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**CITY OF EMERYVILLE  
REDEVELOPMENT AGENCY**

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EMERYVILLE, CALIFORNIA 94608

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August 12, 1996

**CERTIFICATION**

Document Title: Workplan for Additional Site Investigation at  
City of Emeryville Fire Station No. 2, August 7, 1996  
prepared by Woodward-Clyde Consultants

I, representing the City of Emeryville Redevelopment Agency, have read the above referenced document and agree with the conclusions and recommendations contained in the document. To the best of my knowledge, the contents of the document are accurate and the document has been prepared following the Tri-Regional Board of Staff Recommendations for Preliminary Evaluation and Investigation of Underground Tank Site (August 10, 1990) and Appendix A - Reports (August 30, 1991) and the San Francisco Bay RWQCB Interim Guidance on Required Cleanup at Low Risk Fuel Site (January 5, 1996).

Ignacio Dayrit  
Project Coordinator  
City of Emeryville Redevelopment Agency

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**WORKPLAN FOR  
ADDITIONAL SITE  
INVESTIGATION AT  
CITY OF EMERYVILLE  
FIRE STATION NO. 2**

*Prepared for*

City of Emeryville Redevelopment Agency

August 7, 1996

**Woodward-Clyde**



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Project 961199NA

CERTIFICATION

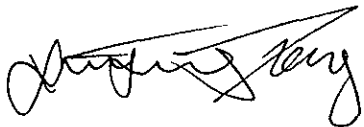
WORKPLAN FOR ADDITIONAL SITE INVESTIGATION AT  
EMERYVILLE FIRE STATION NO. 2  
6303 Hollis Street, Emeryville, California

AUGUST 5, 1996

This report has been prepared by the staff of Woodward-Clyde Consultants and has been reviewed and approved by the professional whose signature appears below.

The findings, recommendations, specifications, or professional opinions are presented within the limits prescribed by the client and in accordance with generally accepted engineering practice in Northern California at the time this work plan was prepared. No other warranty is either expressed or implied.

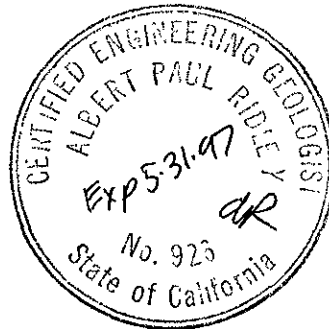
WOODWARD-CLYDE CONSULTANTS



Xinggang Tong  
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# TABLE OF CONTENTS

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<b>Section 1</b>	<b>Introduction .....</b>	<b>1-1</b>
	1.1 Purpose.....	1-1
	1.2 Scope Of Work .....	1-1
	1.3 Site Contacts.....	1-1
	1.4 Site Location.....	1-1
	1.5 Site History .....	1-1
<b>Section 2</b>	<b>Summary Of Results Of Previous Site Investigations .....</b>	<b>2-1</b>
	2.1 Initial Investigations March And July 1995 .....	2-1
	2.2 Underground Tank Removal October 1995 .....	2-1
<b>Section 3</b>	<b>Soil And Groundwater Investigation .....</b>	<b>3-1</b>
	3.1 Regulatory Requirements .....	3-1
	3.2 Soil Investigation.....	3-1
	3.3 Groundwater Investigation .....	3-2
	3.4 Groundwater Monitoring Program .....	3-3
	3.4.1 Monitoring Well Construction.....	3-3
	3.4.2 Well Development .....	3-4
	3.4.3 Water Level Measurement And Groundwater Monitoring .....	3-4
	3.5 Decontamination Procedures And Waste Disposal.....	3-5
	3.5.1 Decontamination Procedures.....	3-5
	3.5.2 Waste Disposal .....	3-5
<b>Section 4</b>	<b>RBCA Evaluation.....</b>	<b>4-1</b>
<b>Section 5</b>	<b>Reports .....</b>	<b>5-1</b>
	5.1 Additional Site Investigation Report .....	5-1
	5.2 Quarterly Reports.....	5-1
<b>Section 6</b>	<b>Schedule .....</b>	<b>6-1</b>
<b>Section 7</b>	<b>References.....</b>	<b>7-1</b>

# TABLE OF CONTENTS

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## Tables

Table 1	List of Contacts, City of Emeryville Fire Station No. 2
Table 2	Summary of Proposed Sample Analyses for Soil
Table 3	Summary of Proposed Sample Analyses for Groundwater
Table 4	Summary of Quarterly Groundwater Sampling and Analysis

## Figures

Figure 1	Site Location Map
Figure 2	Site Plan and Sample Locations
Figure 3	Proposed Monitoring Well Construction

## Appendices

Appendix 1	Tables and Figures from Prior Investigations
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## **1.1 PURPOSE**

Woodward-Clyde Consultants (WCC) was retained by the City of Emeryville Redevelopment Agency (Agency) to prepare a workplan for additional site investigation at the City of Emeryville Fire Station No. 2 facility at 6303 Hollis Street, in Emeryville. The preparation of this workplan follows the recent site investigations and removal of two (2) underground storage tanks (USTs). The results of the investigation and tank removal activities revealed that soil and groundwater beneath the site have been impacted by gasoline. This workplan responds to the Alameda County Environmental Health Services (ACEHS) letter of May 29, 1996 which requested additional soil and groundwater investigation.

## **1.2 SCOPE OF WORK**

The activities to be performed for this additional site investigation include the following tasks:

- Collect grab samples of soil and groundwater at four locations west and south of the former tank area to characterize the extent of gasoline impact
- Install one groundwater monitoring well
- Conduct a Risk-Based Corrective Action (RBCA) evaluation following ASTM Standard E-1739-95 to assess the need for remediation
- Conduct quarterly groundwater monitoring for one year

## **1.3 SITE CONTACTS**

The site is owned by the City of Emeryville. WCC is providing environmental consulting engineering services for the project to the City. Table 1 presents the names and addresses of other important entities involved with the site investigation, including the regulatory agencies who will receive copies of reports and correspondence regarding this work effort.

## **1.4 SITE LOCATION**

The City of Emeryville Fire Station No. 2 (site) is located at 6303 Hollis Street, in Emeryville. The site is located at the northwest corner of Hollis and 63rd Streets in Emeryville, as shown in Figure 1. The facility is located in a mixed use area with light commercial and residential structures in the area. A commercial building is located immediately north of the site. The site is located at an approximate elevation of 15 feet above mean sea level and about one-half mile east of San Francisco Bay.

## **1.5 SITE HISTORY**

A drawing from the City files, prepared in 1949, shows the planned construction of the Fire Station on this site. It is believed that the Fire Station was constructed in about 1949, and has been in continuous use since that time. Two underground fuel storage tanks (UST) were installed on the site, as shown in Figure 2. The 1,000 gallon gasoline UST was a single wall steel tank that

was reportedly replaced in 1989. The 1,000 gallon diesel UST was also a single wall steel tank, and was reportedly replaced in 1982. Actual replacement documents are not available. Both USTs were removed in October 1995.

## 2.1 INITIAL INVESTIGATIONS MARCH AND JULY 1995

WCC performed a preliminary investigation of the tank site area in March 1995 and presented the results in a report dated June 20, 1995 (WCC 1995a). The detections of TPH gasoline and BTEX in soil appear to occur mostly in the soil samples from approximately 5 feet in depth. Borings SB-1 through SB-5 were drilled at the site during the March 1995 investigation. The highest reported detection of gasoline in soil was 540 mg/kg in a soil sample from a depth of 5 feet in SB-1. The highest reported detection of benzene in soil was 0.63 mg/Kg in a soil sample from a depth of 6 feet in SB-2. TPH diesel was not detected in soil from these borings.

The March 1995 investigation included grab groundwater samples collected from SB-1 and SB-3. Only 0.99 mg/L TPH gasoline was reported in groundwater from SB-1. Benzene was detected at 0.22 mg/L in water from SB-3, and 0.0061 mg/L in water from SB-1.

A further round of site investigation was conducted by WCC in July 1995 (WCC 1995b) to better characterize the site and to prepare for tank removal. Borings SB-6 through SB-12 were selected to explore for evidence of petroleum in soil or groundwater at distances farther from the USTs. The July 1995 samples were not analyzed for diesel, because diesel was not detected in the March 1995 investigation. Like in March, the detections of TPH gasoline and BTEX in soil appear to occur mostly in the soil samples from approximately 5 feet in depth. The highest reported concentration of TPH gasoline in soil was 480 mg/Kg at 5.5 feet in SB-7. The highest reported concentration of benzene in soil was 1.2 mg/Kg at 5.5 feet in SB-6.

The July 1995 investigation included grab groundwater samples collected from SB-6 through SB-12. The highest reported detection of TPH gasoline was 5.5 mg/L in groundwater from SB-7. The highest reported detection of benzene was 0.04 mg/L in groundwater from SB-12.

Tables of results and figures from these prior reports are included in Appendix A.

## 2.2 UNDERGROUND TANK REMOVAL OCTOBER 1995

The two USTs and associated piping were removed in October 1995 (WCC 1996). The depth of both tank excavations was approximately 7.5 feet. Groundwater was encountered at an approximate depth of 7 feet.

Soil samples from the floor of each end of both UST excavations were collected after the tanks were removed. Although groundwater was encountered in the excavations, groundwater samples were not collected from the excavations because, in accordance with the workplan for this phase of work, groundwater samples had been collected in the previous site investigations.

TPH gasoline was detected at 380 mg/Kg, and benzene was detected at 0.34 mg/Kg from the east end of the gasoline UST excavation. TPH gasoline was detected up to 560 mg/Kg in stockpile sample Stock-Gas-2, and benzene was detected in sample Stock-Gas-2 at 0.58 mg/Kg. These samples were also analyzed for MTBE, with one detection of MTBE at 0.28 mg/Kg in the west end of the gasoline UST excavation.

TPH diesel was not detected in the diesel UST excavation samples or the stockpile sample. The diesel UST samples were not analyzed for parameters other than TPH diesel.



## **SECTION TWO**

## **Summary Of Results Of Previous Site Investigations**

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The soils from the two excavations were placed in two separate stockpiles. After sampling the stockpiles, the gasoline UST excavation was backfilled with soils from both tank excavations. The diesel UST excavation was backfilled with imported soil. Both excavation areas were paved with asphalt and concrete to match the surrounding grade.

### 3.1 REGULATORY REQUIREMENTS

This site investigation workplan falls under the jurisdiction of Chapter 6.7, division 20 of the Health and Safety Code and the California Underground Storage Tank Regulations (Subchapter 16 of Title 23 of the California Code of Regulations). These regulations prescribe the activities required to investigate and mitigate soil and groundwater affected by the contents of USTs and their appurtenances. Guidance for conducting UST investigations in Emeryville is provided by the RWQCB Tri-Regional Board Staff Recommendations dated August 10, 1990, and Appendix A of these recommendations dated August 30, 1991, and Alameda County Environmental Health Services (Alameda County) requirements.

In January 1996 the San Francisco Bay RWQCB issued Interim Guidance on Required Cleanup at Low Risk Fuel Sites. The following is a summary of the Interim Guidance and Supplemental Instructions:

- For sites with 'low risk' soil and groundwater contamination and having been characterized reasonably well, groundwater monitoring and passive bioremediation should be the preferred remedial alternative. The criteria for low risk groundwater case are defined as below:
  1. The leak has been stopped and sources removed.
  2. The site has been adequately characterized.
  3. The dissolved hydrocarbon plume is not migrating.
  4. No water wells, deeper drinking water aquifers, surface water, or other sensitive receptors are likely to be impacted.
  5. The site presents no significant risk to human health.
  6. The site presents no significant risk to the environment.
- There is no need to completely define a fuel hydrocarbon plume to its non-detect boundary;
- After source removal, monitoring and passive bioremediation should be the first and only choice for most LUFT sites; and
- Perform the ASTM standard Risk Based Corrective Action (RBCA, ASTM E-1739-95) analysis to demonstrate that the site meets acceptable risk levels.

On May 29, 1996 Alameda County Environmental Health Services (ACEHS) sent a letter to the Agency requesting that a workplan be drafted to characterize soil and groundwater *in the western and southern directions from the former tanks*. In addition, Alameda County requested that a groundwater investigation/ monitoring program be conducted at the site to evaluate the threat and/or impact of the petroleum hydrocarbon plume to public health, safety, and the environment, including threat to water quality.

### 3.2 SOIL INVESTIGATION

Four soil borings (SB-13 through SB-16) are proposed in the western and southern directions from the former tanks. Their locations are shown on Figure 2. These four proposed sample locations are intended to satisfy Alameda County's request to better characterize the site in the

western and southern directions from the former UST locations. However, site structures and underground utilities significantly limit access to many areas of the site.

The borings will be drilled with a continuous push method with a core sampler to 15 feet below ground surface (bgs). Borings will be advanced using six-inch and three-foot long samplers with 1.5-inch diameter stainless steel sample liners. As the boring advances and sample liners are retrieved, the borings will be logged by inspecting the soil not intended for laboratory testing. The lithologic log will include soil type and moisture conditions, along with the depth at which the laboratory samples were collected. Six-inch long sample liners from the specified depth intervals will be sealed with Teflon™ sheeting and plastic end caps, labeled, and placed in a ice-cooled container for transport to the analytical laboratory. The boreholes will be backfilled with a cement grout mixture, and the pavement surface will be repaired. Soil cuttings will be placed in 55-gallon drums for proper disposal following the receipt of laboratory reports.

Soil samples will be collected at 5 and 10 feet bgs from each of the four proposed sample locations SB-13 through SB-16. These samples will be analyzed for TPH gasoline by EPA Method 8015 (modified), BTEX and MTBE by EPA Method 8020 at a California Department of Toxic Substance Control certified analytical laboratory.

Underground Services Alert will be contacted at least 48 hours, but not more than 14 days, prior to the field sampling activities. In addition, a private utility locator will also be retained to provide underground utility clearance in the proposed drilling areas. If any underground utilities or surface obstructions prevent borings at the proposed locations, the borings will be relocated to a clear location nearby. Prior to drilling, a drilling permit will be obtained from the Alameda County Water Agency, Zone 7,

### **3.3 GROUNDWATER INVESTIGATION**

A grab groundwater sample will be collected from each of the four soil borings proposed under Section 3.2. Groundwater levels in the area are expected to vary from 7 to 12 feet bgs. After reaching 15 feet bgs at each borehole, one-inch diameter slotted PVC pipe will be placed into the borehole to allow groundwater accumulation within the pipe. A groundwater sample will be collected from each borehole by lowering a fresh disposable bailer into the temporary PVC casing. The samples will be placed into clean sample bottles provided by the analytical laboratory, sealed, labeled and placed in ice-cooled container for transport to the laboratory. The four groundwater samples will be analyzed for TPH gasoline, BTEX, and MTBE.

The depth to groundwater at each borehole will be measured before groundwater samples are collected. The groundwater depths will not be considered stabilized, since the boreholes will remain open for less than one day. After groundwater sample collection, the boreholes will be backfilled with a bentonite-cement slurry, and the pavement will be patched to match the surrounding grade within the same day of drilling.

For quality control purposes, a travel blank water sample will accompany the sample container in which the samples are stored during transportation from the laboratory to the site, and back to the laboratory. The travel blank will be analyzed for TPH gasoline and BTEX only.

### 3.4 GROUNDWATER MONITORING PROGRAM

#### 3.4.1 Monitoring Well Construction

The area of this site is only approximately 150 feet long by 150 feet wide, of which over 50 percent is occupied by the firehouse. For such a small site, we propose to install one groundwater monitoring well only for the purpose of monitoring shallow groundwater quality. Shallow groundwater gradient beneath the site will not be monitored. We believe that it have been well defined in this area by the ACEHS because many groundwater monitoring wells exist in this general area, and groundwater flows westly and southwesterly toward the Bay.

The proposed groundwater monitoring well (MW-1) will be installed approximately 10 feet from the former gasoline UST location in the downgradient direction, located approximately between borings SB-1 and SB-8 (Figure 2), both of which had gasoline detected in both soil and groundwater. This well will serve as the point to monitor shallow groundwater quality.

The boring will be advanced to a depth of approximately 20 feet, using 10-inch hollow-stem augers on a truck-mounted drill rig. Soil samples will be collected at 5-foot intervals beginning at 5 feet below grade. An attempt will be made to collect a soil sample from just above the water table, which varies from 7 to 12 feet below grade. The soil types encountered during drilling will be logged according to the Unified Soil Classification System (USCS) and summarized on the boring log.

Soil samples will be collected using a 2.5-inch-diameter modified California split-spoon sampler lined with clean brass liners. The sampler will be decontaminated between uses. The sampler will be driven a maximum of 18 inches using a 140-pound hammer with a 30-inch drop. The number of blows required to drive the sampler each 6-inch interval (blow count) will be recorded on the log. Brass liners of soil will be retained for laboratory analysis and submitted to the laboratory following the procedures described above. The remaining soil in the brass liners will be examined by a qualified engineer or geologist to determine the soil types for descriptions consistent with the USCS.

The soil boring will be completed as a groundwater monitoring well. The well will be constructed of 2-inch diameter schedule 40 polyvinyl chloride (PVC) piping with flush-threaded ends. The procedure for well installation is as follows:

- The drilling equipment will be decontaminated as described in Section 3.5.1.
- A 10-inch diameter borehole will be drilled to approximately 20 feet bgs using procedures described above. Soil samples will be collected also as described above.
- Two-inch-diameter Schedule 40 PVC casing and 0.02-inch slot size PVC screen will be installed through the hollow-stem auger. The bottom of the well will be capped with a threaded end cap. The well will be screened from 5 to 20 feet.
- Sand pack will be placed by a tremie method as the augers are removed. A conservatively small size such as Lone Star No. 2/12 will be placed to reduce the amount of sediment entering the well. the sand pack thickness will be measured continuously to ensure a solid pack with no bridging. The sand pack will extend approximately 1 to 2 feet above the top of the well screen.

- Approximately two feet of bentonite pellets will be placed into the borehole and hydrated with tap water to form a seal above the sand pack.
- Neat cement grout will be placed from the top of the bentonite seal to the ground surface. The grout will be allowed to set for 24 hours prior to well development.
- The well will be completed at grade, with a watertight locking well cap and a traffic-rated box.

Figure 3 shows typical well construction details.

### 3.4.2 Well Development

The well will be allowed to set 24 hours or more after construction prior to well development. It will be developed by a combination of bailing, surging, and pumping until the discharge water is relatively free of settleable solids or a maximum of 10 well casing volumes has been evacuated from the well. Water quality parameters such as pH and specific conductance will be measured and recorded during development. Following development, the well will be allowed to stabilize for at least 72 hours prior to groundwater sampling.

### 3.4.3 Water Level Measurement and Groundwater Monitoring

The well will be surveyed by a licensed land surveyor for horizontal location and top of casing elevation, relative to a referenced and established benchmark, to a precision of 0.01 foot. Depth to groundwater will be measured from the surveyed reference point at the top of the well casing. Water levels will be measured to the nearest 0.1 foot, prior to any purging activities to avoid disturbance of the static water table. The presence or absence of an immiscible layer on the shallow groundwater will be visually confirmed using a clear bailer.

Groundwater in well MW-1 will be monitoring quarterly for one year for the following parameters:

- Water level prior to purging.
- TPH gasoline and BTEX.
- MTBE will be analyzed for during well installation and during the first quarter of monitoring. If it is not detected in these two consecutive samples, analysis for MTBE will be discontinued.

A trip blank will be included in each round of groundwater sampling for quality control and will be analyzed for TPH gasoline and BTEX.

Prior to sampling, the well will be purged to allow groundwater representative of the saturated soil to enter the well. Three to five well casing volumes of groundwater will be purged from the well. Water quality parameters including pH, temperature, and specific conductance will be recorded during well purging. Samples will be collected when these parameters have stabilized and the water level has returned to at least 80 percent of its static level. Stabilization of these parameters suggests that the water within the well is representative of the groundwater in the saturated soil. Purge water will also be inspected in the field for the presence of odor or sheen. Groundwater samples will be collected using disposable bailers. Water samples will be decanted into appropriate containers provided by laboratory for the TPH gasoline and BTEX analyses.

Samples will be labeled with identifying information, stored in an ice chest cooled with ice, and transported under standard chain-of-custody procedures to an analytical laboratory that is certified by the State of California Department of Toxic Substances Control for environmental analysis.

### **3.5 DECONTAMINATION PROCEDURES AND WASTE DISPOSAL**

#### **3.5.1 Decontamination Procedures**

Down-hole drilling equipment such as augers and well development equipment will be decontaminated using a pressure steam cleaner with potable water before beginning drilling, between each drilling/sampling location, and before leaving the site. Split-spoon samplers, brass tube liners, oil-water interface probe/water level indicators and re-useable bailers will be decontaminated before use by washing/scrubbing in an Alconox™ solution and rinsing with potable water followed by rinsing with deionized water. A decontamination pad will be constructed to contain the runoff water from steam cleaning. The decontamination water will be handled according to Section 3.3.2.

#### **3.5.2 Waste Disposal**

Purged groundwater, equipment decontamination water, and soil cuttings will be collected in separate DOT-approved drums and left on site pending characterization, acceptance and transportation to an appropriate recycling or disposal facility. To ensure proper handling, treatment and/or disposal, the drums will be properly labeled. The labels will include the date of collection, the site address, waste material, material origins (e.g., well number), and the name and phone number of a contact person to whom questions may be addressed.

Following the San Francisco Bay RWQCB's Interim Guidance on Required Cleanup at Low Risk Fuel Sites (January 1996), a Risk-Based Corrective Action (RBCA) evaluation is proposed based on ASTM Standard E-1739-95. The purpose of this RBCA evaluation is to classify the site and to develop screening and target levels to support remedial decision making, if remediation is required. Under this task, the following work scope is proposed:

- Review existing site contamination information to determine the nature and extent of contamination;
- Prepare a RBCA workplan that presents site-specific information and approach to the RBCA evaluation. The workplan will be submitted to the ACEHS for approval;
- Perform RBCA Tier 1 and, if necessary, Tier 2 evaluation following the approval of the workplan. Site-specific risk-based screening levels may be developed and compared with concentrations of chemicals in groundwater and soil. Target levels may be developed to support remedial decision making.
- Prepare a report presenting the RBCA evaluation results.

**5.1 ADDITIONAL SITE INVESTIGATION REPORT**

Following the completion of soil and groundwater investigation, and installation of the groundwater monitoring well, a report will be prepared which will describe the field activities and results of the laboratory analysis. The report will follow the Tri-Regional Guidelines and will include:

- (1) A summary of field activities;
- (2) Tables summarizing analytical data.
- (3) Discussion and interpretations of results
- (4) A site plan, drawn to scale, showing boring locations;
- (5) Copies of boring logs with monitoring well construction details;
- (6) Field data sheets; and
- (7) Copies of laboratory analysis reports.

**5.2 QUARTERLY REPORTS**

Following each quarterly groundwater monitoring, a letter report will be prepared summarizing field activities and tabulated results of chemical analysis including historical analytical results. Copies of laboratory analysis reports will be included. Discussion of changes in groundwater elevations and chemical concentrations will also be presented.



The City will solicit proposals from environmental consulting firms within two weeks following receipt of approval of this workplan from the ACEHS. Proposal evaluation and contract approval by the City Council will require approximately 45 days. If the City receives approval of the workplan from the ACEHS by August 30, 1996, the additional soil and groundwater investigation will be completed by November 15, 1996. A report presenting the investigation results will be submitted to the ACEHS by December 31, 1996.

Quarterly groundwater monitoring is scheduled for the calendar year of 1997. A quarterly groundwater monitoring report will be submitted to the ACEHS within 30 days following the end of each quarter.

Results from this and previous investigations will be reviewed for the preparation of the RBCA workplan, which is scheduled for submission to the ACEHS by December 31, 1996. The RBCA evaluation and a report documenting the evaluation results will be completed within 30 days following the approval of the RBCA workplan from the ACEHS.

- Regional Water Quality Control Board - North Coast, San Francisco Bay, and Central Valley Regions (RWQCB), August 1990. Tri-Regional Board Staff Recommendation for Preliminary Evaluation and Investigation of Underground Tank Sites. Appendix A - Reports, August 1991.
- Woodward-Clyde Consultants, Workplan for Phase II Soil and Groundwater Investigation, City of Emeryville Fire Station No. 2, Emeryville, California, June 20, 1995
- Woodward-Clyde Consultants, Preliminary Investigation and Evaluation Report, City of Emeryville Fire Station No. 2, Emeryville, California, August 25, 1995
- Woodward-Clyde Consultants, Report on Removal of Two Underground Fuel Storage Tanks and Associated Piping, Emeryville Fire Station No. 2, Emeryville, California, January 8, 1996

**TABLE 1**  
**LIST OF CONTACTS**  
**CITY OF EMERYVILLE**  
**FIRE STATION NO. 2**  
**6303 Hollis Street**  
**Emeryville, California**

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**Facility Owner/Operator:**

City of Emeryville  
2200 Powell Street, 12th Floor  
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Ignacio Dayrit  
(510) 596-4356

**Environmental Consultants to City of Emeryville:**

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Alameda, California 94502

Susan Hugo  
(510) 567-6780

**Regional Water Quality Control Board:**

Regional Water Quality Control Board  
2101 Webster Street, Suite 500  
Oakland, California 94612

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**TABLE 2**

**SUMMARY OF PROPOSED SAMPLE ANALYSES FOR SOIL**

**DIRECT PUSH BORINGS**

Boring ID	Sample ID	Sample Depth Interval feet bgs	TPH	BTEX		MTBE
			gasoline 8015 mod	8020 mod	8020 mod	
SB-13	SB-13-5	5 to 5.5	X	X	X	
	SB-13-10	10 to 10.5	X	X	X	
SB-14	SB-14-5	5 to 5.5	X	X	X	
	SB-14-10	10 to 10.5	X	X	X	
SB-15	SB-15-5	5 to 5.5	X	X	X	
	SB-15-10	10 to 10.5	X	X	X	
SB-16	SB-16-5	5 to 5.5	X	X	X	
	SB-16-10	10 to 10.5	X	X	X	

**MONITORING WELL BORING**

Boring ID	Sample ID	Sample Depth Interval feet bgs	TPH	BTEX		MTBE
			gasoline 8015 mod	8020 mod	8020 mod	
MW-1	MW-1-5	5 to 5.5	X	X	X	
	MW-1-10	10 to 10.5	X	X	X	
	MW-1-15	15 to 15.5	X	X	X	
	MW-1-19.5	19.5 to 20	X	X	X	

**TABLE 3**

**SUMMARY OF PROPOSED GROUNDWATER  
SAMPLE ANALYSES**

**DIRECT PUSH BORINGS**

Boring ID	Sample ID	TPH	BTEX	MTBE
		gasoline 8015 mod	8020 mod	8020 mod
SB-13	SB-13-W	X	X	X
SB-14	SB-14-W	X	X	X
SB-15	SB-15-W	X	X	X
SB-16	SB-16-W	X	X	X

**MONITORING WELL BORING**

Boring ID	Sample ID	TPH	BTEX	MTBE
		gasoline 8015 mod	8020 mod	8020 mod
MW-1	MW-1-W	X	X	--

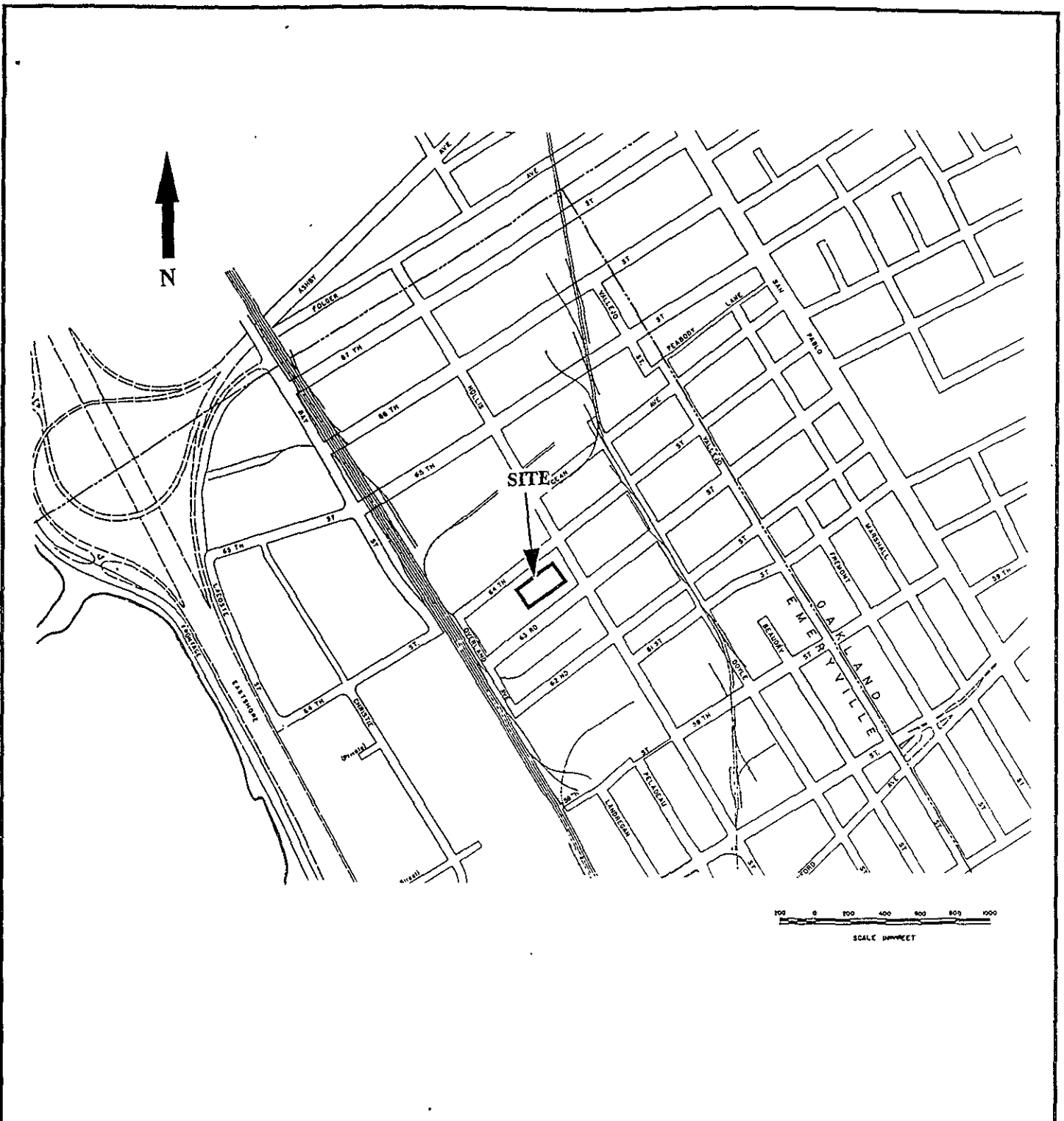
- Notes: (1) One trip blank will be enclosed in each day's sample shipment  
(2) -- indicates not analyzed


TABLE 4

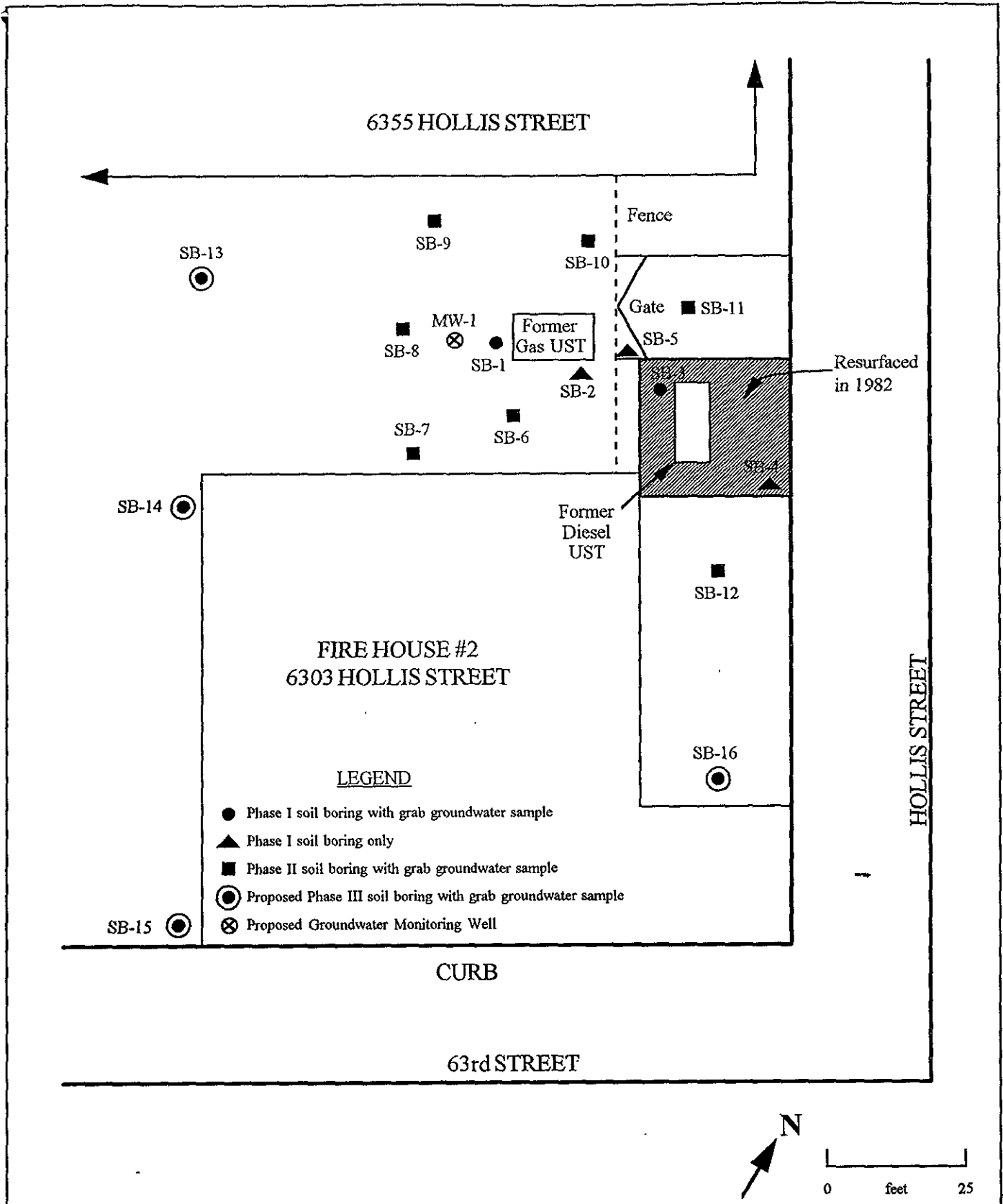
SUMMARY OF QUARTERLY GROUNDWATER  
SAMPLING AND ANALYSIS

Well ID	Sample ID	TPH	BTEX	MTBE
		gasoline 8015 mod	8020 mod	8020 mod
MW-1	MW-1-MO-YR	X	X	X
Trip Blank	Trip Blank MO-YR	X	X	--

- Notes:
- (1) Analysis for MTBE will be discontinued if it is not detected in two consecutive sampling events, including the sample collected when the well is installed
  - (2) One trip blank will be enclosed with each sample shipment
  - (3) -- indicates not analyzed

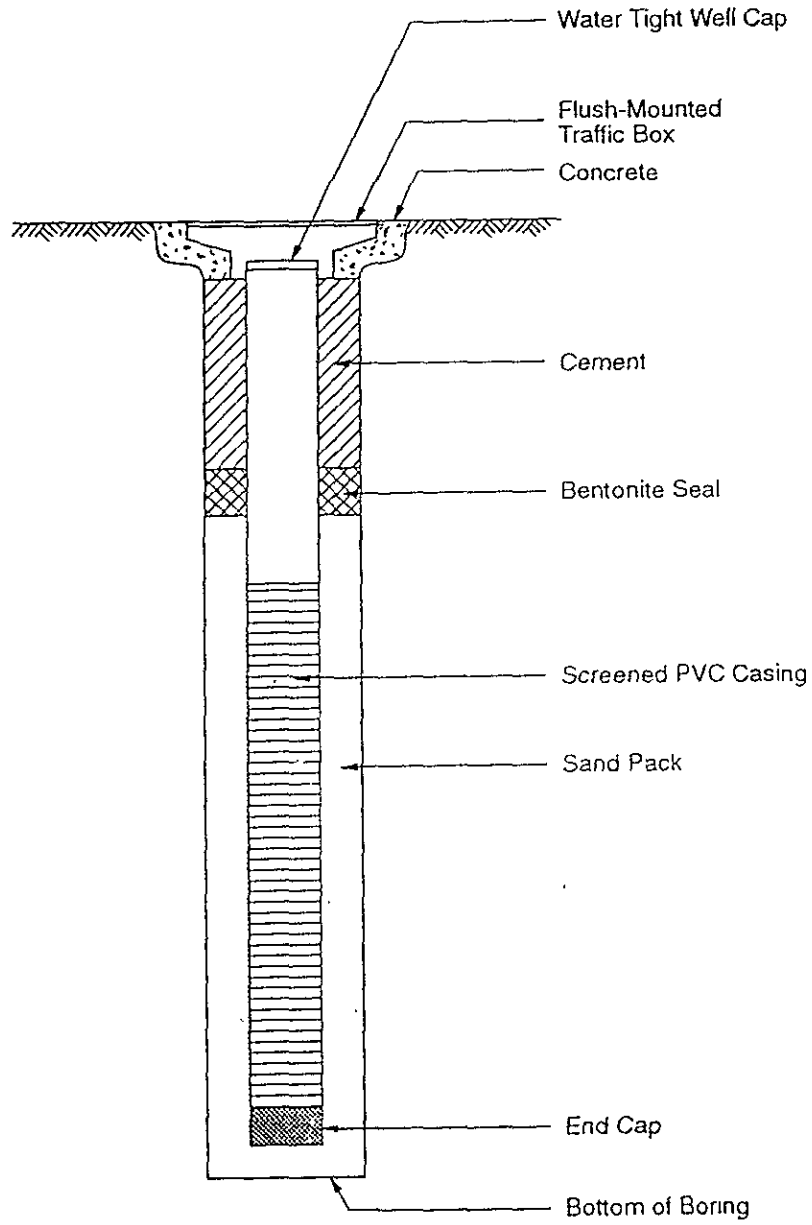


Project No. 94166NA	CITY OF EMERYVILLE Fire Station Number 2	<b>SITE LOCATION</b>	Figure 1
Woodward-Clyde Consultants 			July 15, 1995



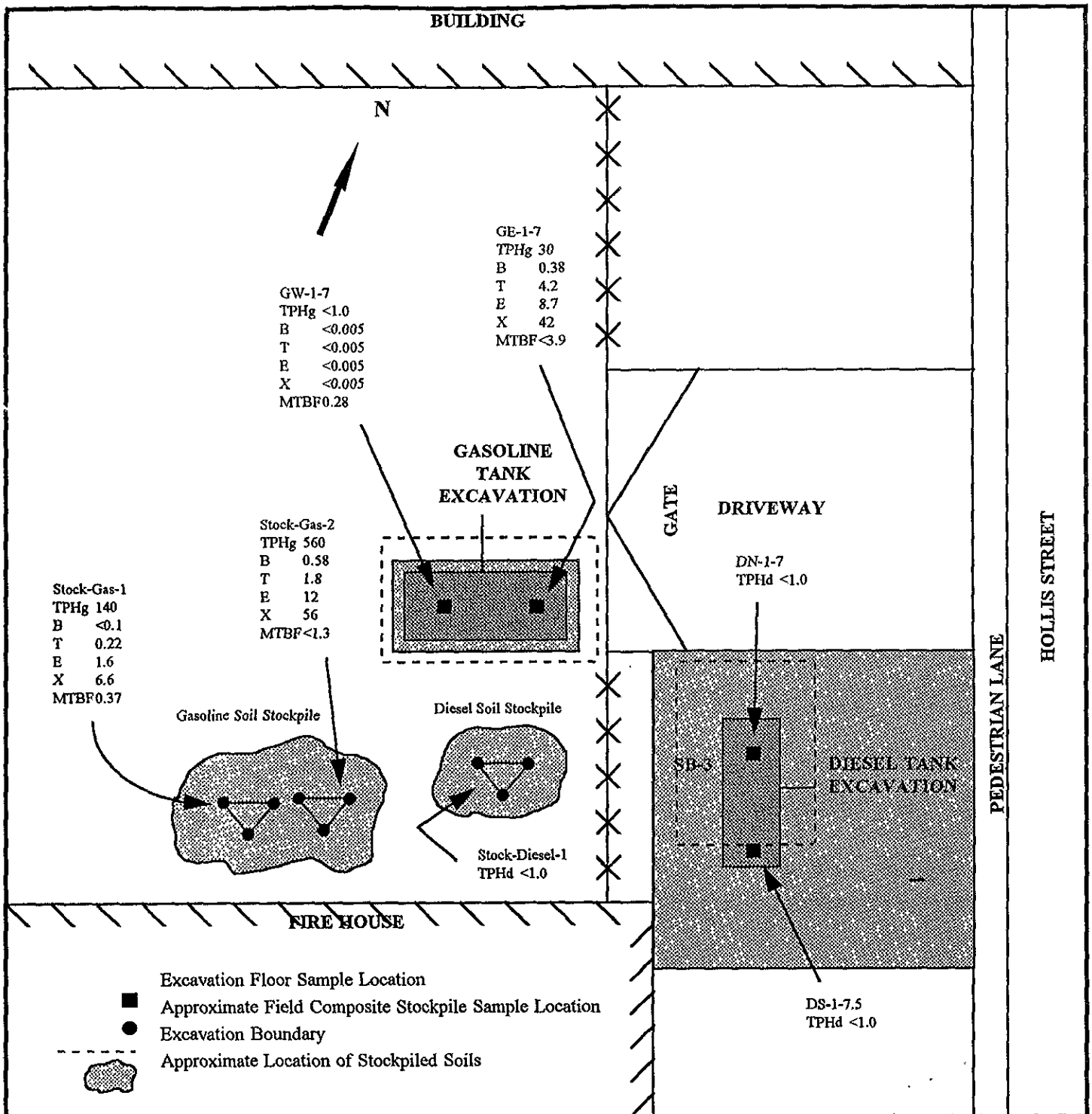
Project No. 941366NA	City of Emeryville Fire Station No. 2	<b>PHASE III PROPOSED SAMPLE AND MONITORING WELL LOCATIONS</b>	Figure 2
<b>Woodward-Clyde Consultants</b>			





		PROPOSED MONITORING WELL CONSTRUCTION	Figure <b>3</b>
Woodward-Clyde Consultants			





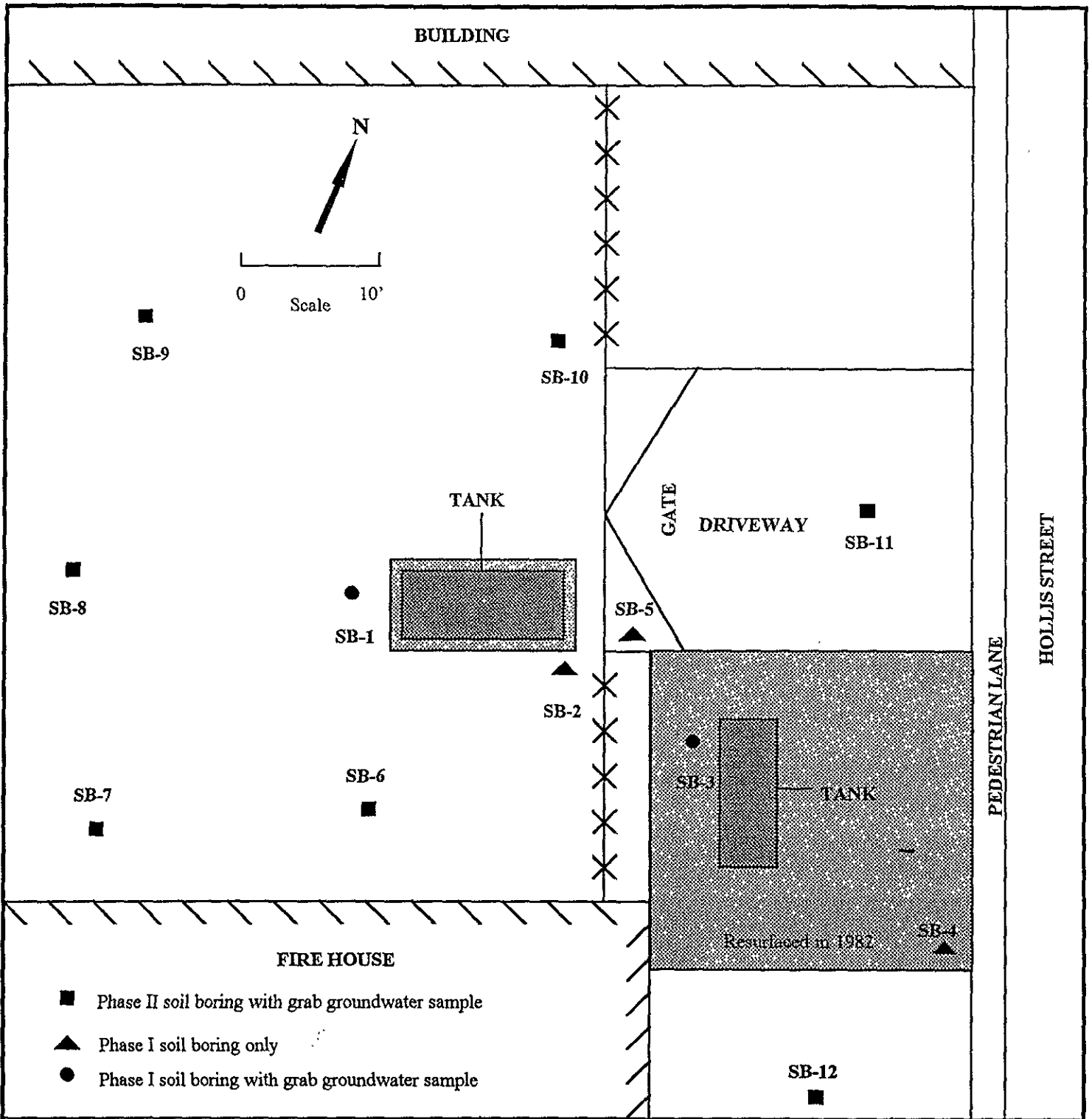
Project No. 941366NA	CITY OF EMERYVILLE Fire Station Number 2	<b>SITE PLAN SHOWING UST EXCAVATIONS,          SOIL SAMPLE LOCATIONS          AND TPH, BTEX, AND MTBE          CONCENTRATIONS</b>	Figure 3
<b>Woodward-Clyde Consultants</b>			December 1995

TABLE 1

SOIL ANALYTICAL RESULTS  
CITY OF EMERYVILLE  
FIRE STATION NO. 2

Sample No.	TPH <sup>a</sup>	TPH <sup>b</sup>	Benzene <sup>c</sup> (mg/kg)	Toluene <sup>c</sup> (mg/kg)	Ethylbenzene <sup>c</sup> (mg/kg)	Xylenes <sup>c</sup> (mg/kg)	MTBE <sup>c</sup> (mg/kg)
	Gasoline (mg/kg)	Diesel (mg/kg)					
GE-1-7'	380	---	0.34	4.2	8.7	42	<3.9
GW-1-7'	<1.0	---	<0.005	<0.005	<0.005	<0.005	0.28
STOCK-GAS-1	140	---	<0.1	0.22	1.6	6.6	<0.37
STOCK-GAS-2	560	---	0.58	1.8	12	56	<1.3
STOCK-DIESEL-1	---	<1.0	---	---	---	---	---
DN-1-7.5'	---	<1.0	---	---	---	---	---
DS-1-7.5'	---	<1.0	---	---	---	---	---

- Notes:
- <sup>a</sup> Total petroleum hydrocarbons by EPA Method 8015 (Mod.), quantified as gasoline.
  - <sup>b</sup> Total petroleum hydrocarbons by EPA Method 8015 (Mod.), quantified as diesel.
  - <sup>c</sup> Benzene, toluene, ethylbenzene, xylenes, and MTBE by EPA Method 8020.
  - Not analyzed



Project No. 941366NA	CITY OF EMERYVILLE Fire Station Number 2	<b>PHASE I &amp; II SOIL BORING LOCATIONS</b>	Figure 2
			July 15, 1995

TABLE 2.

**SOIL SAMPLES ANALYTICAL RESULTS SUMMARY  
FIRE STATION NO. 2  
EMERYVILLE, CALIFORNIA**

Sample ID (Depth, ft)	TPH as Gasoline/BTEX (EPA modified 8015/8020)				
	Benzene	Toluene	Ethylbenzene	Total Xylenes	TPH as Gasoline
SB-6-5.5	1200	4900	8600	47000	440
SB-6-11	ND	ND	ND	ND	ND
SB-7-5.5	690	760	7500	28000	480
SB-7-11	ND	ND	ND	ND	ND
SB-8-5.5	190	230	1500	3500	120
SB-8-11	ND	ND	ND	ND	ND
SB-9-5.5	ND	ND	ND	ND	ND
SB-9-13	ND	ND	ND	ND	ND
SB-10-11.5	ND	ND	ND	ND	ND
SB-11-5.5	1200	5300	3300	17000	170
SB-11-11	ND	ND	5.7	26	ND
SB-12-5.5	8.3	15	ND	24	ND
SB-12-11.5	ND	ND	ND	ND	ND

## Notes:

- (1) Gasoline results are in mg/Kg, all other results are in ug/Kg
  - (2) Samples analyzed by Chromalab, Inc., July 17-18, 1995
  - (3) Refer to laboratory reports for analytical reporting limits
- ND Not detected

TABLE 3.

GROUNDWATER SAMPLES ANALYTICAL RESULTS SUMMARY  
 FIRE STATION NO. 2  
 EMERYVILLE, CALIFORNIA

Sample ID (Depth, ft)	TPH as Gasoline/BTEX (EPA Modified 8015/8020)				
	Benzene	Toluene	Ethylbenzene	Total Xylenes	TPH as Gasoline
SB-6-W	24	27	27	110	0.41
SB-7-W	36	30	180	510	5.5
SB-8-W	18	36	27	100	0.46
SB-9-W	ND	ND	0.7	3.7	ND
SB-10-W	ND	ND	0.6	3.3	ND
SB-11-W	12	8.6	12	44	0.23
SB-12-W	40	130	38	170	0.97
TB	ND	ND	ND	ND	ND

Notes:

- (1) Gasoline results are in mg/L, all other results are in ug/L
  - (2) Samples analyzed by Chromolab, Inc., July 17-18, 1995
  - (3) Refer to laboratory reports for analytical reporting limits
- ND Not Detected

TABLE 1  
 PHASE I SOIL ANALYTICAL RESULTS  
 CITY OF EMERYVILLE  
 FIRE STATION No. 2

Sample No.	Date Sampled	TPH <sup>a</sup> Gasoline (mg/kg)	TPH <sup>b</sup> Diesel (mg/kg)	Benzene (µg/kg)	Toluene (µg/kg)	Ethylbenzene (µg/kg)	Total Xylenes (µg/kg)
SB-1-2'	3/15/95	2.4	NA	280	12	200	370
SB-1-5'	3/15/95	540	NA	ND (1,000)	7,000	10,000	51,000
SB-1-10'	3/15/95	ND (1.0)	NA	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)
SB-2-6'	3/15/95	3.0	NA	630	5.7	ND (5.0)	15
SB-2-10'	3/15/95	ND (1.0)	NA	110	ND (5.0)	9.7	6.1
SB-3-6'	3/15/95	NA	ND (1.0)	420	11,000	5,500	27,000
SB-3-10'	3/15/95	NA	ND (1.0)	47	81	60	80
SB-4-6'	3/15/95	NA	ND (1.0)	ND (50)	54	1,100	3,300
SB-4-11'	3/15/95	NA	ND (1.0)	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)
SB-5-5.5'	3/15/95	NA	ND (1.0)	240	170	2,300	8,200
SB-5-10'	3/15/95	NA	ND (1.0)	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)

Notes: <sup>a</sup> Total petroleum hydrocarbons by EPA Method 8015 (Mod.), quantified as gasoline.  
<sup>b</sup> Total petroleum hydrocarbons by EPA Method 8015 (Mod.), quantified as diesel.  
 Benzene, toluene, ethylbenzene and xylenes by EPA Method 8020.  
 NA - Not analyzed; ND - Not detected at or above the detection limit given in parentheses.

1



TABLE 2  
GROUNDWATER ANALYTICAL RESULTS  
CITY OF EMERYVILLE  
FIRE STATION No. 2

Sample No.	Date Sampled	TPH <sup>a</sup> Gasoline (mg/L)	TPH <sup>b</sup> Diesel (mg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)
SB-3	3/15/95	NA	NA	220	3,800	2,500	14,000
SB-1	3/15/95	0.99	NA	6.1	40	33	160
Trip Blank	3/15/95	NA	NA	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)

Notes:    <sup>a</sup>    Total petroleum hydrocarbons by EPA Method 8015 (Mod.), quantified as gasoline.  
           <sup>b</sup>    Total petroleum hydrocarbons by EPA Method 8015 (Mod.), quantified as diesel.  
 Benzene, toluene, ethylbenzene and xylenes by EPA Method 8020.  
 NA - Not analyzed;   ND - Not detected at or above the detection limit given in parentheses.