenfos	7/9/98	210	-	<0.5	<0.5	0.58	<1	11
GP 5	Glenfos	7/9/98	17,000	-	42	24	820	110	-
GP 8	Glenfos	7/9/98	20,000	<10	1,000	19	420	290	9.5
AEI-9W	AEI	8/23/99	690	3.8	72	0.79	29	24	-
MDL			50	5.0	0.5	0.5		1.5	2.5

MDL = Method Detection Limit

ND = Not detected above the Method Detection Limit (unless otherwise noted)

µg/L = micrograms per liter (ppb)

mg/L = milligrams per liter (ppm)

- Sample not analyzed for this chemical

TPH-g = Total petroleum hydrocarbons as gasoline

FRUITVALE AVENUE

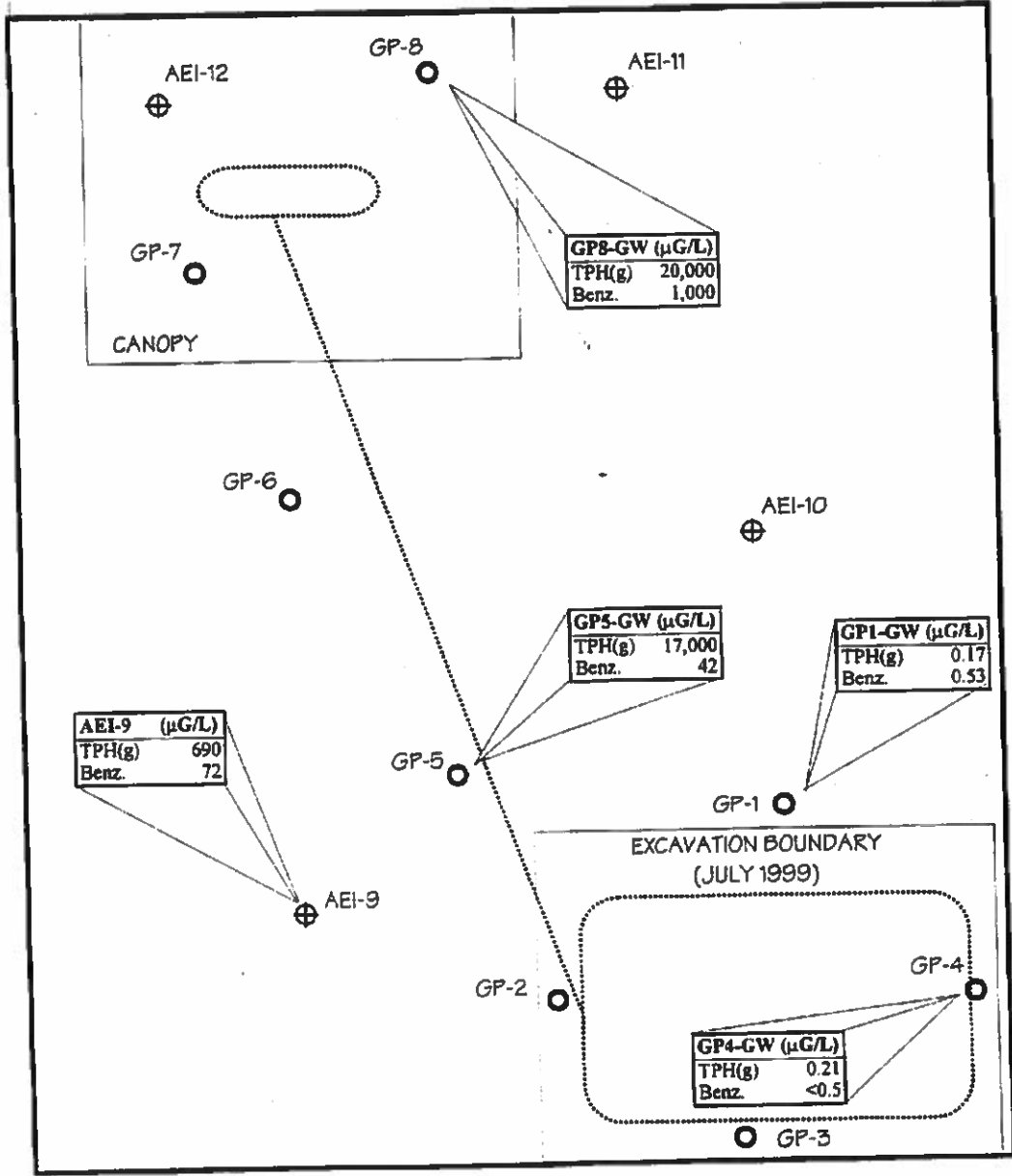
SIDEWALK

BUILDING

BUILDING

SIDEWALK

FARNAM STREET



GP8-GW (µG/L)
TPH(g) 20,000
Benz. 1,000

AEI-9 (µG/L)
TPH(g) 690
Benz. 72

GP5-GW (µG/L)
TPH(g) 17,000
Benz. 42

GP1-GW (µG/L)
TPH(g) 0.17
Benz. 0.53

GP4-GW (µG/L)
TPH(g) 0.21
Benz. <0.5

KEY

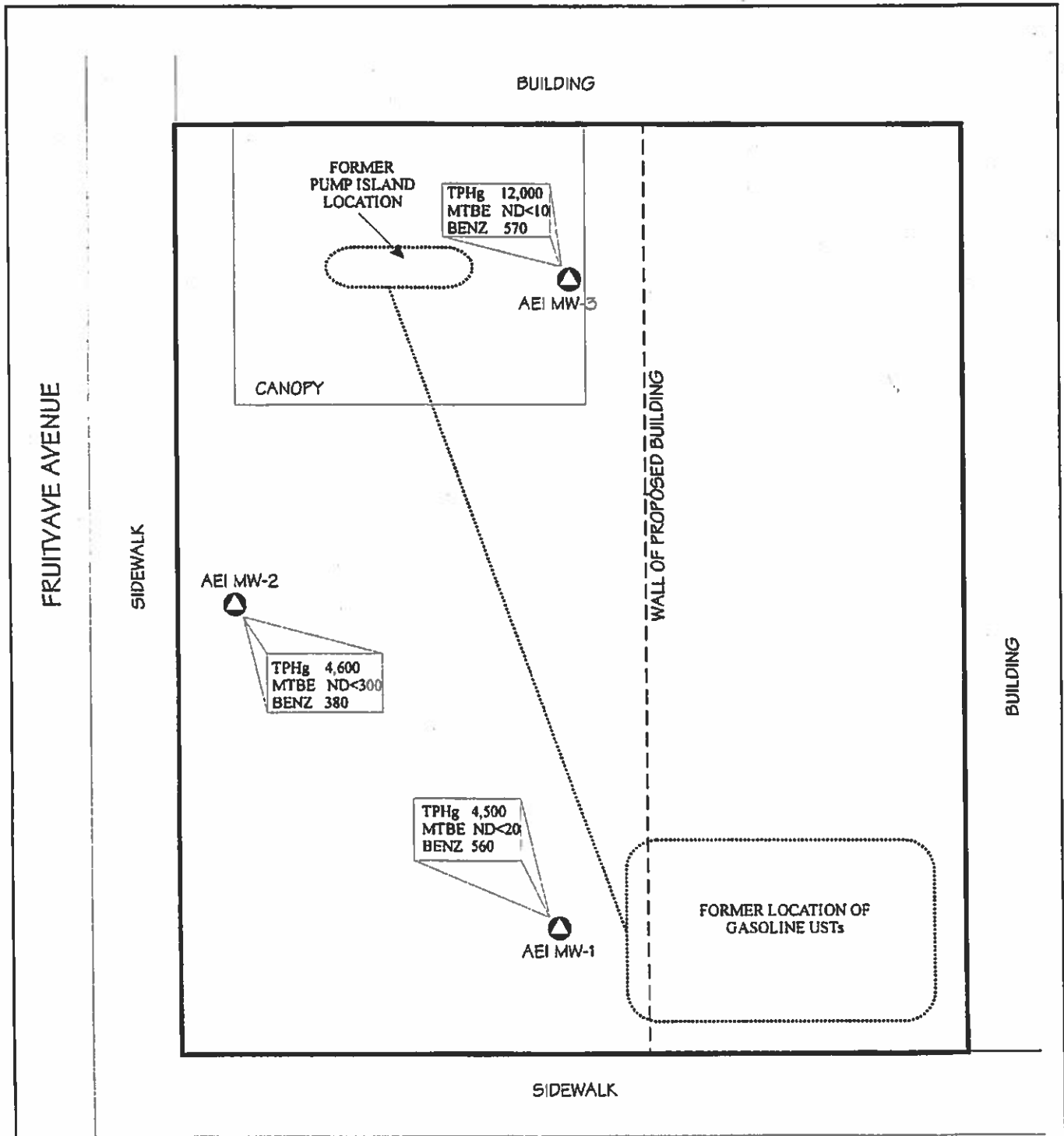
- ⊕ BORING LOCATIONS PERFORMED BY AEI AUGUST 24, 1999
- APPROXIMATE LOCATIONS OF SAMPLING PERFORMED BY GLENFOS; JULY, 1998
- TPH(G) = Total Petroleum Hydrocarbons as gasoline
- Benz. = Benzene

SCALE: 1" = 10'



AEI CONSULTANTS
 3210 OLD TUNNEL RD, SUITE B, LAFAYETTE, CA
 PREVIOUS SOIL BORING LOCATIONS
 WITH GROUNDWATER SAMPLE ANALYTICAL

1450 FRUITVALE AVENUE OAKLAND, CALIFORNIA	FIGURE 2
--	----------




KEY

▲ WELL LOCATIONS INSTALLED BY AEI

TPHg = Total Petroleum Hydrocarbons as gasoline
MTBE = Methyl Tertiary Butyl Ether
Benz = Benzene

All samples measured in ug/L
(micrograms per Liter)

SCALE: 1" = 10'



AEI CONSULTANTS
3210 OLD TUNNEL RD, SUITE B, LAFAYETTE, CA

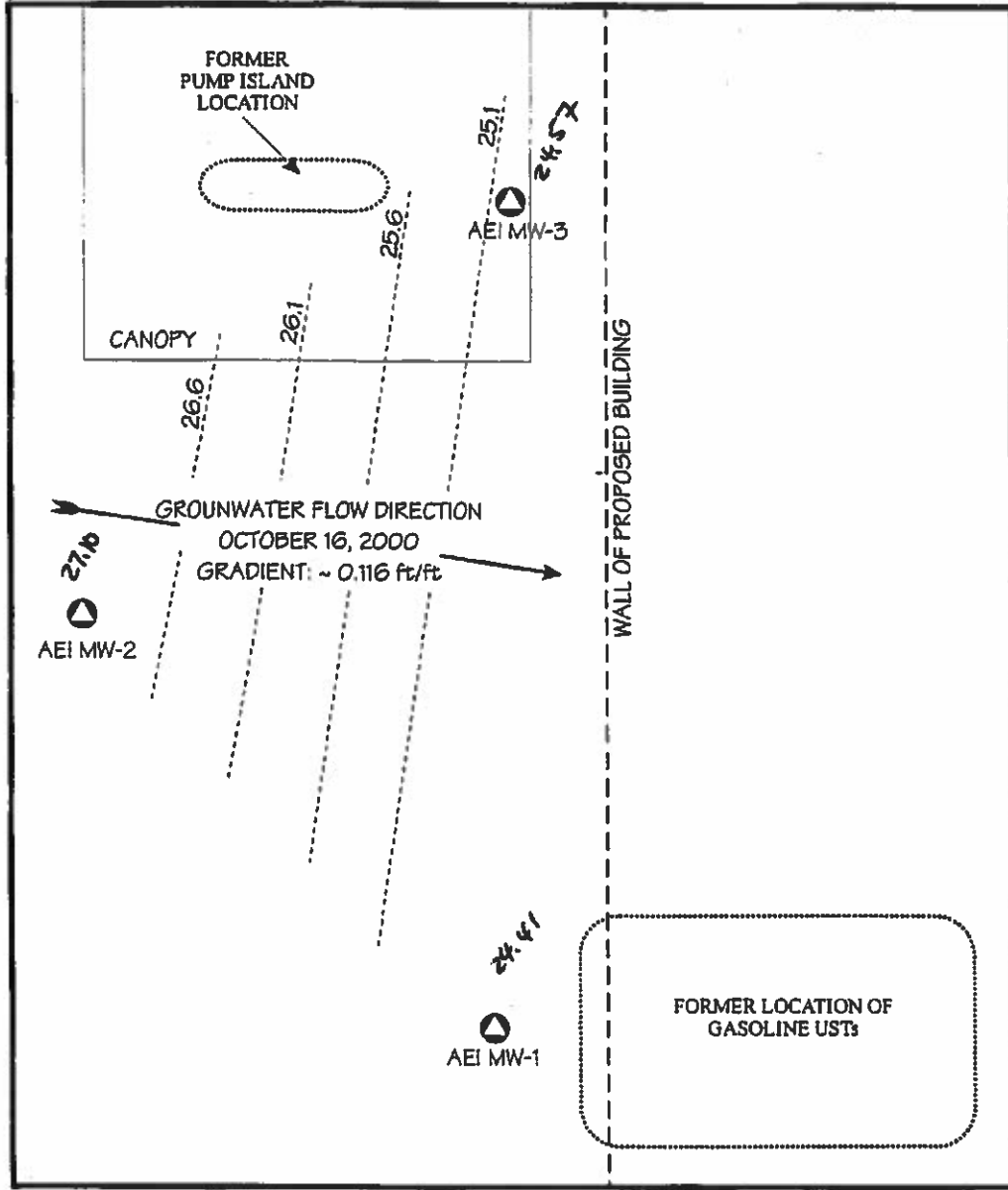
WELL LOCATIONS WITH
GROUNDWATER SAMPLE ANALYTICAL

1450 FRUITVALE AVENUE | **FIGURE 3**
OAKLAND, CALIFORNIA

FRUITVALE AVENUE

SIDEWALK

BUILDING



SIDEWALK

FARNAM STREET

KEY

● WELL LOCATIONS INSTALLED BY AEI

26.6 GROUNDWATER ELEVATION CONTOUR (FEET) 10/16/00

SCALE: 1" = 10'



AEI CONSULTANTS

3210 OLD TUNNEL RD, SUITE B, LAFAYETTE, CA

WELL LOCATIONS WITH
GROUNDWATER GRADIENT MAP

1450 FRUITVALE AVENUE
OAKLAND, CALIFORNIA

FIGURE 4

Table 1
Groundwater Elevations

Well ID	Date	Well Elevation (ft msl)	Depth to Water (ft)	Groundwater Elevation (ft msl)
MW-1	10/16/00	42.13	17.72	24.41
MW-2	10/16/00	42.08	14.98	27.10
MW-3	10/16/00	42.55	17.98	24.57

Notes:

All well elevations are measured from the top of the casing and not from the ground surface

ft msl = feet above mean sea level

**Table 2:
Soil Sample Analytical Results-October 2000**

Sample ID	TPH-g mg/kg	MTBE mg/kg	Benzene mg/kg	Toluene mg/kg	Ethyl- benzene mg/kg	Xylenes mg/kg
MW-1 6.5'	<1.0	<.05	<.005	<.005	<.005	<.005
MW-1 11.5	15.0 ✓	<.05	<.005	0.31	<.005	0.011
MW-2 6.5'	<1.0	<.05	<.005	<.005	<.005	<.005
MW-2 11'	73.0 ✓	<.05	<.005	0.044	0.0080	0.040
MW-3 6.5'	<1.0	<.05	<.005	<.005	<.005	<.005
MW-3 16'	368.0 ✓	<1.0	0.42	2.1	6.5	11.0
MRL	1.0	0.05	0.005	0.005	0.005	0.005

MRL = Method Reporting Limit

TPH-g = Total Petroleum Hydrocarbons as gasoline

MTBE = Methyl tertiary butyl ether

mg/kg = milligram per kilogram

Table 3
Groundwater Sample Analytical Data-October 2000

Well/Sample ID	Date Collected	Consultant Lab	TPHg $\mu\text{g/L}$	MTBE $\mu\text{g/L}$	Benzene $\mu\text{g/L}$	Toluene $\mu\text{g/L}$	Ethylbenzene $\mu\text{g/L}$	Xylenes $\mu\text{g/L}$
MW-1	10/16/00	AEI/MAI	4,500	ND<20	560	14	53	62
MW-2	10/16/00	AEI/MAI	4,600	ND<300	380	3.8	95	33
MW-3	10/16/00	AEI/MAI	12,000	ND<10	570	32	680	1,200
MRL			50.0	5.0	0.5	0.5	0.5	0.5

MRL = Maximum Reporting Limit

$\mu\text{g/L}$ micrograms per liter

AEI AEI Consultants

MAI McCampbell Analytical, Inc.

TPHg total petroleum hydrocarbons as gasoline

MTBE methyl tertiary butyl ether

ND not detected

FRUITVALE AVENUE

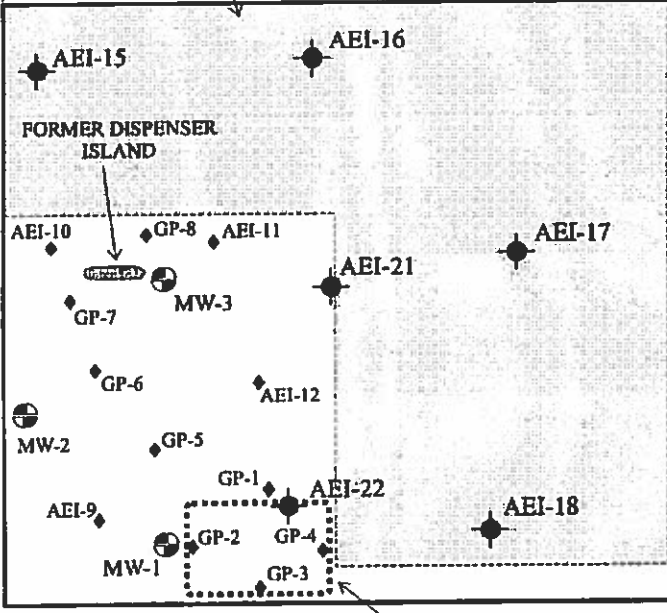
SIDEWALK

COMMERCIAL

FORMER BUILDING FOOTPRINT

RESIDENTIAL

PROPERTY BOUNDARY



AEI-14

AEI-15

AEI-16

AEI-20

FORMER DISPENSER ISLAND

AEI-10

GP-8

AEI-11

AEI-21

AEI-17

GP-7

MW-3

GP-6

AEI-12

MW-2

GP-5

AEI-9

GP-1

AEI-22

AEI-18

MW-1

GP-2

GP-4

AEI-19

AEI-13

EXPLORATORY EXCAVATION

SIDEWALK

FARNAM STREET

RESIDENTIAL

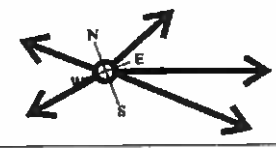
RESIDENTIAL

KEY

- Existing 2" Monitoring Wells
- ◆ Temporary Borings: 1998-1999
- ◆ Temporary Borings: June 2002

SCALE: 1" = 30'

GROUNDWATER FLOW DIRECTION ROSE DIAGRAM (1/2 in = 1 episode)

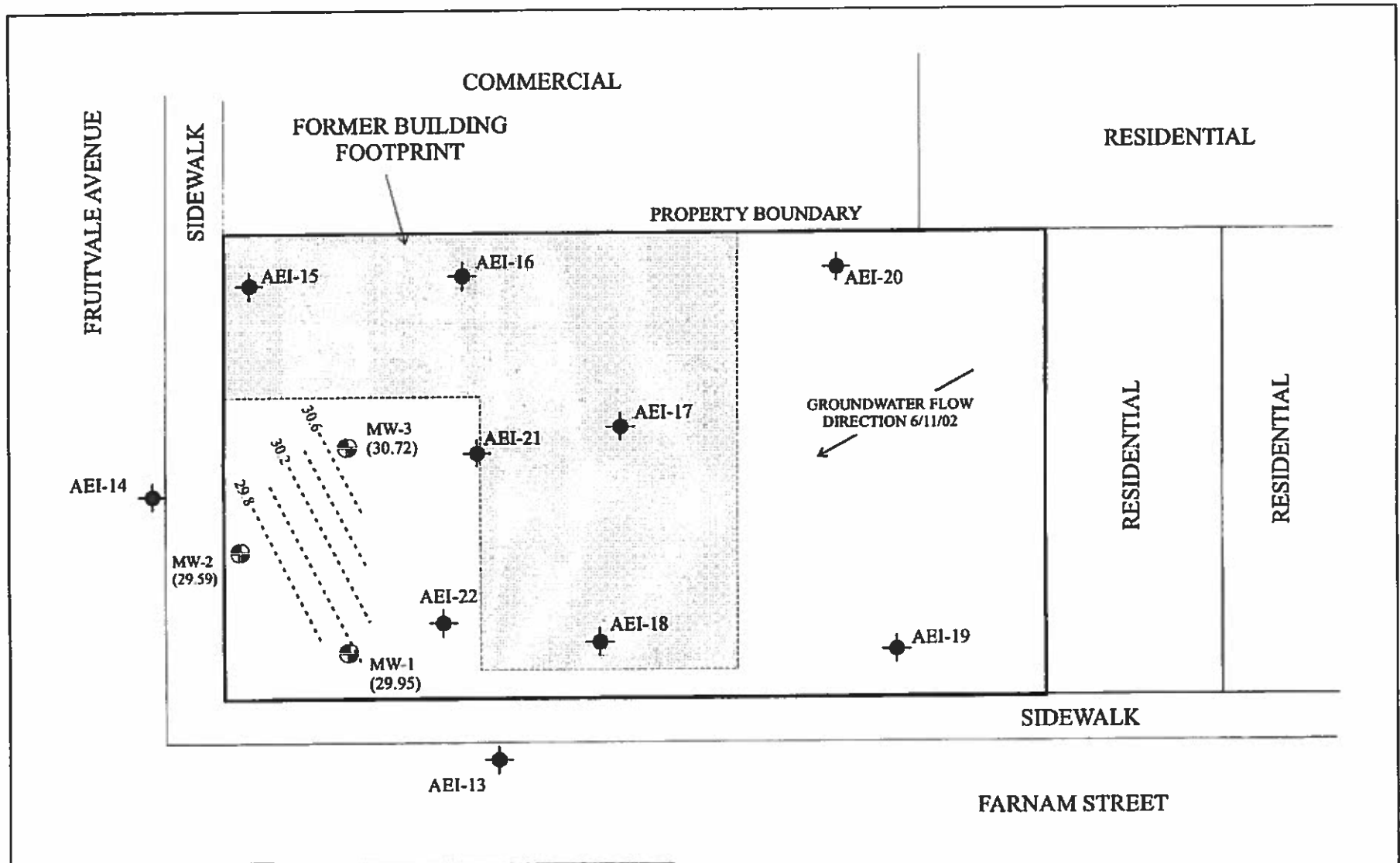


AEI CONSULTANTS
 3210 OLD TUNNEL ROAD, SUITE B, LAFAYETTE, CA

SITE PLAN

1450 FRUITVALE AVENUE
 OAKLAND, CALIFORNIA

FIGURE 3
 AEI PROJECT NO 5183

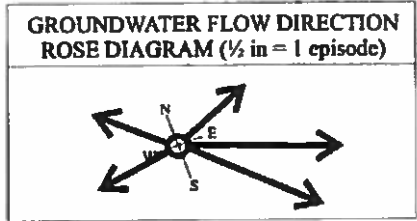


KEY

- Existing 2" Monitoring Wells
- ◆ Temporary Borings: June 2002

Contour Interval = 0.2 ft amsl

SCALE: 1" = 30'



AEI CONSULTANTS
3210 OLD TUNNEL ROAD, SUITE B, LAFAYETTE, CA

WATER TABLE CONTOURS

1450 FRUITVALE AVENUE OAKLAND, CALIFORNIA	FIGURE 4 AEI PROJECT NO 5183
--	---------------------------------

FRUITVALE AVENUE

SIDEWALK

COMMERCIAL

FORMER BUILDING
FOOTPRINT

PROPERTY BOUNDARY

RESIDENTIAL

AEI-15
TPHg - <50
Benz. - <0.5

AEI-16
TPHg - 190
Benz. - 0.86

AEI-20
TPHg - 170
Benz. - 0.81

AEI-14
TPHg - 830
Benz. - 0.56

MW-2
TPHg - 4,400
Benz. - 380

AEI-21
TPHg - 2,200
Benz. - 36

AEI-17
TPHg - 1,700
Benz. - 56

RESIDENTIAL

RESIDENTIAL

MW-1
TPHg - 3,400
Benz. - 620

AEI-22

AEI-18
TPHg - 780
Benz. - 10

AEI-19
TPHg - <50
Benz. - <0.5

SIDEWALK

AEI-13
TPHg - <50
Benz. - <0.5

FARNAM STREET

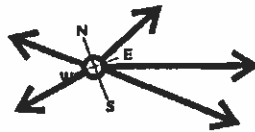
KEY

- Existing 2" Monitoring Wells
- ◆ Temporary Borings: June 2002

Sample Results in µg/l.

SCALE: 1" = 30'

GROUNDWATER FLOW DIRECTION
ROSE DIAGRAM (1/2 in = 1 episode)



AEI CONSULTANTS
3210 OLD TUNNEL ROAD, SUITE B, LAFAYETTE, CA

**GROUNDWATER SAMPLE ANALYTICAL
RESULTS - JUNE 2002**

1450 FRUITVALE AVENUE
OAKLAND, CALIFORNIA

FIGURE 5
AEI PROJECT NO 5183

Table 1
Soil Sample Analytical Data: SB-13 to SB-22

Sample ID	TPH-g mg/kg	MTBE mg/kg	Benzene mg/kg	Toluene mg/kg	Ethyl Benzene mg/kg	Xylenes mg/kg
AEI-13 10'	<1	<0.05	<0.005	<0.005	<0.005	<0.005
AEI-14 10'	<1	<0.05	<0.005	<0.005	<0.005	<0.005
AEI-15 10'	<1	<0.05	<0.005	<0.005	<0.005	<0.005
AEI-16 10'	<1	<0.05	<0.005	<0.005	<0.005	<0.005
AEI-16 19'	41	<0.2	<0.02	<0.02	0.038	0.079
AEI-17 10'	<1	<0.5	<0.005	<0.005	<0.005	<0.005
AEI-17 20'	290	<0.05	0.84	1.3	1.8	2.8
AEI-18 4'	<1	<0.05	<0.005	<0.005	<0.005	<0.005
AEI-18 14'	290	<0.02*	<0.2	0.91	2.3	2.9
AEI-19 15'	<1	<0.05	<0.005	<0.005	<0.005	<0.005
AEI-20 10'	<1	<0.05	<0.005	<0.005	<0.005	<0.005
AEI-20 20'	42	<0.5	<0.05	0.20	0.12	0.15
AEI-21 5'	<1	<0.05	<0.005	<0.005	<0.005	<0.005
AEI-21 13'	12	<0.05	<0.005	0.090	0.028	<0.005
AEI 22 10'	74	<0.1	0.0086	0.58	0.11	0.26
AEI 22 20'	5	<0.05	0.30	0.016	0.26	0.42
MDL	1.0	0.05	0.005	0.005	0.005	0.005

MDL = Method Detection Limit

mg/kg = milligrams per kilogram (ppm)

- Sample not analyzed for this chemical

TPH-g = Total petroleum hydrocarbons as gasoline

* MTBE by EPA method 8260, all others by 602/8020

Table 2
Groundwater Sample Analytical Data: SB-13 to SB-22

Sample ID	TPH-g µg/L	MTBE µg/L	Benzene µg/L	Toluene µg/L	Ethyl- Benzene µg/L	Xylenes µg/L
MW-13 W	<50	<5.0	<0.5	<0.5	<0.5	<0.5
MW-14 W	830	<5.0	0.56	2.7	1.2	2.9
MW-15 W	<50	14*	<0.5	<0.5	<0.5	<0.5
MW-16 W	190	<5.0	0.86	1.0	0.75	1.3
MW-17 W	1,700	<0.5*	56	2.5	89	69
MW-18 W	780	<5.0	10	1.1	41	20
MW-19 W	<50	<5.0	<0.5	<0.5	<0.5	<0.5
MW-20 W	170	<5.0	0.81	0.55	7.7	3.1
MW-21 W	2,200	2.8*	36	<5.0	110	58
MW-22 W	25000	<12*	3800	290	1100	1900

MDL = Method Detection Limit

ND = Not detected above the Method Detection Limit (unless otherwise noted)

µg/L = micrograms per liter (ppb)

- Sample not analyzed for this chemical

TPH-g = Total petroleum hydrocarbons as gasoline

* MTBE by EPA method 8260, all others by 602/8020

**Table 3
Water Table Data**

Well ID	Date	Well Elevation (ft msl)	Depth to Water (ft)	Groundwater Elevation (ft msl)
MW-1	10/16/00	42.13	17.72	24.41
	1/19/01	42.13	9.15	32.98
	4/26/01	42.13	9.40	32.73
	8/3/01	42.13	12.38	29.75
	11/5/01	42.13	16.22	25.91
	3/29/02	42.13	7.96	34.17
	6/11/02	42.13	12.18	29.95
MW-2	10/16/00	42.08	14.98	27.10
	1/19/01	42.08	9.00	33.08
	4/26/01	42.08	8.34	33.74
	8/3/01	42.08	11.70	30.38
	11/5/01	42.08	15.08	27.00
	3/29/02	42.08	8.96	33.12
	6/11/02	42.08	12.49	29.59
MW-3	10/16/00	42.55	17.98	24.57
	1/19/01	42.55	10.90	31.65
	4/26/01	42.55	9.21	33.34
	8/3/01	42.55	12.67	29.88
	11/5/01	42.55	15.90	26.65
	3/29/02	42.55	9.20	33.35
	6/11/02	42.55	11.83	30.72

Episode #	Date	Average Water Table (ft msl)	Change from Previous Episode	Flow direction (gradient)
1	10/16/00	25.36	-	E/SE (0.116)
2	1/19/01	32.57	+7.21	E/NE (0.041)
3	4/26/01	33.27	+0.70	SE (0.034)
4	8/3/01	30.00	-3.27	ESE (0.024)
5	11/5/01	26.52	-3.48	SE (0.033)
6	3/29/02	33.55	+7.03	NW (0.032)
7	6/11/02	30.09	-3.46	SW (0.040)

Notes:

All well elevations are measured from the top of the casings
ft msl = feet above mean sea level

Table 4
Monitoring Well Sample Analytical Data

Well/Sample ID	Date Collected	Consultant/ Lab	TPHg µg/L	MTBE µg/L	Benzene µg/L	Toluene µg/L	Ethylbenzene µg/L	Xylenes µg/L
MW-1	10/16/00	AEI/MAI	4,500	<20	560	14	53	62
	01/19/01	AEI/MAI	13,000	<100	790	46	1,100	210
	04/26/01	AEI/MAI	7,500	<30	470	23	720	120
	08/03/01	AEI/MAI	4,500	<10	440	11	55	6.6
	11/05/01	AEI/MAI	1,700	<10	100	6.0	4.6	2.1
	03/29/02	AEI/MAI	9,500	ND<100	880	32	400	59
	06/11/02	AEI/MAI	3,400	2.4*	620	9.7	75	11
MW-2	10/16/00	AEI/MAI	4,600	<300	380	3.8	95	33
	01/19/01	AEI/MAI	4,200	<10	450	4.7	120	50
	04/26/01	AEI/MAI	5,600	<20	810	12	210	65
	08/03/01	AEI/MAI	2,900	<20	360	3	97	46
	11/05/01	AEI/MAI	2,400	<85	280	3.2	76	25
	03/29/02	AEI/MAI	7,100	ND<100	930	11	220	39
	06/11/02	AEI/MAI	4,400	23*	680	8.1	160	38
MW-3	10/16/00	AEI/MAI	12,000	<10	570	32	680	1,200
	01/19/01	AEI/MAI	27,000	<200	3,400	110	2,200	2,700
	04/26/01	AEI/MAI	33,000	<200	3,300	190	2,800	3,400
	08/03/01	AEI/MAI	23,000	<50	2,300	52	1,800	1,400
	11/05/01	AEI/MAI	30,000	<200	1,900	58	2,000	1,600
	03/29/02	AEI/MAI	29,000	ND<100	2,100	57	2,500	1,700
	06/11/02	AEI/MAI	22,000	<2.5*	2,100	44	2,300	1,600
MRL			50.0	5.0	0.5	0.5	0.5	0.5

MRL = Method Reporting Limit, unless otherwise shown

µg/L = micrograms per liter

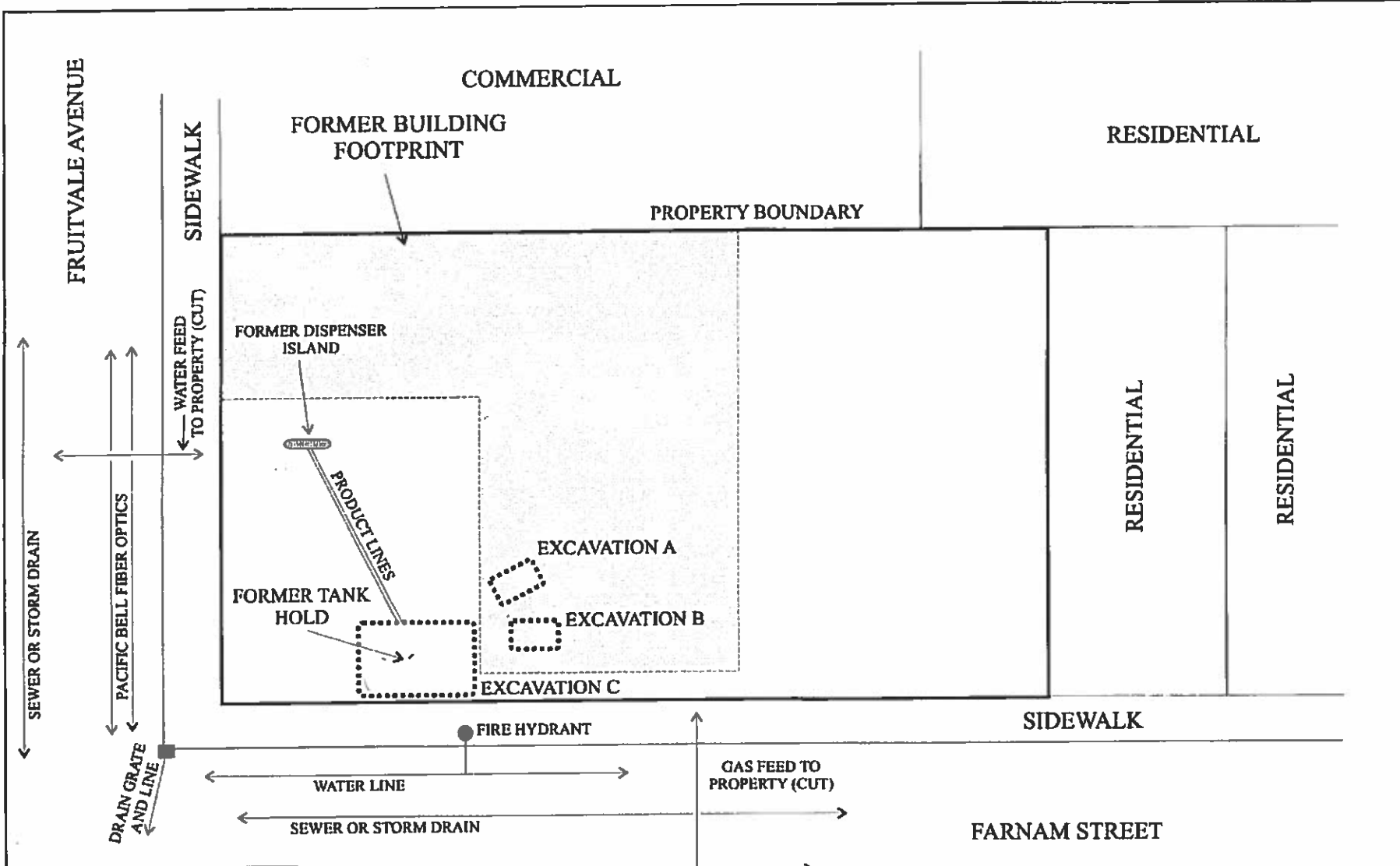
AEI = AEI Consultants

MAI = McCampbell Analytical, Inc.


TPHg = total petroleum hydrocarbons as gasoline


MTBE = methyl tertiary butyl ether

* MTBE concentrations by 8260, all others by 602/8020



KEY

 Extent of Exploratory Excavations: May 1999

 Utility Lines



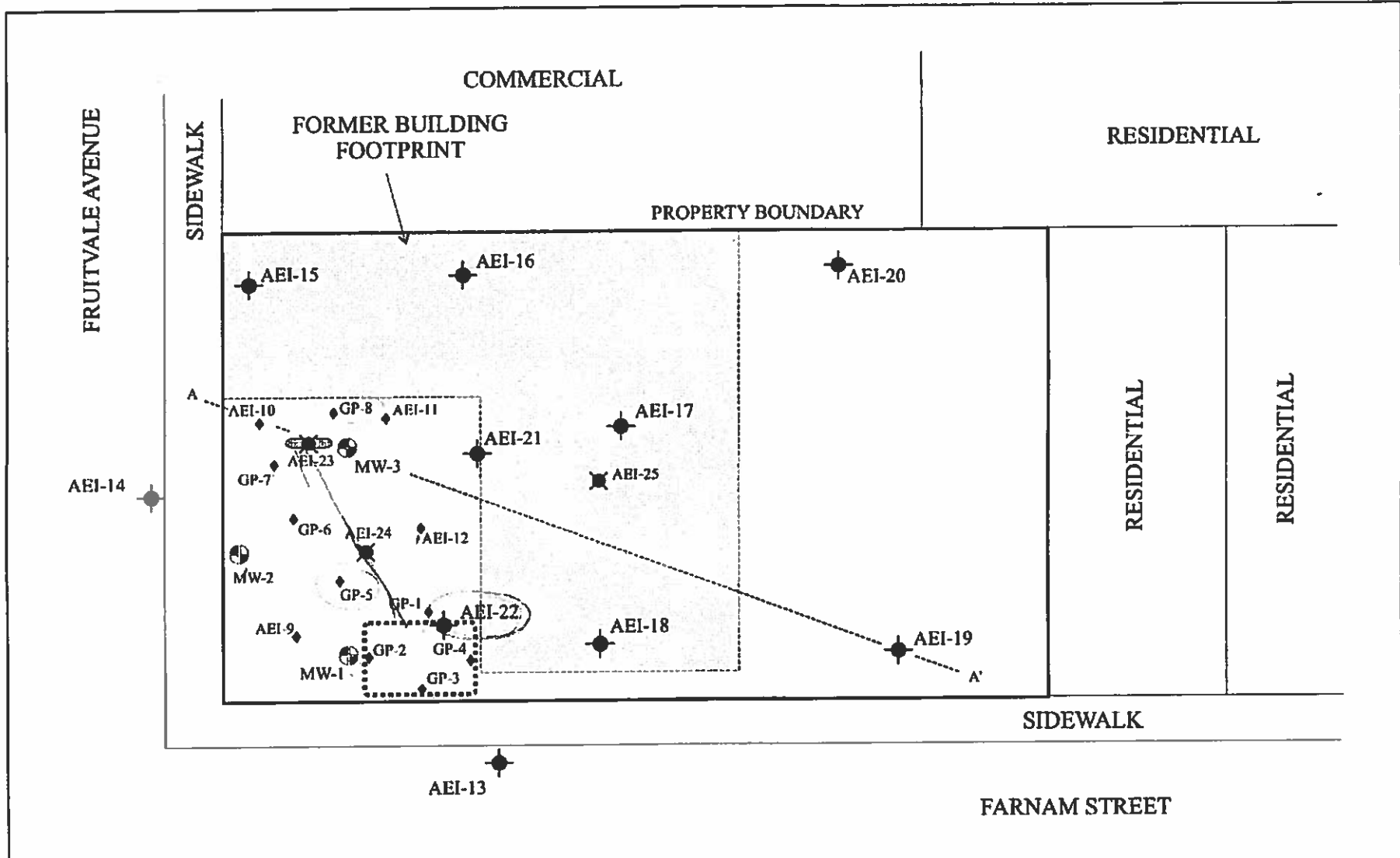
SCALE: 1 in = 30 ft

0' 15' 30'

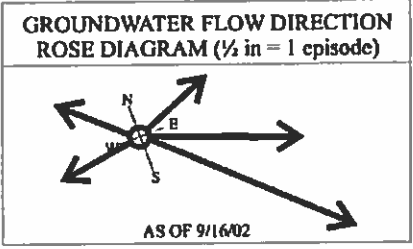
AEI CONSULTANTS
 3210 OLD TUNNEL ROAD, SUITE B, LAFAYETTE, CA

SITE PLAN

1450 FRUITVALE AVENUE OAKLAND, CALIFORNIA	FIGURE 3 AEI PROJECT NO 5624
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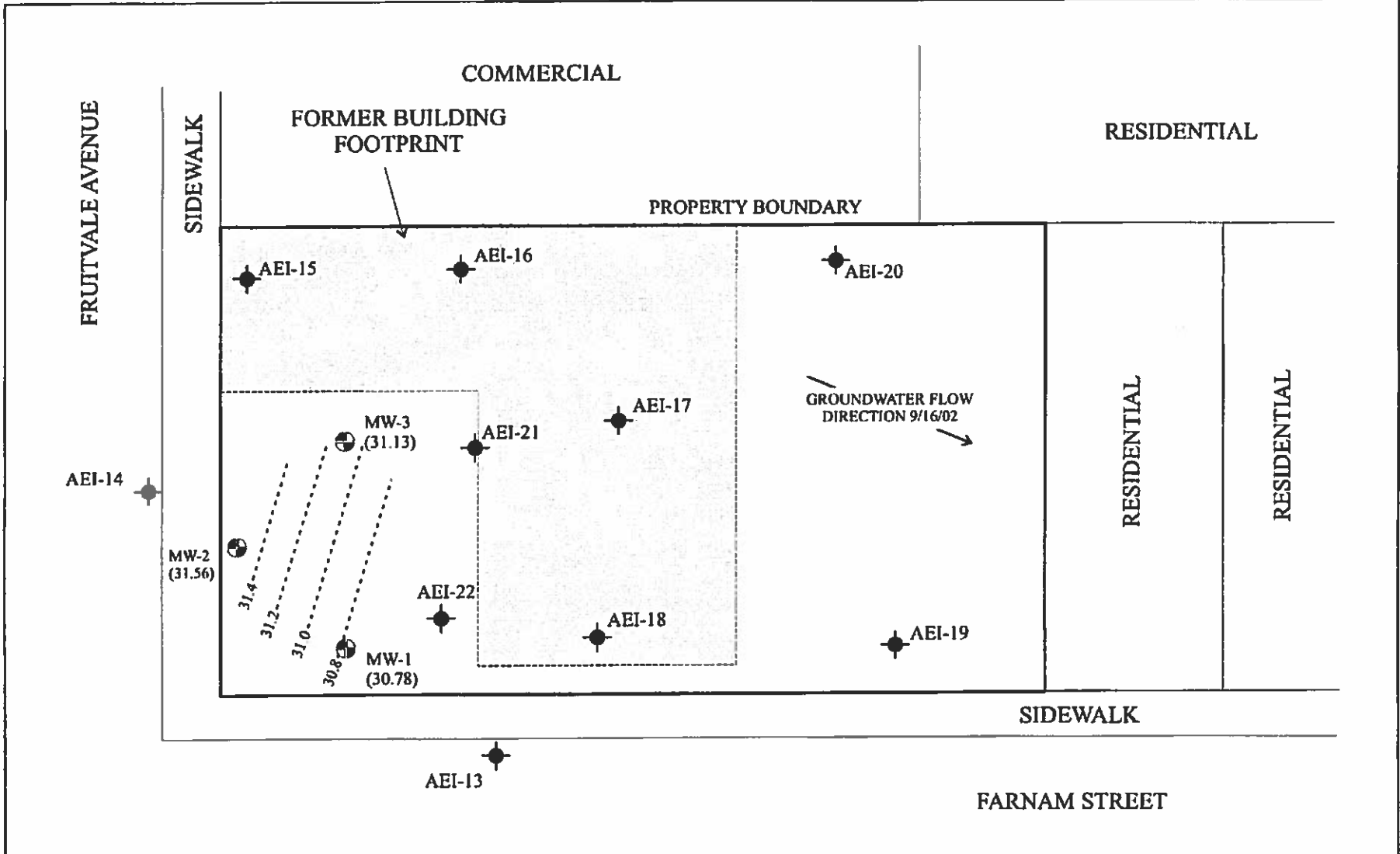


KEY	
	Existing 2" Monitoring Wells
	Temporary Borings: 1998-1999
	Temporary Borings: June 2002
	Hand Auger Borings: Sept. 2002

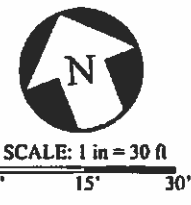
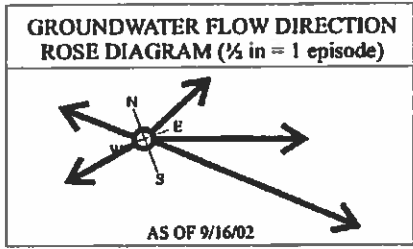


SCALE: 1 in = 30 ft
0' 15' 30'

AEI CONSULTANTS 3210 OLD TUNNEL ROAD, SUITE B, LAFAYETTE, CA	
BORING AND WELL LOCATIONS	
1450 FRUITVALE AVENUE OAKLAND, CALIFORNIA	FIGURE 4 AEI PROJECT NO 5624



KEY
● Existing 2" Monitoring Wells
◆ Temporary Borings: June 2002
Contour Interval = 0.2 ft amsl
SCALE: 1" = 30'



AEI CONSULTANTS 3210 OLD TUNNEL ROAD, SUITE B, LAFAYETTE, CA	
WATER TABLE CONTOURS	
1450 FRUITVALE AVENUE OAKLAND, CALIFORNIA	FIGURE 5 AEI PROJECT NO 5624

FRUITVALE AVENUE

SIDEWALK

PROPOSED BUILDING FOOTPRINT

COMMERCIAL

PROPERTY BOUNDARY

RESIDENTIAL

AEI-14
G - 830
B - 0.56
T - 2.7
E - 1.2
X - 2.9
M - <5.0

AEI-15
G - <50
B - <0.5
T - <0.5
E - <0.5
X - <0.5
M - 14

AEI-16
G - 190
B - 0.86
T - 1.0
E - 0.75
X - 1.3
M - <5.0

AEI-20
G - 170
B - 0.81
T - 0.55
E - 7.7
X - 3.1
M - <5

MW-2
G - 7,400
B - 360
T - 8.4
E - 150
X - 38
M - 92

AEI-21
G - 2,200
B - 36
T - <5
E - 110
X - 58
M - 2.8

AEI-17
G - 1,700
B - 56
T - 2.5
E - 89
X - 69
M - <0.5

AEI-22
G - 25,000
B - 3,800
T - 290
E - 1,100
X - 1,900
M - <12

AEI-18
G - 780
B - 10
T - 1.1
E - 41
X - 20
M - <5

AEI-19
G - <50
B - <0.5
T - <0.5
E - <0.5
X - <0.5
M - <5

MW-1
G - 3,800
B - 100
T - 13
E - 14
X - 7.7
M - <3

AEI-13
G - <50
B - <0.5
T - <0.5
E - <0.5
X - <0.5
M - <5.0

SIDEWALK

FARNAM STREET

RESIDENTIAL

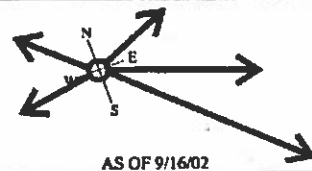
RESIDENTIAL

KEY

- Existing 2" Monitoring Wells
- Temporary Borings: June 2002

Sample Results in µg/l. Data for wells from 9/16/02 event.

GROUNDWATER FLOW DIRECTION ROSE DIAGRAM (1/2 in = 1 episode)



SCALE: 1 in = 30 ft
0' 15' 30'

AEI CONSULTANTS

3210 OLD TUNNEL ROAD, SUITE B, LAFAYETTE, CA

GROUNDWATER SAMPLE ANALYTICAL DATA

1450 FRUITVALE AVENUE
OAKLAND, CALIFORNIA

FIGURE 6
AEI PROJECT NO 5624

FRUITVALE AVENUE

SIDEWALK

PROPOSED BUILDING FOOTPRINT

COMMERCIAL

PROPERTY BOUNDARY

RESIDENTIAL

AEI-23 (2.5')

G - <1.0
B - <0.005
T - <0.005
E - <0.005
X - <0.005
M - <0.05

AEI-23

AEI-21 (5')

G - <1.0
B - <0.005
T - <0.005
E - <0.005
X - <0.005
M - <0.05

AEI-25 (2.5')

G - <1.0
B - <0.005
T - <0.005
E - <0.005
X - <0.005
M - <0.05

AEI-24 (2.5')

G - <1.0
B - <0.005
T - <0.005
E - <0.005
X - <0.005
M - <0.05

GP-6 (5')

G - <1.0
B - <0.005
T - <0.005
E - <0.005
X - <0.01
M - na

AEI-18 (4')

G - <1.0
B - <0.005
T - <0.005
E - <0.005
X - <0.005
M - <0.05

RESIDENTIAL

RESIDENTIAL

SIDEWALK

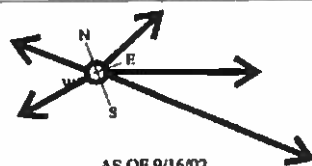
FARNAM STREET

KEY

⊕ ⊙ ⊛ ⊞
G-TPH gasoline
B-Benzene
T-Toluene
E-Ethylbenzene
X-Xylenes
M-MTBE

Boring and well locations with sample depth in parenthesis. All soil sample data in mg/kg

GROUNDWATER FLOW DIRECTION ROSE DIAGRAM (1/2 in = 1 episode)



SCALE: 1 in = 30 ft
0' 15' 30'

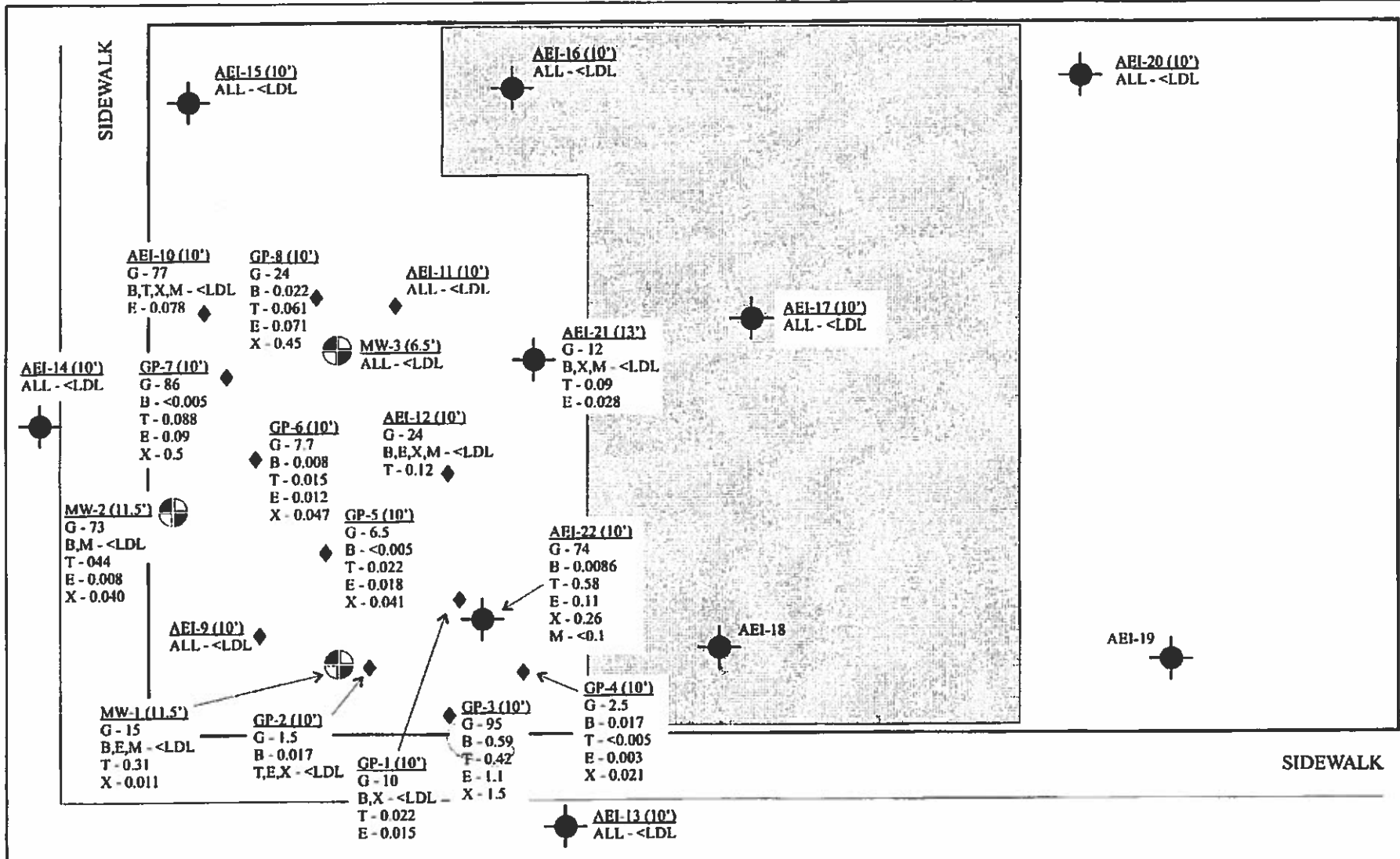
AEI CONSULTANTS

3210 OLD TUNNEL ROAD, SUITE B, LAFAYETTE, CA

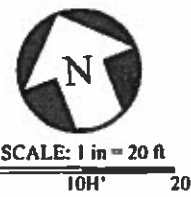
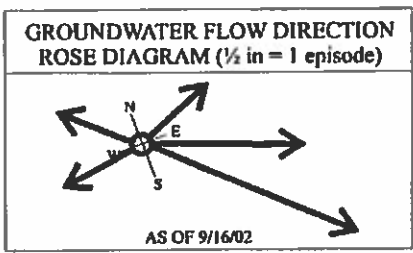
**SOIL SAMPLE ANALYTICAL DATA
(0 TO 5 FEET BGS)**

1450 FRUITVALE AVENUE
OAKLAND, CALIFORNIA

FIGURE 7
AEI PROJECT NO 5624



KEY	
⊕	Boring and well locations with sample depth in parenthesis. All soil sample data in mg/kg. <LDL = less than detection limit.
◆	
⊗	
⊙	
G-TPH gasoline	
B-Benzene	
T-Toluene	
E-Ethylbenzene	
X-Xylenes	
M-MTBE	



AEI CONSULTANTS	
3210 OLD TUNNEL ROAD, SUITE B, LAFAYETTE, CA	
SOIL SAMPLE ANALYTICAL DATA (5 FEET BGS TO WATER TABLE)	
1450 FRUITVALE AVENUE OAKLAND, CALIFORNIA	FIGURE 8 AEI PROJECT NO 5624

Table 1
Sample Analytical Data: Exploratory Excavation Project

Sample ID	Location	TPH-g mg/kg	TPH-d mg/kg	TOG mg/kg	MTBE mg/kg	Benzene mg/kg	Toluene mg/kg	Ethyl Benzene mg/kg	Xylenes mg/kg	Total Lead mg/kg
AEI EBA 6'	Exc. A - Bottom	<1.0	<1.0	<50.0	<0.05	<0.005	<0.005	<0.005	<0.005	6.9
AEI EBB 6'	Exc. B - Bottom	<1.0	<1.0	<50.0	<0.05	<0.005	<0.005	<0.005	<0.005	9.1
AEI EBW 8'	Exc. C - West	<1.0	<1.0	-	<0.05	<0.005	<0.005	<0.005	<0.005	9.4
AEI EBE 8'	Exc. C - East	11	<1.0	-	<0.05	<0.005	0.059	0.028	0.042	32
AEI EBN 8'	Exc. C - North	<1.0	<1.0	-	<0.05	<0.005	<0.005	<0.005	<0.005	8.7
AEI EBS 8'	Exc. C - South	<1.0	<1.0	-	<0.05	<0.005	<0.005	<0.005	<0.005	80

Table 2
Soil Sample Analytical Data

Sample ID	Consultant	Sample Date	TPH-g mg/kg	MTBE mg/kg	Benzene mg/kg	Toluene mg/kg	Ethyl Benzene mg/kg	Xylenes mg/kg	Total Lead mg/kg
GP-1 10'	Glenfos	7/9/1998	10	-	<0.005	0.022	0.015	<0.01	-
GP-2 10'	Glenfos	7/9/1998	1.5	-	0.017	<0.005	<0.005	<0.01	-
GP-2 15'	Glenfos	7/9/1998	27	-	0.017	0.056	0.052	0.51	-
GP-2 30'	Glenfos	7/9/1998	2.5	-	<0.005	<0.005	<0.005	<0.01	-
GP-3 10'	Glenfos	7/9/1998	95	-	0.59	0.42	1.1	1.5	7.3
GP-3 15'	Glenfos	7/9/1998	2.5	-	0.055	0.018	0.055	0.26	-
GP-3 20'	Glenfos	7/9/1998	1.6	-	0.02	<0.005	0.02	0.032	-
GP-3 25'	Glenfos	7/9/1998	<1	-	<0.005	<0.005	<0.005	<0.01	-
GP-4 10'	Glenfos	7/9/1998	2.5	-	0.017	<0.005	0.003	0.021	4.1
GP-5 10'	Glenfos	7/9/1998	6.5	-	<0.005	0.022	0.018	0.041	-
GP-5 15'	Glenfos	7/9/1998	19	-	0.077	0.016	0.43	0.49	-
GP-5 20'	Glenfos	7/9/1998	<1	-	<0.005	<0.005	<0.005	<0.01	-
GP-6 5'	Glenfos	7/9/1998	<1	-	<0.005	<0.005	<0.005	<0.01	-
GP-6 10'	Glenfos	7/9/1998	7.7	-	0.008	0.015	0.012	0.047	6.2
GP-6 15'	Glenfos	7/9/1998	190	-	0.34	0.53	2.3	4.7	-
GP-6 20'	Glenfos	7/9/1998	28	-	0.083	0.081	0.052	0.19	-
GP-7 10'	Glenfos	7/9/1998	86	-	<0.005	0.088	0.09	0.5	-
GP-7 15'	Glenfos	7/9/1998	2.7	-	0.008	0.012	<0.005	0.031	-
GP-8 10'	Glenfos	7/9/1998	24	-	0.022	0.061	0.071	0.45	-
GP-8 15'	Glenfos	7/9/1998	5.8	-	0.021	0.014	0.022	0.06	-
GP-8 20'	Glenfos	8/23/1999	<1	-	<0.005	<0.005	<0.005	<0.01	-
AEI-9 10'	AEI	8/23/1999	<1	<0.05	<0.005	<0.005	<0.005	<0.005	-
AEI-9 20'	AEI	8/23/1999	<1	<0.05	<0.005	<0.005	<0.005	<0.005	-
AEI-10 10'	AEI	8/23/1999	77	<0.05	<0.005	<0.005	0.078	<0.005	-
AEI-10 15'	AEI	8/23/1999	69	0.071	0.1	0.21	0.23	<0.005	-
AEI-11 10'	AEI	8/23/1999	<1	<0.05	<0.005	<0.005	<0.005	<0.005	-
AEI-11 15'	AEI	8/23/1999	210	<0.40	<0.020	1.1	1.2	2.4	-
AEI-12 10'	AEI	8/23/1999	24	<0.05	<0.005	0.12	<0.005	<0.005	-
AEI-12 15'	AEI	8/23/1999	120	<0.40	<0.020	<0.020	1.6	1.6	-
MW-1 6.5'	AEI	9/25-26/00	<1.0	<.05	<.005	<.005	<.005	<.005	-
MW-1 11.5'	AEI	9/25-26/00	15.0	<.05	<.005	0.31	<.005	0.011	-
MW-2 6.5'	AEI	9/25-26/00	<1.0	<.05	<.005	<.005	<.005	<.005	-
MW-2 11'	AEI	9/25-26/00	73.0	<.05	<.005	0.044	0.0080	0.040	-
MW-3 6.5'	AEI	9/25-26/00	<1.0	<.05	<.005	<.005	<.005	<.005	-
MW-3 16'	AEI	9/25-26/00	360.0	<1.0	0.42	2.1	6.5	11.0	-
MDL			1.0	0.05	0.005	0.005	0.005	0.005	

MDL = Method Detection Limit

mg/kg = milligrams per kilogram (ppm)

- Sample not analyzed for this chemical

TPH-g = Total petroleum hydrocarbons as gasoline

Table 2
Soil Sample Analytical Data: Continued

Sample ID	Date	TPH-g mg/kg	MTBE mg/kg	Benzene mg/kg	Toluene mg/kg	Ethyl Benzene mg/kg	Xylenes mg/kg
AEI-13 10'	610-12/02	<1	<0.05	<0.005	<0.005	<0.005	<0.005
AEI-14 10'	610-12/02	<1	<0.05	<0.005	<0.005	<0.005	<0.005
AEI-15 10'	610-12/02	<1	<0.05	<0.005	<0.005	<0.005	<0.005
AEI-16 10'	610-12/02	<1	<0.05	<0.005	<0.005	<0.005	<0.005
AEI-16 19'	610-12/02	41	<0.2	<0.02	<0.02	0.038	0.079
AEI-17 10'	610-12/02	<1	<0.5	<0.005	<0.005	<0.005	<0.005
AEI-17 20' ^{GW}	610-12/02	290	<0.05	0.84	1.3	1.8	2.8
AEI-18 4'	610-12/02	<1	<0.05	<0.005	<0.005	<0.005	<0.005
AEI-18 14'	610-12/02	290	<0.02*	<0.2	0.91	2.3	2.9
AEI-19 15'	610-12/02	<1	<0.05	<0.005	<0.005	<0.005	<0.005
AEI-20 10'	610-12/02	<1	<0.05	<0.005	<0.005	<0.005	<0.005
AEI-20 20' ✓	610-12/02	42	<0.5	<0.05	0.20	0.12	0.15
AEI-21 5'	610-12/02	<1	<0.05	<0.005	<0.005	<0.005	<0.005
AEI-21 13'	610-12/02	12	<0.05	<0.005	0.090	0.028	<0.005
AEI-22 10'	610-12/02	74	<0.1	0.0086	0.58	0.11	0.26
AEI-22 20'	610-12/02	5	<0.05	0.30	0.016	0.26	0.42
AEI-23 2.5'	9/27/2002	<1	<0.05	<0.005	<0.005	<0.005	<0.005
AEI-24 2.5'	9/27/2002	<1	<0.05	<0.005	<0.005	<0.005	<0.005
AEI-25 2.5'	9/27/2002	<1	<0.05	<0.005	<0.005	<0.005	<0.005
MDL		1.0	0.05	0.005	0.005	0.005	0.005

MDL = Method Detection Limit

mg/kg = milligrams per kilogram (ppm)

- Sample not analyzed for this chemical

TPH-g = Total petroleum hydrocarbons as gasoline

* MTBE by EPA method 8260, all others by 602/8020

Table 3
Groundwater Sample Analytical Data: Temporary Borings

Sample ID	Consultant	Date	TPH-g µg/L	MTBE µg/L	Benzene µg/L	Toluene µg/L	Ethyl- Benzene µg/L	Xylenes µg/L
GP 1	Glenfos	7/9/1998	170	-	0.53	<0.5	1.2	2.0
GP 4	Glenfos	7/9/1998	210	-	<0.5	<0.5	0.58	<1
GP 5	Glenfos	7/9/1998	17,000	-	42	24	820	110
GP 8	Glenfos	7/9/1998	20,000	<10	1,000	19	420	290
AEI GW 8'	AEI	5/27/1999	<50	<5.0	<0.5	<0.5	<0.5	<0.5
AEI-9W	AEI	8/23/1999	690	3.8	72	0.79	29	24
AEI-13 W	AEI	610-12/02	<50	<5.0	<0.5	<0.5	<0.5	<0.5
AEI-14 W	AEI	610-12/02	830	<5.0	0.56	2.7	1.2	2.9
AEI-15 W	AEI	610-12/02	<50	14*	<0.5	<0.5	<0.5	<0.5
AEI-16 W	AEI	610-12/02	190	<5.0	0.86	1.0	0.75	1.3
AEI-17 W	AEI	610-12/02	1,700	<0.5*	56	2.5	89	69
AEI-18 W	AEI	610-12/02	780	<5.0	10	1.1	41	20
AEI-19 W	AEI	610-12/02	<50	<5.0	<0.5	<0.5	<0.5	<0.5
AEI-20 W	AEI	610-12/02	170	<5.0	0.81	0.55	7.7	3.1
AEI-21 W	AEI	610-12/02	2,200	2.8*	36	<5.0	110	58
AEI-22 W	AEI	610-12/02	25000	<12*	3800	290	1100	1900

MDL = Method Detection Limit

ND = Not detected above the Method Detection Limit (unless otherwise noted)

µg/L = micrograms per liter (ppb)

- Sample not analyzed for this chemical

TPH-g = Total petroleum hydrocarbons as gasoline

* MTBE by EPA method 8260, all others by 602/8020

Table 4
Water Table Data

Well ID (Screen - ft bgs)	Date	Well Elevation (ft msl)	Depth to Water (ft)	Groundwater Elevation (ft msl)
MW-1 (15-30)	10/16/00	42.13	17.72	24.41
	1/19/01	42.13	9.15	32.98
	4/26/01	42.13	9.40	32.73
	8/3/01	42.13	12.38	29.75
	11/5/01	42.13	16.22	25.91
	3/29/02	42.13	7.96	34.17
	6/11/02	42.13	12.18	29.95
	9/16/02	42.13	11.35	30.78
MW-2 (15-30)	10/16/00	42.08	14.98	27.10
	1/19/01	42.08	9.00	33.08
	4/26/01	42.08	8.34	33.74
	8/3/01	42.08	11.70	30.38
	11/5/01	42.08	15.08	27.00
	3/29/02	42.08	8.96	33.12
	6/11/02	42.08	12.49	29.59
	9/16/02	42.08	10.52	31.56
MW-3 (15-30)	10/16/00	42.55	17.98	24.57
	1/19/01	42.55	10.90	31.65
	4/26/01	42.55	9.21	33.34
	8/3/01	42.55	12.67	29.88
	11/5/01	42.55	15.90	26.65
	3/29/02	42.55	9.20	33.35
	6/11/02	42.55	11.83	30.72
	9/16/02	42.55	11.42	31.13

Episode #	Date	Average Water Table (ft msl)	Change from Previous Episode	Flow direction (gradient)
1	10/16/00	25.36	-	E/SE (0.116)
2	1/19/01	32.57	+7.21	E/NE (0.041)
3	4/26/01	33.27	+0.70	SE (0.034)
4	8/3/01	30.00	-3.27	ESE (0.024)
5	11/5/01	26.52	-3.48	SE (0.033)
6	3/29/02	33.55	+7.03	NW (0.032)
7	6/11/02	30.09	-3.46	SW (0.040)
8	9/16/02	31.16	+1.07	SE (0.028)

Notes:

All well elevations are measured from the top of the casings
ft msl = feet above mean sea level

MRL

Table 5
Monitoring Well Sample Analytical Data
Petroleum Hydrocarbons

Well/Sample ID	Date Collected	Consultant/ Lab	TPHg	MTBE	Benzene	Toluene	Ethylbenzene	Xylenes
			µg/L EPA 8015	µg/L	µg/L	µg/L	µg/L	µg/L
MW-1	10/16/00	AEI/MAI	4,500	<20	560	14	53	62
	01/19/01	AEI/MAI	13,000	<100	790	46	1,100	210
	04/26/01	AEI/MAI	7,500	<30	470	23	720	120
	08/03/01	AEI/MAI	4,500	<10	440	11	55	6.6
	11/05/01	AEI/MAI	1,700	<10	100	6.0	4.6	2.1
	03/29/02	AEI/MAI	9,500	ND<100	880	32	400	59
	06/11/02	AEI/MAI	3,400	<50	620	9.7	75	11
	09/16/02	AEI/MAI	3,800	<10	190	15.0	14	7.7
MW-2	10/16/00	AEI/MAI	4,600	<300	380	3.8	95	33
	01/19/01	AEI/MAI	4,200	<10	450	4.7	120	50
	04/26/01	AEI/MAI	5,600	<20	810	12	210	65
	08/03/01	AEI/MAI	2,900	<20	360	3	97	46
	11/05/01	AEI/MAI	2,400	<85	280	3.2	76	25
	03/29/02	AEI/MAI	7,100	ND<100	930	11	220	39
	06/11/02	AEI/MAI	4,400	<150	680	8.1	160	38
	09/16/02	AEI/MAI	7,400	<250	360	8.4	150	38
MW-3	10/16/00	AEI/MAI	12,000	<10	570	32	680	1,200
	01/19/01	AEI/MAI	27,000	<200	3,400	110	2,200	2,700
	04/26/01	AEI/MAI	33,000	<200	3,300	190	2,800	3,400
	08/03/01	AEI/MAI	23,000	<50	2,300	52	1,800	1,400
	11/05/01	AEI/MAI	30,000	<200	1,900	58	2,000	1,600
	03/29/02	AEI/MAI	29,000	ND<100	2,100	57	2,500	1,700
	06/11/02	AEI/MAI	22,000	<50	2,100	44	2,300	1,600
	09/16/02	AEI/MAI	25,000	<220	2,000	47	2,200	1,100
MRL			50.0	5.0	0.5	0.5	0.5	0.5

Fuel Oxygenates

Well/Sample ID	Date Collected	DIPE	ETBE	MTBE	TAME	TBA	EDB	1,2-DCA
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
MW-1	06/11/02	-	-	2.4	-	-	-	-
	09/16/02	0.56	<0.5	<3.0	<0.5	<0.5	<0.5	<0.5
MW-2	06/11/02	-	-	23	-	-	-	-
	09/16/02	7.30	<1.2	92	<1.2	<1.2	<1.2	<1.2
MW-3	06/11/02	-	-	<2.5	-	-	-	-
	09/16/02	<5.0	<5.0	<5.0	<5.0	<50	<5.0	<5.0
MRL		0.5	0.5	0.5	0.5	5.0	0.5	0.5

MRL = Method Reporting Limit, unless otherwise shown
µg/L = micrograms per liter
AEI = AEI Consultants
MAI = McCampbell Analytical, Inc.
TPHg = total petroleum hydrocarbons as gasoline
MTBE = methyl tertiary butyl ether

Table 6
Groundwater RBSLs: Residential Land Use: Tier 2 Clayey Silts

	<i>Pathway</i>	<i>Risk Type (Cancer / Hazard)</i>	<i>Tier 2 RBSL $\mu\text{g/l}$</i>	<i>Site Maximum $\mu\text{g/l}$</i>
Benzene	Inhalation of indoor air vapors	Cancer	5600	3,800
		Hazard	19000	
	Inhalation of outdoor air vapors	Cancer	>SOL	
		Hazard	>SOL	
Toluene	Inhalation of indoor air vapors	Cancer	nc	290
		Hazard	>SOL	
	Inhalation of outdoor air vapors	Cancer	nc	
		Hazard	>SOL	
E-benzene	Inhalation of indoor air vapors	Cancer	nc	2,200
		Hazard	>SOL	
	Inhalation of outdoor air vapors	Cancer	nc	
		Hazard	>SOL	
Xylenes	Inhalation of indoor air vapors	Cancer	nc	1,900
		Hazard	>SOL	
	Inhalation of outdoor air vapors	Cancer	nc	
		Hazard	>SOL	
MTBE	Inhalation of indoor air vapors	Cancer	nc	92
		Hazard	35000	
	Inhalation of outdoor air vapors	Cancer	nc	
		Hazard	>SOL	

nc - chemical not considered carcinogenic

>SOL: RBSL exceeds the solubility of chemical in water

SAT: RBSL exceeds the saturation of chemical in soil

Source: Oakland, 2000.

Table 7
Subsurface Soil RBSLs: Residential Land Use: Tier 2 Clayey Silts

<i>Pathway</i>		<i>Risk Type (Cancer/ Hazard)</i>	<i>Tier 2 RBSL mg/kg</i>	<i>Site Maximum mg/kg</i>
Benzene	Inhalation of indoor air vapors	Cancer	1.9	0.59
		Hazard	6.2	
	Inhalation of outdoor air vapors	Cancer	160	
		Hazard	650	
Toluene	Inhalation of indoor air vapors	Cancer	nc	0.58
		Hazard	930	
	Inhalation of outdoor air vapors	Cancer	nc	
		Hazard	SAT	
E-benzene	Inhalation of indoor air vapors	Cancer	nc	1.1
		Hazard	SAT	
	Inhalation of outdoor air vapors	Cancer	nc	
		Hazard	SAT	
Xylenes	Inhalation of indoor air vapors	Cancer	nc	1.5
		Hazard	SAT	
	Inhalation of outdoor air vapors	Cancer	nc	
		Hazard	SAT	
MTBE	Inhalation of indoor air vapors	Cancer	nc	<LDL
		Hazard	14,000	
	Inhalation of outdoor air vapors	Cancer	nc	
		Hazard	SAT	

nc - chemical not considered carcinogenic

>SOL: RBSL exceeds the solubility of chemical in water

SAT: RBSL exceeds the saturation of chemical in soil

Source: Oakland, 2000.

<LDL - less than laboratory detection limits, generally 0.1 to 0.05 for MTBE

Table 8
Surface Soil RBSLs: Residential Land Use: Tier 2 Clayey Silts

<i>Pathway</i>		<i>Risk Type (Cancer / Hazard)</i>	<i>Tier 2 RBSL mg/kg</i>	<i>Site Maximum mg/kg</i>
Benzene	Soil Ingestion, dermal contact, and vapor inhalation	Cancer	19	<0.005
		Hazard	63	
Toluene	Soil Ingestion, dermal contact, and vapor inhalation	Cancer	nc	<0.005
		Hazard	7,100	
E-benzene	Soil Ingestion, dermal contact, and vapor inhalation	Cancer	nc	<0.005
		Hazard	3,900	
Xylenes	Soil Ingestion, dermal contact, and vapor inhalation	Cancer	nc	<0.005
		Hazard	53,000	
MTBE	Soil Ingestion, dermal contact, and vapor inhalation	Cancer	nc	<0.05
		Hazard	200	

nc - chemical not considered carcinogenic
 >SOL: RBSL exceeds the solubility of chemical in water
 SAT: RBSL exceeds the saturation of chemical in soil
 Source: Oakland, 2000.

Table 9
Groundwater Screening Levels: Drinking Water Resource Not Threatened
(All Concentrations Expressed in mg/l)

Chemical	Site Maximum	Ceiling Level		Indoor Air Impacts		Aquatic Life Protection (upon discharge to surface water)	Surface Water Concentration
		Nuisance Odor (upon discharge to surface)	Upper Limit	Coarse Soils	Fine Soils		
TPH-gasoline	25000	5000	50000	na	na	500	na
Benzene	3800	20000	50000	84	5800	46	71
Toluene	290	400	50000	76000	530000 (sol)	130	200000
Ethyl-Benzene	2200	300	50000	170000 (sol)	170000 (sol)	290	290000
Xylenes	1900	5300	50000	150000	160000 (sol)	13	na
MTBE	92	1800	50000	50000	490000	8000	na

Components Shown in Red are not considered valid or complete for this site (see text)

Table 10
Surface Soil Screening Levels (<10 feet deep)
(All Concentrations Expressed in mg/kg)

Chemical	Site Maximum	Ceiling	Urban Area Ecotoxicity	Direct Exposure				Indoor Air				Groundwater Protection		
				Residential		Com. / Ind.		Residential		Com. / Ind.		Target GW Conc** (µg/l)	DAF	Soil Level
				Cancer	Non-cancer (HQ = 0.2)	Cancer	Non-cancer (HQ = 0.2)	Coarse Soils	Fine Soils	Coarse Soils	Fine Soils			
TPH-gasoline	95 <i>6/23-10</i>	500	na	na	na	na	na	na	na	na	na	500	834	400
Benzene	0.59	500	25	0.18	1.4	0.39	4.8	0.18*	0.18*	0.39*	0.39*	46	44.8	2.1
Toluene	0.58	500	150	na	120	na	400	30	310	89	520 (sat)	130	64.2	8.4
Ethyl-Benzene	1.1	230	na	na	300(sat=230)	na	1200(sat=230)	76	230 (sat)	220	230 (sat)	290	82.1	24
Xylenes	1.5	210	na	na	270(sat=210)	na	890(sat=210)	210 (sat)	210 (sat)	210 (sat)	210 (sat)	13	78.5	1
MTBE	<0.5***	100	na	34	140	79	2100	3.4	68	12	290	1800	5.59	10

Components Shown in Red are not considered valid or complete for this site (see text)

* Indoor Air exposure pathway levels for benzene set as direct exposure levels (RWQCB, 2001)

** Target groundwater concentration based on lowest component of Table 9, rather than lowest relevant component

*** No MTBE detected in soil above water table. Highest laboratory detection limit shown.

Groundwater Protection Soil Level = Dilution-attenuation factor (DAF) x Target Groundwater Concentration x 0.001 mg/ml

Table 11
Subsurface Soil Screening Levels (>10 feet deep to water table)
(All Concentrations Expressed in mg/kg)

Chemical	Site Maximum	Ceiling		Direct Exposure Construction/Trenchworker		Indoor Air				Groundwater Protection		
		Res.	Com./Ind.	Cancer	Non-cancer (HQ = 0.2)	Residential Coarse Soils	Fine Soils	Com. / Ind. Coarse Soils	Fine Soils	Target GW Conc** (µg/l)	DAF	Soil Level
TPH-gasoline	95	5000	5000	na	na	na	na	na	na	500	834	400
Benzene	0.59	1000	1100	16	58	0.18	0.18	0.39	0.39	46	44.8	2.1
Toluene	0.58	520	520	na	4700(sat=520)	30	310	89	520(sat)	130	64.2	8.4
Ethyl-Benzene	1.1	230	230	na	12000(sat=230)	76	230(sat)	220	230(sat)	290	82.1	24
Xylenes	1.5	210	210	na	11000(sat=210)	210(sat)	210(sat)	210(sat)	210(sat)	13	78.5	1
MTBE	<0.5***	500	1000	2900	4900	3.4	68	12	290	1800	5.59	10

Components Shown in Red are not considered valid or complete for this site (see text)

* Indoor Air exposure pathway levels for benzene set as direct exposure levels (RWQCB, 2001)

** Target groundwater concentration based on lowest component of Table 9, rather than lowest relevant component

*** No MTBE detected in soil above water table. Highest laboratory detection limit shown.

Groundwater Protection Soil Level = Dilution-attenuation factor (DAF) x Target Groundwater Concentration x 0.001 mg/ml

Appendix C

Site Underground Utility Maps

PERSONNEL: D. Bissari

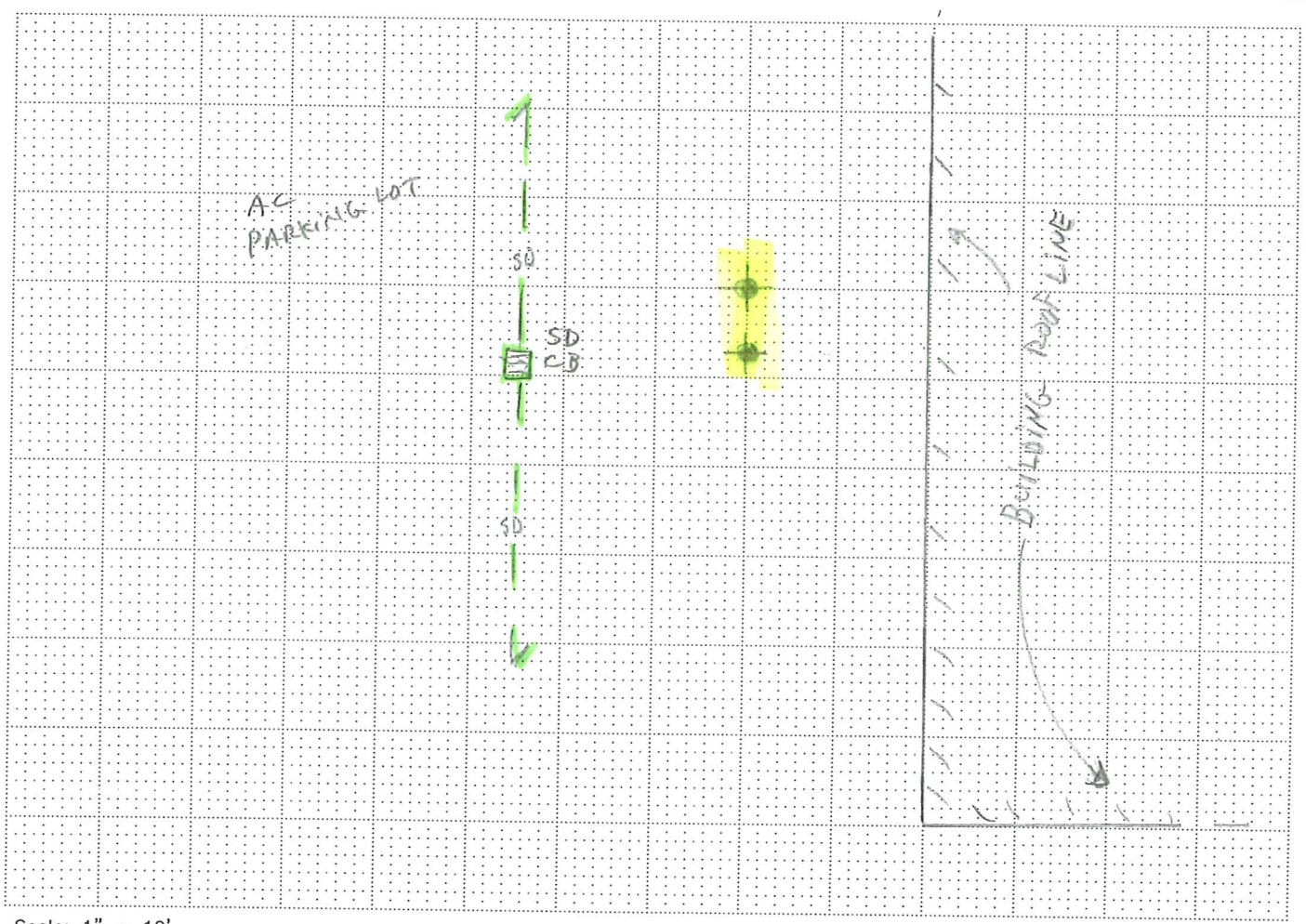
CLIENT: Broadbent & Associates

JOB: 13-1034.13 DATE: 10-24-13

LOCATION: Former ARCO 402
1450 Fruitvale Ave, Oakland, Calif



BORING: SB-1A & SB-1B



Scale: 1" = 10'

EXPLANATION

NOTES

- Original Boring Location
Final Boring Location
Existing Well Location
GPR Traverse
Localized GPR Anomaly
Utility Alignment

- Equipment: GPR (Radar), RD 4000, M Scope, other
Procedure: EMC (Conduction), EMI (Induction), Ambient, GPR
Surface Conditions: Wet, Dry, other

- Utilities: T (Telephone, Comm.), E (Electric), NG (Natural Gas), CA (Compressed Air), STM (Steam), SS (Sanitary Sewer), SD (Storm Drain), W (Water), FS (Fire Supression), UU (Undifferentiated Utility)
Surface: RC (Reinforced Concrete), AC (Asphalt), C (Concrete), Soil, Gravel, other

REMARKS

SD - STORM DRAIN CATCH BASIN

PERSONNEL: D. Bissini

JOB: 13-1034.13

DATE: 10-24-13

CLIENT: Broedelbert & Associates

LOCATION: Former ARCO 402
1450 Fruitvale Ave, Oakland, CA

BORING: SG-2A & SG-2B



Scale: 1" = 10'

EXPLANATION

- Original Boring Location
- Final Boring Location
- Existing Well Location
- GPR Traverse
- Localized GPR Anomaly
- Utility Alignment

- Utilities
- T (Telephone, Comm.)
 - E (Electric)
 - NG (Natural Gas)
 - CA (Compressed Air)
 - STM (Steam)
 - SS (Sanitary Sewer)
 - SD (Storm Drain)
 - W (Water)
 - FS (Fire Supression)
 - UU (Undifferentiated Utility)

- Surface
- RC (Reinforced Concrete)
 - AC (Asphalt)
 - C (Concrete)
 - Soil
 - Gravel
 - other

NOTES

- | | | |
|-------------------|--------------------|----------------------------|
| <u>Equipment:</u> | <u>Procedure:</u> | <u>Surface Conditions:</u> |
| - GPR (Radar) | - EMC (Conduction) | - Wet |
| - RD 4000 | - EMI (Induction) | - Dry |
| - M Scope | - Ambient | - other |
| - other | - GPR | |

REMARKS

SD - STORM DRAIN CATCH BASIN
 CB

PERSONNEL: D. Bissini

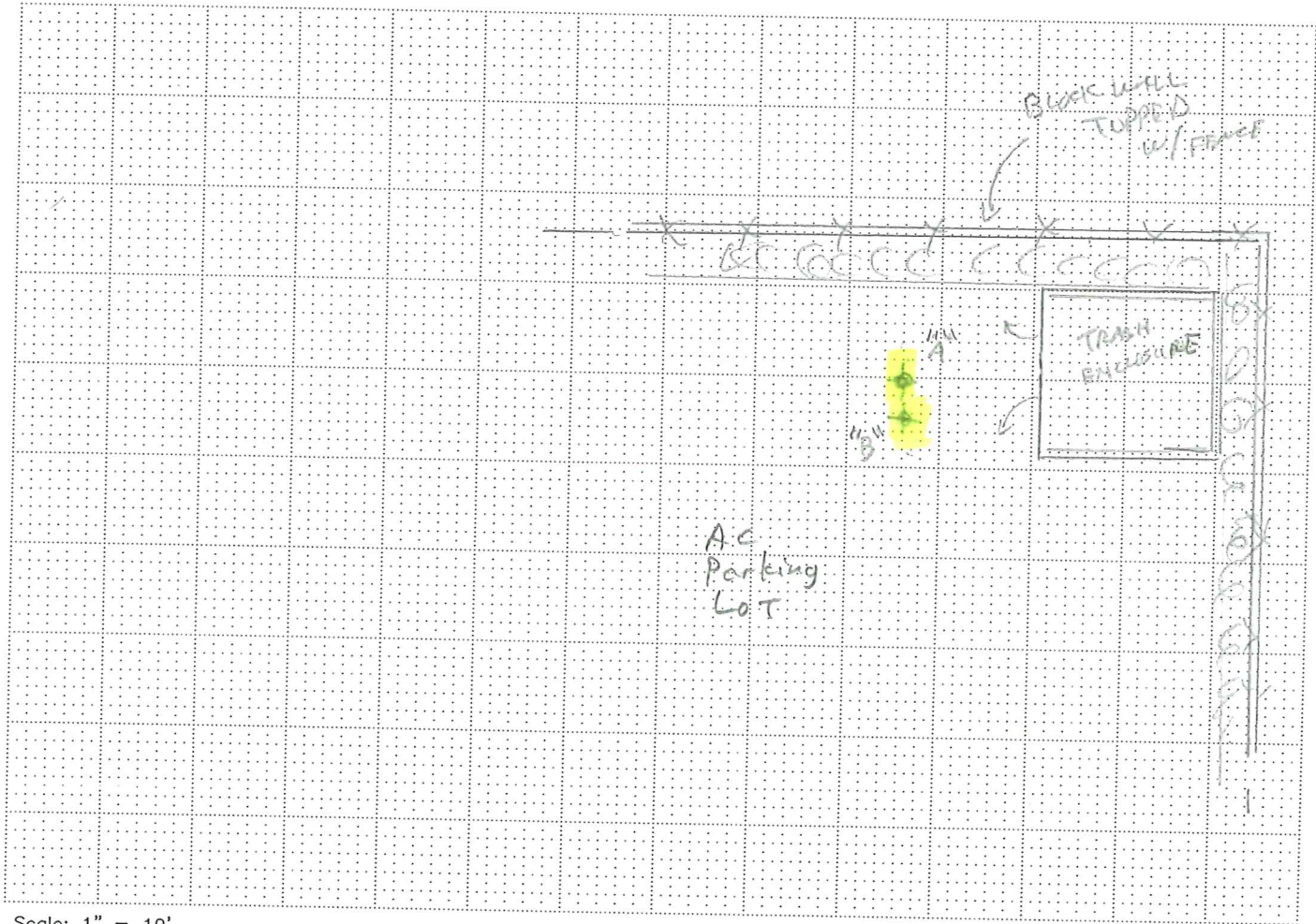
JOB: 13-1034.13

DATE: 10-24-13

CLIENT: Broadbent & Associates

LOCATION: Former ARCO 402
1450 Fruitvale Ave, Oakland, Calif

BORING: SG-3A & SG-3B



Scale: 1" = 10'

EXPLANATION

- Original Boring Location
- Final Boring Location
- Existing Well Location
- GPR Traverse
- Localized GPR Anomaly
- Utility Alignment

Utilities

- T (Telephone, Comm.)
- E (Electric)
- NG (Natural Gas)
- CA (Compressed Air)
- STM (Steam)
- SS (Sanitary Sewer)
- SD (Storm Drain)
- W (Water)
- FS (Fire Suppression)
- UU (Undifferentiated Utility)

Surface

- RC (Reinforced Concrete)
- AC (Asphalt)
- C (Concrete)
- Soil
- Gravel
- other

NOTES

- | | | |
|---|--|---|
| Equipment: | Procedure: | Surface Conditions: |
| <input checked="" type="checkbox"/> GPR (Radar) | <input checked="" type="checkbox"/> EMC (Conduction) | <input type="checkbox"/> Wet |
| <input checked="" type="checkbox"/> RD 4000 | <input checked="" type="checkbox"/> EMI (Induction) | <input checked="" type="checkbox"/> Dry |
| <input checked="" type="checkbox"/> M Scope | <input checked="" type="checkbox"/> Ambient | <input type="checkbox"/> other |
| <input type="checkbox"/> other | <input checked="" type="checkbox"/> GPR | |

REMARKS

PERSONNEL: D. Bissiri

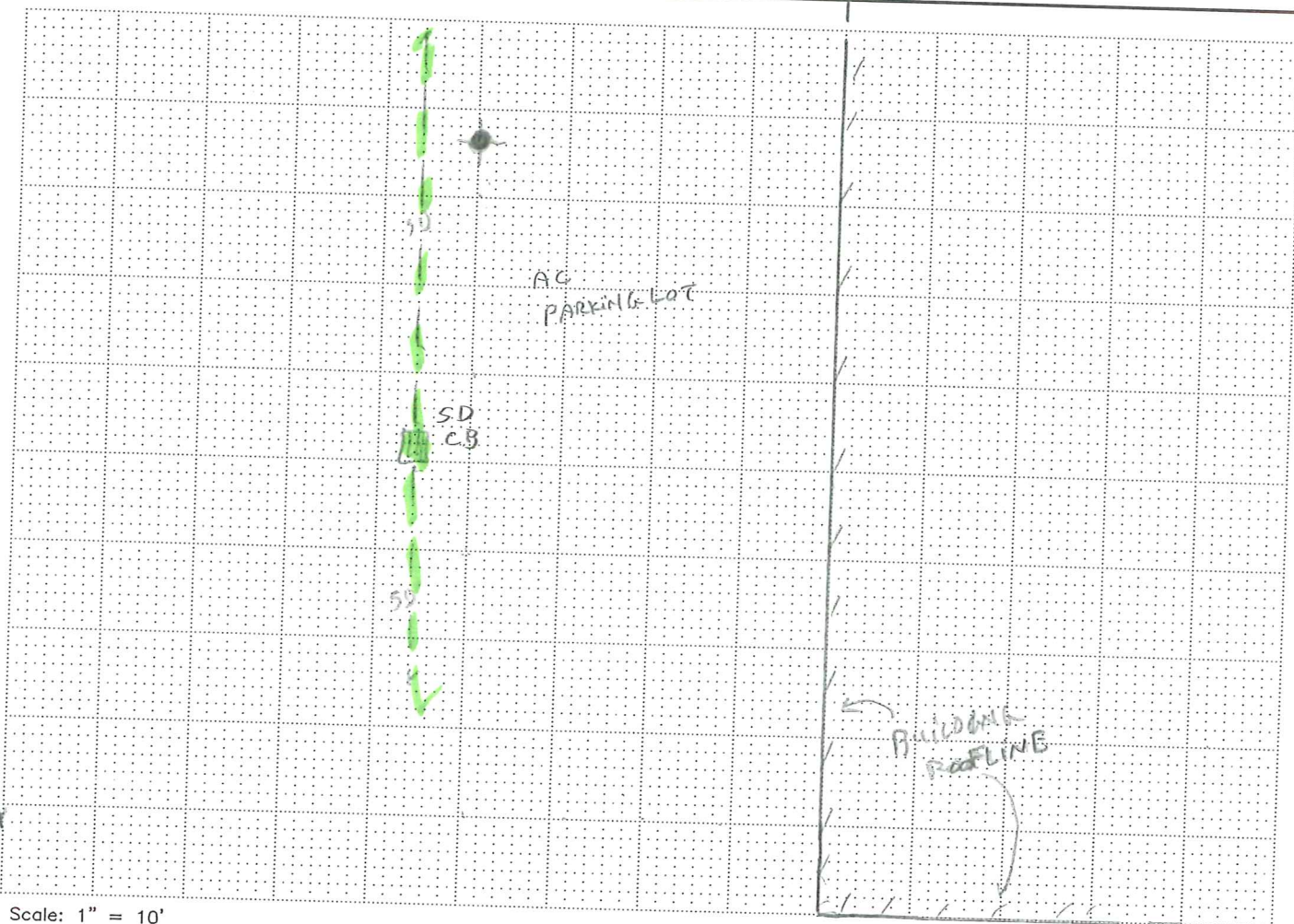
JOB: 13-1034.13

DATE: 10-24-13

CLIENT: Broadbent & Associates

LOCATION: Former ARCO 402
1450 Fruitvale Ave, Oakland, Calif.

BORING: MW-4



Scale: 1" = 10'

EXPLANATION

- Original Boring Location
- Final Boring Location
- Existing Well Location
- GPR Traverse
- Localized GPR Anomaly
- Utility Alignment

Utilities

- T (Telephone, Comm.)
- E (Electric)
- NG (Natural Gas)
- CA (Compressed Air)
- STM (Steam)
- SS (Sanitary Sewer)
- SD (Storm Drain)
- W (Water)
- FS (Fire Suppression)
- UU (Undifferentiated Utility)

Surface

- RC (Reinforced Concrete)
- AC (Asphalt)
- C (Concrete)
- Soil
- Gravel
- other

NOTES

- | | | |
|--------------------------|--------------------|---------------------|
| Equipment: | Procedure: | Surface Conditions: |
| - GPR (Radar) | - EMC (Conduction) | - Wet |
| - RD 4000 | - EMI (Induction) | - Dry |
| - M Scope | - Ambient | - other |
| - other | - GPR | |

REMARKS

SD CB - STORM DRAIN
CATCH BASIN

PERSONNEL: D. BISSIAI

JOB: 13-1034.13

DATE: 10-24-13

CLIENT: Broadbent & Associates

LOCATION: Former ARCO 402
1450 Fruitvale Ave, Oakland, Calif

BORING: MW-5



Scale: 1" = 10'

EXPLANATION

- Original Boring Location
- Final Boring Location
- Existing Well Location
- GPR Traverse
- Localized GPR Anomaly
- Utility Alignment

- Utilities
- T (Telephone, Comm.)
 - E (Electric)
 - NG (Natural Gas)
 - CA (Compressed Air)
 - STM (Steam)
 - SS (Sanitary Sewer)
 - SD (Storm Drain)
 - W (Water)
 - FS (Fire Suppression)
 - UU (Undifferentiated Utility)
- Surface
- RC (Reinforced Concrete)
 - AC (Asphalt)
 - C (Concrete)
 - Soil
 - Gravel
 - other

NOTES

- | | | |
|-------------------|--------------------|----------------------------|
| Equipment: | Procedure: | Surface Conditions: |
| - GPR (Radar) | - EMC (Conduction) | - Wet |
| - RD 4000 | - EMI (Induction) | - Dry |
| - M Scope | - Ambient | - other |
| - other | - GPR | |

REMARKS

REMARKS

PERSONNEL: D. Bissini

CLIENT: Broadbent & Associates

JOB: 13-1034.13

DATE: 10-24-13

LOCATION: Former ARCO 402
1450 Fruitvale Ave, Oakland, Calif



BORING: MW-6



Scale: 1" = 10'

EXPLANATION

NOTES

- Original Boring Location
- Final Boring Location
- Existing Well Location
- GPR Traverse
- Localized GPR Anomaly
- Utility Alignment

- | | | |
|---|--|---|
| Equipment: | Procedure: | Surface Conditions: |
| <input checked="" type="checkbox"/> GPR (Radar) | <input checked="" type="checkbox"/> EMC (Conduction) | <input checked="" type="checkbox"/> Wet |
| <input checked="" type="checkbox"/> RD 4000 | <input checked="" type="checkbox"/> EMI (Induction) | <input checked="" type="checkbox"/> Dry |
| <input checked="" type="checkbox"/> M Scope | <input checked="" type="checkbox"/> Ambient | <input type="checkbox"/> other |
| <input type="checkbox"/> other | <input checked="" type="checkbox"/> GPR | |

- Utilities
- T (Telephone, Comm.)
 - E (Electric)
 - NG (Natural Gas)
 - CA (Compressed Air)
 - STM (Steam)
 - SS (Sanitary Sewer)
 - SD (Storm Drain)
 - W (Water)
 - FS (Fire Suppression)
 - UU (Undifferentiated Utility)
- Surface
- RC (Reinforced Concrete)
 - AC (Asphalt)
 - C (Concrete)
 - Soil
 - Gravel
 - other

REMARKS

SD CB - Storm Drain Catch Basin

PERSONNEL: D. BISSARI

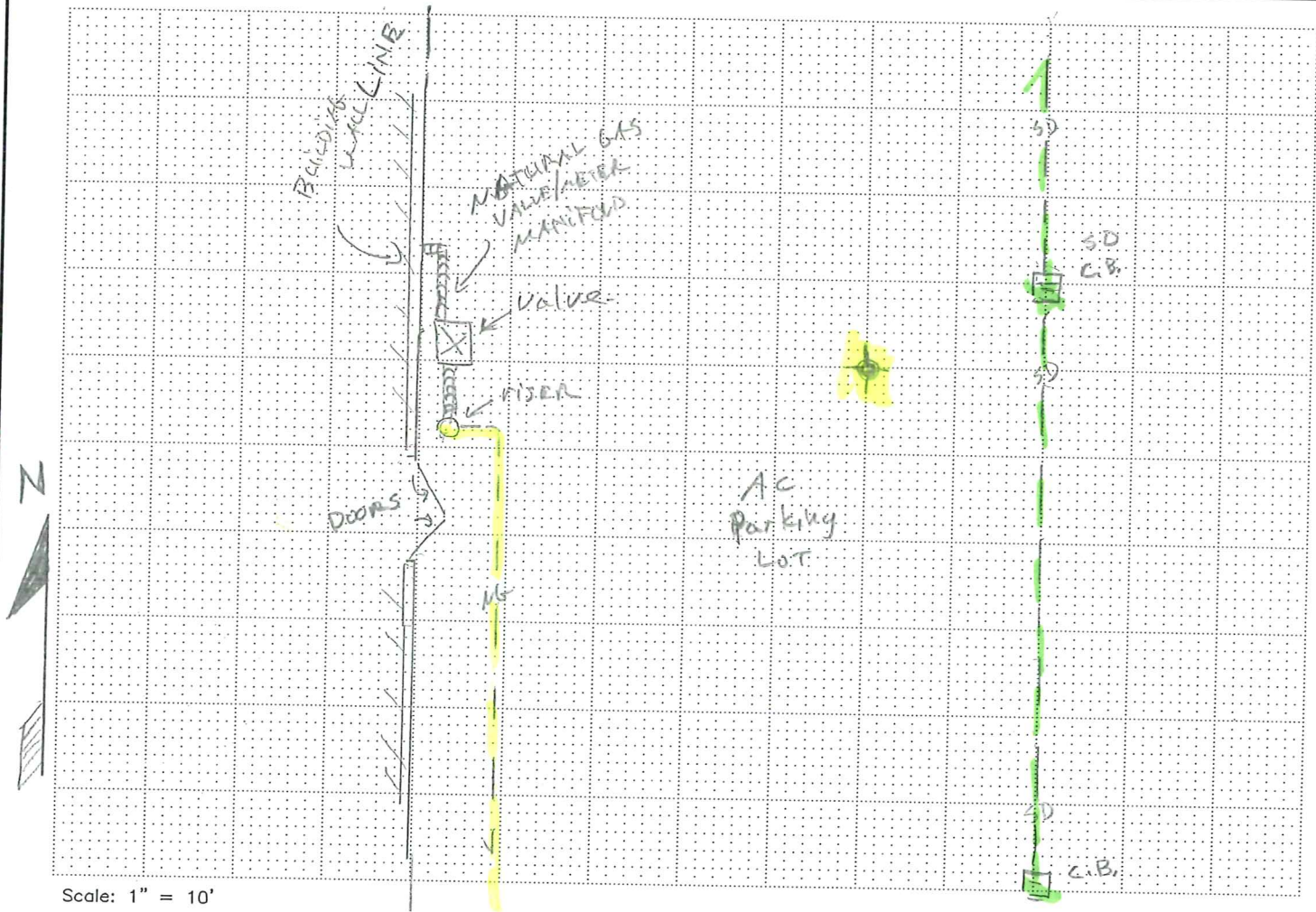
JOB: 13-1034.13

DATE: 10-24-13

CLIENT: Broadbent & Associates

LOCATION: Former ARCO 402
1450 Fruitvale Ave., Oakland Calif.

BORING: MW-7



EXPLANATION

NOTES

- Original Boring Location
 - Final Boring Location
 - Existing Well Location
 - GPR Traverse
 - Localized GPR Anomaly
 - Utility Alignment
- Utilities
- T (Telephone, Comm.)
 - E (Electric)
 - NG (Natural Gas)
 - CA (Compressed Air)
 - STM (Steam)
 - SS (Sanitary Sewer)
 - SD (Storm Drain)
 - W (Water)
 - FS (Fire Supression)
 - UU (Undifferentiated Utility)
- Surface
- RC (Reinforced Concrete)
 - AC (Asphalt)
 - C (Concrete)
 - Soil
 - Gravel
 - other

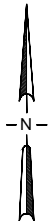
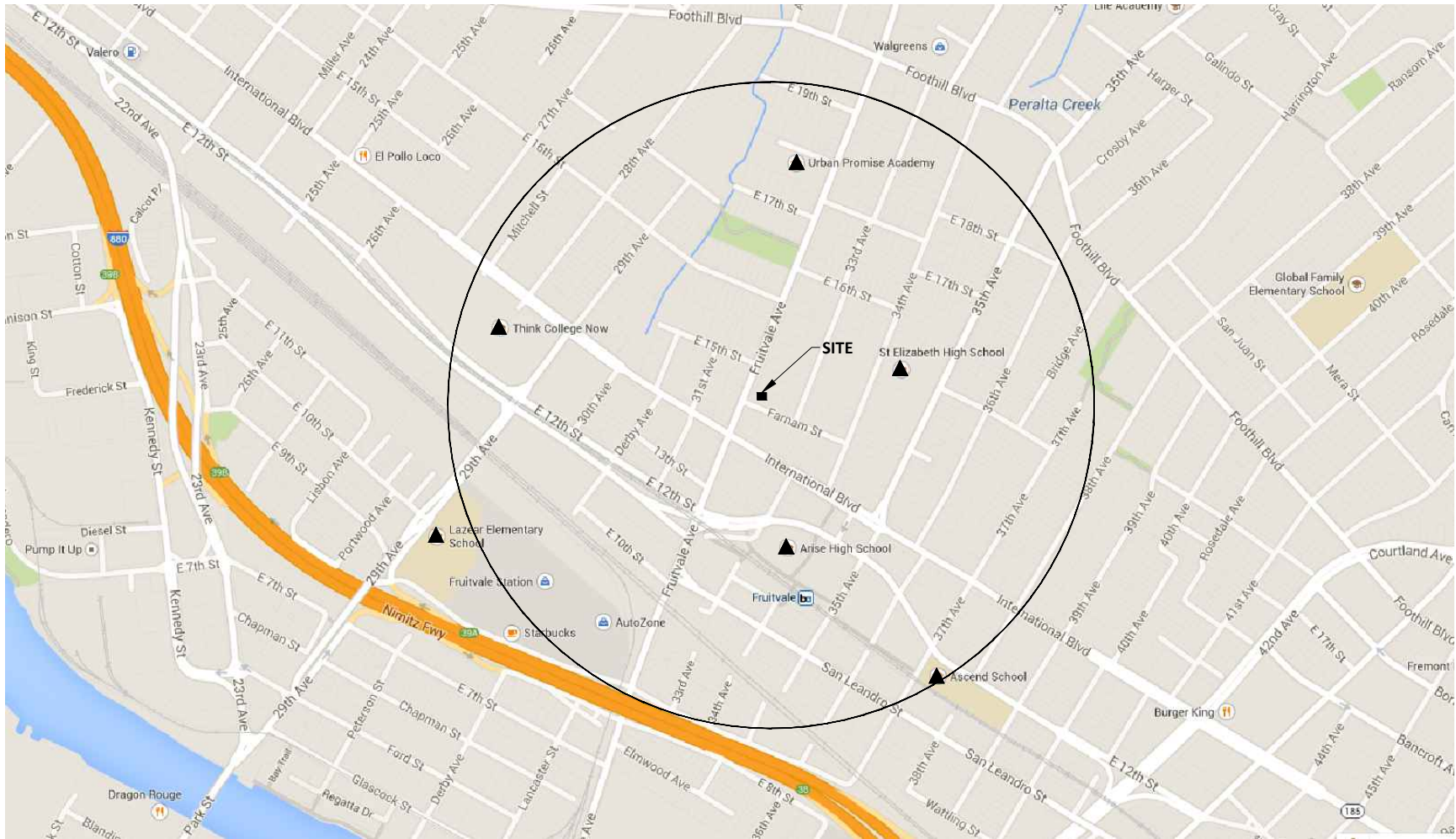
- | | | |
|---------------|--------------------|---------------------|
| Equipment: | Procedure: | Surface Conditions: |
| - GPR (Radar) | - EMC (Conduction) | - Wet |
| - RD 4000 | - EMI (Induction) | - Dry |
| - M Scope | - Ambient | - other |
| - other | - GPR | |

REMARKS

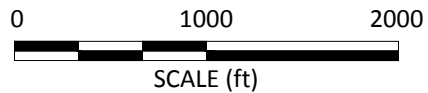
SD - STORM DRAIN
 CB - CATCH BASIN

Appendix D

Sensitive Receptor Survey Table and Aerial Maps



▲ School Locations



BROADBENT
4820 Business Center Drive, Suite 110
Fairfield, CA 94534

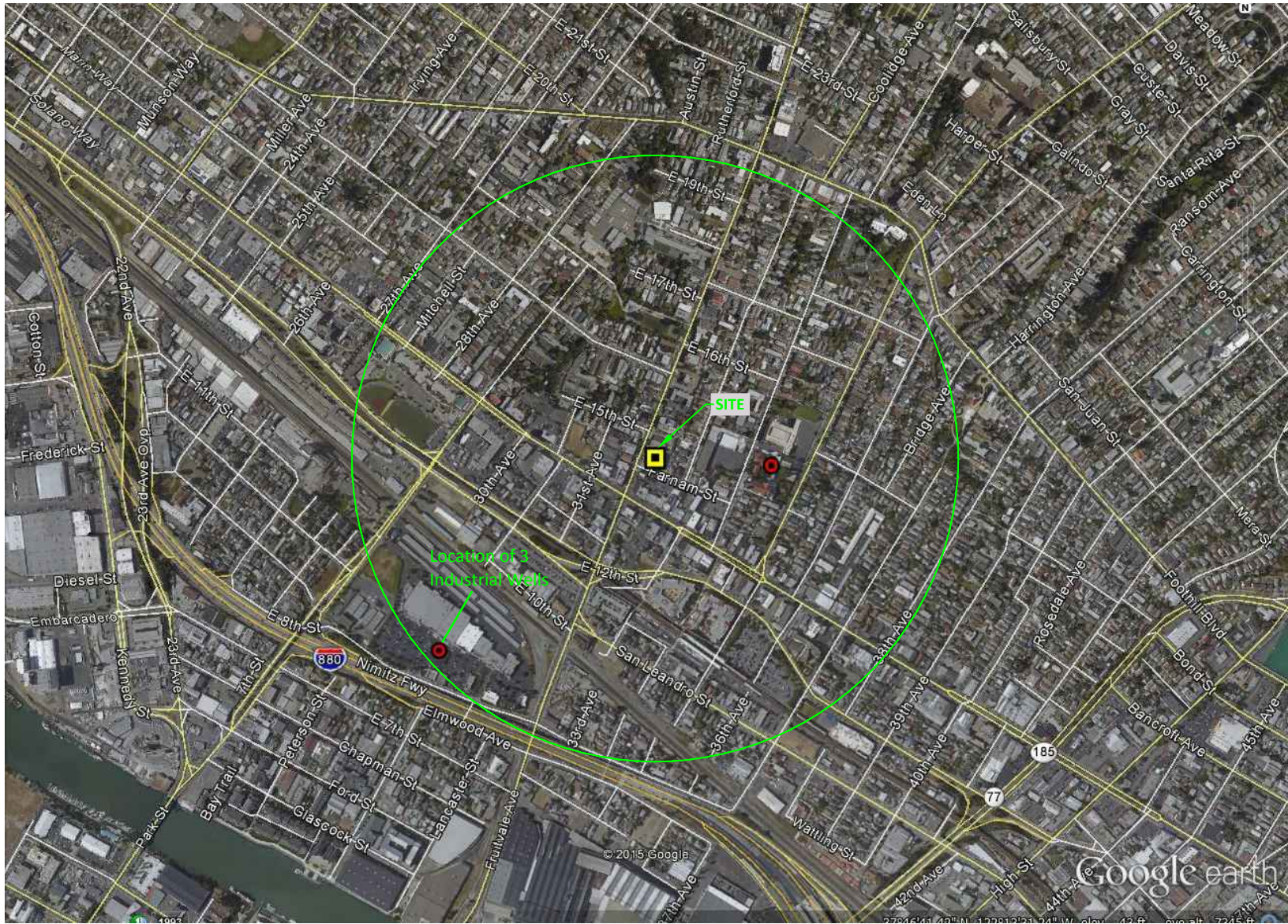
Project No.: 08-88-602 Date: 02/25/2014

ARCO Former Station No 402
1450 Fruitvale Avenue
Oakland, California

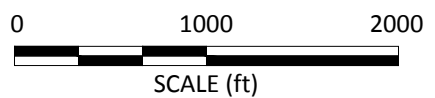
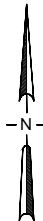
Schools Within 2,000 Feet Radius

Drawing

D



● Well Locations



BROADBENT
 4820 Business Center Drive, Suite 110
 Fairfield, CA 94534
 Project No.: 08-88-602 Date: 02/25/2014

ARCO Former Station No 402
 1450 Fruitvale Avenue
 Oakland, California

Outside Well Locations

Drawing
D

Table D-1: Summary of 2000 Foot Well Search Data for 1450 Fruitvale Avenue
Former BP Station #402, 1450 Fruitvale Avenue, Oakland, California

Tr	Section	Address	Owner	Update	Xcoord	Ycoord	Tsrqg	City	Drilldate	Elevation	Totaldepth	Waterdepth	Diameter	Use
2S/3W	5M 1	3320 E 22ND ST	ROY OVERALL	8/3/1984	122220158	37784104	2S/3W 5M	OAK	/46	0	100	12	12	IRR
2S/3W	7B 3	1100 29TH AVE	DEL MONTE CORP See history search	8/7/1984	122229770	37777290	2S/3W 7B	OAK	?	0	873	87	0	IND
2S/3W	7B 4	1100 29TH Ave	DEL MONTE CORP See history search	8/1/1984	122157622	37722364	2S/3W 7B	OAK	7/54	48	704	0	14	IND
2S/3W	7B 5	1100 29TH Ave	DEL MONTE CORP. See history search	8/1/1984	122157622	37722364	2S/3W 7B	OAK	/19 2006?	48	385	0	14	IND
2S/3W	7G01	2900 GLASCOCK ST	DERR OLIVER INC.	11/14/1984	122232577	37771972	2S/3W 7G	OAK	/19	0	160	61	10	IRR
2S/3W	8C 1	39TH AVE/82 2ND AVE	TRUST FOR PUBLIC LAND-SF	7/30/1984	122216794	37777347	2S/3W 8C	OAK	7/77	0	30	18	4	IRR
2S/3W	8D 4	1500 34TH AVE	Franciscan	1/6/1999	122221837	37778154	2S/3W 8D	OAK	1/99	0	200	0	0	IRR

Table D-2. California Natural Diversity Database Results - Oakland East Quadrangle
Former Richfield Oil Station #402
1450 Fruitvale Avenue, Oakland, Alameda County, California

Element_Type	Scientific_Name	Common_Name	Federal_Status	State_Status	CDFW_Status	CA_Rare_Plant_Rank	Quad_Name	Data_Status
Animals - Amphibians	Ambystoma californiense	California tiger salamander	Threatened	Threatened	SSC	-	Oakland East	Mapped
Animals - Amphibians	Rana boylei	foothill yellow-legged frog	None	None	SSC	-	Oakland East	Mapped
Animals - Amphibians	Rana draytonii	California red-legged frog	Threatened	None	SSC	-	Oakland East	Mapped
Animals - Amphibians	Taricha torosa	Coast Range newt	None	None	SSC	-	Oakland East	Unprocessed
Animals - Arachnids	Microcina leei	Lee's micro-blind harvestman	None	None	-	-	Oakland East	Mapped
Animals - Birds	Accipiter cooperii	Cooper's hawk	None	None	WL	-	Oakland East	Mapped and Unprocessed
Animals - Birds	Accipiter striatus	sharp-shinned hawk	None	None	WL	-	Oakland East	Unprocessed
Animals - Birds	Aquila chrysaetos	golden eagle	None	None	FP ; WL	-	Oakland East	Mapped and Unprocessed
Animals - Birds	Buteo regalis	ferruginous hawk	None	None	WL	-	Oakland East	Unprocessed
Animals - Birds	Circus cyaneus	northern harrier	None	None	SSC	-	Oakland East	Unprocessed
Animals - Birds	Elanus leucurus	white-tailed kite	None	None	FP	-	Oakland East	Unprocessed
Animals - Birds	Ardea alba	great egret	None	None	-	-	Oakland East	Unprocessed
Animals - Birds	Ardea herodias	great blue heron	None	None	-	-	Oakland East	Unprocessed
Animals - Birds	Egretta thula	snowy egret	None	None	-	-	Oakland East	Unprocessed
Animals - Birds	Nycticorax nycticorax	black-crowned night heron	None	None	-	-	Oakland East	Unprocessed
Animals - Birds	Charadrius alexandrinus nivosus	western snowy plover	Threatened	None	SSC	-	Oakland East	Unprocessed
Animals - Birds	Pica nuttalli	yellow-billed magpie	None	None	-	-	Oakland East	Unprocessed
Animals - Birds	Ammodramus savannarum	grasshopper sparrow	None	None	SSC	-	Oakland East	Unprocessed
Animals - Birds	Chondestes grammacus	lark sparrow	None	None	-	-	Oakland East	Unprocessed
Animals - Birds	Melospiza melodia pusillula	Alameda song sparrow	None	None	SSC	-	Oakland East	Mapped
Animals - Birds	Passerculus sandwichensis alaudinus	Bryant's savannah sparrow	None	None	SSC	-	Oakland East	Unprocessed
Animals - Birds	Spizella passerina	chipping sparrow	None	None	-	-	Oakland East	Unprocessed
Animals - Birds	Falco columbarius	merlin	None	None	WL	-	Oakland East	Unprocessed
Animals - Birds	Falco peregrinus anatum	American peregrine falcon	Delisted	Delisted	FP	-	Oakland East	Unprocessed
Animals - Birds	Spinus lawrencei	Lawrence's goldfinch	None	None	-	-	Oakland East	Unprocessed
Animals - Birds	Agelaius tricolor	tricolored blackbird	None	None	SSC	-	Oakland East	Unprocessed
Animals - Birds	Lanius ludovicianus	loggerhead shrike	None	None	SSC	-	Oakland East	Unprocessed
Animals - Birds	Sternula antillarum browni	California least tern	Endangered	Endangered	FP	-	Oakland East	Unprocessed
Animals - Birds	Baeolophus inornatus	oak titmouse	None	None	-	-	Oakland East	Unprocessed
Animals - Birds	Setophaga occidentalis	hermit warbler	None	None	-	-	Oakland East	Unprocessed
Animals - Birds	Setophaga petechia	yellow warbler	None	None	SSC	-	Oakland East	Unprocessed
Animals - Birds	Picoides nuttallii	Nuttall's woodpecker	None	None	-	-	Oakland East	Unprocessed
Animals - Birds	Rallus longirostris obsoletus	California clapper rail	Endangered	Endangered	FP	-	Oakland East	Mapped and Unprocessed
Animals - Birds	Numenius americanus	long-billed curlew	None	None	WL	-	Oakland East	Unprocessed
Animals - Birds	Asio flammeus	short-eared owl	None	None	SSC	-	Oakland East	Unprocessed
Animals - Birds	Athene cucularia	burrowing owl	None	None	SSC	-	Oakland East	Unprocessed
Animals - Birds	Selasphorus rufus	rufous hummingbird	None	None	-	-	Oakland East	Unprocessed
Animals - Birds	Selasphorus sasin	Allen's hummingbird	None	None	-	-	Oakland East	Unprocessed
Animals - Fish	Eucyclogobius newberryi	tidewater goby	Endangered	None	SSC	-	Oakland East	Mapped
Animals - Fish	Spirinchus thaleichthys	longfin smelt	Candidate	Threatened	SSC	-	Oakland East	Mapped
Animals - Fish	Oncorhynchus mykiss irideus	steelhead - central California coast DPS	Threatened	None	-	-	Oakland East	Unprocessed
Animals - Insects	Bombus caliginosus	obscure bumble bee	None	None	-	-	Oakland East	Mapped
Animals - Insects	Bombus occidentalis	western bumble bee	None	None	-	-	Oakland East	Mapped
Animals - Insects	Euphydryas editha bayensis	Bay checkerspot butterfly	Threatened	None	-	-	Oakland East	Mapped
Animals - Mammals	Dipodomys heermanni berkeleyensis	Berkeley kangaroo rat	None	None	-	-	Oakland East	Mapped
Animals - Mammals	Neotoma fuscipes annectens	San Francisco dusky-footed woodrat	None	None	SSC	-	Oakland East	Unprocessed
Animals - Mammals	Taxidea taxus	American badger	None	None	SSC	-	Oakland East	Mapped
Animals - Mammals	Scapanus latimanus parvus	Alameda Island mole	None	None	SSC	-	Oakland East	Mapped
Animals - Mammals	Antrozous pallidus	pallid bat	None	None	SSC	-	Oakland East	Mapped
Animals - Mammals	Corynorhinus townsendii	Townsend's big-eared bat	None	Candidate Threatened	SSC	-	Oakland East	Mapped

Table D-2. California Natural Diversity Database Results - Oakland East Quadrangle
Former Richfield Oil Station #402
1450 Fruitvale Avenue, Oakland, Alameda County, California

Element_Type	Scientific_Name	Common_Name	Federal_Status	State_Status	CDFW_Status	CA_Rare_Plant_Rank	Quad_Name	Data_Status
Animals - Mammals	Lasionycteris noctivagans	silver-haired bat	None	None	-	-	Oakland East	Mapped
Animals - Mammals	Lasiurus cinereus	hoary bat	None	None	-	-	Oakland East	Mapped and Unprocessed
Animals - Mammals	Myotis yumanensis	Yuma myotis	None	None	-	-	Oakland East	Unprocessed
Animals - Mollusks	Helminthoglypta nickliniana bridgesi	Bridges' coast range shoulderband	None	None	-	-	Oakland East	Mapped and Unprocessed
Animals - Mollusks	Tryonia imitator	mimic tryonia (=California brackishwater snail)	None	None	-	-	Oakland East	Mapped
Animals - Mollusks	Gonidea angulata	western ridged mussel	None	None	-	-	Oakland East	Unprocessed
Animals - Reptiles	Masticophis lateralis euryxanthus	Alameda whipsnake	Threatened	Threatened	-	-	Oakland East	Mapped and Unprocessed
Animals - Reptiles	Emys marmorata	western pond turtle	None	None	SSC	-	Oakland East	Mapped and Unprocessed
Community - Terrestrial	Northern Maritime Chaparral	Northern Maritime Chaparral	None	None	-	-	Oakland East	Mapped
Community - Terrestrial	Serpentine Bunchgrass	Serpentine Bunchgrass	None	None	-	-	Oakland East	Mapped
Plants - Bryophytes	Fissidens pauperculus	minute pocket moss	None	None	-	1B.2	Oakland East	Mapped
Plants - Vascular	Sanicula maritima	adobe sanicle	None	Rare	-	1B.1	Oakland East	Mapped
Plants - Vascular	Helianthella castanea	Diablo helianthella	None	None	-	1B.2	Oakland East	Mapped
Plants - Vascular	Monolopia gracilens	woodland woollythreads	None	None	-	1B.2	Oakland East	Mapped
Plants - Vascular	Amsinckia lunaris	bent-flowered fiddleneck	None	None	-	1B.2	Oakland East	Mapped and Unprocessed
Plants - Vascular	Plagiobothrys diffusus	San Francisco popcornflower	None	Endangered	-	1B.1	Oakland East	Mapped
Plants - Vascular	Streptanthus albidus ssp. peramoenus	most beautiful jewelflower	None	None	-	1B.2	Oakland East	Mapped
Plants - Vascular	Arctostaphylos pallida	pallid manzanita	Threatened	Endangered	-	1B.1	Oakland East	Mapped and Unprocessed
Plants - Vascular	Astragalus tener var. tener	alkali milk-vetch	None	None	-	1B.2	Oakland East	Mapped
Plants - Vascular	Hoita strobilina	Loma Prieta hoita	None	None	-	1B.1	Oakland East	Mapped
Plants - Vascular	Trifolium hydrophilum	saline clover	None	None	-	1B.2	Oakland East	Mapped
Plants - Vascular	California macrophylla	round-leaved filaree	None	None	-	1B.2	Oakland East	Mapped
Plants - Vascular	Calochortus umbellatus	Oakland star-tulip	None	None	-	4.2	Oakland East	Unprocessed
Plants - Vascular	Fritillaria liliacea	fragrant fritillary	None	None	-	1B.2	Oakland East	Mapped
Plants - Vascular	Clarkia concinna ssp. automixa	Santa Clara red ribbons	None	None	-	4.3	Oakland East	Mapped
Plants - Vascular	Clarkia franciscana	Presidio clarkia	Endangered	Endangered	-	1B.1	Oakland East	Mapped
Plants - Vascular	Castilleja ambigua var. ambigua	johnny-nip	None	None	-	4.2	Oakland East	Unprocessed
Plants - Vascular	Chloropyron maritimum ssp. palustre	Point Reyes salty bird's-beak	None	None	-	1B.2	Oakland East	Mapped
Plants - Vascular	Meconella oregana	Oregon meconella	None	None	-	1B.1	Oakland East	Mapped and Unprocessed
Plants - Vascular	Leptosiphon acicularis	bristly leptosiphon	None	None	-	4.2	Oakland East	Unprocessed
Plants - Vascular	Chorizanthe robusta var. robusta	robust spineflower	Endangered	None	-	1B.1	Oakland East	Mapped
Plants - Vascular	Eriogonum luteolum var. caninum	Tiburon buckwheat	None	None	-	1B.2	Oakland East	Mapped
Plants - Vascular	Polygonum marinense	Marin knotweed	None	None	-	3.1	Oakland East	Mapped
Plants - Vascular	Stuckenia filiformis ssp. alpina	slender-leaved pondweed	None	None	-	2B.2	Oakland East	Mapped
Plants - Vascular	Horkelia cuneata var. sericea	Kellogg's horkelia	None	None	-	1B.1	Oakland East	Mapped
Plants - Vascular	Dirca occidentalis	western leatherwood	None	None	-	1B.2	Oakland East	Mapped and Unprocessed

Appendix E

Soil Analytical & Soil Vapor Tables

Table 1
Soil Analytical Results
November 2013
Former ARC Station No. 402
1450 Fruitvale Avenue, Oakland, California

Well Identification	Soil Sample Depth (feet bgs)	Date Collected	GRO (mg/kg)	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Total Xylenes* (mg/kg)	MTBE (mg/kg)	ETBE (mg/kg)	TAME (mg/kg)	TBA (mg/kg)	DIPE (mg/kg)	EDB (mg/kg)	Ethanol (mg/kg)	Naphthalene (mg/kg)
MW-4	3.5	11/14/2013	ND<0.39	ND<0.0010	ND<0.0010	ND<0.0010	ND<0.0020	ND<0.0020	ND<0.0020	ND<0.0020	ND<0.051	ND<0.0020	ND<0.0010	ND<0.20	ND<0.0020
MW-4	6.5	11/14/2013	ND<0.40	ND<0.00095	ND<0.00095	ND<0.00095	ND<0.0019	ND<0.0019	ND<0.0019	ND<0.0019	ND<0.047	ND<0.0019	ND<0.00095	ND<0.19	ND<0.0019
MW-4	7.5	11/18/2013	0.99	0.0095	0.0057	0.26	0.06	ND<0.0052	ND<0.0052	ND<0.0052	ND<0.13	ND<0.0052	ND<0.0026	ND<0.52	0.21
MW-4	19.5	11/18/2013	1.8	ND<0.10	ND<0.10	0.66	ND<0.20	ND<0.25	ND<0.25	ND<0.25	ND<5.0	ND<0.25	ND<0.10	ND<15	ND<0.25
MW-5	7.5	11/18/2013	ND<0.37	ND<0.0010	ND<0.0010	ND<0.0010	ND<0.0020	ND<0.0020	ND<0.0020	ND<0.0020	ND<0.050	ND<0.0020	ND<0.0010	ND<0.20	ND<0.0020
MW-5	15.5	11/18/2013	1.3	ND<0.00099	ND<0.00099	ND<0.00099	ND<0.0020	ND<0.0020	ND<0.0020	ND<0.0020	ND<0.050	ND<0.0020	ND<0.00099	ND<0.20	ND<0.0020
MW-5	19.5	11/18/2013	ND<0.39	ND<0.00099	ND<0.00099	ND<0.00099	ND<0.0020	ND<0.0020	ND<0.0020	ND<0.0020	ND<0.050	ND<0.0020	ND<0.00099	ND<0.20	ND<0.0020
MW-6	7.5	11/19/2013	ND<0.38	ND<0.00099	ND<0.00099	ND<0.00099	ND<0.0020	ND<0.0020	ND<0.0020	ND<0.0020	ND<0.049	ND<0.0020	ND<0.00099	ND<0.20	ND<0.0020
MW-6	15.5	11/19/2013	16	ND<0.0010	ND<0.0010	ND<0.0010	ND<0.0020	ND<0.0020	ND<0.0020	ND<0.0020	ND<0.050	ND<0.0020	ND<0.0020	ND<0.20	ND<0.0020
MW-7	7.5	11/19/2013	ND<0.38	ND<0.00099	ND<0.00099	ND<0.00099	ND<0.0020	ND<0.0020	ND<0.0020	ND<0.0020	ND<0.049	ND<0.0020	ND<0.00099	ND<0.20	ND<0.0020
MW-7	15.5	11/19/2013	39	ND<0.00099	ND<0.00099	0.0053	ND<0.0020	ND<0.0020	ND<0.0020	ND<0.0020	ND<0.050	ND<0.0020	ND<0.00099	ND<0.20	ND<0.0020
LTCP Criteria - 0 to 5 feet bgs			NA	8.2	NA	89	NA	NA	NA	NA	NA	NA	NA	NA	45
LTCP Criteria - 5 to 10 feet bgs			NA	12	NA	134	NA	NA	NA	NA	NA	NA	NA	NA	45
LTCP Criteria -Utility Worker			NA	14	NA	314	NA	NA	NA	NA	NA	NA	NA	NA	219

Notes:

feet bgs = feet below ground surface
mg/kg = milligrams per kilogram
GRO = gasoline range organics (C6-C12)
MTBE = methyl tert-butyl ether
ETBE = ethyl tert-butyl ether
TAME = tert-amyl methyl ether
TBA = tert butyl alcohol
DIPE = di isopropyl ether
1,2-DCA = 1,2-dichloroethane
EDB = 1,2-dibromomethane

ND<X.XX = not detected above reporting limit of X.XX
NA = not analyzed
LTCP = Low Threat UST Closure Policy, California State Water Resources Control Board (SWRCB), August 17, 2012
LTCP Criteria listed in Table 1, page 8 of the LTCP for a commercial/industrial exposure scenario

Table 4
Soil Vapor Analytical Results
December 17, 2013
Former ARC Station No. 402
1450 Fruitvale Avenue, Oakland, California

Soil Vapor Probe Identification	Probe Sample Depth (feet bgs)	Date Collected	GRO ($\mu\text{g}/\text{m}^3$)	Benzene ($\mu\text{g}/\text{m}^3$)	Toluene ($\mu\text{g}/\text{m}^3$)	Ethylbenzene ($\mu\text{g}/\text{m}^3$)	Total Xylenes* ($\mu\text{g}/\text{m}^3$)	MTBE ($\mu\text{g}/\text{m}^3$)	Naphthalene ($\mu\text{g}/\text{m}^3$)	Carbon Dioxide (%)	Methane (%)	Oxygen (%)
SG-1A	3-3.5	12/17/2013	ND<8,100	ND<13	ND<15	ND<17	ND<17	ND<14	ND<21	1.7	0.00035	18.0
SG-1B	5-5.5	12/17/2013	46,000	ND<13	ND<15	ND<17	ND<17	ND<14	ND<21	1.1	0.0042	8.0
SG-2A	3-3.5	12/18/2013	ND<8,000	ND<13	ND<15	ND<17	ND<17	ND<14	ND<21	<0.98	0.0038	28.0
SG-2B	5-5.5	12/18/2013	ND<7,800	ND<13	ND<15	ND<17	ND<17	ND<14	ND<21	1.1	0.00076	20.0
SG-3A	3-3.5	12/17/2013	ND<8,000	ND<13	ND<15	ND<17	ND<17	ND<14	ND<21	1.0	0.00029	19.0
SG-3B	5-5.5	12/17/2013	ND<7,600	ND<13	ND<15	ND<17	ND<17	ND<14	ND<21	2.1	0.00027	18.0
ESLs			2,500,000	420.0	1,300,000	4,900	440,000	47,000	360	NA	NA	NA

Notes:

feet bgs = feet below ground surface
 $\mu\text{g}/\text{m}^3$ = micrograms per cubic meter
GRO = gasoline range organics (C6-C12)
MTBE = methyl tert-butyl ether

ND<X.XX = not detected above reporting limit of X.XX $\mu\text{g}/\text{m}^3$

NA = not analyzed

ESLs - Tier 1 Environmental Screening Levels, *Screening for Environmental Concerns at Sites with Contaminated Soil and Groundwater*, California Regional Water Quality Control Board (CRWQCB), Interim Final, December 2013. Commercial/Industrial exposure scenario; Table E-2