

R123



February 25, 2002

Project No. 41-0236-05

Alameda County Health Care Services Agency  
Environmental Protection  
1131 Harbor Bay Parkway, Suite 250  
Alameda, California 94502-6577

ATTN: MR. DON HWANG

SITE: QUIK STOP MARKET NO. 56  
3132 BEAUMONT AVENUE  
OAKLAND, CALIFORNIA

SUBJECT: SITE ASSESSMENT WORKPLAN

Dear Mr. Hwang:

On behalf of Quik Stop Markets, Inc., TRC-Alton Geoscience submits this Site Assessment Workplan for the above referenced property.

If you have any questions regarding this report, please call me at (925) 688-2476.

Sincerely,

A handwritten signature in black ink that reads "Tracy L. Walker". The signature is written in a cursive, flowing style.

Tracy L. Walker, R.G.  
Associate

cc: Mr. Mike Karvelot, Quik Stop Markets, Inc.

Enclosure





Customer-Focused Solutions

**SITE ASSESSMENT WORKPLAN**

February 25, 2002

Quik Stop Market #56  
3132 Beaumont Avenue  
Oakland, California

TRC Project No. 41-00236-05

Prepared For:

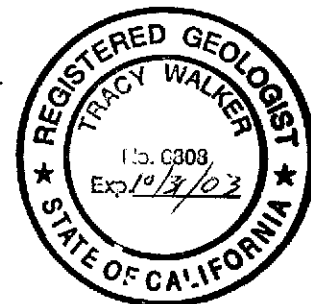
QUIK STOP MARKETS, INC.  
4567 Enterprise Street  
Fremont, California

Prepared By:

*Tracy L. Walker*  
for Mark Trevor  
Staff Geologist

*Tracy L. Walker*

Tracy L. Walker, RG  
Associate



TRC  
5052 Commercial Circle  
Concord, California 94520

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## **Site Assessment Workplan**

Quik Stop Market #56

February 25, 2002

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### **1.0 INTRODUCTION**

On behalf of Quik Stop Markets Inc., TRC submits this workplan for the installation of one groundwater monitoring well at Quik Stop #56, located at 3132 Beaumont Avenue, Oakland, California (Figure 1). This work is being performed as requested by Alameda County Health Care Services Agency (ACHCSA) in a letter dated December 5, 2001. The planned activities include the installation, development, and sampling of one monitoring well. The objective of this assessment is to further characterize the downgradient extent and magnitude of dissolved-phase petroleum hydrocarbons, particularly MTBE, in the shallow groundwater.

### **2.0 SITE DESCRIPTION**

The site is currently operated as a Quik Stop Market convenience store/gasoline service station (Figure 2). The site is surrounded by three city streets, Beaumont Avenue, 14<sup>th</sup> Avenue, and East 32<sup>nd</sup> Street (Figure 2). Most of the surrounding land use is residential, consisting of apartment and single-family buildings. Alameda County Medical Center is located approximately 300-feet to the southwest on Beaumont Avenue.

The site is at an elevation of approximately 140 feet above mean sea level. The topography generally slopes to the southwest. The site is located in the eastern part of the San Francisco Bay area, and is underlain by Quaternary (Pleistocene) alluvium (ACFCD, 1993). This alluvium consists of coalescing alluvial fans, and estuarine and marine deposits. These deposits are heterogeneous inter-fingering layers of clayey gravel, sandy silty clay, and various clay-silt-sand mixtures, and have a maximum thickness of about 200 feet beneath the site. Soil types beneath the site consist of silty and sandy clays from the surface to a depth of approximately 13 feet below grade (fbg), silty sand or clayey silt from approximately 13 to 25 fbg, and silty clay from approximately 25 to 33 fbg.

The site is located in the East Bay Plain Groundwater Basin, Oakland Upland and Alluvial Plain Subarea (DWR, 1975; ACFCD, 1993). Regionally, shallow groundwater occurs in numerous small, discontinuous aquifers within the unconsolidated Quaternary alluvium (Godfrey, 1995), and generally flows to the southwest toward the San Francisco Bay (ACPWA, 1999). The local depth to shallow groundwater is between 6 and 10 fbg. Groundwater beneath the site flows to the southwest with a hydraulic gradient of 0.116 ft/ft.

### **3.0 SITE BACKGROUND**

**September 1998:** Two 10,000-gallon steel gasoline underground storage tanks (USTs) were excavated and removed from the site (Garlow, 1998). These tanks were replaced with two

## Site Assessment Workplan

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12,000-gallon double-walled, fiberglass USTs. During the upgrade activities, approximately 792 cubic yards of soil were excavated to remove potentially impacted soil and accommodate the new orientation of the USTs. All excavated soil was transported under manifest to Forward Landfill in Manteca, California for disposal.

Soil samples collected during the removal of the USTs were below laboratory reporting limits for total petroleum hydrocarbons as gasoline (TPH-g), benzene, toluene, ethylbenzene, and total xylenes (BTEX), and methyl tert-butyl ether (MtBE), except for 0.53 milligrams per kilogram (mg/kg) MtBE detected in one sample at the south corner of the USTs (SW-1), and 240 mg/kg TPH-g, 0.85 mg/kg ethylbenzene, and 130 mg/kg total xylenes in soil sample SW-2. Grab water samples were also collected from the bottom of the excavation and analyzed. However, the analytical results in these samples are likely exaggerated due to matrix interference in the sample (i.e., petroleum hydrocarbons sorbed to the soil particles present in the grab sample).

**February 2000:** Three groundwater monitoring wells (MW-1, MW-2, and MW-3) were installed at the locations shown on Figure 2. Minor TPH-g was detected in a soil sample collected from MW-1 at 6.5 fbg (2.9 mg/kg), but was not detected in all other soil samples collected. Minor MtBE concentrations were detected in soil samples from MW-1 at depths ranging from 6.5 to 21.5 fbg, and MW-3 at 6 and 11 fbg. Detected MtBE concentrations in soil ranged from 0.0083 to 0.66 mg/kg. The only benzene concentration detected was 0.038 mg/kg in one soil sample from MW-3 collected at 11 fbg. Toluene and ethylbenzene were not detected in any of the soil samples. Minor xylene concentrations were detected in MW-1 at 6.5 fbg (0.0097 mg/kg) and MW-3 at 11 fbg (0.019 mg/kg).

Groundwater monitoring has been conducted at the subject site beginning with the installation of monitoring wells and continuing to present. Groundwater has been analyzed for TPH-G, BTEX and MtBE. During this period, all three wells have consistently had non-detectable amounts of BTEX compounds. Monitoring well MW-1, located downgradient from the former UST's has been the only well with detectable concentrations of MtBE and TPH-G. The Fourth Quarter 2001 Progress Report (TRC, 2001) shows that MtBE and TPH-G concentrations were detected in MW-1 at 28,000 and 18,000 ug/L, respectively.

## 4.0 SITE ASSESSMENT ACTIVITIES

### 4.1 PRE-FIELD WORK ACTIVITIES

A well installation permit will be obtained from the ACHCSA before installing the monitoring well. At least three days before mobilizing the drilling equipment to the site, the boring location

will be marked and Underground Services Alert will be notified. Just before drilling, a pilot-hole will be hand augered to approximately 5 fbg to verify the absence of buried utilities at the drilling location.

#### 4.2 DRILLING AND SOIL SAMPLING

The boring will be drilled to a depth of approximately 23 fbg at the proposed location shown on Figure 2. Drilling will be performed using a truck-mounted hollow-stem auger drill rig. Soil samples will be collected at a minimum of five-foot depth intervals during drilling, beginning at 5 fbg (minimum of four samples). Samples will be collected for soil description, field hydrocarbon vapor testing, and analysis at a state-certified laboratory. General field procedures to be followed during this investigation are discussed in Appendix A.

Select soil samples will be appropriately preserved pending submittal to a state-certified laboratory for analysis of TPH-g, BTEX, and MtBE using EPA Method 8260B. Chain-of-Custody protocol will be followed for all samples, thus providing a continuous record of sample possession before actual analysis.

#### 4.3 WELL CONSTRUCTION

The proposed monitoring well will be constructed of 2-inch diameter polyvinyl chloride (PVC) blank (riser) and slotted (screen) casing with the screen interval installed from approximately 7 to 22 fbg (depending on depth to water), across the water table. The screen-formation annulus will be filled with an appropriate filter pack material. The riser-formation annulus will be properly sealed with hydrated bentonite chips and cement grout. The wellhead will be sealed with a watertight, lockable well cap, and a flush-mounted well box will be installed over the wellhead. Groundwater is expected to be encountered at approximately 10 to 12 fbg.

Following installation, the well will be developed (surged and bailed) to improve hydraulic communication between the geologic formation and the well. A wellhead reference point, typically a notch cut into the top of the well casing, will be surveyed relative to a benchmark of known elevation. The wellhead reference point will be from where future depths to groundwater measurements are made. General field procedures for well installation are presented in Appendix A.

#### 4.4 GROUNDWATER SAMPLING ACTIVITIES

Fluid level measurements and groundwater sampling will be conducted no sooner than 24-hours after development of the wells. Fluid levels will be measured relative to the top of casing using a precision of 0.01 feet. The presence and thickness of free-phase product will also be checked in each well.

## **Site Assessment Workplan**

Quik Stop Market #56

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After measuring the fluid level, the well will be purged of three well volumes using an electric submersible pump. The well will then be sampled using a clean, new disposable PVC bailer following standard sampling procedures (Appendix A). The groundwater sample will be appropriately preserved and submitted to a state-certified laboratory for analysis. Chain-of-Custody protocol will be followed for all samples selected for analysis, thereby providing a continuous record of sample possession before actual analysis. The laboratory will analyze the groundwater sample for TPH-G, BTEX, and MtBE using EPA Method 8260B.

### **4.5 WASTE DISPOSAL**

Soil and groundwater generated as a result of the field activities will be stored on-site in Department of Transportation-approved 55-gallon drums pending disposal at an approved disposal/recycling facility. A waste manifest will be prepared for proper transport and disposal of the waste.

### **4.6 REPORTING**

A report discussing the results of the field activities and laboratory analytical results will be prepared. This report will include boring/well logs, laboratory analytical results, findings, and conclusions, and will be submitted to the ACHCSA within six weeks following completion of the field activities.

### **5.0 WORK SCHEDULE**

The planned activities will be performed according to the following estimated completion schedule:

- ACHCSA workplan review and approval expected within four weeks of submittal.
- Completion of field activities within six weeks of workplan approval notification and pending approval of site access from the Alameda County Medical Center.
- Submit technical report within six weeks of completion of field activities.

### **6.0 SITE HEALTH AND SAFETY PLAN**

A site health and safety plan designed to promote project personnel safety and preparedness during the activities described in this work plan is included in Appendix B.

**Site Assessment Workplan**

Quik Stop Market #56

February 25, 2002

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**7.0 REFERENCES**

ACFCD, 1993. Geology Framework of the East Bay Plain Groundwater Basin, Alameda County, California; Alameda County Flood Control and Water Conservation District, August 1993.

ACPWA, 1999. Frank Codd, Alameda County Public Works Agency, Personal Communication via Facsimile (map of groundwater levels in the City of Oakland area); November 16.

DWR, 1975. Sea-Water Intrusion in California, Inventory of Coastal Ground Water Basins; California Department of Water Resources, Bulletin No. 63-5; October.

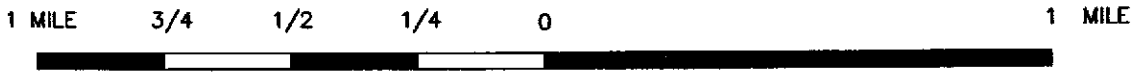
Godfrey, 1995. Andreas Godfrey, Alameda County Public Works-Water Resources Section, Personal Communication; May 22.

Gregg Drilling, 1999. Web Page, [www.greggdrilling.com/water\\_table\\_n.html](http://www.greggdrilling.com/water_table_n.html); November 10.

TRC, 2001. Quarterly Progress Report, Fourth Quarter, 2001, December 15, 2001.



FIGURES



SCALE 1 : 24,000



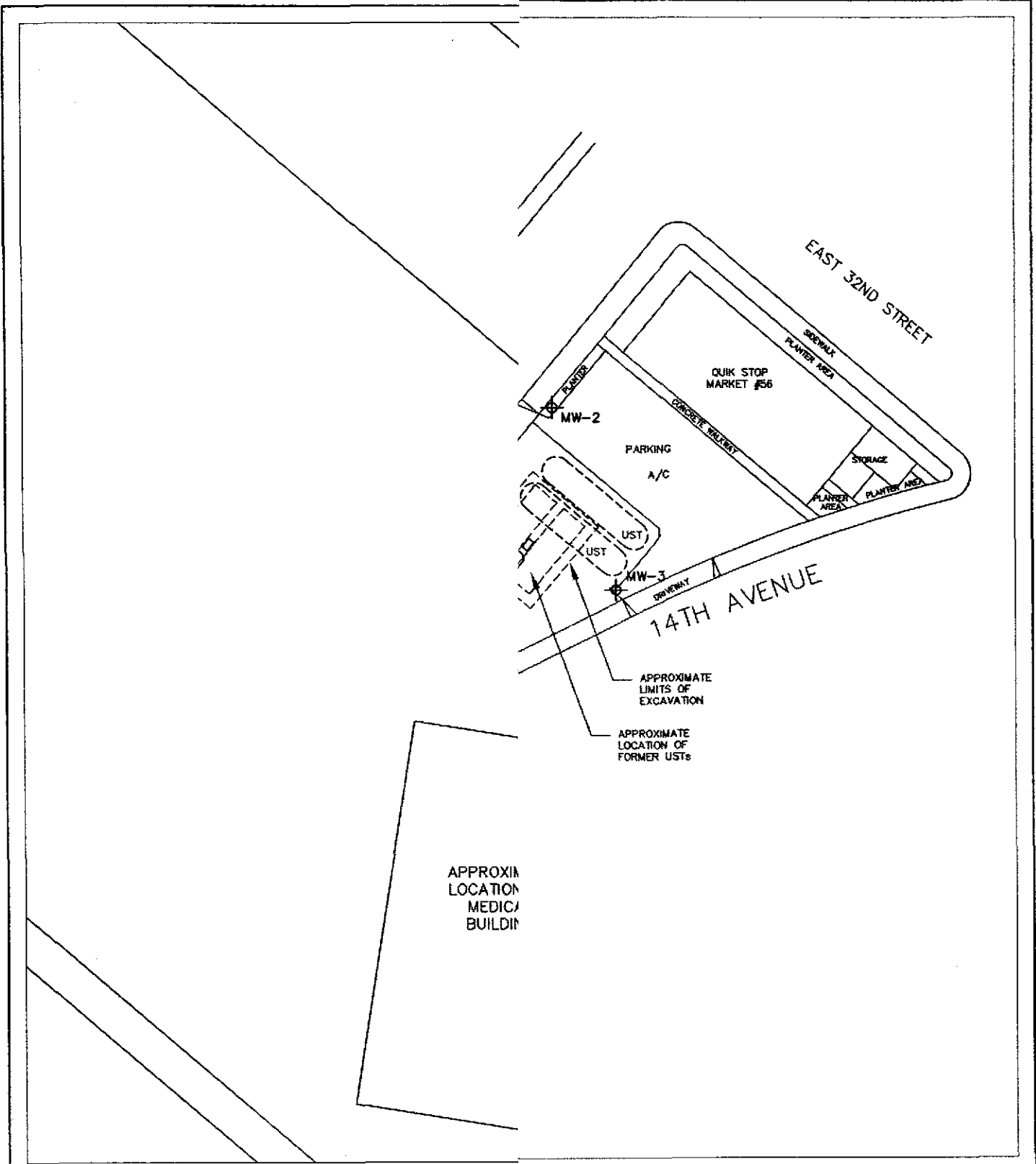
SOURCE:  
 United States Geological Survey  
 7.5 Minute Topographic Maps:  
 Oakland East and  
 Oakland West Quadrangles

**VICINITY MAP**

Quik Stop No. 56  
 3132 Beaumont Avenue  
 Oakland, California

**TRC**

**FIGURE 1**



LEGEND	
MW-1	Monitoring Well
	Proposed Monitoring Well

**SITE PLAN SHOWING PROPOSED MONITORING WELL**

Quik Stop No. 56  
 3132 Beaumont Avenue  
 Oakland, California

SOURCE: Client-provided drawings and Garlow, 1998. Site Doble Thomas Associates.

APPENDIX A  
General Field Procedures

## GENERAL FIELD PROCEDURES

A description of the general field procedures used during site investigation and monitoring activities is presented below. For an overview of protocol, refer to the appropriate section(s).

### DRILLING AND SOIL SAMPLING

Soil borings are drilled using continuous-flight, hollow-stem augers. Borings that are not completed as monitoring wells are grouted to within 5 feet of the ground surface with a cement/bentonite slurry. The remaining 5 feet is filled with concrete.

Soil samples are obtained for soil description, field hydrocarbon vapor screening, and possible laboratory analysis. Soil samples are retrieved from the borings by one of two methods: 1) continuously, using a 5-foot-long, continuous-core barrel sampler advanced into the soil with the lead auger; sample tubes are driven into the core with a mallet, or 2) at 2.5- or 5-foot intervals, using a standard split-spoon sampler lined with four 1.5-inch-diameter stainless steel or brass sample inserts. The split-spoon sampler is driven approximately 18 inches beyond the lead auger with a 140-pound hammer dropped from a height of 30 inches.

For hand auger borings and hand-held, power-driven auger borings, soil samples are retrieved using a hand-driven slide hammer lined with a 1.5-inch-diameter stainless steel sample tube.

During drilling activities, soil adjacent to the laboratory sample is screened for combustible vapors using a combustible gas indicator (CGI) or equivalent field instrument. For each hydrocarbon vapor screening event, a 6-inch-long by 2.5-inch-diameter sample insert is filled approximately 1/3 full with the soil sample, capped at both ends, and shaken. The probe is then inserted through a small opening in the cap, and a reading is taken after approximately 15 seconds and recorded on the boring log. The remaining soil recovered is removed from the sample insert or sampler, and described in accordance with the Unified Soil Classification System. For each sampling interval, field estimates of soil type, density/consistency, moisture, color, and grading are recorded on the boring logs.

### EXCAVATION SOIL SAMPLING

Excavation soil samples are collected either by driving a stainless steel sample tube directly into freshly uncovered soil, or from the backhoe bucket by driving the sample tube into a relatively coherent and undisturbed portion of soil within the bucket. Excavated soil is temporarily stockpiled onsite. Stockpile samples are collected by shoveling below the surface of the pile and inserting a steel sample tube into the soil.

## SOIL SAMPLE HANDLING

Soil sample handling follows the same basic protocol for both drilling and excavation activities. Upon retrieval, soil samples are immediately removed from the sampler, sealed with Teflon sheeting and polyurethane caps, and wrapped with tape. Each sample is labeled with the project number, boring/well number, sample depth, geologist's initials, and date of collection. After the samples have been labeled and documented in the chain of custody record, they are placed in a cooler with ice at approximately 4 degrees Celsius ( C) prior to and during transport to a state-certified laboratory for analysis. Samples not selected for immediate analysis may be transported in a cooler with ice and archived in a frostless refrigerator at approximately 4 C for possible future testing.

## MONITORING WELL INSTALLATION

Monitoring wells are constructed of 4-inch-diameter, flush-threaded Schedule 40 PVC blank and screened (0.020-inch slot size) casing. Where possible, the screened interval will extend at least 10 feet above, and 10 to 20 feet below, the top of the groundwater table. The annular space surrounding the screened casing is backfilled with No. 3 Monterey sand (filter pack) to approximately 2 feet above the top of the screened section.

During well construction, the filter pack is completed by surging with a rig-mounted surge block. A 3-foot-thick bentonite annular seal is placed above the filter pack. The remaining annular space is grouted with Portland cement and/or bentonite grout to the surface. Utility access boxes are installed slightly above grade. Locking, watertight caps are installed to prevent unauthorized access to the well, and limit infiltration of surface fluids.

## FLUID-LEVEL MONITORING

Fluid-levels are monitored in the wells using an electronic interface probe with conductance sensors. The presence of liquid-phase hydrocarbons is verified using a hydrocarbon-reactive paste. The depth to liquid-phase hydrocarbons and water is measured to the nearest 0.01 foot relative to the well box top or top of casing. Well box or casing elevations are surveyed to within 0.02 foot relative to a county or city bench mark.

## GROUNDWATER SAMPLING

Currently, 'pre-purge' and 'non-purge' methods of sampling both comply with regulatory standards.

## NON-PURGE METHOD:

Alton Geoscience utilizes the 'non-purge' method of sampling for all qualifying groundwater monitoring wells. Groundwater samples are collected by lowering a 1.5-inch-diameter, bottom-fill, disposable polyethylene bailer just below the static water level in the well. The samples are carefully transferred from the check-valve-equipped bailer to 1-liter and 40-milliliter glass containers. The sample containers are filled to zero headspace and fitted with Teflon-sealed caps. Each sample is labeled with the project number, well number, sample date, and sampler's initials. Samples remain chilled at approximately 4 C prior to analysis by a state-certified laboratory.

The following criteria necessary for a well to qualify for 'non-purge' sampling are taken from a letter issued by San Francisco Bay Regional Water Quality Control Board on January 31, 1997:

1. The non-purging approach shall be used only for monitoring wells where groundwater has been impacted by petroleum hydrocarbons, BTEX, and MTBE.
2. Non-purge sampling shall be utilized for unconfined aquifers only.
3. The monitoring well shall be properly permitted, constructed (in this case, screened across the water table), and developed.
4. The well is not presently in use for groundwater or soil vapor extraction.
5. The well does not contain free product.
6. For new wells or wells brought into monitoring for the first time, the first round of groundwater sampling performed at a site shall be with both non-purged and purged samples. The purging and sampling method used shall be documented. This shall include the rate of purge and sampling details. For these wells we require measurements of dissolved oxygen, specific conductance, pH, and temperature whether purged or not purged. Also, if biodegradation is being tracked at the well, our requirements do not preclude the measurement of other parameters.
7. Existing wells which have already been routinely purged in previous sampling events immediate to being switched to a non-purging mode do not require an initial duplicate non-purged and purged sample.
8. Monitoring data frequency shall be as required by the appropriate regulatory oversight agency.
9. Should site closure be requested where the non-purged approach has been used, the final confirmation sampling event shall include both non-purged and purged samples from each well or as agreed upon with the appropriate regulatory oversight agency.

## PURGE METHOD:

Groundwater monitoring wells that do not qualify for the 'non-purge' method are purged and sampled in accordance with standard regulatory protocol. Typically, monitoring wells that contain no liquid-phase hydrocarbons are purged of groundwater prior to sampling so that fluids sampled are representative of fluids within the formation. Temperature, pH, and specific conductance are typically measured after each well casing volume has been removed. Purging is considered complete when these parameters vary less than 10% from the previous readings, or when four casing volumes of fluid have been removed. Samples are collected without further purging if the well does not recharge within 2 hours to 80% of its volume before purging.

The purged water is either pumped directly into a licensed vacuum truck or temporarily stored in labeled drums prior to transport to an appropriate treatment or recycling facility. If an automatic recovery system (ARS) is operating at the site, purged water may be pumped into the ARS for treatment.

Groundwater samples are collected by lowering a 1.5-inch-diameter, bottom-fill, disposable polyethylene bailer just below the static water level in the well. The samples are carefully transferred from the check-valve-equipped bailer to 1-liter and 40-milliliter glass containers. The sample containers are filled to zero headspace and fitted with Teflon-sealed caps. Each sample is labeled with the project number, well number, sample date, and sampler's initials. Samples remain chilled at approximately 4 C prior to analysis by a state-certified laboratory.

#### CHAIN OF CUSTODY PROTOCOL

Chain of custody protocol is followed for all soil and groundwater samples selected for laboratory analysis. The chain of custody form(s) accompanies the samples from the sampling locality to the laboratory, providing a continuous record of possession prior to analysis.

#### DECONTAMINATION

##### Drilling and Soil Sampling

Drilling equipment is decontaminated by steam cleaning before being brought onsite. The augers are also steam cleaned before each new boring is commenced. Prior to use, the sampler and sampling tubes are brush-scrubbed in a Liqui-nox and potable water solution and rinsed twice in clean potable water. Sampling equipment and tubes are also decontaminated before each sample is collected to avoid cross-contamination between borings.

##### Groundwater Sampling

Purging and sampling equipment that could contact well fluids is either dedicated to a particular well or cleaned prior to each use in a Liqui-nox solution followed by two tap water rinses.



**APPENDIX B**  
**Site Health and Safety Plan**

# SITE HEALTH AND SAFETY PLAN

For

Well Installation Activities

Quik Stop Market # 56

3132 Beaumont Avenue, Oakland, CA

## 1.0 PLAN SUMMARY

This Site Health and Safety Plan (SHSP) establishes responsibilities, requirements, and procedures for the protection of personnel while performing activities at the above-referenced site. This site-specific plan conforms with the Alton Geoscience Corporate Health and Safety Plan, Hazard Communication Program, and Injury and Illness Prevention Program (IIPP).

During site work, the use of proper health and safety procedures, in accordance with applicable Cal/OSHA regulations shall be required. Site-specific conditions may necessitate modification of the SHSP; however, except in emergency situations no deviations from the plan may be implemented without the prior notification and approval of the Site Safety Officer (SSO).

## 2.0 SITE INFORMATION

This SHSP considers the physical, chemical, and environmental hazards that may be encountered during work activities at the site. Operations associated with this SHSP will be conducted in accordance with an approved workplan. Any changes required or made to the planned activities will be immediately communicated to site personnel by the SSO. Summary information for this project is provided in the following table.

Workplan dated:	January 28, 2002
Principal activities:	Groundwater Monitoring Well Installation
Site description (see Attachment A for site map):	Active service station and convenience store site
Expected depth to groundwater:	Estimated to be 6 to 12 fbg
Contaminants of concern (see Attachment B):	BTEX, constituents of gasoline

## 3.0 SITE SAFETY AUTHORITY

**Site Health and Safety Plan**  
Quik Stop Market # 56  
3132 Beaumont Avenue, Oakland, CA

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Contact information and names of authorized personnel are listed below. A description of responsibilities follows.

Role	Name	Company	Telephone
Site Safety Officer	Steve Kemnitz	TRC Alton Geoscience	(925) 260-6157 cell
Alternate Site Safety Officer	Collin Briese	TRC Alton Geoscience	(7925) 260-9286 cell
Project Manager	Tracey Walker	TRC Alton Geoscience	(925) 260-3952 cell
Supervisor/Offsite Coordinator	Tracey Walker	TRC Alton Geoscience	(800) 260-3952 cell
Local IIPP Coordinator	Steve Kemnitz	TRC Alton Geoscience	(800) 260-6157 cell
Client Contact	Mike Karvelot	Quik Stop Markets, Inc	(510) 657-8500

**Site Safety Officer:** The SSO is responsible for briefing site personnel on potential physical and chemical hazards prior to work start-up, during operations, and whenever other health and safety matters need to be addressed. The SSO will be in charge of conducting the daily Tailgate Safety Meetings. The SSO will see that this SHSP is available onsite and is understood and signed by personnel entering the site. The SSO is also responsible for implementing emergency response procedures when necessary. In the event the SSO is unable to perform these duties, the Alternate SSO will be responsible.

**Project Manager:** The Project Manager (PM), in coordination with the SSO, is responsible for implementing health and safety requirements, including seeing that the SHSP is prepared and available onsite. The PM is the central point of contact for the SSO, Client, and Field Personnel, and has overall responsibility for site operations.

**Field Personnel:** Field Personnel are responsible for understanding and complying with this SHSP. Field Personnel include both Alton employees and Subcontractors hired by Alton Geoscience. Field Personnel are required to participate in briefings prior to commencement of site work; attend daily Tailgate Safety Meetings; and acknowledge receipt and understanding of the SHSP by signing the Compliance Log at the end of this plan.

**Supervisor/Offsite Coordinator:** The Supervisor/Offsite Coordinator, typically the Alton branch manager, should be contacted when mobilization of support from an Alton office is needed, and in case of an emergency requiring offsite assistance.

## Site Health and Safety Plan

Quik Stop Market # 56

3132 Beaumont Avenue, Oakland, CA

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### 4.0 SITE CONTROL

Site control requires the establishment of a regulated area with designated work zones, evacuation protocol, location of medical assistance, site security, and communication guidelines that include a "Buddy System."

#### 4.1 REGULATED AREA(S)

Each site will have an established Exclusion Zone with controlled access, and a Support Zone. Supervision and strict control of access to regulated areas is necessary to protect site personnel as well as the public.

**Exclusion Zone:** (*a.k.a. "Hot Zone"*) This is the area where personnel may be subject to chemical or physical hazards. It is the zone of known or suspected contamination, where equipment operation and/or environmental sampling will take place. The Exclusion Zone is to be clearly identified and isolated with cones, barricades, or high visibility caution tape. Personnel working in the Exclusion Zone will at a minimum use Level D personal protective equipment as described in **Section 7.0**.

The outer boundary of the Exclusion Zone (*"Hot Line"*) will be established by the SSO, so that sufficient area is available to conduct operations while providing a protective buffer for persons and property outside the zone.

**Support Zone:** (*a.k.a. "Safe Zone"*) This is the area outside the Exclusion Zone where administrative and other support functions are located. Adverse exposure to contaminants and physical hazards are unlikely in the Support Zone.

#### 4.2 EVACUATION PROTOCOL

Evacuation protocol and routes from the site will be established by the SSO, and communicated to Field Personnel during the Tailgate Safety Meeting(s) prior to initiating work. Evacuation protocol will be implemented as needed in emergency situations. In the event of an evacuation, personnel will meet at a pre-established location and the SSO will do a "head count" to see that everyone has left the hazard area.

Emergency Response procedures are outlined in **Section 12.0**. Directions to the nearest medical facilities are provided in **ATTACHMENT C**.

#### 4.3 SITE SECURITY

Appropriate security measures will be established in coordination with the site owner/operator and communicated to site personnel. The objective of these measures is to (1) protect the public from

**Site Health and Safety Plan**  
Quik Stop Market # 56  
3132 Beaumont Avenue, Oakland, CA

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potential exposure to physical/chemical hazards; (2) avoid public interference with personnel and safe work practices; and (3) prevent theft or vandalism of equipment at the site.

#### 4.4 COMMUNICATION

Communication is an important aspect of the site control program as well as the entire SHSP. Personnel should keep in mind that hazard assessment is a continuous process, and any potentially unsafe condition must be reported immediately to the SSO.

Onsite personnel will use the "Buddy System" and maintain communication or visual contact between team members during site operations. The Buddy System is used to provide assistance, monitor for chemical exposure and heat stress, and obtain emergency assistance for coworkers when necessary.

Site personnel will be familiar with the following emergency hand signals:

<b>Hand gripping throat:</b>	<b>Can't breathe. Respirator problems.</b>
<b>Grip team member's wrist or both hands on team member's waist:</b>	<b>Leave site immediately, no debate!</b>
<b>Thumbs up:</b>	<b>Yes. I'm all right. I understand.</b>
<b>Thumbs down:</b>	<b>No. Negative.</b>

#### 5.0 HAZARD ASSESSMENT

Hazard assessment is essential for establishing hazard reduction measures. Hazard assessment will consist primarily of site inspections and monitoring. Known operational hazards (heavy equipment, overhead lines, etc.) and site characterization data (contaminant location, concentration, etc.) are also considered in the assessment. The following is a list of potential hazards associated with the activities planned for this site:

**Site Health and Safety Plan**

Quik Stop Market # 56

3132 Beaumont Avenue, Oakland, CA

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<b><u>Physical Hazards</u></b>	Heavy equipment Overhead lines and underground utilities Explosion and fire Traffic - vehicular and pedestrian Tripping, slipping, and falling Head, foot, eye, and back injuries Falling objects Sharp objects Electrical equipment Welding hazards Excavation and trenching
<b><u>Chemical Hazards</u></b>	Gasoline / benzene, toluene, ethylbenzene, xylenes (BTEX) Environmental samples, soil cuttings, decontamination water, dust (nuisance, silica)
<b><u>Environmental Hazards</u></b>	Noise exposure Weather - heat, cold, rain, fog Biological - plants, animals/insects, pathogens
<b><u>Confined Spaces</u></b>	Hazardous atmospheres (Oxygen content; flammable, explosive, or toxic gases) Engulfment potential Restricted movement; limited space for entry/exit

Walk-through safety inspections will be conducted by the SSO daily and as conditions change. Inspection results will be communicated to the work crews during the morning Tailgate Safety Meetings and as needed.

**6.0 HAZARD REDUCTION**

Personnel are required to exercise reasonable caution at all times during work activities. Failure to follow safety protocols and/or continued negligence of health and safety policies will result in expulsion of a crewmember from the site and may result in termination of employment. In general, the potential for hazardous situations will be reduced by the following activities:

*Implementing engineering controls*

*Using personal protective equipment*

*Performing air monitoring*

Engineering Controls, corresponding to the hazard assessment for work at this site, are outlined below in Sections 6.1 through 6.4. Personal protective equipment (PPE) and air monitoring guidelines are outlined in Sections 7.0 and 8.0, respectively.

## 6.1 PHYSICAL HAZARDS AND CONTROLS

### Heavy Equipment

The operation and use of heavy equipment presents the greatest potential for injury to personnel. To minimize these hazards, designated routes and specific traffic patterns will be established. Trucks will use spotters for backing. If personnel need to approach heavy equipment during operation, they will observe the following protocols: make eye contact with the operator, signal the operator to cease heavy equipment activity, and then approach the equipment to inform operator of intentions.

Only equipment that is in safe working order will be used. Only qualified personnel will be allowed to operate heavy equipment. Subcontractors will supply proof of qualifications to operate the equipment. Those crewmembers directly involved in spotting for the operator will be the only personnel allowed within the operating radius of the heavy equipment. Other personnel will remain at a safe distance from these operations.

### Overhead Lines and Underground Utilities

When operating heavy equipment (such as cranes or drill rigs) near overhead power lines, care will be taken to ensure that the crane boom and rigging maintain a distance of *at least 10 feet* from the power lines. A USA utility mark-out is required and will be performed prior to drilling, construction, or excavation to mark/clear underground utilities. In addition, the first 5 feet of soil borings will be excavated using an air-knife or hand auger.

### Explosion and Fire

Liquid petroleum products readily vaporize from standing pools or saturated soil. Ignition sources pose an explosion and fire hazard (e.g., engines, impact sparking, and heat or arc from inappropriate equipment or instrumentation). A direct-reading combustible gas indicator (CGI) will be used to evaluate the possible formation of flammable atmospheres in and around the work area. See Section 8.0: Air Monitoring.

## Site Health and Safety Plan

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Emergency services (911) are to be called immediately in case of a fire or explosion. A portable fire extinguisher will be kept onsite for use on small fires only. Only personnel trained in the proper use of fire extinguishers are authorized to use the onsite fire extinguisher.

### Traffic - Vehicular and Pedestrian

Work to be conducted in the public right-of-way requires an approved traffic control plan and traffic control setup and operation. Project personnel are required to follow state and local traffic laws. Vehicles driven by company personnel will yield to bikes and pedestrians, and at railroad crossings.

Access to work areas will be limited by the SSO to essential personnel. Delineators, barriers, and/or taping will be used to cordon off the work areas, and prevent pedestrian and vehicular traffic from entering the work zones.

### Tripping, Slipping, and Falling

Personnel will be reminded daily to maintain sure footing on all surfaces. Use of safety harnesses is required for personnel working *6 feet or more* above any surface that does not have handrails (includes riding on man-lifts). Work surfaces of unknown or suspect integrity will be strengthened or overlaid with a work platform capable of supporting personnel and equipment working in the area. To minimize tripping hazards caused by construction and other debris, material will be removed daily from the work areas and stockpiled in appropriate designated storage areas. This "housekeeping" effort will be enforced by the SSO at the end of each day.

### Head, Foot, Eye, and Back Injuries

Hard hats, steel toe boots, and safety glasses will be worn during site operations. To avoid back injuries, personnel will be trained in and required to use proper equipment and lifting techniques for manual material handling.

### Falling Objects

Equipment and material will be lowered to the ground "slowly" using a grapple and/or skip bucket. Personnel shall not work under this equipment; nor shall personnel other than the operator ride on the equipment.

### Sharp Objects

Nails, wires, saws, and cutting equipment pose potential hazards such as cuts and punctures during site work. *Only appropriate work tools are to be used.* Personnel are required to exercise caution, and should wear leather work gloves when handling or operating cutting tools, saws, and other



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sharp objects. A consistent housekeeping effort at the site will also help to reduce hazards from sharp objects.

### Electrical Equipment

In order to prevent accidents caused by electric shock, electrical connections will be inspected on a daily basis. Equipment found to have frayed wiring or loose connections will be shut down and locked-out until a qualified electrician has effected repairs. Electrical equipment will be de-energized and tested before any electrical work is started. Equipment will be properly grounded prior to and during work.

In addition, ground fault circuit interrupters (GFCIs) will be installed whenever possible in each circuit between the power source and tool, unless the presence of a potentially explosive atmosphere precludes this procedure. In the event that generators are used to supply power, they will be equipped with GFCIs.

### Welding Hazards

Personnel who perform or observe welding operations are required to use approved welding shields or glasses. This protective equipment will be inspected prior to each use for scratches and pits that could inhibit the ability to shield harmful ultraviolet light. Personnel are required to wear protective clothing to shield their skin from the harmful ultraviolet light produced by welding operations. Personnel working near welding operations that could ignite chemical protective clothing must wear flame-retardant outer apparel (Nomex or equivalent).

### Excavation and Trenching

Excavations and/or trenching *5 feet or more* in depth will incorporate a system of shoring, sloping of the ground, benching, or other means, as provided in CCR Title 8 Construction Orders, to prevent caving. Excavations/trenching will be inspected daily by a qualified person, and after every rainstorm or other hazard-increasing occurrence. Excavations less than 5 feet deep shall also be inspected for indications of potentially hazardous ground movement.

When employees are working in trenches *4 feet or more* in depth, a safe means of access/egress shall be provided and located so that no more than 25 feet of lateral travel is necessary to reach the access/egress point.

No equipment will be allowed and no materials will be piled within *2 feet* of the edge of any trench or excavation. Adequate barrier protection shall be provided to keep mobile equipment and personnel from inadvertently falling into a trench or an excavation.

No excavation work shall take place below the level of the base of an adjacent foundation, retaining wall, or other structure until (1) a qualified person has characterized the situation as one that will

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not create a hazard to workers; or (2) adequate safety measures have been taken for the protection of workers.

Workers shall not be permitted underneath loads handled by excavation or loading equipment. Soil excavation, handling, stockpiling, and backfilling will not be conducted under high-wind conditions. Under these conditions, the work area, excavated material, and unpaved roadways will be watered down until the surface is moist, and maintained in a moist condition to minimize dust.

## 6.2 CHEMICAL HAZARDS AND CONTROLS

### Chemical Characteristics

Hazardous chemicals that may be encountered at this site include diesel and gasoline hydrocarbons. These chemicals are volatile, flammable, and moderately to extremely toxic when inhaled, ingested, or absorbed above certain concentrations. See **ATTACHMENT B** for specific exposure limits and basic toxicology information.

Personnel will use engineering controls and PPE (based on hazard assessment) to prevent chemical exposure.

### Sample Collection

Workers who must come in direct contact with known or suspected contaminated soil or groundwater to collect samples are required to wear protective gloves and other PPE, as needed, to reduce the potential for exposure. Safety glasses will be worn to avoid potential splashing of chemicals into the eyes.

### Soil Cuttings, Decontamination Water, and Dust

As with sample collection, precautions are to be followed for handling materials such as soil cuttings and cleaning/decontamination water. Exposure and potential inhalation of dust (nuisance, silica) will be minimized by wearing dust masks or other appropriate PPE/respiratory protection.

### Disposition of Materials

Excavated soil will be stockpiled and covered, or stored in closed drums or roll-off bins. Purged water will be stored in closed drums or tanks. Drums, tanks, and/or roll-off bins containing soil or water will be labeled in accordance with the hazard communication standard and removed from the site in accordance with client-approved protocol.

### Hygiene

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**Eating, smoking, and drinking is NOT ALLOWED in the work area. Site personnel will wash their hands, arms, and faces thoroughly prior to eating or drinking, and at the end of their shift. Food should never be stored where it may come into contact with, or be contaminated by, petroleum products or other toxic materials.**

### 6.3 ENVIRONMENTAL HAZARDS AND CONTROLS

#### Noise Exposure

Hearing protection (ear plugs or ear muffs) will be worn when project personnel enter high-noise areas. The SSO should see that extra ear plugs are available onsite.

#### Heat Stress

Heat stress may be caused by the combination of ambient factors such as high air temperature, high relative humidity, and low air movement. This condition can result in heat rash, heat cramps, heat exhaustion, and/or heat stroke. It can impair worker coordination and judgement and directly impact health and safety. Heat stress is more likely when PPE is worn. Personnel are to drink plenty of water and take breaks (in shaded rest areas) as needed to help prevent heat stress. As part of the Buddy System, personnel should watch for signs and symptoms of heat stress in coworkers as well as themselves.

#### Cold Exposure

To guard against cold injury (frostbite and hypothermia), which is a danger when the temperature and wind-chill factor are low, employees will wear appropriate clothing, have warm shelter readily available, and maintain carefully scheduled work and rest periods.

#### Biological Hazards

Personnel will assess their surroundings for potential biological hazards, which may be posed by poisonous plants, insects, animals, and indigenous pathogens. Protective clothing and respiratory equipment can help reduce the chances of exposure. Thorough washing of any exposed body parts and equipment will help protect against infection from biological hazards. "*Universal Precautions*" (e.g., wearing latex gloves) must be taken any time there is potential for exposure to human blood, such as when an employee renders first aid to a coworker.

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### 6.4 CONFINED SPACE HAZARDS

Confined space entry is NOT ANTICIPATED during the course of these operations. However, if such a situation is encountered, workers are prohibited from entering confined spaces until the company plan dealing with confined spaces has been implemented.

## 7.0 PERSONAL PROTECTIVE EQUIPMENT

### 7.1 LEVEL OF PROTECTION

Personnel are required to wear PPE appropriate for the task and anticipated exposure to known contaminants. Selection of PPE will be based on hazard assessment, task performance, and air monitoring. Based on the history of this site, the initial level of protection will be Level D. At a minimum, Level D PPE will consist of the following:

- Hardhat  
*at all times in work area*
- Boots: chemical-resistant, steel toe and shank  
*at all times in work area*
- Safety glasses, splash goggles, or hardhat with face shield  
*when there is risk of hazardous substances (sampling) or flying particles (drilling, excavation, etc.) getting into eyes*
- Ear plugs / hearing protection  
*when high-noise equipment/drill rig is in operation*
- Gloves: chemical-resistant  
*when handling soil cuttings or soil/water samples*

Site personnel also are required to *be prepared* with the following items:

- Respirators: half-face, air-purifying with organic vapor cartridges
- Dust masks
- Tyvek coveralls and other suitable protective clothing
- Traffic safety vest
- Leather work gloves and back brace/lifting belt

Air monitoring information will dictate when and if a site will be upgraded to Modified Level D (Level D plus respirator).

## 7.2 RESPIRATOR SELECTION

For operations that require the use of a respirator, the SSO must verify that Field Personnel are medically approved to use respiratory equipment, fit tested, and trained in the proper use of air-purifying respirators. Site personnel are required have their respirator available and ready to use onsite. Only respirators that are NIOSH/MSHA approved are to be used.

Air monitoring will be performed to assess airborne contaminant levels onsite, and to evaluate suitable respiratory protection. Workers will be required to wear half-face, air-purifying respirators with organic vapor cartridges under the following circumstances, as indicated by onsite air monitoring:

- If volatile organic compound (VOC) vapors in the work area continuously exceed the threshold limit value - time-weighted average (TLV-TWA) for gasoline (300 parts per million [ppm]).
- If, at any time, VOC vapors in the work area exceed the threshold limit value - short-term exposure limit (TLV-STEL) for gasoline (500 ppm).

TLV values for gasoline are derived from American Conference of Governmental Industrial Hygienists (ACGIH) standards. Similar precautions will be taken with regard to other toxic chemicals, such as BTEX components. See ATTACHMENT B for additional information and regulatory exposure limits.

## 7.3 REASSESSMENT OF PPE

The levels of protection listed above will be upgraded (or downgraded) based on changes in activities, changes in site conditions, measurements of direct-reading instruments (compared to action levels for contaminants), or other findings. Changes in the level of protection require the approval of the SSO.

## 8.0 AIR MONITORING

Monitoring will be conducted as needed to characterize airborne contaminant levels. The potential hazards associated with the presence of hydrocarbons include (1) personnel exposure to chemicals, and (2) possible formation of flammable atmospheres in and around the work area. Air sampling will be conducted in accordance with NIOSH, OSHA, or EPA methods. The SSO will check to see that air monitoring equipment brought onsite is properly calibrated prior to operation and recalibrated during the course of the day, as necessary.

### 8.1 HYDROCARBON ANALYZER

A hand-held hydrocarbon analyzer will be used for the monitoring of VOCs in the work area in accordance with the requirements outlined in Title 8 CCR 5192. Air monitoring will be conducted in the breathing zone of workers, and the data collected will be used to evaluate suitable respiratory protection against chemicals encountered. Refer to the Respirator Selection guidelines in **Section 7.2** for personal protection measures. Measurements will also be obtained periodically at the top of boreholes or excavation cavities, and during any construction activities in which hydrocarbon-affected soil is encountered; however, only breathing zone measurements will be used to determine whether PPE should be used or discontinued.

### 8.2 COMBUSTIBLE GAS INDICATOR

A direct-reading, portable CGI that measures VOC concentrations in ppm, or as a percentage of the lower explosive limit (LEL), will be used to monitor airborne concentrations of VOCs and evaluate the possible formation of flammable atmospheres in and around the work area. Data will be used to monitor and evaluate vapor concentrations within or emanating from well bores, excavations, and contaminated soil that is stockpiled, moved, or loaded on or about the site. Measurements will be obtained periodically at the top of boreholes or excavation cavities throughout drilling or excavation operations, and during any construction activities in which hydrocarbon-affected soil is encountered. Periodic measurements also will be taken in areas that may contain an accumulation of combustible vapors.

In the event that CGI readings on the site exceed 10 percent of the LEL, work will be suspended, monitoring will be continued as needed to isolate the area of concern, and the following applicable environmental controls will be implemented:

1. Vapors from pooled petroleum product will be suppressed (if necessary) by spraying with foam, appropriate chemical suppressant, or carbon dioxide in gas form or dry ice.
2. Air movers will be used to ventilate the areas of concentration to below 10 percent LEL.
3. Contaminated soil will be covered with clean soil and/or sprayed with water or deodorizing chemicals in order to reduce vaporization of VOCs.

## **9.0 DECONTAMINATION**

Due to the expected low levels and types of contaminants at the site, it is anticipated that personnel will not perform routine decontamination procedures when leaving the Exclusion Zone. Project activities will be initially conducted in Level D PPE. When decontamination is necessary, it will consist of the following:

- Removal of contaminated garments in an "inside out" manner at a designated decontamination station located at the step-off location where personnel routinely enter/exit the Exclusion Zone.
- Placement of contaminated garments in designated plastic bags or drums prior to disposal or transfer offsite. Labels in compliance with the hazard communication standard will be affixed to containers of contaminated debris and clothing.

## **10.0 PERSONNEL TRAINING**

Personnel who will perform field activities shall meet the training requirements specified in the OSHA Hazardous Waste Operations and Emergency Response (HAZWOPER) Standard [29 CFR 1910.120 (e)]. Prior to commencement of work, the SSO will discuss the potential physical and chemical hazards associated with site operations, and review safe work practices with personnel. Personnel are required to acknowledge their understanding and willingness to comply with this SHSP before admission to the site by signing the Compliance Log at the end of the SHSP.

Other job-specific training required to perform tasks within this operation will be verified by the SSO. This training may include, but is not be limited to respirator fit testing, safe lifting techniques, confined spaces, hearing conservation, and proper fire fighting procedures.

## **11.0 MEDICAL PROGRAM**

The site medical program has two main components: a baseline medical surveillance program, and emergency medical assistance procedures.

### **11.1 BASELINE MEDICAL SURVEILLANCE**

Alton Geoscience has established a medical surveillance program to assess, monitor, and help protect the health of employees, in particular, employees who may be exposed to potentially hazardous substances during site work. Personnel will undergo medical examinations as follows:

**Initial:** Pre-employment / prior to any assignment involving work in a hazardous or potentially hazardous environment. The initial examination is used to establish a baseline

## Site Health and Safety Plan

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picture of health against which future changes can be measured, and to identify any underlying illnesses or conditions that might be aggravated by chemical exposures or job activities.

**Periodic:** At least once every 12 months to measure changes in health status.

**Upon notification:** As soon as possible upon notification by an employee that they have developed signs or symptoms indicating possible overexposure to hazardous substances, or in response to an injury or exposure during an emergency situation.

**Exit:** At termination of employment.

### 11.2 EMERGENCY MEDICAL ASSISTANCE

An emergency medical assistance network will be established prior to work start-up. The nearest fire department, police, ambulance service, and hospital with an emergency room will be identified. See ATTACHMENT C for Emergency Services contact information. A vehicle shall be available onsite during work activities to transport injured personnel to the identified emergency medical facilities, if necessary. Company vehicles are to be equipped with a fire extinguisher and first aid kit.

### 12.0 EMERGENCY RESPONSE PLAN

The SSO will have controlling authority during an emergency. In the SSO's absence, the Alternate SSO will be in charge. See ATTACHMENT C for the name, location, and telephone number of emergency response organizations in the vicinity of the project site, and a map to the nearest hospital(s).



## 12.1 EMERGENCY PROCEDURES

In the event of an accident, injury, or other emergency, remember to:

**Stop work and REMAIN CALM.**

**Move personnel to a safe location (evacuation plan).**

**Call 911 or notify other emergency facilities.**

**Address medical emergencies and apply first aid, if necessary.**

**Contain physical hazards.**

(NOTE: Act only if hazard is minimal and you are trained to deal with the situation. Otherwise evacuate and wait for emergency services to arrive.)

**Notify offsite supervisor and client, and initiate accident reporting procedures.**

## 12.2 ACCIDENT REPORTING

In case of an accident, the SSO (or Alternate) will immediately notify the Supervisor/Offsite Coordinator at the nearest Alton office and later provide a report to the PM describing the following:

1. A description of the event (including date and time) that required notification of offsite personnel (i.e., medical facilities, fire department, police department) and the basis for that decision.
2. Date, time, and names of persons/agencies notified, and their response.
3. Details regarding personal injury and property damage, if any.
4. Resolution of incident and the corrective action involved.

All incidents and near misses are to be investigated in accordance with Alton's IIPP. The Supervisor's Report of Accident is to be completed and submitted to the Human Resources department within 24 hours following any accident or injury.

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**SITE HEALTH AND SAFETY PLAN  
COMPLIANCE LOG**

I have reviewed this Site Health and Safety Plan and understand the contents of the plan. I hereby agree to comply with all safety requirements outlined herein.

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

**Site Safety Officer, TRC Alton Geoscience, Inc.**

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

**Alternate Safety Officer, V&W Drilling**

Signature: \_\_\_\_\_ Date: \_\_\_\_\_ Print Name: \_\_\_\_\_  
Company: \_\_\_\_\_

Signature: \_\_\_\_\_ Date: \_\_\_\_\_ Print Name: \_\_\_\_\_  
Company: \_\_\_\_\_

Signature: \_\_\_\_\_ Date: \_\_\_\_\_ Print Name: \_\_\_\_\_  
Company: \_\_\_\_\_

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Company: \_\_\_\_\_

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Company: \_\_\_\_\_

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Quik Stop Market # 56  
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**SITE HEALTH AND SAFETY PLAN**  
**COMPLIANCE LOG**  
(Continued)

Signature: \_\_\_\_\_ Date: \_\_\_\_\_ Print Name: \_\_\_\_\_  
\_\_\_\_\_ Company: \_\_\_\_\_

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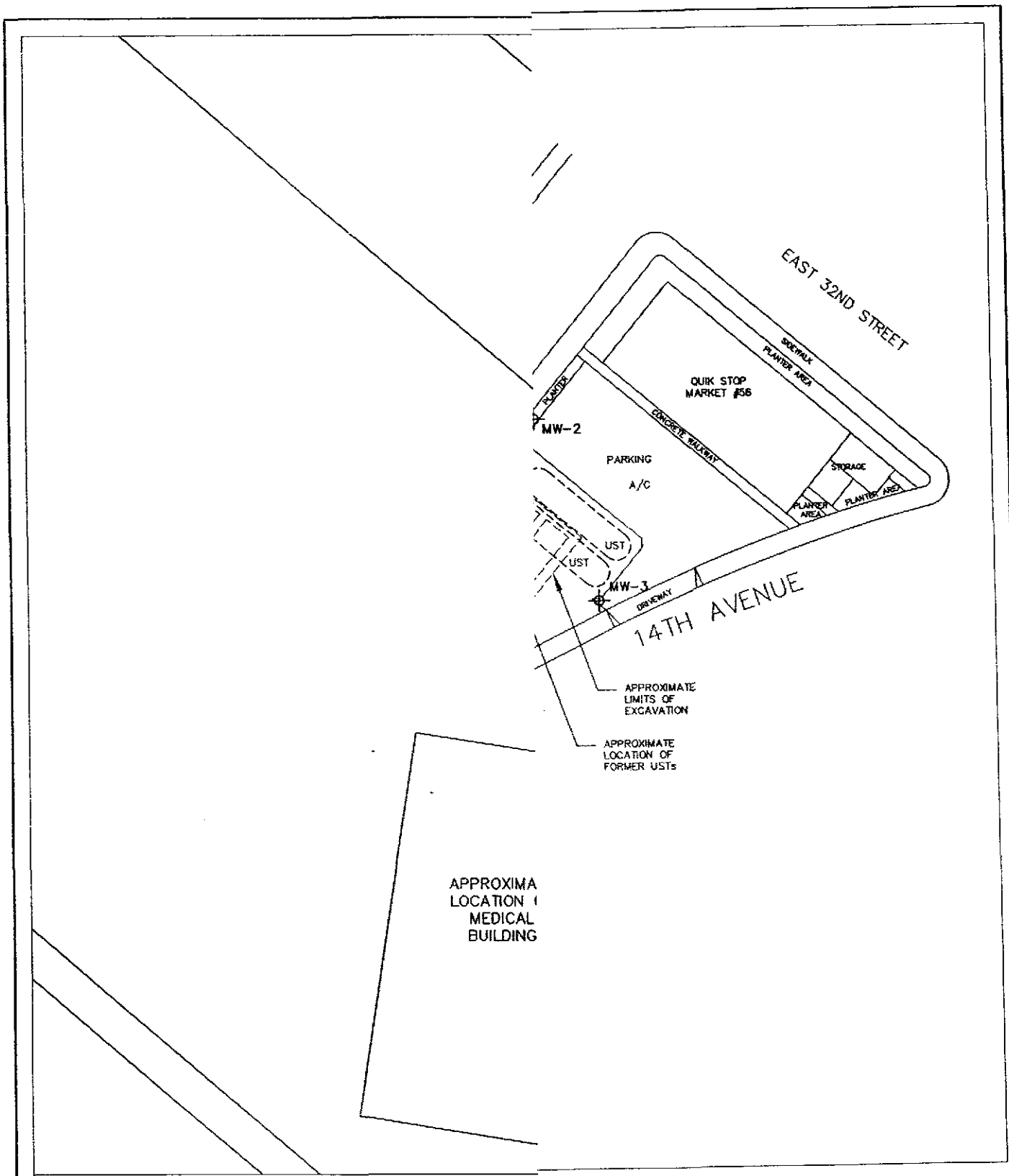
Signature: \_\_\_\_\_ Date: \_\_\_\_\_ Print Name: \_\_\_\_\_  
\_\_\_\_\_ Company: \_\_\_\_\_

**Site Health and Safety Plan**  
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
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**ATTACHMENT A**

**SITE PLAN**



**LEGEND**

MW-1  Monitoring Well

 Proposed Monitoring Well

**SITE PLAN SHOWING PROPOSED MONITORING WELL**

Quik Stop No. 56  
 3132 Beaumont Avenue  
 Oakland, California

SOURCE: Client-provided drawings and Garlow, 1998. Site by Doble Thomas Associates.

**Site Health and Safety Plan**  
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**ATTACHMENT B**

**OCCUPATIONAL HEALTH GUIDELINES  
AND TOXICOLOGICAL INFORMATION**

## **DEFINITIONS**

**Threshold Limit Value:** Threshold limit values (TLVs) refer to airborne concentrations of substances and represent conditions under which it is believed nearly all workers may be repeatedly exposed, day after day, without adverse health effects.

**Threshold Limit Value - Time Weighted Average:** The time weighted average (TWA) is a concentration for a normal 8-hour workday and a 40-hour workweek, to which nearly all workers may be repeatedly exposed, day after day, without adverse effect. TLV-TWAs are established by the ACGIH.

**Recommended Exposure Limit:** Unless otherwise noted, the recommended exposure limit (REL) is a TWA concentration for up to a 10-hour workday during a 40-hour workweek. RELs are established by NIOSH to reduce or eliminate adverse occupational health effects.

**Short Term Exposure Limit:** A short term exposure limit (STEL) is defined as a 15-minute TWA exposure that should not be exceeded at any time during a workday. When compared to the REL (or TLV-TWA for ACGIH standards), the STEL allows the worker to be exposed to a higher concentration, BUT for a shorter period of time. Exposures above the REL up to the STEL should not be longer than 15 minutes and should not occur more than four times per day.

**Permissible Exposure Limit:** Permissible exposure limits (PELs) are TWA concentrations that must not be exceeded during any 8-hour work shift of a 40-hour workweek. PELs are established by OSHA (29 CFR 1910.1000).

**Immediately Dangerous to Life and Health:** Immediately dangerous to life and health (IDLH) values are established as concentrations from which a worker can escape within 30 minutes without suffering loss of life, irreversible health effects, or other deleterious effects that could prevent him/her from escaping the hazardous environment. The purpose of establishing an IDLH exposure concentration is to ensure that workers can escape from a given contaminated environment in the event of failure of respiratory protection equipment.

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**ATTACHMENT C**

**EMERGENCY SERVICES  
PHONE NUMBERS, DIRECTIONS, AND LOCAL AREA MAP**



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**EMERGENCY SERVICES**

**FACILITY / LOCATION** **TELEPHONE**

**Emergency Situation ..... 911**

Medical Facility #1 (*with Emergency Room*)

Alameda County Medical Center (510) 534-8055  
Highland Hospital Campus  
1411 East 31st St.  
Oakland, Ca

From the site, go southwest (left) on Beaumont to the next street. Turn right onto East 31st. The Emergency Room Entrance is on the left hand side. Follow the signs to the Emergency Room.

Oakland Fire Department 911 or (510) 444-3322

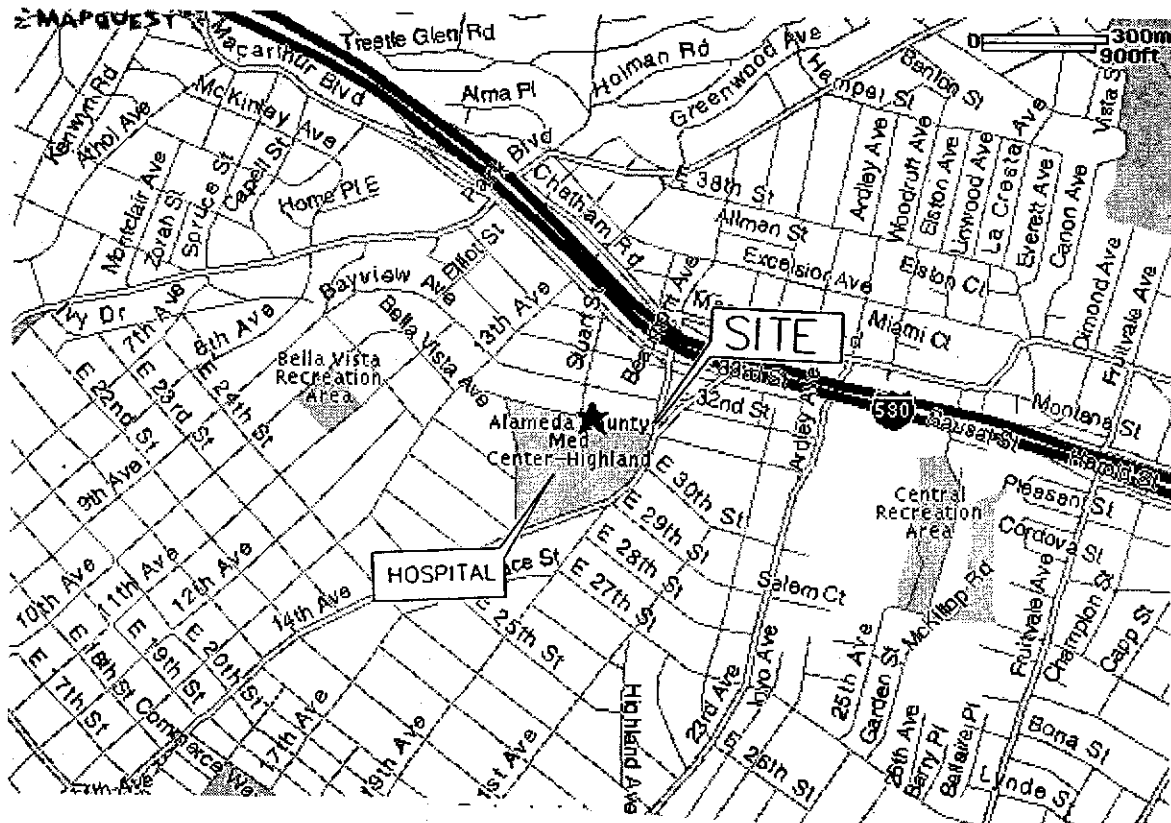
Oakland Police Department 911 or (510) 238-3481

Poison Control Center 1-800-662-9886

Office of Emergency Services (510) 286-0895

Alameda County Department of Health (510) 567-6761

**LOCAL AREA MAP**  
with route to hospital



### TAILGATE SAFETY MEETING CHECKLIST

#### Topics Covered

(Check off as discussed)

- Personnel training/qualifications:** Check cards for OSHA HAZWOPER 40-hour certification/8-hour-refresher training (other if appropriate).
- Supplies:** Indicate location of first aid kit, fire extinguisher, clean water supply (drinking, eye wash), and Site Health and Safety Plan (SHSP).
- Emergency services:** Discuss location of nearest telephone and directions to hospital. Map, directions, phone numbers provided at end of SHSP (Attachment C).
- Site background:** Discuss types, locations, and concentrations of chemicals found onsite, presence of free product, depth to groundwater, etc.
- Work activities:** Discuss scope of work for the day and activities to be performed.
- Potential hazards:** Discuss physical hazards (lifting, pinch points, traffic, working around machinery, etc.); chemical hazards (exposure limits, symptoms, air monitoring); and environmental hazards (heat stress, etc.).
- Air monitoring:** Necessary equipment is onsite and calibrated. Circle: CGI PID
- Personal protective equipment (PPE):** Discuss required level of protection. See that workers have appropriate PPE onsite; includes, but is not limited to, hardhat, steel-toe boots, safety glasses, ear plugs / hearing protection, respirator (with cartridges), gloves, traffic safety vest (other \_\_\_\_\_).
- Utilities:** Utilities have been cleared/marked by appropriate divisions.
- Traffic control** (vehicular and pedestrian): Work area is properly delineated and cordoned off from traffic.
- Compliance log:** SHSP has been reviewed and signed by site personnel.

Site Health and Safety Plan  
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Table B-1

OCCUPATIONAL HEALTH GUIDELINES AND TOXICOLOGICAL INFORMATION  
 Gasoline Constituents

Contaminant	ACGIH TLV-TWA (ppm)	NIOSH REL (ppm)	STEL (ppm)	OSHA PEL (ppm)	IDLH (ppm)	Routes of Exposure	Known or Suspected Carcinogen	Symptoms
Diesel (as Stoddard solvent)	for Diesel fuel/ Kerosene 14.4 (skin only)	Approx .60-98	250-500 (NIOSH ceiling)	500	Approx. 3000-5600	Inhalation, Ingestion, Contact	No	Irritation to eyes, skin, mucous membrane; dermatitis, headache, fatigue, blurred vision, dizziness, slurred speech, confusion, convulsions, aspiration, weakness, restlessness, incoordination
Gasoline	300	n/a	500 (ACGIH)	n/a	n/a	Inhalation, Absorption, Ingestion, Contact	Yes	Irritation to eyes, skin, mucous membrane; dermatitis, headache, fatigue, blurred vision, dizziness, slurred speech, confusion, convulsions, aspiration
Benzene	0.5	0.1	1 (NIOSH)	1	500	Inhalation, Absorption, Ingestion, Contact	Yes	Irritation to eyes, skin, nose, resp system, giddiness, headache, nausea, staggered gait, fatigue, anorexia, weakness/exhaustion, dermatitis
Toluene	50	100	150 (NIOSH)	200	500	Inhalation, Absorption, Ingestion, Contact	No	Irritation to eyes, nose; fatigue, weakness, confusion, euphoria, dizziness, headache, dilated pupils, tears, nervousness, muscle fatigue, insomnia, dermatitis
Ethylbenzene	100	100	125 (NIOSH & ACGIH)	100	800	Inhalation, Ingestion, Contact	No	Irritation to eyes, skin, mucous membranes; headache, dermatitis, narcosis, coma
Xylenes	100	100	150 (NIOSH &	100	900	Inhalation, Absorption,	No	Irritation to eyes, skin, nose, throat; dizziness, excitement, drowsiness,

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(o,m,p,)			ACGIH)			Ingestion, Contact		incoordination, staggering gait, nausea, vomiting, abdominal pain, dermatitis
Methyl tert butyl ether (MTBE)	40	n/a	n/a	n/a	n/a	n/a	n/a	n/a

**TABLE KEY**

ACGIH TLV-TWA      American Conference of Governmental Industrial Hygienists, Threshold Limit Value-Time Weighted Average  
 NIOSH REL        National Institute of Occupational Safety & Health, Recommended Exposure Limit  
 STEL                Short Term Exposure Limit (Gasoline STEL is by ACGIH; BTEX STELs are by NIOSH)  
 OSHA PEL         Occupational Safety and Health Administration, Permissible Exposure Limit  
 IDLH                Immediately Dangerous to Life and Health  
 ppm                 parts per million  
 CNS                 Central Nervous System  
 n/a                  not available (i.e., no value has been established)