

24 September 1992  
Project 1736.10

SEP 24 1992

Mr. Kevin Tinsley  
Alameda County Department of Environmental Health  
Hazardous Materials Division  
80 Swan Way, Room 200  
Oakland, California 94621

Subject: Work Plan for Soil Sampling and Analysis  
Parcel H  
Marina Village, Alameda, California

Dear Mr. Tinsley:

We are submitting this Work Plan on behalf of Alameda Real Estate Investments (AREI) to sample and chemically analyze soil samples from Parcel H within the Marina Village Development in Alameda, California (Figure 1). As agreed in our meeting with you and Dr. Ravi Arulanantham of the Alameda County Health Care Services Agency (ACHCSA) on 15 July 1992, we have developed this sampling and analysis plan to document residual concentrations of petroleum hydrocarbons and lead in soil after Parcel H has been regraded for future construction. Based on the results, we will recommend appropriate post-construction management of the site regarding the presence of petroleum hydrocarbons and lead, to be approved by the ACHCSA.

## BACKGROUND

AREI is preparing to develop Parcel H for commercial/business use. The proposed development consists of two office buildings, paved parking lots and walkways, and landscaping covering about 2 acres of land.

During grading activities associated with surcharging a portion of Parcel H, AREI found that the upper few feet of fill material contained high-boiling, asphalt-like petroleum hydrocarbons ranging in concentration from 30 to 4100 milligrams per kilogram (mg/kg), averaging about 700 to 800 mg/kg. Available data regarding the asphalt-like petroleum hydrocarbons was summarized in our 13 May 1992 letter to you regarding site background information. Industrial Compliance, of Little Rock, Arkansas, prepared a health risk assessment for the asphalt-like petroleum in soil in which they concluded that it does not present a significant risk to future site occupants. The assessment, "Draft Human Health Risk Assessment of Asphaltic Material in Soil at the Marina Village Development," dated June 1992, was submitted to Dr. Arulanantham on 16 July 1992.

Mr. Kevin Tinsley  
Alameda County Department of Environmental Health  
24 September 1992  
Page 2

In response to a request made by Dr. Arulanantham at a meeting on 26 May 1992, Geomatrix further characterized the fill material for heavy metals. The results indicated that lead concentrations in the fill ranged from 17 to 310 mg/kg, and the concentrations varied depending on sample preparation methods. A summary of the lead characterization results was presented in our 27 July 1992 letter to AREI and copied to the ACHCSA. Based on our discussion with Dr. Arulanantham during our 15 July 1992 meeting, we understand that the ACHCSA uses a guideline of a maximum total lead concentration in soil of 180 mg/kg as acceptable for soil beneath residential development. At sites where lead concentrations in soil exceed 180 mg/kg, further evaluation of possible health risks may be necessary, depending on the proposed future use.

The purpose of this sampling and analysis plan is to characterize soil quality beneath the proposed development in terms of both petroleum hydrocarbons and lead. A statistical approach will be used to evaluate lead concentrations so that the ACHCSA can assess whether further health risk assessment is necessary. Additionally, the potential leachability of lead in soil at the site will be evaluated to address Regional Water Quality Control Board (RWQCB) concerns about possible migration of soluble lead to underlying groundwater.

## **SCOPE OF WORK**

The following scope of work was developed:

- Select near-surface sample locations and collect soil samples based on a statistically random sampling grid
- Analyze the samples for total petroleum hydrocarbons as oil and total lead
- Based on results of total lead, select eight samples to analyze for soluble lead using the Toxicity Characteristic Leaching Procedure (TCLP), and one to two samples to analyze for soluble lead using the California Waste Extraction Test (WET)
- Analyze the data statistically to calculate the 95 percent upper confidence limit (UCL) for total and soluble (based on TCLP) lead concentrations

The following tasks describe in detail the above scope of work.

### **Task 1: Select Sample Locations and Collect Samples**

Based on a 20-by-20-foot sample grid shown on the attached Figure 1, and three 1.5-foot thick sublayers of fill (assuming a 4.5-foot thick fill layer), 40 random locations will be selected for sample collection, and 30 of those samples will be randomly selected for

Mr. Kevin Tinsley  
Alameda County Department of Environmental Health  
24 September 1992  
Page 3

initial analysis. Samples will be collected by a Geomatrix field geologist or engineer near the center of each grid within the depth specified for that sample location. AREI will retain a backhoe and operator to assist in sample collection.

Samples will be collected using the following procedure to obtain representative samples and to reduce potential variability in laboratory results due to sample heterogeneity:

- 1) A relatively large sample, on the order of 1 gallon, will be collected from the bucket of the backhoe, and placed in a mixing container.
- 2) The sample will be homogenized as much as possible in the field by Geomatrix personnel, and two smaller subsamples of the homogenized sample will be placed in laboratory supplied 16-ounce glass jars for delivery to the laboratory.
- 3) For subsamples to be analyzed for total and soluble lead, the laboratory will be instructed to mill the entire subsample to a 9.5  $\mu\text{m}$  mesh grain size.

Sampling equipment will be thoroughly wiped and washed with a laboratory-grade detergent before each use. Sample jars will be labeled and placed in an ice-cooled container for transport to the laboratory. The samples will be transported to the laboratory using Geomatrix chain-of-custody protocol. Laboratory analyses will be requested initially for 30 of the 40 samples, and the remaining samples will be held by the laboratory for possible analysis, depending on results of the initial 30 samples.

### **Task 2: Chemically Analyze the Soil Samples**

The initial 30 samples will be analyzed for extractable total petroleum hydrocarbons (TPH) as oil using modified United States Environmental Protection Agency (EPA) Method 8015 and for total lead using EPA Method 6010. Depending on the results, we plan to request analysis of the eight samples with the highest total lead concentrations for soluble lead using the TCLP. Additionally, depending on total lead results, the one or two samples with the highest total lead concentration will be analyzed for soluble lead using the California Waste Extraction Test (WET) procedure. The purpose of the WET procedure is to represent a "worst-case" condition, to address possible RWQCB concerns about leachability.

Depending on the statistical distribution of the data, additional samples may be analyzed for total and/or soluble lead.

### **Task 3: Evaluate Data and Prepare Report**

Total lead results for the initial 30 samples and lead results, using the TCLP for the eight selected samples, will be evaluated statistically. The geometric mean, standard deviation, and 95 percent UCL will be calculated. If additional data is needed to meet statistical constraints, then analyses will be requested for some or all of the remaining 10 samples.



Mr. Kevin Tinsley  
Alameda County Department of Environmental Health  
24 September 1992  
Page 4

In the event that all total lead concentrations in the initial 30 samples are below 180 mg/kg, then the data set will not be evaluated statistically. Soluble lead concentrations, based on TCLP analyses, also will be evaluated statistically, using a linear regression calculation. In the event that soluble lead concentrations are below 5 mg/l for the 8 samples, the data will not be evaluated statistically.

A report will be prepared to summarize the data. The report will include detailed descriptions of the methods and technical rationale used to collect and analyze the data and to arrive at conclusions. The report will be submitted to the ACHCSA for review.

### SCHEDULE

AREI plans to grade the site at the end of September 1992. We anticipate that the samples can be collected within one week after the site is regraded. We anticipate sampling will occur the week of 14 October 1992. Laboratory analysis will be completed on a two-week standard turnaround time; a draft report will be prepared within two weeks of receiving laboratory data. We will coordinate a meeting with AREI and ACHCSA to discuss the draft report, and a final report will be prepared that incorporates review comments.

If you have any questions regarding this work plan, please call either of us at your earliest convenience.

Sincerely,

GEOMATRIX CONSULTANTS, INC.

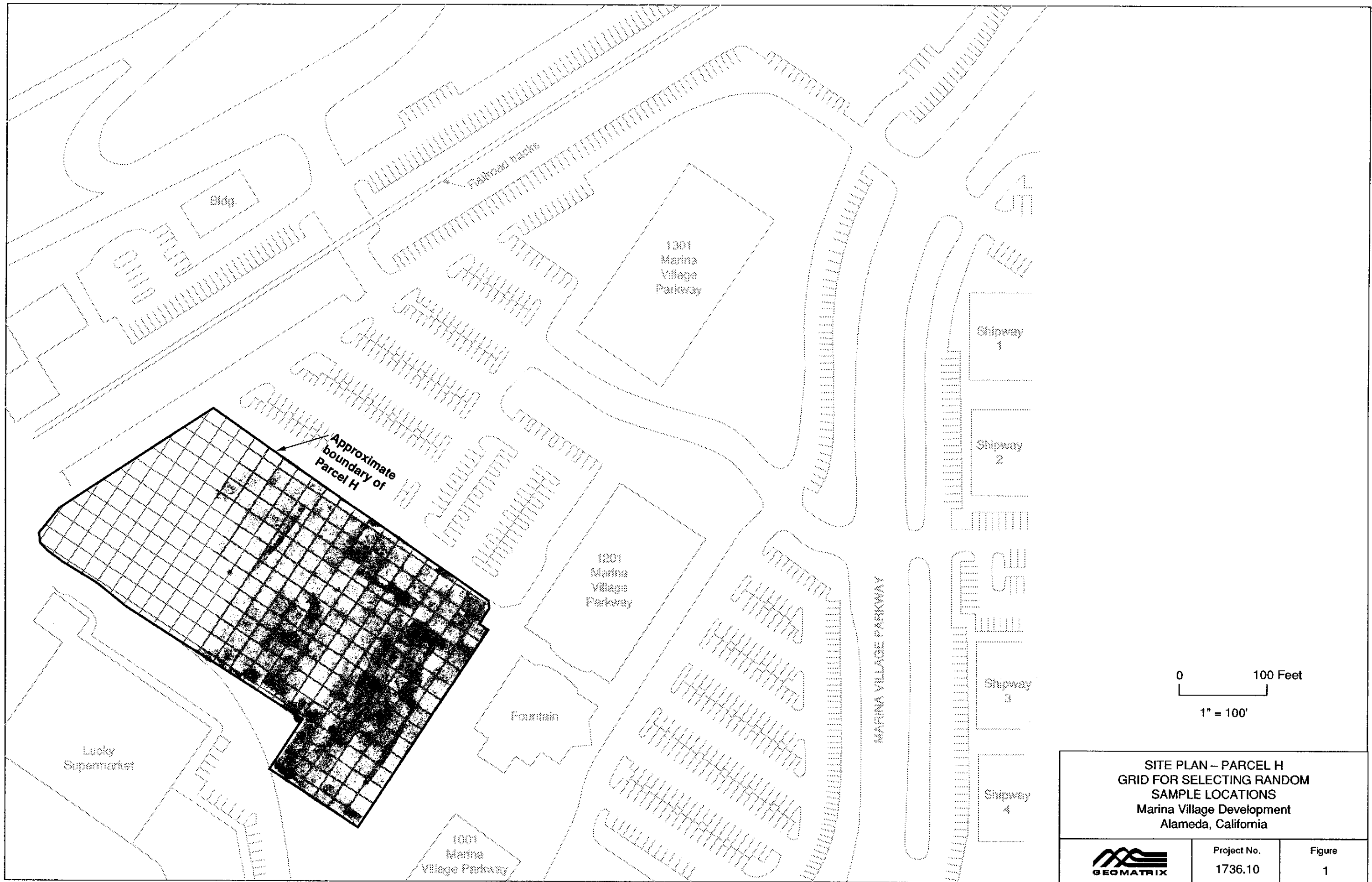
Elizabeth Nixon  
Project Manager

Tom Graf, P.E.  
Vice President


EAN/slr  
CONTR11736WP-H.LTR

cc: Mr. Rahn Verhaeghe, AREI  
Mr. Joe Seiger, AREI  
Mr. Ravi Arulanantham, ACHCSA

Attachment: Figure 1



**SITE PLAN – PARCEL H  
 GRID FOR SELECTING RANDOM  
 SAMPLE LOCATIONS  
 Marina Village Development  
 Alameda, California**

	Project No. 1736.10	Figure 1
---	------------------------	-------------