

**HEALTH & SAFETY PLAN  
UNDERGROUND STORAGE TANK REMOVAL  
229 CASTRO STREET  
OAKLAND, CALIFORNIA**



Project No. 044-00006  
September 8, 2000

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**Project No. 044-00006**

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ENVIRONMENTAL ENGINEERING • GEOTECHNICAL ENGINEERING  
CONSTRUCTION TESTING & INSPECTION

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229 CASTRO STREET  
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**1.0 INTRODUCTION**

This plan describes the health and safety procedures for the activities planned for the removal of a gasoline underground storage tank (UST) at the subject site. Krazan & Associates, Inc. (Krazan) employees and field personnel will abide by this plan. It is intended that project work will comply with applicable codes and regulations of the United States Occupational Safety and Health Administration (OSHA). Each field team member working on this project will have the general responsibility to identify and correct any health and safety hazards and strive to make the work place safe.

**1.1 Project Description**

This project will consist of the removal of a small (500± gallon) UST located within the sidewalk adjacent to 229 Castro Street in Oakland, California. The scope of the project will include exposing the UST and removal by a licensed contractor. Potential activities could include the excavation of contaminated soil and extraction of contaminated groundwater. Sample labeling, preparation, shipment and analyses will also be conducted.

**1.2 Key Personnel & Responsibilities**

The following personnel will have the overall responsibility for the safe operation of this investigation:

|                             |                |
|-----------------------------|----------------|
| Project Directors:          | Dean Alexander |
| Corporate Safety Officer:   | Dean Alexander |
| Task Leader:                | Alex Gallego   |
| On-site Safety Task Leader: | Alex Gallego   |

It is the responsibility of the above-designated safety officers and task leaders to:

- Implement the site safety training program for project field team members as described in this document.
- Insure that field personnel meet or exceed the minimum requirements for health and safety training, medical monitoring, and respiratory fit testing as required by OSHA 29 CFR 1910.120.
- Assure that field personnel have read and understand this Health and Safety Plan.
- Establish effective traffic and pedestrian control around the subject site.
- Insure that adequate site security is maintained.
- Perform work place surveillance for flammable/explosive conditions and insure that a portable fire extinguisher is located on-site.
- Observe activities to insure the proper use of personal protective equipment such as hard hats, protective eyewear, coveralls (Tyvek® etc.), respirators, gloves, steel-toe boots, etc.
- Inspect safety equipment for use by field personnel to insure that it has been maintained and is in a useable condition.
- Shut down or modify field work activity based on the criteria presented in Section 11.0 of this Plan.
- Initiate outside emergency phone calls when an emergency or accident requires medical attention.

Field personnel will have a responsibility to:

- Read, understand, and follow this plan.
- Perform work safety.
- Cooperate with safety personnel.
- Report any unsafe conditions to the immediate supervisor.
- Be aware and alert for signs and symptoms of potential exposure to site contaminants and health concerns.
- Attend the site safety training program/meeting.
- Insure drilling equipment and other machines are properly inspected and maintained and in compliance with applicable sections of the California and United States Occupational Health and Safety Codes.
- Maintain safety related protective equipment such as hard hats, Tyvek® coveralls (or equivalent), gloves, safety eyewear, respirators, etc., as specified in this plan.

## 2.0 HAZARD EVALUATION

This Health and Safety Plan (H&S Plan) addresses specific on-site work activities related to the collecting of samples and data from the project site.

Based on the historical and technical data available, this plan covers anticipated activities and hazards, and makes provision for modification or amendment as health-related data is obtained during this assessment. This plan will be amended with site-specific hazards identified as posing a potential health hazard for workers. For select sites, the Corporate Safety Officer will conduct a preliminary survey involving air and bulk solid sample analysis and amend the H&S Plan as needed.

As analytical data become available, the information will be evaluated by a Health and Safety Task Leader. Appropriate action in the form of Work/Health and Safety Plan modifications will be initiated by the Corporate Safety Officer or the Health and Safety Task Leader.

The anticipated activities of this investigation will include:

- Exposure of the UST with an excavator or backhoe.
- Removal of residual contents of the UST by a licensed hazardous waste transporter.
- Rinsing the interior of the UST with a pressure washer and removal of the rinsate.
- The UST will rendered inert using dry ice.
- Removal of the UST by a licensed hazardous waste transporter.
- Collection of soil and groundwater samples from the excavation.
- Securing the excavation area with temporary fencing and trench plates.

The general categories of hazards associated with this investigation are:

- *Mechanical hazards:* cuts, contusions, slips, trips, falls, being struck by moving objects, being caught by rotating objects; also muscular injury potential caused by overexertion or improper movement (e.g. back injury due to improper lifting).
- *Electrical hazards:* possible excavation of buried cables, exposure to overhead power lines, wet electrical cords.
- *Chemical hazards:* exposure to chemicals/contaminants listed in Section 4.0 of this plan and exposure to extraction solvents.

- *Fire hazards:* possible excavation of buried utilities, equipment fires, flammable petroleum hydrocarbons.
- *Thermal (heat stress) hazards:* exposure to outside temperature extremes and/or increased body temperatures while wearing protective clothing/equipment.
- *Acoustical hazards:* exposure to excessive noise created by excavation operations and/or related to the site-specific operations.
- *Routine job-related hazards* in the subcontractor's laboratory. Neither these hazards nor any activities conducted in the subcontractor's laboratory are covered by this plan.

Job hazard analyses associated with most major work activities are presented in the following sections.

## **2.1 Excavation**

Excavation activities by an excavator or backhoe will potentially expose field personnel to the following hazards:

Chemical hazards:

- Exposure to various chemical substances, including but not limited to petroleum hydrocarbon residue and vapors, and petroleum contaminated soils, sludge or liquids. Certain precautions may be necessary to properly control the potential fire/explosion/health hazards associated with these chemicals.

Physical hazards:

Potential exposure to physical hazards associated with the UST removal include the following:

- Brush, equipment, gas-main, or hydrocarbon fires
- Being hit by equipment
- Falling objects
- Exposure to excessive noise
- Exposure to outside temperature extremes
- Exposure to the potential for heat exhaustion due to protective clothing
- Slips, trips, and falls
- Buried cables and underground utilities
- Overhead utility hazards
- Injury due to using improper tool for the job

## 2.2 Heat Stress/Stroke

During day-to-day field work, the on-site engineer/geologist and/or safety officer will be alert for the signs and symptoms of heat stress. Hazard exists when individuals are required to work in warm or hot temperatures while wearing protective clothing. When the ambient air temperature exceeds 85°F, heat stress may become a problem. For an unacclimatized person this temperature may be less. If these conditions are encountered, the following precautions will be taken:

- The on-site geologist/engineer or safety officer will regularly monitor the ambient air temperature.
- Field team members will be observed for the following signs and symptoms of heat stress (i.e. heat exhaustion/heat stroke):

### Heat Exhaustion

- Profuse sweating
- Skin color change
- Increased heart rate
- Vision problems
- Heat cramps

Any team member who exhibits any signs or symptoms of heat exhaustion will be removed immediately from field work, be requested to remove impervious clothing, and consume electrolyte fluid or cool water while resting in a shaded area. The individual will be instructed to rest until the symptoms are no longer recognizable. If the symptoms appear critical, persist or get worse, immediate medical attention will be sought.

### Heat Stroke

- Hot, dry, unusually red skin
- Delirium
- Elevated temperature of 103-105°F
- Convulsions

Any team member who exhibits any signs or symptoms of heat stroke will be removed immediately from field work, be requested to remove impervious clothing, be immersed in cool water and immediate medical attention will be sought.

## 2.3 Noise

While working around excavation drilling equipment the potential exists for exposure to excessive noise. If noise levels are known/believed to exceed 85 dBA 8-hours per day, individuals will be instructed to use adequate hearing protectors (ear plugs). Random monitoring using a noise dosimeter may be used to document noise levels. Field team members will be given annual evaluations. Field team members have been/will be trained in noise hazards and how to wear the protective equipment.

#### **2.4 Sampling for Chemical Analysis**

Samples will be collected for the purpose of chemical analysis. Additionally, selected samples may be submitted for chemical analysis. Some of these samples may contain high levels of hazardous materials creating the potential for chemical inhalation exposure, skin contact and possibly even ingestion. These activities may pose one of the greatest risks of chemical exposure for the site assessment activities. Appropriate worker training, protective measures and annual medical monitoring will be enforced to control this health hazard potential.

#### **2.5 Packaging and Shipment of Samples**

After the samples have been collected into sample containers, they will be properly packaged to protect shipping personnel. The hazards associated with shipping samples are minimal, provided care is taken to prevent the containers from leaking or breaking. Additionally, sample containers will be plainly marked in case of exposure.

#### **2.6 Sampling for Chemical Analysis**

The preparation of samples for analysis may expose the technician to routine hazards associated with laboratory work. Standard laboratory safety procedures should be used to prepare and analyze these samples. The samples should be treated carefully and handled inside a properly operating fume hood due to their potentially volatile and hazardous nature. In the event of a mishap, the laboratory supervisor should be notified immediately.

### **3.0 SAFE WORK PRACTICES AND LEVEL OF PERSONAL PROTECTION**

The following sections present procedures on how to adequately address the primary potential hazards encountered in the different task of this project. The standard level of personal protection is also defined.

Based on the work to be performed and the type of chemical hazards that may be encountered, EPA Level D personal protection has been determined to be adequately protective and suitable for most of the tasks in this project. It is unlikely that certain tasks may require a higher level of protection, such as air-purifying or air-supplied respirators. These determinations will be made by the Safety Officer or Safety Task Leader and will be specified as amendments to this section of the plan.



### 3.1 Potential Health Hazards

Depending on the conditions encountered, the Task Leader in coordination with the Project Safety Officer may increase or decrease the level of personal protection required of all field team members. Such decisions will be made based on initial and periodic measurements of breathing zone concentrations of petroleum constituents by PID and on other data collected as work is conducted on a given site.

Generally speaking, EPA Level D Personal Protection will be in accordance with the following guidelines:

- Krazan & Associates technician uniform
- Hard hat
- Safety glasses
- Ear plugs (as required)
- Steel-toe boots.

Some general guidelines representing EPA Level C personal protection that may be used are:

- Tyvek® coveralls (or equivalent), neoprene boots and rubber gloves (to be worn by any personnel who handle contaminated equipment).
- Individuals at sites not directly exposed to contaminated soils or liquids may not need to wear Tyvek® coveralls due to the increased hazards of heat stress when wearing this type of clothing.
- Latex or PVC disposable gloves should be worn under butyl rubber or nitrile gloves to provide an extra measure of hand protection when handling heavily contaminated soils and water samples.
- Chemical splash goggles will be worn when increased splash hazards exist, such as steam cleaning activities, during or the handling of contaminated liquid samples.
- Respiratory protection will be worn during drilling activities which have the potential to expose workers to hazardous levels of airborne contaminants. Direct-reading personal breathing zone monitoring will be performed. The criteria established for the use of respiratory protection are discussed in Section 4.0. of this Plan.

### 3.2 Potential Heat Stress Hazards

During conditions when the temperature, humidity, and/or radiant heat are high and air movement is low, the following procedures will be followed to prevent heat stress hazards for workers wearing protective clothing/equipment:

- Work activity will be limited to reduce the amount of heat naturally produced by the body. Alternating work and rest periods will be used in high potential conditions. For example, in moderately hot conditions, 5 minute rest breaks in the shade with 60 minute work periods in the sun may be desirable. Under severe conditions, the duration of rest periods will be increased as necessary.
- Heavy work will be performed during the cooler periods of the day when feasible.
- Under heat stress conditions special attention will be given toward assuring workers replace lost body fluids. Adequate supplies of cool drinking water or electrolyte solution will be provided by each company for their own employees' use. Workers will be instructed in the need to replace the fluids throughout the working day.
- Special care and attention will be paid to field crew members that may not be acclimatized to the area.

### 3.3 Potential Noise Hazards

Exposure to excessive noise will be controlled by issuance and use of hearing protection as instructed by the Task Leader or Safety Officer. Noise levels may be periodically monitored by the Safety Officer.

### 4.0 HYDROCARBON VAPOR HAZARD CRITERIA

Exposure to elevated levels of hydrocarbon vapors presents potential health risks that must be addressed. Work practices and methods will be used to limit exposures. Where elevated exposures persist, respiratory protection will be used to protect personnel from inhalation of hydrocarbon vapors. The hydrocarbon vapors expected to be encountered during the field portion of this investigation are composed of a variety of volatile refined petroleum constituents. Most of these chemicals have limited toxicity thus requiring minimal controls at the concentrations that are anticipated to be encountered. There are certain components, such as benzene vapors, that present significant toxicological hazards and must be properly controlled. Water, soil, and vapor samples collected near the point of release commonly contain benzene at 1% of the total hydrocarbon constituents. Criteria for the use of respiratory protection is based on limiting potential exposures to benzene.

A limit of 100 ppmv total hydrocarbon is proposed as the maximum acceptable hydrocarbon level of exposure without respiratory protection. An H-nu® photoionization detector (PID) will be used to measure total hydrocarbon levels of the sample. When levels of the sample are above 50 ppm, breathing zone concentrations will be monitored and documented every 15 minutes. When a persistent level of 50 ppmv is noted to exist at the breathing zone, an appropriate respirator will be donned by that field team member. In a typical situation, with 1% of the hydrocarbon vapors being benzene, a 50 ppmv

concentration of total hydrocarbon would result in a breathing zone level of 0.5 ppmv benzene. This level is half of the current Permissible Exposure Limit (PEL) of 1 ppm for an 8-hour occupational exposure to benzene.

When possible, to assure benzene exposures are below a 1 ppmv limit, Dräger® benzene detector tubes will be used if PID measurements of the breathing zone concentrations indicated persistent hydrocarbon levels above 50 ppmv. These detector tubes are not compound specific and may respond to other less hazardous petroleum hydrocarbons such as toluene, xylene and ethylbenzene. In the event that benzene detector tube measurements indicate that levels exceed 0.5 ppmv in the breathing zone, respirators will be required. This is considered a conservative approach since the Dräger® detector tubes may respond to several hydrocarbons other than benzene.

Table I summarizes the various hydrocarbon vapor concentration and appropriate responses to prevent exposure to these potential vapor hazards.

**TABLE 1**  
**HYDROCARBON VAPOR CRITERIA AND RESPONSES**

| HYDROCARBON CONCENTRATIONS                                   | RESPONSE  |
|--|---|
| <50 ppmv TVH   | Limited hazard, no special action.  |
| 50-100 ppmv TVH General Work Areas                           | Half-mask OV Respirators worn by all potential exposed in work area.  |
| 50-1400 ppmv TVH General Work Areas                          | Half-mask OV Respirators worn by all potentially exposed in work area. Benzene detector tube measurements taken each 15 minutes until levels below 1 ppm. |
| >1400 ppmv TVH General Work Areas and/to well head emissions | Work stops; procedures taken to subdue excessive vapor levels.  |
| >1 ppmv Benzene at Breathing zone                            | Half-mask OV Respirators worn by all potentially exposed in work area. Benzene detector tube measurements taken each 15 minutes until levels below 1 ppm. |

ppmv = parts per million vapor  
 TVH = Total Volatile Hydrocarbons  
 OV = Organic Vapor

## 5.0 PERSONAL PROTECTIVE CLOTHING/EQUIPMENT REQUIREMENTS

This section specifies personal protective clothing/equipment required for the various tasks to be performed during this investigation. Table 2 summarizes these requirements.

### 5.1 Excavation Operations

- *Respiratory Protection:* Field personnel will be required to have available for use a properly fit tested half-mask air purifying respirator with organic vapor cartridges and particulate pre-filters. These will be required to be worn based on the criteria listed in Section 4.0.
- *Protective Clothing:* Field personnel who handle contaminated soils, liquid, or auger flights will wear semi-permeable (white) Tyvek® coveralls (or equivalent) during Level C activities. Safety helmets (hard hats) will be worn by personnel during field work.
- *Hand Protection:* Butyl rubber or nitrile gloves will be worn by personnel handling contaminated equipment and soils as necessary. Wearing disposable latex or PVC gloves under the butyl gloves will provide added protection and aid in a more effective decontamination process.
- *Hearing Protection:* Based on anticipated on-site noise measurements, field personnel may be required by the Task Safety Leader or Safety Officer to wear hearing protection devices (ear plugs) during excavation operations.
- *Eye Protection:* Each field team member will wear a minimum of impact-resistant safety glasses with attached side shield. Where splashes of potentially hazardous liquid or flying particles are likely, chemical safety goggles will be required in place of safety glasses.
- *Foot Protection:* Field personnel will wear leather neoprene rubber boots (as needed) with steel toes and shanks. Under non-liquid exposure conditions, leather boots with steel toes and shanks are permissible. The boots will be taped to the leg of Tyvek® suits during Level C activities.

At the discretion of the on-site Safety Task Leader, rubber gloves, Tyvek® coveralls and neoprene boots may not be required if soil or water is not obviously contaminated, or if PID measurements of the confirmation soil samples are below 500 ppmv.

### 5.2 Sample Collection

Personnel who may be exposed to contaminated samples and/or liquid splashes will be required to wear the following equipment:

- *Respiratory Protection:* Sampling personnel will be required to have available for use a properly fit tested half-mask air purifying respirator with organic vapor cartridges with particulate pre-filters. Respirators will be worn based on criteria listed in Section 4.0 of this Plan.
- *Body Protection:* Sampling personnel will wear semi-permeable (white) Tyvek® coveralls when contact with contaminated soil or liquids is likely to occur. Safety helmets (hard hats) will be worn when overhead hazards exist.
- *Hand Protection:* Butyl rubber or nitrile gloves will be worn over disposal latex or PVC gloves as needed.
- *Eye Protection:* Impact-resistant safety glasses with attached side shields must be worn during sampling activities. Where splashes may occur, chemical goggles must be worn.
- *Foot Protection:* Leather work boots or neoprene rubber boots with steel toes and shanks will be worn, as needed.

### 5.3 Packaging and Shipment of Samples

- *Eye Protection:* Impact-resistant safety glasses with attached side shields must be worn while packaging samples for shipment, as needed.
- *Hand Protection:* Butyl rubber or nitrile gloves will be worn under disposal PVC gloves, as needed.

Samples will be shipped strictly to a state-approved laboratory. Shipping must comply with Department of Transportation (DOT) regulations. The following instructions will be followed to comply with DOT regulations:

- Tape lids with electrical or other tape
- Wrap the primary container with absorbent brown paper (wading)
- Place the primary container in a plastic bags (zip-lock, or equivalent)
- Place into an "ice chest" with a synthetic or water ice
- Tape or secure the "ice chest" lid and secure with a Chain-of-Custody seal (if applicable)
- Labels identifying the generator's name, address, and known content of the drum

In the event that samples are to be personally transported to the state-approved laboratory, some of the above packaging and shipping requirements may not apply. Any questions should be referred to the project manager.

#### 5.4 Sample Preparation and Analysis

Laboratory safety practices should be accomplished in accordance with the specific labs policy. Krazan, its owners, clients, employees, and representatives are not responsible for safety on laboratory premises. Therefore, both shall be held harmless in the event of any mishap, accident or long-term adverse health effects occurring or originating at the subcontractor laboratory.

**TABLE 2**  
**PERSONAL PROTECTIVE EQUIPMENT REQUIREMENTS**  
**EXCAVATION OPERATIONS**  
Excavation Crew

| <u>MANDATORY ITEMS</u>       | <u>AVAILABLE ITEMS</u> |
|------------------------------|------------------------|
| Safety Glasses               | Respirator             |
| Chemically Resistant Gloves* | Splash Goggles         |
| Safety Boots*                | Ear Plugs              |
| Safety Helmet                | Tyvek® Coveralls*      |

Geologist/Engineers

| <u>MANDATORY ITEMS</u> | <u>AVAILABLE ITEMS</u>      |
|------------------------|-----------------------------|
| Safety Boots*          | Respirator                  |
| Safety Glasses         | Tyvek® Coveralls            |
| Safety Helmet          | Chemically Resistant Gloves |
|                        | Splash Goggles              |
|                        | Ear Plugs                   |

Surveyors/Safety Personnel

| <u>MANDATORY ITEMS</u> | <u>AVAILABLE ITEMS</u>      |
|------------------------|-----------------------------|
| Safety Boots*          | Respirator                  |
| Safety Glasses         | Tyvek® Coveralls            |
| Safety Helmet          | Chemically Resistant Gloves |
|                        | Splash Goggles              |
|                        | Ear Plugs                   |

**PACKAGING AND SHIPPING SAMPLES**

Sample Controller

| <u>MANDATORY ITEMS</u> | <u>AVAILABLE ITEMS</u>      |
|------------------------|-----------------------------|
| Safety Glasses         | Respirator                  |
|                        | Chemically Resistant Gloves |

### SAMPLE PREPARATION AND ANALYSIS

Analyst

#### MANDATORY ITEMS

Safety Glasses

#### AVAILABLE ITEMS

Respirator

Chemically Resistant Gloves

*\* Not required if soil or water is not visibly contaminated, or if PID measurements of the soil samples are below 100 ppmv.*

## 6.0 WORK ZONE ACCESS

During excavation operations, a work zone should be established and roped off. This zone should include excavation equipment and its immediate vicinity. Only authorized personnel will be permitted to enter this work zone. Authorized personnel will include those who have duties requiring their presence in the work zone, have received appropriate health and safety training, and whose background medical records may be obtained to verify that the health of that individual is not at extreme risk by his/her presence.

## 7.0 DECONTAMINATION PROCEDURES

The scope of work proposes that soil excavation and sampling activities occur at areas where chlorinated solvents and petroleum hydrocarbon contaminated soils, sludge, liquids and/or vapors are anticipated. Due to the volatile nature of materials that may be encountered during the initial excavation drilling and sampling operations, decontamination of equipment and vehicles will be of minimal importance since the volatile constituents will rapidly vaporize. However, contaminated sampling equipment and any obvious contaminant accumulations will not leave the project site. Field team members will also abide by the following guidelines to insure that contaminants will not remain in contact with their body.

- Personnel involved in the field portion of this investigation will be instructed to wash their hands, face, neck and arms at the end of each work day. Krazan will assure the presence of soap, water and towels at the drilling site for this purpose. Crews will be instructed to shower at their home or lodge at the end of each workday.
- No eating, drinking, smoking, or chewing of gum or tobacco will be permitted in the work zone.

- During this investigation, the nature of materials handled and the extent of contamination may require formal decontamination procedures and delineated work/clean zones. At the discretion of the Task Leader, the following work zones and decontamination procedures will be used to minimize the transfer of hazardous substances from the site so as to protect the environment and public health.

## 7.1 Work Zones

The field team shall prevent the uncontrolled movement of waste materials or hazardous substances from the drilling site. The team will prevent migration of site contaminants by using the following work zones and equipment/personnel decontamination procedures.

*Exclusion Zone:* A circle around the UST will be defined before removal begins. The zone will be "roped off" with an applicable barricade tape. This designated area will constitute the "Exclusion Zone". This zone is where potentially hazardous surface contaminants, as a result of the activities, and physical hazards to the workers, will be contained. Personal protection equipment will be required in this area according to the discretion of the Task Leader and/or in accordance with the guidelines contained in this plan. The size of the Exclusion Zone may be changed to accommodate site conditions and to ensure contaminant containment at the discretion of the project manager, the safety officer, or the task leader. No personnel will be permitted into the Contamination Reduction Zone or the Exclusion Zone unless they are in full compliance with the existing Safety Plan. The buddy system must be maintained by all personnel while in this zone. Intrinsically safe communications will be maintained with all personnel in this area.

*Contamination Reduction Zone:* An area surrounding the Exclusion Zone will be defined. All personal decontamination activities will occur in this area. A waste container may be placed in this area so that contaminated disposal equipment can be placed inside and covered. Surface/soil contamination in this area may be controlled by use of some form of plastic sheeting.

*Support Zone:* A Support Zone, must be defined for each field activity. Support personal and/or equipment are located in this uncontaminated (clean) area. Normal Krazean field uniforms are appropriate within this zone. The location of this zone depends on factors such as accessibility, wind direction, nearby roads, utilities, traffic patterns, shelter.



## 7.2 Decontamination Protocol

Decontamination of personnel and equipment will be important to ensure that contamination does not spread to others. Personal decontamination mainly involves the removal of some outer wear and good personal hygiene habits. Contamination should never be in contact with the skin. Field team members must follow this plan to ensure that contamination does not remain on equipment, sample containers or their body.

Field team members should remove their personal protective clothing in a certain sequence to avoid contaminating their inner clothing or themselves. When removing personal protective equipment, the following steps should be observed:

*Step 1:* Remove equipment, sample containers, and notes and non-essential items while in the Contamination Reduction Zone. Obtain decontamination solutions or a steam cleaner and decontaminate all tools and sampling equipment. Under most circumstances, all wastes and rinsate will be properly contained.

*Step 2:* Remove outer gloves and boot covers and place them inside a garbage bag or drum.

*Step 3:* Remove tape from boots and gloves and remove the Tyvek® coverall (if used). Tyvek® coverall removal should be accomplished by rolling the outside of the coverall inside itself so that only the inside of it is exposed. Boots, inner gloves, and respirator should still be worn.

*Step 4:* Remove the inner gloves and respirator when in the Support Zone.

## 7.3 Personal Hygiene Requirements

The following procedures should always be observed in the support zone:

- Personnel must wash their hands, face, neck and forearms before consuming any food or liquids, smoking, or using the rest room.
- Personnel must take a shower at the end of each work day. Particular attention should be given to areas of the body that are typically overlooked.

## 8.0 SAFETY AND HEALTH TRAINING

Field personnel will be trained in methods of safely conducting field activities. This plan is intended to provide additional site specific information to accomplish this goal. It will be the responsibility of the Project Directors, the Safety Officer, and the Safety Task Leader to ensure the field team has access to, reads, and understands this plan. It will be the individual's responsibility to bring to the attention of the Project Director or Safety Officer any portion of this plan and related training they do not fully

understand. Prior to the commencement of the field portion of this investigation, the field team will meet to discuss the contents of this plan and make sure all members understand it.

At the site meeting, field team members will be instructed regarding the health and safety hazards. Especially:

- Physical safety hazards
- Emergency procedures
- Explosive/flammability hazards
- The hazardous materials that may be encountered and their potential routes of exposure
- Personal hygiene practices
- The types, proper use, inspection, limitations, maintenance, and storage of protective clothing and equipment (as applicable).
- In the event that the ambient air temperature exceeds 85°F, a review of heat stress symptom recognition/corrective procedures will be conducted. For an unacclimatized person, this value may be less.

Special emphasis will concern the use and limitations of respiratory protection. Half-mask respirators (or equivalent) equipped with air purifying organic vapor cartridges will be used. Full-face respirators will be used if eye irritation or skin contact exposure potential exists.

Medical/physical fitness requirements to wear respiratory protection will be established by a physician, and individuals will be trained in use limitations and maintenance of half-mask and full-face respirators including qualitative fit testing, routine inspection, replacement of parts, cleaning, disinfection, and storage requirements.

Copies of this entire plan will be provided for each field team member at the project site, or prior to arrival.

## 9.0 MEDICAL MONITORING PROGRAM

The field investigation at this project site is expected to involve active physical work and potential exposure to petroleum hydrocarbons, and possibly other related hazardous substances. Exposure to heat stress, noise and physical safety hazards may also be encountered. The work will require people of good health with normal vision and hearing. Krazan's industrial physician is periodically asked to provide documentation of employee medical fitness to perform the required work in the form of signed document. This documentation should also indicate the employee's ability to perform the required work while wearing a respirator.

## 10.0 EMERGENCY RESPONSE PLAN

The emergency procedures described in this plan are designed to give the field team guidance in the handling of medical emergencies, fires, explosions, and excessive emissions. These emergency procedures will be carefully explained to the field team during the on-site health and safety meeting.

### 10.1 Injuries

Medical problems must be quickly dealt with; a road map to the nearest emergency medical facility is kept in an envelope on the dash of each Krazan field vehicle of drill rig. A map with a route to the hospital is included in this plan. The local emergency numbers are:

|                               |                |
|-------------------------------|----------------|
| Police:                       | 911            |
| Fire:                         | 911            |
| Paramedics:                   | 911            |
| Hospital: (Kaiser Foundation) | (510) 596-1000 |

The field team is to seek immediate professional medical attention for all serious injuries. A first aid kit will be present at the site for use in case of minor injuries. If any field team member receives a splash or particle in the eye, the eye is to be flushed for 15 minutes. Clean water or a portable eye wash will be available for this purpose. Instruction will also be provided to wash any skin areas with soap and water if direct contact with contaminants has occurred.

During normal field activities work clothes may become wet. If a field team member's clothing becomes saturated with an obviously contaminated liquid/sludge, the possibility for dermal exposure to contaminants may exist. Under these circumstances, that field team member will change out of the contaminated clothing, clean off any residual liquid/sludge with water, and change into clean clothing of the proper level of protection.

### **10.2 Fire and Explosion Hazards**

Fires are a potential concern during this investigation due to the possibility of encountering flammable petroleum hydrocarbon liquid or vapors. An adequate multi-purpose (A,B,C) fire extinguisher will be located on-site on the drill rig at all times.

The local fire department will be notified by a Krazan representative of the location and anticipated activities in order to provide a more timely response in the event of an emergency. In the remote chance that a fire does occur, the local fire department will be notified immediately. Additional calls to the main office of Krazan will be made. The project director would then notify the client.

### **10.3 Operations Shutdown**

Under certain extremely hazardous situations, the Task Leader, Project Director or Task Safety Officer may request that field operations be temporarily suspended while the underlying hazard is corrected or controlled.

## **11.0 RECORD KEEPING REQUIREMENT**

The following record keeping requirements will be maintained in the health and safety or program file indefinitely:

- Copy of this Health and Safety plan
- Health and Safety training certification forms
- Written respiratory protection program
- Respirator training certification
- Any accident/illness report forms documentation of employees medical ability to perform work and wear respirators

## 12.0 SITE SECURITY

During tank removal, the area will be cordoned off with barricades and caution tape. Any open excavation remaining opened without supervision will be enclosed with temporary fencing to minimize any unauthorized access to the excavation. Caution flagging will also be placed around any excavation.



ENVIRONMENTAL ENGINEERING • GEOTECHNICAL ENGINEERING  
CONSTRUCTION TESTING & INSPECTION

KRAZAN & ASSOCIATES, INC.  
HEALTH AND SAFETY PLAN  
FIELD PERSONNEL RELEASE FORM

I, \_\_\_\_\_ do hereby confirm that I have read and understand the H&S plan for Project Number \_\_\_\_\_, \_\_\_\_\_ located on \_\_\_\_\_. I agree to follow this plan, and to make every effort to make the work place safe. I will report any health or safety hazard that I observe to the Safety Task Leader, Project Safety Officer, or the Project Director.

I agree to defend, indemnify, and hold harmless Krazan & Associates, Inc., its owners, employees, representatives, clients, and the property owner for any accidents, sickness, or injuries resulting from the violation, alleged violation, or non-compliance of this Health & Safety Plan.

Name: \_\_\_\_\_ Title: \_\_\_\_\_

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