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Alameda County  
Environmental Health

March 2, 2009

Paresh C. Khatri  
Hazardous Materials Specialist

Alameda County Health Agency  
Department of Environmental Health Services  
1131 Harbor Bay Parkway, Suite 250  
Alameda, CA 94502-6577

**RE: Groundwater Monitoring Report – First Quarter 2009**  
Foothill Mini Mart  
6600 Foothill Boulevard, Oakland, California  
Fuel Leak Case No. RO0000175  
GeoTracker Global ID: T0600102286

Dear Mr. Khatri:

On behalf of Mr. Ravi Sekhon and pursuant to Alameda County Environmental Health's February 6, 2009 letter, Environmental Risk Specialties Corporation (ERS) has completed the 2009 first quarter groundwater monitoring/sampling for the subject site, and prepared the *Groundwater Monitoring Report – First Quarter 2009*. Attached with this electronic file, please find this report for your review and comments.

If you have questions, please feel free to call the undersigned at (925) 938-1600 ext. 108. Your assistance on this site is very appreciated.

Sincerely,  
ERS



Jim Ho, Ph.D., P.E.  
Principal Engineer

Cc: Ravi Sekhon, 21696 Knuppe Place, Castro Valley, CA 94552

## Groundwater Monitoring Report – First Quarter 2009

Former Sekhon Gas Station  
6600 Foothill Boulevard  
Oakland, CA 94605  
Fuel Leak Case No. RO0000175

Submitted by:  
Mr. Ravi Sekhon

Prepared by:  
Environmental Risk Specialty Corporation  
Walnut Creek, California

March 2009

Mr. Paresh C. Khatri  
Hazardous Material Specialist  
Alameda County Environmental Health  
1131 Harbor Bay Parkway, Suite 250  
Alameda, CA 94502-6577

**RE: Sekhon Gas Station**

6600 Foothill Boulevard  
Oakland, California, 94605  
Fuel Leak Case No. RO0000175  
GeoTracker Global ID: T0600102286  
UST Cleanup Fund Claim No. 14095

Dear Mr. Khatri:

As the responsible party of the above-referenced project location, I have reviewed the *Groundwater Monitoring Report – First Quarter 2009*, prepared by Environmental Risk Specialties Corporation (ERS) of Walnut Creek, California. I declare, under penalty of perjury, that the information and/or recommendations contained in this document or report are true and correct to the best of my knowledge.

Sincerely,



Mr. Ravi Sekhon

Date: 2-27-2009

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## 1. INTRODUCTION

On behalf of Mr. Ravi Sekhon, Environmental Risk Specialties Corporation (ERS) conducted First Quarter 2009 (1Q09) groundwater monitoring on February 6, 2009 for the site located at 6600 Foothill Boulevard, Oakland, California. Mr. Sekhon is a responsible party for the subsurface contamination of the former Sekhon Gas Station (Foothill Mini Mart) located at the subject address, and also the claimant of the UST Cleanup Fund (Claimant # 14095).

All of the existing monitoring wells, MW-1 through MW-6, were gauged and sampled during the 1Q09 groundwater monitoring event. Wells MW-1 through MW-3 are located on the subject property, well MW-4 is located on the property with an address of 6620 Foothill Boulevard (former Dairy Mart Milk owned by Mr. Le Blanc) east of the subject property, and wells MW-5 and MW-6 are located on the southern edge of Foothill Boulevard south of the subject property (see Figure 2). Monitoring wells MW-1 through MW-3 were installed on June 4, 2001, and wells MW-4 through MW-6 were installed on June 26, 2002.

All of the existing monitoring wells were purged and sampled using the Low-Flow Rate Purging (LRP) and Sampling Method (Puls and Barcelona, 1996). The following analytical methods were used to analyze the concerned contaminants: EPA Method 8015M for the total petroleum hydrocarbons as gasoline (TPH-g), EPA Method 8260B for Benzene, Toluene, Ethylbenzene, and Xylenes (BTEX) and fuel oxygenates; including Methyl Tertiary Butyl Ether (MTBE), Tertiary Butyl Alcohol (TBA), methanol, and ethanol.

Following the field gauging and sampling activities conducted on February 6, 2009, ERS has prepared a *Groundwater Monitoring Report – First Quarter 2009*. This report presents the groundwater monitoring activities, monitoring results, findings and discussion, conclusions and recommendations, and forecast of activities for the subject site.

## **2. BACKGROUND**

### **2.1 Site Description**

The Site is located at 6600 Foothill Boulevard, Oakland, California, on the northeastern corner of Havenscourt Boulevard and Foothill Boulevard (Figure 1). Ground surface elevation at the site is approximately 60 feet above msl. Regional topography of the site slopes gently toward the south-southwest. The site is located in an area with mixed commercial and residential uses. It is currently occupied by a retail gasoline station (Golden Gasoline) that includes a convenience store and two gasoline dispenser islands. Each dispenser island has two dispensers.

The property is bounded by an empty commercial building to the east, Foothill Boulevard to the south, Havenscourt Boulevard to the west and Evergreen Cemetery to the north. Across Foothill Boulevard, south of the subject site, and located at the southeast corner of the intersection of Havenscourt Boulevard and Foothill Boulevard, is an empty lot formerly used as a gas station. Adjacent to this empty lot is a two-story residential building with a store. The site plan is shown in Figure 2.

The site is located in the foothills of the Oakland Hills to the north. San Francisco Bay is located approximately two miles to the west of the property, and San Leandro Bay is approximately two miles southwest of the property. The Frick Jr. High School, Luther Burbank School, and Markham School are located within 2,000 feet of the property.

### **2.2 Site History**

The site has been a retail gas station since 1959 and was formerly operated as Shell, ARCO, and BEACON gasoline stations. The underground storage tank (UST) system of the former gas stations consisted of one 8,000-gallon, single wall, steel UST, two 10,000-gallon, single wall, fiberglass USTs, two dispenser islands, and two dispensers on each dispenser island. Mr. Ravi Sekhon purchased the property from the BEACON gas station in 1998.

As part of the UST system upgrade, a suspected leakage of the 8,000-gallon steel UST was noticed in November 1998. Consequently, the steel UST and associated dispensers were removed on December 16, 1998, and the leakage was reported in January 1999. Mr. Steve Crawford of the City of Oakland Fire Department was on site during the tank removal to observe site conditions and to direct sample collections. At Mr. Crawford's direction, two soil samples were collected individually from the eastern and western sidewalls of the UST pit and three soil samples were collected from beneath the dispenser islands. Since the pipe trench between the dispensers and UST pit was less than 20 feet, Mr. Crawford did not require that pipe trench samples be collected. The sampling results from beneath the dispenser islands and from the UST pit sidewall were forwarded to the Alameda County Environmental Health (ACEH) on January 11, 1999. In addition, on December 31, 1998, staff of Edd Clark & Associates collected one grab groundwater sample. A copy of these sample results was also forwarded to

the ACEH (AARS, 2003). Review of all laboratory reports shows that, with the exception of 25 ppb of toluene in the east dispenser island soil sample, the only detected compound in the soil has been MTBE. The water sample from the pit shows that TPH-gasoline, BTEX, and MTBE were detected in the groundwater.

Following the removal of the 8,000-gallon steel UST on December 16, 1998, P&D Environmental (P&D) of Oakland, California, was retained by Mr. Sekhon to provide consulting services. During P&D's site visit on January 9, 1999, approximately 6 inches of groundwater was observed at the bottom of the UST pit, from which a steel UST had just been removed. The measured depth to groundwater was 8.0 feet below ground surface (bgs). Sheen was observed on the water in the UST pit. However, no petroleum hydrocarbon odors were detected in any of the soil at the site. Based on a January 11, 1999 telephone conversation between Mr. Crawford of the City of Oakland Fire Department and the staff of P&D, Mr. Crawford indicated that there was nothing remarkable about the site, and no evidence of contamination other than MTBE, which was reported in the laboratory reports.

Based on the above observations and the sampling results, P&D recommended that the UST pit be backfilled, the upgrade of the remaining UST system be completed, and that a groundwater investigation be performed to determine the extent and origin of petroleum hydrocarbons in groundwater. Subsequently, prior to backfilling, groundwater was pumped from the UST pit and stored in above ground storage tanks pending carbon filtration and discharge to the storm drain with an approved San Francisco Bay Regional Water Quality Control Board temporary groundwater discharge permit. In addition, the stockpile soil generated during UST removal was characterized, profiled and removed from the site to the BFI Vasco Road Landfill in Livermore, California (P&D Environmental, 1999). Additionally, to complete the UST system upgrade, two fiberglass USTs were kept at the site, new dispensers with dispenser pans and sensors, double walled piping, overfill and overspill protection, a sump with a sensor for each UST, and an automatic tank gauging system were installed, and the pit was backfilled in January and February 1999.

Mr. Sekhon retained Advanced Assessment And Remediation Services (AARS) to conduct subsequent groundwater investigation. AARS conducted a preliminary site assessment in June 2001, supervised the installation of monitoring wells MW-1, MW-2, and MW-3 on June 4, 2001, and conducted quarterly sampling on June 13, 2001 (AARS, 2001) and March 21, 2002 (AARS, 2002a). The results of the preliminary site investigation, as well as the June 2001 and March 2002 quarterly monitoring and sampling, confirmed the presence of elevated petroleum hydrocarbons and MTBE in monitoring well MW-2 near the backfilled UST pit. AARS conducted an additional site investigation by installing three monitoring wells MW-4, MW-5, and MW-6 and two soil borings. These monitoring wells were installed on June 26, 2002, and an additional groundwater sampling event was performed on July 9, 2002 (AARS, 2002b). After that, AARS conducted six monitoring and sampling events between July 2003 and November 2005. The analytical results (AARS, 2006) indicated an elevated concentration of petroleum hydrocarbons in MW-4 and the farthest downgradient monitoring well MW-6, as well as



elevated MTBE concentrations in monitoring wells MW-1, MW-2, and MW-6. Results of those monitoring events suggested that off-site migration of petroleum hydrocarbons and MTBE might have occurred. Thus, ACEH requested additional site characterization to define the lateral and vertical extent of the groundwater impact (see ACEH's March 28, 2008 letter posted on Alameda County Environmental Cleanup Oversight Programs' ftp site).

### **2.3 Previous Site Investigations**

To assess the nature and extent of groundwater contamination, P&D prepared and submitted a work plan for a preliminary site investigation. After this work plan was approved by ACEH, Mr. Sekhon retained AARS to supervise the drilling of three soil borings to a maximum depth of 25 feet bgs conducted by Exploration Geoservices of San Jose, California, on June 4, 2001. After being sampled and screened at five-foot intervals, these soil borings were converted into monitoring wells MW-1 through MW-3. One sample from each borehole was delivered for laboratory analysis based on: the groundwater depth, smell of odors, and Photo Ionization Detector (PID) reading. Collected soil samples and groundwater samples from wells MW-1 through MW-3 were analyzed for TPH-g by EPA Method 8015M, and analyzed for BTEX and MTBE by EPA Method 8020. Elevated MTBE concentrations in soil and groundwater samples were found from MW-2 (0.29 mg/Kg and 94,000µg/L, respectively). EPA Method 8260 confirmed the above data. The investigation results are presented in the *Groundwater Quality Investigation* report (AARS, 2001).

A work plan was approved by ACEH (AARS, 2002c) and an additional site investigation was performed in June 2002. AARS supervised drilling and sampling of five borings, SB-1, SB-2, MW-4, MW-5, and MW-6, to a maximum depth of 20 feet bgs by Exploration Geoservices, on June 26 and 27, 2002. Soil samples from these five borings were collected in the same manner as in the 2001 preliminary investigation. Three borings were converted into monitoring wells MW-4 through MW-6 after soil sampling. As in 2001, soil and groundwater samples were analyzed for TPH-g, BTEX, and MTBE using the same EPA methods. The 2002 additional investigation revealed that elevated MTBE concentrations of 37,600, 28,300, 18,600, and 11,300 µg/L were found in wells MW-2, MW-4, MW-5, and MW-6, respectively. Elevated MTBE concentrations of 593, 4,290, and 1160 mg/Kg were found in soil samples collected from borings MW-4, MW-5, and MW-6, respectively, at a depth of 10 feet bgs. The 2002 additional investigation (AARS, 2002b) suggests that both TPH-g and MTBE have migrated to the southeast of the subject property following the groundwater flow. Prior to soil sampling and well installation, a horizontal conduit study and well search was also performed. No significant horizontal and vertical conduits were identified during 2002 investigation.

A work plan was approved by ACEH (AARS, 2003) for another site investigation performed in August 2005 (AARS, 2005). AARS supervised drilling of 12 soil borings, SB-3 through SB-14 by Gregg Drilling and Testing, Inc. of Martinez, California, on August 10 and 11, 2005. Soil borings SB-3 and SB-4 were drilled to 20 feet bgs; soil borings SB-5, SB-6 and SB-10 through SB-14 were drilled to 17 feet bgs. Soil boring SB-7 was drilled to 30 feet bgs, and SB-8 and SB-9 were drilled

to 28 feet bgs. Soil samples were collected from the above borings at five-foot intervals and analyzed for TPH-g, BTEX, and MTBE. Multiple soil samples were collected from borings SB-7, SB-8, and SB-9 based on the change of lithology or PID reading. Temporary well casings were installed in all soil borings for groundwater collection. Since borings SB-9, SB-13, and SB-14 were dry, groundwater samples were not collected (see Table 2). Groundwater was collected from other locations within the screened interval of 10 to 20 feet bgs. Collected soil and groundwater samples were analyzed for TPH-g by EPA Method 8015M, and for BTEX and MTBE by EPA Method 8021B.

The 2005 investigation revealed the following conditions:

- Highly clayey soil exists nearby the UST pit. Thus, the migration of dissolved hydrocarbons in groundwater is limited.
- The hydrocarbon plume is primarily confined to the vicinity of the removed tank pit area and has migrated to the southeast following the direction of groundwater flow.
- Groundwater samples collected from MW-2, MW-4, MW-6, SB-7, and SB-8 detected TPH-g concentrations between 91 and 9,300 µg/L (SB-8), and benzene concentrations between non-detect to 470 µg/L.
- Although MTBE was detected in all monitoring wells and most soil borings (non-detected only in SB-5 and SB-6), with concentrations ranging from 13 (SB-11) to 23,000 µg/L (SB-7), elevated MTBE concentrations were detected in monitoring wells MW-1, MW-2, MW-4, and MW-6, and soil borings SB-7 and SB-8.
- Significant levels of MTBE were detected in soil borings SB-7, SB-8, and SB-9 near the UST pit. TPH-g concentration containing strongly aged gasoline or diesel range compounds between 1.7 and 200 mg/Kg was detected in these soil borings.
- Due to the high mobility of MTBE, the delineated MTBE plume boundary is much broader than the hydrocarbon plume.
- Only a low TPH-g concentration of 4.7 mg/Kg containing strongly aged gasoline or diesel range compounds was detected at SB-4. No TPH-g, BTEX, and MTBE were detected in all other soil borings located on the properties of 6601 and 6619 Foothill Boulevard. In accordance with a personal communication with Mr. Billy Jue, property owner, elevated TPH-g concentration of 13,000 µg/L, detected in groundwater from location of SB-5 located on the property of 6619 Foothill Boulevard, with non-typical gasoline pattern, was likely associated with past railroad activities of General Motor Automotive Plant.

## **2.4 Local Geologic and Hydrogeologic Setting**

The subject property and its vicinity are located in the foothills of the Oakland Hills, as well as at the eastern edge of a broad alluvial plain on the east side of San Francisco Bay. The alluvial plain is relatively flat. The alluvial deposits consist largely of inter-fingered lenses of clayey gravel, sandy and silty clays, and sand to silty clay mixtures. Individual units are discontinuous and have low correlation with distance.

Groundwater under the subject property is often shallow. The average groundwater depths under the subject property on June 4, 2001 and August 11, 2005, were 9.83 and 8.17 feet bgs, respectively. However, the average groundwater depth off site measured on August 11, 2005 was 7.00 feet bgs. Local groundwater elevation varies with rainfall and seasons. The general groundwater flow direction is west or southwest toward the San Francisco Bay or San Leandro Bay.

## **2.5 Groundwater Monitoring History**

As mentioned above, existing monitoring wells were installed separately in June 2001 and 2002. However, the above wells have never been monitored regularly every quarter between 2001 and 2005. All wells were only monitored quarterly for one full year from July 2003 to May 2004 (see Table 2). Wells MW-1 through MW-3 were gauged only twice each year between 2002 and 2005, and wells MW-4 through MW-6 were gauged and sampled twice each year between 2003 and 2005. AARS conducted a final monitoring event on November 30, 2005 (AARS, 2006).

Mr. Ravi Sekhon retained ERS on July 9, 2008, to manage this site cleanup and closure project. Thus, at the request of ACEH in a letter dated July 24, 2008 posted on Alameda County Environmental Cleanup Oversight Programs' ftp site, quarterly groundwater monitoring resumed on August 8, 2008.

## **2.6 Contaminants of Concern**

Cumulative groundwater sampling data of all the sampling events between June 2001 and November 2005 (Table 2) shows that elevated concentrations of dissolved hydrocarbons, including TPH-g and/or benzene, as well as fuel oxygenates, including MTBE and/or TBA, have been detected from on-site monitoring wells MW-1 and MW-2, and off-site monitoring wells MW-4, MW-5, and MW-6. Thus, TPH-g, benzene, MTBE, and TBA are the contaminants of concern for the subject property.

### 3. GROUNDWATER MONITORING ACTIVITIES

All of the 6 monitoring wells for the subject site were gauged and sampled on February 6<sup>th</sup>, 2009. Before gauging, all well lids were opened and allowed to equilibrate for approximately 30 minutes. Depth to water was measured in order from wells with the lowest contaminant concentrations to the highest based on the 4Q08 data.

All existing wells MW-1 through MW-6 were purged and sampled using the Low-Flow Rate Purging (LRP) and Sampling Method (Puls and Barcelona, 1996). The purge rate was calibrated prior to the first purge to establish the flow-rate. Wells were purged with a rate between 0.25 and 0.35 liter per minute (L/min). Depth to water (DTW) and water quality parameters were measured in three-minute intervals. Water quality parameters: pH, temperature, dissolved oxygen (DO), specific conductance (SC), and oxidation-reduction potential (ORP) were measured within the flow-through cell. The water quality parameters were measured using an YSI 6820 instrument, which was calibrated prior to use and decontaminated between wells.

When parameters stabilized according to the low-flow sampling protocol (ASTM, 2002), the purging rate was reduced to approximately 0.15 L/min, the discharge tube was disconnected from the flow-through cell, and samples were collected directly from the dedicated tubing. Appendix A provides copies of the groundwater depth and well purging data sheets recorded in the field.

Water samples were collected, labeled and stored in a chilled ice chest with ice. The samples were delivered to the Kiff Analytical, LLC of Davis, California, a State of California certified laboratory, under standard chain-of-custody protocols. Kiff Analytical performed analysis for TPH-g by EPA Method 8015M, and analyses for BTEX and fuel oxygenates by EPA Method 8260B. Appendix B includes copies of the laboratory reports and chain-of-custody.

## 4. GROUNDWATER MONITORING RESULTS

LRP was used to purge each well prior to groundwater sampling during 1Q09. The groundwater purging rate for each well was set at 0.25 to 0.35 liter per minute (L/min). Groundwater gauging indicated that local groundwater was above the top of the well screen for all monitoring wells MW-1 through MW-6. Thus, the stinger (tubing) for purging/sampling was placed in the middle of each well screen. No sheen or product was visible during 1Q09 sampling. The water quality measurements reveal that, except for well MW-1, local groundwater quality is relatively homogeneous. MW-1 is the only well with a positive ORP (greater than 150 mV) and lower pH value (less than 6.2). The DO concentration of the local groundwater is consistently less than 0.1 mg/L. The above water quality parameter data indicates that, overall, the local groundwater is anaerobic and reductive. In addition to the purging rate and the stinger depth mentioned above, the water quality parameters (pH, temperature, DO, SC, and ORP) and the time required for reaching stabilization of water quality are listed in Table 3. The total volume of water purged from the six monitoring wells was approximately 10 gallons.

### 4.1 Groundwater Elevation and Flow

The historical data indicate that since June 2001, maximum and minimum groundwater depths frequently exist in monitoring wells MW-3/MW-1 and MW-4, respectively. During 1Q09, maximum and minimum groundwater depths again occurred in MW-3 (9.37 feet bgs) and MW-4 (5.15 feet bgs), respectively. Groundwater elevation was calculated by subtracting measured groundwater depth from the top of casing elevation. The top of casing (TOC) elevations and the construction data for the existing wells MW-1 through MW-6 are presented in Table 1.

Calculated groundwater elevations for the 1Q09 monitoring event are listed in Table 2. The calculated groundwater elevation ranges from 53.04 ft above msl (MW-4) to 50.57 ft above msl (MW-3). Since monitoring well MW-4 is located east of well MW-3, the primary groundwater flow direction should be from east to west. The associated groundwater elevation contours are depicted in Figure 3.

Based on the contoured potentiometric surface shown in Figure 3, the primary groundwater flow is in the east-to-west direction with a horizontal hydraulic gradient of approximately 0.015 ft/ft. The groundwater flow distribution determined during 1Q09 monitoring is similar to the groundwater flow observed since February 2004. The delineated groundwater flow direction and calculated hydraulic gradient are presented in Table 2 and Figure 3.

### 4.2 Concentration Level and Distribution of Groundwater Contaminants

The 1Q09 groundwater sampling reveals that the on-site TPH-g concentrations ranging from 50 to 150  $\mu\text{g/L}$  in wells MW-1 through MW-3 are lower than the off-site TPH-g concentrations between 680 and 5,800  $\mu\text{g/L}$  detected in wells MW-4 through MW-6. Again, the highest benzene

concentration of 34 µg/L is found in off-site well MW-6. Except for well MW-6, the BTEX concentrations are either insignificant or consistently less than their associated method reporting limits in other monitoring wells.

As opposed to the centric distribution of TPH-g with respect to well MW-6, elevated MTBE is located in both on-site well MW-1 (610 µg/L) and off-site well MW-6 (140 µg/L). Comparatively lower MTBE concentrations of 10, 5.3, 39, and 5.5 µg/L are detected in other wells MW-2 through MW-5, respectively. Most notably, a highest concentration of 11,000 µg/L for TBA, a degradation product of MTBE, was detected in on-site well MW-2 located near the UST pit. Although on-site well MW-2 has the highest TBA concentration, the detected MTBE concentration is relatively low (10 µg/L). Conversely, although on-site well MW-1 has the highest MTBE concentration (610 µg/L), the associated TBA concentration is only 120 µg/L. This contrast is shown in Figure 6.

Using the 1Q09 analytical data (Appendix B), spatial concentration distributions for the contaminants of concern, i.e., TPH-g, benzene, MTBE, and TBA, are plotted in Figures 4 through 6. Comparing the data obtained from the sampling events conducted on August 11, 2005 (AARS, 2005) and November 30, 2005 (AARS, 2006) with the sampling data exhibited in Figures 4 through 6, significant variations for the concentration levels and plume boundaries have occurred since 2005.

## 5. FINDINGS AND DISCUSSION

### Findings

Historical groundwater monitoring data shows that local groundwater flow frequently occurred in the southward direction along with a higher hydraulic gradient. This situation has been demonstrated in the groundwater flow probability distribution Rose Diagrams included in Figures 3A of the 1Q04, 2Q04, 3Q05, and 4Q05 monitoring reports (AARS, 2004a; 2004b; 2005; 2006). This probably caused the southward migration of TPH-g, benzene, and MTBE from the on-site UST pit area toward the off-site area (Foothill Boulevard) located south of the subject property. Similar to the 3Q08 and 4Q08 monitoring, this situation is again confirmed by lower TPH-g concentrations (50 – 150 µg/L) detected in on-site wells MW-1 through MW-3 and higher TPH-g concentrations (680 – 5,800 µg/L) detected in off-site wells MW-4 through MW-6 during 1Q09. In addition, although migration of TPH-g is mainly southward, its lateral range becomes broader. This situation is clearly shown in Figure 4 of the 2005 site characterization and 3Q05 monitoring report (AARS, 2005) and Figure 4 of the 4Q05 groundwater monitoring report (AARS, 2006), as well as Figure 4 of the 3Q08, 4Q08, and 1Q09 groundwater monitoring reports. In addition, although the center of the TPH-g plume has migrated off-site, based on the 3Q08, 4Q08, and 1Q09 data, the TPH-g plume remains relatively stable.

Similar to TPH-g, benzene also has migrated off site. However, compared with the TPH-g plume, the benzene plume has greatly diminished because benzene is more mobile and volatile than TPH-g, and gasoline contains a higher percentage of TPH-g than benzene. This finding is clearly shown in Figure 5 of the 2005 site characterization and 3Q05 monitoring report (AARS, 2005) and Figure 5 of the 4Q05 groundwater monitoring report (AARS, 2006), as well as Figure 5 of the 3Q08, 4Q08, and 1Q09 groundwater monitoring reports.

Comparing the change of the benzene/TPH-g plumes with the change of the MTBE plume, the effect of dilution and dispersion (natural attenuation) appears to have a stronger influence for MTBE, as opposed to TPH-g and benzene. The MTBE plume has been greatly diminished because the solubility of MTBE is much higher than the solubilities of benzene and TPH-g, and consequently, MTBE is more mobile than benzene and TPH-g. Since a northwestern component of local groundwater flow exists, the MTBE plume has been split into two smaller plumes. This effect is shown in Figure 6 of the 2005 site characterization and 3Q05 monitoring report (AARS, 2005) and Figure 6 of the 4Q05 groundwater monitoring report (AARS, 2006), as well as in Figure 6 of the 3Q08, 4Q08, and 1Q09 groundwater monitoring reports. The diminishing trend of MTBE concentration has been identified in wells MW-2, MW-4, and MW-5 (see Figure 7).

In addition to the above, more findings in 1Q09 are listed below:

- A higher level of TPH-g impact is found off site. The MTBE/TBA impact remains on site.

- Both the level and lateral extent of groundwater impact of TPH-g, benzene, MTBE, and TBA remain relatively stable between November 2008 (4Q08) and February 2009 (1Q09).
- The TPH-g concentration in well MW-3 increases from 55 to 100 µg/L between 4Q08 and 1Q09 events. This situation coincides with the westward groundwater flow delineated in 1Q09.
- The highest TBA concentration of 11,000 µg/L was detected in on-site well MW-2 located near the UST pit. Although well MW-2 has a highest TBA concentration, the detected MTBE concentration is only 10 µg/L. Conversely, although the on-site well MW-1 has a highest MTBE concentration, the associated TBA concentration is nearly the lowest.
- The highest benzene concentration (34 µg/L) is found in off-site well MW-6.
- Except for well MW-6, the BTEX concentrations are either insignificant or less than their associated method reporting limits in other monitoring wells.

### **Discussion**

In addition to the processes of dilution and dispersion, which are most viable for MTBE and TBA, the low DO (less than 0.1 mg/L) and negative ORP measured in wells located within the TPH-g plume (see Table 3 and Figure 4) suggests that biodegradation likely exists in local groundwater. The reasons are:

(1) TPH-g is more susceptible for biodegradation than MTBE. As a result, TPH-g in on-site groundwater has been greatly degraded and the DO in local groundwater has been reduced to levels of 1 mg/L and below.

(2) Although MTBE is much more mobile than TPH-g, it has not been degraded as much as TPH-g under the on-site source area. Thus, elevated MTBE concentrations still remain on site near well MW-1. The highest TBA concentration of 11,000 µg/L was detected in well MW-2, probably due to the fact that MW-2 is located near the UST pit.

Additionally, former groundwater sampling data show that elevated MTBE concentrations had been detected in wells MW-1, MW-2 and MW-4 near the UST pit, as well as in downgradient/off-site wells MW-5 and MW-6 between 2001 and 2005. However, the above historical data and the 3Q08, 4Q08, and 1Q09 sampling data show that the MTBE concentrations in those wells have been diminished since 2001 to 2005 (see Figure 7). It should be noted that both MTBE and TBA concentrations in well MW-2 show an opposite trend. The 3Q08, 4Q08, and 1Q09 TBA concentrations of 17,000, 13,000, and 11,000 µg/L, respectively, are the highest concentrations ever detected in well MW-2 since 2001. Additionally, TBA is highly concentrated in well MW-2, where the associated MTBE concentration is significantly lower than the concentrations in well MW-1 and MW-6 (see Figure 6). All of the above observations suggest



that, in addition to dilution and dispersion, intrinsic natural attenuation of TPH-g and MTBE likely occurs in the groundwater under the subject site.

Since both MTBE and TBA have extremely high water solubility (50,000 mg/L for MTBE, more than 70,000 mg/L for TBA), these compounds are very mobile in groundwater. To show the extent of MTBE degradation to TBA, a TBA to MTBE concentration ratio is used. Base on all the available data (see Table 2), the calculated averaged TBA to MTBE ratios from November 2003 to May 2004 and from August 2008 to February 2009 are presented below:

Monitoring Wells	November 2003 – May 2004	August 2008 – January 2009
	Average TBA/MTBE Concentration Ratio	
MW-1	0.2	0.1
MW-2	0.2	1,306
MW-3	11	95
MW-4	0.2	45
MW-5	2.0	38
MW-6	0.9	3.8

Based on the calculated TBA/MTBE ratios, the following interpretation and/or line of evidence again support the existence of natural degradation of MTBE in groundwater under the subject site:

1. According to the data for the lead scavengers, 1,2-dichloroethane and 1,2-dibromoethane, and the information discussed in the 3Q08 monitoring report, leakage of gasoline at the subject site most likely occurred between 1980s and 1998 (ERS, 2008a). Although MTBE tends to be degraded under aerobic conditions, the aerobic degradation of MTBE was depressed due to the microbial competition for the consumption of dissolved TPH compounds. As a result, the local groundwater conditions gradually turn anaerobic while the TPH compounds are being degraded.

2. The anaerobic degradation rate of MTBE is normally less than its aerobic degradation rate. Thus, relatively longer time is required to induce MTBE degradation under anaerobic conditions; especially when TPH compounds exist because it is easier for microbes to consume TPH than MTBE. Consequently, degradation of MTBE near the source area, e.g. well MW-2, will not be significant until the TPH compounds are sufficiently consumed. This process appears to exist in the source area since the TPH-g concentration in well MW-2 has reached a historical low (50 µg/L) and the TBA concentration still stays at an elevated level (11,000 µg/L).

3. The above situation should take place elsewhere when both TPH compounds and MTBE co-exist, and is reflected in wells MW-3 through MW-6 in 2008 and 1Q09. The relatively higher TBA/MTBE ratio found in wells MW-3, MW-5, and MW-6 in 2003/2004, however, was likely caused by the migration of TBA and MTBE from the source area, not through natural degradation, because TBA is more mobile than MTBE.

4. Like all other wells, groundwater in well MW-1 has low DO. However, the measured ORP values in MW-1 are positive. The cause of low TBA/MTBE ratio in MW-1 in 2003/2004 and 2008/2009 is not clear.

## 6. CONCLUSIONS AND RECOMMENDATIONS

### Conclusions

(1) Although the TPH-g and/or MTBE concentrations in on-site wells MW-1 and MW-2 near the UST pit decreased from 3Q08/4Q08 to 1Q09, concentrations of TPH-g and MTBE in off-site wells MW-4, MW-5, and MW-6 have remained relatively stable. The lateral extent of TPH-g and MTBE plumes has remained relatively stable as well. These data suggest that contaminated soil likely exists in the source areas.

(2) The extremely high MTBE concentration of 94,000 µg/L detected in June 2001 in well MW-2 near and downgradient of the UST pit has greatly reduced to approximately 10 µg/L between August 2008 and February 2009. However, during the same period, the TBA concentration in MW-2 has significantly increased from 980 to approximately 14,000 µg/L. The above data strongly suggests that degradation of MTBE has occurred within the source area as discussed in Section 5, but water quality near the on-site source area and off the site has not been significantly improved.

(3) The lateral range of the MTBE plume has significantly shrunk since 2005 due to the fact that MTBE is extremely mobile when the groundwater flow is significant; and biodegradation of MTBE has occurred in the source area. As a result, the groundwater impact of MTBE is limited to areas near wells MW-1 and MW-6.

(4) Although the MTBE plume has been split, relatively higher MTBE/TBA groundwater impact still exists on site (see Figure 6).

(5) Both TPH-g and benzene have been attenuated and migrated off site from the UST pit area. The resulting hydrocarbon plume center is near off-site well MW-6 (see Figure 4).

(6) Based on the distinct physical and biological characteristics of MTBE and TPH-g, as well as their existing concentration levels, groundwater impact of MTBE appears not as significant as that of TPH-g.

(7) Natural degradation of TPH-g and MTBE exists in the groundwater under the subject site.

## **Recommendations**

Results of the 1Q09 groundwater sampling indicate that MTBE and TBA are the major groundwater contaminants under the site. Off-site groundwater has been impacted by TPH-g, as well as benzene in lower concentrations. Both the 1Q09 groundwater data and the site conceptual model (ERS, 2008b) suggest that contaminated soil still exists on site near the UST pit area. This conclusion is likely because the TPH-g and MTBE concentrations in off-site wells MW-4 and MW-6 are relatively stable. Therefore, in order to cleanup the site and make the neighboring properties available for future development as soon as possible, it is beneficial to deploy an interim remedial measure (Phase 1 cleanup) within the original and newly-created “source areas”, i.e., areas near the tank pit and monitoring wells MW-1, MW-2, MW-4, and MW-6, to terminate further groundwater contamination in off-site areas. Thus, the 2009 site characterization proposed in *Data Gap Work Plan Addendum* (ERS, 2009) should be implemented as soon as possible so that a Feasibility Study can be conducted and the most cost-effective remedial alternative can be selected prior to the preparation and submission of a Corrective Action Plan.

## **7. FORECAST ACTIVITIES**

(1) The 2Q09 quarterly groundwater monitoring and sampling will be conducted on May 5, 2009.

(2) Application for the access of off-site properties has been mailed. Application of an encroachment permit for the installation of wells, as well as sampling of groundwater within the trenches of the 8-inch EBMUD water pipe and the 15-inch storm drain, under Foothill Boulevard and/or Havenscourt Boulevard is being prepared. Pending the availability of the above permits, the data gap investigation proposed in the work plan addendum (ERS, 2009) will be implemented either in March or April 2009.

## 8. REFERENCES

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## **9. REPORT DISTRIBUTION LIST**

Ravi Sekhon (via U.S. Mail)  
21696 Knuppe Place  
Castro Valley, CA 94552

Paresh Khatri (via electronic transmittal)  
Hazardous Materials Specialist  
Alameda County Environmental Health Services

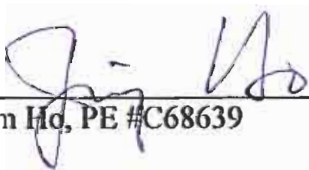
**CERTIFICATION**

This document was prepared under the supervision of a State of California Professional Engineer at Environmental Risk Specialties Corporation (ERS). All statements, conclusions, and recommendations are based solely upon published results from previous consultants, field observations by ERS, and laboratory analysis performed by a California DHS-certified laboratory related to the work performed by ERS.

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Sincerely,

ENVIRONMENTAL RISK SPECIALTIES CORPORATION



Jim Ho, PE #C68639





# **TABLES**

**Table 1**  
**Well Construction Data**  
6600 Foothill Boulevard, Oakland California

Well ID	Date Installed	Casing Diameter	Borehole Diameter	Total Depth	Screened Interval	Sand Interval	Bentonite Seal	Cement	Slot Size	Sand Size
		(inches)	(inches)	(feet)	(feet bgs)	(feet bgs)	(feet bgs)	(feet bgs)	(inches)	
MW-1	6/4/2001	2	8	25	10 - 25	8 - 25	6 - 8	0 - 6	0.01	Lonestar #2
MW-2	6/4/2001	2	8	25	10 - 25	8 - 25	6 - 8	0 - 6	0.01	Lonestar #2
MW-3	6/4/2001	2	8	25	10 - 25	8 - 25	6 - 8	0 - 6	0.01	Lonestar #2
MW-4	6/26/2002	2	8	20	7.5 - 20	6 - 20	5 - 6	0 - 5	0.01	Lonestar #2
MW-5	6/26/2002	2	8	20	7.5 - 20	6 - 20	5 - 6	0 - 5	0.01	Lonestar #2
MW-6	6/26/2002	2	8	20	7.5 - 20	6 - 20	5 - 6	0 - 5	0.01	Lonestar #2

**TABLE 2**

**Cumulative Groundwater Elevation and Analytical Data**

6600 Foothill Blvd, Oakland, California

Monitoring Wells	Total Depth Drilled (ft bgs)	Date Sampled	Top of Casing Elevation (ft, above msl)	Depth to Water (ft, below TOC)	Water Elevation (ft, above msl) <sup>(1)</sup>	Groundwater Flow Direction	GW Gradient (ft/ft)	TPH-g (ug/L)	Benzene (ug/L)	Toluene (ug/L)	Ethylbenzene (ug/L)	Xylenes (ug/L)	MTBE (ug/L)	TBA (ug/L)	ETBE, DIPE, TAME, METH, ETH (ug/L)	1,2-DCA (ug/L)	1,2-EDB (ug/L)
Analysis Methods								EPA 8015M	EPA 8021B/EPA 8260B <sup>(2)</sup>					EPA 8260B			
Maximum Contaminant Level <sup>^</sup>								NA	5	1,000	700	10,000	5	12 (Ca.)	NA	5	0.05
MW-1	25	6/13/2001	100.00 <sup>*</sup>	9.36	90.64	SE	0.05	ND	ND	ND	ND	ND	130	NA	--	--	--
		3/21/2002	100.00 <sup>*</sup>	7.96	92.04	SE	0.024	95	ND	ND	ND	ND	72.5	NA	--	--	--
		7/9/2002	100.00 <sup>*</sup>	8.51	91.49	SE	0.014	ND	ND	ND	ND	ND	208	NA	--	--	--
		7/11/2003	160.25	8.66	151.59	SE	0.012	ND	0.7	ND	ND	1.2	636	NA	--	--	--
		11/13/2003	160.25	8.10	152.15	SE	0.012	ND<5000#	ND	ND	ND	ND	72,000	22,000	--	--	--
		2/19/2004	160.25	8.24	152.01	NW - SW	0.008	1,350	460	ND	ND	ND	82,000	8,630	--	--	--
		5/21/2004	160.25	8.51	151.74	NW - SW	0.019	ND	ND<50	ND<50	ND<50	ND<100	12,000	ND<1000	--	--	--
		8/11/2005	160.25	8.34	151.91	SW	0.008	ND	ND	ND	ND	ND	4,900	NA	--	--	--
		11/30/2005	160.25	9.86	150.39	NW - SW	0.018	ND<250	ND<2.5	ND<2.5	ND<2.5	ND<2.5	8,400	NA	--	--	--
		8/8/2008	60.02	10.62	49.40	NWN - SW	0.031-0.017	390	<1.5	<1.5	<1.5	<1.5	720	7.4J	<1.5, Meth<300, Eth<15	<1.5	<1.5
11/5/2008	60.02	10.78	49.24	NWN - SWW	0.039-0.016	350	<5.0	<10	<10	<10	580	<100	<20, Eth<1,000	--	--		
		<b>2/6/2009</b>	<b>60.02</b>	<b>9.05</b>	<b>50.97</b>	<b>W</b>	<b>0.015</b>	<b>150</b>	<b>&lt;1.5</b>	<b>&lt;1.5</b>	<b>&lt;1.5</b>	<b>&lt;1.5</b>	<b>610</b>	<b>120</b>	<b>&lt;1.5, Meth&lt;600, Eth&lt;15</b>	<b>--</b>	<b>--</b>
MW-2	25	6/13/2001	98.71 <sup>*</sup>	10.44	88.27	SE	0.05	5,800	160	210	290	980	94,000	980	--	--	--
		3/21/2002	98.71 <sup>*</sup>	8.18	90.53	SE	0.024	452	3.4	ND	1.6	2.1	79,100	NA	--	--	--
		7/9/2002	98.71 <sup>*</sup>	8.35	90.36	SE	0.014	497	61.6	ND	ND	1.6	37,600	NA	--	--	--
		7/11/2003	158.97	7.58	151.39	SE	0.012	553	48.9	ND	ND	ND	38,200	NA	--	--	--
		11/13/2003	158.97	8.01	150.96	SE	0.012	ND<2500#	NS	ND	ND	ND	47,000	11,000	--	--	--
		2/19/2004	158.97	6.43	152.54	NW - SW	0.008	4,390	410	265	160	490	26,700	3,930	--	--	--
		5/21/2004	158.97	6.83	152.14	NW - SW	0.019	1,150	254	ND<200	ND<200	ND<400	24,600	ND<4000	--	--	--
		8/11/2005	158.97	7.31	151.66	SW	0.008	91	ND	1.1	ND	ND	6,500	NA	--	--	--
		11/30/2005	158.97	7.98	150.99	NW - SW	0.018	69	ND	1.4	ND	ND	2,300	NA	--	--	--
		8/8/2008	58.74	7.19	51.55	NWN - SW	0.031-0.017	300	<9.0	<9.0	<9.0	<9.0	9.8	17,000	<9.0, Meth<900, Eth<90	<9.0	<9.0
11/5/2008	58.74	7.14	51.60	NWN - SWW	0.039-0.016	510	<0.50	<1.0	<1.0	<1.0	12	13,000	<2.0, Eth<100	--	--		
		<b>2/6/2009</b>	<b>58.74</b>	<b>6.92</b>	<b>51.82</b>	<b>W</b>	<b>0.015</b>	<b>50</b>	<b>&lt;4.0</b>	<b>&lt;4.0</b>	<b>&lt;4.0</b>	<b>&lt;4.0</b>	<b>10</b>	<b>11,000</b>	<b>&lt;4.0, Meth&lt;400, Eth&lt;40</b>	<b>--</b>	<b>--</b>
MW-3	25	6/13/2001	99.90 <sup>*</sup>	9.69	90.21	SE	0.05	300	1	ND	0.07	2	450	NA	--	--	--
		3/21/2002	99.90 <sup>*</sup>	8.80	91.10	SE	0.024	274	1.1	ND	1	2.5	7,520	NA	--	--	--
		7/9/2002	99.90 <sup>*</sup>	9.33	90.57	SE	0.014	ND	ND	ND	ND	ND	40.8	NA	--	--	--
		7/11/2003	160.17	9.35	150.82	SE	0.012	ND	ND	ND	ND	ND	24.3	NA	--	--	--
		11/13/2003	160.17	8.85	151.32	SE	0.012	ND	ND	ND	ND	ND	37	27	--	--	--
		2/19/2004	160.17	8.46	151.71	NW - SW	0.008	83	ND	ND	ND	ND	42.7	508	--	--	--
		5/21/2004	160.17	9.09	151.08	NW - SW	0.019	ND	ND	ND	ND	ND	54	1100	--	--	--
		8/11/2005	160.17	8.87	151.30	SW	0.008	ND	ND	ND	ND	ND	27	NA	--	--	--
		11/30/2005	160.17	9.73	150.44	NW - SW	0.018	ND	ND	ND	ND	ND	28	NA	--	--	--
		8/8/2008	59.94	9.64	50.30	NWN - SW	0.031-0.017	99	<0.50	<0.50	<0.50	<0.50	4.5	130	<0.50, Meth<80, Eth<5.0	<0.50	<0.50
11/5/2008	59.94	9.33	50.61	NWN - SWW	0.039-0.016	55	<0.50	<1.0	<1.0	<1.0	4.5	500	<2.0, Eth<100	--	--		
		<b>2/6/2009</b>	<b>59.94</b>	<b>9.37</b>	<b>50.57</b>	<b>W</b>	<b>0.015</b>	<b>100</b>	<b>&lt;0.50</b>	<b>&lt;0.50</b>	<b>&lt;0.50</b>	<b>&lt;0.50</b>	<b>5.3</b>	<b>770</b>	<b>&lt;0.50, Meth&lt;100, Eth&lt;5.0</b>	<b>--</b>	<b>--</b>

**TABLE 2**

**Cumulative Groundwater Elevation and Analytical Data**

6600 Foothill Blvd, Oakland, California

Monitoring Wells	Total Depth Drilled (ft bgs)	Date Sampled	Top of Casing Elevation (ft, above msl)	Depth to Water (ft, below TOC)	Water Elevation (ft, above msl) <sup>(1)</sup>	Groundwater Flow Direction	GW Gradient (ft/ft)	TPH-g (ug/L)	Benzene (ug/L)	Toluene (ug/L)	Ethylbenzene (ug/L)	Xylenes (ug/L)	MTBE (ug/L)	TBA (ug/L)	ETBE, DIPE, TAME, METH, ETH (ug/L)	1,2-DCA (ug/L)	1,2-EDB (ug/L)
Analysis Methods								EPA 8015M	EPA 8021B/EPA 8260B <sup>(2)</sup>					EPA 8260B			
Maximum Contaminant Level <sup>^</sup>								NA	5	1,000	700	10,000	5	12 (Ca.)	NA	5	0.05
MW-4	20	7/9/2002	98.19 <sup>*</sup>	8.14	90.05	SE	0.014	9,680	43	17	369	1990	28,300	NA	--	--	--
		7/11/2003	158.42	6.73	151.69	SE	0.012	3,170	16.5	6.4	71.7	240	16,600	NA	--	--	--
		11/13/2003	158.42	6.54	151.88	SE	0.012	ND<1000#	49	ND	340	900	16,000	4,500	--	--	--
		2/19/2004	158.42	4.37	154.05	NW - SW	0.008	7,230	107	7	497	1063	14,300	1,440	--	--	--
		5/21/2004	158.42	5.79	152.63	NW - SW	0.019	9,340	194	ND	309	860	7,380	ND<2000	--	--	--
		8/11/2005	158.42	6.65	151.77	SW	0.008	3,000	15	24	87	190	1,200	NA	--	--	--
		11/30/2005	158.42	6.05	152.37	NW - SW	0.018	4,300	18	28	84	130	340	NA	--	--	--
		8/8/2008	58.19	5.91	52.28	NWN - SW	0.031-0.017	3,600	0.53	0.61	5.6	1.5	24	1,800	<0.50, Meth<80, Eth<5.0	<0.50	<0.50
		11/5/2008	58.19	5.33	52.86	NWN - SWW	0.039-0.016	2,000	0.58	<1.0	6.8	1.2	31	760	<2.0, Eth<100	--	--
		<b>2/6/2009</b>	<b>58.19</b>	<b>5.15</b>	<b>53.04</b>	<b>W</b>	<b>0.015</b>	<b>3,400</b>	<b>0.81</b>	<b>&lt;0.50</b>	<b>10</b>	<b>1.2</b>	<b>39</b>	<b>1,400</b>	<b>&lt;0.50, Meth&lt;200, Eth&lt;5.0</b>	<b>--</b>	<b>--</b>
MW-5	20	7/9/2002	97.81 <sup>*</sup>	8.16	89.65	SE	0.014	275	30.2	ND	ND	3	18,600	NA	--	--	--
		7/11/2003	158.03	7.94	150.09	SE	0.012	890	10	0.6	ND	7.1	5,090	NA	--	--	--
		11/13/2003	158.03	7.41	150.62	SE	0.012	ND<1000#	ND	ND	ND	ND	3,400	3,100	--	--	--
		2/19/2004	158.03	6.14	151.89	NW - SW	0.008	1,310	ND	0.7	ND	2.2	438	1,340	--	--	--
		5/21/2004	158.03	7.42	150.61	NW - SW	0.019	1,960	9.7	0.7	ND	ND	214	436	--	--	--
		8/11/2005	158.03	7.67	150.36	SW	0.008	410**	ND	3.3	ND	ND	100	NA	--	--	--
		11/30/2005	158.03	8.51	149.52	NW - SW	0.018	240**	ND	1.8	ND	1.4	82	NA	--	--	--
		8/8/2008	57.80	7.59	50.21	NWN - SW	0.031-0.017	1,900	<0.50	<0.50	<0.50	4.0	8.6	510	<0.50, Meth<50, Eth<5.0	<0.50	<0.50
		11/5/2008	57.80	6.91	50.89	NWN - SWW	0.039-0.016	1,600	<0.50	<1.0	<1.0	1.1	4.8	170	<2.0, Eth<100	--	--
		<b>2/6/2009</b>	<b>57.80</b>	<b>6.98</b>	<b>50.82</b>	<b>W</b>	<b>0.015</b>	<b>680</b>	<b>&lt;0.50</b>	<b>&lt;0.50</b>	<b>&lt;0.50</b>	<b>2.2</b>	<b>5.5</b>	<b>110</b>	<b>&lt;0.50, Meth&lt;200, Eth&lt;5.0</b>	<b>--</b>	<b>--</b>
MW-6	20	7/9/2002	97 <sup>*</sup>	7.45	89.55	SE	0.014	12,000	432	22	637	1740	11,300	NA	--	--	--
		7/11/2003	157.24	7.98	149.26	SE	0.012	2,970	534	6.3	70.1	278	18,000	NA	--	--	--
		11/13/2003	157.24	7.47	149.77	SE	0.012	ND<2500#	300	ND	ND	52	18,000	ND	--	--	--
		2/19/2004	157.24	5.09	152.15	NW - SW	0.008	5,340	184	5	65	127	5,310	4,260	--	--	--
		5/21/2004	157.24	6.38	150.86	NW - SW	0.019	6,110	340	12.7	205	308.8	3,900	4,060	--	--	--
		8/11/2005	157.24	6.68	150.56	SW	0.008	6,100	470	48	23	30	3,200	NA	--	--	--
		11/30/2005	157.24	7.43	149.81	NW - SW	0.018	3,700	310	30	16	12	3,400	NA	--	--	--
		8/8/2008	57.01	6.23	50.78	NWN - SW	0.031-0.017	6,500	63	2.0	42	98	230	810	<0.50, TAME<0.66, Meth<200, Eth<8.0	<0.50	<0.50
		11/5/2008	57.01	5.35	51.66	NWN - SWW	0.039-0.016	4,800	74	<5.0	23	42	340	950	<10, Eth<500	--	--
		<b>2/6/2009</b>	<b>57.01</b>	<b>5.44</b>	<b>51.57</b>	<b>W</b>	<b>0.015</b>	<b>5,800</b>	<b>34</b>	<b>1.1</b>	<b>16</b>	<b>38</b>	<b>140</b>	<b>690</b>	<b>&lt;0.50, Meth&lt;200, Eth&lt;5.0</b>	<b>--</b>	<b>--</b>

TABLE 2 Cumulative Groundwater Elevation and Analytical Data 6600 Foothill Blvd, Oakland, California																	
Monitoring Wells	Total Depth Drilled (ft bgs)	Date Sampled	Top of Casing Elevation (ft, above msl)	Depth to Water (ft, below TOC)	Water Elevation (ft, above msl) <sup>(1)</sup>	Groundwater Flow Direction	GW Gradient (ft/ft)	TPH-g (ug/L)	Benzene (ug/L)	Toluene (ug/L)	Ethyl-benzene (ug/L)	Xylenes (ug/L)	MTBE (ug/L)	TBA (ug/L)	ETBE, DIPE, TAME, METH, ETH (ug/L)	1,2-DCA (ug/L)	1,2-EDB (ug/L)
Analysis Methods								EPA 8015M	EPA 8021B/EPA 8260B <sup>(2)</sup>					EPA 8260B			
Maximum Contaminant Level <sup>^</sup>								NA	5	1,000	700	10,000	5	12 (Ca.)	NA	5	0.05
SB-1/GW	20	6/27/2002	--	--	--	--		554	1	0.8	11.6	76.2	74.1	NA	--	--	--
SB-2/GW	20	6/27/2002	--	--	--	--		3000	95.6	10.2	394	831	485*	NA	--	--	--
SB-3/GW	20	8/11/2005	--	--	--	--		ND	ND	ND	ND	ND	32	NA	--	--	--
SB-4/GW	20	8/11/2005	--	--	--	--		160**	ND	ND	ND	ND	180	NA	--	--	--
SB-5/GW	17	8/10/2005	--	--	--	--		13000**	ND<5.0	260	ND<5.0	ND<5.0	ND<50	NA	--	--	--
SB-6/GW	17	8/10/2005	--	--	--	--		ND	ND	ND	ND	ND	ND	NA	--	--	--
SB-7/GW	30	8/11/2005	--	--	--	--		2900	19	ND<10	160	ND	23000	NA	--	--	--
SB-8/GW	28	8/11/2005	--	--	--	--		9300	230	10	460	1500	11000	NA	--	--	--
SB-10/GW	17	8/10/2005	--	--	--	--		ND	ND	ND	ND	ND	16	NA	--	--	--
SB-11/GW	17	8/10/2005	--	--	--	--		ND	ND	ND	ND	ND	13	NA	--	--	--
SB-12/GW	17	8/10/2005	--	--	--	--		ND	ND	ND	ND	ND	ND	NA	--	--	--

**Notes:**

TPH-g total petroleum hydrocarbons as gasoline  
 MTBE Methyl Tertiary Butyl Ether  
 TBA Tertiary Butyl Alcohol  
 ETBE Ethyl-tetra-butyl ether  
 DIPE Diisopropyl ether  
 TAME Tertiary-amyl methyl ether  
 METH Methanol  
 ETH Ethanol  
 1,2-DCA 1,2-Dichloroethane  
 1,2-EDB 1,2-Dibromoethane  
 SB Soil Boring  
 GW Grab Ground Water

ND = "non-detect" or below the Method Reporting Limits

NA = Not Available

<sup>^</sup> US EPA Drinking Water Standard

\* The top of casing (TOC) elevations originally surveyed on June 13, 2001 used MW-1 as the common datum with an assumed elevation of 100.00 feet above mean sea level (MSL). All other TOC elevations were surveyed relative to MW-1. All the wells were again surveyed per GeoTracker standard on July 11, 2003, by PLS Surveys, Inc., a California licensed surveyor. All elevations are reported with respect to feet above mean sea level (MSL).

+ Confirmed by GC/MS method 8260B

\*\* Laboratory reported does not match gasoline pattern

# See Laboratory explanations (dated November 26 & December 8, 2003)

<sup>(1)</sup> The TOC elevations reported in all previous groundwater monitoring reports are incorrect. The datum elevation adopted previously was revised on August 4, 2008 using City of Oakland datum (NAD83). The revised TOC elevations are converted to mean sea level elevation and used to calculate all the groundwater elevations.

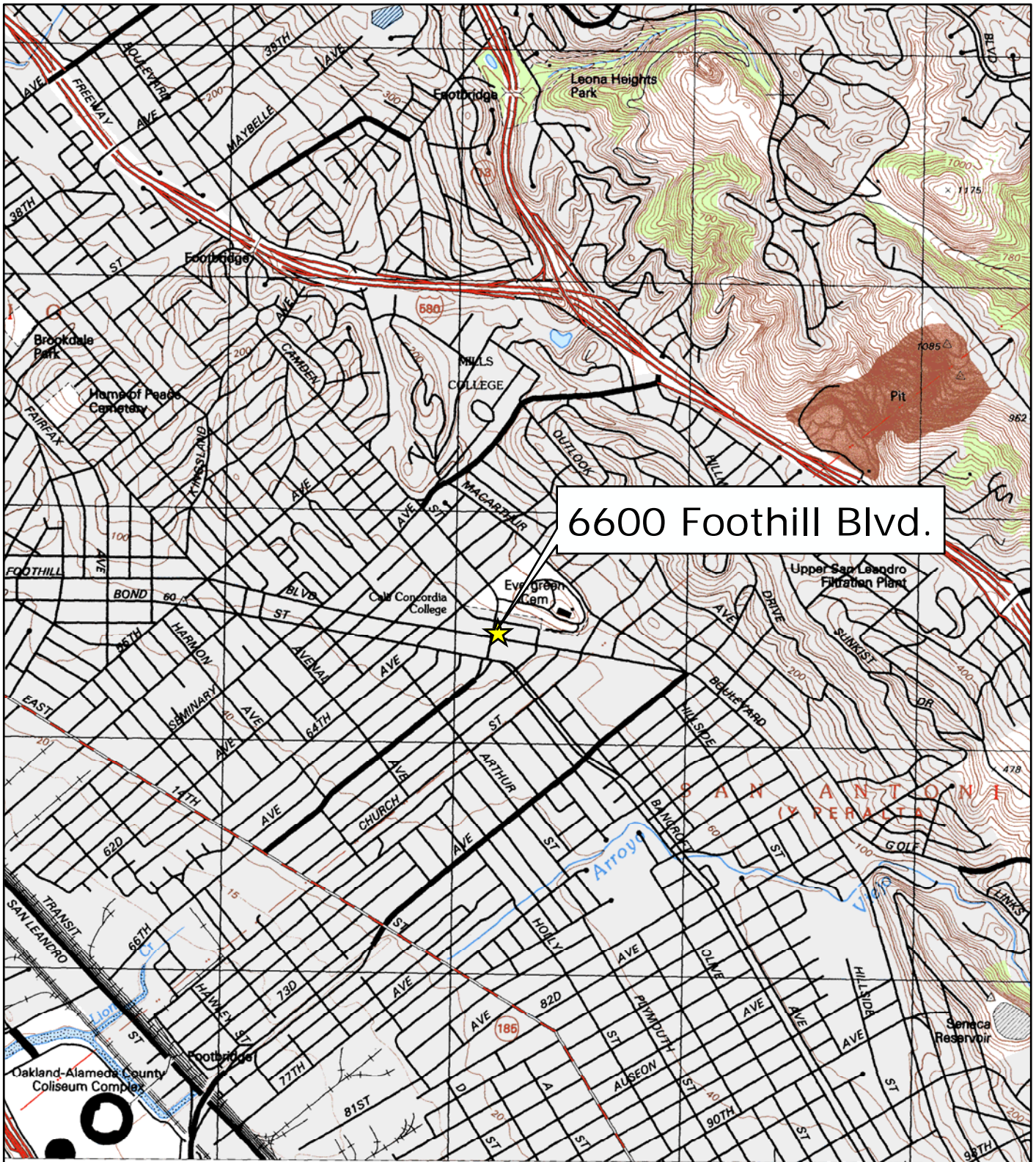
<sup>(2)</sup> EPA 8260B adopted since 8/8/2008

ug/L - microgram per liter (part per billion)

**Table 3**  
**Field Measured Water Quality Parameters**  
6600 Foothill Blvd, Oakland, California

Monitoring Wells	Date	Purging Time	pH	Temperature	Specific Conductivity	DO	ORP
		(minutes)	(SU)	(°F)	(µmhos/cm)	(mg/l)	(mV)
MW-1	08/08/08	26	5.76	73.43	491	0.58	149.3
	11/05/08	22	5.86	72.11	453	0.06	132.7
	<b>02/06/09</b>	<b>30</b>	<b>6.13</b>	<b>66.79</b>	<b>541</b>	<b>0.01</b>	<b>152</b>
MW-2	08/08/08	21	6.39	75.47	788	0.82	-33.4
	11/05/08	22	6.36	74.96	739	0.16	-10.9
	<b>02/06/09</b>	<b>32</b>	<b>6.52</b>	<b>67.15</b>	<b>889</b>	<b>0.06</b>	<b>-25</b>
MW-3	08/08/08	19	6.31	72.81	290	0.53	-37.6
	11/05/08	18	6.5	73.71	259	0.37	-18.5
	<b>02/06/09</b>	<b>28</b>	<b>6.63</b>	<b>69.21</b>	<b>384</b>	<b>0.1</b>	<b>-66</b>
MW-4	08/08/08	27	6.58	73.5	638	0.56	-59.2
	11/05/08	20	6.74	72.92	470	0.16	-86.8
	<b>02/06/09</b>	<b>18</b>	<b>6.93</b>	<b>64.38</b>	<b>561</b>	<b>0.01</b>	<b>-97</b>
MW-5	08/08/08	29	6.35	70.41	307	0.63	-54.1
	11/05/08	24	6.63	71.54	368	0.24	-70.1
	<b>02/06/09</b>	<b>15</b>	<b>6.91</b>	<b>64.4</b>	<b>279</b>	<b>0.01</b>	<b>-98</b>
MW-6	08/08/08	19	6.18	70.71	595	0.52	-18.8
	11/05/08	16	6.47	68.52	608	0.05	-57.3
	<b>02/06/09</b>	<b>15</b>	<b>6.87</b>	<b>62.94</b>	<b>604</b>	<b>0.01</b>	<b>-71</b>

# FIGURES



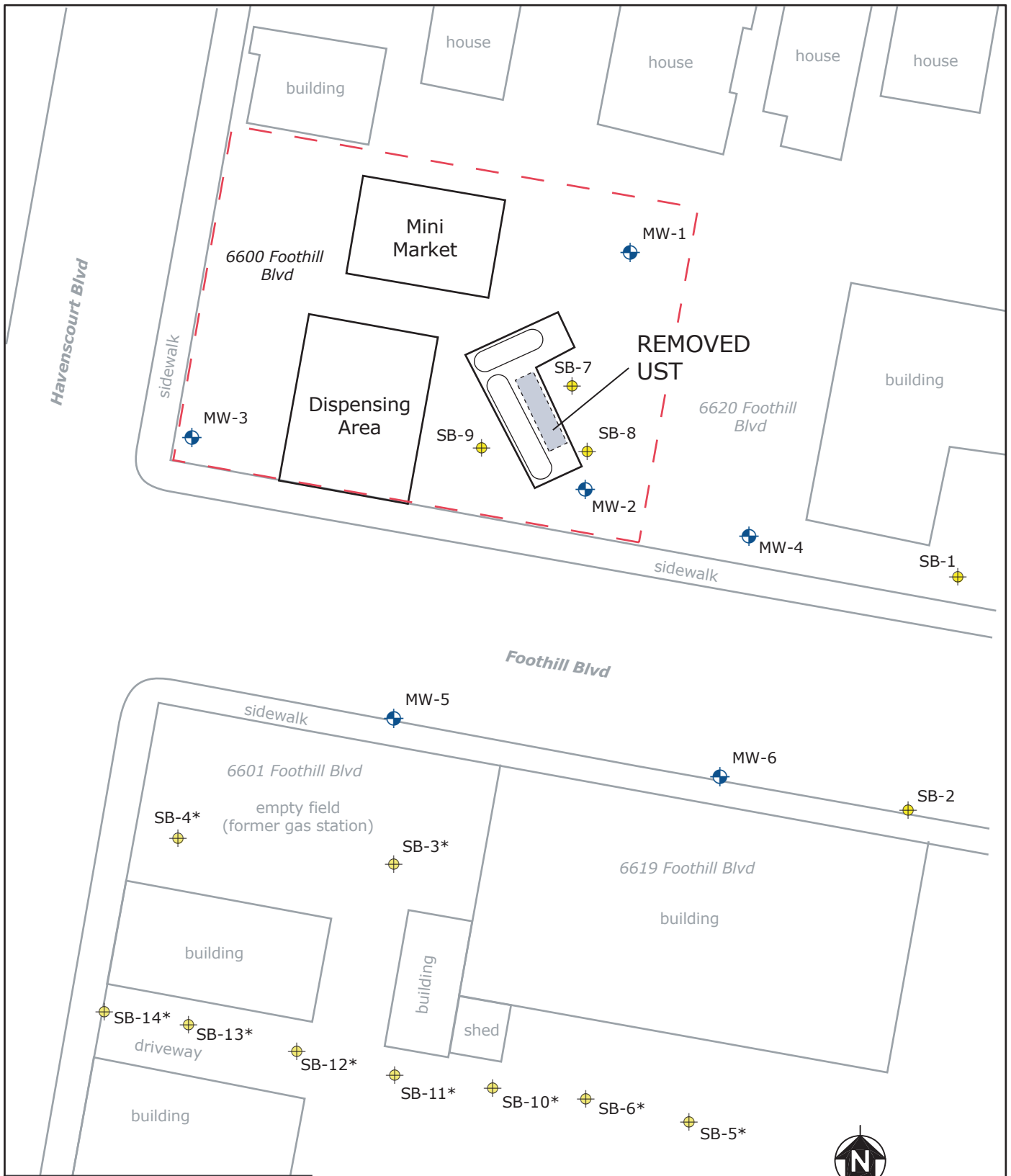
6600 Foothill Blvd.






0 1,000 2,000  
 Feet  
 1 inch equals 2,000 feet

<p><b>Vicinity Map</b></p> <p>6600 Foothill Blvd, Oakland, CA</p>	<p>Figure  <b>1</b>  <b>ers</b></p>
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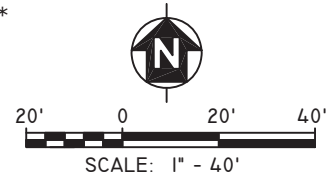




**LEGEND**

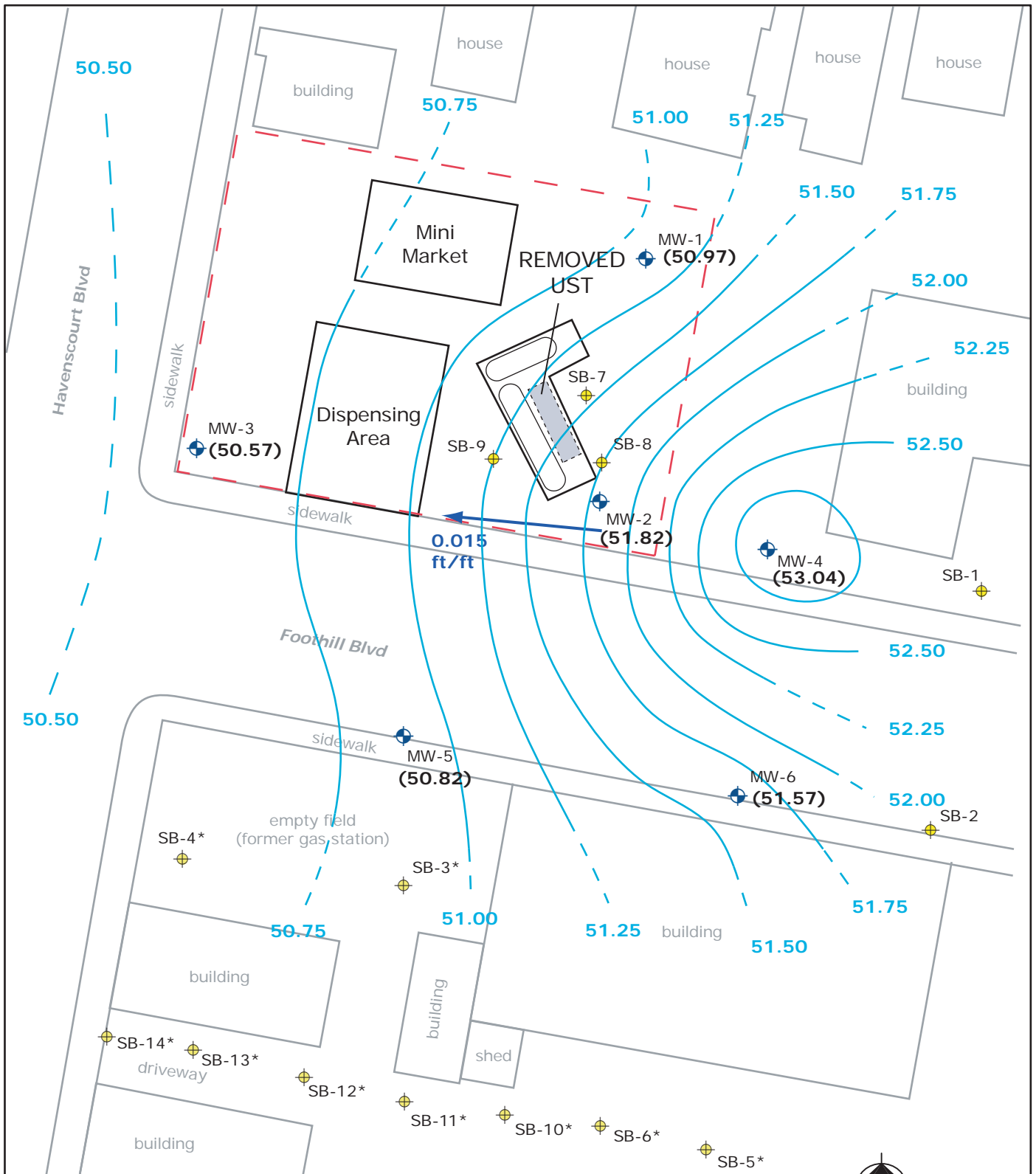
-  MW-3 Monitoring Well
-  SB-8 Soil Boring (2002 & 2005)
-  Approximate Property Boundary

\* = location approximate







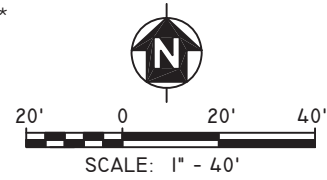
**Site Plan**  
6600 Foothill Blvd, Oakland, CA 94605

Figure  
**2**  
**ers**

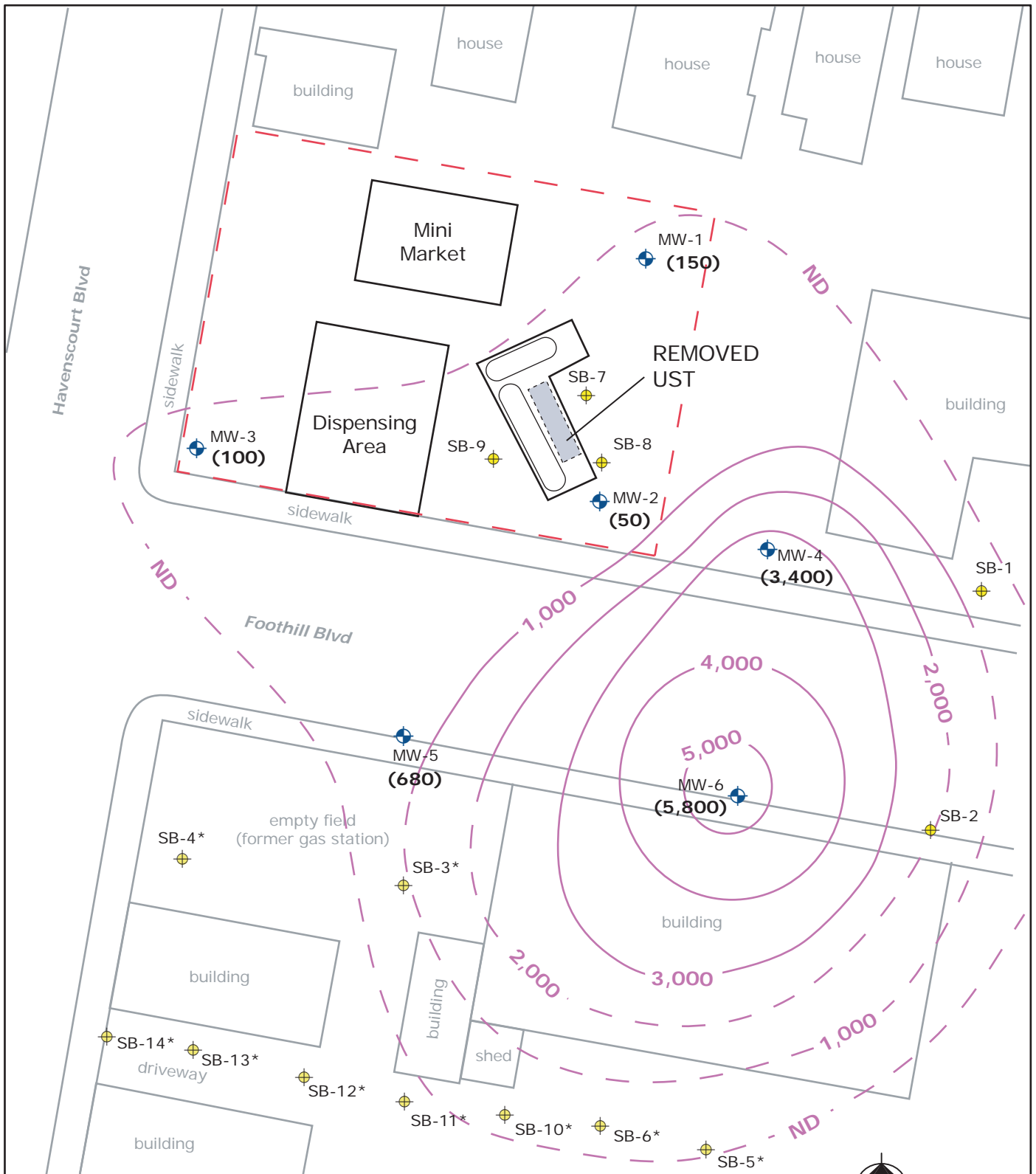


**LEGEND**

-  MW-3 Monitoring Well
-  SB-8 Soil Boring (2002 & 2005)
-  Approximate Property Boundary
-  Groundwater Flow Direction
- \* = location approximate



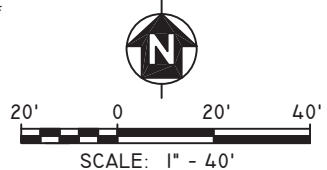
**Groundwater Elevation Contours**  
 (February 6, 2009)  
 6600 Foothill Blvd, Oakland, CA 94605



**LEGEND**

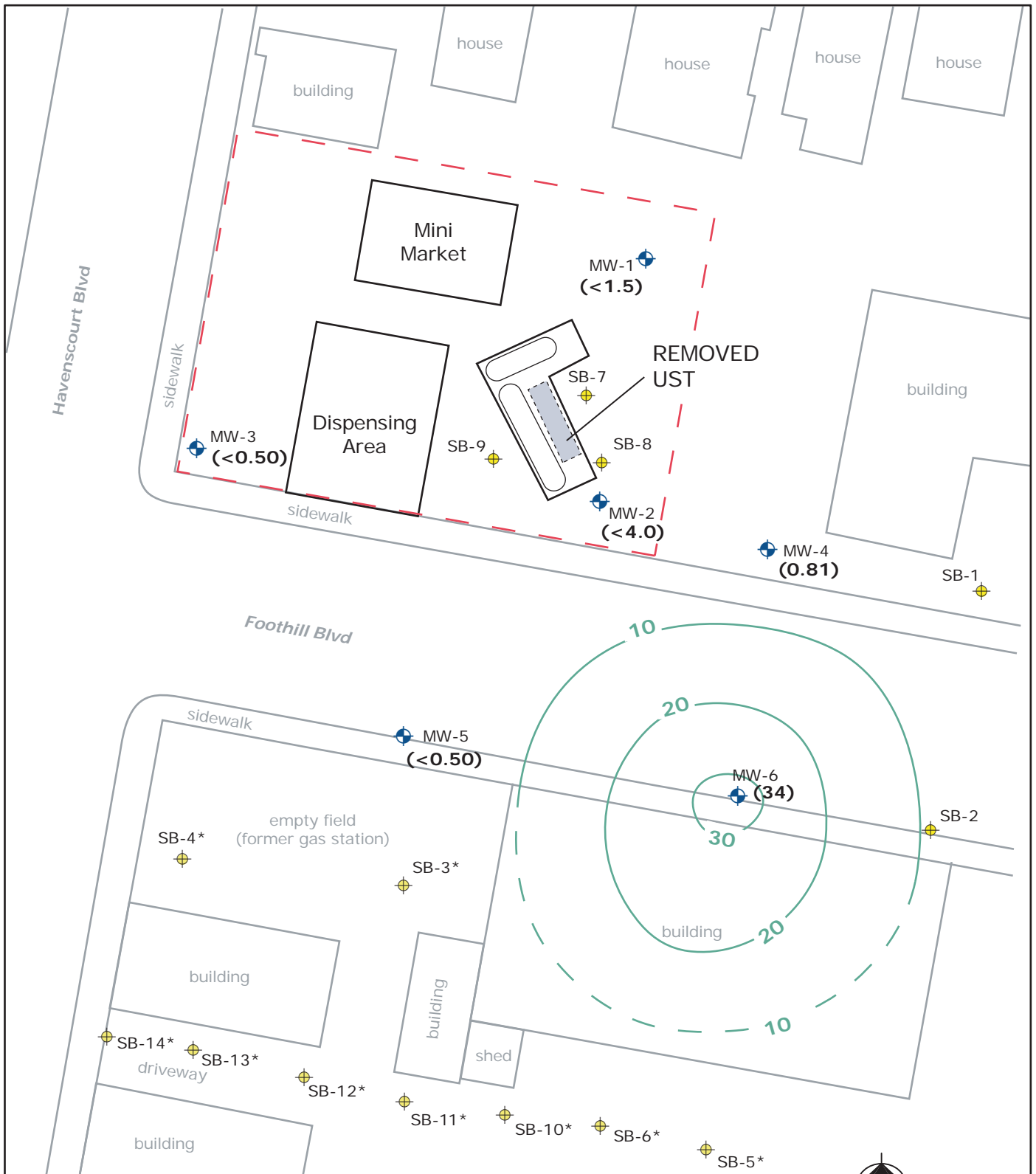
- MW-3 Monitoring Well
- SB-8 Soil Boring (2002 & 2005)
- Approximate Property Boundary
- TPHg Concentration Contour

\* = location approximate.  
TPHg concentrations in units of µg/L.



**TPHg Concentration Contours**  
(February 6, 2009)  
6600 Foothill Blvd, Oakland, CA 94605

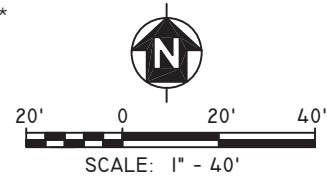
Figure  
**4**  
**ers**



**LEGEND**

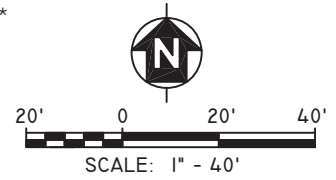
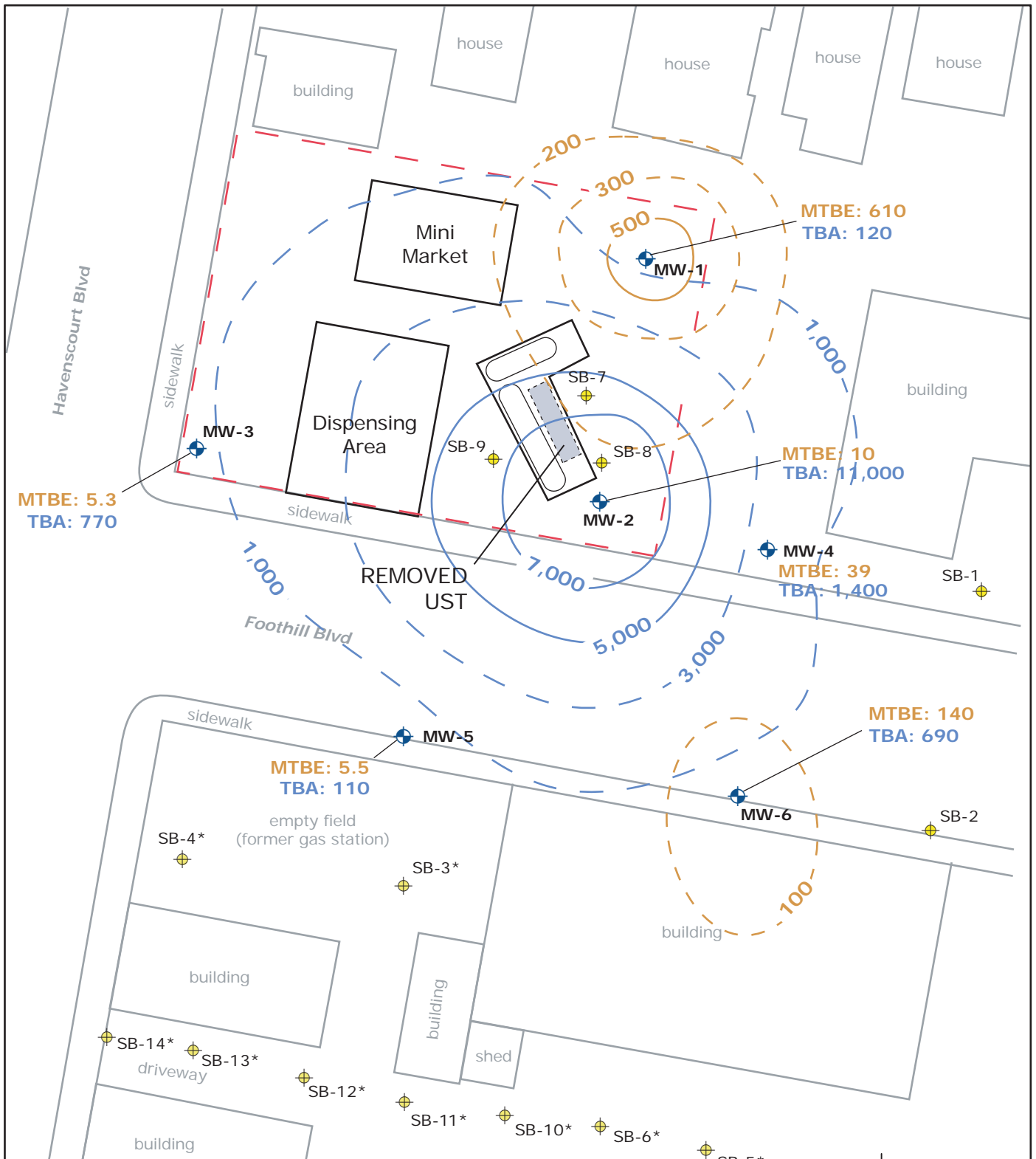
-  MW-3 Monitoring Well
-  SB-8 Soil Boring (2002 & 2005)
-  Approximate Property Boundary
-  Benzene Concentration Contour

\* = location approximate.  
Benzene concentrations in units of µg/L.



**Benzene Concentration Contours**  
(February 6, 2009)  
6600 Foothill Blvd, Oakland, CA 94605

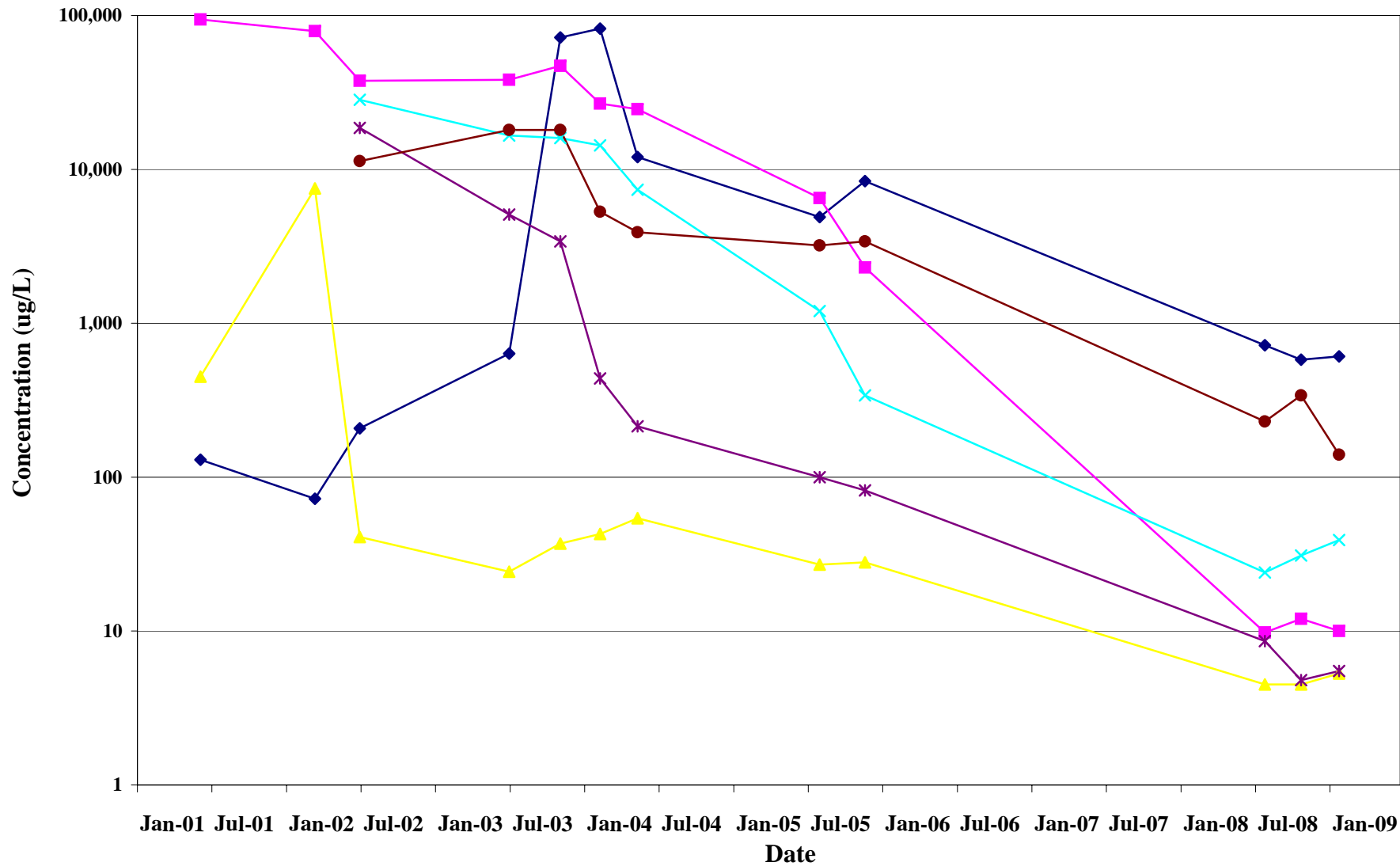
Figure  
**5**  
**ers**



**MTBE and TBA Concentration Contours**  
 (February 6, 2009)  
 6600 Foothill Blvd, Oakland, CA 94605

Figure  
**6**  
 ers

**Figure 7**  
**MTBE Concentration Change Over Time**



◆ MW-1    ■ MW-2    ▲ MW-3    × MW-4    \* MW-5    ● MW-6

# APPENDIX A

### Monitoring Well Gauging and Purging Data Sheet

Date: 2/6/09		Project No. Sekhon		Site: Sekhon Gas Station		Location: 6600 Foothill Blvd, Oakland		Initials: LTL			
Purge Method: Peri w/ Ded. Tubing			Gauging Time: 0930		Gauging Time: 1000		Purge Starting Time: 1023		Purge Ending Time: 1345		Sampling Method: Peri. w/ Ded Tubing
Well ID	Diameter (in)	Depth to Bottom (ft)	Initial Depth to Water from TOC (ft)	Equilibrated Depth to Water from TOC (ft)	Static Water Column (ft)	Casing Volume (gal)	Purged Volume <del>(gal)</del> (Liters)	Depth to Product (ft)	Note:		
MW-1	2"	24.52	10.08	9.05	15.47	2.52	7.5	no product	over 1 hour for to stabilize DTW		
MW-2		24.62	6.92	6.92	17.70	2.89	7.5				
MW-3		24.01	9.37	9.37	14.64	2.38	6.75				
MW-4		19.91	5.15	5.15	14.76	2.41	5.1				
MW-5		19.69	6.98	6.98	12.71	2.08	4.65				
MW-6	↓	19.39	5.44	5.44	13.95	2.28	5.25	↓			
Casing Volume = Static Water Column x Conversion Factor					Conversion Factor: 2-in well = 0.163 gal/ft, 4-in well = 0.653 gal/ft, 6-in well = 1.469 gal/ft						
Total purged volume from all wells <del>(gals)</del> (Liters): 36.75											



**Monitor Well Data Sheet**

Site Name: Sekhon Gas Station	Well/Sample ID: MW-1
Location: 6600 Foothill Blvd, Oakland CA	Initial Depth to Water (DTW): 9.05
Client: Ravi Sekhon	Total Well Depth (TD): 24.52
Sampler: LTL	Well Diameter: 2"
Date: 2/6/09	1 Casing Volume: 2.52 gal
Purge Method: Peristaltic Pump	Purge Rate: 0.25 L/min
Sample Method: Low Flow	Sampling Rate: 0.15 L/min
2" well x 1 foot = 0.6 liters	4" well x 1 foot = 2.4L

Time	pH	SC	DO	Temp	DTW	Cumulative Volume	ORP	Notes
hh:mm	SU	µmhos/cm	mg/l	°C	feet	liters	mV	
1103	6.18	516	0.56	19.11	9.95	0.75	68	
1106	6.11	527	0.10	19.18	10.27	1.5	88	
1109	6.11	533	0.01	19.20	10.50	2.25	105	
1112	6.11	535	0.01	19.22	10.71	3	118	
1115	6.12	537	0.01	19.23	10.93	3.75	128	
1118	6.12	537	0.01	19.25	11.12	4.5	135	
1121	6.12	539	0.01	19.25	11.31	5.25	141	
1124	6.12	540	0.01	19.23	11.44	6	146	
1127	6.12	541	0.01	19.28	11.57	6.75	150	
1130	6.13	541	0.01	19.33	11.67	7.5	152	
Did Well Dewater?	NO	Start Purge Time:	1100	DTW prior to sample:	11.67			
Casing volumes Purged:		Stop Purge Time:	1130	Start Sample Time:	1130			
Length of Tubing (ft):	~26'	Total Liters Purged:	7.5	Total Sample Volume:	240mL			
Well Recharge:	poor	Turbidity:	very low	Color:	none			
Odor:	none	Sheen:	none	Product Thickness (in):	N/A			

Notes:

**Monitor Well Data Sheet**

Site Name: Sekhon Gas Station	Well/Sample ID: MW-2
Location: 6600 Foothill Blvd, Oakland CA	Initial Depth to Water (DTW): 6.92
Client: Ravi Sekhon	Total Well Depth (TD): 24.62
Sampler: LTL	Well Diameter: 2"
Date: 2/6/09	1 Casing Volume: 2.89 gal
Purge Method: Peristaltic Pump	Purge Rate: 0.25 L/min
Sample Method: Low Flow	Sampling Rate: 0.15 L/min
2" well x 1 foot = 0.6 liters	4" well x 1 foot = 2.4L

Time	pH	SC	DO	Temp	DTW	Cumulative Volume	ORP	Notes
hh:mm	SU	µmhos/cm	mg/l	°C	feet	liters	mV	
1146	6.47	875	0.91	19.15	7.92	0.75	7	
1149	6.49	875	0.50	19.21	8.88	1.5	3	
1152	6.49	874	0.26	19.26	9.65	2.25	2	
1155	6.50	874	0.24	19.33	10.15	3	1	
1158	6.49	875	0.19	19.36	10.38	3.75	-1	
1201	6.50	878	0.13	19.36	10.59	4.5	-5	
1204	6.51	884	0.11	19.39	10.81	5.25	-12	
1207	6.52	887	0.06	19.42	11.03	6	-19	
1210	6.53	890	0.05	19.46	11.22	6.75	-25	
1213	6.52	889	0.06	19.53	11.45	7.5	-25	
Did Well Dewater?	No	Start Purge Time:	1143	DTW prior to sample:	11.45			
Casing volumes Purged:		Stop Purge Time:	1215	Start Sample Time:	1215			
Length of Tubing (ft):	~26'	Total Liters Purged:	7.5	Total Sample Volume:	240ml			
Well Recharge:	poor	Turbidity:	very low	Color:	none			
Odor:	none	Sheen:	none	Product Thinkness (in):	N/A			

Notes:

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**Monitor Well Data Sheet**

Site Name: Sekhon Gas Station	Well/Sample ID: MW-3
Location: 6600 Foothill Blvd, Oakland CA	Initial Depth to Water (DTW): 9.37
Client: Ravi Sekhon	Total Well Depth (TD): 24.01
Sampler: LTL	Well Diameter: 2"
Date: 2/6/09	1 Casing Volume: 2.38 gal
Purge Method: Peristaltic Pump	Purge Rate: 0.25 L/min
Sample Method: Low Flow	Sampling Rate: 0.15 L/min
2" well x 1 foot = 0.6 liters	4" well x 1 foot = 2.4L

Time	pH	SC	DO	Temp	DTW	Cumulative Volume	ORP	Notes
hh:mm	SU	µmhos/cm	mg/l	°C	feet	liters	mV	
1025	6.52	461	1.61	19.92	9.55	0.75	-35	
1028	6.63	445	0.65	20.30	9.57	1.5	-51	
1031	6.65	434	0.38	20.44	9.60	2.25	-56	
1034	6.65	421	0.25	20.51	9.60	3	-60	
1037	6.64	413	0.19	20.58	9.61	3.75	-62	
1040	6.64	400	0.15	20.62	9.62	4.5	-63	
1043	6.63	390	0.11	20.68	9.64	5.25	-64	
1046	6.63	389	0.08	20.71	9.63	6	-65	
1049	6.63	384	0.10	20.67	9.63	6.75	-66	

Did Well Dewater?	No	Start Purge Time:	1022	DTW prior to sample:	9.63
Casing volumes Purged:		Stop Purge Time:	1050	Start Sample Time:	1050
Length of Tubing (ft):	~25'	Total Liters Purged:	6.75	Total Sample Volume:	240 mL
Well Recharge:	good	Turbidity:	low	Color:	none
Odor:	none	Sheen:	none	Product Thickness (in):	N/A

Notes:

### Monitor Well Data Sheet

Site Name: Sekhon Gas Station	Well/Sample ID: MW-4
Location: 6600 Foothill Blvd, Oakland CA	Initial Depth to Water (DTW): 5.15
Client: <i>Ravi Sekhon</i>	Total Well Depth (TD): 19.91
Sampler: <i>LTL</i>	Well Diameter: 2"
Date: 2/6/09	1 Casing Volume:
Purge Method: Peristaltic Pump	Purge Rate: 0.3 L/min
Sample Method: Low Flow	Sampling Rate: 0.15 L/min
2" well x 1 foot = 0.6 liters	4" well x 1 foot = 2.4L

Time	pH	SC	DO	Temp	DTW	Cumulative Volume	ORP	Notes
hh:mm	SU	µmhos/cm	mg/l	°C	feet	liters	mV	
1325	6.94	561	0.65	18.27	6.53	0.9	-91	
1328	6.94	561	0.13	18.27	6.85	1.8	-93	
1331	6.93	565	0.35	18.22	7.10	2.7	-94	
1334	6.93	561	0.01	18.15	7.33	3.6	-95	slowed purge rate to 0.25 L/min
1337	6.93	561	0.01	18.07	7.39	4.35	-96	
1340	6.93	561	0.01	17.99	7.43	5.10	-97	

Did Well Dewater?	NO	Start Purge Time:	1322	DTW prior to sample:	7.43
Casing volumes Purged:		Stop Purge Time:	1340	Start Sample Time:	1340
Length of Tubing (ft):	~21'	Total Liters Purged:	5.1	Total Sample Volume:	240 mL
Well Recharge:	good	Turbidity:	none	Color:	yellow <del>water</del>
Odor:	<del>none</del>	Sheen:	none	Product Thickness (in):	N/A

Notes: *slight TPH*

**Monitor Well Data Sheet**

Site Name: Sekhon Gas Station	Well/Sample ID: MW-5
Location: 6600 Foothill Blvd, Oakland CA	Initial Depth to Water (DTW): 6.98
Client: Ravi Sekhon	Total Well Depth (TD): 19.69
Sampler: LTL	Well Diameter: 2"
Date: 2/6/09	1 Casing Volume: 2.08 gal
Purge Method: Peristaltic Pump	Purge Rate: 0.35 L/min (see notes)
Sample Method: Low Flow	Sampling Rate: 0.15 L/min
2" well x 1 foot = 0.6 liters	4" well x 1 foot = 2.4L

Time	pH	SC	DO	Temp	DTW	Cumulative Volume	ORP	Notes
hh:mm	SU	µmhos/cm	mg/l	°F	feet	liters	mV	
1232	6.87	287	0.66	18.10	7.47	1.05	-88	
1235	6.86	281	0.01	18.14	7.81	2.1	-91	
1238	6.89	280	0.01	18.09	7.92	3.15	-94	Slowed purge rate to 0.25 L/min
1241	6.91	279	0.01	18.02	7.87	3.9	-96	
1244	6.91	279	0.01	18.00	7.91	4.65	-98	
Did Well Dewater?	No	Start Purge Time:	1229	DTW prior to sample:	7.91			
Casing volumes Purged:		Stop Purge Time:	1244	Start Sample Time:	1244			
Length of Tubing (ft):		Total Liters Purged:	4.65	Total Sample Volume:	240 ml			
Well Recharge:	good	Turbidity:	very low	Color:	none			
Odor:	none	Sheen:	none	Product Thickness (in):	N/A			

Notes:

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**Monitor Well Data Sheet**

Site Name: Sekhon Gas Station	Well/Sample ID: MW-6
Location: 6600 Foothill Blvd, Oakland CA	Initial Depth to Water (DTW): 5.44
Client: Ravi Sekhon	Total Well Depth (TD): 19.39
Sampler: LTL	Well Diameter: 2"
Date: 2/6/09	1 Casing Volume: 2.28 gal
Purge Method: Peristaltic Pump	Purge Rate: 0.35 L/min
Sample Method: Low Flow	Sampling Rate: 0.15 L/min
2" well x 1 foot = 0.6 liters	4" well x 1 foot = 2.4L

Time	pH	SC	DO	Temp	DTW	Cumulative Volume	ORP	Notes
hh:mm	SU	µmhos/cm	mg/l	°C	feet	liters	mV	
1259	6.75	617	1.20	16.00	6.04	1.05	-57	
1302	6.79	617	0.18	16.40	6.22	2.1	-61	
1305	6.83	612	0.01	16.76	6.30	3.15	-66	
1308	6.85	607	0.01	17.03	6.32	4.2	-69	
1311	6.87	604	0.01	17.19	6.35	5.25	-71	
Did Well Dewater?	NO	Start Purge Time:	1256	DTW prior to sample:	6.35			
Casing volumes Purged:		Stop Purge Time:	1311	Start Sample Time:	1311			
Length of Tubing (ft):	~21'	Total Liters Purged:	5.25	Total Sample Volume:	240 mL			
Well Recharge:	good	Turbidity:	very low	Color:	none			
Odor:	slight TPH	Sheen:	none	Product Thickness (in):	N/A			

Notes: Casing broken, cap smashed into casing, probably from weight of automobile on lid.

# APPENDIX B



Report Number : 67238

Date : 02/13/2009

Tyson Fulmer  
Environmental Risk Services Corporation  
1600 Riviera Avenue, Suite 310  
Walnut Creek, CA 94596

Subject : 6 Water Samples  
Project Name : Former Sekhon Gas Station  
Project Number : 6600 FHB

Dear Mr. Fulmer,

Chemical analysis of the samples referenced above has been completed. Summaries of the data are contained on the following pages. Sample(s) were received under documented chain-of-custody. US EPA protocols for sample storage and preservation were followed.

Kiff Analytical is certified by the State of California (# 2236). If you have any questions regarding procedures or results, please call me at 530-297-4800.

Sincerely,

A handwritten signature in black ink, appearing to read "Joel Kiff".

Joel Kiff





Report Number : 67238

Date : 02/13/2009

Subject : 6 Water Samples  
Project Name : Former Sekhon Gas Station  
Project Number : 6600 FHB

## Case Narrative

The Method Reporting Limit for Methanol has been increased due to the presence of an interfering compound for samples MW-1, MW-3, MW-4, MW-5 and MW-6.



Report Number : 67238

Date : 02/13/2009

Project Name : **Former Sekhon Gas Station**

Project Number : **6600 FHB**

Sample : **MW-1**

Matrix : Water

Lab Number : 67238-01

Sample Date :02/06/2009

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
<b>Benzene</b>	< 1.5	1.5	ug/L	EPA 8260B	02/12/2009
<b>Toluene</b>	< 1.5	1.5	ug/L	EPA 8260B	02/12/2009
<b>Ethylbenzene</b>	< 1.5	1.5	ug/L	EPA 8260B	02/12/2009
<b>Total Xylenes</b>	< 1.5	1.5	ug/L	EPA 8260B	02/12/2009
<b>Methyl-t-butyl ether (MTBE)</b>	<b>610</b>	1.5	ug/L	EPA 8260B	02/12/2009
<b>Diisopropyl ether (DIPE)</b>	< 1.5	1.5	ug/L	EPA 8260B	02/12/2009
<b>Ethyl-t-butyl ether (ETBE)</b>	< 1.5	1.5	ug/L	EPA 8260B	02/12/2009
<b>Tert-amyl methyl ether (TAME)</b>	< 1.5	1.5	ug/L	EPA 8260B	02/12/2009
<b>Tert-Butanol</b>	<b>120</b>	7.0	ug/L	EPA 8260B	02/12/2009
<b>Methanol</b>	< <b>600</b>	600	ug/L	EPA 8260B	02/12/2009
<b>Ethanol</b>	< <b>15</b>	15	ug/L	EPA 8260B	02/12/2009
1,2-Dichloroethane-d4 (Surr)	100		% Recovery	EPA 8260B	02/12/2009
Toluene - d8 (Surr)	98.9		% Recovery	EPA 8260B	02/12/2009



Report Number : 67238

Date : 02/13/2009

Project Name : **Former Sekhon Gas Station**

Project Number : **6600 FHB**

Sample : **MW-2**

Matrix : Water

Lab Number : 67238-02

Sample Date :02/06/2009

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
<b>Benzene</b>	< 4.0	4.0	ug/L	EPA 8260B	02/10/2009
<b>Toluene</b>	< 4.0	4.0	ug/L	EPA 8260B	02/10/2009
<b>Ethylbenzene</b>	< 4.0	4.0	ug/L	EPA 8260B	02/10/2009
<b>Total Xylenes</b>	< 4.0	4.0	ug/L	EPA 8260B	02/10/2009
<b>Methyl-t-butyl ether (MTBE)</b>	<b>10</b>	4.0	ug/L	EPA 8260B	02/10/2009
<b>Diisopropyl ether (DIPE)</b>	< 4.0	4.0	ug/L	EPA 8260B	02/10/2009
<b>Ethyl-t-butyl ether (ETBE)</b>	< 4.0	4.0	ug/L	EPA 8260B	02/10/2009
<b>Tert-amyl methyl ether (TAME)</b>	< 4.0	4.0	ug/L	EPA 8260B	02/10/2009
<b>Tert-Butanol</b>	<b>11000</b>	20	ug/L	EPA 8260B	02/10/2009
<b>Methanol</b>	< 400	400	ug/L	EPA 8260B	02/10/2009
<b>Ethanol</b>	< 40	40	ug/L	EPA 8260B	02/10/2009
1,2-Dichloroethane-d4 (Surr)	102		% Recovery	EPA 8260B	02/10/2009
Toluene - d8 (Surr)	98.3		% Recovery	EPA 8260B	02/10/2009



Report Number : 67238

Date : 02/13/2009

Project Name : **Former Sekhon Gas Station**

Project Number : **6600 FHB**

Sample : **MW-3**

Matrix : Water

Lab Number : 67238-03

Sample Date :02/06/2009

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
<b>Benzene</b>	< 0.50	0.50	ug/L	EPA 8260B	02/09/2009
<b>Toluene</b>	< 0.50	0.50	ug/L	EPA 8260B	02/09/2009
<b>Ethylbenzene</b>	< 0.50	0.50	ug/L	EPA 8260B	02/09/2009
<b>Total Xylenes</b>	< 0.50	0.50	ug/L	EPA 8260B	02/09/2009
<b>Methyl-t-butyl ether (MTBE)</b>	5.3	0.50	ug/L	EPA 8260B	02/09/2009
<b>Diisopropyl ether (DIPE)</b>	< 0.50	0.50	ug/L	EPA 8260B	02/09/2009
<b>Ethyl-t-butyl ether (ETBE)</b>	< 0.50	0.50	ug/L	EPA 8260B	02/09/2009
<b>Tert-amyl methyl ether (TAME)</b>	< 0.50	0.50	ug/L	EPA 8260B	02/09/2009
<b>Tert-Butanol</b>	770	5.0	ug/L	EPA 8260B	02/09/2009
<b>Methanol</b>	< 100	100	ug/L	EPA 8260B	02/09/2009
<b>Ethanol</b>	< 5.0	5.0	ug/L	EPA 8260B	02/09/2009
1,2-Dichloroethane-d4 (Surr)	99.5		% Recovery	EPA 8260B	02/09/2009
Toluene - d8 (Surr)	100		% Recovery	EPA 8260B	02/09/2009



Report Number : 67238

Date : 02/13/2009

Project Name : **Former Sekhon Gas Station**

Project Number : **6600 FHB**

Sample : **MW-4**

Matrix : Water

Lab Number : 67238-04

Sample Date :02/06/2009

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
<b>Benzene</b>	<b>0.81</b>	0.50	ug/L	EPA 8260B	02/07/2009
<b>Toluene</b>	<b>&lt; 0.50</b>	0.50	ug/L	EPA 8260B	02/07/2009
<b>Ethylbenzene</b>	<b>10</b>	0.50	ug/L	EPA 8260B	02/07/2009
<b>Total Xylenes</b>	<b>1.2</b>	0.50	ug/L	EPA 8260B	02/07/2009
<b>Methyl-t-butyl ether (MTBE)</b>	<b>39</b>	0.50	ug/L	EPA 8260B	02/07/2009
<b>Diisopropyl ether (DIPE)</b>	<b>&lt; 0.50</b>	0.50	ug/L	EPA 8260B	02/07/2009
<b>Ethyl-t-butyl ether (ETBE)</b>	<b>&lt; 0.50</b>	0.50	ug/L	EPA 8260B	02/07/2009
<b>Tert-amyl methyl ether (TAME)</b>	<b>&lt; 0.50</b>	0.50	ug/L	EPA 8260B	02/07/2009
<b>Tert-Butanol</b>	<b>1400</b>	5.0	ug/L	EPA 8260B	02/07/2009
<b>Methanol</b>	<b>&lt; 200</b>	200	ug/L	EPA 8260B	02/07/2009
<b>Ethanol</b>	<b>&lt; 5.0</b>	5.0	ug/L	EPA 8260B	02/07/2009
1,2-Dichloroethane-d4 (Surr)	95.4		% Recovery	EPA 8260B	02/07/2009
Toluene - d8 (Surr)	97.7		% Recovery	EPA 8260B	02/07/2009



Report Number : 67238

Date : 02/13/2009

Project Name : **Former Sekhon Gas Station**

Project Number : **6600 FHB**

Sample : **MW-5**

Matrix : Water

Lab Number : 67238-05

Sample Date :02/06/2009

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
<b>Benzene</b>	<b>&lt; 0.50</b>	0.50	ug/L	EPA 8260B	02/07/2009
<b>Toluene</b>	<b>&lt; 0.50</b>	0.50	ug/L	EPA 8260B	02/07/2009
<b>Ethylbenzene</b>	<b>&lt; 0.50</b>	0.50	ug/L	EPA 8260B	02/07/2009
<b>Total Xylenes</b>	<b>2.2</b>	0.50	ug/L	EPA 8260B	02/07/2009
<b>Methyl-t-butyl ether (MTBE)</b>	<b>5.5</b>	0.50	ug/L	EPA 8260B	02/07/2009
<b>Diisopropyl ether (DIPE)</b>	<b>&lt; 0.50</b>	0.50	ug/L	EPA 8260B	02/07/2009
<b>Ethyl-t-butyl ether (ETBE)</b>	<b>&lt; 0.50</b>	0.50	ug/L	EPA 8260B	02/07/2009
<b>Tert-amyl methyl ether (TAME)</b>	<b>&lt; 0.50</b>	0.50	ug/L	EPA 8260B	02/07/2009
<b>Tert-Butanol</b>	<b>110</b>	5.0	ug/L	EPA 8260B	02/07/2009
<b>Methanol</b>	<b>&lt; 200</b>	200	ug/L	EPA 8260B	02/07/2009
<b>Ethanol</b>	<b>&lt; 5.0</b>	5.0	ug/L	EPA 8260B	02/07/2009
1,2-Dichloroethane-d4 (Surr)	95.6		% Recovery	EPA 8260B	02/07/2009
Toluene - d8 (Surr)	98.7		% Recovery	EPA 8260B	02/07/2009



Report Number : 67238

Date : 02/13/2009

Project Name : **Former Sekhon Gas Station**

Project Number : **6600 FHB**

Sample : **MW-6**

Matrix : Water

Lab Number : 67238-06

Sample Date :02/06/2009

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
<b>Benzene</b>	<b>34</b>	0.50	ug/L	EPA 8260B	02/07/2009
<b>Toluene</b>	<b>1.1</b>	0.50	ug/L	EPA 8260B	02/07/2009
<b>Ethylbenzene</b>	<b>16</b>	0.50	ug/L	EPA 8260B	02/07/2009
<b>Total Xylenes</b>	<b>38</b>	0.50	ug/L	EPA 8260B	02/07/2009
<b>Methyl-t-butyl ether (MTBE)</b>	<b>140</b>	0.50	ug/L	EPA 8260B	02/07/2009
<b>Diisopropyl ether (DIPE)</b>	<b>&lt; 0.50</b>	0.50	ug/L	EPA 8260B	02/07/2009
<b>Ethyl-t-butyl ether (ETBE)</b>	<b>&lt; 0.50</b>	0.50	ug/L	EPA 8260B	02/07/2009
<b>Tert-amyl methyl ether (TAME)</b>	<b>&lt; 0.50</b>	0.50	ug/L	EPA 8260B	02/07/2009
<b>Tert-Butanol</b>	<b>690</b>	5.0	ug/L	EPA 8260B	02/07/2009
<b>Methanol</b>	<b>&lt; 200</b>	200	ug/L	EPA 8260B	02/07/2009
<b>Ethanol</b>	<b>&lt; 5.0</b>	5.0	ug/L	EPA 8260B	02/07/2009
1,2-Dichloroethane-d4 (Surr)	84.8		% Recovery	EPA 8260B	02/07/2009
Toluene - d8 (Surr)	86.5		% Recovery	EPA 8260B	02/07/2009

**QC Report : Method Blank Data**Project Name : **Former Sekhon Gas Station**Project Number : **6600 FHB**

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	< 0.50	0.50	ug/L	EPA 8260B	02/09/2009
Ethylbenzene	< 0.50	0.50	ug/L	EPA 8260B	02/09/2009
Toluene	< 0.50	0.50	ug/L	EPA 8260B	02/09/2009
Total Xylenes	< 0.50	0.50	ug/L	EPA 8260B	02/09/2009
Diisopropyl ether (DIPE)	< 0.50	0.50	ug/L	EPA 8260B	02/09/2009
Ethanol	< 5.0	5.0	ug/L	EPA 8260B	02/09/2009
Ethyl-t-butyl ether (ETBE)	< 0.50	0.50	ug/L	EPA 8260B	02/09/2009
Methanol	< 50	50	ug/L	EPA 8260B	02/09/2009
Methyl-t-butyl ether (MTBE)	< 0.50	0.50	ug/L	EPA 8260B	02/09/2009
Tert-Butanol	< 5.0	5.0	ug/L	EPA 8260B	02/09/2009
Tert-amyl methyl ether (TAME)	< 0.50	0.50	ug/L	EPA 8260B	02/09/2009
1,2-Dichloroethane-d4 (Surr)	101		%	EPA 8260B	02/09/2009
Toluene - d8 (Surr)	99.7		%	EPA 8260B	02/09/2009

Benzene	< 0.50	0.50	ug/L	EPA 8260B	02/07/2009
Ethylbenzene	< 0.50	0.50	ug/L	EPA 8260B	02/07/2009
Toluene	< 0.50	0.50	ug/L	EPA 8260B	02/07/2009
Total Xylenes	< 0.50	0.50	ug/L	EPA 8260B	02/07/2009
Diisopropyl ether (DIPE)	< 0.50	0.50	ug/L	EPA 8260B	02/07/2009
Ethanol	< 5.0	5.0	ug/L	EPA 8260B	02/07/2009
Ethyl-t-butyl ether (ETBE)	< 0.50	0.50	ug/L	EPA 8260B	02/07/2009
Methanol	< 50	50	ug/L	EPA 8260B	02/07/2009
Methyl-t-butyl ether (MTBE)	< 0.50	0.50	ug/L	EPA 8260B	02/07/2009
Tert-Butanol	< 5.0	5.0	ug/L	EPA 8260B	02/07/2009
Tert-amyl methyl ether (TAME)	< 0.50	0.50	ug/L	EPA 8260B	02/07/2009
1,2-Dichloroethane-d4 (Surr)	100		%	EPA 8260B	02/07/2009
Toluene - d8 (Surr)	102		%	EPA 8260B	02/07/2009

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	< 0.50	0.50	ug/L	EPA 8260B	02/12/2009
Ethylbenzene	< 0.50	0.50	ug/L	EPA 8260B	02/12/2009
Toluene	< 0.50	0.50	ug/L	EPA 8260B	02/12/2009
Total Xylenes	< 0.50	0.50	ug/L	EPA 8260B	02/12/2009
Diisopropyl ether (DIPE)	< 0.50	0.50	ug/L	EPA 8260B	02/12/2009
Ethanol	< 5.0	5.0	ug/L	EPA 8260B	02/12/2009
Ethyl-t-butyl ether (ETBE)	< 0.50	0.50	ug/L	EPA 8260B	02/12/2009
Methanol	< 50	50	ug/L	EPA 8260B	02/12/2009
Methyl-t-butyl ether (MTBE)	< 0.50	0.50	ug/L	EPA 8260B	02/12/2009
Tert-Butanol	< 5.0	5.0	ug/L	EPA 8260B	02/12/2009
Tert-amyl methyl ether (TAME)	< 0.50	0.50	ug/L	EPA 8260B	02/12/2009
1,2-Dichloroethane-d4 (Surr)	99.4		%	EPA 8260B	02/12/2009
Toluene - d8 (Surr)	100		%	EPA 8260B	02/12/2009



**QC Report : Matrix Spike/ Matrix Spike Duplicate**Project Name : **Former Sekhon Gas Station**Project Number : **6600 FHB**

Parameter	Spiked Sample	Sample Value	Spike Level	Spike Dup. Level	Spiked Sample Value	Duplicate Spiked Sample Value	Units	Analysis Method	Date Analyzed	Spiked Sample Percent Recov.	Duplicate Spiked Sample Percent Recov.	Relative Percent Diff.	Spiked Sample Percent Recov. Limit	Relative Percent Diff. Limit
Benzene	67229-02	<0.50	39.2	39.0	37.9	37.6	ug/L	EPA 8260B	2/9/09	96.7	96.5	0.201	70-130	25
Methyl-t-butyl ether	67229-02	1.1	39.4	39.2	34.3	34.6	ug/L	EPA 8260B	2/9/09	84.1	85.6	1.73	70-130	25
Tert-Butanol	67229-02	260	199	198	448	448	ug/L	EPA 8260B	2/9/09	95.2	95.7	0.502	70-130	25
Toluene	67229-02	<0.50	40.0	39.7	40.8	40.2	ug/L	EPA 8260B	2/9/09	102	101	0.918	70-130	25
Benzene	67201-29	<0.50	39.3	39.3	41.4	40.4	ug/L	EPA 8260B	2/7/09	105	103	2.41	70-130	25
Methyl-t-butyl ether	67201-29	<0.50	39.6	39.6	35.6	35.9	ug/L	EPA 8260B	2/7/09	90.1	90.6	0.629	70-130	25
Tert-Butanol	67201-29	7.6	200	200	204	210	ug/L	EPA 8260B	2/7/09	98.2	101	3.19	70-130	25
Toluene	67201-29	<0.50	40.1	40.1	41.2	40.8	ug/L	EPA 8260B	2/7/09	103	102	1.09	70-130	25
Benzene	67256-05	<0.50	39.3	39.3	42.6	42.2	ug/L	EPA 8260B	2/12/09	108	107	0.899	70-130	25
Methyl-t-butyl ether	67256-05	0.63	39.6	39.6	42.2	41.8	ug/L	EPA 8260B	2/12/09	105	104	1.01	70-130	25
Tert-Butanol	67256-05	<5.0	200	200	212	214	ug/L	EPA 8260B	2/12/09	106	107	0.860	70-130	25
Toluene	67256-05	<0.50	40.1	40.1	42.7	41.9	ug/L	EPA 8260B	2/12/09	106	104	1.85	70-130	25

**QC Report : Laboratory Control Sample (LCS)**Project Name : **Former Sekhon Gas Station**Project Number : **6600 FHB**

Parameter	Spike Level	Units	Analysis Method	Date Analyzed	LCS Percent Recov.	LCS Percent Recov. Limit
Benzene	39.3	ug/L	EPA 8260B	2/9/09	95.8	70-130
Methyl-t-butyl ether	39.6	ug/L	EPA 8260B	2/9/09	87.7	70-130
Tert-Butanol	200	ug/L	EPA 8260B	2/9/09	96.7	70-130
Toluene	40.1	ug/L	EPA 8260B	2/9/09	101	70-130
Benzene	39.5	ug/L	EPA 8260B	2/7/09	109	70-130
Methyl-t-butyl ether	39.8	ug/L	EPA 8260B	2/7/09	94.8	70-130
Tert-Butanol	201	ug/L	EPA 8260B	2/7/09	104	70-130
Toluene	40.3	ug/L	EPA 8260B	2/7/09	107	70-130
Benzene	39.2	ug/L	EPA 8260B	2/12/09	108	70-130
Methyl-t-butyl ether	39.4	ug/L	EPA 8260B	2/12/09	105	70-130
Tert-Butanol	199	ug/L	EPA 8260B	2/12/09	106	70-130
Toluene	39.9	ug/L	EPA 8260B	2/12/09	106	70-130

February 16, 2009

Joel Kiff  
Kiff Analytical  
2795 2nd Street, Suite 300  
Davis, CA 95616-6593

Subject: **Calscience Work Order No.: 09-02-0936**  
**Client Reference: Former Sekhon Gas Station**

Dear Client:

Enclosed is an analytical report for the above-referenced project. The samples included in this report were received 2/10/2009 and analyzed in accordance with the attached chain-of-custody.

Unless otherwise noted, all analytical testing was accomplished in accordance with the guidelines established in our Quality Systems Manual, applicable standard operating procedures, and other related documentation. The original report of subcontracted analysis, if any, is provided herein, and follows the standard Calscience data package. The results in this analytical report are limited to the samples tested and any reproduction thereof must be made in its entirety.

If you have any questions regarding this report, please do not hesitate to contact the undersigned.

Sincerely,

*Wendy Hsiao for*

Calscience Environmental  
Laboratories, Inc.  
Amanda Porter  
Project Manager

Kiff Analytical  
 2795 2nd Street, Suite 300  
 Davis, CA 95616-6593

Date Received: 02/10/09  
 Work Order No: 09-02-0936  
 Preparation: EPA 5030B  
 Method: EPA 8015B (M)

Project: Former Sekhon Gas Station

Page 1 of 3

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
MW-1	09-02-0936-1-C	02/06/09 11:30	Aqueous	GC 18	02/10/09	02/11/09 05:29	090210B01

Parameter	Result	RL	DF	Qual	Units
TPH as Gasoline	150	50	1		ug/L
<u>Surrogates:</u>	<u>REC (%)</u>	<u>Control Limits</u>		<u>Qual</u>	
1,4-Bromofluorobenzene	107	38-134			

MW-2	09-02-0936-2-C	02/06/09 12:15	Aqueous	GC 18	02/09/09	02/10/09 19:58	090209B02
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Parameter	Result	RL	DF	Qual	Units
TPH as Gasoline	50	50	1		ug/L
<u>Surrogates:</u>	<u>REC (%)</u>	<u>Control Limits</u>		<u>Qual</u>	
1,4-Bromofluorobenzene	105	38-134			

MW-3	09-02-0936-3-C	02/06/09 10:50	Aqueous	GC 18	02/10/09	02/11/09 01:34	090210B01
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Parameter	Result	RL	DF	Qual	Units
TPH as Gasoline	100	50	1		ug/L
<u>Surrogates:</u>	<u>REC (%)</u>	<u>Control Limits</u>		<u>Qual</u>	
1,4-Bromofluorobenzene	106	38-134			

MW-4	09-02-0936-4-B	02/06/09 13:40	Aqueous	GC 18	02/11/09	02/11/09 18:04	090211B01
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Parameter	Result	RL	DF	Qual	Units
TPH as Gasoline	3400	500	10		ug/L
<u>Surrogates:</u>	<u>REC (%)</u>	<u>Control Limits</u>		<u>Qual</u>	
1,4-Bromofluorobenzene	111	38-134			

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers

Kiff Analytical  
 2795 2nd Street, Suite 300  
 Davis, CA 95616-6593

Date Received: 02/10/09  
 Work Order No: 09-02-0936  
 Preparation: EPA 5030B  
 Method: EPA 8015B (M)

Project: Former Sekhon Gas Station

Page 2 of 3

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
MW-5	09-02-0936-5-B	02/06/09 12:44	Aqueous	GC 18	02/11/09	02/11/09 18:38	090211B01

Parameter	Result	RL	DF	Qual	Units
TPH as Gasoline	680	250	5		ug/L
<u>Surrogates:</u>	<u>REC (%)</u>	<u>Control Limits</u>		<u>Qual</u>	
1,4-Bromofluorobenzene	104	38-134			

MW-6	09-02-0936-6-B	02/06/09 13:11	Aqueous	GC 18	02/11/09	02/11/09 19:12	090211B01
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Parameter	Result	RL	DF	Qual	Units
TPH as Gasoline	5800	2500	50		ug/L
<u>Surrogates:</u>	<u>REC (%)</u>	<u>Control Limits</u>		<u>Qual</u>	
1,4-Bromofluorobenzene	103	38-134			

Method Blank	099-12-436-2,812	N/A	Aqueous	GC 18	02/09/09	02/10/09 05:47	090209B02
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Parameter	Result	RL	DF	Qual	Units
TPH as Gasoline	ND	50	1		ug/L
<u>Surrogates:</u>	<u>REC (%)</u>	<u>Control Limits</u>		<u>Qual</u>	
1,4-Bromofluorobenzene	111	38-134			

Method Blank	099-12-436-2,823	N/A	Aqueous	GC 18	02/10/09	02/10/09 22:12	090210B01
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Parameter	Result	RL	DF	Qual	Units
TPH as Gasoline	ND	50	1		ug/L
<u>Surrogates:</u>	<u>REC (%)</u>	<u>Control Limits</u>		<u>Qual</u>	
1,4-Bromofluorobenzene	98	38-134			

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers

Kiff Analytical  
 2795 2nd Street, Suite 300  
 Davis, CA 95616-6593

Date Received: 02/10/09  
 Work Order No: 09-02-0936  
 Preparation: EPA 5030B  
 Method: EPA 8015B (M)

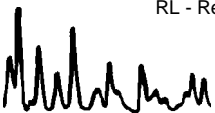
Project: Former Sekhon Gas Station

Page 3 of 3

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	099-12-436-2,830	N/A	Aqueous	GC 18	02/11/09	02/11/09 14:43	090211B01

<u>Parameter</u>	<u>Result</u>	<u>RL</u>	<u>DF</u>	<u>Qual</u>	<u>Units</u>
TPH as Gasoline	ND	50	1		ug/L
<u>Surrogates:</u>	<u>REC (%)</u>	<u>Control Limits</u>		<u>Qual</u>	
1,4-Bromofluorobenzene	95	38-134			

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers





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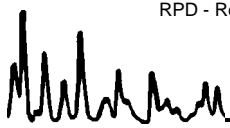
Date Received: 02/10/09  
 Work Order No: 09-02-0936  
 Preparation: EPA 5030B  
 Method: EPA 8015B (M)

Project Former Sekhon Gas Station

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
09-02-0733-1	Aqueous	GC 18	02/09/09	02/10/09	090209S02

Parameter	MS %REC	MSD %REC	%REC CL	RPD	RPD CL	Qualifiers
TPH as Gasoline	75	77	68-122	2	0-18	

RPD - Relative Percent Difference , CL - Control Limit





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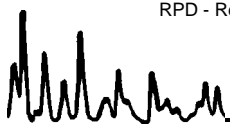
Date Received: 02/10/09  
 Work Order No: 09-02-0936  
 Preparation: EPA 5030B  
 Method: EPA 8015B (M)

Project Former Sekhon Gas Station

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
09-02-0930-3	Aqueous	GC 18	02/10/09	02/11/09	090210S01

Parameter	MS %REC	MSD %REC	%REC CL	RPD	RPD CL	Qualifiers
TPH as Gasoline	97	98	68-122	1	0-18	

RPD - Relative Percent Difference , CL - Control Limit





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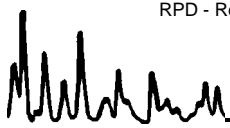
Date Received: 02/10/09  
 Work Order No: 09-02-0936  
 Preparation: EPA 5030B  
 Method: EPA 8015B (M)

Project Former Sekhon Gas Station

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
09-02-0324-33	Aqueous	GC 18	02/11/09	02/11/09	090211S01

Parameter	MS %REC	MSD %REC	%REC CL	RPD	RPD CL	Qualifiers
TPH as Gasoline	81	78	68-122	4	0-18	

RPD - Relative Percent Difference , CL - Control Limit





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Date Received: N/A  
 Work Order No: 09-02-0936  
 Preparation: EPA 5030B  
 Method: EPA 8015B (M)

Project: Former Sekhon Gas Station

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number
099-12-436-2,812	Aqueous	GC 18	02/09/09	02/10/09	090209B02

Parameter	LCS %REC	LCSD %REC	%REC CL	RPD	RPD CL	Qualifiers
TPH as Gasoline	78	78	78-120	1	0-10	

RPD - Relative Percent Difference , CL - Control Limit

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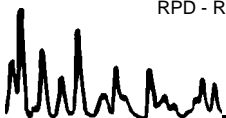
Date Received: N/A  
 Work Order No: 09-02-0936  
 Preparation: EPA 5030B  
 Method: EPA 8015B (M)

Project: Former Sekhon Gas Station

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number
099-12-436-2,823	Aqueous	GC 18	02/10/09	02/10/09	090210B01

<u>Parameter</u>	<u>LCS %REC</u>	<u>LCSD %REC</u>	<u>%REC CL</u>	<u>RPD</u>	<u>RPD CL</u>	<u>Qualifiers</u>
TPH as Gasoline	80	80	78-120	1	0-10	

RPD - Relative Percent Difference , CL - Control Limit





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Date Received: N/A  
 Work Order No: 09-02-0936  
 Preparation: EPA 5030B  
 Method: EPA 8015B (M)

Project: Former Sekhon Gas Station

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number
099-12-436-2,830	Aqueous	GC 18	02/11/09	02/11/09	090211B01

<u>Parameter</u>	<u>LCS %REC</u>	<u>LCSD %REC</u>	<u>%REC CL</u>	<u>RPD</u>	<u>RPD CL</u>	<u>Qualifiers</u>
TPH as Gasoline	80	80	78-120	0	0-10	

RPD - Relative Percent Difference , CL - Control Limit

Work Order Number: 09-02-0936

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<u>Qualifier</u>	<u>Definition</u>
*	See applicable analysis comment.
1	Surrogate compound recovery was out of control due to a required sample dilution, therefore, the sample data was reported without further clarification.
2	Surrogate compound recovery was out of control due to matrix interference. The associated method blank surrogate spike compound was in control and, therefore, the sample data was reported without further clarification.
3	Recovery of the Matrix Spike (MS) or Matrix Spike Duplicate (MSD) compound was out of control due to matrix interference. The associated LCS and/or LCSD was in control and, therefore, the sample data was reported without further clarification.
4	The MS/MSD RPD was out of control due to matrix interference. The LCS/LCSD RPD was in control and, therefore, the sample data was reported without further clarification.
5	The PDS/PDSD associated with this batch of samples was out of control due to a matrix interference effect. The associated batch LCS/LCSD was in control and, hence, the associated sample data was reported with no further corrective action required.
A	Result is the average of all dilutions, as defined by the method.
B	Analyte was present in the associated method blank.
C	Analyte presence was not confirmed on primary column.
E	Concentration exceeds the calibration range.
H	Sample received and/or analyzed past the recommended holding time.
J	Analyte was detected at a concentration below the reporting limit and above the laboratory method detection limit. Reported value is estimated.
ME	LCS Recovery Percentage is within LCS ME Control Limit range.
N	Nontarget Analyte.
ND	Parameter not detected at the indicated reporting limit.
Q	Spike recovery and RPD control limits do not apply resulting from the parameter concentration in the sample exceeding the spike concentration by a factor of four or greater.
U	Undetected at the laboratory method detection limit.
X	% Recovery and/or RPD out-of-range.
Z	Analyte presence was not confirmed by second column or GC/MS analysis.





2795 Second Street, Suite 300  
 Davis, CA 95618  
 Lab: 530.297.4800  
 Fax: 530.297.4808

Calscience  
 7440 Lincoln Way  
 Garden Grove, CA 92841-1427  
 714-895-5494

COC No. **0936**  
**67238** Page 1 of 1

Project Contact (Hardcopy or PDF to): **Troy Turpen** EDF Report? **YES** Chain-of-Custody Record and Analysis Request

Company/Address: **Kiff Analytical** Recommended but not mandatory to complete this section: **Analysis Request** TAT

Phone No.: **530-297-4800** FAX No.: **530-297-4808** Sampling Company Log Code: **ERWC** Global ID: **T0600102286**

Project Number: **6600 FHB** P.O. No.: **67238** Deliverables to (Email Address): **inbox@kiffanalytical.com**

Project Name: **Former Sekhon Gas Station** Container / Preservative Matrix

Project Address: **Sampling** VOA 40 ml HCl Water TPH as Gasoline BY EPA 8015

**Sample Designation** Date Time VOA 40 ml HCl Water TPH as Gasoline BY EPA 8015 4-Days For Lab Use Only

MW-1 02/06/09 11:30 3 X X X 1

MW-2 02/06/09 12:15 3 X X X 2

MW-3 02/06/09 10:50 3 X X X 3

MW-4 02/06/09 13:40 3 X X X 4

MW-5 02/06/09 12:44 3 X X X 5

MW-6 02/06/09 13:11 3 X X X 6

Relinquished by: **[Signature] Kiff Analytical** Date: **02/09/09** Time: **1400** Received by:

Relinquished by: Date: Time: Received by:

Relinquished by: **DAVID BLOOM** Date: **2/10/09** Time: **0815** Received by Laboratory: **Woburn CA**

Remarks:

Bill to: **Accounts Payable**

**SAMPLE RECEIPT FORM**

Cooler 1 of 1

CLIENT: KIPP ANALYTICAL

DATE: 2 / 10 / 09

**TEMPERATURE:** (Criteria: 0.0 °C – 6.0 °C, not frozen)

Temperature 1.9 °C - 0.2 °C (CF) = 1.7 °C     Blank     Sample

Sample(s) outside temperature criteria (PM/APM contacted by: \_\_\_\_\_).

Sample(s) outside temperature criteria but received on ice/chilled on same day of sampling.

Received at ambient temperature, placed on ice for transport by Courier.

Ambient Temperature:     Air     Filter     Metals Only     PCBs Only    Initial: WS

**CUSTODY SEALS INTACT:**

Cooler     \_\_\_\_\_     No (Not Intact)     Not Present     N/A    Initial: WS

Sample     \_\_\_\_\_     No (Not Intact)     Not Present    Initial: WS

SAMPLE CONDITION:	Yes	No	N/A
Chain-Of-Custody (COC) document(s) received with samples.....	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
COC document(s) received complete.....	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sampler's name indicated on COC.....	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Sample container label(s) consistent with COC.....	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sample container(s) intact and good condition.....	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Correct containers and volume for analyses requested.....	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Analyses received within holding time.....	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Proper preservation noted on COC or sample container.....	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Volatile analysis container(s) free of headspace.....	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Tedlar bag(s) free of condensation.....	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**CONTAINER TYPE:**

**Solid:**     4ozCGJ     8ozCGJ     16ozCGJ     Sleeve     EnCores®     TerraCores®     \_\_\_\_\_

**Water:**     VOA     VOAh     VOAna<sub>2</sub>     125AGB     125AGBh     125AGBpo<sub>4</sub>     1AGB     1AGBna<sub>2</sub>

1AGBs     500AGB     500AGBs     250CGB     250CGBs     1PB     500PB     500PBna     250PB

250PBn     125PB     125PBzanna     100PBsterile     100PBna<sub>2</sub>     \_\_\_\_\_     \_\_\_\_\_     \_\_\_\_\_

**Air:**     Tedlar®     Summa®     \_\_\_\_\_

Container:    C:Clear    A:Amber    P:Poly/Plastic    G:Glass    J:Jar    B:Bottle

Preservative:    h:HCL    n:HNO<sub>3</sub>    na<sub>2</sub>:Na<sub>2</sub>S<sub>2</sub>O<sub>3</sub>    na:NaOH    po<sub>4</sub>:H<sub>3</sub>PO<sub>4</sub>    s:H<sub>2</sub>SO<sub>4</sub>    znna:ZnAc<sub>2</sub>+NaOH

Checked/Labeled by: WS

Reviewed by: JP

Scanned by: WS

