Alameda County
APR 0 9 2004
Environmental Health

Corrective Action Plan
Former Cox Cadillac Property
230 Bay Place
Oakland, California

April 8, 2004
001-09171-04

Prepared for
Bond Companies
350 W. Hubbard Street, Suite 4560
Chicago, Illinois 60610

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April 8, 2004

001-09171-04

Mr. Don Hwang
Hazardous Materials Specialist
Local Oversight Program
Alameda County Environmental Health Services
1131 Harbor Bay Parkway, Suite 250
Alameda, California 94502-6577

Subject: Corrective Action Plan, Former Cox Cadillac Property, 230 Bay Place, Oakland, California (Fuel Leak Case No. RO0000148)

Dear Mr. Hwang:

On behalf of Bond Companies, LFR Levine·Fricke (LFR) has prepared this Corrective Action Plan (CAP) to address the chemicals of concern at the former Cox Cadillac property located at 230 Bay Place in Oakland, California. Bond Companies and LFR request that Alameda County Environmental Health Services review and approve the enclosed CAP.

If you have any questions or comments, please contact me at (510) 596-9536.

Sincerely,

Charles Pardini

Charles H. Pardini, R.G.
Principal Geologist
Assistant Operations Manager

cc: Mr. Robert Bond, Bond Companies
Zachary Walton, Esq., Paul, Hastings, Janofsky & Walker LLP

Enclosure

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CONTENTS

TABLES

FIGURES

1.0 INTRODUCTION

1.1 Purpose of the Corrective Action Plan

This Corrective Action Plan (CAP) has been prepared by LFR Levine·Fricke (LFR), on behalf of Bond Companies, to present the proposed remediation plan for soil and groundwater at the former Cox Cadillac property located at 230 Bay Place in Oakland, California ("the Site"; Figure 1).

Review of previously prepared reports indicated that the soil and groundwater at the Site has been affected by petroleum hydrocarbons associated with releases from historical underground storage tanks (USTs) that have been removed from the Site. The purpose of the CAP is to summarize the results of the remedial investigations and the interim remedial measures (IRMs) conducted to date at the Site and, based on these site activities, to propose a corrective action for clean-up of the Site. The primary objective of the CAP is to protect human health and the environment. It is LFR's understanding that the Site will be redeveloped with a commercial building in the near future. It is our understanding that the proposed primary use of the Site will be as a Whole Foods grocery store.

1.2 Scope of the Corrective Action Plan

The CAP presents the following:

- A purpose and scope of the CAP (Section 1.0)
- A description of the Site, including the history and a description of the physical characteristics of the Site (Section 2.0)
- A summary of the remedial investigations and IRMs conducted to date (Section 3.0)
- A discussion of the nature and extent of contamination in soil and groundwater beneath the Site (Section 4.0)
- A presentation of the proposed Corrective Action Objectives (CAOs; Section 5.0)
- An evaluation of corrective action technologies (Section 6.0)
- A description of the proposed corrective action for the Site (Section 7.0)
- A schedule for the corrective action (Section 8.0)
- A summary of the costs for the proposed corrective action (Section 9.0)

2.0 SITE DESCRIPTION

2.1 Site Location and Description

The Site was formerly occupied by Cox Cadillac and was used for automobile sales and service. It is currently vacant. The facility comprises 45,300 square feet, of which approximately 6,500 square feet were formerly used as a sales showroom and offices, while the remainder was formerly used for automobile storage, bodywork, painting, and indoor service.

The Site is located in a mixed residential and commercial area approximately 1,000 feet north of Lake Merritt in Oakland. The Site consists of approximately 2.2 acres and was occupied by an abandoned automobile showroom building shell. The remainder of the Site is covered with concrete or asphalt (Figure 2). A portion of the building was constructed as early as 1915. The primary structure was demolished in February and March 2004 in accordance with the City of Oakland Department of Building and Department of Public Works. The portion of the structure that was constructed in 1915 is considered to have architectural/historical significance and has been retained.

The site vicinity is primarily residential, commercial, and light-industrial facilities, primarily automobile dealerships and service stations. Single-family and multi-unit residential buildings occupy the property to the northeast and southeast of the Site. The property to the northwest of the Site is occupied by a church and associated school. An auto dealership, auto repair shops, and a service station occupy the properties to the south and west of the Site across Bay Place.

Surface elevation at the Site is approximately 12 feet above mean sea level. Topography in the site vicinity slopes gently to the southwest toward Vernon Street (USGS 1993).

2.2 Regional Geology and Hydrogeology

The region is underlain by the Quaternary-age Temescal and Alameda Formations. The Temescal Formation consists of inter-fingering layers of clayey gravel, sandy silty clay, and various clay-silt-sand mixtures. The Temescal Formation varies in depth to a maximum of approximately 60 feet and is underlain by the Alameda Formation, which consists of unconsolidated continental and marine gravels, sand, silt, and clay, with some shells and organic materials in various places. The Alameda Formation has a maximum known thickness of 1,050 feet (Radbruck 1957; ETIC 2004a).

The Site is located in the East Bay Plain Groundwater Basin. Regional groundwater flow is to the west, in the general direction of the San Francisco Bay (RWQCB 1995; ETIC 2004a).

2.3 Site Geology and Hydrogeology

The description of the lithology at the Site is derived from previous investigations that were conducted at the Site and in the site vicinity. In general, the Site is underlain by clays, silts, and sands. Fill material containing a mixture of brick, concrete, and gravel is present from below the concrete slab to approximately 5 feet below ground surface (bgs) in some areas of the Site. In addition, a concrete subfloor is present beneath the southern area of the showroom. Groundwater is first encountered at the Site at approximately 8 to 12 feet bgs and the groundwater rises to a static level of approximately 3 to 5 feet bgs. The shallow groundwater flow direction beneath the Site is to the southwest, with an average hydraulic gradient of approximately 0.05 foot/foot (Figure 3; ETIC 2004b).

2.4 Historical Site Use

The Site was formerly occupied by Cox Cadillac and was used for automobile sales and service, including storage, maintenance, repair, and painting, and is currently vacant. The Site consists of approximately 2.2 acres and was formerly occupied by an approximately 6,500-square-foot automobile showroom. The remainder of the Site is covered with concrete and asphalt (Figure 2).

3.0 SUMMARY OF REMEDIAL INVESTIGATIONS AND INTERIM REMEDIAL ACTIVITIES

Several soil and groundwater investigations have been conducted at the Site since 1992. The following sections summarize these activities and the results obtained from the previous soil and groundwater investigations that have taken place at the Site.

3.1 Underground Storage Tanks

The Site formerly housed a Cadillac car dealership, including a service facility. Three USTs were present at the Site as part of the service facility (Figure 2). A 1,050-gallon-capacity mineral spirits tank reportedly located on Harrison Street was removed in September 1992 (PES Environmental, Inc. [PES] 1992). Reportedly, PES did not identify any environmental issues regarding leakage from this tank that would warrant additional soil or groundwater investigation or remediation.

The other two USTs were the focus of the environmental investigations conducted at the Site. These USTs consisted of a 3,000-gallon-capacity waste oil storage tank, removed in December 1988 by R.S. Eagan & Company, and a 10,000-gallon-capacity gasoline storage tank, with associated product piping, removed in January 1994 (Eisenberg, Olivieri, & Associates [EOA] 1994a). The waste oil UST was located just southeast of the indoor service area (Figure 2), and the gasoline UST was located on the Site near the intersection of Bay Place and Vernon Street (Figure 2).

3.1.1 Waste Oil Underground Storage Tank

During removal of the waste oil UST, holes were reportedly observed in the UST and free product was present in the excavation. Approximately 27 cubic yards of affected soil were excavated and removed from the Site during removal of the waste oil UST in 1988 (Figure 2; PES 1993).

3.1.2 Gasoline Underground Storage Tank

During the excavation and removal of the 10,000-gallon-capacity UST, a hole was observed in the product piping that lead from the UST to the fuel dispenser (west of the UST). Free-phase product was observed on the groundwater surface in the gasoline UST excavation. Two soil samples were collected from the excavation for the gasoline UST at depths of approximately 4 feet bgs (southern wall) and 5 feet bgs (northern wall). Groundwater was encountered at approximately 5 feet bgs. Therefore, no soil samples were collected from beneath the UST because of the relatively high groundwater level. The product piping was reportedly present at depths between approximately 9 inches (dispenser end) and 24 inches bgs (UST end). Three soil samples were collected from the piping excavation. Approximately 50 cubic yards of soil were excavated and removed during removal of this UST in 1994 (EOA 1994a).

In June 1994, an additional soil excavation was conducted at the Site to remove the source of the affected groundwater at the Site. Approximately 100 cubic yards of total petroleum hydrocarbon- (TPH-) affected soil adjacent to the former gasoline UST, along the western portion of the former product piping route, were excavated and removed. Based on the analytical results of confirmation soil samples collected during these excavation activities, soil containing up to 700 milligrams per kilogram (mg/kg) of TPH as gasoline (TPHg) remained in soil following excavation activities (EOA 1994b).

In July 1997, an additional 50 cubic yards of TPH-affected soil were excavated from the area adjacent to the eastern edge of the former gasoline UST and the former product piping route. A total of three confirmation soil samples (two from the southern sidewall and one from the northern sidewall) were collected from a depth of approximately 2.5 feet bgs. One of the soil samples collected from the southern sidewall contained benzene at a concentration of 0.009 mg/kg and total xylenes at a concentration of 0.013 mg/kg. The other analytes were below laboratory reporting limits in the three samples (PES 1999).

3.2 Soil Investigations

In addition to the UST removals, several soil and groundwater investigations have been conducted at the Site. The following presents a summary of the results of the soil data collected during the investigations; the data for the soil samples are presented on Figure 4.

PES conducted a soil-quality investigation inside the building in 1999, adjacent to the location of the former gasoline UST, to delineate potentially affected soil within the building. Reported concentrations of petroleum hydrocarbons in soil collected from borings inside the building (B-2 and B-3) were below the laboratory reporting limit of 1 mg/kg for TPHg. With the exception of xylenes that were detected at a concentration of 0.005 mg/kg in a soil sample from soil boring B-2, the chemicals analyzed were below laboratory reporting limits. Reported concentrations for soil samples collected from boring B-3 at depths between 4 and 4.5 feet bgs were 0.038 mg/kg of benzene, 0.0051 mg/kg of total xylenes, and 0.18 mg/kg of methyl tertiary-butyl ether (MTBE; Figure 4; PES 1999).

On July 28, 2000, LFR advanced soil boring SB-1 in the former showroom, between the southeastern wall and PES soil boring B-3 (Figure 4). LFR collected a soil sample from a depth of approximately 2 feet bgs. However, a deeper soil sample and a groundwater sample could not be collected at this location because what appeared to be a concrete subslab was encountered immediately beneath the 2-foot sample depth. The analytical results for the collected sample (SB-1) did not indicate the presence of petroleum hydrocarbons above laboratory reporting limits (LFR 2000).

Two soil samples were collected from boring EB-1, which was drilled in the northern corner of the building by Lowney Associates on July 27, 2000 (Figure 4). During drilling, Lowney Associates reportedly noticed hydrocarbon odor in this boring. The soil sample collected from a depth of approximately 1.5 feet bgs contained concentrations of TPHg at 370 mg/kg, ethylbenzene at 0.078 mg/kg, and xylenes at 1.6 mg/kg. Benzene and toluene were not present above laboratory reporting limits. The soil sample collected from a depth of approximately 4 feet bgs from soil boring EB-2 contained TPHg at 17 mg/kg, toluene at 0.013 mg/kg, ethylbenzene at 0.024 mg/kg, and xylenes at 0.086 mg/kg. Benzene was not present above laboratory reporting limits (LFR 2000).

In May 2001, LFR collected soil samples from approximately 4 and 7.5 feet bgs from soil boring LF-1, located near soil boring B-3 (Figure 4). The sample collected at approximately 4 feet contained TPHg at 3.2 mg/kg, TPH as diesel (TPHd) at 5.3 mg/kg, and TPH as motor oil (TPHmo) at 4.3 mg/kg. Benzene, toluene, ethylbenzene, and total xylenes (BTEX) were detected at 0.100 mg/kg, 0.016 mg/kg, 0.026 mg/kg, and 0.029 mg/kg, respectively. The sample collected at approximately 7.5 feet bgs did not contain petroleum hydrocarbons above their laboratory reporting limits.

In November 2003, ETIC conducted a soil investigation to further characterize the lateral and vertical extent of TPH and BTEX compounds in site soils and groundwater (ETIC 2004a). The results of the groundwater investigation are summarized in Section 3.3. This investigation consisted of advancing 15 borings (UB1 through UB4, GP1 through GP9, GP2A, and GP4A), collecting soil samples from select borings, and analyzing the samples for TPHg, BTEX, and gasoline oxygenates. The results are presented on Figure 4. Soil samples collected from on-site locations GP2 and GP2A contained TPHg at concentrations up to 810 mg/kg; benzene up to 33 mg/kg, toluene up to 32 mg/kg, ethylbenzene up to 23 mg/kg, and xylenes up to 79 mg/kg;

respectively, and MTBE up to 3.0 mg/kg. These concentrations were detected in soil samples collected near the former gasoline UST location. Analysis of one off-site soil sample collected at 5 feet bgs detected only benzene (0.0093 mg/kg) and ethylbenzene (0.0092 mg/kg) above laboratory reporting limits.

In March 2004, LFR advanced eight soil borings (SB-1 through SB-8) to further assess the constituents in soil under the concrete slabs and to help delineate the lateral extent of the affected groundwater. The results of the groundwater investigation are summarized in Section 3.3. Generally, two soil samples were collected from each boring (SB-1 through SB-6) in the 0- to 2-foot range and in the 3.5- to 5.5-foot range. The soil samples were analyzed for TPHg, TPHd, BTEX, and MTBE. TPHg, BTEX, and MTBE were not detected in soil samples collected from SB-1 and SB-4 through SB-6 (Figure 4). TPHg was detected in a soil sample collected from SB-3 at a concentration of 1.2 mg/kg. TPHd was detected in 10 of 11 soil samples collected from soil borings SB-1 through SB-6. Concentrations of TPHd ranged from less than 1.0 mg/kg in the soil sample collected from approximately 4.5 feet bgs at soil boring SB-2 to 130 mg/kg in the soil sample collected from approximately 3 feet bgs at soil boring SB-3. However, based on the laboratory's review of the chromatograms for each of the samples that contained detectable concentrations of TPHd, the diesel did not match the standard and is considered degraded gasoline or naturally occurring oils. TPHg and BTEX were detected in a soil sample collected from SB-2, located immediately adjacent to the former waste oil storage tank, at concentrations of 30 mg/kg, 0.86 mg/kg, 0.14 mg/kg, 0.68 mg/kg, and 2.07 mg/kg, respectively. MTBE was not detected in the samples analyzed from boring SB-2.

3.3 Groundwater Investigations

Several groundwater investigations have also been conducted at the Site. In 1993, PES conducted investigations that included the installation of several groundwater monitoring wells. Permanent well MW-1 was installed in March 1993. Temporary wells TW-1 through TW-7 were installed in October 1993, and five of them were converted to permanent monitoring wells (TW-2 and TW-4 through TW-7; PES 1993). In addition, a second permanent monitoring well (MW-2) was installed in December 1998 (PES 1999). The locations of these wells are shown on Figure 3. Well TW-7 is located immediately downgradient (with respect to the direction of groundwater flow) from the former gasoline UST; TW-5 is located downgradient from the former fuel dispenser, in the vicinity of the product piping and close to the former building (PES 1993).

Since 1993, groundwater investigations and monitoring have periodically been conducted. Historical groundwater monitoring data are presented in Table 1. More recently, ETIC conducted a grab groundwater investigation in November 2003 and groundwater monitoring in January 2004. In March 2004, LFR conducted a separate grab groundwater investigation. The purpose of ETIC's and LFR's grab groundwater investigations was to further characterize the likely on-site or off-site sources of the hydrocarbon and MTBE groundwater plume at the Site, delineate the lateral extent of the plume, and characterize its chemical composition. Iso-concentration contours for TPHg, benzene, and MTBE are depicted on Figures 5, 6, and 7, respectively.

In November 2003, ETIC conducted a groundwater investigation that consisted of collecting eight grab groundwater samples from soil borings GP1, GP2A, GP6 through GP9, UB1, and UB2 (Table 2; ETIC 2004a). These samples were analyzed for TPHg, BTEX, and gasoline oxygenates. Reportedly, the on-site groundwater samples contained TPHg up to a concentration of 67,000 micrograms per liter (μg/l), benzene to 9,500 μg/l, ethylbenzene to 1,800 μg/l, toluene to 5,700 μg/l, and total xylenes to 6,100 μg/l. These maximum detections were detected in the grab groundwater sample collected from soil boring GP-6, located in the former indoor service area. MTBE was detected at the highest concentrations (5,800 μg/l in GP1 and 7,300 μg/l in GP2A) near the former gasoline UST location. One groundwater sample collected off site at location UB-2 was found to contain TPHg at 14,000 μg/l and MTBE at 37 μg/l while the groundwater sample collected from UB-1 contained toluene (1.5 μg/l, total xylenes (2.0 μg/l), and MTBE (0.84 μg/l).

ETIC collected groundwater samples from five on-site groundwater monitoring wells (MW-1, MW-2, TW-2, TW-6, and TW-7) in January 2004. The results, presented in Table 1, indicated that TPHg and BTEX were not detected in monitoring wells MW-2, TW-2, and TW-6. Groundwater samples collected from MW-1 and TW-7 had elevated concentrations of TPHg of 32,000 μg/l and 16,000 μg/l, respectively, and benzene concentrations of 2,700 μg/l and 2,500 μg/l, respectively. The farthest downgradient well, MW-2, had the highest concentration of MTBE at 2,100 μg/l (ETIC 2004b).

LFR collected eight grab groundwater samples in March 2004 from soil borings SB-1 through SB-8, identified as GW-1 through GW-8 (Table 3). These samples were analyzed for TPHg, TPHd, BTEX, and MTBE. TPHg, TPHd, and BTEX were not detected in the grab groundwater samples collected from soil borings SB-1 and SB-4 through SB-7. TPHg and BTEX were detected in GW-3 at relatively low concentrations and in GW-2 at relatively high concentrations. The concentrations of TPHg and benzene in GW-3 were 970 μg/l and 48 μg/l, respectively. The concentrations of TPHg and benzene in GW-2 were 970,000 μg/l and 23,000 μg/l, respectively. Sample GW-2 was collected directly downgradient from the former waste oil tank area. MTBE was only detected in three samples (GW-5, GW-6, and GW-7) at concentrations ranging from 1.1 μg/l to 55 μg/l.

Samples were collected from seven of the eight soil borings for the analysis of TPHd. The sediments at soil boring SB-2 did not yield enough water to allow the collection of a sample for the analysis of TPHd. TPHd was detected in each of the seven groundwater samples collected from soil borings SB-1 and SB-3 through SB-8. Concentrations of TPHd ranged from 260 μg/l in the grab groundwater sample collected at soil boring SB-1 to 350,000 μg/l in the grab groundwater sample collected from soil boring SB-3. As with the soil samples, based on the laboratory's review of the chromatograms for each of the samples that contained detectable concentrations of TPHd, the diesel did not match the standard and is considered degraded gasoline or naturally occurring oils.

3.4 Interim Corrective Actions

In 1999, PES conducted an IRM at the Site to address petroleum hydrocarbon–affected groundwater. This IRM consisted of introducing oxygen and nutrients into the groundwater at the Site to enhance biodegradation of petroleum hydrocarbons, and the placement of Oxygen Releasing Compound (ORC) in selected wells at the Site. Following completion of the IRM activities, PES concluded that the IRM had been effective in reducing the concentrations of petroleum hydrocarbons in groundwater in wells MW-1 and TW-6. However, the remedial activities were not effective at reducing the concentrations of petroleum hydrocarbons in groundwater in well TW-7 (PES 2000).

4.0 NATURE AND EXTENT OF CONTAMINATION

To assess the nature and extent of the contamination in soil and groundwater at the Site, LFR reviewed several reports that presented results of subsurface investigations. LFR's evaluation is presented below.

4.1 Constituents in Soil

Evaluation of soil data collected during several of the investigations conducted at the Site indicates that the soil contamination appears to be localized in the vicinity of the former UST locations (Figure 4).

Soil data collected during previous site investigations indicate that relatively low concentrations of TPHg and BTEX are present in the shallow soil (less than 5 feet bgs) in localized areas in the vicinity of the former USTs. TPHg was detected at a maximum concentration of 810 mg/kg, and BTEX compounds were detected at maximum concentrations of 33 mg/kg, 3.4 mg/kg, 1.4 mg/kg, and 4.2 mg/kg, respectively. MTBE was detected in soil at a maximum concentration of 1.6 mg/kg. As discussed above, TPHd has been detected in the soil samples collected at the Site. However, based on the laboratory's review of the chromatograms for each of the samples that contained detectable concentrations of TPHd, the diesel did not match the standard and is considered degraded gasoline or naturally occurring oils. Soil sample results collected during several subsurface investigations indicate that the lateral extent of gasoline contamination is likely limited to the former UST areas.

4.2 Constituents in Groundwater

Recent groundwater monitoring events and groundwater investigations have been used to evaluate the nature and extent of constituents in groundwater.

TPHg, BTEX, and MTBE (hereafter referred to as chemicals of potential concern [COPC]), and other oxygenates have been detected in the groundwater at the Site.

Figures 5 through 7 illustrate the estimated lateral extent of TPHg, benzene, and MTBE at the Site based on November 2003, January 2004, and March 2004 groundwater data. The grab groundwater data have been used to define the lateral extent of the affected groundwater.

Based on evaluation of groundwater sampling data, gasoline-affected groundwater is present in the vicinity of the former waste oil tank, and the former gasoline UST and its associated piping and dispenser. The highest concentration of gasoline is present downgradient from the former waste oil tank. The recent concentrations of TPHg and benzene detected in groundwater monitoring well MW-1 are 32,000 μg/l and 2,700 μg/l, respectively. MTBE appears to be limited to the area of the former gasoline UST. The highest concentration is 2,500 μg/l in well TW-7. As discussed above, TPHd has been detected in the grab groundwater samples collected at the Site. However, based on the laboratory's review of the chromatograms for each of the samples that contained detectable concentrations of TPHd, the diesel did not match the standard and is considered degraded gasoline or naturally occurring oils. The lateral extent of COPC has been defined on the north, east, south, and west by the absence of COPC in samples collected from wells TW-2 and TW-6, and grab groundwater samples collected from soil borings SB-1, SB-4, SB-6, SB-8, UB-1, and UB-2 (Figures 5, 6, and 7). Groundwater monitoring wells MW-1 and MW-2 are completed at a depth of approximately 20 feet bgs and are screened between 5 feet and 20 feet. Wells TW-2 and TW-4 through TW-7 are completed to a depth of between approximately 8 feet and 10 feet and are screened between approximately 3 and 10 feet bgs. The grab groundwater samples have been collected at depths ranging from approximately 6 to 10 feet bgs.

5.0 CORRECTIVE ACTION OBJECTIVES

The objective of the corrective action is to reduce the concentrations of TPHg, BTEX, and MTBE (the COPCs) in the vadose zone and in the groundwater to levels that do not pose unacceptable risks to human health and/or the environment. In order to support commercial development at the Site, LFR proposes to establish the RWQCB's commercial Environmental Screening Levels for a non-drinking water source (ESLs; February 2004) as the CAOs for the Site. A list of the COPC and their respective CAOs is presented in the table below. COPC will be removed so that the highest detected concentration is equal to or less than the corresponding ESL.

LFR proposes to conduct a removal action as a means to reduce on-site concentrations. The removal action will consist of excavating affected soil with concentrations above the CAOs for the site COPCs and off-site disposal. This removal action is described in Section 6.0. The objective of the removal action is to reduce the concentrations of the COPCs (TPHg, TPHd, BTEX, and MTBE) in the vadose zone and approximately 3 feet below the vadose zone, to levels that do not pose a threat to human health and/or the environment.

As discussed above, LFR proposes to use the RWQCB ESL (February 2004) for a commercial scenario where groundwater is not a potential drinking water source as the soil clean-up goals. TPHg, TPHd, BTEX, and MTBE are present in groundwater above their respective ESLs. However, LFR is not proposing a remedial action objective for the groundwater because shallow groundwater at the Site is not suitable for drinking water, and the shallow groundwater underlying the Site most likely represents a perched groundwater zone that is vertically separated from potable water aquifers by approximately 150 feet of generally fine-grained, low-permeability sediments. In addition, no complete exposure pathway exists to a potential human or ecological receptor and the presence of the petroleum hydrocarbon–affected groundwater appears to be limited in extent, based on the groundwater monitoring data and grab groundwater investigation data results. As part of the remedial effort, LFR proposes to excavate the TPHg-, TPHd-, BTEX-, and MTBE-affected soils, which will remove the source of the contamination to and into the shallow groundwater. It is anticipated that TPHg, TPHd, BTEX, and MTBE in groundwater will naturally bioattenuate over time. Periodic groundwater monitoring will be conducted to assess the residual concentrations in groundwater and to evaluate bioattenuation.

The proposed soil clean-up goals are presented below.

CHEMICAL	CORRECTIVE GOAL FOR VADOSE ZONE (milligrams per kilogram)
TPHg	400
Benzene	0.38
MTBE	5.6

6.0 CORRECTIVE ACTION ALTERNATIVE EVALUATION

Several remediation technologies and treatment options were considered that could be implemented to remediate affected soil. The remedial technologies that were evaluated include the following:

1. No Action
2. Excavation and Off-Site Disposal
3. Enhanced Bioremediation

These technology options were evaluated on the basis of effectiveness, implementability, and costs. The technologies and the treatment options that were considered suitable and most capable for achieving CAOs, given the site conditions, were assembled into the proposed CAP for the Site. Evaluation criteria are generally summarized as follows:

Effectiveness: This criterion focuses on the following:

- the potential effectiveness of handling the estimated areas or volumes of chemically affected media
- the ability of the technology to meet the desired CAOs
- the reliability and proven history of the remedial technology or the treatment option to perform its intended function with respect to removal of the COPCs

Implementability: Implementability encompasses both technical and practical feasibility of implementing a remedial technology or treatment option. Implementability includes the ability to acquire the required materials; availability of treatment, storage, and disposal services; and the availability of necessary equipment and skilled workers to construct and implement the remedial technology or treatment option.

Costs: This criterion compares the relative capital and operation and maintenance costs of each technology or treatment option, including labor, materials, and monitoring costs. Relative costs are used rather than detailed estimates. The cost analysis is made on the basis of engineering judgment and is evaluated as to whether costs are high, low, or moderate relative to other technologies or treatment options.

6.1 Remedial Technologies

6.1.1 No Action

Taking no action would mean that the affected soil and groundwater would be left in place without implementing any removal, treatment, or other mitigating actions.

Effectiveness:

Based on an interpretation of the groundwater analytical data collected since October 1993, the lateral extents of the COPC plumes do not appear to have reduced. While the concentrations of the COPCs appear to have generally reduced over the last 10 years, the concentrations of TPHg, benzene, and MTBE in several of the wells remain significantly above their respective action levels. Therefore, implementing No Action at the Site will not allow for attainment of the CAOs for the Site.

Implementability:

This option has high implementability. No action would need to be taken; therefore, no implementation, beyond groundwater monitoring, would be necessary.

Cost:

The cost of this technology is low and would consist of costs associated with ongoing quarterly groundwater monitoring.

Because this technology would not be effective in meeting the CAOs, this technology was not retained for use in the proposed CAP.

6.1.2 Excavation and Off-Site Disposal

Excavation would involve removal of soil affected by COPCs using standard equipment such as excavators, backhoes, and loaders. This option would require shoring to stabilize the excavation walls, sidewall sampling, pumping of affected groundwater from the open excavation, disposal of excavated soils, and backfilling of the excavation with clean soils.

Effectiveness:

If implemented at the Site, this technology would be very effective in removing COPC-affected soils, and reducing the concentrations of COPC in groundwater. Risks from long-term exposure to COPC-affected soil would be eliminated because the contaminated soil would be removed.

Some COPC-affected soils have been removed from the Site; however, soil investigation data indicate that soil contamination is present in the vicinity of the former USTs and below the groundwater table. Excavation to remove soils affected by COPCs would be very effective in reducing remediation time frame.

Implementability:

For construction purposes, it has been anticipated that the soils at the Site would be removed to a depth of approximately 3 feet bgs. To further reduce COPC concentrations in soil, additional excavation of affected soils in specific locations (known as "Hot Spot" removal) that extend to a depth of 8 feet bgs could be employed. Based on the likelihood that the upper 3 feet of soil would be removed from the Site during construction activities, this technology would have very high implementability.

Costs:

Costs of this technology are expected to be moderate as a "Hot-Spot" removal technology.

This technology has been retained for use in the proposed CAP as a "Hot Spot" removal technology.

6.1.3 Enhanced Bioremediation

Enhanced bioremediation is a process in which indigenous or inoculated microorganisms degrade organic chemicals in soil and groundwater. To bioremediate petroleum hydrocarbon constituents, a suitable electron acceptor is usually injected into the soil and groundwater to stimulate bacterial activity and promote biodegradation. Bioremediation could occur in the presence of oxygen or in the absence of oxygen. When oxygen is injected for use as the electron acceptor, the bioremediation process is referred to as aerobic bioremediation. When the bioremediation occurs in the absence of oxygen, the process is referred to as anaerobic bioremediation.

From January 1999 to January 2000, PES reportedly introduced ORC and a microbial-enhancing solution of potable water, hydrogen peroxide, and a blend of nutrients to wells MW-1 and TW-4 through TW-7 to promote microbial activity that would facilitate the aerobic bioremediation of COPCs. A discussion of the effectiveness of this technology is presented below.

Effectiveness:

Between January 1999 and January 2000, an unknown quantity of ORC and a microbial-enhancing solution were reportedly introduced at the Site by PES. The remedial program was effective in reducing the concentrations of petroleum hydrocarbons in groundwater at wells MW-1 and TW-6, located upgradient and cross-gradient of the former gasoline UST. However, significant remedial progress was not demonstrated in well TW-7, located immediately downgradient from the former UST.

Based on this information, the aerobic bioremediation technology implemented at the Site has had limited effectiveness in significantly reducing COPC concentrations. Although remediation of COPC-affected groundwater may be occurring at a slow rate, it is LFR's opinion that implementation of this technology alone will not reduce COPC concentrations below the proposed CAOs. A more aggressive remedial technology aimed at reducing COPC mass in the subsurface is required for timely remediation. Therefore, this technology alone will not be retained for use in the proposed CAP; however, it may be combined with a primary remedial approach to enhance biodegradation of residual petroleum hydrocarbons at the Site.

Implementability:

This option alone has moderate implementability. Implementation of injection-type, enhanced bioremediation will require introduction of ORC at the Site over an extended period of time. This will require coordination with the future site tenants.

However, if this technology were to be implemented by broadcasting ORC in powder form into an open excavation, this technology would have high implementability.

Costs:

The cost of this technology is anticipated to be low to moderate.

Because this technology has been implemented at the Site and has only demonstrated limited effectiveness, it will not be considered a single remedy in the CAP at this time; however, it may be combined with another remedy in order to enhance biodegradation of residual petroleum hydrocarbons in groundwater.

7.0 CORRECTIVE ACTION PLAN

To meet the CAOs and based on the corrective action alternative evaluation, LFR proposes to perform the following tasks that comprise the CAP:

- **Excavation and Off-Site Disposal:** This action will include excavating affected soils in the former UST, piping, and dispenser locations, as shown on Figure 8. In addition, affected groundwater will be pumped from the open excavation. The affected soil and groundwater removed from the excavation will be disposed of off site.
- **Enhanced Bioremediation:** ORC in a powder form will be broadcast in the open excavation prior to backfilling.
- **Periodic Groundwater Monitoring:** This task will include continued performance of periodic groundwater monitoring.

7.1 Removal Action Implementation

A site-specific Health and Safety Plan will be prepared for the planned excavation activities. Before excavating the soil, LFR will coordinate clearance of the excavation areas for underground utilities by contacting Underground Service Alert and retaining a private utility locating subcontractor. Excavation permits will be obtained from the appropriate city and/or county agency, if required.

Figure 8 shows the estimated extent of the excavation areas. It is estimated that approximately 1,400 and 1,500 cubic yards of in-place soil will be excavated and disposed of off site.

Prior to soil excavation activities, interlocking sheet piles will be driven into the ground to a depth of 16 feet on the sides of the excavation nearest the existing building. This will help ensure the stability of the building. Following installation of the sheet piles, the soil will be excavated using conventional excavation equipment (backhoes, dump trucks, loaders, etc.). An LFR professional will be on site to observe excavation and to collect confirmation samples. During the soil excavation and handling, a water truck will be present for dust suppression. In addition, LFR will monitor air quality for dust downwind of the excavation. Excavated materials will be loaded into 20-cubic-yard bins or directly into trucks, as appropriate, and removed from the Site for disposal. The appropriate disposal facility will be chosen depending on the COPC concentrations. It is anticipated that the soil will be disposed of off site at a Class II subtitle D facility or a Class III municipal facility.

Groundwater entering the excavation will be pumped from the excavation to a holding tank located on site. It has been anticipated that approximately 10,000 gallons of water will be pumped from the excavation. At the cessation of groundwater pumping, a groundwater sample will be collected from the holding tank and analyzed. The appropriate disposal facility will be chosen depending on the COPC concentrations. It is anticipated that the water will be disposed of off site at a licensed recycling facility.

LFR's professional will observe newly exposed soils along the areal and vertical extent of the excavation for olfactory and visual indications of COPCs. The LFR professional will also screen soils for volatile organic vapors, using a photoionization detector calibrated to an isobutylene span gas concentration of 100 parts per million. The excavation will be extended until olfactory and visual indications of COPC contamination are not observed. LFR will then collect soil confirmation samples along the sidewalls of the excavation. Soil samples will not be collected from the floor of the excavation because the excavation will extend below the groundwater table.

LFR will collect one soil sample for each 20 linear feet of excavation sidewall. The soil samples will be properly sealed, labeled, logged, and placed in an ice-chilled cooler for transport to the analytical laboratory under chain-of-custody control. Samples will be transported to a laboratory certified by the California Department of Health Services for chemical analysis.

The analytical program for the confirmation soil samples will be based on COPCs that are present in the excavation area. The proposed analytical program includes TPHg and TPHd, using EPA Method 8015m, and BTEX and MTBE, using EPA Method 8260

The results of the confirmation samples will be compared against the CAOs for the COPCs. If the concentrations of the COPCs exceed the CAOs, the excavations will be extended laterally or vertically, as required, until residual concentrations are below the CAOs. Following completion of the additional excavation activities, additional confirmation samples will be collected.

7.2 Site Restoration

Once the CAOs have been achieved, ORC will be broadcast into the base of the excavation. The excavations will be backfilled with clean fill. Clean gravel and soil will be imported and backfilled in the excavation. Gravel will be used to backfill the excavation below the groundwater table. Above the groundwater table the soil will be placed in 2-foot lifts and compacted to 90 percent relative compaction. The top 2 feet will be placed in 1-foot limits and compacted to 95 percent relative compaction.

LFR will also confirm that the levels of COPCs in the fill will meet the same CAOs before using them for backfill. LFR will provide the Alameda County Environmental Health Services (ACEHS) with analytical data from the local quarry or other source from which fill will be supplied. LFR will also collect samples from the import fill at the rate of one sample per 1,000 cubic yards. The samples will be analyzed for the COPCs to verify that the levels of these constituents in the fill material do not exceed their respective CAOs. Upon completion of the corrective actions, site development will continue.

7.3 Periodic Groundwater Monitoring

Groundwater monitoring at the Site will consist of periodic groundwater elevation measurements in the Site's monitoring wells and collection of groundwater samples from the monitoring wells.

The current monitoring program consists of quarterly groundwater elevation measurements and the collection of groundwater samples from five monitoring wells. It is anticipated that these wells will be properly abandoned before the initiation of construction activities. As part of proposed the CAP, three new groundwater monitoring wells will be installed and periodically monitored. The location of these proposed groundwater monitoring wells is shown on Figure 9.

During each sampling event, the groundwater samples will be collected by low-flow sampling techniques, using a peristaltic pump, and analyzed for the following analytes:

- TPHg and TPHd, using EPA Method 8015M
- BTEX, using EPA Method 8260B
- Fuel oxygenates, using EPA Method 8260B

LFR proposes to conduct semiannual measurements of groundwater elevations and to collect groundwater samples for one year after the completion of the soil excavation activities. After this first year, LFR will likely request to reduce the periodic groundwater monitoring program to annually for two years. The need for further groundwater monitoring will be evaluated at the end of the third year.

As additional data are obtained during the performance of the periodic groundwater monitoring, the frequency of groundwater elevation measurements and sampling will be reevaluated and recommendations for modifications will be made, if appropriate. Proposed modifications to the monitoring program will be discussed with the ACEHS.

8.0 PROJECT SCHEDULE AND REPORT OF COMPLETION

Implementation of the corrective action activities will begin upon receiving approval of this CAP. The corrective action activities will be performed in conjunction with site redevelopment activities and will occur during the dry season (between April and October 2004). Table 4 summarizes the anticipated schedule for the corrective action tasks.

After excavations are backfilled and all of the analytical results have been received, LFR will prepare a report that describes the corrective actions and presents the analytical results. The report will briefly discuss the subsurface sampling and analysis program, present the analytical data, and compare analytical data to clean-up goals. In addition, LFR will prepare and submit letter reports presenting the results of the periodic groundwater monitoring event.

A “no further action” designation will be requested from the ACEHS following the completion of the corrective actions and completion of the periodic groundwater monitoring.

9.0 CORRECTIVE ACTION PLAN COSTS

An engineering cost estimate was prepared to estimate capital costs, and long-term operation and maintenance, groundwater monitoring costs, and closure-related costs to implement the CAP at the Site. A summary breakdown of the various components of the engineering cost estimate is presented in Table 5.

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Table 1 Groundwater Analytical Data, Former Cox Cadillac, 230 Bay Place, Oakland, California

			Concentration (µg/L)																
Well Number	Sample Date		Benzene	Toluene	Ethyl-benzene	Total Xylenes	TPH-g		MTBE		1,2-DCA	EDB	TAME	TBA	DIPE	ETBE	1,1-DCA	Dissolved Lead	Ethanol
MW-1	03/03/93		8,500	7,500	4,400	15,000	110,000		--		350	--	--	--	--	--	--	--	--
MW-1	10/13/93		6,100	4,800	4,000	11,000	74,000		--		350	80	--	--	--	--	--	--	--
MW-1	12/22/94		18,000	11,000	2,800	16,000	110,000		--		130	--	--	--	--	--	<1.0	--	--
MW-1	03/24/95		3,700	1,800	2,200	4,700	25,000		--		130	--	--	--	--	--	<5.0	23	--
MW-1	06/29/95		5,300	2,100	3,200	7,500	28,000		--		110	--	--	--	--	--	<2.0	14	--
MW-1	09/29/95		5,600	2,200	3,800	7,400	43,000		--		98	--	--	--	--	--	<1.0	16	--
MW-1	02/23/96		4,800	3,000	3,400	7,700	46,000		--		96	--	--	--	--	--	<1.0	24	--
MW-1	01/12/99		2,600	970	2,900	5,700	39,000		800		--	--	--	--	--	--	--	--	--
MW-1	04/13/99		1,500	500	<50	4,000	29,000		520		--	--	--	--	--	--	--	--	--
MW-1	07/07/99		1,900	870	1,600	3,900	31,000		<250		--	--	--	--	--	--	--	--	--
MW-1	10/06/99		2,100	910	1,800	4,400	32,000		<250	a	--	--	--	--	--	--	--	--	--
MW-1	01/11/00		52	3.9	63	12	2,400		<5.0	a	--	--	--	--	--	--	--	--	--
MW-1	04/06/01		4,300	3,200	2,600	7,300	32,000		<10	a	--	--	--	--	--	--	--	--	--
MW-1	07/25/01		2,300	1,300	2,500	6,200	24,000		<25	a	--	--	--	--	--	--	--	--	--
MW-1	11/20/01		2,100	890	2,500	3,600	33,000		<100	a	--	--	--	--	--	--	--	--	--
MW-1	01/23/02		2,400	1,400	2,500	5,900	28,000		350		--	--	--	--	--	--	--	--	--
MW-1	04/26/02		3,200	2,400	2,700	6,300	39,000		2,800		--	--	--	--	--	--	--	--	--
MW-1	07/25/02		2,300	1,300	2,500	4,700	26,000		<500		--	--	--	--	--	--	--	--	--
MW-1	10/22/02		2,800	1,300	4,300	8,600	42,000		<10		<50	<50	<50	<100	<50	<50	--	--	--
MW-1	01/27/03		1,600	660	2,100	3,100	20,000		<20		<100	<100	<100	<200	<100	<100	--	--	--
MW-1	10/22/03	b	2,000	800	1,600	2,800	22,000		<20		<20	<20	<20	<200	<40	<20	--	--	<1,000
MW-1	01/30/04		2,700	1,400	2,900	5,800	32,000		<25		<25	<25	<25	<250	<50	<25	--	--	<1,300
MW-2	01/12/99		1.5	<0.50	<0.50	<0.50	<50		2,900		--	--	--	--	--	--	--	--	--
MW-2	04/13/99		0.76	<0.50	<0.50	<0.50	<50		3,800		--	--	--	--	--	--	--	--	--
MW-2	07/07/99		<25	<25	<25	<25	<2,500		7,000	a	--	--	--	--	--	--	--	--	--
MW-2	10/06/99		73	<25	<25	<25	2,800		300	a	--	--	--	--	--	--	--	--	--
MW-2	01/11/00		890	<100	<100	<100	11,000		8,400	a	--	--	--	--	--	--	--	--	--
MW-2	04/06/01		210	<25	<25	<25	2,800		3,800	a	--	--	--	--	--	--	--	--	--
MW-2	07/25/01		250	<12.5	<12.5	<12.5	3,400		4,200	a	--	--	--	--	--	--	--	--	--
MW-2	11/20/01		870	<100	<100	200	12,000		8,700		--	--	--	--	--	--	--	--	--
MW-2	01/23/02		100	<25	<25	<25	3,900		3,300		--	--	--	--	--	--	--	--	--
MW-2	04/26/02		13	<0.50	<0.50	<1.5	90		6,900		--	--	--	--	--	--	--	--	--
MW-2	07/25/02		<50	<50	<50	<100	<5,000		6,600		--	--	--	--	--	--	--	--	--
MW-2	10/22/02		<5.0	<5.0	<5.0	<10	7,800		7,000		<250	<250	<250	<500	<250	<250	--	--	--
MW-2	01/27/03		90	100	60	78	6,100		6,400		<250	<250	<250	<500	<250	<250	--	--	--
MW-2	10/22/03	b	<10	<10	<10	<20	2,000	g	3,000		<10	<10	<10	<100	<20	<10	--	--	<500
MW-2	01/30/04		<25	<25	<25	<50	<2,500		2,100		<25	<25	<25	<250	<50	<25	--	--	<1,300

Table 1 Groundwater Analytical Data, Former Cox Cadillac, 230 Bay Place, Oakland, California

Concentration (µg/L)

Well Number	Sample Date	Benzene	Toluene	Ethyl-benzene	Total Xylenes	TPH-g	MTBE	1,2-DCA	EDB	TAME	TBA	DIPE	ETBE	1,1-DCA	Dissolved Lead	Ethanol
TW-1	10/13/93	<0.50	<0.50	<0.50	<0.50	<50	--	<0.50	<0.50	--	--	--	--	--	--	--
TW-2	10/13/93	<0.50	<0.50	<0.50	<0.50	<50	--	<0.50	<0.50	--	--	--	--	--	--	--
TW-2	01/12/99	<0.50	<0.50	<0.50	<0.50	<50	<5.0	--	--	--	--	--	--	--	--	--
TW-2	04/13/99	<0.50	<0.50	<0.50	<0.50	<50	<5.0	--	--	--	--	--	--	--	--	--
TW-2	07/07/99	<0.50	<0.50	<0.50	<0.50	<50	<5.0	--	--	--	--	--	--	--	--	--
TW-2	10/06/99	<0.50	<0.50	<0.50	<0.50	<50	<5.0	--	--	--	--	--	--	--	--	--
TW-2	01/11/00	<0.50	<0.50	<0.50	<0.50	<50	<5.0	--	--	--	--	--	--	--	--	--
TW-2	04/06/01	<0.50	<0.50	<0.50	<0.50	<50	<5.0	--	--	--	--	--	--	--	--	--
TW-2	07/25/01	<0.50	<0.50	<0.50	<0.50	<50	<5.0	--	--	--	--	--	--	--	--	--
TW-2	11/20/01	<0.50	<0.50	<0.50	<0.50	<50	<5.0	--	--	--	--	--	--	--	--	--
TW-2	01/23/02	<0.50	<0.50	<0.50	<0.50	<50	<5.0	--	--	--	--	--	--	--	--	--
TW-2	04/26/02	<0.50	<0.50	<0.50	<1.5	<50	<5.0	--	--	--	--	--	--	--	--	--
TW-2	07/25/02	<0.50	<0.50	<0.50	<1.0	<50	<5.0	--	--	--	--	--	--	--	--	--
TW-2	10/22/02	<0.50	<0.50	<0.50	<1.0	<50	<1.0	<5.0	<5.0	<5.0	<10	<5.0	<5.0	--	--	--
TW-2	01/27/03	<0.50	<0.50	<0.50	<1.0	<50	<1.0	<5.0	<5.0	<5.0	<10	<5.0	<5.0	--	--	--
TW-2	10/22/03 b	<0.50	<0.50	<0.50	<1.0	53 g	<0.50	<0.50	<0.50	<0.50	<5.0	<1.0	<0.50	--	--	<25
TW-2	01/30/04	<0.50	<0.50	<0.50	<1.0	<50	<0.50	<0.50	<0.50	<0.50	<5.0	<1.0	<0.50	--	--	<25
TW-3	10/13/93	<0.50	<0.50	<0.50	<0.50	<50	--	<0.50	<0.50	--	--	--	--	--	--	--
TW-4	10/13/93	65	18	49	33	2,000	--	<5.0	<5.0	--	--	--	--	--	--	--
TW-4	10/03/03 b	<0.50	0.97	0.63	1.4	<50	<0.50	<0.50	<0.50	<0.50	<5.0	<1.0	<0.50	--	--	<25
TW-5	10/13/93	20,000	25,000	3,800	23,000	140,000	--	<100	<100	--	--	--	--	--	--	--
TW-5	10/03/03 b	4,400	1,700	820	2,900	21,000	<100	<100	<100	<100	<100	<200	<100	--	--	<5,000
TW-6	10/14/93	3,800	1,600	110	540	4,100	--	<1.0	<1.0	--	--	--	--	--	--	--
TW-6	12/22/94	5,400	2,700	3,100	6,800	24,000	--	<1.0	--	--	--	--	--	<1.0	--	--
TW-6	03/24/95	4,900	530	270	380	10,000	--	<2.0	--	--	--	--	--	<2.0	<3.0	--
TW-6	06/29/95	12,000	6,600	1,000	3,000	28,000	--	<1.0	--	--	--	--	--	<1.0	4.2	--
TW-6	09/29/95	19,000	5,200	1,500	4,000	47,000	--	<1.0	--	--	--	--	--	<1.0	3.3	--
TW-6	02/23/96	13,000	5,200	1,100	2,770	25,000	--	<1.0	--	--	--	--	--	<1.0	5.2	--
TW-6	01/12/99	9,900	4,100	1,000	4,000	29,000	210	--	--	--	--	--	--	--	--	--
TW-6	04/13/99	0.70	<0.50	<0.50	0.62	<50	22	--	--	--	--	--	--	--	--	--
TW-6	07/07/99	13	<0.50	<0.50	2.2	55	8.1 a	--	--	--	--	--	--	--	--	--
TW-6	10/06/99	0.59	<0.50	<0.50	<0.50	<50	<5	--	--	--	--	--	--	--	--	--
TW-6	01/11/00	<0.50	<0.50	<0.50	<0.50	<50	<5.0	--	--	--	--	--	--	--	--	--
TW-6	04/06/01	<0.50	<0.50	<0.50	<0.50	<50	<5.0	--	--	--	--	--	--	--	--	--

Table 1 Groundwater Analytical Data, Former Cox Cadillac, 230 Bay Place, Oakland, California

Concentration (µg/L)

Well Number	Sample Date		Benzene	Toluene	Ethyl-benzene	Total Xylenes	TPH-g	MTBE		1,2-DCA	EDB	TAME	TBA	DIPE	ETBE	1,1-DCA	Dissolved Lead	Ethanol
TW-6	07/25/01		<0.50	<0.50	<0.50	<0.50	<50	<5.0		--	--	--	--	--	--	--	--	--
TW-6	11/20/01		<0.50	<0.50	<0.50	<0.50	<50	<5.0		--	--	--	--	--	--	--	--	--
TW-6	01/23/02		<0.50	<0.50	<0.50	<0.50	<50	<5.0		--	--	--	--	--	--	--	--	--
TW-6	04/26/02		<0.50	<0.50	<0.50	<1.5	<50	<5.0		--	--	--	--	--	--	--	--	--
TW-6	07/25/02		**0.60**	<0.50	<0.50	<1	<50	<5.0		--	--	--	--	--	--	--	--	--
TW-6	10/22/02		<0.50	<0.50	<0.50	<1.0	<50	<1.0		<5.0	<5.0	<5.0	<10	<5.0	<5.0	--	--	--
TW-6	01/27/03		<0.50	<0.50	<0.50	<1.0	<50	<1.0		<5.0	<5.0	<5.0	<10	<5.0	<5.0	--	--	--
TW-6	10/22/03	b	<0.50	<0.50	<0.50	<1.0	<50	<5.0		<0.50	<0.50	<0.50	<5.0	<1.0	<0.50	--	--	<25
TW-6	01/30/04		<0.50	<0.50	<0.50	<1.0	<50	<5.0		<0.50	<0.50	<0.50	<5.0	<1.0	<0.50	--	--	<25
TW-7	10/14/93		**48,000**	**15,000**	**3,400**	**16,000**	**100,000**	--		<50	<50	--	--	--	--	--	--	--
TW-7	12/22/94		**49,000**	**33,000**	**7,300**	**28,000**	**210,000**	--		<1.0	--	--	--	--	--	<1.0	--	--
TW-7	03/24/95		**13,000**	**7,000**	**1,500**	**5,600**	**56,000**	--		<2.0	--	--	--	--	--	<2.0	<3.0	--
TW-7	06/29/95		**39,000**	**8,100**	**3,000**	**8,300**	**100,000**	--		<1.0	--	--	--	--	--	<1.0	**3.5**	--
TW-7	09/29/95		**32,000**	**8,700**	**2,900**	**8,600**	**74,000**	--		<1.0	--	--	--	--	--	<1.0	**3.5**	--
TW-7	02/23/96		**22,000**	**8,400**	**2,700**	**6,900**	**50,000**	--		<5.0	--	--	--	--	--	<5.0	**3.8**	--
TW-7	01/12/99		**7,300**	**670**	**2,700**	**960**	**29,000**	<100		--	--	--	--	--	--	--	--	--
TW-7	04/13/99		**4,500**	**1,800**	**180**	**8,200**	**54,000**	**1,200**		--	--	--	--	--	--	--	--	--
TW-7	07/07/99		**8,000**	**4,500**	**1,200**	**3,500**	**42,000**	**2,200**	a	--	--	--	--	--	--	--	--	--
TW-7	10/06/99		**9,700**	**1,600**	**1,600**	**2,100**	**29,000**	**580**	a	--	--	--	--	--	--	--	--	--
TW-7	01/11/00		**8,500**	**7,100**	**1,600**	**6,700**	**52,000**	**2,600**	a	--	--	--	--	--	--	--	--	--
TW-7	04/06/01		**4,800**	**1,800**	**2,200**	**3,400**	**22,000**	**690**	a	--	--	--	--	--	--	--	--	--
TW-7	07/25/01		**5,100**	**660**	**1,400**	**2,100**	**20,000**	**1,100**	a	--	--	--	--	--	--	--	--	--
TW-7	11/20/01		**6,400**	**1,100**	**1,000**	**2,400**	**26,000**	**1,600**		--	--	--	--	--	--	--	--	--
TW-7	01/23/02		**5,100**	**510**	**2,200**	**3,900**	**25,000**	**1,200**		--	--	--	--	--	--	--	--	--
TW-7	04/26/02		**4,400**	**1,300**	**2,900**	**2,370**	**29,000**	**1,600**		--	--	--	--	--	--	--	--	--
TW-7	07/25/02		**4,900**	**470**	**1,600**	**1,700**	**21,000**	**1,900**		--	--	--	--	--	--	--	--	--
TW-7	10/22/02		**6,700**	**410**	**1,100**	**1,500**	**31,000**	**1,700**	a	<100	<100	<100	<200	<100	<100	--	--	--
TW-7	01/27/03		**2,700**	**710**	**1,900**	**1,100**	**17,000**	**680**		<100	<100	<100	<200	<100	<100	--	--	--
TW-7	10/22/03	b	**2,900**	**130**	**310**	**370**	**13,000**	**660**		<13	<13	<13	<130	<25	<13	--	--	<630
TW-7	01/30/04		**2,500**	**520**	**1,900**	**550**	**16,000**	**300**		<25	<25	<25	<250	<50	<25	--	--	<1,300

Table 1 Groundwater Analytical Data, Former Cox Cadillac, 230 Bay Place, Oakland, California

		Concentration (µg/L)														
Well Number	Sample Date	Benzene	Toluene	Ethyl-benzene	Total Xylenes	TPH-g	MTBE	1,2-DCA	EDB	TAME	TBA	DIPE	ETBE	1,1-DCA	Dissolved Lead	Ethanol

Notes:

TPHg - Total Petroleum Hydrocarbons as gasoline

MTBE - Methyl tertiary butyl ether

DCA - Dichloroethane

EDB - Ethylene dibromide

TAME - Tertiary amyl methyl ether

TBA - Tertiary butyl alcohol

DIPE - Di-isopropyl ether

ETBE - Ethyl tertiary butyl ether

µg/L = Micrograms per liter.

< = Not detected at or above indicated laboratory reporting limit.

-- = Not Analyzed

a = MTBE Confirmation by EPA Method 8260B.

b = Samples were analyzed by EPA Method 8260B.

g = hydrocarbon reported in gasoline range does not match our gasoline standard.

Table 2

Grab Groundwater Analytical Data
Former Cox Cadillac Site
230 Bay Place
Oakland, CA

Sample Number	Sample Date	Sample Depth (feet)	TPH-g	Benzene	Toluene	Ethyl-benzene	Total Xylenes	MTBE	1,2-DCA	EDB	TAME	TBA	DIPE	ETBE	Ethanol
GP1	11/25/2003	10	**7,500**	**300**	**470**	<1.0	**420**	**5,800**	NA	NA	<1.0	<10	<1.0	<1.0	NA
GP2A	11/26/2003	10	**32,000**	**3,100**	**84**	**1,300**	<100	**7,300**	<50	<50	<50	<500	<100	<50	NA
GP6	11/26/2003	15	**67,000**	**9,500**	**5,700**	**1,800**	**6,100**	<100	**180**	**150**	<100	<1,000	<200	<100	NA
GP7	11/26/2003	13	<50	**4.0**	**0.70**	<0.50	<0.50	<0.50	**0.73**	<0.50	<0.50	<5.0	<1.0	<0.50	NA
GP8	11/26/2003	15	<50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<5.0	<1.0	<0.50	NA
GP9	11/26/2003	14	<50	<0.50	**0.55**	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<5.0	<1.0	<0.50	NA
UB1	10/10/2003	10	<50	<0.50	**1.5**	<0.50	**2.0**	**0.84**	<0.50	<0.50	<0.50	<5.0	<1.0	<0.50	<25
UB2	10/10/2003	10	**14,000**	<5.0	<5.0	<5.0	<5.0	**37**	<5.0	<5.0	<5.0	<50	<10	<5.0	<250

Notes:

Bold denotes detection above laboratory detection limit.
All analtyical values reported in micrograms per liter.
TPHg - Total Petroleum Hydrocarbons as gasoline
MTBE - Methyl tert-butyl ether
DCA - Dichloroethane
EDB - Ethylene dibromide
TAME - Tert-amyl methyl ether
TBA - Tert-butyl alcohol
DIPE - Di-isopropyl ether
ETBE - Ethyl tert-butyl ether
< = Not detected at or above indicated laboratory reporting limit.
NA = Not Analyzed

Table 3
Grab Groundwater Analytical Data
Former Cox Cadillac Site
230 Bay Place
Oakland, California

Expressed in micrograms per liter (µg/l)

Sample Number	Sample Date	TPH-g	TPH-d	Benzene	Toluene	Ethyl-benzene	Total Xylenes	MTBE
GW-1	3/15/2004	ND	ND	ND	ND	ND	ND	ND
GW-2	3/15/2004	**970,000**	**970,000**	**23,000**	**33,000 C**	**22,000**	**79,000**	ND
GW-3	3/15/2004	**970**	**970**	**48**	**93**	**42**	**90.7**	ND
GW-4	3/15/2004	ND	ND	ND	ND	ND	ND	ND
GW-5	3/15/2004	ND	ND	ND	ND	ND	ND	**21**
GW-6	3/15/2004	ND	ND	ND	ND	ND	ND	**29**
GW-6D	3/15/2004	ND	ND	ND	ND	ND	ND	**55**
GW-8	3/15/2004	ND	ND	ND	ND	ND	ND	**1.1**
GW-7	3/22/2004	ND	**680**	ND	ND	**1**	ND	**ND**

Notes:

Bold denotes detection above laboratory detection limit.

TPHg = Total petroleum hydrocarbons as gasoline
TPHd = Total petroleum hydrocarbons as diesel
MTBE = Methyl tertiary-butyl ether
ND = Not detected
C = Presence confirmed, but Relative Percent Difference (RPD) between columns exceeds 40%.

Table 4
Anticipated Number of Work Days for Project Implementation and Reporting of Corrective Action Plan
Former Cox Cadillac
230 Bay Place
Oakland, California

Schedule of Tasks

Task	Days to Complete	Cumulative Days
Installation of Sheet Piles	7	7
Soil Excavation Activities*	8	15
Site Restoration	5	20
Reporting	30	50
Periodic Groundwater Monitoring	ongoing	ongoing

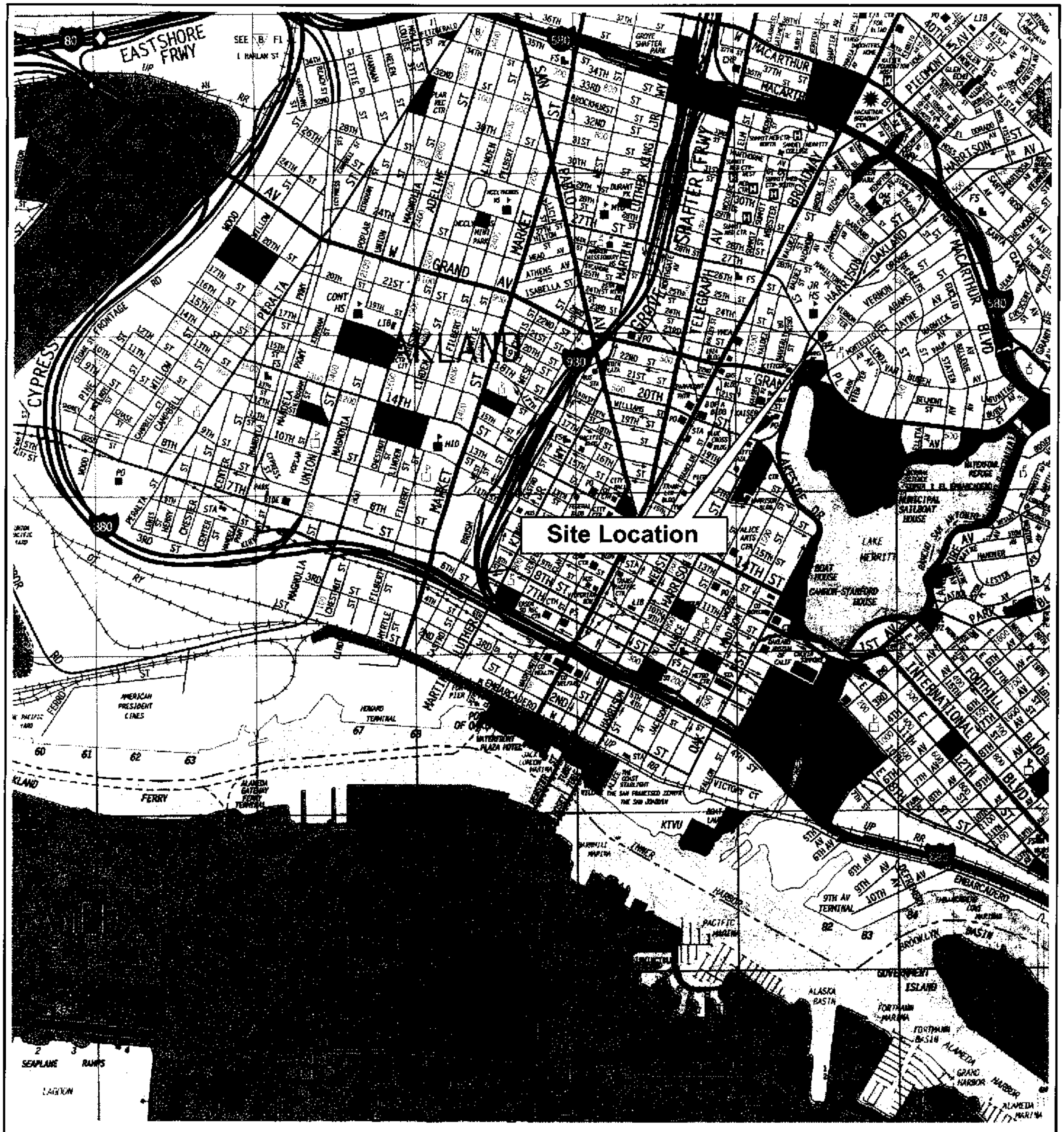
Note:

* = includes pumping of groundwater from excavation and application of Oxygen Releasing Compound

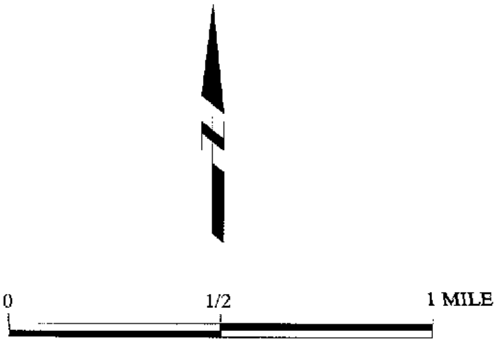
Table 5
Corrective Action Plan Implementation Cost Estimate
Former Cox Cadillac, Oakland, California

Year	TASK 1	TASK 2	TASK 3	TASK 4
	Project Management	Well Installation and Periodic Monitoring and Reporting	Soil Excavation	Site Closure Implementation (and Report Preparation)
2004	$16,804	$21,556	$364,889	$0
2005	$5,473	$10,199	$0	$0
2006	$5,473	$5,100	$0	$0
2007	$10,476	$6,241	$0	$16,055
Subtotal	**$38,226**	**$43,096**	**$364,889**	**$16,055**

Total Estimated Cost: $462,266



© 1999 Copyright Thomas Bros. Map ®



Site Vicinity Map

Former Cox Cadillac, 230 Bay Place, Oakland, California

LFR
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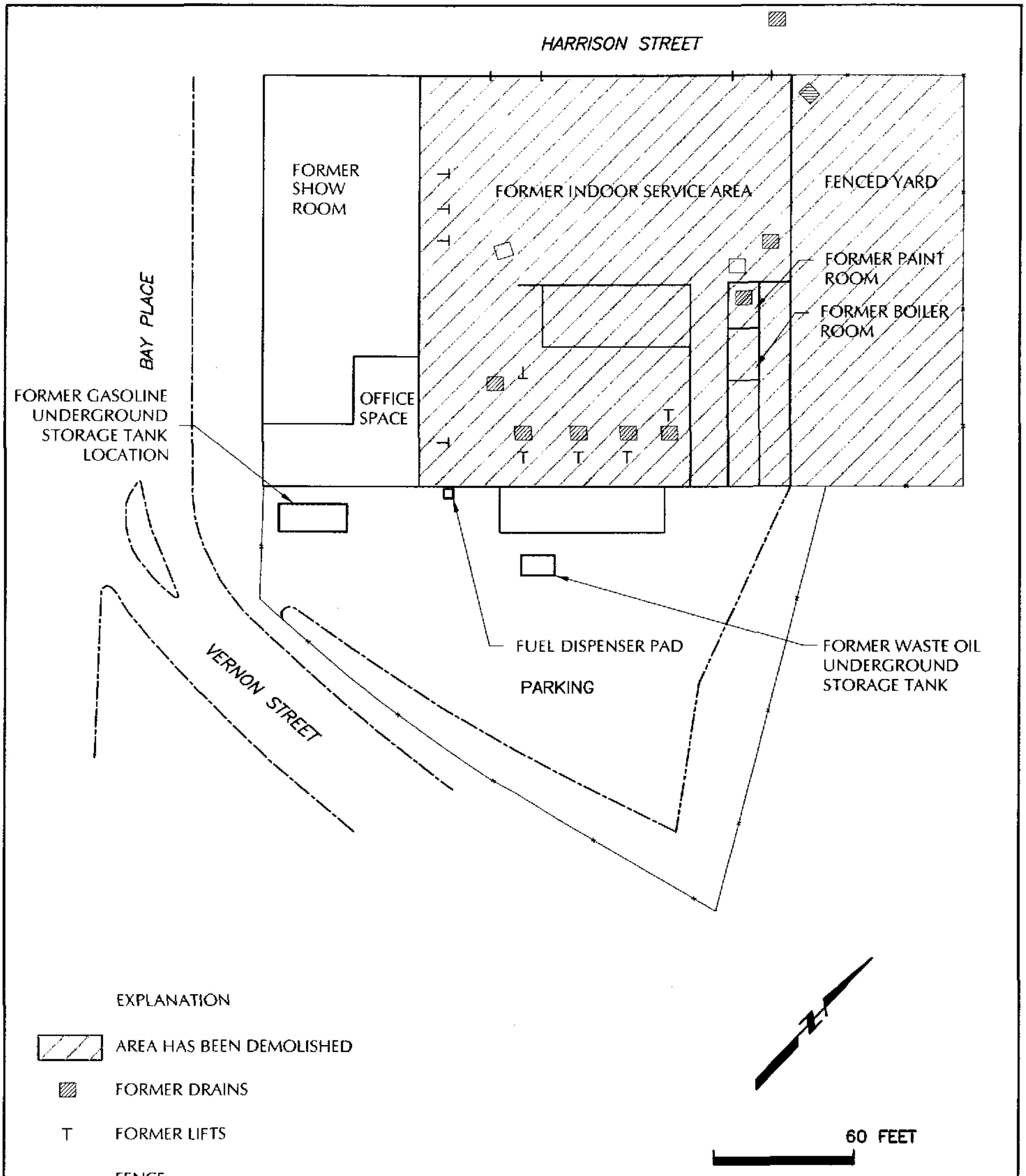
Figure 1

DESIGN\001\09171\SiteVicinity.CDR 091803



EXPLANATION

▨ AREA HAS BEEN DEMOLISHED

▨ FORMER DRAINS

T FORMER LIFTS

—×— FENCE

—·—·— RETAINING WALL

—— CURB

NOTES:

1. LOCATIONS OF ALL FEATURES DEPICTED ARE APPROXIMATE

Site Plan

Former Cox Cadillac, 230 Bay Place, Oakland, California

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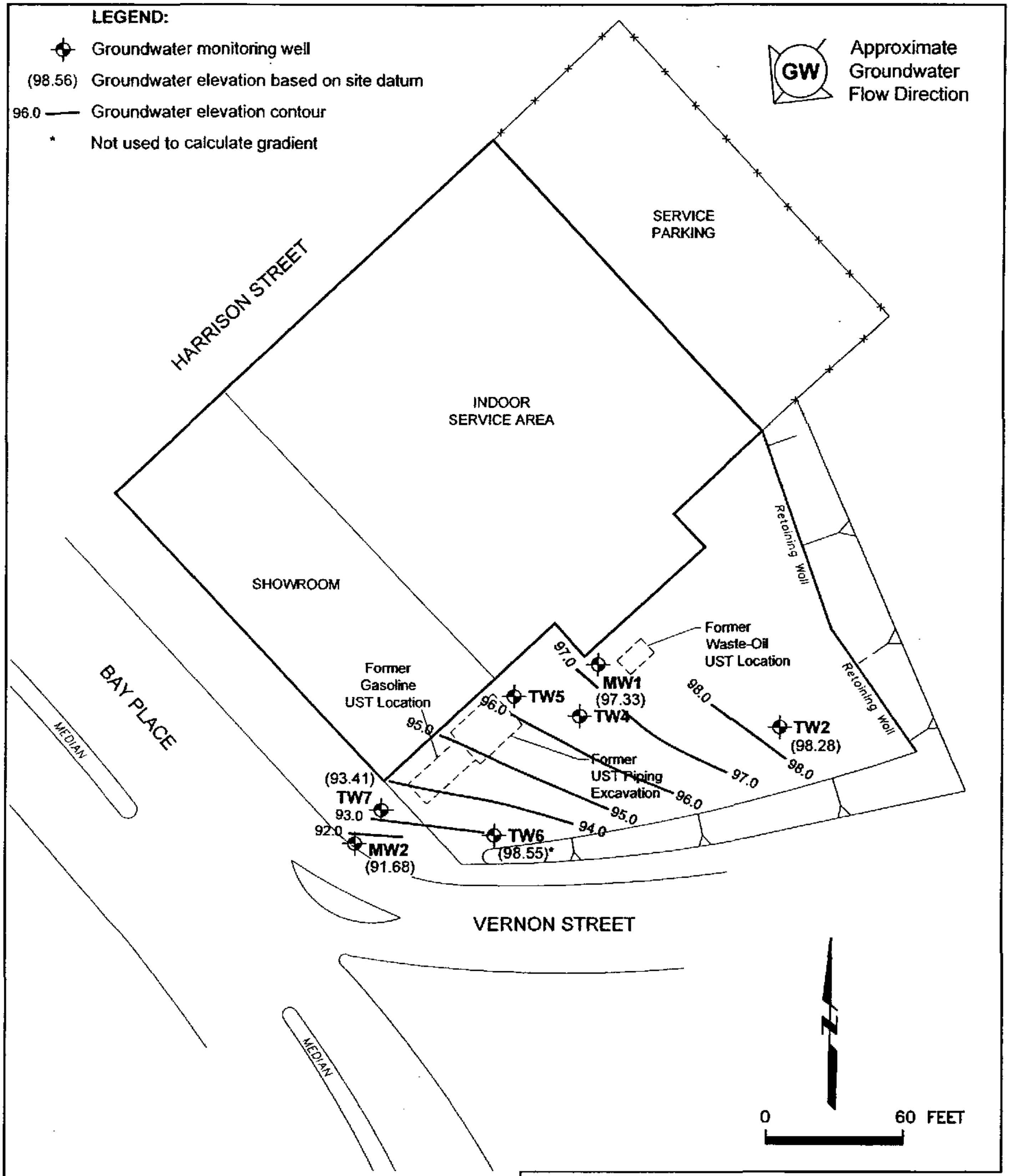
Figure 2



NOTES:

1. LOCATIONS OF ALL FEATURES DEPICTED ARE APPROXIMATE

SOURCE: ETIC, 2004

Groundwater Elevation Data
January 2004

Former Cox Cadillac, 230 Bay Place, Oakland, California

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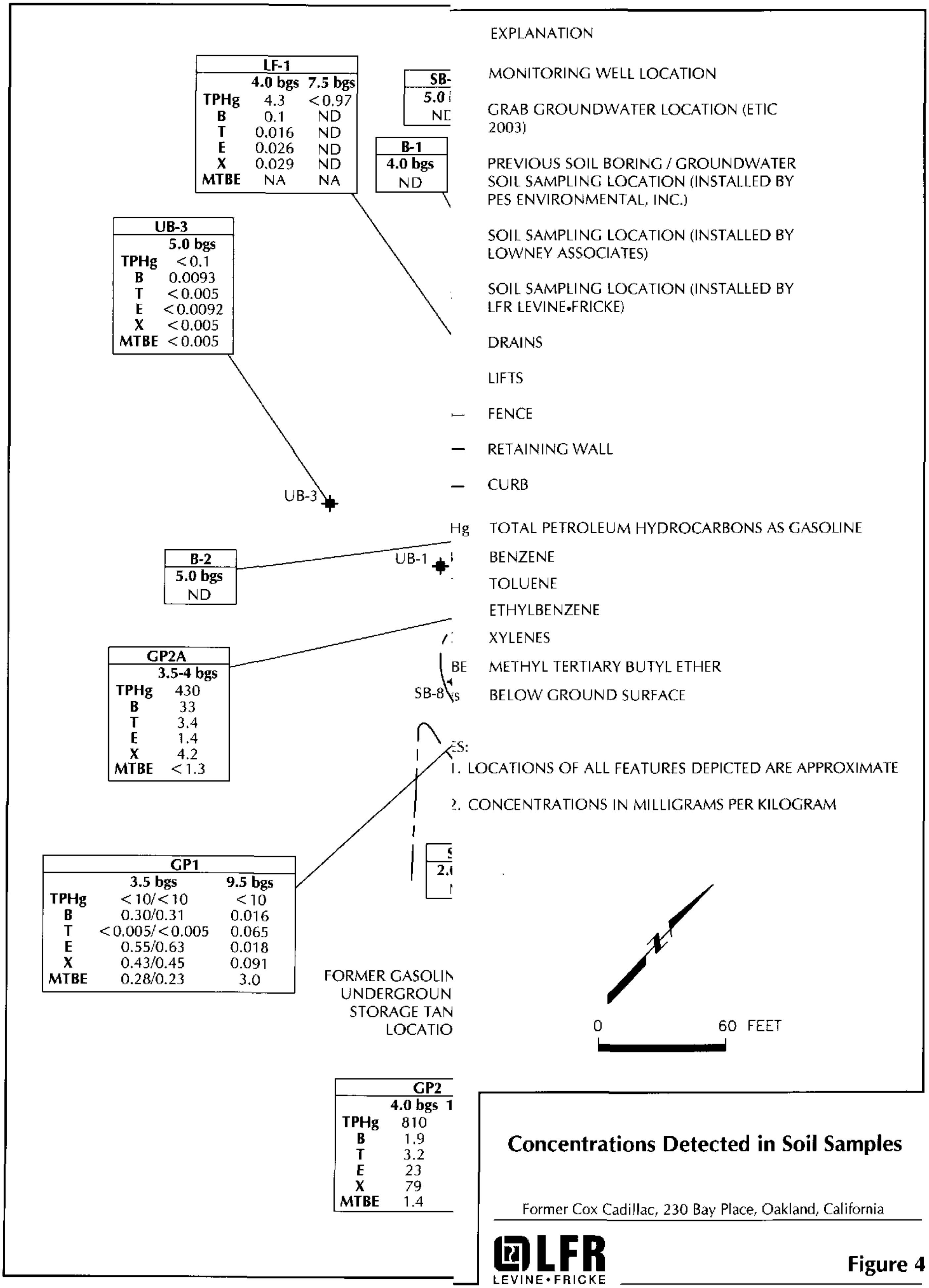
Figure 3

I:\Design\001\09171\00\000\DWG\GWE data.dwg, GWE, 03/31/2004 01:04:59 PM



LF-1	4.0 bgs	7.5 bgs
TPHg	4.3	<0.97
B	0.1	ND
T	0.016	ND
E	0.026	ND
X	0.029	ND
MTBE	NA	NA

SB-
5.0
ND

B-1
4.0 bgs
ND

UB-3	5.0 bgs
TPHg	<0.1
B	0.0093
T	<0.005
E	<0.0092
X	<0.005
MTBE	<0.005

B-2
5.0 bgs
ND

GP2A	3.5-4 bgs
TPHg	430
B	33
T	3.4
E	1.4
X	4.2
MTBE	<1.3

GP1	3.5 bgs	9.5 bgs
TPHg	<10/<10	<10
B	0.30/0.31	0.016
T	<0.005/<0.005	0.065
E	0.55/0.63	0.018
X	0.43/0.45	0.091
MTBE	0.28/0.23	3.0

GP2	4.0 bgs
TPHg	810
B	1.9
T	3.2
E	23
X	79
MTBE	1.4

EXPLANATION

MONITORING WELL LOCATION

GRAB GROUNDWATER LOCATION (ETIC 2003)

PREVIOUS SOIL BORING / GROUNDWATER SOIL SAMPLING LOCATION (INSTALLED BY PES ENVIRONMENTAL, INC.)

SOIL SAMPLING LOCATION (INSTALLED BY LOWNEY ASSOCIATES)

SOIL SAMPLING LOCATION (INSTALLED BY LFR LEVINE•FRICKE)

DRAINS

LIFTS

FENCE

RETAINING WALL

CURB

Hg TOTAL PETROLEUM HYDROCARBONS AS GASOLINE

BENZENE

TOLUENE

ETHYLBENZENE

XYLENES

BE METHYL TERTIARY BUTYL ETHER

S BELOW GROUND SURFACE

ES:

1. LOCATIONS OF ALL FEATURES DEPICTED ARE APPROXIMATE
2. CONCENTRATIONS IN MILLIGRAMS PER KILOGRAM

Concentrations Detected in Soil Samples

Former Cox Cadillac, 230 Bay Place, Oakland, California

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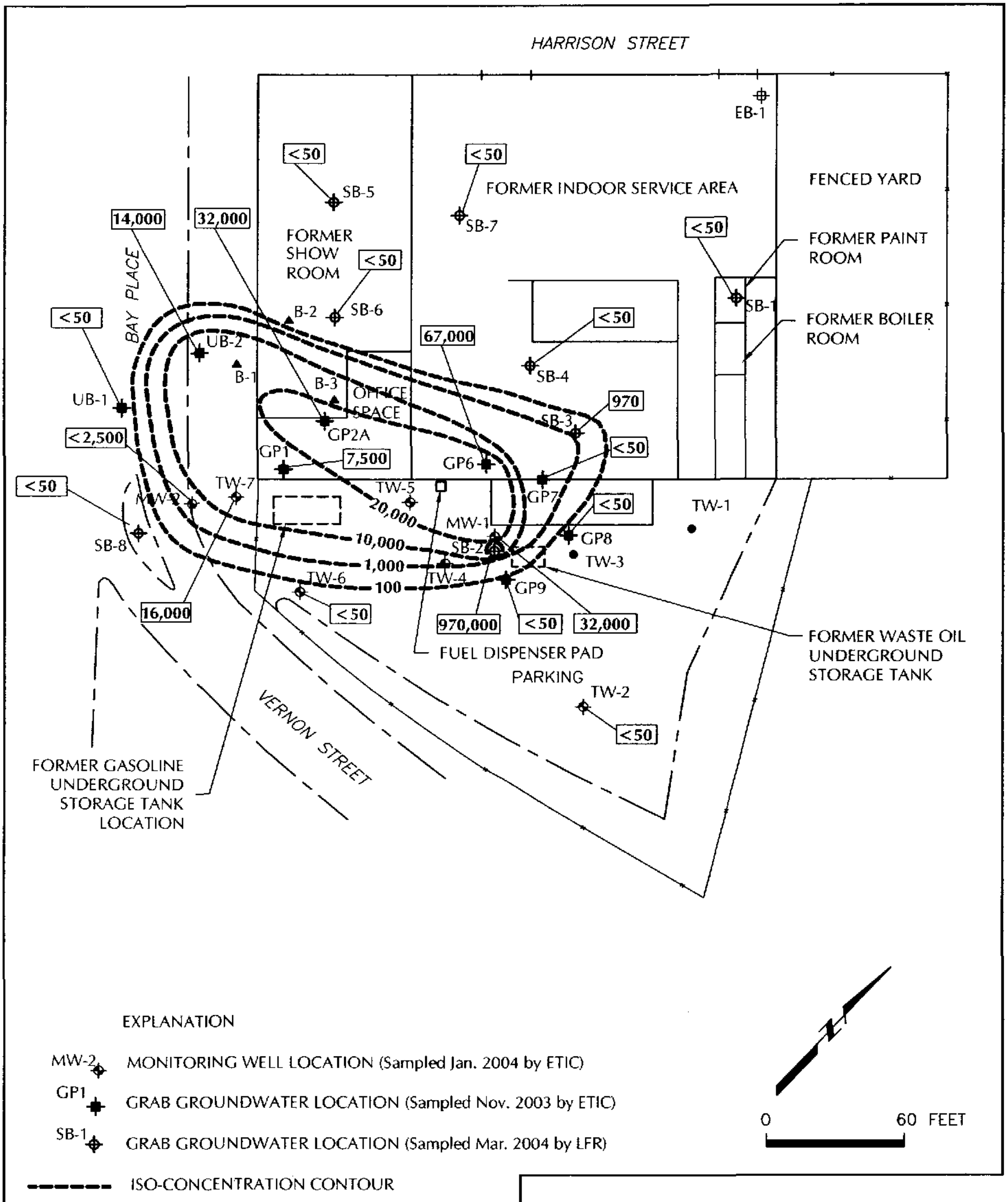
Figure 4

I:\Design\001\09171\04\000\DWG\Concentrations in Soil.dwg, Concentrations in soil, 04/08/2004 09:56:34 AM



EXPLANATION

MW-2 ⌖ MONITORING WELL LOCATION (Sampled Jan. 2004 by ETIC)

GP1 ✚ GRAB GROUNDWATER LOCATION (Sampled Nov. 2003 by ETIC)

SB-1 ⌖ GRAB GROUNDWATER LOCATION (Sampled Mar. 2004 by LFR)

– – – – ISO-CONCENTRATION CONTOUR

NOTES:

1. LOCATIONS OF ALL FEATURES DEPICTED ARE APPROXIMATE
2. CONCENTRATIONS IN MICROGRAMS PER LITER

Total Petroleum Hydrocarbons as Gasoline Iso-Concentration Contours

Former Cox Cadillac, 230 Bay Place, Oakland, California

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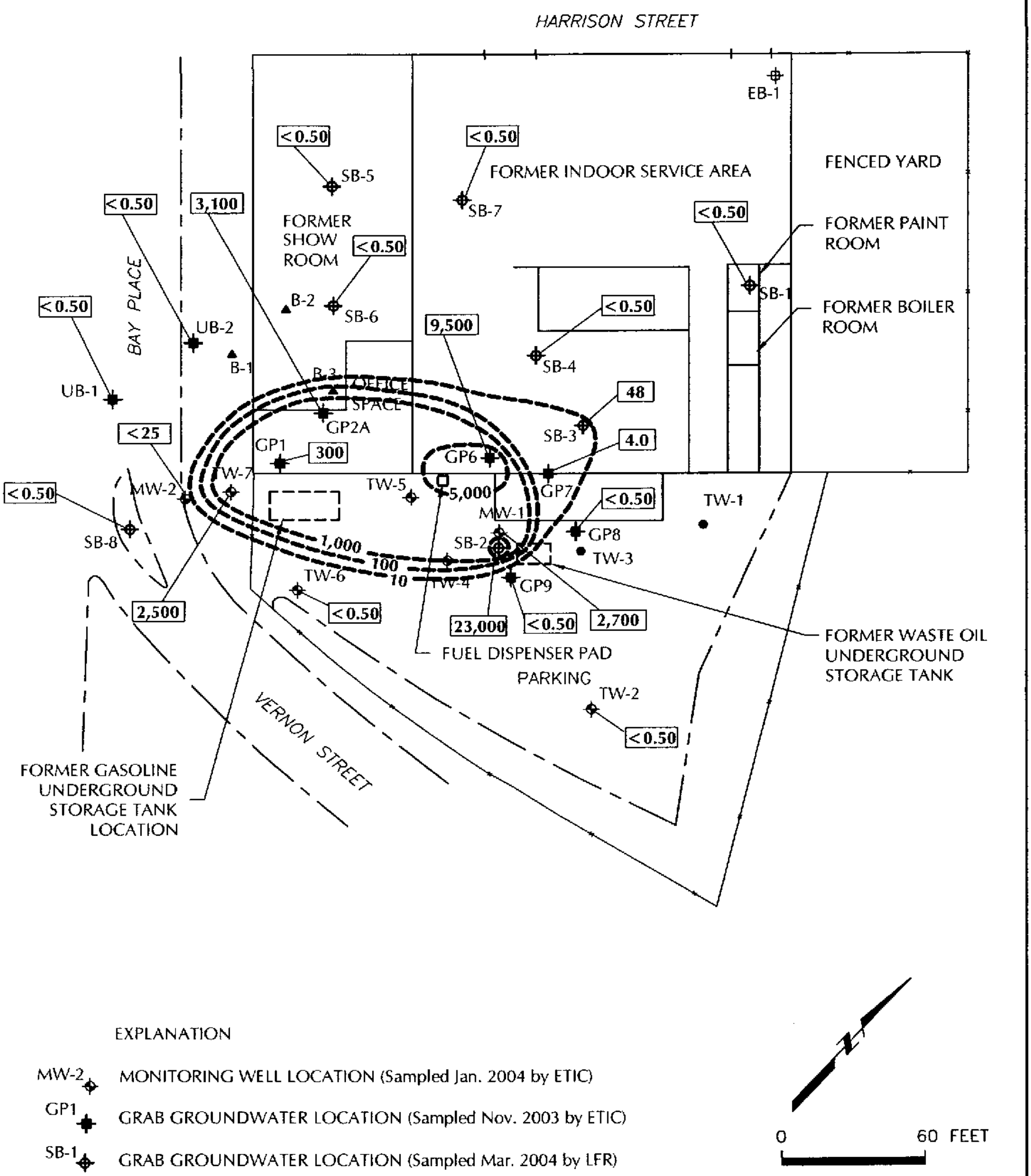
Figure 5

I:\Design\001\09171\00\000\DWG\TPH as Gas.dwg, TPH ISOconcentration Contours, 04/01/2004 09:37:41 AM



EXPLANATION

MW-2 ⌖ MONITORING WELL LOCATION (Sampled Jan. 2004 by ETIC)

GP1 ✚ GRAB GROUNDWATER LOCATION (Sampled Nov. 2003 by ETIC)

SB-1 ⌖ GRAB GROUNDWATER LOCATION (Sampled Mar. 2004 by LFR)

- - - - - - ISO-CONCENTRATION CONTOUR

NOTES:

1. LOCATIONS OF ALL FEATURES DEPICTED ARE APPROXIMATE
2. CONCENTRATIONS IN MICROGRAMS PER LITER

Benzene Iso-Concentration Contours

Former Cox Cadillac, 230 Bay Place, Oakland, California

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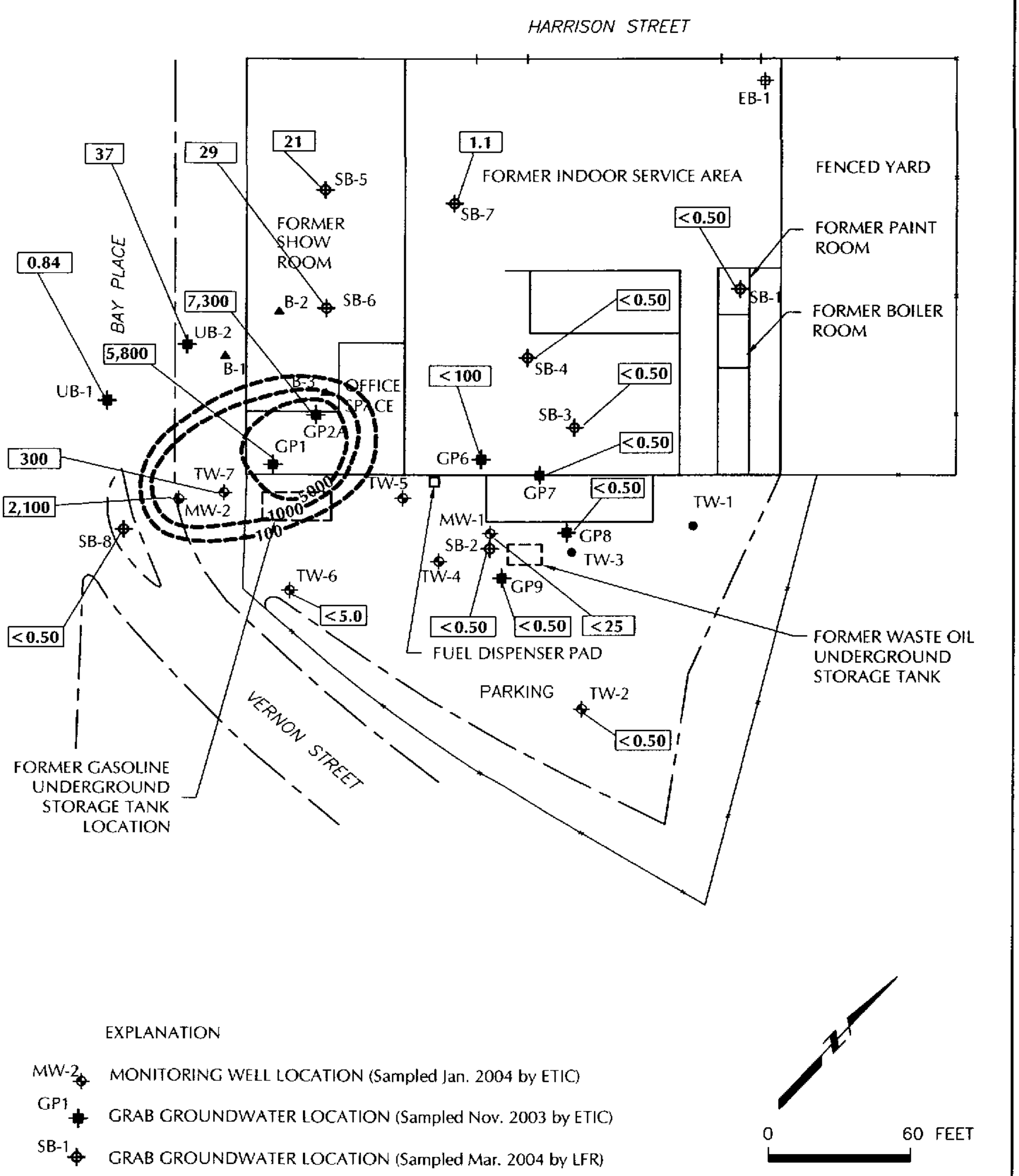
Figure 6

I:\Design\001\09171\00\000\DWG\BENZENE.dwg, Benzene ISOconcentration Contours, 04/01/2004 09:36:29 AM



EXPLANATION

MW-2 ⌖	MONITORING WELL LOCATION (Sampled Jan. 2004 by ETIC)
GP1 ✚	GRAB GROUNDWATER LOCATION (Sampled Nov. 2003 by ETIC)
SB-1 ⌖	GRAB GROUNDWATER LOCATION (Sampled Mar. 2004 by LFR)
------	ISO-CONCENTRATION CONTOUR

NOTES:

1. LOCATIONS OF ALL FEATURES DEPICTED ARE APPROXIMATE
2. CONCENTRATIONS IN MICROGRAMS PER LITER

Methyl Tertiary Butyl Ether Iso-Concentration Contours

Former Cox Cadillac, 230 Bay Place, Oakland, California

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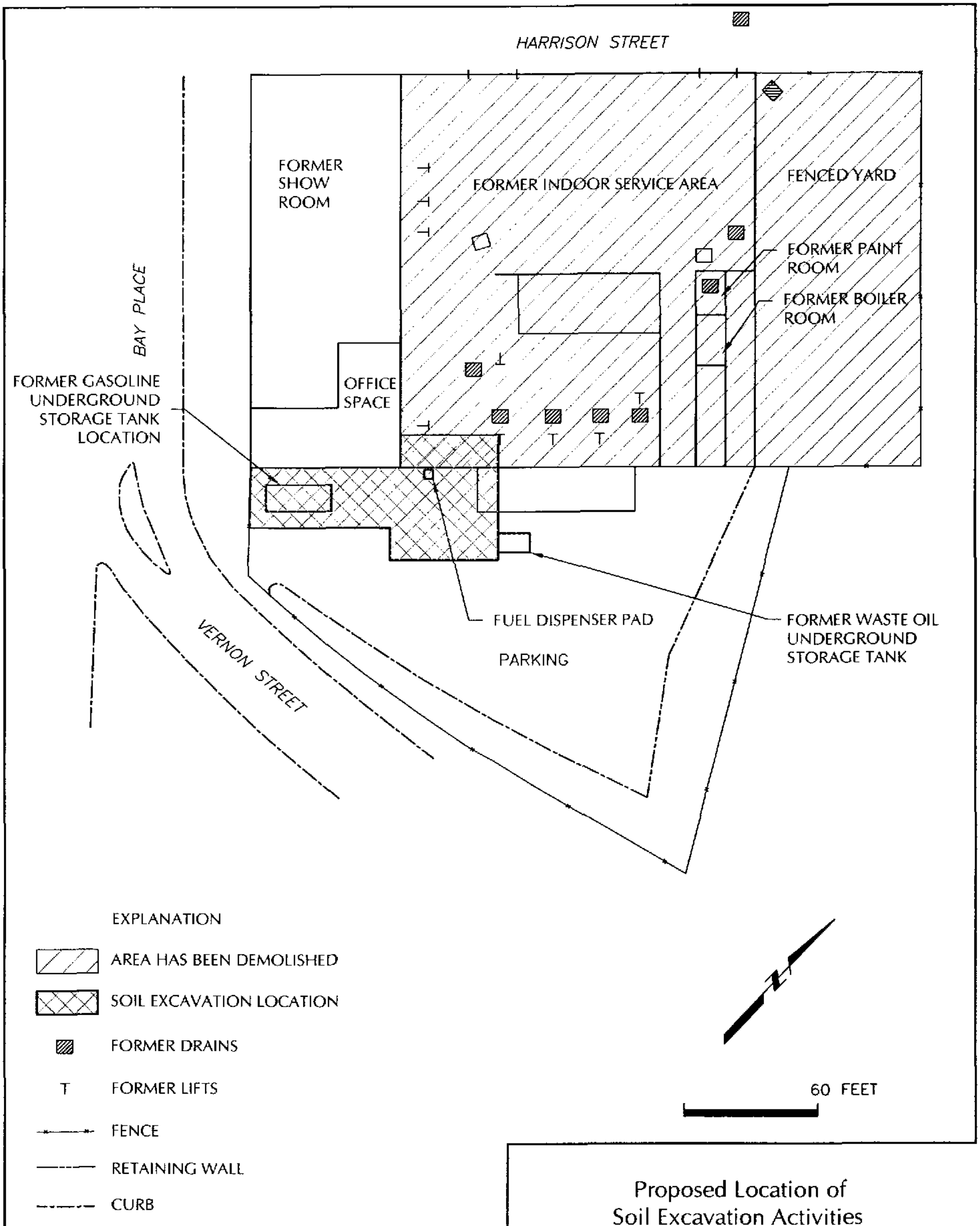
Figure 7

I:\Design\001\09171\00\000\DWG\mtbe.dwg, MTBE, 04/01/2004 09:41:20 AM



NOTES:

1. LOCATIONS OF ALL FEATURES DEPICTED ARE APPROXIMATE

Proposed Location of Soil Excavation Activities

Former Cox Cadillac, 230 Bay Place, Oakland, California

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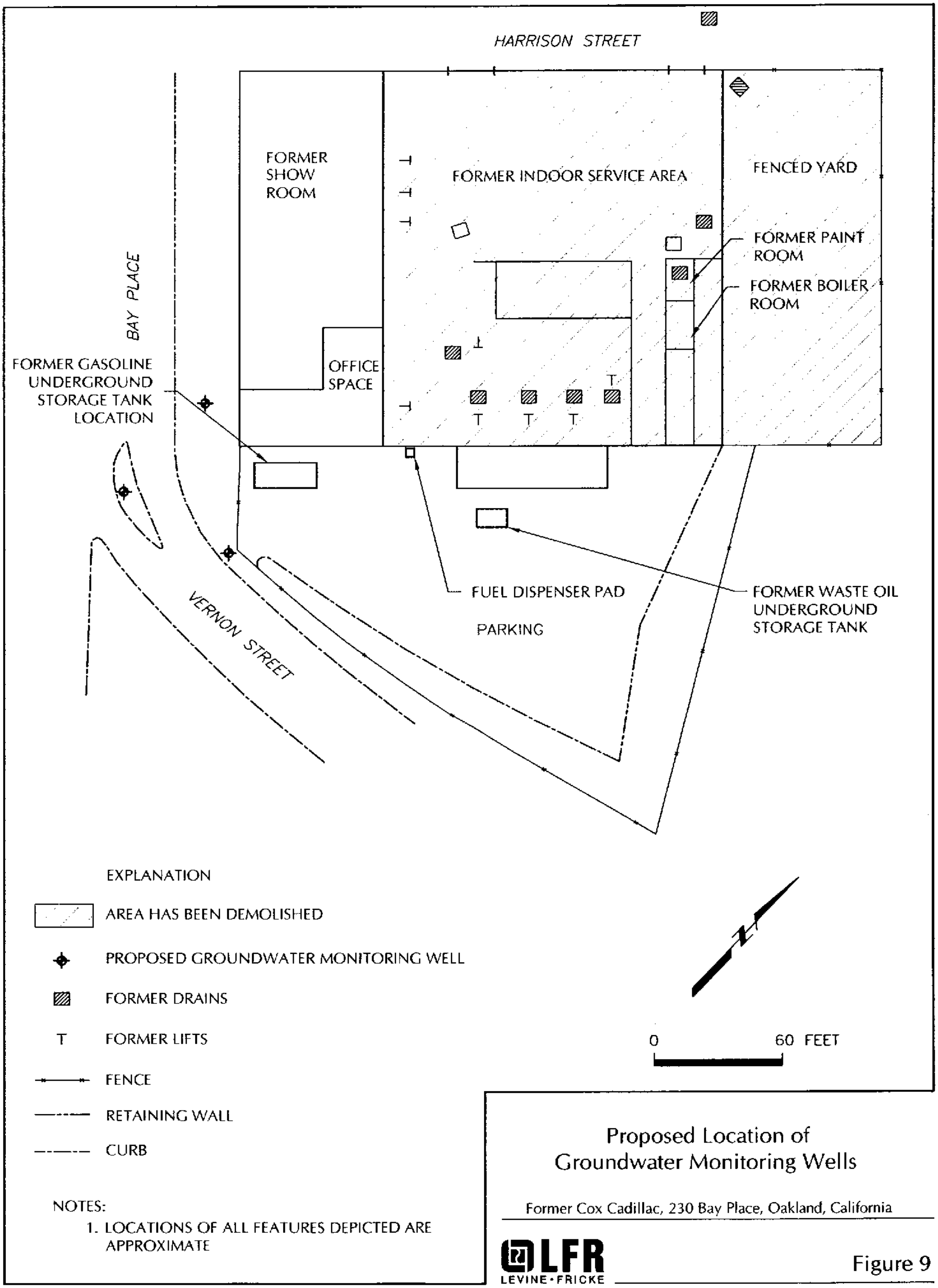
Figure 8

I:\Design\001\09171\00\000\DWG\Site Plan.dwg, Proposed Soil Excavation, 04/01/2004 09:43:35 AM



NOTES:

1. LOCATIONS OF ALL FEATURES DEPICTED ARE APPROXIMATE

Proposed Location of Groundwater Monitoring Wells

Former Cox Cadillac, 230 Bay Place, Oakland, California

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Figure 9

I:\Design\001\09171\00\000\DWG\Site Plan.dwg, Proposed GW Monitoring Wells, 03/29/2004 02:37:24 PM