

First Environmental Group

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April 25, 1994

Juliet Shin
Alameda County Health Agency
Department of Environmental Health
80 Swan Way, Room 200
Oakland, CA 94621

ALCO
HAZMAT
94 APR 26 PM 2:22

Subject: Soil Bioremediation Work Plan
Zee Rental Properties
711 Cleveland Avenue
Albany, California

Dear Mrs. Shin:

First Environmental Group is pleased to present the attached soil bioremediation Work Plan for the Zee Rental Properties property located at 711 Cleveland Avenue in Albany, California.

The proposed remedial activities include the following:

- Soil bioremediation
- Post remedial confirmation sampling
- Report preparation

If you have any questions or require additional information, please call.

Sincerely,

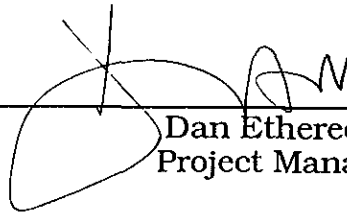


Dan Etheredge
Project Manager

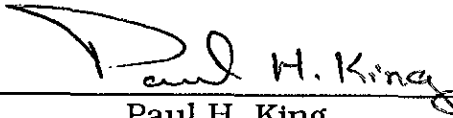
cc: Roxanne Harris, Subsurface Environmental

**SOIL BIOREMEDIATION WORK PLAN
711 CLEVELAND AVENUE
ALBANY, CALIFORNIA**

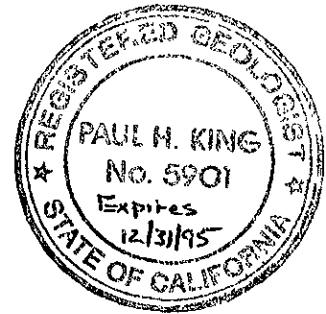
Prepared by:



Dan Etheredge
Project Manager



Paul H. King
CA Registered Geologist



Prepared for:
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11072 San Pablo Avenue, Suite 315
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**SOIL BIOREMEDIATION WORK PLAN
ZEE RENTAL PROPERTIES
711 CLEVELAND AVENUE
ALBANY, CALIFORNIA**

INTRODUCTION

First Environmental Group (FEG) has prepared the enclosed Work Plan to address the petroleum hydrocarbon contaminated soil, for the Zee Rental Properties property, located at 711 Cleveland Avenue in Albany, California (the "site", Figure 1). This work plan addresses the soil bioremediation and associated activities for the petroleum hydrocarbon contaminated soil at the site.

All work will be performed under the direct supervision of an appropriately registered professional. This Work Plan is prepared in accordance with guidelines set forth in the document "Tri-Regional Board Staff Recommendations for Preliminary Evaluation and Investigation of Underground Tank Sites", dated August 20, 1991.

BACKGROUND

The site is located at 711 Cleveland Avenue in Albany, California. Underground storage tanks (USTs) at the site were used to store diesel and gasoline. It is FEG's understanding that all USTs have been removed under the direction and approval of the Alameda County Department of Environmental Health (ACDEH). Soil samples were collected from the tank pit. The results of the sampling during the UST remedial activities indicated that petroleum hydrocarbon contamination was present in onsite soils.

Soil surrounding the previous tank location has been excavated. Currently, approximately 650 cubic yards of petroleum affected soil is stockpiled on the site.

Contamination, in the form of total petroleum hydrocarbons as gasoline (TPH-G) and total petroleum hydrocarbons as diesel (TPH-D) were discovered in the site soils at concentrations up to 220 mg/kg and 2,100 mg/kg, respectively.

The site has been sold to Caltrans for the construction of a freeway on-ramp.

SCOPE OF WORK

The activities described in this Scope of Work are proposed to bioremediate the petroleum hydrocarbon affected soils. The proposed Scope of Work includes the following specific tasks:

- Task 1: Development of a Health and Safety Plan
- Task 2: Soil Bioremediation Activities
- Task 3: Laboratory Analyses
- Task 4: Report Preparation

Task 1: Development of a Health and Safety Plan

In accordance with Occupational Safety and Health Administration guidelines, the FEG Health and Safety Director will develop a Health and Safety Plan (HSP). The HSP will include an analysis of hazards that may be encountered by on-site workers conducting the proposed work and precautions to mitigate the identified hazards.

Task 2: Soil Bioremediation Activities

A Rotar Screening unit, mounted in place of the loader bucket on a Caterpillar front end loader, will be used to apply our bioremediation product. The Rotar uses a tumbling drum which tills the soil, breaking up any clay balls, while oxygenating the soil and screening out larger rocks. The enzyme product, stored in portable tanks mounted on the loader, is applied to the soil, as it spins within the Rotar bucket, with the use of a spray bar.

Contaminated soil is scooped into the Rotar as with any conventional loader bucket. As the soil is moved, the Rotar oxygenates and screens the soil while the enzyme is applied. A new stockpile of treated soil is then created adjacent to its present location. This stockpile will be placed upon 6 mil polyethylene sheeting. No further oxygenation, water or nutrient addition is required, therefore we don't anticipate the leaching of contaminants to the surrounding soil or groundwater.

Based on our experience with similar products, we anticipate the treatment duration to be two weeks. The soil will then be utilized as backfill material, to backfill the site excavation, upon analytical confirmation.

Task 3: Laboratory Analyses

Soil samples collected from the treated soil stockpile will be analyzed at a state-certified laboratory. The soil samples will be analyzed for total recoverable petroleum hydrocarbons using EPA Method 5520F and total petroleum hydrocarbons as gasoline using EPA Method 5030.

How about discuss or ACDEH?

The minimum number of confirmation samples that are required to adequately characterize the final residual concentrations at a 95% confidence level will be computed using EPA Method SW-846. This methodology uses the mean and standard deviation of the soil sample laboratory analytical results and compares these results to the proposed cleanup levels (10 mg/kg), assuming a standard normal distribution. The appropriate number of confirmation samples is directly proportional to the square of the variance and inversely proportional to the square of the difference between the cleanup level and the mean concentration of the sample population.

At least 20 discrete samples will be collected and analyzed.

(At least 1 per every 32 yd³)

Task 4: Report Preparation

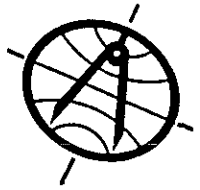
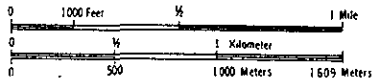
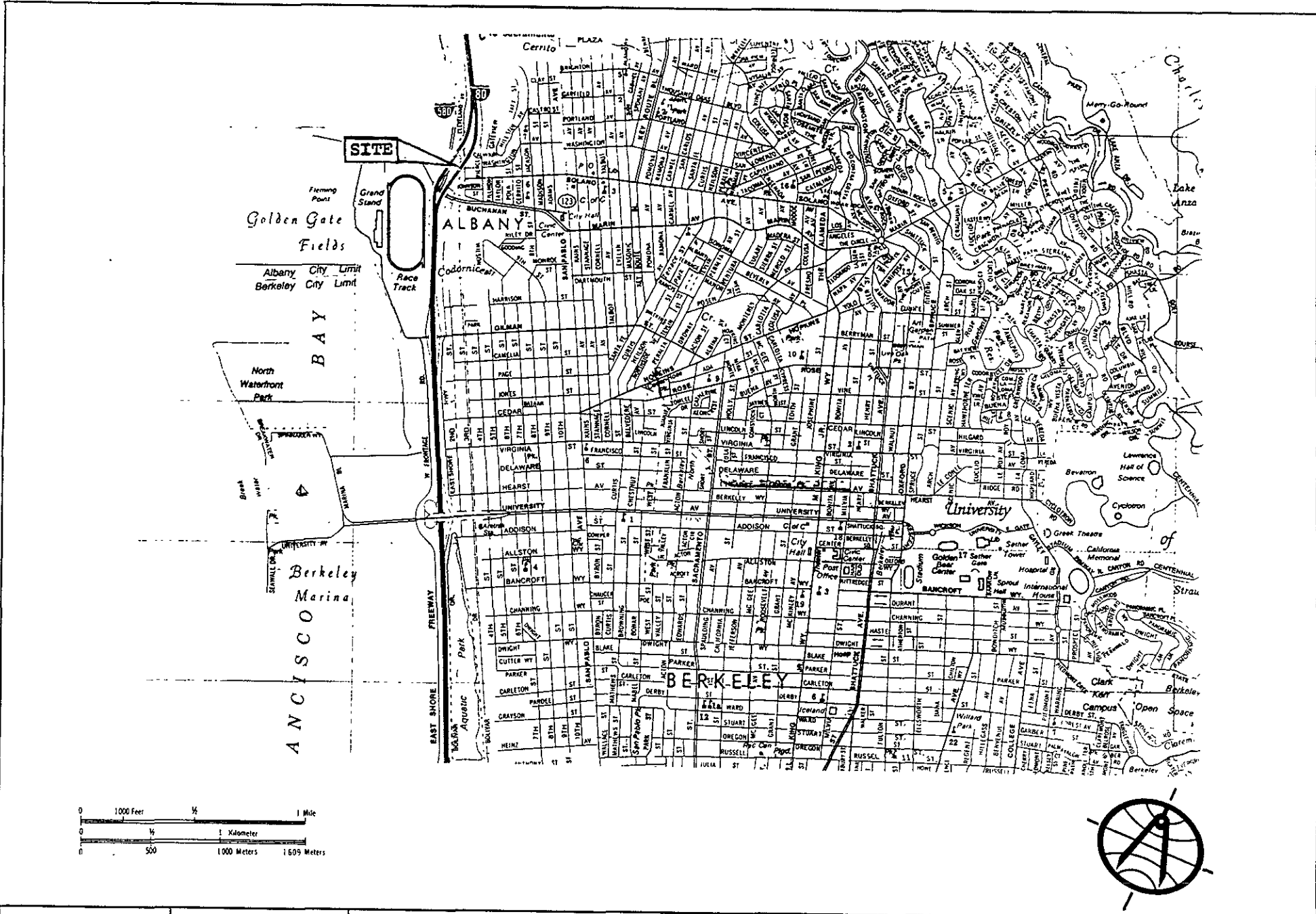
This task will include evaluating the field and laboratory analytical data obtained in Tasks 2 and 3. A written report will be prepared following receipt of the analytical results. The report will document the bioremediation and sampling activities and will include conclusions regarding the cleanup process. Laboratory analytical documentation, chain of custody documents, a discussion of the sample results, a tabulated summary of the sample results, a site map showing the sample locations, and the stamp of an appropriate registered professional will also be included.

This report shall be submitted to ACDEH within two weeks following receipt of laboratory analytical results.

SCHEDULE

The approximate estimated duration for each of the tasks are listed below.

<u>Activity</u>	<u>Working Days</u>
Work Plan Submittal	Day 0
Work Plan Approval	Day 7
Development of a Health and Safety Plan	Day 9
Soil Bioremediation	Day 10
Sample Collection	Day 24
Receipt of Laboratory Analyses	Day 31
Submittal of Draft Report to Subsurface Env.	Day 38
Submittal of Final Report to ACDEH	Day 45



Scale: As Shown	April, 1994	SITE MAP 711 Cleveland Avenue, Albany, California	Figure 1
First Environmental Group			project # 41001

APPENDIX
SAMPLING PROCEDURES

SAMPLING PROCEDURES

Soil sampling will be conducted to provide data to verify the bioremediation of petroleum hydrocarbons in the soils at the site. Soil samples will be used for chemical analysis and lithologic description.

Sample Collection, Preservation Methods and Containers

Soil samples will be collected by directly driving precleaned brass tubes into the soil. The samples will completely fill the tubes to minimize head space. The ends of these tubes shall be covered with aluminum foil or Teflon, covered with plastic end caps, and taped with duct tape around the caps to prevent possible moisture and chemical loss. The sample will then be labeled. After being sealed and labeled, soil samples will be immediately placed in a chilled cooler containing ice (4° C or less) for delivery to the analytical laboratory. Samples will be analyzed at the laboratory within 7 days of sample collection.

Documentation

The following information concerning each sample will be recorded at the time of sampling:

- project name and number
- site location
- sampler's name
- time and date of sampling
- sampling location
- sampling method
- sample number
- sample depth
- sample condition (disturbed/undisturbed)
- laboratory analyses requested

Each sample will be packaged and transported appropriately, as described in the following protocol.

- o Collect samples in appropriately-sized and prepared containers.
- o Properly seal and package sample containers.
- o Record sample information and complete chain-of-custody and analyses request forms.

- o Samples will be packaged in the cooler so that the potential for shipping damage is minimized.
- o Chill samples to approximately 4^o C or less.
- o Seal the chain-of-custody form inside a zip-lock bag and place inside the cooler.

Decontamination Procedures

Equipment Decontamination

All equipment used for collecting samples during this investigation which might come into contact with contaminated materials will be properly decontaminated before and after each use, and before initial use at the site. This will be accomplished through steam-cleaning and/or washing with Alconox (a laboratory-grade detergent) and rinsing with deionized, distilled, or fresh water.

Sample Custody

In order to check and link each reported datum with its associated sample, sample custody and documentation procedures were established. Three separate, interlinking documentation and custody procedures--for field, office, and laboratory--can be described. The chain-of-custody (COC) forms, which are central to these procedures, are attached to all samples and their associated data throughout the tracking process.

Field Custody Procedures

Field documentation will include sample labels, field logbook, and chain-of-custody/analyses request forms. These documents will be filled out in indelible ink. Any corrections to the document will be made by drawing a line through the error and entering the correct value without obliterating the original entry. Persons correcting the original document will be expected to initial any changes made. The documents are as follows.

Sample Labels

Labels will be used to identify samples. The label is made of a waterproof material with a water-resistant adhesive. The sample label, to be filled out using waterproof ink, will contain at least the following information: sampler's name; sample number, date, time, location, depth; boring number; and preservative used.

Field Log

A field log will be used to record daily field activities. The project manager is responsible for making sure that a copy of the field log is sent to the project file as soon as each sampling round is completed. Field log entries will include the following:

- o field worker's name;
- o field log number;
- o date and time data are entered;
- o location of activity;
- o personnel present on-site;
- o sampling and measurement methods;
- o total number of samples collected;
- o sample numbers;
- o sample distribution (laboratory);
- o field observations, comments;
- o sample preservation methods used, if any.

Chain-of-Custody (and Analysis Request) Form

The chain-of-custody (COC) form is filled out for groups of samples collected at a given location on a given day. The COC will accompany every shipment of samples to the respective analytical laboratories.

The COC makes provision for documenting sample integrity and the identity of any persons involved in sample transfer. Other information entered on the COC includes:

- o project name and number;
- o project location;
- o sample number;
- o sampler's/recorder's signature;
- o date and time of collection;
- o collection location;
- o sample type;
- o number of sample containers for each sample;
- o analyses requested;
- o results of laboratory's inspection of the condition of each sample and the presence of head space, upon receipt by the laboratory;
- o inclusive dates of possession;
- o name of person receiving the sample;
- o laboratory sample number;
- o date of sample receipt;
- o name of analytical laboratory; and
- o temperature of sample.