SOIL AND GROUNDWATER INVESTIGATION WORKPLAN

GUY'S DIESEL
3820 San Leandro Street
Oakland, California

April 9, 1998

Project No. 581.1

Brunsing Associates, Inc.

SOIL AND GROUNDWATER INVESTIGATION WORKPLAN

GUY'S DIESEL
3280 San Leandro Street
Oakland, California

prepared for:

Mr. Kelly Engineer
All Star, Inc.
1791 Pine Street
Concord, California 94520

prepared by:

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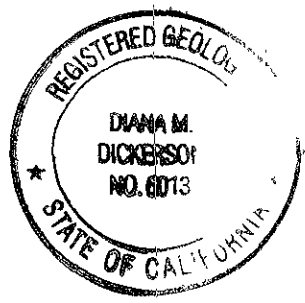
Project No. 581.1

Author: Carl Schwab
Project Geologist

Reviewer: Diana M Dickerson
Diana Dickerson R.G., R.E.A.
Environmental Manager



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1.0 INTRODUCTION

This document has been prepared by BACE Environmental, a division of Brunsing Associates, Inc. (BAI), to provide a workplan for additional soil sampling and groundwater monitoring well installation, related to the removal of underground storage tanks (USTs) at the 3820 San Leandro Street site (Plate 1). The soil sampling plan is intended to comply with the request for additional samples, as specified in the letter dated March 6, 1998, from Hernán Gómez, Hazardous Materials Inspector for the City of Oakland, Fire Services Agency (OFSA). The plan for monitoring well installation is intended to comply with Alameda County Environmental Health Services' (ACEHS) request for a soil and groundwater investigation, as outlined in a March 11, 1998 letter from Mr. Barney Chan, Hazardous Materials Specialist. This workplan is being submitted concurrently to both the OFSA and ACEHS for review by both agencies.

2.0 UNDERGROUND TANK REMOVAL AND SOIL DISPOSAL

It is our understanding that four USTs (two diesel fuel and two gasoline) were excavated and removed from the site on January 20, 1998. At that time, 5 soil samples for laboratory analysis were collected from the tank excavation. Tank removal and sampling procedures and sampling results are documented in American Consulting Remediation and Construction's (ACRC's) "Tank Closure Report" for the site. Soil sampling locations are shown on the site map (Plate 2). A summary of the analytical results for the soil samples collected are presented in Table 1.

It is our understanding that soil removed from the underground tank excavation was stockpiled on site. Stockpile samples were collected and submitted for analysis to allow for characterization for landfill disposal. It is also our understanding that the soils were transported by Den Beste Transportation, under non-hazardous waste manifest, to Forward Landfill, a licensed Class II facility, for disposal. BACE will advise the site owner to forward copies of the landfill disposal documentation to the OFSA and ACEHS following receipt.

3.0 ADDITIONAL SOIL INVESTIGATION

As discussed in BAI's letter of March 9, 1998, to Mr. Hernán Gómez, soil samples will be collected by advancing a series of soil borings using a C-57 licensed drilling company, rather than using an excavator or backhoe. This is due to the danger of damaging the new fiberglass tanks that have been installed. Soil borings will be advanced using 4-inch diameter solid stem augers, or 8-inch diameter hollow stem drill augers. A drilling permit will be obtained from Alameda County Public Works

prior to initiating field work. Prior to drilling any borings Underground Services Alert will also be contacted to inform utility companies of the proposed drilling locations. Proposed soil boring locations (B-1 through B-8) are shown on Plate 2. Monitoring wells will be constructed in two of the proposed soil borings (B-2 and B-5) following the completion of soil sampling. The other borings will be backfilled with hydrated bentonite chips, and grout. Soil cuttings generated by drilling operations will be stored on site in 55-gallon drums, pending disposal at an appropriate, licensed facility.

3.1 Soil Boring Locations

The soil boring locations have been chosen to be close to the prior sampling locations or former tank locations, without being too close to the new tanks. We understand that due to the soft, saturated soil at the site, caused by the heavy rains this winter, access to the boring locations with a truck-mounted drill rig is not feasible at this time. We are therefore requesting that you approve the pouring of the concrete slab at the site, prior to sampling, to enable us to access the proposed boring locations. In addition, the piping and fuel lines in the new pump island area need to be covered as soon as possible to minimize the potential for damage. Boring locations have been selected to comply with the OFSA letter of March 6, 1998, as follows (OFSA requests shown by italics).

1. Retake soil samples where soil samples #2, 3, and 5 were taken.
Borings B-5 and B-2 are located approximately 3 to 4 feet from the locations where samples #2 and #3 were taken. Sample location #5 is located in the middle of the former underground tank excavation. The excavation was extended approximately 20 feet towards the fuel islands, on the side of the tank where sample #5 was collected, to accommodate the placement of the new underground tanks. We have placed Boring B-3 at the edge of the tank excavation on the same side as sample #5.

2. Take soil samples, one from the end of the previously existent 4,000 gallon gasoline tank and another from the end of the removed 8,000 gallon gasoline tank.
Boring B-4 has been placed at the south end of the former 4,000 gallon gasoline tank and boring B-5 is located at the north end. The north end of the former 8,000 gallon gasoline tank was located under where the current tanks are placed, precluding sampling. Boring B-1 has been placed outside the former tank excavation on the south side, near where the end of the 8,000 gallon gasoline tank was located.

3. Sample areas previously occupied by fuel islands and piping ~~round~~ run.
The location of the former fuel islands is shown on Plate 2. According to ACRC the fuel lines to the former tank ran down the middle, between the two former fuel islands. Borings B-3 and B-~~7~~ 7 have been placed in locations to sample the former fuel line area, and borings B-~~6~~ 6 and B-8 have been placed where the former fuel islands were located.

4. Remove the stockpile

As discussed earlier, stockpile soils have been transported to Forward Landfill. We will inform the site owner of the need to provide copies of the disposal documentation to your office.

The FSA/OES also requires sampling of the tank pit water

As discussed in our March 9, 1998 letter, we will collect a water sample from a PVC pipe and well screen that was inserted into the pea gravel backfill in the tank excavation. The water sample will be collected when we are on site to complete the soil sampling.

3.2 Soil Sampling Procedures

Based on information contained in ACRC's Tank Closure Report, it is our understanding that the main portion of the underground tank excavation was extended to a depth of approximately 16 feet to accommodate the new tanks, and the excavation around the 4,000-gallon tank was extended to a depth of approximately 12 feet. The report also notes that the samples taken at the ends of the tanks were collected at a depth of approximately 12 feet, where water was observed to be infiltrating into the excavation. Sample #4 was reportedly collected from below the tanks at a depth of approximately 14.5 feet.

BAI proposes to advance soil borings B-1 through B-5 to a total depth of approximately 16 feet. It is anticipated that three soil samples will be collected from each boring, at approximate 5-foot intervals. The soil samples collected at approximately 5 to 6 feet will not be submitted for analysis unless the field geologist notes obvious indications of contamination. One soil sample from each boring will be collected at a depth of approximately 12 feet in native soils, and a third sample will be collected at a depth of approximately 15 to 16 feet. Samples will be field screened for organic vapors using a photoionization detector. All samples taken at 12 feet will be analyzed. Samples collected at 16 feet will be analyzed if field screening indicates the presence of organic vapors, if visual evidence of contamination is noted, or if the sample collected at a depth of 12 feet is found to be contaminated.

According to ACRC, the fuel island area was excavated to a depth of approximately 3 feet to accommodate the new fuel lines. BACE proposes to collect soil samples from borings B-3, B-6, B-7 and B-8 at depths of approximately 3 to 4 feet, and 6 to 8 feet. The deeper soil sample will be analyzed if analysis of the more shallow sample indicates the presence of contamination. If obviously contaminated soil is found to a depth of 8 feet in any of these borings, the boring will be extended until the vertical limit of contamination is reached. Drilling will be supervised by a BACE geologist using the Unified Soil Classification System for soil classification.

3.3 Sample Analyses

what about MTBE

All soil samples submitted for laboratory analysis will be analyzed for total petroleum hydrocarbons (TPH) as diesel, TPH as gasoline, and benzene, toluene, ethylbenzene and xylenes (BTEX). Samples for analysis will be collected in clean, decontaminated, brass tubes using a split-spoon sampler. The brass tubes will be removed from the sample driver and the ends will be covered with aluminum foil and capped. The brass tubes will be labelled using a waterproof marker to designate the location, date, name of person doing the sampling, depth at which the sample was taken, and sample ID. The sample will be sealed in a zip-lock bag, placed in a cooled ice chest, and submitted to a state-certified analytical laboratory for analysis. A chain-of-custody form will be completed and included with all samples.

4.0 GROUNDWATER INVESTIGATION

To investigate the potential for impact to groundwater at the site, BACE proposes to install three groundwater monitoring wells (MW-1, MW-2 and MW-3, Plate 2). Following well installation, the monitoring wells will be developed and sampled.

4.1 Monitoring Well Installation

Monitoring well borings will be completed using 8-inch diameter hollow-stem augers. Drilling will be supervised by a BACE geologist. It is anticipated that the monitoring wells will be advanced to a depth of approximately 20 to 25 feet. Drilling of the soil borings and construction of the monitoring wells will take place following workplan approval by the OFSA and ACEHS, and monitoring well permit approval by Alameda County Public Works.

The monitoring wells will be constructed using 2-inch diameter, threaded, Schedule 40 PVC. The screened portion of the well casings will consist of 0.020-inch, factory milled slots. The top of the ~~screened interval of the well casings will extend to~~ approximately 10 feet bgs. Following insertion of the well casing, a sand pack of clean Lonestar #2/12 sand, or equivalent, will be placed to a depth of approximately one to two feet above the top of the well screen. A two-foot thick bentonite seal will be placed above the sand pack. The annulus above the bentonite seal will be grouted with a neat cement grout. The well will be completed with a water-tight utility box grouted in place at grade, and with a water-tight, locking cap sealing the well casing. A permanent well identification number will be placed on the utility box.

4.2 Monitoring Well Development

The monitoring wells will be developed a minimum of 48 hours following completion of well construction, through surging with a surge block and evacuating water with a hand-held bailer, or through pumping with a submersible pump, until groundwater is relatively free of sediment. A minimum of five casing volumes of water will be removed. Groundwater pH, conductivity, and temperature will be measured during well development to ensure that these parameters stabilize prior to the end of the development process.

4.3 Survey of Well Casings

The top of the well casings for the newly installed wells will be surveyed relative to mean sea level. The horizontal locations of the well heads will also be surveyed relative to a permanent building or monument on the site.

4.4 Monitoring Well Sampling

Purging of the monitoring wells prior to sampling will be performed a minimum of 24 hours after the well has re-equilibrated from development. Prior to purging, groundwater levels will be measured and the wells will be checked for floating product using a dual-interface probe. If no free product is encountered, the monitoring wells will be purged until a minimum of three casing volumes of water have been removed, water is relatively clear of sediment, and pH, conductivity and water temperature have stabilized. Groundwater samples will be collected using a clean bailer and will be transferred to laboratory-supplied containers. Sample containers will be sealed, labeled, and stored in a cooled ice chest until delivery to a California-certified laboratory for analysis. A chain-of-custody form will be completed and submitted to the laboratory with the samples. All groundwater samples will be analyzed for TPH as diesel, TPH as gasoline, BTEX, and methyl tertiary butyl ether (MTBE).

4.5 Storage of Wastewater

Purge water from well development and sampling will be stored on site in 55-gallon drums, pending disposal at an appropriate, licensed facility.

5.0 SITE SAFETY PLAN

A site safety plan covering the field work outlined in this document is included as Appendix A.

6.0 DISTRIBUTION

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Senior Deputy District Attorney
Consumer Environmental Protection Division
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Oakland, California 94621

TABLES

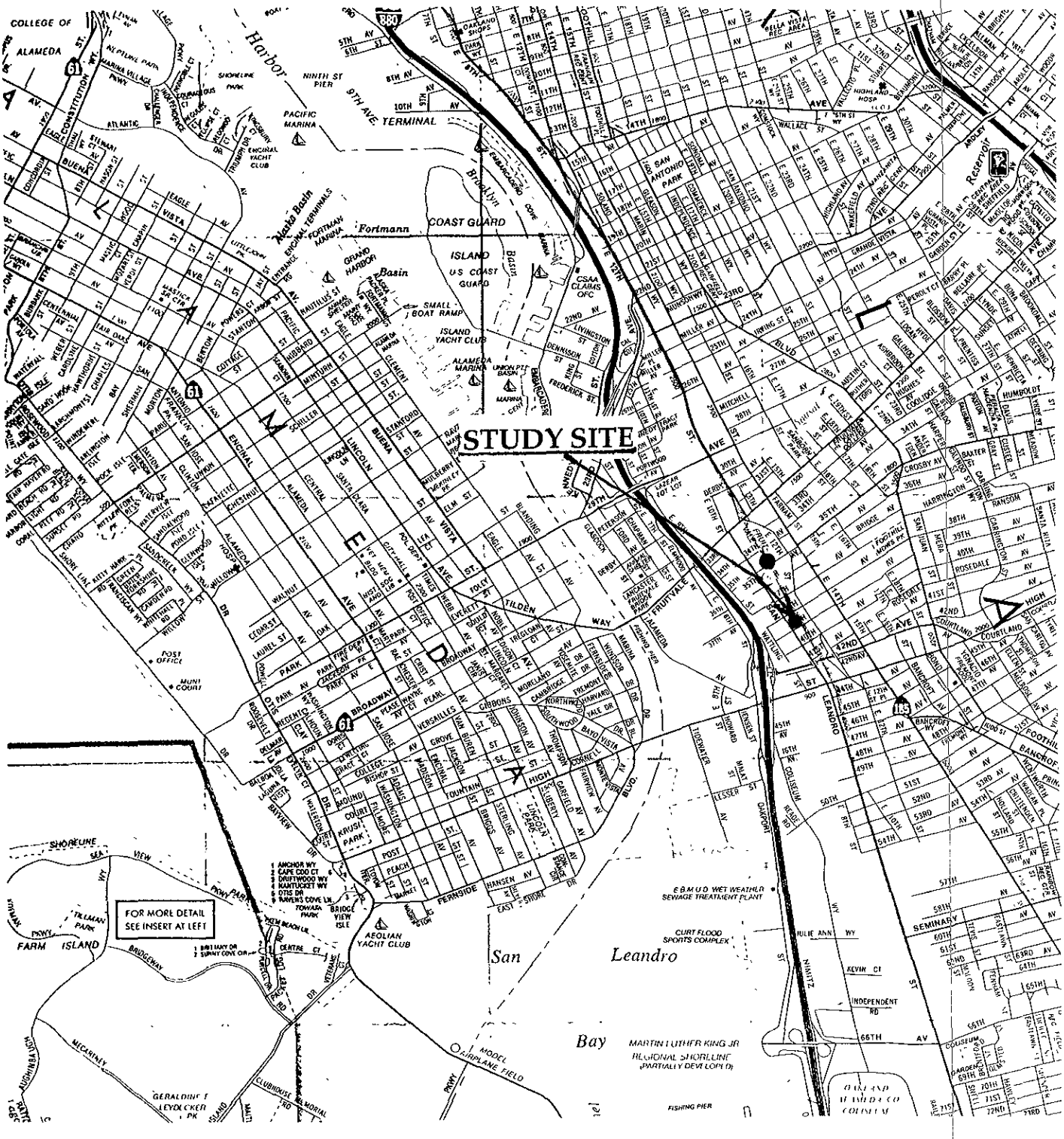
TABLE 1: Soil Analysis Summary

3820 San Leandro Street
Oakland, California

Sample Number	TPH as Diesel (mg/kg)	TPH as Gasoline (mg/kg)	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Xylenes (mg/kg)	Total Lead (mg/kg)
#1	180	34	0.11	<0.05	0.12	0.24	nr
#2	3,200	2,600	34	5.3	47	170	nr
#3	3,700	1,400	5.0	3.5	26	6.5	nr
#4	11	170	0.88	0.48	1.5	0.71	nr
#5	510	130	0.82	0.42	2.2	8.6	nr
Comp. (A,B,C)	1,700	260	0.16	0.40	1.0	4.2	nr
Comp. (D,E,F)	1,200	750	0.14	0.34	1.5	7.0	nr
Comp. (1,2,3,4)	180	2.6	<0.005	<0.005	<0.005	<0.005	3.4
Comp. (5,6,7,8)	500	220	<0.0625	<0.0625	<0.0625	1.4	5.3
Comp. (9,10,11,12)	450	79	<0.125	<0.125	<0.125	0.87	nr

Comp. samples are 4-point composite stockpile samples
mg/kg = milligrams per kilogram which is essentially equivalent to parts per million (ppm).
nr= Analysis not requested

PLATES



Ref: CSAA Oakland, Berkley, Alameda 1992

PROJECT NO.: 581.1		
DRAWN BY:	CES	4/8/98
CHECKED BY:		
APPROVED BY:		

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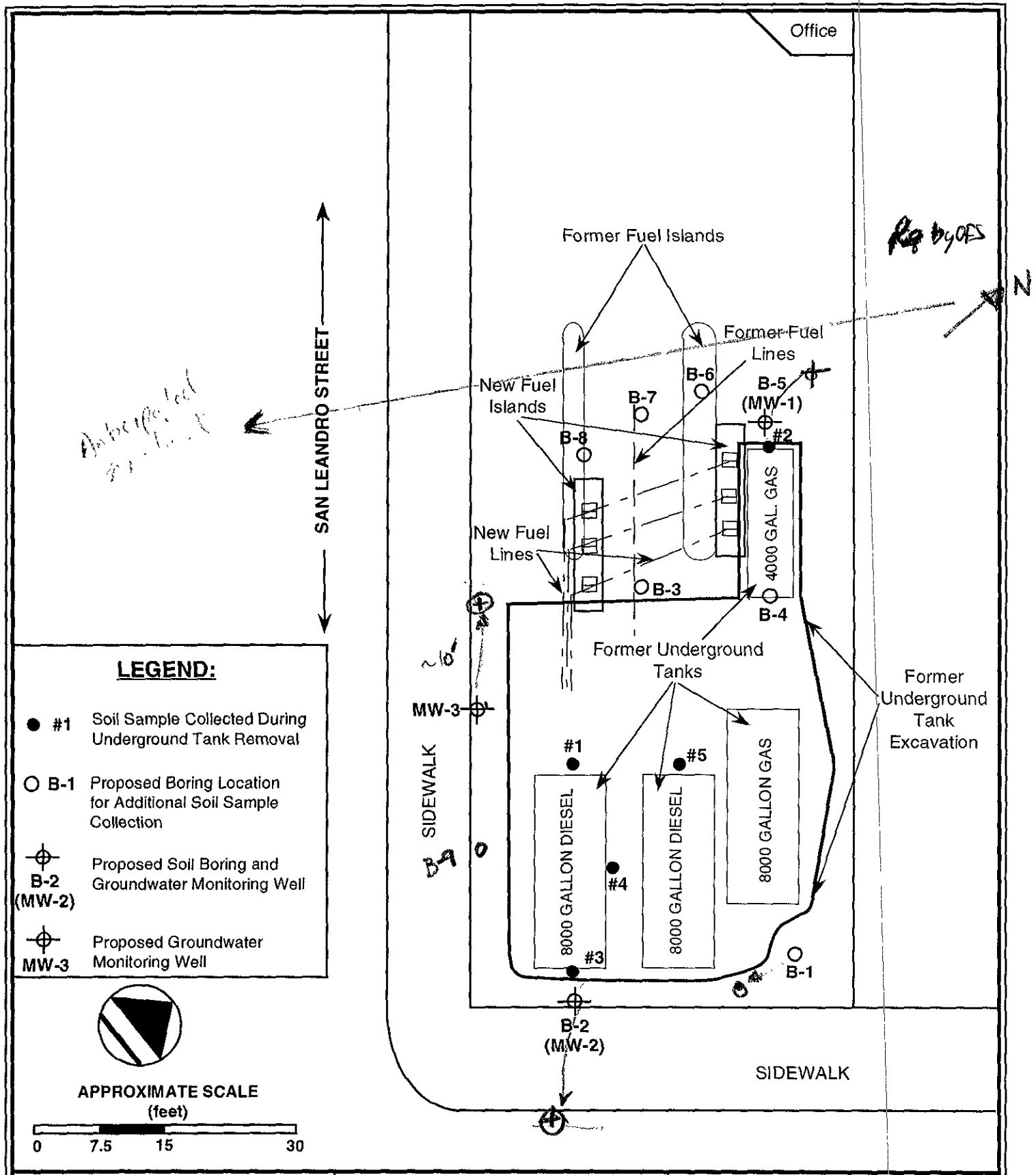
PLATE 1
SITE LOCATION MAP
Guy's Diesel
3820 San Leandro Street
Oakland, California



LEGEND:

- ● #1 — Soil Sample Collected During Underground Tank Removal
- ○ B-1 — Proposed Boring Location for Additional Soil Sample Collection
- ⊕ B-2 (MW-2) — Proposed Soil Boring and Groundwater Monitoring Well
- ⊕ MW-3 — Proposed Groundwater Monitoring Well

APPROXIMATE SCALE
(feet)

0 7.5 15 30

PROJECT NO.: 581.1		
DRAWN BY:	CES	4/3/98
CHECKED BY:		
APPROVED BY:		
REVISED:		

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PLATE 2
SITE MAP
Guy's Diesel
3820 San Leandro Street
Oakland, California

APPENDIX A

Site Health and Safety Plan
3820 San Leandro Street

SITE HEALTH AND SAFETY PLAN
Guy's Diesel
3820 San Leandro Street, Oakland

INTRODUCTION

This site health and safety plan outlines recommended procedures to be followed while performing a soil and groundwater investigation at Guy's Diesel, 3820 San Leandro Street, Oakland, California. The procedures presented herein are intended to serve as guidelines; they are not a substitute for the sound judgement of onsite personnel. As work is completed, appropriate revisions shall be made by onsite personnel, and as time permits, shall be approved by the Project Manager. The key personnel that will be responsible for following the health and safety procedures described herein are:

Joel Bruxvoort	Project Geologist/Project Manager
Tom Allan	Staff Engineer/Site Safety Officer

The field activities that will be performed include:

- Drilling up to 9 soil borings and completing 3 borings as wells
- Collecting soil samples from the borings
- Developing and sampling the well

Results of previous site investigation indicate that Level D protection will be adequate for most field activities, but onsite personnel should be prepared to wear Level C protection, including respirators with organic cartridges when drilling. Air monitoring will be performed during drilling activities to assess organic vapor levels and to evaluate whether respirators are needed. During drilling activities, site personnel shall wear hard hats, steel-toed boots and chemical resistant gloves, at a minimum. During well development and groundwater sampling, site personnel shall wear chemical resistant gloves while performing sampling activities and shall have respirators with organic cartridges available for use, as warranted. The overall hazard from chemical exposure at this site, based on information currently available to BACE, is believed to be low to moderate. The overall physical hazard of this site is believed to be low to moderate. The subsurface utilities leading to the site will be located by Underground Services Alert, a minimum of 48 hours prior to the start of drilling. In addition, onsite utilities will be located by the client or the client's representative.

RESULTS OF CHEMICAL ANALYSES

The maximum concentrations of petroleum hydrocarbons detected in soil during investigation performed at the site to date are shown below:

Chemical	Soil	
TPH as diesel	3,700	mg/kg
TPH as gasoline	2,600	mg/kg
Benzene	34	mg/kg
Toluene	5.3	mg/kg
Ethylbenzene	47	mg/kg
Xylenes	170	mg/kg

mg/kg = milligrams per kilogram
µg/kg = micrograms per kilogram

TRAINING

All field personnel working at the site will be responsible for having completed a certified 40-hour health and safety training course as required by OSHA, under 29 CFR 1910.120 (OSHA certified). The field operations will be undertaken only by OSHA-certified personnel familiar with appropriate safety procedures and this Site Safety Plan.

HAZARD ASSESSMENT

Based on available data, the compounds that may be encountered during this investigation are diesel, gasoline, benzene, toluene, ethylbenzene, and xylenes. Gasoline is a volatile, flammable liquid with various constituents, including benzene, a known human carcinogen. Effects of overexposure to gasoline include headaches, blurred vision, dizziness, and nausea.

In dealing with hazardous or potentially hazardous substances, personnel must protect themselves from the four basic routes of exposure: inhalation, skin absorption, ingestion, and eye contact. The four basic routes are discussed below.

1. Inhalation

Breathing a gas, vapor, mist, fume, or dust is the most common accidental form of exposure; this route of entry is the most likely to cause systemic illness. Respirators with the appropriate organic cartridges may be required while conducting the field activities. No excessive facial hair, which interferes with a satisfactory fit of the mask-to-face seal, will be allowed on personnel required to wear respiratory protective equipment.

Air monitoring will be performed using a photoionization detector (PID) during drilling activities to evaluate whether exposure to organic vapors is occurring. Periodic readings will be taken with a PID from a point at the top of the borehole and in the breathing zone.

Threshold limit values will be used to evaluate if exposure to organic vapors requires use of respirators by onsite personnel. Two indices are given below: The Time Weighted Average (TWA), defined as the average exposure concentration for a normal eight-hour workday during forty-hour work week, to which nearly all workers may be repeatedly exposed, day after day, without adverse effect; and the Short-Term Exposure Limit (STEL), defined as a fifteen minute TWA exposure which should not be exceeded at any time during a workday and should not be reached more than four times in a work day with a minimum of one hour between exposures.

Individual Hazard Evaluation Parameters

- Gasoline: TWA = 300 ppm
STEL = 500 ppm
- Diesel TWA = 100 ppm
STEL = Not available
- Benzene: TWA = 1 ppm
STEL = 5 ppm
- Toluene: TWA = 100 ppm
STEL = 150 ppm
- Ethylbenzene: TWA = 100 ppm
STEL = 125 ppm
- Xylenes: TWA = 100 ppm
STEL = 150 ppm

ppm = parts per million

Because a PID measures total organic vapors (TOVs), respirators will be donned when a PID reading reaches 75% of the STEL (for gasoline, 350 ppm) or when a PID reading is greater than 75% of the TWA (for gasoline, 225 ppm) for periods exceeding 15 minutes in length. Because of the low TWA and STEL limits for benzene, the Site Safety Officer may require that a Draeger Tube test for benzene levels be performed to determine that TWA and STEL levels for benzene are not exceeded. In general benzene concentrations for the samples collected at the site to date have been relatively low, reflecting the relatively old age of the gasoline at the site.

The Site Safety Officer may require that a contamination reduction zone be established around the work area from which personnel who are not OSHA-certified will be excluded. If a contamination reduction zone is established, periodic air monitoring at the edge of the contamination reduction zone in a down wind direction will be conducted to ensure that PID readings at the boundary remain at or below background levels. The air monitoring data will be recorded in a daily field report prepared by the Site Safety Officer.

2. Skin Absorption

Skin exposure to hazardous materials may result in skin irritation or penetration. Skin penetration is probably the second most common accidental means of entry of chemicals into the body. The following precautions may be required when performing any field activities.

- Ensure that skin areas which may come into contact with potentially contaminated soil or water are protected during site work by wearing rubber boots, disposable coveralls, and/or gloves.
- After completing the day's work, remove disposable protective clothing and leave onsite in 55-gallon drums; care should be taken to avoid skin contact with these items.
- Equipment which has come in contact with potentially contaminated soil at the site should be thoroughly cleaned before leaving the site.
- Unnecessary contact with potentially contaminated surfaces should be avoided.

3. Ingestion

Hazardous materials may be carried to the mouth by hand when eating, drinking, chewing gum or tobacco, or smoking. These activities are therefore prohibited until contaminated clothing has been removed and hands have been washed. Liquids will not be syphoned by mouth under any circumstances. If ingestion occurs, do not induce vomiting.

4. Eye Contact

The eyes may be harmed by chemicals in solid, liquid, or vapor form. Irritant effects vary in degree from mild to severe. The following precautions to avoid eye injury will be taken when at the site:

- Do not rub eyes while working.
- Do not wear contact lenses when working or while wearing contaminated gloves or other contaminated clothing.

- Safety goggles or glasses (without side perforations) may be required by the Site Safety Officer.

EMERGENCY PROCEDURES

The following procedure should be used in the event of an accident (physical injury or exposure to toxic materials):

1. As soon as it is safe, remove the injured or exposed person(s) from immediate danger.

2. Render FIRST AID, if necessary.

3. Depending on the type and severity of the injury, call 911 for an ambulance for transport to a local hospital or transport the individual(s) to the hospital. These first three steps should be followed even if there is no apparent serious injury. Emergency telephone numbers and the fastest route to the nearest hospital shall be readily available onsite.

4. Relocate other onsite personnel to a safe place until the Project Manager determines that it is safe for work to resume.

5. Steps to prevent a recurrence of the accident should be implemented immediately.

LOCATION OF MEDICAL FACILITIES

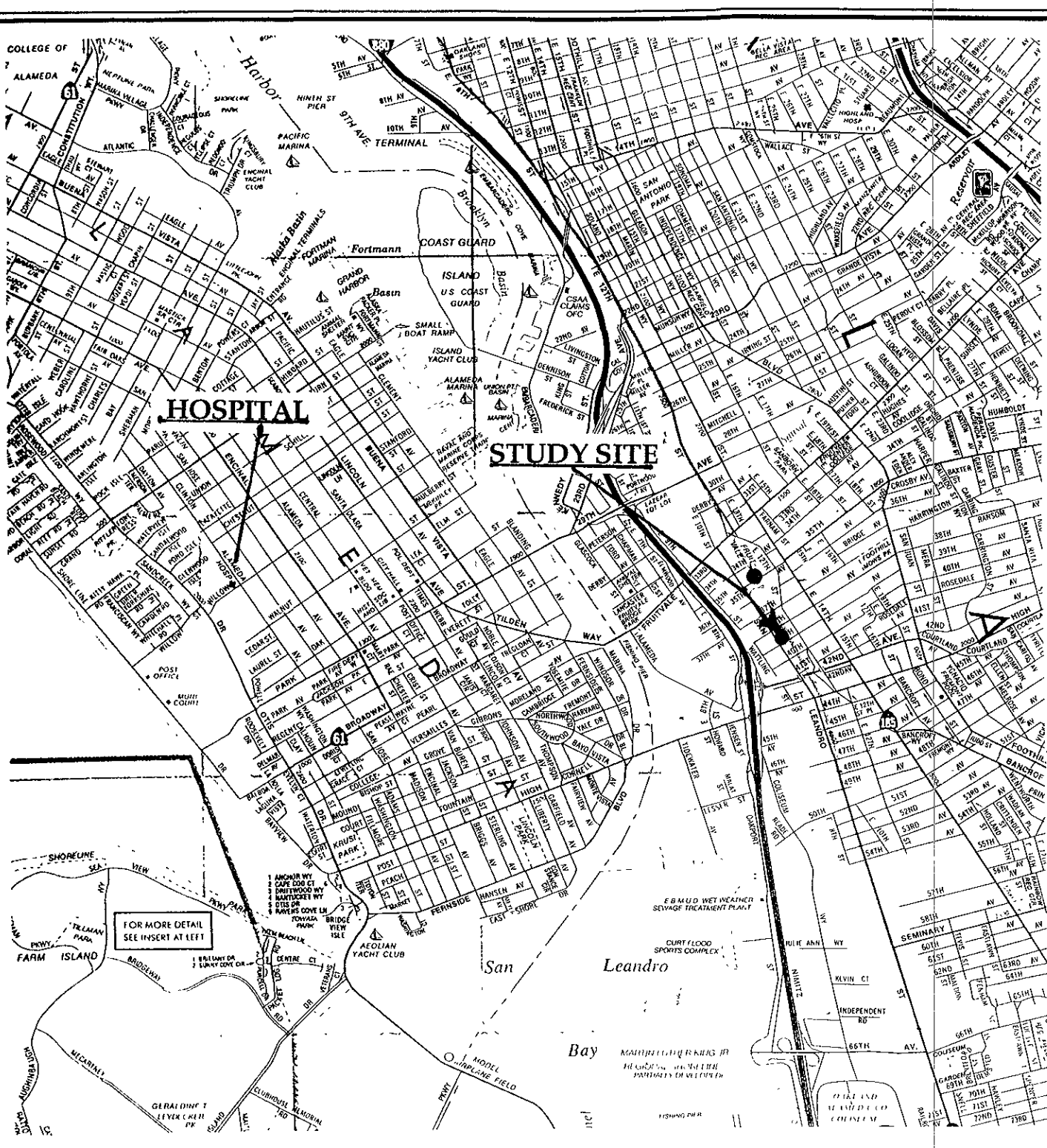
The nearest medical facility in the vicinity of the site is **Alameda Hospital, 2070 Clinton Avenue, Alameda, California**. Directions to the hospital are: Follow San Leandro Street north to Fruitvale Ave. Turn left (west) on Fruitvale, which turns into Tilden Way and then Lincoln Ave. in Alameda. Make a left turn on Willow Street (west) and follow to the intersection with Clinton Avenue. Hospital is on the northwest corner. The route to the hospital is also shown graphically on the hospital route map at the end of this plan.

Telephone numbers for medical and emergency services are listed below.

EMERGENCY/AMBULANCE	911
Alameda Hospital Emergency Room	523-4357
Alameda Hospital	522-3700

SITE HEALTH AND SAFETY MEETING

A site health and safety meeting will be held before field work commences. The purpose of this meeting is to distribute copies of this site health and safety plan to field personnel. The Site Safety Officer will discuss the plan and encourage the field personnel to read the plan. Topics of discussion will include the route to the hospital, the location of the nearest telephone, and the location and operation of the kill switch on the drill rig.



Ref: CSAA Oakland, Berkley, Alameda 1992

APPROXIMATE SCALE
(feet)

0 2640 5280

PROJECT NO.:	581.1	
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APPROVED BY:		

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PLATE A1
Hospital Route Map
Guy's Diesel
3820 San Leandro Street
Oakland, California