



REMEDIAL ACTION WORK PLAN
for

2345 East 14th Street
Oakland, California

8-28-00

Prepared For:

Mr. Stanley Wong
2200 East 12th Street
Oakland, CA 94606

By:

Sequoia Environmental Corporation

Project Code SW-01
August 28, 2000

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ENVIRONMENTAL
PROTECTION

This workplan was prepared by Sequoia Environmental Consulting Services for Mr. Stanley Wong. The subject property is located at 2345 East 14th Street, Oakland, California (Credit World Auto Sales).

Our professional service was offered using that degree of care and skill ordinarily exercised under similar circumstances by other professionals practicing in this field. No other warranty, express or implied is made as to professional advice in this report.

Prepared By:

Chris Wabuzoh

August 28'00

Chris Wabuzoh
Senior Geologist
REA #02842

Date

Ola Balogun, Ph.D., P.E.
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ABalogun

August 28, 2000
Date

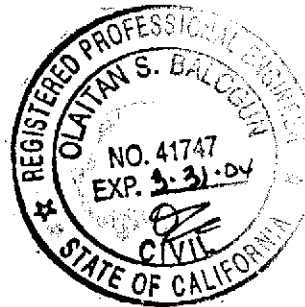


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**REMEDIAL ACTION WORKPLAN
2345 EAST 14TH STREET
OAKLAND, CALIFORNIA**

1.0 INTRODUCTION

Mr. Stanley Wong contracted Sequoia Environmental Corporation to prepare a Remedial Action Workplan (RAW) for the property located at 2345 East 14th Street, Oakland, California. The purpose of the workplan is to present the proposed remedial actions for the free product in the on-site groundwater monitoring wells. The RAW describes remedial procedures that are cost-effective, protective of human health and the environment, and complying with all applicable relevant and appropriate federal, state and local requirements. Feasibility study was not required for this project.

1.1 Objectives

The objectives of this project are as follows:

- Determine the extent of petroleum hydrocarbon plume.
- Determine the present level of free products in the on-site groundwater monitoring wells.
- Purge groundwater monitoring wells.
- Remediate contaminated groundwater using existing monitoring wells.
- Coordinate remedial activities with the Alameda County Department of Environmental Health.

1.2 Background Information

Previous environmental work performed at the site included the removal of four underground storage tanks, soil excavation, subsurface investigations and quarterly monitoring of on-site groundwater wells.

On August 5, 1988, four underground storage tanks and associated piping were removed from the site by Tank Protect Engineering of Northern California. The capacity of each tank varies from 1,000 to 8,000 gallons. The tanks were used to store unleaded gasoline and waste oil. Soil samples were collected from the bottom locations of the tanks and sent to a state certified laboratory for chemical analyses. The samples collected from the gasoline locations were analyzed for

total petroleum hydrocarbons as gasoline (TPH-G), aromatic hydrocarbons as benzene, toluene, ethylbenzene and xylenes (BTEX) and lead. Samples collected from the waste oil tank location were analyzed for total petroleum hydrocarbons as diesel (TPH-D), total oil and grease (TOG) and volatile organics using appropriate EPA Methods.

Laboratory results show that the samples collected from the gasoline tanks' locations contained 130 to 1,500 parts per million (ppm) of TPH-G, 0.17 to 160 ppm of BTEX and 4.6 to 316 ppm of lead. Ethylbenzene and total xylenes were the components of volatile organics detected. Laboratory results of samples collected from the waste oil tank location show TOG range from 570 to 780 ppm and TPH-D range from 65 to 110 ppm.

On October 3, 1988, Tank Protect Engineering performed a subsurface investigation. It involved the drilling of three soil borings. The purpose of the investigation was to characterize the soil in the vicinity of the tanks. Two soil borings (B-1 and B-2) were located in vicinity of the gasoline tanks and one boring (B-3) was located in the vicinity of the waste oil tank. The borings were drilled to 15 feet below ground surface (bgs). Groundwater was encountered and grab groundwater samples were collected. The soil and grab water samples were sent to state-certified laboratory for chemical analyses. Soil samples from B-1 and B-2 were analyzed for TPH-G, BTEX, and sample from B-3 was analyzed for BTEX, TOG and halogenated volatile organics using appropriate EPA Methods.

Laboratory results of the soil samples show that samples B-1 and B-2 contain 3.4 ppm and 83 ppm of TPH-G respectively. Sample B-3 contains 88 ppm of TOG and BTEX ranging from 0.360 to 0.850 ppm. Results of grab groundwater samples were 67,000 to 110,000 ppb for TOG in samples B-1 and B-2 respectively and BTEX ranging from 2,400 to 17,000 ppb. Grab water sample from boring B-3, contains 290,000 ppb of TOG, and BTEX ranging from 160 to 1,300 ppb.

The subsurface investigation showed that the soil in the vicinity of the former location of the underground storage tanks were impacted by petroleum hydrocarbons.

On May 22, 1991, Earth Systems Environmental, Inc., (ESE) performed a subsurface investigation at the site. The investigation involved drilling of five soil borings (TH-1 through TH-5) and installation of three groundwater monitoring wells (MW-1, MW-2 and MW-3). The purpose of the investigation was to further characterize the soil at the subject property. The soil borings were located as listed below.

Boring TH-1 is at the center of former tank locations.

Boring TH-2 is at the easterly end.

Boring TH-3 is at the westerly end near the waste oil.

Boring TH-4 is between borings TH-1 and TH-3.

Boring TH-5 is at the southerly end.

Monitoring well MW-1 is at the south side of former underground storage tank location.

Monitoring wells MW-2 and MW-3 are at the north and west side of the property lines.

With the exception of boring TH-1, two soil samples were collected from the borings and monitoring wells. One sample was collected from boring TH-1. With the exception of boring TH-2, all soil samples were collected at 10 and 18 feet bgs. In boring TH-2 a sample was collected at 30 feet bgs. Samples collected from the gasoline tanks areas were analyzed for TPH-G, samples from the waste oil tank area were analyzed for total recoverable hydrocarbons (TRH) and TPH-G, and samples from boring TH-5 were analyzed for TPH-G and BTEX.

Laboratory results for the soil samples are listed below.

With the exception of one sample from TH-5, all the soil samples contained detectable levels of TPH-G that range from 10 to 4,320 ppm.

The deeper sample collected from boring TH-5 was non-detect for all the analytes.

All the soil samples contained TRH which range from 20 to 1,600 ppm.

BTEX was detected in the samples collected from the former gasoline tanks areas.

Water samples collected from the monitoring wells were analyzed for TPH-G and BTEX. Laboratory results of the groundwater samples show that TPH-G was detected in well MW-1 and MW-2 at concentration of 2,090,000 ppb and 10,000 ppb respectively. BTEX was detected in well MW-1 at concentrations ranging from 2,145 to 23,150 ppb. TPH-G and BTEX were non-detect in well MW-3. Subsequent monitoring of the three groundwater wells shows the presence of free product in all the wells.

On July 22 and 23, 1993, Tank Protect Engineering performed a subsurface investigation of the site. The purpose of the investigation was to determine the lateral and vertical extent of petroleum hydrocarbons in the vadose zone. Two soil borings, MW-4 and MW-5, were drilled and completed as monitoring wells. Boring MW-4 was located at the east corner of the site and MW-5 was located downgradient from the former tank locations. Borings MW-4 and MW-5 were drilled to 34.5 feet and 24 feet respectively. Soil samples were collected during drilling, and in addition, the new and three existing monitoring wells were monitored to determine the depth to groundwater and any presence of free

product. Free product was present and the thickness varies from 0.01 to 0.77 feet. Groundwater samples were collected from the wells.

All the samples were sent to state-certified laboratory for chemical analyses. They were analyzed for TPH-G, BTEX using appropriate EPA Methods. Laboratory results of the soil samples collected from wells' MW-4 and MW-5, show that TPH-G was detected in all the samples collected at approximately 16 feet bgs. BTEX was detected only in samples collected from boring MW-5 at a depth of approximately 16 feet bgs. Laboratory results of the groundwater samples show that TPH-G and BTEX were detected in all five wells. Levels of TPH-G in MW-1, MW-2, MW-3, MW-4 and MW-5 are 150,000 ppb, 49,000 ppb, 9,600 ppb, 150 ppb and 120,000 ppb respectively. Well MW-4, which is located up-gradient, had levels of BTEX that range from 0.8 to 3.7 ppb.

The subsurface investigation shows that well MW-4 is the limit of eastward migration of petroleum hydrocarbons.

In 1994, Tank Protect Engineering performed excavation of the former underground tanks' locations. The purpose of the excavation was to remove soil impacted by petroleum hydrocarbons. Using a backhoe, an area of approximately 2,520 square feet was excavated. Impacted soil was placed on plastic sheeting. Verification samples were collected at various stages during the excavation. Excavated soil was treated on-site and was used for backfilling upon approval by the Alameda County Department of Environmental Health.

On May 5, 1997, Tank Protect Engineering performed a subsurface investigation. The purpose of the investigation was to use soil borings to determine the extent of groundwater contamination. Borings SB-1 and SB-2 were located in the up-gradient direction and SB-3 through SB-5 were located in the downgradient direction. The borings were drilled to 30 feet bgs, and soil and grab groundwater samples were collected. All the samples were analyzed for TPH-G and BTEX.

Laboratory results show that TPH-G was detected in soil samples collected from boring SB-2 (16.5-17.0) and SB-5 (11.5-12.0) at levels of 3.7 ppm and 91 ppm respectively. Levels of BTEX vary from 0.0071 to 0.042 ppm. Laboratory results of the grab groundwater samples show that TPH-G, benzene and ethylbenzene were detected in water samples collected from SB-2W and SW-5W at concentrations of 6,100 ppb, 870 ppb and 17 ppb; and 890 ppb, 5.4 ppb and 1.4 ppb respectively.

Presently all five groundwater wells are monitored on a quarterly basis by Tank Protect Engineering. The last reported monitoring was performed on December 28, 1999. During the monitoring activities free product was present in wells MW-1, MW-2 and MW-3, and Product thickness was 0.25-, 1.32- 4.5 feet

respectively. Groundwater samples were collected from all the wells and analyzed for TPH-G, BTEX and MTBE using appropriate EPA Methods. Laboratory results show that TPH-G was detected in wells MW-1, MW-2, MW-3 and MW-5 at concentration of 27,000 ppb, 75,000 ppb, 4,300 ppb and 25,000 ppb respectively. TPH-G, MTBE and BTEX were non-detect in well MW-4. The determined groundwater gradient is 0.02 feet per foot in north-northwest direction.

• Need a baseline monitoring (last event was 12/99)

2.0 DEFINE EXTENT OF PETROLEUM HYDROCARBON PLUME

Prior to site mitigation, Sequoia Environmental proposes to define the extent of petroleum hydrocarbon plume at the project by performing subsurface investigation.

2.1 Soil Boring/Monitoring Well

Sequoia Environmental proposes to drill ⁽⁷⁾ ~~eight~~ soil borings and collect soil and groundwater samples. The proposed borings will be located as listed below.

Two soil borings (SB-1, SB-2) will be located at the north and northeast corner of monitoring well MW-2 respectively.

One soil boring (SB-3) will be located at the southwest corners of MW-2.

One soil boring (SB-4) will be located at the west corner of monitoring well MW-3.

One soil boring (SB-5) will be located at the east corner of MW-3.

One soil boring (SB-6) will be located at the northeast corner of MW-1.

One soil boring (SB-7) will be located at the south corner of monitoring well MW-1.

See Figure 4 for the locations of the proposed soil borings and monitoring well locations.

The borings will be drilled with truck mounted hollow stem auger. Each boring will be drilled to 15 feet below ground surface. During drilling, soil samples will be collected at 5-foot interval using California Modified Split Spoon Sampler containing three brass liners. At the end of each sampling run, the ends of middle brass liner will be covered with Teflon foil and caps, sealed with duct or clear tape and labeled. The liner will be placed in a cooler containing ice. Soil samples from the remaining liners will be emptied into a zip-lock bag, kept under sunshine and screened with organic vapor analyzer (OVA) after 120 seconds. The soil will be later examined and described using Unified Soil Classification System (USCS). During drilling of each soil boring, grab water samples will be collected if groundwater is encountered. Drilling will be stopped if groundwater is encountered before 15 feet below ground surface.

The soil boring, SB-7, at the east corner of MW-1 is located at the up-gradient direction of the project site. The boring will be drilled to 20 feet below ground surface into the saturated zone. The boring will be constructed as a four-inch injection well. It will be constructed with 4-inch 15 feet PVC casing and 4-inch 5 feet PVC screen. The annular space will be filled with Monterey sand up to 2 feet above the screen/casing joint, 2 feet of bentonite and cement grout. The well will be secured with a Christy box and lock (see Figure 5 for well construction).

At the completion of construction, the well will be developed by purging with an electric pump or disposable bailer. Prior to purging, the well will be gauged with an interphase probe to determine the depth to groundwater and any possible presence of free product. In addition, existing groundwater monitoring wells (MW-1, MW-2, MW-3 and MW-5) will be gauged and purged. Well purging will be stopped when temperature, conductivity, pH appear to have stabilized. The wells will be allowed to recharge to approximately 80 to 90 percent of their initial volume. Using a disposable bailer, groundwater samples will be collected and put into 40-ml glass vials containing dilute hydrochloric as preservative. The vials will be labeled and placed in a cooler containing ice.

All soil and groundwater samples will be sent to a state-certified environmental laboratory for chemical analysis following proper chain of custody procedures. The samples will be analyzed for TPH-G, BTEX and MTBE. / 8260

All drilling activities will be performed in accordance with the Regional Water Quality Control Board, San Francisco Bay Region and Alameda County Environmental Services guidelines. All project activities will be supervised by a professional engineer or registered geologist.

Baseline Sampling

At the completion of analytical results, a subsurface investigation report will be compiled. The report will contain drilling activities, field observation, drill logs and analytical results. The findings of the report will be used to document the baseline sampling at the project site.

3.0 TREATMENT PROCESS

Previous subsurface investigations show that petroleum hydrocarbons did impact the soil and groundwater.

Depth to groundwater at the site varies from 12 to 16.50 feet below ground surface.

(1997)

Soil boring SB-5 appears to indicate that low levels of petroleum hydrocarbons migrated off-site. No free product was present in groundwater sample.

Monitoring well MW-3 and boring SB-2 appear to indicate that petroleum hydrocarbons migrated in the southward direction. No free product was present in the groundwater sample collected from boring SB-2.

The contaminant at the project site is ^{TPH &}aromatic hydrocarbons. It is amenable to biological degradation. Biodegradation process enhances natural biological activities in soil and groundwater in order to increase petroleum hydrocarbon decomposition. The end products are carbon dioxide and water.

Biotreatment

Groundwater will be pumped from designated extraction wells into four holding tanks connected in series with capacities of 200 gallons. Treated water leaving the holding tank will be pumped into the subsurface through an infiltration or injection well (see Figure 2).

Surface pumps will be installed at the four extraction wells (MW-1, MW-2, MW-3 and MW-5). Groundwater pumped from the wells will be connected to bioreactor tanks containing microbes, nutrients and hydrogen peroxide. In addition, aeration system of 4 cfm will be connected to the tanks. Groundwater water will circulate in the tanks. At the completion of circulation (residency period), treated water will be re-injected into the subsurface through an infiltration well. The treated water leaving the tank contains microbes which are deposited in the soil and groundwater. These microbes accelerate the treatment process. Bacterial activities will increase as continuous water with microbes travel to the infiltration well which is in an up-gradient direction.

The treatment process will be monitored to document the progress of the treatment activities. Initial monitoring will be performed two weeks after inception. Subsequent monitoring will be performed on a monthly basis. During monitoring activities, water samples will be collected from sample ports located along the pipes leading from the extraction wells, into and leaving the bioreactor. The samples will be analyzed for TPH-G, BTEX and MTBE. In addition to collecting water samples, the treatment system will be checked for malfunctioning and correction made if any. Prior to each monitoring activity the environmental health inspector will be notified 72 hours before commencement of field activities.

At the completion of analytical results a monitoring report will be compiled. The report will contain all field activities, observation, laboratory results and next monitoring schedule.

3.1 Permits and Notification

No permit will be required to perform the tasks outlined in this Remedial Action Workplan. The county environmental health inspector will be notified four days prior to commencing any field activities.

3.2 Site Map and Plans

Site plan, groundwater gasoline concentration plan and groundwater gradient map that were used to compile the remedial action workplan were prepared by Tank Protect Engineering. They are presented in Appendix A.

Figure 1, shows the Site Map of project location.

Figure 2, shows a sketch of the treatment system.

Figure 3, shows the Site Plan.

Figure 4, shows proposed soil/groundwater well locations.

Figure 5, shows extraction well construction.

Figure 7, shows Groundwater Gradient Map.

Figure 9, shows Groundwater Gasoline Concentration.

3.3 Schedule

Upon approval from the Alameda County Department of Environmental Health, mobilization for remediation activities will begin.

Activity	Duration (in weeks)								
Purging of Wells	x	x	x						
Construction & Treatment				x	x				
Monitoring									x

4.0 EVALUATION OF TREATMENT PROCESS

Initially, remediation system will be monitored after seven days of operation. Subsequent site visits will be on a bi-weekly to monthly basis, which will be based on the progress of the treatment of free product. Generally, the remediation system does not require frequent monitoring.

4.1 Project Evaluation

The monitoring activities will involve measuring the depth to groundwater and free product if any. A monitoring report describing all project activities and field

observations will be prepared. The report will be sent to the Alameda County Department of Environmental Health for review and approval.

A compilation of monitoring reports may be used to determine if further subsurface investigation at the site is necessary.

4.2 Key Contaminants

Samples collected during the performance of this project will be analyzed for TPH-G, BTEX and MTBE. It is expected that the levels of these analytes will be reduced in sympathy with the treatment of free product.

4.3 Potential Delays

Potential delays during the performance of this project may be due to adverse weather conditions that may inhibit field activities. Delays due to personnel and equipment are not likely.

4.4 Hours of Operation

All project activities will be performed during daylight hours (8am to 5pm).

5.0 SITE MONITORING PLAN

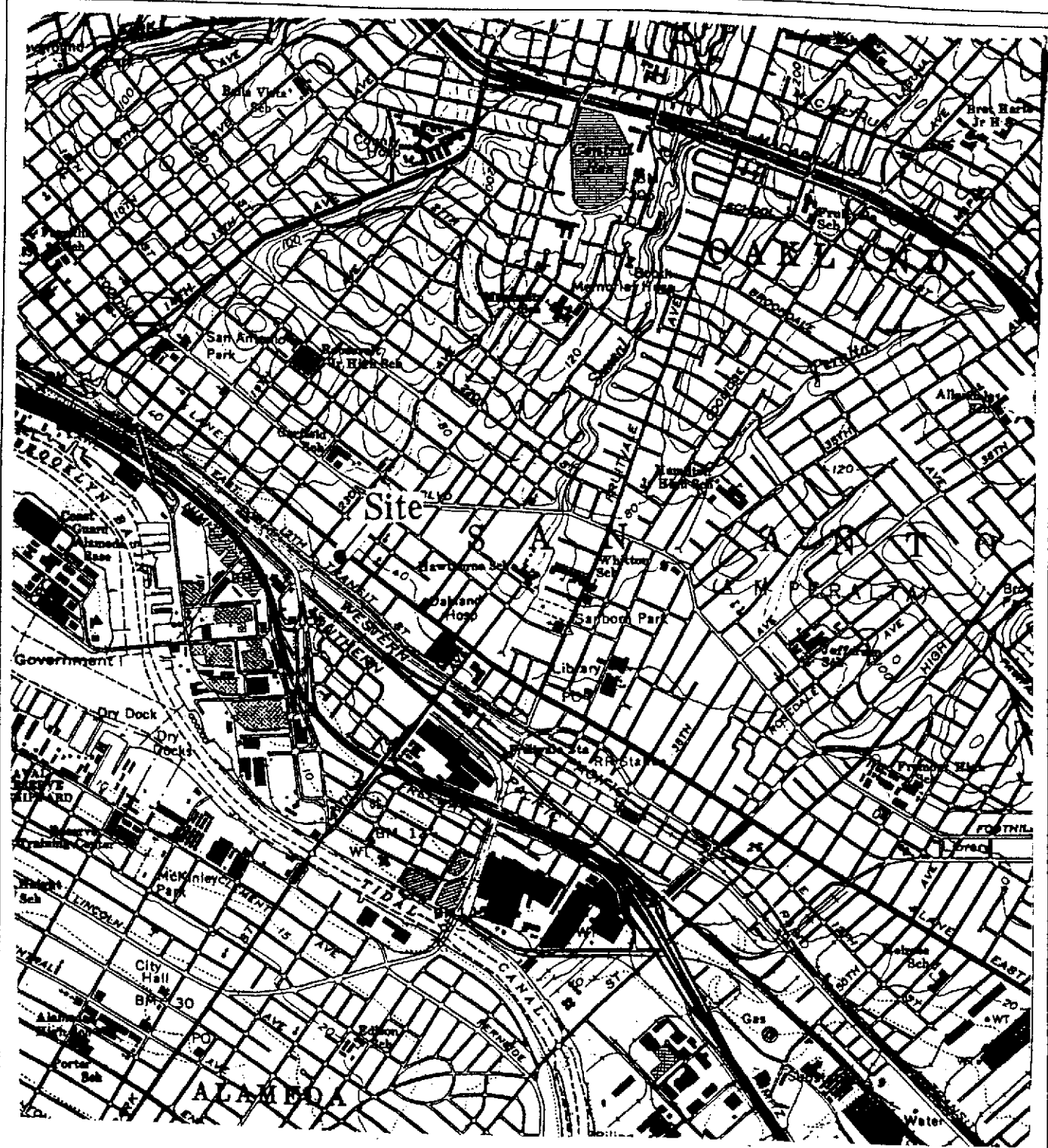
At the completion of free product treatment, Sequoia Environmental proposes to monitor the groundwater wells for two quarters. During the monitoring activities, the wells will be gauged, purged and groundwater samples collected for chemical analyses. All groundwater-monitoring activities will be in accordance with the Alameda County Department of Environmental Health and the Regional Water Quality Control Board guidelines.

6.0 SECURITY

Remediation system will be on-site. The subject site will be secured with chain link fence and a lock.

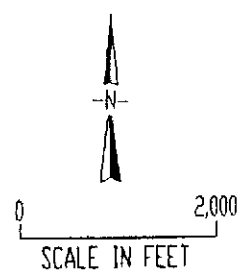
6.1 Public Notification

Information about activities and chemicals of concern as determined by the state will be posted outside the treatment unit.



LEGEND

REFERENCE: USGS 7.5 MINUTE
 SERIES QUADRANGLE MAP
 OAKLAND EAST, CALIFORNIA
 PHOTOREVISED 1980



TANK PROTECT ENGINEERING

SITE VICINITY MAP.

CREDIT WORLD AUTO SALES
 2345 E. 14TH STREET
 OAKLAND, CA 94601

DATE	5/21/97
FIGURE	1
FILE #	267-3N
DRAWN BY	YK
CHECKED BY	LNI

0a well has a surface pump.

12/99 ←
←

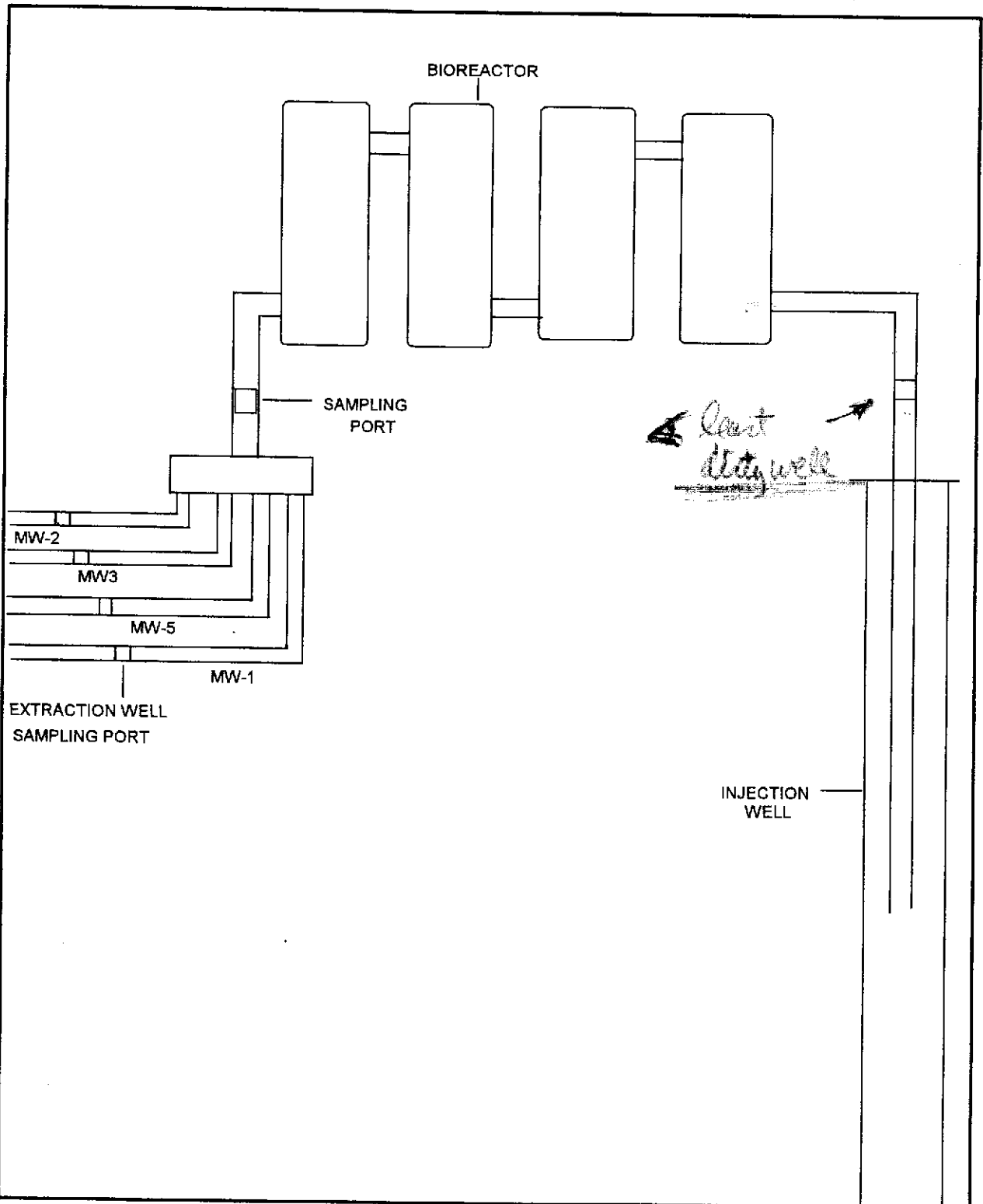
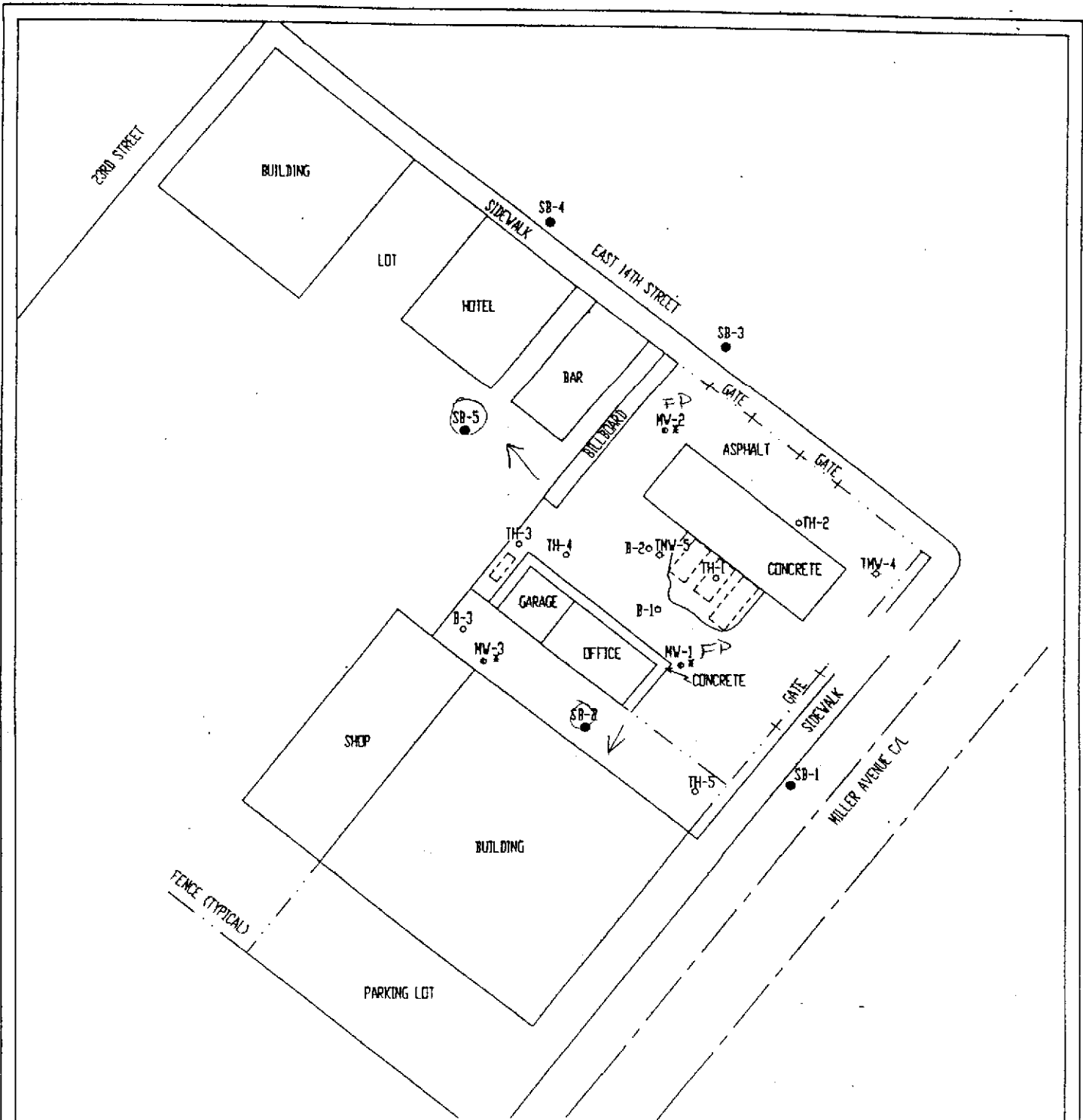


FIGURE 2

MAP TYPE: BIOREMEDIATION SYSTEM DATE: FEBRUARY 5, 2001

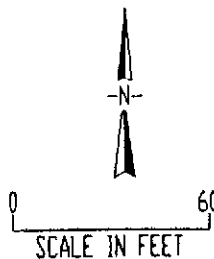
SITE ADDRESS: 2345 EAST 14TH STREET, CALIFORNIA SCALE: NOT TO SCALE

SEQUOIA ENVIRONMENTAL 11 Aladdin Avenue, Suite B, San Leandro, CA 94577 (510)614-1900



LEGEND

- TMW-4 NAME AND LOCATION OF MONITORING WELL INSTALLED BY TPE
- MW-1 NAME AND LOCATION OF MONITORING WELL INSTALLED BY OTHERS
- B-1 NAME AND APPROXIMATE LOCATION OF SOIL BORING DRILLED BY OTHERS
- SB-1 LOCATION OF SOIL BORING
- □ □ □ LOCATION OF FORMER UNDERGROUND STORAGE TANK



TANK PROTECT ENGINEERING

SITE PLAN:
LOCATION OF SOIL BORINGS

CREDIT WORLD AUTO SALES
2345 E. 14TH STREET
OAKLAND, CA 94601

DATE	5/21/97
FIGURE	3
FILE #	267-27N
DRAWN BY	VK
CHECKED BY	LMH

5/22/01 Site insp. - all 7 borings (1 new) near completion @ 230 pm.
 will survey wells tomorrow.

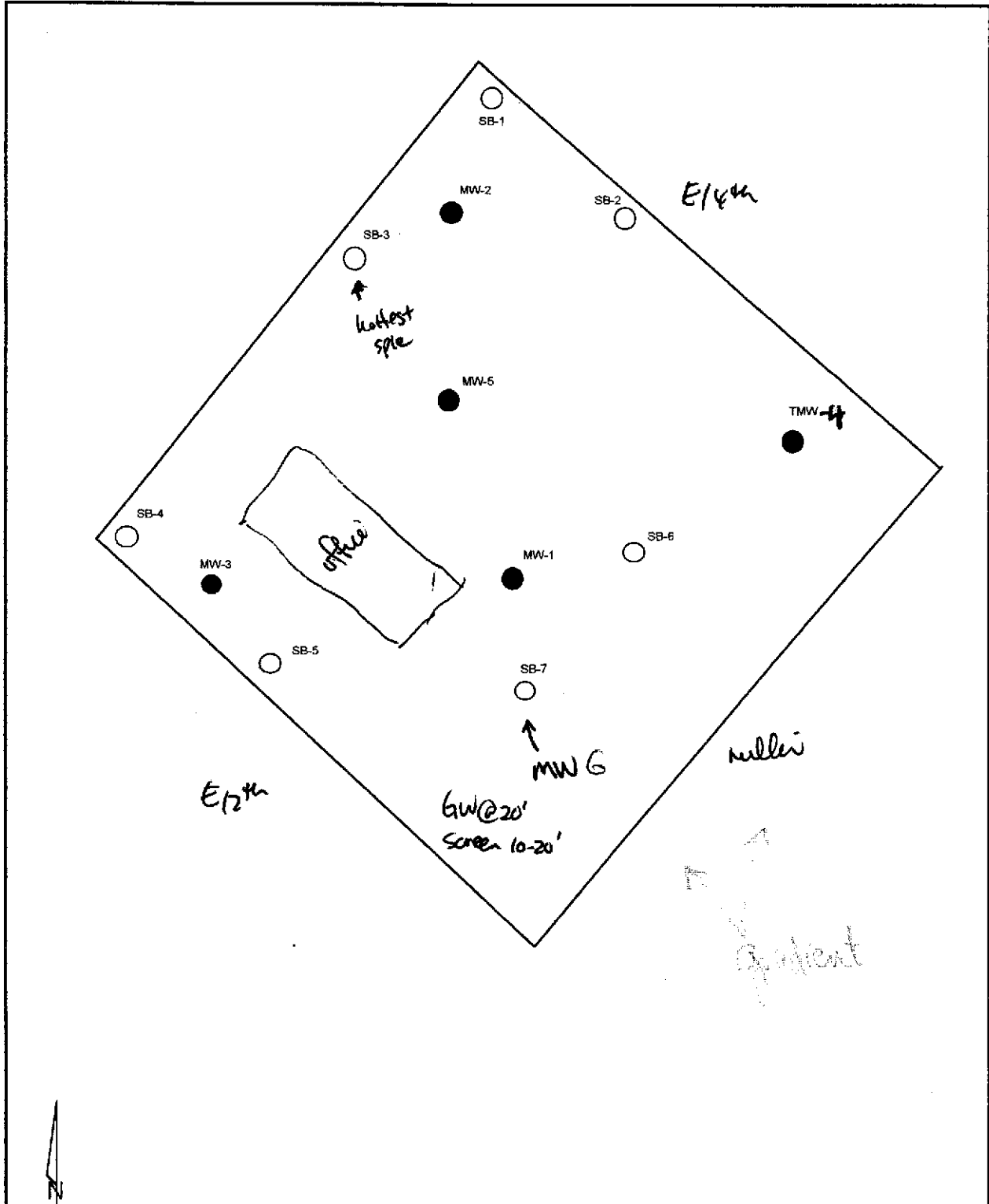


FIGURE 4

MAP TYPE: PROPOSED SOIL/GROUNDWATER LOCATIONS	○ PROPOSED BORING LOCATION	SCALE: NOT TO SCALE
SITE ADDRESS: 2345 EAST 14TH STREET, CALIFORNIA	● EXISTING MONITORING WELL	DATE: FEBRUARY 5, 2001
SEQUOIA ENVIRONMENTAL 111 Aladdin Avenue, Suite B, San Leandro, CA 94577 (510)614-1900		

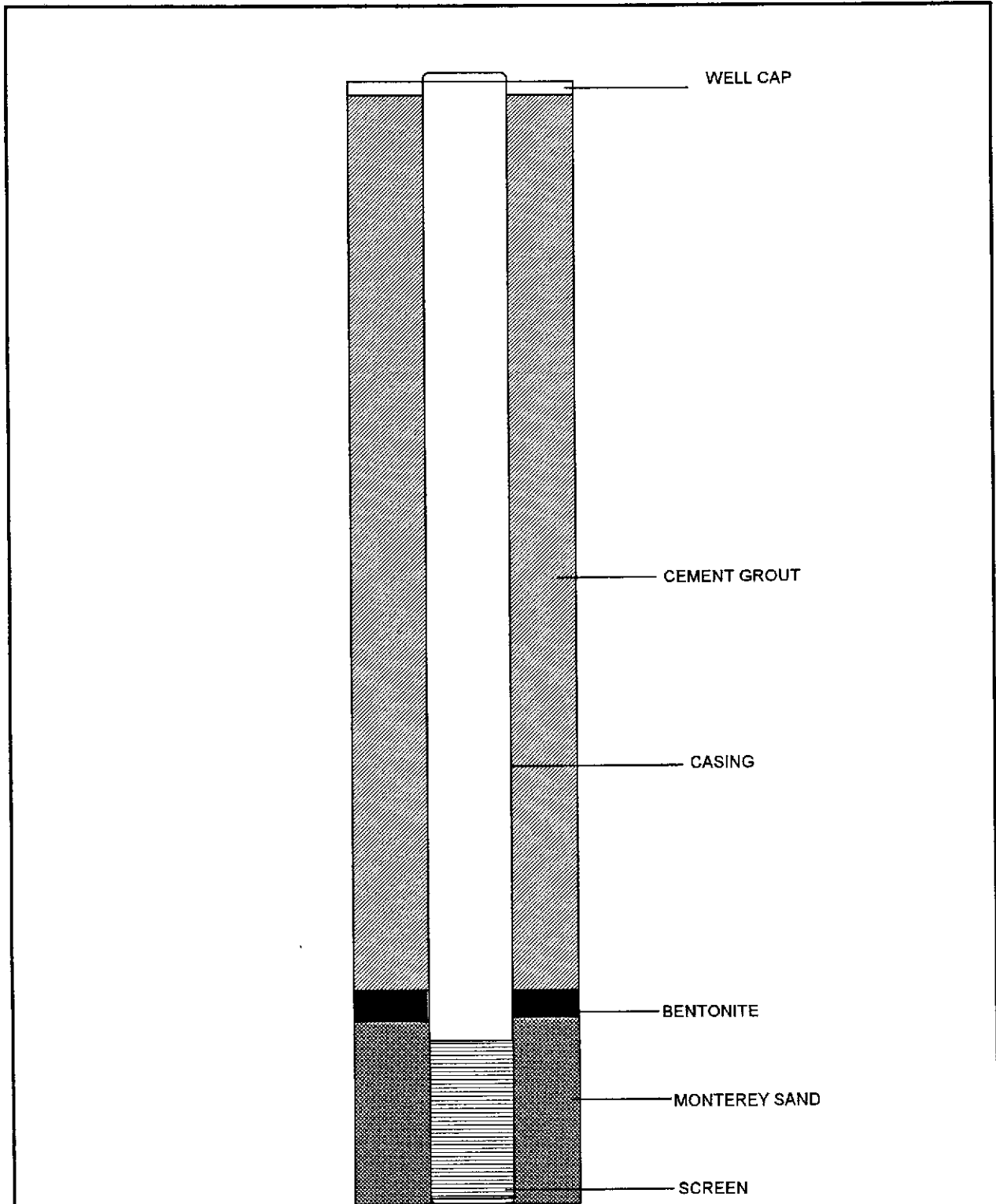


FIGURE 5

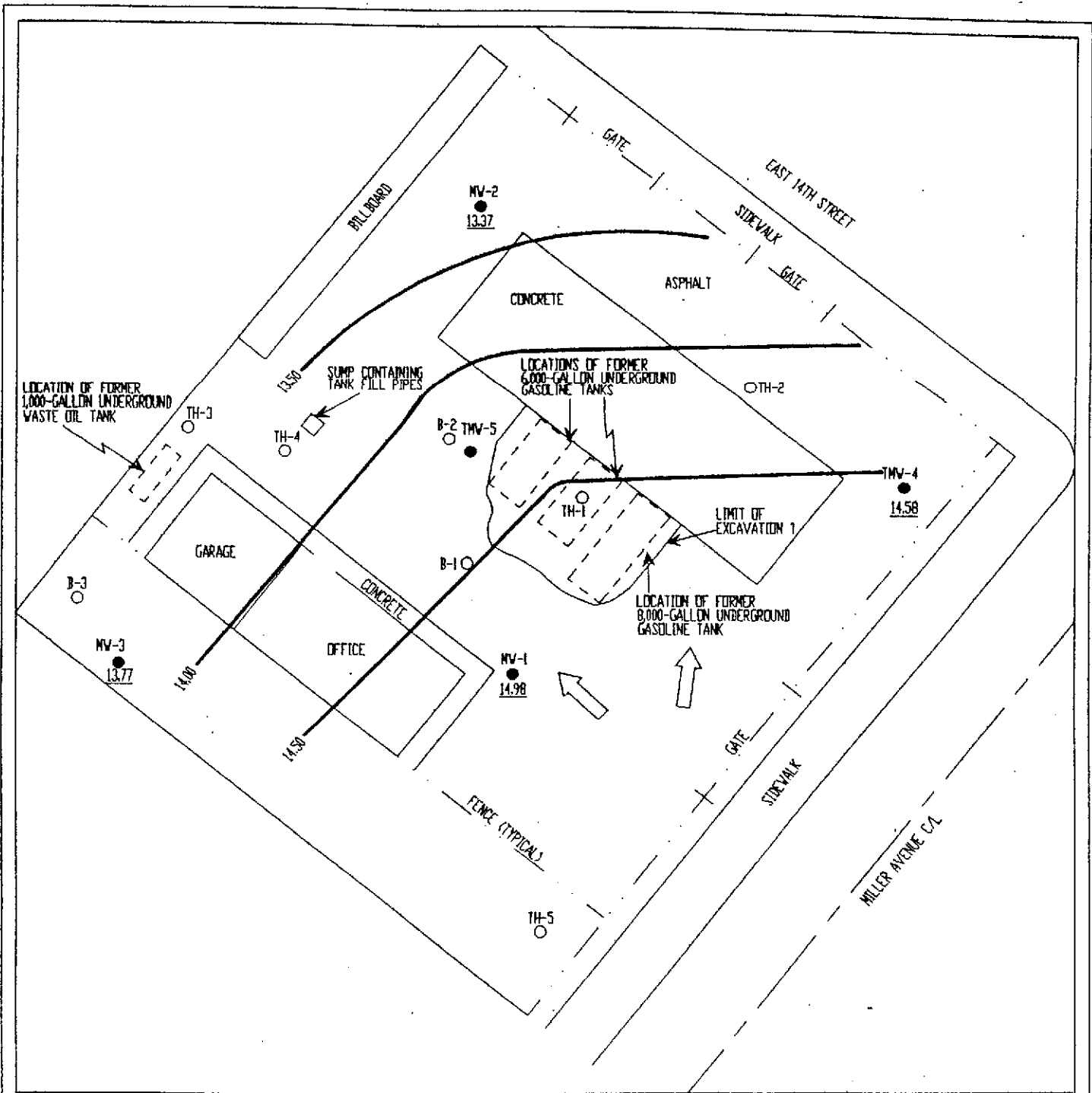
MAP TYPE: EXTRACTION WELL

DATE: FEBRUARY 5, 2001

SITE ADDRESS: 2345 EAST 14TH STREET, CALIFORNIA

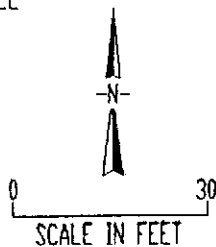
SCALE: NOT TO SCALE

SEQUOIA ENVIRONMENTAL 11 Aladdin Avenue, Suite B, San Leandro, CA 94577 (510)614-1900



LEGEND

- TMW-4 NAME AND LOCATION OF MONITORING WELL INSTALLED BY TPE
- MW-1 NAME AND LOCATION OF MONITORING WELL INSTALLED BY OTHERS
- B-1 NAME AND APPROXIMATE LOCATION OF SOIL BORING DRILLED BY OTHERS
- 14.98 POTENTIOMETRIC ELEVATION
- 14.50 POTENTIOMETRIC CONTOUR
- GROUNDWATER FLOW DIRECTION

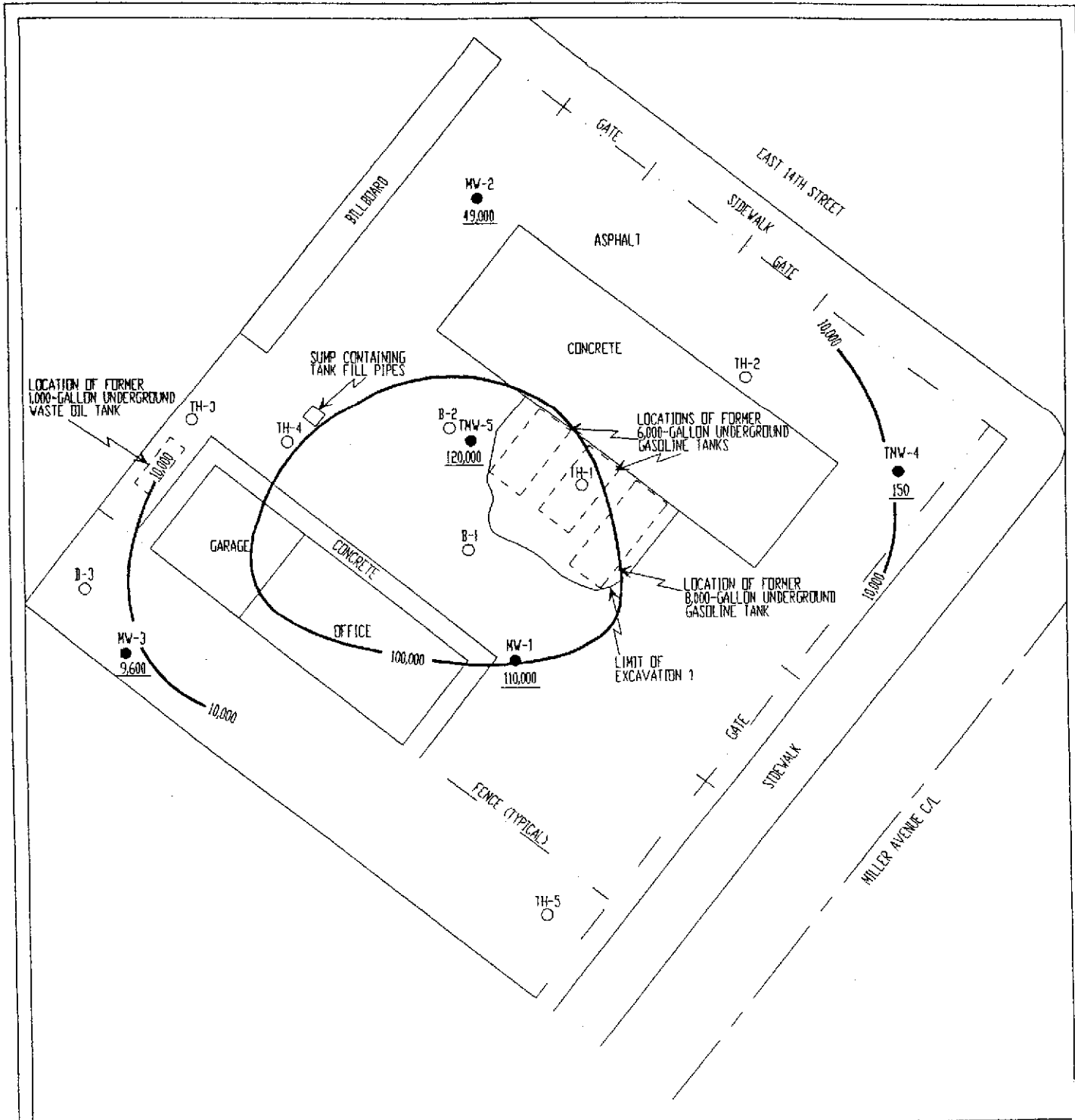


TANK PROTECT ENGINEERING

SITE PLAN:
GROUNDWATER GRADIENT MAP (3/7/97)

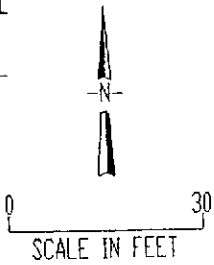
CREDIT WORLD AUTO SALES
2345 E. 14TH STREET
OAKLAND, CA 94601

DATE	5/21/97
FIGURE	7
FILE #	267-26N
DRAWN BY	VK
CHECKED BY	LNH



LEGEND

- TNW-4 NAME AND LOCATION OF MONITORING WELL INSTALLED BY TPE
- MW-1 NAME AND LOCATION OF MONITORING WELL INSTALLED BY OTHERS
- B-1 NAME AND APPROXIMATE LOCATION OF SOIL BORING DRILLED BY OTHERS
- 9,600 TPHG CONCENTRATION (ppb)
- 10,000 ISOCENTRATION CONTOUR (ppb)



TANK PROTECT ENGINEERING

SITE PLAN
 TPHG GROUNDWATER ISOCENTRATION MAP (8/17/93)

CREDIT WORLD AUTO SALES
 2345 E. 14TH STREET
 OAKLAND, CA 94601

DATE	10/4/93
FIGURE	9
FILE #	267-13
DRAWN BY	AK
CHECKED BY	JVM



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for

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Prepared For:

Mr. Stanley Wong
2200 East 12th Street
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Sequoia Environmental Corporation

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Prepared By:

Chris Wabuzoh

August 28 '00

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Senior Geologist
REA #02842

Date

Ola Balogun, Ph.D., P.E.
Civil Engineer #41747

Ola Balogun

August 28, 2000
Date

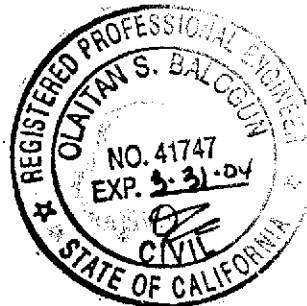


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APPENDIX

Site Map and Site Plans

APPENDIX A

**REMEDIAL ACTION WORKPLAN
1405 NORTH CAROLAN AVENUE
BURLINGAME, CALIFORNIA**

1.0 INTRODUCTION

Mr. Stanley Wong contracted Sequoia Environmental Corporation to prepare a Remedial Action Workplan (RAW) for the property located at 2345 East 14th Street, Oakland, California. The purpose of the workplan is to present the proposed remedial actions for the free product in the on-site groundwater monitoring wells. The RAW describes remedial procedures that are cost-effective, protective of human health and the environment, and complying with all applicable relevant and appropriate federal, state and local requirements. Feasibility study was not required for this project.

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The objectives of this project are as follows:

- Determine the present level of free products in the on-site groundwater monitoring wells.
- Purge groundwater monitoring wells with a vacuum truck.
- Remediate affected groundwater monitoring wells.
- Coordinate remedial activities with the Alameda County Department of Environmental Health.

1.2 Background Information

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Laboratory results show that the samples collected from the gasoline tanks' locations contained 130 to 1,500 parts per million (ppm) of TPH-G, 0.17 to 160 ppm of BTEX and 4.6 to 316 ppm of lead. Ethylbenzene and total xylenes were the components of volatile organics detected. Laboratory results of samples collected from the waste oil tank location show TOG range from 570 to 780 ppm and TPH-D range from 65 to 110 ppm.

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Laboratory results of the soil samples show that samples B-1 and B-2 contain 3.4 ppm and 83 ppm of TPH-G respectively. Sample B-3 contains 88 ppm of TOG and BTEX ranging from 0.360 to 0.850 ppm. Results of grab groundwater samples were 67,000 to 110,000 ppb for TOG in samples B-1 and B-2 respectively and BTEX ranging from 2,400 to 17,000 ppb. Grab water sample from boring B-3, contains 290,000 ppb of TOG, and BTEX ranging from 160 to 1,300 ppb.

The subsurface investigation showed that the soil in the vicinity of the former location of the underground storage tanks were impacted by petroleum hydrocarbons.

On May 22, 1991, Earth Systems Environmental, Inc., (ESE) performed a subsurface investigation at the site. The investigation involved drilling of five soil borings (TH-1 through TH-5) and installation of three groundwater monitoring wells (MW-1, MW-2 and MW-3). The purpose of the investigation was to further characterize the soil at the subject property. The soil borings were located as listed below.

Boring TH-1 is at the center of former tank locations.
Boring TH-2 is at the easterly end.
Boring TH-3 is at the westerly end near the waste oil.

Boring TH-4 is between borings TH-1 and TH-3.

Boring TH-5 is at the southerly end.

Monitoring well MW-1 is at the south side of former underground storage tank location.

Monitoring wells MW-2 and MW-3 are at the north and west side of the property lines.

With the exception of boring TH-1, two soil samples were collected from the borings and monitoring wells. One sample was collected from boring TH-1. With the exception of boring TH-2, all soil samples were collected at 10 and 18 feet bgs. In boring TH-2 a sample was collected at 30 feet bgs. Samples collected from the gasoline tanks areas were analyzed for TPH-G, samples from the waste oil tank area were analyzed for total recoverable hydrocarbons (TRH) and TPH-G, and samples from boring TH-5 were analyzed for TPH-G and BTEX.

Laboratory results for the soil samples are listed below.

With the exception of one sample from TH-5, all the soil samples contained detectable levels of TPH-G that range from 10 to 4,320 ppm.

The deeper sample collected from boring TH-5 was non-detect for all the analytes.

All the soil samples contained TRH which range from 20 to 1,600 ppm.

BTEX was detected in the samples collected from the former gasoline tanks areas.

Water samples collected from the monitoring wells were analyzed for TPH-G and BTEX. Laboratory results of the groundwater samples show that TPH-G was detected in well MW-1 and MW-2 at concentration of 2,090,000 ppb and 10,000 ppb respectively. BTEX was detected in well MW-1 at concentrations ranging from 2,145 to 23,150 ppb. TPH-G and BTEX were non-detect in well MW-3. Subsequent monitoring of the three groundwater wells shows the presence of free product in all the wells.

On July 22 and 23, 1993, Tank Protect Engineering performed a subsurface investigation of the site. The purpose of the investigation was to determine the lateral and vertical extent of petroleum hydrocarbons in the vadose zone. Two soil borings, MW-4 and MW-5, were drilled and completed as monitoring wells. Boring MW-4 was located at the east corner of the site and MW-5 was located downgradient from the former tank locations. Borings MW-4 and MW-5 were drilled to 34.5 feet and 24 feet respectively. Soil samples were collected during drilling, and in addition, the new and three existing monitoring wells were monitored to determine the depth to groundwater and any presence of free product. Free product was present and the thickness varies from 0.01 to 0.77 feet. Groundwater samples were collected from the wells.

All the samples were sent to state-certified laboratory for chemical analyses. They were analyzed for TPH-G, BTEX using appropriate EPA Methods. Laboratory results of the soil samples collected from wells' MW-4 and MW-5, show that TPH-G was detected in all the samples collected at approximately 16 feet bgs. BTEX was detected only in samples collected from boring MW-5 at a depth of approximately 16 feet bgs. Laboratory results of the groundwater samples show that TPH-G and BTEX were detected in all five wells. Levels of TPH-G in MW-1, MW-2, MW-3, MW-4 and MW-5 are 150,000 ppb, 49,000 ppb, 9,600 ppb, 150 ppb and 120,000 ppb respectively. Well MW-4, which is located up-gradient, had levels of BTEX that range from 0.8 to 3.7 ppb.

The subsurface investigation shows that well MW-4 is the limit of eastward migration of petroleum hydrocarbons.

In 1994, Tank Protect Engineering performed excavation of the former underground tanks' locations. The purpose of the excavation was to remove soil impacted by petroleum hydrocarbons. Using a backhoe, an area of approximately 2,520 square feet was excavated. Impacted soil was placed on plastic sheeting. Verification samples were collected at various stages during the excavation. Excavated soil was treated on-site and was used for backfilling upon approval by the Alameda County Department of Environmental Health.

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Laboratory results show that TPH-G was detected in soil samples collected from boring SB-2 (16.5-17.0) and SB-5 (11.5-12.0) at levels of 3.7 ppm and 91 ppm respectively. Levels of BTEX vary from 0.0071 to 0.042 ppm. Laboratory results of the grab groundwater samples show that TPH-G, benzene and ethylbenzene were detected in water samples collected from SB-2W and SW-5W at concentrations of 6,100 ppb, 870 ppb and 17 ppb; and 890 ppb, 5.4 ppb and 1.4 ppb respectively.

Presently all five groundwater wells are monitored on a quarterly basis by Tank Protect Engineering. The last reported monitoring was performed on December 28, 1999. During the monitoring activities free product was present in wells MW-1, MW-2 and MW-3, and Product thickness was 0.25-, 1.32- 4.5 feet respectively. Groundwater samples were collected from all the wells and analyzed for TPH-G, BTEX and MTBE using appropriate EPA Methods. Laboratory results show that TPH-G was detected in wells MW-1, MW-2, MW-3

and MW-5 at concentration of 27,000 ppb, 75,000 ppb, 4,300 ppb and 25,000 ppb respectively. TPH-G, MTBE and BTEX were non-detect in well MW-4. The determined groundwater gradient is 0.02 feet per foot in north-northwest direction.

2.0 TREATMENT PROCESS

Previous subsurface investigations appear to define the extent of petroleum hydrocarbons impact at the site. The observations are listed below.

Petroleum hydrocarbons have impacted the groundwater.

Depth to groundwater at the site varies from 12 to 16.50 feet below ground surface.

Soil borings SB-3 and SB-4 appear to define the extent of petroleum hydrocarbon migration in the northward direction.

Boring SB-1 and monitoring well MW-4 appear to show the limit of the eastward migration of petroleum hydrocarbons.

Soil boring SB-5 appears to indicate that low levels of petroleum hydrocarbons migrated off-site. No free product was present in groundwater sample.

Monitoring well MW-3 and boring SB-2 appear to indicate that petroleum hydrocarbons migrated in the southward direction. No free product was present in the groundwater sample collected from boring SB-2.

2.1 Baseline Monitoring

Prior to treatment activities, all the monitoring wells will be gauged with an interphase probe to determine the depth to groundwater and any presence of free product. The wells will be purged using a vacuum truck and dedicated stingers. After purging, the wells will be allowed to recharge to approximately 80% of their respective volumes. Groundwater samples will be collected from wells that do contain free product. The water samples will be sent to state-certified laboratory for chemical analyses. All water samples will be analyzed for TPH-D, TPH-G, TOG, MTBE and BTEX using appropriate EPA Methods. The information gathered during this process will be used as baseline information to monitor the progress of remediation activities.

2.2 Treatment of Free Product

Sequoia Environmental proposes to treat the free product in the monitoring wells by using bioenhancement compounds. The compounds will be introduced into

the affected monitoring wells through PVC pipes perforated at the bottom ends. The enhancement compounds will create an optimum environment for the growth of hydrogen digesting microbes. The progress of the biotreatment will be monitored and samples will be collected on a scheduled intervals. The results of the monitoring activities will be used to determine the frequency of replenishing the bioenhancement compounds.

2.3 Construction

Mobilization for construction activities will begin seven days after county approval of the remedial action workplan.

2.4 Permits and Notification

No permit will be required to perform the tasks outlined in this Remedial Action Workplan. The county environmental health inspector will be notified four days prior to commencing any field activities.

2.5 Site Map and Plans

Site plan, groundwater gasoline concentration plan and groundwater gradient map that were used to the compile the remedial action workplan were prepared by Tank Protect Engineering. They are presented in Appendix A.

Figure 1, shows the Site Map of project location.

Figure 3, shows the Site Plan

Figure 7, shows Groundwater Gradient Map

Figure 9, shows Groundwater Gasoline Concentration

2.6 Schedule

Upon approval from the Alameda County Department of Environmental Health, mobilization for remediation activities will begin.

Activity	Duration (in weeks)								
	1	2	3	4	5	6	7	8	9
Purging of Wells	x	x	x						
Construction & Treatment				x	x				
Monitoring									x

3.0 EVALUATION OF TREATMENT PROCEDURES

Initially, remediation system will be monitored after seven days of operation. Subsequent site visits will be on a bi-weekly to monthly basis, which will be based on the progress of the treatment of free product. Generally, the remediation system does not require frequent monitoring.

3.1 Project Evaluation

The monitoring activities will involve measuring the depth to groundwater and free product if any. A monitoring report describing all project activities and field observations will be prepared. The report will be sent to the Alameda County Department of Environmental Health for review and approval.

A compilation of monitoring reports may be used to determine if further subsurface investigation at the site is necessary.

3.2 Key Contaminants

Samples collected during the performance of this project will be analyzed for TPH-G, BTEX and MTBE. It is expected that the levels of these analytes will be reduced in sympathy with the treatment of free product.

3.3 Potential Delays

Potential delays during the performance of this project may be due to adverse weather conditions that may inhibit field activities. Delays due to personnel and equipment are not likely.

3.4 Hours of Operation

All project activities will be performed during daylight hours (8am to 5pm).

4.0 SITE MONITORING PLAN

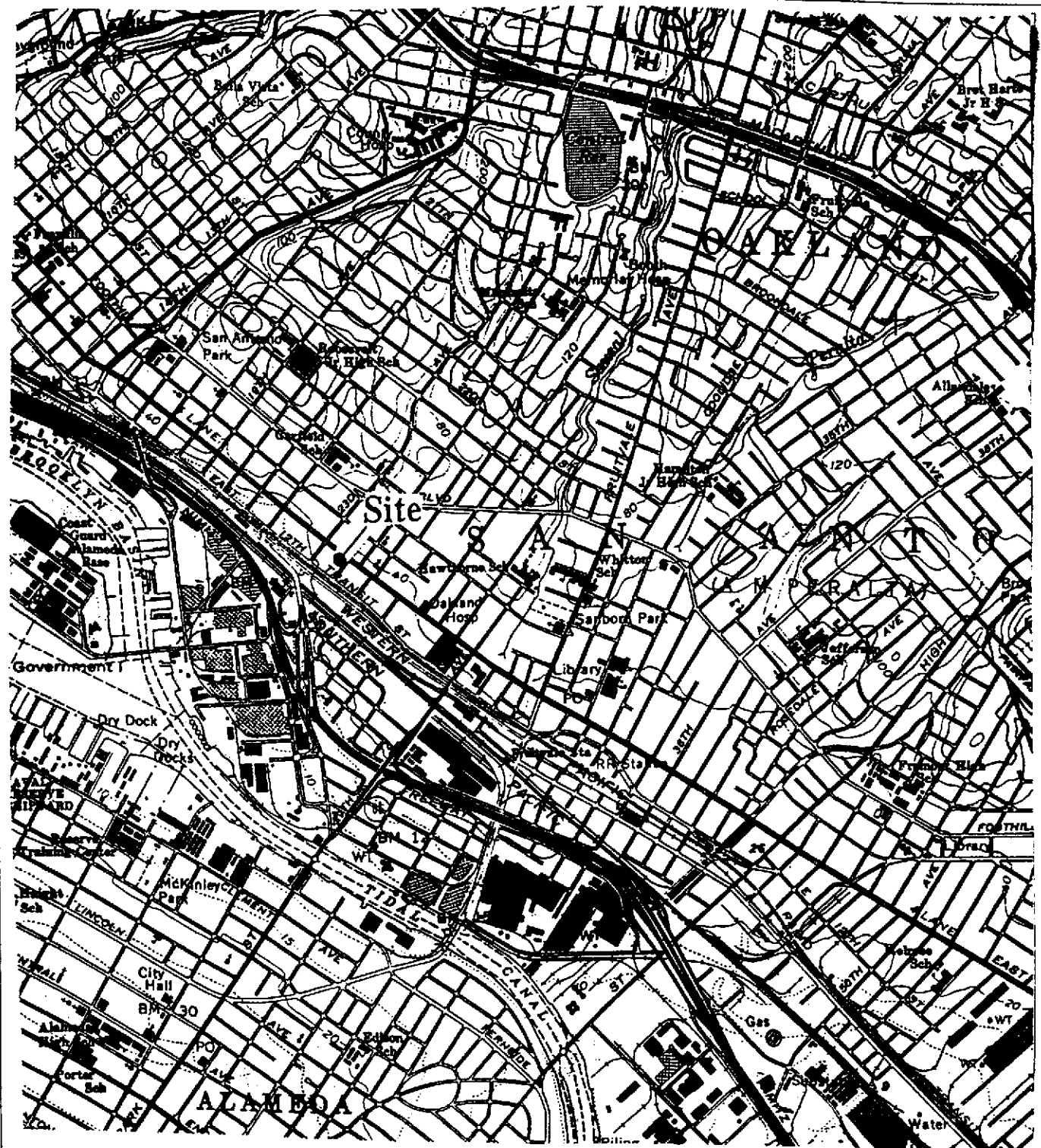
At the completion of free product treatment, Sequoia Environmental proposes to monitor the groundwater wells on a quarterly basis for one year. During the monitoring activities, the wells will be gauged, purged and groundwater samples collected for chemical analyses. All groundwater-monitoring activities will be in accordance with the Alameda County Department of Environmental Health and the Regional Water Quality Control Board guidelines.

5.0 SECURITY

Remediation system will be on-site. The subject site will be secured with chain link fence and a lock.

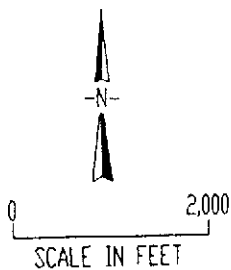
5.1 Public Notification

Information about activities and chemicals of concern as determined by the state will be posted outside the treatment unit.



LEGEND

REFERENCE: USGS 7.5 MINUTE
 SERIES QUADRANGLE MAP
 OAKLAND EAST, CALIFORNIA
 PHOTOREVISED 1980

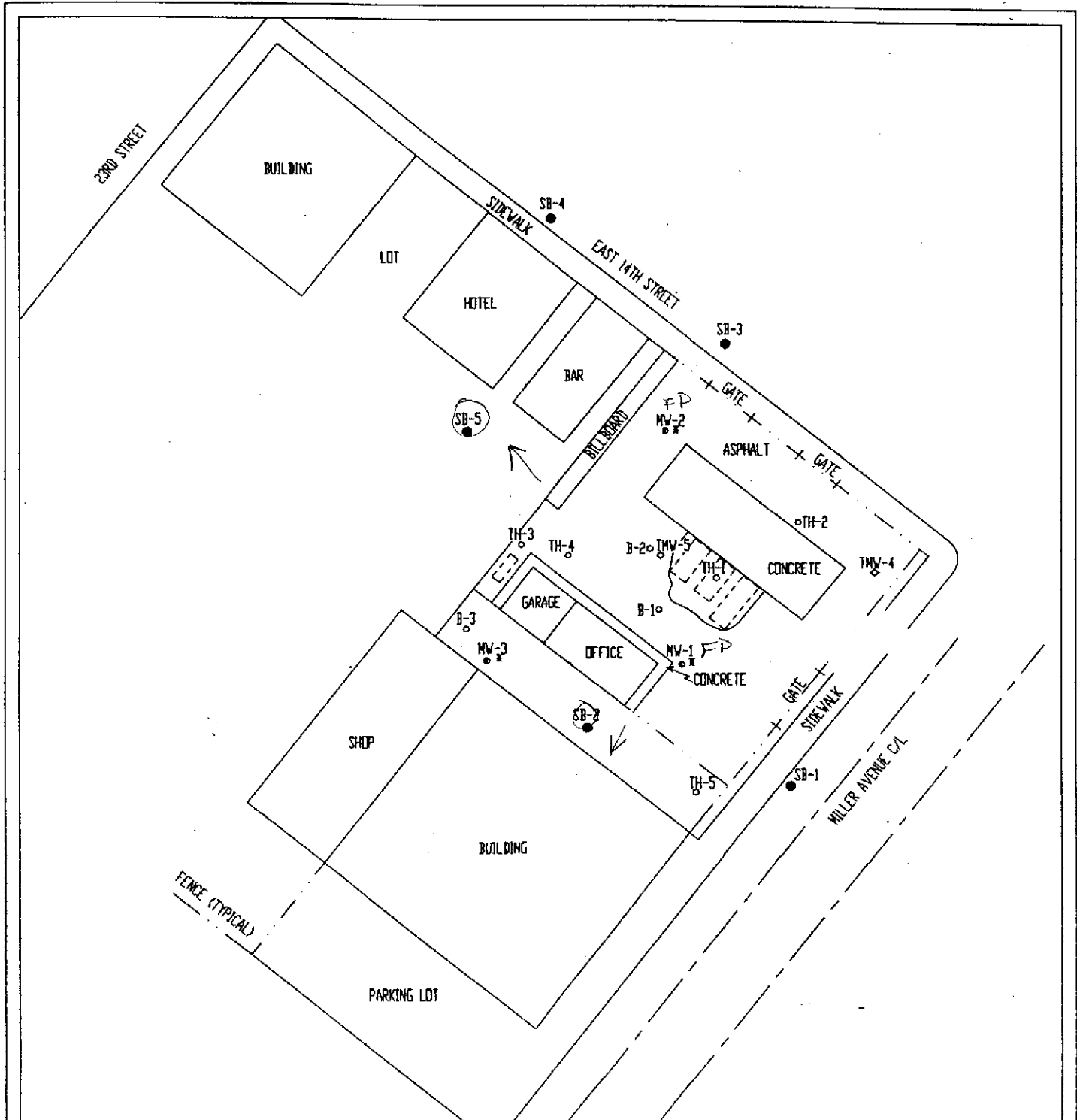


TANK PROTECT ENGINEERING

SITE VICINITY MAP

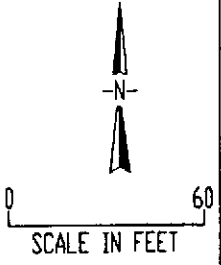
CREDIT WORLD AUTO SALES
 2345 E. 14TH STREET
 OAKLAND, CA 94601

DATE	5/21/97
FIGURE	I
FILE #	267-IN
DRAWN BY	VK
CHECKED BY	LNH



LEGEND

- TMW-4 NAME AND LOCATION OF MONITORING WELL INSTALLED BY TPE
- MW-1 NAME AND LOCATION OF MONITORING WELL INSTALLED BY OTHERS
- B-1 NAME AND APPROXIMATE LOCATION OF SOIL BORING DRILLED BY OTHERS
- SB-1 LOCATION OF SOIL BORING
- LOCATION OF FORMER UNDERGROUND STORAGE TANK

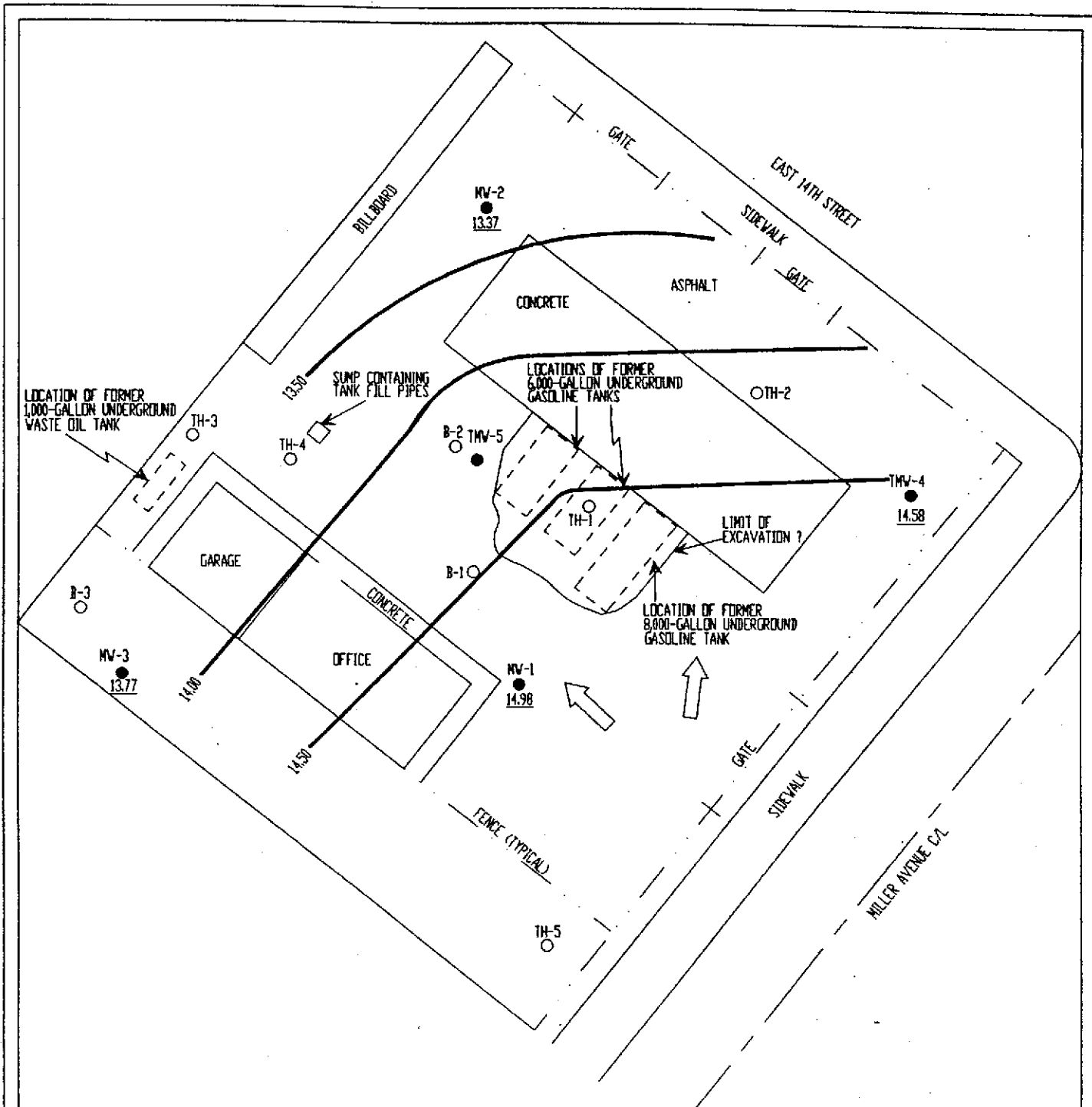


TANK PROTECT ENGINEERING

**SITE PLAN:
LOCATION OF SOIL BORINGS**

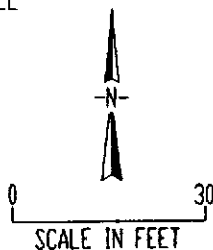
CREDIT WORLD AUTO SALES
2345 E. 14TH STREET
OAKLAND, CA 94601

DATE	5/21/97
FIGURE	3
FILE #	267-27N
DRAWN BY	VK
CHECKED BY	LMH



LEGEND

- TMW-4 NAME AND LOCATION OF MONITORING WELL INSTALLED BY TPE
- MV-1 NAME AND LOCATION OF MONITORING WELL INSTALLED BY OTHERS
- B-1 NAME AND APPROXIMATE LOCATION OF SOIL BORING DRILLED BY OTHERS
- 14.98 POTENTIOMETRIC ELEVATION
- 14.50- POTENTIOMETRIC CONTOUR
- ← GROUNDWATER FLOW DIRECTION

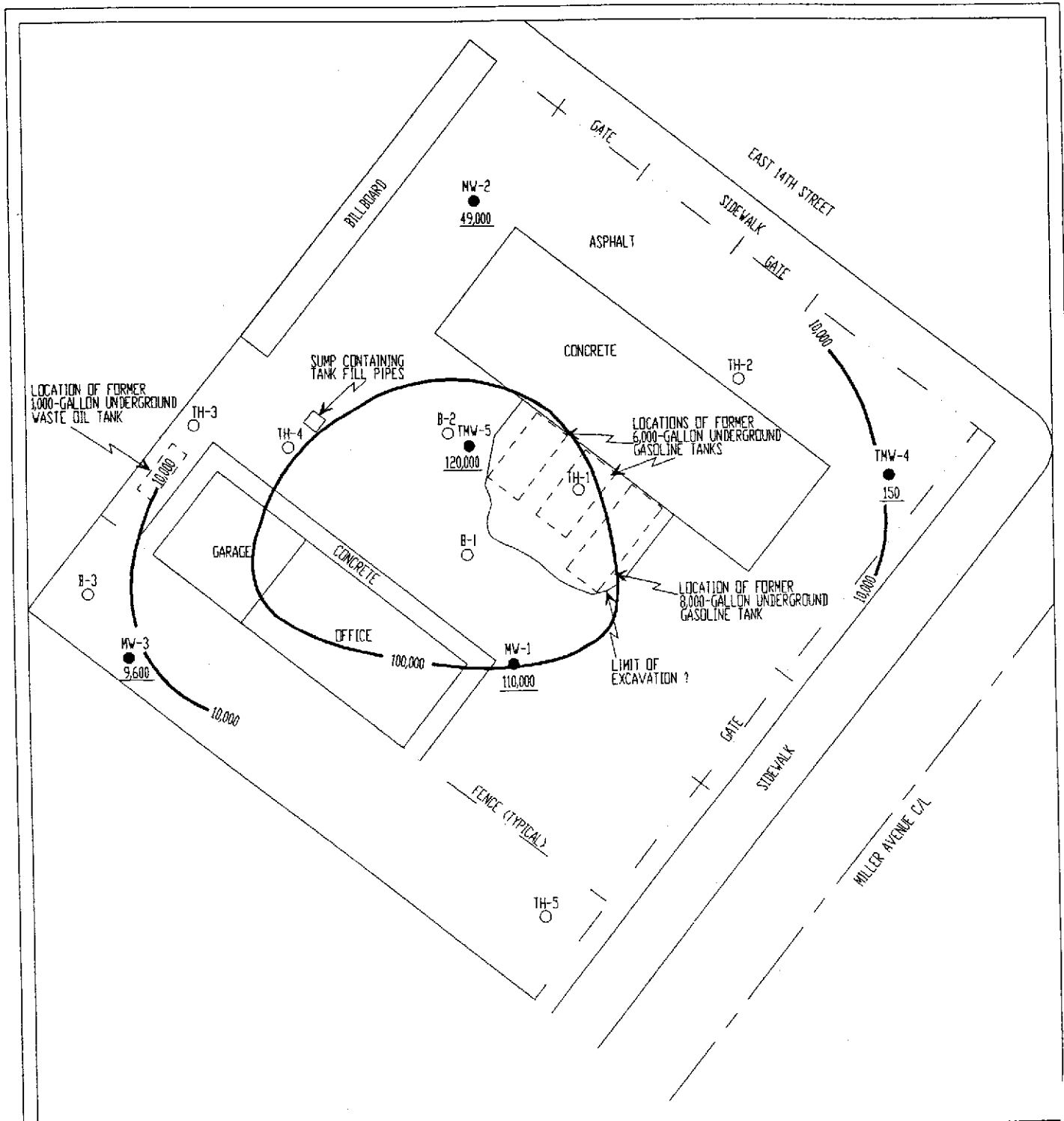


TANK PROTECT ENGINEERING






SITE PLAN:
GROUNDWATER GRADIENT MAP (3/7/97)

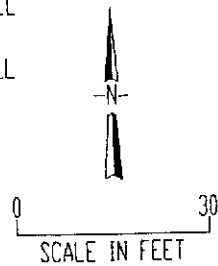
CREDIT WORLD AUTO SALES
2345 E. 14TH STREET
OAKLAND, CA 94601

DATE	5/21/97
FIGURE	7
FILE #	267-26N
DRAWN BY	VK
CHECKED BY	LNH



LEGEND

- 
 NAME AND LOCATION OF MONITORING WELL INSTALLED BY TPE
- 
 NAME AND LOCATION OF MONITORING WELL INSTALLED BY OTHERS
- 
 NAME AND APPROXIMATE LOCATION OF SOIL BORING DRILLED BY OTHERS
- 
 TPHG CONCENTRATION (ppb)
- 
 ISOCONCENTRATION CONTOUR (ppb)



TANK PROTECT ENGINEERING

SITE PLAN
 TPHG GROUNDWATER ISOCONCENTRATION MAP (8/17/93)

CREDIT WORLD AUTO SALES
 2345 E. 14TH STREET
 OAKLAND, CA 94601

DATE	10/4/93
FIGURE	9
FILE #	267-13
DRAWN BY	AK
CHECKED BY	JVM



REMEDIAL ACTION WORK PLAN
for

2345 East 14th Street
Oakland, California

8-28-00

Prepared For:

Mr. Stanley Wong
2200 East 12th Street
Oakland, CA 94606

By:

Sequoia Environmental Corporation

Project Code SW-01
August 28, 2000

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APPENDIX

Site Map and Site Plans

APPENDIX A

**REMEDIAL ACTION WORKPLAN
1405 NORTH CAROLAN AVENUE
BURLINGAME, CALIFORNIA**

1.0 INTRODUCTION

Mr. Stanley Wong contracted Sequoia Environmental Corporation to prepare a Remedial Action Workplan (RAW) for the property located at 2345 East 14th Street, Oakland, California. The purpose of the workplan is to present the proposed remedial actions for the free product in the on-site groundwater monitoring wells. The RAW describes remedial procedures that are cost-effective, protective of human health and the environment, and complying with all applicable relevant and appropriate federal, state and local requirements. Feasibility study was not required for this project.

1.1 Objectives

The objectives of this project are as follows:

- Determine the present level of free products in the on-site groundwater monitoring wells.
- Purge groundwater monitoring wells with a vacuum truck.
- Remediate affected groundwater monitoring wells.
- Coordinate remedial activities with the Alameda County Department of Environmental Health.

What about extent of FP?

1.2 Background Information

Previous environmental work performed at the site included the removal of four underground storage tanks, soil excavation, subsurface investigations and quarterly monitoring of on-site groundwater wells.

On August 5, 1988, four underground storage tanks and associated piping were removed from the site by Tank Protect Engineering of Northern California. The capacity of each tank varies from 1,000 to 8,000 gallons. The tanks were used to store unleaded gasoline and waste oil. Soil samples were collected from the bottom locations of the tanks and sent to a state certified laboratory for chemical analyses. The samples collected from the gasoline locations were analyzed for total petroleum hydrocarbons as gasoline (TPH-G), aromatic hydrocarbons as benzene, toluene, ethylbenzene and xylenes (BTEX) and lead. Samples

collected from the waste oil tank location were analyzed for total petroleum hydrocarbons as diesel (TPH-D), total oil and grease (TOG) and volatile organics using appropriate EPA Methods.

Laboratory results show that the samples collected from the gasoline tanks' locations contained 130 to 1,500 parts per million (ppm) of TPH-G, 0.17 to 160 ppm of BTEX and 4.6 to 316 ppm of lead. Ethylbenzene and total xylenes were the components of volatile organics detected. Laboratory results of samples collected from the waste oil tank location show TOG range from 570 to 780 ppm and TPH-D range from 65 to 110 ppm.

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Laboratory results of the soil samples show that samples B-1 and B-2 contain 3.4 ppm and 83 ppm of TPH-G respectively. Sample B-3 contains 88 ppm of TOG and BTEX ranging from 0.360 to 0.850 ppm. Results of grab groundwater samples were 67,000 to 110,000 ppb for TOG in samples B-1 and B-2 respectively and BTEX ranging from 2,400 to 17,000 ppb. Grab water sample from boring B-3, contains 290,000 ppb of TOG, and BTEX ranging from 160 to 1,300 ppb.

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Boring TH-1 is at the center of former tank locations.
Boring TH-2 is at the easterly end.
Boring TH-3 is at the westerly end near the waste oil.

Boring TH-4 is between borings TH-1 and TH-3.

Boring TH-5 is at the southerly end.

Monitoring well MW-1 is at the south side of former underground storage tank location.

Monitoring wells MW-2 and MW-3 are at the north and west side of the property lines.

With the exception of boring TH-1, two soil samples were collected from the borings and monitoring wells. One sample was collected from boring TH-1. With the exception of boring TH-2, all soil samples were collected at 10 and 18 feet bgs. In boring TH-2 a sample was collected at 30 feet bgs. Samples collected from the gasoline tanks areas were analyzed for TPH-G, samples from the waste oil tank area were analyzed for total recoverable hydrocarbons (TRH) and TPH-G, and samples from boring TH-5 were analyzed for TPH-G and BTEX.

Laboratory results for the soil samples are listed below.

With the exception of one sample from TH-5, all the soil samples contained detectable levels of TPH-G that range from 10 to 4,320 ppm.

The deeper sample collected from boring TH-5 was non-detect for all the analytes.

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The subsurface investigation shows that well MW-4 is the limit of eastward migration of petroleum hydrocarbons.

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*will
change
to semi-
annually*

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Soil boring SB-5 appears to indicate that low levels of petroleum hydrocarbons migrated off-site. No free product was present in groundwater sample.

Monitoring well MW-3 and boring SB-2 appear to indicate that petroleum hydrocarbons migrated in the southward direction. No free product was present in the groundwater sample collected from boring SB-2.

*This direction
not defined*

2.1 Baseline Monitoring

Prior to treatment activities, all the monitoring wells will be gauged with an interphase probe to determine the depth to groundwater and any presence of free product. The wells will be purged using a vacuum truck and dedicated stingers. After purging, the wells will be allowed to recharge to approximately 80% of their respective volumes. Groundwater samples will be collected from wells that do contain free product. ~~The water samples will be sent to state-certified laboratory for chemical analyses. All water samples will be analyzed for TPH-D, TPH-G, TOG, MTBE and BTEX using appropriate EPA Methods.~~ The information gathered during this process will be used as baseline information to monitor the progress of remediation activities.

2.2 Treatment of Free Product

Sequoia Environmental proposes to treat the free product in the monitoring wells by using bioenhancement compounds. The compounds will be introduced into

the affected monitoring wells through PVC pipes perforated at the bottom ends. The enhancement compounds will create an optimum environment for the growth of hydrogen digesting microbes. The progress of the biotreatment will be monitored and samples will be collected on a scheduled intervals. The results of the monitoring activities will be used to determine the frequency of replenishing the bioenhancement compounds.

2.3 Construction

Mobilization for construction activities will begin seven days after county approval of the remedial action workplan.

2.4 Permits and Notification

No permit will be required to perform the tasks outlined in this Remedial Action Workplan. The county environmental health inspector will be notified four days prior to commencing any field activities.

2.5 Site Map and Plans

Site plan, groundwater gasoline concentration plan and groundwater gradient map that were used to compile the remedial action workplan were prepared by Tank Protect Engineering. They are presented in Appendix A.

- Figure 1, shows the Site Map of project location.
- Figure 3, shows the Site Plan
- Figure 7, shows Groundwater Gradient Map
- Figure 9, shows Groundwater Gasoline Concentration

2.6 Schedule

Upon approval from the Alameda County Department of Environmental Health, mobilization for remediation activities will begin.

Activity	Duration (in weeks)									
	1	2	3	4	5	6	7	8	9	10
Purging of Wells	x	x	x							
Construction & Treatment				x	x					
Monitoring										x

3.0 EVALUATION OF TREATMENT PROCEDURES

Initially, remediation system will be monitored after seven days of operation. Subsequent site visits will be on a bi-weekly to monthly basis, which will be based on the progress of the treatment of free product. Generally, the remediation system does not require frequent monitoring.

3.1 Project Evaluation

The monitoring activities will involve measuring the depth to groundwater and free product if any. A monitoring report describing all project activities and field observations will be prepared. The report will be sent to the Alameda County Department of Environmental Health for review and approval.

A compilation of monitoring reports may be used to determine if further subsurface investigation at the site is necessary.

3.2 Key Contaminants

Samples collected during the performance of this project will be analyzed for TPH-G, BTEX and MTBE. It is expected that the levels of these analytes will be reduced in sympathy with the treatment of free product.

*2mg after
2 analytes.*

3.3 Potential Delays

Potential delays during the performance of this project may be due to adverse weather conditions that may inhibit field activities. Delays due to personnel and equipment are not likely.

3.4 Hours of Operation

All project activities will be performed during daylight hours (8am to 5pm).

4.0 SITE MONITORING PLAN

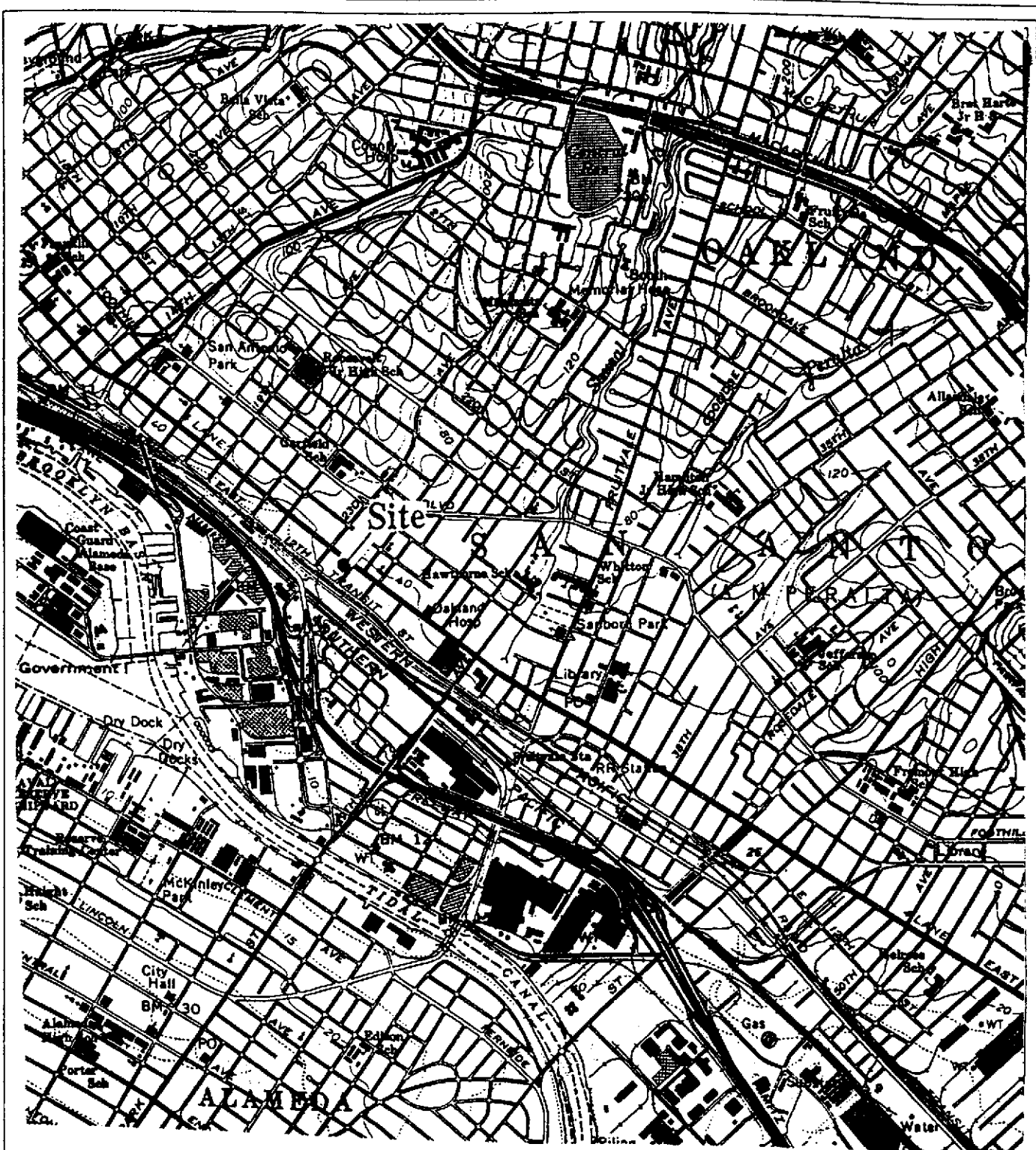
At the completion of free product treatment, Sequoia Environmental proposes to monitor the groundwater wells on a quarterly basis for one year. During the monitoring activities, the wells will be gauged, purged and groundwater samples collected for chemical analyses. All groundwater-monitoring activities will be in accordance with the Alameda County Department of Environmental Health and the Regional Water Quality Control Board guidelines.

5.0 SECURITY

Remediation system will be on-site. The subject site will be secured with chain link fence and a lock.

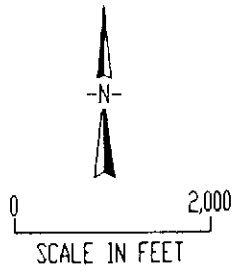
5.1 Public Notification

Information about activities and chemicals of concern as determined by the state will be posted outside the treatment unit.



LEGEND

REFERENCE: USGS 7.5 MINUTE
 SERIES QUADRANGLE MAP
 OAKLAND EAST, CALIFORNIA
 PHOTOREVISED 1980

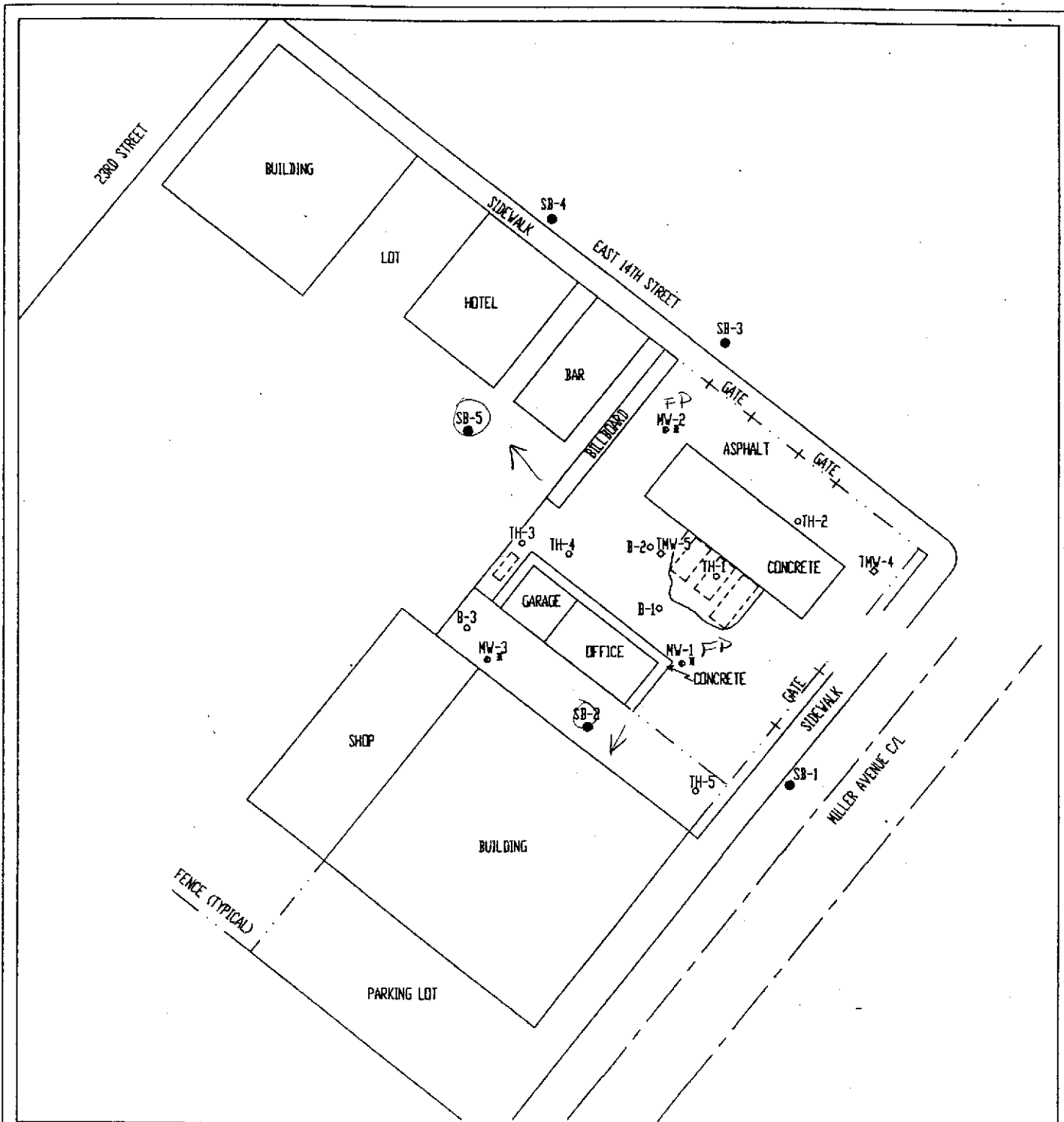


TANK PROTECT ENGINEERING

SITE VICINITY MAP

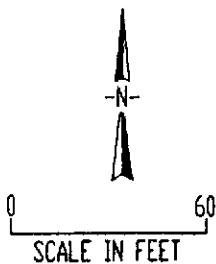
CREDIT WORLD AUTO SALES
 2345 E. 14TH STREET
 OAKLAND, CA 94601

DATE	5/21/97
FIGURE	1
FILE #	267-JN
DRAWN BY	VK
CHECKED BY	LNH



LEGEND

- TMW-4 NAME AND LOCATION OF MONITORING WELL
◊ INSTALLED BY TPE
- MW-1 NAME AND LOCATION OF MONITORING WELL
● INSTALLED BY OTHERS
- B-1 NAME AND APPROXIMATE LOCATION OF
○ SOIL BORING DRILLED BY OTHERS
- SB-1 LOCATION OF SOIL BORING
●
- LOCATION OF FORMER
UNDERGROUND STORAGE TANK

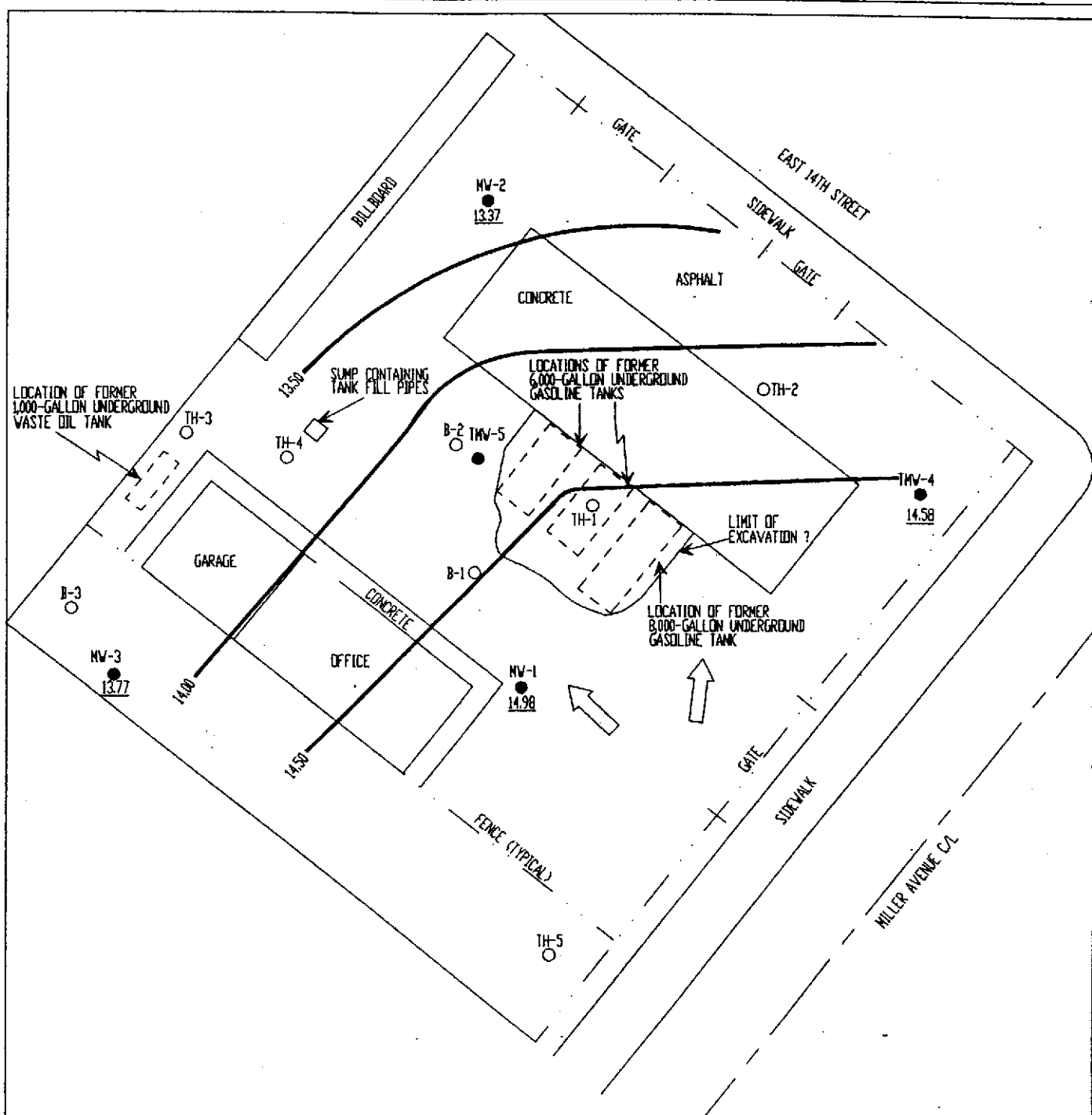


TANK PROTECT ENGINEERING

SITE PLAN:
LOCATION OF SOIL BORINGS

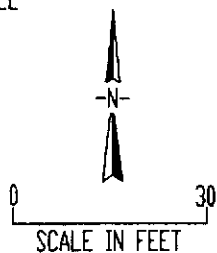
CREDIT WORLD AUTO SALES
2345 E. 14TH STREET
OAKLAND, CA 94601

DATE	5/21/97
FIGURE	3
FILE #	267-27N
DRAWN BY	VK
CHECKED BY	LMH



LEGEND

- TMW-4 NAME AND LOCATION OF MONITORING WELL INSTALLED BY TPE
- MW-1 NAME AND LOCATION OF MONITORING WELL INSTALLED BY OTHERS
- B-1 NAME AND APPROXIMATE LOCATION OF SOIL BORING DRILLED BY OTHERS
- 14.98 POTENTIOMETRIC ELEVATION
- 14.50- POTENTIOMETRIC CONTOUR
- ← GROUNDWATER FLOW DIRECTION

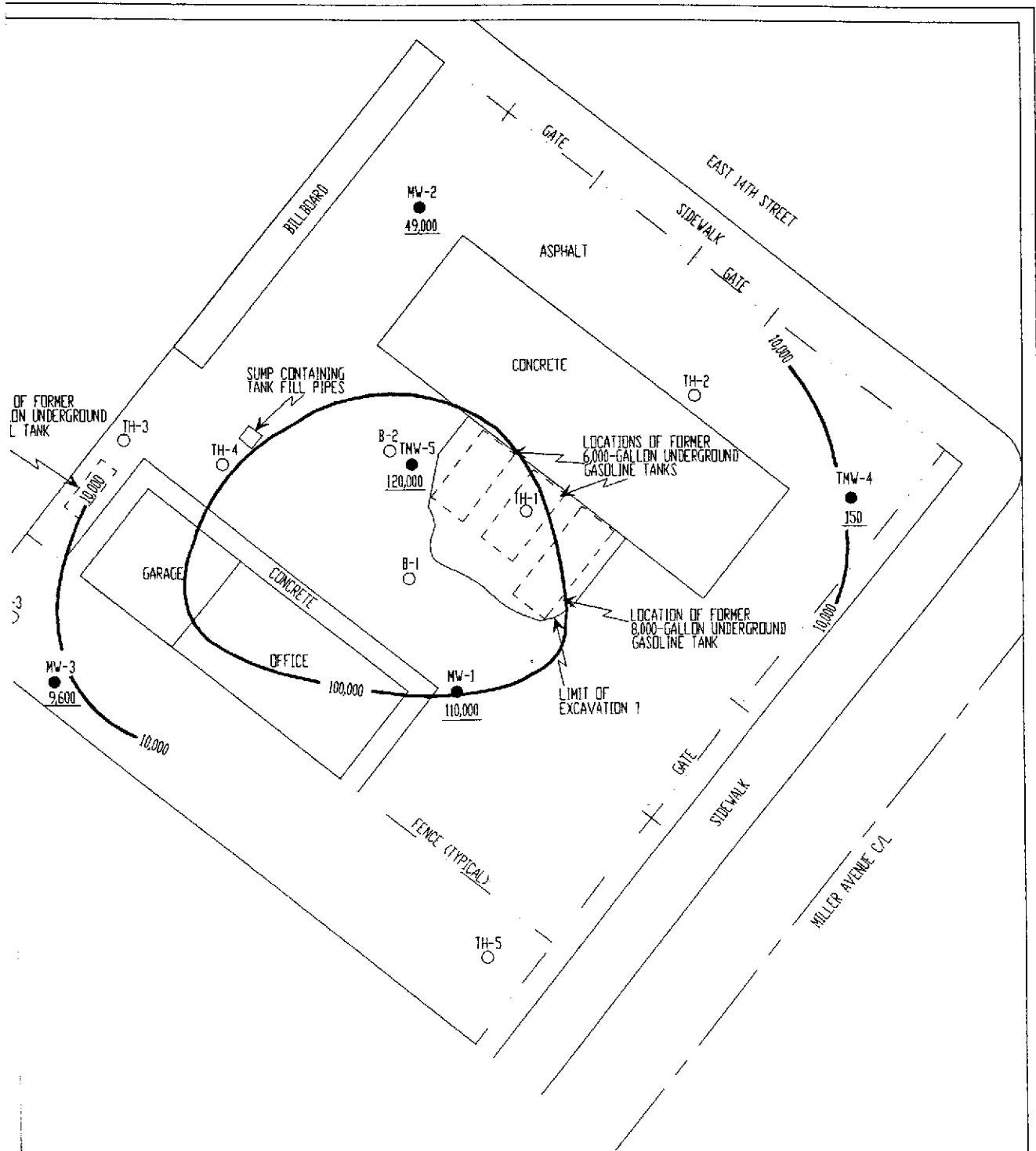


TANK PROTECT ENGINEERING

SITE PLAN:
GROUNDWATER GRADIENT MAP (3/7/97)

CREDIT WORLD AUTO SALES
2345 E. 14TH STREET
OAKLAND, CA 94601

DATE	5/21/97
FIGURE	7
FILE #	267-26N
DRAWN BY	VK
CHECKED BY	LNH



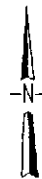
LEGEND

NAME AND LOCATION OF MONITORING WELL INSTALLED BY TPE

NAME AND LOCATION OF MONITORING WELL INSTALLED BY OTHERS

NAME AND APPROXIMATE LOCATION OF SOIL BORING DRILLED BY OTHERS

TPHG CONCENTRATION (ppb)
ISOCONCENTRATION CONTOUR (ppb)



TANK PROTECT ENGINEERING

SITE PLAN
TPHG GROUNDWATER ISOCONCENTRATION MAP (8/17/93)

CREDIT WORLD AUTO SALES
2345 E. 14TH STREET
OAKLAND, CA 94601

DATE	10/4/93
FIGURE	9
FILE #	267-13
DRAWN BY	AK
CHECKED BY	JVM