

**SITE SAFETY PLAN
UNDERGROUND TANK REMOVAL**

**Melinda Henry-Dare
1726 Park Street
Alameda, California 94501**

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TMC Project No. 489101**

California

13908 San Pablo Avenue
Suite 101
San Pablo, California 94806
(510) 232-8366 FAX (510) 232-5133



Oregon

317 W. Broadway
Suite 14
Eugene, Oregon 97401
(503) 342-6606 FAX (503) 342-1632

1.0 INTRODUCTION

This document describes the health and safety procedures for the removal of a 500 gallon waste oil tank at 1726 Park Street, Alameda, California. All personnel from TMC Environmental, Inc. (TMC) and subcontractors will follow this plan. The prime responsibility for employee safety lies with each company for its own employees. It is expressly intended that all project work comply with applicable sections of the California Occupational Health and Safety Code. All parties working on this project will maintain a general responsibility to identify and correct any health and safety hazards and are responsible for working in a safe manner.

2.0 PROJECT DESCRIPTION

The tank removal involves the excavation of potentially contaminated soils and unearthing of a 500 gallon waste oil tank. The work to be performed will include the excavation and stockpiling of contaminated soils and the manifested disposal of an underground tank. A soil sample will be collected approximately two feet below the tank. The sample will be analyzed by a local certified laboratory under proper chain of custody for constituents as required by State and local agencies. The excavation will be back filled, compacted and resurfaced to grade with like material.

3.0 KEY PERSONNEL

The project personnel who will have overall responsibility for the safe operation of this project are:

Project Manager: Tom Edwards
(510) 232-8366

Jim Tracy
(415) 863-6375

Safety Officer: Tom Edwards
(510) 232-8366

3.1 Project Manager and Safety Officer Responsibilities

The responsibilities of the Project Managers and Safety Officers are:

- o To conduct initial site safety training for all project field team members as described in this document,
- o To assure all field team personnel have read and understand the Health and Safety Plan,
- o To assure all work performed by field personnel is conducted in accordance with safe practices outlined in this plan,
- o To coordinate with safety personnel fire-watch, traffic control and site security,
- o To monitor activities to assure the proper use of personal protective equipment such as hard hats, protective eye wear, gloves, coveralls, respirators, etc,
- o To monitor ambient hydrocarbon vapors,
- o To make certain personnel safety equipment is in a usable condition, and
- o To shut down or modify field work activity based on criteria presented in Section 12.0.

3.2 Sub-Contractor Responsibilities

The responsibilities of the sub-contractor with respect to safety are:

- o To read, understand and accept this Health and Safety Plan,
- o To assure all members of its crew attend the safety training program,
- o To make certain equipment and other machines are properly inspected and maintained and are in compliance with applicable sections of the California Health and Safety Code,
- o To supply and maintain safety related protective equipment such as hard hats, safety boots, protective

coveralls, gloves, safety eye wear, respirators, etc., as specified in this plan,

- o To assure each employee working at this site read and comply with this Health and Safety Plan, and
- o To enforce corrective action under the direction of the Site Safety Officer.

3.3 Field Team Member Responsibilities

The responsibilities of the field team members are:

- o Read, understand and follow this plan,
- o Perform work safety,
- o Cooperate with safety personnel,
- o Report any unsafe conditions to the immediate supervisor, and
- o Be aware and alert for signs and symptoms of potential exposure to site contaminants and heat stress.

4.0 HAZARD EVALUATION

As air, water, soil and chemical substance monitoring data become available for all site work, the information will be evaluated by the Site Safety Officer. Appropriate action in the form of Health and Safety modifications will be initiated by the Safety Officer if necessary.

The anticipated activities of this project include:

- o Excavation, removal and disposal of a subsurface soil. The excavation will be resurfaced with clean, like material to grade,
- o Removal of one 300 gallon waste oil tank,
- o Collection of soil or water sample,
- o Analyses of collected samples by a California State Certified laboratory, and
- o Monitoring of ambient hydrocarbon concentrations during project activities.

The general types of hazards associated with this project are:

- o Mechanical hazards: swinging objects, machinery, etc,
- o Electrical hazards: buried cables and overhead power lines,
- o Chemical hazards: waste oil, and its associated constituents,
- o Fire hazards: natural gas and product lines, flammable petroleum hydrocarbons, and motor driven equipment,
- o Thermal hazards: heat stress, and
- o Acoustical hazards: excessive noise created by machinery.

Job hazard analyses associated with each major work activity are presented in the following sections.

4.1 Hazard Evaluation: Soil Excavation

Excavating contaminated soil will potentially expose field personnel to the following hazards:

- o Chemical hazards:
 - Exposure to various chemical substances, including but not limited to, petroleum hydrocarbon liquids and vapors, caustic and acidic mists, liquids and solids.
- o Physical hazards:
 - operating machinery,
 - falling objects, and
 - exposure to outside temperature extremes.
- o Fire, Electrical and Noise Hazards:
 - underground gas and product lines, and
 - excessive machinery noise.

4.2 Hazard Evaluation: Solid and Liquid Materials Sampling

Soil will be collected for analyses in a backhoe bucket above ground. A groundwater sample may be collected from the tank excavation using a bailer. The samples may contain high levels of hazardous chemicals creating the potential for chemical exposure through inhalation and skin contact. Sample collecting may pose one of the greatest risks of chemical exposure for site workers.

4.3 Hazard Evaluation: Packaging and Shipment of Liquid or Solid Samples

The potential for overexposure to hazardous gasoline constituents still exist during the shipment of samples to the lab. After the samples have been collected in brass tubes or appropriate sample bottles, the containers will be properly packaged to protect shipping and laboratory personnel from exposure. The hazards associated with shipping samples are minimal provided the containers are prevented from leaking or breaking.

5.0 HAZARD CRITERIA

5.1 Hydrocarbon Vapors

Exposure to elevated levels of hydrocarbon vapors presents potential health risks that need to be properly controlled. Work practices and methods will be instituted to limit exposures. Where elevated exposures persist, respiratory protection will be the primary control method to protect personnel from inhalation of hydrocarbon vapors. The hydrocarbon vapors expected to be encountered during project activities are composed of a variety of volatile and non-volatile refined petroleum compounds. The majority of these have limited toxicity requiring minimal controls at the concentrations expected.

There are certain compounds such as benzene that present significant hazards and must be properly controlled. To do so, a working limit of 100 ppmv total hydrocarbon is proposed as the maximum acceptable level of exposure without respiratory protection. In a typical situation with 1% of the hydrocarbon vapors being benzene, a 100 ppmv concentration of total hydrocarbon will result in a breathing zone of less than 1 ppmv benzene. This level is one tenth of the current occupational Permissible Exposure Limit (PEL) for an 8 hour exposure to benzene. A Bacharach 503 vapor analyzer will be used to measure real time breathing zone concentration for comparison with the 100 ppmv working limit. When a persistent level of 100 ppmv is observed, appropriate respirators will be donned and other vapor measurements will be made. If hydrocarbon vapors exceed 1000

ppmv, work will be stopped. The field crew will be instructed to stay up wind and methods will be applied to subdue fugitive vapor emissions such as sprinkling soil with water, or the use of a copes blower. The Site Safety Officer will make such determinations.

5.2 Heat Stress and Noise

A hazard exists when individuals are required to work in warm temperatures, particularly while wearing impervious protective clothing. When the ambient air temperature exceeds 65 degrees, heat stress may become a problem. If these conditions are encountered, the following precautions will be taken:

- o During day-to-day field work, the on-site supervisor will be alert for the signs and symptoms of heat stress.

Field workers will be observed for the following signs and symptoms of heat stress.

- o profuse sweating, or complete lack of sweating,
- o skin color change,
- o increased heart rate,
- o body temperatures in excess of 100 degrees as measured by thermometers, and
- o vision problems.

Any team member who exhibits any of these signs or symptoms will be removed immediately from field work and be requested to 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.

When working around mechanical equipment the potential exists for exposure to excessive noise. To deal with the health hazards of excessive noise, ear plugs will be provided.

6.0 PERSONAL PROTECTIVE EQUIPMENT REQUIREMENTS

This section specifies personal protective equipment required for the various tasks of this project.

6.1 Soil Excavation

Respiratory Protection: all field personnel will be required to have available an air purifying respirator with organic vapor cartridges. The respirators will be required based on criteria listed in Section 5.1.

Protective Clothing: all field personnel who handle contaminated soil or liquid will wear impervious coveralls and butyl rubber gloves. Impervious coveralls will not be required if soil or water is not visibly contaminated, or if vapor measurements are below 500 ppmv.

Head Protection: Field personnel will wear non-metallic safety helmets.

Foot Protection: Field personnel will wear neoprene rubber boots with steel toes. Under non-liquid exposure conditions, leather boots with steel toes and shanks are permissible.

Ear Protection: Field personnel, based on noise levels, may be required to wear earplugs during soil excavation.

Eye Protection: Field personnel will wear chemical-resistant safety glasses with attached side shield where splashes of potentially hazardous liquid or particles are likely.

6.2 Soil and Liquid Sample Collection

Personnel who are likely to be exposed to contaminated soil or water samples will be required to wear the same personal protective equipment as outlined in section 6.1

6.3 Packaging and Shipment of Liquid and Solid Samples

Eye Protection: Personnel will wear chemical resistant safety glasses with attached side shield while packaging samples.

Hand Protection: butyl rubber or nitrile gloves will be worn while packaging the samples.

Packaging and Shipping Requirements: all samples which are to be shipped for analysis must comply with Department of Transportation (DOT) regulations, as follows:

- o Package the primary container to protect it from breaking,
- o tape all lids with hydrocarbon resistant tape,
- o wrap the primary container with absorbent brown paper

- (wadding), and
- o place the primary container in a plastic (zip-loc) bag.

7.0 WORK ZONES

During the tank removal, a work zone around the immediate vicinity of the project will be established and taped off. Only authorized personnel will be permitted to enter the work zone. Authorized personnel will include those who have duties requiring their presence in the work zone and have read this site safety plan. Work zones are also created to aid in the decontamination of equipment and personnel. The following describes the zones to be established:

- o **Exclusion Zone:** A 75 foot circle around the work area will be defined before work starts. The area inside the circle will constitute the "Exclusion Zone". The exclusion zone constitutes the area where potentially hazardous airborne contaminants and physical hazards to the workers exist. Full personal protection must be available to all personnel in this area. The size of the Exclusion Zone may be changed to accommodate site conditions and to ensure contaminant containment.
- o **Contamination Reduction Zone:** A formal decontamination zone should not be required during the tank removal. However, an area will be designated in the event extreme waste oil contamination is encountered. The decontamination zone will be an area where personnel can clean protective equipment. A waste container will be placed outside of the exclusion zone so contaminated equipment can be placed inside and covered.
- o **Support Zone:** A support zone, the outermost zone, must be defined for each field activity. Support equipment is located in this uncontaminated or clean area. Normal work clothes are appropriate within this zone. The location of this zone depends on factors such as accessibility, wind direction (it should be up wind of excavation), and resources (e.g. roads, utilities, shelter).

8.0 DECONTAMINATION PROCEDURES

Petroleum hydrocarbon liquids and vapors are anticipated. However, no formal decontamination procedure will be followed with the exception of general cleaning. No eating, drinking or smoking will be permitted in the exclusion zone. All personnel involved in work activities will be instructed to wash their

hands, face, neck and forearms at the end of the work day. Soap, water and towels will be provided at the site for this purpose. The field personnel will also be instructed to shower at home at the end of each work day.

As work progresses, the nature of materials handled and the extent of contamination may possibly require formal decontamination procedures and delineated work/clean zones. However, we do not expect that such formal procedures will be necessary at this site and will only proceed at the Safety Officers discretion.

In the event extreme contamination is encountered, decontamination of personnel, equipment and vehicles will be important to insure that contamination does not spread to unsuspecting people and property. Personal decontamination mainly involves personal hygiene. Contamination should not be present on the skin if the proper protective methods specified in this plan are used. However all field personnel will be instructed to follow these guidelines to ensure that contamination does not remain on equipment, sample containers or in contact with their bodies.

The field team should remove their personal protective clothing in the following sequence:

Step 1: Move out of the exclusion zone and into the decontamination zone. Do not remove personal protective equipment.

Step 2: Obtain decontamination solutions and decontaminate the spades, shovels and other equipment by brushing them under a water rinse. A high-pressure steam cleaner may also be used for decontamination. All wastes and spent decontamination liquids will be properly contained.

Step 3: Remove outer gloves and coveralls and place them inside a garbage bag. Keep the air purifying respirator on.

Step 4: Move to the support zone and remove the respirator.

9.0 MONITORING PROGRAM

Personal exposure to ambient airborne hazards will be monitored to assure that personnel exposures do not exceed acceptable limits and that appropriate selection of protective equipment items is made. Airborne hydrocarbon vapor concentrations will be measured primarily by the use of a Bacharach 503 sniffer. If concentrations approach criteria levels, all personnel will be notified of possible site safety changes. Audits will be conducted by the Safety Officer to insure compliance with the

Safety Plan and to provide additional support as required.

9.1 Ambient Vapor Reading

A Bacharach 503 sniffer vapor monitor will be used during drilling and excavation activities. This instrument will be used to measure both excavation and breathing zone concentrations of hydrocarbon vapors. The instrument will be calibrated before and after field measurements each day using known calibration gases. Readings will be taken in the area where the field team members are working and surrounding down-wind areas. Measurements will be taken every 30 minutes when hydrocarbon vapors indicate levels above 30 ppmv. All readings will be recorded in a field notebook.

10.0 SAFETY AND HEALTH TRAINING

This section summarizes the content of the health and safety training to be provided to the field team. It may be used as a future reference for the field team concerning health and safety matters.

Each section of this plan is intended to provide information to accomplish safety for all workers. It will be the responsibility of the Project Safety Officer to assure the field team has access to this plan, reads the safety procedures, and understands how to conduct work safely. It will be the individuals responsibility to bring to the attention of the Safety Officer any portion of this plan and related training they do not fully understand. Prior to beginning site work, the field team will discuss the contents of this plan and make sure all members are adequately informed in safe work practices.

All field team members will be instructed regarding potential health and safety hazards. Specifically, the following topics will be covered in the initial training session:

- o Physical safety hazards, (e.g., muscular stress and strain, unguarded equipment, electrical shock, overhead hazards, etc.),
- o Emergency procedures, (vapor controls, medical and fire emergencies, etc.),
- o Explosive/flammability hazards,
- o Hazardous materials that may be encountered and potential routes of exposures, (inhalation and skin contact with petroleum hydrocarbons),
- o Physical hazards such as noise and heat stress,

- o Hygienic practices, (washing up before lunch/coffee breaks, no eating/drinking/smoking allowed in taped off areas, etc.), and
- o Types, proper use, limitations, maintenance, inspection, and storage of protective clothing and equipment.

Personal protective equipment includes:

- o eye protection, gloves, coveralls, respirators, hard hats, and hearing protection.

Special emphasis will be placed on the use and limitations of respiratory protection. Half-mask respirators equipped with air purifying organic vapor cartridges will be used. Half-mask respirators and eye goggles will be used if eye irritation or skin contact exposure potential exists. Each individual will be responsible for the limitations and maintenance of half-mask and full-face respirators including qualitative fit testing, routine inspection, replacement of parts, cleaning, disinfection, and storage requirements. Written instructions and procedures concerning respirators and criteria for use will be provided for each field worker by the Site Safety Officer if needed.

11.0 MEDICAL MONITORING PROGRAM

The tank removal is expected to involve active physical work and potential exposure to petroleum hydrocarbons, heat stress, noise and physical safety hazards common to subsurface operations. The work will require people of reasonable health with normal vision and hearing acuity. The companies involved with this project are responsible for assuring the health and fitness of their employees on this project. As a general rule, each worker should have clearance from a physician dated no later than one year prior to start-up of the project. This documentation should also indicate the employees' ability to perform the required work while wearing an air purifying respirator.

12.0 EMERGENCY RESPONSE PLAN

Emergency procedures listed in this plan are designed to give the field team instruction on how to handle medical emergencies and fires and explosions. The emergency procedures will be carefully reviewed with the field team during the health and safety training session.

12.1 Injuries

Medical problems occurring on site will be handled quickly. Emergency telephone numbers will be written down and posted in the passenger compartment of the field vehicles. The local emergency numbers are:

Alameda Police, Fire and Rescue Dial 911

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

12.2 Fire and Explosion Hazards

Fires on site are of particular concern during soil excavation and removal activities due to the possibility of encountering flammable petroleum hydrocarbon liquid or vapors. During these activities the Site Safety Officer will be present and equipped with an explosive vapor monitor for area monitoring and a multi-purpose (A, B, C,) fire extinguisher.

The local fire department will be notified of the location and anticipated activities in order to minimize the fire risk to the surrounding neighborhood. In addition, any flammable material will be cleared away from the site prior to the start of work. If a fire does occur, the local fire department will be contacted immediately.

12.3 Operation Shutdown

Under extreme hazardous situations the on-site supervisor, Safety Officer, or Project Manager may request that operations be temporarily suspended while the underlying hazard is corrected or controlled. If vapor measurements with the explosive vapor monitor show levels approaching explosive limits, operations will be stopped while the area is controlled. During this activity, all personnel will be required to stand up wind to prevent exposure to fugitive vapor emissions. The Safety Officer will have ultimate authority for operations shutdown.

12.4 Community Protection

To assure the community is protected from health and fire hazards, up wind and downwind monitoring with the Bacharach 503 sniffer will be performed if the general work area has hydrocarbon levels exceeding 100 ppmv. If down wind monitoring indicates persistent levels above 30 ppmv at the perimeter of the

work area, work will be shut down and vapor emission control efforts will be instituted until measurements demonstrate levels have dropped below 30 ppmv. An alternative approach of expanding the taped off area zone may be used to provide additional community protection.

13.0 RECORD KEEPING REQUIREMENT

The following record keeping requirements will be maintained in the program file indefinitely. The particular organization responsible for these records are also listed.

- o Copy of this Health and Safety Plan - TMC
- o Health and Safety Training Certification Form for Site Safety Officer - TMC
- o Any accident/illness report forms - All Parties
- o Personal sampling results - TMC
- o Documentation of employees medical ability to perform work and wear respirators - All parties

14.0 REMARKS AND SIGNATURES

This Site Safety Plan was prepared following current standards and practices. All work performed at the project site will be performed under the supervision of a California Registered Engineering Geologist.

Prepared By:

Approved By:

Tom Edwards
President

Mark Youngkin
California Registered
Engineering Geologist
No. 1380