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Via Overnight Courier

July 9, 1997

Ms. Eva Chu
Hazardous Materials Specialist
Alameda County Health Agency
Division of Environmental Protection
Department of Environmental Health
1131 Harbor Bay Parkway, 2nd Floor
Alameda, CA 94502

Dear Ms. Chu:

Enclosed please find three copies of the *Final Proposed Workplan, **Former Hummingbird Haven** Glide Airport, Livermore, California* in anticipation of our meeting with you at 10:00 a.m. on July 16, 1997. Also enclosed is a check in the amount of $1,245.00.

If you have any questions, please contact me.

Sincerely,

Lawrence P. Casey
Consultant to the Receiver

FINAL
Proposed Workplan
Former Hummingbird Haven Glider Airport
Livermore, California

July 1997

Prepared for

Jones, Day, Reavis & Pogue
555 West Fifth Street, Suite 4600
Los Angeles, California

HLA Project No. 38532 1

Stephanie Powell
Project Geologist

Andrew Keller
Principal Environmental Scientist

July 8, 1997

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Engineering and Environmental Services
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Irvine, California 92606 - (714) 260-1800

CONTENTS

PLATES

APPENDIXES

DISTRIBUTION

1.0 INTRODUCTION

Harding Lawson Associates (HLA) has prepared this proposed workplan on behalf of Jones, Day, Reavis & Pogue (JDRP) to describe closure activities at the former Hummingbird Haven Glider Airport (the Site) located at 8638 Patterson Pass Road in Livermore, California (Plate 1).

The closure activities will include the following:

- Removal of three underground storage tanks (USTs)
- Preparation of a Site-specific risk assessment to assess soil closure levels that are protective of human health and the environment
- Excavation of impacted soils to remove potential source areas that could impact groundwater or present a risk to human health or the environment
- Confirmation soil sampling to ensure remedial objectives are met
- Groundwater sampling from three existing monitoring wells to assess groundwater quality

Based on previous investigations, petroleum hydrocarbons have been detected in the soil in the vicinity of the USTs at a maximum concentration of 1,700 parts per million (ppm). No benzene has been detected in any of the soil samples analyzed. The maximum level of petroleum hydrocarbons detected in groundwater samples has been 5.4 ppm. Petroleum hydrocarbons have been detected in only one of the four onsite monitoring wells. Benzene was also detected in only one of the four groundwater monitoring wells at a level of 0.02 ppm.

Based upon the results of additional soil samples to be collected from the UST excavation pit and the investigations conducted to date, HLA will perform a risk assessment to establish soil closure levels for impacted soils. Based on the existing groundwater quality data set, as provided in this plan, and the removal of the USTs and contamination source area, low levels of total petroleum hydrocarbons (TPH) and benzene, toluene, ethylbenzene, and xylenes (BTEX) in groundwater will be monitored but not remediated.

This plan outlines the closure activities that will take place as part of the UST removal, the criterion established to guide the closure activities, and the closure report that will be submitted to appropriate agencies upon completion of these activities. Upon completion and submission of the report, HLA will request closure for the Site.

2.0 SITE DESCRIPTION

2.1 General

The following information was extracted from a 1989 report prepared by another consultant.

The Site is located at 8638 Patterson Pass Road, at the intersection of Patterson Pass Road and Greenville Road, in the city of Livermore, California. The Site is bordered to the south by Patterson Pass Road, to the west by North Greenville Road, and to the northwest by vacant pasture land. The eastern and northern borders are Section boundaries. Lawrence Livermore National Laboratory (LLNL) is located across Greenville Road to the southwest.

The Site consists of approximately 83 gross acres and was historically been utilized as a glider airport. The Site slopes slightly to the west. The Site is predominantly used as grazing land. With the exception of a realigned portion of Patterson Pass Road, the Site does not appear to have any paved areas.

The Site is generally undeveloped, but contains a farm house with attendant facilities located at the northeast corner.

2.2 Geology

The Site is located in the lower, western foothills of the Diablo Range and a portion of the adjacent Livermore Valley. Tertiary marine sandstones comprise the low, rounded hills approximately 1,000 feet north of the property. Pleistocene alluvial deposits occur on the gently sloping valley floor at the base of the hills and presumably overlie the older marine sandstones.

From a review of soil boring logs developed in 1989, it appears that the soils immediately beneath the Site surface consist of a sandy clay to 3.5 feet below ground surface (bgs) and then a clayey sand from 3.5 to 10 feet bgs. From 10 to 15 feet bgs is a sand, and from 15 to 23 feet bgs is a hard, sandy clay. From 23 to 42 feet bgs is a clayey sand, and from 42 to 48 feet bgs is a silty sand that is saturated. Finally, from 48 to 56 feet is a wet, clayey sand.

The active Greenville Fault is located adjacent to and north of the property.

2.3 Hydrogeology

According to a 1983 groundwater evaluation report by another consultant for a planned but unbuilt Greenville Industrial Park, little is known regarding the occurrence and movement of groundwater beneath the Site. However, it does seem that a groundwater subbasin boundary divides the Altamont Subbasin to the east from the Livermore Valley groundwater to the west. The western boundary of the Altamont Subbasin is reported to be the Greenville Fault, which runs diagonally southeast to northwest, north of the Site. The effect of the Greenville Fault on the movement of groundwater near the Site is not definitively known.

A monitoring well installed on the Site in 1989 indicated a west-northwest direction of groundwater flow beneath the property, with a gradient of approximately 0.024 foot per foot. The first encountered water at monitoring well MW-1 along the western boundary of the Site was at about 40 feet bgs, and the static water level was approximately the same in this well.

3.0 PREVIOUS INVESTIGATIONS

According to a 1989 report by another consultant, three USTs are located at the previous hangar area of the former landing strip. Two of the USTs are steel and one is fiberglass. According to the 1989 report, all of the USTs are approximately 1,000-gallon in size. The first UST was installed in approximately 1956 and was replaced by another UST at an unspecified date after the first UST was found to be leaking. A second tank was also found to be leaking and was replaced by a fiberglass UST in 1978. There is no information regarding the third UST. All three USTs remain in place at the Site, and there is no record of the fuel being removed from the USTs.

3.1 1989 Subsurface Investigation

Need to see MW construction detail any report?

In 1989, a subsurface investigation was performed to determine if soil and/or groundwater contamination existed in the area of the USTs. A soil boring (DH-8) was advanced to a depth of 25 feet approximately 5 feet southwest of the location of the oldest UST, in what was believed to be a downgradient direction from the UST cluster. The groundwater direction was indicated as west to northwest. Two soil samples were collected from depths of 20 and 25 feet bgs.

The samples were analyzed using EPA Method 8015 Modified for total petroleum hydrocarbons (TPH) and indicated gasoline-range constituents in the 20-foot sample at a concentration of 11 parts per million (ppm) and in the 25-foot sample at a concentration of 1,700 ppm. The analysis for benzene, toluene, ethylbenzene, and xylenes (BTEX) by EPA Methods 5030 and 8020 also revealed a large disparity between the two samples. The 20-foot sample concentrations were not detected for benzene and toluene, 0.019 ppm for ethylbenzene, and 0.099 ppm for xylenes, whereas the 25-foot sample concentrations were not detected for benzene [with a 150-part-per-billion (ppb) detection limit], 9.3 ppm for toluene, 18 ppm for ethylbenzene, and 84 ppm for xylenes.

The report indicated that the concentration difference between the two samples may be due to the higher apparent permeability of the sandy material in the 25-foot sample versus the 20-foot sample. Additionally, it was speculated that the age of the leak could have played a role in the disparity. The report indicated another factor that might cause the low ratio of benzene and toluene to ethylbenzene and xylene would be the nature of the fuel. The aviation fuel used for the small airplanes that previously operated at the glider airstrip was a high-octane gasoline. The high octane rating may cause a low ratio of benzene and toluene to ethylbenzene and xylenes because the fuel mix was designed to exclude some of the lower chain hydrocarbons, such as benzene.

One monitoring well was installed at the Site (MW-1) during the investigation. Refer to Plate 2 for the well location. The well was sampled and analyzed by EPA Method 8240 for volatile organic compounds (VOCs) and by EPA Method 8270 for semivolatile organic compounds (SVOCs). The groundwater sample analyses did not detect VOCs or SVOCs in the well. MW-1 is located near LLNL and therefore indicates it is likely that VOC-contaminated groundwater has not migrated beneath the Site from LLNL. The depth to groundwater measured in the well was 43 feet bgs. The groundwater gradient was determined to be approximately 0.024 foot per foot, and the direction of groundwater flow beneath the Site is west-northwest.

3.2 April 1997 Subsurface Investigation

In April 1997, the Alameda County Building Department, Fire Department, and Environmental Department were contacted regarding records of the USTs at the Site. None of the agencies had any records or knowledge of the USTs. A geophysical survey was also performed to locate the USTs and determine their rough sizes. The survey was unable to distinguish individual USTs. Only two vent pipes and two fill pipes were observed; therefore, it was suspected that possibly only two USTs existed.

Groundwater Samples

Three monitoring wells (MWT-1 through MWT-3) that were installed in 1989 and are located adjacent to the USTs were sampled. A total of four monitoring wells are onsite. (Refer to Plates 2 and 3.) The water samples were analyzed for TPH-purgeable (as gasoline), TPH-extractable (as diesel, motor oil, and kerosene), BTEX, methyl tert-butyl ether (MtBE), and total lead. Monitoring Wells MWT-1 and MWT-3 did not contain detectable concentrations of any of the petroleum hydrocarbon constituents. MWT-2, located downgradient of the USTs, contained 5.4 ppm TPH-purgeable, and BTEX concentrations ranged from 0.02 to 0.89 ppm. The benzene concentration was 0.02 ppm. All three wells contained total lead concentrations ranging from 0.010 to 0.018 ppm.

Depth to groundwater, as measured on March 26, 1997, was approximately 32 feet bgs for MWT-1, 31 feet bgs for MWT-2, and 30 feet bgs for MWT-3. The calculated groundwater gradient was 0.028 foot per foot to the northwest.

MW-1, the previously installed monitoring well, was also sampled and analyzed for VOCs and SVOCs. No VOCs or SVOCs were detected above the respective analytical detection limits.

In three of the soil borings advanced in the vicinity of the USTs during the investigation, Hydropunch water samples were obtained. TPH-purgeable as gasoline was detected in two of the three Hydropunch samples at concentrations of 0.066 and 0.220 ppm. BTEX was detected in two samples ranging from 0.0021 to 0.051 ppm. The highest benzene level was 0.0021 ppm. TPH-extractable was detected in all three samples at a maximum concentration of 0.180 ppm. Total lead was detected in all three samples at concentrations ranging from 0.087 to 0.25 ppm. Because the water samples were not filtered, the lead results may not be representative of actual concentrations. Refer to Plate 3 for the location of the Hydropunch samples.

Soil Samples

?

Nine soil samples from the five exploratory borings were submitted for chemical analysis. Total lead was not detected in any of the samples. TPH-purgeable as gasoline, with a concentration of 0.140 ppm, and BTEX compounds, ranging from not detected to 0.0067 ppm, were detected in only one sample. Benzene was not detected in any of the samples. Three of the nine soil samples contained concentrations of TPH-extractable as diesel ranging from 0.0011 to 0.0044 ppm.

any detection of MtBE?

4.0 CLOSURE CRITERIA

4.1 Soil Closure Criteria

A baseline risk assessment will be conducted to evaluate risks to human health and the environment (e.g., groundwater quality) that could occur if no remedial actions are taken at the Site. The results of the baseline risk assessment will be used to determine if remedial action is necessary and, if so, which areas of the Site and which chemicals must be addressed.

The baseline risk assessment will be conducted in accordance with American Society for Testing and Materials (ASTM, 1995) guidelines. The baseline risk assessment will include two components: an evaluation of potential human health risks and an evaluation of the potential for chemicals in soil to further degrade groundwater quality. For the groundwater impact evaluation, a leachate model acceptable to the ACEPD will be used to determine if the indicator constituents present in soil can be left in place without significant degradation to groundwater underlying the site.

The baseline risk assessment will consist of the components detailed below.

4.1.1 Selection of Indicator Chemicals

Based on existing and supplemental Site data (proposed to be collected in this workplan), indicator constituents of petroleum hydrocarbons in soil will be identified for inclusion in the quantitative risk assessment. The purpose of selecting indicator constituents is to focus the assessment on those chemicals that could be expected to pose a potential threat to potential human receptors or groundwater quality.

Indicator constituents will be selected so that the most prevalent, mobile, persistent, and toxic compounds detected at the site (i.e., those chemicals that likely represent the greatest potential threat to groundwater or human health) will be quantitatively evaluated in the risk assessment. According to CalEPA (1994) and ASTM (1995) guidance, the constituents identified as meeting these criteria are BTEX and polycyclic aromatic hydrocarbons (PAHs). These chemicals are considered the most mobile and or/toxic components of petroleum products.

4.1.2 Exposure Assessment

Exposure assessment is the estimation of the timing (frequency and duration), route, and magnitude of exposure to chemicals. These factors, in addition to bioavailability (e.g., absorption) factors, determine the total chemical intake for an exposed population. The nature of the potentially exposed populations, the relevant routes of exposure, and the methods that will be used to estimate exposures at the Site are discussed below.

Exposure Scenario

The intended future use of this property is anticipated to be a corporation yard; however, both a commercial and residential scenario will be evaluated in the risk assessment. The residential scenario provides the most conservative evaluation of risks to human health.

Exposure Pathways

Pathways of exposure are the means through which an individual may come into contact with a chemical. Typical pathway determinants are environmental conditions (e.g., distance to the nearest potentially exposed populations), potential for a chemical to transfer across media, and the general behaviors and lifestyles of the potentially exposed populations.

Only complete exposure pathways will be quantitatively evaluated in the risk assessment. Complete exposure pathways are defined as those for which the following elements exist at a site:

- A source and mechanism for chemical release,
- An environmental transport medium (e.g., air, water, soil),
- A point of potential human contact with the medium, and
- An exposure route at the contact point.

No near surface soil samples collected -

Potential Human Exposure Pathways at the Site

Volatile chemicals, if present in surface or subsurface soils, can migrate from soil to air. This movement may result in exposure by inhalation. Because petroleum hydrocarbon releases at the Site occurred in the subsurface, direct contact with impacted soil does not represent a complete exposure pathway. Exclusion of direct contact pathways where contamination is limited to subsurface soils is consistent with ASTM guidance for petroleum sites (ASTM, 1994). The volatile indicator constituents that will be evaluated in the risk assessment for inhalation exposure are BTEX and volatile PAHs (by CalEPA criteria, 1994). The volatile PAHs are acenaphthene, anthracene, fluorene, and naphthalene (CalEPA, 1994). The nonvolatile PAHs (e.g., benzo[a]pyrene, chrysene] are not considered to be of concern for human health because they are located in the subsurface.

Volatile chemicals, if present in groundwater, can migrate as vapor through soil to air. Therefore, receptors may be exposed to volatile groundwater chemicals by the inhalation route.

In summary, the exposure pathways that will be evaluated in the baseline risk assessment are inhalation of vapors migrating from soil and groundwater to ambient air. The potential for petroleum hydrocarbons to migrate through soil to groundwater will also evaluated.

what about to indoor air?

what is source of drinking water at site (any irrigation/water supply wells?)

4.1.3 Fate and Transport Modeling

Vapor Emissions Models

Vapor emissions models for soil and groundwater presented in ASTM RBCA guidance (ASTM, 1995) will be utilized as an initial screen in the risk assessment. If the exposure concentrations predicted by the ASTM models result in estimated risks that are within the acceptable risk range (less than 10^{-5}), HLA will utilize the results in the baseline risk assessment. However, because the ASTM models are extremely conservative, if predicted exposure concentrations of indicator constituents exceed risk-based criteria, HLA will propose conducting more sophisticated, less conservative modeling prior to finalizing the baseline risk assessment.

Soil properties strongly influence vapor emissions rates. Therefore, relevant Site-specific soil parameter values (e.g., organic carbon content, bulk density) will be utilized, where available. For soil parameters for which analytical data are not available, conservative EPA default values will be used (EPA, 1996).

these values can be collected at time of UST removal

The groundwater and soil input concentrations to the vapor emissions models will consist of the 95th percentile of the upper confidence limit of the arithmetic mean (95% UCL), the use of which is supported by ASTM guidance (1995).

Leachate Evaluation

Probably not needed since we're not dealing w/ a recent release, and there are already GW-MWs and initial GW analysis in 1989 - This can be confirmed w/ more recent + future QMR.

The BTEX chemicals are considered highly mobile and can migrate to groundwater. Therefore, the potential transport of these chemicals to groundwater will be evaluated in the risk assessment, consistent with ASTM guidance (1995) to ensure the residual chemical concentration does not further degrade the groundwater quality. Naphthalene is the most mobile PAH, and thus transport to groundwater for this constituent will also be evaluated, if this PAH is present in soils at the Site.

The leachate model presented in ASTM guidance (1995) will be utilized as an initial screen in the risk assessment. If the groundwater concentrations predicted using the ASTM models are below the chemical-specific maximum contaminant levels (MCLs), HLA will utilize the results of the screen in the baseline risk assessment. However, because the ASTM leachate model is very conservative, if groundwater concentrations predicted in the screen exceed the chemical-specific MCL, HLA will propose conducting more sophisticated, less conservative modeling as the basis for the groundwater impact assessment.

As with vapor emissions, transport of petroleum constituents is significantly influenced by soil properties. Therefore, relevant Site-specific soil parameter values will be utilized, where available.

The input concentrations for the leachate model will consist of the 95% UCL.

4.1.4 Toxicity Assessment

The relationship between the dose of a chemical and the probability of an adverse health effect in the exposed population is characterized in the dose-response assessment. This section of the risk assessment will present the dose response assessment for the indicator constituents evaluated in the risk assessment.

Noncarcinogenic Health Effects

Reference doses (RfDs) are derived from human or animal studies in which a threshold effect or no-effect level has been identified. An RfD is an average daily dose that is not expected to cause adverse health effects in even the most sensitive of individuals.

CalEPA does not promulgate noncancer toxicity criteria. Therefore, EPA RfDs will be used to evaluate noncarcinogenic health hazard in the risk assessment. The RfDs will be obtained from the EPA online database referred to as IRIS.

Cancer Slope Factors

The cancer slope factor (SF) is a toxicity value that quantitatively defines the relationship between chemical dose and tumor response rate. The chemical-specific SF represents the upperbound estimate of the probability of an individual contracting cancer, per unit intake of chemical, over a 70-year lifetime.

CalEPA toxicity criteria will be utilized to evaluate potential carcinogenic responses to benzene, which is the only Site-related chemical that is a carcinogen.

4.1.5 Risk Characterization

The methods used to quantify potential health risks for each receptor will be consistent with EPA and CalEPA guidelines for risk characterization (EPA, 1989; CalEPA, 1992).

Noncancer Health Effects

The estimates of noncancer health effects will be evaluated using a "hazard index" (HI) approach. The HI will be determined by summing the hazard quotient (HQ) for each chemical. The HQ is equivalent to the average daily dose divided by the RfD.

Cancer Risk

The incremental cancer risk associated with potential Site exposures will be estimated by multiplying the lifetime average daily dose of benzene by the chemical-specific SF for benzene.

4.2 Determination of Risk-Based Soil Closure Levels

If the baseline risk assessment indicates the potential for adverse health effects or significant impact to groundwater (based on criteria acceptable to the ACEPD), HLA will derive Site-specific soil closure levels. HLA will apply Site-specific fate/transport models and standard risk assessment procedures to establish soil concentrations protective of human health and groundwater quality. Derivation of the closure levels of indicator constituents will utilize the same models and exposure assumptions provided in the baseline risk assessment.

4.3 Groundwater Closure Criteria

Based on previous investigations, the maximum level of petroleum hydrocarbons detected in the groundwater has been 5.4 ppm. Petroleum hydrocarbons have been detected only in one of the four onsite monitoring wells. Benzene was also detected in only one of the four groundwater monitoring wells at a level of 0.02 ppm.

HLA recommends that the Lawrence Livermore National Laboratory, Recommendations to Improve the Cleanup Process for California's Leaking Underground Fuel Tanks (LUFTs) dated October 16, 1995 be utilized for the minor groundwater impacts at the Site. The conclusions of this report are as follows:

> Fuel hydrocarbons (FHCs) have limited impacts on human health, the environment, or California's groundwater resources. Where shallow groundwater has been impacted by LUFT FHCs, well construction standards provide protection of deeper drinking water wells. The costs of cleaning up LUFT FHCs are often inappropriate when compared to the magnitude of the impact on groundwater resources.
>
> Further, if an FHC source is removed, passive bioremediation processes act to naturally reduce FHC plume mass and to eventually complete the FHC cleanup. Benzene plume lengths tend to stabilize at relatively short distances from the FHC release site. Remediation alternatives that utilize pump and treat are recognized as being ineffectual at reaching MCL groundwater cleanup standards for FHCs in many geologic settings. Passive bioremediation can provide a remediation alternative that is as efficient as actively engineered remediation processes such as pump and treat.

Although the MCL for benzene is 0.001 ppm, because benzene was detected in only one of the four onsite groundwater monitoring wells (concentration of 0.02 ppm) and has never been detected in the soils, HLA proposes to apply the recommendations outlined in the 1995 report as a basis for allowing the current low levels of benzene to naturally attenuate in the groundwater at the Site.

5.0 PREREMOVAL ACTIVITIES

5.1 Health And Safety Plan

A Site Health and Safety Plan (H&S Plan) has been prepared in accordance with the Alameda County Department of Environmental Health, Environmental Protection Division requirements (ACEPD), as outlined in the instructions to the Underground Tank Closure Plan. A copy of the H&S Plan is provided in Appendix A.

5.2 Permits And Notifications

HLA has completed the Underground Tank Closure Plan required by the ACEPD. This Plan is provided as Appendix B. Once the plan is approved by the ACEPD, HLA will obtain all necessary permits for the UST removals, including permits with the Bay Area Air Quality Management District, local fire department, and local building department. The State of California Application Forms A and B will also be completed and submitted to the ACEPD for each UST. Refer to Appendix C for copies of these forms.

HLA will contact the ACEPD a minimum of 3 days prior to the scheduled UST removal activities to ensure that a representative will be available for oversight of the activities. All other permitting agencies' notification requirements will also be met. All permits, in addition to this workplan, the H&S Plan, and the ACEPD-approved Underground Tank Closure Plan will be onsite during UST removal activities.

5.3 Utility Clearance

Underground Service Alert will be contacted prior to performing the Site geophysical clearance. A geophysical survey will also be performed prior to UST removal activities for two purposes: (1) to ensure that all utilities in the vicinity of the USTs are identified prior to subsurface activities and (2) to attempt to delineate the UST locations and associated piping.

6.0 UST REMOVAL ACTIVITIES

6.1 UST Removal

HLA will remove the soil overburden utilizing a backhoe equipped with a bucket until the tops of the USTs are observable. The removed soils will be stockpiled proximal to the UST area and will be placed on bermed plastic. When not in use, these stockpiles will be covered with plastic sheeting.

Prior to removal, any material in all associated piping will be flushed out into the USTs. The USTs will be purged of fluids and triple-rinsed by a state-certified hazardous waste hauler. The wastes will be disposed of at a permitted and licensed hazardous waste disposal facility. The USTs will be degassed with approximately 15 pounds of dry ice, provided the USTs are 1,000 gallons in capacity. For every additional 1,000 gallons of capacity, 15 additional pounds of dry ice will be added, if applicable. The lower explosive limit (LEL) will be monitored using a combustible gas/oxygen meter in order to maintain a nonexplosive atmosphere within the excavation and the UST. The UST will be certified to be clean and free of hydrocarbons (0 percent LEL) by an HLA representative.

All accessible piping to or from the USTs will be removed prior to the removal of the UST. Inaccessible piping will be permanently plugged. The USTs will be removed from the excavation pit utilizing a crane and will be visually inspected for leaks and other damage. The USTs and all product lines will be placed onto trucks and transported as nonhazardous waste for disposal as scrap metal to an approved scrap metal recycler.

6.2 Sampling and Analysis

The excavation pit will be visually inspected for signs of soil contamination. If, based on field observations and the use of an organic vapor analyzer (OVA) the excavation pit appears to be free of contamination, two soil samples will be collected from each UST pit, one at each end of the former tank location. Refer to Appendix D for HLA's soil sampling procedure. This sampling follows the ACEPD guidelines for USTs with capacities between 1,000 to 10,000 gallons where groundwater is not present in the excavation pit.

Soil samples will also be collected from beneath the UST piping. One soil sample will be collected for every 20 linear feet of piping that is removed. A groundwater sample will be collected if any groundwater is present in the excavation pit.

Also collect "clean" ss from pit bottom/sidewall for soil parameter values porosity, bulk density, total organic carbon content, water content.

All samples will be submitted to an onsite, State of California-certified mobile laboratory for analysis of VOCs using EPA Test Method 8015 Modified for the gasoline- and diesel-range hydrocarbons to confirm that VOC-impacted soil with concentrations exceeding the closure criterion has been removed. If the confirmatory sampling from the onsite laboratory indicates that the concentration in the bottom sample is below the closure criterion, the excavation will be appropriately backfilled from an onsite borrow area.

If the confirmatory samples do not meet the closure criterion, the excavation will be continued an additional 2 feet and resampled. This procedure will continue until confirmatory soil sampling indicates that the VOC concentration in the bottom of the excavation is below the closure criterion.

Additionally, because the mobile laboratory cannot analyze using the methods required by the Tri-Regional Board, HLA will also submit duplicate samples to a State of California-certified fixed laboratory for analysis per the Tri-Regional Board recommended minimum verification analyses. Only the confirmation samples that meet the closure criterion, as determined by the onsite laboratory, will be submitted to the fixed laboratory. The samples will be analyzed for the following: TPH modified for gasoline using EPA Method 5030, TPH modified for diesel using EPA Method 3550, BTXE using EPA Method 8020 or 8240, TPH and BTXE using EPA Method 8260, and total lead using Atomic Absorption. Refer to Appendix E for HLA's chain-of-custody procedure. The detection limits for these analyses are 1 ppm, 5 ppm, 5 ppb (except for xylene which is 15 ppb), 2 ppb, and 1 ppm, respectively.

All excavations that are not backfilled up to existing grade by the end of each working day will be surrounded by fencing and/or plywood and barricaded.

If analytical data indicate the presence of any soil or groundwater contamination, an Underground Storage Tank Unauthorized Release Report will be completed and submitted to the ACEPD within 5 working days of the discovery.

6.3 Soil Profiling and Disposal

Two confirmatory soil samples will be collected from each soil stockpile for the purpose of assessing disposal options. Disposal options will primarily be based on VOC concentration and volume of excavated soil. Options include offsite transportation as a non-hazardous waste for burial at an appropriate landfill, or recycling of the soil at an appropriate treatment facility. If the volume of excavated soils makes offsite disposal cost-prohibitive, onsite ex-situ remediation strategies such as bioremediation or vapor extraction may be utilized, as appropriate. If the onsite remedial approach is utilized, upon achieving the closure criterion, the soils will be placed into the borrow area onsite.

6.4 Monitoring Well Sampling And Analysis

Three monitoring wells, MWT-1 through MWT-3, will be sampled concurrent with the UST removal activities. HLA will sample the monitoring wells as described in the procedure provided in Appendix F. Groundwater elevations will be measured in each well prior to sampling using the surveyed elevation of the top of each well casing relative to mean sea level. Based on groundwater elevations, the groundwater flow direction will be determined. The groundwater samples will be submitted to a State of California-certified laboratory for the following analyses: TPH modified for gasoline using EPA Method 5030, TPH modified for diesel using EPA Method 3550, BTXE using EPA Method 8020 or 8240, TPH and BTXE using EPA Method 8260, and total lead using Atomic Absorption. Refer to Appendix E for HLA's chain-of-custody procedure. The results of the groundwater sampling and analysis will be incorporated into the closure report discussed in Section 7.0.

MTBE and PAHs

7.0 CLOSURE REPORT

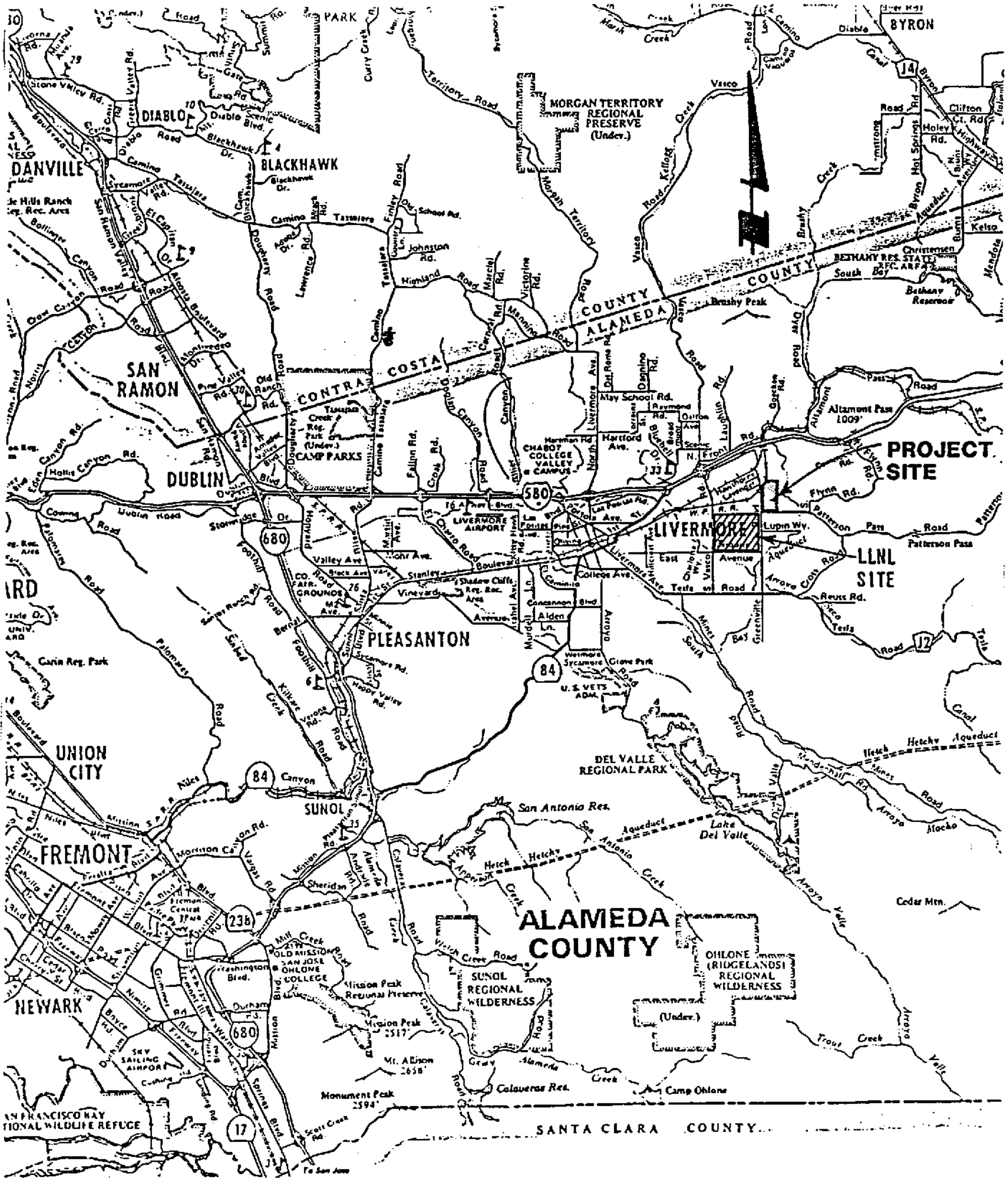
A closure report detailing the work performed as part of the UST removal activities will be submitted to the ACEPD within 60 days of the tank removal. The closure report will be written in accordance with ACEPD requirements and will include, at a minimum, the following:

- General description of closure activities
- Description of USTs, fittings, and piping connections
- UST sizes and former contents, if ascertainable
- UST conditions at time of removal
- Description of excavation activities
- Log of stratigraphic units encountered
- Depth of observed groundwater, if applicable
- Descriptions and locations of stained or odor-bearing soil
- Description of any observed free product or sheen
- Detailed description of sampling methods
- Description of any remedial measures conducted at the time of the UST removal
- Scaled figures showing excavation size and depth, nearby buildings, sample locations and depths, and tank and piping locations
- Chain-of-custody records
- Copies of signed laboratory reports
- Copies of "TSDF to Generator" manifests for all hazardous wastes hauled offsite
- Documentation of the disposal of and the volume and final destination of all non-manifested contaminated soil disposed of offsite

8.0 REFERENCES

Alameda County Environmental Health Department, Environmental Protection Division. 1996. *Underground storage tank removal process in Alameda County.* March (revised date).

Lawrence Livermore National Laboratory. 1995. *Recommendations to improve the cleanup process for California's leaking underground fuel tanks (LUFTs).* Prepared for the California State Water Resources Control Board and the Senate Bill 1764 Leaking Underground Fuel Tank Advisory Committee, October 16



REFERENCE: "LIVERMORE AND PLEASANTON AREA MAP," COPYRIGHT BY COMPASS MAPS, INC., MODESTO, CALIFORNIA, 1982.

0 1 2 3 4 5 6 7 8

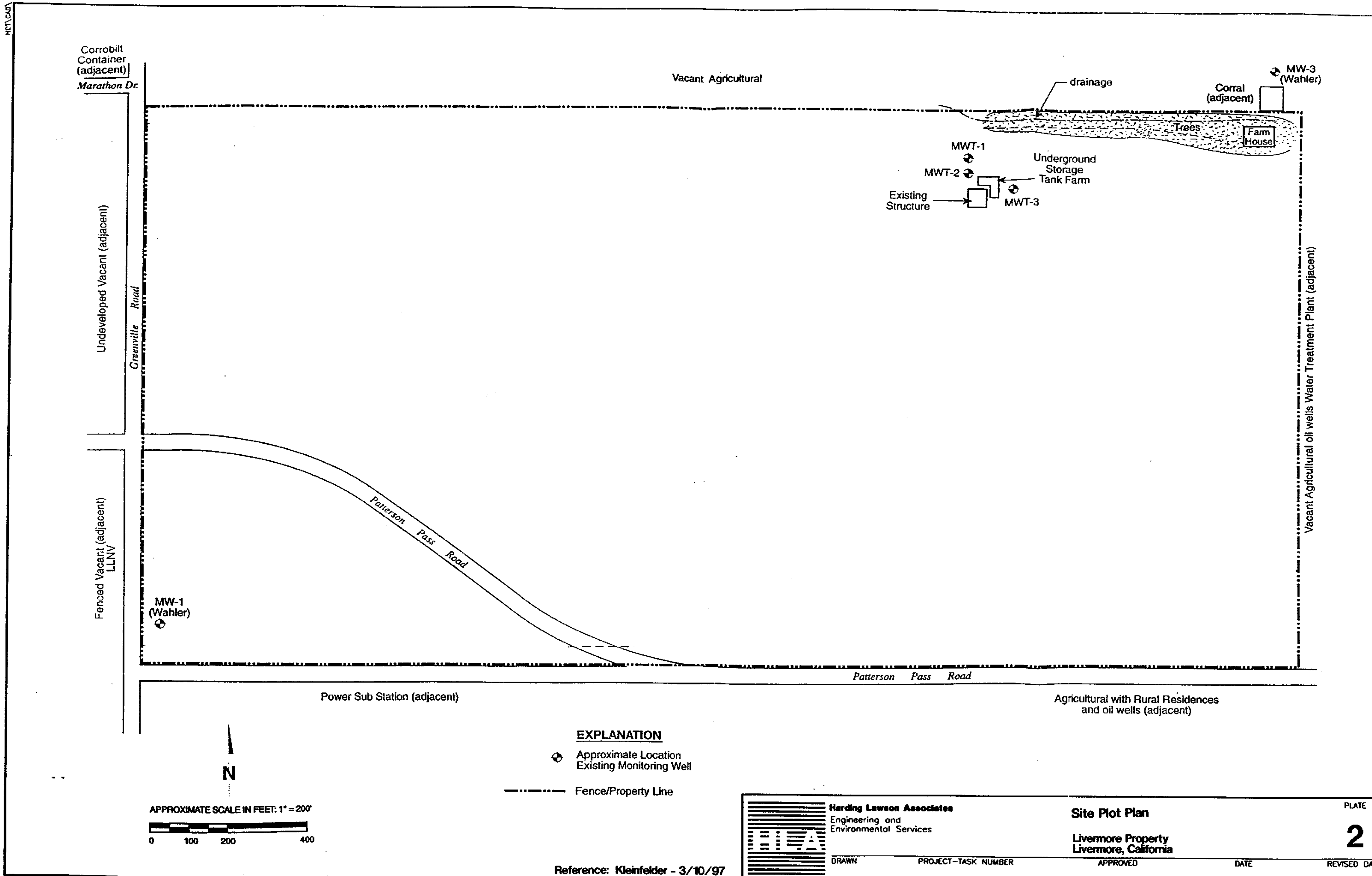
SCALE IN MILES

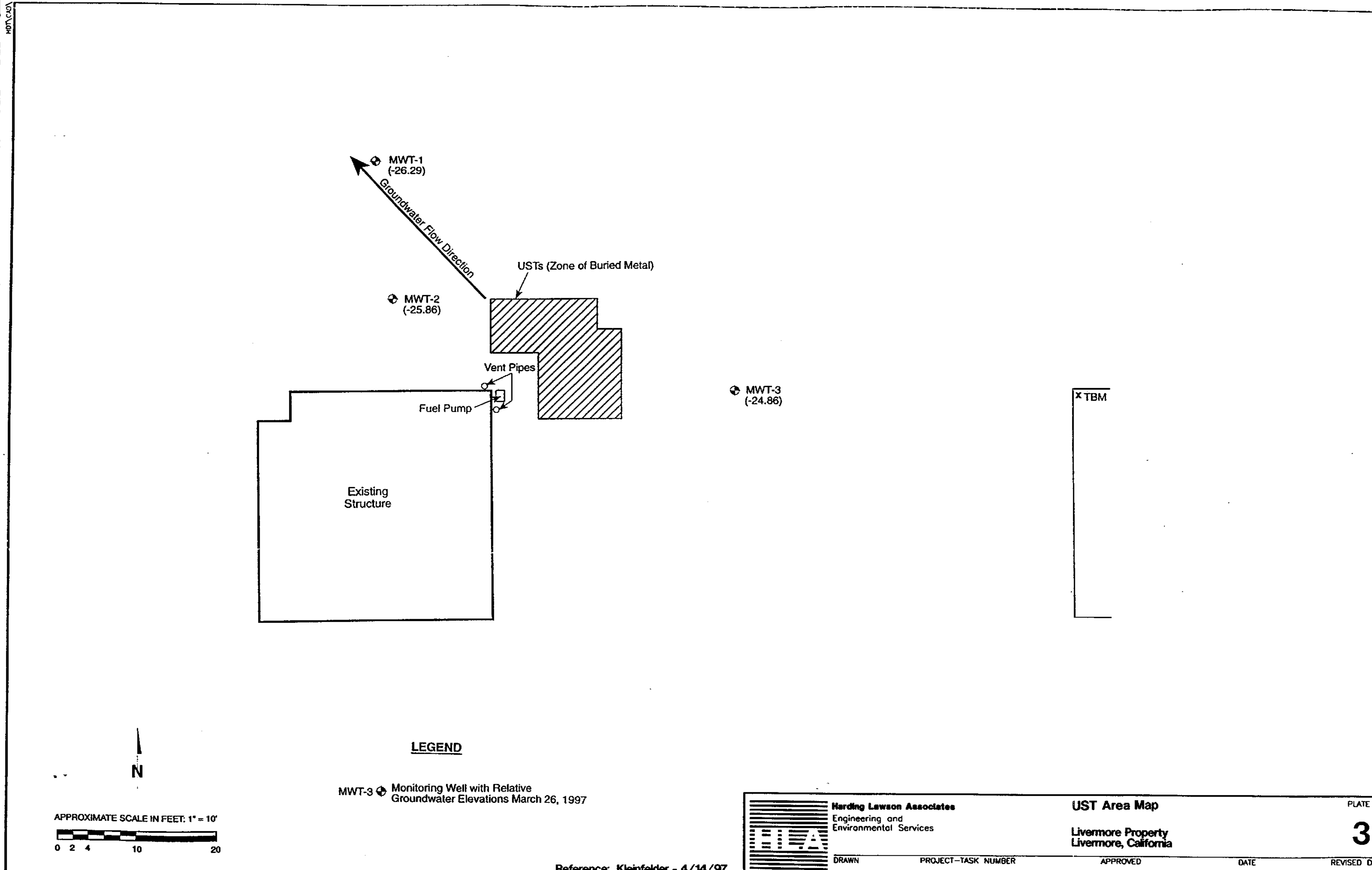
HARDING LAWSON ASSOCIATES
Engineering and
Environmental Services

Site Location Map

PLATE
1

DRAWN	PROJECT–TASK NUMBER	APPROVED	DATE	REVISED DATE


Corrobilt Container (adjacent)
Marathon Dr.
Vacant Agricultural
drainage
Corral (adjacent)
MW-3 (Wahler)
Trees
Farm House
MWT-1
MWT-2
Underground Storage Tank Farm
Existing Structure
MWT-3
Undeveloped Vacant (adjacent)
Greenville Road
Vacant Agricultural oil wells Water Treatment Plant (adjacent)
Patterson Pass Road
Fenced Vacant (adjacent) LLNV
MW-1 (Wahler)
Patterson Pass Road
Power Sub Station (adjacent)
Agricultural with Rural Residences and oil wells (adjacent)
N
APPROXIMATE SCALE IN FEET: 1" = 200'
0
100
200
400
EXPLANATION
Approximate Location Existing Monitoring Well
Fence/Property Line
Reference: Kleinfelder - 3/10/97
Harding Lawson Associates
Engineering and Environmental Services
Site Plot Plan
Livermore Property
Livermore, California
PLATE
2
DRAWN
PROJECT-TASK NUMBER
APPROVED
DATE
REVISED DATE



Harding Lawson Associates
Engineering and Environmental Services

UST Area Map

Livermore Property
Livermore, California

PLATE 3

DRAWN	PROJECT-TASK NUMBER	APPROVED	DATE	REVISED DATE

APPENDIX A

SITE HEALTH AND SAFETY PLAN

(to be provided under separate cover)

APPENDIX B

ALAMEDA COUNTY UNDERGROUND TANK CLOSURE PLAN

Project Specialist

ALAMEDA COUNTY HEALTH CARE SERVICES AGENCY
DEPARTMENT OF ENVIRONMENTAL HEALTH
ENVIRONMENTAL PROTECTION DIVISION
1131 HARBOR BAY PARKWAY, RM 250
ALAMEDA, CA 94502-6577
PHONE # 510/567-6700
FAX # 510/337-9335

UNDERGROUND TANK CLOSURE PLAN

* * * Complete according to attached instructions * * *

1. Name of Business: Residential / Farming

   Business Owner or Contact Person (PRINT): DENNIS SCHMUCKER

2. Site Address: 8638 Patterson Pass Road

   City: Livermore   Zip: ______   Phone: Not Available

3. Mailing Address: 1010 Second Avenue, Suite 1421

   City: San Diego, California   Zip: 92101   Phone: (619) 235-3050

4. Property Owner: Attention: Dennis Schmucker, Receiver
   Monarch Industrial Park Limited

   Business Name (if applicable): ______

   Address: 1010 Second Avenue, Suite 1421

   City, State: San Diego, California   Zip: 92101
   Attention: Dennis Schmucker, Receiver

5. Generator name under which tank will be manifested

   → The USTs will be certified clean onsite and sent offsite as scrap metal.

   EPA ID# under which tank will be manifested C A → _ _ _ _ _ _ _ _ _ _

   Not Applicable   required

6. Contractor Harding Lawson Associates

Address 30 Corporate Park, Suite 400

City Irvine, California 92606 Phone (714) 260-1800

License Type* Class A Hazardous ID# 705710

***Effective January 1, 1992, Business and Professional Code Section 7058.7 requires prime contractors to also hold Hazardous Waste Certification issued by the State Contractors License Board.**

7. Consultant (if applicable) Harding Lawson Associates

Address 30 Corporate Park, Suite 400

City, State Irvine, California 92606 Phone (714) 260-1800

8. Main Contact Person for Investigation (if applicable)

Name Andrew Keller Title Consulting Principal Environmental Scientist

Company Harding Lawson Associates

Phone (714) 260-1800

9. Number of underground tanks being closed with this plan 3

Length of piping being removed under this plan Unknown

Total number of underground tanks at this facility (**confirmed with owner or operator) 3

10. State Registered Hazardous Waste Transporters/Facilities (see instructions).

**** Underground storage tanks must be handled as hazardous waste ****

a) Product/Residual Sludge/Rinsate Transporter

Name To Be Determined EPA I.D. No. _____

Hauler License No. _____ License Exp. Date _____

Address _____

City _____ State _____ Zip _____

b) Product/Residual Sludge/Rinsate Disposal Site

Name To Be Determined EPA ID# _____

Address _____

City _____ State _____ Zip _____

c) **Tank and Piping Transporter**

Name To Be Determined EPA I.D. No. ______

Hauler License No. ______ License Exp. Date ______

Address ______

City ______ State ______ Zip ______

d) **Tank and Piping Disposal Site**

Name To Be Determined EPA I.D. No. ______

Address ______

City ______ State ______ Zip ______

11. Sample Collector

Name Brian Hawes, Staff II Geologist

Company Harding Lawson Associates

Address 30 Corporate Park, Suite 400

City Irvine State CA Zip 92606 Phone (714) 260-1800

12. Laboratory

Name To Be Determined must be CA state certified lab

Address ______

City ______ State ______ Zip ______

State Certification No. ______

13. Have tanks or pipes leaked in the past? Yes[x] No[ ] Unknown[ ]

If yes, describe. Refer to attached Workplan, Section 3.0

14. **Describe methods to be used for rendering tank(s) inert:**

Refer to attached Workplan, Section 6.1

Before tanks are pumped out and inerted, all associated piping must be flushed out into the tanks. All accessible associated piping must then be removed. Inaccessible piping must be permanently plugged.

The Bay Area Air Quality Management District, 415/771-6000, along with local Fire and Building Departments, must also be contacted for tank removal permits. Fire departments typically require the use of a combustible gas indicator to verify tank inertness. It is the contractor's responsibility to bring a working combustible gas indicator on-site to verify that the tank is inert.

15. Tank History and Sampling Information *** (see instructions) ***
Refer to attached Workplan, Sections 3.0 and 6.2

Tank		Material to be sampled (tank contents, soil, groundwater)	Location and Depth of Samples
Capacity	Use History include date last used (estimated)		

One soil sample must be collected for every 20 linear feet of piping that is removed. A ground water sample must be collected if any ground water is present in the excavation.

Excavated/Stockpiled Soil	
Stockpiled Soil Volume (estimated)	**Sampling Plan**
Refer to attached Workplan, Section 6.0	

Stockpiled soil must be placed on bermed plastic and must be completely covered by plastic sheeting.

Will the excavated soil be returned to the excavation immediately after tank removal? [ ] yes [ ] no [x] unknown

If yes, explain reasoning ______________________________

If unknown at this point in time, please be aware that excavated soil may not be returned to the excavation without prior approval from Alameda County. This means that the contractor, consultant, or responsible party must communicate with the Specialist IN ADVANCE of backfilling operations.

16. Chemical methods and associated detection limits to be used for analyzing samples:
The Tri-Regional Board recommended minimum verification analyses and practical quantitation reporting limits should be followed.
See attached Table 2.

17. Submit Site Health and Safety Plan (See Instructions)

Contaminant Sought	EPA or Other Sample Preparation Method Number	EPA or Other Analysis Method Number	Method Detection Limit
Refer to attached Workplan, Section 6.2			

18. Submit Worker's Compensation Certificate copy

Name of Insurer Fireman's Fund

19. Submit Plot Plan ***(See Instructions)***

20. Enclose Deposit (See Instructions)

21. Report any leaks or contamination to this office within 5 days of discovery.
The written report shall be made on an Underground Storage Tank Unauthorized Leak/Contamination Site Report (ULR) form.

22. **Submit a closure report to this office within 60 days of the tank removal. The report must contain all information listed in item 22 of the instructions.**

23. Submit State (Underground Storage Tank Permit Application) Forms A and B (one B form for each UST to be removed) (mark box 8 for "tank removed" in the upper right hand corner)

I declare that to the best of my knowledge and belief that the statements and information provided above are correct and true.

I understand that information, in addition to that provided above, may be needed in order to obtain approval from the Environmental Protection Division and that no work is to begin on this project until this plan is approved.

I understand that any changes in design, materials or equipment will void this plan if prior approval is not obtained.

I understand that all work performed during this project will be done in compliance with all applicable OSHA (Occupational Safety and Health Administration) requirements concerning personnel health and safety. I understand that site and worker safety are solely the responsibility of the property owner or his agent and that this responsibility is not shared nor assumed by the County of Alameda.

Once I have received my stamped, accepted closure plan, I will contact the project Hazardous Materials Specialist at least three working days in advance of site work to schedule the required inspections.

CONTRACTOR INFORMATION

Name of Business Harding Lawson Associates

Name of Individual Andrew Keller, Consulting Principal Environmental Scientist

Signature [signature] Date 7/8/97

PROPERTY OWNER OR MOST RECENT TANK OPERATOR (Circle one)

Name of Business Monarch Industrial Park, Ltd.

Name of Individual Dennis B. Schmucker as Receiver

Signature [signature] Date 7-9-97

General Instructions

* Three (3) copies of this plan plus attachments and a deposit must be submitted to this Department.

* Any cutting into tanks requires local fire department approval.

* One complete copy of your approved plan must be at the construction site at all times; a copy of your approved plan must also be sent to the landowner.

* State of California Permit Application Forms A and B are to be submitted to this office. One Form A per site, one Form B for each removed tank.

Line Item Specific Instructions

2. SITE ADDRESS
   Address at which closure is taking place.

5. EPA I.D. NO. under which the tanks will be manifested
   EPA I.D. numbers may be obtained from the State Department of Toxic Substances Control, 916/324-1781.

6. CONTRACTOR
   Prime contractor for the project.

10. STATE REGISTERED HAZARDOUS WASTE TRANSPORTERS/FACILITIES

    a) All residual liquids and sludges are to be removed from tanks before tanks are inerted.

    c) Tanks must be hauled as hazardous waste.

    d) This is the place where tanks will be taken for cleaning.

15. TANK HISTORY AND SAMPLING INFORMATION
    Use History - This information is essential and must be accurate. Include tank installation date, products stored in the tank, and the date when the tank was last used.

    Material to be sampled - e.g. water, oil, sludge, soil, etc.

    Location and depth of samples - e.g. beneath the tank a maximum of two feet below the native soil/backfill interface, side wall at the high water mark, etc.

16. <u>CHEMICAL METHODS AND ASSOCIATED DETECTION LIMITS</u>
See attached Table 2.

17. <u>SITE HEALTH AND SAFETY PLAN</u>
A <u>site specific</u> Health and Safety plan must be submitted. We advocate the site health and safety plan include the following items, at a minimum:

a) The name and responsibilities of the site health and safety officer;

b) An outline of briefings to be held before work each day to appraise employees of site health and safety hazards;

c) Identification of health and safety hazards of each work task. Include potential fire, explosion, physical, and chemical hazards;

d) <u>For each hazard</u>, identify the action levels (contaminant concentrations in air) or physical conditions which will trigger changes in work habits to ensure workers are not exposed to unsafe chemical levels or physical conditions;

e) Description of the work habit changes triggered by the above action levels or physical conditions;

f) Frequency and types of air and personnel monitoring - along with the environmental sampling techniques and instrumentation - to be used to detect the above action levels. Include instrumentation maintenance and calibration methods and frequencies;

g) Confined space entry procedures (if applicable);

h) Decontamination procedures;

i) Measures to be taken to secure the site, excavation and stockpiled soil during and after work hours (e.g. barricades, caution tape, fencing, trench plates, plastic sheeting, security guards, etc.);

j) Spill containment/emergency/contingency plan. Be sure to include emergency phone numbers, the location of the phone nearest the site, and directions to the hospital nearest the site;

k) Documentation that all site workers have received the appropriate OSHA approved trainings and participate in appropriate medical surveillance per 29 CFR 1910.120; and

l) A page for employees to sign acknowledging that they have read and will comply with the site health and safety plan.

The safety plan must be distributed to all employees and contractors working in hazardous waste operations on site. **A complete copy of the site health and safety plan along with any standard operating procedures shall be on site and accessible at all times.**

Hazardous Waste Operations and Emergency Response; Final Rule, March 6, 1989. Safety plans of certain underground tank sites may need to meet the complete requirements of this Rule.

19. PLOT PLAN
The plan should consist of a scaled view of the facility at which the tank(s) are located and should include the following information:

a) Scale;

b) North Arrow;

c) Property Lines;

d) Location of all Structures;

e) Location of all relevant existing equipment including tanks and piping to be removed and dispensers;

f) Streets;

g) Underground conduits, sewers, water lines, utilities;

h) Existing wells (drinking, monitoring, etc.);

i) Depth to ground water; and

j) All existing tank(s) and piping in addition to the tank(s) being removed.

20. DEPOSIT
A deposit, payable to "County of Alameda" for the amount indicated on the Alameda County Underground Storage Tank Fee Schedule, must accompany the plans.

21. Blank Unauthorized Leak/Contamination Site Report forms may be obtained in limited quantities from this office or from the San Francisco Bay Regional Water Quality Control Board (510/286-1255). Larger quantities may be obtained directly from the State Water Resources Control Board at (916) 739-2421.

22. TANK CLOSURE REPORT
The tank closure report should contain the following information:

a) General description of the closure activities;

b) Description of tank, fittings and piping conditions. Indicate tank size and former contents; note any corrosion, pitting, holes, etc.;

c) Description of the excavation itself. Include the tank and excavation depth, a log of the stratigraphic units encountered within the excavation, a description of root holes or other potential contaminant pathways, the depth to any observed ground water, descriptions and locations of stained or odor-bearing soil, and descriptions of any observed free product or sheen;

d) Detailed description of sampling methods; i.e. backhoe bucket, drive sampler, bailer, bottle(s), sleeves

e) Description of any remedial measures conducted at the time of tank removal;

f) To-scale figures showing the excavation size and depth, nearby buildings, sample locations and depths, and tank and piping locations. Include a copy of the plot plan prepared for the Tank Closure Plan under item 19;

g) Chain of custody records;

h) Copies of signed laboratory reports;

i) Copies of "TSDF to Generator" Manifests for all hazardous wastes hauled offsite (sludge, rinsate, tanks and piping, contaminated soil, etc.); and

j) Documentation of the disposal of/and volume and final destination of all non-manifested contaminated soil disposed offsite.

TABLE #2
RECOMMENDED MINIMUM VERIFICATION ANALYSES FOR UNDERGROUND TANK LEAKS

HYDROCARBON LEAK	SOIL ANALYSIS		WATER ANALYSIS	
Unknown Fuel	TPH G	GCFID(5030)	TPH G	GCFID(5030)
	TPH D	GCFID(3550)	TPH D	GCFID(3510)
	BTX&E	8020 or 8240	BTX&E	602, 624 or 8260
	TPH AND BTX&E 8260			
Leaded Gas	TPH G	GCFID(5030)	TPH G	GCFID(5030)
	BTX&E	8020 OR 8240	BTX&E	602 or 624
	TPH AND BTX&E 8260		TOTAL LEAD AA	
	TOTAL LEAD AA			
	------Optional-------			
	TEL	DHS-LUFT	TEL	DHS-LUFT
	EDB	DHS-AB1803	EDB	DHS-AB1803
Unleaded Gas	TPH G	GCFID(5030)	TPH G	GCFID(5030)
	BTX&E	8020 or 8240	BTX&E	602, 624 or 8260
	TPH AND BTX&E 8260			
Diesel, Jet Fuel and Kerosene	TPH D	GCFID(3550)	TPH D	GCFID(3510)
	BTX&E	8020 or 8240	BTX&E	602, 624 or 8260
	TPH AND BTX&E 8260			
Fuel/Heating Oil	TPH D	GCFID(3550)	TPH D	GCFID(3510)
	BTX&E	8020 or 8240	BTX&E	602, 624 or 8260
	TPH AND BTX&E 8260			
Chlorinated Solvents	CL HC	8010 or 8240	CL HC	601 or 624
	BTX&E	8020 or 8240	BTX&E	602 or 624
	CL HC AND BTX&E 8260		CL HC AND BTX&E 8260	
Non-chlorinated Solvents	TPH D	GCFID(3550)	TPH D	GCFID(3510)
	BTX&E	8020 or 8240	BTX&E	602 or 624
	TPH AND BTX&E 8260		TPH and BTX&E 8260	
Waste and Used Oil or Unknown (All analyses must be completed and submitted)	TPH G	GCFID(5030)	TPH G	GCFID(5030)
	TPH D	GCFID(3550)	TPH D	GCFID(3510
	TPH AND BTX&E 8260			
	O & G	5520 D & F	O & G	5520 B & F
	BTX&E	8020 or 8240	BTX&E	602, 624 or 8260
	CL HC	8010 or 8240	CL HC	601 or 624
	ICAP or AA TO DETECT METALS: Cd, Cr, Pb, Zn, Ni			
	METHOD 8270 FOR SOIL OR WATER TO DETECT:			
	PCB*		PCB	
	PCP*		PCP	
	PNA		PNA	
	CREOSOTE		CREOSOTE	

* If found, analyze for dibenzofurans (PCBs) or dioxins (PCP)

Reference: Tri-Regional Board Staff Recommendations for Preliminary Evaluation and Investigation of Underground Tank Sites, 10 August 1990

EXPLANATION FOR TABLE #2: MINIMUM VERIFICATION ANALYSIS

1. OTHER METHODOLOGIES are continually being developed and as methods are accepted by EPA or DHS, they also can be used.

2. For DRINKING WATER SOURCES, EPA recommends that the 500 series for volatile organics be used in preference to the 600 series because the detection limits are lower and the QA/QC is better.

3. APPROPRIATE STANDARDS for the materials stored in the tank are to be used for all analyses on Table #2. For instance, seasonally, there may be five different jet fuel mixtures to be considered.

4. To AVOID FALSE POSITIVE detection of benzene, benzene-free solvents are to be used.

5. TOTAL PETROLEUM HYDROCARBONS (TPH) as gasoline (G) and diesel (D) ranges (volatile and extractible, respectively) are to be analyzed and characterized by GCFID with a fused capillary column and prepared by EPA method 5030 (purge and trap) for volatile hydro- carbons, or extracted by sonication using 3550 methodology for extractable hydrocarbons. Fused capillary columns are preferred to packed columns; a packed column may be used as a "first cut" with "dirty" samples or once the hydrocarbons have been characterized and proper QA/QC is followed.

6. TETRAETHYL LEAD (TEL) analysis may be required if total lead is detected unless the determination is made that the total lead concentration is geogenic (naturally occurring).

7. CHLORINATED HYDROCARBONS (CL HC) AND BENZENE, TOLUENE, XYLENE AND ETHYLBENZENE (BTX&E) are analyzed in soil by EPA methods 8010 and 8020 respectively, (or 8240) and in water, 601 and 602, respectively (or 624).

8. OIL AND GREASE (O & G) may be used when heavy, straight chain hydrocarbons may be present. Infrared analysis by method 418.1 may also be acceptable for O & G if proper standards are used. Standard Methods" 17th Edition, 1989, has changed the 503 series to 5520.

9. PRACTICAL QUANTITATION REPORTING LIMITS are influenced by matrix problems and laboratory QA/QC procedures. Following are the Practical Quantitation Reporting Limits:

	SOIL PPM	WATER PPB
TPH G	1.0	50.0
TPH D	1.0	50.0
BTX&E	0.005	0.5
O & G	50.0	5,000.0

Based upon a Regional Board survey of Department of Health Services Certified Laboratories, the Practical Quantitation Reporting Limits are attainable by a majority of laboratories with the exception of diesel fuel in soils. The Diesel Practical Quantitation Reporting Limits, shown by the survey, are:

ROUTINE	MODIFIED PROTOCOL
≤ 10 ppm (42%)	≤ 10 ppm (10%)
≤ 5 ppm (19%)	≤ 5 ppm (21%)
≤ 1 ppm (35%)	≤ 1 ppm (60%)

When the Practical Quantitation Reporting Limits are not achievable, an explanation of the problem is to be submitted on the laboratory data sheets.

10. LABORATORY DATA SHEETS are to be signed and submitted and include the laboratory's assessment of the condition of the samples on receipt including temperature, suitable container type, air bubbles present/absent in VOA bottles, proper preservation, etc. The sheets are to include the dates sampled, submitted, prepared for analysis, and analyzed.

11. IF PEAKS ARE FOUND, when running samples, that do not conform to the standard, laboratories are to report the peaks, including any unknown complex mixtures that elute at times varying from the standards. Recognizing that these mixtures may be contrary to the standard, they may not be readily identified; however, they are to be reported. At the discretion of the LIA or Regional Board the following information is to be contained in the laboratory report:

    The relative retention time for the unknown peak(s) relative to the reference peak in the standard, copies of the chroma- togram(s), the type of column used, initial temperature, temperature program is C/minute, and the final temperature.

12. REPORTING LIMITS FOR TPH are: gasoline standard ≤ 20 carbon atoms, diesel and jet fuel (kerosene) standard ≤ 50 carbon atoms. It is not necessary to continue the chromatography beyond the limit, standard, or EPA/DHS method protocol (whichever time is greater).

EPILOGUE

ADDITIVES: Major oil companies are being encouraged or required by the federal government to reformulate gasoline as cleaner burning fuels to reduce air emissions. MTBE (Methyl-tertiary butyl ether), ETHANOL (ethyl alcohol), and other chemicals may be added to reformulate gasolines to increase the oxygen content in the fuel and thereby decrease undesirable emissions (about four percent with MTBE). MTBE and ethanol are, for practical purposes, soluble in water. The removal from the water column will be difficult. Other compounds are being added by the oil companies for various purposes. The refinements for detection and analysis for all of these additives are still being worked out. If you have any questions about the methodology, please call your Regional Board representative.

ALAMEDA COUNTY ENVIRONMENTAL PROTECTION DIVISION

DECLARATION OF SITE ACCOUNT REFUND RECIPIENT

There may be excess funds remaining in the Site Account at the completion of this project. The PAYOR (person or company that issues the check) will use this form to predesignate another party to receive any funds refunded at the completion of this project. In the absence of this form, the PAYOR will receive the refund.

SITE INFORMATION:

Site ID Number
(if known)

Name of Site

Street Address

City, State & Zip Code

I designate the following person or business to receive any refund due at the completion of all deposit/refund projects:

Name

Street Address

City, State & Zip Code

Signature of Payor

Date

Name of Payor
(PLEASE PRINT CLEARLY)

Company Name of Payor

RETURN FORM TO:

County of Alameda, Environmental Protection
1131 Harbor Bay Parkway, Rm 250
Alameda CA 94502-6577
Phone#(510) 567-6700

rev.4/6/95;closure.pln\RW

APPENDIX C

UST REMOVAL FORMS A AND B

(to be provided under separate cover)

APPENDIX D

SOIL SAMPLING PROCEDURES

APPENDIX D

SOIL SAMPLING PROCEDURES

This appendix describes the soil sampling procedures likely to be utilized by HLA as part of implementation of the workplan.

HLA's field investigation will include soil classification and soil sampling. All field work will be performed by either an HLA geologist or engineer and HLA-supervised subcontractors.

Soil borings will be drilled using a 20- or 25-ton cone penetrometer test (CPT) rig. An HLA geologist or engineer will observe the soil sampling and log the soil from the CPT borings. Soils will be monitored with an OVA or PID and classified in accordance with the USCS.

CPT soil borings will be sampled according to the workplan using a piston-type soil sampler (1.25-inch-inside-diameter). Each sampler will be lined with four 6-inch-long stainless-steel tubes.

The CPT rig utilizes a dual-piston, hydraulic ram to deploy the 2.5-inch-outside-diameter rod and soil sampler assembly through the specially designed opening in the floor of the CPT rig. Samples are obtained by advancing the soil sampler into the native soil in a "closed" position to the desired depth interval. The inner cone tip portion of the sampler is then retracted to a locked position leaving a hollow sample tube lined with stainless steel liners. The hollow sampler is then pushed to collect a soil sample. Generally, soil recovery ranges from one-and-a-half or two sample tubes, depending on soil type and degree of saturation. The filled sampler and deployment rods are then retrieved to the interior of the CPT rig through opening in the floor.

Multiple depths will be sampled by retracting the deployment rods between each desired sample interval, attaching and readvancing a clean sampler to the next sample interval.

After retrieving and opening the sampler, samples from the shoe and second tube will be placed in a Ziploc bag and monitored for volatile organic vapors using a PID or an OVA. The PID will be equipped with a 10.2-electron-volt lamp and will be calibrated each day against an isobutylene (benzene equivalent) standard. After monitoring and classifying, the soil in the bags will be discarded into the roll-off bin or onto the stockpiled soil.

The bottom sample tube from each sampling interval will be sealed with Teflon-lined plastic caps, labeled, placed in a Ziploc bag, and stored on ice in a field cooler. Samples will be described with respect to their color, soil type, moisture, and other characteristics such as grain size, particle shape, cementation, plasticity, stratification, presence of organic matter, and contaminant stain. Sample descriptions will be recorded on the daily field log for each boring. All samples submitted for analysis will be handled under chain-of-custody protocol.

To minimize the potential for cross-contamination, steam-cleaned augers will be used for each boring, and all sampling equipment will be washed with a Liqui-Nox and water solution and rinsed with potable water between each sampling interval. No soil residuals are created by CPT borings. Approximately 5 gallons of water residuals derived from cleaning will be added to the investigation derived soil residuals from drilled borings.

APPENDIX E

SAMPLE TRACKING, STORAGE, AND HANDLING

APPENDIX E

SAMPLE TRACKING, STORAGE, AND HANDLING

1.0 PURPOSE

The purpose of this procedure is to describe the process for sample handling, inventory, and processing. This procedure applies to all samples obtained during site investigation activities.

2.0 SCOPE

Numerous samples will be collected during the soil investigation. These samples will be sent to a chemical laboratory for analysis and some will be retained for possible future analysis. This procedure describes the handling and processing controls imposed on those samples that arrive at HLA offices for storage and/or analysis.

3.0 EQUIPMENT AND MATERIALS

The following equipment and materials will be utilized during soil sample handling, inventory, and processing:

- Completed boring log
- Red pen
- Completed Chain-of-custody (COC) forms

4.0 PROCEDURES

4.1 Sample Handling

1. After each sample is collected, the COC form will be filled out for all samples. The sample identification number will be placed in the station described/notes columns. A different COC form will be filled out for each laboratory receiving samples.

2. Sample tags will be filled out and affixed to tubes, poly or glass jars

3. Sample containers pending chemical analysis will be placed in a cooler, on ice, until transported to the laboratory or HLA office. Samples for chemical analysis will be delivered to the laboratory within 24 hours of collection.

4. The field geologist/engineer responsible for sample collection will fax a copy of the COC form to the responsible geologist/engineer.

4.2 Laboratory Testing

1. The responsible geologist/engineer will check for COC form to ensure that the correct tests have been requested.

2. The responsible geologist/engineer then will notify the field engineer/geologist, who in turn will notify the laboratory that samples are ready for pickup, and the laboratory will arrange for sample transportation. The engineer/geologist may alternately transfer the samples to the laboratory directly from the field.

3. The white copy of the COC form will be signed by the laboratory upon sample receipt. HLA will retain two copies of the COC form (pink copy returned with results).

APPENDIX F

GROUNDWATER MONITORING AND SAMPLING PROCEDURE

APPENDIX F

GROUNDWATER MONITORING AND SAMPLING FIELD PROCEDURES

FIELD PROCEDURES

Groundwater Monitoring

Groundwater levels will be measured using an electronic well sounder. The electronic sounder uses a tape marked in 1-foot increments and intermediate 0.01-foot intervals. Groundwater levels will be recorded to the nearest 0.01 foot from an established measuring point on the top of the monitoring well casing.

Total well depth will be measured by lowering the electronic sounder to the bottom of the monitoring well. Depth to water will be measured directly off the tape from the measuring point on the top of the well casing. To assure that accurate readings will be taken, the electronic sounder will be raised and lowered two or three times before recording the measurement on the groundwater sampling form. The monitoring equipment will be cleaned between wells by washing with Liqui-Nox and rinsing with deionized water.

Monitoring Well Purging

The volume of groundwater to be purged from each monitoring well will be calculated based on casing volume. The purge water volume will be recorded on the groundwater sampling form. The objective of each purging cycle will be to remove a minimum of three to four well-casing volumes of water from the well before collecting a sample.

The wells will be pumped by attaching a 1/2-inch-diameter, clear polyvinyl chloride (PVC) hose to the submersible pump and lowering the pump into the monitoring well.

During pumping, the pump will be lowered to approximately 5 to 10 feet below the static water level in the monitoring well. As groundwater is extracted from the well, the temperature, pH, and electrical conductivity (EC) will be measured.

To minimize the potential for cross contamination, the purging equipment will be washed with Liqui-Nox and triple-rinsed with deionized water between wells.

Purge Water Handling and Disposal

Groundwater purged from the monitoring wells and the rinsate water will be stored onsite pending analytical results. The purged water will be appropriately disposed upon receipt of all analytical data.

Groundwater Sample Collection

A groundwater sample will be collected from the monitoring well after a minimum of three to four well-casing volumes of water has been removed and the temperature, pH, and EC had stabilized.

After purging is completed, the wells will be allowed to recover to within 80 percent of their prepurge level before samples will be collected.

The monitoring wells will be sampled using a 1.5-inch-diameter Teflon bailer with a bottom check ball. The wells will be sampled in the same order as they will be purged. The bailer will be lowered to the approximate location of the pump intake. The water sample will be decanted from the bottom of the bailer into two 40-milliliter glass sample vials using a sampling port. The vials will be carefully filled to avoid overflow. The vials will be immediately sealed with Teflon-lined screw lids so that the formation of air bubbles will be avoided. Once the vial is sealed, it will be inverted to ensure that no air bubbles have been trapped. If air bubbles are present, the water sample will be discarded, and the procedure will be repeated until two vials are collected. To minimize the potential for cross contamination, the sampling bailer will be washed with Liqui-Nox and triple-rinsed with deionized water between monitoring wells.

Once collected, the samples will be labeled with the monitoring well identification number and the date and time of sample collection. The samples will be double-bagged in plastic Ziploc bags and immediately placed in an ice chest filled with "blue ice" or equivalent. The samples will be recorded on a chain-of-custody form prepared and signed by the person(s) collecting the samples. Prior to shipment, the samples will be carefully packed with foam padding to avoid breakage of the sample vials during transport. The cooler will be securely strapped with shipping tape. The samples will be then shipped with the chain-of-custody form for overnight delivery to the state-certified laboratory performing the analyses.

Quality Assurance and Quality Control of Field Procedures

During the field work, written field reports will be prepared daily, documenting the work activities and any unusual events or occurrences. Groundwater monitoring and sampling report forms will be also prepared. At the end of each sampling day or as soon as possible, the written reports and the groundwater monitoring and sampling reports will be reviewed by the task manager for completeness and accuracy of data collected. Any unusual occurrences or discrepancies in the field work performed will be noted by the task manager on the written reports and on the groundwater monitoring and sampling reports. The task manager will communicate any discrepancies to the field personnel to verify the reports prior to beginning the following day's field work.

Quality Assurance and Quality Control Samples

To provide for quality assurance and quality control (QA/QC) documentation during the sampling, a minimum of one duplicate and one equipment rinsate blank will be collected. A trip blank may also be prepared in the field and/or by a state-certified laboratory and transported with the samples (if the trip blank is prepared in the field, distilled water will be used). The QA/QC samples will be labeled with a predetermined sample number and shipped with the other samples. To reduce the possibility of the QA/QC samples being identified by the laboratory performing the analyses, the QA/QC samples will be recorded on the same chain-of-custody form used for the other samples.

DISTRIBUTION

FINAL
Workplan
Former Hummingbird Haven Glider Airport
Livermore, California

July 8, 1997

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