File No. 7-92-514-SA

PROPOSED ADDITIONAL SUBSURFACE INVESTIGATION WORK PLAN FOR TONY'S EXPRESS AUTO SERVICES LOCATED AT 3609 EAST 14TH STREET OAKLAND, CALIFORNIA

MAY 13, 1996

PREPARED FOR:

MR. ABOLGHASSEM RAZI

TONY'S EXPRESS AUTO SERVICES

3609 EAST 14TH STREET

OAKLAND, CALIFORNIA 94601

BY:

SOIL TECH ENGINEERING, INC.

1761 JUNCTION AVENUE

SAN JOSE, CALIFORNIA 95112

SOIL TECH ENGINEERING, INC.

File No. 7-92-514-SA

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SOIL TECH ENGINEERING

Environmental and Geological Engineers

1761 JUNCTION AVENUE, SAN JOSE, CA 95112 (408) 441-1881

May 13, 1996

File No. 7-92-514-SA

Mr. Abolghassem Razi
Tony's Express Auto Services
3609 East 14th Street
Oakland, California 94601

SUBJECT: PROPOSED ADDITIONAL SUBSURFACE INVESTIGATION WORK PLAN FOR TONY'S EXPRESS STATION Located at 3609 East 14th Street, in Oakland, California

Dear Mr. Razi:

As requested by the Alameda County Department of Environmental Health--UST Local Oversight Program (ACDEH) in a letter dated January 11, 1996, the proposed work plan has been prepared in accordance with State and Local Regulatory Agency requirement for your site.

The proposed additional subsurface investigation work plan consist of the tasks required by the agencies in order to define the extent of contamination at the site. Please submit this work plan to ACDEH.

File No. 7-92-514-SA

If you have any questions or require additional information, please feel free to contact our office at (408) 441-1881.

Sincerely,

SOIL TECH ENGINEERING, INC.

FRANK HAMEDI-FARD
GENERAL MANAGER

LAWRENCE KOO, P. E.
C. E. #34928

File No. 7-92-514-SA

PROPOSED ADDITIONAL SUBSURFACE INVESTIGATION WORK PLAN FOR TONY'S EXPRESS STATION LOCATED AT 3609 EAST 14TH STREET OAKLAND, CALIFORNIA APRIL 9, 1996

INTRODUCTION:

A proposed additional subsurface investigation work plan for the subject site was requested by the Alameda County Department of Environmental Health--UST Local Oversight Program.

The eight on-site monitoring wells continued to detect dissolved petroleum hydrocarbons in the shallow groundwater. This work plan proposes a scope of work to assess the lateral extent of petroleum hydrocarbons in subsurface soil and groundwater.

GENERAL SITE DESCRIPTION:

The site is located at the intersection of 36th Avenue and East 14th Street, in Oakland, California (Figure 1). The site is currently used as a gasoline service station. The site is relatively flat, and the properties surrounding are primarily commercial business and residential housing. Figure 2 shows the locations of the main building, fuel tanks areas, existing on-site monitoring wells and proposed borings/monitoring well(s).

BACKGROUND:

The subject site is a gasoline service station. On July 18, 1992, Soil Tech Engineering, Inc. (STE) conducted a limited subsurface investigation to determine if soil near the product lines and underground storage tanks at the site had been contaminated with petroleum hydrocarbons. Six borings were drilled, and one soil sample was collected from each boring from depths of 5 to 15 feet below grade. The samples were analyzed for Total Petroleum Hydrocarbons as gasoline (TPHg), and Benzene, Toluene, Ethylbenzene and Total Xylenes (BTEX). Laboratory results indicated that the samples contained TPHg ranging from 20 to 460 milligrams per kilogram (mg/Kg) TPHg and low levels of BTEX. These results were presented in our preliminary subsurface (soil) investigation dated August 3, 1992.

On July 1, 1993, a 10,000 gallon and a 6,000 gallon underground gasoline storage tank and a 550 gallon underground waste oil storage tank were removed from the site and properly disposed. STE was retained to conduct soil sampling in the excavations created by the removal of the tanks and the associated piping. All soil sampling was conducted under the supervision of Mr. Barney Chan of ACHCSA. Three new underground gasoline storage tanks were installed at the site in July and August 1993.

The soil samples from the tank areas were taken at approximately 12 feet below grade, waste oil soil samples were taken at approximately 7 feet below grade and the piping area samples ranged

from 2 to 5 feet below grade. The soil analyses from the tank excavation detected low to moderate levels of Total Petroleum Hydrocarbons as gasoline (TPHg) and ranged from 2.1 to a maximum of 640 mg/Kg. Soil samples from the old piping areas showed elevated TPHg ranging from 75 to a maximum of 4,100 mg/Kg. No hydrocarbons nor Volatile Organic Compounds (VOC's) were detected in the waste oil tank excavation area. The details of the soil sampling event are described in STE's report entitled "Soil Sampling Below Removed Underground Tanks at Tony's Express Station...", dated July 27, 1993.

Due to the elevated TPHg, Alameda County Health Department requested a work plan for subsurface investigation in a letter, dated August 6, 1993. STE prepared a preliminary site assessment work plan, dated August 5, 1993. The work plan was submitted to the Alameda County Health Department for approval. The county approved the work plan in a letter, dated August 18, 1993.

In August 1993, STE conducted an interim corrective action and preliminary soil & groundwater investigation by drilling thirteen soil borings and converting three into monitoring wells. Monitoring wells STMW-1, STMW-2 and STMW-3 were drilled in the vicinity of the former underground fuel tanks. Groundwater was first encountered at the depth of 16 feet below grade during drilling operations. STE recommended quarterly monitoring for at least one year to further assess the site as required by Alameda County Health Department.

To allow for future in-situ remediation of difficult to reach impacted soils, four vertical 6-inch diameter soil vapor extraction probes were installed in four soil borings and two horizontal perforated pipes were installed next to the two dispenser islands. These six probes were connected by non-perforated pipes to a vault in front of the northeast corner of the site building.

All impacted soils removed during excavation of former tanks and over-excavation of contaminated soil were bio-remediated on-site. When contaminant levels were acceptably low, a letter of request for disposal was sent to Redwood Landfill in Novato, California. A copy of STE's letter to Redwood Landfill requesting the disposal of treated soil along with soil analyses were included in the November 1993 request.

Three quarterly monitoring of the three on-site wells events were conducted by STE in December 1994, March 1995, and June 1995. The results of these groundwater sampling events are presented in our reports dated December 8, 1994, March 10, 1995 and June 13, 1995. The groundwater surface had risen from approximately 15½ feet below grade during our initial sampling in October 1993 to approximately 9½ to 10½ feet below grade during our last quarterly monitoring event in June 1995.

Low to moderate levels of TPHg and BTEX were detected in the groundwater for the last three quarters. Levels of contaminants

were lower in March 1995 than in December 1994. Levels of contaminants has decreased significantly than the initial sampling in October 1993 due to the high groundwater elevation and dissolution. Groundwater flow direction has been to the south-southeast only during all three sampling events.

Additional five monitoring wells were installed in August 1995. The detail of the additional investigation is described in STE's report dated October 9, 1995. Since then, all the wells have been continuously monitored and sampled on quarterly bases.

OBJECTIVE:

The main objective of additional subsurface investigation is to define the lateral extent of dissolved hydrocarbons in soil and groundwater in down-gradient and up-gradient from the underground tank system.

SCOPE OF WORK:

The scope of work is to assess the lateral extent of dissolved petroleum hydrocarbons.

A. Prepare a site safety plan.

B. Obtain the necessary drilling permit.

C. Drill 7 to 10 exploratory borings up-gradient and down-gradient of the fuel tank areas in accordance with State and Local Regulatory Agency requirements.

D. Install three additional groundwater monitoring wells.

E. Develop, sample and survey monitoring wells.

F. Analyze the soil and groundwater for Total Petroleum Hydrocarbons as gasoline (TPHg), Benzene, Toluene, Ethylbenzene and Total Xylenes (BTEX).

G. Analyze the field data and laboratory results.

H. Prepare a technical report.

METHODS AND PROCEDURES:

The methods and procedures for drilling, installing and sampling soil borings and groundwater are described in this section of the work plan. The preliminary investigation approach will be consistent with the (1) Regional Water Quality Control Board (RWQCB) "Tri-Regional Board staff Recommendations for Preliminary Evaluation and Investigation of Underground Tank Sites" dated August 1990, (2) LUFT Manual, (3) Alameda County Health Department guidelines for such fuel tank sites, and (4) our Standard Operation Procedures (SOP) Appendix "B".

TASK A. SITE SAFETY PLAN:

A site safety plan has been prepared and will be available on-site at the time the field work is conducted. The site safety plan is attached in Appendix "D".

TASK B. OBTAIN PERMIT:

Following work plan approval by the state and local agencies, STE will acquire drilling permits, schedule field activities and locate underground utility lines prior to beginning field work.

TASK C. CONDUCT EXPLORATORY SOIL BORINGS:

In order to assess the vertical and lateral extent of hydrocarbons at the site, seven to ten soil borings will be drilled to the depth of the groundwater. The drilling procedures will consist of using a combination of hydro punch and hand auger due to limited assess availability. Soil samples will be collected from each boring at 5-foot intervals and at significant lithologic changes. Collect groundwater through a temporarily casing. The soil samples recovered for chemical analysis will be retained in the sleeve covered with aluminum foil and plastic caps, wrapped with tape, labeled and placed immediately into an iced cooler.

TASK D. INSTALL GROUNDWATER MONITORING WELLS:

Based on the results of soil and groundwater samples, three of the exploratory borings will be converted into groundwater moni-

toring wells to depths of approximately 5 to 10 feet below the top of the saturated zone. The borings will be drilled using 8-inch diameter hollow-stem augers. Each monitoring well will be constructed of 2-inch diameter, clean, flush-threaded, Schedule 40 PVC blank and screened (0.020-inch slot size) casing, and the required filter pack. Well installation will follow the standard procedures and requirements of the RWQCB and Alameda County-Zone 7 (see Standard Operation Procedures in Appendix "B").

The top of each monitoring well will be secured with a water-tight locking cap and utility box finished flush with the ground surface.

TASK E. DEVELOP, SAMPLE AND SURVEY MONITORING WELLS:

The monitoring wells will be properly developed, purged and sampled in accordance with applicable regulations and guidelines of the RWQCB and ACDEH. The samples will be placed in clean containers for transport to a California certified-laboratory for analysis following proper chain-of-custody procedures.

All wells will be surveyed as to location and elevation in reference to an established benchmark to within 0.01 foot. Depth-to-water in each well will be measured from the top of the casing using an electronic sounder. Wells will be monitored prior to sampling for presence or absence of any free floating petroleum product.

TASK F. ANALYZED SOIL AND GROUNDWATER SAMPLES:

Selected soil and groundwater samples will be transported to a California certified-laboratory for analysis following proper chain-of-custody procedures. Soil and water samples will be analyzed for TPHg and BTEX distinction by EPA Methods 5030, 8015 and 8020. All samples will be analyzed using a standard 2 -week reporting time.

TASK G. ANALYZED DATA AND LABORATORY RESULTS:

Upon completion of the soil and groundwater sample analysis, a detailed analysis of the results and available information will be compiled to define the extent and nature of hydrocarbons in the soil and/or groundwater, if any, at the site.

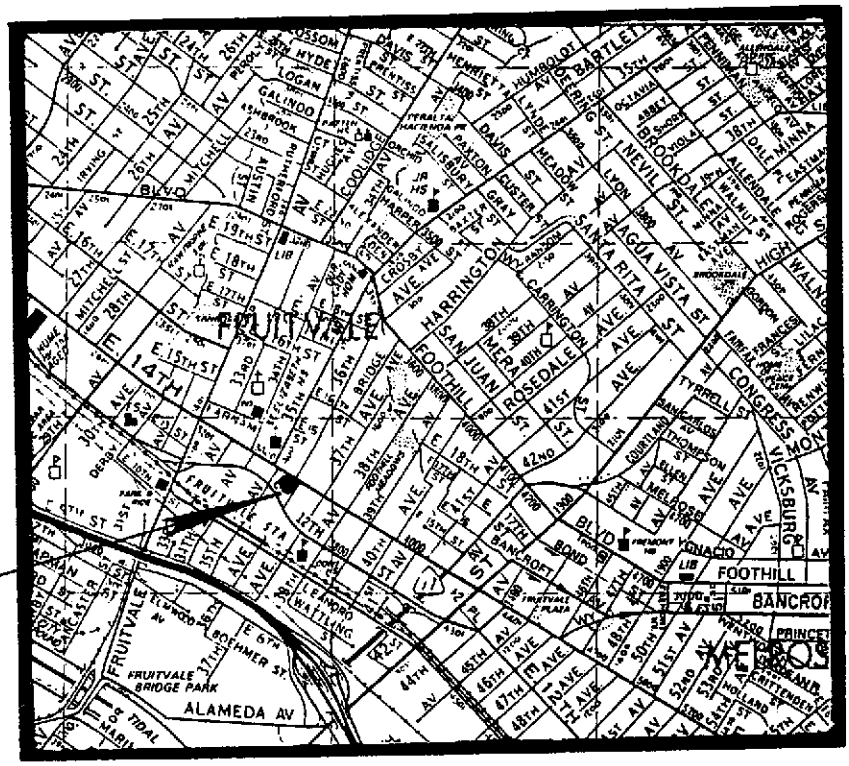
TASK H. PREPARE REPORT:

A report presenting the results and findings of the explor-tory soil borings and monitoring well installation, including the boring logs and laboratory reports, will be prepared and submitted to the Tony's Express Station for review. Then the report should be submitted to ACEHD.

File No. 7-92-514-SA

A P P E N D I X "A"

SOIL TECH ENGINEERING, INC.



Site Location

Thomas Brothers Map 1993 Edition
San Francisco, Alameda
and Contra Costa Counties

Page 12 A3

Figure 1

File No. 7-92-514-SA

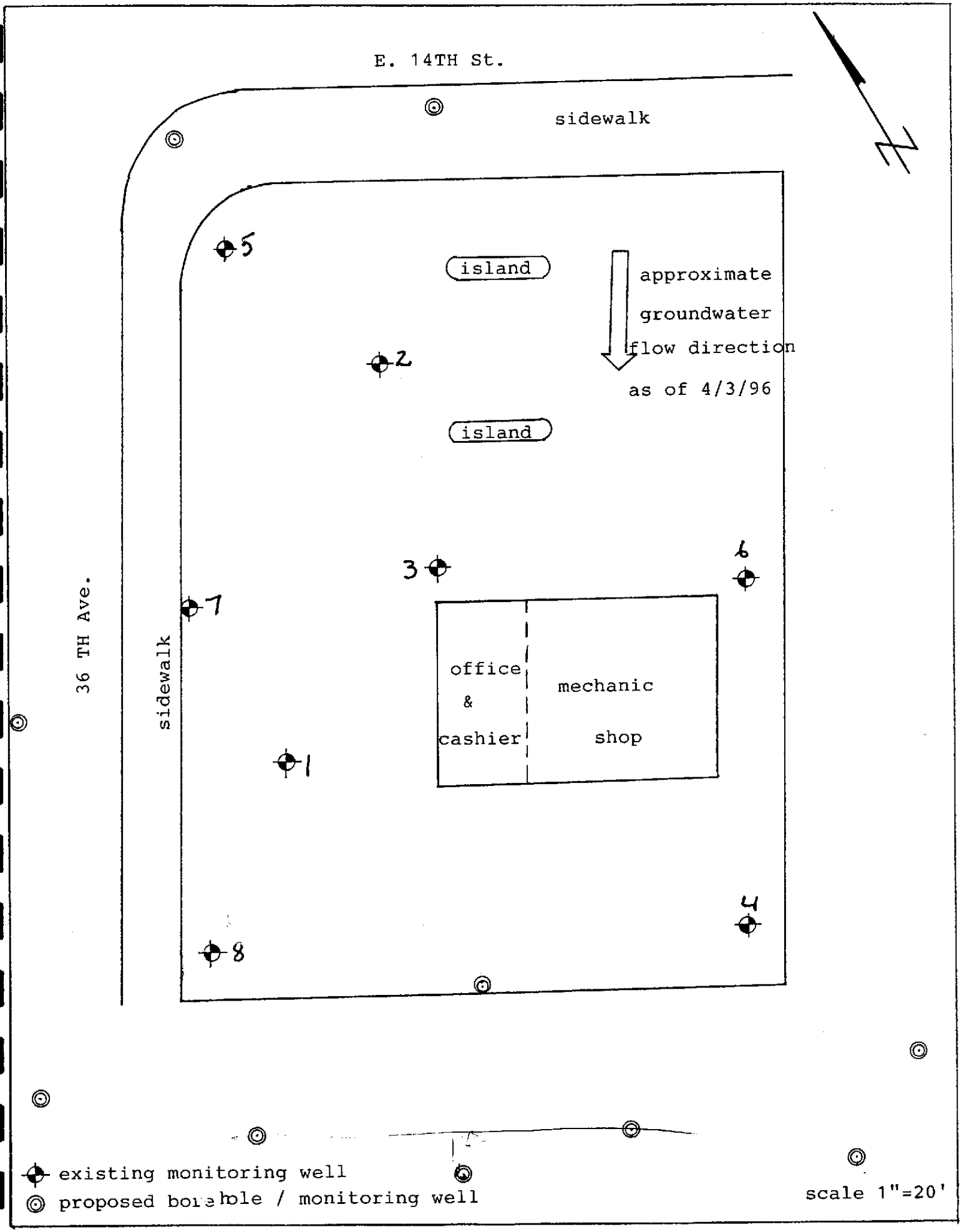


Figure 2 SOIL TECH ENGINEERING INC M2

File No. 7-92-514-SA

A P P E N D I X "B"

SOIL TECH ENGINEERING, INC.

File No. 7-92-514-SA

DRILLING AND SOIL SAMPLING PROCEDURE

Mobile drill rig B-40L, using a continuous, solid-flight, hollow stem auger will be used in drilling the soil borings to the desired depths.

Prior to drilling, all drilling equipment (auger, pin, drilling head) will be thoroughly steam-cleaned to minimize the possibility of cross-contamination and/or vertical migration of possible contaminants.

In addition, prior to obtaining each individual soil sample, all sampling tools, including the split-spoon sampler and brass liners will be thoroughly washed in a Trisodium Phosphate (TSP) solution followed by a rinse in distilled water.

During the drilling operation, relatively undisturbed soil samples will be taken from the required depth by forcing a 2-inch I.D. split-spoon sampler insert with a brass liner into the ground at various depths by means of a 140-lb. hammer falling 30-inches or by hydraulic forces.

The samplers will contain relatively undisturbed soil. In general, the first section of soil from the sampler (shoe) will be used in the field for lithologic inspection and evidence of contamination. The selected brass liner will be immediately trimmed, the ends of the brass liner will be covered tightly with

aluminum foil and plastic caps, sealed with tape, labelled, placed in a plastic bag and stored in a cold ice chest in order to minimize the escape of any volatiles present in the samples. Soil samples for analysis will then be sent to a state-certified hazardous waste laboratory accompanied by a chain-of-custody record.

Soil samples collected at each sampling interval will be inspected for possible contamination (odor or peculiar colors). Soil vapor concentrations will be measured in the field by using a Photoionization Detector (PID), PhotoVac Tip Air Analyzer. The soil sample will be sealed in a Zip-Loc plastic bag and placed in the sun to enhance volatilization of the hydrocarbons from the sample. The purpose of this field analysis is to qualitatively determine the presence or absence of hydrocarbons and to establish which soil samples will be analyzed at the laboratory. The data will be recorded on the drilling log at the depth corresponding to the sampling point.

Other soil samples may be collected to document the stratigraphy and estimate relative permeability of the subsurface materials.

Soil tailings that are obtained during drilling will be stored at the site, pending the analytical test results to determine proper disposal.

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1761 JUNCTION AVE., SAN JOSE, CA 95112

File No. _____

Date _____

By _____

Job _____

Site Description _____ (continued on reverse side)

Type of Drill Rig _____ Hole Dia. _____

(NOTE WATER LEVEL, TIME, DATE AT END OF LOG, CAVING, ETC.)

Elev. _____ Datum _____

ample uality	Blows/6 inches	Sample Loc.	Sample No.	Depth		Soil Classification	Penetrometer
				1			
				2			
				3			
				4			
				5			
				6			
				7			
				8			
				9			
				0			
				1			
				2			
				3			
				4			
				5			
				6			
				7			
				8			
				9			
				0			
				1			
				2			

SOP3

File No. 7-92-514-SA

MONITORING WELL INSTALLATION

The boreholes for the monitoring wells were hand augered with a diameter of at least two inches larger than the casing outside diameter (O.D.).

The monitoring wells were cased with threaded, factory-perforated and blank, schedule 40 P.V.C. The perforated interval consisted of slotted casing, generally 0.010 to 0.040 inch wide by 1.5 inch long slot size, with 42 slots per foot (slots which match formation grain size as determined by field grain-size distribution analysis). A P.V.C. cap was fastened to the bottom of the casing (no solvents, adhesive, or cements were used), the well casing was thoroughly washed and steam-cleaned.

After setting the casing inside the borehole, kiln-dried sand or gravel-filter material was poured into the annular space to fill from the bottom of the boring to two feet above the perforated interval. A one to two feet thick bentonite plug was placed above this filter material to prevent grout from infiltrating down into the filter material. Approximately one to two gallons of distilled water were added to hydrate the bentonite pellets. Then the well was sealed from the top of the bentonite seal to the surface with concrete or neat cement containing about 5% bentonite (see Well Construction Detail).

To protect the well from vandalism and surface water contamination, Christy boxes with a special type of Allen screw were installed around the well head, (for wells in parking lots, driveways and building areas). Steel stove pipes with padlocks were usually set over well-heads in landscaped areas.

In general, groundwater monitoring wells extend to the base of the upper aquifer, as defined by the consistent (less than 5 feet thick) clay layer below the upper aquifer, or at least 10 to 15 feet below the top of the upper aquifer, whichever is shallower. The wells do not extend through the laterally extensive clay layer below the upper aquifer. The wells are terminated one to two feet into such a clay layer.

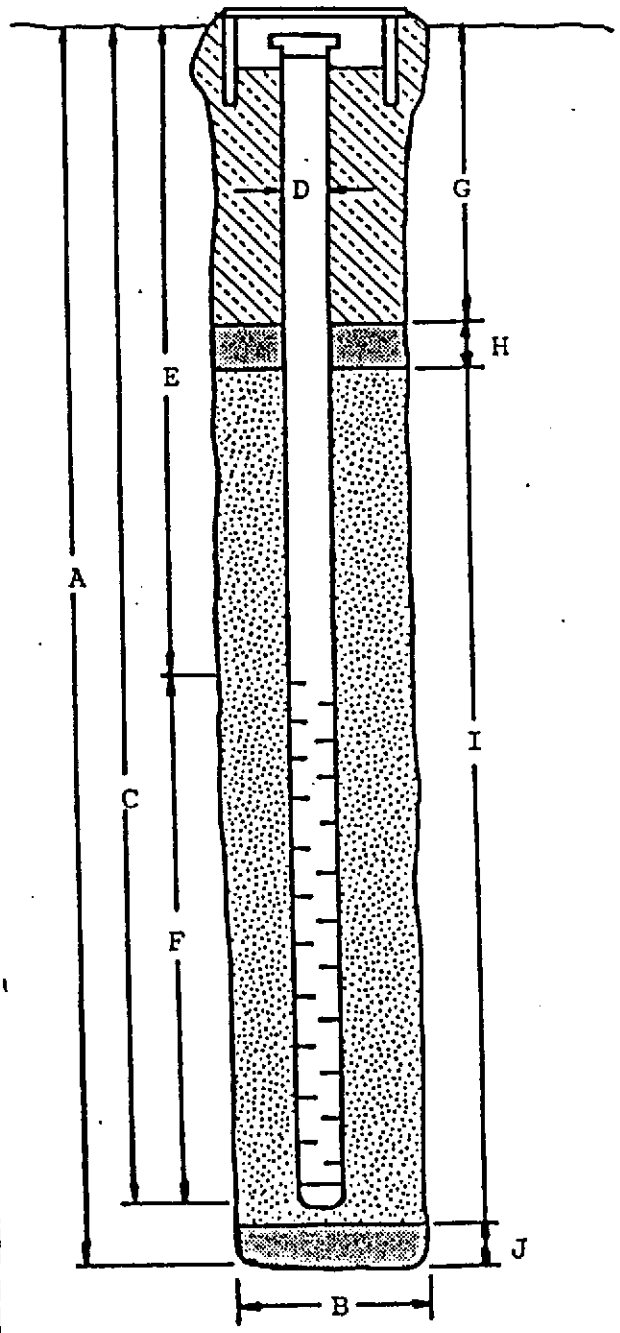
WELL DETAILS

PROJECT NAME:_____ BORING/WELL NO._____

PROJECT NUMBER:_____ CASING ELEVATION:_____

WELL PERMIT NO.:_____ SURFACE ELEVATION:_____

G-5 Vault Box



A. Total Depth:_____

B. Boring Diameter:_____

Drilling method:_____

C. Casing Length:_____

Material:_____

D. Casing Diameter:_____

E. Depth to Perforations:_____

F. Perforated Length:_____

Perforated Interval:_____

Perforation Type:_____

Perforation Size:_____

G. Surface Seal:_____

Seal Material:_____

H. Seal:_____

Seal Material:_____

I. Gravel Pack:_____

Pack Material:_____

Size:_____

J. Bottom Seal:_____

Seal Material:_____

File No. 7-92-514-SA

WELL DEVELOPMENT

For all newly installed groundwater monitoring wells, the well casing, filter pack and adjacent formations were cleared of disturbed sediment and water.

Well development techniques included pumping, bailing, surging, swabbing, jetting, flushing or air lifting by using a stainless steel or Teflon bailer, a submersible stainless steel pump, or air lift pump. The well development continued until the discharged water appeared to be relatively free of all turbidity.

All water and sediment generated by well development were collected in 55-gallon steel drums (Department of Transportation approved), closed-head (17-H) for temporarily storage, and were then disposed of properly, depending on analytical results.

To assure that cross-contamination did not occur between wells, all well development tools were steam-cleaned or thoroughly washed in a Trisodium Phosphate (TSP) solution followed by a rinse in distilled water before each well development.

SOIL TECH ENGINEERING

Soil, Foundation and Geological Engineers

1761 JUNCTION AVENUE, SAN JOSE, CA 95112 (408) 441-1881

FILE NO:_____ WELL NO:_____

DATE:_____ SAMPLER:_____

DEPTH TO WELL:_____ 1 WELL VOLUME:_____

DEPTH TO WATER:_____ 5 WELL VOLUMES:_____

HEIGHT OF WATER COLUMN:_____ ACTUAL PURGED VOLUME:_____

CASING DIAMETER: ___ 2" ___ 4"

CALCULATIONS:

2" - X 0.1632 _____

4" - 0.653 _____

PURGE METHOD: ___ BAILER ___ DISPLACEMENT PUMP ___ OTHER

SAMPLE METHOD: ___ BAILER ___ OTHER

SHEEN: ___ NO ___ YES, DESCRIBE_____

ODOR: ___ NO ___ YES, DESCRIBE_____

FIELD MEASUREMENTS

TIME	VOLUME	pH	TEMP.	E.C.

File No. 7-92-514-SA

GROUNDWATER SAMPLING

Prior to collection of groundwater samples, all of the sampling equipment (i.e. bailer, cables, bladder pump, discharge lines and etc...) was cleaned by pumping TSP water solution followed by distilled water.

Prior to purging, the well "Water Sampling Field Survey Forms" were filled out (depth to water and total depth of water column were measured and recorded). The well was then bailed or pumped to remove four to ten well volumes or until the discharged water temperature, conductivity and pH stabilized. "Stabilized" is defined as three consecutive readings within 15% of one another.

The groundwater sample was collected when the water level in the well recovered to 80% of its static level.

Forty milliliter (ml.), glass volatile organic analysis (VOA) vials with Teflon septa were used as sample containers. The groundwater sample was decanted into each VOA vial in such a manner that there was a meniscus at the top. The cap was quickly placed over the top of the vial and securely tightened. The VOA vial was then inverted and tapped to see if air bubbles were present. If none were present, the sample was labeled and refrigerated for delivery under chain-of-custody to the laboratory. The label information would include a sample identification number, job identification number, date, time, type of analysis requested, and the sampler's name.

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1761 JUNCTION AVENUE, SAN JOSE, CA 95112 (408) 441-1881

MONITORING WELL SURVEY SHEET

NAME: _____ DATE: _____

FACILITY NAME AND ADDRESS: _____

_____

PROJECT NO.: _____

FIELD ACTIVITIES

WELL NUMBER	ROD READING	RIM ELEVATION	WATER ELEVATION

WARNING: HAVE YOU SURVEYED ALL WELLS? LOCATED ALL WELLS?

HAVE YOU CHECKED FOR AND SURVEYED EXISTING MONITORING WELLS ON ADJACENT PROPERTIES OR PROPERTIES ACROSS THE STREET?

DO WE HAVE ACCURATE SKETCHES AT 1"=30' (AND 1"=100' IF NECESSARY)? IF NOT, MAKE THEM.

SOP10

\SURVEY

Volume of Water in Casing or Hole

Diameter of Casing or Hole (In)	Gallons per foot of Depth	Cubic Feet per Foot of Depth	Liters per Meter of Depth	Cubic Meters per Meter of Depth
1	0.041	0.0055	0.509	0.509×10^{-3}
1½	0.092	0.0123	1.142	1.142×10^{-3}
2	0.163	0.0218	2.024	2.024×10^{-3}
2½	0.255	0.0341	3.167	3.167×10^{-3}
3	0.367	0.0491	4.558	4.558×10^{-3}
3½	0.500	0.0668	6.209	6.209×10^{-3}
4	0.653	0.0873	8.110	8.110×10^{-3}
4½	0.826	0.1104	10.26	10.26×10^{-3}
5	1.020	0.1364	12.67	12.67×10^{-3}
5½	1.234	0.1650	15.33	15.33×10^{-3}
6	1.469	0.1963	18.24	18.24×10^{-3}
7	2.000	0.2673	24.84	24.84×10^{3}
8	2.611	0.3491	32.43	32.43×10^{3}
9	3.305	0.4418	41.04	41.04×10^{3}
10	4.080	0.5454	50.67	50.67×10^{3}
11	4.937	0.6600	61.31	61.31×10^{3}
12	5.875	0.7854	72.96	72.96×10^{3}
14	8.000	1.069	99.35	99.35×10^{3}
16	10.44	1.396	129.65	129.65×10^{3}
18	13.22	1.767	164.18	164.18×10^{3}
20	16.32	2.182	202.68	202.68×10^{3}
22	19.75	2.640	245.28	245.28×10^{3}
24	23.50	3.142	291.85	291.85×10^{3}
26	27.58	3.687	342.52	342.52×10^{3}
28	32.00	4.276	397.41	397.41×10^{3}
30	36.72	4.909	456.02	456.02×10^{3}
32	41.78	5.585	518.87	518.87×10^{3}
34	47.16	6.305	585.68	585.68×10^{3}
36	52.88	7.069	656.72	656.72×10^{3}

1 Gallon = 3.785 Liters
1 Meter = 3.281 Feet
1 Gallon Water Weighs 8.33 lbs. = 3.785 Kilograms
1 Liter Water Weighs 1 Kilogram = 2.205 lbs.
1 Gallon per foot of depth = 12.419 liters per foot of depth
1 Gallon per meter of depth = 12.419×10^{3} cubic meters per meter of depth

From Groundwater and Wells, Second Edition

CHAIN OF CUSTODY RECORD

SOP12

PROJ. NO.	NAME
SAMPLERS: *(Signature)*	

NO.	DATE	TIME	SOIL	WATER	LOCATION	CONTAINER	ANALYSES REQUESTED (2)	REMARKS

Relinquished by: *(Signature)*	Date / Time	Received by: *(Signature)*	Relinquished by: *(Signature)*	Date / Time	Receive by: *(Signature)*
Relinquished by: *(Signature)*	Date / Time	Received by: *(Signature)*	Relinquished by: *(Signature)*	Date / Time	Received by: *(Signature)*
Relinquished by: *(Signature)*	Date / Time	Received for Laboratory by: *(Signature)*	Date / Time	Remarks	

SOIL TECH ENGINEERING

Soil, Foundation and Geological Engineers

1761 JUNCTION AVENUE, SAN JOSE, CA 95112 (408) 441-4881

Sample Type: Soils, Oils, Solvents, Polids, Highly Contaminated Liquids (c)

General Composition	Sample Volume	Sample Container	Preservative	Holding Time (recommended/regulatory)
Weak Acids and Bases		plastic or glass		
Photosensitive materials		amber glass		
Volatile organics		40 ml glass vial with TFE lined septum		
Non-volatile organics		glass with TFE lined cap		
Measurement - General Chemical Categories, Inorganic				
Inorganics, general		plastic or glass		
Metals, total		plastic or glass		
Measurement - General Chemical Categories, Organic				
Acid extractables		glass with TFE lined cap		
Base/neutral extractables		glass with TFE lined cap		
Measurement Specific Chemicals - Inorganic				
Hydrofluoric acid		plastic		
Phosphoric acid		plastic		

SAMPLE MANAGEMENT

Sample Type: Waste

General Composition	Sample Volume	Sample Container	Preservative	Holding Time (d) (recommended/regulatory)
Measurement - Specific Chemicals, Inorganic				
Ammonia			add 1 ml conc H_3PO_4	24 hrs
Arsenic			add 6 ml conc HNO_3/L	6 months
Chlorine			cool 4°C	24 hrs
Chromium VI			add 6 ml conc H_2SO_4/L	24 Hrs
Cyanide, total			add 2.5 ml of 50% NaOH/L, cool 4°C	24 hrs
Fluoride			cool 4°C	7 days
Mercury, total			add 5 ml conc HNO_3L	38 days
Mercury, dissolved			filter, add 5 ml conc HNO_3/L	38 days
Selenius			add 5 ml conc HNO_3/L	6 months
Sulfide			add 2 ml conc HC1/1	24 hrs
Zinc			add 2 ml conc HC1/1	-

Sample Type: Soils, Oils, Solvents, Solids, Highly Contaminated Liquids (c)

Strong acids, pH<2	glass
Strong bases, pH>12.5	plastic

SAMPLE MANAGEMENT

Sample Type: Water and Wastewater

General Composition	Sample Volume	Sample Container	Preservative	Holding Time (d) (recommended/regulatory)
Sulfate	50 ml	plastic or glass	cool 4°C	7 days/28 days
Sulfide	500 ml	plastic or glass	cool 4°C, add 4 drops 2N Zn acetate/100 ml	24 hrs/28 days
Sulfite	50 ml	plastic or glass	determine on site	no holding
Measurement - Specific Chemicals, Organic				
NTA	50 ml	plastic or glass waterline & center	cool 4°C	24 hrs
Measurement - Physical Properties				
Acidity			cool 4°C	24 hrs
Alkalinity			cool 4°C	24 hrs
pH			determine on site	6 hrs
			cool 4°C	
Measurement - General Chemical Categories, Inorganic				
Metals, dissolved			filter on site, add 5 ml conc HNO_3/L	6 months
Metals, total			add 5 ml conc HNO_3/L	6 months
Measurement - General Chemical Categories, Organic				
Phenolics			add H_3PO_4 to pH 4 and 1 g $CuSO_4$/L, cool 4°C	24 hrs

Sample Type: Water and Wastewater

General Composition	Sample Volume	Sample Container	Preservative	Holding Time (d) (recommended/regulatory)
Measurements - Specific Chemicals, Inorganic				
Ammonium	500 ml	plastic or glass	cool, 4°C, add H_2SO_4 to pH<2	24 hr/28 days
Boron	100 ml	plastic	none required	28 days/28 days
Chlorine	200 ml	plastic or glass	determine on site	no holding
Chromium VI	300 ml	plastic or glass, rinse with 1:1 HNO_3	cool, 4°C	24 hrs/28 days
Cyanide, total	500 ml	plastic or glass add NaOH to pH>12	cool, 4°C, dark	24 hrs/14 days
Cyanide, amenable to chlorination	50 ml	plastic or glass	add 100 mg NaS_2O_3	
Fluoride	300 ml	plastic	none required	7 days/28 days
Iodide	100 ml	plastic or glass	cool, 4°C	24 hrs/ -
Iodine	500 ml	plastic or glass	determine on site	1/2 hr/ -
Mercury, total	500 ml	plastic or glass rinsed with 1:1 HNO_3	cool, 4°C add HNO_3 to pH<2	28 days/28 days
Mercury, dissolved	100 ml	plastic or glass	filter on site add HNO_3 to pH<1	glass: 38 days hard plastic: 13 days
Nitrate	100 ml	plastic or glass	cool, 4°C add H_2SO_4 to pH<2	24 hrs/48 hrs
Nitrate & nitrate	200 ml	plastic or glass	cool, 4°C add H_2SO_4	24 hrs/28 days
Nitrate	100 ml	plastic or glass	cool, 4°C or freeze	

SAMPLE MANAGEMENT

Sample Type: Water and Wastewater

General Composition	Sample Volume	Sample Container	Preservative	Holding Time (d) (recommended/regulatory)
Measurement - General Chemical Categories, Organic				
Acid extractables		2 liter glass with TFE lined cap		
Base/neutral extractable		2 liter glass with TFE lined cap		
MBA's	250 ml	plastic or glass	cool, 4°C	24 hr
Oil and Grease	1000 ml	glass, wide mouthed, calibrated	cool, 4°C, H_2SO_4 to pH<2	24 hr/28 days 24 hr/28 days
Organics		glass rinsed with organic solvents, TFE cap		
Phenolics	500 ml	glass		24 hr/28 days
Purgeables by purge and trap	50 ml	glass, TFE lined cap		

SAMPLE MANAGEMENT

Sample Type: Water and Wastewater (a,b,c)

General Composition	Sample Volume	Sample Container	Preservative	Holdin Time (d) (recommended/regulatory)
Nonvolatile organics		2 liter glass with TFE lined cap		
Photosensitive materials		1 liter amber glass		
Volatile organics		40 ml glass vial with TFE lined cap (collect in duplicate)		
Volatile	100 ml	Plastic or glass	cool, 4°C	7 days
Measurement - Physical Properties				
Acidity	100 ml	plastic or borosilioate glass	cool, 4°C	24 hr/14/days
Alkalinity	200 ml	plastic or glass	cool, 4°C	24 hr/14/days
pH	25 ml	plastic or glass	determine on site	2 hr/2 hr
Temperature	1000 ml	plastic or glass	determine on site	no holding
Measurement - General Chemical Categories, Inorganic				
metals, dissolved	200 ml	plastic(g) or glass	filter on site (f)	6 mos (e)
metals, total	100 ml	plastic(g) or glass rinsed with 1:1 HNO_3	HNO_3 to pH<2 (g)	6 mos/6 mos (e)

File No. 7-92-514-SA

A P P E N D I X "C"

SOIL TECH ENGINEERING, INC.

File No. 7-92-514-SA

TYPES OF PROTECTIVE CLOTHING AND RESPIRATION THAT SHOULD BE USED AT HAZARDOUS WASTE SITES LOCATED AT 3609 EAST 14TH STREET OAKLAND, CALIFORNIA

The degree of hazard is based on the waste material's physical, chemical, and biological properties and anticipated concentrations of the waste. The level of protective clothing and equipment worn must be sufficient to safeguard the individual. A four category system is described below.

LEVEL A

Level A consists of a pressure-demand SCBA (air supplying respirator with back mounted cylinders), fully encapsulated resistant suit, inner and outer chemical resistant gloves, chemical resistant steel safety boots (toe, shank, and metatarsal protection), and hard hat. Optional equipment might include cooling systems, abrasive resistant gloves, disposable oversuit and boot covers, communication equipment, and safety line. Level A is worn when the highest level of respiratory, skin, and eye protection is required. Most samplers will never wear Level A protection.

LEVEL B

Level B protection is utilized in areas where full respiratory protection is warranted, but a lower level of skin and eye protection is sufficient (only a small area of head and neck is exposed). Level B consists of SCBA, splash suit (one or two piece) or disposable chemical resistant coveralls, inner and outer chemical resistant gloves, chemical resistant safety boots, and hard hat with face shield. Optional items include glove and boot covers and inner chemical resistant fabric coveralls.

LEVEL C

Level C permits the utilization of air-purifying respirators. Level B body, foot, and hand protection is normally maintained. Many organizations will permit only the use of approved full-face masks equipped with a chin or harness-mounted canister. However, many sites are visited by personnel wearing a half-mask cartridge respirator.

LEVEL D

Level D protection consists of a standard work uniform of coveralls, gloves, safety shoes or boots, hard hat, and goggles or safety glasses.

Two basic types of respirators are air-purifying and air-supplying. Air-purifying respirators are designed to remove specific contaminants by means of filters and/or sorbents. Air-purifying respirators come in various sizes, shapes, and models and can be outfitted with a variety of filters, cartridges, and canisters. Each mask and cartridge or canister is designed for protection against certain contaminant concentrations. Just because a cartridge says it is for use against organic vapors does not mean that it is good for all organic vapors.

Air-supplying respirators are utilized in oxygen-deficient atmospheres (less than 19.5 percent) or when an air-purifying device is not sufficient. Air is supplied to a face-mask from an uncontaminated source of air via and air line from stationary tanks, from a compressor, or from air cylinders worn on the back (SCBA). Rated capacities of the SCBA's are normally between 30 and 60 minutes. Only positive pressure (pressure demand) respirators should be used in high concentration hazardous environments.

Respirators often malfunction during cold weather or after continued use. Only NIOSH (National Institute for Occupational Safety and Health) MSHA (Mine Safety and Health Administration) approved respirators should be used.

Contact lenses are not permitted for use with any respirator. Contact lenses should not be worn at any site since they tend to concentrate organic materials around the eyes; soft plastic contact

lenses can absorb chemicals directly. In addition, rapid removal of contact lenses may be difficult in an emergency. Since eye glasses can prevent a good seal around the temple when wearing goggles or full face masks, spectacle adapters are available for masks and goggles.

File No. 7-92-514-SA

OUTLINE OF DRUM HANDLING PROCEDURES
FOR THE PROPERTY
LOCATED AT 3609 EAST 14TH STREET
OAKLAND, CALIFORNIA

1. Test material per site-specific test requirements.

2. Classify Material as: Clean/Non-Hazardous.

3. Labeling of Drums:

   * Pending Label: Used to describe material pending final analytical testing. Labels must be immediately affixed to drum during field work.

   * Non-Hazardous Label: Required within 24 hours after analytical results are received.

   * Hazardous Label: Required within 24 hours after analytical results are received.

   * For Pick-Up Label: Must be affixed to drum prior to arranged pick-up date by certified hauler.

4. Remove within 21 days of generation. Empty drums, where material was disposed in bulk, must be removed the same day they are emptied.

5. Disposal of Material:

   * Clean: Any local landfill.

   * Non-Hazardous: Class III landfill.

   * Hazardous: Class I landfill.

6. Manifests may be signed by the on-site contractor or consultant, owner, or other authorized representatives. The transporter should not sign the manifest.

   It is the responsibility of the contractor, consultant and owner to arrange for a person to sign the manifest on the day of pick-up.

7. Reporting:

   Reports shall include the following:

   * Completed soil and water worksheets.
   * Copy of the analytical results.
   * State how and where material was disposed.
   * If drums are emptied and material was disposed of in bulk, state how empty drums were handled.
   * The signed blue and yellow copies of the hazardous waste manifest.

SOIL:

1. Test Requirements and Methods: Per STE site-specific test requirements.

   * TPH: EPA Method 8015.
   * BTEX: EPA Method 8020.
   * O&G: 503 D&E.
   * Lead:

     -Total Lead - EPA Method 7421.

-Inorganic (soluble) Lead: DOS Title 22, Waste Extraction Test, §22-66700.

-Organic - EPA Method 8240.

* Ignitable:

2. Classification:

* Clean: TPH, BTEX, O&G, VOC and non-detectable (<100 ppm).

* Non-Hazardous if any are true:

-TPH less than 1,000 ppm.

-Lead - Inorganic (soluble) Lead less than 5 ppm (STLC) or less than 100 ppm (TTLC).
- Organic Lead less than 13 ppm (TTLC).

* Hazardous if any are true:

-TPH greater than 1,000 ppm.

-Lead - Inorganic (soluble) Lead greater than 5 ppm (STLC) or greater than 1,000 ppm (TTLC).
- Organic Lead greater than 13 ppm (TTLC).

-Ignitable - If TPH > 1,000 ppm, then conduct Bunsen Burner Test.
- If soil bums vigorously and persistently, soils are RCRA D001.

* VOC - less than 1,000 ppm.

3. Responsibility for Disposal:

* Clean: Consultant, contractor or owner.

* Non-Hazardous: Consultant, contractor or owner.

4. Types of Drums: DOT-17H for a solid, solidified, or sludge material.

5. Disposal Facility:

   * Clean: Any local landfill.

   * Non-Hazardous: Class III or II landfill.

   * Hazardous: Class I landfill.

WATER:

1. Test Requirements and Methods: Per site-specific test requirements.

   * TPH: EPA Method 8015.

   * BTEX: EPA Method 602.

2. Classification:

   * Clean Water: TPH and BTEX non-detectable.

   * Hazardous:

     -Water with dissolved product and detectable TPH and BTEX.

     -Water with free product.

     -Free product only.

3. Responsibility for Disposal:

   * Clean: Consultant/Contractor.

   * Non-Hazardous: Consultant, contractor or owner.

4. Types of Drums: DOT-17C or DOT-17E for liquid or slurry.

5. Disposal Facility:

   * Clean Water: Into sanitary sewer per Local Sewer District approval or into storm sewer with proper approval from Water Board.

   * Non-Hazardous:

     -Water with TPH and BTEX only.

     -Water with free product.

     -Arrange certified waste hauler to pick and dispose.

   * Hazardous:

     -Free product only.

     -Arrange disposal by a certified hazardous waste hauler.

File No. 7-92-514-SA

A P P E N D I X "D"

File No. 7-92-514-SA

HEALTH AND SAFETY PLAN
FOR THE PROPERTY
LOCATED AT 3609 EAST 14TH STREET
OAKLAND, CALIFORNIA

GENERAL:

This Health and Safety Plan (HSP) contains the minimum requirements for the subject site field work. The field activities include drilling, soil sampling and water sampling. All personnel and contractors will be required to strictly adhere with this HSP requirements.

The objective of the HSP plan is to describe procedures and actions to protect the worker, as well as unauthorized person, from inhalation and ingestion of, and direct skin contact with potentially hazardous materials that may be encountered at the site. The plan describes (1) personnel responsibilities and (2) protective equipment to be used as deemed when working on the site. At a minimum, all personnel working at the site must read and understand the requirements of this HSP. A copy of this HSP will be on-site, easily accessible to all staff and government field representative.

HAZARD ASSESSMENT:

The major contaminants expected to be encountered on the project are gasoline and its hydrocarbon constituents. The anti-

cipated contaminants and their exposure standards are listed in Table 1. It is not anticipated that the potential levels of exposure will reach the permissible exposure limits (PEL) or threshold limit values (TLV). Inhalation and dermal contact are the potential exposure pathways. Protective clothing will be mandatory for field personnel specified in this Plan. In addition, respiratory protective devices are required to be worn by each person on-site or to be within easy reach should irritating odors be detected or irritation of the respiratory tract occur.

TABLE 1
EXPOSURE LIMITS OF ANTICIPATED CHEMICAL CONTAMINANTS IN PARTS PER MILLION (ppm)

Contaminant	PEL	EL	ED	CL	TWA	STEL
Benzene* [skin] & [carc]	1	---	--------	---	10	5
Ethylbenzene	100	---	--------	---	100	125
Toluene [skin]	100	200	10 min per 8 hours	500	100	150
Xylene (o, m, & p isomers) [skin]	100	200	30 min per 8 hours	300	100	150

PEL - permissible exposure limit: 8 hours, time-weighted average, California Occupational Safety and Health Administration Standard (CAL-OSHA).

EL - excursion limit: maximum concentration of an airborne contaminant to which an employee may be exposed without regard to duration provided the 8 hours time-weighted average for PEL is not exceeded (CAL-OSHA).

ED - excursion duration: maximum time period permitted for an exposure above the excursion limit but not exceeding the ceiling limit (CAL-OSHA).

CL - Ceiling limit: maximum concentration of airborne contaminant which employees may be exposed permitted (CAL-OSHA).

TWA - time-weighted average: 8 hours, [same as threshold limit value (TLV)], American Conference of Governmental Industrial Hygienists (ACGIH).

STEL - short-term exposure limit: 15 minutes time-weighted average (ACGIH).

[carc] - substance identified as a suspected or confirmed carcinogen.

[skin] - substance may be absorbed into the bloodstream through the skin, mucous membranes or eyes.

* - Federal OSHA benzene limits given for PEL and STEL; STEL has a 50 minutes duration limit.

A brief description of the physical characteristics, incompatibilities, toxic effects, routes of entry and target organs has been summarized from the NIOSH Pocket Guide to Chemical Hazards for the contaminants anticipated to be encountered. This information is used in on-site safety meetings to alert personnel to the hazards associated with the expected contaminants.

BENZENE:

Benzene is a colorless, aromatic liquid. Benzene may create an explosion hazard. Benzene is incompatible with strong oxidizers, chlorine, and bromine with iron. Benzene is irritating to the eyes, nose and respiratory system. Prolonged exposure may result in giddiness, headache, nausea, staggering gait, fatigue, bone marrow depression or abdominal pain. Routes of entry include inhalation, absorption, ingestion and skin or eye contact. The target organs are blood, the central nervous system (CNS), skin, bone marrow, eyes and respiratory system. Benzene is carcinogenic.

ETHYLBENZENE:

Ethylbenzene is a colorless, aromatic liquid. Ethylbenzene may create an explosion hazard. Ethylbenzene is incompatible with strong oxidizers. Ethylbenzene is irritating to the eyes and mucous membranes. Prolonged exposure may result in headache, dermatitis, narcosis or coma. Routes of entry include inhalation, ingestion and skin or eye contact. The target organs are the eyes, upper respiratory system, skin and the CNS.

TOLUENE:

Toluene is a colorless, aromatic liquid. Toluene may create an explosion hazard. Toluene is incompatible with strong oxidizers. Prolonged exposure may result in fatigue, confusion, euphoria, dizziness, headache, dilation of pupils, lacrimation,

insomnia, dermatitis or photophobia. Routes of entry are inhalation, absorption, ingestion and skin or eye contact. The target organs are the CNS, liver, kidneys and skin.

XYLENE ISOMERS:

Xylene is a colorless, aromatic liquid. Xylene may create an explosion hazard. Xylene is incompatible with strong oxidizers. Xylene is irritating to the eyes, nose and throat. Prolonged exposure may result in dizziness, excitement, drowsiness, staggering gait, corneal vacuolization, vomiting, abdominal pain or dermatitis. Routes of entry are inhalation, absorption, ingestion and skin or eye contact. The target organs are the CNS, eyes, gastrointestinal tract, blood, liver, kidneys and skin.

GENERAL PROJECT SAFETY RESPONSIBILITIES:

Key personnel directly involved in the investigation will be responsible for monitoring the implementation of safe work practices and the provisions of this plan are (1) the drilling project supervisor and (2) Soil Tech Engineering, Inc. (STE) project field engineer. These personnel are responsible for knowing the provisions of the plan, communicating plan requirements to workers under their supervision and regulatory agencies inspectors and for enforcing the plan.

The personnel-protective equipment will be selected to prevent field personnel from exposure to fuel hydrocarbons that may be present at the site. To prevent direct skin contact, the following protective clothing will be worn as appropriate while working at the site:

1. Tyvek coveralls.
2. Butyl rubber or disposable vinyl gloves.
3. Hard hat with optional face shield.
4. Steel toe boots.
5. Goggles or safety glasses.

The type of gloves used will be determined by the type of work being performed. Drilling personnel will be required to wear butyl rubber gloves because they may have long duration contact with the subsurface materials. STE sampling staff will wear disposable gloves when handling any sample. These gloves will be charged between each sample.

Personnel protective equipment shall be put on before entering the immediate work area. The sleeves of the overalls shall be outside of the cuffs of the gloves to facilitate removal of clothing with the least potential contamination of personnel. If at any time protective clothing (coveralls, boots or gloves) become torn, wet or excessively soiled, it will be replaced immediately.

Total organic vapors will be monitored at the site with a portable PID. Should the total organic vapor content approach that of the threshold limit value (TLV) for any of the substances listed in Table 1, appropriate safety measures will be implemented under the supervision of the site project engineer. These precautions include, but are not limited to, the following: (1) Donning of respirators (with appropriate cartridges) by site personnel, (2) forced ventilation of the site, (3) shutdown of work until such time as appropriate safety measures sufficient to insure the health and safety of site personnel can be implemented.

No eating, drinking or smoking will be allowed in the vicinity of the drilling operations. STE will designate a separate area on site for eating and drinking. Smoking will not allowed at the vicinity of the site except in designated areas. No contact lenses will be worn by field personnel.

WORK ZONES AND SECURITY MEASURES:

The Project Engineer will call Underground Service Alert (USA) and the utilities will be marked before any drilling is conducted on-site, and the borings will be drilled at safe distances from the utilities. The client will also be advised to have a representative on-site to advise us in selecting locations of borings with respect to utilities or underground structures. Soil Tech Engineering, Inc. assumes no responsibility to utilities not so located. The first 5 feet will be hand augered before any drilling equipment is operated.

Each of the areas where the borings will be drilled will be designated as Exclusion Zones. Only essential personnel will be allowed into an Exclusion Zone. When it is practical and local topography allows, approximately 25 to 75 feet of space surrounding those Exclusion Zones will be designated as Contamination Reduction Zones.

Cones, wooden barricades or a suitable alternative will be used to deny public access to these Contamination Reduction Zones. The general public will not be allowed close to the work area under any conditions. If for any reason the safety of a member of the public (e.g. motorist or pedestrian) may be endangered, work will cease until the situation is remedied. Cones and warning signs will be used when necessary to redirect motorists or pedestrians.

LOCATION AND PHONE NUMBERS OF EMERGENCY FACILITIES:

For emergency reasons, the closest facilities addresses and phone numbers are listed below:

City of Oakland Fire Department 911

Highland General Hospital (510) 534-8055
1411 East 31st Street, Oakland, CA

ADDITIONAL CONTINGENCY TELEPHONE NUMBERS:

Poison Control Center . . . . . (800) 523-2222

Soil Tech Engineering Administrative Office . . . . (408) 441-1881

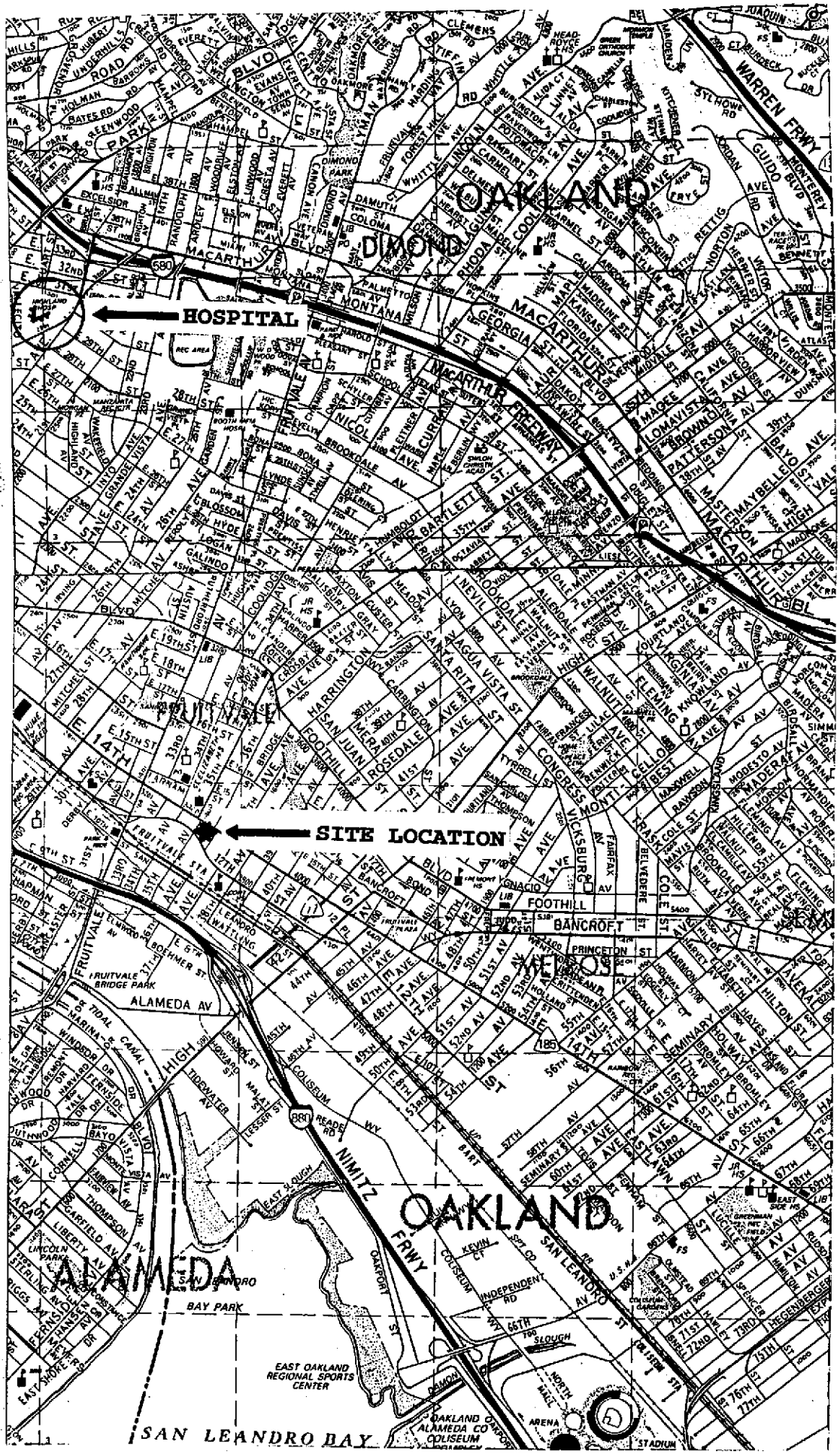
CHEMTREC . . . . . (800) 424-9300

NOTE: Only call CHEMTREC stands for Chemical Transportation Emergency Center, a public service of the Chemical Manufacturer's Association. CHEMTREC can usually provide hazard information, warnings and guidance when given the identification number or the name of the product and the nature of the problem. CHEMTREC can also contact the appropriate experts.

This Site Safety Plan has been reviewed by the project engineer, STE field personnel and all subcontractors.

Amendments or modifications to this Plan may be written on a separate page and attached to this Plan. Any amendments or modifications must be reviewed and approved by the personnel name above.

File No. 7-92-514-SA



DIRECTION TO THE HOSPITAL: Take north 23rd Avenue from East 14th Street. Turn west (left) at 31st Street. The Highland Hospital is located at the corner of 31st Street and 14th Avenue.

File No. 7-92-514-SA

A P P E N D I X "E"

SOIL TECH ENGINEERING, INC.