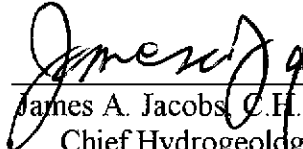


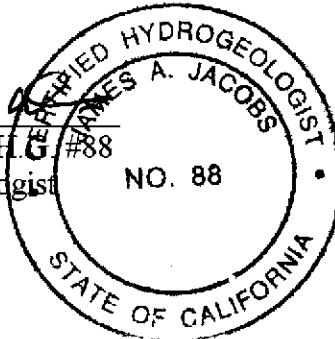
SITE CLOSURE REPORT

23rd Avenue Partners
1125 Miller Ave.
Oakland, California

Prepared for:
Mr. Al Pelton
Dreisbach Enterprises
P.O. Box 7509
Oakland, CA 94601

October 3, 2002


James A. Jacobs, C.H.G. #88
Chief Hydrogeologist



The seal is circular with the text "REGISTERED HYDROGEOLOGIST" around the top inner edge and "STATE OF CALIFORNIA" around the bottom inner edge. In the center, it reads "JAMES A. JACOBS" and "NO. 88".

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- Appendix A Figures and Tables from Subsurface Investigation (EBS, 2001)
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1.0 INTRODUCTION

Environmental Bio-Systems, Inc. (EBS) is pleased to present this Site Closure Report for 1125 Miller Avenue in Oakland, California. The Site Closure Report is based on agreed upon activities described in the EBS workplan, submitted in March 21, 2002. The workplan was approved and amended by Ms. Eva Chu of the Alameda County Environmental Health Services in April 15, 2002.

SITE LOCATION & DESCRIPTION

The Site contains a single two-story building currently housing apartments and studio space. It is located at 1125 Miller Avenue, in the City of Oakland, County of Alameda, and California. The United States Geological Survey Oakland East Quadrangle Map shows the site to be located in Section six, Township two south, Range three west of the Mount Diablo Base and Meridian (U.S.G.S., 1980). Site Location Map and Site Map, Figures 1 and 2, respectively, are included in Appendix A.

Miller Avenue bounds the Site from the southwest to north. Another apartment building lies across Miller Place to the northeast. A fenced parking and storage lot abuts the southeast end of the building. A set of railroad tracks lies behind a chain-link fence to the northeast of the Subject Property.

1.1 Proposed Scope of Work

To evaluate the potential for contaminant migration on the site, the following activities were to be performed.

- Determine depth to storm drain, sanitary sewers, and water lines in the streets.
- Determine depth and lateral distance to any underground creeks.
- Develop a site plan.
- Develop proof to document that migration of contaminants will not travel by way of preferential pathways.
- Prepare a risk management plan to protect residents and construction workers in the event that excavation, is performed in area with residual soil contamination in vadose zone (mostly under former dispenser, and some by UST at 9 feet bgs)

1.2 Site History

In order to evaluate subsurface structures or conduits, a review related to the historical development of the Subject Property and the adjacent properties was conducted. Data sources included historic maps and historic aerial photographs.

Primary sources of information:

<u>Contact</u>	<u>Title/Office</u>	<u>Document</u>	<u>Phone</u>
Rob Colantuono	EDR Information	Env't'l. Data/Photos	800-352-0050

Sources of regulatory information:

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<u>Agency</u>	<u>Method</u>	<u>Phone</u>
RWQCB; Region 2; Oakland, CA	File Review	510-622-2300
Alameda County Environmental Health Dept.	File Review	510-567-6700

1.3 Environmental Inspection

An inspection of the property and all exterior improvements was conducted on May 29, 2002 and June 12, 2002 by James A. Jacobs, a California Registered Environmental Assessor (REA #1511), and Certified Hydrogeologist (CHG #88). Photographs were taken and are attached in Appendix B. The property at 1125 Miller Avenue in Oakland is currently used for apartments and studios.

A reconnaissance of properties within a one-quarter mile property radius was conducted to visually identify nearby sites that might have regulatory information and files. The area contains mixed residential and commercial units along Miller Avenue, East 23rd Avenue, and East 11th Street.

1.4 Records Search

EBS environmental specialists used regulatory agency published lists from Environmental Data Resources (EDR) of sites within a 3/4 mile-radius around the Subject Property.

1.5 Sensitive Receptor Survey

EBS mapped out the preferential pathways in the field. Additional information was based on interviews, as well as historic maps and photos. Additional information was obtained from the City of Oakland Public Works Department (PWD). EBS reviewed maps and records regarding preferential pathways at the PWD.

EBS estimated groundwater flow direction and a current well survey. EBS reviewed Regional Water Quality Control Board (RWQCB) files for nearby sites having groundwater monitoring wells and flow direction data. EBS prepared sensitive receptor information based on the findings.

1.6 Closure Report

As part of the Closure Report, EBS prepared a report with several sections, including, a Sensitive Receptor Survey, a Risk Assessment and a Risk Management Plan (RMP) for the Subject Property.

2.0 PROPERTY DESCRIPTION

2.1 Property Setting and Surrounding Uses

The purpose of the Subject Property inspections on May 29 and June 12, 2002 were to evaluate potential subsurface structures that might allow migration of residual contamination on the property. All descriptions and observations reflect conditions on the property and surrounding properties on those days. A magnetic-induction tool was used to trace subsurface pipes and conduits in the sidewalk along Miller Avenue and Miller Place on June 12, 2002.

2.2 Topography, Geology and Hydrology

Topography

Based on the USGS East Oakland 7.5 minute topographic quadrangle map (1949), the local topography is relatively flat, with a slight topographic gradient of approximately one percent to the southwest toward the Alameda Tidal Canal. The elevation of the Subject Property is approximately 18 feet above mean sea level.

Regional Geology

The Site is located Within the Coast Ranges Province of California. This province is bounded on the north by the Oregon State line, on the east by the South Fork Mountain and Coast Range trusts bordering the Klamath Mountains and Great Valley Provinces, on the south by the Santa Ynez Fault and Transverse Ranges Province, and on the west by the continental borderland. San Francisco Bay fills a late Pliocene structural depression that divides the regionally southeast-northwest trending Coast Ranges province into northern and southern portions. Extensive folding and faulting during the late Pliocene to mid-Pleistocene Epochs created northwest trending ranges within this province. The deeper Jurassic Franciscan Formation meta-sediments, found east of the San Andreas Fault, consists of fractured greywacke, serpentine, shales, cherts, limestones and conglomerates making up the core of the California Coast Range. The Franciscan represents a subduction zone complex. The area in which the Site is located has been geologically mapped as Quaternary (Holocene) estuarine deposits (Bay Mud, Qhbm). The Hayward Fault Zone is mapped approximately 3.5 miles east of the Site. The faults and soil characterizations of the area were reviewed on the Geological Map of California prepared by the California Geological Survey, (Jennings, 1969).

Site Geology

Soils encountered during EBS drilling of October, 2000 (EBS, 2001) typically included medium-grained dense sand to approximately two feet below ground surface (bgs), at which depth medium-stiff silty clay was encountered. The clay become very stiff at approximately four feet bgs, continuing to approximately 16 feet bgs, at which depth clayey silty sand was encountered to the total drilled depth (22 feet bgs). Groundwater was first encountered at between 16.5 and 17 feet bgs. Groundwater flow direction on the Subject Property is estimated to be flowing to the south and west toward the

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Alameda Tidal Canal and ultimately into San Francisco Bay. The Alameda Tidal Canal, located between the Oakland Harbor and the San Leandro Bay, is a little more than ¼ mile south and southwest of the Subject Property.

3.0 SITE HISTORY

3.1 Previous Environmental Work

December 1998

EBS excavated and removed two 5,000-gallon diesel USTs and associated product piping from the site. Two soil samples were collected near the ends of each tank (a total of four samples) from approximately nine feet below ground surface (bgs). All four soil samples were subsequently analyzed for total petroleum hydrocarbons calculated as diesel (TPHd), benzene, toluene, ethylbenzene and total xylenes (BTEX), and methyl tertiary butyl ether (MtBE). Sample locations adjacent to the ends of Tank A were both taken from the south pit wall due to access limitations. Of the two samples taken from the ends of this tank, the east end sample was found to contain 1,800 milligrams per kilogram (mg/kg) TPHd and 0.051 mg/kg xylenes. The west end sample from this tank was not found to contain detectable concentrations of any of the chosen analytes. Samples collected from the soil adjacent to the ends of Tank B (north and west pit walls) were not found to contain any of the chosen analytes.

October 2000

In October 2000, EBS drilled four soil cores (designated TW1, TW2, TW3 and D1). Soil cores TW1 through TW3 were drilled in the concrete-paved area surrounding the former UST excavation. Core D1 was drilled adjacent to the former dispenser location. The dispenser had been housed within an enclosed room at the north end of the building. EBS collected four soil samples from the cores and installed pre-packed temporary well points in two of the cores (TW2 and TW3). The sampling was performed by FAST-TEK Engineering Support Services of Point Richmond, California (C-57 Lic. #624461) using a Geoprobe 5400 direct push rig. The borings TW2 and TW3 were drilled to a total depth of 22 feet bgs. Boring D1 was drilled to a total depth of 8 feet bgs, and core TW1 was abandoned at 3 feet bgs due to subsurface obstructions without soil or groundwater sampling. Groundwater was encountered between 16.5 feet and 17.0 feet below ground surface (bgs).

EBS submitted four soil samples and two groundwater samples to Analytical Sciences, Inc. of Petaluma, California, California State certified laboratory for the following analyses: Total petroleum hydrocarbons as diesel (TPHd) benzene, toluene, ethyl benzene and total xylenes (BTEX), methyl t-butyl ether (MTBE).

Analytical Results Soil sample TW2-16.5' was found to contain 4,200 mg/kg TPHd and 1.4 mg/kg benzene. Soil sample TW3-17' was found to contain 2,700 mg/kg TPHd. Soil samples D1-3' and D1-8' were found to contain 3,400 and 34 mg/kg TPHd, respectively. Groundwater sample TW2-H₂O was found to contain 660 µg/L TPHd, 65 µg/L benzene, 2.4 µg/L, toluene, and 3.2 µg/L total xylenes. Groundwater sample TW3-H₂O was found to contain 800 µg/L TPHd and 0.9 µg/L benzene. The results were presented in an EBS Subsurface Exploration Report dated December 31, 2001.

3.2 Aerial Photograph Review

A site usage review of the Subject Property was accomplished using historic aerial photographs in order to evaluate subsurface structures, such as buried streams, or other features that might contribute to subsurface migration of on-site contaminants. EBS interpreted the following photographs from 1939, 1946, 1959, 1965, 1982 and 1994. Copies of the historic aerial photographs were submitted to the client.

EDR; Flyer: Fairchild; 1939; Black & White, 1" = 555 ft. Photograph

The Subject Property has a variety of commercial buildings. Street orientation is significantly different than it is today. The rectangular block is bounded by Miller Avenue and 23rd Avenue in the northwest-southeast directions, respectively, and East 11th Street and Miller Place on the northeast and southwest directions, respectively. The nearby PG&E Substation is present, as is the Southern Pacific Railroad tracks. North of the area, currently called Miller Place is vacant.

EDR; Flyer: Jack Ammann; 1946; Black & White, 1" = 655 ft. Photograph

The Subject Property has a variety of commercial buildings. Street orientation is significantly different than it is today. The rectangular block is bounded by Miller Avenue and 23rd Avenue in the northwest-southeast directions, respectively, and East 11th Street and Miller Place on the northeast and southwest directions, respectively. The nearby PG&E Substation is present, as is the Southern Pacific Railroad tracks. The area north of the current Miller Place has a newly built triangular shaped building located on it. Based on the shadows, the building appears to be several stories high.

EDR; Flyer: Cartright; 1959; Black & White, 1" = 833 ft. Photograph

The Subject Property has a variety of commercial buildings. Street orientation is significantly different than it is today. The rectangular block is bounded by Miller Avenue and 23rd Avenue in the northwest-southeast directions, respectively, and East 11th Street and Miller Place on the northeast and southwest directions, respectively. The nearby PG&E Substation is present, as is the Southern Pacific Railroad tracks. The area north of the current Miller Place has a building with a distinctive triangular shaped roof, and an adjacent lower story four-sided roofline was added.

EDR; Flyer: Cartright; 1965; Black & White, 1" = 666 ft. Photograph

The Subject Property has had all the commercial buildings removed and the lot is vacant. The rectangular block which was once bounded by Miller Avenue and 23rd Avenue in the northwest-southeast directions, respectively, and East 11th Street and Miller Place on the northeast and southwest directions, respectively has been changed significantly by 1965. The streets have their current orientations. A few vehicles or truck trailers appear to be parked on the Subject Property, which appears to be a dirt lot. Across the street from the Subject Property, the lot appears to be a dirt lot. The nearby PG&E Substation is present, as is the Southern Pacific Railroad tracks. The

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area north of the current Miller Place has the buildings listed above.

EDR; Flyer: Western State Aerial; 1982; Color Infrared, 1" = 690 ft. Photograph

The Subject Property has the current building on it, having an irregular shaped footprint. The area across the street appears to have trees and grass. The nearby PG&E Substation is present, as is the Southern Pacific Railroad tracks. The area north of the current Miller Place has the existing buildings, as described above.

EDR; Flyer: USGS; 1994; Black & White, 1" = 666 ft. Photograph

The Subject Property has the current building on it, having an irregular shaped footprint. The area across the street appears to have trees and grass. The nearby PG&E Substation is present, as is the Southern Pacific Railroad tracks. The area north of the current Miller Place has the existing buildings, as described above.

3.3 Historic Maps

EBS reviewed six historic United States Geological Survey (USGS) topographic maps from 1897 to 1980. Twelve Sanborn Fire Insurance Maps covering the Subject Property and surrounding areas were researched by EBS for the years from 1903 to 1969 from the Environmental Risk Information and Imagery Service (ERIIS) collection.

USGS Concord Quadrangle Map; East Bay Area, California 15 Minute Series, 1897; 1:62,500

The Subject Property is vacant on the 1897 map. Adjacent buildings are not shown on the topographic map. East 14th Street is on the map. 10th, 11th, 12th Streets, Livermore Street and 23rd Avenue appear on this early map. Buildings are sparse. The nearest stream is the Diamond Creek which is about ½ mile southeast of the Subject Property. The Diamond Creek empties into San Leandro Bay. Topography is relatively flat. Alameda in 1897 was a peninsula, with Oakland Harbor on the west and San Leandro Bay on the east. The train tracks adjacent the Subject Property are shown on the map as the "Livermore Line". No surface waterways or drainage channels were noted on the map in a ¼ mile radius of the area of the Subject Property.

USGS Oakland East Quadrangle Map; Oakland, California 7.5 Minute Series, 1949; 1:24,000

Most of the two lane streets in the area of the Subject Property are shown on this topographic map. The main streets in the area of the Subject Property are East 12th and East 14th Streets, as well as 29th Street, which run from East 12th Street southwest into what is now, Alameda Island. Alameda Island was created with the Alameda Tidal Canal, connecting Brooklyn Basin in Oakland Harbor with San Leandro Bay. The train tracks adjacent the Subject Property are shown on the map as the Southern Pacific Railroad. No surface waterways or drainage channels were noted on the map in a ¼

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mile radius of the area of the Subject Property.

USGS Oakland East Quadrangle Map; Oakland, California 7.5 Minute Series, 1959; 1:24,000

Highway 17, also called the Nimitz Freeway is seen south of the Subject Property. Most of the two lane streets in the area of the Subject Property are shown on this topographic map. The main streets in the area of the Subject Property are East 12th and East 14th Streets, as well as 29th Street, which run from East 12th Street southwest into Alameda Island. No surface waterways or drainage channels were noted on the map in a ¼ mile radius of the area of the Subject Property.

USGS Oakland East Quadrangle Map; Oakland, California 7.5 Minute Series, 1968; 1:24,000

This topographic map has been photorevised based on the 1959 topographic map. Highway 17, also called the Nimitz Freeway is seen south of the Subject Property. Most of the two lane streets in the area of the Subject Property are shown on this topographic map. The main streets in the area of the Subject Property are East 12th and East 14th Streets, as well as 29th Street, which run from East 12th Street southwest into Alameda Island. No surface waterways or drainage channels were noted on the map in a ¼ mile radius of the area of the Subject Property.

USGS Oakland East Quadrangle Map; Oakland, California 7.5 Minute Series, 1973; 1:24,000

This topographic map has been photorevised based on the 1959 topographic map. Highway 17, also called the Nimitz Freeway is south of the Subject Property. Most of the two lane streets in the area of the Subject Property are shown on this topographic map. The main streets in the area of the Subject Property are East 12th and East 14th Streets, as well as 29th Street, which run from East 12th Street southwest into Alameda Island. No surface waterways or drainage channels were noted on the map in a ¼ mile radius of the area of the Subject Property.

USGS Oakland East Quadrangle Map; Oakland, California 7.5 Minute Series, 1980; 1:24,000

This topographic map has been photorevised based on the 1959 topographic map. Highway 17, also called the Nimitz Freeway is south of the Subject Property. A significant number of new industrial and commercial buildings are shown southwest of 23rd Avenue and southwest of the Nimitz Freeway near the Subject Property. The main streets in the area of the Subject Property are still East 12th and East 14th Streets, as well as 29th Street, which run from East 12th Street southwest into Alameda Island. No surface waterways or drainage channels were noted on the map in a ¼ mile radius of the area of the Subject Property.

3.4 Detailed Insurance Maps

The Sanborn Fire Insurance Maps were reviewed by EBS and copies were submitted to the client.

Sanborn Library LLC, 1903; 1 inch = 170 ft.

The earliest historical insurance map examined is the 1903 map. The Subject Property has been subdivided, but no structures exist on the property. The current East 23rd Avenue was called Park Avenue, which is 80 feet wide. The current Miller Ave. and Miller Place were noted to be the northern extension of 24th Avenue, and unnamed street, respectively. Some residences are located to the west of the Subject Property. No surface waterways, surface drainage channels or buried contained streams are noted in the area of the Subject Property. The only pipe near the Subject Property is the 4-inch diameter water pipe trending north-south along the center of Park Avenue. The Southern Pacific Railroad tracks are present to the northeast of the Subject Property.

Sanborn Library LLC, 1911; 1 inch = 170 ft.

By 1911, the Subject Property has been subdivided, but no structures exist on the property. The current East 23rd Avenue was called Park Avenue. The current Miller Ave. and Miller Place were noted to be the northern extension of 24th Avenue, and Livingston Street, respectively. More residences exist in the neighborhood. The Pacific Gas & Electric substation on 24th Avenue appears on the 1911 map. No surface waterways, surface drainage channels or buried contained streams are noted in the area of the Subject Property. The only pipes near the Subject Property are the 6 and 12-inch diameter water pipe trending north-south along the center of Park Avenue, the 2-inch diameter water pipes in the center of the East 11th Street and 24th Avenue. The Southern Pacific Railroad tracks are present to the northeast of the Subject Property

Sanborn Library LLC, 1950; 1 inch = 170 ft.

By 1950, the current East 23rd Avenue is shown with associated freeway ramps for the adjacent freeway. More residences exist in the neighborhood. The Pacific Gas & Electric substation on 24th Avenue appears on the 1950 map. Park Avenue is now called 23rd Avenue. The current street Miller Place, lists as 30 feet wide. The current Miller Avenue, known in 1950 as "Miller (24th Av.)", is 60 feet wide.

The rectangular block containing the Subject Property has two residences on it, as well as a lumber storage building south of Miller Place. Also on the block were an auto repair shop, restaurant, lodging, and soda bottling plant. North of Miller Place is a lumber planing mill and a Montgomery Ward Co. facility with a concrete floor. No surface waterways, surface drainage channels or buried contained streams are noted in the area of the Subject Property. The only pipes near the Subject Property are the 6 and 12-inch diameter water pipe trending north-south along the center of 23rd Avenue, the

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12-inch diameter water pipes along East 11th Street from 23rd Avenue and the 2-inch diameter water pipe on Miller Avenue (24th Avenue). The Southern Pacific Railroad tracks are present to the northeast of the Subject Property.

Sanborn Library LLC, 1952; 1 inch = 170 ft.

The current East 23rd Avenue is shown with associated freeway ramps for the adjacent freeway. Most residential building has occurred, so few vacant lots exist in the neighborhood. The Pacific Gas & Electric substation on 24th Avenue appears on the 1952 map. The current street Miller Place, is 30 feet wide. The current Miller Avenue, known in 1950 as "Miller (24th Av.)", is 60 feet wide. The rectangular block containing the Subject Property has two residences on it, as well as a lumber storage building south of Miller Place. Also on the block were a former auto repair shop (empty), restaurant, lodging, and soda bottling plant. North of Miller Place is a lumber planing mill and a Montgomery Ward Co. facility with a concrete floor. No surface waterways, surface drainage channels or buried contained streams are noted in the area of the Subject Property. The only pipes near the Subject Property are the 6 and 12-inch diameter water pipe trending north-south along the center of 23rd Avenue, the 12-inch diameter water pipes along East 11th Street from 23rd Avenue and the 2-inch diameter water pipe on Miller Avenue (24th Avenue). The Southern Pacific Railroad tracks are present northeast of the Subject Property.

Sanborn Library LLC, 1953; 1 inch = 170 ft.

The current East 23rd Avenue is shown with associated freeway ramps for the adjacent freeway. The Pacific Gas & Electric substation on 24th Avenue appears on the 1953 map. The current street Miller Place, lists as 30 feet wide. The current Miller Avenue, known in 1950 as "Miller (24th Av.)", lists as 60 feet wide. The rectangular block containing the Subject Property has two residences on it, as well as a lumber storage building south of Miller Place. Also on the block were a food products manufacturing plant in the former auto repair shop, restaurant, and lodging. The soda bottling plant was replaced by a Venetian blind factory with a concrete floor. North of Miller Place is a lumber planing mill and a Montgomery Ward Co. facility with a concrete floor. No above groundwater ways are noted in the area of the Subject Property. The only pipes near the Subject Property are the 6 and 12-inch diameter water pipe trending north-south along the center of 23rd Avenue, the 12-inch diameter water pipes along East 11th Street from 23rd Avenue and the 2-inch diameter water pipe on Miller Avenue (24th Avenue). The Southern Pacific Railroad tracks are present northeast of the Subject Property.

Sanborn Library LLC, 1957; 1 inch = 170 ft.

The current East 23rd Avenue is shown with associated freeway ramps for the adjacent freeway. The Pacific Gas & Electric substation on 24th Avenue appears on the 1957 map. The current street Miller Place, is 30 feet wide. The current Miller Avenue, known in 1950 as "Miller (24th Av.)", is 60 feet wide. The Subject Property has two

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residences on it, as well as a commercial storage building south of Miller Place. Also on the block were machine shop (replacing the former food products manufacturing plant), restaurant, Venetian blind factory and lodging house. North of Miller Place is a truck storage business in the former lumber planing mill and a steel cabinet shop in the space formerly used by Montgomery Ward Co. No surface waterways, surface drainage channels or buried contained streams are noted in the area of the Subject Property. The only pipes near the Subject Property are the 6 and 12-inch diameter water pipe trending north-south along the center of 23rd Avenue, the 12-inch diameter water pipes along East 11th Street from 23rd Avenue and the 2-inch diameter water pipe on Miller Avenue (24th Avenue). The Southern Pacific Railroad tracks are present northeast of the Subject Property.

Sanborn Library LLC, 1959; 1 inch = 170 ft.

The current East 23rd Avenue is shown with associated freeway ramps for the adjacent freeway. The Pacific Gas & Electric substation on 24th Avenue appears on the 1959 map. The current street Miller Place, is 30 feet wide. The current Miller Avenue, known in 1950 as "Miller (24th Av.)", is 60 feet wide. The Subject Property a commercial storage building south of Miller Place. The building appears to be used for old machinery storage and firewood storage (with wood posts and concrete floor). The two residences have been removed. Also on the block were machine shop (replacing the former food products manufacturing plant), restaurant, Venetian blind factory and lodging house. North of Miller Place is a truck storage business in the former lumber planing mill and a steel cabinet shop in the space formerly used by Montgomery Ward Co. No surface waterways, surface drainage channels or buried contained streams are noted in the area of the Subject Property. The only pipes near the Subject Property are the 6 and 12-inch diameter water pipe trending north-south along the center of 23rd Avenue, the 12-inch diameter water pipes along East 11th Street from 23rd Avenue and the 2-inch diameter water pipe on Miller Avenue (24th Avenue). The Southern Pacific Railroad tracks are present northeast of the Subject Property.

Sanborn Library LLC, 1960; 1 inch = 170 ft.

The current East 23rd Avenue is shown with associated freeway ramps for the adjacent freeway. The Pacific Gas & Electric substation on 24th Avenue appears on the 1960 map. The current street Miller Place, is 30 feet wide. The current Miller Avenue, known in 1950 as "Miller (24th Av.)", is 60 feet wide. A rectangular block contains the Subject Property. The block contains a commercial storage building south of Miller Place. The building appears to be used for old machinery storage and woodworking (with wood posts and concrete floor). A steel and reinforced concrete building was located where the two residences had been removed earlier. Also on the block were machine shop (replacing the former food products manufacturing plant), restaurant, Venetian blind factory and lodging house. North of Miller Place is a truck storage business in the former lumber planing mill and a steel cabinet shop in the space formerly used by Montgomery Ward Co. No surface waterways, surface drainage channels or buried contained streams are noted in the area of the Subject Property. The

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Sanborn Library LLC, 1964; 1 inch = 170 ft.

Major changes occurred between 1960 and 1964. The entire rectangular block bounded by Miller Place and East 11th Street and Miller Avenue and 23rd Avenue, was replanned and all structures were removed. A continuation of East 11th Street, called East 11th Street Place bisects the property. The new road, East 11th Street Place is 35 feet wide. The current East 23rd Avenue is shown with associated freeway ramps for the adjacent freeway. The Pacific Gas & Electric substation on 24th Avenue appears on the 1964 map. The current street Miller Place is 30 feet wide. The current Miller Avenue is 30 feet wide. North of Miller Place is a rug factory in the former truck storage business and a steel cabinet shop. No surface waterways, surface drainage channels or buried contained streams are noted in the area of the Subject Property. The only pipes near the Subject Property are the 6 and 12-inch diameter water pipe trending north-south along the center of 23rd Avenue, the 12-inch diameter water pipes along East 11th Street from 23rd Avenue and the former 2-inch diameter water pipe on Miller Avenue (24th Avenue) was upgraded into a 6-inch diameter water line. The Southern Pacific Railroad tracks are present northeast of the Subject Property.

Sanborn Library LLC, 1965; 1 inch = 170 ft.

As noted, major changes occurred between 1960 and 1964. The current East 23rd Avenue is shown with associated freeway ramps for the adjacent freeway. The western portion of the 23rd Avenue has become a raised freeway overpass. The lower eastern portion of 23rd Avenue is now walled off and is called Calcot Place (East 11th St. Place). The entire rectangular block bounded by Miller Place and East 11th Street and Miller Avenue and 23rd Avenue, was redesigned and all structures were removed. A continuation of East 11th Street, called East 11th Street Place bisects the property. The new road, East 11th Street Place is 35 feet wide. The current East 23rd Avenue is shown with associated freeway ramps for the adjacent freeway. The Pacific Gas & Electric substation on 24th Avenue appears on the 1965 map. The current street Miller Place, is 30 feet wide. The current Miller Avenue, lists as 30 feet wide. North of Miller Place is a rug factory in the former truck storage business and a steel cabinet shop. No surface waterways, surface drainage channels or buried contained streams are noted in the area of the Subject Property. The only pipes near the Subject Property are the 6 and 12-inch diameter water pipe trending north-south along the center of 23rd Avenue, the 12-inch diameter water pipes along East 11th Street from 23rd Avenue and the former 2-inch diameter water pipe on Miller Avenue (24th Avenue) was upgraded into a 6-inch diameter water line. The Southern Pacific Railroad tracks are present northeast of the Subject Property.

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Sanborn Library LLC, 1967; 1 inch = 170 ft.

The current East 23rd Avenue is shown with associated freeway ramps for the adjacent freeway. The western portion of the 23rd Avenue has become a raised freeway overpass. The lower eastern portion of 23rd Avenue is now walled off and is called Calcot Place (East 11th St. Place). The Pacific Gas & Electric substation on 24th Avenue appears on the 1967 map. The current street Miller Place, is 30 feet wide. The Subject Property has a new (and the current building) shown on the 1967 map. The map shows a unequal, 5-sided building used for printing.. The building has a concrete floor. The street in front of the building is called "East 11th Street Place (Calcot Pl.)". The current Miller Avenue, lists as 30 feet wide. North of Miller Place is nail storage in the former rug factory and a steel cabinet shop. No surface waterways, surface drainage channels or buried contained streams are noted in the area of the Subject Property. The only pipes near the Subject Property are the 6 and 12-inch diameter water supply pipe trending north-south along the center of 23rd Avenue, the 12-inch diameter water pipes along East 11th Street from 23rd Avenue and the former 2-inch diameter water pipe on Miller Avenue (24th Avenue) was upgraded into a 6-inch diameter water line. The Southern Pacific Railroad tracks are present northeast of the Subject Property.

Sanborn Library LLC, 1969; 1 inch = 170 ft.

The current East 23rd Avenue is shown with associated freeway ramps for the adjacent freeway. The western portion of the 23rd Avenue has become a raised freeway overpass. The lower eastern portion of 23rd Avenue is now walled off and is called Calcot Place (East 11th St. Place). The Pacific Gas & Electric substation on 24th Avenue appears on the 1967 map. The current street Miller Place, is 30 feet wide. The Subject Property has a new (and the current building) shown on the 1967 map. The map shows a unequal, 5-sided building used for printing.. The building has a concrete floor. The street in front of the building is called "Calcot Place (East 11th St. Pl.)". The current Miller Avenue, lists as 30 feet wide. North of Miller Place is nail storage in the former rug factory and a steel cabinet shop. No surface waterways, surface drainage channels or buried contained streams are noted in the area of the Subject Property. The only pipes near the Subject Property are the 6 and 12-inch diameter water pipe trending north-south along the center of 23rd Avenue, the 12-inch diameter water pipes along East 11th Street from 23rd Avenue and the former 2-inch diameter water pipe on Miller Avenue (24th Avenue) was upgraded into a 6-inch diameter water line. The Southern Pacific Railroad tracks are present northeast of the Subject Property.

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3.4 Public Works Maps

EBS reviewed public works sewer maps from the City of Oakland to determine the locations of utility pipes and subsurface obstacles. The pipe depths and pipe diameter are estimated based on the City of Oakland Public Works Department maps, site inspection and EDR historic maps.

SEWER LINES

There is an **abandoned 12-inch diameter sewer line in 23rd Avenue**. There is **now a 15-inch diameter sewer line on 23rd Avenue**. There are three manholes near the Subject Property, two at the intersection of Miller Place and 23rd Avenue and one at the intersection of Miller Avenue and Miller Place at the northwest corner of the Subject Property. Those lines appear to be 12-inch diameter sewer lines. The sewer lines are likely to be constructed of vitrified clay pipe (vcp). The sewer lines appear to be at 8 to 10 feet below ground surface near the Subject Property. Sewer drain lines appear to run along Miller Place, but connect to the main sewer lines on East 23rd Avenue.

STORM DRAINS

A storm water inlet grate is located **approximately ten feet from the corner of Miller Place and Miller Avenue**. The **storm drain** is estimated to be up to **8-inches in diameter** and appears to run along 23rd Avenue to the grate inlet in the northwest corner of the Subject Property. The storm drain then runs east along Miller Place to the storm drain inlet grate on the east side of the property, then south to connect with the storm drains from East 11th Street. **Storm drains appear to be about 3 to 5 feet below ground surface** at the Subject Property. Storm drain lines appear to run along Miller Place to the west-central portion of Miller Avenue where the storm drains connect with the storm drain lines on East 11th Avenue.

WATER LINES

There is a 6-inch diameter steel water supply line in the center of Miller Avenue, with connection to the white fire hydrant south of Miller Place. The hydrant exists within a few feet of the storm drain system at the northwest corner of the Subject Property. The hydrant is connected by 6-inch diameter water supply line into the 12-inch diameter water line on 23rd Avenue. **Water lines are estimated to be about 5 to 8 feet below ground surface**. The 12-inch diameter water supply line runs north on East 11th Street and makes the turn as a 12-inch diameter pipe toward the northwest toward 23rd Avenue. Where the turn in the 12-inch diameter pipe occurs, a 6-inch diameter water supply line runs to the northeast along Miller Avenue, supplying the Subject Property at 1125 Miller Avenue.

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4.0 RISK-BASED ANALYSIS AND SENSITIVE RECEPTOR SURVEY

EBS performed a risk base analysis and sensitive receptor survey.

4.1 Sensitive Receptor Survey

The area surrounding the Subject Property is used for residential units, commercial and industrial purposes. Contact with the impacted groundwater (greater than 16 feet below ground surface) or the diesel impacted soil (2 to 3 feet below ground surface) is unlikely during normal business or residential uses of the Subject Property. The contaminants are sealed beneath the concrete pavement.

As requested as part of the site closure process, EBS conducted an evaluation of subsurface conduits, nearby groundwater flow direction and gradient, a survey of nearby groundwater wells, and rudimentary consideration of the potential for sensitive receptor contact with compounds of concern.

4.2 Subsurface Conduit Survey

Subsurface conduits at the Site include relatively shallow utility trenches (i.e. gas, water and sewer). The nearest observed trench supplies a fire hydrant located approximately 12 feet northwest of TW3. According to the EBS utility survey, the supply line for this hydrant approaches from the northwest (the supply line does not extend beneath the Subject Property). Gas and sewer lines were not observed in proximity to the former UST excavation area.

On May 29, June 12 and July 20, 2002, James A. Jacobs, using a CST Magna Trak 102 locator, conducted a magnetic and induction survey to better evaluate subsurface utilities and conduits that might allow for subsurface contamination to migrate in the subsurface. Based on the magnetic and induction tool responses, the work confirmed the pipes as shown on the maps as obtained on July 19, 2002 at the Oakland Public Works Department.

4.3 Groundwater Flow Direction and Gradient

According to an Earth Systems Environmental, Inc. letter report dated 26 July 1993, groundwater flow direction at a nearby site (527 23rd Avenue) is to the north. Figure 2 of that report shows the gradient to be approximately 0.01 feet per feet.

EBS obtained an Environmental Data Resources (EDR) database listing all environmental sites from more than twenty regulatory lists within ½ mile radius of the Subject Property. The EDR report was reviewed by EBS and copies were submitted to the client. The EDR database was used to create a list of nearby sites. Based on the EDR Physical Setting Source Map - 770535.3 shows various groundwater flow directions for various sites near the Subject Property. There were no sites with groundwater data within ½ mile of the Subject Property on the EDR map. Note: sites

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within ¼ mile of Oakland Harbor to San Leandro Bay are likely to be influenced by tidal action.

This EDR list of environmental sites was the basis of the file search at the Regional Water Quality Control Board, Region 2, Oakland, California. Files from dozens of sites were examined. The nearest sites, listed below, had groundwater information. Distance is listed in miles. A rose diagram showing Sites # 2-5 (refer to table below) was plotted by EBS and is included in Appendix C. The groundwater flow directions correspond with the general area flow as determined by EDR on their Physical Setting Source Map and Geocheck Physical Setting Source Map Findings File, included in Appendix C.

SITE #	NAME DATE	ADDRESS (Sub. Prop)	DISTANCE OF FLOW	DIRECTION MEAS.
1	Sub. Prop.	1125 Miller Ave.	0	Not available
2	Shell Station 6/25/95	2142 E. 12 th St.	¼ to ½ NNW	S45°W to S22.5°W
3	Oil Changers 8/9/95	3132 E. 12 th St.	¼ to ½ ESE	S22.5°W to Due S.
4	Texaco-Exxon 1/10/01	2200 E. 12 th St.	¼ to ½ NW	Due West ^{*1}
5	J.W. Silveira ^{*2} 5/00	1200 20 th Ave.	¼ to ½ NW	N22.5°E to N45°E ^{*3}

Notes: ^{*1} From first quarter 1998 to first quarter 2001 (13 data points), dominant groundwater gradient direction is between S67.5°W and N67.5°W. Gradient = 0.018.

^{*2} Also known as the William Wurzbach Company property.

^{*3} Average of 4 readings: 2/00; 5/00; 9/00 and 12/00. The readings were consistent and within a few degrees of each other.

Groundwater gradients in the region are generally low, if not flat, therefore variations in flow direction are common. In this area, tidal influences might also be present, especially at Site # 5 where the distance to the Oakland Harbor is less than ¼ mile to the southwest. Based on the three of the four sites (#2, 3 and 4) listed above, the flow averages toward the south to west, toward Oakland Harbor of the San Francisco Bay and the tidal harbor between Oakland and Alameda. Site #5 shows a different flow direction, and is interpreted to be less representative of the Subject Property. Local variations might be present.

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Based on the above information, EBS interprets the shallow groundwater in the vicinity of the Subject Property to move generally toward the south and west. Deviations might occur based on the raised freeway ramp to the west, which probably has deep concrete footings. These footings might obstruct the natural shallow groundwater flow to the south-west.

4.4 Well Survey

EBS requested a well survey from the Alameda County Public Works Agency showing groundwater wells within a 1/2-mile radius of the Site. The nearest down-gradient well is located approximately 300 feet to the south-southeast of the Subject Property. According to the survey, this well was drilled to a total depth of 345 feet bgs on an unspecified date. The survey also states this well has been abandoned. No other wells are shown in proximity to the site. Well survey maps are included in Appendix C.

EBS contracted with Environmental Data Resources for a database report with reported water wells, and public water supply wells posted on the map. No wells were found on the Federal USGS Well Information Database, the Federal FRDS Public Water Supply System Information Database or the State Database Well Information System within 1,000 feet of the Subject Property.

4.5 Migration Pathways to Sensitive Receptors

The closest identified sensitive receptors are the occupants residing in the Site building. Additional receptors are located in the adjacent apartment building to the northeast of the Site. The compound of greatest concern is benzene, a known carcinogen with relatively high vapor pressure. Although this compound was not detected in high concentrations or at shallow depths in soil samples (none of the excavation samples and only one of the core samples), it has been found in both water samples collected during the recent phase of sampling. Asphalt and concrete pavement covering the surface of the Subject Property provides a potentially effective vapor barrier between the residual benzene concentration in groundwater and the closest receptors.

The effectiveness of this barrier in preventing vapor phase contaminants from migration into the adjacent buildings correlates to the integrity of the slabs underlying them. Inside the building, sealing the ground floor concrete surfaces with an impermeable concrete sealer and caulking all cracks will minimize any potential for upward migration of any contaminants and maintain the integrity of the pavement, which serves as a contamination cap.

Diesel is the primary constituent of concern on the Subject Property in both soil and groundwater. Diesel contains hundreds of compounds, most of which are semivolatile polynuclear aromatic hydrocarbons (PAHs) and long-chain alkanes. It is likely that a significant portion of the mass of contamination is adsorbed to the soils within the

dissolved phase because of the limited solubility of the PAHs and long-chain alkanes. A dissolved plume of hydrocarbons, and soil contamination has been present at the site for more than 10 years.

DIESEL CHARACTERISTICS

Vapor Pressure	Diesel and motor oil are very low.
Solubility in Water	Diesel is relatively insoluble in water.
Viscosity of Diesel	Approximately 18 times is viscous as water at 38° C.
Boiling Point	Approximately 3 times that of water (300° C +/-)
Melting Point	Diesel has a very low melting point

PAH CHARACTERISTICS

Molecular Weights	Range from 128 – 276
Melting Points	High (>80° C)
Vapor Pressures	Very Low at 20° C to 30° C
Solubility in Water	Relatively insoluble at 20° C to 30° C
Specific Gravity	Heavier than water (specific gravities of 1.025 to 1.25)
Kows	Greater than 1,000
Koc	Values are high, ranging from 14,000 to 5,500,000

The Henry's Law Constant (K_H), is the ratio of the partial pressure of a compound in air to the concentration of the compound in water at a given temperature. The components of diesel (PAHs and long-chain alkanes) have low Henry's Law Constants, which indicates the propensity of a compound, such as diesel or the constituents, to volatilize when moving through the unsaturated soil. Diesel, and the constituents such as PAHs and long-chain alkanes, do not migrate in the vapor form through the soil under normal conditions.

A soil sample from boring TW2 at 3 feet below ground surface detected diesel at 4,200 mg/kg at the Subject Property. Upward volatilization or migration to the surface of the diesel contaminants in soil in boring TW2 is unlikely based on the chemical characteristics of diesel, as described above.

Benzene, which does have a high Henry's Law Constant, does migrate easily through the soil pore spaces. Benzene, also a constituent of diesel, was detected at the Subject Property only at depths of 16.5 feet in the soil at 1.4 mg/kg in boring TW2 and in the groundwater samples of temporary wells TW2 and TW3 at 65 µg/L and 0.90µg/L, respectively. Both water samples were collected at depths in excess of 16 feet. Therefore, based on the contaminants present, their depths, concentrations of benzene, and associated vapor characteristics, upward migration of benzene to the surface is unlikely to happen. Although toluene and xylenes were also detected in the

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groundwater sample in temporary well TW2, the concentrations were 2.4 µg/L and 3.2 µg/L. Toluene and xylenes have a lower Henry's Law Constant than benzene and they are less mobile than benzene in the subsurface groundwater as well as in the unsaturated soil. Therefore, toluene and xylenes are unlikely to migrate to the surface at the Subject Property.

Based on the chemical characteristics of the contaminant, there is a low potential for diesel to volatilize and migrate through soil pores. The subsurface conduits mapped were detected in the sidewalks and in the streets adjacent to the Subject Property, approximately 20 to 30 feet from the building occupants at 1125 Miller Avenue. Based on the contaminants present on the Subject Property and the location of the subsurface conduits, such as storm drains and water lines, EBS concludes that these conduits do not create a significant issue for migration of diesel in the shallow soil.

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5.0 SUMMARY

1. In October, 2001, EBS drilled four exploratory soil cores at the Site. One of the cores was abandoned without sampling due to an impenetrable obstruction. Groundwater was encountered in two of the borings at 16.5 and 17 feet bgs. Screening of soil samples using an OVM yielded no detectable ionizable compounds. Four soil samples were submitted for laboratory analysis to detect TPHd, BTEX, and MtBE. Temporary wells were constructed of pre-packed well screen within two of the soil cores. Groundwater samples were collected from both temporary wells and submitted for laboratory analysis to detect TPHd, BTEX, and MTBE. Soil samples were found to contain TPHd at concentrations up to 4,200 mg/kg, and benzene up to 1.4 mg/kg. Groundwater samples were found to contain TPHd at concentrations up to 800 µg/L, benzene up to 65 µg/L, toluene up to 2.4 µg/L, and total xylenes up to 3.2 µg/L.
2. Subsurface conduits at the Site include relatively shallow utility trenches (i.e. gas, water and sewer). The nearest observed trench supplies a fire hydrant located approximately 12 feet northwest of TW3. According to the utility survey conducted during this project, the supply line for this hydrant approaches from the northwest (the supply line does not extend beneath the Site). Gas and sewer lines were not observed in proximity to the former UST excavation.
3. According to the EBS well survey dated 26 July 1993, groundwater flow direction at a nearby site (527 23rd Avenue) is to the north with a gradient of approximately 0.01 feet per feet.
4. An Alameda County Public Works Agency survey of groundwater wells showed no water supply wells or other active wells in the nearby vicinity.
5. The nearest sensitive receptors are present in residential dwellings on the Site and on an adjacent property immediately to the east of the Site.
6. A Risk Management Plan (RMP) was prepared and should be used to prevent exposure to subsurface contaminants to workers or residents. The concrete surface inside the building should be maintained and sealed to minimize any potential for upward migration of contaminants. Written documentation of this activity should be performed. The RMP also stipulates that no wells (domestic or irrigation) can be installed on the Subject Property.

6.0 DISCUSSION

Capillary fringe soil from within both borings adjacent to the former UST pit was impacted with moderately high concentrations of diesel. One of the deeper samples (TW2) at 16.5 feet below ground surface was also found to contain a moderate concentration of benzene (1.4 mg/kg) as well. Water sampled from within the two temporary wells (TW2 and TW3) also displayed impact from diesel, benzene, toluene and xylenes. A core placed beneath the former fuel dispenser (D1-3') showed a moderately high concentration of diesel (3,400 mg/kg) in shallow soil with only a low concentration (34 mg/kg) found in a deeper sample (D1-8') collected well above the depth at which groundwater was encountered in the other two borings. This sample was notably not found to contain any BTEX compounds.

The location of the dispenser within a shallow partition of the building inhibits removal of affected underlying soil. Impact found in the other two borings was indicative of capillary fringe contamination caused by contact with impacted groundwater. The configuration of the site in close proximity to a City street, sidewalk and fire hydrant also inhibits further excavation of soil in the area surrounding the former UST pit. Further excavation of this soil would also yield negligible benefits given the extremely high probability that continued contact with contaminated groundwater would re-impact clean soil used to backfill the excavation.

Preliminary discussion with the ACHCSA has indicated their receptiveness to considering alternative routes to closure of this site. To this end EBS reviewed a State Water Resource Control Board (SWRCB) guidance document and compared published risk based screening levels (RBSLs) with site chemical data in an effort to determine whether or not reported concentrations pose a significant risk to human health or the environment.

RBSLs used for comparison were taken from the State Water Resources Control Board (SWRCB) Region II document "The Application of Risk-Based Screening Levels and Decision Making to Sites with Impacted Soil And Groundwater (Interim Final - August 2000)." The document references compounds commonly found at hazardous materials impacted sites and is intended as an aid in the decision making process rather than as a list of definitive clean-up levels. The Tier I RBSLs were compared with results from the Subject Property to provide a reportedly conservative quick reference of maximum levels beyond which a threat to health may be present.

Table D-1 of the State Water Resources Control Board (SWRCB) Region II document "The Application of Risk-Based Screening Levels and Decision Making to Sites with Impacted Soil And Groundwater (Interim Final - August 2000), displays values applicable to residential sites where soil impact is greater than three meters below ground surface (bgs) and where the groundwater is not a current or potential source of drinking water. The final RBSL for benzene of 0.18 mg/kg was exceeded in the sample collected from the capillary fringe in core TW2. The RBSL for soil where leeching to

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groundwater will occur, however, is 2.1 mg/kg. The maximum value reported to date for this compound in soil from pit walls or cores was nearly half this amount.

Table F-1 of the same document lists RBSLs where groundwater is a potential drinking water resource (no data is listed when not a potential source of drinking water). Data from this table is presumably far more conservative than what would be considered appropriate for a site such as the subject property where affected groundwater is too shallow to be suitable for drinking water. The general RBSL for benzene is 1.0 µg/L. The benzene RBSL for indoor air impacts from water contamination is 84 µg/L. This general RBSL was substantially exceeded by one of the two reported concentrations benzene found in site water, however the only two samples found to contain benzene (soil or water) were taken in the area of the former UST pit opposite from the building. The indoor air impacts RBSL for benzene is clearly well in excess of the maximum value reported in site samples. Table F-1 also lists residential soil RBSLs for TPH middle distillates (including diesel). The RBSL for soil where leaching to groundwater will occur is 500 mg/kg. Diesel values for soil samples collected from the cores significantly exceeded this value.

The northward direction of groundwater flow documented at a nearby site strongly suggests that water borne contaminants would move away from the site building as well as the adjacent apartment building. Sample analytical data would seem to support that this flow direction remains accurate at the Site, as the water-soluble BTEX compounds have only been found in samples lying to the northwest of the former USTs. Given a northward direction of flow the probability of benzene or any of the other BTEX constituents found in the cores being present in groundwater beneath the two nearby structures containing sensitive receptors can be assumed low.

Additional sensitive receptors in the assumed groundwater flow direction are unlikely to be impacted given the regionally flat gradient and the length of distance before reaching further inhabited structures. Our research also revealed no potential conduits such as wells or utilities that are Rely to aid in the migration of contaminants from the Site or into underlying deeper aquifers.

Although some of the RBSLs were exceeded by site samples EBS still believes that the ACHCSA should review this Site for conditional closure. The lack of RBSLs for a configuration similar to this Site where the quality of affected groundwater is not an issue, make it difficult to draw conclusions from the referenced published figures alone.

Site specific and regional conditions do not indicate the probability for carcinogenic compounds associated with a release from the former USTs to be present beneath either of the adjacent inhabited structures. In light of this fact EBS believes this Site should be granted conditional closure. A Risked Management Plan has been developed and included in Appendix D. The Risk Management Plan should be used by a contractor to protect employees and others if shallow soil disturbance were planned. It stipulates that

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the concrete cap be maintained. The RMP also states that no wells (potable or irrigation) can be installed on the Subject Property. This requirement is insignificant due to the lack of large quantities of potable water in the subsurface near the Subject Property.

Concrete is a porous pavement. The integrity of the pavement inside the building on the Subject Property is important. Using an impermeable concrete sealer and caulking all cracks will minimize any potential for upward migration of any contaminants and maintain the integrity of the pavement, which serves as a contamination cap. This reduces potential exposure risks within the building. Documentation of sealing and maintaining the concrete (with photos and letter report) is recommended as part of the Risk Management Plan.

Copies of this report have been prepared for the client and should be submitted to the ACHCSA, the San Francisco Bay Region Water Quality Control Board, and other interested parties as required.

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7.0 LIMITATIONS

The recommendations in this report were developed in accordance with generally accepted standards of current environmental practice in California. These recommendations are time- dependent and should not be considered valid after a one-year period from the issue of this report. After one year from the issue of this report, site conditions and recommendations contained within this report should be reviewed. This study was performed solely to evaluate environmental conditions of the site subsurface relative to hydrocarbon impact at the subject Site. No engineering or geotechnical references are implied or should be inferred. No industrial hygiene references are implied or should be inferred. Additional data, such as collecting soil, water or vapor samples can lower the uncertainties associated with relying on existing or incomplete data.

Evaluation of the condition of the Site, for the purpose of this study, was made from a limited number of observation points. Subsurface conditions may deviate away from these points. Additional work, including further study of the Subsurface, can reduce the inherent uncertainties associated with this type of work. The project was performed, and the report was prepared for the sole use of our client, Dreisbach Enterprises, Inc. The report and the findings contained herein shall not be disclosed to nor used by any other party, other than Dreisbach Enterprises without the prior written consent of Environmental Bio-Systems, Inc. It is the responsibility of the Client to convey all data, conclusions and recommendations to regulatory agencies and other parties, as appropriate.

The recommendations herein are professional opinions that EBS has endeavored to provide with competence and reasonable care. We are not able to eliminate the risks associated with environmental work. No guarantees or warrants, express or implied, are provided regarding our recommendations. It is the responsibility of the client to convey any and all recommendations to governmental agencies and other parties, as appropriate.

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8.0 REFERENCES

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Earth Systems Environmental, Inc., July 26, 1993, Letter Report, Soil and Groundwater Investigation.

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Environmental Data Resources, April 29, 2002, The EDR Radius Map with GeoCheck; Topographic Maps, Sanborn Insurance Maps, Historic Aerial Photographs; 23rd Avenue Partners, 1125 Miller Ave., Oakland, CA 94617; Inquiry Number: 770535.3S, Southport, Connecticut.

State Water Resources Control Board (SWRCB) August, 2000, Application of Risk-Based Screening Levels and Decision Making to Sites with Impacted Soil And Groundwater (Interim Final) San Francisco Region, (Region 2).

United States Geological Survey (USGS), 1959, photorevised, 1980, Oakland East, California Quadrangle Map, 7.5 Minute Series, Topographic Map, Washington, D.C.

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9.0 DISTRIBUTION

EBS will submit copies of this report to the following individuals after client approval:

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APPENDICES

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APPENDIX A

TABLE 1. SOIL SAMPLE RESULTS

BORE-HOLE	DEPTH (feet)	TPHd (mg/kg)	BTEX (mg/kg)	MTBE (mg/kg)
TW2	16.5	4,200	B=1.4	ND
TW3	17	2,700	ND	ND
D1	3	3,400	ND	ND
D1	8	34	ND	ND

NOTES:

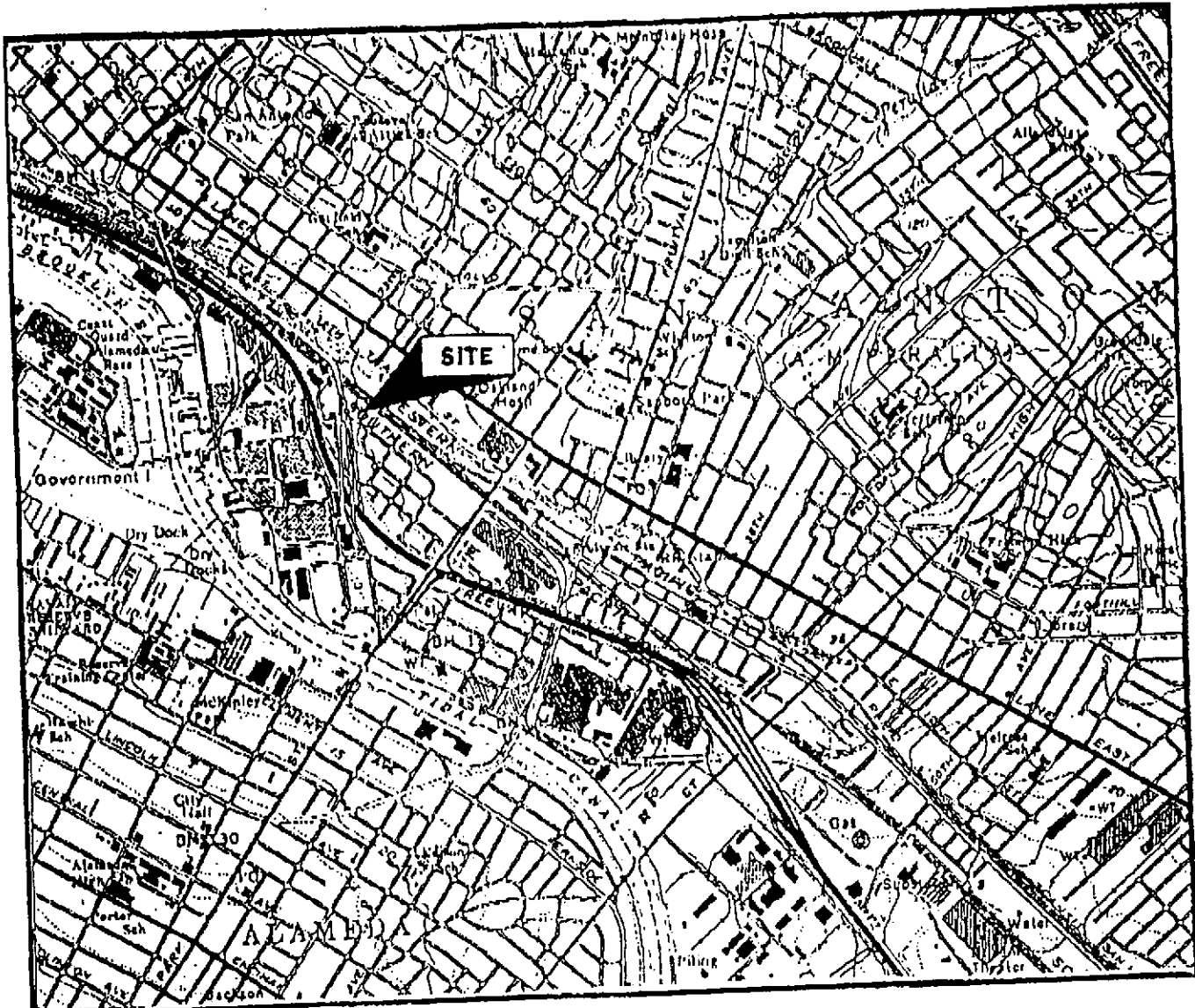
TPHd: Total petroleum hydrocarbons quantified as diesel.
 BTEX: Benzene, toluene, ethyl benzene, total xylenes.
 MTBE: Methyl tert butyl ether.
 mg/kg: Milligrams per kilogram.
 ND: Not detected above the laboratory reporting limit.
 See laboratory report for individual reporting limits.

TABLE 2. GROUND WATER SAMPLE RESULTS

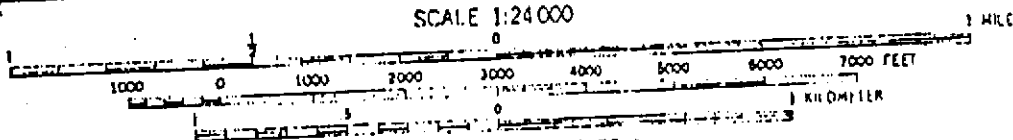
TEMPORARY WELL ID	TPHd (µg/L)	BTEX (µg/L)	MTBE (µg/L)
TW2	660	B=65 T=2.4 X=3.2	ND
TW3	800	B=0.90	ND

NOTES:

TPHd: Total petroleum hydrocarbons quantified as diesel.
 BTEX: Benzene, toluene, ethylbenzene, total xylenes.
 MTBE: Methyl tert butyl ether.
 (µg/L): Micrograms per Liter.
 ND: Not detected above the laboratory reporting limit.
 See laboratory report for individual reporting limits.





SCALE 1:24 000



CONTOUR INTERVAL 20 FEET
 DOTTED LINES REPRESENT 5 FOOT CONTOURS
 NATIONAL GEODETIC VERTICAL DATUM OF 1929
 DEPTH CURVES IN FEET—DATUM IS MEAN LOWER LOW WATER
 THE RELATIONSHIP BETWEEN THE TWO DATUMS IS VARIOUS
 SHORELINE SHOWN REPRESENTS THE APPROXIMATE LINE OF HIGH WATER
 THE MEAN RANGE OF TIDE IS APPROXIMATELY 5 FEET

Source: USGS Oakland East, California 7.5 Minute Quadrangle Map

 ENVIRONMENTAL BIO-SYSTEMS, INC.	DATE: 3/31/89	FIGURE 1: SITE LOCATION MAP
	DRAWN BY: DAS	
	SCALE: 1" = 2,000'	

ENVIRONMENTAL BIO SYSTEMS, INC. PROJECT #079-007AB

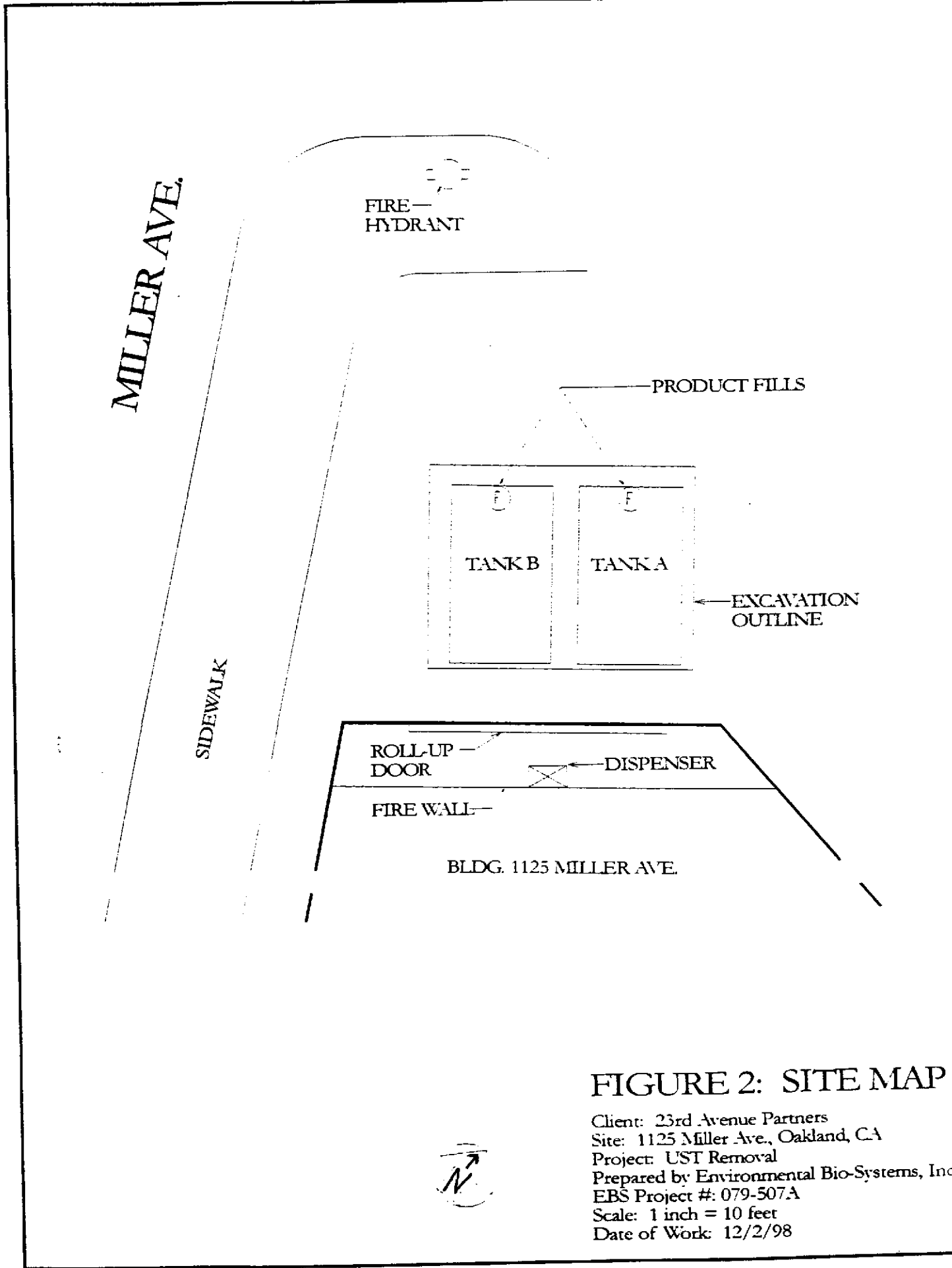
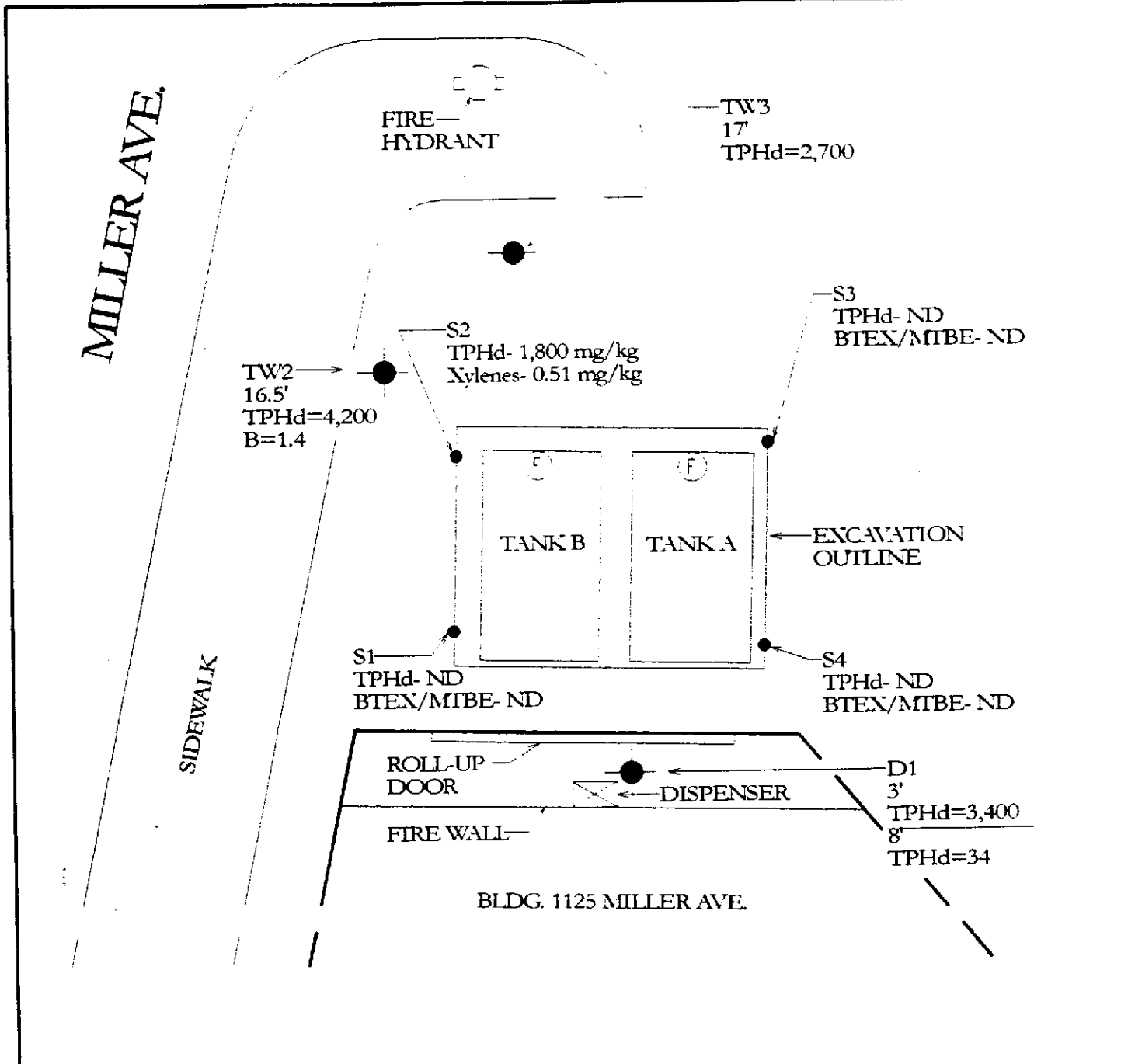


FIGURE 2: SITE MAP

Client: 23rd Avenue Partners
Site: 1125 Miller Ave., Oakland, CA
Project: UST Removal
Prepared by: Environmental Bio-Systems, Inc.
EBS Project #: 079-507.A
Scale: 1 inch = 10 feet
Date of Work: 12/2/98



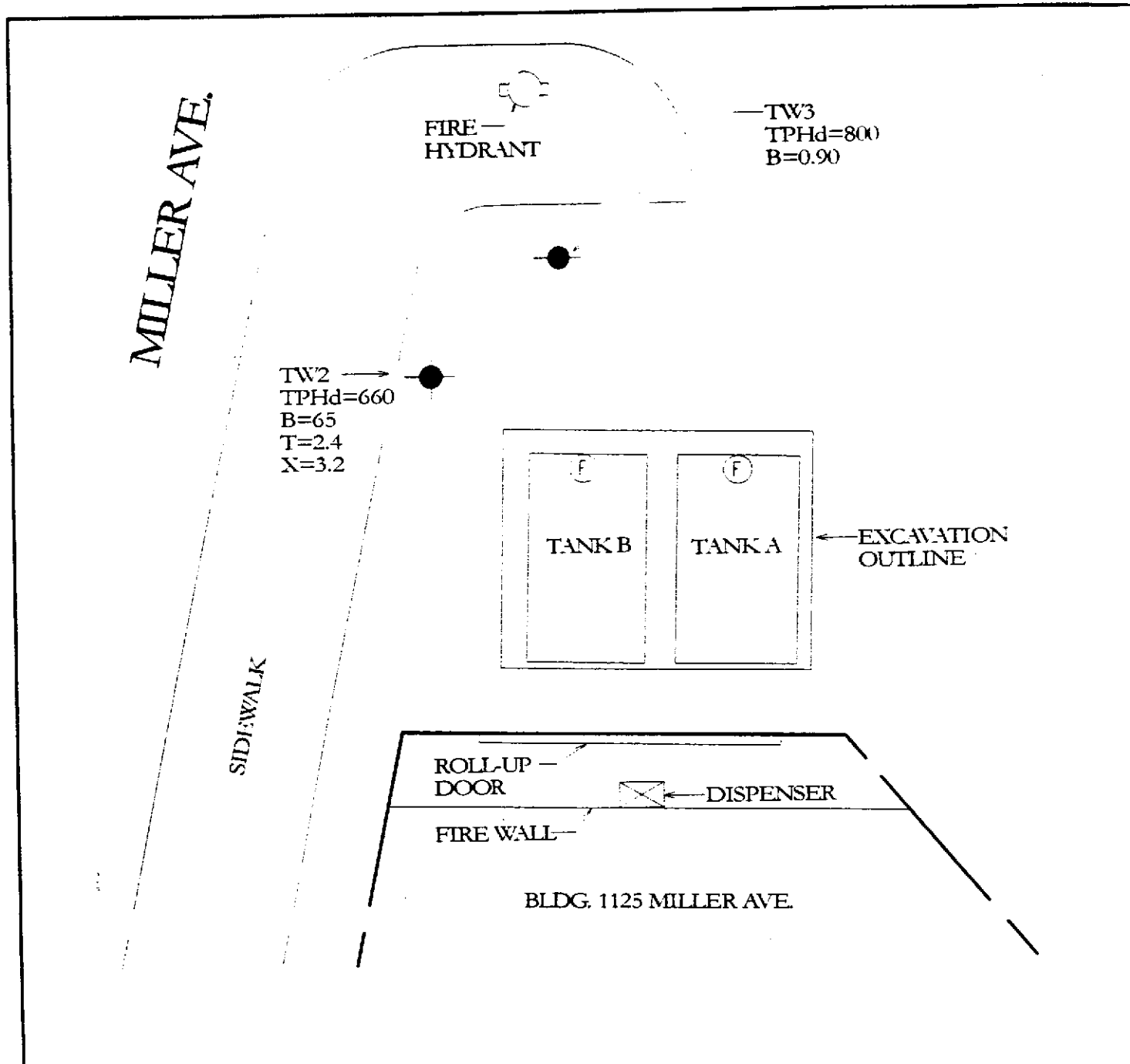
NOTES:

- Soil Core/Temporary Well Location and Designation
- Sample results expressed in milligrams per kilogram (mg/kg).

FIGURE 3: SOIL SAMPLE RESULTS



Client: 23rd Avenue Partners
 Site: 1125 Miller Ave., Oakland, CA
 Project: UST Removal
 Prepared by Environmental Bio-Systems, Inc.
 EBS Project #: 079-507A
 Scale: 1 inch = 10 feet
 Date of Work: 12/2/98



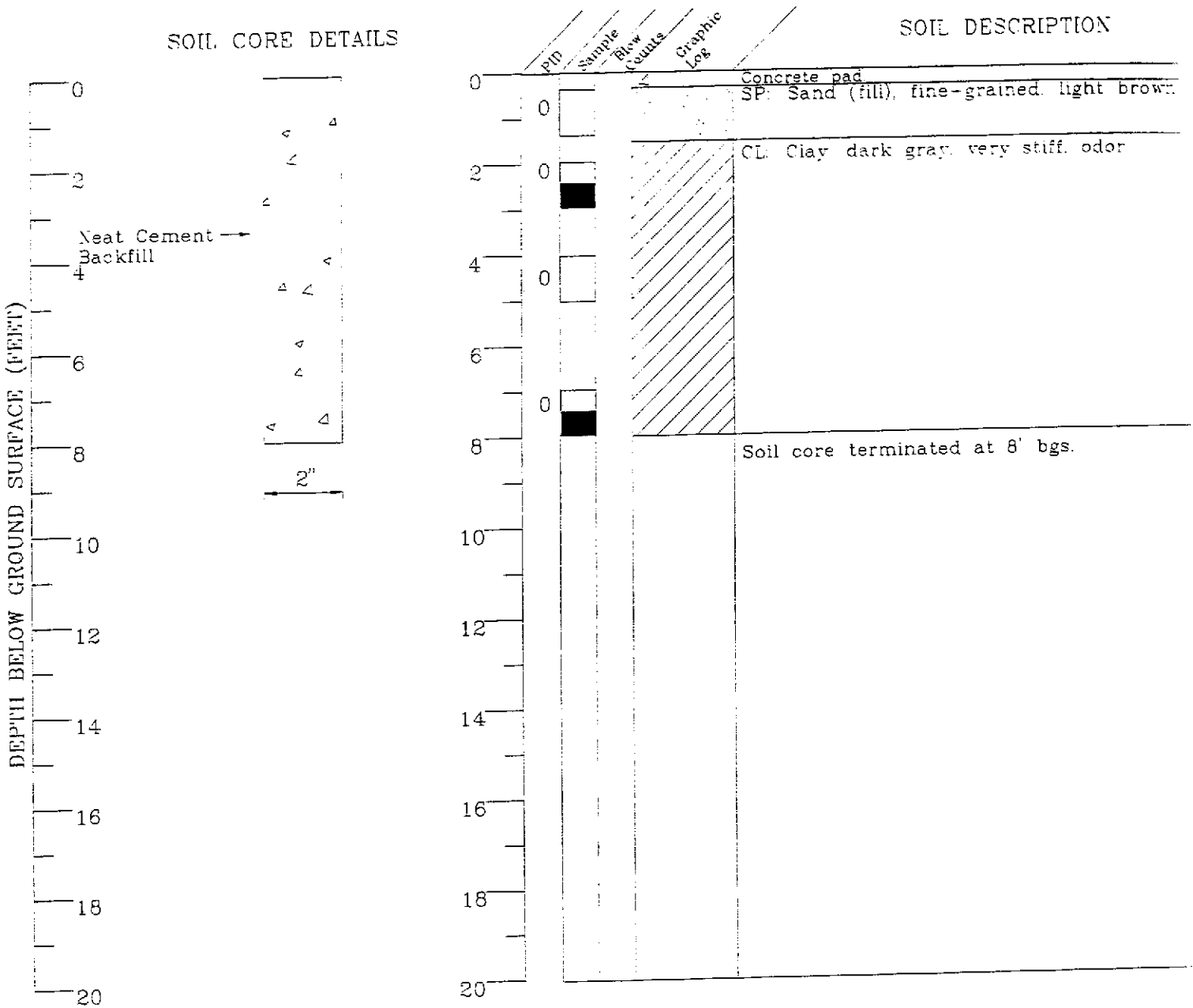
NOTES:

● Soil Core/Temporary Well Location and Designation
 Sample results expressed in micrograms per liter (ug/l).

FIGURE 4: WATER SAMPLE RESULTS

Client: 23rd Avenue Partners
 Site: 1125 Miller Ave., Oakland, CA
 Project: UST Removal
 Prepared by Environmental Bio-Systems, Inc.
 EBS Project #: 079-507.A
 Scale: 1 inch = 10 feet
 Date of Work: 12/2/98

LOG OF SOIL BORING D1



Logged by: DAS Inspector: N/A Date(s): 10/23/00	Drilling Contractor: Fast-Tek Drilling Method: DPT Driller: Art	Sanitary Seal/Backfill: Neat Cement Sampler Type: 4' Spoon Total Boring Depth: 8' bgs
---	---	---



EXPLANATION

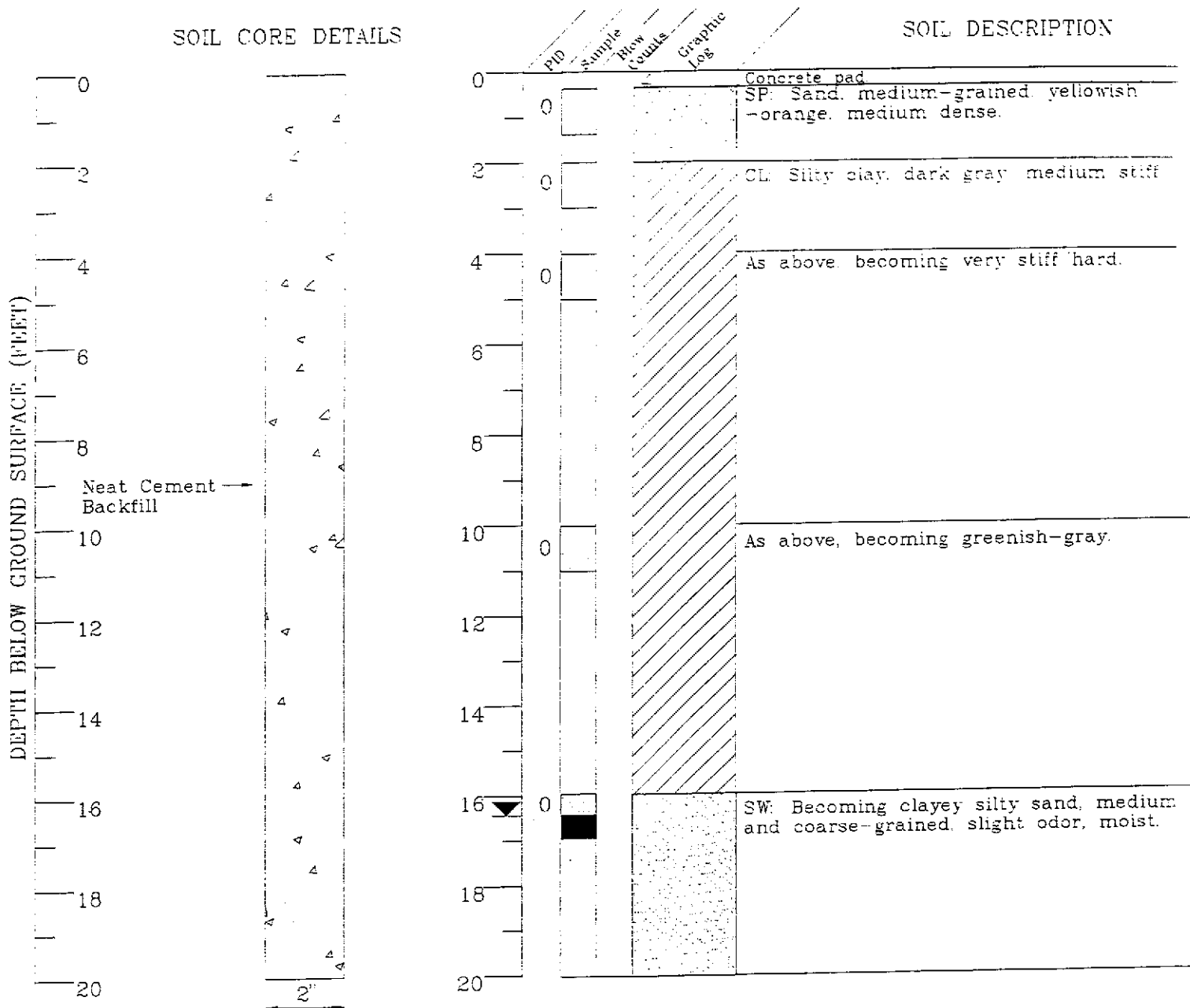
	water level during drilling		gradational
	potentiometric water level	NR	no recovery
	drill sample		approximate
	chemical analysis sample		certain
	sieve sample		approximate
	grab sample		uncertain

SITE:
 1125 MILLER AVENUE
 OAKLAND CALIFORNIA

PROJECT #: 079-541A

CLIENT:
 DREISBACH ENTERPRISES
 P.O. BOX 7509
 OAKLAND, CALIFORNIA

LOG OF SOIL BORING TW2



Logged by: DAS
 Inspector: N/A
 Date(s): 10/23/00

Drilling Contractor: Fast-Tek
 Drilling Method: DPT
 Driller: Art

Sanitary Seal/Backfill: Neat Cement
 Sampler Type: 4' Spoon
 Total Boring Depth: 20' bgs



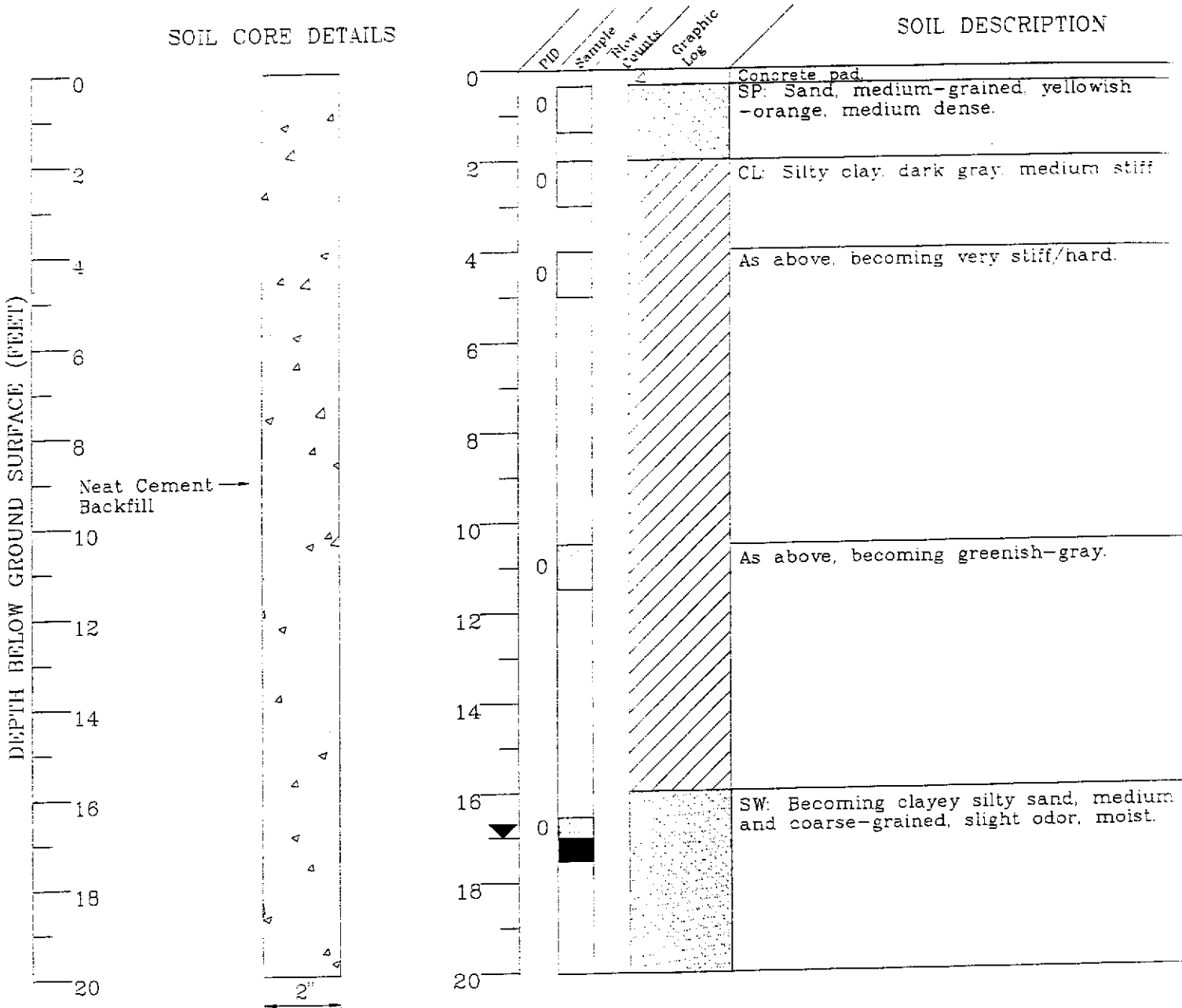
EXPLANATION	
water level during drilling	gradational
potentiometric water level	NR no recovery
drill sample	CONTACTS
chemical analysis sample	— certain
sieve sample	- - - approximate
grab sample	— uncertain

SITE:
 1125 MILLER AVENUE
 OAKLAND, CALIFORNIA

PROJECT #: 079-541A

CLIENT:
 DREISEBACH ENTERPRISES
 P.O. BOX 7509
 OAKLAND, CALIFORNIA

LOG OF SOIL BORING TW3



Logged by: DAS
 Inspector: N/A
 Date(s): 10/23/00

Drilling Contractor: Fast-Tek
 Drilling Method: DPT
 Driller: Art

Sanitary Seal/Backfill: Neat Cement
 Sampler Type: 4' Spoon
 Total Boring Depth: 20' bgs

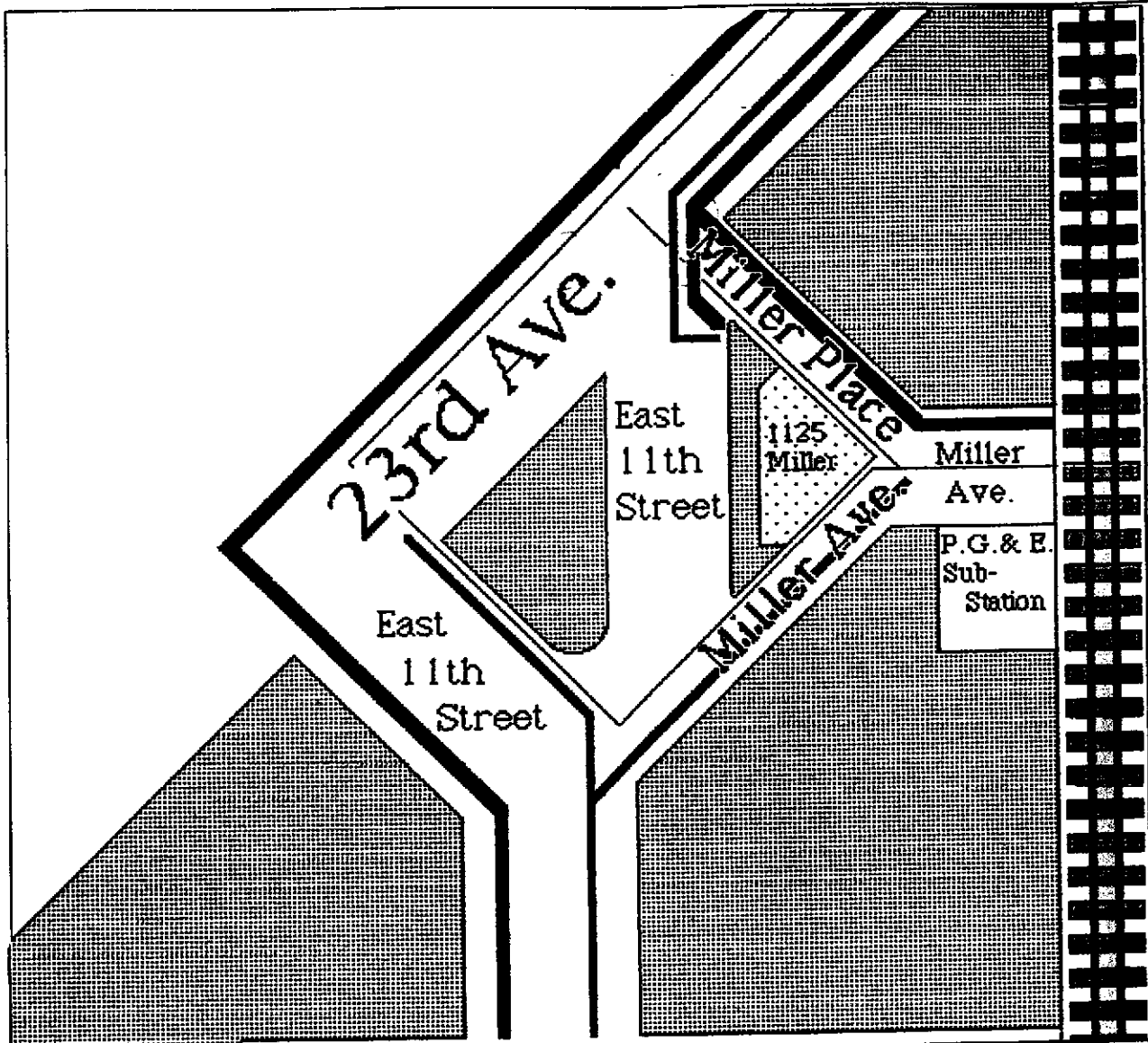


EXPLANATION	
	water level during drilling
	potentiometric water level
	drill sample
	chemical analysis sample
	sieve sample
	grab sample
	gradational
	NR no recovery
CONTACTS	
	certain
	approximate
	uncertain

SITE:
 1125 MILLER AVENUE
 OAKLAND, CALIFORNIA

PROJECT #: 079-541A

CLIENT:
 DREISBACH ENTERPRISES
 P.O. BOX 7509
 OAKLAND, CALIFORNIA



Key

	Sewer Pipes
	Water Pipes
	Storm Pipes



Project #: 590

Date Drawn: Sept. 13, 2002

Drawn By: RBJ

Scale: not to scale

Subsurface Pipes

23rd Avenue Partners
1125 Miller Avenue
Oakland, California

Environmental Bio-Systems, Inc.
707 View Point Road
Mill Valley, CA 94941
TEL: 415-381-5195; FAX: 415-381-5816; e-mail: augerpro@jps.net

APPENDIX B



Site Closure Report Photos 6/12/02
Photographs taken by J. Jacobs
Site Closure Report Photos
23rd Avenue Properties
Oakland, California

Top Photo: Looking southwest
Mini-park across East 11th Ave.
23rd Avenue in background (red cars)
Bottom Photo: Looking east
Hydrant and storm drain at bottom



Site Closure Report Photos 6/12/02
Photographs taken by J. Jacobs
Site Closure Report Photos
23rd Avenue Properties
Oakland, California

Top Photo: Left on E. 11th
right street: Miller Ave.
Building in center of photo.
Bottom Photo: Looking NE
across Miller Place to Lofts

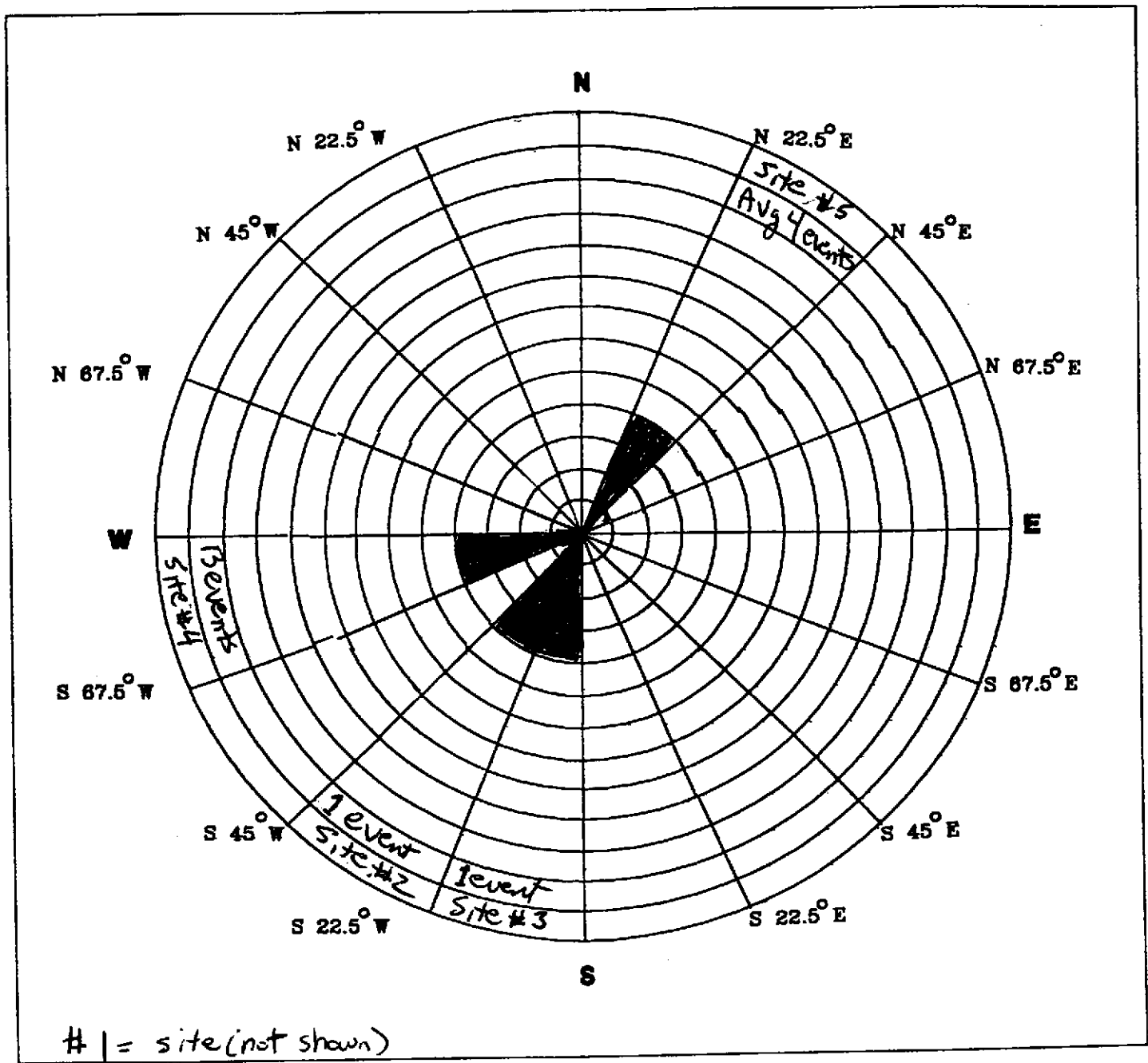


Site Closure Report Photos 6/12/02
Photographs taken by J. Jacobs
Site Closure Report Photos
23rd Avenue Properties
Oakland, California

Top Photo: Looking southeast
Note white hydrant and storm drain.
Building in right of photo.
Bottom Photo: Looking north
23rd Ave. freeway ramp on left

Environmental Bio-Systems, Inc.
707 View Point Road
Mill Valley, CA 94941
TEL: 415-381-5195; FAX: 415-381-5816; e-mail: augerpro@jps.net

APPENDIX C



EXPLANATION

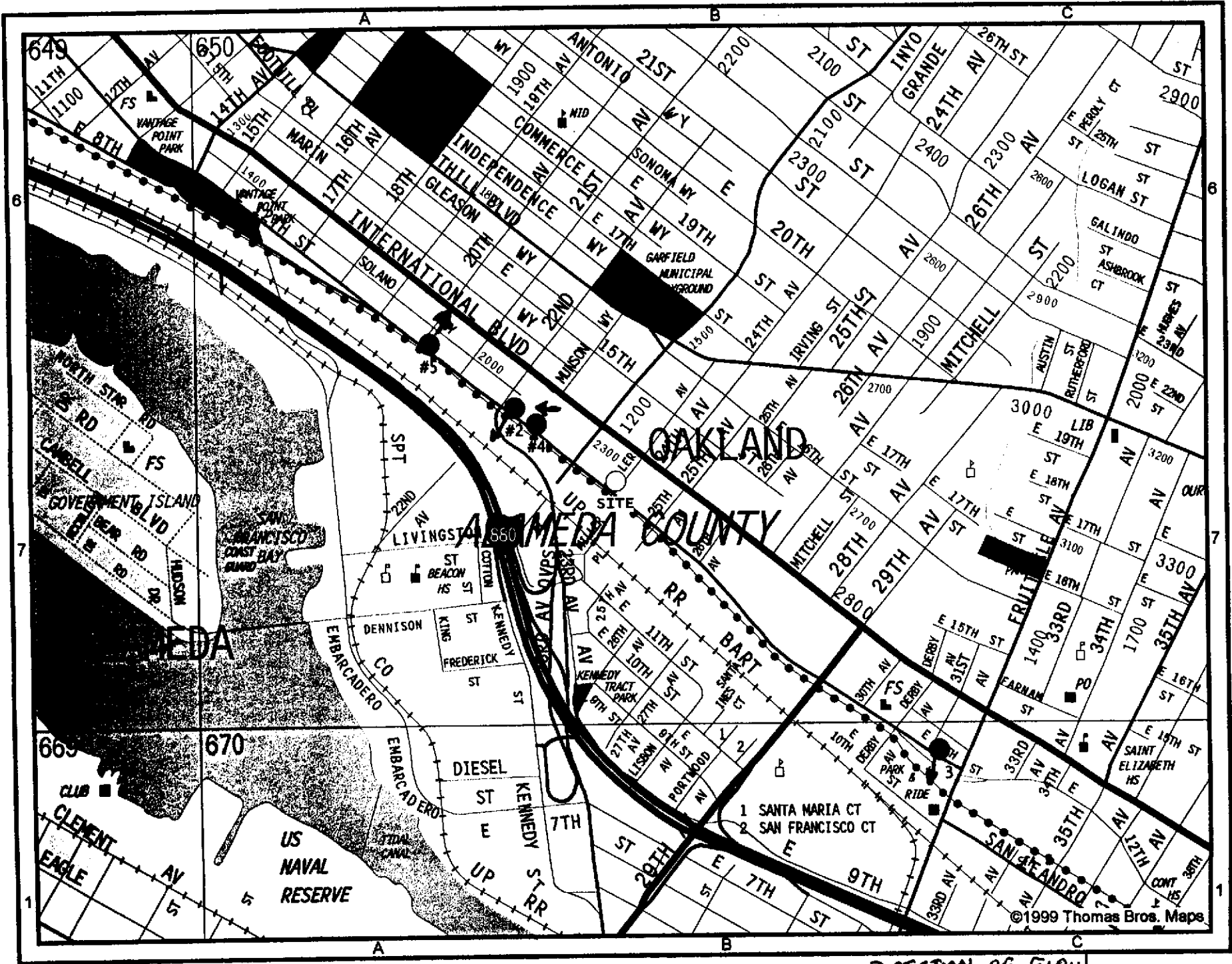
N Compass Direction

Rose diagram developed by evaluating the groundwater gradient direction from the quarterly monitoring data. Each circle on the rose diagram represents of monitoring events that the gradient plotted in that 22.5 degree sector.

GROUNDWATER FLOW DIRECTION ROSE DIAGRAM

1125 Miller Ave.
Oakland, CA

9-02
EBS



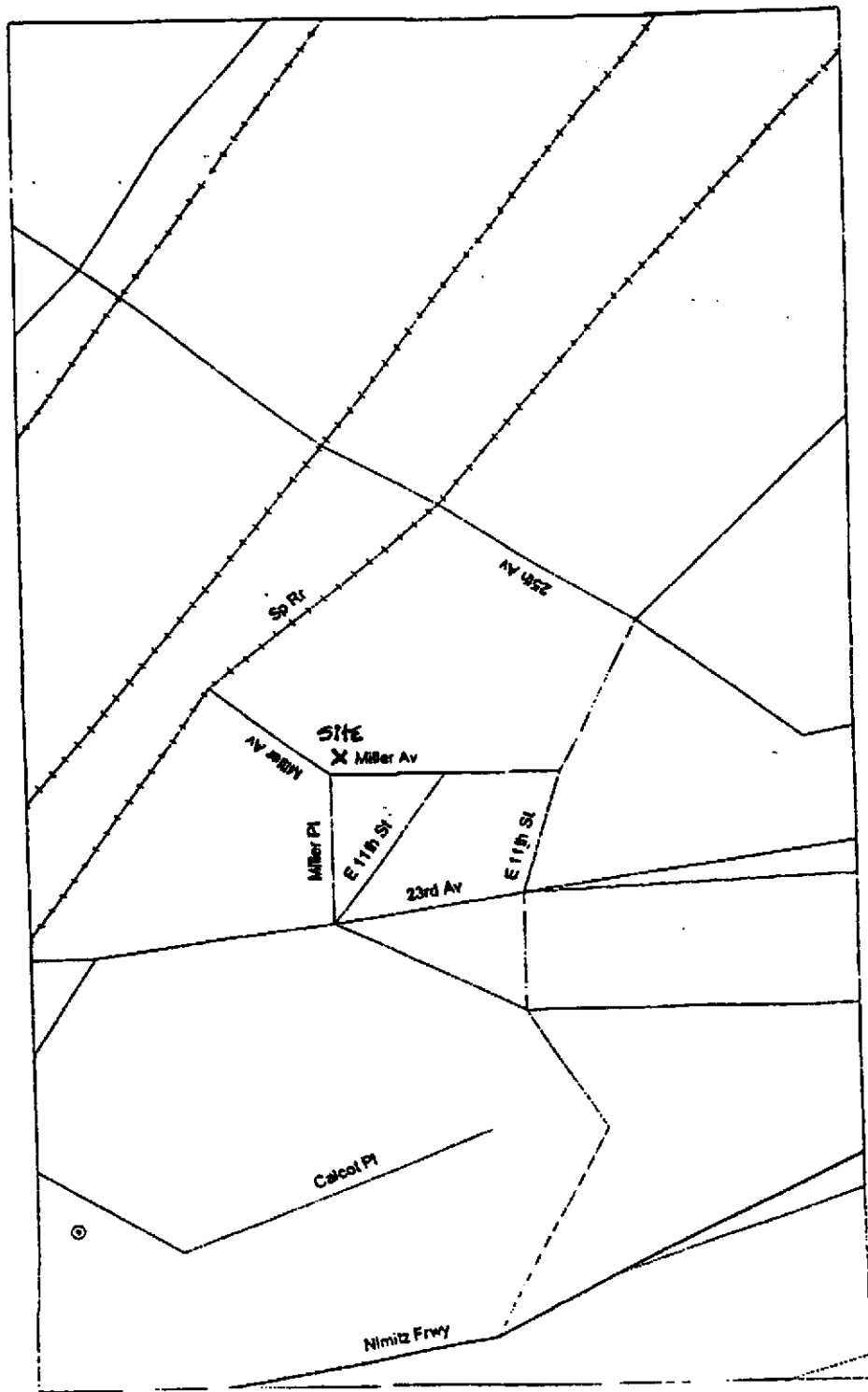
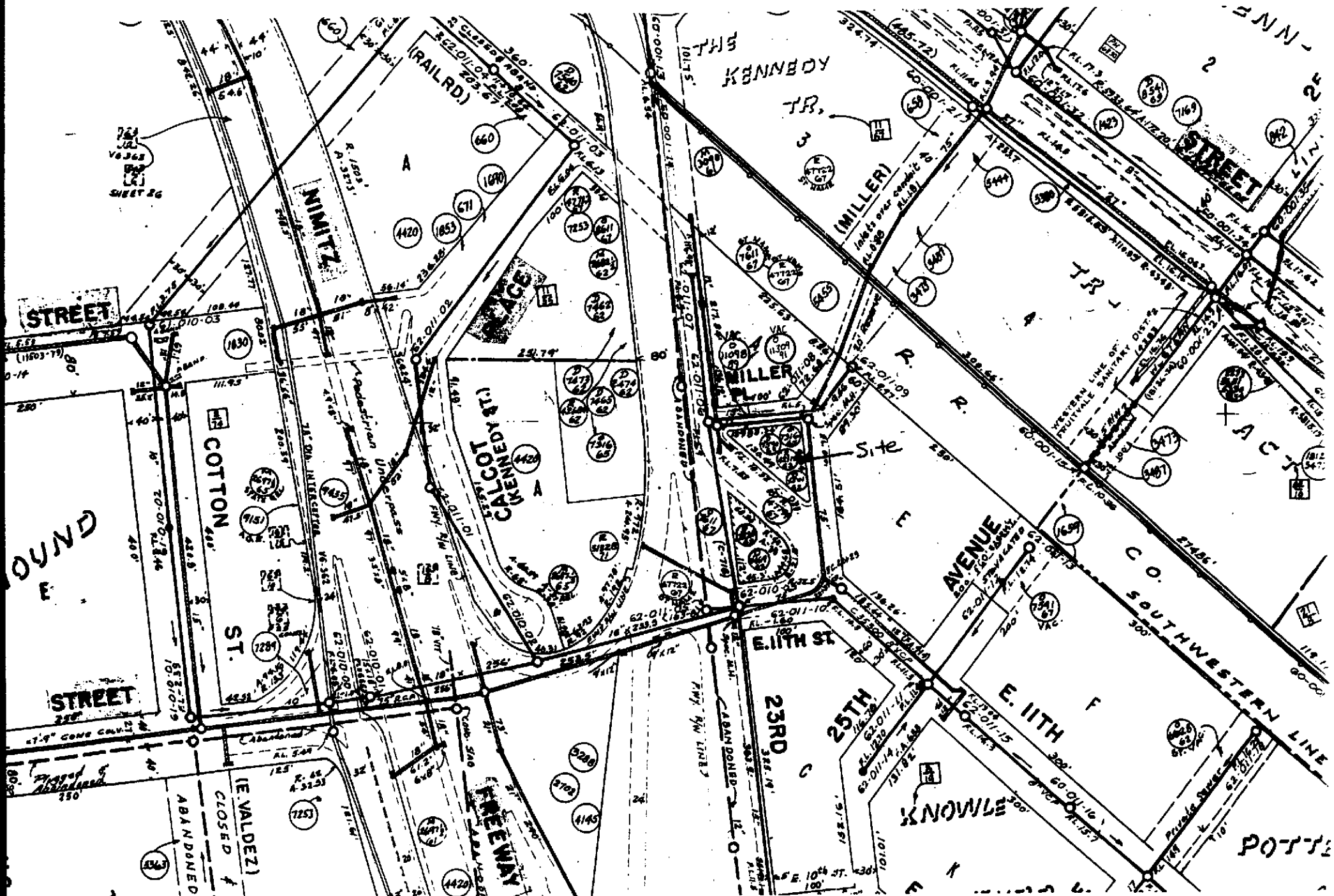


FIGURE 5: WELL SEARCH MAP



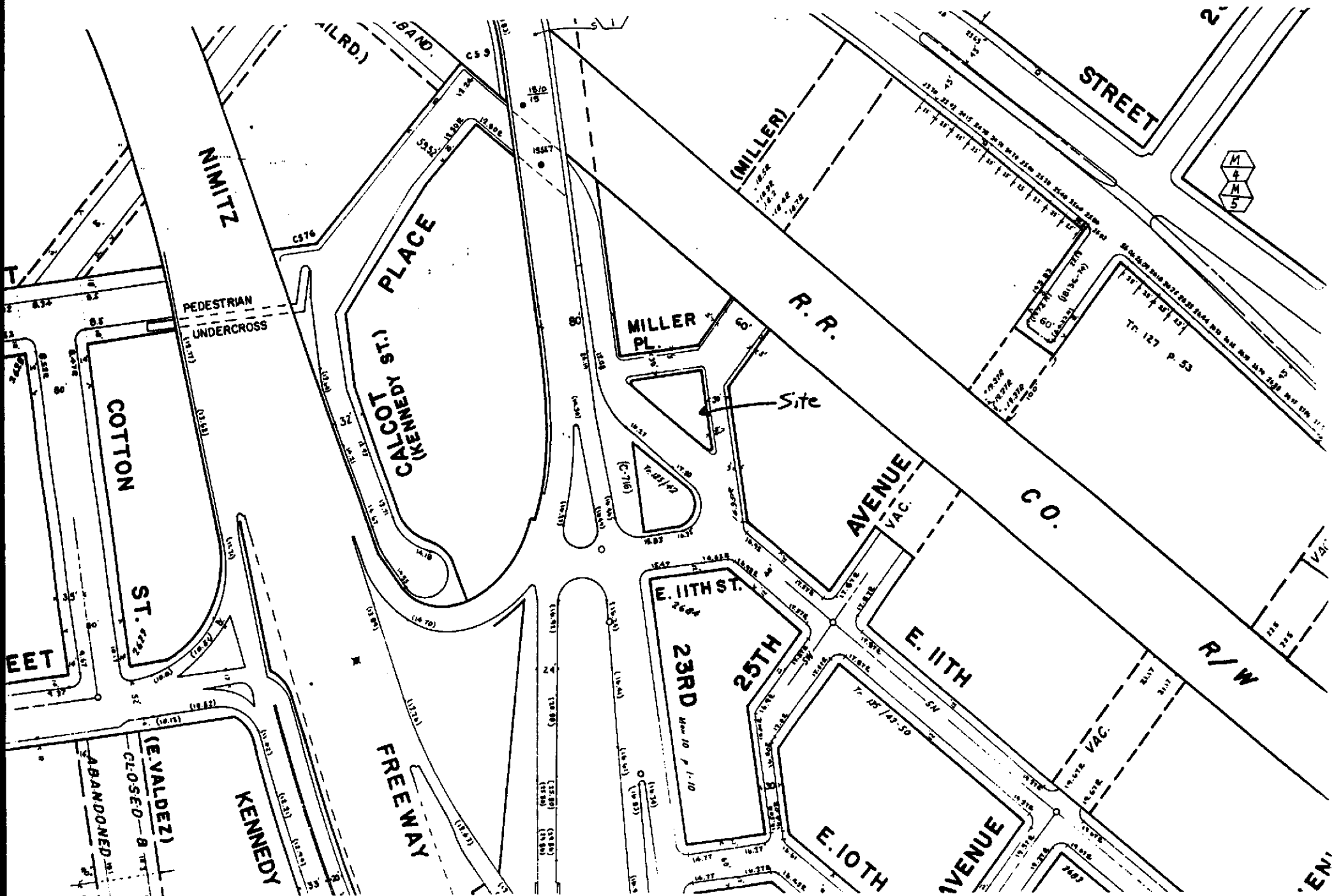
Client: 23rd Avenue Partners
 Site: 1125 Miller Ave., Oakland, CA
 Project: UST Removal
 Prepared by Environmental Bio-Systems, Inc.
 EBS Project #: 079-507A
 Scale: 1 inch = 10 feet
 Date of Work: 12/2/98



1125 Miller Ave
Oakland, CA

City of Oakland
Dept Public Works

9-1-02
N



1125 Miller Ave.
Oakland, CA

City of Oakland
Dept of Public Works

9-1-02



PHYSICAL SETTING SOURCE MAP - 770535.3s



- Major Roads
- Contour Lines
- Earthquake Fault Lines
- Water Wells
- Public Water Supply Wells
- Groundwater Flow Direction
- Indeterminate Groundwater Flow at Location
- Groundwater Flow Varies at Location
- Cluster of Multiple Icons
- Earthquake epicenter, Richter 5 or greater
- Closest Hydrogeological Data
- Oil, gas or related wells

TARGET PROPERTY: 23rd Avenue Partners
ADDRESS: 1125 Miller Ave
CITY/STATE/ZIP: Oakland CA 94617
LAT/LONG: 37.7805 / 122.2365

CUSTOMER: Environmental Bio-Systems, Inc
CONTACT: Jim Jacobs
INQUIRY #: 770535.3s
DATE: April 29, 2002 3:51 pm

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

Site-Specific Hydrogeological Data*:

Search Radius: 2.0 miles
 Status: Not found

AQUIFLOW®

Search Radius: 2.000 Miles.

EDR has developed the AQUIFLOW Information System to provide data on the general direction of groundwater flow at specific points. EDR has reviewed reports submitted by environmental professionals to regulatory authorities at select sites and has extracted the date of the report, groundwater flow direction as determined hydrogeologically, and the depth to water table.

<u>MAP ID</u>	<u>LOCATION FROM TP</u>	<u>GENERAL DIRECTION GROUNDWATER FLOW</u>
A1	0 - 1/8 Mile South	Not Reported
B2	1/8 - 1/4 Mile North	NE
B3	1/8 - 1/4 Mile North	Varies
A4	1/8 - 1/4 Mile SW	NW
B5	1/8 - 1/4 Mile NNE	NW
B6	1/8 - 1/4 Mile NNE	N
B7	1/8 - 1/4 Mile NNW	SW
B8	1/8 - 1/4 Mile NNW	SE
C9	1/4 - 1/2 Mile South	SW
10	1/4 - 1/2 Mile SE	N, S, Varies
C11	1/4 - 1/2 Mile SSW	SE
C12	1/4 - 1/2 Mile South	N
D13	1/4 - 1/2 Mile South	SW
D14	1/4 - 1/2 Mile South	Varies
E15	1/2 - 1 Mile NW	WSW
E16	1/2 - 1 Mile NW	WSW
E17	1/2 - 1 Mile NW	WSW
F18	1/2 - 1 Mile SSW	NE
F19	1/2 - 1 Mile SSW	NE
F20	1/2 - 1 Mile SSW	NE
G21	1/2 - 1 Mile South	SW
G22	1/2 - 1 Mile South	NE
G23	1/2 - 1 Mile South	N
G24	1/2 - 1 Mile South	Varies
G25	1/2 - 1 Mile South	Varies
G26	1/2 - 1 Mile South	Varies
G27	1/2 - 1 Mile South	NE
28	1/2 - 1 Mile West	NNE
H29	1/2 - 1 Mile WSW	N
H30	1/2 - 1 Mile WSW	N
I31	1/2 - 1 Mile South	SE
I32	1/2 - 1 Mile South	SE
I33	1/2 - 1 Mile South	NE
I34	1/2 - 1 Mile South	NE
I35	1/2 - 1 Mile South	Varies
36	1/2 - 1 Mile ESE	E
J37	1/2 - 1 Mile South	Not Reported
J38	1/2 - 1 Mile South	Not Reported
I39	1/2 - 1 Mile South	NE, NW, Varies
I40	1/2 - 1 Mile South	Varies
I41	1/2 - 1 Mile South	NW

* ©1995 Site-specific hydrogeological data gathered by CERCLIS Alerts, Inc., Seabrook Island, WA. All rights reserved. All of the information and opinions presented are those of the cited EPA reports, which were compiled under a Comprehensive Environmental Response Compensation and Liability Information System (CERCLIS) investigation.

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

MAP ID	LOCATION FROM TP	GENERAL DIRECTION GROUNDWATER FLOW
K42	1/2 - 1 Mile SSE	N
K43	1/2 - 1 Mile SSE	N
K44	1/2 - 1 Mile SSE	N
K45	1/2 - 1 Mile SSW	Varies
L46	1/2 - 1 Mile SE	Varies
47	1/2 - 1 Mile NW	S, SW
L48	1 - 2 Miles SE	NE
49	1 - 2 Miles SE	Varies
J50	1 - 2 Miles South	S
M51	1 - 2 Miles SSW	NE
M52	1 - 2 Miles SSW	NE
N53	1 - 2 Miles SSW	NW
N54	1 - 2 Miles SSW	NNE
55	1 - 2 Miles SW	N, SE
M56	1 - 2 Miles SSW	N
M57	1 - 2 Miles SSW	NNE
M58	1 - 2 Miles SSW	NNE
O59	1 - 2 Miles WSW	N
O60	1 - 2 Miles WSW	W
O61	1 - 2 Miles WSW	W
O62	1 - 2 Miles WSW	NW
P63	1 - 2 Miles SE	SW
P64	1 - 2 Miles SE	SW
M65	1 - 2 Miles South	NE
N66	1 - 2 Miles SSW	NW
N67	1 - 2 Miles SSW	NW
P68	1 - 2 Miles SE	SSW
Q69	1 - 2 Miles SSW	NE
70	1 - 2 Miles SW	NW
Q71	1 - 2 Miles South	W
R72	1 - 2 Miles SE	Varies
R73	1 - 2 Miles SE	Varies
R74	1 - 2 Miles SE	SW
P75	1 - 2 Miles SE	NE
Q76	1 - 2 Miles SSW	SW
Q77	1 - 2 Miles SSW	SW
78	1 - 2 Miles ESE	SE
79	1 - 2 Miles WNW	E
S80	1 - 2 Miles NNE	E
S81	1 - 2 Miles NNE	E
T82	1 - 2 Miles SSW	SW
U83	1 - 2 Miles WSW	Varies
U84	1 - 2 Miles WSW	Varies
U85	1 - 2 Miles WSW	NE
T86	1 - 2 Miles SSW	Varies
T87	1 - 2 Miles SSW	Varies
88	1 - 2 Miles SE	S
V89	1 - 2 Miles ESE	NW
W90	1 - 2 Miles NW	NW
V91	1 - 2 Miles ESE	NW
W92	1 - 2 Miles NW	N
W93	1 - 2 Miles NW	N
W94	1 - 2 Miles NW	N
95	1 - 2 Miles WNW	SW
W96	1 - 2 Miles WNW	SE
X97	1 - 2 Miles SE	W

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

<u>MAP ID</u>	<u>LOCATION FROM TP</u>	<u>GENERAL DIRECTION GROUNDWATER FLOW</u>
X98	1 - 2 Miles SE	W
Y99	1 - 2 Miles ESE	NW
Z100	1 - 2 Miles NNW	SW,W,Varies
Z101	1 - 2 Miles NNW	SW,W,Varies
Z102	1 - 2 Miles NNW	SW,W,Varies
103	1 - 2 Miles North	E
AA104	1 - 2 Miles South	SE
AA105	1 - 2 Miles South	SE
106	1 - 2 Miles SE	NNE
Y107	1 - 2 Miles ESE	NE
AB108	1 - 2 Miles NE	NE,W,Varies
AB109	1 - 2 Miles NE	SW
110	1 - 2 Miles SE	WSW
AC111	1 - 2 Miles WSW	SE
AC112	1 - 2 Miles WSW	Varies
AC113	1 - 2 Miles WSW	Varies
AD114	1 - 2 Miles SSW	NNE
AD115	1 - 2 Miles SSW	Varies
AE116	1 - 2 Miles SE	SW
AE117	1 - 2 Miles SE	SW
AF118	1 - 2 Miles SSW	SW
AF119	1 - 2 Miles SSW	SW
AG120	1 - 2 Miles NW	E
AG121	1 - 2 Miles NW	E
122	1 - 2 Miles WSW	SW
123	1 - 2 Miles ENE	Varies
AH124	1 - 2 Miles West	Varies
AH125	1 - 2 Miles West	Varies
AH126	1 - 2 Miles West	Varies
127	1 - 2 Miles NW	NW
AI128	1 - 2 Miles SSW	NNE
129	1 - 2 Miles East	NE
AH130	1 - 2 Miles West	Varies
AH131	1 - 2 Miles West	Varies
132	1 - 2 Miles ENE	N
133	1 - 2 Miles WNW	SE
AI134	1 - 2 Miles SSW	NNE
135	1 - 2 Miles SSW	SW
136	1 - 2 Miles SE	WSW

For additional site information, refer to Physical Setting Source Map Findings.

GROUNDWATER FLOW VELOCITY INFORMATION

Groundwater flow velocity information for a particular site is best determined by a qualified environmental professional using site specific geologic and soil strata data. If such data are not reasonably ascertainable, it may be necessary to rely on other sources of information, including geologic age identification, rock stratigraphic unit and soil characteristics data collected on nearby properties and regional soil information. In general, contaminant plumes move more quickly through sandy-gravelly types of soils than silty-clayey types of soils.

GEOLOGIC INFORMATION IN GENERAL AREA OF TARGET PROPERTY

Geologic information can be used by the environmental professional in forming an opinion about the relative speed at which contaminant migration may be occurring.

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

ROCK STRATIGRAPHIC UNIT

Era: Cenozoic
 System: Quaternary
 Series: Quaternary
 Code: Q (decoded above as Era, System & Series)

GEOLOGIC AGE IDENTIFICATION

Category: Stratified Sequence

Geologic Age and Rock Stratigraphic Unit Source: P.G. Schruben, R.E. Arndt and W.J. Bawiec, Geology of the Conterminous U.S. at 1:2,500,000 Scale - a digital representation of the 1974 P.B. King and H.M. Beikman Map, USGS Digital Data Series DDS - 11 (1994).

DOMINANT SOIL COMPOSITION IN GENERAL AREA OF TARGET PROPERTY

The U.S. Department of Agriculture's (USDA) Soil Conservation Service (SCS) leads the National Cooperative Soil Survey (NCSS) and is responsible for collecting, storing, maintaining and distributing soil survey information for privately owned lands in the United States. A soil map in a soil survey is a representation of soil patterns in a landscape. Soil maps for STATSGO are compiled by generalizing more detailed (SSURGO) soil survey maps. The following information is based on Soil Conservation Service STATSGO data.

Soil Component Name: URBAN LAND

Soil Surface Texture: variable

Hydrologic Group: Not reported

Soil Drainage Class: Not reported

Hydric Status: Soil does not meet the requirements for a hydric soil.

Corrosion Potential - Uncoated Steel: Not Reported

Depth to Bedrock Min: > 10 inches

Depth to Bedrock Max: > 10 inches

Soil Layer Information							
Layer	Boundary		Soil Texture Class	Classification		Permeability Rate (in/hr)	Soil Reaction (pH)
	Upper	Lower		AASHTO Group	Unified Soil		
1	0 inches	6 inches	variable	Not reported	Not reported	Max: 0.00 Min: 0.00	Max: 0.00 Min: 0.00

OTHER SOIL TYPES IN AREA

Based on Soil Conservation Service STATSGO data, the following additional subordinant soil types may appear within the general area of target property.

Soil Surface Textures: sand
 loamy sand
 silty clay loam

Surficial Soil Types: sand
 loamy sand
 silty clay loam

Shallow Soil Types: No Other Soil Types

Deeper Soil Types: sand

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

fine sand
stratified

ADDITIONAL ENVIRONMENTAL RECORD SOURCES

According to ASTM E 1527-00, Section 7.2.2, "one or more additional state or local sources of environmental records may be checked, in the discretion of the environmental professional, to enhance and supplement federal and state sources... Factors to consider in determining which local or additional state records, if any, should be checked include (1) whether they are reasonably ascertainable, (2) whether they are sufficiently useful, accurate, and complete in light of the objective of the records review (see 7.1.1), and (3) whether they are obtained, pursuant to local, good commercial or customary practice." One of the record sources listed in Section 7.2.2 is water well information. Water well information can be used to assist the environmental professional in assessing sources that may impact groundwater flow direction, and in forming an opinion about the impact of contaminant migration on nearby drinking water wells.

WELL SEARCH DISTANCE INFORMATION

<u>DATABASE</u>	<u>SEARCH DISTANCE (miles)</u>
Federal USGS	1.000
Federal FRDS PWS	Nearest PWS within 1 mile
State Database	1.000

FEDERAL USGS WELL INFORMATION

<u>MAP ID</u>	<u>WELL ID</u>	<u>LOCATION FROM TP</u>
No Wells Found		

FEDERAL FRDS PUBLIC WATER SUPPLY SYSTEM INFORMATION

<u>MAP ID</u>	<u>WELL ID</u>	<u>LOCATION FROM TP</u>
No PWS System Found		

Note: PWS System location is not always the same as well location.

STATE DATABASE WELL INFORMATION

<u>MAP ID</u>	<u>WELL ID</u>	<u>LOCATION FROM TP</u>
No Wells Found		

Environmental Bio-Systems, Inc.
707 View Point Road
Mill Valley, CA 94941
TEL: 415-381-5195; FAX: 415-381-5816; e-mail: augerpro@ips.net

APPENDIX D

Environmental Bio-Systems, Inc.
707 View Point Road
Mill Valley, CA 94941
TEL: 415-381-5195; FAX: 415-381-5816; e-mail: augerpro@ips.net

September 11, 2002

Ms. Eva Chu
Alameda County Health Care Services Agency
Department of Environmental Health
Environmental Protection Division
1131 Harbor Bay Parkway, Room 250
Alameda, CA 94502-6577

Re: Risk Management Plan
23rd Avenue Partners
1125 Miller Ave.
Oakland, California

Dear Ms. Chu:

Environmental Bio-Systems, Inc. (EBS) has been retained by Mr. Al Pelton of the Miller Avenue Partners to provide a risk management plan for the subject property at 1125 Miller Avenue in Oakland, California. This report summarizes the findings of work conducted at the subject site from December 1998 up to the Site Closure Report dated September 11, 2002. The purpose of the risk assessment is to evaluate whether petroleum hydrocarbon contamination in the form of diesel in soil and groundwater in the vicinity of a former underground storage tank location and subsurface utility trenches create a human health risk or risk of exposure. The assessment of human health risk or risk of exposure is used as a basis for a plan to manage potential future risks following EBS's recommended closure of the site.

Scope of Work

The scope of work included the following:

- 1) Provide a plan for managing potential risks identified for future activities at the site.

BACKGROUND

Site Description

The Site contains a single two-story building currently housing apartments and studio space. It is located at 1125 Miller Avenue, in the City of Oakland, County of Alameda, and California.

Miller Avenue bounds the Site from the southwest to north. Another apartment building lies across Miller Place to the northeast. A fenced parking and storage lot abuts the southeast end of the building.

Environmental Bio-Systems, Inc.
707 View Point Road
Mill Valley, CA 94941
TEL: 415-381-5195; FAX: 415-381-5816; e-mail: augerpro@jps.net

Site Background

The release at the Subject Property was discovered during the removal of two USTs in 1999. The Client owns the site. The principal project contacts are:

Client: Mr. Al Pelton, Dreisbach Enterprises, P.O. Box 7509, Oakland, CA 94601, tel.: (510) 533-6600.

Consultant: Mr. James A. Jacobs, C.H.G.#88, Chief Hydrogeologist, Environmental Bio-Systems, Inc., 707 View Point Road, Mill Valley, CA 94941, tel.: (415) 381-5195.

Site Environmental History

December 1998

EBS excavated and removed two 5,000-gallon diesel USTs and associated product piping from the site. Soil samples contained up to 1,800 milligrams per kilogram (mg/kg) TPHd and 0.051 mg/kg xylenes..

October 2000

In October 2000, EBS drilled four soil cores (designated TW1, TW2, TW3 and D1). Shallow soil (3 ft.) contained up to 3,400 mg/kg of diesel. Benzene was detected only at depth (16.5 feet) at 1.4 mg/kg in the soil. Diesel and benzene were detected up to 800 65 µg/L and 65 µg/L in groundwater, respectively. The results are summarized in the attached Tables 1 and 2 from the December 31, 2001 EBS Subsurface Investigation Report.

CONTAMINANT FATE AND TRANSPORT

Chemicals are attenuated in the soil through a variety of factors, including diffusion, dispersion, adsorption, advection, natural attenuation and decay. In addition, chemical interaction with other organic and inorganic constituents of the aquifer makes it difficult to predict with great accuracy the movement and fate of chemicals in the groundwater. Other variables affecting mobility are solubility, adsorption characteristics and degradation

• Potential Routes of Migration

The potential routes of contaminant migration are limited in the study area to movement through soil, groundwater, and air. Buried utilities along Miller Avenue may have some potential to act as a conduit for migration, however, these utilities are located hydraulically up-gradient from the former UST excavation and are therefore very unlikely to be impacted by residual contamination.

Migration of the minor amounts of remaining volatile (benzene) contamination through air is highly unlikely due to the depth below ground surface (>16 feet) at which contamination remains. Further, contaminant migration through air would be impeded by pavement covering the site and by clay soils in the shallow subsurface.

Environmental Bio-Systems, Inc.
707 View Point Road
Mill Valley, CA 94941
TEL: 415-381-5195; FAX: 415-381-5816; e-mail: augerpro@ips.net

Contamination within shallow soil and groundwater could volatilize and disperse into the atmosphere where inhalation of vapor could become a health risk.

Another possible exposure pathway is for groundwater to transport the contaminants into domestic water wells where the contaminants are ingested. The site is served by a public water supply and no domestic wells are known to be located on site or adjacent properties. Based upon information supplied by the Alameda County Health Care Services Agency, the Regional Water Quality Control Board, Region 2 and the Environmental Data Resources database report, no drinking water wells are located within 1 mile of the site in the down-gradient direction.

The underground storage tanks formerly located at the site were removed and surrounding impacted soils were later excavated and disposed. Secondary exposure sources include subsurface soils (> 3 feet) and a plume of dissolved phase petroleum hydrocarbon contamination.

- **Factors Relating to Contamination Migration**

Hydrocarbons entering the vadose zone become part of a complex three-phase system. The solid phase (primarily mineral particles) provides a matrix within which water, solutes, organic matter, and contaminants such as these chemicals are absorbed. The voids or pores between these solid particles are filled with liquid and gaseous phases. Factors in remediation are soil texture, structure, porosity, moisture content, organic matter content, and temperature.

- **Contaminant Persistence**

Diesel and the BTEX chemicals are likely to break down in-situ into non-toxic chemicals based on widespread, naturally occurring, aerobic biological or chemical processes. No evidence is available currently proving that contamination is migrating from the site. Adsorption onto the soil is likely to occur.

RISK ASSESSMENT

- **Human Health Evaluation**

The risk assessment for the property evaluated the potential human health and environmental risks existing on the property. The risk assessment focuses primarily on assessing potential health risks posed to on-site workers or tenants. Benzene, a known carcinogen, is the chemical of primary concern for this study.

- **Exposure Assessment**

The primary exposure pathways through which humans could encounter TPH-d in soil or TPH-d or the BTEX compounds in groundwater in the study area include:

Environmental Bio-Systems, Inc.

707 View Point Road

Mill Valley, CA 94941

TEL: 415-381-5195; FAX: 415-381-5816; e-mail: augerpro@jps.net

- Inhalation (breathing) of chemicals emanating from the property. Since the chemicals in the soils at 2 feet to 10+ feet below ground surface in the 1,800 square foot study area contain a relatively non-permeable dark gray stiff clay and pavement at the surface, the potential for exposure in air or in the breathing zone is very limited.
- Ingestion (eating) of chemical-laden soil or water. This method of exposure is highly unlikely since the impacted soils at approximately 3 feet to 17 feet below ground surface are overlain by a concrete or asphalt pavement; therefore, soil exposure is limited. Shallow groundwater is not used for drinking purposes, so water exposure to human receptors is limited.
- Dermal (skin) contact with contaminated soils. Since the chemicals in the soils and groundwater in the study area are unlikely to have a pathway to human receptors, the shallow soils (3 feet) or breathing zone exposure to diesel or benzene is near zero. In addition, this method of exposure is highly unlikely since the impacted soils at 3 feet to 17 feet below ground surface are overlain in most areas by a concrete or asphalt pavement, and soil exposure is limited.

The on-site accessibility to native soils at depths of 3 to 17 feet and to groundwater is limited. Communication via vertical conduits in the study area is minimal due to stiff dark gray clay. This lithologic description is consistent with low permeable materials, minimizing the potential vertical migration of the hydrocarbons to within zones that could release the hydrocarbons into the atmosphere or into shallow soil zones that could be ingested.

- Toxicity Assessment

The primary constituents of concern with respect to toxicity on this property are benzene. In California, benzene is listed as a carcinogen. Because the shallow groundwater on the property is not presently and is unlikely to be used as a source of drinking water, human exposure to benzene are not likely to occur in the study area.

RECOMMENDATIONS

- 1) Based on the evaluation of the chemical data and the exposure pathways and human health risks, this study suggests a minimal present or future risk of exposure at the site.
- 2) Based on this finding, EBS recommends case closure for the site at 1125 Miller Avenue in Oakland, California.

RISK MANAGEMENT

Due to the limited exposure pathways listed above (inhalation, ingestion, and dermal contact), the risk of human exposure to contaminated soil or groundwater is limited at the property as it is

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currently utilized and configured. To properly manage potential future risks of human exposure, EBS recommends the following.

- If the subsurface soil at the subject property is disturbed (i.e. excavated), proper monitoring of exposed soil, groundwater, and any resulting vapors should be conducted. Proper monitoring is necessary to minimize exposure risk of workers or tenants to chemicals, which may be contained in soil and groundwater.

During future earth moving activities at the site, the contractor working at the site should monitor the work area and most importantly the breathing zone of the workers for volatile organic vapors. The breathing zone of the workers should be monitored using a photoionization detector or equivalent instrument to measure the concentration of volatile organic vapors in air.

If photoionization detector (PID) readings indicate that high concentrations of volatile organic vapors are present within the breathing zone of the workers, the workers should be removed from the area until concentrations are below approximately 15 parts per million in the breathing zone. If possible, work should be conducted where PID readings for air in the breathing zone are zero. If high concentrations of volatile organic vapors persist in the breathing zone, work should be conducted in modified level D personal protective equipment (standard work uniform with an OSHA approved air purifying respirator).

Every effort should be made to avoid contact of future site workers with site groundwater. If skin contact of workers with site groundwater is unavoidable due to the nature of a task to be performed, those personnel should conduct work in a modified personal protection level D (nitrile gloves, tyvek® or other splash protective suit, and rubber overboots).

- Groundwater at the site is unsuitable for human consumption and may present an increased risk of human exposure to potentially contained chemicals if used for small-scale irrigation or other uses. Onsite groundwater use is not recommended or allowed, given the levels of contaminants present in the subsurface.
- If any structure is constructed over the area of residual soil and groundwater contamination in the future, potential health risks would be re-evaluated in terms of health risks to building occupants as a result of evaporation of volatile organic compounds from soil and groundwater into indoor air.
- Concrete is a porous pavement. The integrity of the pavement inside the building on the Subject Property is important. Using an impermeable concrete sealer and caulking all cracks will minimize any potential for upward migration of any contaminants and maintain the integrity of the pavement, which serves as a contamination cap. This reduces potential exposure risks within the building. Documentation of sealing and maintaining the concrete (with photos and letter report) is recommended as part of the Risk Management Plan.

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LIMITATIONS

The authors and firm offer no assurance and assume no responsibility for site conditions or activities, which were beyond the scope of work requested by the client and referenced in the introduction of this report. No soil engineering or geotechnical recommendations are implied or should be inferred. Evaluation of the geologic conditions at the site for the purpose of this investigation is made from a limited number of observation points. There may be variations in subsurface conditions away from the sample points available. Data from this report reflects the sample conditions at specific locations at a specific point in time. No other interpretations, representations, warranties, guarantees, express or implied, are included or intended by this report. This project involved hazardous or toxic compounds and there are certain inherent risk factors involved (such as limitations on laboratory or analytical methods or equipment, variations in subsurface conditions, and risks associated with specific analysis not requested by the client), which may adversely affect the results of the project, even though the services were performed with such skill and care as are generally accepted professional standards for the environmental geology profession.

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EBS will submit copies of this report to the following individuals after client approval:

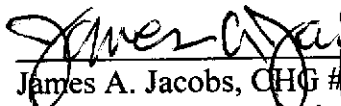
Ms. Eva Chu
Alameda County Health Care Services Agency
Department of Environmental Health
Environmental Protection Division
1131 Harbor Bay Parkway, Room 250
Alameda, CA 94502-6577

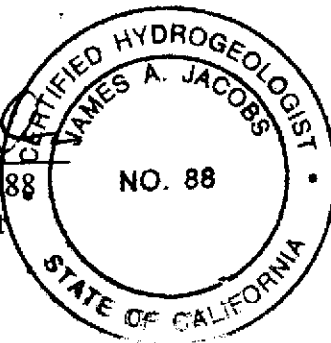
Mr. Al Pelton
Dreisbach Enterprises
P.O. Box 7509
Oakland, CA 94601

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EBS is pleased to have been of service on this project. If you have any questions or concerns, please call me at (415) 381-5195.

Sincerely,
Environmental Bio-Systems, Inc.


James A. Jacobs, CHG #88
Certified Hydrogeologist



A circular professional seal for James A. Jacobs, a Certified Hydrogeologist in the State of California. The seal contains the text: "CERTIFIED HYDROGEOLOGIST", "JAMES A. JACOBS", "NO. 88", and "STATE OF CALIFORNIA".

Attachment

TABLE 1. SOIL SAMPLE RESULTS

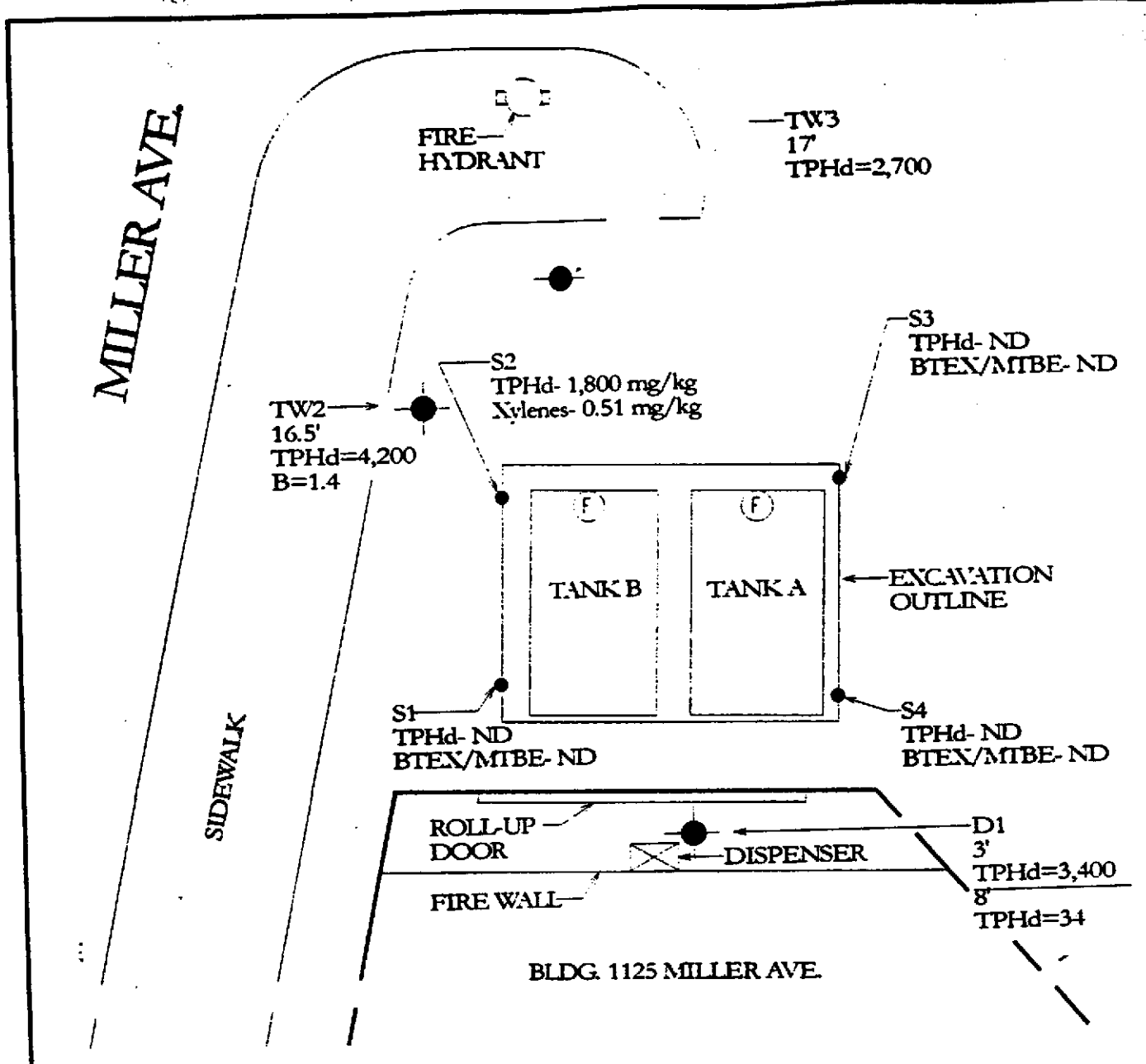
BORE-HOLE	DEPTH (feet)	TPHd (mg/kg)	BTEX (mg/kg)	MTBE (mg/kg)
TW2	16.5	4,200	B=1.4	ND
TW3	17	2,700	ND	ND
D1	3	3,400	ND	ND
D1	8	34	ND	ND

NOTES:
 TPHd: Total petroleum hydrocarbons quantified as diesel.
 BTEX: Benzene, toluene, ethyl benzene, total xylenes.
 MTBE: Methyl tert butyl ether.
 mg/kg: Milligrams per kilogram.
 ND: Not detected above the laboratory reporting limit.
 See laboratory report for individual reporting limits.

TABLE 2. GROUND WATER SAMPLE RESULTS

TEMPORARY WELL ID	TPHd (µg/L)	BTEX (µg/L)	MTBE (µg/L)
TW2	660	B=65 T=2.4 X=3.2	ND
TW3	800	B=0.90	ND

NOTES:
 TPHd: Total petroleum hydrocarbons quantified as diesel.
 BTEX: Benzene, toluene, ethylbenzene, total xylenes.
 MTBE: Methyl tert butyl ether.
 (µg/L): Micrograms per Liter.
 ND: Not detected above the laboratory reporting limit.
 See laboratory report for individual reporting limits.



NOTES:

- Soil Core/Temporary Well Location and Designation
- Sample results expressed in milligrams per kilogram (mg/kg).

FIGURE 3: SOIL SAMPLE RESULT



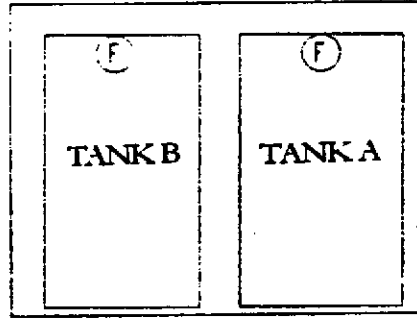
Client: 23rd Avenue Partners
 Site: 1125 Miller Ave., Oakland, CA
 Project: UST Removal
 Prepared by Environmental Bio-Systems, Inc.
 EBS Project #: 079-507A
 Scale: 1 inch = 10 feet
 Date of Work: 12/2/98

MILLER AVE.

FIRE HYDRANT

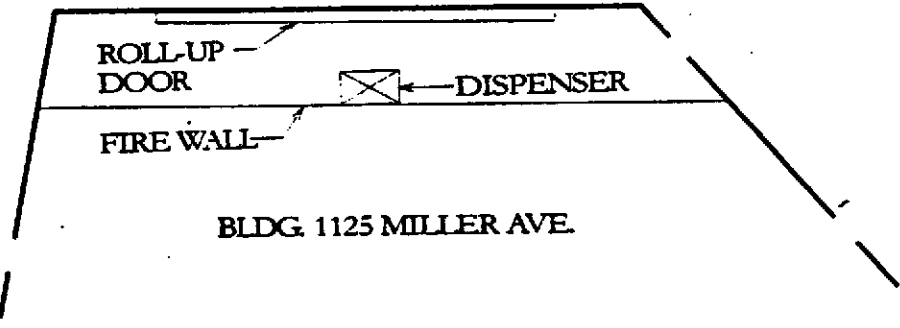
TW3
TPHd=800
B=0.90

TW2
TPHd=660
B=65
T=2.4
X=3.2



EXCAVATION
OUTLINE

SIDEWALK



ROLL-UP
DOOR

DISPENSER

FIRE WALL

BLDG. 1125 MILLER AVE.

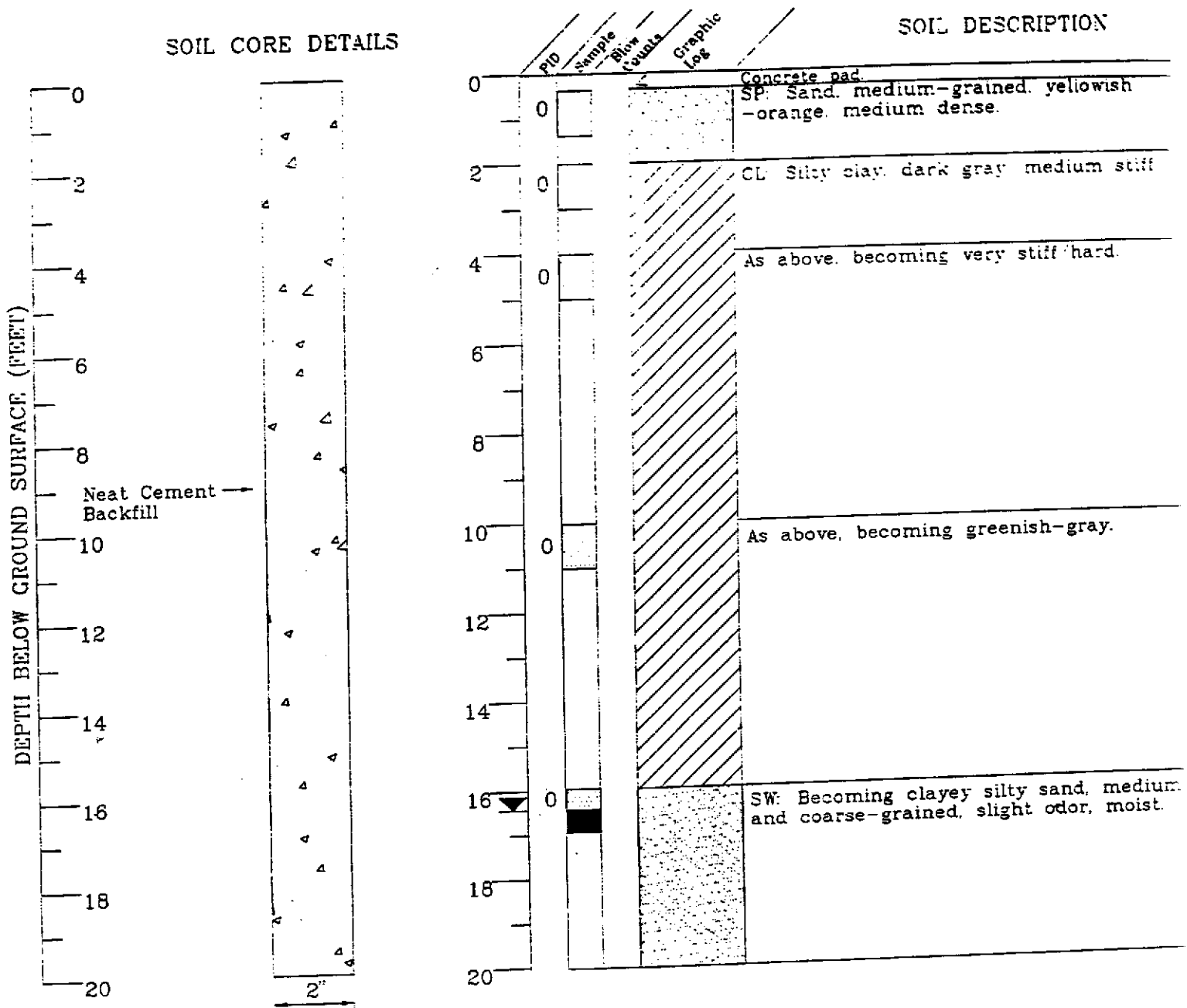
NOTES:

● Soil Core/Temporary Well Location and Designation
Sample results expressed in micrograms per liter (ug/l).

FIGURE 4: WATER SAMPLE RESULTS

Client: 23rd Avenue Partners
Site: 1125 Miller Ave., Oakland, CA
Project: UST Removal
Prepared by: Environmental Bio-Systems, Inc.
EBS Project #: 079-507.A
Scale: 1 inch = 10 feet
Date of Work: 12/2/98

LOG OF SOIL BORING TW2



Logged by: DAS
 Inspector: N/A
 Date(s): 10/23/00

Drilling Contractor: Fast-Tek
 Drilling Method: DPT
 Driller: Art

Sanitary Seal/Backfill: Neat Ceme
 Sampler Type: 4' Spoon
 Total Boring Depth: 20' bgs



**ENVIRONMENTAL
 BIO-SYSTEMS, INC.**

EXPLANATION

- water level during drilling
- potentiometric water level
- drill sample
- chemical analysis sample
- sieve sample
- grab sample
- gradational
- NR no recovery
- CONTACTS
- certain
- approximate
- uncertain

SITE:
 1125 MILLER AVENUE
 OAKLAND, CALIFORNIA

PROJECT #: 079-541A

CLIENT:
 DREISBACH ENTERPRISES
 P.O. BOX 7509
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