March 20, 1996

SOIL REMEDIATION WORKPLAN

625 HEGENBERGER ROAD
OAKLAND, CALIFORNIA

3-20-96

Prepared For:

Diversified Investment Management Group
400 Oyster Point Blvd.
South San Francisco, California

Prepared By:

All Environmental, Inc.
2641 Crow Canyon Road
San Ramon, CA 94583

ALL ENVIRONMENTAL, INC.
Environmental Engineering & Construction

March 20, 1996

Mr. Barney Chan
Alameda County Health Care Services Agency
Department of Environmental Health
Division of Hazardous Materials
80 Swan Way, Room 200
Oakland, CA 94621

Subject: **Soil Remediation**
625 Hegenberger Road
Oakland, California

Dear Mr. Chan:

Enclosed is the proposed Soil Remediation Workplan for the above referenced site. If you approve this workplan, AEI anticipates beginning the field work in the first week of April. If you have any question please feel free to contact the either of the undersigned.

Sincerely,

Joseph P. Derhake, CAC, EIT
Project Manager

Michael Carey
Senior Geologist
CEG 1351

CERTIFIED ENGINEERING GEOLOGIST
MICHAEL C. CAREY
C.E.G. 1351
EXP: 10-29-96
STATE OF CALIFORNIA

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1.0 Introduction

This workplan is prepared on behalf of Diversified Investment Management Corporation, the owners of the subject site. The workplan sets forth a methods for the removal of contaminated soil, the on-site remediation of that soil through aeration, and the eventual reuse of the soil on-site. In general, this workplan will be the fulfillment of Draft Levine Fricke Work Order, included in Appendix A. With the one notable modification being the action level to which AEI proposes to excavate.

Technical decisions made for this workplan were based on data included in Levine Fricke's "Report on a Supplemental Site Investigation and a Conceptual Remediation Plan," dated April of 1995 and on the quarterly monitoring reports prepared by Levine Fricke (LF) and by All Environmental, Inc. (AEI).

This workplan is being submitted to Alameda County Health Care Services Agency (ACHCSA) for their formal concurrence with the recommended remediation procedures and the re-use of the soil on-site.

2.0 Site History

The site, located at the corner of Hegenberger Road and Collins Drive in Oakland, California (See Figure 1), is a former fuel service station. The automobile tune-up shop and convenience store, which has occupied the site since the closure of the service station, are no longer in business. The cinder block building, which once contained the convenience store and automobile tune-up shop, is scheduled to be demolished.

In October 1993, three underground storage tanks (USTs) and related structures were removed from the site under the observation of LF. Approximately 300 cubic yards (cy) of soil excavated during the UST removal is being stored on-site until a treatment plan is implemented. Soil has been set on bermed plastic and covered completely with plastic, in accordance with the UST Closure Plan.

LF and Subsurface Consultants have performed shallow soil borings, and groundwater investigations, which included drilling soil borings, installing six groundwater monitoring wells, and collecting and analyzing soil and groundwater samples.

The quarterly monitoring of the six monitoring wells on-site was performed by LF through January of 1995. AEI began monitoring the wells in October of 1995 and has implemented an ongoing quarterly monitoring program. Reports for quarterly monitoring events in October of 1995 and January of 1996 were submitted to ACHCSA.

Results of the soil investigations, indicated that total petroleum hydrocarbons as gasoline (TPHg), the gasoline constituents benzene, toluene, and ethylbenzene, and xylene (BTEX), total petroleum hydrocarbons as diesel (TPHd), and total petroleum hydrocarbons as oil (TPHo) are present in elevated concentrations at the site.

3.0 Objectives

This workplan is designed to meet the following objectives: 1) to remediate soils, which may be considered a source of continued groundwater contamination; 2) to remove contaminants, which may complicate future development of the subject site.

Once the objectives are fulfilled and the cleanup goals are met, AEI believes this site should expeditiously be considered for closure, with the exception of the requirement for ongoing groundwater monitoring.

Once the remedial goals for soil set forth herein are met, the concentrations of hydrocarbons in groundwater are likely to attenuate.

3.1 Proposed Cleanup Goals

In 1995 the ACHCSA approved the following cleanup criteria for unsaturated zone soils at the site:

Compounds	Soil Approved Cleanup Level
Total BTEX	1 milligram per kilogram (mg/Kg)
TPHg	100 mg/Kg
TPHd	500 mg/Kg
TPHo	1,000 mg/Kg.

In light of the recently published Lawrence Livermore National Laboratory's (LLNL) "Recommendations to Improve the Cleanup Process of California's Leaking Underground Fuel Tanks" (October 1995); the December 8, 1995 letter from the State Water Resource Control Board Executive Director, Walt Pettit, recommending closure of low risk soil and groundwater sites; and the January 5, 1996 memorandum from Loretta K. Barsamian, Executive Director of the San Francisco Bay Regional Water Quality Control Board (SFBRWQCB), concurring with the LLNL study and providing supplemental instructions for the cleanup of low risk sites; AEI recommends the application of less stringent action levels.

The objective of this project will be to gain closure as a low risk groundwater site, as defined in the Supplemental Instructions from the SFBRWQCB. The Supplemental

Instructions provide for the following six criteria to be met by a site to be considered as a low risk soils case:

1. Removal of ongoing sources of soils contamination
2. The plume has been characterized adequately
3. The dissolved hydrocarbon plume is not migrating.
4. No water wells, deeper drinking aquifers, surface water, or other sensitive receptors are likely to be impacted.
5. The site presents no significant risk to human health.
6. The site presents no significant risk to the environment.

AEI believes that criteria two, four, and six are already been satisfied as shown in LF's "Report on a Supplemental Site Investigation and a Conceptual Remediation Plan."

In order to satisfy criteria number one, AEI recommends removing all soil with sufficient mobile constituents (leachate, vapors, or gravity flow) to degrade groundwater quality. As benzene is the most toxic compound in gasoline, AEI proposes to give additional emphasis to benzene concentrations.

As the cleanup level for benzene proposed below more than one order of magnitude lower than the EPA Proposed Remediation Goal (PRG), AEI believes this level is low enough to be protective to human health without additional risk assessment. Thus, AEI believes that the fulfillment of is workplan will satisfy criteria five.

Once this project is completed, only criteria three will remain unsatisfied. AEI believes that once the source of groundwater contamination is removed, future groundwater monitoring will show the attenuation of hydrocarbon concentrations in the groundwater.

AEI recommends that the ACHCSA approve the following new action levels:

10^{-5} risk soil-vap from soil to bldg

Compound	Proposed Cleanup Level	Reuse level
Benzene	0.050 mg/Kg	.005
Total BTEX	1.0 mg/Kg	.1
TPHg	500 mg/Kg	50
TPHd	1000 mg/Kg	100
TPHo	1000 mg/Kg	100

must also analyze for (PAH's ?)

All soil above the target cleanup goals will be excavated and treated. Any soil which is excavated will be treated to a level one order of magnitude below the target cleanup levels prior to backfilling.

.05 B corresponds to 10^{-5} commercial S.V. from soil to bld - commercial

- GW cannot be used for drinking purposes
- Note if GW conc doesn't decrease a tier 2 evaluation will be necessary currently exceed 10^{-4} GW-volatilization to Bld → commercial (Q.14)

4.0 Remedial Method

4.1 Feasibility of On-Site Aeration

LF evaluated several alternatives for remediation of the impacted soil on the subject site. On-site aeration was found to be the most economical alternative. The soil has characteristics suitable for on-site aeration, as most of the contamination is TPHg.

4.2 Soil Excavation

AEI estimates that approximately 1,500 cy to 2,500 cy of soil will need to be removed and aerated to reach the cleanup levels proposed in Section 3. As the excavation progresses, soil samples will be collected to document remaining TPH and BTEX concentrations, in the excavation sidewalls. One soil sample will be collected every 20 linear feet along the excavation walls and one soil sample will be collected every 400 square feet of the excavation floor. If groundwater enters the excavation, floor excavation samples will not be collected.

OK

In order to minimize sampling expense, AEI will use soil screening techniques to field screen soil samples. The field engineer will monitor the limits of the excavation for the presence of obviously affected soil. Soil samples will be screened in the field using an organic vapor meter (OVM) and a PetroFLAG field test kit. – what's this for?

Each soil spl above must be analyzed.

How is this determined?

Some of the overburden soil excavated will not need to be treated. AEI will excavate uncontaminated overburden soil and stockpile it in discrete piles, avoiding mixing soil from different locations. AEI will collect ten soil samples for screening per 100 cy excavated. The two locations with the highest field screening readings will be sampled for laboratory analysis. If the laboratory analysis reveals levels below the proposed cleanup levels, then the material will be used as backfill.

"uncontaminated?" not acceptable

AEI's field engineer will be on-site during the excavation and will document all construction activities by completing daily work reports and by taking photographs. The photographs and daily work reports will be submitted with the closure report.

The contaminated soil will be stockpiled on six mil plastic sheets and covered with plastic. The soil will be profiled by the method described in Section 4.4.1.

4.3 Soil Contaminated with TPH Diesel and TPH Oil

AEI anticipates excavating approximately 150 cy of soil contaminated with heavier hydrocarbons, TPHd and TPHo. Data from the several subsurface investigations and soil screening data collected in the field with the PetroFLAG test kit will be used to distinguish this soil in the field.

Soil contaminated with heavier hydrocarbon is not suitable for on-site aeration; therefore, the soil will be disposed of off-site. All of the soil will be manifested and the manifests will be included in the final report.

4.4 On-site Aeration Procedure

The aeration will consist of the following seven tasks: 1) baseline sampling, 2) air monitoring and engineering controls; 3) construction of the aeration cell, 4) spreading the soil within the aeration cell, 5) tilling the soil, 6) measuring contamination reduction, and 7) confirmation sampling.

AEI does not anticipate vapor concentration in the air around the perimeter of the stockpiled soil to reach levels which could be dangerous to public health. Nevertheless, during the aeration process AEI will implement an air monitoring program, which will monitor the vapor levels around the perimeter of the aeration cell. If vapor levels are higher than expected, AEI will discontinue aeration and implement changes in the remedial methods.

As the soil aeration will be done during the summer months, AEI does not anticipate any significant surficial runoff from the aeration cell during the aeration process. If a significant amount of runoff does occur, ~~storm water runoff samples will be collected and~~ risks to human health will be evaluated. Waste S.W. issue, ~~Contact OFD.~~

4.4.1 Baseline Sampling

AEI will collect twelve to sixteen soil samples from the excavated soil. Every four samples will be composited into one and analyze in the laboratory for TPHg and BTEX. The results of the baseline analysis will be used to determine how much soil can be exposed at once within BAAQMD regulations. ok

The samples will be sent to a California State Certified Laboratory for analysis for the following, as appropriate.

- TPHg/BTEX by EPA Method 8020/8015 modified;
- TPHo by EPA Method 3550;
- TPHd by EPA Method 8015 modified.

4.4.2 Air Monitoring Program and Engineering Controls

In order to protect the general public and on-site personnel from exposure to vapors, AEI proposes the following air monitoring program. The air will be monitored during times of maximum exposure, specifically during soil excavation, soil placement, and soil tilling. Once a precedent is established, the frequency of the air monitoring events will be determined.

Real time air data will be collected using an OVM. In order to be conservative, AEI will compare the vapor levels, which will consist of a mixture of volatile constituents within fuels, to the OSHA Permissible Exposure Limits (for workers exposed over an 8 hour period--time weighted average) for benzene, the most toxic of the gasoline constituents. The OSHA PEL for benzene is 1 part per million. In the event that a breathing zone vapor concentrations of 1 part per million are encountered, then workers will wear the appropriate personnel protective equipment.

Is this done?

In the event that vapor levels above 1 part per million are encountered along the perimeter of the workplace, AEI will make the necessary changes in the remedial methods. – exc. must stop if this is the case.

The following engineering controls will be applied to prevent exposure to the general public. Hay bales will be used to berm the soil to prevent runoff. In the event runoff does occur, the berm will be fixed to prevent further runoff. However, if runoff proves to be a problem the storm water will be sampled, the risk to the environment will be evaluated, and reporting requirements will be fulfilled.

The fence surrounding the aeration cell will be sufficient to restrict access and warning signs will be posted. A fence will be constructed ten feet from the aeration cell, in order to provide a buffer zone between the aerating soil and the general public. The buffer zone will provide considerable dilution of vapor concentrations in the air resulting from the aerating soil. this aeration zone should also be monitored. (how?)

All air monitoring and soil sampling data will be made available to interested parties upon request.

4.4.3 Construction of Aeration Cell

The aeration cells will be built on the north end of the property (see Figure 1 for the probable cell layout).

The aeration cell will consist of a six mill plastic bottom to prevent vertical contaminant migration. Hay bales will be used to line the perimeter, preventing water from flowing in or out of the aeration cell. The size and number of cells will be a function of the contamination levels revealed in the baseline sampling results and the resulting limits as defined by BAAQMD Regulation 8 Rule 40.

4.4.4 Soil Tilling

Soil tilling will be performed to expedite the aeration process. Soil tilling will consist of discing the soil and/or turning the soil with the appropriate equipment. During tilling events the air monitoring program described above will be implemented for the perimeter and on-site personnel. Professional judgment will be used in evaluating the data collected, to determine the necessity of vapor level monitoring throughout the entire project.

Soil placement and soil tilling are regulated by BAAQMD, Regulation 8, Rule 40. AEI will use the results of the baseline sampling to determine how much soil can be aerated within BAAQMD's standards (8-40-301).

4.4.5 Progress Evaluation

Soil samples will be collected in order to evaluate progress and eventually to signal completion of the project. In order to minimize laboratory expenses, an OVM will be used to screen the soil samples in the field.

4.4.6 Confirmation Sampling

Once the progress evaluations have shown that the contaminant levels have dropped an order of magnitude below the target cleanup level, AEI will conduct confirmation sampling. AEI will collect one soil sample per 50 in place yards of soil. Confirmitory sampling results will be evaluated using "EPA Methods of Evaluating the Attainment of Cleanup Standards" to assess whether additional sampling and analysis should be conducted.

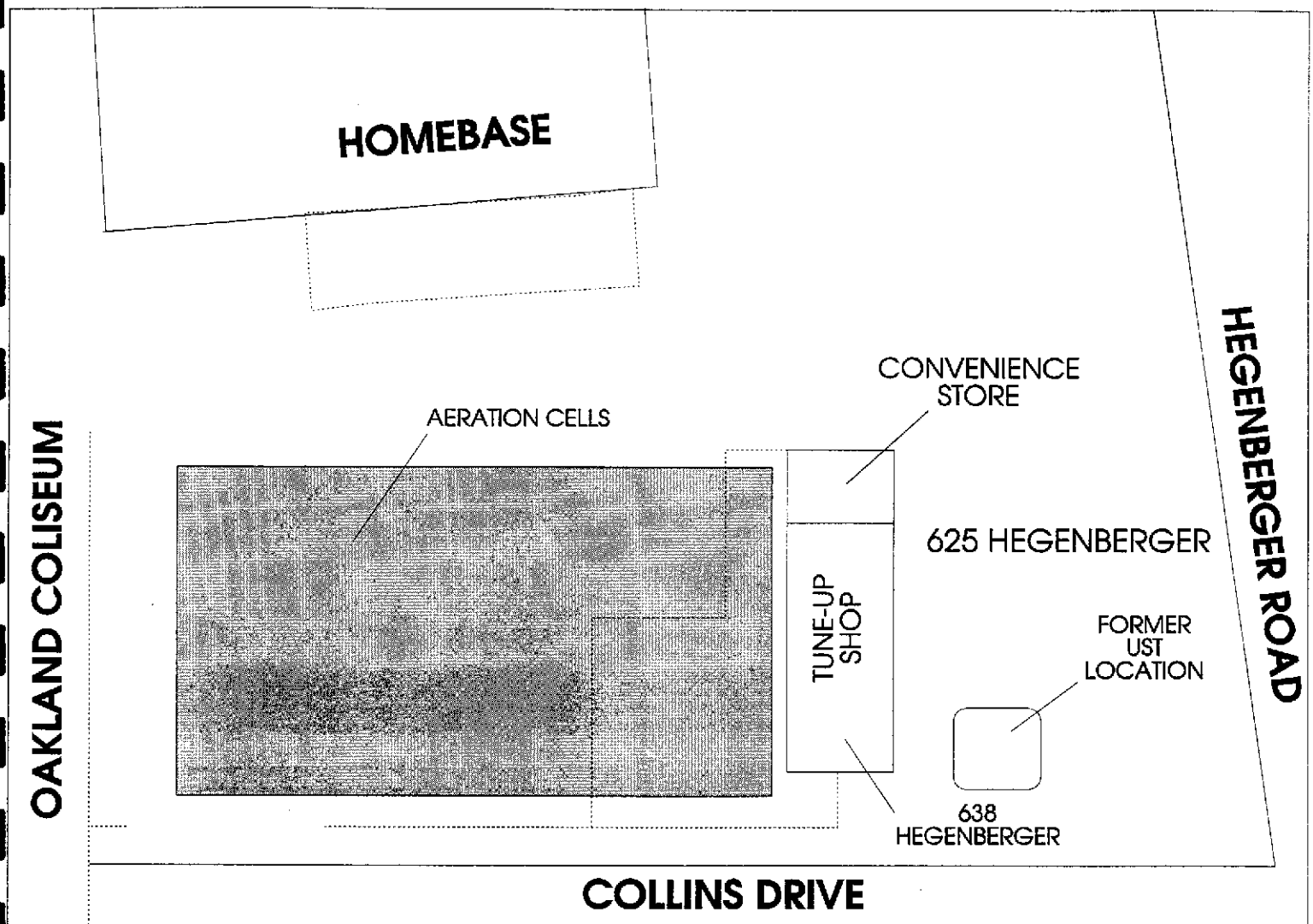
what's this?
SW846

5.0 Soil Reuse

The remediated soil will be place back into the excavation from which it came. The soil will be compacted to 90% compaction.

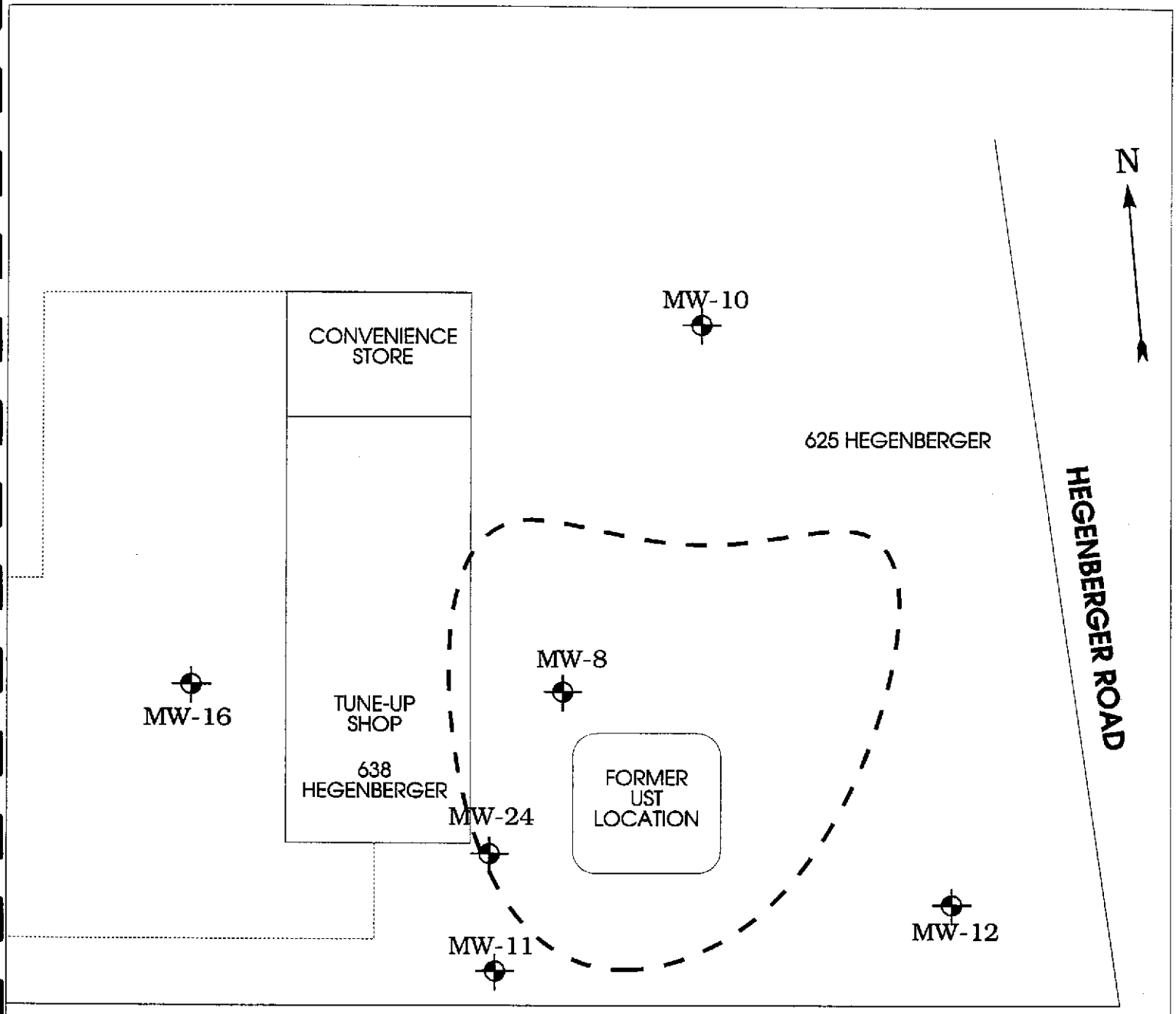
Laboratory results documenting the TPHg and BTEX concentrations in remediated soil will be provided to ACHCSA prior to placing the soil.

1) MWs to be destroyed? (L+F said 11, 12 + 8 would be)
2) verify # of confirmation soils.



N

ALL ENVIRONMENTAL, INC. 2641 CROW CANYON ROAD, SAN RAMON, CA		
SCALE: NOT TO SCALE		REVISED BY:
DATE: MAR, 1996		APPROVED BY:
GENERAL SITE AREA		
625 Hegenberger Road, Oakland		FIGURE 1



0 20 40 FEET

SCALE: 1" = 40'

Proposed Area of Likely Excavation
Benzene: >0.050mg/Kg
TPHg: >500mg/Kg

MW-8 Monitoring Well

ALL ENVIRONMENTAL, INC. 2641 CROW CANYON ROAD, SAN RAMON, CA		
DRAWN BY: B. CAMPBELL		REVISED BY:
DATE: MAR, 1996		APPROVED BY:
PROPOSED AREA OF LIKELY EXCAVATION		
625 Hegenberger Road, Oakland		FIGURE 2

INTRODUCTION

This work order presents Levine•Fricke's proposed scope of work and estimated budget to provide consulting services related to the remediation of petroleum-affected soil at the former fuel station site located at 625 Hegenberger Road, Oakland, California ("the Site"; Figure 1). Levine•Fricke has prepared this work order in accordance with a request from Mr. James Graeb of Diversified Investment and Management Corp (DI). The work order is based upon Levine•Fricke's "Report on a Supplemental Site Investigation and a Conceptual Remediation Plan," which was submitted to Mr. Barney Chan of Alameda County Health Care Services Agency (ACHCSA) on April 5, 1995.

BACKGROUND

The Site, located at the corner of Hegenberger Road and Collins Drive in Oakland (Figure 1), is a former fuel service station. An active automobile tuneup shop and convenience store are currently adjacent to the former fuel service station location.

In October 1993, three underground storage tanks (USTs) and related structures were removed from the Site under the observation of Levine•Fricke (Levine•Fricke 1994a). Approximately 300 cubic yards (cy) of soil excavated during the UST removal is being stored on site until a treatment plan is implemented. Soil has been set on bermed plastic and covered completely with plastic, in accordance with the UST Closure Plan.

Levine•Fricke and Subsurface Consultants have performed shallow soil and ground-water investigations which included drilling soil borings, installing ground-water monitoring wells, and collecting and analyzing soil and ground-water samples. Six ground-water monitoring wells are located on the Site and a quarterly ground-water monitoring program has been implemented.

Results of shallow soil sampling and ground-water monitoring, as well as soil and ground-water sampling conducted during the UST removal, indicate that total petroleum hydrocarbons as gasoline (TPHg), the gasoline constituents benzene, toluene, ethylbenzene, and toluene (BTEX), total petroleum hydrocarbons as diesel (TPHd), and total petroleum hydrocarbons as oil (TPHo) are present at the Site above the approved cleanup criteria outlined below.

OBJECTIVES

The objective of the proposed scope of work is to remediate accessible petroleum-affected soil to the cleanup criteria approved by the ACHCSA. Excavated soil affected with TPHg and the BTEX compounds will be aerated on site as needed

to meet cleanup criteria and then used to backfill the excavation. Soil above the ground water affected with TPHd and/or TPHo above the cleanup criteria will be disposed of and/or treated.

APPROVED CLEANUP CRITERIA

The ACHCSA has approved the following cleanup criteria for unsaturated zone soils at the Site:

Compound	Level
Total BTEX Compounds	1 milligram per kilogram (mg/kg)
TPHg	100 mg/kg
TPHd	500 mg/kg
TPHo	1,000 mg/kg

PROPOSED SCOPE OF WORK

The scope of work consists of the following tasks.

Task 1: Preparation of Work Plan
Task 2: Preparation of Plans and Specifications
Task 3: Bid Period Services
Task 4: Preconstruction Activities
Task 5: Construction Management
Task 6: Management of Affected Soil
Task 6A: Aeration of Gasoline- and BTEX-Affected Soil
Task 6B: Stockpiling and Treatment of Oil and Grease-Affected Soil
Task 7: Laboratory Analyses
Task 8: Report Preparation
Task 9: Project Management and Regulatory Interface

These tasks are described below.

Task 1: Preparation of Work Plan

A work plan for remediation activities will be submitted to ACHCSA. The work plan will detail all activities related to excavation and treatment of petroleum-affected soil at the Site, as well as sampling protocol and backfill

requirements. This task includes preparation of the remedial work plan and response to agency comments (one letter).

Task 2: Preparation of Plans and Specifications

Levine•Fricke will prepare plans and specifications detailing field construction work for the project. We will prepare the necessary documents as one bid package for excavation, aeration of TPHg- or BTEX-affected soil, disposal or treatment of TPHd- and/or TPHo-affected soil, and backfilling of the excavation. The plans and specifications will include sufficient detail to allow competitive bidding of the project by qualified contractors.

The plans will include a site layout and two cross sections. Unit costs for loading, transportation, and disposal of TPHo-affected soil will be included in contractor bids.

The specifications will include contractual sections and technical specifications applicable to the construction. The contractual sections will include information for bidders, general conditions, special conditions, and the contract. The technical specifications will include sitework specifications such as aeration and backfilling specifications.

Task 3: Bid Period Services

Once the contract documents are approved by DI, Levine•Fricke will perform bid period services. These services include selecting and pre-qualifying bidders (with DI approval), issuing the construction contract for bid, conducting a site bid walk, answering bid questions, preparing an addendum to the plans and specifications (if needed), receiving and reviewing bids, and submitting a compiled bid value table to DI for selection of the contractor. Levine•Fricke will assist DI in the selection of a contractor based upon cost, experience, and understanding of the scope of work to be performed. It is anticipated that three to five contractors will be pre-qualified for bidding on the construction.

Task 4: Preconstruction Activities

Destroy Ground-Water Monitoring Wells. Because ground-water monitoring wells MW-11, MW-12, and MW-8 are in the proposed remediation area, these three monitoring wells will be properly destroyed and sealed before remediation begins under permit from the Alameda County Water Conservation District.

Conduct Preconstruction Meeting. Levine•Fricke will hold a preconstruction meeting with the excavation contractor to review the contractor's site use plan, work tasks for the project, contractual issues, and the proposed schedule. This task will

also include reviewing contractor submittals before the meeting and contractor interaction before the meeting.

Permits. Levine-Fricke will notify the Bay Area Air Quality Management District (BAAQMD) of excavation activities. Levine-Fricke will verify that the contractor has obtained the appropriate excavation permits from the City of Oakland.

Prepare Site Health and Safety Plan. Levine-Fricke will prepare a Health and Safety Plan (HSP) for its personnel at the Site to cover field activities to be performed under this work order, in accordance with Occupational Safety and Health Administration (OSHA) guidelines.

Task 5: Construction Management

Soil above ground water that contains petroleum hydrocarbons above the approved cleanup criteria will be excavated and treated. Soil affected with TPHg and the BTEX compounds will be aerated on site, and after successful aeration to concentrations below cleanup criteria, will be used to backfill the excavation. Soil affected with TPHd or oil above cleanup criteria will be removed from the Site and treated or disposed of.

Confirm Underground Utility Survey. The Contractor will be responsible for contracting Underground Service Alert concerning the locations of public underground utilities entering the Site before soil excavation activities begin. A private utility locator will also be retained by the Contractor to survey within the Site for underground utilities. Levine-Fricke will confirm that the Contractor has performed the underground utility surveying.

Site Health and Safety Implementation. The contractor will be responsible for implementing its own HSP to protect its personnel. Levine-Fricke's field engineer will be our site safety officer (SSO), and will document compliance with the HSP prepared by the contractor and required by OSHA regulations. The estimated budget for this task assumes that Levine-Fricke's field engineer can provide these services in the course of other inspection duties, and no additional field personnel have been budgeted. Levine-Fricke will hold an initial health and safety meeting at the Site before construction begins, and will respond as needed to health and safety questions during construction; our estimated budget assumes that both functions will take no more than six hours total.

Observation of Soil Excavation. Soil containing concentrations of petroleum hydrocarbons above the approved cleanup goals will be excavated and aerated or treated off site. Clean overburden soils will be stockpiled on site for reuse as a backfill material. Affected soil will be excavated until analytical test results indicate that concentrations of petroleum hydrocarbons are below the approved cleanup criteria. Affected soil will be excavated vertically to within 0.5 foot of the first

encountered ground water, at approximately 7 to 10 feet below ground surface (bgs). For the purposes of this work order, we have assumed that the ground water will be encountered at approximately 8.5 feet bgs; thus, the excavation will be approximately 8 feet deep. While the excavation is not intended to extend into ground water, if ground water is encountered in the excavation, it will be pumped out of the excavation to the degree deemed appropriate by the Levine•Fricke field engineer, and recycled by a state-certified petroleum recycler. Unit costs for pumping and recycling ground water will be included in the contractor's bid.

Soil will be excavated laterally until confirmation sidewall samples indicate that soil does not contain concentrations of petroleum hydrocarbons above cleanup criteria or until excavation is limited by surface structures. Affected soil extending beneath the building and/or extending beneath Collins Drive will not be excavated. Based upon analytical test results and measured ground-water depth, we estimate that approximately 4,000 to 6,000 in-place cy of soil will be excavated.

Soil affected with gasoline and/or the BTEX compounds will be excavated and placed directly onto aeration beds constructed on the site. Soil affected with oil will be temporarily stockpiled on site pending off-site disposal or treatment. Based on analytical test results and observations made during previous investigations, we anticipate disposing of or treating approximately 50 to 150 in-place cy of oil-affected soil.

The excavation will be constructed and configured in accordance with California and federal OSHA regulations.

In estimating the budget for this task, we have assumed that the field engineer and a technician will be at the Site (including travel) for seven 12-hour days.

Excavation Confirmation Sampling. As excavation progresses, soil samples will be collected to document remaining TPH concentrations, if any, in the excavation sidewalls. We will collect one soil sample for every approximately 20 linear feet along the excavation walls. One soil sample will be collected for every 400 square feet of the excavation floor, unless ground water has entered the excavation. If ground water is encountered in the excavation, floor excavation samples will not be collected. If laboratory results indicate that chemical compounds are present above cleanup goals, the excavation will be extended and the sidewalls resampled. This process will be repeated until chemical analysis results indicate that residual petroleum concentrations are below cleanup goals. For the purposes of this work order, we have assumed that a total of 170 excavation confirmation soil samples will be collected and analyzed. If more than 170 samples are required to confirm that cleanup criteria have been met, the costs associated with analysis of the samples will be considered out of scope.

Soil samples will be collected in brass sleeves using a manual sample driver, or samples will be collected out of the backhoe bucket with the assistance of the contractor. Soil samples collected from the excavation will be analyzed by a state-certified analytical laboratory on a standard turnaround time basis. Strict chain-of-custody protocol will be observed during all sample handling activities.

Staff time for excavation confirmation sampling is included in the Soil Excavation subtask.

Observation and Testing of Excavation Backfilling and Repaving. As soon as the excavation confirmation sample test results indicate that affected soils above the cleanup criteria have been removed, the excavation will be partially backfilled using the stockpiled clean overburden soils and imported soil. After aeration is complete, the successfully aerated soil will be used to backfill the excavation. The asphalt parking lot will be repaved to match the existing surface.

An 8-foot-high chain-link fence outfitted with barbed wire and wood slats will be installed around the excavation. The fence will be removed upon completion of backfilling activities.

In estimating the budget for this subtask, we have assumed the field technician will be at the Site (including travel) for five 12-hour days.

Field Inspection. A Levine-Fricke field engineer or technician will be present during all field construction activities. The field engineer will monitor the contractor's progress, verify that excavated soil is being placed in the appropriate location, document the work performed, and answer field questions from ACHCSA concerning soil sampling and the limits of the excavation.

The field engineer will monitor the limits of excavation for the presence or absence of obviously affected soil. Soils will be screened in the field using an organic vapor meter (OVM). Additionally, we will use a PetroFLAG field test kit to screen soil samples in the field for the presence or absence of diesel-range petroleum hydrocarbons. This will provide on-site data during excavation, to assist in evaluating confirmation soil sampling locations, the final excavation limits, and the appropriate stockpile in which to place differing soils.

During backfilling operations, a Levine-Fricke engineer or technician will test the backfill to ensure that sufficient compaction has been attained by the contractor using a field nuclear density gauge. The engineer or technician will also measure dust levels in proximity to the active work zone with a portable dust meter.

Documentation of Work. The field engineer will document daily construction activities. Such documentation will include a daily construction report and

photographs. The project documents will be used to prepare the completion report to be submitted to the ACHCSA (see Task 7).

Task 6: Observation and Documentation of Soil Treatment

This task includes Levine-Fricke oversight of aeration of TPHg- and BTEX-affected soil and of stockpiling and treatment or disposal of TPHd- and oil and grease-affected soil at the selected treatment or disposal facility. Soil samples will be collected and analyzed before initiating aeration to establish baseline petroleum hydrocarbon concentrations. Soil samples will also be collected and analyzed after completion of aeration to confirm that petroleum hydrocarbon concentrations have been successfully reduced to below cleanup criteria.

Task 6A: Aeration of Gasoline- and BTEX-Affected Soil

Soil excavated and suspected of containing gasoline and BTEX compounds (based on OVM readings, field observations, and PetroFLAG results) will be placed onto on-site aeration beds and aerated.

Aeration. Aeration beds will be constructed on site directly on the existing pavement surface. The aeration beds will be bermed completely with hay bales to prevent movement of liquids onto or off soil being aerated.

It is anticipated that approximately 2,000 to 5,000 in-place cy of gasoline-affected soil may be aerated (including the 300 loose cy of soil stockpiled on site from the UST excavation). Soil will be placed onto aeration beds at a uniform depth and covered until ready for aeration. It will be the responsibility of the contractor to determine the number and size of aeration beds.

During aeration, soils will be exposed at a rate consistent with BAAQMD Regulation 8, Rule 40. After soils are exposed for aeration, they will remain uncovered until treatment is concluded. It is anticipated that additional soil will be exposed every day until treatment is nearly complete and that exposed soil will be turned over approximately seven to eight times a month to increase chemical removal rates. We anticipate that soil will aerate within six months. For the purposes of this work order, we have estimated that soil will be turned over a total of 45 times during the aeration process. We have budgeted a Levine-Fricke engineer or technician to visit the Site for one 8-hour day each week for six months to observe the contractor turning the soil and to collect confirmation samples from aerated soil.

If the time to successfully aerate soils exceeds six months, or if additional visits to observe the contractor are necessary, the costs associated with the additional work will be considered out of scope. In addition, if the concentrations of volatile organic compounds (VOCs) in the affected soil are such that all soil cannot be uncovered in

accordance with BAAQMD regulations within the six-month period, then costs associated with continuing aeration activities will be considered out of scope.

Baseline and Aeration Confirmation Sampling. Before aeration begins, four to six soil samples will be collected from each aeration bed and analyzed to assess baseline concentrations of TPHg and BTEX. Thereafter, soil samples will be collected and analyzed periodically to evaluate the degree of treatment achieved to date. Approximately one confirmatory sample per 50 in-place cy of treated soil will be collected to assess whether concentrations have been reduced to levels below cleanup criteria. Confirmatory sampling results will be evaluated using "EPA Methods for Evaluating the Attainment of Cleanup Standards" to assess whether additional sampling and analysis should be conducted.

Baseline and aeration confirmation samples will be collected in clean brass tubes from the aeration beds. The samples will be capped, labeled and placed in a chilled ice chest for transport to a state-certified analytical laboratory under strict chain-of-custody protocol. The baseline and confirmation soil samples will be analyzed on a standard turnaround time basis.

We have budgeted for the analysis of 10 baseline soil samples. In addition, we have assumed that 5,000 in-place cy of soil will be aerated and that one soil sample will be collected and analyzed for each 50 in-place cy of soil. Therefore, we have assumed that 100 aeration confirmation samples will be collected and analyzed. Costs associated with the collection and analysis of more than 110 baseline and aeration confirmation sampling will be considered out of scope.

Task 6B: Stockpiling and Treatment of Oil and Grease-Affected Soil

Soil excavated and suspected of containing TPHo or TPHd will be temporarily placed on plastic in stockpiles adjacent to the aeration beds. The stockpile will be placed on and covered by one layer of 6-milliliter visquine. Once the excavation is complete, the TPHo-affected soil will be sampled for treatment facility profiling. We estimate that approximately 50 to 150 in-place cy of TPHo-affected soil may be treated or disposed of off site. Costs for the loading, transporting, and disposing of or treating TPHo-affected soil will be included in the selected contractor's bid as a unit cost and is not included in this work order.

Stockpile Profile Sampling. The oil-affected stockpiled soil will be sampled and analyzed for petroleum hydrocarbons and other chemicals in accordance with the requirements of the selected disposal or treatment facility requirements. For the purposes of this work order, we have assumed that one sample will be sufficient to characterize the TPHo-affected soil for treatment or disposal. If additional samples are required by the selected treatment or disposal facility, the costs associated with collection and analysis of the additional samples will be considered out of scope.

Soil samples will be collected as described in Task 5.

Task 7: Laboratory Analyses

Excavation Confirmation Samples. Confirmation soil samples collected from the excavation floor and sidewalls will be analyzed for TPHg and for the BTEX compounds using EPA-approved methods. Twenty percent of the soil samples will also be analyzed for TPHd and TPHo.

Aerated Soil. Soil samples collected from aeration beds will be analyzed for TPHg and for the BTEX compounds using EPA-approved methods. Twenty percent of the samples collected will additionally be analyzed for TPHd and TPHo.

Stockpiled Soil. Soil samples collected from stockpiled oil-affected soils will be analyzed for petroleum hydrocarbons and other chemicals based upon the disposal or treatment facility requirements. For the purposes of this work order, we have assumed that the following analyses will be required: total extractable petroleum hydrocarbons (TPHe), the BTEX compounds, VOCs, semivolatile organic compounds (SVOCs), reactivity, corrosivity, and ignitability (RCI), and the 17 California Code of Regulations Metals (CCR 17) by TTLC.

check VOCs & semivolatile RCI for metals necessary

Task 8: Report Preparation

A report summarizing the remediation activities conducted at the Site will be prepared and submitted to the ACHCSA. The report will describe field activities and present analytical results for final confirmation soil samples collected from the excavation and from aeration beds. The report will include three to four figures and two to three tables. The report will include recommendations for managing petroleum hydrocarbon-affected ground water though the Regional Water Quality Control Board's proposed Non-Attainment Zone Policy.

Task 9: Project Management and Regulatory Interface

Under this task, Levine-Fricke has estimated the cost of project and staff scheduling and coordination; budget tracking; and interaction with agencies, DI, and the selected contractor.

As part of project management, we will be monitoring the contractor's progress and budget and Levine-Fricke's budget, to ensure that the work is progressing within the project time schedule and within these budgets. DI will be updated concerning the project's status on a regular basis. Modifications to the scope of work and/or the estimated budget presented in this work order will not be made without prior approval from DI.

During remediation, Levine•Fricke will respond to telephone calls from ACHCSA staff, and may accompany ACHCSA staff on site visits. If site conditions change, negotiations with ACHCSA staff may be necessary, to modify existing site cleanup goals or establish new cleanup goals. Following completion of remedial activities, regulatory interactions will be aimed at gaining approval for the Completion Report.

ESTIMATED SCHEDULE

Levine•Fricke can begin work on this project within one week after authorization from DI. We expect that the bid package will be available for review by DI within four weeks of authorization. Preconstruction activities can begin within two weeks of authorization. We expect to solicit bids within two weeks of DI's approval of the bid package and to select a contractor within three weeks. Remediation activities should start within two weeks of acceptance of the bid. We expect excavation to take seven work days. Partial backfilling will be accomplished within one week after final excavation confirmation sample test results are received. Successful aeration of the affected soil is expected to take six months. Backfilling will take a total of approximately five days.

Barring unforeseen difficulties, Levine•Fricke anticipates that a remedial activities report can be prepared and submitted for review by DI within six weeks after the field portion is finished.

OUT-OF-SCOPE SERVICES

If out-of-scope services are required, these costs will be billed on a time-and-materials basis consistent with Levine•Fricke's standard Schedule of Charges. Out-of-scope work will be performed only with prior written approval from an appropriately authorized DI representative.