Phase I/II/III Compilation Report
Del Monte Plant No. 35
West and East Parcel
Emeryville, California

Prepared for
Del Monte, USA

by

CH2MHILL

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Section 1
Introduction

Section 1

Introduction

This report contains activities conducted at the Del Monte Plant 35 property in Emeryville, Alameda County, California (Figure 1-1). Del Monte Plant 35 consists of two parcels; the East Parcel (Haven Street and eastward) at 1250 Park Avenue and the West Parcel (west of Haven Street) at 4204 Hollis Street (Figure 1-2). The following is a list of the major environmental activities conducted at Del Monte Plant 35:

- A 1989 Property Assessment
- A 1989 Property Assessment and Underground Fuel Oil Tank Removals
- A 1989 Underground Gasoline Storage Tank Removal
- A 1989 Soil Investigation of the Proposed Haven Street Location
- Quarterly Monitoring of Groundwater Wells on the Plant 35 West Parcel

The purpose of this report is to compile all the information obtained during the above activities into a single document and to determine if additional investigative or remedial activities are necessary. The above activities and other environmental activities conducted at Plant 35 are separated into a logical sequence of Phase I, Phase II, and Phase III work. This document also separates information obtained from the Plant 35 West Parcel and East Parcel. The following is a summary of the sections in this report:

Phase I Activities (Section 2A and 2B): Property assessments conducted at Plant 35.

Phase II Activities (Section 3A and 3B): Procedures and results of soil and groundwater investigations and underground tank removals conducted at the Plant 35 West and East Parcels. Quarterly groundwater monitoring data is also included.

Phase III Activities (Section 4A and 4B): Remedial activities conducted to date at the Plant 35 West and East Parcels. This includes excavation, treatment, and disposal of soils containing hydrocarbons.

Recommendations and conclusions of areas of potential concern are discussed in Sections 5A and 5B.

General Background

Del Monte Plant 35 is located on approximately 13 acres. Del Monte acquired the Plant 35 property in 1927 or 1928. Del Monte Plant 35 operations included fish oil processing and fruit canning. Del Monte separates the Plant 35 property into the West Parcel and East Parcel; the West Parcel is approximately 2 acres in size and the East

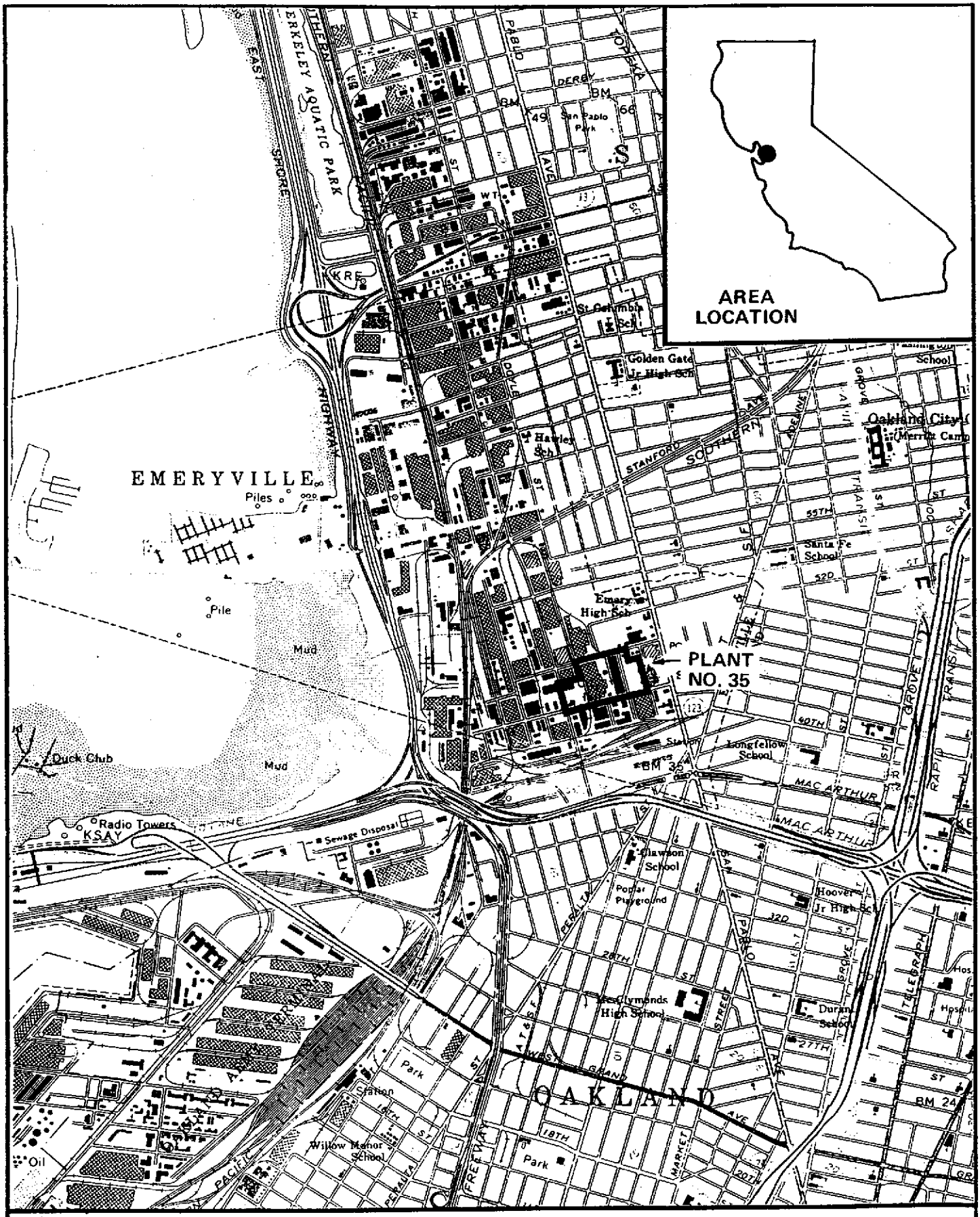

FIGURE 1-1
PROPERTY LOCATION MAP
DEL MONTE PLANT 35
EMERYVILLE, CALIFORNIA

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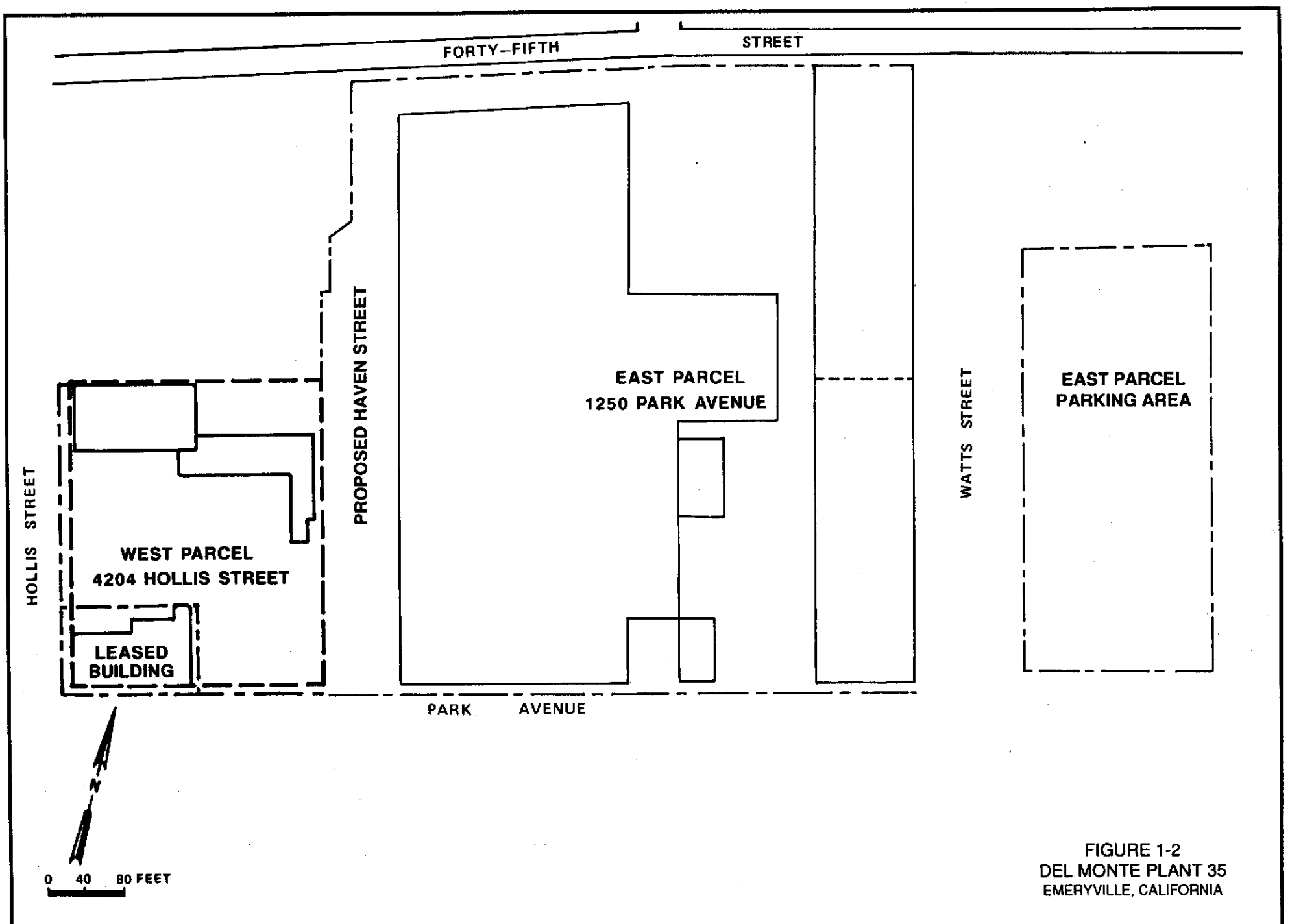

FIGURE 1-2
DEL MONTE PLANT 35
EMERYVILLE, CALIFORNIA

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Parcel is approximately 11 acres in size. Currently, Del Monte is not operating Plant 35.

The following is a chronology of Plant 35 events or documents which are documented in this report:

Date	Event/Document
1927 or 1928	Del Monte acquires Plant 35 property.
1971	A medical research company, TECNA, begins leasing building located at the corner of Hollis Street and Park Avenue (West Parcel).
1976-1989	Thoratec Laboratories Inc., leases building located at the corner of Hollis Street and Park Avenue (same building leased by TECNA) and conducts medical research (West Parcel).
Jan. 1986	Removal of an underground gasoline tank (approx. size was 3,500 gal.) located in the box yard near 45th Street (East Parcel).
1985/1986	An old railroad tank car used to store fuel oil underground near the boiler room was filled in place with grout (East Parcel).
1/28/86	Removal of a 550-gallon underground gasoline tank located near general office area near Park Ave (East Parcel).
3/22/89	Removal of four 50-gallon underground fuel oil tanks located near the southwest corner of the property (West Parcel).
3/22/89	Removal of a 550-gallon underground gasoline tank located below the sidewalk along Park Ave. Soil surrounding the tank contained TPH-gas. The excavated soil which contained organic compounds was aerated and subsequently disposed of at a Class II landfill (West Parcel).
June 1989	CH2M HILL submits "Plant 35 Property Assessment Study" to Del Monte (West and East Parcel).
Aug. 1989	CH2M HILL submits "Underground Gasoline Storage Tank Removal Study" to Del Monte. This report describes the removal of the 550-gallon tank located below the sidewalk along Park Ave and the associated soil and groundwater sampling (West Parcel).
Sept. 1989	CH2M HILL submits "Property Assessment and Tank Removal Study, Plant 35 Southwest Corner" to Del Monte. This report

describes a property assessment of the southwest corner of Plant 35 and the removal of the four 55-gallon fuel oil tanks (West Parcel).

All information obtained during the above studies is contained within this report.

Section 2A
Phase I—West Parcel

Section 2A

Phase I—West Parcel

Introduction

Objectives

CH2M HILL conducted Phase I property assessments of portions of the Plant 35 property in 1989. The purpose of these property assessments was to collect and review information about activities conducted at Plant 35 and nearby properties to evaluate whether chemicals may have been released to soil or groundwater beneath the property. This section contains the portion of the 1989 Phase I property assessments pertaining to the West Parcel.

The property assessment included the following activities:

- A walk-through inspection and visual examination of the building and surrounding area, and interviews with the plant manager about site history, past operations, and chemical use
- A drive-through windshield survey of surrounding nearby properties within approximately one-quarter mile
- A review of regulatory agency documentation including:
  - California Regional Water Quality Control Board, San Francisco Region (SFRWQCB)--Leaking Underground Storage Tanks
  - State of California Department of Health Services (DHS)—Hazardous Waste Sites
  - U.S. Environmental Protection Agency (EPA), Toxic Substances Control Division—Hazardous Waste Generators and Treatment, Storage, and Disposal Facilities
- A review of aerial photographs taken between 1947 and 1988

The Phase I—West Parcel section of this report explains the objectives of the West Parcel Phase I investigation and describes the background of Del Monte's West Parcel including property development and use. Neighboring properties and potential offsite sources are included in Appendix A.

Background

This subsection presents a summary of the environmental setting and property development and use of the Plant 35—West Parcel. Information about property development and use was obtained from discussions with the plant manager, property plot plans, and historic aerial photographs. The dates of the photographs reviewed were March 24, 1947; September 16, 1949; August 14, 1953; May 3, 1957; July 7, 1959; May 2, 1969; April 24, 1973; September 14, 1979; June 21, 1983; and March 30, 1988. The photographs showing specific features of interest are included in Appendix B.

Geographic Setting

This property is in the generally flat-lying area between San Francisco Bay to the west and the Berkeley Hills to the east. It is approximately one-third of a mile east of the original shoreline of San Francisco Bay (Nichols and Wright, 1971), and about one-half mile from the current shoreline.

Regional Geology

The active Hayward fault is approximately 3 miles to the east of this property and generally separates the bedrock-dominated Berkeley Hills from the alluvial and marine sediments that comprise the sloping plain that underlies the property. The alluvial and marine sediments consist of interbedded clays, silts, sands, and gravels. The alluvial sediments contain a larger proportion of sand and gravel, and the grain size generally increases toward the foot of the hills. The marine deposits are finer-grained and consist mainly of clay.

Regional Hydrogeology

The property is located above the Alameda Bay Plain Groundwater Basin (DWR, 1980). Groundwater in the Alameda Bay Plain Basin occurs within the generally discontinuous, permeable alluvial and marine sediments that extend from the ground surface to depths of over 500 feet below ground surface (DWR, 1980).

Regional information is not available about the horizontal or vertical directions of groundwater flow in the Emeryville area. Based on information for areas to the south (such as San Leandro), however, groundwater flow in both shallow and deeper zones is likely to be westward toward San Francisco Bay. If there is local pumping, it is likely from the deeper zones, and such pumping could affect the direction of groundwater flow.

According to the Water Quality Control Plan for the San Francisco Bay Basin (SFRWQCB, 1982, 1986), potential beneficial uses of groundwater applicable to the main groundwater basins in the San Francisco area are municipal supply, industrial process water supply, industrial service supply, and agricultural supply. Factors limiting

groundwater development in these basins include sea-water intrusion, aquifer materials of low permeability, and water quality (DWR, 1975).

Local Geology

The fill below Plant No. 35 is composed primarily of clay containing gravels. The native soil beneath the interface is predominantly silty clay. Based on the lithologic logs of the soil borings (Appendix E), fill extends to a depth of 5 to 8 feet below ground surface. The native silty clay extends from beneath the fill to a depth of approximately 15 to 20 feet below the ground surface. The silty clay is underlaid with silty sand.

Local Groundwater

Shallow groundwater exists beneath the Plant 35 property at a depth of approximately 7 to 11 feet below ground surface. The shallow groundwater flow is west to west southwest toward the San Francisco Bay under a horizontal hydraulic gradient of approximately 0.014 (1989 data).

Property Development and Use

The Plant 35—West Parcel is located on approximately 2 acres of land located along Park Avenue and Hollis Street in Emeryville, California (Figure 2A-1). In the early 1920s, both the West and East Parcels were occupied by the Verdant Packing Company. Del Monte acquired the West and East Parcels as a single parcel in 1927 or 1928.

A fish oil processing operation existed on the western portion, including the West Parcel, of Plant 35 up until the early 1950s. Two concrete fish processing pits associated with the fish oil processing operation were located on the East Parcel, immediately adjacent to the West Parcel. Little else is known about the fish oil processing operation.

A building identified as Plant No. 554 appeared in a 1942 plot plan, covering virtually the entire West Parcel. It is not clear whether this building actually existed because Plant No. 554 was not seen in a 1947 aerial photograph, and fish processing operations were conducted in this area until at least 1949.

The building that is currently on the southwest corner of the West Parcel existed in March 1947, based on the aerial photograph (Appendix B). It is unknown what operations were conducted in this building during these early years. In 1971, a company called TECNA leased the building; however, no information is available on TECNA's operations except that the company performed medical research. Thoratec Laboratories, Inc. leased the building from 1976 to January 1989. Thoratec also conducted medical research. Chemicals reportedly used by Thoratec included methanol,

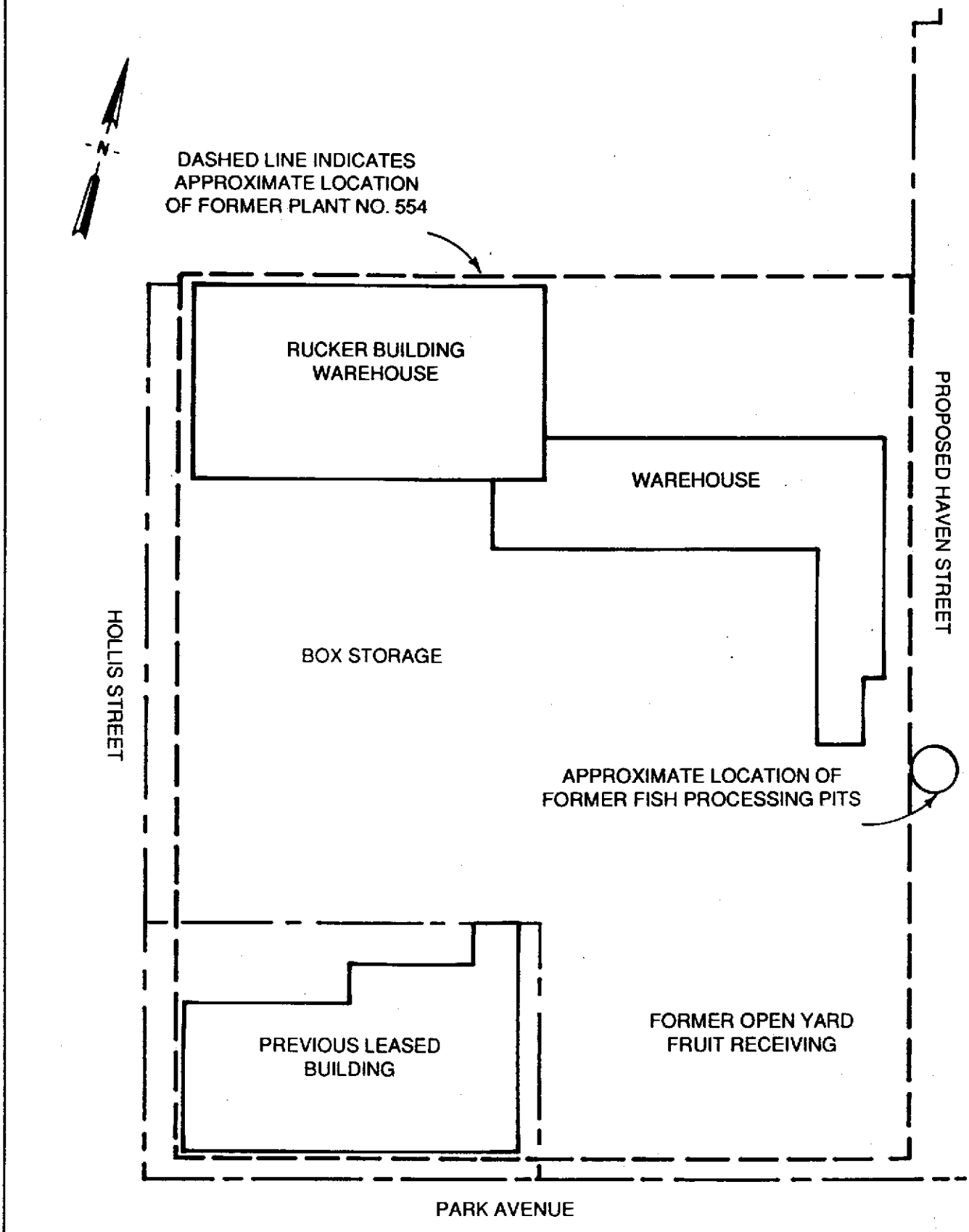

FIGURE 2A-1
DEL MONTE PLANT 35-WEST
PARCEL
Emeryville, California

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acetone, ethanol, dimethylacetamide, dimethylformamide, and octamethylcyclotetrasiloxane (communication between J. Layton, Plant No. 35 Manager, and Thoratec, Inc.).

A September 1949 aerial photograph of Plant 35 (Appendix B) indicates that there were eight large and eight smaller vertical tanks. The tanks appear to have been on a foundation. According to Mr. Layton, the tanks were used as part of the fish processing operations to store various types of fish oil. A building existed at the location of the current Rucker Building Warehouse, but it is not known what it was used for in 1949.

By 1953, the 16 vertical fish oil tanks on the West Parcel no longer existed. According to Mr. Layton, an incinerator was on the west side of the West Parcel in the early 1950s (May 1957 aerial photograph—Appendix B). Incinerators were typically used in the Emeryville area around that time for burning garbage.

The stacks of lug boxes seen in the 1957 photograph were no longer on the property in the 1959 photograph.

A 1969 aerial photograph shows an aboveground tank used for pressed grapes at the northeast corner of a West Parcel warehouse.

1989 Chemical Storage areas of the Plant 35—West Parcel are shown on Figure 2A-2. In 1989, the Rucker building was used for storage and the warehouse located immediately southeast of the Rucker Building warehouse was used to store waste oil, grease, and detergent. This warehouse also contained an instrument room where trichloroethylene (TCE) was used to clean various instruments. The TCE was stored in a drum, and less than 55 gallons were usually present in the warehouse at any time.

Current Property Use

Del Monte Plant 35 has not been operating and the buildings have been vacated since the end of 1989. No hazardous chemicals or wastes are stored on the property (J. Layton, Plant 35 Manager, 1992).

Underground Tanks

Five underground storage tanks are known to have existed at the Del Monte—West Parcel. Four of the tanks were used to store fuel oil and were located north of the "Leased Building" (Figure 2A-2).

Upon sampling the tank contents, it was discovered that the tanks also contained some chlorinated solvents. The tanks were small, with a capacity of about 50 gallons each, and were made of steel.

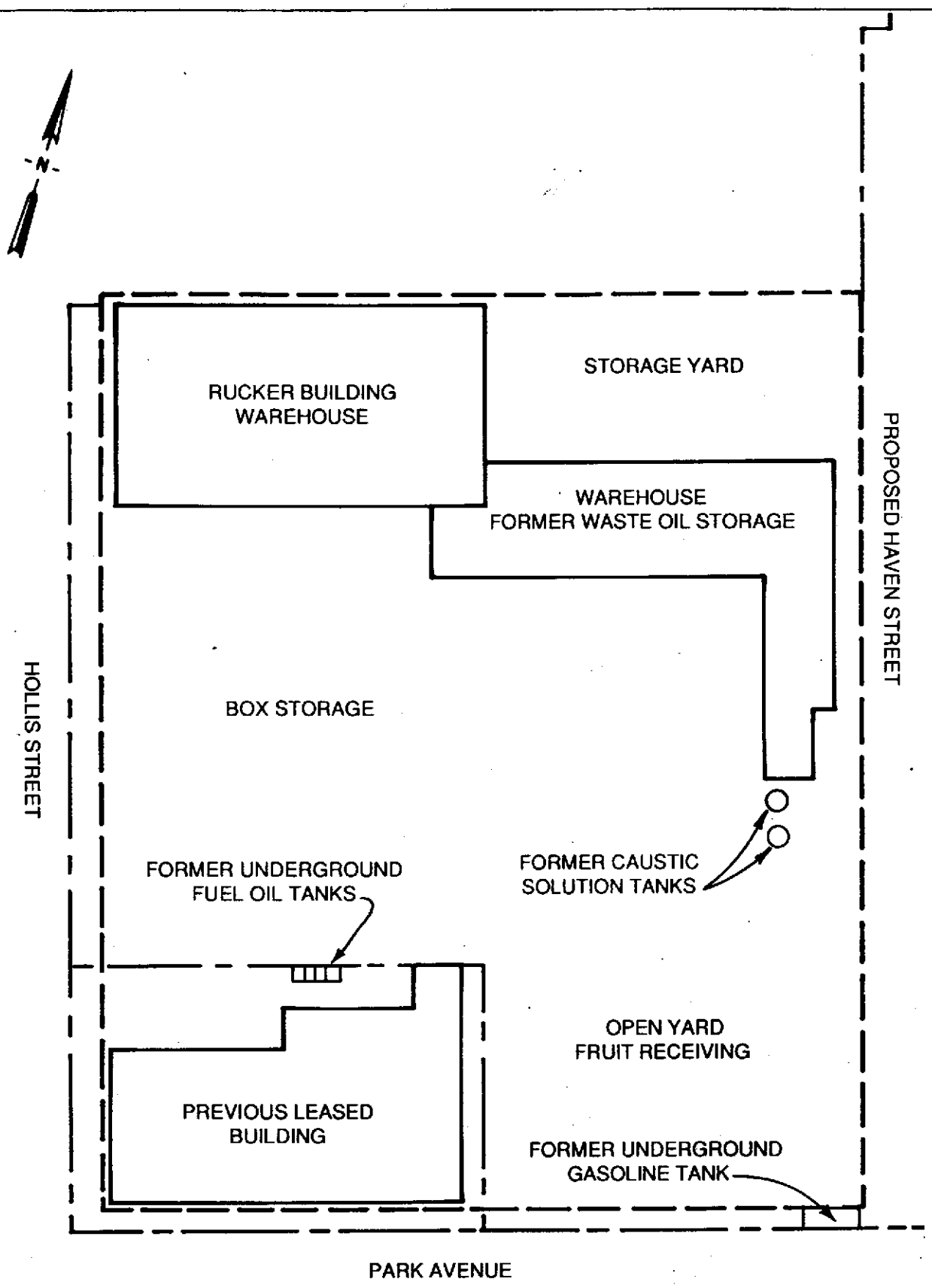

FIGURE 2A-2
CHEMICAL STORAGE AREAS AND
TANK LOCATIONS
DEL MONTE PLANT 35-WEST PARCEL
Emeryville, California

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The fifth underground tank was located near the southeast corner of the West Parcel (Figure 2A-2). This tank had a capacity of about 550 gallons and was used to store gasoline.

All five tanks were removed on March 22, 1989. The investigation and removal of these tanks is described in Section 3A of this report.

Section 2B
Phase I—East Parcel

Section 2B

Phase I—East Parcel

Introduction

Objectives

CH2M HILL conducted Phase I property assessments of portions of the Plant 35 property in 1989. The purpose of these property assessments was to collect and review information about activities conducted at Plant No. 35 and nearby properties to evaluate whether chemicals may have been released to soil or groundwater beneath Plant No. 35. This section contains the portion of the 1989 Phase I property assessments pertaining to the East Parcel. The information obtained during this assessment contributes to the fulfillment of legal requirements for the sale of nonresidential property. A copy of the California legal requirements concerning liabilities related to hazardous substances in real estate transactions is provided in Appendix C.

This property assessment included the following activities:

- A walk-through inspection of buildings and surrounding areas, and interviews with the plant manager about site history, past operations, and chemical use at Plant No. 35
- A drive-through windshield survey of surrounding nearby properties within approximately one-quarter mile
- A review of regulatory agency documentation including:
  - San Francisco Regional Water Quality Control Board (SFRWQCB)—Leaking Underground Storage Tanks
  - State of California Department of Health Services (DHS)—Hazardous Waste Sites
  - U.S. Environmental Protection Agency (EPA), Toxic Substances Control Division—Hazardous Waste Generators and Treatment, Storage, and Disposal Facilities
- A review of aerial photographs taken between 1947 and 1988

Background

This subsection presents a summary of the history of Plant No. 35, including property development, property use, and previous investigations at the property. The environmental setting for Plant 35 is described in Section 2A. Neighboring properties and potential offsite sources are included in Appendix A.

Property History

Information about the history of Plant No. 35 was obtained from discussions with the Bay Area production manager, property plot plans, and historic aerial photographs taken between 1947 and 1988. The dates of the photographs reviewed were March 24, 1947; September 16, 1949; August 14, 1953; May 3, 1957; July 7, 1959; May 2, 1969; April 24, 1973; September 14, 1979; June 21, 1983; and March 30, 1988. The photographs showing specific features of interest have been reproduced for this report and are included in Appendix B.

Property Development

Del Monte's Plant No. 35—East Parcel is located on approximately 11 acres at 1250 Park Avenue in Emeryville, Alameda County, California (Figure 2B-1). In the early 1920s, the property was occupied by the Verdant Packing Company. Del Monte acquired the Plant No. 35 property in 1927 or 1928. A fish oil processing operation existed on the western portion of the property (including the West Parcel) up until about the early 1950s. Very little is known about the fish processing operations except that according to Mr. James Layton, the Bay Area production manager, two concrete pits remain on the property that may be remnants of the fish processing operations. The location of the pits is shown in Figure 2B-2. An underground pipe leading to the pits was encountered when Plant No. 35 employees were placing a drain under the pit hopper. Where the pipe leading to the pits was coming from is not known. The employees reported that the pipe contained what smelled like fish waste that had been there for a long time. An employee stated that there was a large augering device in the pipe that may have been used to force the waste into the pits. The pits appeared to be encased with 4- to 6-inch-thick concrete and were covered with a steel plate. The top of the pits was about 2 feet below the ground surface and paved over with asphalt. According to Mr. Layton, the pits appeared to be empty. The fish pit was removed in 1989.

On the majority of the East Parcel, Del Monte operated a fruit cannery. According to a 1942 plot plan of the property, the main building that contained the fruit cannery operations existed at the center of the property and was identified as Plant No. 35.

A 1949 aerial photograph of Plant No. 35 is included in Appendix B. Most of the buildings that are now present on the property existed in 1949. A plot plan of the plant shows the fruit cannery separated into sections for various aspects of cannery operations, including a pear shed, a shook room, a label and case storage room, a

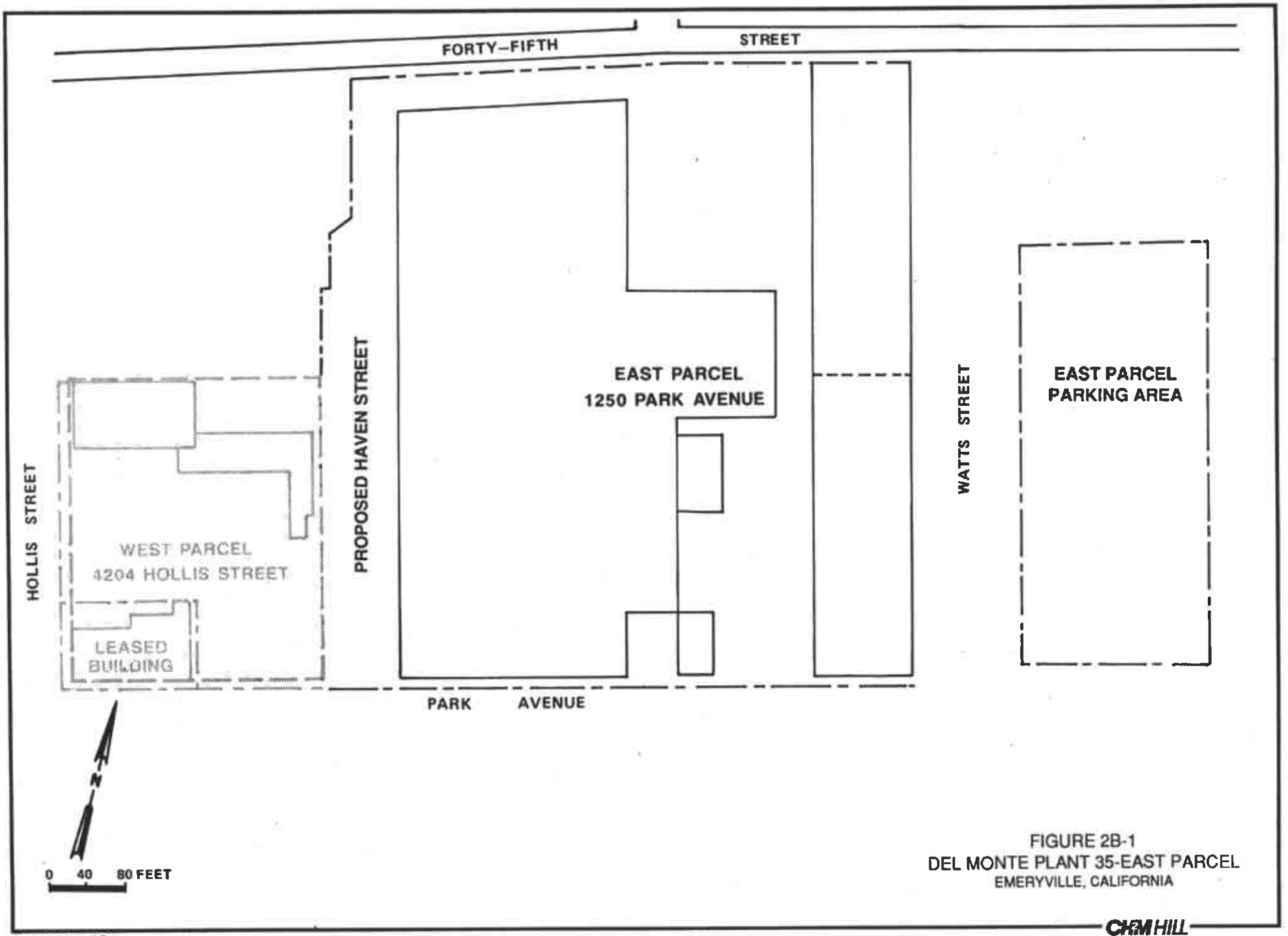

FIGURE 2B-1
DEL MONTE PLANT 35-EAST PARCEL
EMERYVILLE, CALIFORNIA

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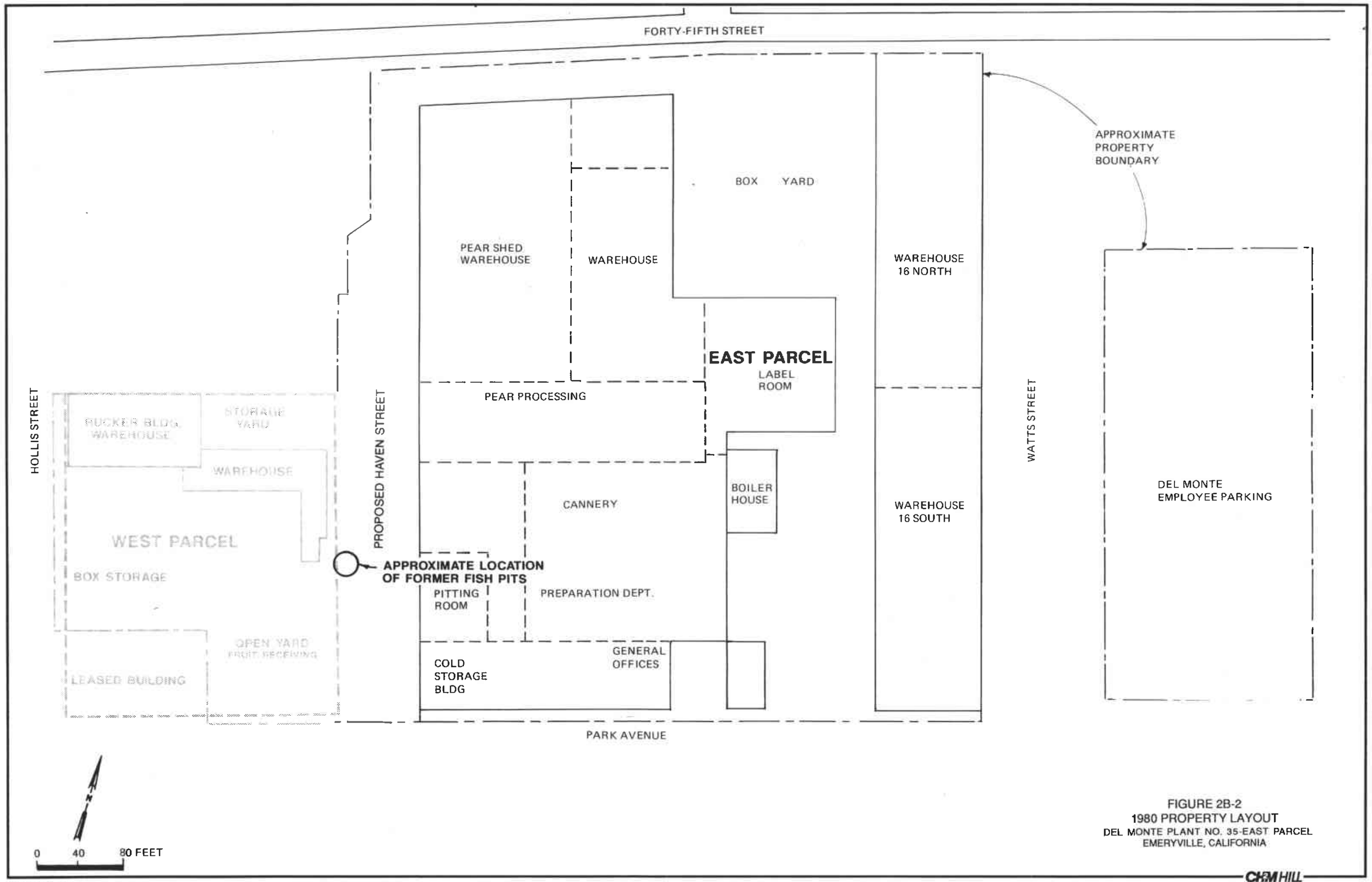

FIGURE 2B-2
1980 PROPERTY LAYOUT
DEL MONTE PLANT NO. 35-EAST PARCEL
EMERYVILLE, CALIFORNIA

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grader room, two factory areas, cold rooms, and offices. (The plot plan has been revised many times and it is unknown when the various sections existed.) Railroad cars were parked along the west side of the fruit cannery (1949 aerial photograph). A baseball diamond was on the eastern portion of the property. The open areas along Watts Street do not appear to have been paved.

A bus parking yard was on the north side of the property in 1949, and other industrial or manufacturing facilities were located north, west, and south of Plant No. 35 along Hollis Street, Park Avenue, and 45th Street. East of the property, across San Pablo Avenue, were residential areas.

In 1952, an addition to the boiler house was constructed and two new boilers were added to the one existing boiler (May 1957 aerial photograph—Appendix B). Three syrup tanks were added on the east side of the fruit cannery, and two lye tanks were added on the west side.

Warehouse 16, along Watts Street, was constructed in 1954 (May 1957 aerial photograph—Appendix B). In 1957 the open area between Warehouse 16 and the fruit cannery did not appear to have been paved. Wooden lug boxes were stacked and covered with canvas in various locations on the property; seven stacks were located in the west portion of the property and five were between the fruit cannery and Warehouse 16. The baseball diamond on the east portion of the property did not appear to have been maintained. The surrounding area had not changed substantially.

An addition to the fruit cannery, constructed in 1959, was used as a labeling building; it is shown in the 1969 aerial photograph (Appendix B). By 1959, the baseball diamond had been replaced with a building and an unpaved parking area.

By 1979, the area between Warehouse 16 and the main cannery appears to have been paved and the parking area across Watts Street appears to have been graded. A 1988 aerial photograph of Plant No. 35 is shown in Appendix B.

The former chemical storage areas and tank locations on the Plant No. 35—East Parcel are shown in Figure 2B-3. In 1989, Warehouse 16 was used to store cans and other items for the fruit cannery operations. The fruit cannery contained sections for pear preparation, pear processing, piting, canning, and labeling (Figure 2B-3). Chlorine, used for sterilization, was stored in a one-ton aboveground gas cylinder near the pear shed area in the cannery, and chlorine liquid is stored in aboveground tanks near the pitting room (Figure 2B-3).

Solvent was used at Plant No. 35 for cleaning parts and equipment. A solvent, used at Plant 35, 105 Solvent MS, is composed of mineral spirits (500 ppm), dye, and antistatic agent. There were 12 to 15 mobile parts cleaning stations; all were self-contained and equipped with 5-gallon tanks of solvent. The solvent was pumped out of the tank as it was used, and the waste was returned to the tank and recirculated. Safety Kleen provided the solvent and containers and replaced the tanks with new solvent according

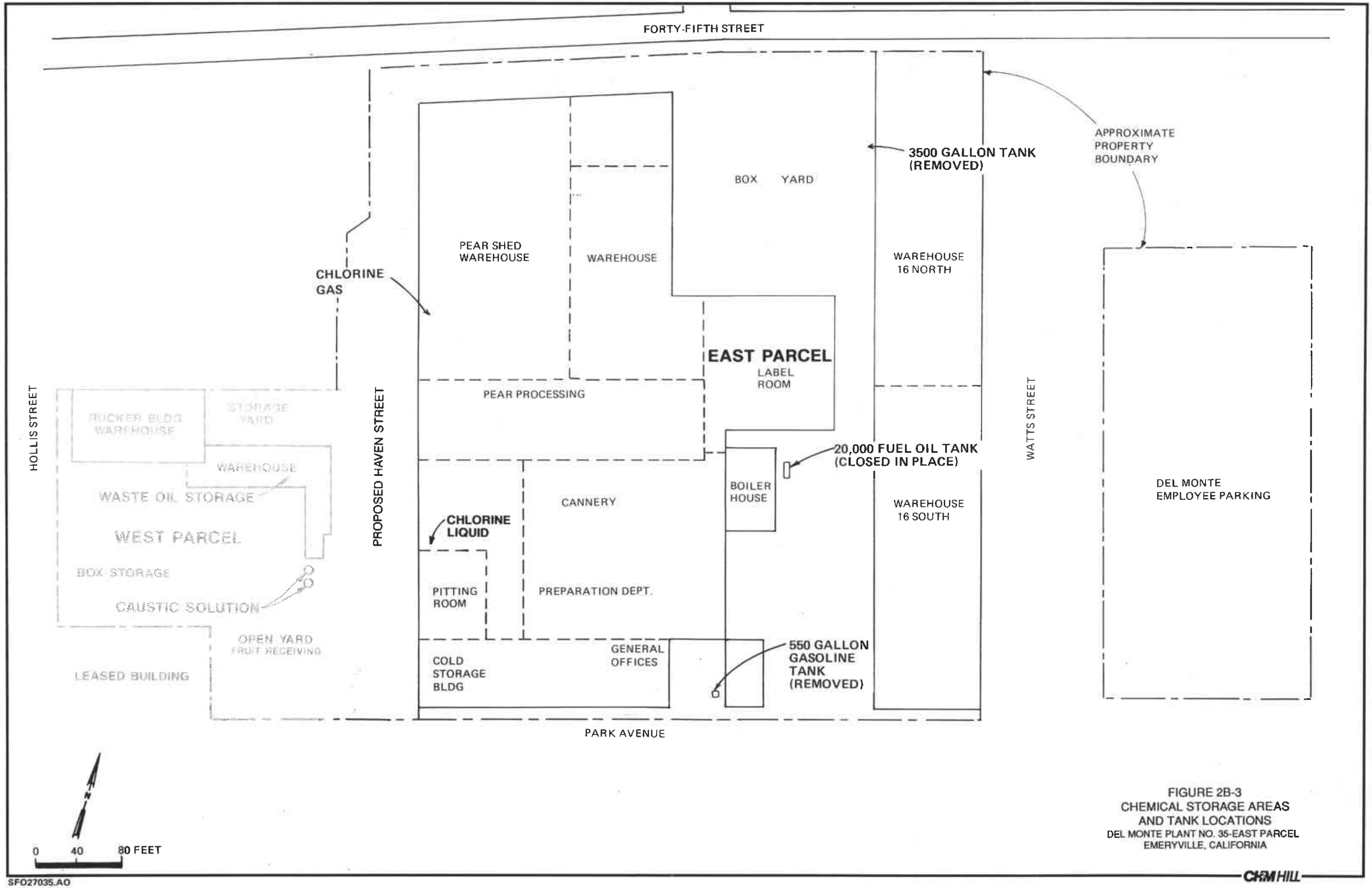

FIGURE 2B-3
CHEMICAL STORAGE AREAS
AND TANK LOCATIONS
DEL MONTE PLANT NO. 35-EAST PARCEL
EMERYVILLE, CALIFORNIA

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to a time schedule. According to Mr. Layton, the plant generally used less than 55 gallons of solvent per month. Actual purchase records are available. According to Mr. Layton, this method and type of solvent have been used at Plant No. 35 for the past few years (before 1989). The types of solvents the plant previously used are not known.

Chemicals used by Del Monte at Plant No. 35, in addition to chlorine and caustic solution, included glue for labeling, DuJet floor cleaner, and Super Loob. The components of the DuJet cleaner and Super Loob are unknown.

Current Property Use

Del Monte Plant 35 has not been operating and the buildings have been vacated since the end of 1989. No hazardous chemicals or wastes are stored on the property (J. Layton, 1992).

Previous Investigations

Three underground storage tanks are known to have been located on the Plant No. 35—East Parcel. Two tanks were removed and one was closed in place. The information about the tank closures is incomplete and unclear, but what is known is summarized in the following paragraphs. Whether the SFRWQCB was notified of the previous tank activities is also not known.

A gasoline tank was removed from the box yard near 45th Street in January 1986 (Figure 2B-3). The size of the tank is not known: it appears to have been estimated in December 1985 to be 2,000 gallons and revised to 3,500 gallons after it was removed. Soil samples collected during the removal of the 3,500-gallon tank contained 10 parts per million (ppm) total petroleum hydrocarbons (TPH), 0.06 ppm benzene, 0.26 ppm toluene, and 0.35 ppm xylene (Hansen, 1986).

An old railroad tank car, used to store fuel oil, was buried next to the boiler room (Figure 2B-3). According to Mr. Layton, the tank was pumped out in the early 1980s but it became filled again, possibly with groundwater. The reported information is not clear, but it appears that soil samples were collected on the north and south sides of the tank in November 1985. In December 1985, additional soil samples and a groundwater sample were collected. The exact locations of the samples are not known. The data are shown in Table 2B-1. Based on the data, the tank was filled in place with grout.

A 550-gallon gasoline tank previously located near the general offices on Park Avenue (Figure 2B-3) was removed on January 28, 1986, and a soil sample was collected from 3 feet below the bottom of the excavation (Hansen, 1986). Because of inclement weather and because the excavation was near a building, the excavation was backfilled pending laboratory results. The soil sample data are presented in Table 2B-2. In 1989, SFRWQCB required further investigation if soils contained concentrations greater than 100 ppm TPH. On February 7, 1986, one soil boring was drilled next to the backfilled

Table 2B-1
Data from 20,000-Gallon Tank Investigation

Sample Type	Date of Sample	Depth o Sample (ft)	Volatile Hydrocarbons (ppm)[a]	Extractable Hydrocarbons (ppm)[a]	Oil and Grease (ppm)[a]
Soil—North	11/19/85	--	3.0	0.35	116
—South	11/19/85	--	5.0	0.18	8.5
Soil	12/03/85	20	--	0.80	60
	12/03/85	22	--	0.30	37
	12/03/85	24	--	1.80	18
Water	12/03/85	--	--	0.83	2

[a]ppm = parts per million as mg/kg soil or mg/l water.

Note: Exact sampling locations are unknown.

Source: Letter from Mr. Steven J. Anderson, Exceltech, to Mr. Todd Simon. Del Monte, dated January 30, 1986.

Table 2B-2
Existing Data from 550-Gallon UST Closure

Type	Date of Sample	Depth of Sample (feet)	Total Volatile Hydrocarbons[a] (ppm)	Benzene (ppm)	Toluene (ppm)	Xylene (ppm)	Ethyl-benzene (ppm)
Soil	1/28/86	10[b]	1,500	46	45	22	--
	2/07/86	7[c]	150	0.54	1.5	0.94	--
	2/07/86	10[c]	17	0.13	0.098	0.063	--
	2/07/86	13[c]	1.3	0.014	0.064	0.048	--
	2/07/86	16[c]	0.10	0.018	0.033	0.031	--
Water	2/07/86	16[d]	6.2	0.044	0.04	0.025	--
	2/07/86	13[e]	1.9	0.033	0.024	0.020	--
	8/07/87	16[f]	<0.05	<0.005	0.0012	0.00060	--

[a]Equivalent to total petroleum hydrocarbons as gasoline (personal communication with Trace Analysis Laboratories, Inc., February 1, 1989).
[b]Soil sample collected from the tank excavation, 3 feet below the tank bottom.
[c]Soil samples collected from a boring located adjacent to excavated tank location.
[d]Water sample collected from a soil boring located adjacent to excavated tank location. It does not appear that this was a completed monitoring well.
[e]Water sample collected from a soil boring 13 feet from excavated tank location.
[f]Water sample collected from completed monitoring well at same location as in d.

Note: ppm = parts per million in mg/kg for soil and mg/l for water.

Sources: Letter from Michael Hansen, Exceltech, Inc. to Mr. Todd Simon, Del Monte Corporation, dated February 25, 1986.

area, and another about 13 feet away in the downgradient direction. Soil samples were collected from the first boring, and groundwater was collected from both locations.

These data are also shown in Table 2B-2. The report is unclear, but it appears that the second boring was backfilled (material unknown) and covered with an asphalt patch, and a monitoring well was installed in the first boring. The monitoring well was resampled in August 1987; these data are also shown in Table 2B-2.

During a field investigation conducted at Plant No. 35 at the same time as this property assessment and during subsequent tank removal activities, groundwater samples were collected from the monitoring well near this tank (designated MW6). The field investigation and monitoring results are discussed in Section 3B.

Section 3A
Phase II—West Parcel

Section 3A

Phase II—West Parcel

Introduction

CH2M HILL conducted or supervised the following Phase II activities at Del Monte's Plant 35—West Parcel:

Activity	Date	Purpose
Geophysical Survey	December 1988	To determine the orientation of the 550-gallon gas UST and search for unknown USTs
Monitoring Well Installation of MW1 and MW2 (along with MW3-MW5 on East Parcel)	December 1988	To determine the depth and direction of shallow groundwater flow beneath the property
Soil and Groundwater Investigation in Vicinity of Fuel Oil Tanks	February thru July 1989	To determine soil and groundwater quality in vicinity of the fuel oil tanks
Soil and Groundwater Investigation in Vicinity of 550-Gallon Gasoline Tank	February thru May 1989	To determine soil and groundwater quality in vicinity of the gasoline tank
Quarterly Groundwater Monitoring of MW7-MW11	May 1989 - Current	To monitor groundwater quality beneath West Parcel

The above activities are described in the following subsections: Investigation Methods and Procedures, and Discussion of Results.

Investigation Methods and Procedures

Geophysical Survey

The objectives of the geophysical survey were to determine the orientation of the underground gasoline storage tank (UST) located on the West Parcel and to survey accessible areas of the property for unknown underground tanks or other objects. Ground penetrating radar (GPR) and electromagnetic induction (EM) were used for the survey. The geophysical surveys were performed in the open spaces around and between buildings as allowed by access. The methodology used and the area of the property surveyed are described in detail in the geophysical report in Appendix D.

A single tank was located in the southeast corner of the West Parcel, near the Park Street entrance to the open receiving yard ("B" in Figure 3A-1). Although there was no visible fill pipe or inspection cover for this tank, a vent pipe did exist. The GPR indicated a buried object with a signature similar to an UST; 4 feet wide and 9 feet long with an east/west orientation. (During subsequent excavation to remove this tank, it was discovered to be a few feet south, outside the fence.)

The EM and GPR data delineated another possible buried object in the open receiving yard near the Park Avenue entrance. The object is approximately 5 feet square. The location of this object is indicated by a "C" in Figure 3A-1.

In the storage yard east of the Rucker Building Warehouse, two anomalous areas were resolved solely with GPR data. One of these appears to be a buried object 5 feet wide and 10 feet long oriented in an east/west direction (labeled "D" in Figure 3A-1). The other anomaly, labeled "E" in Figure 3A-1, is approximately 6 feet wide and 20 feet long. According to Mr. Layton, this may be a reinforced foundation for the aboveground pressed grape tank seen in the May 1969 aerial photograph (Appendix B).

In the southwestern box storage yard, an EM anomoly was resolved using GPR data; it was found to be a large area of asphalt underlaid by closely spaced rebar ("F" in Figure 3A-1). This area is approximately 25 feet square. According to Mr. Layton, because various structures existed in this area in the past, such as aboveground tanks and a lug box truck loading platform (Section 2A), the anomaly may indicate a reinforced foundation.

Monitoring Well Installation and Sampling of MW1 and MW2

Soil Sample from MW2

In December 1988, a soil sample, SB2, was collected from the borehole of monitoring well MW2. The SB2 sample location is shown in Figure 3A-1. SB2 was collected from a depth of 8 feet below ground surface outside of the oil shed where 55-gallon drums of oils and greases were stored.

Procedure for Sampling SB2. Soil boring SB2 was drilled using 8-inch outer diameter hollow stem augering equipment operated by ENSCO Environmental Services.

Prior to drilling, the boring location was marked with spray paint on the pavement and subsurface utilities were cleared. Before each sampling, the sampler and brass sleeves were washed in Alconox and rinsed with clean water. The brass sleeves were also rinsed with isopropanol, allowed to dry, and rinsed with deionized water.

Soil samples were collected by driving a 2.5-inch-diameter, 18-inch-long Modified California sampler containing three 6-inch brass sleeves ahead of the augers. After

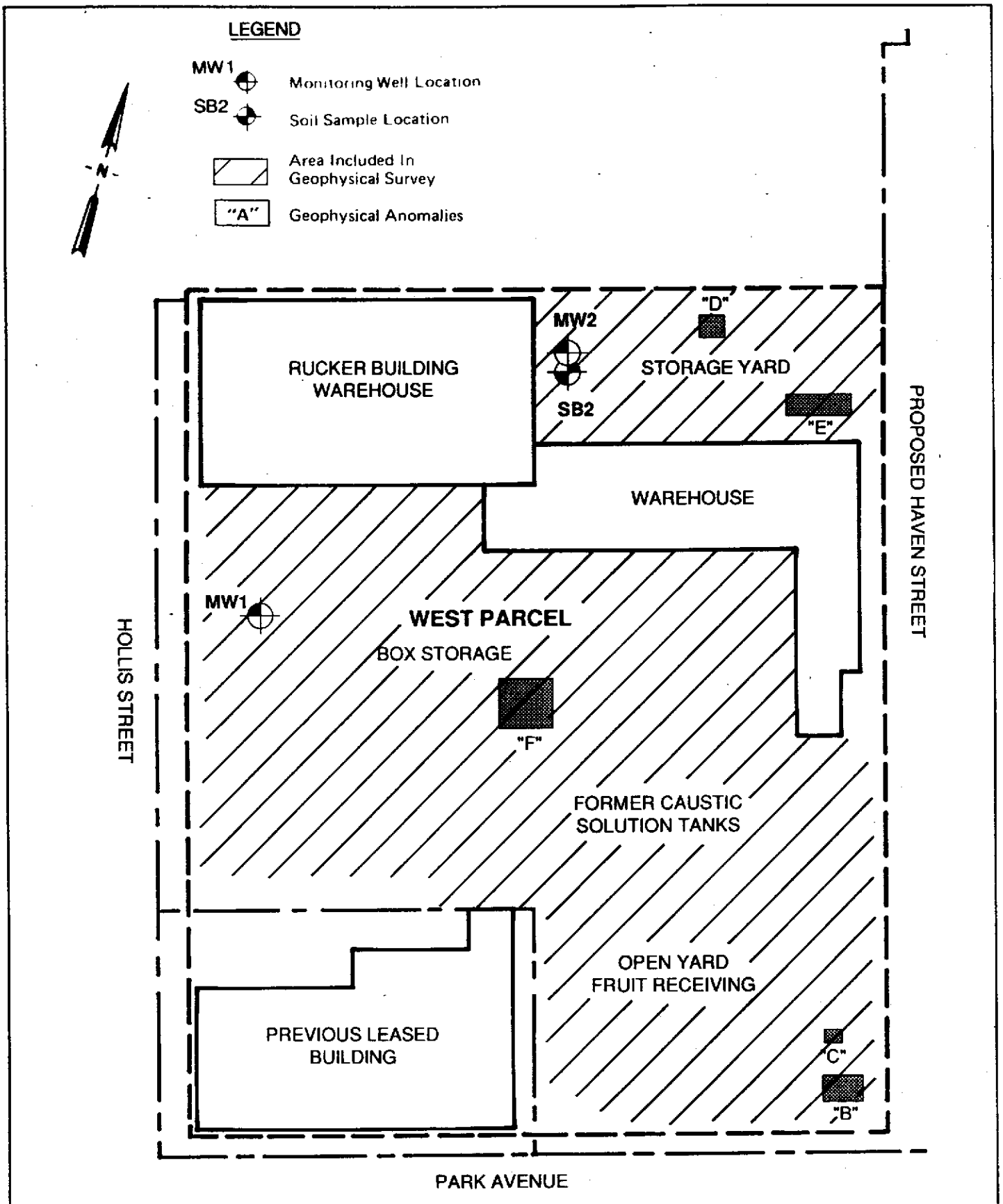

FIGURE 3A-1
SAMPLING LOCATIONS
DEL MONTE PLANT NO. 35-WEST PARCEL
EMERYVILLE, CALIFORNIA

CH2M HILL

removing the sampler, the augers were advanced to the bottom of the sampled hole. Upon encountering native clay, the middle brass sleeve, containing the soil sample most representative of the clay beneath the fill/native clay interface, was retained for laboratory analysis. If the interface was passed, another boring was drilled to the correct depth adjacent to the first boring. The subsurface lithology was described using the contents of the top and bottom brass sleeves and the drill cuttings.

Soil samples were labeled, sealed with teflon-lined caps and electrical tape, decontaminated with Alconox and water, placed in ziplock plastic bags, and stored in an ice-filled cooler. Chain-of-custody forms were placed in a ziplock plastic bag and taped to the inside lid of the cooler. Custody seals were then taped across the closed lid of the cooler, and the coolers were shipped to the laboratory by Greyhound bus for overnight delivery.

The fill below Plant No. 35 is composed primarily of clay containing gravels. The native soil beneath the interface is predominantly silty clay. Based on the lithologic logs of the soil borings (Appendix E), fill extends to a depth of 5 and 8 feet below ground surface. The native silty clay extends from beneath the fill to a depth of approximately 15 to 20 feet below the ground surface. The silty clay is underlaid with silty sand. To collect soils with the highest potential for containing organic chemicals, the SB2 soil sample was collected at the interface of the fill and native soil.

To assess whether chemicals used near the oil shed are present in the soil, the sample was analyzed for chlorine, volatile organic compounds (VOCs) (EPA Method 8240), base/neutral compounds (EPA Method 8270), and total petroleum hydrocarbons (TPH) as diesel and gasoline. The results of the soil sample analyses are presented in Table 3A-1 and laboratory data sheets are included in Appendix F.

Table 3A-1
SB2 Soil Sampling Results
Del Monte Plant 35—West Parcel

Compound Detected	Concentration (mg/kg)
	SB2
TPH as gasoline	140
Methylpentenoic Acid	<0.005
di-n-Butylphthalate	0.150
Toluene	<0.010
Trichloroethylene	<0.005

TPH as gasoline was detected in SB2. SB2 is located near the oil shed where waste oils and greases were stored. The groundwater was also sampled at this location and does not contain detectable levels of TPH.

The other compounds detected have not been reported to have been used at Plant No. 35. Di-n-butylphthalate was found in SB2 (it was also found in two East Parcel samples, SB3 and SB7—Section 3B). This compound has a number of applications including as an ingredient in adhesives, printing inks, and paper coatings (Sax, 1987). It also frequently appears in laboratory analyses because it is commonly associated with plastics.

Well Installation of MW1 and MW2

In December 1988, CH2M HILL conducted a groundwater investigation at the Plant No. 35 property to determine the depth and direction of shallow groundwater flow beneath the property and to evaluate whether organic chemicals were present in the shallow groundwater. As noted in Section 2A, the regional direction of groundwater flow is approximately west and toward San Francisco Bay. To evaluate local shallow groundwater flow and quality, two monitoring wells (MW1 and MW2) were installed at the Plant 35—West Parcel (three wells, MW3, MW5, MW5, were installed at the East Parcel and are discussed in Section 3B). The rationale for the West Parcel well locations is described below and the locations are shown in Figure 3A-1:

- MW1 was located downgradient of the East Parcel Wells along Hollis Street in the Box Storage Yard to evaluate general downgradient water quality.

- MW2 was located east of the Rucker building Warehouse near the waste oil storage to determine if these compounds were in the shallow groundwater at this location.

Monitoring Well Installation and Development. The monitoring wells were installed and developed between December 5, 1988, and December 9, 1988. The absence of underground utilities in the vicinity of the proposed monitoring wells was verified first by contacting Underground Services Alert and subsequently by contacting the specific utility companies.

The boreholes for the monitoring wells were drilled using 8-inch outer diameter hollow stem augering equipment operated by ENSCO Environmental Services. Drilling proceeded by augering to the desired sampling depth and driving a Modified California sampler, containing three 6-inch brass tubes, or a split spoon 18 inches in front of the augers. Upon removing the sampler, augering continued until the next sampling depth. Samples were taken approximately every 5 feet. The subsurface lithology was logged from drill cuttings and Modified California or split spoon samples. Drilling of the

boreholes for the wells was stopped at the bottom of the first saturated permeable zone of reasonable thickness (greater than 3 feet).

The monitoring wells were constructed with 2-inch inner diameter, flush threaded, schedule 40 PVC casing and 0.01-inch slot screen. A threaded cap was placed on the bottom of the casing. The first saturated permeable interval encountered while drilling was screened using between 5 and 10 feet of screen. Well casing and screen were installed through the hollow stem augers.

Clean, washed Monterey sand (Lone Star No. 2) was used for gravel pack. The gravel pack was installed from the bottom of the borehole upward using the augers to tremmie the sand in the annular space between the borehole wall and the well screen. The top of the gravel pack was installed to approximately 2 feet above the top of the screen.

After the gravel pack was emplaced, a 1- to 2-foot-thick layer of bentonite pellets was placed on top of the gravel pack. Water was added to the borehole after the bentonite pellets were emplaced and the bentonite pellets were allowed to hydrate for 15 to 30 minutes before well construction continued.

An annular cement-bentonite grout was installed from the top of the bentonite to the ground surface. All the wells except MW5 were completed below grade with a locking steel cover and a water-tight concrete box. Monitoring Well MW5 was completed above grade with a locking steel monument.

The wells were developed by pumping with bilge pumps until the water was free of fine-grained particles. Elevations of the top of the well casing were surveyed to the nearest 0.01 foot (Appendix I).

Prior to installing each well, the drilling equipment was decontaminated by steam cleaning. Water from steam cleaning drilling equipment and from cleaning sampling equipment was temporarily stored onsite in a 630-gallon Baker tank. Upon completion of the field work, water was discharged to the storm sewer as approved by the SFRWQCB.

Drill cuttings from each borehole were temporarily stored onsite in 55-gallon drums. The appropriate well number was recorded on each drum. Most of the soil was used on the property as backfill after the underground storage tanks were removed. Soil from MW2 (also SB2) was spread on a plastic sheet and aerated until the concentration of TPH as gasoline was below detection. The soil was then disposed in a landfill with the soil from the subsequent underground storage tank removals.

Water Level Monitoring. The water level in each of the monitoring wells was measured prior to sampling using a chalked steel tape. The date and time of each measurement was recorded in a fieldbook, as was the depth to the water from the

reference point marked on the top of the well casing. The water level data are presented in Table 3A-2.

Table 3A-2
December 1988 Water Level Data for MW1 and MW2
Del Monte Plant 35—West Parcel

Monitoring Well	Surface Elevation (MSL)[a]	Depth to Water[b]	Date of Water Level Measurement
MW1	20.78 feet	10.6 feet	12/14/88
MW2	24.47 feet	11.5 feet	12/20/88

[a]Measured in feet above mean sea level at top of well casing.
[b]Measured in feet below the top of the well casing.

Groundwater Sampling of MW1 and MW2. Groundwater sample collection began at least 2 days after the wells had been developed if the well was developed by a method other than bailing. If the well was hand bailed, it was sampled on the same day it was developed. Prior to sampling, the sampling equipment was cleaned with Alconox and the Teflon bailer was rinsed with isopropanol and deionized water.

Prior to sampling, a minimum of three casing volumes of water was removed from the well using a Teflon bailer. While evacuating the water from the well, pH, conductivity, and temperature were measured. A water sample was then collected using a Teflon bailer and transferred to the appropriate sample containers. Sample containers were labeled, decontaminated with Alconox and clean water, placed in ziplock plastic bags, and stored in an ice-filled cooler. Chain-of-custody forms were placed in a ziplock plastic bag and taped to the inside lid of the cooler. Custody seals were taped across the closed lid of the cooler, and the coolers were shipped to the laboratory by Greyhound bus for overnight delivery.

Shallow groundwater exists beneath the Plant No. 35 property at a depth of approximately 11 feet below ground surface under unconfined conditions in MW1 and MW2. This shallow groundwater flows horizontally from northeast to southwest under a horizontal hydraulic gradient of approximately 0.015 feet/foot. The vertical component of groundwater flow cannot be evaluated from available data.

As with the soil samples, groundwater samples were analyzed for chlorine, VOCs (EPA Method 624), base/neutral compounds (EPA Method 625), and TPH as gasoline and diesel. In addition, groundwater was analyzed for pH, total dissolved solids (TDS), electrical conductivity (EC), and chloride. The results of the laboratory analyses are presented in Table 3A-3 and the laboratory data sheets are provided in Appendix F.

Table 3A-3 Groundwater Sampling Results for MW1 and MW2 Del Monte Plant 35—West Parcel		
	Concentration (mg/l)	
Compound Detected	MW1	MW2
Acetone	0.021	0.052
1,2-Dichloroethane (1,2-DCA)	0.008	0.007
2-Butanone	ND	ND
4-Methylphenol	ND	ND
Trichloroethylene (TCE)	ND	ND
bis(2-Ethylhexyl)phthalate	0.020	ND
Tetrachloroethylene (PCE)	ND	0.008
di-n-Butylphthalate	ND	0.004
ND = Not detected		

Monitoring wells MW4 and MW5 are located on the upgradient side of the Plant No. 35 property (north and east, respectively). The compounds detected in the samples collected from these wells indicate chemicals that may be migrating into the Plant No. 35 subsurface. Monitoring wells MW1, MW2, and MW3 are downgradient of MW4, and MW6 is downgradient of MW5.

The compounds detected in the MW1 and MW2 samples were similar to those found in upgradient samples.

Acetone was detected in one upgradient well and two downgradient wells. Acetone is a common solvent used in laboratory analyses and its presence may be due to laboratory contamination. Bis(2-ethylhexyl)phthalate was detected in groundwater from MW1 and MW5. It also frequently appears in laboratory analyses because it is commonly associated with plastics.

Drinking water and aquatic toxicity data are shown in Table 6 for reference only. Three of the compounds (1,2-DCA; PCE; and TCE) detected in the monitoring wells were found at concentrations near or below the federal or state drinking water standards. As mentioned in Section 2, these criteria do not specifically apply to Plant No. 35 because the groundwater beneath the property and in the Emeryville area is not used for drinking water. The area is highly industrialized, and the water quality is not adequate for drinking purposes.

Soil and Groundwater Sampling Associated with the Removal of the West Parcel Fuel Oil Tanks

Sampling of Tank Contents

On December 1, 1988, prior to removal, the four fuel oil tanks (Figure 3A-2) were sampled to identify the constituents and to help determine the volume of the contents needing disposal. The contents were analyzed for total petroleum hydrocarbons (TPH) as gasoline (EPA Method 5030/Modified 8015) and diesel (EPA Methods 3550/Modified 8015) and BTEX compounds (benzene, toluene, ethylbenzene, and xylene)(EPA Methods 5030/602).

Because the HNu and the explosimeter indicated levels of volatile organic compounds above background at the fill pipe, the level of protection for the sampling team was upgraded to level C (respirators) to continue sampling. In addition, the samples were also analyzed for volatile organic compounds (VOCs) (EPA Methods 601 and 602). The detected compounds are shown in Table 3A-4. The laboratory data sheets are provided in Appendix F.

Table 3A-4
Sampling Results of Fuel Oil Tank Contents
Del Monte Plant 35—West Parcel

Constituent	Tank 1 (ppm)[a]	Tank 2 (ppm)[a]	Tank 3 (ppm)[a]	Tank 4	
				Nonaqueous Phase (ppm)[a]	Aqueous Phase (ppm)[a]
Dichlorodifluoromethanes and	<0.001	0.810	<0.01	<0.01	
Vinylchloride	<0.005	0.006	0.05	<0.05	<0.001
Methylene chloride	<0.005	0.020	<0.01	<0.01	0.058
1,1-Dichloroethene	<0.001	0.002	<0.01	<0.01	0.001
1,1-Dichloroethane	<0.001	4.200	<0.01	<0.01	<0.001
trans-1,2-Dichloroethene	0.024	0.1	0.059	0.011	0.003
Chloroform	0.003	0.1	0.010	0.019	0.025
1,2-Dichloroethane	0.004	0.1	<0.01	<0.01	0.012
Carbon tetrachloride	0.013	52	0.093	9.100	0.003
Trichloroethene	<0.001	0.1	0.01	<0.01	13
Bromodichloromethane	0.017	12	47	3.900	0.006
Benzene	0.014	0.054	0.260	0.078	3.600
Toluene	0.004	0.045	0.220	0.020	0.160
Ethyl benzene	0.015	0.130	0.01	0.070	0.053
Xylene	190			16,000	0.280
TPH-gas		<100	100		

[a]Parts per million as mg/l
ND = Not detected

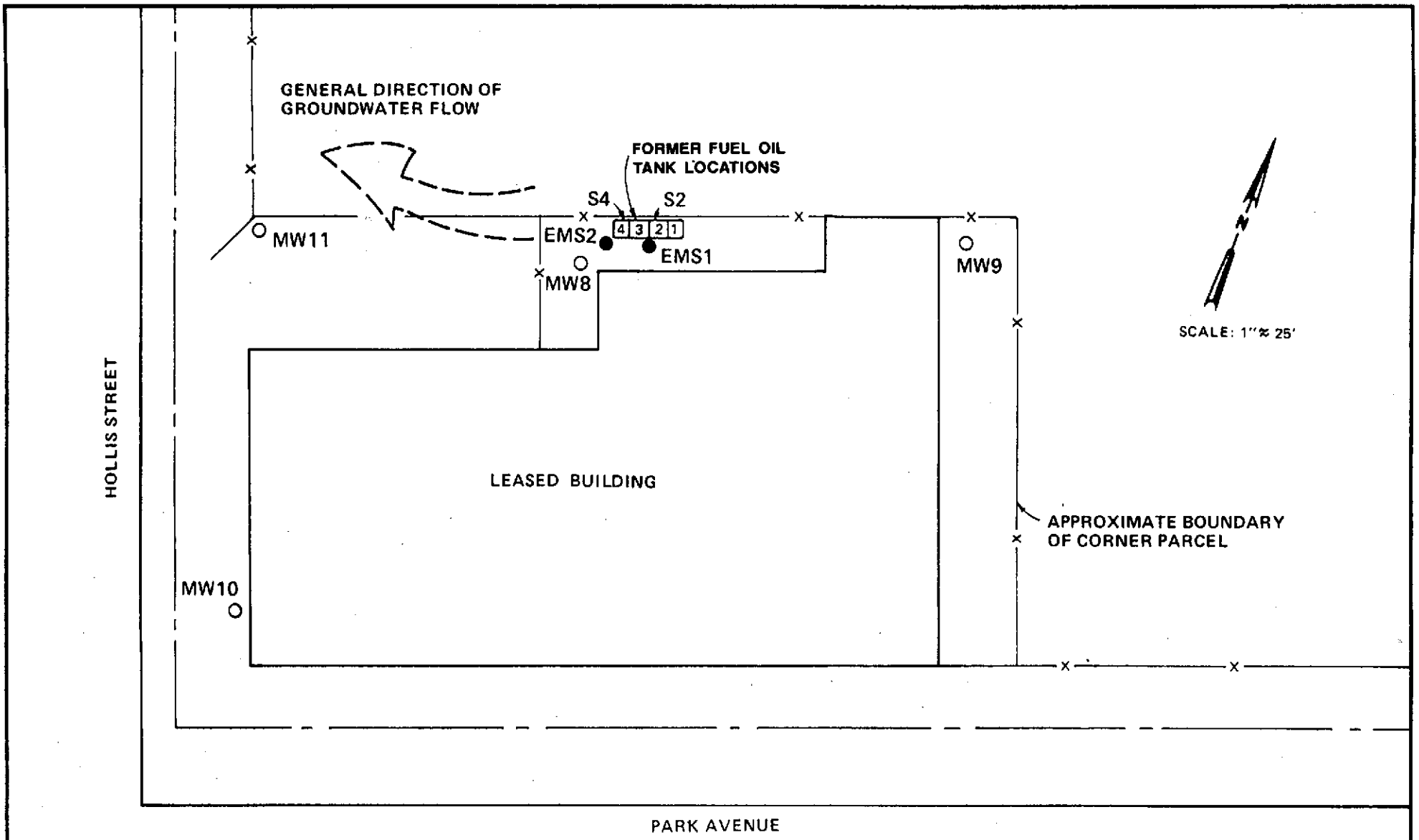

FIGURE 3A-2
FUEL OIL TANK SAMPLING LOCATIONS
DEL MONTE PLANT-35 WEST PARCEL
EMERYVILLE, CALIFORNIA

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CH2M HILL

Initial Soil Sampling

Soil samples were collected on February 8, 1989, prior to tank removal, to assess whether a potential release had occurred. Two borings (EMS-1, EMS-2) were drilled downgradient of the fuel tanks as shown in Figure 3A-2.

Before sampling, equipment was decontaminated by washing in Alconox, rinsing twice with clean water, and rinsing once with distilled water. The brass sleeves used for soil sampling were also rinsed with isopropanol and allowed to dry.

The soil borings were drilled using 8-inch outer diameter hollow stem augering equipment operated by Exploration Geoservices, Inc. Soil samples were collected by driving a 2.5-inch-diameter, 18-inch-long Modified California sampler containing three 6-inch brass sleeves ahead of the augers. The sampler was advanced so that the middle sleeve was at the desired sample depth. At each location, a sample was collected between 6 and 6.5 feet below ground surface (bgs) and between 8.5 and 9 feet bgs.

The samples were analyzed for TPH as gasoline and diesel, BTEX compounds, and chlorinated solvents (EPA Method 8010). The analytical results are shown in Table 3A-5. The laboratory data sheets and chain-of-custody records are provided in Appendix F.

Table 3A-5
Soil Sampling Results of Fuel Oil Tank
Del Monte Plant 35—West Parcel

Sample ID[a]	Date	TPH as Gasoline[b]	Trichloro-ethylene TCE[b]	1,2 Dichloro-ethylene ethene 1,2-DCE[b]	Tetrachloro-ethene PCE[b]	Chloroform[b]	Freon 113[b]	Xylene[b]
EMS1-6	2/8/89	<0.1	<0.005	<0.005	<0.005	<0.005	0.006	<0.005
EMS1-9	2/8/89	<0.1	<0.005	<0.005	<0.005	<0.005	0.008	<0.005
EMS2-6	2/8/89	0.3	0.008	<0.005	<0.005	0.008	<0.005	<0.005
EMS2-9	2/8/89	<0.1	0.017	<0.005	<0.005	<0.005	<0.005	0.006
S2-S2	3/22/89	<5	0.07	0.07	<0.01	<0.01	<0.01	<0.1
S2-S4	3/22/89	<5	<0.01	0.03	<0.01	<0.01	<0.01	<0.1
MW10-10	7/6/89	NA	<0.01	0.01	<0.01	<0.01	<0.01	NA
MW10-16	7/6/89	NA	<0.01	0.02	0.01	<0.01	<0.01	NA
MW11-10	7/6/89	NA	0.02	<0.01	<0.01	<0.01	<0.01	NA
MW11-16	7/6/89	NA	0.02	<0.01	<0.01	<0.01	<0.01	NA

[a]Refer to Figure 2-1 for sampling locations
ND = Not detected
NA = Not analyzed
[b] = Parts per millon as mg/kg

The soil cuttings generated from drilling the borings were used to backfill the boreholes which were then sealed with a concrete cap.

Underground Fuel Oil Tanks Removal

Four underground storage tanks were removed from the West Parcel, north of the (previously) Leased Building, on March 22, 1989. The removal activities followed California Water Quality Control Board Leaking Underground Fuel Tank (LUFT) guidelines (SWRCB, 1989). The Bay Area Air Quality Management District was notified in writing one week prior to removing the tanks as was required by Regulation 8, Rule 40.

The tanks were numbered 1 through 4 from east to west as shown in Figure 3A-2. The tanks were small, with a capacity of about 50 gallons each, and were made of steel. They were used to store fuel oil but reportedly not used for over 20 years. As shown in Table 3A-4, the tanks also contained some chlorinated solvents. The four tanks were exposed in one excavation.

Prior to removal, the contents of the tanks were pumped out and the tanks were rinsed with water until the explosimeter indicated that the lower explosive limit (LEL) was at a safe level. About 500 gallons of liquid, including the contents and rinse water, were pumped out and treated and disposed by Solvent Service, Inc. A copy of the manifest is provided in Appendix G. Dry ice was then added to the tanks. After about one hour, the LEL and oxygen levels were measured:

Tank 1: LEL--0 to 3 percent; Oxygen—0 percent
Tank 2: LEL--5 percent; Oxygen—0 percent
Tank 3: LEL--100 percent; Oxygen—0 percent
Tank 4: LEL--45 percent; Oxygen—0 percent

Because there was no oxygen in the tanks, they were removed with the permission of Mr. Jim Eversole, Assistant Chief Fire Marshall, City of Emeryville. Prior to removal, the tanks did not appear to have large holes except on top where the fill pipes were broken off during excavation. Because the tanks were bent and broken during removal, their in-ground condition could not be accurately evaluated after they were removed. After the tanks were removed, the LEL in Tank 3 was zero percent and oxygen was 20 percent; in Tank 4, the LEL was 70 to 75 percent and oxygen was 12 percent. More dry ice was added to these two tanks. All of the tanks were covered with plastic prior to transport and disposal by H&H Ship Service, Company. A copy of the manifest is provided in Appendix G.

Mr. Dennis Byrne, Hazardous Materials Specialist, Alameda County Health Agency, was present to witness soil sampling. The soil surrounding the tank consisted of black silty clay. No detectable concentrations of volatile organics were measured using an organic vapor meter (OVM) at several locations at the bottom of the excavation. Soil samples were collected by driving clean 2-inch diameter, 6-inch long brass tubes into the base of the excavation at the former locations of Tanks 2 and 4 (samples S2-S2 and S2-S4, respectively). The samples were analyzed for TPH as gasoline and diesel,

BTEX, chlorinated solvents (EPA Method 8010), and semivolatile compounds (EPA Method 8270). The detected compounds are shown on Table 3A-5. The laboratory data sheets and chain-of-custody records are provided in Appendix F. The excavation was backfilled with the soil that was originally removed and some of the clean soil excavated from the 550-gallon gasoline tank removal (described in this report).

Groundwater Monitoring Well Installation and Sampling

A groundwater monitoring well (MW8) was installed about 10 feet downgradient of the former fuel oil tank locations as shown in Figure 3A-2. After the groundwater data were received, three additional wells were installed: MW9, MW10, and MW11 (Figure 3A-2). The wells were installed fairly close together so that they were located near the (previously) leased building. The well installation, development, and sampling activities are described in this section.

Well Installation. CH2M HILL developed well construction specifications following RWQCB guidelines and retained Exploration Geoservices, Inc. of San Jose, California to drill and install the monitoring wells. The location of underground utilities in the vicinity of the proposed wells was delineated by contacting Underground Services Alert and subsequently by contacting specific utility companies. Prior to drilling, 18-inch-wide square holes were cut through the existing concrete or asphalt and holes about 3.5 feet deep were dug by Diablo Tank and Equipment to verify the absence of underground piping.

MW8 was installed on May 3, 1989, and MW9, MW10, and MW11 were installed on July 5 and 6, 1989. Before installation, the drilling equipment was decontaminated by steam cleaning.

The boreholes for MW8 and MW10 were drilled using a Mobile B-24 drill with 6-inch outer diameter flight augers. Flight augers were required because a small drill rig was needed for close access to buildings. The flight augers were suitable for well installation because of the cohesiveness of the soil. MW9 and MW11 were drilled using a Mobile B-40 drill with a 9-inch outer diameter hollow stem auger.

The borehole for MW8 was drilled to about 25 feet bgs, which is about 15 feet below the bottom of the tanks as required by the LUFT Field Manual. The boreholes for MW9, MW10, and MW11 were drilled to about 20 feet bgs. Once total depth was reached, the augers were withdrawn from the borehole and the monitoring well was installed within the open 6-inch or 9-inch-diameter boring.

The monitoring wells were constructed with 2-inch-diameter, flush threaded, schedule 40 PVC casing and 0.020-inch slot screen. Threaded caps were placed on the bottom of the casings. Because MW8 was installed according to the LUFT Field Manual requirements, the screen extended from about 5 feet to about 25 feet bgs. Groundwater was encountered between 9 and 10 feet bgs in MW8 and MW9, and

between about 7 and 8 feet bgs in MW10 and MW11. MW9, MW10, and MW11 were installed to monitor the region of groundwater movement and the screened intervals were based on the lithology encountered. The screened intervals covered a region where there was a higher percentage of fine sand or silt because this was the only permeable layer encountered. This region was from approximately 10 feet to 20 feet bgs in MW9, and from about 8 feet to 18 feet bgs in MW10 and MW11. (Boring logs are included in Appendix E.)

Clean, washed Monterey sand (Lone Star No. 3, 8 x 20 sieve size) was used for sand pack. The elevation of the sand pack was continually sounded as the sand was being added. The sand pack was installed from the bottom of the borehole upward to approximately 1.5 to 2 feet above the top of the screen.

After the sand pack was in place, a 1-foot-thick bentonite pellet seal was placed on top of the gravel pack. Water was added to the borehole in MW8 (MW9, MW10, and MW11 were submerged so water was not necessary) and the bentonite pellets were allowed to hydrate for 15 to 30 minutes to form a seal before well construction continued.

An annular seal of portland cement concrete was installed from the top of the bentonite (about 2.5 feet bgs) to the ground surface. The wells were completed below grade with a water-tight traffic box. The top of the traffic box protrudes approximately 0.5 inch above the top of the existing pavement ("ground surface") to promote drainage. A locking, watertight well cap and lock were placed in the top of the PVC casing upon completion of the wells.

During Drilling MW8, the subsurface lithology was logged from drill cuttings. MW9 and MW11, however, were sampled continuously using a wireline sampler, and MW10 was sampled every 5 feet using a Modified California sampler. Four samples were collected from each boring from the region where the screen would be installed; two samples were analyzed for physical properties (bulk density; porosity; percent silt, sand, and clay; and percent organic carbon in the silt, sand, and clay), and two samples were analyzed for chlorinated solvents (EPA Method 8010). The chemical data are summarized in Table 3A-5. The laboratory data sheets, chain-of-custody records are included in Appendix F. The monitoring well boring logs are included in Appendix H.

For each of the wells, the elevation of the top of the casing was surveyed to the nearest 0.01 foot. The survey data is provided in Appendix I.

Well Development. MW8 was developed on May 8 and 9, 1989, by pumping with bilge and gas-powered centrifugal pumps until the water was free of fine-grained particles. MW9, MW10, and MW11 were developed on July 10, 1989, using a gas-powered centrifugal pump. A total of approximately 126 gallons were purged from MW8, 65 gallons from MW9, 110 gallons from MW10, and 110 gallons from MW11. Electrical conductivity remained fairly constant but the water was still slightly cloudy due to the high clay and silt content of the soils.

Groundwater Sampling. Groundwater from MW8 was sampled on May 12, 1989, and on July 10, 1989, when MW9, MW10, and MW11 were sampled. Prior to sampling at each well, the well sounder and clear bailer were decontaminated with an Alconox and tap water wash followed by a tap water rinse. The sampling bailer was also rinsed with isopropanol then distilled water. New rope and plastic hose was used for sampling each well.

Standing water was purged from the wells using a hand-powered suction pump MW8 and a gas-powered centrifugal pump at MW9, MW10, and MW11. New plastic hose was used for each well. Over 10 well casing volumes of groundwater were removed from each of the wells. While evacuating the water from the well, temperature and specific conductance were measured. A water sample was then collected using a teflon bailer and transferred to the appropriate sample containers. The 40-ml VOA bottles were carefully filled to prevent aeration or formation of air bubbles within the containers after sealing. Sample containers were labeled, decontaminated with Alconox and clean water, placed in zip-lock plastic bags, and stored in an ice-filled cooler. Chain-of-custody records were completed and samples were delivered to the laboratory on the same or following day. All pumped groundwater was stored in 55-gallon drums on the property.

The groundwater sample collected from MW8 on May 12, 1989, was analyzed for chlorinated solvents (EPA Method 601) and phenols (EPA Method 604). The samples collected from MW9, MW10, and MW11 on July 10, 1989, were analyzed for chlorinated solvents, pH, electrical conductivity, sulfate, nitrate, chloride, and total dissolved solids (TDS); the sample collected from MW8 on July 10, was analyzed for chlorinated solvents only. The detected compounds are shown in Table 3A-6. Laboratory data sheets and chain-of-custody records are provided in Appendix F.

Table 3A-6
Groundwater Sampling Results (May end July 1989)
Del Monte Plant 35—West Parcel

Sample ID	Concentration (ppm)						
	1,2-DCE[a]	1,1-DCE[b]	1,2-DCA[c]	TCE[d]	PCE[e]	VC[f]	DP[g]
MW8 (5/12/89)	0.29	<0.010	<0.010	1.4	0.02	0.078	<0.010
MW8 (7/10/89)	0.14	<0.0025	<0.0025	0.330	0.014	0.017	<0.0025
MW8-dup	0.13	<0.0025	<0.0025	0.310	0.012	0.016	<0.0025
MW9	0.063	<0.0005	<0.0005	0.013	0.038	0.016	<0.0005
MW10	0.085	0.0008	<0.0005	0.027	0.042	0.028	<0.0005
MW11	0.073	<0.001	0.004	0.160	0.012	0.016	0.0057

[a]1,2-Dichloroethene
[b]1,1-Dichloroethenene
[c]1,2-Dichloroethane
[d]Trichloroethene
[e]Tetrachloroethe
[f]Vinyl chloride
[g]1,2-Dichloropropane

Waste Disposal

Water from steam cleaning drilling equipment, from cleaning development and sampling equipment, and from development and sampling was temporarily stored in 55-gallon drums on the property. The water was removed from the site, and treated and disposed by Solvent Service, Inc.

Drill cuttings from each well were stored in separate 55-gallon drums. A sample of the cuttings from MW8 was collected because the soil was not sampled during drilling. The sample from MW8 cuttings (ST-1) contained 0.02 ppm 1,2-dichloroethene (1,2-DCE) and 0.63 ppm trichloroethene (TCE). The soil was then spread separately on a plastic sheet and aerated. After aeration, a sample of MW8 cuttings (DM-MW8S) contained 0.18 ppm TCE and 0.15 ppm of chloroform. The laboratory data sheets and chain-of-custody records are provided in Appendix F. The soil from MW8 was transported by Kern Backhoe Services, Inc. to Liquid Waste Management's Class II landfill in McKittrick, California. The soil cuttings from MW9, MW10, and MW11 were temporarily stored on the property, and were disposed after aeration to nondetectable concentrations.

Soil and Groundwater Sampling Associated with the Removal of the 550-Gallon Gasoline Tank

Initial Soil Sampling

Soil samples were collected on February 8, 1989, prior to tank removal, to assess whether a potential release had occurred. One soil boring (EMS-3) was drilled near the anticipated location of the gasoline tank (Figure 3A-3).

Before sampling, equipment was decontaminated by washing with Alconox, rinsing twice with clean water, and rinsing once with distilled water. The brass sleeves used for soil sampling were also rinsed with isopropanol and allowed to dry.

The soil boring was drilled using 8-inch outer diameter hollow stem augering equipment operated by Exploration Geoservices, Inc. Soil samples were collected by driving a 2.5-inch-diameter, 18-inch-long Modified California sampler containing three 6-inch brass sleeves ahead of the augers. The sampler was advanced so that the middle sleeve was at the desired sample depth. A sample was collected between 6 and 6.5 feet bgs and between 8 and 8.5 feet bgs.

The samples were analyzed for TPH as gasoline and diesel, and for BTEX compounds (benzene, toluene, ethylbenzene, and xylene). The analytical results are shown in Table 3A-7. The laboratory data sheets and chain-of-custody records are provided in Appendix F.

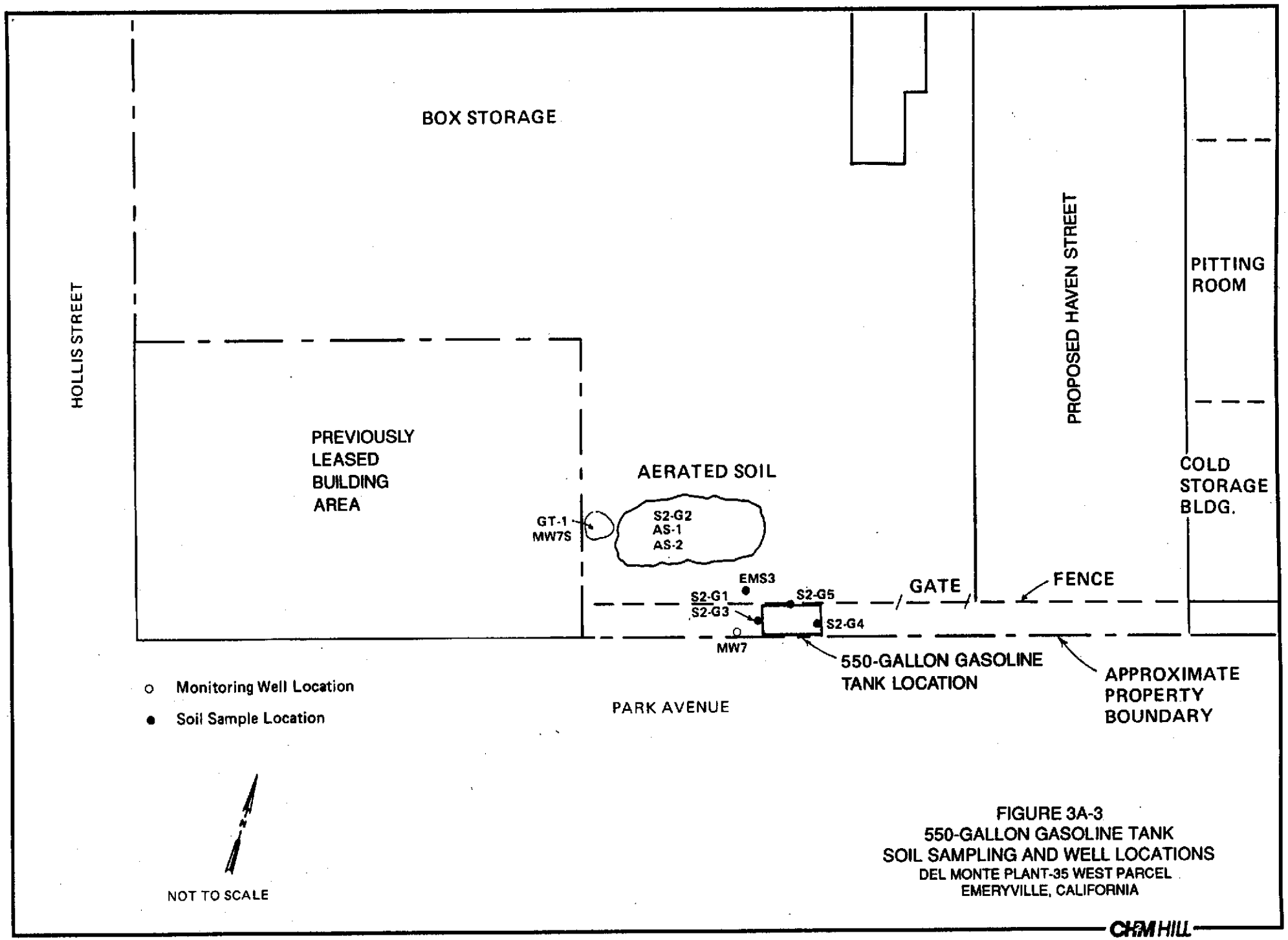

FIGURE 3A-3
550-GALLON GASOLINE TANK
SOIL SAMPLING AND WELL LOCATIONS
DEL MONTE PLANT-35 WEST PARCEL
EMERYVILLE, CALIFORNIA

CH2M HILL

SFO28830.RC

Table 3A-7
Laboratory Results of Initial Soil Sampling from Gasoline Tank Location
Del Monte Plant 35—West Parcel

Compounds Detected	Soil Sample EMS-3 (mg/kg)	
	6 feet	8 feet
TPH as diesel	<10	<10
THP as gasoline	1.5	0.9
Benzene	<0.005	<0.005
Ethylbenzene	<0.005	<0.005
Toluene	<0.005	<0.005
Xylenes, total	<0.005	<0.005

Notes:
Laboratory analyses performed on samples: Total Petroleum Hydrocarbons (TPH) as diesel: Preparation by EPA Method 3550 (sonication), analysis by modified EPA Method 8015 (GC/FID)

Total Petroleum Hydrocarbons as gasoline: Preparation by EPA Method 5030, analysis by modified EPA Method 8015 (GC/FID)

Benzene, toluene, ethylbenzene, xylene: Preparation by EPA Method 5030, analysis by EPA Method 8020

The soil cuttings were stored in a 55-gallon drum on the Plant No. 35 property until laboratory results were available. In March 1989, the soil was spread on a plastic sheet and aerated with the soil removed during excavation of the gasoline tank. Sampling and disposal of the aerated soil are described in the next subsection.

Underground 550-Gallon Gasoline Tank Removal

An underground gasoline storage tank with a capacity of about 550 gallons was removed from the Plant No. 35 property on March 22, 1989. The removal activities followed California Regional Water Quality Control Board (RWQCB) Leaking Underground Fuel Tank (LUFT) guidelines (RWQCB, 1988). The Bay Area Air Quality Management District was notified in writing one week prior to removing the tanks as required by Regulation 8, Rule 40. The gasoline pumps were removed over 10 years ago and, at about that time, the contents of the tanks were also pumped out.

Prior to removal, the tank was rinsed with water until the explosimeter indicated that the lower explosive limit (LEL) was at a safe level. Approximately 15 pounds of dry ice was then added to the tank. After about 45 minutes to one hour, the LEL was approximately 40 percent and oxygen was at zero percent. The tank was removed and placed on a flat-bed truck. Mr. Jim Eversole, Assistant Chief Fire Marshall, City of Emeryville, was present to witness the removal. No large holes were apparent in the tank. Some vapor from the dry ice was escaping from some small holes at the bottom of the fill end of the tank. The rinsewater and tank were transported and disposed by H&H Ship Service Corp. Copies of the manifests are included in Appendix G.

The soil backfill surrounding the tank consisted of sandy silt. Silty clay was encountered at about 0.5 foot below the bottom of the tank or at about 6.5 feet below ground surface.

Soil Sampling

Soil samples were collected from three sides of the excavation as shown in Figure 3A-3 by bringing a shovel full of soil up with a backhoe, removing the top layer of soil, and quickly driving a clean 6-inch brass tube into the soil with a hammer. The brass tubes were decontaminated before coming on the property by washing with Alconox, rinsing with clean water, rinsing with distilled water, then rinsing with isopropanol, allowed to dry, and stored in sealed plastic bags.

The samples were labeled, sealed with aluminum-lined caps and electrical tape, placed in plastic bags, and stored in a cooler. Chain-of-custody records were completed and the coolers were delivered to the laboratory the same day. All samples were analyzed for TPH as gasoline (Modified EPA Method 8015) and BTEX compounds (EPA Method 8020). Laboratory data sheets and chain-of-custody records are provided in Appendix F.

Mr. Dennis Byrne, Hazardous Materials Specialist, Alameda County Health Agency, was present to witness soil sampling. Per concurrence by Mr. Byrne, soil was not removed and a sample was not collected on the south side of the excavation because of potential structural damage to a 12 kilovolt power line that rested in loose gravel backfill beneath the sidewalk. A sample (S2-G1) was collected from the west end (downgradient end) of the excavation from about 6 feet below ground surface. An organic vapor meter (OVM) was used to assess the extent of TPH as gasoline contamination in the field. The OVM indicated about 350 ppm volatile organics in this sample. The analytical results showed the sample contained 280 ppm TPH as gasoline and 1.5 ppm xylene (Table 3A-8). The silty clay beneath the tank contained approximately 1 to 2 ppm volatile organics based on the OVM. It appeared that the gasoline had migrated only a limited extent into the silty clay. A small amount of water was present in the excavation, but not enough to collect a sample.

Table 3A-8
Soil Sampling Results from Tank Gasoline Removal
Del Monte Plant 35—West Parcel

Sample ID[a]	Field OVM	Concentration (mg/kg)						
		TPH					Lead	
		Gasoline	Diesel	BE[b]	Toluene	Xylene	TTLC	STLC
Gasoline Tank Removal								
S2-G1	350	280	<10	<0.1	<0.1	1.5	NA	NA
S2-G3	22	<10	<10	<0.1	<0.1	<0.1	NA	NA
S2-G4	ND	<10	<10	<0.1	<0.1	<0.1	NA	NA
S2-G5	465	470	<10	<0.1	<0.1	5.4	NA	NA
Soil Stockpile								
S2-G2	NA	220	<10	<0.1	0.14	0.72	NA	NA
AS-1	NA	18	NA	NA	NA	NA	NA	NA
AS-2	NA	NA	NA	NA	NA	NA	140	3.8
Well Cuttings								
GT-1	NA	52	NA	NA	NA	NA	NA	NA
MW7S	NA	<10	NA	NA	NA	NA	NA	NA
S-2	NA	NA	NA	NA	NA	NA	36	0.5

NA: Not analyzed
ND: Not detected
<10: Not detected at the detection limit shown
[a]Sampling Locations (refer to Figure 2-1 in text):
S2-G1: West end of gasoline tank excavation before soil removal
S2-G3: West end of gasoline tank excavation after soil removal
S2-G4: East end of gasoline tank excavation
S2-G5: Fence (north) side of gas tank excavation
S2-G2: Soil removed from gasoline tank excavation--before aeration
AS-1: Soil removed from gasoline tank excavation--after aeration
AS-2: Soil removed from gasoline tank excavation--after aeration (for lead analysis)
GT-1: Well cuttings from MW7--before aeration
MW7S: Well cuttings from MW7--after aeration
S-2: Well cuttings from MW7--after aeration (for lead analysis)
[b]Benzene, Ethylbenzene

Monitoring Well Installation and Sampling

A groundwater monitoring well (MW7) was installed approximately 6 feet downgradient of the tank excavation as shown in Figure 3A-3. The well installation, development, and sampling activities are described in this section.

Well Installation. CH2M HILL developed well construction specifications following California RWQCB guidelines and retained Exploration Geoservices, Inc. of San Jose, California to drill and install the monitoring well. The absence of underground utilities in the vicinity of the well locations was verified first by contacting Underground Utilities Alert and subsequently by contacting specific utility companies. Clearance from

overhead powerlines was verified with Pacific Gas and Electric. Prior to drilling, a 16-inch-wide square hole was cut through the existing concrete.

The well was installed on May 3, 1989. Before installation, the drilling equipment was decontaminated by steam cleaning.

The borehole for the monitoring well was drilled using a Mobile B-24 drill with 6-inch outside diameter flight augers. Flight augers were suitable for well installation because of the cohesiveness of the soil. The borehole was drilled to about 25 feet bgs, which is about 15 feet below the bottom of the tank as required by the California RWQCB LUFT Manual. Once total depth was reached, the augers were withdrawn from the borehole and the monitoring well was installed within the open 6-inch diameter boring.

The monitoring well was constructed with 2-inch outer diameter, flush threaded, schedule 40 PVC casing and 0.020-inch slot screen. Threaded caps were placed on the bottom of the casings. The screen extended from about 5 feet to about 25 feet bgs.

Clean, washed Monterey sand (Lone Star No. 3, 8 by 20 sieve size) was used for sand pack. The elevation of the sand pack was continually sounded as the sand was being added. The sand pack was installed from the bottom of the borehole upward to approximately 1.5 to 2 feet above the top of the screen.

After the sand pack was in place, a 1-foot-thick bentonite pellet seal was placed on top of the gravel pack. Water was added to the borehole and the bentonite pellets were allowed to hydrate for 15 to 30 minutes to form a seal before well construction continued.

An annular seal of portland cement concrete was installed from the top of the bentonite (2.5 feet bgs) to the traffic box at ground surface. The well was completed below grade with a water-tight traffic box. The top of the traffic box protrudes approximately 0.5 inch above the top of the existing pavement ("ground surface") to promote drainage. A locking, watertight well cap and lock were placed in the top of the PVC casing upon completion of the well.

During drilling, the subsurface lithology was logged from drill cuttings. The well log is included in Appendix H. The elevation of top of the well casing was surveyed to the nearest 0.01 foot. The survey data are also provided in Appendix I.

Well Development. The well was developed on May 4, 1989, both by bailing and pumping with a bilge pump and gas-powered centrifugal pump until the water appeared to be free of fine-grained particles. A total of approximately 77 gallons was purged from MW7.

Water from steam cleaning drilling equipment, from cleaning development and sampling equipment, and from well development was temporarily stored in 55-gallon drums on the property.

While drilling the well, the odor of gasoline was evident in soil cuttings from MW7. The drill cuttings were stored in a 55-gallon drum and a sample of the cuttings was collected. The sample of MW7 cuttings (GT-1) contained 52 ppm TPH as gasoline (Table 3A-8). The soil was then spread on a plastic sheet and aerated. After aeration, a sample of MW7 cuttings (MW7S) did not contain detectable concentrations of TPH as gasoline (Table 3A-8). A sample was also collected (S-2) for lead analysis. The sample contained 36 mg/kg of total lead (TTLC method) and 0.5 mg/l of soluble lead (STLC method) (Table 3A-8). The laboratory data sheets and chain-of-custody records are provided in Appendix F. The soil from MW7 was transported with the soil removed from the tank excavation by Kern Backhoe Services, Inc. to Liquid Waste Management's Class II landfill, in McKittrick, California.

Groundwater Sampling. MW6 and MW7 were sampled on May 12, 1989, at least 24 hours after MW7 was developed, and on July 10, 1989. Prior to sampling at each well, the well sounder, clear bailer, rope, and plastic hose used for purging the wells were decontaminated with an Alconox and tap water wash followed by a tap water rinse. The sampling bailer was also rinsed with isopropanol then distilled water. MW6 was sampled first because it was assumed to be the least contaminated well, followed by MW7.

Before collecting groundwater samples, the water elevation was measured to the nearest 0.01 inch with an electric well sounder, and free-floating petroleum product thickness was measured using a clear, acrylic bailer. No free product or petroleum sheen was observed on the surface of the water standing in the wells; the odor of gasoline, however, was noted in MW7.

Standing water was purged from the wells using a hand-powered suction pump with a clean plastic hose. Approximately 12 gallons (about seven well volumes) were purged from MW6 and about 13 to 18 gallons (about four well volumes) were removed from MW7. While evacuating the water from the well, the specific conductance was measured. A water sample was then collected using a Teflon bailer and transferred to the appropriate sample containers. The 40-ml VOA bottles were carefully filled to prevent any aeration or formation of air bubbles within the containers after sealing. Sample containers were labeled, decontaminated with Alconox and clean water, placed in zip-lock plastic bags, and stored in an ice-filled cooler. Chain-of-custody records were completed and samples were delivered to the laboratory the same day. All discarded groundwater was stored in 55-gallon drums on the property.

The groundwater samples collected from MW6 and MW7 were analyzed for TPH as gasoline (Modified EPA Method 8015) and BTEX compounds (EPA Method 8020). Laboratory data sheets and chain-of-custody records are provided in Appendix F. The groundwater sampling results for MW6 and MW7 are shown in Table 3A-9.

Table 3A-9
M7 Groundwater Sampling Results (May and July 1989)
Del Monte Plant 35—West Parcel
(mgl)

Well	Date	TPH as Gasoline	Benzene	Toluene	Ethyl-benzene	Xylene
MW7	5/12/89	1.00	0.049	0.0016	0.0045	0.0059
	7/10/89	0.50	0.0052	0.0006	<0.0003	0.0056

<0.0003: Not detected at detection limit shown.

Discussion of Results

This subsection discusses the subsurface investigation results associated with the removal of the four 50-gallon underground fuel oil tanks and the removal of the 550-gallon underground gasoline tank, both located on the West Parcel.

Subsurface Investigation of West Parcel Fuel Oil Tanks

Soils

The TCE concentration in soil and groundwater is illustrated in Figure 3A-4. TCE was detected in soil beneath Tank 2 (the contents of which contained the highest TCE concentration of 52 ppm) at 0.07 ppm but was not detected 2 feet away at 6 and 9 feet bgs (Sample EMS1 in Table 3A-5). TCE was not detected in soil beneath Tank 4 (the contents of which contained 13 ppm TCE) but was detected about 2 feet away at 0.08 and 0.017 ppm at 6 and 9 feet bgs, respectively (Sample EMS2 in Table 3A-5). TCE was also detected in the soil cuttings from MW8, about 6 feet from the excavation, at 0.63 ppm. TCE was not detected in the soil from MW9, upgradient of the tanks, or MW10. At 10 and 16 feet bgs in MW11, TCE was detected near the analytical detection limit.

As shown in Figure 3A-5, 1,2-DCE was detected in soil beneath Tank 2 at 0.07 ppm and beneath Tank 4 at 0.03 ppm. 1,2-DCE was not detected in soil samples collected 2 feet away from the tanks, but was detected in cuttings from MW8 at 0.02 ppm, and in MW10 at 0.01 and 0.02 ppm at 10 and 16 feet bgs, respectively (Table 3A-5).

PCE, Freon 113, xylene, and chloroform were also detected at low concentrations in some of the soil samples (Table 3A-5).

It appears that the extent of soil contamination is limited to the vicinity of the tanks because TCE and 1,2-DCE were not detected at MW9 (upgradient), and was only detected at or near the analytical detection limit in MW10 and MW11. These samples were collected from the saturated zone and the solvents that were detected in the soil could be associated with transport in the groundwater.

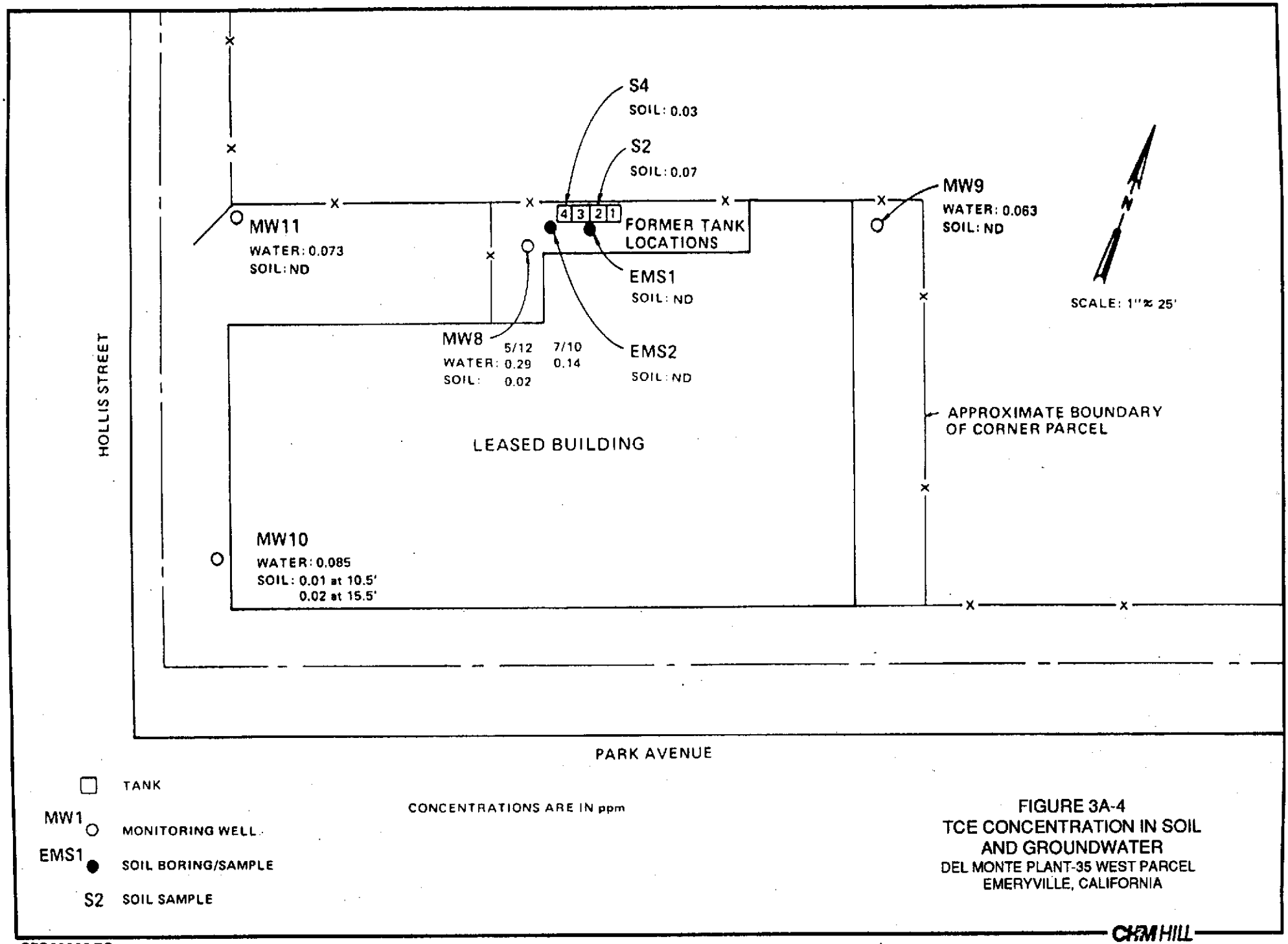

FIGURE 3A-4
TCE CONCENTRATION IN SOIL AND GROUNDWATER
DEL MONTE PLANT-35 WEST PARCEL
EMERYVILLE, CALIFORNIA

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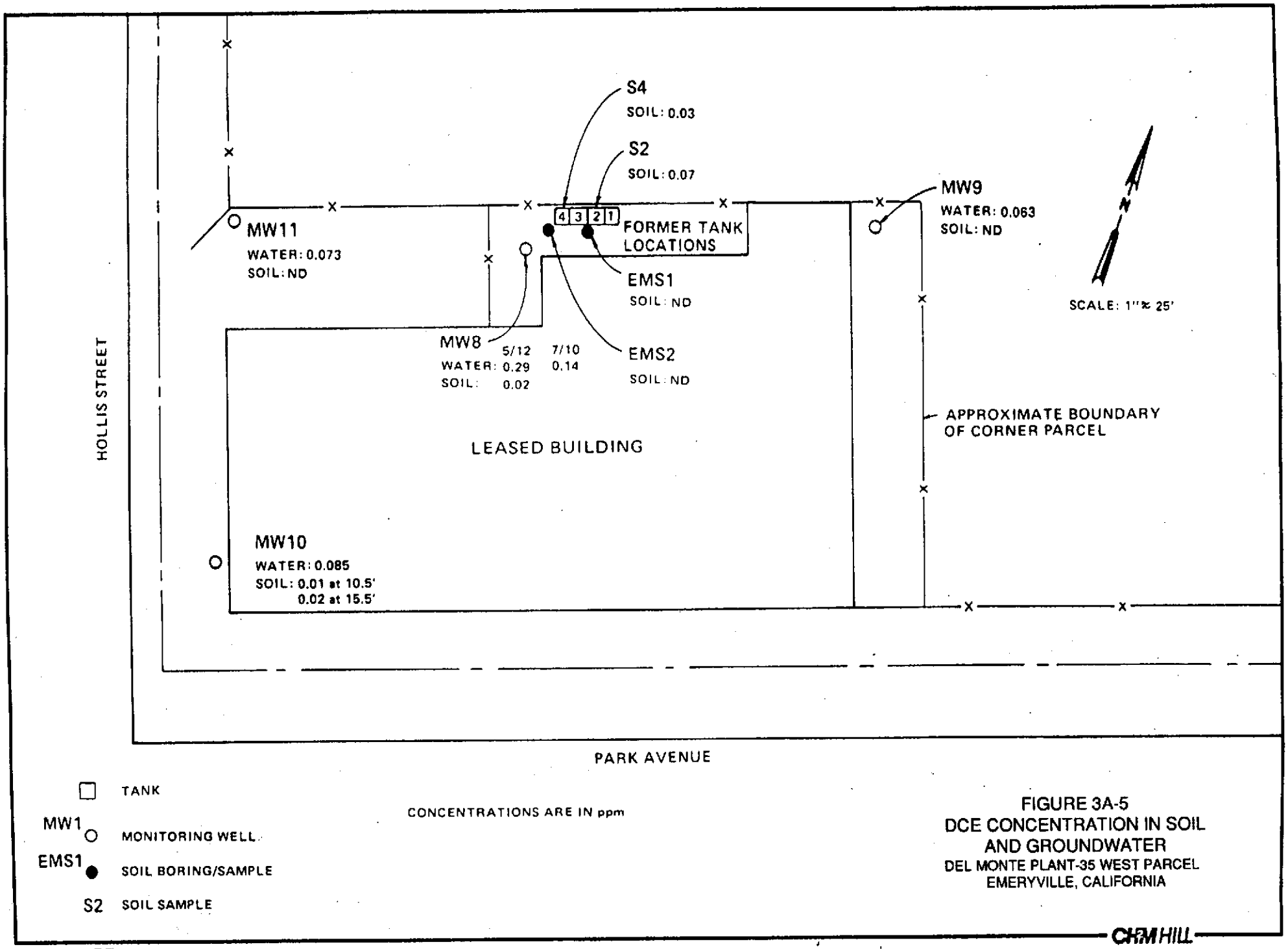


FIGURE 3A-5
DCE CONCENTRATION IN SOIL AND GROUNDWATER
DEL MONTE PLANT-35 WEST PARCEL
EMERYVILLE, CALIFORNIA

CH2M HILL

SFO28830.RC

The potential for human exposure to the chemicals in the soil may be through direct dermal contact. The soil, however, is covered by a concrete loading dock. It is possible that future excavation of soils could expose workers through direct contact or inhalation. However, any future exposure can be controlled by protecting workers during excavation or by soil treatment before excavation begins.

Groundwater

Shallow groundwater exists beneath the corner parcel at a depth of approximately 7 to 10 feet bgs. The soils consist of clay, silty clay, and sandy silt with some fine sand. The shallow groundwater flows west to west southwest toward San Francisco Bay under a horizontal hydraulic gradient of approximately 0.014 ft/ft (1989 data). The rate of movement of the shallow groundwater can be calculated using the following formula:

$$V = ki/\Phi_p$$

where,

V = velocity (ft/year)
k = hydraulie conductivity (ft/day * 365 days/year)
i = hydraulic gradient (ft/ft)
Φ_p = effective porosity (%)

The hydraulic conductivity value was obtained from an investigation report on the Electro-Coatings site, a California Superfund site, located one block west on Hollis Street (Woodward-Clyde, 1981, 1983). The investigation included an 8-hour pump test and two slug tests. The hydraulic conductivity at Electro-Coatings was determined to be approximately 0.25 feet/day for the clayey silt and sandy clay layer beneath that property. This layer appears to be similar to the silty clay layer beneath the Del Monte corner property. The porosity was determined to be 42.5 percent by averaging the porosity values for the six samples taken from MW9, MW10, and MW11 (Appendix J). Using the above formula, the velocity for the shallow groundwater is approximately 3 feet per year:

$$\frac{(0.25 \text{ ft/day}) * (365 \text{ days/year}) * (0.014 \text{ ft/ft})}{0.425} = 3 \text{ ft/year}$$

The source of the chlorinated solvents in the four tanks is not known. As previously mentioned, the building was leased by different companies from 1971 to 1976 and 1976 to 1989. If it is assumed that the solvents leaked from the tanks in 1976, they could have traveled up to about 39 feet in the groundwater based on the groundwater velocity calculated. However, chemical compounds generally do not travel as fast as the groundwater because of retardation and dispersion effects with the surrounding soil.

As would be expected, MW8, the well closest to the tanks, contained the highest concentrations of TCE and 1,2-DCE, and the concentration of TCE was lowest in the upgradient well, MW9, and higher in MW11 than MW10 (Figures 3A-4 and 3A-5). The concentration of 1,2-DCE, however, was similar in MW9, MW10 and MW11 (Figure 3A-5), and the PCE concentration was similar in MW9 and MW10, but lower in MW11.

It is unclear how the contaminated groundwater migrated upgradient to MW9. Because water accumulates in the basement of a building on the main portion of the Plant No. 35 property on a periodic basis, the potential affects of the tidal fluctuation was tested. A data recorder was installed in MW9, MW11, and MW1, to record the water level over a 24-hour period. The data are presented in Table 3A-10 and shown in Figure 3A-6. It does not appear that the tides have a significant impact on the groundwater flow direction.

The contaminated groundwater may have been transported through the backfill in utility trenches. There are at least four utility lines in the vicinity of the upgradient well, MW9. (Three holes were dug, in which conduits were encountered, before a clear area could be found to install the well.) However, the presence of conduits between the former tank locations and MW9 is not known.

As seen in Table 3A-6, the concentration of TCE, 1,2-DCE, and vinyl chloride in MW8 have decreased substantially since the source, the underground tanks, were removed.

Subsurface Investigation of the West Parcel 550-Gallon Gasoline Tank

Soils

It appears that most of the gasoline-contaminated soil was associated with the sandy silt backfill and only minimal contamination extended into the silty clay beneath the tank. Most of the soil contaminated with TPH as gasoline was removed prior to backfilling the excavation, thus reducing a continuing source of gasoline contamination to the groundwater. The extent of remaining contamination is addressed below.

The initial soil sample collected from the west end of the excavation contained 280 ppm TPH as gasoline and 1.5 ppm xylene. Soil was removed from the excavation until the sample did not contain detectable concentrations of TPH as gasoline. The soil cuttings from MW7, about 6 feet downgradient of the west end, contained 52 ppm of TPH as gasoline.

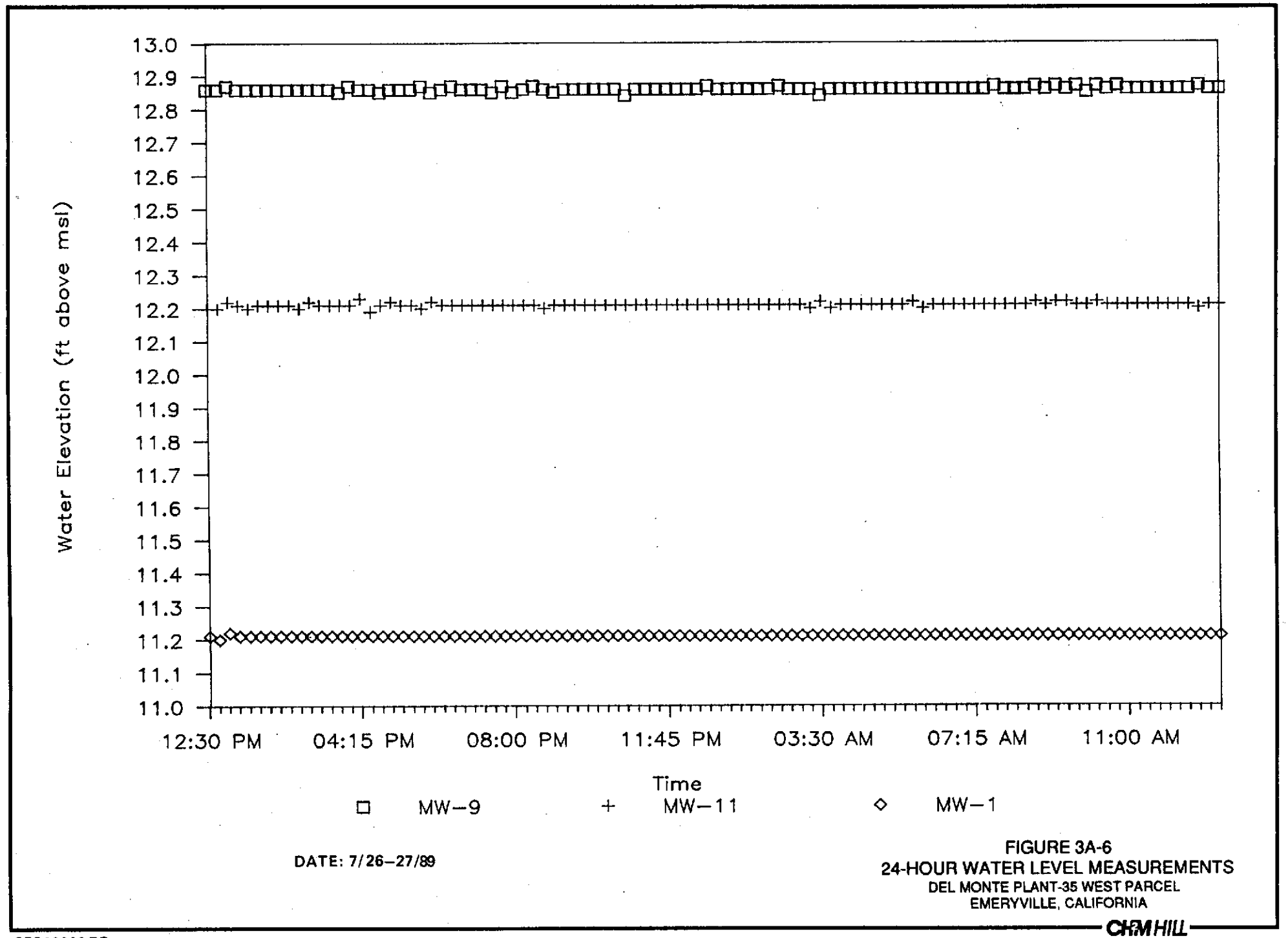
On the north side of the excavation, as much soil as possible was removed without causing damage to the property fence. A sample of the soil on this side contained 470 ppm of TPH as gasoline. Per concurrence with Dennis Byrne, Alameda County Health Agency, removal of soil at this concentration was not required. The extent of gasoline contamination on this side appears to be limited, however, based on samples collected

Table 3A-10

24-HOUR WATER LEVEL MEASUREMENTS

		MW-9		MW-11		MW-1	
Elevation at toc		22.3		19.3		20.8	
Date	Time	Level	Elevation	Level	Elevation	Level	Elevation
26-Jul-89	12:30 PM	9.4	12.9	7.1	12.2	9.6	11.2
26-Jul-89	12:45 PM	9.4	12.9	7.1	12.2	9.6	11.2
26-Jul-89	01:00 PM	9.4	12.9	7.1	12.2	9.6	11.2
26-Jul-89	01:15 PM	9.4	12.9	7.1	12.2	9.6	11.2
26-Jul-89	01:30 PM	9.4	12.9	7.1	12.2	9.6	11.2
26-Jul-89	01:45 PM	9.4	12.9	7.1	12.2	9.6	11.2
26-Jul-89	02:00 PM	9.4	12.9	7.1	12.2	9.6	11.2
26-Jul-89	02:15 PM	9.4	12.9	7.1	12.2	9.6	11.2
26-Jul-89	02:30 PM	9.4	12.9	7.1	12.2	9.6	11.2
26-Jul-89	02:45 PM	9.4	12.9	7.1	12.2	9.6	11.2
26-Jul-89	03:00 PM	9.4	12.9	7.1	12.2	9.6	11.2
26-Jul-89	03:15 PM	9.4	12.9	7.1	12.2	9.6	11.2
26-Jul-89	03:30 PM	9.4	12.9	7.1	12.2	9.6	11.2
26-Jul-89	03:45 PM	9.4	12.9	7.1	12.2	9.6	11.2
26-Jul-89	04:00 PM	9.4	12.9	7.1	12.2	9.6	11.2
26-Jul-89	04:15 PM	9.4	12.9	7.1	12.2	9.6	11.2
26-Jul-89	04:30 PM	9.4	12.9	7.1	12.2	9.6	11.2
26-Jul-89	04:45 PM	9.4	12.9	7.1	12.2	9.6	11.2
26-Jul-89	05:00 PM	9.4	12.9	7.1	12.2	9.6	11.2
26-Jul-89	05:15 PM	9.4	12.9	7.1	12.2	9.6	11.2
26-Jul-89	05:30 PM	9.4	12.9	7.1	12.2	9.6	11.2
26-Jul-89	05:45 PM	9.4	12.9	7.1	12.2	9.6	11.2
26-Jul-89	06:00 PM	9.4	12.9	7.1	12.2	9.6	11.2
26-Jul-89	06:15 PM	9.4	12.9	7.1	12.2	9.6	11.2
26-Jul-89	06:30 PM	9.4	12.9	7.1	12.2	9.6	11.2
26-Jul-89	06:45 PM	9.4	12.9	7.1	12.2	9.6	11.2
26-Jul-89	07:00 PM	9.4	12.9	7.1	12.2	9.6	11.2
26-Jul-89	07:15 PM	9.4	12.9	7.1	12.2	9.6	11.2
26-Jul-89	07:30 PM	9.4	12.9	7.1	12.2	9.6	11.2
26-Jul-89	07:45 PM	9.4	12.9	7.1	12.2	9.6	11.2
26-Jul-89	08:00 PM	9.4	12.9	7.1	12.2	9.6	11.2
26-Jul-89	08:15 PM	9.4	12.9	7.1	12.2	9.6	11.2
26-Jul-89	08:30 PM	9.4	12.9	7.1	12.2	9.6	11.2
26-Jul-89	08:45 PM	9.4	12.9	7.1	12.2	9.6	11.2
26-Jul-89	09:00 PM	9.4	12.9	7.1	12.2	9.6	11.2
26-Jul-89	09:15 PM	9.4	12.9	7.1	12.2	9.6	11.2
26-Jul-89	09:30 PM	9.4	12.9	7.1	12.2	9.6	11.2
26-Jul-89	09:45 PM	9.4	12.9	7.1	12.2	9.6	11.2
26-Jul-89	10:00 PM	9.4	12.9	7.1	12.2	9.6	11.2
26-Jul-89	10:15 PM	9.4	12.9	7.1	12.2	9.6	11.2
26-Jul-89	10:30 PM	9.4	12.9	7.1	12.2	9.6	11.2
26-Jul-89	10:45 PM	9.4	12.8	7.1	12.2	9.6	11.2
26-Jul-89	11:00 PM	9.4	12.9	7.1	12.2	9.6	11.2
26-Jul-89	11:15 PM	9.4	12.9	7.1	12.2	9.6	11.2
26-Jul-89	11:30 PM	9.4	12.9	7.1	12.2	9.6	11.2
26-Jul-89	11:45 PM	9.4	12.9	7.1	12.2	9.6	11.2
27-Jul-89	12:00 AM	9.4	12.9	7.1	12.2	9.6	11.2
27-Jul-89	12:15 AM	9.4	12.9	7.1	12.2	9.6	11.2
27-Jul-89	12:30 AM	9.4	12.9	7.1	12.2	9.6	11.2
27-Jul-89	12:45 AM	9.4	12.9	7.1	12.2	9.6	11.2

		MW-9		MW-11		MW-1	
Elevation at toc		22.3		19.3		20.8	
Date	Time	Level	Elevation	Level	Elevation	Level	Elevation
27-Jul-89	01:00 AM	9.4	12.9	7.1	12.2	9.6	11.2
27-Jul-89	01:15 AM	9.4	12.9	7.1	12.2	9.6	11.2
27-Jul-89	01:30 AM	9.4	12.9	7.1	12.2	9.6	11.2
27-Jul-89	01:45 AM	9.4	12.9	7.1	12.2	9.6	11.2
27-Jul-89	02:00 AM	9.4	12.9	7.1	12.2	9.6	11.2
27-Jul-89	02:15 AM	9.4	12.9	7.1	12.2	9.6	11.2
27-Jul-89	02:30 AM	9.4	12.9	7.1	12.2	9.6	11.2
27-Jul-89	02:45 AM	9.4	12.9	7.1	12.2	9.6	11.2
27-Jul-89	03:00 AM	9.4	12.9	7.1	12.2	9.6	11.2
27-Jul-89	03:15 AM	9.4	12.9	7.1	12.2	9.6	11.2
27-Jul-89	03:30 AM	9.4	12.8	7.1	12.2	9.6	11.2
27-Jul-89	03:45 AM	9.4	12.9	7.1	12.2	9.6	11.2
27-Jul-89	04:00 AM	9.4	12.9	7.1	12.2	9.6	11.2
27-Jul-89	04:15 AM	9.4	12.9	7.1	12.2	9.6	11.2
27-Jul-89	04:30 AM	9.4	12.9	7.1	12.2	9.6	11.2
27-Jul-89	04:45 AM	9.4	12.9	7.1	12.2	9.6	11.2
27-Jul-89	05:00 AM	9.4	12.9	7.1	12.2	9.6	11.2
27-Jul-89	05:15 AM	9.4	12.9	7.1	12.2	9.6	11.2
27-Jul-89	05:30 AM	9.4	12.9	7.1	12.2	9.6	11.2
27-Jul-89	05:45 AM	9.4	12.9	7.1	12.2	9.6	11.2
27-Jul-89	06:00 AM	9.4	12.9	7.1	12.2	9.6	11.2
27-Jul-89	06:15 AM	9.4	12.9	7.1	12.2	9.6	11.2
27-Jul-89	06:30 AM	9.4	12.9	7.1	12.2	9.6	11.2
27-Jul-89	06:45 AM	9.4	12.9	7.1	12.2	9.6	11.2
27-Jul-89	07:00 AM	9.4	12.9	7.1	12.2	9.6	11.2
27-Jul-89	07:15 AM	9.4	12.9	7.1	12.2	9.6	11.2
27-Jul-89	07:30 AM	9.4	12.9	7.1	12.2	9.6	11.2
27-Jul-89	07:45 AM	9.4	12.9	7.1	12.2	9.6	11.2
27-Jul-89	08:00 AM	9.4	12.9	7.1	12.2	9.6	11.2
27-Jul-89	08:15 AM	9.4	12.9	7.1	12.2	9.6	11.2
27-Jul-89	08:30 AM	9.4	12.9	7.1	12.2	9.6	11.2
27-Jul-89	08:45 AM	9.4	12.9	7.1	12.2	9.6	11.2
27-Jul-89	09:00 AM	9.4	12.9	7.1	12.2	9.6	11.2
27-Jul-89	09:15 AM	9.4	12.9	7.1	12.2	9.6	11.2
27-Jul-89	09:30 AM	9.4	12.9	7.1	12.2	9.6	11.2
27-Jul-89	09:45 AM	9.4	12.9	7.1	12.2	9.6	11.2
27-Jul-89	10:00 AM	9.4	12.9	7.1	12.2	9.6	11.2
27-Jul-89	10:15 AM	9.4	12.9	7.1	12.2	9.6	11.2
27-Jul-89	10:30 AM	9.4	12.9	7.1	12.2	9.6	11.2
27-Jul-89	10:45 AM	9.4	12.9	7.1	12.2	9.6	11.2
27-Jul-89	11:00 AM	9.4	12.9	7.1	12.2	9.6	11.2
27-Jul-89	11:15 AM	9.4	12.9	7.1	12.2	9.6	11.2
27-Jul-89	11:30 AM	9.4	12.9	7.1	12.2	9.6	11.2
27-Jul-89	11:45 AM	9.4	12.9	7.1	12.2	9.6	11.2
27-Jul-89	12:00 PM	9.4	12.9	7.1	12.2	9.6	11.2
27-Jul-89	12:15 PM	9.4	12.9	7.1	12.2	9.6	11.2
27-Jul-89	12:30 PM	9.4	12.9	7.1	12.2	9.6	11.2
27-Jul-89	12:45 PM	9.4	12.9	7.1	12.2	9.6	11.2
27-Jul-89	01:00 PM	9.4	12.9	7.1	12.2	9.6	11.2
27-Jul-89	01:15 PM	9.4	12.9	7.1	12.2	9.6	11.2



DATE: 7/26-27/89

FIGURE 3A-6
24-HOUR WATER LEVEL MEASUREMENTS
DEL MONTE PLANT-35 WEST PARCEL
EMERYVILLE, CALIFORNIA

CH2M HILL

SFO28830.RC

at EMS3 to the northwest (Figure 3A-6). This sample contained 1.5 ppm TPH as gasoline at 6 feet below ground surface (bgs) and 0.9 ppm at 8 feet bgs (Appendix F).

Soil was also removed from the east end of the excavation until a sample did not contain detectable concentrations. On the south side of the excavation, however, soil was not removed and samples were not collected because of potential problems with the 12 kilovolt electrical line in the sidewalk. This was also with concurrence with Dennis Byrne.

Groundwater

Groundwater was encountered at approximately 7 feet bgs in MW7. There was no free-floating product or sheen evident on the water table. As seen in Table 3A-9, in MW7, BTEX, and TPH-gasoline has decreased in the 2-month period between May and July, 1989.

According to the Water Quality Control Plan for the San Francisco Bay Basin (California RWQCB, San Francisco Region, 1982, 1986), potential beneficial uses of groundwater applicable to the main groundwater basins are municipal supply, industrial process water supply, industrial service supply, and agricultural supply. The Emeryville area is above the northern East Bay Area of the Santa Clara Valley groundwater basin. The lack of attention to the northern area of this basin tends to indicate a low level of groundwater use (RWQCB, 1982 and 1986; DWR, 1963 and 1975; USGS, 1972 and 1988). This may be because of limited groundwater yield due to the extensive area covered by the bay mud, and because the northern area of Alameda County is highly developed and industrialized. In addition, the groundwater beneath Plant No. 35 is above the recommended California secondary drinking water standards for total dissolved solids and electrical conductivity (Appendix L).

State and federal drinking water standards and aquatic toxicity levels for organic chemicals are provided in Appendix L as a point of reference only. These standards do not specifically apply to the groundwater at Plant No. 35 because this water is not a source of drinking water and aquatic wildlife is not directly exposed to it.

Toluene, ethylbenzene, and xylene in groundwater samples collected from the shallow groundwater zone beneath Plant No. 35 are all below the California and/or federal criteria. The benzene concentration in MW7 was above the California and federal maximum contaminant level (1 mg/l) for drinking water during this 1989 investigation. Current monitoring data for MW7 indicates that benzene concentrations are below the 1 µg/l MCL. The groundwater beneath the Plant No. 35 is not currently used for drinking water. In addition, it does not appear that future beneficial uses would be impaired as seen by the reduction in concentrations between May and July (Table 3A-8).

Potential receptors of the shallow groundwater may be aquatic life because the groundwater flows westward towards the San Francisco Bay. The benzene, toluene, and ethylbenzene concentrations currently beneath Plant No. 35, however, are below the lowest reported acute toxicity effects level for freshwater and saltwater aquatic life, and further attenuation would be expected before this shallow groundwater migrates to the Bay.

Quarterly Groundwater Monitoring at West Parcel

Five West Parcel monitoring wells (MW7 to MW11) have been monitored quarterly (four sampling events per year) since mid-1989. The groundwater quality data obtained from the quarterly monitoring is submitted quarterly to the Alameda County Health Agency and the San Francisco Bay Region RWQCB. The most recent quarterly monitoring report (February 25, 1992) is in Appendix K. Table 3A-11 presents the gasoline constituent analytical results for MW7. Table 3A-12 presents the chlorinated hydrocarbons analytical results for MW7 to MW11. Tables 3A-11 and 3A-12 also indicate compounds which exceed maximum contaminant levels (MCLs); it should be noted that some of the analyses were above the MCLs. Figures 3A-7 and 3A-8 show trends in benzene and TPH-gasoline in MW7. Figure 3A-9 shows trends in vinyl chloride concentrations in MW7, MW8, MW9, MW10, and MW11. Other common gasoline constituents, toluene, xylene, and ethylbenzene, have not exceeded the respective MCLs in MW7. No apparent trends were observed for the other chlorinated compounds.

TABLE 3A - 11
DEL MONTE PLANT NO. 35
4204 HOLLIS STREET, EMERYVILLE, CA
QUARTERLY GROUNDWATER MONITORING RESULTS
(Removed Gasoline Tank)

Concentration (mg/l)

Monitoring Well	Sampling Date	TPH Gasoline	Benzene	Ethyl-benzene	Toluene	Xylene
MW7	12-May-89	1.000	0.0490	0.0045	0.0016	0.0059
MW7	10-Jul-89	0.500	0.0052	<0.0003	0.0006	0.0056
MW7	24-Oct-89	1.800	0.0081	<0.0003	<0.0003	0.0120
MW7	07-Feb-90	1.300	0.0100	0.0039	0.0010	0.0130
MW7	10-Jul-90	0.210	0.0006	<0.0003	0.0003	0.0010
MW7	17-Oct-90	0.640	0.0020	0.0030	0.0010	0.0014
MW7	24-Jan-91	0.300	0.0018	0.0024	0.0019	0.0053
MW7	17-Apr-91	0.400	<0.0005	<0.0005	<0.0005	<0.0005
MW7	31-Jul-91	0.070	<0.0005	<0.0005	<0.0005	0.0009
MW7	22-Oct-91	0.100	<0.0005	0.0010	<0.0005	<0.0005
MW7	23-Jan-92	<0.05	<0.0005	<0.0005	<0.0005	<0.0005
WATER QUALITY STANDARDS						
	Cancer Risk	--	0.00066	--	--	--
	Primary MCL	--	0.001	0.68	2.0	1.75
	AATC (Freshwater	--	5.3	32.0	17.0	--

Shading indicates concentration exceeds MCL

TABLE 3A - 12
DEL MONTE PLANT NO. 35, WEST PARCEL
4204 HOLLIS STREET, EMERYVILLE, CA
QUARTERLY GROUNDWATER MONITORING RESULTS

Monitoring Well	Sampling Date	Concentration (mg/l) 1,2-DCE(a)	1,1-DCE(b)	1,2-DCA(c)	TCE(d)	PCE(e)	VC(f)	1,2-DP(g)
MW7	17-Apr-91	0.085	<0.0005	<0.0005	0.023	0.014	0.0051	<0.0005
MW7	31-Jul-91	0.100	<0.0005	<0.0005	0.029	0.019	0.0051	<0.0005
MW7	22-Oct-91	0.130	<0.001	<0.001	0.030	0.020	0.003	<0.001
MW7	23-Jan-92	0.100	<0.0005	<0.0005	0.029	0.017	0.0031	<0.0005
MW8	12-May-89	0.29	<0.0100	<0.0100	1.400	0.020	0.0780	<0.0100
MW8	10-Jul-89	0.14	<0.0025	<0.0025	0.330	0.014	0.0170	<0.0025
MW8-dup	10-Jul-89	0.13	<0.0025	<0.0025	0.310	0.012	0.0160	<0.0025
MW8	24-Oct-89	0.10	<0.0020	<0.0020	0.330	0.024	0.0040	<0.0020
MW8	07-Feb-90	0.10	<0.0020	<0.0020	0.520	0.018	0.0120	<0.0020
MW8	10-Jul-90	0.005	<0.0002	<0.0005	0.091	0.036	0.0030	<0.0005
MW8	17-Oct-90	0.059	<0.0010	<0.0010	0.160	0.021	0.0020	<0.0010
MW8	24-Jan-91	0.160	<0.0020	0.0050	0.450	0.013	0.0090	0.0270
MW8	17-Apr-91	0.210	<0.0050	<0.0050	0.830	0.016	<0.0050	<0.0050
MW8	31-Jul-91	0.085	<0.0020	<0.0020	0.350	0.030	0.0020	<0.0020
WATER QUALITY STANDARDS								
Primary MCL		---	0.006	0.00050	0.0050	0.0050	0.0005	0.0050
Cancer Risk		---	0.000033	0.00094	0.0027	0.0008	0.0020	---
AATC (Freshwater)		23.2	11.6	118	45	5.28	---	23

a total 1,2-Dichloroethene*
b 1,1-Dichloroethene
c 1,2-Dichloroethane
d Trichloroethene
e Tetrachloroethene
f Vinyl chloride
g 1,2-Dichloropropane
* Sum of cis-1,2-Dichloroethene and trans-1,2-Dichloroethene

Dark shading indicates concentration exceeds MCL
Light shading indicates analytical detection limit exceeds MCL

TABLE 3A - 12
DEL MONTE PLANT NO. 35, WEST PARCEL
4204 HOLLIS STREET, EMERYVILLE, CA
QUARTERLY GROUNDWATER MONITORING RESULTS

Monitoring Well	Sampling Date	Concentration (mg/l) 1,2-DCE(a)	1,1-DCE(b)	1,2-DCA(c)	TCE(d)	PCE(e)	VC(f)	1,2-DP(g)
MW8	22-Oct-91	0.040	<0.0050	<0.0050	0.630	0.020	<0.0050	<0.0050
MW8	23-Jan-92	0.160	<0.0050	<0.0050	0.690	0.029	<0.0050	<0.0050
MW9	10-Jul-89	0.0630	<0.0005	<0.0005	0.013	0.038	0.0160	<0.0005
MW9	24-Oct-89	0.0064	<0.0005	<0.0005	0.029	0.048	0.0230	<0.0005
MW9	07-Feb-90	0.0550	<0.0005	<0.0005	0.015	0.030	0.0071	<0.0005
MW9	10-Jul-90	0.0030	<0.0002	<0.0005	0.009	0.043	0.0100	<0.0005
MW9	17-Oct-90	0.0700	<0.0005	<0.0005	0.014	0.032	0.0046	<0.0005
MW9	24-Jan-91	0.0700	<0.0020	<0.0020	0.220	0.023	<0.0020	<0.0020
MW9	17-Apr-91	0.0440	<0.0005	<0.0005	0.012	0.026	<0.0005	<0.0005
MW9	31-Jul-91	0.0550	<0.0005	<0.0005	0.014	0.032	0.0023	<0.0005
MW9	22-Oct-91	0.0710	<0.0005	<0.0005	0.015	0.033	0.0028	<0.0005
MW9	23-Jan-92	0.0640	<0.0005	<0.0005	0.010	0.027	0.0021	<0.0005
WATER QUALITY STANDARDS								
	Primary MCL	---	0.006	0.00050	0.0050	0.0050	0.0005	0.0050
	Cancer Risk	---	0.000033	0.00094	0.0027	0.0008	0.0020	---
	AATC (Freshwater)	23.2	11.6	118	45	5.28	---	23

a total 1,2-Dichloroethene*
b 1,1-Dichloroethene
c 1,2-Dichloroethane
d Trichloroethene
e Tetrachloroethene
f Vinyl chloride
g 1,2-Dichloropropane
* Sum of cis-1,2-Dichloroethene and trans-1,2-Dichloroethene

Dark shading indicates concentration exceeds MCL
Light shading indicates analytical detection limit exceeds MCL

TABLE 3A - 12
DEL MONTE PLANT NO. 35, WEST PARCEL
4204 HOLLIS STREET, EMERYVILLE, CA
QUARTERLY GROUNDWATER MONITORING RESULTS

Monitoring Well	Sampling Date	Concentration (mg/l) 1,2-DCE(a)	1,1-DCE(b)	1,2-DCA(c)	TCE(d)	PCE(e)	VC(f)	1,2-DP(g)
MW10	10-Jul-89	0.0850	0.0008	<0.0005	0.027	0.042	0.0280	<0.0005
MW10	24-Oct-89	0.1048	<0.0005	<0.0005	0.037	0.028	0.0069	<0.0005
MW10	07-Feb-90	0.0500	<0.0005	<0.0005	0.011	0.008	0.0053	<0.0005
MW10	10-Jul-90	0.0090	<0.0002	<0.0005	0.030	0.076	0.054	<0.0005
MW10-dup	10-Jul-90	0.0100	0.0050	<0.0005	0.028	0.069	0.017	<0.0005
MW10	17-Oct-90	0.1400	<0.0005	<0.0005	0.035	0.037	0.013	<0.0005
MW10	24-Jan-91	0.0650	<0.0005	<0.0005	0.014	0.031	0.0033	<0.0005
MW10	17-Apr-91	0.2100	<0.002	<0.002	0.048	0.052	0.010	<0.002
MW10	31-Jul-91	0.2800	<0.002	<0.002	0.066	0.014	0.002	<0.002
MW10	22-Oct-91	0.1600	<0.001	<0.001	0.040	0.040	0.005	<0.001
MW10	23-Jan-92	0.2400	<0.002	<0.002	0.046	0.054	0.010	<0.002
WATER QUALITY STANDARDS								
	Primary MCL	---	0.006	0.00050	0.0050	0.0050	0.0005	0.0050
	Cancer Risk	---	0.000033	0.00094	0.0027	0.0008	0.0020	---
	AATC (Freshwater)	23.2	11.6	118	45	5.28	---	23

a total 1,2-Dichloroethene*
b 1,1-Dichloroethene
c 1,2-Dichloroethane
d Trichloroethene
e Tetrachloroethene
f Vinyl chloride
g 1,2-Dichloropropane
* Sum of cis-1,2-Dichloroethene and trans-1,2-Dichloroethene

Dark shading indicates concentration exceeds MCL
Light shading indicates analytical detection limit exceeds MCL

TABLE 3A - 12
DEL MONTE PLANT NO. 35, WEST PARCEL
4204 HOLLIS STREET, EMERYVILLE, CA
QUARTERLY GROUNDWATER MONITORING RESULTS

Monitoring Well	Sampling Date	Concentration (mg/l) 1,2-DCE(a)	1,1-DCE(b)	1,2-DCA(c)	TCE(d)	PCE(e)	VC(f)	1,2-DP(g)
MW11	10-Jul-89	0.073	<0.001	0.004	0.160	0.012	0.0160	0.0057
MW11	24-Oct-89	0.188	<0.002	0.010	0.410	0.015	0.0220	0.0200
MW11	07-Feb-90	0.105	<0.002	0.002	0.270	0.008	0.0110	0.0130
MW11	10-Jul-90	0.004	<0.002	0.023	0.046	0.018	0.0150	<0.0005
MW11	17-Oct-90	0.150	<0.002	0.011	0.300	0.008	<0.002	0.0310
MW11	24-Jan-91	0.120	<0.001	<0.001	0.029	0.029	0.0030	<0.0010
MW11	17-Apr-91	0.100	<0.001	0.014	0.160	0.012	0.005	0.0290
MW11	31-Jul-91	0.250	<0.002	<0.002	0.061	0.065	0.012	0.0020
MW11	22-Oct-91	0.180	<0.002	0.005	0.560	0.020	0.005	0.0300
MW11	23-Jan-92	0.160	<0.002	0.013	0.290	0.019	<0.002	0.0210
WATER QUALITY STANDARDS								
	Primary MCL	---	0.006	0.00050	0.0050	0.0050	0.0005	0.0050
	Cancer Risk	---	0.000033	0.00094	0.0027	0.0008	0.0020	---
	AATC (Freshwater)	23.2	11.6	118	45	5.28	---	23

a total 1,2-Dichloroethene*
b 1,1-Dichloroethene
c 1,2-Dichloroethane
d Trichloroethene
e Tetrachloroethene
f Vinyl chloride
g 1,2-Dichloropropane
* Sum of cis-1,2-Dichloroethene and trans-1,2-Dichloroethene

Dark shading indicates concentration exceeds MCL
Light shading indicates analytical detection limit exceeds MCL

Figure 3A-7

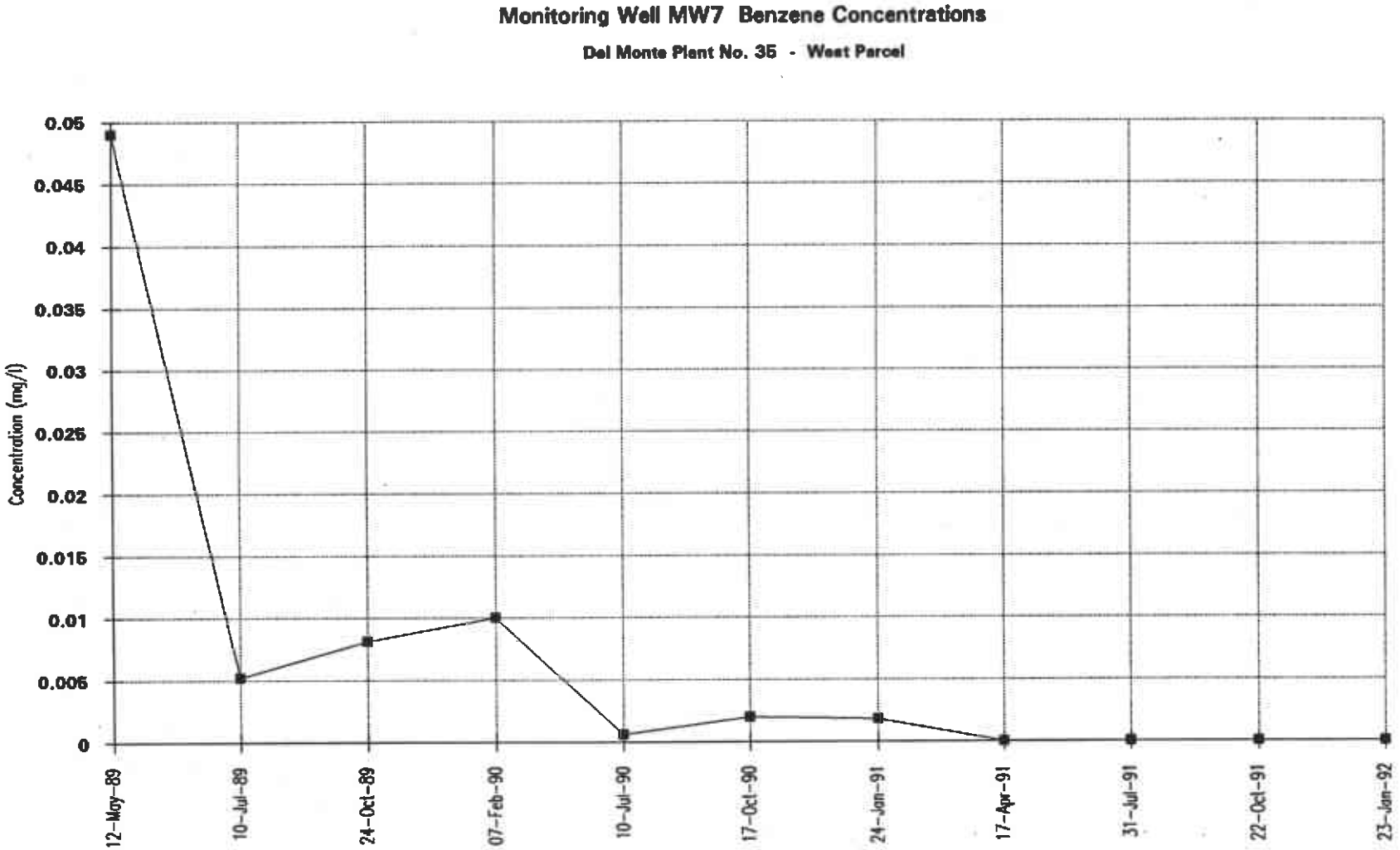

Monitoring Well MW7 Benzene Concentrations
Del Monte Plant No. 35 - West Parcel
Concentration (mg/l)
0.05
0.045
0.04
0.035
0.03
0.025
0.02
0.015
0.01
0.005
0
12-May-89
10-Jul-89
24-Oct-89
07-Feb-90
10-Jul-90
17-Oct-90
24-Jan-91
17-Apr-91
31-Jul-91
22-Oct-91
23-Jan-92

Figure 3A-8

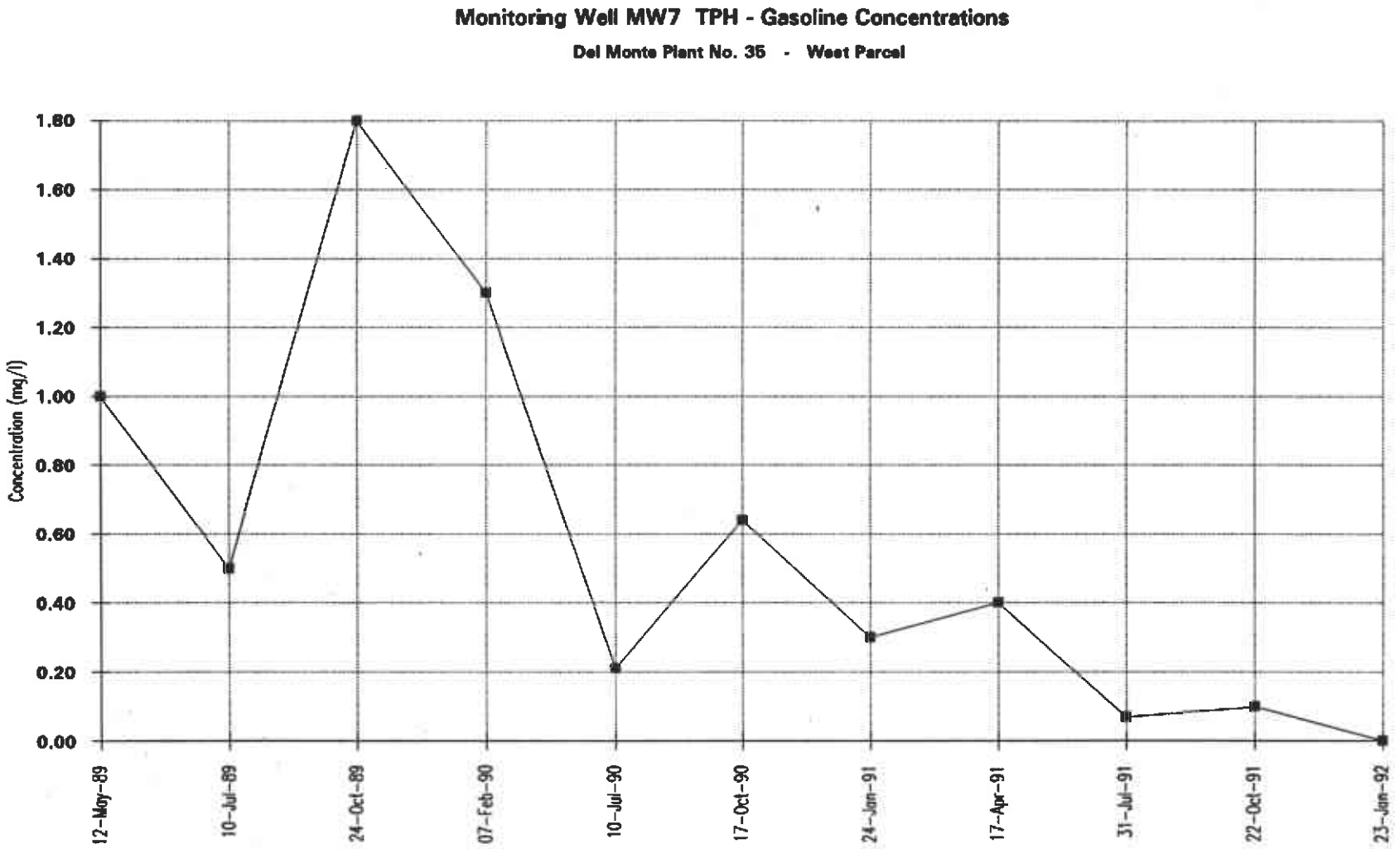
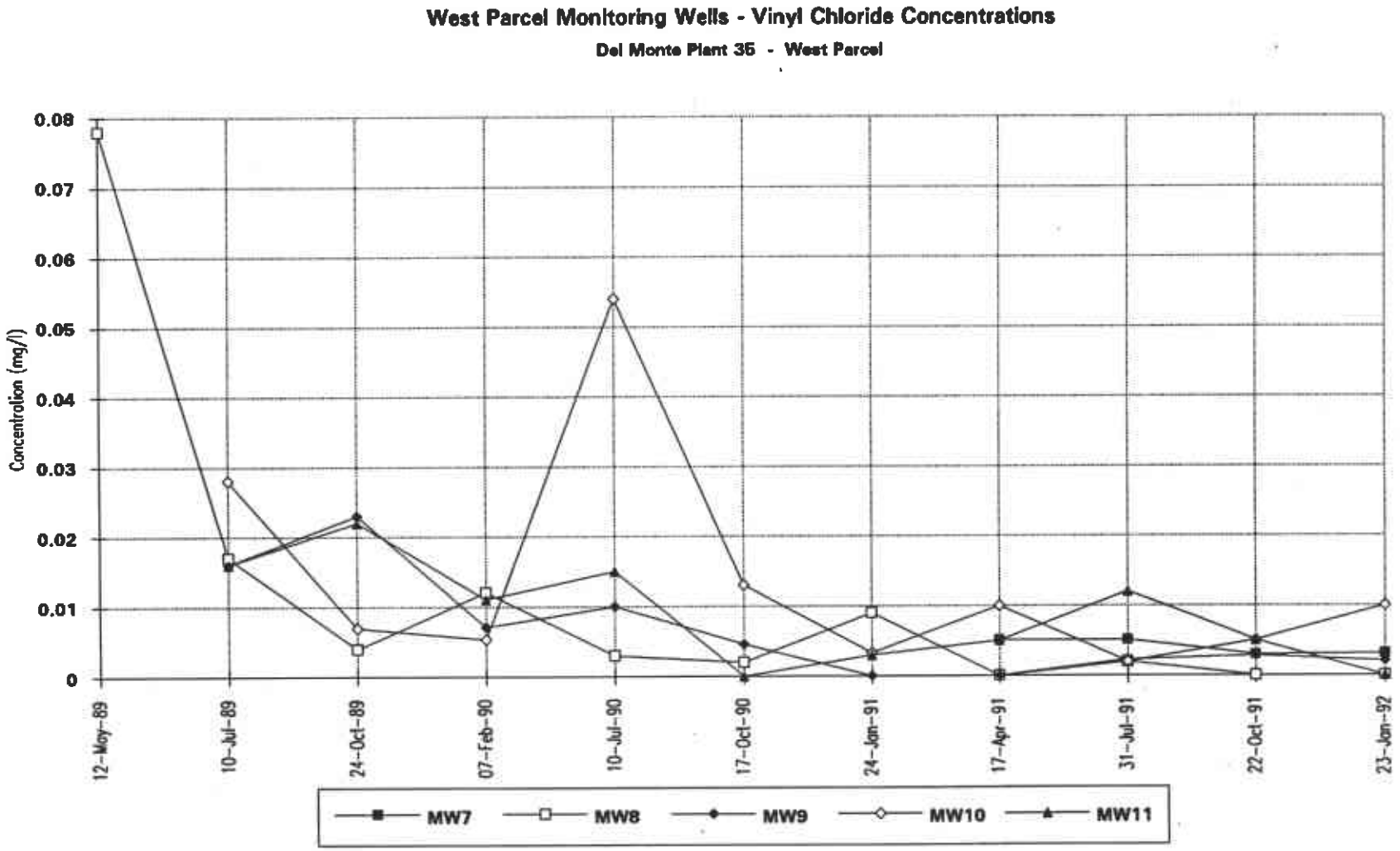

Monitoring Well MW7 TPH - Gasoline Concentrations
Del Monte Plant No. 35 - West Parcel
Concentration (mg/l)
1.80
1.60
1.40
1.20
1.00
0.80
0.60
0.40
0.20
0.00
12-May-89
10-Jul-89
24-Oct-89
07-Feb-90
10-Jul-90
17-Oct-90
24-Jan-91
17-Apr-91
31-Jul-91
22-Oct-91
23-Jan-92

Figure 3A-9


West Parcel Monitoring Wells - Vinyl Chloride Concentrations
Del Monte Plant 35 - West Parcel
Concentration (mg/l)
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0
12-May-89
10-Jul-89
24-Oct-89
07-Feb-90
10-Jul-90
17-Oct-90
24-Jan-91
17-Apr-91
31-Jul-91
22-Oct-91
23-Jan-92
MW7
MW8
MW9
MW10
MW11

Section 3B
Phase II—East Parcel

Section 3B

Phase II—East Parcel

Introduction

CH2M HILL conducted or supervised the following Phase II activities at Del Monte's Plant 35—East Parcel:

Activity	Date	Purpose
Soil Boring Sample Analysis of SB3 and SB7 (Chemical Storage Areas)	December 1988	To analyze soil in vicinity of chlorine storage
Monitoring Well Installation of MW3-MW5 (along with MW1 and MW2 on West Parcel)	December 1988	To analyze quality, depth, and direction of groundwater beneath the property
Haven Street Soil Investigation	November-December 1989	To determine presence of soil contamination before construction of Haven Street
Monitoring of MW6	1986-1990	To monitor groundwater quality in vicinity of removed 550-gallon underground gasoline tank.

Geophysical Survey

A geophysical survey was performed in December 1988 on the Plant 35 West and East Parcels. The objective of the survey on the East Parcel was to identify subsurface anomalies that represented underground tanks or other objects. The East Parcel area surveyed is shown in Figure 3B-1.

No subsurface anomalies were identified on the East Parcel.

Soil Sampling in Chlorine Storage Areas

Soil samples were collected at the Plant No. 35—East Parcel property near areas of chemical storage to evaluate whether chemicals were present in the soil at those locations. The soil borings were drilled between December 5 and 9, 1988. The sample

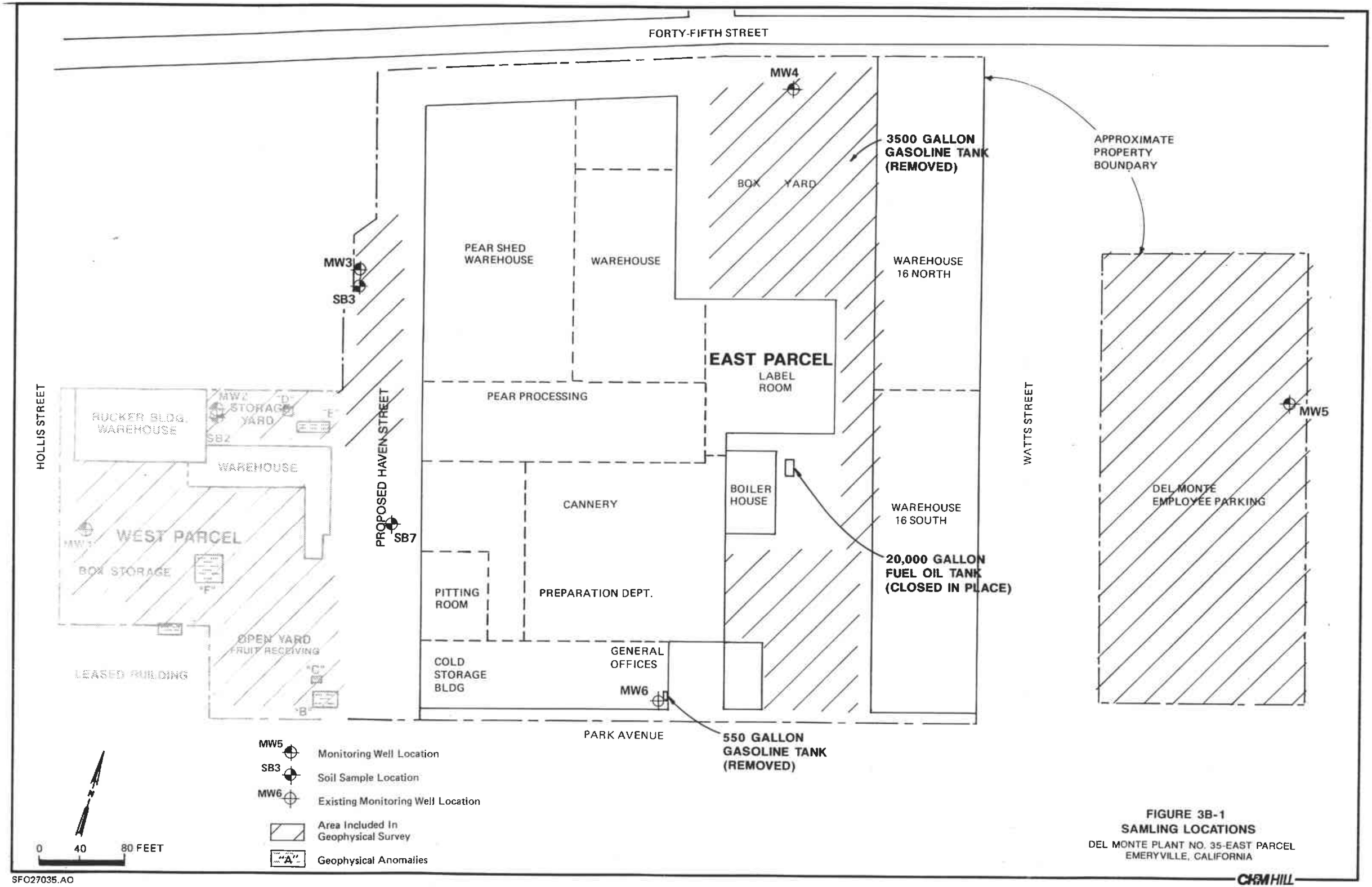


FIGURE 3B-1
SAMLING LOCATIONS
DEL MONTE PLANT NO. 35-EAST PARCEL
EMERYVILLE, CALIFORNIA

SFO27035.AO

CH2M HILL

locations are shown in Figure 3B-1. The rationale for the sample locations was as follows:

- SB3 was collected from a depth of 5.5 feet below ground surface outside of the warehouse where the one-ton chlorine cylinders are stored (1988).

- SB7 was collected from a depth of 5.5 feet below ground surface outside of the main warehouse where the 1,500-gallon tanks of liquid chlorine and chlorine cleansing agent are stored (1988).

Soil Sampling Procedures

The soil borings were drilled using 8-inch outer diameter hollow stem augering equipment operated by ENSCO Environmental Services.

Prior to drilling, the boring location was marked with spray paint on the pavement and subsurface utilities were cleared. Before each sampling, the sampler and brass sleeves were washed in Alconox and rinsed with clean water. The brass sleeves were also rinsed with isopropanol, allowed to dry, and rinsed with deionized water.

Soil samples were collected by driving a 2.5-inch-diameter, 18-inch-long Modified California sampler containing three 6-inch brass sleeves ahead of the augers. After removing the sampler, the augers were advanced to the bottom of the sampled hole. Upon encountering native clay, the middle brass sleeve, containing the soil sample most representative of the clay beneath the fill/native clay interface, was retained for laboratory analysis. If the interface was passed, another boring was drilled to the correct depth adjacent to the first boring. The subsurface lithology was described using the contents of the top and bottom brass sleeves and the drill cuttings.

Soil samples were labeled, sealed with teflon-lined caps and electrical tape, decontaminated with Alconox and water, placed in ziplock plastic bags, and stored in an ice-filled cooler. Chain-of-custody forms were placed in a ziplock plastic bag and taped to the inside lid of the cooler. Custody seals were then taped across the closed lid of the cooler, and the coolers were shipped to the laboratory by Greyhound bus for overnight delivery.

Decontamination fluids were contained in a 630-gallon Baker tank. Cuttings were returned to the borehole from which they were drilled and covered with an asphalt cap where necessary.

The fill below Plant No. 35 is composed primarily of clay containing gravels. The native soil beneath the interface is predominantly silty clay. Based on the lithologic logs of the soil borings (Appendix E), fill extends to a depth of 5 and 8 feet below ground surface. The native silty clay extends from beneath the fill to a depth of approximately 15 to 20 feet below the ground surface. The silty clay is underlaid with silty sand. To

collect soils with the highest potential for containing organic chemicals, soil samples were collected at the interface of the fill and native soil.

To assess whether chemicals used at Plant No. 35 are present in the soil, the samples were analyzed for chlorine, volatile organic compounds (VOCs) (EPA Method 8240), base/neutral compounds (EPA Method 8270), and total petroleum hydrocarbons (TPH) as diesel and gasoline. The results of the soil sample analyses are presented in Table 3B-1 and laboratory data sheets are provided in Appendix F.

Table 3B-1
East Parcel Chemical Storage Areas
Soil Sampling Results

Compound Detected	Concentration (ppm)[a]	
	SB3	SB7
TPH as gasoline	<50	390
Methylpentenoic Acid	<0.005	0.035
di-n-Butylphthalate	0.048	0.100
Toluene	<0.010	<0.010
Trichloroethylene	<0.005	<0.005

[a]Parts per million as mg/kg

TPH as gasoline was detected in soil from SB7. The presence of TPH near SB7 may be because of railroad and heavy equipment traffic in the vicinity.

The other compounds detected have not been reported to have been used at Plant No. 35. Di-n-butylphthalate was found in both soil samples. This compound has a number of applications including as an ingredient in adhesives, printing inks, and paper coatings (Sax, 1987). It also frequently appears in laboratory analyses because it is commonly associated with plastics.

Groundwater Investigation of East Parcel

A groundwater investigation was conducted at the Plant No. 35 property to determine the depth and direction of shallow groundwater flow beneath the property and to evaluate whether organic chemicals are present in the shallow groundwater. As noted in Section 2A, the regional direction of groundwater flow is approximately west and toward San Francisco Bay. To evaluate local shallow groundwater flow and quality, five monitoring wells were installed at the Plant No. 35 property, three of which were in-

stalled on the East Parcel. The rationale for the East Parcel well locations is described below and the locations are shown in Figure 3B-1:

- MW3 was located outside the warehouse near the chlorine tanks storage area to determine if chlorine, among other compounds, was in the shallow groundwater at this location.

- MW4 was located on the perimeter of the property along 45th Street to evaluate whether groundwater containing organic chemicals was entering the subsurface beneath the Plant No. 35 property from potential upgradient sources located to the northeast.

- MW5 was located in the employee parking lot on Watts Street to evaluate whether groundwater containing organic chemicals was entering the subsurface beneath Plant No. 35 from potential upgradient sources located to the north and east.

- MW6, the existing monitoring well that was installed as part of a previous underground storage tank removal, is located on the south side of the property near the general offices on Park Avenue.

In addition, a quality control replicate sample (identified as GW8) was collected at MW4.

Monitoring Well Installation and Development

The monitoring wells were installed and developed between December 5, 1988, and December 9, 1988. The absence of underground utilities in the vicinity of the proposed monitoring wells was verified first by contacting Underground Services Alert and subsequently by contacting the specific utility companies.

The boreholes for the monitoring wells were drilled using 8-inch-outer diameter hollow-stem augering equipment operated by ENSCO Environmental Services. Drilling proceeded by augering to the desired sampling depth and driving a Modified California sampler, containing three 6-inch brass tubes, or a split spoon 18 inches in front of the augers. Upon removing the sampler, augering continued until the next sampling depth. Samples were taken approximately every 5 feet. The subsurface lithology was logged from drill cuttings and Modified California or split spoon samples. Drilling of the boreholes for the wells was stopped at the bottom of the first saturated permeable zone of reasonable thickness (greater than 3 feet).

The monitoring wells were constructed with 2-inch-inner diameter, flush threaded, schedule 40 PVC casing and 0.01-inch slot screen. A threaded cap was placed on the bottom of the casing. The first saturated permeable interval encountered while drilling

was screened using between 5 and 10 feet of screen. Well casing and screen were installed through the hollow stem augers.

Clean, washed Monterey sand (Lone Star No. 2) was used for gravel pack. The gravel pack was installed from the bottom of the borehole upward using the augers to tremmie the sand in the annular space between the borehole wall and the well screen. The top of the gravel pack was installed to approximately 2 feet above the top of the screen.

After the gravel pack was emplaced, a 1- to 2-foot-thick layer of bentonite pellets was placed on top of the gravel pack. Water was added to the borehole after the bentonite pellets were emplaced and the bentonite pellets were allowed to hydrate for 15 to 30 minutes before well construction continued.

An annular cement-bentonite grout was installed from the top of the bentonite to the ground surface. All the wells except MW5 were completed below grade with a locking steel cover and a water-tight concrete box. Monitoring Well MW5 was completed above grade with a locking steel monument.

The wells were developed by pumping with bilge pumps until the water was free of fine-grained particles. Elevations of the top of the well casing were surveyed to the nearest 0.01 foot (Appendix I).

Prior to installing each well, the drilling equipment was decontaminated by steam cleaning. Water from steam cleaning drilling equipment and from cleaning sampling equipment was temporarily stored onsite in a 630-gallon Baker tank. Upon completion of the field work, water was discharged to the storm sewer as approved by the SFRWQCB.

Drill cuttings from each borehole were temporarily stored onsite in 55-gallon drums. The appropriate well number was recorded on each drum. Most of the soil was used on the property as backfill after the underground storage tanks were removed. Soil from MW2 (also SB2) was spread on a plastic sheet and aerated until the concentration of TPH as gasoline was below detection. The soil was then disposed in a landfill with the soil from the subsequent underground storage tank removals.

Water Level Monitoring

The water level in each of the monitoring wells was measured prior to sampling using a chalked steel tape. The date and time of each measurement was recorded in a field-book, as was the depth to the water from the reference point marked on the top of the well casing. The water level data are presented in Table 3B-2.

Table 3B-2 1988 East Parcel Water Level Data			
Monitoring Well	**Surface Elevation (MSL)[a]**	**Depth to Water[b]**	**Date of Water Level Measurement**
MW3	23.17 ft	7.0 ft	12/12/88
MW4	28.81 ft	5.0 ft	12/21/88
MW5	36.97 ft	8.5 ft	12/21/88
MW6	27.51 ft	8.6 ft	12/06/88

[a]Measured in feet above mean sea level at top of well casing.
[b]Measured in feet below the top of the well casing.

Groundwater Sampling

Groundwater sample collection began at least 2 days after the wells had been developed if the well was developed by a method other than bailing. If the well was hand bailed, it was sampled on the same day it was developed. Prior to sampling, the sampling equipment was cleaned with Alconox and the Teflon bailer was rinsed with isopropanol and deionized water.

Prior to sampling, a minimum of three casing volumes of water was removed from the well using a Teflon bailer. While evacuating the water from the well, pH, conductivity, and temperature were measured. A water sample was then collected using a Teflon bailer and transferred to the appropriate sample containers. Sample containers were labeled, decontaminated with Alconox and clean water, placed in ziplock plastic bags, and stored in an ice-filled cooler. Chain-of-custody forms were placed in a ziplock plastic bag and taped to the inside lid of the cooler. Custody seals were taped across the closed lid of the cooler, and the coolers were shipped to the laboratory by Greyhound bus for overnight delivery.

Shallow groundwater exists beneath the Plant No. 35—East Parcel at a depth of approximately 7 feet below ground surface under confined conditions in MW3, MW4, MW5, and MW6. This shallow groundwater flows horizontally from northeast to southwest under a horizontal hydraulic gradient of 0.015 feet/foot (Table 3B-2). The vertical component of groundwater flow cannot be evaluated from available data.

As with the soil samples, groundwater samples were analyzed for chlorine, VOCs (EPA Method 624), base/neutral compounds (EPA Method 625), and TPH as gasoline and diesel. In addition, groundwater was analyzed for pH, total dissolved solids (TDS),

electrical conductivity (EC), and chloride. The results of the laboratory analyses are presented in Table 3B-3 and the laboratory data sheets are provided in Appendix F.

Table 3B-3
Groundwater Sampling Results
(December 1988)

Compound Detected	Concentration (ppm)[a]						
	West Parcel		East Parcel				
	MW1	MW2	MW3	MW4	MW4 Replicate	MW5	MW6
Acetone	0.021	0.052	ND	ND	ND	0.017	ND
1,2-Dichloroethane (1,2-DCA)	0.008	0.007	0.007	ND	ND	0.008	0.0088
2-Butanone	ND	ND	0.017	ND	0.031	ND	0.0061
4-Methylphenol	ND	ND	0.002	ND	0.005	ND	ND
Trichloroethylene (TCE)	ND	ND	ND	0.013	ND	ND	ND
bis(2-Ethylhexyl)phthalate	0.020	ND	ND	ND	ND	0.090	ND
Tetrachloroethylene (PCE)	ND	0.008	ND	ND	ND	ND	ND
di-n-Butylphthalate	ND	0.004	0.003	ND	0.004	ND	ND

[a]Parts per million as mg/l
ND = Not detected

Monitoring Wells MW4 and MW5 are located on the upgradient side of the Plant No. 35 property (north and east, respectively). The compounds detected in the samples collected from these wells indicate chemicals that may be migrating into the Plant No. 35 subsurface. Monitoring Wells MW1, MW2 (West Parcel wells), and MW3 are downgradient of MW4, and MW6 is downgradient of MW5.

The compounds detected in downgradient groundwater samples from beneath Plant No. 35 were similar to those found in upgradient samples.

Acetone was detected in one upgradient well and two downgradient wells. Acetone is a common solvent used in laboratory analyses and its presence may be because of laboratory contamination. Bis(2-ethylhexyl)phthalate was detected in groundwater from MW1 and MW5. It also frequently appears in laboratory analyses because it is commonly associated with plastics.

Drinking water and aquatic toxicity data are shown in Appendix L for reference only. Three of the compounds (1,2-DCA; PCE; and TCE) detected in the monitoring wells were found at concentrations above the federal or state drinking water standards. These criteria do not specifically apply to Plant No. 35 because the groundwater be-

neath the property and in the Emeryville area is not used for drinking water. The area is highly industrialized, and the water quality is not adequate for drinking purposes.

Haven Street Soil Investigation

CH2M HILL conducted a soil investigation of the planned Haven Street location at Del Monte's Plant 35—East Parcel. The Haven Street area is a portion of the Plant 35 property located at 1250 Park Avenue that, in 1989, was planned to be transferred to the City of Emeryville. The City was expected to develop this property as a new public road to be named Haven Street. This investigation included the following activities:

- Establishing soil sampling locations over the site.
- Drilling soil borings to various depths and collecting soil samples.
- Excavating soils in an area believed to contain 2 concrete fish waste pits and sampling of the contents.
- Laboratory analysis of the soil and pit samples for selected parameters to assess the potential existence of environmental contamination.

Objectives

The purpose of the investigation at the Haven Street area was to assess the potential presence of soil contamination before any road construction. Specific objectives included soil sampling to determine the potential vertical and horizontal extent of contamination in two principal zones below the site: 1) the zone associated with the excavation and construction of Haven Street (i.e., approximately 0 to 1.5 feet depth) and 2) the zone below the construction but above the saturated zone (i.e., approximately 1.5 to 10 feet depth). Investigations in the vicinity of the reported fish waste pits included locating and delineating the pit(s) followed by sampling to determine if any chemical contaminants are present.

Background of Haven Street Investigation

The proposed Haven Street area is currently part of Del Monte's Plant 35—East Parcel, located at 1250 Park Avenue in Emeryville. In 1989, Del Monte planned to transfer this section of property to the City of Emeryville for construction of Haven Street (Figure 3B-2). According to Mr. Kolb, Director of Public Works for Emeryville, the standard city street is 60 feet wide and involves soil excavation to approximately 1.5 feet below ground surface (bgs). The Haven Street soil investigation was therefore developed to evaluate the proposed area of excavation.

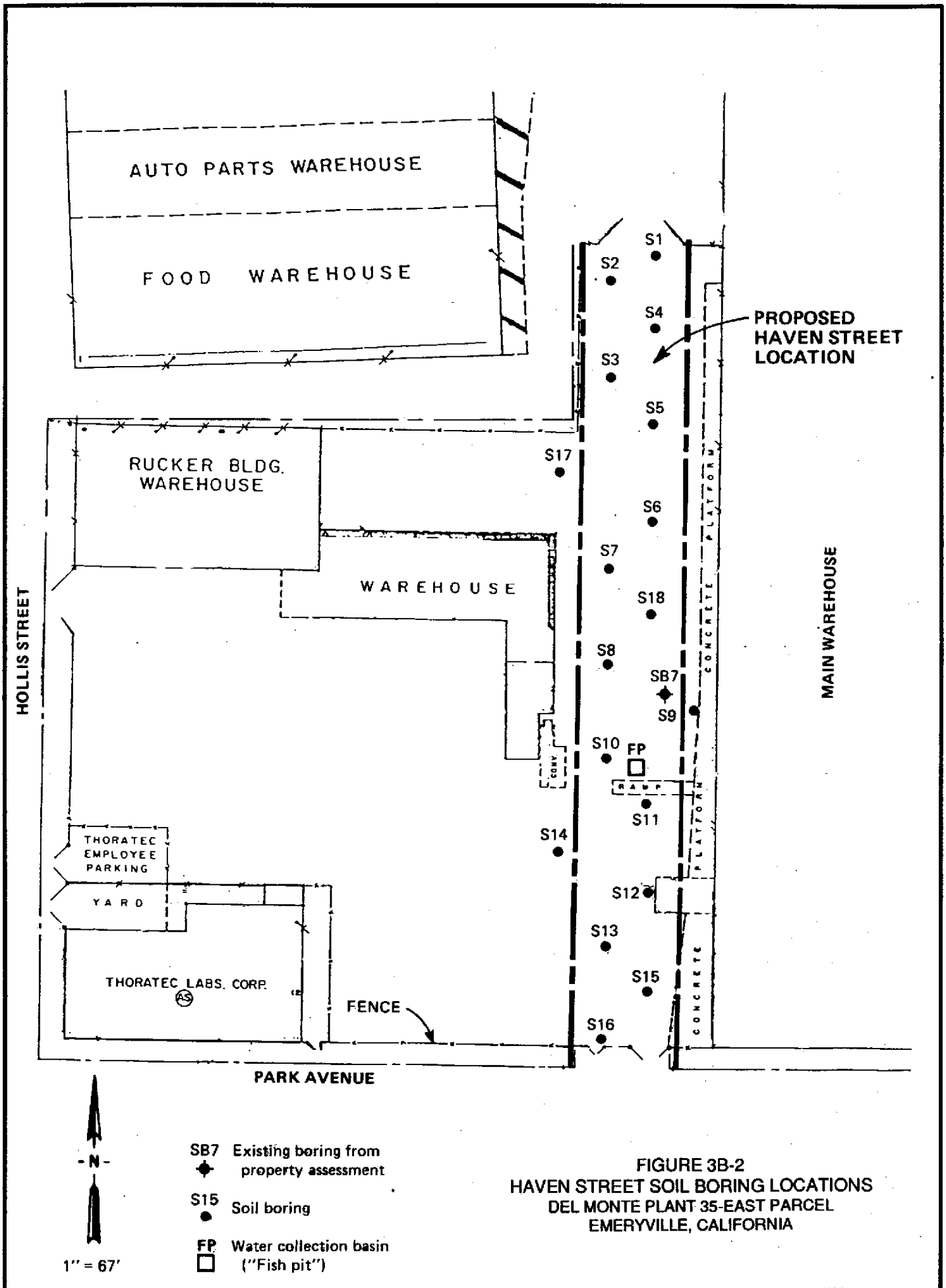


FIGURE 3B-2
HAVEN STREET SOIL BORING LOCATIONS
DEL MONTE PLANT 35-EAST PARCEL
EMERYVILLE, CALIFORNIA

CH2M HILL

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The depth to groundwater beneath the Haven Street area is approximately 7 to 10 feet bgs according the December 1988 water level data collected from Monitoring Wells MW1 through MW6. Therefore, soil sampling for the Haven Street investigation was limited to 7 to 10 feet bgs.

During past construction at Plant 35 and within the Haven Street area, two underground concrete structures were reportedly discovered during replacement of an underground drain pipe. The structures were encountered approximately 2.5 feet bgs, one on either side of the excavated drain pipe trench. These structure were assumed, because of there "fishy" odor, to be fish waste pits (i.e., water collection basins) used when the plant processed fish oil, according to Mr. Layton of Del Monte. Reportedly, the basins were covered with a steel lid. The contents and size of the basins were unknown.

Field Investigation

In the following subsections, the methods and procedures for investigation of the soils and reported fish waste pits at the Haven Street site are described.

Soil Borings

The soil investigation was conducted between November 6 through 8, 1989. The soil borings were drilled by Exploration Geoservices, Inc. Before drilling, the concrete and asphalt at each sample location was cut by Diablo Tank and Construction Company. CH2M HILL provided oversight during the drilling, collected and packaged soil samples, and arranged for laboratory analysis.

A sampling grid was established on approximately 25-foot centers within the Haven Street area (Figure 3B-2) for a total of 18 sampling locations. Three borings were located 10 feet from the proposed east and west boundaries of the 60-foot-wide Haven Street area. Boring completion depths were grouped into three depth intervals; 1) shallow (0 to 1.5 feet), intermediate (1.5 to 3.0 feet), and deep (7.5 to 9.5) as reported in Table 3B-4. Sample collection depths were measured from directly beneath the asphalt or concrete surface to the sample depth. Before advancing each boring, the drilling and sampling equipment were decontaminated by steam cleaning.

The borings were drilled using a Mobile B-50 drill rig with 6-inch-outer diameter hollow-stem augering equipment. Soil samples were collected by drilling to the desired sample depth and then driving an 2.5-inch-diameter, Modified California Sampler ahead of the augers. One brass tube was placed at the top of the sampler before driving. After the soil sample was collected, the brass tube ends were wrapped with aluminum foil, covered with plastic caps, and sealed with electrical tape. This tube was then sent to a laboratory for analysis. All of the 18 borings were sampled for TPH constituents. No fuel odors were observed nor were volatile organics detected by HNu monitoring of the soil samples.

Table 3B-4
Soil Sample Designation and Analyses
Haven Street Investigation
Del Monte Plant 35—East Parcel

Boring	Sample Depth Interval (feet)	Sample Depth Interval Designation	Laboratory Analyses
S-1	1.0-1.5	S	TPH
S-2	1.5-2.0 2.0-2.5	I I	PP TPH
S-3	7.5-8.0	D	TPH
S-4	1.0-1.5	S	TPH
S-5	1.0-1.5	S	TPH
S-6	1.0-1.5	S	TPH
S-7	1.0-1.5	S	TPH
S-8	9.0-9.5	D	TPH,PP
S-9	1.0-1.5	S	TPH
S-10	2.0-2.5 2.5-3.0	I I	TPH PP
S-11	1.5-2.0	I	TPH
S-12	1.0-1.5 1.5-2.0	S I	PP TPH
S-13	1.0-1.5	S	TPH
S-14	9.0-9.5	D	TPH
S-15	9.0-9.5	D	TPH
S-16	1.5-2.0 2.0-2.5	I I	TPH PP
S-17	1.0-1.5	S	TPH,PP
S-18	1.0-1.5	S	TPH
FP-1	--	--	TPH,PP

S = Shallow zone (0 to 1.5-foot depth)
I = Intermediate zone (1.5 to 3.0-foot depth)
D = Deep zone (7.5 to 9.5-foot depth)
FP-1 = Drainwater Collection Basin ("Fish Pit")
TPH = Total Petroleum Hydrocarbons (EPA Method 418.1)
PP = Priority pollutant parameters, including volatile organic compounds (EPA Method 8210), base/neutral compounds (EPA 8270), and 13 metals (EPA 6010/7000 series)

In 6 of the 18 borings, soils located below the position of the brass tube in the sampler were collected and placed in laboratory-supplied glass jars and sent for priority pollutant analyses (i.e., volatile organic compounds (EPA Method 8240), base/neutral compounds (EPA Method 8270), and 13 metals (EPA 6010/7000 series) (Table 3B-5). The glass jars were sealed with electrical tape, placed in ziplock plastic bags, and stored in a cooler. Chain-of-custody forms were completed before delivering the samples to the laboratory.

After sampling, the bottom 5 feet of the four deep boreholes were sealed with a bentonite cement. The drill cuttings were used to fill the remaining few feet of borehole to the ground surface. The shallow and intermediate depth borings were backfilled with the drill cuttings only.

Fish Waste Pit Excavation and Sampling

The investigation of the reported fish waste pits was conducted on November 14, 1989. With the help of Mr. Layton, the approximate location of the two pit areas was identified and excavated by Diablo Tank and Construction Company with oversight by CH2M HILL. Only one concrete pit was discovered during the excavation and it was determined to be an old drain-water collection basin for the plant. This basin was located on the south side of the drain pipe previously installed by Mr. Layton. The excavated area on the north side of the drain pipe contained two vertically standing, parallel concrete structures, although they apparently were not associated with the collection basin.

The drain-water collection basin was covered with a steel lid, which was removed during the investigation. The basin was approximately 2.5 feet in width, 3 feet in length, and 4 feet in depth and located 2.5 feet belowgrade. It was not determined if the basin has a concrete bottom or was resting directly on the underlying clayey soils. Five conduits were connected to the basin, although their origin or end destinations are unknown.

No odors or elevated HNu meter readings were observed in the basin. No liquid was present in the basin. A soil sample from the bottom of the basin was collected using a decontaminated, stainless steel trowel. The trowel was decontaminated by washing with trisodium phosphate (TSP), followed by a clean water rinse, isopropanol rinse, and air drying. The sample was placed in a glass jar provided by the laboratory and analyzed for TPH and the suite of priority pollutants detailed above for the soil borings (Table 3B-5). The sample was placed in a ziplock plastic bag and stored in a cooler. This sample was included on chain-of-custody forms which were completed prior to delivering the samples to the laboratory.

Table 3B-5
Soil Sampling Results
Haven Street Investigation
Del Monte Plant 35—East Parcel

Boring	Sample Depth Interval	Sample Depth Interval Designation	Parameter Concentrations (mg/kg)																
							Metals												
			TPH	Fluoranthene	Bis (2-ethylhexyl) phthalate	Toluene	Ag	Be	Cd	Cr	Cu	Ni	Pb	Sb	Tl	Zn	As	Se	Hg
S-1	1.0-1.5	S	<50	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
S-2	1.5-2.0 2.0-2.5	I I	<50	<0.03	<3	<0.1	<0.4	<0.2	4.3	56	19	55	<6	<1	<4	50	4.1	<0.4	0.08
S-3	7.5-8.0	D	<50	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
S-4	1.0-1.5	S	1,200	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
S-5	1.0-1.5	S	670	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
S-6	1.0-1.5	S	220	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
S-7	1.0-1.5	S	<50	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
S-8	9.0-9.5	D	<50	<0.03	<3	<0.1	<0.4	0.44	4.5	54	17	53	<6	<1	<4	46	5.1	<0.4	0.10
S-9	1.0-1.5	S	<50	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
S-10	2.0-2.5 2.5-3.0	I I	<50	<0.4	<40	0.1	<0.4	<0.2	4.3	58	23	42	14	<1	<4	72	2.8	<0.4	0.16
S-11	1.5-2.0	I	<50	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
S-12	1.0-1.5 1.5-2.0	S I	<50	<0.03	<3	0.7	<0.4	0.36	4.6	48	23	46	<6	<1	<4	54	4.6	<0.4	0.08
S-13	1.0-1.5	S	<50	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
S-14	9.0-9.5	D	<50	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
S-15	9.0-9.5	D	<50	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
S-16	1.5-2.0 2.0-2.5	I I	<50	<0.03	<3	0.3	<0.4	0.41	4.8	43	19	40	<6	<1	<4	49	7.2	<0.4	0.06
S-17	1.0-1.5	S	78	<0.2	<20	<0.1	<0.4	<0.2	4.3	280	27	46	42	<1	<4	97	3.9	<0.4	0.08
S-18	1.0-1.5	S	68	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
FP-1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

S = Shallow depth zone
I = Intermediate zone
D = Deep depth zone
FP-1 = Drainwater Collection Basin ("Fish Pit")
TPH = Total Petroleum Hydrocarbons, Analysis EPA Method 418.1
PP = Priority pollutant parameters, including volatile organic compounds (EPA Method 8210), base/neutral compounds (EPA 8270), and 13 metals (EPA 6010/7000 series). Priority pollutant metals include: silver (Ag), beryllium (Be), cadmium (Cd), chromium (Cr), copper (Cu), nickel (Ni), lead (Pb), antimony (Sb), thallium (Tl), zinc (Zn), arsenic (As), selenium (Se), and mercury (Hg).

Once sampling was completed, the excavation was backfilled with the original soils and sectioned off by flagging as a safety precaution. The concrete and asphalt debris from both the excavation and the soil borings were transported and disposed of by Diablo Tank.

Haven Street Soil Sampling Results

The results of the soil sampling and analysis from the Haven Street area and the drain-water collection basin are shown in Table 3B-5. Of the soil samplés from the "shallow" depth grouping, five had detectable (>50 ppm) levels of TPH and one had detectable (>0.1 ppm) toluene. TPH concentrations wee less than 100 ppm in two samples, between 100 and 1,000 ppm in two samples, and exceeded 1,000 ppm in one sample (S-4, containing 1,200 ppm). Two "intermediate" depth soil samples, S-10 and S-16, contained toluene in concentrations of 0.1 and 0.3 ppm toluene, respectively, slightly above the analytical method detection limit (MDL) of 0.1 ppm. No contamination was detected in the "deep" depth interval soil samples.

Parameter concentrations detected in the drain-water collection basin sample included 1,360 ppm TPH, 0.35 ppm fluoranthene, and 1.9 ppm bis(2-ethylhexyl) phthalate. The analytical MDL for these parameters were 225 ppm, 0.33 ppm, and 0.33 ppm, respectively.

Results from the metal analyses for both the soil borings and collection basin samples are shown on Table 3B-5 as total metal concentrations. The reported concentrations of total metals for the samples are significantly less than the established total threshold limit concentrations (TTLC) criteria listed in the California Administrative Code, Title 22, Article 11.

Soils encountered beneath the Haven Street site generally consisted of gray, fat to lean clays, silty clays, and sandy silty clays. Soil boring logs were not completed for the Haven Street investigation borings because of the limited soil sampling within the borehole and the relatively shallow completion depths of the borings.

Haven Street Investigation Conclusions

Detectable concentrations of TPH were found in the Soil Boring Samples S-4, S-5, S-6, S-17, and S-18 and in the collection Basin Soil Sample FP-1. All levels of TPH are below the 1,000 ppm action level guideline (1988) established by the Alameda County Health Agency (ACHA) except two, S-4 (1,200 ppm) and FP-1 (1,360 ppm).

Toluene concentrations were only slightly elevated above the MDL (0.1 ppm) in the soil samples taken from Boring S-10 (0.1 ppm), S-12 (.7 ppm), and S-16 (.3 ppm). No TTLC for toluene in soils is reported in the California Administrative Code, Title 22, Article 11. Remedial actions based on these concentration levels will not likely be required.

The fluoranthene concentration of 350 ppm in the sample from FP-1 is slightly above the MDL of 330 ppm. Fluoranthene is a common coal tar residue. It has not been listed as a carcinogen by the U.S. EPA, and the EPA has not established a Reference Dose (RfD) value to describe its noncarcinogenic effect. No remedial action will likely be required based on this concentration level.

The compound bis(2-ethylhexyl) phthalate is a plasticizer found in all plastic products and is listed as a probable carcinogenic by the EPA. The EPA RfD is 0.02 mg/kg/day. This is an estimate of the daily exposure by oral intake that is likely to be without appreciable health risk during a lifetime. This compound is also a commonly reported laboratory contaminant resulting from the use of plastic laboratory containers and equipment. No remedial action will likely be required based on this concentration level.

Contamination within the shallow depth zone (i.e., 0 to 1.5 feet) at the site and associated with the planned excavation and construction of Haven Street, is generally at low to nondetectable levels, except for two locations, S-4 and FP-1 (Figure 3B-2). Concentrations of TPH at these locations are above the ACHA action levels criteria and require remedial action.

The toluene contamination within the intermediate depth zone (i.e., 1.5-3.0 feet) is minimal as reported in samples collected from Borings S-10 and S-17. No TPH contamination was detected. Samples collected from the deep depth zone (i.e., 7.0 to 9.5 feet) also contained no detectable contamination.

The origin of the contamination at the Haven Street area is believed to be related to normal truck and train traffic activities in the warehouse yard. Other areas having chemical compounds in the soil may exist at the Haven Street property, but these would be expected to be patchy areas of limited area and depth, similar in nature to the findings of this investigation.

Haven Street Investigation Recommended Action

Based on the results of the investigation showing generally low contaminant concentrations in soil, no immediate remedial action is recommended. However, investigation and removal of the contaminated soils in the vicinity of Boring S-4 and the drain-water collection basin (FP-1) during construction of Haven Street by the City of Emeryville is recommended. These areas contain soils with TPH contamination greater than the 1,000-ppm action level criteria established by the ACHA and are viewed by ACHA as a potential environmental and health risk.

During construction, a visual inspection of soils should be conducted to evaluate whether other areas exist which have been impacted by hydrocarbons. If appropriate,

field screening for volatile organic compounds may be conducted with an HNu organic vapor analyzer or similar monitoring device. Soils determined to be potentially contaminated, either by visual inspection or results of the HNu monitoring, should be removed and stockpiled separately from the remaining soils. These soils should then be sampled for TPH and BTEX constituents to determine the appropriate disposal requirements.

Monitoring of Groundwater Monitoring Well MW6

Monitoring Well MW6 is located west and downgradient of the former 550-gallon gasoline tank located at the East Parcel (Figure 3B-1). This well was monitored between 1986 and 1990 for the gasoline constituents associated with the former tank. Table 3B-6 presents the monitoring data for MW6. Monitoring of MW6 was discontinued after February 1990 because it was determined that the petroleum hydrocarbon concentrations had stabilized at levels below MCLs and near or below the analytical method detection limits for BTEX and TPH as gasoline.

Table 3B-6
Quarterly Groundwater Monitoring Results for MW6
(Removed Gasoline Tank Site)

Monitoring Well	Sampling Date	Concentration (mg/l)				
		TPH Gasoline	Benzene	Ethylbenzene	Toluene	Xylene
MW6	02/07-86	6.200	0.0440	NA	0.0400	0.0250
MW6	08/07/87	<0.050	<0.0005	NA	0.0012	0.0006
MW6	12/06/88	<1.000	<0.0010	<0.0010	<0.0020	<0.0030
MW6	03/12/89	0.910	<0.0003	<0.0003	<0.0003	0.0110
MW6	07/10/89	0.210	<0.0003	<0.0003	<0.0003	0.0060
MW6	10/24/89	<0.050	<0.0003	<0.0003	<0.0003	<0.0003
MW6	02/07/90	0.095	<0.0003	<0.0003	0.0004	0.0039
MW6-dup	02/07/90	<0.050	<0.0003	0.0004	0.0003	0.0012
Primary MCL			0.001	0.68	2.0	1.75

Section 4A
Phase III—West Parcel

Section 4A

Phase III—West Parcel

Introduction

Phase III remedial activities conducted to date at the Plant 35—West Parcel include the tank excavations of four 50-gallon underground fuel oil tanks and a 550-gallon underground gasoline tank, and the treatment and disposal of the gasoline tank excavation soil.

Excavation of Four 50-Gallon Fuel Oil Tanks

Four underground storage tanks were removed from the West Parcel, north of the (previously) Leased Building, on March 22, 1992. The excavation procedures are included in Section 3A. The excavation was backfilled with the soil that was originally removed from the fuel oil tanks excavation and some of the clean soil excavated from the 550-gallon gasoline tank removal (described in the following subsection).

Excavation of 550-Gallon Gasoline Tank

A 550-gallon gasoline tank was removed from the southeast corner of the West Parcel on March 22, 1992. The excavation procedures are included in Section 3A.

Soil Excavation

As much of the contaminated soil as possible was removed from the excavation. After additional soil was removed from the west end, a second sample (S2-G3) was collected. The OVM indicated about 22 ppm volatile organics. The laboratory analysis showed that the sample did not contain detectable concentrations of TPH as gasoline or BTEX compounds (Table 3A-8) indicating that most of the gasoline-contaminated soil was removed from the west end.

Soil was removed from the east end of the excavation until the level of organic vapors was below the detection limit of the OVM. A soil sample (S2-G4) was then collected from the backhoe bucket of soil taken from about 6 feet below the ground surface (Figure 3A-3). The laboratory analysis (Table 3A-8) showed that the sample did not contain detectable concentrations of TPH as gasoline or BTEX compounds indicating that most of the contaminated soil was removed from the east end.

Only a few inches could be removed from the north side of the excavation because of potential structural damage to the fence. A sample was collected (S2-G5) and the OVM indicated about 465 ppm volatile organics. The laboratory results showed the

sample contained 470 ppm gasoline and 5.4 ppm xylene (Table 3A-8). Per concurrence by Mr. Byrne, after the laboratory data were available, no additional soil excavation was conducted.

After the sampling results were received, the excavation was filled with pea gravel, and the sidewalk was replaced and
inspected by the City of Emeryville Building Department.

Soil Aeration and Disposal

During excavation of the tank, soil containing TPH as gasoline was encountered as discussed in the previous section. Thereafter, each backhoe bucket of soil was monitored with the OVM. As seen by the data presented in the previous section, there was a good correlation between the OVM concentrations measured in the field and the laboratory results. The OVM appears to yield conservative results to assess TPH as gasoline contamination in soil at this site, and there-fore, the OVM was a reliable indicator. The soil containing TPH as gasoline was separated and stored on a plastic sheet on the property, and the clean soil was used as backfill in the excavation where the 4 fuel oil tanks were removed.

A composite soil sample (S2-G2) was collected from the pile of contaminated soil before aeration. The sample was collected from an area of the pile that contained a representative mixture of visibly contaminated and clean soil. The soil was then spread on plastic and aerated. As shown in Table 3A-8, the soil contained gasoline, xylene, and toluene before aeration. A composite sample (AS-1), which contained 18 ppm TPH as gasoline (Table 3A-8), was collected on May 4, 1989, after aeration. Another composite sample (AS-2) was collected on May 25, 1989, to be analyzed for lead as required prior to disposal in a landfill. The soil contained 140 mg/kg of total lead (TTLC method) and 3.8 mg/l soluble lead (STLC method) (Table 3A-8). The laboratory data sheets and the chain-of-custody records are provided in Appendix F. The soil was transported by Kern Backhoe Services, Inc. to Liquid Waste Management's Class II landfill, in McKittrick, California. A copy of the nonhazardous waste hauler record is provided in Appendix G.

Section 4B
Phase III—East Parcel

Section 4B
Phase III—East Parcel

Phase III remedial activities conducted to date at the Plant 35—East Parcel include the tank excavation and removal of a 3,500-gallon gasoline underground tank and a 550-gallon underground gasoline tank and the closure-in-place of a 20,000-gallon gasoline tank. The available information from the above work is summarized in Section 2B (Previous Investigations). Exceltech conducted the excavation, removal, and investigation of the gasoline tank removals.

Section 5A
Recommendations and Conclusions for the West Parcel

Section 5A

Recommendations and Conclusions for the West Parcel

The areas of interest for the Del Monte Plant 35—West Parcel are as follows:

- Soil in the vicinity of the former fuel oil tanks
- Soil in the vicinity of the former gasoline tank

Soil in Vicinity of Former Fuel Oil Tanks

It is recommended that the unsaturated soil in the vicinity of the former fuel oil tanks be excavated to nondetectable levels of the compounds listed in Table 5A-1. This can be accomplished after the formerly "Leased Building" at the southwest corner of the West Parcel is removed. Removing this soil will eliminate the groundwater contamination source. Confirmation soil samples will be collected to determine if the compounds in Table 5A-1 are below the respective detection limits; a minimum of four and a maximum of 25 confirmation soil samples will be collected.

Table 5A-1
Soil Remediation Levels in Fuel Oil Tank Area
Del Monte Plant 35 - West Parcel

Compound	Method	Detection Limit (ug/kg)
1,2-Dichloroethylene	EPA 8240	5 ug/kg
1,1-Dichloroethylene	EPA 8240	5 ug/kg
1,2-Dichloroethane	EPA 8240	5 ug/kg
Trichloroethylene (TCE)	EPA 8240	5 ug/kg
Perchloroethylene (PCE)	EPA 8240	5 ug/kg
Vinyl Chloride	EPA 8240	10 ug/kg

Soil in Vicinity of the Former Gasoline Tank

No further work is recommended at the former gasoline tank location. The tank and most of the soil containing gasoline constituents was removed in 1989. Gasoline constituent concentrations in the groundwater immediately downgradient of the former gasoline tank have been below MCLs since April 1991.

Section 5B
Recommendations and Conclusions for the East Parcel

Section 5B

Recommendations and Conclusions for the East Parcel

The main areas of interest for the Del Monte Plant 35 - East Parcel are as follows:

- Haven Street soil containing TPH-gasoline
- The closed in place 20,000-gallon fuel oil tank
- The removed 3,500-gallon gasoline tank area
- The removed 550-gallon gasoline tank area
- Monitoring Wells MW3 - MW6.

Haven Street

The soil sampling activities conducted along the proposed location for Haven Street is discussed in Section 3B. Three of the surface soil samples collected exceeded 100 mg/kg TPH-gasoline (S-4, S-5, S-6). These three samples locations were adjacent to one another. It is recommended that unsaturated soil in the vicinity of these three soil samples be excavated to levels at or below 100 mg/kg TPH-gasoline. A minimum of 10 and a maximum of 25 confirmation soil samples will be collected.

20,000-Gallon Fuel Oil Tank

The available information for the 20,000-gallon fuel oil tank closure-in-place is summarized in Section 2B. The investigation occurred in 1985; at the time of the investigation, underground tank investigation regulations were not firmly established. The 1985 investigation analyzed soil and groundwater samples for volatile hydrocarbons, extractable hydrocarbons, and oil and grease; no samples were analyzed for TPH-diesel or BTEX. In order to confirm that TPH-diesel and BTEX concentrations in the soil and groundwater are near or below detection limits, it is recommended that a soil boring be drilled at each end of the tank. Soil samples and groundwater grab samples collected from each boring will be analyzed for TPH-diesel and BTEX as recommended by the Regional Water Quality Control Board as the minimum verification analyses for an underground fuel oil tank investigation.

3,500-Gallon Gasoline Tank

The available information for the removed 3,500-gallon gasoline tank is summarized in Section 2B. At the time of the investigation, in 1986, underground tank investigation regulations were not firmly established. However, the petroleum hydrocarbon concentrations detected in the soil are low (10 mg/kg TPH, 0.06 mg/kg benzene, 0.26 mg/kg toluene, and 0.35 mg/kg xylene). Based on this information, no further investigative or remedial work is recommended.

550-Gallon Gasoline Tank

The available information for the removed 550-gallon gasoline tank is summarized in Section 2B. Monitoring Well MW6 data, located immediately downgradient of the former gasoline tank, indicates that petroleum hydrocarbon concentrations are below MCLs in this area (Section 3B). Based on this information, no further investigative or remedial work is recommended.

East Parcel Monitoring Wells

Groundwater is no longer being monitored on the East Parcel. It is therefore recommended that the four East Parcel monitoring wells (MW3 - MW6) be destroyed according to the California Department of Water Resources Well Standards.

Section 6
References

Section 6

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