WORK PLAN FOR A PRELIMINARY SUBSURFACE INVESTIGATION

at
706 Harrison Street
Oakland, California

for

Mr. Bo Gin
288 11th Street
Oakland, California

Job No.: E0012-1

by

FRANK LEE AND ASSOCIATES

April 22, 1991

FRANK LEE & ASSOCIATES

GEOTECHNICAL CONSULTANTS

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April 22, 1991

Mr. Bo Gin
288 11th Street
Oakland, California

Subject: WORK PLAN FOR A PRELIMINARY
SUBSURFACE SOILS INVESTIGATION
706 Harrison Street
Oakland, California

Dear Mr. Gin,

Frank Lee and Associates (FLA) are pleased to present to you this work plan to perform a limited subsurface soil investigation at the subject site. This work is to investigate for the presence and/or extent of petroleum-contaminated soils at the site. The proposed scope of work includes: a) drilling eight (8) soils borings in the vicinity of the former underground storage tanks; b) collecting soil samples from each boring; c) submit the collected soil samples to a laboratory for chemical analysis; and d) write a report that summarizes the field activities and presence the results of the findings.

Please review the enclosed work plan. It is our understanding that you wish to start the proposed work as soon as possible. We will do all that we can to accommodate you. If you have any questions concerning the scope of the work please feel free to give us a call at (415) 657-7792. Thank you.

Respectfully submitted,

REGISTERED PROFESSIONAL ENGINEER
FRANK TZONG-HWA LEE
C 34975
CIVIL
STATE OF CALIFORNIA

Frank Lee 4/22/91

Frank Lee
Principal, P.E.

Frank Lee 9/30/91

Enclosures: PROPOSAL/WORK PLAN FOR A PRELIMINARY
SUBSURFACE INVESTIGATION

Copies: Addressee (1)
Mr. Paul Smith, Alameda County Health, Hazardous Materials Division, Oakland, California (1)
San Francisco Bay Regional Water Quality Control Board, Oakland, California (1)

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PROPOSAL/WORK PLAN FOR A PRELIMINARY SUBSURFACE INVESTIGATION

INTRODUCTION

This proposal/work plan describes the work to perform a preliminary investigation for the extent of petroleum hydrocarbon contamination in the soils at 706 Harrison Street, Oakland, California (hereafter referred to as "site"). See enclosed Plate 1; Site Vicinity Map. The contaminated soils at the site are believed to be associated with apparent unauthorized discharges of petroleum hydrocarbons from six underground fuel storage tanks formerly located at the site. These actions are part of the requirements by the California Regional Water Quality Control Board--San Francisco Bay Region (RWQCB) and the Alameda County Environmental Health, Hazardous Materials Division (ACEH), as this unauthorized discharge appears to have impacted soils at the site, and could potentially impact ground water.

SITE DESCRIPTION

The site is located at the north east corner of Harrison and Seventh Streets, in the southeastern portion of the Oakland city limits. The Alameda/Oakland Harbor is located approximately one half mile south of the site. Land use of the general area is predominantly commercial, mixed with residential.

The site is estimated to be one-quarter acre in size, and is rectangular in shape (see Plate 2, Site Schematic). Harrison and Seventh Streets bound the western and southern portions of the site, respectively. A gasoline service station borders the northern limits of the site. A private residence borders the site's eastern limits.

On February 19, and March 15, 1991, FLA performed two visual reconnaissances of the site and the immediate surrounding area. The site is currently vacant and primarily unpaved. The site's surface appeared relatively flat. Three pits, and stockpiled soils (resulting from the removal of underground storage tanks) were also observed at the site. A chain-link fence surrounds the perimeter of the site. There was no visual evidence of existing water wells (domestic or monitoring) at the site. FLA believes that depth to ground water is approximately 20 to 25 feet below grade, and flows in a southerly direction. Reportedly, public utilities service the site.

SUMMARY OF SITE HISTORY

You reported that you leased the site from ARCO beginning in 1963, and have occupied the site since that time. You also reported purchasing the site from ARCO in 1978. It is the understanding of FLA that the site was being used as a gas station previous to your occupation of the property. The station contained four 1000-gallon leaded gasoline tanks, one 100-gallon automotive waste oil tank and two dispenser/pump islands at the time of your association with the site. You stated that two 6,000-gallon unleaded gasoline tanks were installed in 1976, however, the age of the other storage tanks or station is not known. The approximate location of these former features are indicated on Plate 3, Historic Site Schematic. It is the understanding of FLA that no "as-built" plans or diagrams are available for the installation of the tanks or related piping, and no tank testing or monitoring records are available. You reportedly are not aware of any unauthorized discharges from these tanks.

You stated that you used the station facilities at the site up to 1985, and that the facility has been closed since that time. Reportedly, you provided for the removal and recycling of product from the underground storage tanks in July 1988. This work was performed by Waste Oil Recovery Systems. You also reported that structures existing on the site were demolished and removed from the site December, 1990.

PREVIOUS SITE WORK

Preliminary Soils Chemical Testing

On October 14, 1988, FLA performed a limited subsurface soils investigation at the site; see Attachment 1, Frank Lee and Associates Report, October 14, 1988. This work was performed in conjunction with a geotechnical study of the site. It is our understanding that the chemical testing of the soils was for your information and not required by any regulatory agency.

Seven borings were drilled on the site (indicated as B-1 through B-7 in the Frank Lee and Associates Report), five of which (B-1 through B-5) were placed near the existing tanks. Soil samples recovered from borings B-1 through B-5 were chemically analyzed by Sequoia Analytical, located in Redwood City, California, for Low to Medium Boiling Point Hydrocarbons (TPH Gasoline), with Benzene, Toluene, Ethyl Benzene, and Total Xylenes (BTEX) distinction, and Total Lead (Pb).

Chemical analysis results of the recovered soil samples are presented in the Frank Lee and Associates Report, and the following page in Table 1, 1988 Chemical Analysis Results.

TABLE 1

1988 CHEMICAL ANALYSIS RESULTS

Sample Description	Sample Depth (Feet)	Analyte (Parts per Million) TPH Gasoline	B	T	E	X	Pb
B-1-1	15 - 15-1/2	ND	ND	ND	ND	ND	--
B-2-3 & B-2-4 (Composite)	15-1/2 - 16 20 - 20-1/2	19	0.83	1.5	0.88	2.6	2.1
B-3-1 & B-4-3 (Composite)	10 - 10-1/2 15-1/2 - 16	1.3	ND	ND	ND	ND	2.3
B-5-2	15 - 15-1/2	5.1	ND	ND	ND	ND	--

ND - Below detection limits
-- - Not analyzed

These results reveal detectable levels of hydrocarbons and lead in the soil samples. These values appear relatively low.

Tank Removal

Information provided to FLA reveals that the above mentioned fuel storage tanks were removed from the site in January, 1991, by Tank Protect Engineering, located in Union City, California; see Attachment 2, Results of Tank Closure Soil Samples. It is the understanding of FLA that Tank Protection Engineering has not provided you with details of the tank closure activities, however, available information indicates that 13 soil samples were recovered from the tank pits, and two samples from beneath a former pump island. These samples are indicated as S1-N, S1-S (recovered from the "northern" 6,000-gallon gasoline tank), S2-N, S2-S, S3-N, S3-S, S4-N, S4-S, S5-N, S5-S (recovered from the four 1,000-gallon gasoline tanks), S6-E, S6-W (recovered from the "southern" 6,000- gallon gasoline tank), WO-1 (recovered form the waste oil tank), I1-S, and I1-N (apparently recovered from the

pump island). The approximate locations of these soil samples are indicated on Plate 4, Tank Closure Soil Samples. Chemical analysis results are presented in Attachment 2, and below in Table 2, Chemical Analysis Results of Tank Closure Soil Samples.

TABLE 2

Chemical Analysis Results of Tank Closure Soil Samples

Sample Description	TPH Gasoline	TPH Diesel	Analyte (Parts per Million) B	T	EB	X	Pb
6000-Gal. North:							
S1-S	390	--	0.69	0.56	3.1	8.7	ND
S1-N	ND	--	0.070	0.063	0.013	0.054	ND
1000-Gal. North:							
S2-N	6,800	--	75	290	98	540	ND
S2-S	5,700	--	82	280	85	460	5.5
1000-Gal. Cntr-North							
S3-N	3,600	--	19	100	53	280	ND
S3-S	4,600	--	30	210	78	470	ND
1000-Gal. Cntr-South							
S4-N	ND	--	0.013	0.010	ND	0.026	ND
S4-S	8,000	--	7.9	56	84	450	ND
1000-Gal. South							
S5-N	9,400	--	17	160	97	650	4.7
S5-S	12	--	0.023	0.016	0.053	0.19	3.3
6000-Gal. South							
S6-W	ND	--	0.010	0.010	ND	0.030	ND
S6-E	400	--	0.21	0.57	5.0	9.8	4.3
Pump Island:							
I1-N	ND	--	ND	0.0088	ND	0.022	370
I1-S	ND	--	0.0050	0.012	0.0092	0.050	45
Waste Oil Tank:							
WO 1	ND	ND	ND	ND	ND	ND	ND

TABLE 2, Continued....

Additional Analysis
from Waste Oil Tank
Soil Sample:

METALS:
Cadmium - ND; Chromium - 33 ppm; Lead - 28 ppm;
Nickel - 26 ppm; Zinc - 710 ppm

HALOGENATED VOLATILE ORGANICS:
ND

SEMI-VOLATILE ORGANICS:
Benzo pyrene - 100 ppb; Fluoranthene - 110 ppb;
Pyrene - 150 ppb; Open Scan - ND

ND - Non detected
PPM - Parts per Million
PPB - Parts per Billion
-- - Not Analyzed

Results of the tank closure soil samples, recovered from the four leaded gasoline storage tanks, reveal relatively high levels of gasoline, and related compounds. Detectable levels of gasoline hydrocarbons were also found in samples collected from the 6,000-gallon unleaded gasoline tanks.

Detectable levels of Semi-Volatile Organics, Cadmium, Chromium, Lead, Nickel, and Zinc were found in the soil sample recovered from the waste oil tank. These levels appear relatively low.

Reportedly, the tanks were visually inspected upon their removal. The tanks were found to be made of metal with no obvious evidence of holes or product leaks. You indicated there was no obvious evidence of soil staining or petroleum-like odor in the backfill (sand) or soil materials surrounding the tanks. During our site reconnaissances, the open tank pits were visually inspected. There was no evidence of soil staining or petroleum odors in the pits.

Job: E0012-1 April 22, 1991

SCOPE OF WORK

The following proposed work shall be performed to verify and/or investigate the extent of petroleum hydrocarbon soil contamination in the vicinity of the former tanks. The scope of work is as follows:

1. Obtain and complete boring permits.

2. Drill 8 soils borings in or near the locations indicated on Plate 5, Proposed Boring and Sample Locations. The borings will be drilled, and samples will be recovered and handled as indicated in the Drilling, Sampling and Sealing Protocol presented on Page 8. Borings shall be terminated when water-saturated materials are first encountered, believed to be approximately 20 to 25 feet below grade. We estimate that three soil samples will be recovered from each boring. Depth to ground water will be noted. The ground water and drilling equipment (surface of the augers) will be visually examined for a sheen or for free petroleum product.

Soil borings B-1, B-3, B-4, B-5, B-6, B-7, and B-8 will be placed in the areas suspected to be contaminated, as indicated in the tank closure soil sample results. Boring B-2 will be placed in the vicinity of a former pump island, not previously soil sampled during the tank closure activities.

Soil samples will be delivered to a State-certified laboratory, Sequoia Analytical Laboratory, located in Redwood City, California. Soil samples from Borings B-1 to B-7 will be chemically analyzed for TPH as gasoline (EPA Method 5020 or 5030), with BTEX distinction (EPA Method 8020). Samples from B-8 will be chemically analyzed for Semi-Volatile Organics (EPA Method 8270). Unless otherwise specified by you, the samples will be submitted for normal 15 working-day results. Upon completion of soil sampling, each boring will be backfilled to surface grade (tremied) with neat cement or equivalent. If required, an inspector from the Alameda County Health, Hazardous Materials Division will be present during the soil sampling and/or backfilling process.

3. A technical report of the findings and field observations will be prepared, and singed by a State-registered Professional Civil Engineer. All work will be supervised by a State-registered Professional Civil Engineer.

A copy of the report should be submitted to the Regional Water Quality Control Board and the Alameda County Health, Hazardous Materials Division for their review and consideration for further action.

PURPOSE OF WORK

The purpose of the work outlined above is to verify the presence of petroleum hydrocarbon levels indicated in the tank closure soil samples, and/or investigate the extent of chemical soil contamination in the immediate vicinity of the former underground tanks. It is our understanding that you are considering to excavate the contaminated materials, and remediate these materials on site, if conditions permit. The results of this investigation will be used as guidelines for soil excavation activities to remove the contaminated soil materials. A work plan for the excavation or additional required work (i.e. ground water investigation) will be submitted to the RWQCB and the Alameda County Health, Hazardous Materials Division prior to commencement of the work.

DRILLING, SOIL SAMPLING, AND SAMPLE HANDLING PROTOCOL

Soil boring procedures will follow guidelines recommended by the California Regional Water Quality Control Board and the Alameda County Health, Hazardous Materials Division.

Soil Borings

Proper permits will be obtained from Zone 7 Water District. If required an inspector will be present to witness the backfilling of the borings. All drilling and backfilling/tremie work will be performed by a State-licenced C-57 driller.

Soil borings will be drilled with a continuous-flight hollow-stem auger of at least 3 inches ID and 6-8 inches OD. All augers will be thoroughly steam-cleaned prior to visiting the site. Between borings at the site, the augers will be steam-cleaned at a location well away from the proposed borings or adequate lengths of clean auger will be available to complete all of the borings without reusing auger sections.

A geologic drilling log will be maintained of the materials encountered and sample locations in each boring. The log will include field descriptions of the soil properties, lithologic variations, moisture conditions, and any unusual characteristics noted that may indicate the presence of chemical contamination. The materials encountered will be variously screened using a Gastector hydrocarbon detection field instrument.

Soil Sampling

All chemical sampling, handling, and storage will be conducted in accordance with Environmental Protection Agency and Regional Water Quality Control Board guidelines for the investigation of suspected underground storage tank fuel leaks. If required, an inspector from the Alameda County Health, Hazardous Materials Division will be on site to witness sampling activities.

Soil sampling will commence at or near the bottom limits of the former tanks; approximately eight to 10 feet below grade. If contamination is encountered shallower in the soil profile, soil sampling will commence at that depth. Subsequent samples will be recovered at five-foot increments or less to the depth of the water-saturated zone. If encountered, soil samples shall be recovered at or near lithologic changes, soil - backfill or soil - ground water interfaces, and from soils that appear contaminated. Soil samples will be taken with a California

Modified split-spoon sampler. The sampler, containing 3 2-inch (O.D.) by 6-inch (length) clean brass sampler liners, will be carefully inserted into the hollow stem of the continuous-flight augers. Using a 140-pound hammer, falling a distance of approximately 30 inches, the sampler will be driven at least one foot into undisturbed materials beyond the bottom end of the auger. The number of blows necessary to drive the sampler one foot will be recorded on the boring log.

Soils samples in the bottom of the three brass liners in the sampling casings (if in good condition) will be taken as the samples to be tested. All sample containers will be properly sealed, labeled and identified, in the field. The ends of the sample liners will be capped with aluminum foil, and sealed in place by clean plastic caps and aluminized duct tape.

Middle liners from the sampler casing will be extruded in the field and examined to help provide information for the boring logs. Using the Gastector, the materials in the liner will be screened for the presence of petroleum hydrocarbon vapors. This information, along with field observations, will be used for the selection of samples to be submitted for laboratory analyses. The cuttings from the borings will also be examined during the drilling activities. Cuttings and soils samples not retained for chemical analysis will be placed in DOT approved 55-gallon drums, and secured on site. Upon determination of their chemical disposition, these materials will be appropriately disposed of.

After the sample is collected, the soil sampler casings will be disassembled, steam-cleaned or cleaned in soapy (TSP) water, rinsed with clean tap water and finally rinsed with de-ionized water, and air-dried just prior to taking each sample. The cleaned casings will then be re-assembled with similarly cleaned

and dried brass liners. Rinseate materials will be placed in DOT approved 55-gallon drums, and secured on site. Upon determination of their chemical disposition, these materials will be appropriately disposed of.

Samples will be delivered to the laboratory within two days of its acquisition. Samples will be continuously kept on dry ice during transport to the laboratory. Unless otherwise requested by the laboratory, no preservatives will be added to the sample.

Sealed samples will only be opened by laboratory personnel who will perform the chemical analysis. Samples will analyzed within two weeks from their collection date.

Sample Custody

All samples collected will be labeled with the following information: job name, sample number, location, date and time collected, name of collector, and any pertinent remarks. Field records of soil samples will be maintained on a field log. All field records will be written in ink. Copies of all field documentation will be maintained in an on-site file and the originals will be kept at the FLA office. Samples will be kept in an ice chest cooled to approximately four degrees centigrade, by ice, during temporary storage and transportation to the laboratory.

Chain of custody forms will be filled out by the sample collector before releasing the sample for storage or transportation. The form will then be routed with the samples through storage, transportation, and laboratory analysis. Copies of the completed chain of custody forms will be provided to the laboratory. A field log book will document when samples are released from storage for transport to the analytical laboratory.

When the samples arrive at the laboratory, a laboratory representative will sign the chain of custody forms and enter a laboratory identification number onto the sample label and chain of custody form. The identification number will be used by the laboratory in its internal tracking system, thus the status of a particular sample can be determined at any time by referring to the laboratory log books. Both the laboratory identification and field sample numbers will be cited when the analytical results are reported.

LABORATORY QUALITY ASSURANCE

All samples collected during this project will be analyzed by a State Department of Health Services (DHS)-certified laboratory for the selected parameters in accordance with standard EPA-approved methods. All laboratory quality assurance/quality control (QA/QC) information will be made available in a Summary Report prepared by the laboratory. Laboratory quality control measures will include those required by the DHS under their Hazardous Waste Laboratory Certification Program.

The following additional sample control may be utilized dependent upon the scope of work. Ten percent of the soil samples will be split and analyzed separately as duplicates. One set of samples will be submitted to the laboratory as a blind duplicate. In addition, a trip blank obtained from the laboratory and/or a field blank will be submitted for analysis.

DATA VALIDATION AND REPORTING

Data collected and used in project reports will be appropriately identified and will be included in a separate appendix in the final report. All data will be reviewed. Apparent abnormalities (e.g., unexpected order-of-magnitude difference among samples and/or instrument readings) will be investigated by reviewing procedures, field instrument procedures and calibrations, and laboratory QC results.

SITE SPECIFIC SAFETY PLAN

Introduction

This document describes the health and safety procedures for the activities planned in performing a preliminary site investigation at the **706 Harrison Street, Oakland, California.** All personnel and subcontractors will follow this plan. The prime responsibility for employee safety lies with each company involved in the work for its own employees. It is expressly intended that all project work will comply with applicable sections of the California Occupational Health and Safety Code. All parties working on this project will maintain a general responsibility to identify and correct any health and safety hazards and are responsible for working in a safe manner.

Key Personnel

Project personnel who will have overall responsibility for the safe operation of this project are:

Site Contact:	**Mr. Bo Gin** (415) 763-2096
Frank Lee and Assoc. Project Manager and Safety Officer:	**Michael Princevalle** (415) 426-5456

Frank Lee
President Frank Lee
and Associates: (415) 657-7792

Project Manager and Safety Officer Responsibilities

The responsibilities of the Key Personnel are:

- To conduct initial site safety training for all project field team members as described in this document,
- To assure all field team personnel have read and understand the Health and Safety Plan,
- To assure all work performed by field personnel is conducted in accordance with safe practices outlined in this plan,
- To coordinate with safety personnel fire-watch, traffic control and site security,
- To monitor activities to assure the proper use of personal protective equipment such as hard hats, protective eye wear, gloves, coveralls, respirators, etc,
- To monitor ambient hydrocarbon vapors,
- To make certain personnel safety equipment is in a usable condition, and
- To shut down or modify field work activity based on criteria presented in the site safety plan

Sub-Contractor Responsibilities

The responsibilities of the subcontractor with respect to safety are:

- To read, understand and accept this Health and Safety Plan,
- To assure all members of its crew attend the safety training program,
- To make certain equipment and other machines are properly inspected and maintained and are in compliance

with applicable sections of the California Health and Safety Code,

- To supply and maintain safety related protective equipment such as hard hats, safety boots, protective coveralls, gloves, safety eye wear, respirators, etc., as specified in this plan,
- To assure each employee working at this site read and comply with this Health and Safety Plan, and
- To enforce corrective action under the direction of the Site Safety Officer.

Field Team Member Responsibilities

The responsibilities of the field team members are:

- Read, understand and follow this plan,
- Perform work safety,
- Cooperate with safety personnel,
- Report any unsafe conditions to the immediate supervisor, and
- Be aware and alert for signs and symptoms of potential exposure to site contaminants and heat stress.

HAZARD CRITERIA

Hazard Evaluation

As air, water, soil and chemical substance monitoring data become available for all site work, the information will be evaluated by the Site Safety Officer. Appropriate action in the form of Health and Safety modifications will be initiated by the Safety Officer if necessary.

The anticipated activities of this project include:

- Drilling and sampling of borings,
- Collection of soil samples,

- Monitoring of ambient hydrocarbon concentrations during project activities.

The general types of hazards associated with this project are:

- Mechanical hazards: swinging objects, machinery, etc,
- Electrical hazards: buried cables, overhead power lines,
- Chemical hazards: gasoline, diesel, waste oil
- Fire hazards: natural gas and product lines, flammable petroleum hydrocarbons, and motor driven equipment,
- Thermal hazards: heat stress,
- Acoustical hazards: excessive noise created by machinery.

Job hazard analyses associated with each major work activity are presented in the following sections.

Hazard Evaluation: Soil Borings

Drilling soil borings and installing ground water monitoring wells in contaminated soil will potentially expose field personnel to the following known hazards:

- Chemical hazards:
  - -- Exposure to various chemical substances, including but not limited to, petroleum hydrocarbon liquids and vapors from gasoline and diesel fuel, waste petroleum oil and grease.

- Physical hazards:
  - -- operating machinery,
  - -- falling objects, and
  - -- exposure to outside temperature extremes.

- o Fire, Electrical and Noise Hazards:
  - -- underground gas and product lines, and
  - -- excessive machinery noise.

Due to the nature of drilling, there is a risk for electrical shock from overhead and underground electrical lines. There is also a risk of physical injury from moving machinery and heavy drilling equipment. Explosive hazards exist when fuel concentrations in the bore hole reach explosive levels; > 10% LEL.

Hydrocarbon Vapors

Hydrocarbon vapors expected to be encountered consist of gasoline and diesel fuel. Exposure to elevated levels of hydrocarbon vapors presents potential health risks that need to be properly controlled. Work practices and methods will be instituted to limit exposures. Where elevated exposures persist, respiratory protection will be the primary control method to protect personnel from inhalation of hydrocarbon vapors. The hydrocarbon vapors expected to be encountered during project activities are composed of a variety of volatile refined petroleum compounds. The majority of these have limited toxicity requiring minimal controls at the concentrations expected.

Petroleum fuel consists of hundreds of chemical compounds. There are certain compounds such as benzene that present significant hazards and must be properly controlled. To do so, a working limit of 100 ppmv total hydrocarbon is proposed as the maximum acceptable level of exposure without respiratory protection. In a typical situation with 1% of the hydrocarbon vapors being benzene, a 100 ppmv concentration of total hydrocarbon will result in a breathing zone of less than 1 ppmv benzene. This level is one tenth of the current occupational Permissible

Exposure Limit (PEL) for an 8 hour exposure to benzene.

Action Levels Of Hydrocarbon Components in Petroleum Fuel:

Gasoline	**>300ppm**	**PEL**	**LEL > 10%**
Benzene	**> 1ppm**	**"**	**Oxygen <19.5%**
Toluene	**>100ppm**	**"**	
Xylene	**>100ppm**	**"**	
Ethyl Benzene	**>100ppm**	**"**	

A hydrocarbon vapor analyzer will be used to measure real time breathing zone concentration for comparison with the 100 ppmv working limit. When a persistent level of 100 ppmv is observed, appropriate respirators will be donned and other vapor measurements will be made. If hydrocarbon vapors exceed 1000 ppmv or 10 ppm benzene, work will be stopped. The field crew will be instructed to stay up wind and methods will be applied to subdue fugitive vapor emissions such as sprinkling soil with water, or the use of copus blower. The site Safety Officer will make such determinations.

If LEL is >10% in or around the tank, work must stop and not commence until determined safe and/or LEL% <10.
If oxygen levels in the immediate work area are < 19.5%, work must stop until determined safe and/or levels are >19.5%.

Symptoms Of Acute Overexposure: Gasoline and gasoline vapors may be irritating to the skin, eyes and respiratory tract. Gasoline vapors may effect the central nervous system and may cause headaches and dizziness.

Oxygen Deficiency: May cause dizziness.

Heat Stress and Noise

A hazard exists when individuals are required to work in warm temperatures, particularly while wearing impervious protective clothing. When the ambient air temperature exceeds 65 degrees, heat stress may become a problem. If these conditions are encountered, the following precautions on the next page will be taken:

- During day-to-day field work, the on-site supervisor will be alert for the signs and symptoms of heat stress.

Field workers will be observed for the following signs and symptoms of heat stress.

- profuse sweating, or complete lack of sweating,
- skin color change,
- increased heart rate,
- body temperatures in excess of 100 degrees as measured by thermometers, and
- vision problems.

Any team member who exhibits any of these signs or symptoms will be removed immediately from field work and be requested to consume electrolyte fluid or cool water while resting in a shaded area. The individual will be instructed to rest until the symptoms are no longer recognizable. If the symptoms appear critical, persist or get worse, immediate medical attention will be sought.

When working around mechanical equipment the potential exists for exposure to excessive noise. To deal with the health hazards of excessive noise, ear plugs will be provided.

Personal Protective Equipment Requirements

This section specifies personal protective equipment required for the various tasks of this project.

Soil Borings and Sampling

Respiratory Protection: all field personnel will be required to have available an air purifying respirator with organic vapor cartridges. The respirators will be required based on criteria presented in this safety plan. All respirators must be NIOSH approved, canister-equipped for all organic vapors up to 1000 ppm.

Protective Clothing: all field personnel who handle contaminated soil or liquid will wear impervious coveralls and butyl rubber gloves. Impervious coveralls will not be required if soil or water is not visibly contaminated, or if vapor measurements are below 500 ppmv. Level "D" protective clothing and equipment will be worn at all times on the job site. All employees will have level "C" protective equipment available at all times. The site safety officer will monitor air borne contaminant levels for determination of when to don level "C" equipment.

Head Protection: Field personnel will wear non-metallic safety helmets.

Foot Protection: Field personnel will wear neoprene rubber boots with steel toes. Under non-liquid exposure conditions, leather boots with steel toes and shanks are permissible.

Ear Protection: Field personnel, based on noise levels, may be required to wear earplugs during soil excavation.

Eye Protection: Field personnel will wear chemical-resistant safety glasses with attached side shield where splashes of potentially hazardous liquid or particles are likely.

Work Zones

During soil excavation and well drilling operations, a work zone around the immediate vicinity of the project will be established and taped off. Only authorized personnel will be permitted to enter the work zone. Authorized personnel will include those who have duties requiring their presence in the work zone and have read this site safety plan. Work zones are also created to aid in the decontamination of equipment and personnel. The following describes the zones to be established:

- Exclusion Zone: A 75 foot circle around the work area will be defined before work starts. The area inside the circle will constitute the "Exclusion Zone". The exclusion zone constitutes the area where potentially hazardous airborne contaminants and physical hazards to the workers exist. Full personal protection must be available to all personnel in this area. The size of the Exclusion Zone may be changed to accommodate site conditions and to ensure contaminant containment.

- Contamination Reduction Zone: A formal decontamination zone should not be required during the preliminary investigation. However, an area will be designated in the event extreme gasoline contamination is encountered. The decontamination zone will be an area where personnel can clean protective equipment. A waste container will be placed outside of the exclusion zone so contaminated equipment can be placed inside and covered.

- Support Zone: A Support Zone, the outermost zone, must be defined for each field activity. Support equipment is located in this uncontaminated or clean area. Normal work clothes are appropriate within this zone. The location of this zone depends on factors such as accessibility, wind direction (it should be up wind of excavation), and resources (e.g. roads, utilities, shelter).

Decontamination Procedures

Petroleum hydrocarbon liquids and vapors are anticipated. Due to the volatile nature of the hydrocarbons that may be encountered during the initial excavation and sampling operations, decontamination of equipment and vehicles will be of minimal importance since the volatile hydrocarbons will rapidly vaporize. Therefore, no formal decontamination procedure will be followed with the exception of general cleaning. No eating, drinking or smoking will be permitted in the exclusion zone. All personnel involved in work activities will be instructed to wash their hands, face, neck and forearms at the end of the work day. Soap, water and towels will be provided at the site for this purpose. The field personnel will also be instructed to shower at home at the end of each work day.

As work progresses, the nature of materials handled and the extent of contamination may possibly require formal decontamination procedures and delineated work/clean zones. However, we do not expect that such formal procedures will be necessary at this site and will only proceed at the Safety Officers discretion.

In the event extreme contamination is encountered, decontamination of personnel, equipment and vehicles will be important to insure that contamination does not spread to unsuspecting people and property. Personal decontamination mainly involves personal hygiene. Contamination should not be present on the skin if the proper protective methods specified in this plan are used. However all field personnel will be instructed to follow these guidelines to ensure that contamination does not remain on equipment, sample containers or in contact with their bodies.

The field team should remove their personal protective clothing in the following sequence:

Step 1: Move out of the exclusion zone and into the decontamination zone. Do not remove personal protective equipment.

Step 2: Obtain decontamination solutions and decontaminate the spades, shovels and other equipment by brushing them under a water rinse. A high-pressure steam cleaner may also be used for decontamination. All wastes and spent decontamination liquids will be properly contained.

Step 3: Remove outer gloves and coveralls and place them inside a garbage bag. Keep the air purifying respirator on.

Step 4: Move to the support zone and remove the respirator.

Monitoring Program

Personal exposure to ambient airborne hazards will be monitored to assure that personnel exposures do not exceed acceptable limits and that appropriate selection of protective equipment

items is made. Airborne hydrocarbon vapor concentrations will be measured primarily by the use of a hydrocarbon vapor meter. If concentrations approach criteria levels, all personnel will be notified of possible site safety changes. Audits will be conducted by the Safety Officer to insure compliance with the Safety Plan and to provide additional support as required.

Ambient Vapor Reading

A hydrocarbon vapor detector will be used during drilling and excavation activities. This instrument will be used to measure both excavation and breathing zone concentrations of hydrocarbon vapors. The instrument will be calibrated on a regular schedule using known calibration gases. Readings will be taken in the area where the field team members are working and surrounding down-wind areas. Measurements will be taken every 30 minutes when hydrocarbon vapors indicate levels above 30 ppmv. All readings will be recorded in a field notebook.

Emergency Response Plan

Emergency procedures listed in this plan are designed to give the field team instruction on how to handle medical emergencies and fires and explosions. The emergency procedures will be carefully reviewed with the field team during the health and safety training session.

Emergency Phone Numbers:

Fire Dept	911
Ambulance	911
Police	911
Hospital - Merrit (Hawthorn & Webster Aves)	(415) 655-4000
Site or Client Phone	(415) 763-2096
Poison Control Center	(415) 428-3248
Chem Trec	(800) 424-9300

EPA Emergency Response		(415) 974-7511
State Office of Emergency Services		(800) 852-7550
Emergency Response/	(Erickson)	(415) 235-1393
Clean-up	(H and H)	(415) 543-4835

* Note: Prior to starting work, note the nearest location of functional telephone - See neighboring Shell Station

Injuries

Medical problems occurring on site will be handled quickly. Emergency telephone numbers will be written down and posted in the passenger compartment of the field vehicles. The local emergency numbers are:

Police, Fire and Rescue **Dial 911**

Emergency and First Aid Procedures:

Eye Contact: Flush with clear water for 15 minutes or until irritation subsides. See a physician.

Skin Contact: Wash thoroughly with soap and clean water.

Inhalation: Remove from area away from vapor/exposure. Call physician and start resuscitation IMMEDIATELY if breathing has stopped.

Ingestion: DO NOT INDUCE VOMITING; call physician IMMEDIATELY.

Oxygen deficiency: Move out of oxygen deficient area into fresh air. Call physician and resuscitation IMMEDIATELY if breathing has stopped.

The field team will be instructed to seek immediate professional medical attention for all serious injuries. A first aid kit will be present at the work site for use in case of minor injuries. If anyone receives a splash or particle in the eye, the field team will be instructed to irrigate the eye for 15 minutes. Instruction will also be provided to wash any skin areas with soap and water if direct contact with contaminants has occurred.

Fire and Explosion Hazards

Fires on site are of particular concern during soil drilling and sampling activities due to the possibility of encountering flammable petroleum hydrocarbon liquid or vapors. During these activities the Site Safety Officer will be present and equipped with an explosive vapor monitor for area monitoring and a multi-purpose (A, B, C,) fire extinguisher.

Flammable materials will be cleared away from the site prior to the start of work. If a fire does occur, the local fire department will be contacted immediately.

Operation Shutdown

Under extreme hazardous situations the on-site supervisor, Safety Officer, or Project Manager may request that operations be temporarily suspended while the underlying hazard is corrected or controlled. If vapor measurements with the explosive vapor monitor show levels approaching explosive limits, operations will be stopped while the area is controlled. During this activity, all personnel will be required to stand up wind to prevent exposure to fugitive vapor emissions. The Safety Officer will have ultimate authority for operations shutdown.

Community Protection

To assure the community is protected from health and fire hazards, up wind and downwind monitoring with the hydrocarbon vapor monitor will be performed if the general work area has hydrocarbon levels exceeding 100 ppmv. If down wind monitoring indicates persistent levels above 30 ppmv at the perimeter of the work area, work will be shut down and vapor emission control efforts will be instituted until measurements demonstrate levels have dropped below 30 ppmv. An alternative approach of expanding the taped off area zone may be used to provide additional community protection.

Record Keeping

The following record keeping requirements will be maintained in the program file indefinitely.

- Copy of this Health and Safety Plan
- Health and Safety Training Certification Form for Site Safety Officer
- Any accident/illness report forms
- Personal sampling results
- Documentation of employees medical ability to perform work and wear respirators

Pertinent documentation will be provided to workers and agencies as required by Federal and State safety laws.

SITE CONDITIONS AND ASSUMPTIONS

The site conditions and assumptions for this investigation are indicated below.

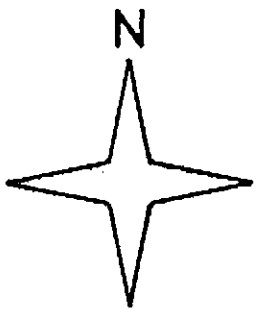
1. Site/soil conditions allow for the borings and sampling to be completed by standard, machine powered drilling and sampling equipment. Site and/or weather conditions will allow for the

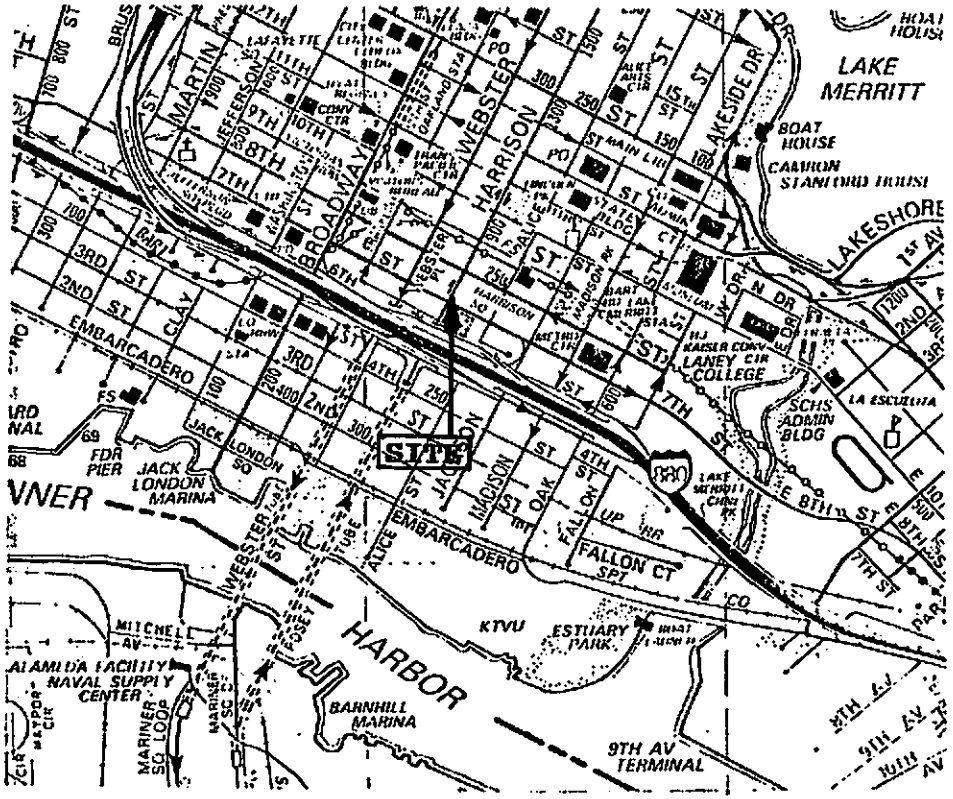
completion of soil excavation work within two (2) days upon commencement.

2. Free ground water is no deeper than 25 feet below grade.

3. Client shall provide or arrange access to the site necessary for completion of the job. All work is to be performed during normal business hours.

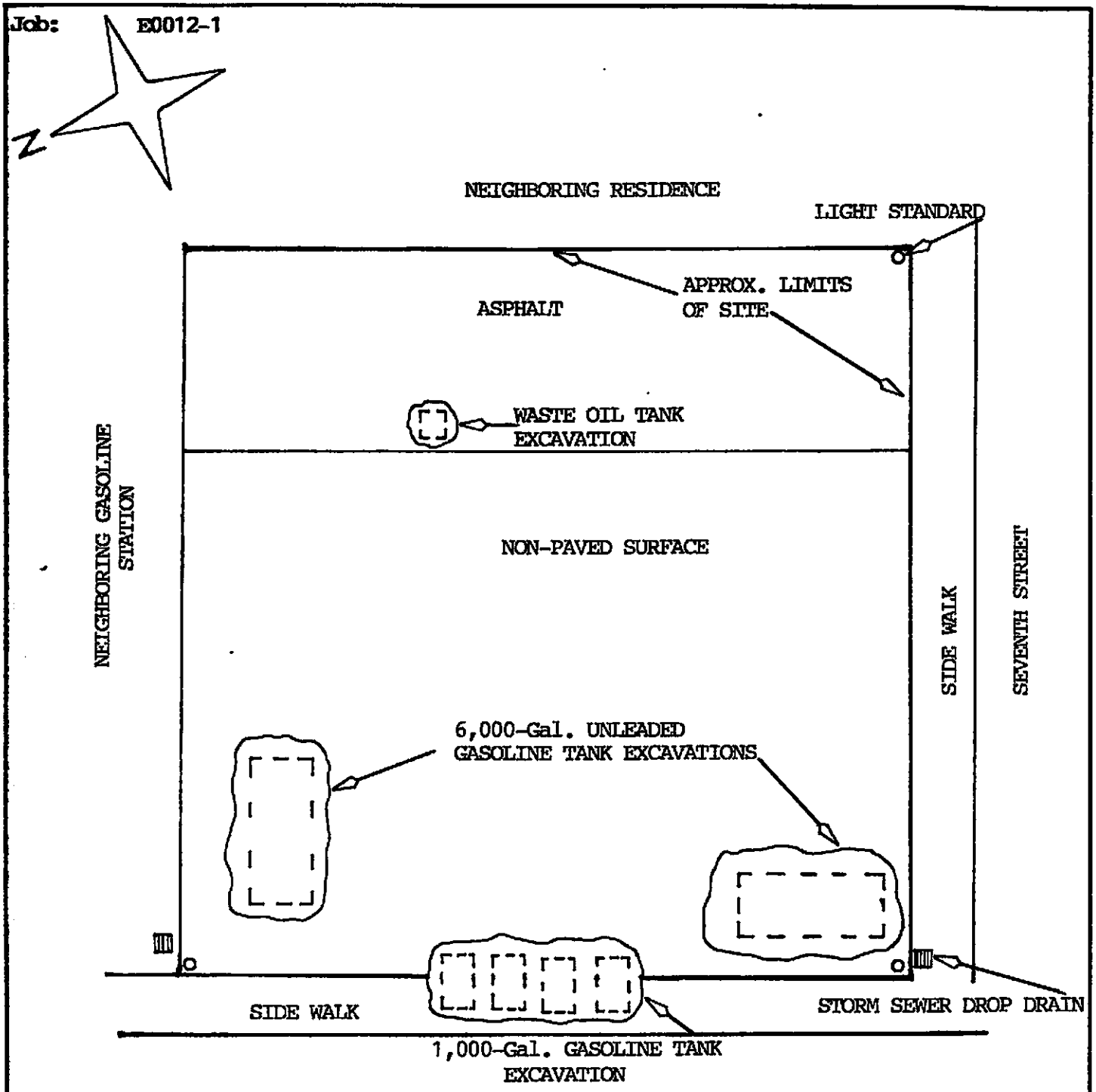
4. Client shall indicate to FLA and be responsible for the accuracy of the legal property lines and for the locations of hazardous materials or underground facilities that may affect site conditions. FLA shall not be responsible for, but shall exercise reasonable care to minimize or prevent damage to underground utilities, or installations caused by the soil boring or sampling activities.





FRANK LEE AND ASSOCIATES		
SCALE: None	APPROVED BY:	DRAWN BY
DATE: 4-22-91		REVISED
SITE LOCATION MAP 706 Harrsion Street Oakland, California		
E0012-1		DRAWING NUMBER Plate 1

Job: E0012-1

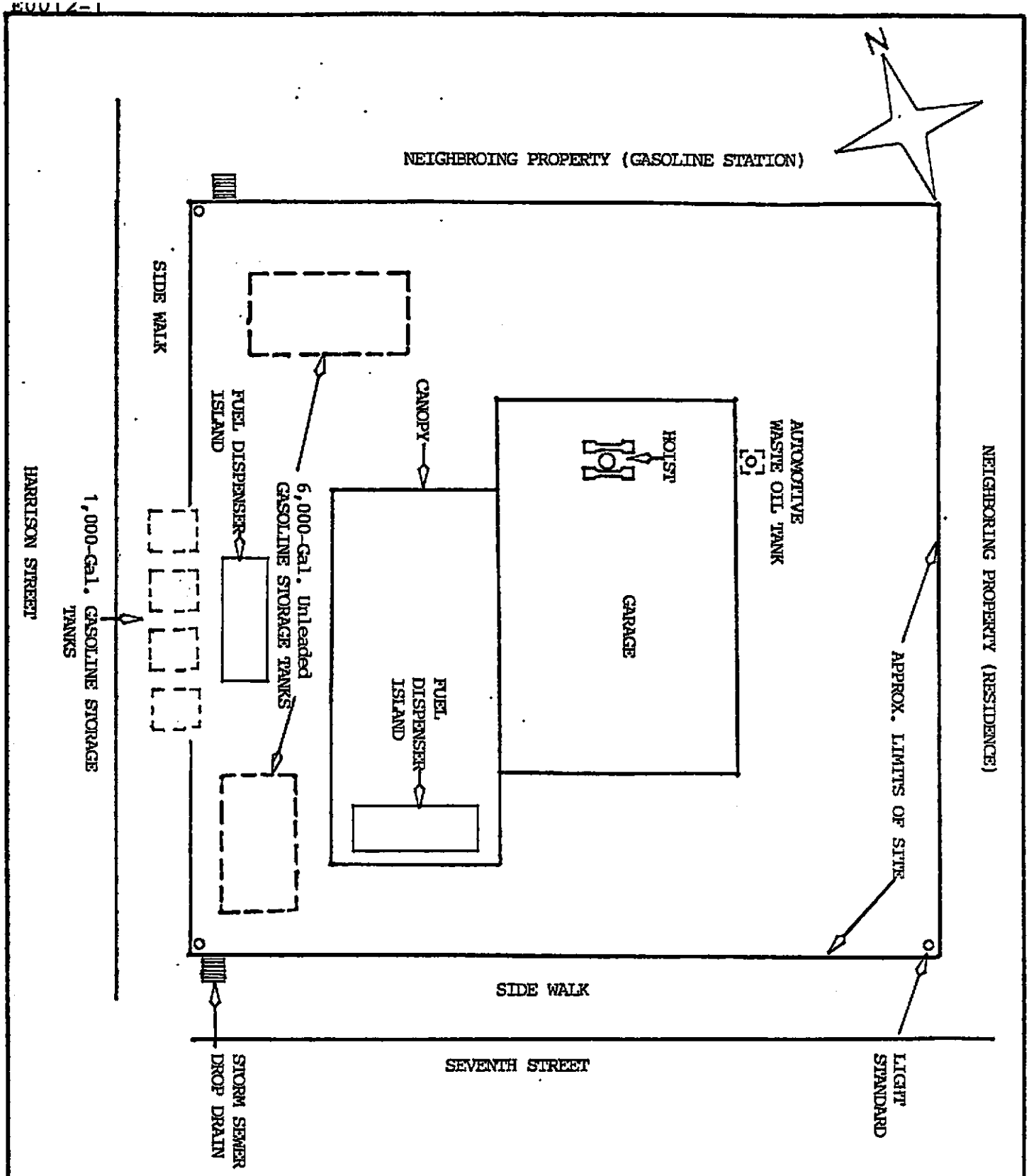


SITE SCHEMATIC
706 Harrison Str.
Oakland, California

Scale: None

FRANK LEE AND ASSOCIATES

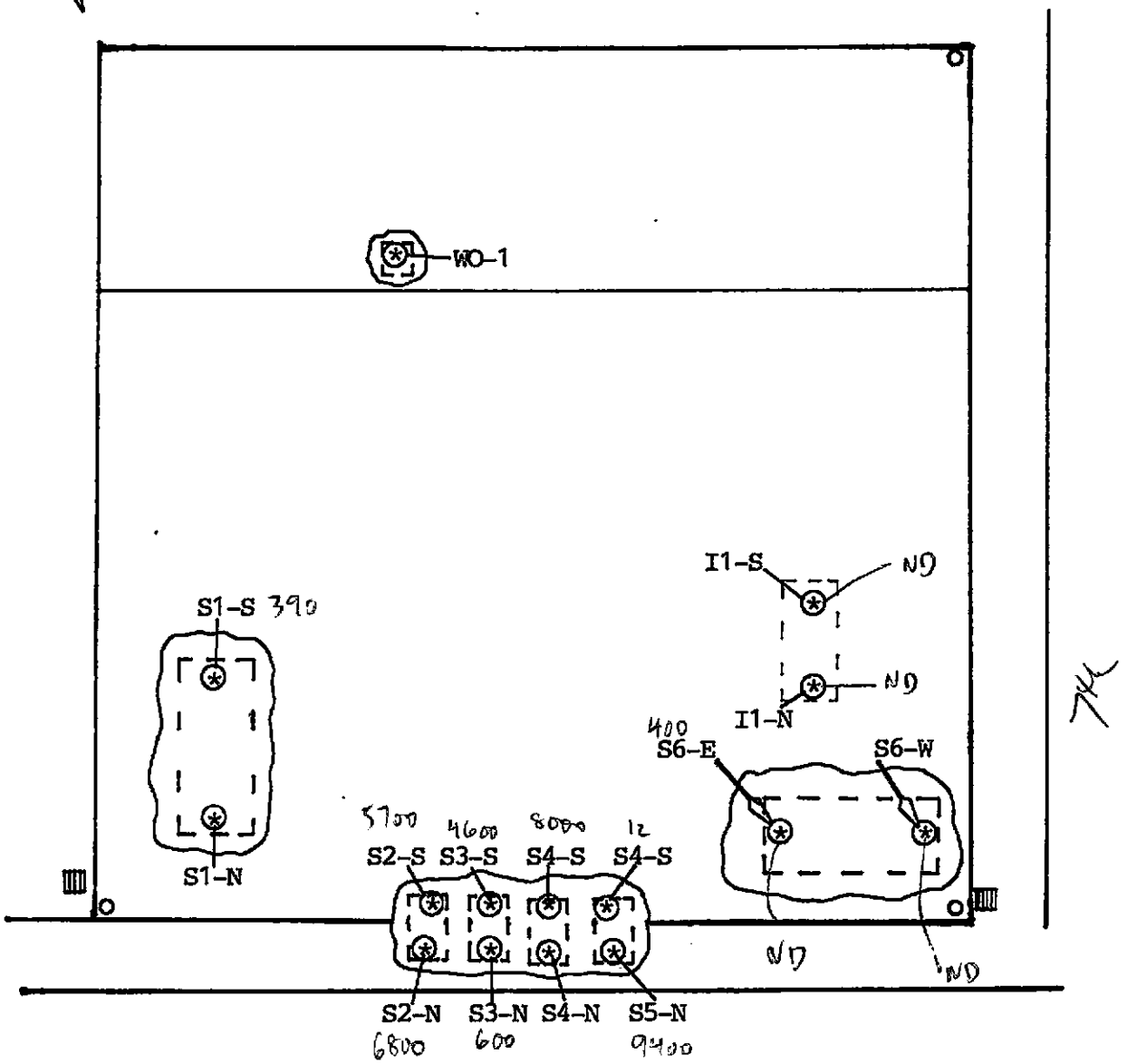
Plate 2



HISTORIC SITE SCHEMATIC
706 Harrison Str.
Oakland, California

Scale: None

Job: E0012-1



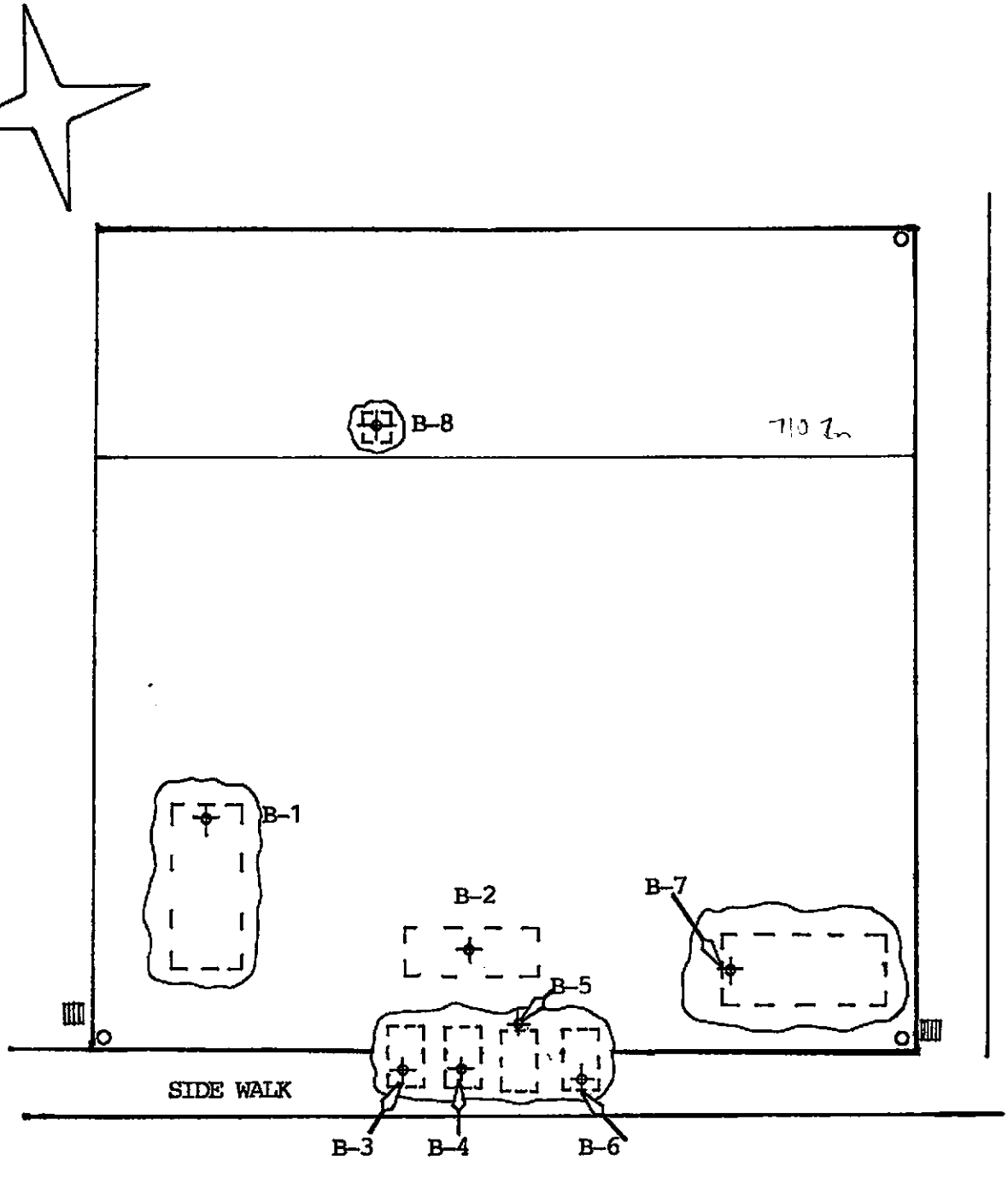
Harr.

⊛ APPROX. LOCATIONS OF SOIL SAMPLES

TANK CLOSURE SOIL SAMPLE LOCATIONS
706 Harrison Str.
Oakland, California

Scale: None

Job: E0012-1



PROPOSED SOIL
BORING LOCATIONS

PROPOSED BORING AND
SOIL SAMPLE LOCATIONS
706 Harrison Str.
Oakland, California

Job: E0012-1 April 22, 1991

ATTACHMENT 1

FRANK LEE AND ASSOCIATES REPORT,
OCTOBER 14, 1988

FRANK LEE & ASSOCIATES

FRANK LEE & ASSOCIATES

GEOTECHNICAL CONSULTANTS
10 KOOTENAI COURT, FREMONT, CALIFORNIA 94539
(415) 657-7792

October 14, 1988
Job No: 8888L

Mr. Bo Gin
288 11th Street
Oakland, California 94607

Subject: PRELIMINARY SOILS CHEMICAL TESTING
706 Harrison Street
Oakland, California

Dear Mr. Gin:

This letter is to report the results of preliminary soils chemical testing for petroleum hydrocarbons as gasoline and lead at the subject site. This preliminary work was performed at your request to investigate the presence of the above-listed compounds beneath the site, and was conducted in conjunction with work completed for a soils and foundation investigation at the site.

The site is presently occupied by a closed gasoline station with six existing on-site underground gasoline storage tanks, and one underground waste oil tank. Exploration in the vicinity of the waste oil tank was not a part of this investigation. We understand that the gasoline has been pumped out of the gasoline tanks. Four of the gasoline tanks are located just outside of the southwest property boundary beneath the City sidewalk. Five of the seven borings drilled as a part of the soils and foundation investigation were located as nearly as possible to the underground gasoline storage tanks, the locations of which were reported to us by you. The approximate locations of the underground tanks and the borings are shown on the Generalized Site Plan.

Soil samples were collected from the borings at depths of approximately 15 feet in Borings B-1, B-2, B-4, and B-5, and 10 feet in Boring B-3 (below the depth of the underground gasoline storage tanks) in 6-inch brass liners for chemical testing. Because a chemical odor was detected in the sample from 15 feet in Boring B-2, a sample was also taken at 20 feet. The samples were obtained in accordance with standard protocol for petroleum compounds. All tools that contacted samples were thoroughly cleaned before and between samplings with trisodium phosphate, double-rinsed, and air-dried. The samples were sealed in the field in their original liners with aluminum foil and clean plastic caps wrapped with aluminized duct tape, and immediately placed on ice for transport to the laboratory. In addition to the odor noted in the sample from 15 feet deep in Boring B-2, slight

petroleum odor was also noted in the samples from approximately 15 feet deep during the drilling of Borings B-1 and -5.

The soils samples from Borings B-1 and B-5, a composite of the two samples from Boring B-2, and a composite of the samples from Borings B-3 and -4 near the gasoline tanks were tested for the presence and concentration of total petroleum hydrocarbons as gasoline with BTEX (benzene, toluene, ethyl benzene, xylenes) distinction. The samples were tested by Sequoia Analytical Laboratory of Redwood City, California, a state-certified laboratory. The results of the laboratory testing, as shown on the attached Laboratory Data Sheets, indicate that none of the compounds tested for were detected at concentrations at or above State Regional Water Quality Control Board action levels. The composite samples from Boring B-2 and Borings B-3 and -4 were additionally tested for lead, which indicated lead below the soluble threshold limit concentration (STLC) as designated in Title 22 of the California Administrative Code.

While the results of this preliminary chemical testing do not indicate the presence of the compounds tested for at or above regulatory action levels at the site, these results do not preclude the existence of these compounds at such levels at the site. A more complete investigation of the presence of these or other contaminants at the site, if necessary and/or possible, would include research to determine the number, types, sizes, and locations of any former underground storage tanks, and the history of chemical use at the site. In addition, any underground storage tanks remaining beneath the site must be either properly closed or monitored in accordance with the requirements of the City of Oakland. If the underground tanks are removed at a later date, it may be possible to obtain samples to help confirm the results of the present investigation.

We are pleased to be working with you on this project. If you have any questions or if we can be of any other service, please feel free to call. Thank you.

Very truly yours,

FRANK LEE & ASSOCIATES

Frank Lee

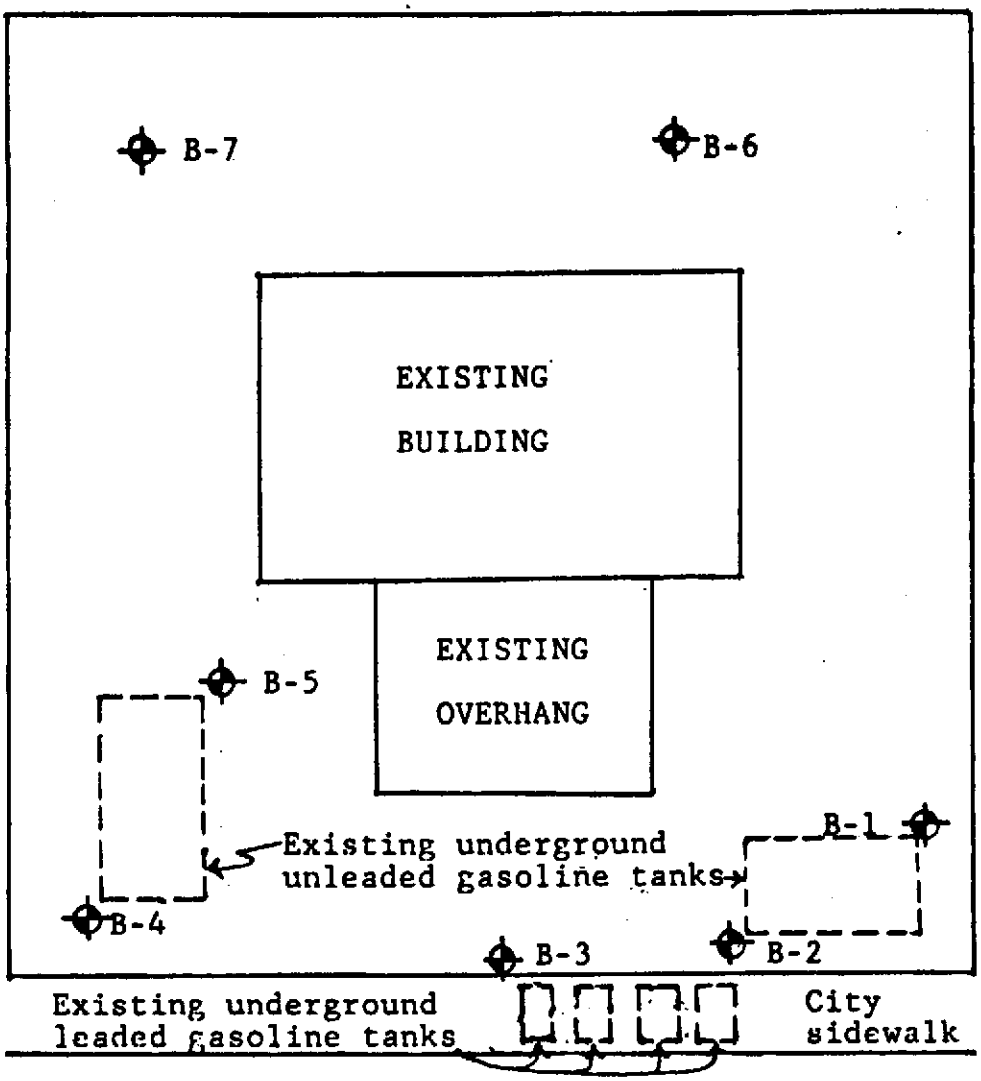
Frank Lee
Professional Engineer 34975

REGISTERED PROFESSIONAL ENGINEER FRANK TZONG-HIN LEE C 34975 CIVIL STATE OF CALIFORNIA

Frank Lee 10/14/88
EXP 9/30/91

Attachment: Generalized Site Plan
Laboratory Data Sheets and Chain of Custody

Copies: Addressee (2)



GENERALIZED SITE PLAN

706 HARRISON STREET

OAKLAND, CALIFORNIA

Scale: 1" = approx. 20'

Job No: 8888-S1

APPENDIX A

LABORATORY DATA SHEETS

AND CHAIN OF CUSTODY

SEQUOIA Analytical Laboratory
2549 Middlefield Road
Redwood City, CA 94063 • (415) 364-9222 • FAX (415) 364-9233

Frank Lee & Associates
10 Kootenia Court
Fremont, CA 94539
Attn: Frank Lee

Date Sampled: 08/18/88
Date Received: 08/19/88
Date Analyzed: 09/07/88
Date Reported: 09/20/88

Project: #8888, 706 Harrison St., Oakland

TOTAL PETROLEUM FUEL HYDROCARBONS WITH BTEX DISTINCTION

Sample Number	Sample Description Soil	Low to Medium Boiling Point Hydrocarbons ppm	Benzene ppm	Toluene ppm	Ethyl Benzene ppm	Xylenes ppm
8082072	B1-1	N.D.	N.D.	N.D.	N.D.	N.D.
8082073	Composite B2-3, B2-4	19	0.83	1.5	0.88	2.6
8082074	Composite B3-1, B4-3	1.3	N.D.	N.D.	N.D.	N.D.
8082075	B5-2	5.1	N.D.	N.D.	N.D.	0.34
Detection Limits:		1.0	0.05	0.1	0.1	0.1

Method of Analysis: EPA 5030 or 3810/8015/8020

SEQUOIA ANALYTICAL LABORATORY

Arthur G. Burton
Laboratory Director

SEQUOIA Analytical Laboratory
2549 Middlefield Road
Redwood City, CA 94063 • (415) 364-9222 • FAX (415) 364-9233

Frank Lee & Associates
10 Kootenia Court
Fremont, CA 94539
Attn: Frank Lee

Date Sampled: 08/18/88
Date Received: 08/19/88
Date Reported: 09/20/88

Project: #8888, 706 Harrison St., Oakland

LABORATORY ANALYSIS

Analyte: Lead, mg/kg

Sample Number	Sample Description	Detection Limit	Sample Result
	Soil, Composite		
8082073	B2-3, B2-4	0.05	2.1
8082074	B3-1, B4-3	0.05	2.3

Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL LABORATORY

Arthur G. Burton
Laboratory Director

CHAIN OF CUSTODY RECORD

PROJ. NO. 8888

PROJECT NAME: 706 Harrison Street, Oakland

SAMPLERS: Signature: Diane Barclay

DEPTH	STA NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION / INSTRUCTIONS	NO OF CONTAINERS (6" brass liners)
5-15½'	B-1-1	8/18/88				Total Volatile Hydrocarbons with BTEX	1
5½-16'	B-2-3	"			✓	Composite these 2 samples, test for Total Volatile Hydrocarbons with BTEX and lead	1
20-20½'	B-2-4	"			✓		1
10-10½'	B-3-1	"			✓	Composite these 2 samples, test for Total Volatile Hydrocarbons with BTEX and lead	1
15½-16'	B-4-3	"			✓		1
15-15½'	B-5-2	"			✓	Total volatile hydrocarbons with BTEX	1

Relinquished by:Signature	Date/Time	Received by:Signature	Date/Time
Diane Barclay	8/19 8AM	Frank Lee	8/19/88 8AM
Frank Lee	8/19/88 10:45 AM	M Tague	8/19/88 10:15 AM

REMARKS: Please send results to:
Frank Lee & Associates
10 Kootenai Court
Fremont, CA 94539
(415) 657-7742

Please use standard turnaround times.

Job: E0012-1 April 22, 1991

ATTACHMENT 2

RESULTS OF TANK CLOSURE SOIL SAMPLES

from tank pull 1-17-91

FRANK LEE & ASSOCIATES

Copy

SEQUOIA ANALYTICAL

1900 Bates Avenue • Suite LM • Concord, California 94520
(415) 686-9600 • FAX (415) 686-9689

Tank Protect Engineering of N. Calif	Client Project ID:	#123A-011791-1	Sampled:	Jan 17, 1991
2821 Whipple Road	Matrix Descript:	Soil	Received:	Jan 22, 1991
Union City, CA 94587	Analysis Method:	EPA 5030/8015/8020	Analyzed:	1/29-1/30/91
Attention: Josie	First Sample #:	101-0527	Reported:	Feb 5, 1991

TOTAL PETROLEUM FUEL HYDROCARBONS with BTEX DISTINCTION (EPA 8015/8020)

Sample Number	Sample Description	Low/Medium B.P. Hydrocarbons mg/kg (ppm)	Benzene mg/kg (ppm)	Toluene mg/kg (ppm)	Ethyl Benzene mg/kg (ppm)	Xylenes mg/kg (ppm)
101-0527	S1-S	390	0.69	0.56	3.1	8.7
Detection Limits:		**5.0**	**0.025**	**0.025**	**0.025**	**0.025**

Low to Medium Boiling Point Hydrocarbons are quantitated against a gasoline standard.
Analytes reported as N.D. were not present above the stated limit of detection. Because matrix effects and/or other factors required additional sample dilution, detection limits for this sample have been raised.

SEQUOIA ANALYTICAL

Belinda C. Vega
Laboratory Director

SEQUOIA ANALYTICAL

1900 Bates Avenue • Suite LM • Concord, California 94520
(415) 686-9600 • FAX (415) 686-9689

Tank Protect Engineering of N. Calif	Client Project ID:	#123A-011791-1	Sampled: Jan 17, 1991
2821 Whipple Road	Matrix Descript:	Soil	Received: Jan 22, 1991
Union City, CA 94587	Analysis Method:	EPA 5030/8015/8020	Analyzed: 1/29-1/30/91
Attention: Josie	First Sample #:	101-0528	Reported: Feb 5, 1991

TOTAL PETROLEUM FUEL HYDROCARBONS with BTEX DISTINCTION (EPA 8015/8020)

Sample Number	Sample Description	Low/Medium B.P. Hydrocarbons mg/kg (ppm)	Benzene mg/kg (ppm)	Toluene mg/kg (ppm)	Ethyl Benzene mg/kg (ppm)	Xylenes mg/kg (ppm)
101-0528	S1-N	N.D.	0.070	0.063	0.013	0.054
101-0530	S3-S	4,600	30	210	78	470
101-0531	S2-N	6,800	75	290	98	540
101-0532	S3-N	3,600	19	100	53	280
101-0533	S5-S	12	0.023	0.016	0.053	0.19
101-0534	S4-S	8,000	7.9	56	84	450
101-0535	S5-N	9,400	17	160	97	650
101-0536	S4-N	N.D.	0.013	0.010	N.D.	0.026
101-0537	S6-W	N.D.	0.010	0.010	N.D.	0.030
101-0538	S6-E	400	0.21	0.57	5.0	9.8
Detection Limits:		**1.0**	**0.0050**	**0.0050**	**0.0050**	**0.0050**

Low to Medium Boiling Point Hydrocarbons are quantitated against a gasoline standard.
Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL

Belinda C. Vega
Laboratory Director

1010527.TPE <2>

SEQUOIA ANALYTICAL

1900 Bates Avenue • Suite LM • Concord, California 94520
(415) 686-9600 • FAX (415) 686-9689

Tank Protect Engineering of N. Calif	Client Project ID:	#123A-011791-1	Sampled: Jan 17, 1991
2821 Whipple Road	Matrix Descript:	Soil	Received: Jan 22, 1991
Union City, CA 94587	Analysis Method:	EPA 5030/8015/8020	Analyzed: Jan 30, 1991
Attention: Josie	First Sample #:	101-0539	Reported: Feb 5, 1991

TOTAL PETROLEUM FUEL HYDROCARBONS with BTEX DISTINCTION (EPA 8015/8020)

Sample Number	Sample Description	Low/Medium B.P. Hydrocarbons mg/kg (ppm)	Benzene mg/kg (ppm)	Toluene mg/kg (ppm)	Ethyl Benzene mg/kg (ppm)	Xylenes mg/kg (ppm)
101-0539	I1-N	N.D.	N.D.	0.0088	N.D.	0.022
101-0540	I1-S	N.D.	0.0050	0.012	0.0092	0.050
Detection Limits:		**1.0**	**0.0050**	**0.0050**	**0.0050**	**0.0050**

Low to Medium Boiling Point Hydrocarbons are quantitated against a gasoline standard.
Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL

Belinda C. Vega
Laboratory Director

SEQUOIA ANALYTICAL

1900 Bates Avenue • Suite LM • Concord, California 94520
(415) 686-9600 • FAX (415) 686-9689

Tank Protect Engineering of N. Calif	Client Project ID:	#123A-011791-1	Sampled:	Jan 17, 1991
2821 Whipple Road	Matrix Descript:	Soil	Received:	Jan 22, 1991
Union City, CA 94587	Analysis Method:	EPA 5030/8015/8020	Analyzed:	1/29-1/30/91
Attention: Josie	First Sample #:	101-0529	Reported:	Feb 5, 1991

TOTAL PETROLEUM FUEL HYDROCARBONS with BTEX DISTINCTION (EPA 8015/8020)

Sample Number	Sample Description	Low/Medium B.P. Hydrocarbons mg/kg (ppm)	Benzene mg/kg (ppm)	Toluene mg/kg (ppm)	Ethyl Benzene mg/kg (ppm)	Xylenes mg/kg (ppm)
101-0529	S2-S	5,700	82	280	85	460
Detection Limits:		**50**	**0.25**	**0.25**	**0.25**	**0.25**

Low to Medium Boiling Point Hydrocarbons are quantitated against a gasoline standard.
Analytes reported as N.D. were not present above the stated limit of detection. Because matrix effects and/or other factors required additional sample dilution, detection limits for this sample have been raised.

SEQUOIA ANALYTICAL

Belinda C. Vega
Laboratory Director

SEQUOIA ANALYTICAL

1900 Bates Avenue • Suite LM • Concord, California 94520
(415) 686-9600 • FAX (415) 686-9689

Tank Protect Engineering of N. Calif	Client Project ID:	#123A-011791-1	Sampled:	Jan 17, 1991
2821 Whipple Road	Sample Descript:	Soil	Received:	Jan 22, 1991
Union City, CA 94587	Analysis for:	Total Lead by AA	Extracted:	Jan 25, 1991
Attention: Josie	First Sample #:	101-0527	Analyzed:	Jan 30, 1991
			Reported:	Feb 5, 1991

LABORATORY ANALYSIS FOR: Total Lead by AA

Sample Number	Sample Description	Detection Limit mg/kg	Sample Result mg/kg
101-0527	S1-S	0.50	N.D.
101-0528	S1-N	0.50	N.D.
101-0529	S2-S	0.50	5.5
101-0530	S3-S	0.50	N.D.
101-0531	S2-N	0.50	N.D.
101-0532	S3-N	0.50	N.D.
101-0533	S5-S	0.50	3.3
101-0534	S4-S	0.50	N.D.
101-0535	S5-N	0.50	4.7
101-0536	S4-N	0.50	N.D.
101-0537	S6-W	0.50	N.D.

Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL

Belinda C. Vega
Laboratory Director

1010527.TPE <5>

SEQUOIA ANALYTICAL

1900 Bates Avenue • Suite LM • Concord, California 94520
(415) 686-9600 • FAX (415) 686-9689

Tank Protect Engineering of N. Calif	Client Project ID:	#123A-011791-1	Sampled:	Jan 17, 1991
2821 Whipple Road	Sample Descript:	Soil	Received:	Jan 22, 1991
Union City, CA 94587	Analysis for:	Total Lead by AA	Extracted:	Jan 25, 1991
Attention: Josie	First Sample #:	101-0538	Analyzed:	Jan 30, 1991
			Reported:	Feb 5, 1991

LABORATORY ANALYSIS FOR: Total Lead by AA

Sample Number	Sample Description	Detection Limit mg/kg	Sample Result mg/kg
101-0538	S6-E	0.50	4.3
101-0539	I1-N	5.0	370
101-0540	I1-S	0.50	45

Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL

Belinda C. Vega
Laboratory Director

1010527.TPE <6>

SEQUOIA ANALYTICAL

1900 Bates Avenue • Suite LM • Concord, California 94520
(415) 686-9600 • FAX (415) 686-9689

Tank Protect Engineering of N. Calif	Client Project ID:	#123A-011791-1	Sampled: Jan 17, 1991
2821 Whipple Road	Sample Descript.:	Soil, WO1	Received: Jan 22, 1991
Union City, CA 94587	Analysis Method:	EPA 5030/8015/8020	Analyzed: Feb 1, 1991
Attention: Josie	Lab Number:	101-0526	Reported: Feb 5, 1991

TOTAL PETROLEUM FUEL HYDROCARBONS WITH BTEX DISTINCTION (EPA 8015/8020)

Analyte	Detection Limit mg/kg (ppm)	Sample Results mg/kg (ppm)
Low to Medium Boiling Point Hydrocarbons	1.0	N.D.
Benzene	0.0050	N.D.
Toluene	0.0050	N.D.
Ethyl Benzene	0.0050	N.D.
Xylenes	0.0050	N.D.

Low to Medium Boiling Point Hydrocarbons are quantitated against a gasoline standard.
Analytes reported as N.D. were not present above the stated limit of detection.

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Tank Protect Engineering of N. Calif	Client Project ID:	#123A-011791-1	Sampled: Jan 17, 1991
2821 Whipple Road	Matrix Descript:	Soil	Received: Jan 22, 1991
Union City, CA 94587	Analysis Method:	EPA 3550/8015	Extracted: Jan 29, 1991
Attention: Josie	First Sample #:	101-0526	Analyzed: Jan 30, 1991
			Reported: Feb 5, 1991

TOTAL PETROLEUM FUEL HYDROCARBONS (EPA 8015)

Sample Number	Sample Description	High B.P. Hydrocarbons mg/kg (ppm)
101-0526	WO1	N.D.

Detection Limits:	**1.0**

High Boiling Point Hydrocarbons are quantitated against a diesel fuel standard.
Analytes reported as N.D. were not present above the stated limit of detection.

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Tank Protect Engineering of N. Calif	Client Project ID:	#123A-011791-1	Sampled:	Jan 17, 1991
2821 Whipple Road	Matrix Descript:	Soil, WO1	Received:	Jan 22, 1991
Union City, CA 94587	Analysis Method:	SM 5520 E&F (Gravimetric)	Extracted:	Jan 25, 1991
Attention: Josie	First Sample #:	101-0526	Analyzed:	Jan 25, 1991
			Reported:	Feb 5, 1991

TOTAL RECOVERABLE PETROLEUM OIL

Sample Number	Sample Description	Oil & Grease mg/kg (ppm)
101-0526	WO1	N.D.

Detection Limits:	30

Analytes reported as N.D. were not present above the stated limit of detection.

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1010527.TPE <9>

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Tank Protect Engineering of N. Calif	Client Project ID:	#123A-011791-1	Sampled:	Jan 17, 1991
2821 Whipple Road	Sample Descript:	Soil, WO1	Received:	Jan 22, 1991
Union City, CA 94587			Extracted:	Jan 24, 1991
Attention: Josie	Lab Number:	101-0526	Analyzed:	1/25-1/31/91
			Reported:	Feb 5, 1991

LABORATORY ANALYSIS

Analyte	Detection Limit mg/kg	Sample Results mg/kg	
Cadmium	0.50	N.D.	
Chromium	0.25	33	←
Lead	0.25	28	←
Nickel	2.5	26	
Zinc	0.50	710	↑

	STLC	TTLC
Zn	250	5000
Cd	1.0	100
Cr	5, 560	500, 2500
Pb	5.	1000

Analytes reported as N.D. were not present above the stated limit of detection.

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1010527.TPE <10>

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Tank Protect Engineering of N. Calif	Client Project ID:	#123A-011791-1	Sampled:	Jan 17, 1991
2821 Whipple Road	Sample Descript:	Soil, WO1	Received:	Jan 22, 1991
Union City, CA 94587	Analysis Method:	EPA 5030/8010	Analyzed:	Jan 30, 1991
Attention: Josie	Lab Number:	101-0526	Reported:	Feb 5, 1991

HALOGENATED VOLATILE ORGANICS (EPA 8010)

Analyte	Detection Limit µg/kg	Sample Results µg/kg
Bromodichloromethane	5.0	N.D.
Bromoform	5.0	N.D.
Bromomethane	5.0	N.D.
Carbon tetrachloride	5.0	N.D.
Chlorobenzene	5.0	N.D.
Chloroethane	25	N.D.
2-Chloroethylvinyl ether	5.0	N.D.
Chloroform	5.0	N.D.
Chloromethane	5.0	N.D.
Dibromochloromethane	5.0	N.D.
1,2-Dichlorobenzene	10	N.D.
1,3-Dichlorobenzene	10	N.D.
1,4-Dichlorobenzene	10	N.D.
1,1-Dichloroethane	5.0	N.D.
1,2-Dichloroethane	5.0	N.D.
1,1-Dichloroethene	5.0	N.D.
Total 1,2-Dichloroethene	5.0	N.D.
1,2-Dichloropropane	5.0	N.D.
cis-1,3-Dichloropropene	5.0	N.D.
trans-1,3-Dichloropropene	5.0	N.D.
Methylene chloride	10	N.D.
1,1,2,2-Tetrachloroethane	5.0	N.D.
Tetrachloroethene	5.0	N.D.
1,1,1-Trichloroethane	5.0	N.D.
1,1,2-Trichloroethane	5.0	N.D.
Trichloroethene	5.0	N.D.
Trichlorofluoromethane	5.0	N.D.
Vinyl chloride	10	N.D.

Analytes reported as N.D. were not present above the stated limit of detection.

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Tank Protect Engineering of N. Calif	Client Project ID:	#123A-011791-1	Sampled:	Jan 17, 1991
2821 Whipple Road	Sample Descript:	Soil, WO1	Received:	Jan 22, 1991
Union City, CA 94587	Analysis Method:	EPA 8270	Extracted:	Jan 23, 1991
Attention: Josie	Lab Number:	101-0526	Analyzed:	Feb 5, 1991
			Reported:	Feb 5, 1991

SEMI-VOLATILE ORGANICS by GC/MS (EPA 8270)

Analyte	Detection Limit µg/kg	Sample Results µg/kg
Acenaphthene	100	N.D.
Acenaphthylene	100	N.D.
Aniline	100	N.D.
Anthracene	100	N.D.
Benzidine	2,500	N.D.
Benzoic Acid	500	N.D.
Benzo(a)anthracene	100	N.D.
Benzo(b)fluoranthene	100	N.D.
Benzo(k)fluoranthene	100	N.D.
Benzo(g,h,i)perylene	100	N.D.
Benzo(a)pyrene	100	100
Benzyl alcohol	100	N.D.
Bis(2-chloroethoxy)methane	100	N.D.
Bis(2-chloroethyl)ether	100	N.D.
Bis(2-chloroisopropyl)ether	100	N.D.
Bis(2-ethylhexyl)phthalate	500	N.D.
4-Bromophenyl phenyl ether	100	N.D.
Butyl benzyl phthalate	100	N.D.
4-Chloroaniline	100	N.D.
2-Chloronaphthalene	100	N.D.
4-Chloro-3-methylphenol	100	N.D.
2-Chlorophenol	100	N.D.
4-Chlorophenyl phenyl ether	100	N.D.
Chrysene	100	N.D.
Dibenz(a,h)anthracene	100	N.D.
Dibenzofuran	100	N.D.
Di-N-butyl phthalate	500	N.D.
1,3-Dichlorobenzene	100	N.D.
1,4-Dichlorobenzene	100	N.D.
1,2-Dichlorobenzene	100	N.D.
3,3-Dichlorobenzidine	500	N.D.
2,4-Dichlorophenol	100	N.D.
Diethyl phthalate	100	N.D.
2,4-Dimethylphenol	100	N.D.
Dimethyl phthalate	100	N.D.
4,6-Dinitro-2-methylphenol	500	N.D.
2,4-Dinitrophenol	500	N.D.

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Tank Protect Engineering of N. Calif	Client Project ID:	#123A-011791-1	Sampled:	Jan 17, 1991
2821 Whipple Road	Sample Descript:	Soil, WO1	Received:	Jan 22, 1991
Union City, CA 94587	Analysis Method:	EPA 8270	Extracted:	Jan 23, 1991
Attention: Josie	Lab Number:	101-0526	Analyzed:	Feb 5, 1991
			Reported:	Feb 5, 1991

SEMI-VOLATILE ORGANICS by GC/MS (EPA 8270)

Analyte	Detection Limit µg/kg	Sample Results µg/kg
2,4-Dinitrotoluene	100	N.D.
2,6-Dinitrotoluene	100	N.D.
Di-N-octyl phthalate	100	N.D.
Fluoranthene	100	110
Fluorene	100	N.D.
Hexachlorobenzene	100	N.D.
Hexachlorobutadiene	100	N.D.
Hexachlorocyclopentadiene	100	N.D.
Hexachloroethane	100	N.D.
Indeno(1,2,3-cd)pyrene	100	N.D.
Isophorone	100	N.D.
2-Methylnaphthalene	100	N.D.
2-Methylphenol	100	N.D.
4-Methylphenol	100	N.D.
Naphthalene	100	N.D.
2-Nitroaniline	500	N.D.
3-Nitroaniline	500	N.D.
4-Nitroaniline	500	N.D.
Nitrobenzene	100	N.D.
2-Nitrophenol	100	N.D.
4-Nitrophenol	500	N.D.
N-Nitrosodiphenylamine	100	N.D.
N-Nitroso-di-N-propylamine	100	N.D.
Pentachlorophenol	500	N.D.
Phenanthrene	100	N.D.
Phenol	100	N.D.
Pyrene	100	150
1,2,4-Trichlorobenzene	100	N.D.
2,4,5-Trichlorophenol	500	N.D.
2,4,6-Trichlorophenol	100	N.D.

Analytes reported as N.D. were not present above the stated limit of detection.

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Tank Protect Engineering of N. Calif	Client Project ID:	#123A-011791-1	Sampled:
2821 Whipple Road	Sample Descript:	Soil	Received: Jan 22, 1991
Union City, CA 94587	Analysis Method:	EPA 8270 & "Open Scan"	Extracted:
Attention: Josie	Lab Number:		Analyzed:
			Reported:

SEMI-VOLATILE ORGANICS by GC/MS, TENTATIVELY IDENTIFIED COMPOUNDS

Analyte	Detection Limit µg/kg	Sample Results µg/kg

No additional peaks > 250 µg/kg were identified by the Mass Spectral Library.

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Laboratory Director

Please Note:
All identifications are tentative and concentrations are estimates based upon spectral comparison to the EPA NIST library. Positive identification or specification between isomers cannot be made without retention time standards.

TANK PROTECT ENGINEERING
2821 WHIPPLE ROAD
UNION CITY, CA 94587
(415)429-8088
(800)523-8088
FAX(415)429-8089

CHAIN OF CUSTODY

PROJECT NO.	SITE NAME & ADDRESS
123A-011791-1 BP Gin	706 Harrison St. Oakland, Ca.

SAMPLER NAME, ADDRESS AND TELEPHONE NUMBER
Tank Protect Engineering
2821 Whipple Rd. Union City, Ca. 94587

ID NO.	DATE	TIME	SOIL	WATER	SAMPLING LOCATION	(1) TYPE OF CON-TAINER	ANALYTES REQUESTED: TOTAL LIGHT HC	AROMATIC HC (BTX)	TOTAL HEAVY HC	OIL & GREASE	VOC SCAN (624's)	OTHER	REMARKS
W.O-1	1/17/91	3:05	✓		1010526								gas/btex; diesel; TPG; 8010: Cd, Cr, Ni, Pb, Zn; 827 for waste oil
S1-S	"	3:20	✓		527								All required analyses by TRI - Rigional Guidline for TPH G & BTEX & Total Lead (AA)
S1-N	"	3:28	✓		526								" "
S2-S	"	3:40	✓		529								" "
S3-S	"	3:45	✓		530								" "
S2-N	"	3:52	✓		531								" "
S3-N	"	3:58	✓		532								" "
S5-S	"	4:05	✓		533								" "
S4-S	"	4:20	✓		534								" "

Relinquished by : (Signature)	Date / Time	Received by : (Signature)	Relinquished by : (Signature)	Date / Time	Received by : (Signature)
[signature]	1-22-91/15:20	Patrick Hook			
Patrick Hook	1-22-91/1705				
Relinquished by : (Signature)	Date / Time	Received for Laboratory by: (Signature)	Date / Time	Remarks	
		[signature]	1/22 11:15AM		

DATE: _____

TANK PROTECT ENGINEERING

2821 WHIPPLE ROAD
UNION CITY, CA 94587
(415)429-8088
(800)523-8088
FAX(415)429-8089

CHAIN OF CUSTODY

PROJECT NO.	SITE NAME & ADDRESS
1234-01791-1 BACM	706 Harrison St. Oakland, Ca 94607

SAMPLER NAME, ADDRESS AND TELEPHONE NUMBER
Tank Protect Engineering
2821 Whipple Rd. Union City, Ca 94587

ID NO.	DATE	TIME	SOIL	WATER	SAMPLING LOCATION	(1) TYPE OF CONTAINER	ANALYTES REQUESTED: TOTAL LIGHT HC	AROMATIC HC (BTX)	TOTAL HEAVY HC	OIL & GREASE	VOC SCAN (624's)	OTHER	REMARKS
S5-N	1/17/91	4:25	✓		1010535								TPHG & BTEX & Total Lead (AA)
S4-N	"	4:28	✓		536								" "
S6-W	"	4:50	✓		537								" "
S6-E	"	4:54	✓		538								" "
I1-N		5:00	✓		Island 539 (th)								" "
I1-S		5:03	✓		" 540 (th)								" "

Relinquished by : (Signature)	Date / Time	Received by : (Signature)	Relinquished by : (Signature)	Date / Time	Received by : (Signature)
[signature]	1-22-91 / 3:20pm	Patrick Hook			
Patrick Hook	1-22-91 / 4:15pm				

Relinquished by : (Signature)	Date / Time	Received for Laboratory by: [Signature]	Date / Time	Remarks

DATE: _____