SOMA
CORPORATION

January 30, 1995 SOMA 95-2053

STID 2586
2/7/95 called Peng Leong re: WP

Ms. Susan Hugo
Senior Hazardous Materials Specialist
Alameda County Department of Environmental Health
Environmental Protection Division
1131 Harbor Bay Parkway, Number 250
Alameda, California 94502

Subject: Work Plan - Characterization of Petroleum-Affected Soils and Groundwater
Fordham Property
5515 Doyle Street
Emeryville, California

Dear Susan:

Enclosed is our Work Plan for the characterization of petroleum-affected soils and groundwater at the Fordham Property located at 5515 Doyle Street in Emeryville, California ("the Site").

The following activities are presented in the Work Plan:

- Development of a Health and Safety Plan
- Soil Sampling
- Well Installation and Development
- Groundwater Sampling
- Determination of Groundwater Flow Direction
- Profiling and Disposal of Soil Stockpile
- Laboratory Analyses
- Preparation of Limited Site Investigation Report
- Quarterly Groundwater Monitoring

The above corrective action was requested by the Alameda County Department of Environmental Health (ACDEH) in the ACDEH Notice dated December 12, 1994.

1260B 45th Street • Emeryville, CA 94608
(510) 654-3900 • FAX (510) 654-1960

We have also included qualification statements for the lead professionals who will be involved with this project.

If you have any questions or comments concerning this Work Plan, please call me.

Sincerely,

Norman T. Ozaki, Ph.D.
President

Peng Leong, P.E.
Associate Engineer

REGISTERED PROFESSIONAL ENGINEER
PENG K. LEONG
C039707
CIVIL
STATE OF CALIFORNIA

Enclosure

cc: Mr. Ronald Silberman, Fordham Properties

SOMA
CORPORATION

WORK PLAN
LIMITED SITE INVESTIGATION

FORDHAM PROPERTY
5515 DOYLE STREET
EMERYVILLE, CALIFORNIA

JANUARY 30, 1995

SOMA 95-2053

Prepared for:

Mr. Ronald Silberman
Fordham Properties
5743 Landregan Street
Emeryville, California 94608

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January 26, 1995 SOMA 95-2053

WORK PLAN
LIMITED SITE INVESTIGATION

FORDHAM PROPERTY
5515 DOYLE STREET
EMERYVILLE, CALIFORNIA

1.0 INTRODUCTION

At the request of Mr. Ronald Silberman of Fordham Properties, SOMA Corporation ("SOMA") has prepared this Work Plan to conduct a further environmental assessment of petroleum-affected soils and/or groundwater at the Fordham Property located at 5515 Doyle Street in Emeryville, California ("the Site"; Figure 1).

This Work Plan describes the soil and groundwater sampling activities associated with assessing the lateral and vertical extent of petroleum constituents encountered during removal of the underground storage tank (UST) at the Site. The site investigation will be limited to analysis of soil and groundwater samples for total petroleum hydrocarbons (TPH) as gasoline (TPHg); TPH as diesel (TPHd); benzene, toluene, ethylbenzene, and xylenes (BTEX); and total lead.

This investigation was requested by the Alameda County Department of Environmental Health (ACDEH) in the ACDEH Notice dated December 12, 1994. Implementation of further site investigation was required based on the presence of elevated concentrations of petroleum constituents detected in the excavation floor samples and observation of holes in the wall of the UST during removal. ACDEH will be providing oversight for the investigation activities.

2.0 SITE DESCRIPTION

The Site is located on the northwest corner of Doyle Street and 55th Street in Emeryville, California. The Site is essentially flat. The open area at the northwest corner of the Site and the driveway along the northern edge of the Site are paved with concrete.

A warehouse covers most of the property. The warehouse is currently used by several commercial and light industrial businesses.

3.0 BACKGROUND

Cottle Engineering excavated and removed one 550-gallon UST in August 1994. The UST

was located at the western portion of the Site (Figure 2). Soil samples collected from underneath the UST contained up to:

- 4,200 mg/kg of TPHg,
- 0.22 mg/kg of benzene,
- 87 mg/kg of toluene,
- 90 mg/kg of ethylbenzene, and
- 540 mg/kg of xylenes.

Corrosion and several holes were reportedly observed in the lower portion of the UST walls.

Groundwater was not encountered during removal of the UST. The excavation was not backfilled following removal of the UST due to the detection of elevated concentrations of petroleum hydrocarbons in the soil.

4.0 LIMITED SITE INVESTIGATION

The scope of work for the proposed activities at the Site will consist of the following tasks:

Task 1: Development of a Health and Safety Plan
Task 2: Soil Sampling
Task 3: Well Installation and Development
Task 4: Groundwater Sampling
Task 5: Documentation of Groundwater Flow Direction
Task 6: Profiling and Disposal of Soil Stockpile
Task 7: Laboratory Analyses
Task 8: Preparation of a Limited Site Investigation Report
Task 9: Quarterly Groundwater Monitoring

These tasks are described in detail below.

4.1 Development of a Health and Safety Plan

In accordance with Occupational Safety and Health Administration (OSHA) guidelines, the SOMA Health and Safety Officer will develop an HSP. The HSP will include an analysis of potential hazards encountered by on-site workers conducting the proposed work and precautions to mitigate the identified hazards.

The health and safety measures presented in the HSP will be implemented during the investigation activities.

4.2 Soil Sampling

Soil samples will be collected from one soil boring located within 10 feet of the former UST excavation. The approximate location of the most nearly "downgradient" area which is accessible for the proposed exploratory boring and well installation is shown in Figure 2. The direction of groundwater flow will be verified as described in Section 4.5.

Depending on the field observations during the initial soil boring, two additional borings may be conducted in other directions from the excavation. Exact placement of these borings will be determined in the field by the project manager after reviewing the results of the initial boring and after considering the physical constraints of the Site.

It is expected that groundwater will be encountered at approximately 10 to 15 feet below the top of the concrete paving at the Site. The initial boring/well is therefore expected to be approximately 20 to 25 feet deep. Any additional borings will be terminated at an appropriate depth as determined by the field geologist.

Soil boring/well installation permit(s) will be obtained from Alameda County Water Management District Zone 7 ("Zone 7") prior to initiation of drilling activities. The soil boring location(s) will be cleared of underground utilities by a private underground utility locator. Underground Services Alert will also be notified to assist in locating underground utilities. Additionally, the concrete paving at the boring location(s) will be cored or cut and removed.

The soil boring(s) will be drilled using 8-inch diameter hollow stem augers. The hollow stem augers will be advanced into the soil using a truck mounted drill rig. Soil samples will be collected from the boring(s) at approximate five foot intervals below ground surface (bgs), at significant lithologic changes, and at areas that are visibly stained and/or where hydrocarbon odors are detected. Soil sampling will continue to the first encountered groundwater. It is anticipated that three soil samples will be analyzed from the boring location based on the above sampling protocol, and the anticipated depth to groundwater of approximately 10 to 15 feet bgs. The soil samples and drill cuttings will be screened for volatile organic vapors using a portable photoionizer detector (PID).

The soil samples will be collected by driving a 2-inch Modified California Sampler (containing clean brass tubes) ahead of the hollow stem augers into undisturbed soil. The brass tubes will be retrieved from the sampler, screened with the PID, then immediately lined with aluminum foil, capped with air-tight plastic lids, sealed and labeled. After being sealed and labeled, soil samples will be maintained at a temperature of 4°C or lower using crushed ice during delivery to the laboratory and prior to analysis by the laboratory. Sample documentation and custody procedures included in Appendix A will be followed. Samples will be analyzed at the laboratory within specific holding times.

The augers and drilling tools will be steam-cleaned prior to use. The Modified California Sampler will be washed with Alconox (a laboratory grade detergent), rinsed with tap water, and fitted with clean brass tubes between each soil sampling interval.

The soil cuttings will be placed (on and under polyethylene sheets) with the stockpile of excavated petroleum-impacted soils.

4.3 Well Installation and Development

The initial soil boring at the Site will be converted to a monitoring well. Drill cuttings and soil samples will be examined and documented on a near continuous basis for lithologic description.

After the hollow stem augers have been sufficiently advanced into saturated sediments, 2-inch diameter schedule 40 polyvinyl chloride (PVC) well casing will be placed inside the hollow stem augers. Assuming a maximum boring depth of approximately 25 feet, 18 feet of 2-inch-diameter, 0.010-inch slotted casing will be located between the approximate depths of 7 and 25 feet. Approximately 7 feet of flush-threaded, 2-inch-diameter PVC solid casing will be installed from the top of the slotted casing to existing grade. The actual length and depth of the well screen installed will be adjusted in the field, based upon the depth to groundwater and the types, depths, and thicknesses of the sediments encountered. The well will be screened across the groundwater table to allow the measurement of floating petroleum product, if any.

The hollow stem augers will then be slowly retrieved from the borehole as the well annulus materials such as sand, bentonite, and grout are added. The slotted interval will be sand packed using Lonestar No. 3 sand or equivalent to a minimum of 2 feet above the uppermost slot. An annular seal will be placed from the top of the sand pack to the surface. The sealing material will be placed in one continuous operation until the specified interval is filled. The annular seal will be a neat cement grout composed of one sack of Portland Type I/II Cement (94 lbs.) to five gallons of clean water. A bentonite "spacer" not exceeding 1 foot in length will be installed between the sand pack and the cement seal. In the event standing water is present, the neat cement grout will be placed by means of a tremie pipe lowered to within three feet of the underlying layer of material or bottom of the well. The tremie pipe will remain in place in the neat cement grout until placement is complete. The cover of the monitoring well will be clearly marked "monitoring well".

The total boring depth, as well as the depths of the sand pack and bentonite seal, will be sounded with a weighted tape during installation of the well. These measurements will be recorded on a drill log. The drilling, logging, soil sampling, and well construction activities will be performed under the supervision of a California Registered Geologist or Professional Engineer.

The well at the Site will be developed a minimum of 72 hours following completion of well installation. The well will be developed prior to sampling to remove fine particles near the well screen, improve water sample clarity, and improve hydraulic communication with the surrounding formation. The well will be developed by surging, pumping, and/or bailing approximately 10 well casing volumes of water. Parameters such as water clarity, pH, temperature, specific conductance and volume extracted will be measured during the development process to gauge its progress. Observations regarding odor and possible oily sheens will also be noted. When these parameters stabilize and the purged water clears, the well will be considered developed.

4.4 Groundwater Sampling

Prior to sampling, the depth-to-groundwater will be measured using an electric water level meter. Floating petroleum hydrocarbons (product) on the ground water, if present, will be measured with an electronic product/water interface probe or a clear acrylic bailer.

Groundwater samples will be collected approximately 24 hours following well development. Groundwater sampling will involve pumping and/or bailing a minimum of three to five well casing volumes of water out of the well prior to sampling. The parameters listed above will be measured during purging. In the case of a slowly-recovering well, the well will be pumped or bailed dry and then allowed to recover to approximately 80 percent of its static water level or for approximately two hours before being pumped dry again. A rapidly-recovering well will be pumped or bailed near-continuously until the parameters listed above have stabilized.

Groundwater samples will be collected using a Teflon bailer. The samples will be transferred into 40-ml VOA vials with Teflon septa and 1-liter amber-colored glass bottles. In addition, the lead sample will be filtered in the field using a 0.45 micron filter prior to being placed into acidified 500 ml plastic bottles. The samples will be stored in a chilled cooler containing crushed ice for delivery to the laboratory. A field blank sample will also be collected for quality control purposes. Sample documentation and custody procedures included in Appendix A will be followed.

The equipment used during well development and groundwater sampling activities which might come into contact with the groundwater will be thoroughly cleaned before and after each use. This will be accomplished by washing with Alconox (a laboratory-grade detergent) and/or steam cleaning and rinsing with deionized water.

The water purged from the well during development and sampling activities will be stored onsite in 55-gallon covered drums pending analytical results.

4.5 Determination of Groundwater Flow Direction

Groundwater flow direction will be determined from site investigation reports for the following properties:

Former Chevron Asphalt Plant & Terminal	1520 Powell Street
Hollis Street Project	6050 Hollis St.
Del Monte Plant	4204 Hollis St./1250 Park
Sherwin Williams	Sherwin & Horton
Clementina, Ltd.	5521 Doyle St.

In addition, after the well is completed, the vertical elevation of the top of casing (measuring point) will be surveyed to the nearest 0.01 foot, and tied horizontally into a benchmark located in the vicinity of the Site. If possible, the measuring point of the monitoring well at 5521 Doyle St. will also be surveyed or established with reference to a common benchmark. Surveying activities will be performed by a California licensed Land Surveyor.

The elevation of the groundwater surface (potentiometric surface) will be measured in the new well and, if possible, the well at 5521 Doyle St., to determine elevation of groundwater at the Site and to evaluate the local gradient between these two wells. The wells are placed approximately 175 feet apart, with the existing well located slightly upgradient on the interpreted potentiometric surface. Groundwater level measurements will be gauged using an electronic water-level probe attached to an engineer's measuring tape graduated to 0.01-foot intervals.

Measurements will be recorded from the top of the groundwater surface to the top of the well casing (measuring point). The difference between the top of the well casing elevation and the depth to the top of the groundwater surface is a measurement of the potentiometric surface of the groundwater table. The potentiometric surface of the groundwater table at the two well locations will be compared to the area gradient interpreted from the referenced site characterizations.

4.6 Profiling and Disposal of Soil Stockpile

Representative discrete and/or composite samples will be collected from the existing soil stockpile for waste characterization and profiling purposes. The waste profile will be submitted to an appropriately licensed waste disposal facility for review and acceptance.

The excavated petroleum-impacted soils will be loaded onto dump trucks, manifested, and transported to the selected disposal facility following acceptance of the waste profile.

4.7 Laboratory Analyses

The soil and groundwater samples will be analyzed by a state-certified laboratory for:

- TPHd using EPA Method 3550/GCFID;
- TPHg using EPA Method 5030/GCFID;
- BTEX using EPA Method 8020; and
- Total lead using EPA Method 7420.

Waste characterization samples will be analyzed according to the protocol of the proposed waste disposal facility.

All samples will be analyzed on the laboratory's normal turnaround basis.

4.8 Preparation of a Limited Site Investigation Report

This task will include evaluating the field and laboratory analytical data obtained during the soil and groundwater sampling at the Site. A written report will be prepared following completion

of limited site investigation activities. The report will present:

- field investigation activities;
- field observations, measurements and readings;
- lithologic logs;
- well and groundwater data;
- laboratory analytical results;
- manifests for soil disposal; and
- findings regarding the extent of the petroleum-affected soils and groundwater.

This report will be submitted to ACDEH under the seal of a California Registered Geologist or Registered Civil Engineer within three weeks following receipt of laboratory analytical results.

4.9 Quarterly Groundwater Monitoring

Collection of groundwater samples and groundwater elevation measurements will be performed at approximate 3-month intervals following collection of the initial round of groundwater samples during the limited site investigation. This work will be performed in accordance with procedures presented in Sections 4.4 and 4.5.

A report will be prepared after each quarterly sampling event. The report will present:

- groundwater sampling activities;
- groundwater elevation measurements;
- well and groundwater data;
- laboratory analytical results; and
- methods and disposal of any contaminated material.

Further investigation activities and results, remedial actions, and other activities pertaining to the environmental issues associated with the former UST will also be documented and presented in the quarterly monitoring reports.

These quarterly monitoring reports will be submitted to ACDEH under the seal of a California Registered Geologist or Registered Civil Engineer within 3 weeks following receipt of laboratory analytical results.

5.0 IMPLEMENTATION SCHEDULE

The approximate estimated duration for each task and the schedule for the work at the Site is presented below. The estimated durations and proposed schedule do not include work delays due to unfavorable weather conditions, acts of God, labor strikes, and other events beyond the control of Fordham Properties and SOMA.

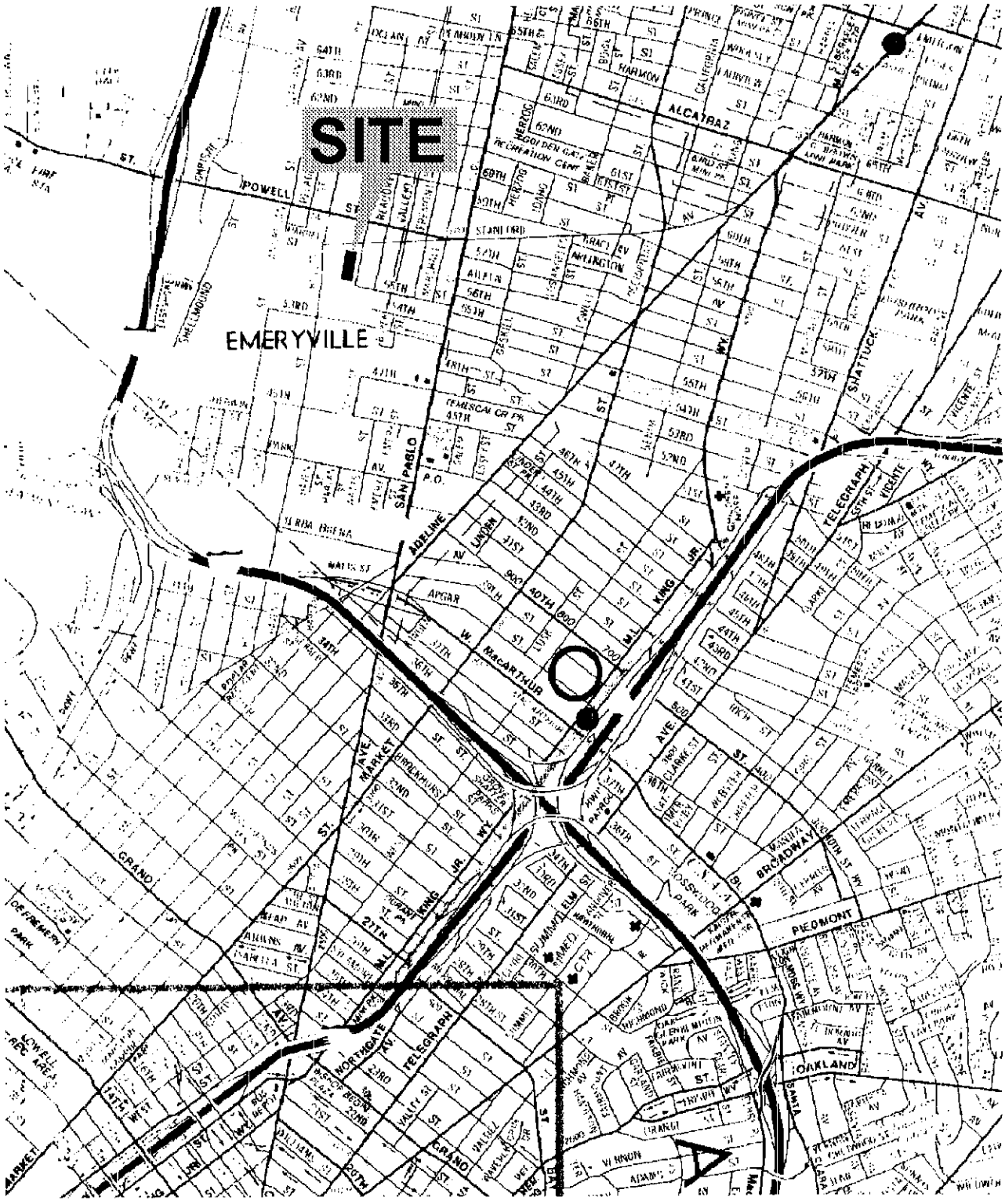
5.1 ESTIMATED DURATIONS

Activity	Estimated Duration (Working Days)
Task 1: Development of a Health and Safety Plan	1 - 2
Task 2: Soil and Stockpile Sampling	7 - 10
Task 3: Well Installation and Development	Concurrent with Task 2
Task 4: Groundwater Sampling	1 - 2
Task 5: Document Groundwater Flow Direction	1 - 2
Task 6: Profiling and Disposal of Soil Stockpile	30 - 60
Task 7: Laboratory Analyses	15 - 20
Task 8: Preparation of a Limited Site Investigation Report	10 - 15
Task 9: Quarterly Groundwater Monitoring	20 - 25

5.2 TENTATIVE SCHEDULE

The tentative schedule presented below for the site assessment activities is based on a start date of no later than February 20, 1995.

Activity	Estimated Completion Date (1995)
Task 1: Development of a Health and Safety Plan	Feb 22
Task 2: Soil and Stockpile Sampling	Mar 08
Task 3: Well Installation and Development	Concurrent with Task 2
Task 4: Groundwater Sampling	Mar 15
Task 5: Establish Groundwater Flow Direction	Mar 17
Task 6: Profiling and Disposal of Soil Stockpile	May 3
Task 7: Laboratory Analyses	Apr 7
Task 8: Preparation of a Limited Site Investigation Report	Apr 28
Task 9: Quarterly Groundwater Monitoring	June 14 Sept 13 Dec 13



MAP SOURCE : CSAA

Scale : 1" ± 1800'

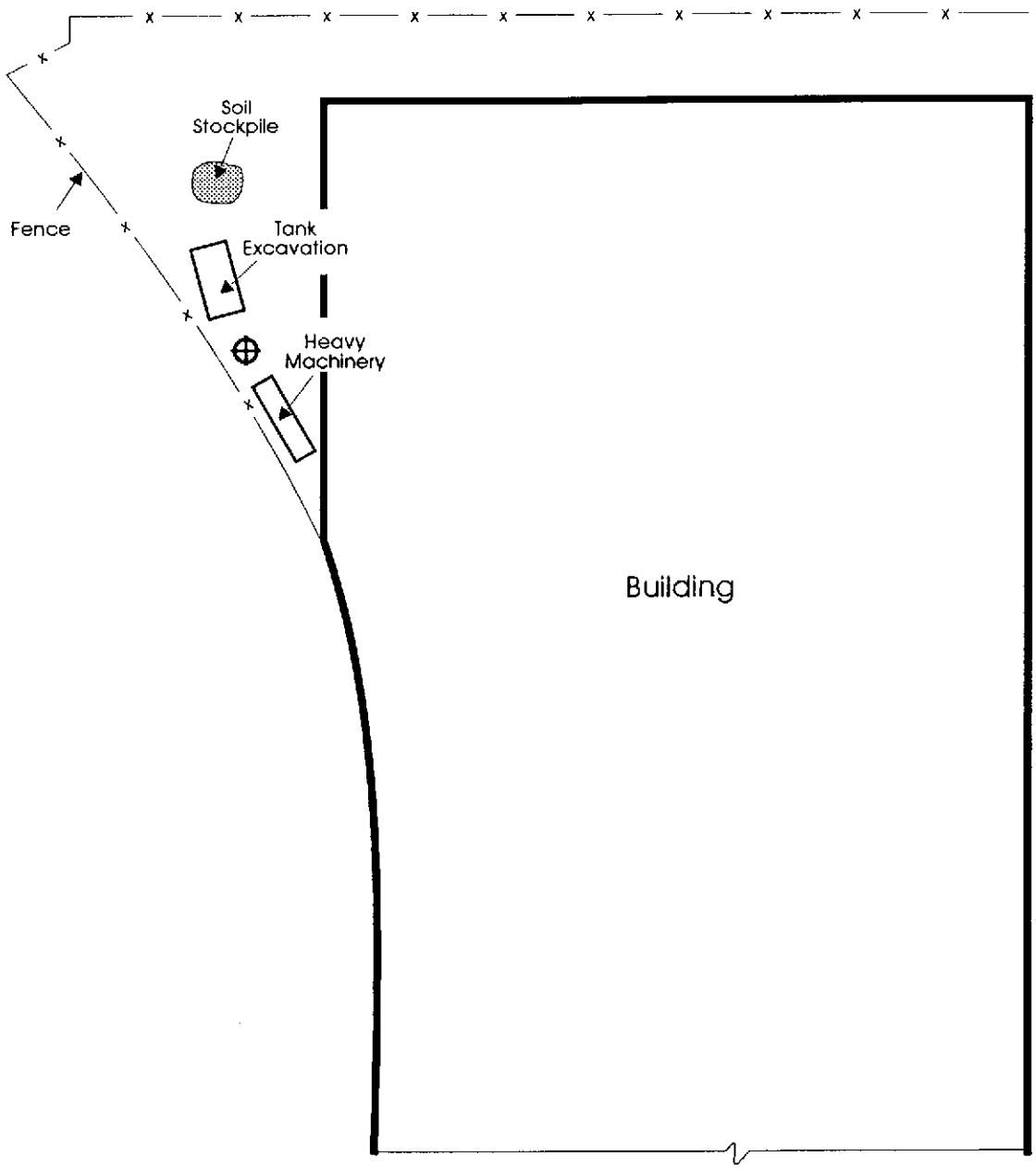
SOMA

SITE LOCATION

Fordham Property

Figure 1

January 1995



EXPLANATION:

⊕ Proposed Monitoring Well

Scale : 1" ± 30'

SOMA

PROPOSED MONITORING WELL LOCATIONS

Fordham Property

Figure **2**

January 1995

APPENDIX A

SAMPLE DOCUMENTATION
AND
CUSTODY PROCEDURES

SAMPLE DOCUMENTATION AND CUSTODY PROCEDURES

DOCUMENTATION

- The following information will be entered on the sample collection data form at the time of sampling:

  - project name and number
  - sampler's name
  - time and date of sampling
  - sampling location
  - sampling method
  - sample number
  - sample condition (disturbed/undisturbed)
  - laboratory analyses requested
  - type of preservative, if any

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

- Collect samples in appropriately-sized and prepared containers
- Properly seal and package sample containers.
- Fill out field sample log and chain-of-custody and analyses request forms.
- Separate and place samples into coolers according to laboratory destination. Samples will be packaged so that the potential for shipping damage is minimized.
- Chill samples to approximately 4° C. Blue ice or regular crushed ice used in the coolers will be sealed in a plastic bag other than the one in which it was purchased.
- Seal the top two copies of the chain-of-custody form inside a zip-lock bag. Use strapping tape to hold the packet on the inside of the cooler.
- Seal cooler with several strips of strapping tape.

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, daily field activities logbook, and chain-of-custody and 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, and preservative used.

Field Log of Daily Activities

A field log will be used to record daily field activities. The field geologist 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:

- field worker's name;
- field log number;
- date and time data are entered;
- location of activity;
- personnel present on-site;
- sampling and measurement methods;
- total number of samples collected;
- sample numbers;
- sample distribution (laboratory);
- field observations, comments;
- 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 be filled out in triplicate form, and will accompany, every shipment of samples to the respective analytical laboratories.

Two copies will accompany the samples to the analytical laboratory. The third copy is kept in the SOMA QA/QC file. 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:

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

APPENDIX B

QUALIFICATION STATEMENTS

PENG K. LEONG
Principal Engineer

EDUCATION

University of California: M.S. Civil Engineering
University of Toronto: B.S. Civil Engineering

REGISTRATION

California Professional Civil Engineer: C039707

PROFESSIONAL HISTORY

ICES., Principal Engineer, 1992-date
Levine-Fricke, Inc., Senior Associate Engineer, 1988-1992
Parsons Brinckerhoff Quade & Douglas, Inc., Senior Engineer, 1985-1988
Kitchell CEM, Project Coordinator, 1984-1985
CRS/Sirrine, Geotechnical Engineer, 1982-1984
University of Toronto, Research Engineer, 1979-1981

REPRESENTATIVE EXPERIENCE

Mr. Leong has a diverse background in geotechnical and environmental engineering. Within the past ten years, he has managed and peer reviewed numerous projects ranging from investigation, characterization, and remediation, of petroleum hydrocarbons, organic solvents, pesticides, volatile and semi-volatile organic compounds, and heavy metals in soil and groundwater. He has worked closely with regulatory agencies to develop innovative strategies, remedial action plans, air monitoring programs, and implemented health and safety programs for field remedial activities. Additionally, Mr. Leong also evaluated engineering design and construction documents for completeness and compliance with program requirements. Mr. Leong is well known for his trouble-shooting abilities and has applied these skills to bring complicated and challenging projects to a rapid conclusion.

ANDREW M. LOJO
Senior Geologist

EDUCATION

San Francisco State University: B.A. Geology, 1988

REGISTRATION

California Registered Geologist: RG 6034

PROFESSIONAL HISTORY

ICES., Senior Project Geologist, 1994-date
Levine-Fricke, Inc., Project Geologist, 1988-1994
California State Department of Transportation,
Engineering Services & Geotechnical Division, 1988

REPRESENTATIVE EXPERIENCE

Mr. Lojo has a diverse background in geological and hydrogeological applications pertaining to environmental assessments and remediation. Within the past six years, he has managed numerous projects ranging from investigation, characterization, and remediation, of petroleum hydrocarbons, organic solvents, pesticides, volatile and semi-volatile organic compounds, and heavy metals in soil and groundwater. He has developed innovative strategies, implemented health and safety programs and air monitoring programs for field remedial activities. Additionally, Mr. Lojo is well known for his abilities to expedite the completion of complicated projects.

Mr. Lojo also performed the seismic and geologic hazard mitigation analysis for the EIR of a major highway expansion project and investigations of a major landslide.