



December 7, 2000

ENVIRONMENTAL  
PROTECTION  
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WORKPLAN  
for  
SOIL AND GROUNDWATER ASSESSMENT  
at  
Compare Prices Service Station  
2844 Mountain Boulevard  
Oakland, California

Submitted by:  
AQUA SCIENCE ENGINEERS, INC.  
208 West El Pintado  
Danville, CA 94526  
(925) 820-9391

## 1.0 INTRODUCTION

This submittal presents Aqua Science Engineers, Inc. (ASE)'s workplan for a soil and groundwater assessment at the Compare Prices Service Station located at 2844 Mountain Boulevard in Oakland, California (Figure 1). This site was formally Desert Petroleum Station #796. The proposed site assessment activities were initiated by Mr. Shahram Shahnazi, the responsibly party, as required by the Alameda County Health Care Services Agency (ACHCSA) in their letter dated July 5, 2000 (Appendix A).

In addition to the work described in this workplan, the July 5, 2000 letter also requests that the possibility of a leak be investigated and also requests interim remediation. ASE understands that the property has now been sold and that the new owner will be replacing the current underground storage tanks (USTs) and dispensers. Since the USTs and dispensers will soon be replaced, it does not appear to be necessary to perform extensive checks on the current UST system. In addition, ASE anticipates that soil overexcavation will take place at the time of the UST removal as a remediation measure.

The letter also requests that distances to drinking water wells and surface water supplies be determined. Please note that this work was previously completed by Remediation Service International (RSI) in their Corrective Action Plan dated February 3, 1995. The nearest beneficial use of water is an irrigation well located 2,200-feet southwest of the site, which draws water from 240-feet below ground surface (bgs).

## 2.0 BACKGROUND INFORMATION

In March 1989, soil contamination was initially identified at the site during the replacement of the product lines by Diablo Tank and Equipment. Up to 8,400 parts per million (ppm) total petroleum hydrocarbons as gasoline (TPH-G) were identified in soil samples collected from the southern edge of the USTs.

In July 1989, On-site Technologies excavated and disposed of contaminated soil from the southern end of the premium unleaded tank. Up to 3,300 ppm TPH-G were collected from the sidewalls of the excavation.

In May 1990, RSI conducted a soil and groundwater assessment at the site, which included the installation of four groundwater monitoring wells

(RS-1 through RS-4). Hydrocarbons were detected in both soil and groundwater during this assessment.

In June 1991, soil remediation began at the site using soil vapor extraction (SVE). In October 1991, groundwater remediation began at the site using RSI's S.A.V.E. system. Remediation was suspended in 1992 apparently due to Desert Petroleum's financial problems.

The site has been monitored on a quarterly basis since May 1990. Beginning in 1995, hydrocarbon concentrations started to rise and free-floating hydrocarbons became present in monitoring well MW-1. Between October and December 1996, 30.4 gallons of gasoline and 1,077 gallons of contaminated groundwater were removed from monitoring well RS-1 during interim free-product removal.

In March 1999, Western Geo-Engineers of Woodland, California prepared a quarterly groundwater monitoring report and subsurface conduit study for the site. This subsurface conduit study identified a sewer line with its bottom below the typical depth to groundwater at the site. This sewer line could potentially act as a conduit for the migration of groundwater contamination.

Between January and April 2000, ASE drilled 13 borings on and off-site to determine the extent of hydrocarbon contamination in the site vicinity. Elevated hydrocarbon concentrations, including up to 6,400 parts per billion (ppb) benzene and 410,000 ppb MTBE, were detected in groundwater samples collected from borings located near the intersection of Warner Court and Mountain Boulevard. Elevated hydrocarbon concentrations extend west across Mountain Boulevard to a retaining wall, which separates Mountain Boulevard and Highway 13 below. This retaining wall acts as a barrier for groundwater movement to the west. The extent of hydrocarbons has been defined to both the north and south of the site on the western side of Mountain Boulevard, and to the south on the eastern side of Mountain Boulevard. The extent of contamination has not been defined to non-detectable to the east on Werner Court and to the north on the eastern side of Mountain Boulevard. However, groundwater samples collected from the borings furthest from the site in these directions have shown a significant decrease in concentrations.

### **3.0 PROPOSED SCOPE OF WORK (SOW)**

ASE's proposed scope of work is to install five additional groundwater monitoring wells at the site to monitor the seasonal variations of

hydrocarbon concentrations in (a) the areas of the site that have the highest dissolved hydrocarbon concentrations, and (b) downgradient off-site areas west of Mountain Boulevard. ASE recommends the following placement of these new wells: One on-site near the corner of Werner Court and Mountain Boulevard, one on-site near boring BH-K, and three across Mountain Boulevard (near borings BH-C, BH-A and BH-F) which will allow the continued monitoring of the downgradient center of the plume as well as its lateral extent to the north and south along Mountain Boulevard. To accomplish this task, ASE has prepared the following scope of work:

- 1) Obtain a drilling permit from the Alameda County Public Works Agency and encroachment and excavation permits from the City of Oakland allow for the installation of groundwater monitoring wells in the City of Oakland right-of-way.
- 2) Drill five soil borings in both on and off-site locations. Since all of the locations are beneath overhead utility lines, a specialized limited access drill rig will be required. Traffic lane closure will be required to complete this drilling task.
- 3) Analyze one soil sample from each boring at a CAL-EPA certified analytical laboratory for TPH-G by modified EPA Method 5030/8015 and benzene, toluene, ethylbenzene and total xylenes (collectively known as BTEX) and methyl tertiary butyl ether (MTBE) by EPA Method 8020.
- 4) Construct a 2-inch diameter groundwater monitoring well in each borings described in task 2.
- 5) Develop each monitoring well described in task 3 using surge block agitation and bailer evacuation.
- 6) Collect groundwater samples from all nine (4 pre-existing and 5 new) site monitoring wells.
- 7) Analyze one groundwater sample from each monitoring well at a CAL-EPA certified analytical laboratory for TPH-G by modified EPA Method 5030/8015 and BTEX and MTBE by EPA Method 8020.
- 8) Survey the top of casing elevation of each monitoring well and prepare a potentiometric surface map for the site.

9) Prepare a soil and groundwater assessment report for the site.

Details of the assessment are presented below.

**TASK 1 - *OBTAIN THE NECESSARY PERMITS REQUIRED TO COMPLETE THIS PROJECT***

Prior to drilling, ASE will obtain a drilling permit from the ACPWA. ASE will also obtain encroachment and excavation permits from the City of Oakland to allow for drilling and well installation in the Mountain Boulevard right of way. Underground Service Alert (USA) will also be notified to have underground utility lines marked in the site vicinity at least 48 hours prior to beginning field activities. A traffic control plan will also be prepared and submitted to the city for approval as necessary.

**TASK 2 - *DRILL FIVE SOIL BORINGS IN ON AND OFF-SITE LOCATIONS AND COLLECT SOIL SAMPLES***

Using a limited access drill rig equipped with hollow-stem augers, ASE will drill five (5) soil borings in the locations shown on Figure 2. The borings will be located as follows: one on-site near the corner of Werner Court and Mountain Boulevard, one on-site near boring BH-K, and three across Mountain Boulevard (near borings BH-C, BH-A and BH-F) which will allow the continued monitoring of the downgradient center of the plume as well as its lateral extent to the north and south along Mountain Boulevard. The drilling will be directed by a qualified geologist.

Undisturbed soil samples will be collected at 5-foot intervals as drilling progresses for subsurface hydrogeologic description and possible chemical analysis. The samples will be described by the ASE geologist according to the Unified Soil Classification System. The samples will be collected in brass or stainless steel tubes using a drive sampler driven ahead of the auger tip using hydraulic direct push. Samples to be retained for analysis will be immediately removed from the sampler, trimmed, sealed with Teflon tape and plastic caps, secured with duct tape, labeled with the site location, sample designation, date and time the sample was collected, and the initials of the person collecting the sample. The samples will be placed into an ice chest containing wet ice for delivery under chain of custody to a CAL-EPA certified analytical laboratory.

Soil from the remaining tubes not sealed for analysis will be removed for hydrogeologic description and will be screened for volatile compounds with an organic vapor meter (OVM). The soil will be screened by

emptying soil from one of the tubes into a plastic bag. The bag will be sealed and placed in the sun for approximately 10 minutes. After the hydrocarbons have been allowed to volatilize, the OVM will measure the vapor through a small hole, punched in the bag. These OVM readings will be used as a screening tool only since these procedures are not as rigorous as those used in an analytical laboratory.

All sampling equipment will be cleaned in buckets with brushes and a TSP or Alconox solution, then rinsed twice with tap water. Rinsates will be contained on-site in 55-gallon steel drums and stored on-site until off-site disposal can be arranged.

Traffic lane closure will be required to complete this drilling. This lane closure will require flagmen as well as proper signage and coning. The lane closure will comply with City of Oakland requirements.

### *TASK 3 - ANALYZE THE SOIL SAMPLES*

At least one soil sample from each boring will be analyzed at a CAL-EPA certified analytical laboratory for TPH-G by modified EPA Method 5030/8015 and BTEX and MTBE by EPA Method 8020. The soil samples analyzed will be chosen based on field observations such as odors, staining and OVM readings. If no field indications of contamination are present, the unsaturated sample closest to the water table (capillary zone) will be analyzed.

### *TASK 4 - COMPLETE THE BORINGS AS MONITORING WELLS*

ASE will complete the borings described in task 2 as 2-inch diameter groundwater monitoring wells. The wells will be constructed with 2-inch diameter, flush-threaded, schedule 40, 0.020-inch slotted PVC well screen and blank casing. The well casing will be lowered through the augers and #3 Monterey sand will be placed in the annular space between the well casing and the borehole to approximately 1.5-feet above the screened interval. Approximately 0.5-foot of bentonite pellets will be placed on top of the sand pack and will be hydrated with clean tap water. This bentonite layer will prevent the cement sanitary seal from infiltrating into the sand pack. Cement mixed with 3 to 5 percent bentonite powder by volume will be used to fill the annular space between the bentonite layer and the surface to prevent surface water from infiltrating into the well. The well head will be protected by a locking well plug and an at-grade, traffic-rated well box (See Figure 4 - Typical Monitoring Well).

Each well will be screened to monitor the first water-bearing zone encountered. Wells are typically screened with 5-feet of screen above the water table and 10 to 15-feet of screen below the water table.

#### *TASK 5 - DEVELOP THE MONITORING WELLS*

The monitoring wells will be developed after waiting at least 72 hours following well construction. The wells will be developed using at least two episodes of surge block agitation and evacuation using bailers and/or pumps. At least ten well casing volumes of water will be removed during the development, and development will continue until the water appears to be reasonably clear. The well development purge water will be stored temporarily on-site in sealed and labeled 55-gallon steel drums until off-site disposal can be arranged.

#### *TASK 6 - SAMPLE THE MONITORING WELLS*

After waiting 72 hours following the well development, ASE will collect groundwater samples from all nine groundwater monitoring wells (the five new wells and the four pre-existing monitoring wells). Prior to purging and sampling, the groundwater surface in each well will be checked for sheen or free-floating hydrocarbons. The thickness of any free-floating hydrocarbons will be measured with an oil/water interface probe and an acrylic bailer lowered slowly to the groundwater surface and filled approximately half full for direct observation. ASE will also measure the depth to groundwater in all site wells prior to purging water from any well. Prior to sampling, each well will be purged of at least four well casing volumes of groundwater. The temperature, pH and electrical conductivity of evacuated water will be monitored during the well purging, and purging will continue beyond four well casing volumes if these parameters have not stabilized. Groundwater samples will be collected from each well using disposable polyethylene bailers. Groundwater samples will be decanted from the bailers into 40-ml glass volatile organic analysis (VOA) vials, preserved with hydrochloric acid, and sealed without headspace. The samples will be labeled with the site location, sample designation, date and time the samples were collected, and the initials of the person collecting the samples. The samples will be placed into an ice chest with ice for transport to the analytical laboratory under chain of custody. Purged groundwater will be stored temporarily on-site in sealed and labeled 55-gallon steel drums until off-site disposal can be arranged.

**TASK 7 - ANALYZE THE GROUNDWATER SAMPLES**

Groundwater sample collected from all nine wells will be analyzed at a CAL-EPA certified analytical laboratory for TPH-G by modified EPA Method 5030/8015 and BTEX and MTBE by EPA Method 8020.

**TASK 8 - SURVEY THE TOP OF CASING ELEVATION OF EACH WELL**

ASE will survey the top of casing elevation of each well relative to the existing site wells. These elevations will be used with the depth to groundwater measurements to determine the groundwater flow direction and gradient beneath the site.

**TASK 9 - PREPARE A SUBSURFACE ASSESSMENT REPORT**

ASE will prepare a subsurface assessment report outlining the methods and findings of this assessment. This report will include a summary of the results, the site background and history, description of the well construction, development and sampling, tabulated soil and groundwater analytical results, conclusions and recommendations. Formal boring logs, analytical reports, and chain of custody documents will be included as appendices. This report will be submitted under the seal of a California registered civil engineer or geologist.

**SCHEDULE**

The process of obtaining the encroachment permit for the project will begin immediately. ASE will begin the drilling portion of the project as soon as the encroachment permit is secured.



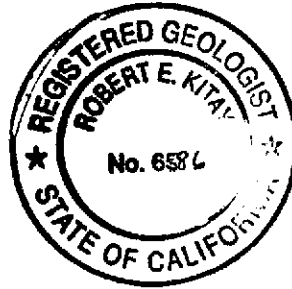
Should you have any questions or comments, please call us at (925) 820-9391.

Respectfully submitted,

AQUA SCIENCE ENGINEERS, INC.



Robert E. Kitay, R.G., R.E.A.  
Senior Geologist



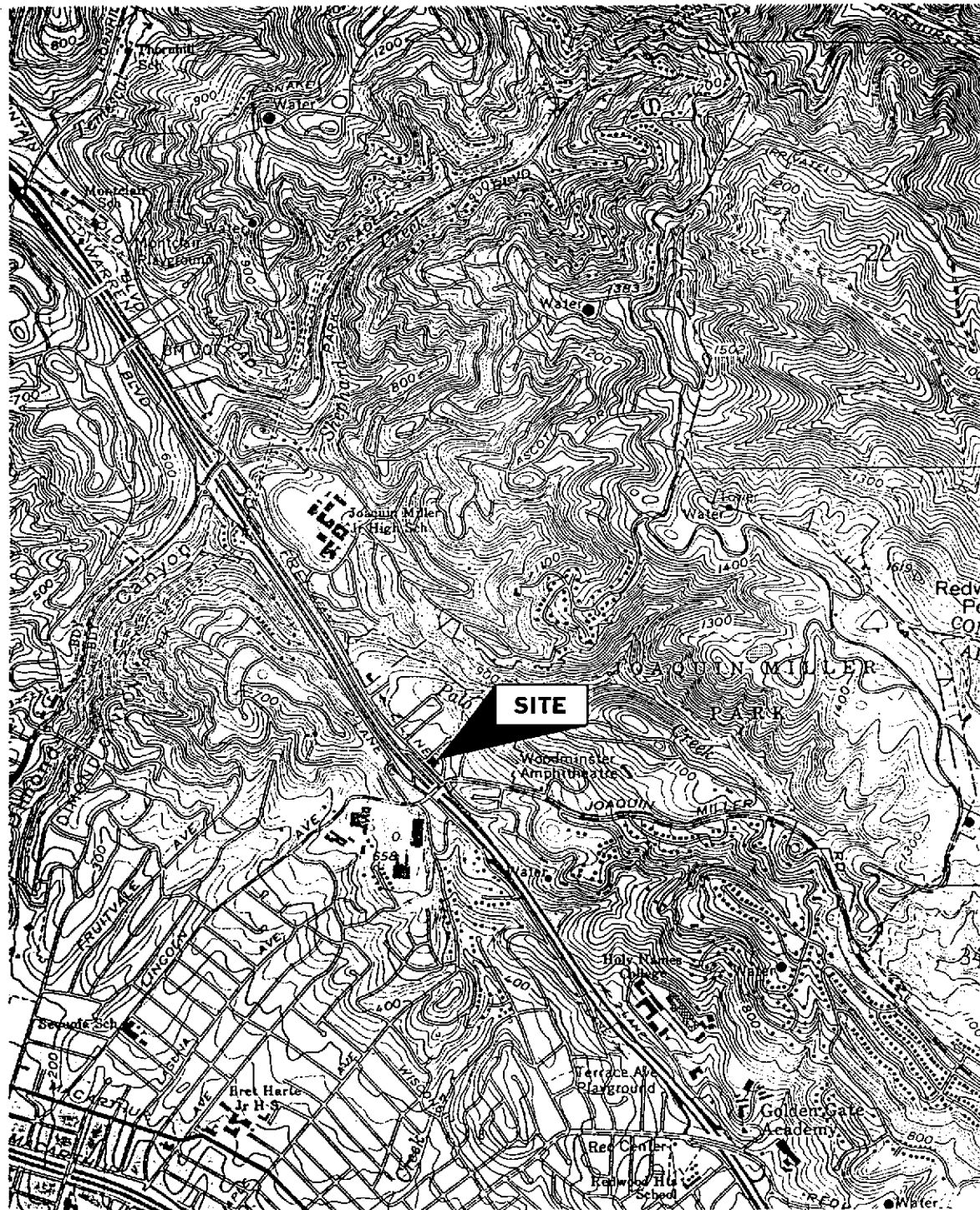
cc: Mr. Shahram Shahnazi, 1005 Northgate Drive, San Rafael, CA 94903

Mr. Don Hwang, Alameda County Health Care Services Agency, 1131 Harbor Bay Parkway, Suite 250, Alameda, CA 94502

Mr. Chuck Headlee, California Regional Water Quality Control Board, San Francisco Bay Region, 1515 Clay Street, Suite 1400, Oakland, CA 94612



NORTH



SITE LOCATION MAP

2844 Mountain Boulevard  
Oakland, California

Aqua Science Engineers

Figure 1



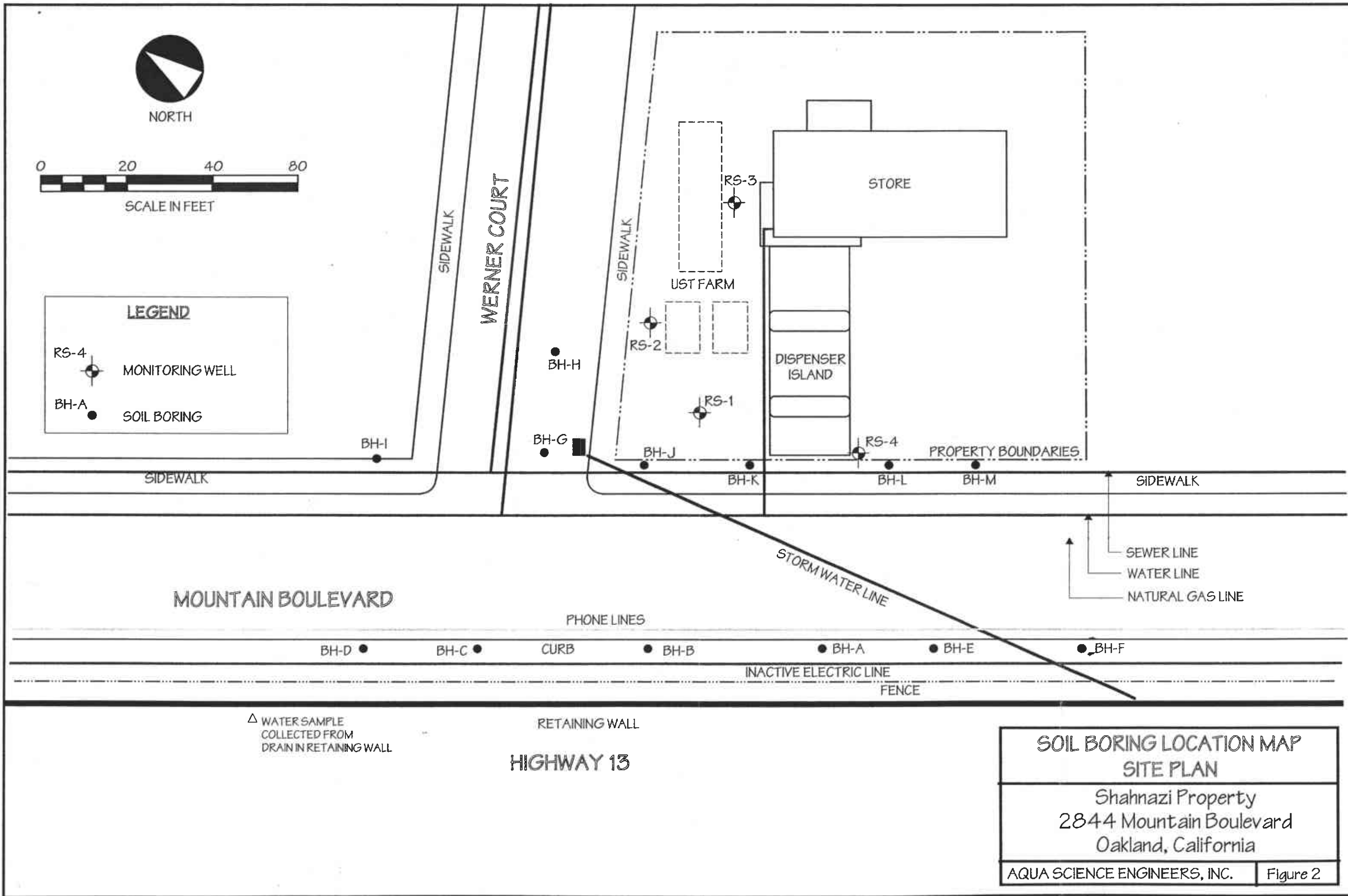
NORTH



SCALE IN FEET

LEGEND

- RS-4 MONITORING WELL
- BH-A SOIL BORING



MOUNTAIN BOULEVARD

WERNER COURT

STORE

UST FARM

DISPENSER ISLAND

PROPERTY BOUNDARIES

STORMWATER LINE

SEWER LINE  
 WATER LINE  
 NATURAL GAS LINE

PHONE LINES

INACTIVE ELECTRIC LINE  
FENCE

RETAINING WALL

HIGHWAY 13

△ WATER SAMPLE COLLECTED FROM DRAIN IN RETAINING WALL

SOIL BORING LOCATION MAP  
SITE PLAN

Shahnazi Property  
2844 Mountain Boulevard  
Oakland, California



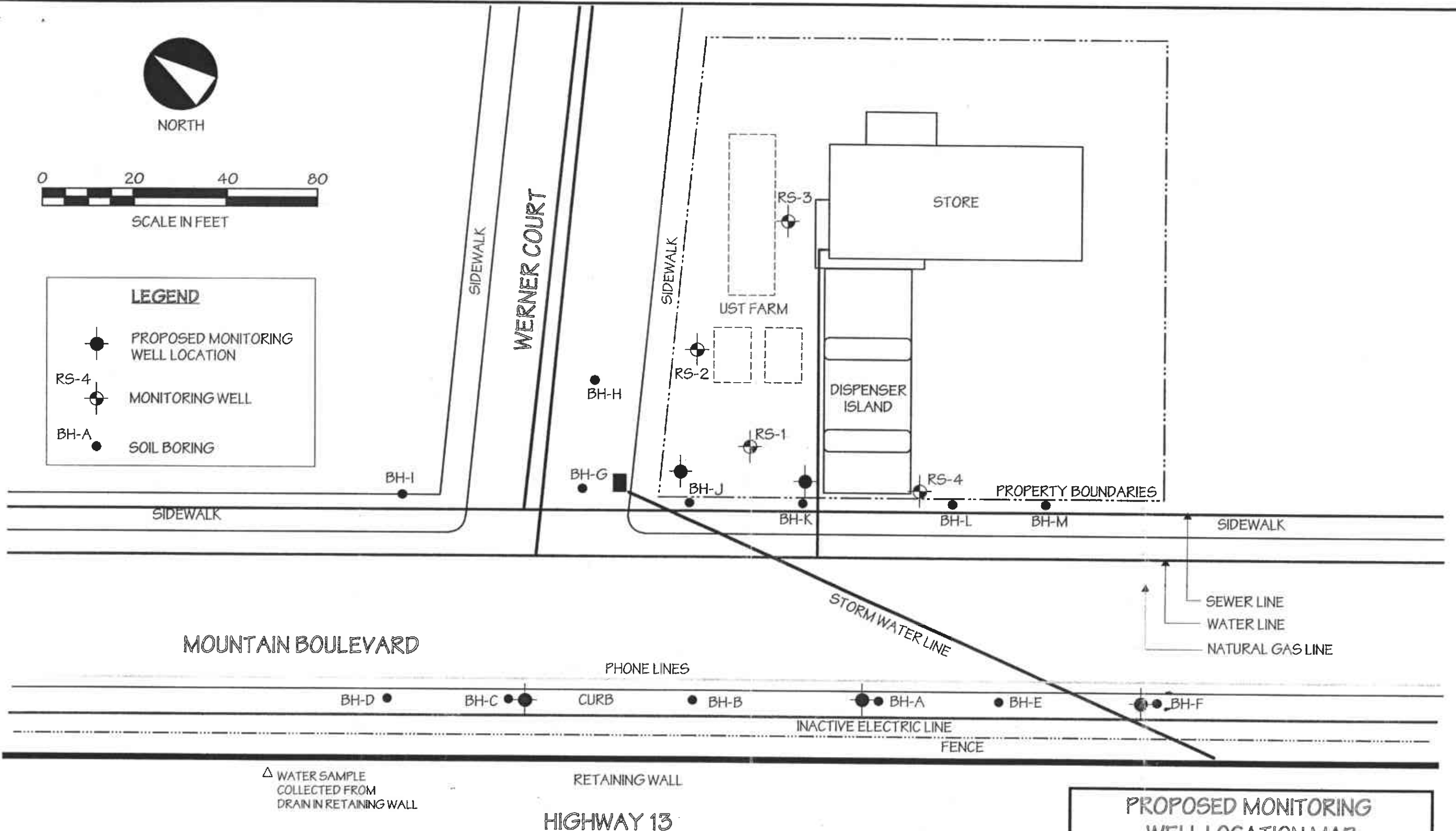
NORTH



SCALE IN FEET

**LEGEND**

- PROPOSED MONITORING WELL LOCATION
- MONITORING WELL
- SOIL BORING



△ WATER SAMPLE COLLECTED FROM DRAIN IN RETAINING WALL

RETAINING WALL  
HIGHWAY 13

<b>PROPOSED MONITORING WELL LOCATION MAP</b>	
Shahnazi Property 2844 Mountain Boulevard Oakland, California	
AQUA SCIENCE ENGINEERS, INC.	Figure 3

## **APPENDIX A**

July 5, 2000 Letter  
From The ACHCSA

ALAMEDA COUNTY  
HEALTH CARE SERVICES



AGENCY  
DAVID J. KEARS, Agency Director

ENVIRONMENTAL HEALTH SERVICES  
ENVIRONMENTAL PROTECTION  
1131 Harbor Bay Parkway, Suite 250  
Alameda, CA 94502-6577  
(510) 567-6700  
FAX (510) 337-9335

July 5, 2000

Shahram Shahnazi  
140 Geldert Dr.  
Tiburon, CA 94520

Dear Mr. Shahnazi:

Subject: Compare Prices, 2844 Mountain Blvd., Oakland, CA  
StId 851

"Report for Soil and Groundwater Assessment..." dated May 24, 2000 by Aqua Science Engineers was reviewed. The report indicated Methyl Tertiary-Butyl Ether (MTBE) concentrations as high as 410,000 ug/l, 170,000 ug/l, and 130,000 ug/l, close to the property boundaries. The highest benzene concentration was 6,400 ug/l, which was adjacent to the property boundary. The recommendation for five additional groundwater monitoring wells is acceptable. However, first, the possibility of the onsite tank system as the source of the MTBE and benzene in the subsurface (tank, pipe joint, spill bucket, surface spill, etc.) needs to be investigated. A summary of suggested methods for determining the source of leaks in tank systems is included in Appendix D (enclosed). After that, the distance to receptors (drinking water wells and surface water supplies) in the vicinity need to be determined. This information can then be used to develop a site conceptual model (SCM). Due to the high concentrations found, interim remedial action is also required.

Provide a workplan which addresses these issues within 30 days. If you have any questions, call me at (510) 567-6746.

Sincerely,

  
Don Hwang  
Hazardous Materials Specialist

Enclosure (1)

C: Robert Kitay, Aqua Science Engineers, Inc., 208 W. El Pintado, Danville, CA 94526

file