June 4, 1997

# RISK MANAGEMENT PLAN
# 67 KING AVENUE
# PIEDMONT, CALIFORNIA
# AEI PROJECT NO. 2171

**Prepared For:**

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# 1.0 INTRODUCTION

## 1.1 Authorization

This risk management report has been prepared on behalf of Mr. Richard Grinold, owner of the subject site, by All Environmental, Inc. (AEI) for the property located at 67 King Avenue in Piedmont, California.

## 1.2 Purpose

The purpose of this Risk Management Plan is to identify potential environmental risks associated with the fuel release at the subject site and to set forth a plan for managing and minimizing these risks.

In preparing this report AEI relied primarily on the data presented in the Underground Storage Tank Closure Report, submitted February 11, 1994.

## 1.3 Project Background

The subject site had a 1,500 gallon fuel oil tank installed around the time of the original development of the site, presumably prior to 1950. AEI removed this tank in the winter of 1994. The removal was conducted under a UST Closure Permit from the Alameda County Health Care Services Agency.

The tank was closed in place and filled with a cement sand slurry. Prior to the closure, two soil borings were drilled on each end of the tank with a hand auger to determine if petroleum hydrocarbons were released from the subject site. Petroleum Hydrocarbons were found in the soil beneath the tank.

## 1.4 Sample Analyses

The subsurface soil samples were analyzed for Total Petroleum Hydrocarbons (TPH) as Diesel, EPA Method 3550/8015 and Benzene, Toluene, Ethylbenzene, Xylenes (BTEX), EPA Method 8020. The results of this investigation are found below.

| Sample I.D. | TPH Diesel (mg/kg) | Benzene (ug/kg) | Toluene (ug/kg) | Ethyl Benzene (ug/kg) | Total Xylenes (ug/kg) |
|---|---|---|---|---|---|
| E 7'6" | 1300 | 9.8 | 18 | 23 | 92 |
| W 6' | 8200 | 13 | 30 | 38 | 180 |

mg/kg = milligrams per kilogram
ug/kg = micrograms per kilogram

These soil samples were collected from beneath the tank at 7' below ground surface and 6' below ground surface, respectively. These concentrations of petroleum hydrocarbons and BTEX are indicative of a fuel release.

### 1.5 Geology and Hydrogeology

The lithology of the area is generally, silts, sandy clays, and clay. Groundwater is expected to be between 40 and 100 feet below ground surface, according to Mr. Andreas Godfree of Alameda County Public Works Department.

## 2.0 LIMITED RISK ASSESSMENT

### 2.1 Potential Groundwater Impact

As the groundwater is expected to be at a depth of 40 feet or deeper, the fuel release may not have migrated to groundwater. However, if groundwater contamination has occurred, the absence of any wells within 1,000 feet of the subject site mitigates this concern. Furthermore, based on the size of the tank and the fact that the contaminant is fuel oil (fuel oil is less mobile than gasoline), it is highly unlikely that this plume could spread laterally over 300 feet.

what is this based on?

### 2.2 Potential Health Risks

The primary chemical of concern is benzene. Benzene is a known carcinogen; it is volatile and relatively mobile. The other aromatics, toluene, ethylebenzene, and xylene, are suspected carcinogens and are also actively regulated.

As these compounds are volatile, the primary route of exposure is typically inhalation. The Federal Occupational Safety and Health Administration (OSHA) considers 1 part per million (ppm) benzene in the air an unsafe exposure level. Likewise, 3,000 ppm of benzene in a breathing zone is considered immediately dangerous to life and health.

Historically, regulatory action levels for benzene have been set on a case by case basis. Recently, regulators have allowed risk-based closure. When the contamination threaten neither groundwater aquifers, nor any sensitive environmental receptors, the site can be given closure if it does not represent a threat to human health.

The American Society for Testing and Materials published "Risk-Based Corrective Action Applied at Petroleum Release Sites," and within this document are risk-based tables of safe levels of hydrocarbon contamination. In Table 4 of this document, the Tier 1 Risk-Based Screening Levels Look-Up Table, the safe benzene concentration for contaminated soil volatilizing to an outdoor environment at a residential site is 272 ug/kg—benzene concentrations found in the soil were between 9 ug/kg and 13 ug/kg. The benzene concentrations found in the soil samples are an order of magnitude below the "Look-Up Level"; and therefore, the soil contamination at the subject site does not likely represent a concern to human health.

The "Look-Up Level" for soil contamination below a building is much lower and the contamination at the subject site would be a concern, if it were directly below a building. The Tier 1 Risk Based Screening Level for benzene under a building is 5 ug/Kg.

**2.3 Minimizing Risks to Humans**

can be a problem if building is over contamination / tank

The primary route of exposure for benzene and the other aromatics is inhalation. Secondary routes of exposure include dermal exposure and ingestion.

As the contaminated soil samples were collected from six and seven feet below ground surface, respectively (this is likely the depth of highest contamination) the potential for dermal exposure is virtually zero, unless the soil is excavated.

Benzene can migrate through the soil and volatilize into the atmosphere, potentially exposing humans to benzene vapors. However, as discussed in Section 2.1 the concentrations of benzene present are not a concern. This could change however, if any enclosed structures were built on top of the contaminated area. It is highly unlikely that any significant concentrations of benzene have migrated to under the main structure at 67 King Avenue or any of the neighboring structures.

Ingestion of benzene contaminated soil is highly unlikely as long as the contaminated soil is not excavated. However, growing fruit or vegetables for consumption in the soil above the contamination could be a risk.

# 3.0 RECOMMENDATIONS AND MANAGEMENT PRACTICES

This minor fuel contamination can easily be safely managed in place. To avoid human exposure to the benzene risk, AEI recommends taking the following precautions.

- Do not excavate the contaminated soil. If excavation in this area is necessary contact a licensed hazardous waste contractor.

- Do not build any enclosed structure on top of the contaminated soil. The Risk Screening Levels referred to in this report applied to soil in an open-air environment and the action level for soil under a building is much lower.

- AEI recommends that plants intended for human consumption not be grown in the contaminated area.

AEI recommends that these management practices are implemented and that the site is given closure.

## 4.0 SIGNATURE AND CERTIFICATION

This report was prepared for Joseph P. Derhake, a registered civil engineer, with the intention of submitting this report to Alameda County Health Care Services and to the Client, Mr. Richard Grinold.

I hereby certify that the information presented in this report is true and accurately represented.

Joseph P. Derhake, PE, CAC
Principal