SECOR
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WELL SCREEN
ABOVE GW LEVEL
TO 25 FT
7-25 OR 9-10—25

Request for Conditional Site Closure
725 Julie Ann Way
Oakland, California

March 2, 2004
SECOR PN: 05OT.50096.01/0005

Submitted to:

Mr. Amir Gholami
Alameda County Health Care Services Agency
Underground Fuel Storage Tank
Local Oversight Program

Submitted by:

SECOR International Incorporated
57 Lafayette Circle, 2nd Floor
Lafayette, California 94549

on behalf of

Penske Truck Leasing, Inc.
Route 10 Green Hill Road
P.O. Box 7635
Reading, PA 19603-7635

EXECUTIVE SUMMARY

On behalf of Penske Truck Leasing Company, L.P. (Penske), SECOR International Incorporated (SECOR) is submitting this Case Closure Summary as part of the Alameda County Health Care Services Agency (ACHCSA) Underground Fuel Storage Tank Local Oversight Program requirement. The Case Closure Summary presents the case information, release and site characterization information, site history and description of corrective actions.

In addition, the figures, tables and appendices shown below further present the site characterization data:

Figures

- Figure 1 – Site Location Map,
- Figure 2 – Shallow Groundwater Contours 2nd Semiannual Event, 2002,
- Figure 3 – Petroleum Hydrocarbon Concentrations 2nd Semiannual Event, 2002,
- Figure 4 – Fenton's Reagent Treatment Area,
- Figure 5 – Benzene Concentrations in Groundwater, December 2002,
- Figure 6 – Total Petroleum Hydrocarbon as diesel (TPHd) Concentrations in Groundwater, December 2002,
- Figure 7 – Historical Benzene Concentrations in Soil,
- Figure 8 – Historical TPHd Concentrations in Soil,
- Figure 9 – Soil Location and Concentration Map;

Tables

- Table 1 – Tables and report from *Tank Removal Report, Scott Co.*, November 6, 1989,
- Table 2 – Chronological Listing of Groundwater Analytical Results,
- Table 3 – Chronological Listing of Groundwater Elevation Data;

Appendices

- Appendix A – *Revised RBCA Evaluation, San Francisco French Bread Facility, 580 Julie Ann Way*, February 17, 2000,
- Appendix B – *Tier I and Tier II Risk-Based Corrective Action Evaluation, Metz Baking Company*, December 7, 1999,
- Appendix C – *EDR GeoCheck Report*, February 11, 2003,
- Appendix D – Figures and Associated Cross Sections from *Numerous Site Assessments, Geraghty & Miller, Inc.*, September 1990, February 1990 and July 1994, and
- Appendix E – Boring Logs and Tables showing Soil Analytical Results from *Numerous Site Assessments, Geraghty & Miller, Inc.*, September 1990, February 1990 and July 1994.

CONCEPTUAL SITE MODEL

Constituents of Concern - Petroleum Hydrocarbon Release Areas

Selection of petroleum hydrocarbons as constituents of concern (COC) in soil and groundwater is based on a comparison of site concentrations to Environmental Screening Levels (ESLs) for subsurface soils greater than and/or less than 3 meters (as appropriate), permitted for industrial land-use, where groundwater is not a current or potential source of drinking water (Interim Final – July 2003, San Francisco Bay Area Regional Water Quality Control Board). COCs retained for evaluation in soil are TPHg, TPHd, benzene, toluene and xylenes (total); and TPHg for groundwater.

Petroleum hydrocarbons appear to have been released at the Facility in the central portion of the Site around the former UST and waste oil tank. Figure 9 illustrates petroleum hydrocarbon concentrations in the upper fifteen to twenty feet of soil, obtained from historical data collected by other consultants. Figure 9 also illustrates the approximate boundaries of previous excavation activities. Figures 2, 3 and 4 in Appendix D (site map with cross-section locations, and cross-sections A to A' and B to B', respectively) illustrate the release scenario of the site conceptual model indicating the relative location of USTs and the waste oil tank, the TPHg/TPHd/benzene concentrations in soil from July 1994, and the location of the drainage ditch. The majority of shallow unsaturated soils containing significant concentrations of petroleum hydrocarbons were excavated from the Site at the time of the tank pull. In October 2000 SECOR treated the vadose zone, saturated soils and groundwater in the source area and the vicinity of MW-1 and MW-7 with Fenton's Reagent which significantly reduced contamination, and removed all separate phase TPHd, which had been observed in MW-1 and MW-7.

Migration in Soils

Petroleum hydrocarbon concentrations in soils are shown on Figures 9 and Appendix E. These data suggest that petroleum hydrocarbons exceeding the respective ESLs were concentrated in the central portion of the Site (namely in the vicinity of BH-1, BH-4, MW-1, MW-4 and MW-7), at depths of approximately 5 and 15 feet below ground surface. PID readings from the borings (see Appendix E) are consistent with the laboratory analytical data. Fenton's Reagent treatment conducted in October 2000 was designed to significantly reduce soil and groundwater concentrations, and eliminate residual separate phase observed in MW-1 and MW-7. Groundwater monitoring results since 2000 have shown the TPHd was drastically reduced in all wells, and separate phase TPHd is no longer observed in MW-1 and MW-7. The available analytical data conducted before the Fenton's Reagent treatment suggests that petroleum hydrocarbons have not migrated vertically into deeper soils or laterally off-site. All

petroleum hydrocarbons appear to have remained on-site based on soil groundwater data.

Migration in Groundwater

Petroleum hydrocarbons reported as TPHd in groundwater at the Site are presented on Figures 3 and 6. These data suggest the following:

- TPHd concentrations exceeding the diesel ESL is concentrated in the central portion of the Site (namely, MW-1, MW-4 and MW-7) and bounded by a clean down gradient well, MW-8.

- As shown on Table 2, TPHd concentrations continue to generally decrease in groundwater samples collected from monitoring wells MW-1, MW-4 and MW-7. These data suggest that Fenton's Reagent treatment conducted in October 2000 has been successful in eliminating free-product from monitoring wells MW-1, MW-4 and MW-7 and creating a more conducive environment for biodegradation. The greatest effect of the Fenton's Reagent treatment was observed within a year of treatment, continuing TPHd concentration reductions are attributable to less residual source in soils from the elimination of separate phase and anaerobic biodegradation.

CURRENT SOIL AND GROUNDWATER CONDITIONS

The anticipated current soil concentrations are below any of the concentrations observed in the past. For evaluation purposes, post excavation soil concentrations were used here to assess soil concentrations prior to Fenton's Reagent treatment (based on soil data taken during well/boring installation from 1990 to 1994). Current groundwater (based on data collected during the Second Semiannual Groundwater Monitoring Report for 2002) concentrations for the constituents of concern are shown below from the most recent sampling events. For comparison purposes, the ESLs are shown (in parentheses) as well. These screening levels are extremely conservative since they are risk-based levels.

- Soil
  - TPHg – 820 ppm (400 ppm)
  - TPHd – 5,500 ppm (500 ppm)
  - Benzene – 3.2 ppm (0.5 ppm)
  - Toluene – 15 ppm (9.3 ppm)
  - Ethylbenzene – 8.3 ppm (13 ppm)
  - Xylenes (Totals) – 28 ppm (1.5 ppm)

The soil ESLs for each of the constituents summarized were exceeded, with the exception of ethylbenzene. However, note that the soil concentrations above were collected during well installation from 1990 to 1994 and since then, Fenton's Reagent treatment was conducted in October 2000 and groundwater concentrations demonstrate that the affected soil has ceased impacting groundwater above ESLs for all of the constituents except TPHd at MW-1 and MW-7. Further, TPH and BTEX concentrations in groundwater show a significant decreasing trend since the Fenton's Reagent treatment. The change in soil impacts is supported strongly by groundwater data, which is a reflection of the soil hydrocarbon concentrations.

- Groundwater
  - TPHg – 340 ppb (500 ppb)
  - TPHd – 17,000 ppb (640 ppb)
  - Benzene – 2.2 ppb (46 ppb)
  - MTBE – 6 ppb (1800 ppb)

None of the groundwater ESLs were exceeded for each of the constituents, with the exception of TPHd.

The ACHCSA has approved risk-based closure for an adjacent TPH and BTEX impacted site located at 580 Julie Ann Way (in close proximity to the Site), which has TPHg and BTEX concentrations at approximately the same or higher levels as the Site. According to the Tier I and Tier II Risk-Based Corrective Action Evaluation Report and addendum prepared for the 580 Julie Ann Way site (see attached), benzene is the chemical at that Site driving the estimated hazard index (HI) and cancer risk for both the hypothetical on-site indoor commercial worker and the on-site commercial worker receptor. Therefore, a Risk Management Plan was prepared to address potential exposure risk to potential on-site construction workers. The pre-Fenton's Reagent treatment soil concentrations (1990 and 1994) shown above for TPH and BTEX were slightly higher at the Penske Site than the 580 Julie Ann Way site, but the Site BTEX concentrations were well below the Region 9 Preliminary Remediation Goals (PRGs; these guidelines are used to determine which constituents are to be retained for the Tier II risk evaluation), with the exception of benzene. Benzene concentrations at the Site may have exceeded the PRGs, but were well below the benzene specific ESL.

CONCLUSIONS

Based on the results of site characterizations, source remediation and long term monitoring, the Site Conceptual Model indicates that the COCs are:

- contained on-site by low permeability soils, a flat groundwater gradient; and
- natural attenuation.

There are no potential receptors except industrial workers working in upgradient and down gradient buildings which do not overlie the impacted areas, and the potential the down gradient drainage ditch, that is down gradient of MW-8, which only had 97 µg/L of TPHd or greater than 6 times lower than the TPHd ESL. The groundwater aquifer is designated a non-beneficial use aquifer. Although soil benzene and xylene concentrations exceeded ESLs a decade ago, Fenton's Reagent treatment and natural attenuation has degraded both of these COCs as is observed by their absence in groundwater. TPHd currently exceeds ESLs for soil and groundwater in three monitoring wells, but it is not volatile or mobile, and poses no danger to any potential receptors off-Site or on-Site, including industrial workers working in excavations.

As a result, the site meets requirements for conditional closure, and SECOR, on behalf of Penske, respectfully requests conditional site closure with a deed restriction to limit site use to commercial industrial, as the Site is currently zoned and used.

Alameda County Environmental Health

CASE CLOSURE SUMMARY
UNDERGROUND FUEL STORAGE TANK LOCAL OVERSIGHT PROGRAM

I. AGENCY INFORMATION

Date: 12/15/2003

Agency Name: Alameda County Environmental Health	Address: 1131 Harbor Bay Parkway
City/State/Zip: Alameda, CA 94502	Phone: (510) 567-6700
Responsible Staff Person:	Title: Hazardous Materials Specialist

II. CASE INFORMATION (see Figure 1 – Site Location Map)

Site Facility Name: Former Penske Truck Leasing Facility		
Site Facility Address: 725 Julie Ann Way, Oakland, CA		
RB LUSTIS Case No.: ---	Local Case No.:	LOP Case No.:
URF Filing Date:	SWEEPS No.: ---	APN:

Responsible Parties	Addresses	Phone Number
Mr. Richard Saut, Environmental Project Manager	Penske Truck Leasing Company, L.P. Route 10, Green Hills P.O.Box 7635 Reading, Pennsylvania 19603-7635	**(610) 775-6010**

Tank I.D. No	Size in Gallons	Contents	Closed In Place/Removed?	Date
1	10,000	Diesel	Removed	1989
2	10,000	Unleaded Gasoline	Removed	1989
3	1,000	Diesel	Removed	1989
4	550	Waste Oil	Removed	1989
Piping			Removed	1989

III. RELEASE AND SITE CHARACTERIZATION INFORMATION

Cause and Type of Release: holes found in tanks	
Site characterization complete? Yes	Date Approved By Oversight Agency: ----

Monitoring wells installed? Yes	Number: 8	Proper screened interval? Yes
Highest GW Depth Below Ground Surface: 4.10 ft	Lowest Depth: 7.72 ft	Flow Direction: West /Southwest (Northern Portion of the Site), Undetermined/mounding (Southern Portion of the Site)
Most Sensitive Current Use: NA/Groundwater is currently not being used for any purpose.		

Summary of Production Wells in Vicinity:

According to the water well search report (GeoCheck Report) conducted by Environmental Data Resources, Inc. (EDR), no production wells were found within a 1 mile radius of the Site. The sources/databases searched were: Public Water Systems – Environmental Protection Agency (EPA)/Office of Drinking Water, Public Water Systems Violation and Enforcement Data – EPA/Office of Drinking Water, United States Geological Survey (USGS) Water Wells, California Drinking Water Quality Database, California Oil and Gas Well Locations for Districts 2, 3, 5 and 6. See attached report.

Are drinking water wells affected? No	Aquifer Name: East Bay Plain
Is surface water affected? No	Nearest SW Name: An unnamed ditch is located immediately west of the site, parallel to Coliseum Way. The ditch drains to a larger ditch, which appears to drain to the bay. MW-8 is the furthest downgradient well and contains only 97 µg/l TPHd, and has historically been below MCLs with the exception of one sampling event conducted during the Fenton's reagent treatment which was probably a spike due to short-term movement of dissolved TPH toward that well during treatment. Concentrations in all wells have decreased significantly since the Fenton's reagent test. The ditch is most influenced by runoff from the adjacent roadways and rail spurs. Rainwater runoff probably results in groundwater recharge in that area during the rainy season, accounting for variability in groundwater flow direction.
Off-Site Beneficial Use Impacts (Addresses/Locations): None identified	
Reports on file? Yes	Where are reports filed? Alameda County Environmental Health

TREATMENT AND DISPOSAL OF AFFECTED MATERIAL

Material	Amount (Include Units)	Action (Treatment or Disposal w/Destination)	Date
Tank	2 @ 10,000 gallons 1 @ 1,000 gallon 1 @ 550 gallon	Disposed of at H&H Ship Service Company, San Francisco, California	10/10/1989
Piping	Not reported	Assumed disposed of along with tanks	10/10/1989
Petroleum Residue and Water	~1,300 gallons	Disposed of by Hydro-Chem Services at Refinery Services, Patterson, California	10/10/1989
Soil	Not reported	Not reported	NA
Groundwater	None reported	NA	NA

MAXIMUM DOCUMENTED CONTAMINANT CONCENTRATIONS BEFORE AND AFTER CLEANUP

(See the attached Tables 1,2 and 3 for additional information on contaminant locations and concentrations; and historical groundwater elevations)

	Soil (ppm)		Water (ppb)			Soil (ppm)		Water (ppb)	
Contaminant	1a Before	2b After	3c Before	3d After	Contaminant	1a Before	2b After	2 Before	3 After
TPH (Gas) e	2,100	820	390,000	340	Benzene	36	3.2	2,200	2.2
TPH (Diesel)	13,000	5,500	2,700,000	17,000	Toluene	110	15	16,000	ND
Oil & Grease	NA	NA	NA	NA	Ethyl Benzene	38	8.3	5,300	ND
Heavy Metals	NA	NA	NA	NA	Xylenes	185	28	28,000	ND
VOCs	ND	ND	NA	NA	MTBE (if not analyzed, explain below) f	NA	NA	NA	6.0

1 – Tank Removal Report, Scott Co., November 6, 1989

2 – September 1990, February 1993 and July 1994 Site Assessment

3 – Second Semiannual Groundwater Monitoring Report for 2002

NA- Not Analyzed

ND – Not Detected

a - Soil data is based on soil samples taken after tank removal, but approximately eight years prior to Fenton's reagent treatment

b – Soil data is based on soil samples collected during boring/well installation (1990-1994).

c – Groundwater data is based on samples collected from monitoring wells MW-1 and MW-7 from February 1997 to December 2002.

d – Groundwater data is based on groundwater collected in December 2002.

e - Note that TPHg concentrations were low at the time of well installation and exceeded 100,000 µg/l after installation before decreasing again.

f - MTBE was not analyzed until the middle of September 1997 and onwards since there has never been any historical usage or storage of MTBE at the site.

Site History and Description of Corrective Actions:

In October 1989, one 10,000-gallon unleaded gasoline underground storage tank (UST), one 10,000-gallon diesel UST, one 550-gallon waste oil UST, and one 550-gallon diesel tank were removed from the subject site. Following collection of confirmation soil samples, two excavations were conducted to remove residual hydrocarbons residing in subsurface soils.

Following excavation activities and under the direction of the Alameda County Health Care Services Agency (ACHCSA), the former UST excavation was backfilled with clean pea gravel and capped with asphalt.

Soil samples collected from the former UST cavity detected concentrations of total petroleum hydrocarbons as gasoline (TPHg) ranging from 22.4 milligrams per kilogram (mg/kg) to 2,100 mg/kg. Concentrations of total petroleum hydrocarbons as diesel (TPHd) ranged from 240 mg/kg to 13,000 mg/kg. Oil and grease were detected in two of the samples collected from the gasoline and diesel UST excavations at concentrations of 54 mg/kg and 35 mg/kg. The maximum benzene, toluene, ethylbenzene and xylene (BTEX) concentrations were 36 mg/kg, 110 mg/kg, 38 mg/kg, and 185 mg/kg, respectively.

During September 1990, six soil borings were advanced in and around the former UST excavations to investigate the extent of impacted soil and groundwater. Three groundwater monitoring wells were installed (MW-1 through MW-3) in the vicinity of the former USTs. TPHg was detected in soil samples collected from two of the six borings and all of the groundwater monitoring wells at concentrations ranging from 1 to 820 mg/kg at depths ranging from 5 to 20 feet below ground surface (bgs). TPHd was detected in all of the soil borings and wells at concentrations ranging from 32 to 980 mg/kg at depths ranging from 5 to 20 feet bgs. Benzene was also detected in all of the soil borings and wells at concentrations ranging from 0.01 to 3.2 mg/kg. TPHg was detected in monitoring well MW-1 at a maximum concentration of 170 micrograms per liter (µg/l). Groundwater samples collected from monitoring wells MW-2 and MW-3 were below the laboratories minimum detection limit for TPHg. TPHd in groundwater samples collected from all three of the newly installed monitoring wells at concentrations ranging from 80 to 2,900 µg/l. Benzene was detected in all of the groundwater samples collected at concentrations ranging from 0.4 to 20 µg/l.

In February 1993, two additional groundwater monitoring wells were installed to better define the extent of groundwater impact. Monitoring well MW-4 and MM-5 were subsequently installed. The locations of these monitoring wells are depicted on Figure 2. TPHg was detected in soil samples collected from monitoring well MW-4 only at concentrations ranging from 6 to 400 mg/kg at depths ranging from 5 to 15 feet bgs. TPHd was detected within soil samples collected from both monitoring wells MW-4 and MW-5 at concentrations ranging from 21 to 4,100 mg/kg at depths between 5 and 15 feet bgs.

A third site assessment was conducted in July 1994. The objective of this site assessment was to further define the extent of soil and groundwater both downgradient (to the west) and crossgradient (to the north and southwest) of the former USTs. Four additional soil borings were drilled, three of which were converted to groundwater monitoring wells MW-6, MW-7 and MW-8. TPHg was detected in soil samples collected borings MW-6, MW-7, MW-8 and BH-4 at concentrations ranging from 1 mg/kg (boring MW-8 at 15.5 feet bgs) to 31 mg/kg (boring MW-7 at 15 feet bgs). TPHd was detected in soil samples collected from boring MW-7, MW-8 and BH-4 at concentrations ranging from 41 mg/kg (boring MW-8 at 10.5 feet bgs) to 5,500 mg/kg (boring MW-7 at 15 feet bgs). Benzene was detected in soil samples collected from borings MW-7, MW-8 and BH-4 at maximum concentrations ranging from 0.008 mg/kg (boring BH-4 at 5 feet bgs) to 0.039 mg/kg (boring MW-8 at 5.5 feet bgs).

Based on the results of the third site assessment, a non-attainment-type zone was established with the concurrence of the ACHCSA. Concentrations of benzene reported in monitoring wells MW-7

and MW-8 (2.7 µg/l) were much lower than the 21 µg/l limit established by the Regional Water Quality Control Board (RWQCB) to protect nearby estuary waters. The ACHCSA was also in concurrence with this limit. Since the concentrations of benzene within groundwater samples collected from monitoring wells MW-3, MW-6, MW-7 and MW-8 located to the northwest and west of the former USTs were lower than the limit established by the ACHCSA and the RWQCB to protect possible downgradient receptors, the attainment zone was established.

As a step to reduce overall hydrocarbon concentrations in the highly impacted zones, Fenton's reagent treatment was conducted at the Site in October 2000. To date, six quarterly groundwater monitoring events (one baseline and five post treatment events) have been conducted at the Site to evaluate the effectiveness of the treatment.

Based on the historical and current results, SECOR concludes that the Fenton's reagent treatment has been successful in eliminating free-product from wells MW-1, MW-4 and MW-7. In addition, the treatment has also created a more conducive environment for biodegradation of TPH and BTEX. The purpose of the Fenton's reagent treatment was to remove residual free-product and further remediate soil and groundwater.

The ACHCSA has approved closure for another site located at 580 Julie Ann Way (in close proximity to the Site), which has TPHg and BTEX concentrations at approximately the same level as the Site. According to the Tier I and Tier II Risk-Based Corrective Action Evaluation Report and addendum prepared for the 580 Julie Ann Way site (see attached), benzene is the only chemical at that Site with the majority of the estimated hazard index (HI) and cancer risk for both the hypothetical on-site indoor commercial worker and the on-site commercial worker receptor. Therefore, a Risk Management Plan was prepared to address potential exposure risk to potential on-site construction workers. Although the soil concentrations for BTEX are slightly higher at the Penke Site, compared to the 580 Julie Ann Way site, the concentrations do not exceed the Region 9 Preliminary Remediation Goals (PRGs; these guidelines are used to determine which constituents are to be retained for the Tier II risk evaluation), with the exception of benzene and xylenes.* Benzene was the only constituent that exceeded the Region 9 PRG for groundwater and will likely be retained for a Tier II risk evaluation, if conducted. For the detected TPH concentrations, as discussed in the Standard Guide for Risk-Based Corrective Action Applied at Petroleum Release Sites (ASTM 1995, November 1995), it is not practical to evaluate every compound present in a petroleum mixture. Therefore, risk management decisions are generally based on assessing the potential impacts from a select group of indicator compounds. The relatively low toxicities and dissolved phase mobility of aliphatic hydrocarbons (TPH) have made these chemicals of less concern to aromatic hydrocarbons. It was also stated that TPH data should not be used for risk assessments because the general measure of TPH provides insufficient information about the amounts of individual chemicals of concern present. The ASTM report further states that "of the larger number of compounds present in petroleum products, aromatic hydrocarbons (BTEX, polyaromatic hydrocarbons, and alike) are the constituents that human and aquatic organisms tend to be most sensitive to." Because BTEX data is present for this Site, TPH data was not considered. The soil concentrations presented for the Penske site were obtained from the base of the tank cavity, during tank removal activities in 1989. Note that since then, Fenton's reagent treatment was conducted and groundwater results have demonstrated that the affected soil has not impacted the groundwater as the TPH and BTEX concentrations have been generally decreasing. As summarized above, SECOR recommends that this Site be closed based on the same qualifications as the 580 Julie Ann Way site due to the similarities with respect to contaminant type and concentrations.

* The soil data is eight years old and the data predates the Fenton's reagent treatment conducted in the same area in October of 2000.

IV. CLOSURE

Does completed corrective action protect existing beneficial uses per the Regional Board Basin Plan? Yes X No		
Does corrective action protect public health for current land use? Yes		
Site Management Requirements:		
Should corrective action be reviewed if land use changes? Yes		
Monitoring Wells Decommissioned: Yes	Number Decommissioned: 3	Number Retained: 0
List Enforcement Actions Taken: none		
List Enforcement Actions Rescinded: none		

V. ADDITIONAL COMMENTS, DATA, ETC.

Considerations and/or Variances:
Conclusion:

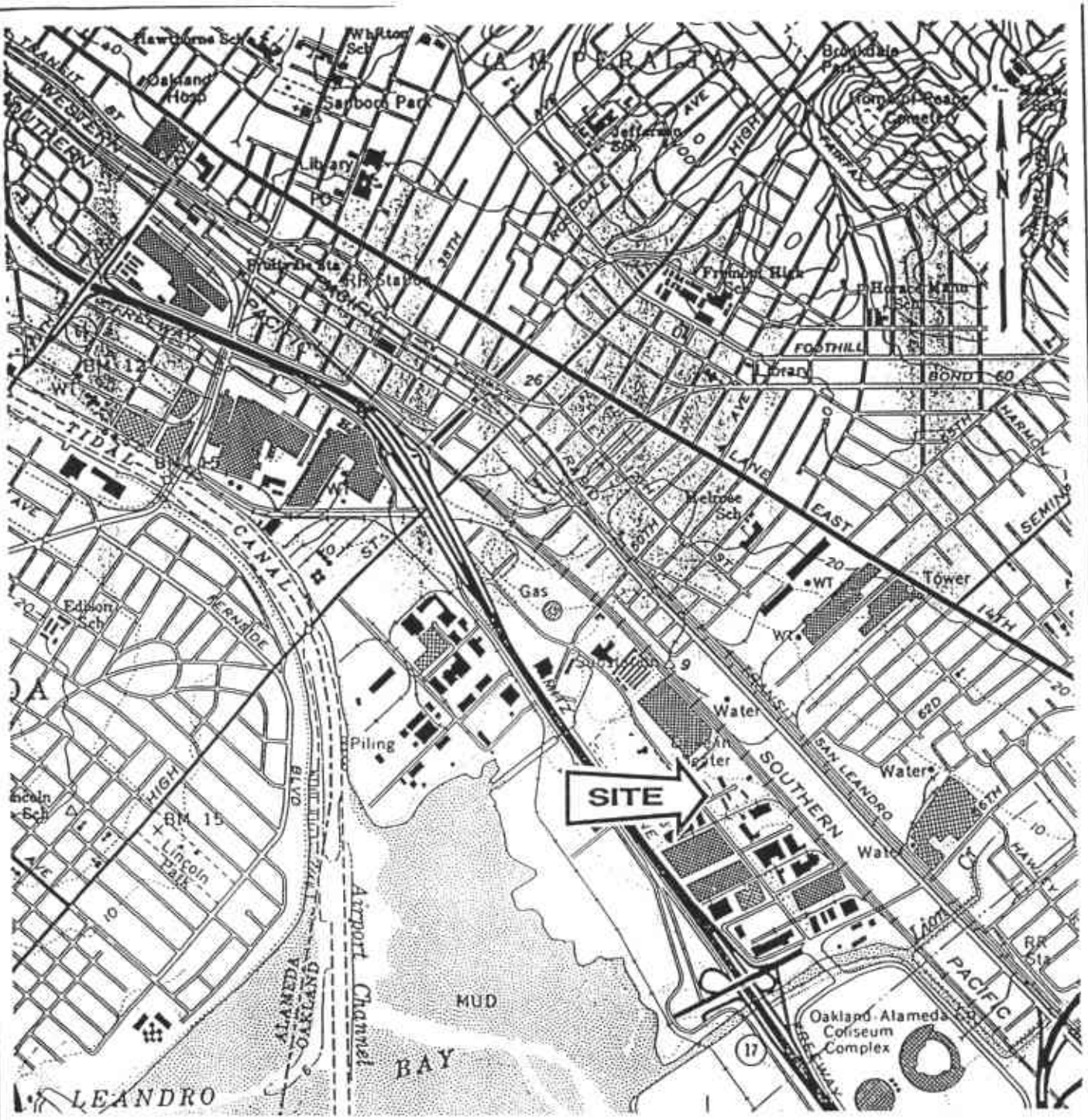
VI. LOCAL AGENCY REPRESENTATIVE DATA

Prepared by: Amir K. Gholami	Title: Hazardous Materials Specialist
Signature:	Date:
Reviewed by:	Title:
Signature:	Date:
Approved by:	Title:
Signature:	Date:

This closure approval is based upon the available information and with the provision that the information provided to this agency was accurate and representative of site conditions.

VII. REGIONAL BOARD NOTIFICATION

Regional Board Staff Name:	Title:
RB Response:	Date Submitted to RB:
Signature:	Date:



SOURCE: USGS 7.5 MINUTE TOPOGRAPHIC MAP
OAKLAND EAST, CALIFORNIA
(PHOTOREVISED 1980)

SECOR
International Incorporated

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APPR	AEM
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JOB NO.	014.07694.001

FIGURE 1
FORMER PENSKE TRUCKING COMPANY
725 JULIE ANN WAY
OAKLAND, CALIFORNIA

SITE LOCATION MAP

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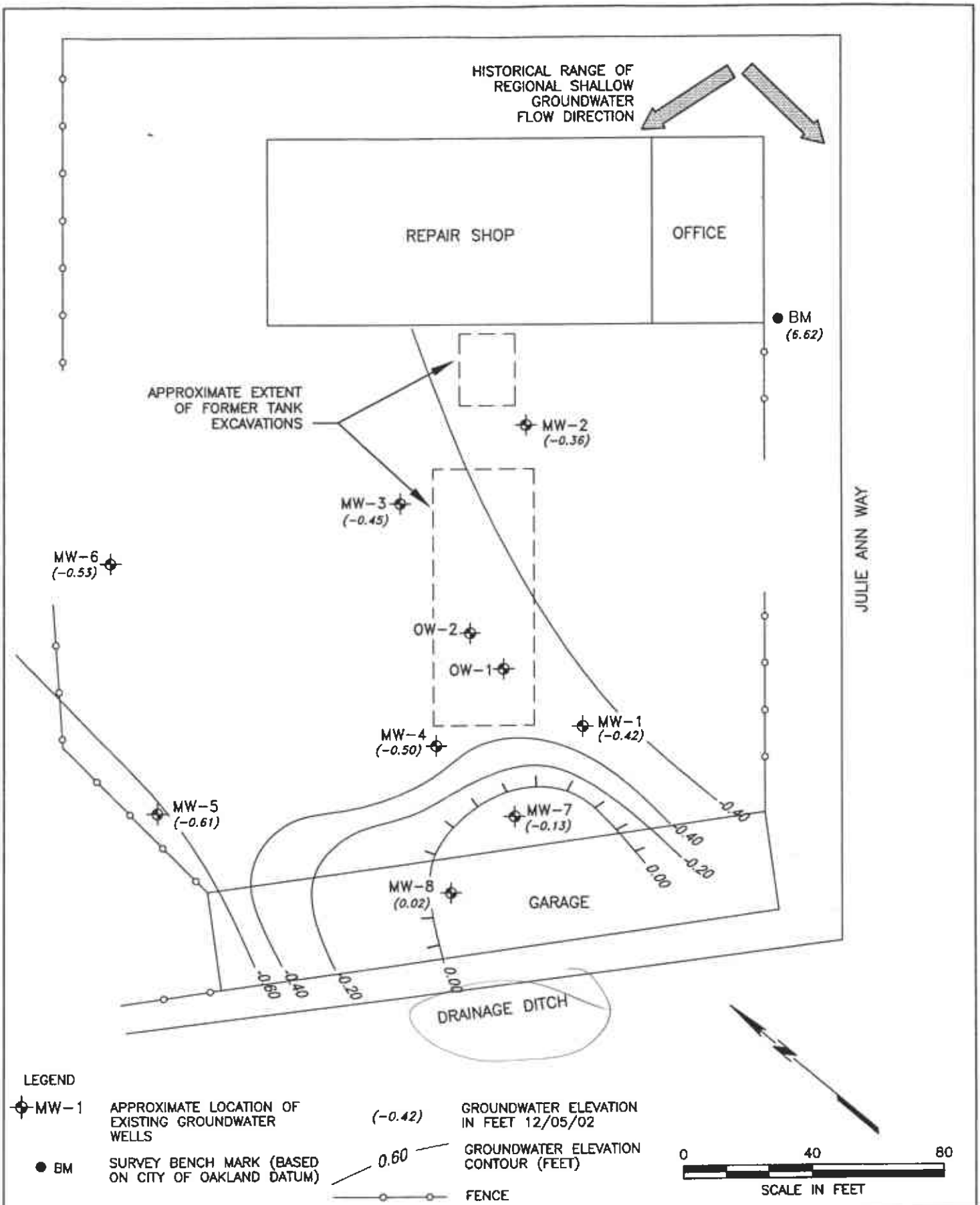

SECOR International Incorporated

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FIGURE 2
FORMER PENSKE TRUCKING COMPANY
725 JULIE ANN WAY
OAKLAND, CALIFORNIA

SHALLOW GROUNDWATER CONTOURS 2ND SEMIANNUAL EVENT, 2002

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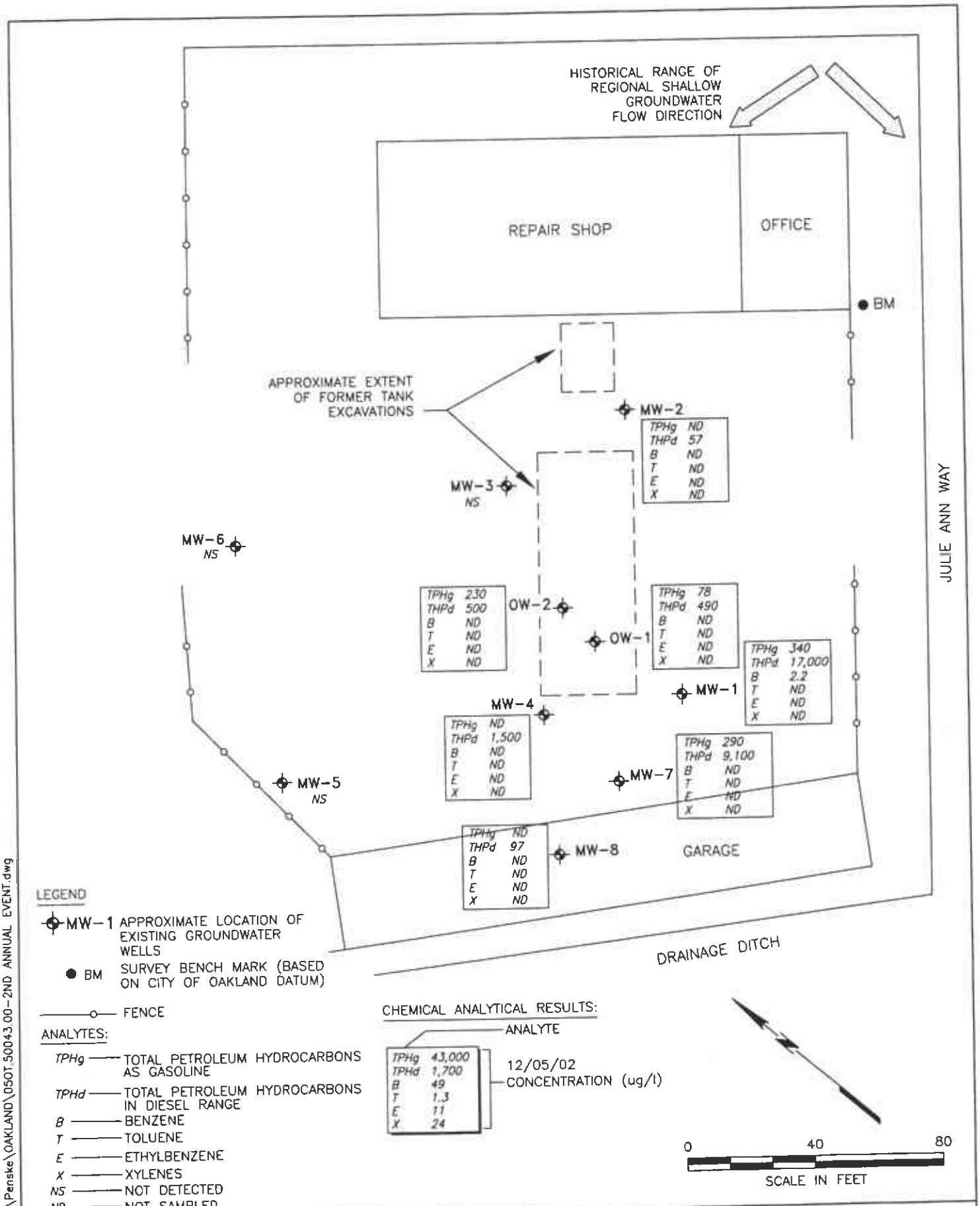

SECOR International Incorporated

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FIGURE 3
FORMER PENSKE TRUCKING COMPANY
725 JULIE ANN WAY
OAKLAND, CALIFORNIA

PETROLEUM HYDROCARBON CONCENTRATIONS
2ND SEMIANNUAL EVENT, 2002

20031208.10540576 K:\Penske\OAKLAND\050T.50043.00-2ND ANNUAL EVENT.dwg

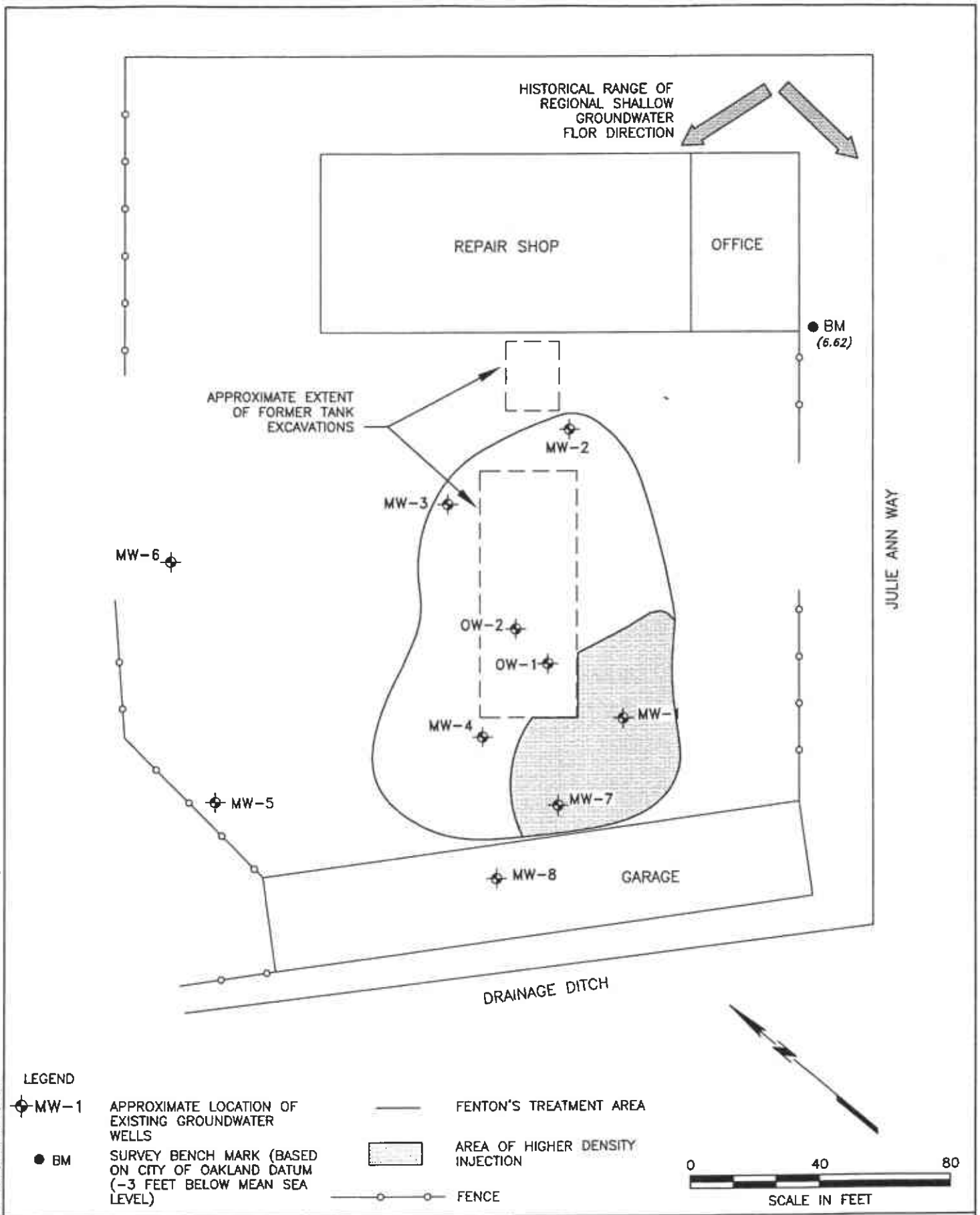

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FIGURE 4
FORMER PENSKE TRUCKING COMPANY
725 JULIE ANN WAY
OAKLAND, CALIFORNIA
FENTON'S REAGENT TREATMENT AREA

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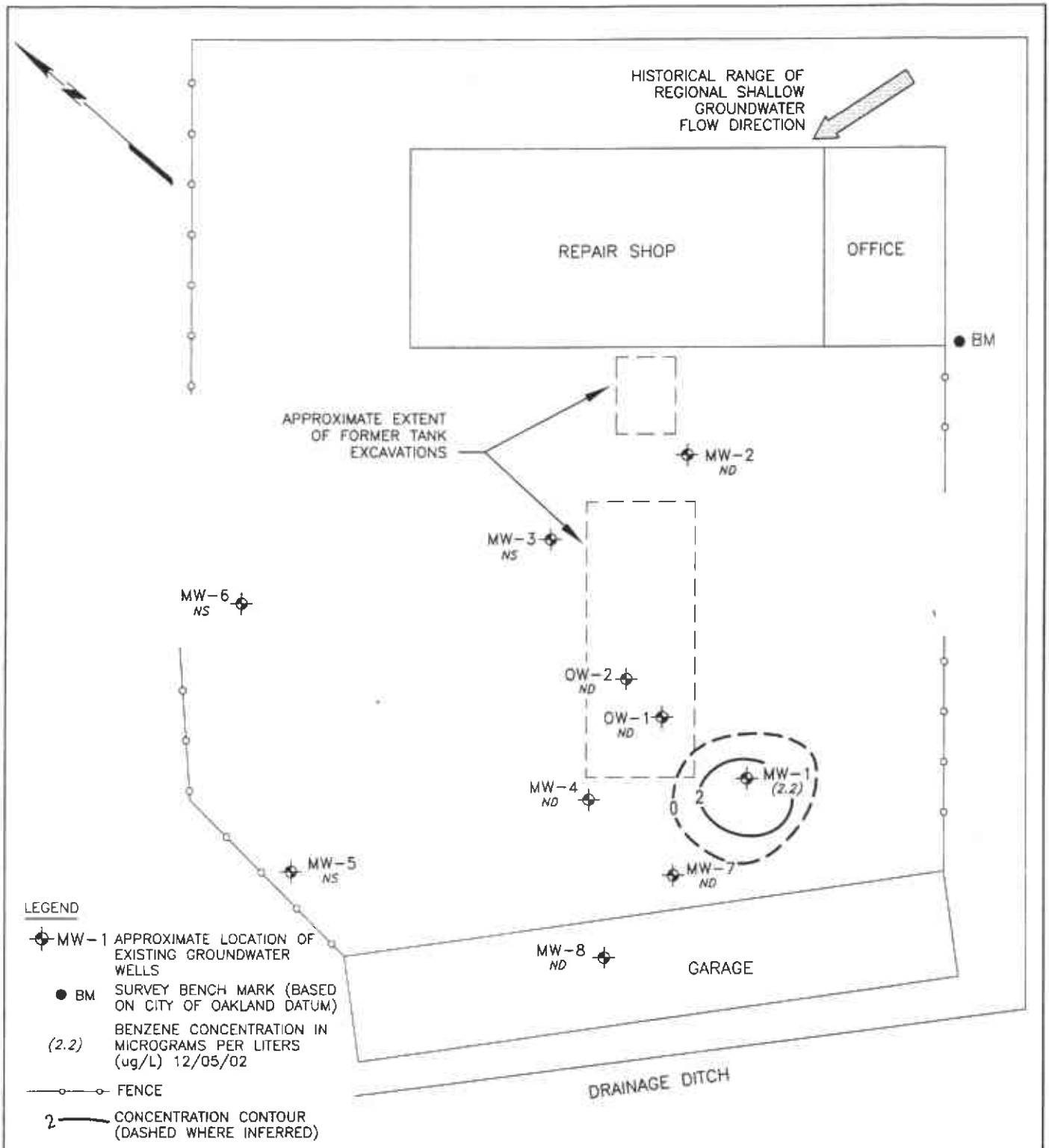

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JOB NO.	050T.50034.00

FIGURE 5

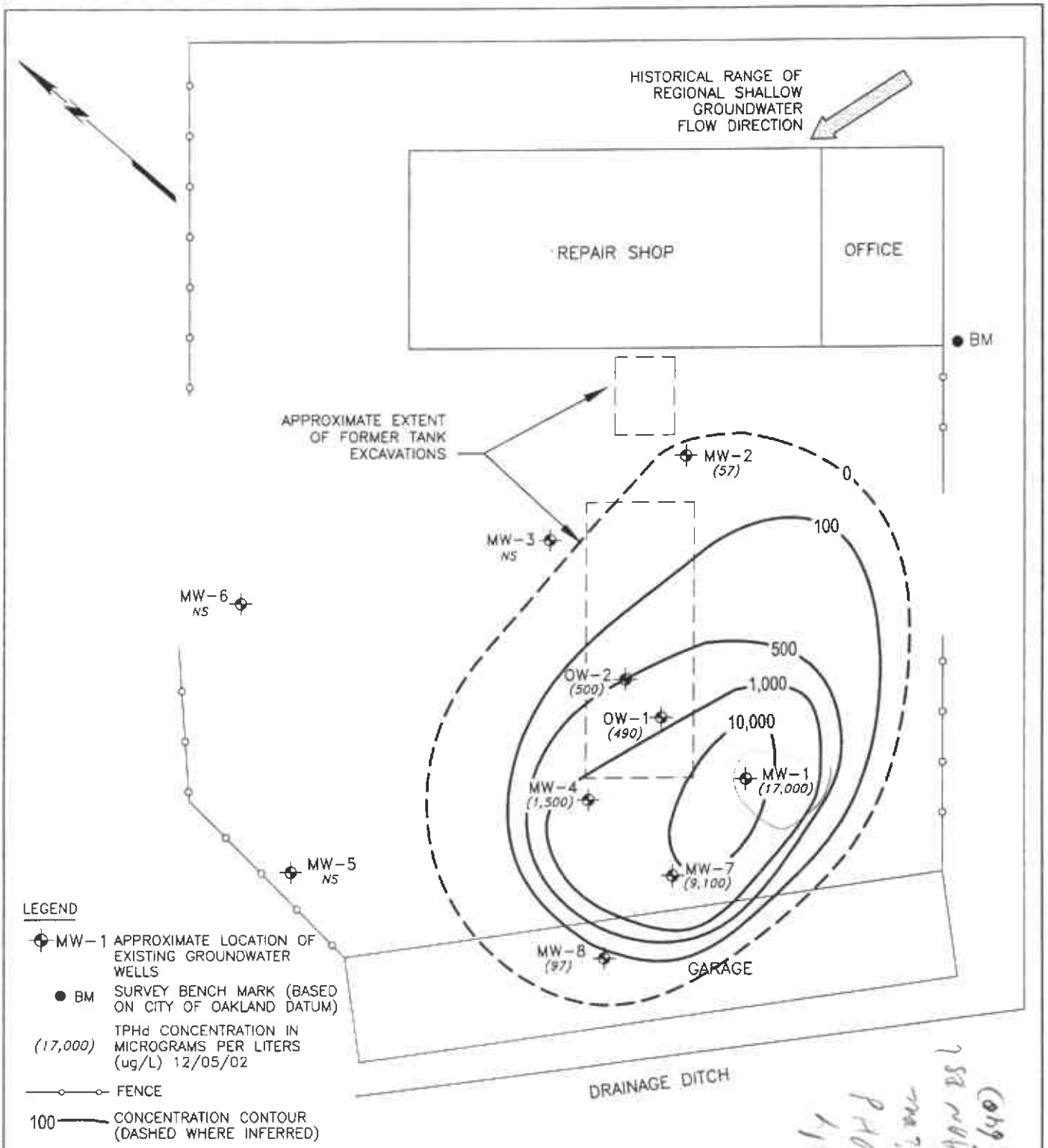
FORMER PENSKE TRUCKING COMPANY

725 JULIE ANN WAY

OAKLAND, CALIFORNIA

BENZENE CONCENTRATIONS IN GROUNDWATER

20030324 15491422 E:\Penske\OAKLAND\050T.50043.00-2ND ANNUAL EVENT.dwg



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DATE	20 MARCH 2003
JOB NO.	050T.50034.00

FIGURE 6

FORMER PENSKE TRUCKING COMPANY
725 JULIE ANN WAY
OAKLAND, CALIFORNIA

TPHd CONCENTRATIONS IN GROUNDWATER

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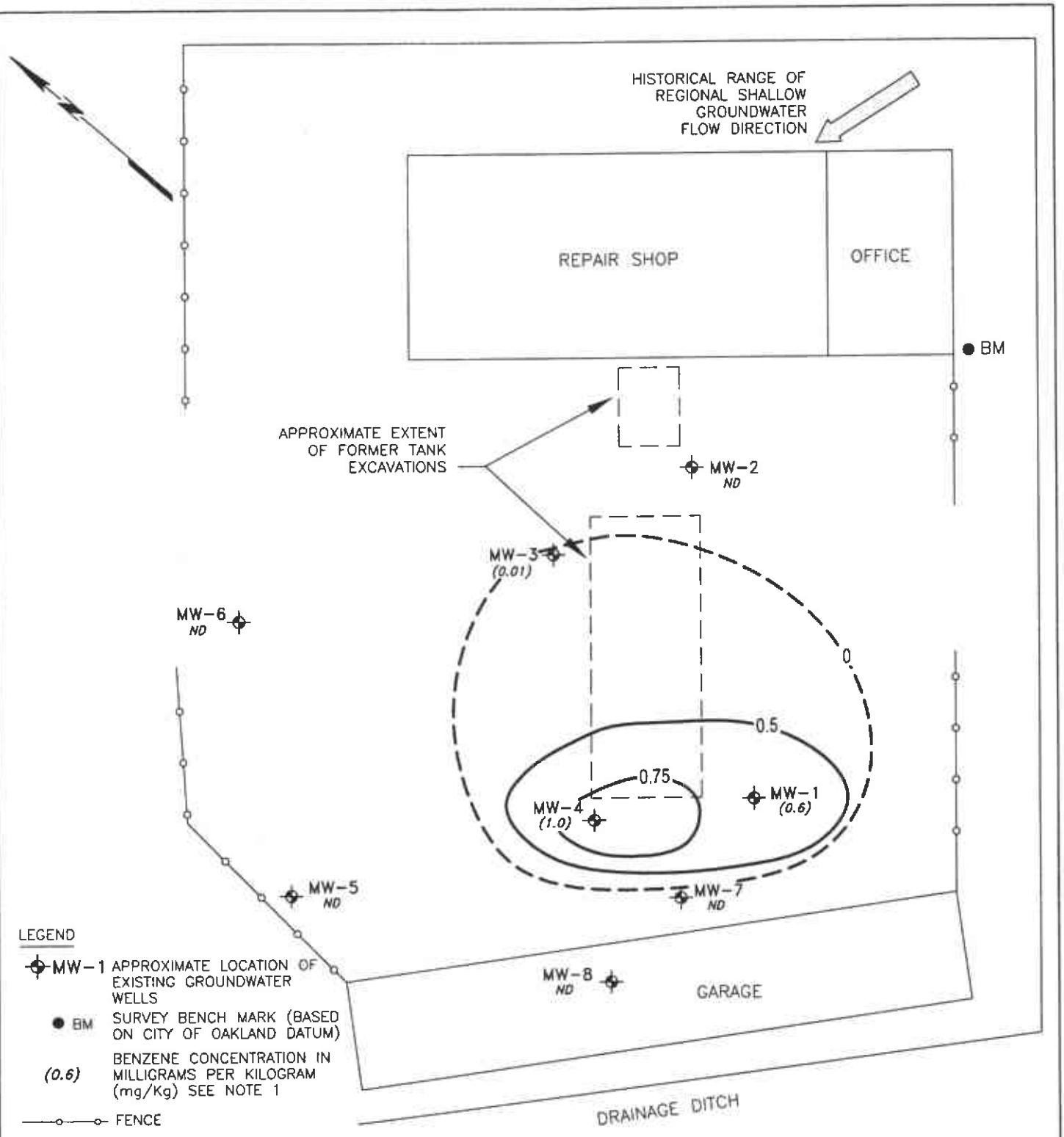

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DATE	20 MARCH 2003
JOB NO.	050T.50034.00

FIGURE 7

FORMER PENSKE TRUCKING COMPANY
725 JULIE ANN WAY
OAKLAND, CALIFORNIA

HISTORICAL BENZENE CONCENTRATIONS IN SOIL

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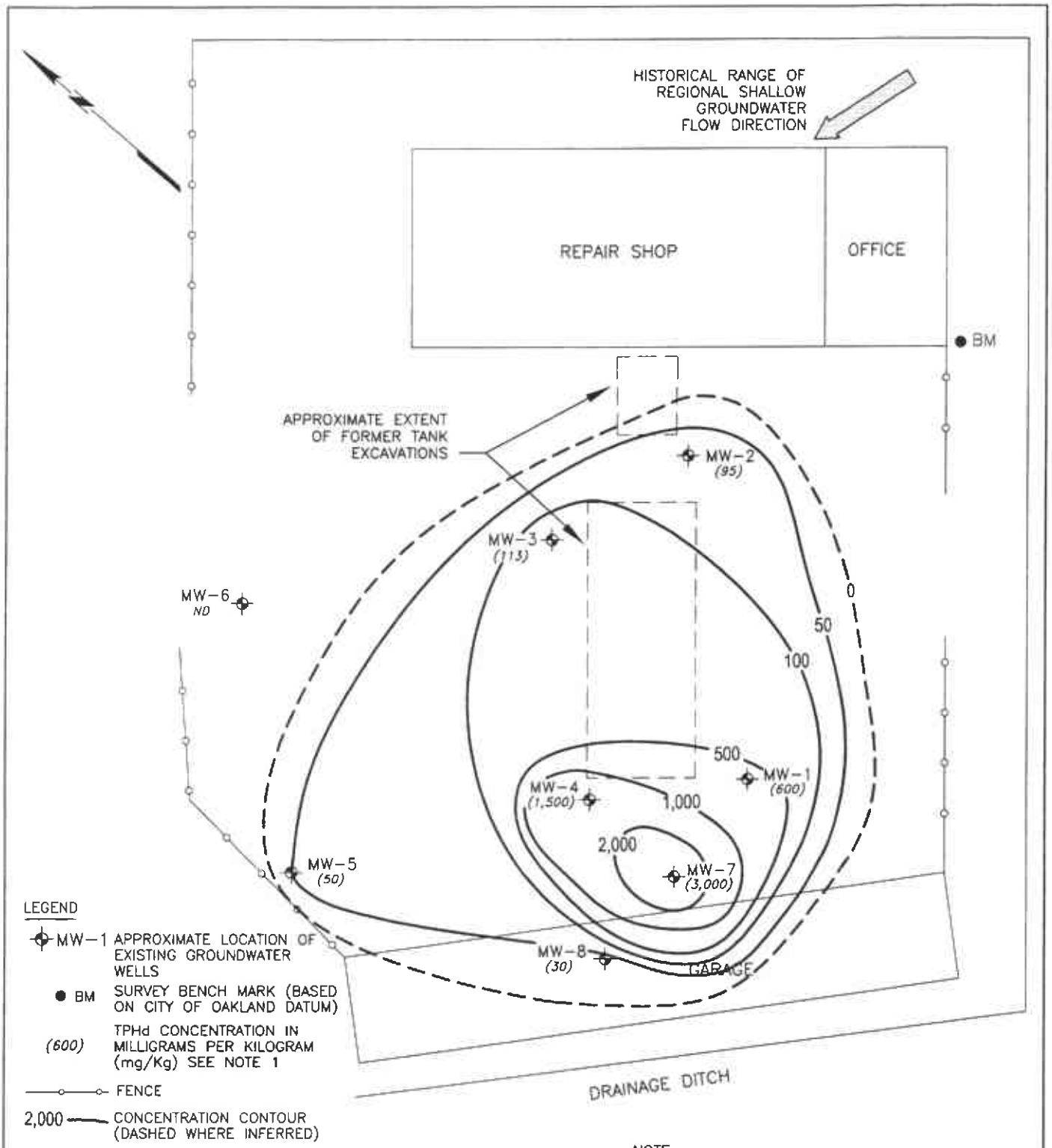

SECOR

DRAWN	RRR
APPR	MGT
DATE	20 MARCH 2003
JOB NO.	050T.50034.00

FIGURE 8

FORMER PENSKE TRUCKING COMPANY
725 JULIE ANN WAY
OAKLAND, CALIFORNIA

HISTORICAL TPHd CONCENTRATIONS IN SOIL

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BH-4	DEPTH (FEET)		
	5	10	15
	CONCENTRATION (MG/KG)		
TPHg	5	5	11
TPHd	<10	1,300	1,200
B	0.008	<0.005	0.009
T	0.1	0.018	0.098
E	<0.005	0.013	0.037
X	0.16	0.079	0.31
VOCs	NA	NA	NA

MW-6	DEPTH (FEET)		
	7	11	13
	CONCENTRATION (MG/KG)		
TPHg	7	2	<1
TPHd	<10	<10	<10
B	<0.005	<0.005	<0.005
T	0.03	0.013	0.017
E	0.006	0.005	0.005
X	0.067	0.036	0.032
VOCs	NA	NA	NA

BH-1	DEPTH (FEET)		
	10	15	20
	CONCENTRATION (MG/KG)		
TPHg	<1	380	150
TPHd	<10	460	<10
B	0.01	3.2	2.1
T	<0.003	15	8.1
E	<0.003	4.4	2.1
X	0.006	28	12
VOCs	NA	NA	NA

MW-4	DEPTH (FEET)		
	5	10	15
	CONCENTRATION (MG/KG)		
TPHg	440	26	6
TPHd	4,100	320	170
B	1.6	0.38	0.022
T	<0.15	0.009	0.045
E	8.3	0.7	0.045
X	1.4	0.56	0.15
VOCs	NA	NA	NA

MW-5	DEPTH (FEET)		
	5	10	15
	CONCENTRATION (MG/KG)		
TPHg	<1	<1	<1
TPHd	21	<1	130
B	<0.003	<0.003	<0.003
T	<0.003	<0.003	<0.003
E	<0.003	<0.003	<0.003
X	<0.003	<0.003	<0.003
VOCs	NA	NA	NA

LEGEND

- BH-1 SOIL BORING LOCATION
- MW-1 MONITORING WELL LOCATION
- SURVEY BENCH MARK (BASED ON CITY OF OAKLAND DATUM WHICH IS 3 FEET LOWER THAN MEAN SEA LEVEL

ABBREVIATION

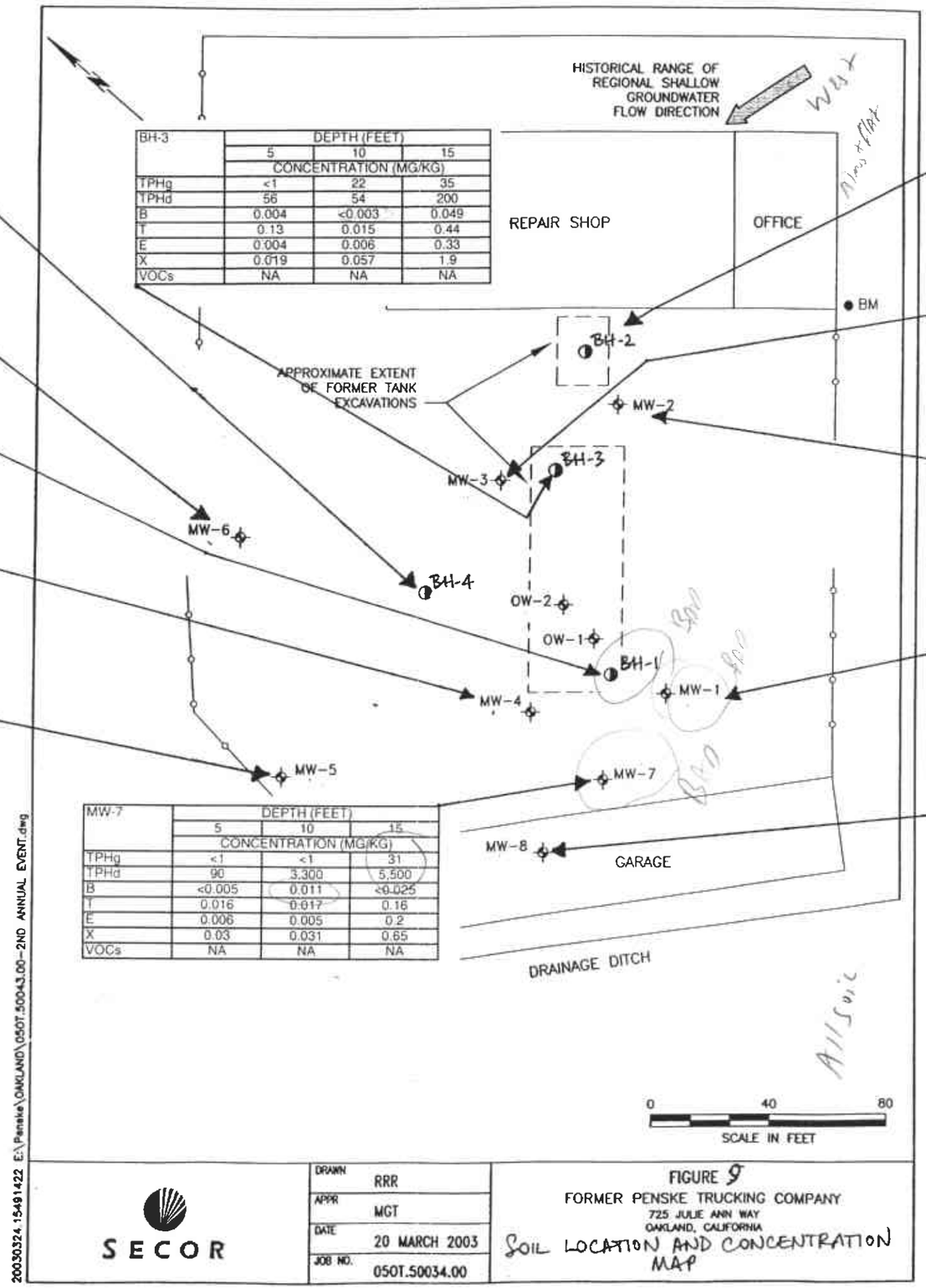
- TPHg - TOTAL PETROLEUM HYDROCARBONS AS GASOLINE
- TPHd - TOTAL PETROLEUM HYDROCARBONS AS DIESEL
- B - BENZENE
- T - TOLUENE
- E - EHTHYLBENZENE
- X - XYLENES (TOTAL)
- VOCs - VOLATILE ORGANIC COMPOUNDS
- [D] - DETECTED ACETONE (0.072 MG/KG); BENZENE (0.045 MG/KG); TOLUENE (0.03 MG/KG); XYLENES (TOTAL) (0.015 MG/KG).
- NA - NOT ANALYZED

REFERENCES:

1. RESULTS OF INITIAL SOIL AND GROUNDWATER ASSESSMENT ACTIVITIES. 11/15/1990, REVISED 12/4/1990, GERAGHTY & MILLER, INC. (GMI).
2. SITE ASSESSMENT REPORT – ADDITIONAL SOIL AND GROUNDWATER ASSESSMENT, 3/15/1993, GMI.
3. SITE ASSESSMENT REPORT – ADDITIONAL SOIL AND GROUNDWATER ASSESSMENT, 9/29/1994, GMI.

NOTES:

1. SAMPLE CONCENTRATIONS ARE REPORTED IN MG/KG.
2. SAMPLES NOT DETECTED FOR ANY PARAMETERS ARE DENOTED WITH <.



BH-3	DEPTH (FEET)		
	5	10	15
	CONCENTRATION (MG/KG)		
TPHg	<1	22	35
TPHd	56	54	200
B	0.004	<0.003	0.049
T	0.13	0.015	0.44
E	0.004	0.006	0.33
X	0.019	0.057	1.9
VOCs	NA	NA	NA

MW-7	DEPTH (FEET)		
	5	10	15
	CONCENTRATION (MG/KG)		
TPHg	<1	<1	31
TPHd	90	3,300	5,500
B	<0.005	0.011	<0.025
T	0.016	0.017	0.16
E	0.006	0.005	0.2
X	0.03	0.031	0.65
VOCs	NA	NA	NA

BH-2	DEPTH (FEET)	
	10	15
	CONCENTRATION (MG/KG)	
TPHg	<1	<1
TPHd	<10	36
B	<0.003	<0.003
T	<0.003	<0.003
E	<0.003	<0.003
X	<0.003	<0.003
VOCs	<	<

MW-3	DEPTH (FEET)		
	5	10	15
	CONCENTRATION (MG/KG)		
TPHg	<1	26	44
TPHd	<10	190	150
B	0.005	<0.003	0.025
T	<0.003	0.018	0.18
E	<0.003	0.007	0.087
X	<0.003	0.096	0.33
VOCs	NA	NA	NA

MW-2	DEPTH (FEET)			
	5	10	15	20
	CONCENTRATION (MG/KG)			
TPHg	1	<1	4	<1
TPHd	170	32	85	<10
B	0.14	<0.003	<0.003	<0.003
T	0.02	<0.003	<0.003	0.017
E	0.006	<0.003	<0.003	<0.003
X	0.031	<0.003	<0.003	0.005
VOCs	[D]	<	<	NA

MW-1	DEPTH (FEET)		
	5	10	15
	CONCENTRATION (MG/KG)		
TPHg	2	820	2
TPHd	<10	760	980
B	0.04	1	0.53
T	0.015	0.56	2.2
E	0.01	0.46	0.93
X	0.051	4.1	4.5
VOCs	NA	NA	NA

MW-8	DEPTH (FEET)		
	5.5	10.5	15.5
	CONCENTRATION (MG/KG)		
TPHg	18	5	1
TPHd	50	41	<10
B	0.039	<0.005	<0.005
T	0.23	0.011	0.013
E	0.3	<0.005	0.005
X	0.85	0.2	0.037
VOCs	NA	NA	NA

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SECOR

DRAWN	RRR
APPR	MGT
DATE	20 MARCH 2003
JOB NO.	050T.50034.00

FIGURE 9
FORMER PENSKE TRUCKING COMPANY
725 JULIE ANN WAY
OAKLAND, CALIFORNIA
SOIL LOCATION AND CONCENTRATION MAP

SCOTT CO.
MECHANICAL CONTRACTORS
1919 Market Street
P.O. Box 12954
Oakland, California 94604
(415) 834-2333
Contractors License No. 184480

November 6, 1989

Geraghty & Miller, Inc.
1050 Marina Way South
Richmond, California 94804

Attention: Mr. Jeffrey W. Hawkins R.G.

Gentlemen:

Please find enclosed a summary of the tank pull, soil sampling and analytical results.

If there are any questions please don't hesitate to call.

Sincerely,

SCOTT CO. OF CALIFORNIA

Bob Dias

Bob Dias
Environmental Manager

Summary of activities of tank pull at Hertz Penskie, 725 Julie Ann Street, Oakland, California, October 10th, 1989.

Arrived on site at 1200 hours. Underground Storage tanks were scheduled to be removed at 1230 hours. All the tanks were exposed in the tank pits, and dry ice had already been put in the tanks. I met with Ariu Levi, of the Alameda County Health Agency, who arrived on the site about 1300 hours. The fire marshal arrived shortly after. I also met with Carolyn Boyles, of E.A. Engineering, Science and Technology. She was hired by Scott Co. to take soil samples, draw up a map of soil locations, and fill out chain-of-custody of samples. She drew up a site map (Figure 1) and identified the tanks while waiting for the arrival of the trucks that were to haul the tanks away. No water was seen in either of the tank pits. A layer of brick, concrete, and wood was exposed at about 4 to 5 feet below ground level in the diesel/gasoline tank pit. It appeared that this was the level of the original landscape and that the soil above was more recent, imported fill. The depth to this brick, etc., was variable.

At 1335 hours the tank removal began. The first tank pulled was the tank that had contained unleaded gasoline. Several inches of water was pooled in the depression left by the tank, and water was draining from inside the tank through a hole located at the bottom of the tank below the fill spout. The tank wrappings were fairly decomposed, particularly at the bottom. The water in the pit had a strong odor of product and was black in color.

The second tank removed was the large diesel tank. No holes or evidence of weakness in the seams was seen. The tank wrappings were partially decomposed, and water was pooled beneath the tank. This water had a strong product odor and appeared to have product in it.

The third tank removed was the small (about 550 gallon) diesel tank. The tank appeared intact, and there was no water in the shallow depression. While the waste oil tank was being pulled Carolyn began soil sampling. Seven soil samples were taken at the two tank pits. Figure 1 shows the sample depths, location, and OVM readings for the samples.

Mr. Levi stated which analyses he wanted run on the samples (according to State of California Leaking Underground Fuel Tank guidelines) and the location of some of the samples, namely Samples 3 and 6. He did not think it was necessary to run an 8270 (priority pollutants) on Sample 7 (from the waste oil tank). The analyses that have been performed are listed on the attached copy of the chain-of-custody.

Figure 2 shows the locations of remaining samples to be taken. Two soil piles from the diesel/gasoline tank pit and one pile from the waste oil tank pit were on the site. One composite sample from the waste oil pit pile and one composite sample from the two diesel/gasoline tank pit piles need to be taken. Also, one sample for every 20 feet of product lines (one to two

samples) and one sample from inside the garage at the remote oil drain pipe still need to be taken. Because the product lines and the pipe in the garage had not yet been exposed, it was decided to take the composite samples at a later date, when the other samples will be taken. For the composite sample from the diesel/gasoline piles and the sample(s) along the product lines, Mr. Levi requested analysis for total petroleum hydrocarbons (TPH) as gasoline, diesel, oil and grease, and also for the volatile aromatics, benzene, toluene, xylene, and ethylbenzene (BTXE). For the pile from the waste oil tank pit and the sample in the garage he requested analyses for TPH as gasoline, diesel, oil and grease; for the volatile organics, including BTXE, by GC/MS; and for the metals cadium, chromium, lead and zinc. Again, he did not feel that running an 8270 was necessary.

The water collected in the tank depressions in the tank pit did not look like groundwater but, rather, water that had accumulated during the cleaning of the tanks. Mr. Levi requested we pump this water out of the pit and then, if new water seeped in, collect a sample of that. When we arrived 16 hours later with a truck to pump this water out of the pit, the water was gone. It had seeped down below the excavation, and no new water had seeped in. After the samples were collected a chain-of-custody form was filled out and given to Ray Rodda for Transport to Western Environmental Science & Technology for analyses.

The four tanks to be cut up and scrapped were shipped to H & H Environmental Services at 220 China Basin Street, San Francisco, California.

Certificate of disposal to follow.

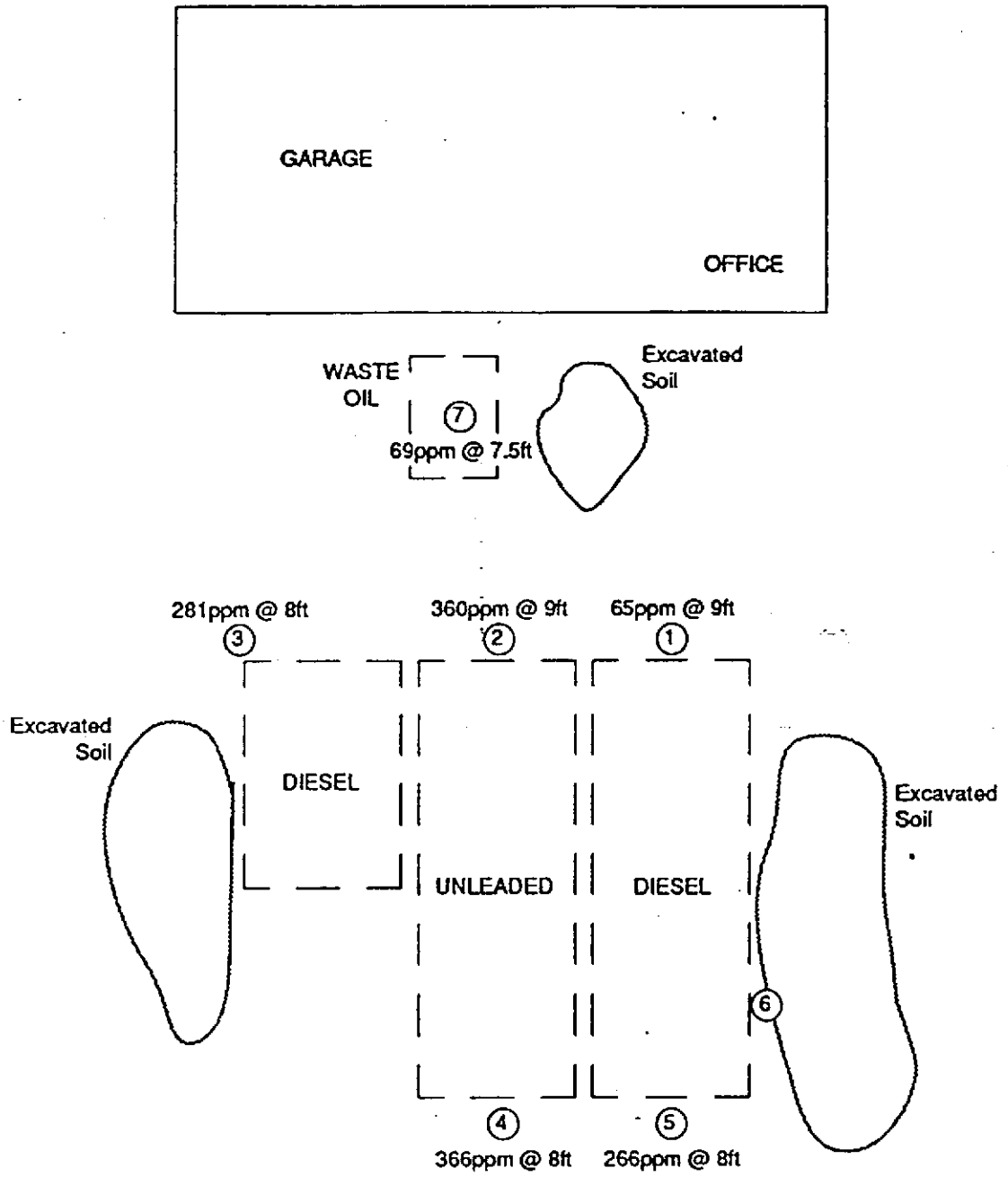
Sincerely,

SCOTT CO. OF CALIFORNIA

Bob Dias
Environmental Manager

BD:jj

cc: Mark Althen (Hertz Penske)

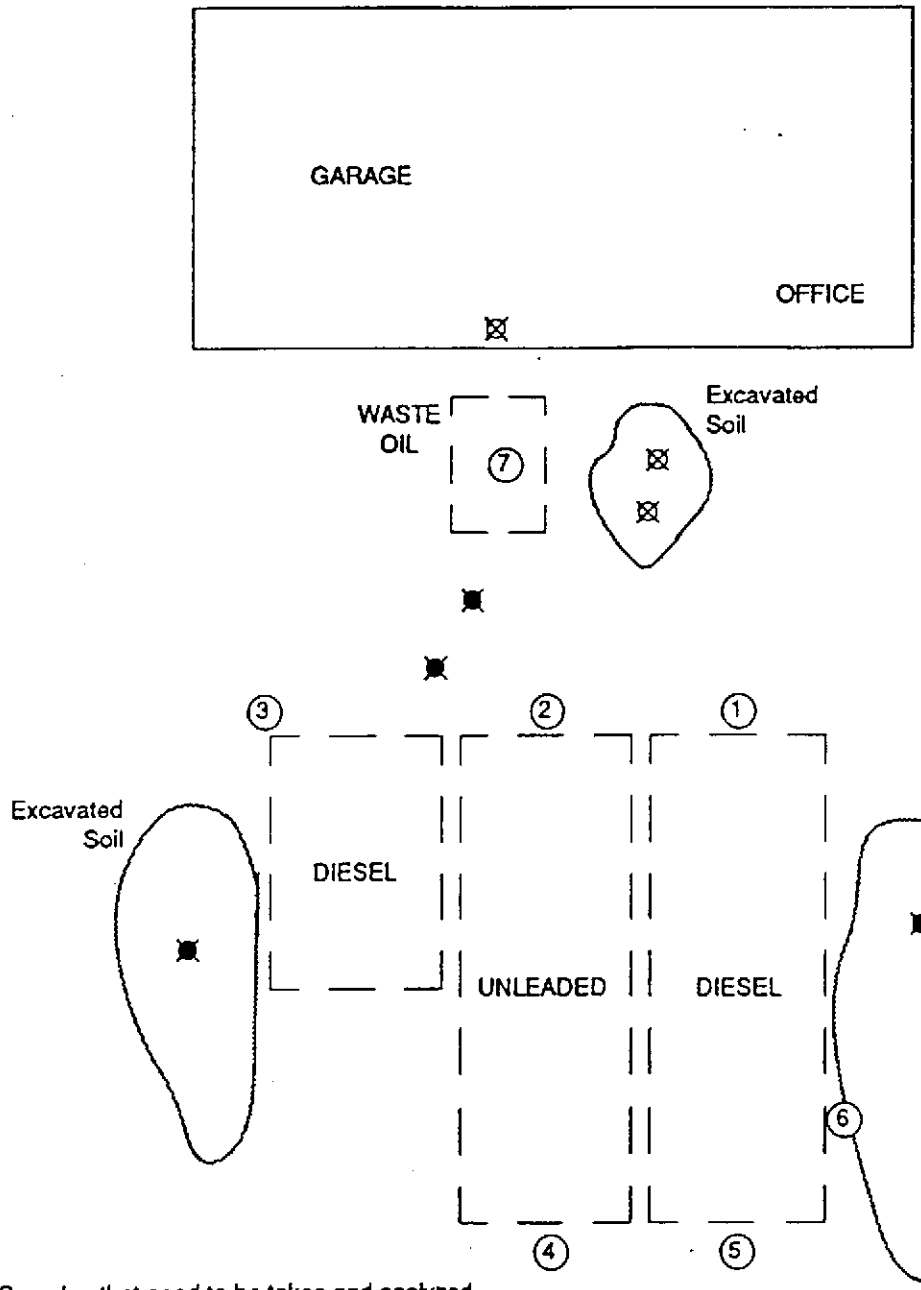


NOT TO SCALE

EA ENGINEERING, SCIENCE, AND TECHNOLOGY
41 Lafayette Circle
Lafayette, CA. 94549

Figure 1. Map of soil sample locations and OVM readings from the sample area at Hertz Penske, 10 October 1989.

Drawn	Date
Reviewed	Date 10-23-89



Samples that need to be taken and analyzed for TPH gas and diesel - 5030
oil and grease - 503 DYE
BTXE and Chlorinated Hydrocarbons - 824
ICAP or AA for Cd, Cr, Pb, Zn

Samples that need to be taken and analyzed for TPH gas and diesel - 5030
BTXE - 8020

NOT TO SCALE

EA ENGINEERING, SCIENCE, AND TECHNOLOGY
41 Lafayette Circle
Lafayette, CA. 94549

Drawn	Date
Reviewed	Date 10-23-89

Figure 2. Map of sample locations, Hertz Penske, 10 October 1989.

EA ENGINEERING, SCIENCE, AND TECHNOLOGY, INC.

☒ Lafayette, Ca. 941 Lafayette Cir. (415) 283-7077
☐ Newport Beach, Ca. 25001 Birch Street Suite B (714) 852-0513

CHAIN OF CUSTODY - REQUEST FOR ANALYSIS

0863

RESULTS DUE DATE: _____ RUSH ☑ yes ☐ no

LABORATORY: _____

LAB. I.D. NUMBER: _____

LAB. CONTACT: _____

PROJECT NAME/LOCATION: HARTZ PROJ
725 ELLIS ANN, OAKLAND

PROJ. MGR./EA CONTACT: CL BOYLES

PROJECT NUMBER: _____

SAMPLING TEAM: CL BOYLES
J DECKER

CARRIER/WAYBILL NUMBER: _____

DATE SAMPLES SHIPPED: 10-10-89

SAMPLE NUMBER	SAMPLE LOCATION	SAMPLE TYPE	COLLECTION DATE/TIME	PRESERVATIVE	REQUESTED ANALYSES (METHODS) TPH (8015 to DOHS modified) ☒ GAS ☒ DIESEL	VOLATILE AROMATICS ☐ ALL ☒ BTXE (8020/602)	GREASE and OIL (413.2/1664)	VHC (Halogen, 8010/601)	VOC GC/MS (8240/624)	Pb, Cr, As, Metals, Zn, Cd				Samples Received In Good Condition
SAMPLE 1	9ft	SOIL/GRAB	10-10-89/1500	NONE	X	X								
2	9ft		/1510		X	X								
3	8ft		/1515		X	X	X							
4	8ft		/1520		X	X								
5	8ft		/1525		X	X	X							
6	9.5ft		/1530		X	X								
7	7.5ft	↓	↓ /1535	↓	X		X		X	X				

EXPECTED NORMAL REPORTING LIMITS:	BENZENE	TOLUENE	XYLENE	Et BENZENE	TPH
Water	0.5ppb	0.5ppb	0.5ppb	0.5ppb	0.5ppm
Soil	0.5ppb	0.5ppb	0.15ppm	0.5ppb	10ppm

SPECIAL INSTRUCTIONS: _____

	NAME	COMPANY	DATE	TIME
Relinquished by:	[signature]	EA ENGINEERING	10-10-89	16:00
Received by:	[signature]	SCOTT Co	10-10-89	
Relinquished by:				
Received by:				
Relinquished by:				
Received by:				

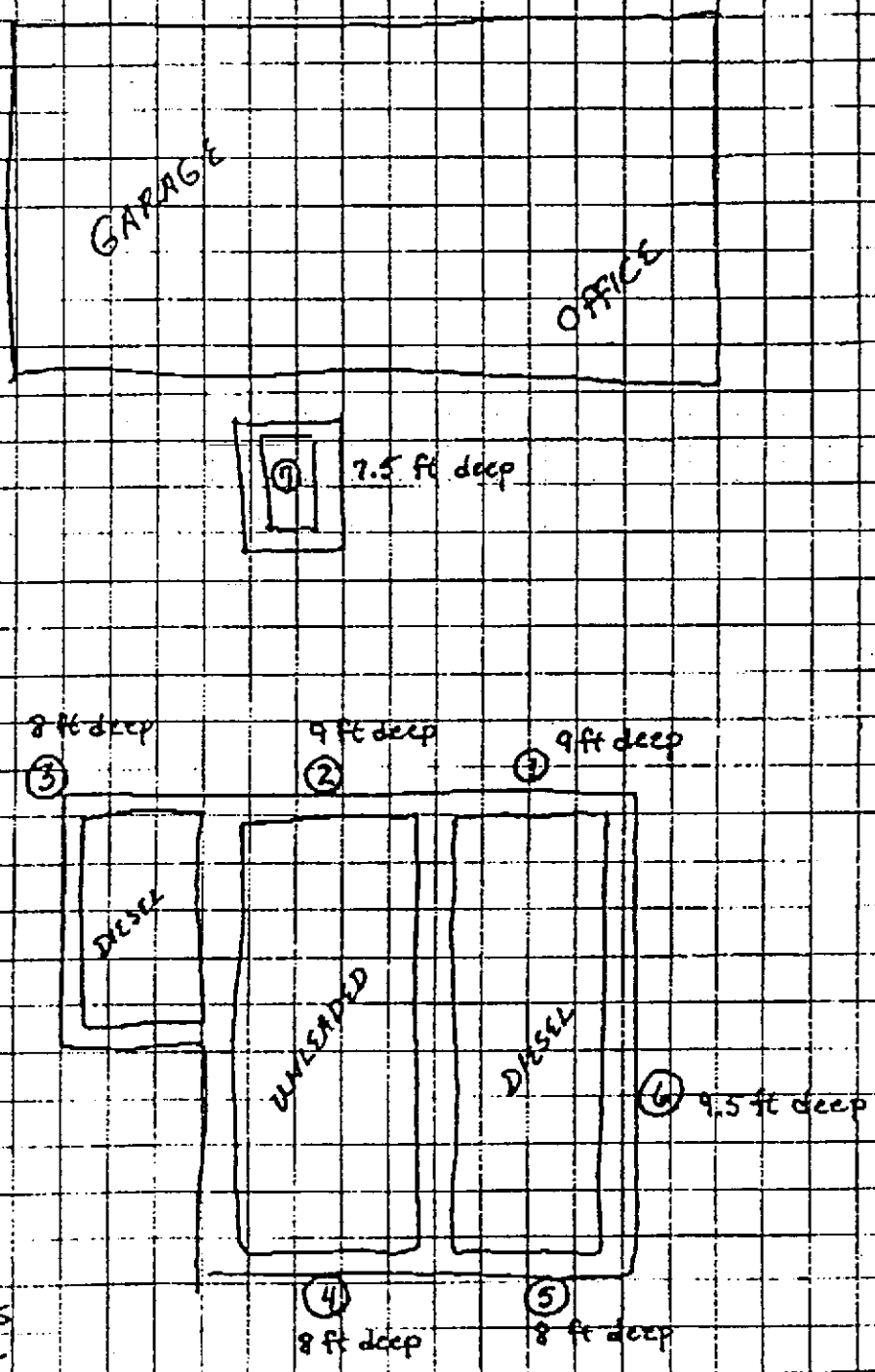
DISTRIBUTION: White - Accompany Shipment

Project ____ Project No. ____

Subject ____ Sheet No. ____ of ____

Drawing No. ____

Computed by ____ Date ____ Checked by ____ Date ____



SOIL SAMPLE LOCATIONS
AT HERTZ PENSKE, 725
JULIANN, OAKLAND, CA
10 OCTOBER 1989

October 12, 1989
Sample Log 1123

Jay Groh
Scott Company
1919 Market Street
Oakland, CA 94607

Subject: Analytical Results for 7 Soil Sample(s)
Identified as: Hertz - Penske
Received: October 11, 1989

Dear Mr. Groh:

Analysis of the sample(s) referenced above has been completed. This report is written to confirm results communicated on October 12, 1989 and describes procedures used to analyze the samples.

Samples were received in brass sleeves that were sealed with aluminum foil and plastic endcaps. Each sample was transported and received under documented chain of custody, assigned a consecutive log number and stored at 4 degrees C until analysis was performed.

Sample(s) were analyzed for the following:

"BTEX" (EPA Method 8020/Purge-and-Trap)
"TPH as Gasoline" (Modified EPA Method 8015/Purge-and-Trap)
"TPH as Diesel" (Modified EPA Method 8015/Extraction)

Please refer to the following table(s) for summarized analytical results and contact us if you have questions regarding procedures or results. The chain-of-custody document is enclosed.

Submitted by:

Joel Kiff
Project Chemist

Approved by:

Robert G. Smith, Ph.D.
Laboratory Director

Western Environmental
Science & Technology
[illegible]46 Olive Drive, Suite 3
[illegible]vis, CA 95616
916 753-9500

October 12, 1989
Sample Log 1123

Table 1: 'BTEX' Results for 7 Soil Sample(s) Identified as
Hertz - Penske
Received October 11, 1989

--all concentrations are units of mg/kg--

Sample	Benz.	Tol.	Eth.Benz.	Xyl.
Sample 1, 9'	.46	.27	<.05	.09
Sample 2, 9'	10.3	21.2	6.5	36
Sample 3, 8'	32	79	9.1	66
Sample 4, 8'	36	110	38	185
Sample 5, 8'	12	38	11	61
Sample 6, 9.5'	<.05	<.05	<.05	<.05
Sample 7, 7.5'	.16	.08	.05	<.05
Reporting Limit	.05	.05	.05	.05

Western Environmental
Science & Technology
[illegible] Olive Drive, Suite 3
[illegible], CA 95616
916 753-9500

October 12, 1989
Sample Log 1123

Table 2: TPH Results for 7 Soil Sample(s) Identified as
Hertz - Penske
Received October 11, 1989

--all concentrations are units of mg/kg--

Sample	TPH as Gasoline	TPH as Diesel
Sample 1, 9'	161	2300
Sample 2, 9'	430	4400
Sample 3, 8'	1410	13000
Sample 4, 8'	2100 ✓	2800
Sample 5, 8'	830	4200
Sample 6, 9.5'	22.4 ✓	840
Sample 7, 7.5'	97	240
Reporting Limit	.5	10

(215-775-6442)

Western Environmental
Science & Technology
[redacted] Olive Drive, Suite 3
D[redacted]s, CA 95616
([redacted]) 753-9500

Anlab
ANALYTICAL LABORATORY
A DIVISION OF DEWANTE & STOWELL

1914 S STREET, SACRAMENTO, CALIFORNIA 95814 • 916-447-2946

October 24, 1989
Sample Date: 10/10/89
Sample Rec'd: 10/12/89
Report #123616

Western Environmental Science & Technology
1046 Olive Drive, Suite 3
Davis, California 95616

Attn: Joel Kiff

Project Name: Hertz-Penske

ANALYSES	Sample 3 1515 hours 123616-1	Sample 5 1525 hours 123616-2	Sample 7 1535 hours 123616-3	MDL
Grease & Oil, %	0.54	0.35	0.07	0.06
Total Cadmium, mg/kg			<0.5	0.5
Total Chromium, mg/kg			46	1.0
Total Lead, mg/kg			11	5.0
Total Zinc, mg/kg			36	0.5

Data Certified by Tom King

Report Approved by Franklin J. Haywood

:nl

Anlab
ANALYTICAL LABORATORY
A DIVISION OF DEWANTE & STOWELL
1914 S STREET, SACRAMENTO, CALIFORNIA 95814 • 916-447-2946

Volatile Organic Priority Pollutants
EPA #8240

Report Date: 10/24/89
Client: Western Environmental Science & Technology
Report #: 123616 Page: 2

Sample Description: Sample 7 Anlab ID#: 123616-3 Units: mg/kg

Date Sample Collected:	Time Sample Collected:	Sample Received @ Lab:	Date Analysis Completed:
10/10/89	1535	10/12/89	10/16/89

Project Name: Hertz-Penske

STORET	COMPOUND	CONCENTRATION	MDL
34030	Benzene	<0.2	0.2
32101	Bromodichloromethane	<0.2	0.2
32104	Bromoform	<0.2	0.2
34413	Bromomethane	<0.2	0.2
32102	Carbon tetrachloride	<0.2	0.2
34301	Chlorobenzene	<0.2	0.2
34311	Chloroethane	<0.2	0.2
34576	2-Chloroethylvinyl ether	<0.4	0.4
32106	Chloroform	<0.2	0.2
34418	Chloromethane	<0.2	0.2
32105	Dibromochloromethane	<0.2	0.2
34536	1,2-Dichlorobenzene	<0.2	0.2
34566	1,3-Dichlorobenzene	<0.2	0.2
34571	1,4-Dichlorobenzene	<0.2	0.2
34496	1,1-Dichloroethane	<0.2	0.2
34531	1,2-Dichloroethane	<0.2	0.2
34501	1,1 Dichloroethene	<0.1	0.1
34546	Trans-1,2-Dichloroethene	<0.2	0.2
34541	1,2-Dichloropropane	<0.2	0.2
34704	cis-1,3-Dichloropropene	<0.2	0.2
34699	trans-1,3-Dichloropropene	<0.2	0.2
34371	Ethyl benzene	<0.2	0.2
34423	Methylene chloride	<0.2	0.2
34516	1,1,2,2-Tetrachloroethane	<0.2	0.2
34475	Tetrachloroethene	<0.2	0.2
34010	Toluene	<0.2	0.2
34506	1,1,1-Trichloroethane	<0.2	0.2
34511	1,1,2-Trichloroethane	<0.2	0.2
39180	Trichloroethene	<0.2	0.2
39175	Vinyl Chloride	<0.4	0.4
34488	Trichlorofluoromethane	<0.2	0.2
	Xylene	<0.2	0.2

Data Certified by TK Report Approved by

Anlab
ANALYTICAL LABORATORY
A DIVISION OF DEWANTE & STOWELL

1914 S STREET, SACRAMENTO, CALIFORNIA 95814 • 916-447-2946

Purgeable Halocarbons
EPA #8010

Client: Western Environmental Science & Technology

Report Date: 10/24/89
Report # 123616 Page: 3

Sample Description: Sample 7 Anlab ID# 123616-3 Units: mg/kg

Date Sampled Collected:	Time Sample Collected:	Date Received @ Lab:	Date Analysis Completed:
10/10/89	1535	10/12/89	10/23/89

Project Name: Hertz-Penske

COMPOUND	CONCENTRATION	MDL
Bromodichloromethane	<0.05	0.05
Bromoform	<0.05	0.05
Bromomethane	<0.05	0.05
Carbon tetrachloride	<0.05	0.05
Chlorobenzene	<0.05	0.05
Chloroethane	<0.05	0.05
2-Chloroethylvinyl ether	<0.1	0.1
Chloroform	<0.05	0.05
Chloromethane	<0.05	0.05
Dibromochloromethane	<0.05	0.05
1,2-Dichlorobenzene	<0.05	0.05
1,3-Dichlorobenzene	<0.05	0.05
1,4-Dichlorobenzene	<0.05	0.05
Dichlorodifluoromethane	<0.05	0.05
1,1-Dichloroethane	<0.05	0.05
1,2-Dichloroethane	<0.05	0.05
1,1-Dichloroethene	<0.02	0.02
1,2-Dichloroethene	<0.05	0.05
1,2-Dichloropropane	<0.05	0.05
1,3-Dichloropropene	<0.05	0.05
1,3-dichloropropene	<0.05	0.05
Methylene chloride	<0.05	0.05
1,1,2,2-Tetrachloroethane	<0.05	0.05
Tetrachloroethene	<0.05	0.05
1,1,1-Trichloroethane	<0.05	0.05
1,1,2-Trichloroethane	<0.05	0.05
Trichloroethene	<0.05	0.05
Trichlorofluoromethane	<0.05	0.05
Vinyl Chloride	<0.1	0.1

Data Certified by TK Report Approved By

TABLE 2
CHRONOLOGICAL LISTING OF
GROUNDWATER ANALYTICAL RESULTS
PENSKE TRUCK LEASING FACILITY
725 Julie Ann Way
Oakland, California

WELL NO.		DATE	CONCENTRATIONS (µg/L)						
			USEPA Method 8015M		USEPA Method 8020				
			TPHd	TPHg	BENZENE	TOLUENE	ETHYL-BENZENE	TOTAL XYLENES	MTBE
MW-1	1	02/20/97	200,000	2,900[a]	260	61	42	96	NS
	2	05/28/97	28,000[b]	2,100	230	42	55	110	NS
	3	09/19/97	2,700,000	110,000	230	140	250	700	ND
	4	11/17/97	950,000[c]	40,000[c]	240[c]	190[c]	270[c]	880[c]	ND[c]
	5	02/27/98	1,200,000	380,000	50	50	200	800	ND
	6	05/27/98	280,000	13,000	110	13	66	390	ND
	7	10/01/98	63,000	1,300[d]	43	1.2	15	84	ND
	8	12/22/98	79,000[e,f]	2,000[e,g]	32[e]	ND[e]	23[e]	130[e]	ND
	9	12/28/99	43000	1,700	49	1.3	11	24	ND
	10	03/14/00	4,300	540	59	1.3	12	23	NA
	11	06/28/00	290,000*	1,300#	26	ND	ND	23	ND
	12	09/14/00	770,000	1,100	34	ND	3.9	17	ND
	13	12/11/00	28,000	2,000	10	ND	ND	9.3	ND
	14	03/14/01	8,400	350	12	ND	ND	ND	ND
	15	06/13/01	13,000	340	6.4	ND	ND	1.6	ND
	16	08/29/01	26,000*	140#	ND	ND	ND	ND	ND
	17	12/12/01	5,600*	160#	0.65	ND	ND	ND	ND
	18	04/12/02	23,000*	260#	3.4	ND	ND	ND	NA
	19	12/05/02	17,000	340*	2.2	ND	ND	ND	6.0
MW-2	1	02/20/97	1,000	ND	ND	ND	ND	ND	NS
	2	05/28/97	3,700[b]	ND	ND	ND	ND	ND	NS
	3	09/19/97	4,100	ND	ND	ND	ND	ND	ND
	4	11/17/97	1,300	ND	ND	ND	ND	ND	ND
	5	02/27/98	340	ND	ND	0.9	ND	ND	ND
	6	05/27/98	1,300	ND	ND	ND	ND	ND	ND
	7	10/01/98	3,500[i]	3,200[d]	ND	ND	ND	ND	ND
	8	12/22/98	1,200[h,k]	67[d]	ND	ND	ND	ND	ND
	9	12/28/99	750	ND	ND	ND	ND	ND	ND
	10	03/15/00	92	ND	ND	ND	ND	ND	ND
	11	06/28/00	ND	ND	ND	ND	ND	ND	ND
	12	09/14/00	120	ND	ND	ND	ND	ND	ND
	13	12/11/00	ND	ND	ND	ND	ND	ND	ND
	14	03/14/01	75	ND	ND	ND	ND	ND	ND
	15	06/13/01	ND	ND	ND	ND	ND	ND	ND
	16	08/29/01	ND	ND	ND	ND	ND	ND	ND
	17	12/12/01	150*	ND	ND	ND	ND	ND	ND
	18	04/12/02	ND	ND	ND	ND	ND	ND	NA
	19	12/05/02	57*	ND	ND	ND	ND	ND	ND
MW-3	1	02/20/97	140	ND	ND	ND	ND	ND	NS
	2	05/28/97	240[b]	ND	ND	ND	ND	ND	NS
	3	09/19/97	ND	ND	0.7	ND	ND	ND	ND
	4	11/17/97	ND	ND	ND	ND	ND	ND	ND
	5	02/27/98	ND	ND	ND	ND	ND	ND	ND
	6	05/27/98	ND	ND	ND	ND	ND	ND	ND
	7	10/01/98	56	ND	ND	ND	ND	ND	ND
	8	12/22/98	NS	NS	NS	NS	NS	NS	NS
	9	12/28/99	NS	NS	NS	NS	NS	NS	NS

TABLE 2
CHRONOLOGICAL LISTING OF
GROUNDWATER ANALYTICAL RESULTS
PENSKE TRUCK LEASING FACILITY
725 Julie Ann Way
Oakland, California

WELL NO.		DATE	CONCENTRATIONS (µg/L) USEPA Method 8015M TPHd	TPHg	USEPA Method 8020 BENZENE	TOLUENE	ETHYL-BENZENE	TOTAL XYLENES	MTBE
	10	03/14/00	NS	NS	NS	NS	NS	NS	NS
	11	06/28/00	NS	NS	NS	NS	NS	NS	NS
	12	09/14/00	NS	NS	NS	NS	NS	NS	NS
	13	12/11/00	NS	NS	NS	NS	NS	NS	NS
	14	03/14/01	NS	NS	NS	NS	NS	NS	NS
	15	06/13/01	NS	NS	NS	NS	NS	NS	NS
	16	08/29/01	NS	NS	NS	NS	NS	NS	NS
	17	12/13/01	NS	NS	NS	NS	NS	NS	NS
	18	04/11/02	NS	NS	NS	NS	NS	NS	NS
	19	12/05/02	NS	NS	NS	NS	NS	NS	NS
MW-4	1	02/20/97	470,000	64,000[m]	ND	ND	ND	ND	NS
	2	05/28/97	1,000,000[b]	11,000[m]	ND	ND	ND	ND	NS
	3	09/19/97	2,600,000	37,000	260	ND	ND	ND	ND
	4	11/17/97	57,000[c]	4,400[c]	25[c]	ND[c]	ND[c]	ND[c]	ND[c]
	5	02/27/98	9,300	580	2.7	0.8	0.8	3	ND
	6	05/27/98	11,000	3,900	1.4	0.6	ND	ND	ND
	7	10/01/98	670,000	2,400[n]	5.7	ND	ND	4.6	ND
	8	12/22/98	3,700[e,o]	ND[p]	ND[p]	ND[p]	ND[p]	ND[p]	ND[p]
	9	12/28/99	5,800	1,000	ND	ND	ND	ND	ND
	10	03/14/00	4,800	350	ND	ND	ND	ND	NA
	11	06/28/00	8,400*	120#	ND	ND	ND	ND	ND
	12	09/14/00	19,000	130	ND	ND	ND	ND	ND
	13	12/11/00	730	120	ND	ND	ND	ND	ND
	14	03/14/01	580	ND	ND	ND	ND	ND	ND
	15	06/13/01	260	54	ND	ND	ND	ND	ND
	16	08/29/01	30,000*	940#	ND	ND	ND	ND	ND
	17	12/13/01	260*	ND	ND	ND	ND	ND	ND
	18	04/12/02	230*	ND	ND	ND	ND	ND	NA
	19	12/05/02	1,500*	ND	ND	ND	ND	ND	ND
MW-5	1	02/20/97	1,100[b]	ND	ND	ND	ND	ND	NS
	2	05/28/97	560[b,q]	60[m]	ND	ND	ND	ND	NS
	3	09/19/97	1,000	70	ND	ND	ND	ND	ND
	4	11/17/97	1,100	70	0.6	0.7	0.5	ND	5
	5	02/27/98	ND	ND	ND	ND	ND	ND	5
	6	05/27/98	770	ND	ND	ND	ND	ND	ND
	7	10/01/98	630	ND	ND	ND	ND	ND	ND
	8	12/22/98	890[r]	ND	ND	ND	ND	ND	ND
	9	12/28/99	440	ND	ND	ND	ND	ND	ND
	10	03/15/00	NS	NS	NS	NS	NS	NS	NS
	11	06/28/00	110*	ND	ND	ND	ND	ND	ND
	12	09/14/00	NS	NS	NS	NS	NS	NS	NS
	13	12/11/00	130	ND	ND	ND	ND	ND	ND
	14	03/14/01	NS	NS	NS	NS	NS	NS	NS
	15	06/13/01	120	ND	ND	ND	ND	ND	ND
	16	08/29/01	NS	NS	NS	NS	NS	NS	NS
	17	12/13/01	530*	ND	ND	ND	ND	ND	ND
	18	04/11/02	230*	ND	ND	ND	ND	ND	NA

TABLE 2
CHRONOLOGICAL LISTING OF
GROUNDWATER ANALYTICAL RESULTS
PENSKE TRUCK LEASING FACILITY
725 Julie Ann Way
Oakland, California

WELL NO.		DATE	CONCENTRATIONS (ug/L) USEPA Method 8015M TPHd	TPHg	USEPA Method 8020 BENZENE	TOLUENE	ETHYL-BENZENE	TOTAL XYLENES	MTBE
	19	12/05/02	NS	NS	NS	NS	NS	NS	NS
MW-6	1	02/20/97	NS	NS	NS	NS	NS	NS	NS
	2	05/28/97	NS	NS	NS	NS	NS	NS	NS
	3	09/19/97	NS	NS	NS	NS	NS	NS	NS
	4	11/17/97	NS	NS	NS	NS	NS	NS	NS
	5	02/27/98	NS	NS	NS	NS	NS	NS	NS
	6	05/27/98	NS	NS	NS	NS	NS	NS	NS
	7	10/01/98	NS	NS	NS	NS	NS	NS	NS
	8	12/22/98	NS	NS	NS	NS	NS	NS	NS
	9	12/28/99	NS	NS	NS	NS	NS	NS	NS
	10	03/15/00	NS	NS	NS	NS	NS	NS	NS
	11	06/28/00	NS	NS	NS	NS	NS	NS	NS
	12	09/14/00	NS	NS	NS	NS	NS	NS	NS
	13	12/11/00	NS	NS	NS	NS	NS	NS	NS
	14	03/14/01	NS	NS	NS	NS	NS	NS	NS
	15	06/13/01	NS	NS	NS	NS	NS	NS	NS
	16	08/29/01	NS	NS	NS	NS	NS	NS	NS
	17	12/13/01	NS	NS	NS	NS	NS	NS	NS
	18	04/11/02	NS	NS	NS	NS	NS	NS	NS
	19	12/05/02	NS	NS	NS	NS	NS	NS	NS
MW-7	1	02/20/97	1,500,000	15,000[m]	81	51	ND	ND	NS
	2	05/28/97	440,000[b]	390,000[m]	ND	ND	ND	ND	NS
	3	09/19/97	910,000	3,600	110	64	37	ND	ND
	4	11/17/97	18,000,000[c]	15,000[c]	110[c]	41[c]	12[c]	110[c]	ND[c]
	5	02/27/98	290,000	45,000	80	60	ND	ND	ND
	6	05/27/98	1,600	140	2.3	0.9	0.9	3	ND
	7	10/01/98	89,000	710[n]	39	2.4	11	31	ND
	8	12/22/98	240,000[o]	3,900[g]	51	ND	ND	ND	ND
	9	12/28/99	300,000	2,300	51	5.3	13	27	ND
	10	03/14/00	640,000	620	31	5.3	9.9	31	NA
	11	06/28/00	2,900,000	3,200#	15	ND	3.2	30	ND
	12	09/14/00	15,000,000	1,900	11	ND	10	39	ND
	13	12/12/00	340,000	4,500	ND	ND	ND	17	ND
	14	03/14/01	170,000	8,000	ND	ND	ND	ND	ND
	15	06/13/01	19,000	100	0.99	ND	ND	ND	6.2
	16	08/29/01	27,000*	120#	3.9	ND	ND	ND	5
	17	12/12/01	6,900*	610#	ND	ND	ND	ND	ND
	18	04/12/02	2,600*	110#	ND	ND	ND	ND	NA
	19	12/05/02	9,100*	290#	ND	ND	ND	ND	5.7
MW-8	1	02/20/97	2,500	340[a]	2.1	53	7.1	94	NS
	2	05/28/97	200[b,s]	480[a]	2.5	12	ND	76	NS
	3	09/19/97	7,000	1,000	0.8	5	0.5	130	ND
	4	11/17/97	520	250	1.4	2.1	0.7	3	ND
	5	02/27/98	150	ND	ND	ND	ND	ND	ND
	6	05/27/98	70	ND	ND	ND	ND	ND	ND
	7	10/01/98	440[t]	ND	ND	ND	ND	ND	ND
	8	12/22/98	NS	NS	NS	NS	NS	NS	NS

TABLE 2
CHRONOLOGICAL LISTING OF
GROUNDWATER ANALYTICAL RESULTS
PENSKE TRUCK LEASING FACILITY
725 Julie Ann Way
Oakland, California

WELL NO.	DATE	CONCENTRATIONS (ug/L) USEPA Method 8015M		USEPA Method 8020				
		TPHd	TPHg	BENZENE	TOLUENE	ETHYL BENZENE	TOTAL XYLENES	MTBE
	[9] 12/28/99	130	ND	ND	ND	ND	ND	ND
	[10] 03/14/00	170	ND	ND	ND	ND	ND	NA
	[11] 06/28/00	300*	ND	ND	ND	ND	ND	ND
	[12] 09/14/00	310	ND	ND	ND	ND	ND	ND
	[13] 12/11/00	15,000	ND	ND	ND	ND	ND	ND
	[14] 03/14/01	130	ND	ND	ND	ND	ND	ND
	[15] 06/13/01	100	ND	ND	ND	ND	ND	ND
	[16] 08/29/01	160*	ND	ND	ND	ND	ND	ND
	[17] 12/13/01	97*	ND	ND	ND	ND	ND	ND
	[18] 04/12/02	ND	ND	ND	ND	ND	ND	NA
	[19] 12/05/02	97*	ND	ND	ND	ND	ND	ND
OW-1	[9] 12/28/99	7,700	3,400	11	ND	ND	2.6	ND
	[10] 03/15/00	5,300	700	1.7	ND	ND	ND	ND
	[11] 06/29/00	1,300*	140#	4	ND	ND	2.2	6.6
	[12] 09/14/00	5,800	180	ND	ND	ND	ND	ND
	[13] 12/12/00	230	110	3.4	ND	ND	ND	ND
	[14] 03/14/01	2,200	110	4	ND	ND	0.5	ND
	[15] 06/13/01	1,500	120	2.5	ND	ND	ND	ND
	[16] 08/29/01	1,200*	130#	ND	ND	ND	ND	ND
OW-1 Cont.	[17] 12/12/01	3,100*	76#	ND	ND	ND	ND	ND
	[18] 04/11/02	3,600*	300#	ND	ND	ND	ND	NA
	[19] 12/05/02	490#	78#	ND	ND	ND	ND	ND
OW-2	[9] 12/28/99	3,300	770	36	ND	ND	1.7	16
	[10] 03/15/00	1,100	350	24	ND	ND	ND	9.3
	[11] 06/29/00	850*	160#	7.4	ND	ND	ND	13
	[12] 09/14/00	6,300	590	26	0.79	ND	1.7	17
	[13] 12/12/00	320	210	6.6	ND	ND	ND	7.4
	[14] 03/14/01	960	320	5.6	ND	ND	ND	ND
	[15] 06/13/01	900	250	2.9	ND	ND	ND	10
	[16] 08/29/01	1,400*	270#	5.3	ND	ND	ND	ND
	[17] 12/12/01	4,100*	280#	14	ND	ND	ND	11
	[18] 04/11/02	4,100*	820#	6.4	ND	ND	ND	NA
	[19] 12/05/02	500*	230#	ND	ND	ND	ND	5.6

Notes:

mg/L - micrograms per liter
TPHd - Total Petroleum Hydrocarbons as diesel
TPHg - Total Petroleum Hydrocarbons as gasoline
MTBE - Methyl tert butyl ether

NS - Well not sampled
ND - Not detected at or above the laboratory detection limit
NA - Not analyzed

(a) - Laboratory reports that chromatogram indicates gasoline and unidentified hydrocarbons >C8.
(b) - Laboratory reports that the laboratory control sample failed for this batch, as well as when it was initially analyzed on 6/3/97. All results should be considered as estimated values. No additional sample was available for re-extraction.
(c) - Laboratory reports reporting limits for diesel and gas/BTEX elevated due to high levels of target compound. Samples run at dilution.
(d) - Laboratory reports the peak pattern present in this sample represents an unknown mixture atypical of gasoline in the range of n-C09 to greater than n-C12. Quantitation is based on a gasoline reference in the range of n-C07 to n-C12 only.
(e) - Laboratory reports reporting limit(s) raised due to high level of analyte present in sample.
(f) - Laboratory reports the hydrocarbon pattern present in this sample represents an unknown mixture in the range of n-C09 to n-C36. Quantitation is based on a diesel reference between n-C10 and n-C24 only.
(g) - Laboratory reports that chromatogram indicates diesel and unidentified hydrocarbons >C20.
(h) - Diesel range concentration reported. A nonstandard diesel pattern was observed in the chromatogram.
* - Hydrocarbon reported does not match the diesel standard.

TABLE 2
CHRONOLOGICAL LISTING OF
GROUNDWATER ANALYTICAL RESULTS
PENSKE TRUCK LEASING FACILITY
725 Julie Ann Way
Oakland, California

WELL NO.	DATE	CONCENTRATIONS (µg/L)						
		USEPA Method 8015M		USEPA Method 8020				
		TPHd	TPHg	BENZENE	TOLUENE	ETHYL BENZENE	TOTAL XYLENES	MTBE

\# - Hydrocarbon reported (in the gasoline range) does not match lab standard.

Note that beginning in 2000 and onwards, silica gel cleanup was used in the analysis for TPH-d to remove ambient organic acids that elute in this range.

1 - Unknown source and date or issue
2 - Unknown source and date or issue
3 - Unknown source and date or issue
4 - Unknown source and date or issue
5 - Unknown source and date or issue
6 - Unknown source and date or issue
7 - Unknown source and date or issue
8 - 4th Quarterly Groundwater Monitoring Report 1998, February 5, 1999
9 - 4th Quarterly Groundwater Monitoring Report 1999, February 28, 2000
10 - 1st Quarterly Groundwater Monitoring Report 2000, July 7, 2000
11 - 2nd Quarterly Groundwater Monitoring Report 2000, August 18, 2000
12 - 3rd Quarterly Groundwater Monitoring Report 2000, December 12, 2000
13 - 4th Quarterlyl Groundwater Monitoring Report 2000, February 8, 2001
14 - 1st Quarterly Groundwater Monitoring Report 2001, July 5, 2001
15 - 2nd Quarterly Groundwater Monitoring Report 2001, unknown date of issue
16 - 3rd Quarterly Groundwater Monitoring Report 2001, February 7, 2002
17 - 4th Quarterlyl Groundwater Monitoring Report 2001, February 7, 2002
18 - 1st Semi-Annual Groundwater Monitoring Report 2002, February 4, 2003
19 - 2nd Semi-Annual Groundwater Monitoring Report 2002, January 15, 2003

TABLE 3
CHRONOLOGICAL LISTING OF
GROUNDWATER ELEVATION DATA
PENSKE TRUCK LEASING FACILITY
725 Julie Ann Way
Oakland, California

WELL NO.	DATE	RE (FEET)[a]	DTW (FEET)	CWTE (FEET)
MW-1	02/20/97	5.43	5.41	0.02
	05/28/97		5.98	-0.55
	09/19/97		6.45	-1.02
	11/17/97		6.14	-0.71
	02/27/98		4.83	0.60
	05/27/98		6.42	-0.99
	10/01/98		6.49	-1.06
	12/22/98		6.35	-0.92
	12/28/99		7.34	-1.91
	03/14/00		4.95	0.48
	06/28/00		5.54	-0.11
	09/14/00		6.41	-0.98
	12/11/00		6.08	-0.65
	03/14/01		6.11	-0.68
	06/13/01		5.68	-0.25
	08/29/01		6.13	-0.70
	12/12/01		5.31	0.12
	04/11/02		5.21	0.22
	12/05/02		5.85	-0.42
MW-2	02/20/97	6.20	6.26	-0.06
	05/28/97		6.65	-0.45
	09/19/97		6.90	-0.70
	11/17/97		6.75	-0.55
	02/27/98		5.31	0.89
	05/27/98		5.87	0.33
	10/01/98		6.95	-0.75
	12/22/98		6.70	-0.50
	12/28/99		7.08	-0.88
	03/15/00		5.45	0.75
	06/28/00		6.37	-0.17
	09/14/00		6.86	-0.66
	12/11/00		7.33	-1.13
	03/14/01		5.75	0.45
	06/13/01		6.33	-0.13
	08/29/01		6.71	-0.51
	12/12/01		5.92	0.28
	04/11/02		5.88	0.32
	12/05/02		6.56	-0.36
MW-3	02/20/97	6.10	6.36	-0.26
	05/28/97		6.62	-0.52
	09/19/97		6.83	-0.73
	11/17/97		6.77	-0.67
	02/27/98		5.38	0.72
	05/27/98		6.05	0.05
	10/01/98		6.95	-0.85
	12/22/98		6.73	-0.63
	12/28/99		7.22	-1.12
	03/14/00		NM	NM
	06/28/00		6.37	-0.27
	09/14/00		7.06	-0.96
	12/11/00		6.68	-0.58
	03/14/01		5.85	0.25
	06/13/01		6.34	-0.24
	08/29/01		6.70	-0.60
	12/12/01		5.95	0.15
	04/11/02		5.86	0.24
	12/05/02		6.55	-0.45
MW-4	02/20/97	5.18	5.29	-0.11
	05/28/97		5.66	-0.48
	09/19/97		6.00	-0.82
	11/17/97		6.06	-0.88
	02/27/98		4.66	0.52
	05/27/98		5.98	-0.80

TABLE 3
CHRONOLOGICAL LISTING OF
GROUNDWATER ELEVATION DATA
PENSKE TRUCK LEASING FACILITY
725 Julie Ann Way
Oakland, California

WELL NO.	DATE	RE (FEET)[a]	DTW (FEET)	CWTE (FEET)
MW-4 Cont.	10/01/98		5.23	-0.05
	12/22/98		6.57	-1.39
	12/28/99		6.54	-1.36
	03/14/00		4.86	0.32
	06/28/00		5.55	-0.37
	09/14/00		6.05	-0.87
	12/11/00		5.93	-0.75
	03/14/01		5.04	0.14
	06/13/01		5.25	-0.07
	08/29/01		5.89	-0.71
	12/12/01		5.14	0.04
	04/11/02		4.96	0.22
	12/05/02		5.68	-0.50
MW-5	02/20/97	4.71	4.68	0.03
	05/28/97		5.21	-0.50
	09/19/97		5.43	-0.72
	11/17/97		5.28	-0.57
	02/27/98		4.10	0.61
	05/27/98		5.40	-0.69
	10/01/98		5.42	-0.71
	12/22/98		5.40	-0.69
	12/28/99		5.73	-1.02
	03/14/00		NM	NM
	06/28/00		5.11	-0.40
	09/14/00		NM	NM
	12/11/00		5.48	-0.77
	03/14/01		4.57	0.14
	06/13/01		5.05	-0.34
	08/29/01		5.34	-0.63
	12/12/01		4.79	-0.08
	04/11/02		4.66	0.05
	12/05/02		5.32	-0.61
MW-6	02/20/97	5.37	5.38	-0.01
	05/28/97		5.93	-0.56
	09/19/97		6.15	-0.78
	11/17/97		6.06	-0.69
	02/27/98		4.74	0.63
	05/27/98		5.40	-0.03
	10/01/98		6.37	-1.00
	12/22/98		6.06	-0.69
	12/28/99		6.40	-1.03
	03/14/00		NM	NM
	06/28/00		6.71	-1.34
	09/14/00		6.17	-0.80
	12/11/00		NM	NM
	03/14/01		5.11	0.26
	06/13/01		6.65	-1.28
	08/29/01		6.00	-0.63
	12/12/01		5.33	0.04
	04/11/02		5.15	0.22
	12/05/02		5.90	-0.53
MW-7	02/20/97	5.38	5.70	-0.32
	05/28/97		5.46	-0.08
	09/19/97		5.91	-0.53
	11/17/97		5.59	-0.21
	02/27/98		4.68	0.70
	05/27/98		5.17	0.21
	10/01/98		5.80	-0.42
	12/22/98		5.78	-0.40
	12/28/99		7.72	-2.34
	03/14/00		4.50	0.88
	06/28/00		5.51	-0.13
	09/14/00		5.93	-0.55

TABLE 3
CHRONOLOGICAL LISTING OF
GROUNDWATER ELEVATION DATA
PENSKE TRUCK LEASING FACILITY
725 Julie Ann Way
Oakland, California

WELL NO.	DATE	RE (FEET)[a]	DTW (FEET)	CWTE (FEET)
MW-7 Cont.	12/11/00		5.72	-0.34
	03/14/01		4.58	0.80
	06/13/01		5.18	0.20
	08/29/01		5.53	-0.15
	12/12/01		4.73	0.65
	04/11/02		4.68	0.70
	12/05/02		5.25	0.13
MW-8	02/20/97	5.44	5.10	0.34
	05/28/97		5.68	-0.24
	09/19/97		5.95	-0.51
	11/17/97		5.91	-0.47
	02/27/98		4.50	0.94
	05/27/98		6.10	-0.66
	10/01/98		6.13	-0.69
	12/22/98		6.10	-0.66
	12/28/99		6.30	-0.86
	03/14/00		5.01	0.43
	06/28/00		5.47	-0.03
	09/14/00		5.99	-0.55
	12/11/00		5.84	-0.40
	03/14/01		4.90	0.54
	06/13/01		5.40	0.04
	08/29/01		5.80	-0.36
	12/12/01		5.05	0.39
	04/11/02		4.95	0.49
	12/05/02		5.42	0.02
OW-1	12/28/99		5.77	NA
	03/15/00		4.47	NA
	06/29/00		4.95	NA
	08/29/01		5.01	NA
	09/14/00		5.31	NA
	12/11/00		5.17	NA
	03/14/01		4.54	NA
	06/13/01		4.75	NA
	12/12/01		4.80	NA
	04/11/02		4.52	NA
	12/05/02		5.13	NA
OW-2	12/28/99		6.08	NA
	03/15/00		4.76	NA
	06/29/00		5.15	NA
	09/14/00		5.60	NA
	12/11/00		5.45	NA
	03/14/01		4.77	NA
	06/13/01		5.01	NA
	08/29/01		5.31	NA
	12/12/01		5.10	NA
	04/11/02		4.83	NA
	12/05/02		5.42	NA

Notes:

RE - Reference Elevation
DTW - Depth to Water
CWTE - Corrected Water Table Elevation
(a) - All well elevations resurveyed to site benchmark on February 10, 1993
NM - Not Measured
NA - Not Available

SECOR
International Incorporated

February 17, 2000

Mr. Barney M. Chan
Alameda County Health Care Services Agency
1131 Harbor Bay Parkway
Alameda, California 94502-6577

RE: REVISED RBCA EVALUATION, SAN FRANCISCO FRENCH BREAD FACILITY, 580 JULIE ANN WAY, OAKLAND, CALIFORNIA, FOR THE METZ BAKING COMPANY.

Dear Mr. Chan,

In response to your letter to Mr. Christopher Rants dated December 21, 1999 (Attachment 1), we have revised the Tier 1 and Tier 2 Risk-Based Corrective Action (RBCA) Evaluation for 580 Julie Ann Way, Oakland, California 94621 (the Site) by adding the following analytical soil data collected from the Site:

- Data collected on June 19, 1991 from soil borings: SB-A; SB-B; SB-C; SB-D; SB-E; SB-F; and

- Data collected on November 12, 1993 from soil borings: SB-G; SB-H; SB-I; SB-J; SB-K; SB-L; SB-M.

The revised soil data set is presented in Table A-1 (Attachment 3) and the results of a "revised" risk assessment are presented herein. In addition, an incorrect link between spreadsheets was discovered in the original RBCA submitted to your agency in December 1999. This letter therefore addresses the following two issues:

I. Incorrect link in the December 7th 1999 RBCA; and
II. Incorporating the 1991 and 1993 soil data results into the revised RBCA.

Each of these sections is discussed in detail below.

I. Incorrect Link in the December 7th 1999 RBCA

Upon review of our initial work, we detected an incorrect link between the data tables used to estimate benzene and MTBE concentrations in air (Appendix B) and the exposure point concentration table (Table 4-5). This error resulted in an underestimation of health impacts associated with groundwater vapor inhalation (both the hypothetical onsite indoor commercial worker and construction worker) and the inhalation of vapors from soil (indoor commercial worker only). As a result, we have revised the appropriate tables and text to reflect this correction. **Replacement pages are provided in Attachment 2 of this letter.** It is important to note, that although the HIs and cancer risks are higher the previously reported, the conclusions of the original RBCA evaluation (SECOR, 1999) do not change as:

1390 Willow Pass Road, Suite 360, Concord, CA 94520-5250 (925) 686-9780 (925) 686-3099 Fax www.secor.com

- Only the estimated HI and lifetime excess cancer risk for the hypothetical onsite construction worker receptor are at or exceed agency threshold levels of concern (estimated HI and cancer risk of 5 and 1 x 10^{-5}, respectively); and

- Benzene is the only Site-related chemical associated with the majority of the estimated HI and cancer risk for either of the two hypothetical human receptors evaluated in the BCA.

In addition, the Oakland Zoning Department has verified that the Site and its surrounding area are designated for heavy industrial (M-40) use only (SECOR, 2000). For this reason, an evaluation of any residential exposure scenarios is not considered relevant for this Site.

II. Incorporating the 1991 and 1993 Soil Data Results into the Revised RBCA

Using the same methodology described in our December 7th RBCA, inclusion of the above-listed data results in higher HIs and cancer risks than those previously estimated and summarized in the December 7, 1999 RBCA submitted to your department. The revised HI and cancer risk estimates for the two hypothetical human receptors are summarized below and all tables related to this evaluation are in Attachment 3 of this letter.

Hypothetical Onsite Indoor Commercial Worker Receptor

As originally evaluated in the SECOR RBCA (SECOR, 1999), the HI and cancer risk for the hypothetical onsite indoor commercial worker receptor were 0.08 and 5 x 10^{-6}, respectively (Table 4-7 of Attachment 2). With the addition of the June 1991 and November 1993 soil data, the revised HI and cancer risk for this receptor are 0.2 and 1 x 10^{-5}, respectively (Table 4-7 of Attachment 3). The additional soil data results in a higher cancer risk estimate for this receptor equal to the CalEPA threshold level of concern (1 x 10^{-5}; California Health and Welfare Agency, 1988). Estimated HIs under both the original and the revised scenario are below the USEPA (1989) threshold level of concern (1).

Hypothetical Onsite Construction Worker Receptor

As originally evaluated, the HI and cancer risk for the hypothetical onsite indoor commercial worker receptor were 5 and 1 x 10^{-5}, respectively (Table 4-7 of Attachment 2). With the addition of the June 1991 and November 1993 soil data, the revised HI and cancer risk for this receptor are 20 and 5 x 10^{-5}, respectively (Table 4-7 of Attachment 3). Under both the original and the revised scenarios, the HI and cancer risk exceed the USEPA (1989) and CalEPA (California Health and Welfare Agency, 1988) threshold levels of concern for noncancer effects (1) and cancer risks (10^{-5}).

Soil Screening Target Levels

Under both the original and revised case, benzene remains the only Site-related chemical associated with the majority of the estimated HI and cancer risk for both the hypothetical onsite indoor commercial worker and the onsite construction worker receptor. The soil and groundwater site-specific target levels (SSTLs)

for benzene remain 2 milligrams per kilogram (mg/kg) and 0.16 milligrams per liter (mg/L), respectively (SECOR, 1999).

Actual versus Estimated Impacts

The results of RBCA (under both the original and revised scenarios) is based on the following key conservative assumptions:

- COPCs at the Site are present at the historical maximum detected concentrations;
- COPCs are present at concentrations equivalent to those observed as far back as 1991 (i.e., no degradation has occurred); and
- An office building will be located directly over the highest concentrations of benzene detected.

Because it is unlikely that any of the above listed conditions exist, actual health impacts at the Site are (very) likely to be lower than those estimated in this RBCA.

Risk Management Plan

Based on the evaluation of the additional soil samples, the Risk Management Plan presented in the original RBCA (SECOR, 1999) addresses potential exposure risks to onsite construction workers and, therefore, does not require revision.

If you have any questions regarding the information provided in this letter, please feel free to contact either Daniel Lee or Mark Stelljes (925-686-9780).

Sincerely,

Daniel Lee, M.P.H.
Senior Risk Assessment Scientist

Rosemary Hood for
William E. Brasher, P.E.
Project Manager

Mark E. Stelljes

Mark Stelljes, PhD.
Principal Toxicologist

cc: Christopher Rants, Metz Baking Company
Dave Graves, Interstate Brands

References

California Health and Welfare Agency (HWA), 1988. California Code of Regulations, Division 2, Chapter 3, California State Drinking Water and Toxic Enforcement Action of 1989. Article 8, Section 12711 et. Seq.

SECOR International Inc., 1999. Tier I and Tier II Risk-Based Corrective Action Evaluation. Metz Baking Company, 580 Julie Ann Way Oakland, CA. SECOR Project No. 005.02811.005.

SECOR International Inc., 2000. Correspondence between Bill Brasher and the Oakland Zoning Department. February 2.

United States Environmental Protection Agency (USEPA), 1989. Risk Assessment Guidance for Superfund, Volume 1, Human Health Evaluation Manual (Part A), Interim Final. Office of Emergency and Remedial Response, Washington, D.C., EPA/540/1-89/002, July.

ATTACHMENT 1
LETTER FROM BARNEY M. CHAN TO CHRISTOPHER RANTS,
DECEMBER 21, 1999

ALAMEDA COUNTY
HEALTH CARE SERVICES
AGENCY
DAVID J. KEARS, Agency Director

ENVIRONMENTAL HEALTH SERVICES
ENVIRONMENTAL PROTECTION
1131 Harbor Bay Parkway
Alameda, CA 94502-6577
(510) 567-6700
(510) 337-9432

December 21, 1999
StID #4008

Mr. Christopher Rants
P.O. Box 448
Sioux City, Iowa, 51102

Re: Tier 1 and Tier 2 RBCA Evaluation for 580 Julie Ann Way, Oakland CA 94621

Dear Mr. Rants:

Our office has received and reviewed the December 7, 1999 Tier I and Tier II RBCA Evaluation prepared by SECOR International (SECOR), your consultant. I have also spoken with Mr. Brasher regarding my concerns. The general approach taken in this evaluation is acceptable, however, it appears that the soil data has not included two soil samples, SB-F @7' and SB-G@ 5.5', both of which reported elevated benzene concentrations at 28 and 24 ppm, respectively. You should include these data points in your evaluation and issue an addendum or justify why these data points are not valid.

In addition, although the site is not foreseen to be residential in the future, please verify the property's zoning. Should residential be possible, please include either a residential exposure in the RBCA evaluation or make note of the need to evaluate this exposure pathway if future land use changes. This notice should be included in the Risk Management Plan.

Please provide your written response to these items within 45 days or no later than February 8, 2000.

You may contact me at (510) 567-6765 if you have any questions.

Sincerely,

Barney M. Chan
Hazardous Materials Specialist

C: B. Chan, files
✓ Mr. K. Krantz, Interstate Brands West, 580 Julie Ann Way, Oakland CA 94621
Mr. Willliam Brasher, SECOR International Inc., 360 22nd St., Oakland 94612-3019

2RBCA580Julie

ATTACHMENT 2

REPLACEMENT PAGES FOR THE DECEMBER 7TH 1999 RBCA CONDUCTED BY SECOR

Ettinger (1991). Chemical concentrations in outdoor air were estimated using the box model as described by USEPA, 1991; Dobbins, 1979, and CalEPA 1994a. All modeling inputs, outputs, and equations used to estimate chemical concentrations in indoor and outdoor air are presented in Appendix B. All EPCs used in this assessment are summarized in Table 4-5.

EPCs were then combined with intake/exposure factors to estimate daily doses. These doses were then used to estimate noncancer effects (hazard quotients [HQs] for individual chemicals and hazard indices [HIs] for multichemical and multipathway exposures) and cancer risks based on the methods outlined by USEPA (1989). Daily doses are summarized in Appendix C for the hypothetical onsite indoor commercial worker receptor and in Appendix D for the hypothetical onsite construction worker receptor. The daily dose resulting from dermal exposure to chemicals in groundwater requires development of an absorbed dose, which is different from the dose estimates derived for the ingestion and inhalation exposure pathways. The absorbed dose (DA_{event}) for each chemical in groundwater was calculated using methods consistent with USEPA (1992) which are summarized in Table 4-6. These DA_{event} terms are then used in the exposure equations as summarized in Appendix D.

4.5 RESULTS OF THE TIER II EVALUATION

This section summarizes the results of the Tier II RBCA for the hypothetical onsite indoor commercial worker (Section 4.5.1) and onsite construction worker receptor (Section 4.5.2).

4.5.1 Hypothetical Onsite Indoor Commercial Worker Receptor

The estimated noncancer multipathway HI and the total excess cancer risk for this hypothetical receptor are 0.08 and 5×10^{-6}, respectively. In both cases, these values are well below the USEPA and CalEPA threshold levels of 1 (USEPA, 1989; CalEPA, 1992). The cancer risk is also below the State of California's threshold level of 1×10^{-5} for workers (California Health and Welfare Agency, 1988). Pathway-specific HIs and cancer risks estimated for this receptor are summarized in Table 4-7. Individual and chemical-specific HQs and cancer risks are provided in Appendix C.

4.5.2 Hypothetical Onsite Construction Worker Receptor

The estimated noncancer multipathway HI and the total excess cancer risk for this hypothetical receptor are 5 and 1×10^{-5}, respectively. The HI exceeds the USEPA and CalEPA threshold level of 1 (USEPA, 1989; CalEPA, 1992). The cancer risk estimate is equal to the California cancer risk threshold of 1×10^{-5} for workers (California, 1988). Exposures associated with the inhalation of benzene vapors emanating from soil (Table D-4) and dermal contact with benzene in groundwater (Table D-5) account for virtually

Table 4-5.

Exposure Point Concentrations for the Chemicals Evaluated Under the Tier II RBCA Evaluation[a]

Metz Baking Company Risk-Based Corrective Action Evaluation

580 Julie Ann Way

Oakland, California

Project No. 005.02811.002

	Construction Worker Receptor					Indoor Commercial Worker Receptor	
			Outdoor Air			Indoor Air	
COPC	Soil (mg/kg)[b]	Groundwater (mg/L)[c]	From Soil (mg/m^3)[d]	From Groundwater (mg/m^3)	Dust-in-Air (mg/m^3)	From Soil (mg/m^3)	From Groundwater (mg/m^3)
Volatile Organic Compounds							
Benzene	5.1	0.270	6.15E-02	3.77E-03	--[f]	7.20E-04	1.12E-03
Methyl Tert Butyl Ether	--	0.060	--	8.86E-05	--	--	3.50E-04
Semi-Volatile Organic Compounds							
Naphthalene	NSC[e]	0.26	--	--	--		
2-Methylnaphthalene	3.6	0.093	--	--	2.74E-09		

Footnotes:

[a] These outdoor and indoor air concentrations account for concentrations of chemicals of potential concern (COPCs) in either soil or groundwater. In all cases vapor fluxes were estimated separately for COPCs detected in both soil and groundwater.

[b] mg/kg = milligrams per kilogram.

[c] mg/L = milligrams per liter.

[d] mg/m^3 = milligrams per cubic meter.

[e] Chemical not identified as a COPC for this medium.

[f] Not applicable for this chemical and medium

Table 4-7.
Summary of Noncancer Adverse Health Effects and Excess Cancer Risks for Hypothetical Onsite Receptors
Metz Baking Company Risk-Based Corrective Action Evaluation
580 Julie Ann Way
Oakland, California
Project No. 005.02811.002

Exposure Pathway	Hypothetical Potential Receptors			
			Onsite	
	Indoor Commercial Worker Receptor		Onsite Construction Worker Receptor	
	Hazard Index	Cancer Risk	Hazard Index	Cancer Risk
Soil				
Incidental Ingestion of Soil	- -[a]	- -	3 E-03	1 E-08
Dermal Contact with Soil	- -	- -	8 E-04	4 E-09
Inhalation of Fugitive Dust	- -	- -	2 E-16	- -
Inhalation of Vapors Emanating from Soil	3 E-02	2 E-06	3 E+00	7 E-06
Multipathway Total for Soil	**3 E-02**	**2 E-06**	**3 E+00**	**7 E-06**
Groundwater				
Dermal Contact with Groundwater	- -	- -	2 E+00	7 E-06
Inhalation of Vapors Emanating From Groundwater	5 E-02	3 E-06	2 E-01	4 E-07
Multipathway Total for Groundwater	**5 E-02**	**3 E-06**	**2 E+00**	**8 E-06**
Total Multipathway	**8 E-02**	**5 E-06**	**5 E+00**	**1 E-05**

Footnote:

[a] "- -" = Not applicable.

Table C-1. Risk Characterization for the Hypothetical Onsite Indoor Commercial Worker Receptor Inhalation of Chemical Vapors Volatilizing from Soil Metz Baking Company Risk-Based Corrective Action Evaluation 580 Julie Ann Way Oakland, California Project No. 005.02811.002

Pathway: Inhalation of Chemical Vapors Volatilizing from Soil[a]

Chronic Daily Intake (CDI)[b] = (Cas_in x InR x ET x EF x ED) / (BW x AT)

Chemical	Noncarcinogenic Effects			Carcinogenic Effects		
	CDI (mg/kg-day)[c]	Inhalation Reference Dose (RfDi) (mg/kg-day)	Hazard Quotient (HQ) (unitless)	CDI (mg/kg-day)	Inhalation Slope Factor (SFi) $(mg/kg\text{-}day)^{-1}$	Excess Cancer Risk (unitless)
Volatile Organic Compounds						
Benzene	5.6E-05	1.7E-03	3 E-02	2.0E-05	1.0E-01	2 E-06
		Total Hazard Index =	3 E-02		**Total Excess Cancer Risk =**	2 E-06

Footnotes:

[a] For the purposes of this assessment, it is assumed that this receptor will be exposed to chemical vapors volatilizing from the subsurface soil.

[b] Refer to Table 4-1 for explanation of acronyms used in equation.

[c] mg/kg-day = milligrams per kilogram body weight per day.

[d] "- -" = Not applicable.

Table C-2. Risk Characterization for the Hypothetical Onsite Indoor Commercial Worker Receptor Inhalation of Chemical Vapors Volatilizing from Groundwater Metz Baking Company Risk-Based Corrective Action Evaluation 580 Julie Ann Way Oakland, California Project No. 005.02811.002

Pathway: Inhalation of Chemical Vapors Volatilizing from Groundwater[a]

Chronic Daily Intake (CDI)[b] = (Cas_in x InR x ET x EF x ED) / (BW x AT)

Chemical	Noncarcinogenic Effects			Carcinogenic Effects		
	CDI (mg/kg-day)[c]	Inhalation Reference Dose (RfDi) (mg/kg-day)	Hazard Quotient (HQ) (unitless)	CDI (mg/kg-day)	Inhalation Slope Factor (SFi) $(mg/kg\text{-}day)^{-1}$	Excess Cancer Risk (unitless)
Volatile Organic Compounds						
Benzene	8.8E-05	1.7E-03	5 E-02	3.1E-05	1.0E-01	3 E-06
Methyl-tert-butyl ether	2.7E-05	8.0E-01	3 E-05	9.8E-06	- -	- -
		Total Hazard Index =	5 E-02	**Total Excess Cancer Risk =**		3 E-06

Footnotes:

[a] For the purposes of this assessment, it is assumed that this receptor will be exposed to chemical vapors volatilizing from groundwater up through the subsurface soil.

[b] Refer to Table 4-1 for explanation of acronyms used in equation.

[c] mg/kg-day = milligrams per kilogram body weight per day.

[d] "- -" = Not applicable.

Table D-5. Risk Characterization for the Hypothetical Onsite Outdoor Construction Worker Receptor Dermal Contact with Groundwater Metz Baking Company Risk-Based Corrective Action Evaluation 580 Julie Ann Way Oakland, California Project No. 005.02811.002

Pathway: Dermal Contact with Groundwater

Chronic Daily Intake (CDI)[a] = (DAevent_gw x SA x EF x ED) / (BW x AT)

Chemical	Noncarcinogenic Effects			Carcinogenic Effects		
	CDI (mg/kg-day)[b]	Subchronic Oral Reference Dose (RfDo) (mg/kg-day)	Hazard Quotient (HQ) (unitless)	CDI (mg/kg-day)	Oral Slope Factor (SFo) $(mg/kg\text{-}day)^{-1}$	Excess Cancer Risk (unitless)
Volatile Organic Compounds						
Benzene	5.1E-03	3.0E-03	2 E+00	7.3E-05	1.0E-01	7 E-06
Methyl-tert-butyl ether	1.8E-04	8.0E-01	2 E-04	2.5E-06	- -e	- -
Semi-Volatile Organic Compounds						
Naphthalene	3.0E-03	2.0E-01	1 E-02	4.2E-05	- -	- -
2-Methylnaphthalene	1.1E-03	2.0E-01	5 E-03	1.5E-05	- -	- -
	Total Hazard Index =		2 E+00	Total Excess Cancer Risk =		7 E-06

Footnotes:

[a] Refer to Table 4-1 for explanation of acronyms used in equation.

[b] mg/kg-day = milligrams per kilogram body weight per day.

[c] "- -" = Not applicable.

Table D-6. Risk Characterization for the Hypothetical Onsite Outdoor Construction Worker Receptor Inhalation of Chemical Vapors Volatilizing from Groundwater Metz Baking Company Risk-Based Corrective Action Evaluation 580 Julie Ann Way Oakland, California Project No. 005.02811.002

Pathway: Inhalation of Chemical Vapors Volatilizing from Groundwater

Chronic Daily Intake (CDI)[a] = (Caw_out x InR x ET x EF x ED) / (BW x AT)

Chemical	Noncarcinogenic Effects			Carcinogenic Effects		
	CDI (mg/kg-day)[b]	Subchronic Inhalation Reference Dose (RfDi) (mg/kg-day)	Hazard Quotient (HQ) (unitless)	CDI (mg/kg-day)	Inhalation Slope Factor (SFi) $(mg/kg\text{-}day)^{-1}$	Excess Cancer Risk (unitless)
Volatile Organic Compounds						
Benzene	2.9E-04	1.7E-03	0.172254905	4.2E-06	1.0E-01	4.18333E-07
Methyl-tert-butyl ether	6.9E-06	8.0E-01	8.61193E-06	9.8E-08	- -	- -
		Total Hazard Index =	2 E-01	**Total Excess Cancer Risk =**		4 E-07

Footnotes:

[a] Refer to Table 4-1 for explanation of acronyms used in equation.

[b] mg/kg-day = milligrams per kilogram body weight per day.

ATTACHMENT 3
REVISED TABLES REFLECTING THE INCLUSION OF SOIL DATA COLLECTED IN JUNE 1991 AND NOVEMBER 1993

NOTE:

FOR DIRECT COMPARISON PURPOSES, TABLE NUMBERS OF MATERIALS IN ATTACHMENT 3 ARE IDENTICAL TO THOSE PRESENTED IN THE DECEMBER 7TH RBCA

TABLE A-1-New Soil Data
SOIL ANALYTICAL RESULTS
t Baking Company Risk-Based Corrective Action Evaluation
580 Julie Ann Way
Oakland, California
Project No. 005.02811.002

Benzene		Toluene		Ethylbenzene		Xylenes		MTBE[a]		TOC[d]		PAH[e]	Naphthalene	2-Methylnaphthalene	Di-n-Butylphthalate
0.17	0.17	0.03	0.03	1.3	1.3	0.84	0.84						3.3	3.6	0.76
0.13	0.13	0.02	0.02	0.57	0.57	1.8	1.8								
ND	0.0025	ND	0.0025	ND	0.0025	0.01	0.01								
ND	0.0025	0.049	0.049	0.046	0.046	0.072	0.072								
2.1	2.1	ND	0.31	ND	0.31	1.2	1.2	ND	0.31			ND[f]			
ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025			ND[f]			
ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	6,220	6,220	ND[f]			
										7,310	7,310				
										778	778				
5.1	5.1	1.4	1.4	3.3	3.3	12	12								
0.75	0.75	0.084	1.4	0.35	0.35	0.35	0.35								
1.1	1.1	0.17	0.17	0.48	0.48	1.3	1.3								
0.75	0.75	0.010	0.010	0.043	0.043	0.063	0.063								
0.034	0.034	ND	0.005	0.10	0.10	0.22	0.22								
0.59	0.59	0.59	0.59	0.38	0.38	1.2	1.2								
3	3														
3	3														
1	1														
1	1														
0.02	0.02														
28	28														
0.098	0.098	0.031	0.031	ND	0.0025	ND	0.0025								
24	24	4.9	4.9	58	58	230	230								
0.006	0.003	0.099	0.099	0.14	0.14	0.17	0.17								
0.2	0.2	0.072	0.072	0.11	0.11	0.45	0.45								
ND	0.0025	0.14	0.14	ND	0.0025	ND	0.0025								
ND	0.0025	0.049	0.049	ND	0.0025	ND	0.0025								
ND	0.0025	0.065	0.065	ND	0.0025	ND	0.0025								
ND	0.0025	0.24	0.24	ND	0.0025	0.010	0.010								
ND	0.0025	1.3	1.3	ND	0.0025	0.008	0.008								
28		**5**		**58**		**230**		ND		**7310.00**		**0.00**	**3.3**	**3.6**	**0.76**
0.006		**0.02**		**0.043**		**0.008**		ND					**3.3**	**3.6**	
1.192		**0.335**		**0.809**		**1.732**		ND		**4769.33**			**3.3**	**3.6**	**0.76**

Table 4-5-New Soil Data.
Exposure Point Concentrations for the Chemicals Evaluated Under the Tier II RBCA Evaluation[a]
Metz Baking Company Risk-Based Corrective Action Evaluation
580 Julie Ann Way
Oakland, California
Project No. 005.02811.002

	Construction Worker Receptor					Indoor Commercial Worker Receptor	
			Outdoor Air			Indoor Air	
COPC	Soil (mg/kg)[b]	Groundwater (mg/L)[c]	From Soil (mg/m^3)[d]	From Groundwater (mg/m^3)	Dust-in-Air (mg/m^3)	From Soil (mg/m^3)	From Groundwater (mg/m^3)
Volatile Organic Compounds							
Benzene	28	0.270	3.38E-01	3.77E-03	--[f]	3.95E-03	1.12E-03
Methyl Tert Butyl Ether	--	0.060	--	8.86E-05	--	--	3.50E-04
Semi-Volatile Organic Compounds							
Naphthalene	NSC[e]	0.26	--	--	--		
2-Methylnaphthalene	3.6	0.093	--	--	2.74E-09		

Footnotes:

[a] These outdoor and indoor air concentrations account for concentrations of chemicals of potential concern (COPCs) in either soil or groundwater. In all cases vapor fluxes were estimated separately for COPCs detected in both soil and groundwater.

[b] mg/kg = milligrams per kilogram.

[c] mg/L = milligrams per liter.

[d] mg/m^3 = milligrams per cubic meter.

[e] Chemical not identified as a COPC for this medium.

[f] Not applicable for this chemical and medium

Table 4-7-New Soil Data.
Summary of Noncancer Adverse Health Effects and Excess Cancer Risks for Hypothetical Onsite Receptors
Metz Baking Company Risk-Based Corrective Action Evaluation
580 Julie Ann Way
Oakland, California
Project No. 005.02811.002

Exposure Pathway	Hypothetical Potential Receptors			
			Onsite	
	Indoor Commercial Worker Receptor		Onsite Construction Worker Receptor	
	Hazard Index	Cancer Risk	Hazard Index	Cancer Risk
Soil				
Incidental Ingestion of Soil	- -[a]	- -	2 E-02	7 E-08
Dermal Contact with Soil	- -	- -	5 E-03	2 E-08
Inhalation of Fugitive Dust	- -	- -	2 E-16	- -
Inhalation of Vapors Emanating from Soil	2 E-01	1 E-05	2 E+01	4 E-05
Multipathway Total for Soil	**2.E-01**	**1.E-05**	**2.E+01**	**4.E-05**
Groundwater				
Dermal Contact with Groundwater	- -	- -	2.E+00	7.E-06
Inhalation of Vapors Emanating From Groundwater	5.E-02	3.E-06	2.E-01	4.E-07
Multipathway Total for Groundwater	**5.E-02**	**3.E-06**	**2.E+00**	**8.E-06**
Total Multipathway	**2.E-01**	**1.E-05**	**2.E+01**	**5.E-05**

Footnote:

[a] "- -" = Not applicable.

Table C-1-New Soil Data. Risk Characterization for the Hypothetical Onsite Indoor Commercial Worker Receptor Inhalation of Chemical Vapors Volatilizing from Soil Metz Baking Company Risk-Based Corrective Action Evaluation 580 Julie Ann Way Oakland, California Project No. 005.02811.002

Pathway: Inhalation of Chemical Vapors Volatilizing from Soil[a]

Chronic Daily Intake (CDI)[b] = (Cas_in x InR x ET x EF x ED) / (BW x AT)

Chemical	Noncarcinogenic Effects			Carcinogenic Effects		
	CDI (mg/kg-day)[c]	Inhalation Reference Dose (RfDi) (mg/kg-day)	Hazard Quotient (HQ) (unitless)	CDI (mg/kg-day)	Inhalation Slope Factor (SFi) $(mg/kg-day)^{-1}$	Excess Cancer Risk (unitless)
Volatile Organic Compounds						
Benzene	3.1E-04	1.7E-03	2 E-01	1.1E-04	1.0E-01	1 E-05
		Total Hazard Index =	2 E-01		**Total Excess Cancer Risk =**	1 E-05

Footnotes:

[a] For the purposes of this assessment, it is assumed that this receptor will be exposed to chemical vapors volatilizing from the subsurface soil.

[b] Refer to Table 4-1 for explanation of acronyms used in equation.

[c] mg/kg-day = milligrams per kilogram body weight per day.

[d] "- -" = Not applicable.

Table C-2-New Soil Data. Risk Characterization for the Hypothetical Onsite Indoor Commercial Worker Receptor Inhalation of Chemical Vapors Volatilizing from Groundwater Metz Baking Company Risk-Based Corrective Action Evaluation 580 Julie Ann Way Oakland, California Project No. 005.02811.002

Pathway: Inhalation of Chemical Vapors Volatilizing from Groundwater[a]

Chronic Daily Intake (CDI)[b] = (Cas_in x InR x ET x EF x ED) / (BW x AT)

Chemical	Noncarcinogenic Effects			Carcinogenic Effects		
	CDI (mg/kg-day)[c]	Inhalation Reference Dose (RfDi) (mg/kg-day)	Hazard Quotient (HQ) (unitless)	CDI (mg/kg-day)	Inhalation Slope Factor (SFi) $(mg/kg\text{-}day)^{-1}$	Excess Cancer Risk (unitless)
Volatile Organic Compounds						
Benzene	8.8E-05	1.7E-03	5 E-02	3.1E-05	1.0E-01	3 E-06
Methyl-tert-butyl ether	2.7E-05	8.0E-01	3 E-05	9.8E-06	- -	- -
	Total Hazard Index =		5 E-02	**Total Excess Cancer Risk =**		3 E-06

Footnotes:

[a] For the purposes of this assessment, it is assumed that this receptor will be exposed to chemical vapors volatilizing from groundwater up through the subsurface soil.

[b] Refer to Table 4-1 for explanation of acronyms used in equation.

[c] mg/kg-day = milligrams per kilogram body weight per day.

[d] "- -" = Not applicable.

Table D-5-New Soil Data. Risk Characterization for the Hypothetical Onsite Outdoor Construction Worker Receptor Dermal Contact with Groundwater Metz Baking Company Risk-Based Corrective Action Evaluation 580 Julie Ann Way Oakland, California Project No. 005.02811.002

Pathway: Dermal Contact with Groundwater

Chronic Daily Intake (CDI)[a] = (DAevent_gw x SA x EF x ED) / (BW x AT)

Chemical	Noncarcinogenic Effects			Carcinogenic Effects		
	CDI (mg/kg-day)[b]	Subchronic Oral Reference Dose (RfDo) (mg/kg-day)	Hazard Quotient (HQ) (unitless)	CDI (mg/kg-day)	Oral Slope Factor (SFo) $(mg/kg\text{-}day)^{-1}$	Excess Cancer Risk (unitless)
Volatile Organic Compounds						
Benzene	5.1E-03	3.0E-03	2 E+00	7.3E-05	1.0E-01	7 E-06
Methyl-tert-butyl ether	1.8E-04	8.0E-01	2 E-04	2.5E-06	--e	--
Semi-Volatile Organic Compounds						
Naphthalene	3.0E-03	2.0E-01	1 E-02	4.2E-05	--	--
2-Methylnaphthalene	1.1E-03	2.0E-01	5 E-03	1.5E-05	--	--
	Total Hazard Index =		2 E+00	**Total Excess Cancer Risk =**		7 E-06

Footnotes:

[a] Refer to Table 4-1 for explanation of acronyms used in equation.

[b] mg/kg-day = milligrams per kilogram body weight per day.

[c] "- -" = Not applicable.

Table D-6-New Soil Data. Risk Characterization for the Hypothetical Onsite Outdoor Construction Worker Receptor Inhalation of Chemical Vapors Volatilizing from Groundwater Metz Baking Company Risk-Based Corrective Action Evaluation 580 Julie Ann Way Oakland, California Project No. 005.02811.002

Pathway: Inhalation of Chemical Vapors Volatilizing from Groundwater

Chronic Daily Intake (CDI)[a] = (Caw_out x InR x ET x EF x ED) / (BW x AT)

Chemical	Noncarcinogenic Effects			Carcinogenic Effects		
	CDI (mg/kg-day)[b]	Subchronic Inhalation Reference Dose (RfDi) (mg/kg-day)	Hazard Quotient (HQ) (unitless)	CDI (mg/kg-day)	Inhalation Slope Factor (SFi) $(mg/kg\text{-}day)^{-1}$	Excess Cancer Risk (unitless)
Volatile Organic Compounds						
Benzene	2.9E-04	1.7E-03	0.172254905	4.2E-06	1.0E-01	4.18333E-07
Methyl-tert-butyl ether	6.9E-06	8.0E-01	8.61193E-06	9.8E-08	- -	- -
		Total Hazard Index =	2 E-01	Total Excess Cancer Risk =		4 E-07

Footnotes:

[a] Refer to Table 4-1 for explanation of acronyms used in equation.

[b] mg/kg-day = milligrams per kilogram body weight per day.

Table B-1. New Soil Data

Vapor Flux from Soil at Soil Surface for the Hypothetical Onsite Indoor Commercial Worker Receptor [a]

Metz Baking Company Risk-Based Corrective Action Evaluation

580 Julie Ann Way

Oakland, California

Project No. 005.02811.002

Parameter definition	Units	Symbol	Benzene
Maximum detected concentration in soil [b]	mg/kg	C_s	28.0
Air-filled porosity [c]	--	θ_a	0.28
Water-filled porosity [c]	--	θ_w	0.15
Total soil porosity [c,d]	--	n	0.43
Chemical diffusivity in air [c]	cm^2/sec	D_i	8.80E-02
Dimensionless Henry's Law constant [c]	--	H'	2.28E-01
Chemical diffusivity in water [c]	cm^2/sec	D_w	9.80E-06
Dry soil bulk density [c]	g/cm^3	ρ_b	1.50
Soil particle density [c]	g/cm^3	ρ_s	2.65
Soil organic carbon partition coefficient [c]	cm^3/g	K_{oc}	3.07E+03
Fraction of organic carbon in soil [c]	g/g	f_{oc}	0.006
Soil-water partition coefficient [e]	cm^3/g	K_d	1.84E+01
Exposure interval [f]	secs	T	7.88E+08
Apparent diffusivity [g]	cm^2/sec	D_A	5.78E-05
Vapor flux at soil surface from shallow soils [h]	**mg/m^2-sec**	**F**	**1.28E-04**

Footnotes:

[a] Chemical vapor flux at soil surface from volatilization is based on Jury et al. (1984) model, as described in Soil Screening Guidance: User's Guide (USEPA, 1996c).

[b] From Table 4-5.

[c] Chemical and default soil properties were obtained from USEPA Soil Screening Guidance User's Guide (USEPA, 1996c).

[d] $(1 - (\rho_b / \rho_s))$

[e] $K_{oc} \times f_{oc}$

[f] Represents the number of seconds in 25 years of exposure.

[g] $[(\theta_a^{10/3} \times D_i \times H' + \theta_w^{10/3} \times D_w) / n^2] / (\rho_b \times K_d + \theta_w + \theta_a \times H')$.

[h] $[C_s \times ((2 \times \rho_b \times D_A) / (3.14 \times D_A \times T)^{1/2} \times 10^{-4})] \times 0.001$ kg soil/g soil.

References:

Jury, W.A., W.J. Farmer, and W.F. Spencer. 1984. Behavior Assessment Model for Trace Organics in Soil: II. Chemical Classification and Parameter Sensitivity. J. Environ. Qual. 13(4):567-572.

Mackay, D., W.Y. Shiu, and K.C. Ma. 1992. Illustrated Handbook of Physical-Chemical Properties and Environmental Fate for Organic Chemicals, Vol. I, Monoaromatic Hydrocarbons, Chlorobenzenes, and PCBs. Lewis Publishers, Inc., Chelsea, Michigan.

Mackay, D., W.Y. Shiu, and K.C. Ma. 1993. Illustrated Handbook of Physical-Chemical Properties and Environmental Fate for Organic Chemicals, Vol. III, Volatile Organic Compounds. Lewis Publishers, Inc., Chelsea, Michigan

USEPA. 1996c. Soil Screening Guidance. User's Guide.

Table B-2. New Soil Data
Estimated Indoor Chemical Vapor Air Concentrations
from Soil for the Hypothetical Onsite Indoor Commercial Worker Receptor[a]
Metz Baking Company Risk-Based Corrective Action Evaluation
580 Julie Ann Way
Oakland, California
Project No. 005.02811.002

Parameter Definition	Units [b]	Symbol	Benzene
Estimated vapor flux at soil surface from soil[c]	mg/sec-m²	F	1.28E-04
Aerial fraction of cracks in concrete slab-on-grade foundation [d]	--	Fc	1.00E-02
Sensitivity of crack fraction to vapor retardation[e]	--	Sc	5.00E-01
Adjusted vapor flux at building floor surface[f]	mg/sec-m²	F"	2.57E-06
Volumetric flow rate for infiltration air per unit area[g]	L/sec-m²	Q	6.49E-01
Unit conversion factor	m³/L	CF	1.00E-03
Volumetric flow rate for infiltration air per unit area[h]	m³/sec-m²	Q'	6.49E-04
Concentration of chemical in indoor air[i]	mg/m³	C_{in}	3.95E-03

Footnotes:

[a] Model for estimating chemical vapors in indoor air from ASTM, 1995; Wadden and Scheff, 1983; Johnson and Ettinger, 1991.

[b] mg/sec-m² = milligrams per second per square meter; L/sec-m² = liters per second per square meter; m³/L = cubic meters per liter; m³/sec-m² = cubic meters per second per square meter; mg/m³ = milligrams per cubic meter.

[c] From Table B-1.

[d] Default value from ASTM, 1995.

[e] Based on Johnson and Ettinger (1991) for medium permeability vadose soils. The vadose soil type is characterized as "sandy silty clays". (SECOR, 1

[f] (F' x {Fc/ Sc}).

[g] Value based on the average of ASHRAE's reported range of 0.75 to 2 cfm/ft², which was multiplied by 0.472 to obtain a value of 0.649.

[h] (Q x CF).

[i] (F" / Q').

References:

American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE). 1999. ASHRAE Handbook: Heating, Ventilating, and Air

American Society for Testing and Materials (ASTM). 1995. Standard Guide for Risk-Based Corrective Action Applied at Petroleum Release Sites. Designation E 1739-95.American Society for Testing and Materials, West Conshohocken, PA. November.

Johnson and Ettinger. 1991. Heuristic Model for Predicting the Intrusion Rate of Contaminated Vapors into Buildings. P.C. Johnson and R.A. Ettinger, Environ. Sci. Technol.25: 1445-1452.

SECOR International, Inc. 1999. Quarterly Groundwater Monitoring Report for First Quarter 1999, 580 Julie Ann Way, Oakland, CA.

Wadden and Scheff. 1983. Air Quality Models. Chapter 6 in Indoor Air Pollution. R.A. Wadden and P.A. Scheff, J. Wiley & Sons, Interscience.

American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE). 1989. ASHRAE Standard: Ventilation for Acceptable Indoor Air Quality. American Society of Heating, Refrigerating, and Air-Conditioning Engineers, Inc., Atlanta, GA. ASHRAE 62-1989.

Table B-3. New Soil Data
Estimated Vapor Flux at Soil Surface for Hypothetical Onsite Construction Worker Receptor [a]
Metz Baking Company Risk-Based Corrective Action Evaluation
580 Julie Ann Way
Oakland, California
Project No. 005.02811.002

Parameter definition	Units	Symbol	Benzene
Maximum Detected Concentration in soil [b]	mg/kg	C_s	28.0
Air-filled porosity [c]	--	θ_a	0.28
Water-filled porosity [d]	--	θ_w	0.15
Total soil porosity [e,f]	--	n	0.43
Chemical diffusivity in air [c]	cm^2/sec	D_i	8.80E-02
Dimensionless Henry's Law constant [c]	--	H'	2.28E-01
Chemical diffusivity in water [c]	cm^2/sec	D_w	9.80E-06
Dry soil bulk density [c]	g/cm^3	ρ_b	1.50
Soil particle density [c]	g/cm^3	ρ_s	2.65
Soil organic carbon partition coefficient [c]	cm^3/g	K_{oc}	3.07E+03
Fraction of organic carbon in soil [c]	g/g	f_{oc}	0.006
Soil-water partition coefficient [e]	cm^3/g	K_d	1.84E+01
Exposure interval [f]	secs	T	3.15E+07
Apparent diffusivity [g]	cm^2/sec	D_A	5.78E-05
Vapor flux at soil surface [h]	**mg/m^2-sec**	F	**6.42E-04**
Agitation factor [i]	--	AF	37
Adjusted vapor flux at soil surface from shallow soils [k]	**mg/m^2-sec**	F'	**2.37E-02**

Footnotes:

[a] Chemical vapor flux at soil surface from volatilization is based on Jury et al. (1984) model, as described in Soil Screening Guidance: User's Guide (USEPA, 1996c).

[b] From Table 4-5.

[c] Chemical and default soil properties were obtained from USEPA Soil Screening Guidance User's Guide (USEPA, 1996c).

[d] $(1 - (\rho_b / \rho_s))$

[e] $K_{oc} \times f_{oc}$

[f] Represents the number of seconds in 1 year of exposure.

[g] $[(\theta_a^{10/3} \times D_i \times H' + \theta_w^{10/3} \times D_w) / n^2] / (\rho_b \times K_d + \theta_w + \theta_a \times H')$

[h] $[C_s \times ((2 \times \rho_b \times D_A) / (3.14 \times D_A \times T)^{1/2} \times 10^{-4}))] \times 0.001$ kg soil/g soil

[i] The average agitation factor of 37 was used to represent construction worker soil handling (USEPA, 1989a).

[j] (AF x F)

References:

Jury, W.A., W.J. Farmer, and W.F. Spencer. 1984. Behavior Assessment Model for Trace Organics in Soil: II. Chemical Classification and Parameter Sensitivity. J. Environ. Qual. 13(4):567-572.

Mackay, D., W.Y. Shiu, and K.C. Ma. 1992. Illustrated Handbook of Physical-Chemical Properties and Environmental Fate for Organic Chemicals, Vol. I, Monoaromatic Hydrocarbons, Chlorobenzenes, and PCBs. Lewis Publishers, Inc., Chelsea, Michigan.

Mackay, D., W.Y. Shiu, and K.C. Ma. 1993. Illustrated Handbook of Physical-Chemical Properties and Environmental Fate for Organic Chemicals, Vol. III, Volatile Organic Compounds. Lewis Publishers, Inc., Chelsea, Michigan.

USEPA. 1988. Superfund Exposure Assessment Manual.

USEPA. 1989a. Air/Superfund National Technical Guidance Study Series, Vol. III - Estimation of Air Emissions from Cleanup Activities at Superfund Sites.

USEPA. 1996c. Soil Screening Guidance: User's Guide.

Table B-4. New Soil Data
Concentration in Ambient Air from Soils
for the Hypothetical Onsite Construction Worker Receptor[a]

Metz Baking Company Risk-Based Corrective Action Evaluation
580 Julie Ann Way
Oakland, California
Project No. 005.02811.002

Parameter definition	Units	Symbol	Benzene
Adjusted vapor flux at soil surface from shallow soils [b]	mg/sec-m^2	F'	2.37E-02
Area of source [c]	m^2	A	80
Length dimension perpendicular to the wind [d]	m	LS	12.5
Wind speed [e]	m/sec	V	0.225
Ambient air mixing zone [f]	m	MH	2
Concentration of chemical in ambient air [g]	**mg/m^3**	**C_a**	**3.38E-01**

Footnotes:

[a] Concentration in ambient air is evaluated based on the model described in the Preliminary Endangerment Assessment Guidance Manual (California,1994).

[b] Based on adjusted vapor flux at soil surface for the construction worker receptor (Table B-3).

[c] Based on the excavated area of the UST area, 21ft x 41ft (SECOR, 1999).

[d] Estimated based on the area of impacted area (former location of USTs) - 21 ft x 41 ft. Using a conversion factor of 0.305, 41 ft is equal to 12

[e] Estimated based on the largest impacted area assessed, assuming wind direction is west to east. This includes a stagnation factor for the expected lower winds in a trench.

[f] Default value for California (1994).

[g] (F x A) / (LS x V x MH)

References:

California. 1994. Preliminary Endangerment Assessment Guidance Manual. State of California Environmental Protection Agency,

Table B-5. New Soil Data
Emissions of Chemical Vapors from Groundwater for the Hypothetical Onsite Indoor Commercial Worker Receptor[a]
Metz Baking Company Risk-Based Corrective Action Evaluation
580 Julie Ann Way
Oakland, California
Project No. 005.02811.002

Parameter Definition	Units	Symbol	Benzene	Methyl-tert-Butyl Ether
Groundwater concentration[b]	ug/l	Cp	270	60
Temperature of groundwater	degsK	T	293	293
Gas constant	atm-m^3/mole-degK	R	0.000082	0.000082
Dimensionless Henry's Law constant[c]	ug/l/ug/l	H'	2.28E-01	4.22E-01
Soil gas concentration[d]	ug/l	Cm	6.16E+01	2.53E+01
Air diffusion coefficient[e]	cm^2/sec	Di	1.04E-01	7.90E-02
Unit conversion factor	mg-l/ug-cm^3	CF1	1.00E-06	1.00E-06
Soil gas concentration[e]	mg/cm^3	Cm'	6.16E-05	2.53E-05
Air-filled soil porosity[f]	--	Pa	0.28	0.28
Total soil porosity [f]	--	Pt	0.43	0.43
Depth of soil cover [g]	cm	L	140.8176	140.8176
Estimated flux rate at soil surface[h]	mg/cm^2-sec	F	3.63E-09	1.14E-09
Unit conversion factor	cm^2/m^2	CF2	1.00E+04	1.00E+04
Estimated flux rate at soil surface[i]	mg/m^2-sec	F'	3.63E-05	1.14E-05

Footnotes:

[a] Model from Karimi et al., 1987, based on Shen's model (Shen, 1981; USEPA, 1988).

[b] Maximum detected chemical concentration. From Table 4-5.

[c] Values from USEPA (1996).

[d] H' x Cp

[e] Cm x CF1

[f] Default screening values (California, 1994).

[g] Average based on SECOR's reported range of 3.52 to 5.79 feet below ground surface (SECOR, 1999)

[h] [(Di)(Cm')(Pa^3.333/Pt^2)]/L

[i] F x CF2

References:

California. 1994. Preliminary endangerment assessment guidance manual. State of California Environmental Protection Agency,

Karimi et al. 1987. Vapor-Phase Diffusion of Benzene in Soil. A.A. Karimi, W.J. Farmer, and M.M. Cliath, J. Environ. Qual. 16(1): 38-43.

SECOR International, Inc. 1999. Quarterly Groundwater Monitoring Report for First Quarter 1999, 580 Julie Ann Way, Oakland, CA, ST ID #4008, for Metz Baking Company. May 20.

Shen. 1981. Estimating Hazardous Air Emissions from Disposal Sites. T.T. Shen, Poll. Engin. 13(8): 31-34.

USEPA. 1988. Superfund exposure assessment manual. U.S. Environmental Protection Agency, Office of Remedial Response, Washington, D.C., EPA/540/1-88/001. April.

USEPA. 1996. Soil Screening Guidance: User's Guide. United States Environmental Protection Agency, Office of Solid Waste and Emergency Response, Washington D.C., Publication 9355.4-23, July.

Table B-6. New Soil Data
Estimated Indoor Chemical Vapor Air Concentrations for the Onsite Indoor Commercial Worker Receptor[a]
Metz Baking Company Risk-Based Corrective Action Evaluation
580 Julie Ann Way
Oakland, California
Project No. 005.02811.002

Parameter Definition	Units [b]	Symbol	Benzene	Methyl-tert-Butyl Ether
Estimated vapor flux at soil surface from groundwater volatilization[c]	mg/sec-m^2	F	3.63E-05	1.14E-05
Aerial fraction of cracks in concrete slab-on-grade foundation [d]	- -	Fc	1.00E-02	1.00E-02
Sensitivity of crack fraction to vapor retardation[e]	--	Sc	5.00E-01	5.00E-01
Adjusted vapor flux at building floor surface[f]	mg/sec-m^2	F'	7.27E-07	2.27E-07
Volumetric flow rate for infiltration air per unit area[g]	L/sec-m^2	Q	6.49E-01	6.49E-01
Unit conversion factor	m^3/L	CF	1.00E-03	1.00E-03
Volumetric flow rate for infiltration air per unit area[h]	m^3/sec-m^2	Q'	6.49E-04	6.49E-04
Concentration of chemical in indoor air[i]	mg/m^3	C_{in}	1.12E-03	3.50E-04

Footnotes:

[a] Model for estimating chemical vapors in indoor air from ASTM, 1995; Wadden and Scheff, 1983; Johnson and Ettinger, 1991.

[b] mg/sec-m^2 = milligrams per second per square meter; L/sec-m^2 = liters per second per square meter; m^3/L = cubic meters per liter; m^3/sec-m^2 = cubic meters per second per square meter; mg/m^3 = milligrams per cubic meter.

[c] From Table B-5.

[d] Default value from ASTM, 1995.

[e] Based on Johnson and Ettinger (1991) for medium permeability vadose soils. The vadose soil type at the site can be characterized as "sandy silty clays".

[f] (F' x [Fc/ Sc]).

[g] Refer to Footnote g from Table B-2.

[h] (Q x CF).

[i] (F" / Q').

References:

American Society for Testing and Materials (ASTM). 1995. Standard Guide for Risk-Based Corrective Action Applied at Petroleum Release Sites. Designation E 1739-95.American Society for Testing and Materials, West Conshohocken, PA. November.

Johnson and Ettinger. 1991. Heuristic Model for Predicting the Intrusion Rate of Contaminated Vapors into Buildings. P.C. Johnson and R.A. Ettinger, Environ. Sci. Technol.25: 1445-1452.

Wadden and Scheff. 1983. Air Quality Models. Chapter 6 in Indoor Air Pollution. R.A. Wadden and P.A. Scheff, J. Wiley & Sons, Interscience.

American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE). 1989. ASHRAE Standard: Ventilation for Acceptable Indoor Air Quality. American Society of Heating, Refrigerating, and Air-Conditioning Engineers, Inc., Atlanta, GA. ASHRAE 62-1989.

Table B-7. New Soil Data
Estimated Chemical Vapor Flux from Groundwater for the Hypothetical Onsite Construction Worker Receptor
Onsite Construction Worker Receptor[a]
Metz Baking Company Risk-Based Corrective Action Evaluation
580 Julie Ann Way
Oakland, California
Project No. 005.02811.002

Parameter definition	Units[b]	Symbol	Benzene	Methyl-tert-Butyl Ether
Groundwater concentration[c]	ug/L	Cp	270	60
Dimensionless Henry's Law constant[d]	ug/L//ug/L	H'	2.28E-01	2.20E-02
Soil gas concentration[e]	ug/L	Cm	6.16E+01	1.32E+00
Air diffusion coefficient[d]	cm^2/sec	Di	7.20E-02	7.90E-02
Unit conversion factor	ug-L/ug-cm^3	CF1	1.00E-06	1.00E-06
Soil gas concentration[f]	mg/cm^3	Cm'	6.16E-05	1.32E-06
Air-filled soil porosity[g]	--	Pa	2.80E-01	2.80E-01
Total soil porosity[g]	--	Pt	0.43	0.43
Depth of soil cover[h]	cm	L	30	30
Estimated flux rate at soil surface[i]	mg/cm^2-sec	F	1.13E-08	2.66E-10
Unit conversion factor	cm^2/m^2	CF2	1.00E+04	1.00E+04
Estimated vapor flux at soil surface from groundwater volatilization[j]	mg/m^2-sec	F'	1.13E-04	2.66E-06

Footnotes:

[a] Model from Karimi et al., 1987; based on Shen's model (Shen, 1981; USEPA, 1988).

[b] ug = micrograms; L = liters; cm = centimeters; sec = seconds; m = meters; mg = milligrams; g = grams; kg = kilogram.

[c] Maximum detected concentration as reported in Table 4-5.

[d] USEPA (1996).

[e] H' x Cp.

[f] Cm x CF1.

[g] Default ASTM, 1995.

[h] Corressponds to one foot of vadose zone.

[i] [(Di)(Cm')(Pa^3.333/Pt^2)]/L

[j] F x CF2

References:

Karimi et al. 1987. Vapor-Phase Diffusion of Benzene in Soil. A.A. Karimi, W.J. Farmer, and M.M. Cliath, J. Environ. Qual. 16(1): 38-43.

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Table B-8. New Soil Data
Estimated Outdoor Chemical Vapor Air Concentrations for the Onsite Construction Worker Receptor[a]
Metz Baking Company Risk-Based Corrective Action Evaluation
580 Julie Ann Way
Oakland, California
Project No. 005.02811.002

Parameter definition	Units[b]	Symbol	Benzene	Methyl-tert-Butyl Ether
Estimated vapor flux at soil surface from groundwater volatilization[c]	mg/sec-m^2	F	1.13E-04	2.66E-06
Length of emissions source[d]	m	d	15	15
Site wind speed[e]	m/sec	u_s	2.25	2.25
Trench wind speed stagnation factor[f]	--	Tf	0.1	0.1
Trench wind speed[g]	m/sec	u	0.225	0.225
Air mixing zone height[e]	m	h	2	2
Air concentration of vapor[h]	mg/m^3	Ca	3.77E-03	8.86E-05

Footnotes:

[a] Model based on box model (USEPA, 1991; Dobbins, 1979; California, 1994).

[b] mg = milligrams; sec = seconds; m = meters.

[c] From Table B-7.

[d] Assumed dimension of trench prallel to predominant wind direction.

[e] Standard default assumption for box model (USEPA, 1991; California, 1994).

[f] Assumed stagnation factor for below ground trench.

[g] u_s x Tf.

[h] (F x d)/(u x h).

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1.0 INTRODUCTION

A Tier I and Tier II Risk-Based Corrective Action (RBCA) evaluation was conducted for the San Francisco French Bread facility located at 580 Julie Ann Way, Oakland, California (the Site) and owned by the Metz Baking Company (Metz). This RBCA was conducted in direct response to the Alameda County Department of Environmental Health Services (ACDEH, 1999) letter dated July 21, 1999, in which the RBCA approach was recommended to expedite closure of the site.

The RBCA evaluation was conducted consistent with the American Society for Testing and Materials (ASTM) guidelines (ASTM, 1995). In general the tiered approach is designed as a step-wise process to evaluate potential exposures and associated risks to hypothetical receptors posed by releases of petroleum-derived chemicals, and to identify appropriate corrective actions to mitigate risks, if necessary, to levels considered acceptable to regulatory agencies. RBCA evaluations typically involve Tier I and Tier II methods. Results of the generic, conservative Tier I are used as the basis for conducting a more site-specific assessment in Tier II. At the end of the process either no further action is recommended, or site-specific risk target levels (i.e., risk-based) are identified that can serve as remediation goals. The remainder of this report is organized as follows:

- Site Description and Data Evaluation (Section 2.0);
- Tier I RBCA Evaluation (Section 3.0);
- Tier II RBCA Evaluation (Section 4.0); and
- Recommended Risk Management Plan (Section 5.0).

References cited in the report are presented in Section 6.0.

2.0 SITE DESCRIPTION AND DATA EVALUATION

The Site is located in a mixed commercial/industrial area of Oakland, California and consists of a large warehouse/bakery and an open asphalt parking/work area (Figure 2-1). The Site is expected to remain industrial. Baked food products are prepared and distributed at the Site, which historically included operation of one 8,000-gallon underground storage tank (UST) and one 10,000-gallon UST (SECOR, 1998). Previous site investigations conducted by Groundwater Technology, Inc. (GTI), indicate that one or both of the USTs leaked fuel into the surrounding soils prior to their removal in 1995.

A total of 15 soil samples were collected between September 1995 and May 1998 from 13 different locations between 1 and 12 feet below ground surface (bgs). Laboratory analysis indicated the presence of total recoverable petroleum hydrocarbons (TRPH); TPH as gasoline (TPHg), diesel (TPHd), and motor oil (TPHmo); BTEX (benzene; toluene; ethylbenzene; and xylenes); methyl-tert-butyl ether (MTBE); naphthalene; 2-methylnaphthalene; and di-n-butylphthalate. The results of these soil sampling analyses are summarized in Table A-1 of Appendix A.

Groundwater at the Site has been sampled since 1996 and on a quarterly basis since June 1998 (SECOR, 1998, 1999). Laboratory analysis indicated the presence of TRPH, TPHg, TPHd, and TPHmo, BTEX, MTBE, naphthalene, and 2-methylnaphthalene in groundwater. The results of these groundwater sampling analyses are summarized in Table A-2 of Appendix A.

As indicated above, several types of TPH have been detected in soil and groundwater. As discussed by ASTM (1995), it is not practical to evaluate every compound present in a petroleum mixture. For this reason, risk management decisions are generally based on assessing the potential impacts from a select group of indicator compounds. It is inherently assumed in this approach that a significant fraction of the total potential impact from all chemicals is due to these indicator compounds. The relatively low toxicities and dissolved-phase mobility of aliphatic hydrocarbons have made these chemicals of less concern relative to aromatic hydrocarbons. When additives are present, these should be separately considered. Therefore, "TPH data should not be used for risk assessment because the general measure of TPH provides insufficient information about the amounts of individual chemicals of concern present" (ASTM, 1995). ASTM (1995) further states that "of the large number of compounds present in petroleum products, aromatic hydrocarbons (BTEX, PAHs, and so forth) are the constituents that human and aquatic organisms tend to be most sensitive to". Because both BTEX and PAH data have been collected at the site, TPH data were not used in this RBCA consistent with these recommendations.

For groundwater, the last four quarters of analytical data for BTEX were used in the evaluation because these data are expected to best reflect current Site conditions. However, PAHs were only analyzed in samples collected in August 1996. Therefore, PAH data from these older samples were also used in this RBCA

The BTEX and PAH data presented in Appendix A were used to conduct the Tier I and Tier II RBCA evaluation for this Site. As a conservative measure, it was assumed that all detected chemicals were present at their maximum detected concentrations.

Sections 3.0 and 4.0 present the results of the Tier I and Tier II RBCA evaluation, respectively.

3.0 TIER I RBCA EVALUATION

Consistent with ASTM (1995) recommended guidelines for a UST site, a Tier I evaluation was conducted comparing the maximum detected concentrations of chemicals against appropriate Risk Based Screening Levels (RBSLs). RBSLs represent media-specific conservatively developed values, below which adverse health effects are not expected. For the purposes of this evaluation, USEPA Region IX Preliminary Remediation Goals (PRGs; USEPA, 1999a) were selected as appropriate RBSLs for this Site.

As stated in USEPA (1999a), PRGs are estimated "...contaminant concentrations in environmental media (soil, air, and water) that are considered protective of humans, including sensitive groups, over a lifetime. Exceeding a PRG suggests that further evaluation of the potential risks that may be posed by site contaminants is appropriate." PRGs "...can be used to screen pollutants in environmental media". PRGs incorporate potential soil and groundwater exposure via ingestion, dermal contact, and inhalation of volatiles. Because these represent the primary pathways of potential exposure at this Site, they are relevant to use as RBSLs for this Tier I evaluation. Chemicals at concentrations below PRGs can be considered below levels of concern, and therefore can be excluded from further evaluation.

As indicated previously in Section 2.0, the Site is expected to remain exclusively "industrial" (i.e., no residences will be built on the Site). For this reason, industrial-based PRGs were selected as the most relevant Tier I RBSLs. However, industrial-based groundwater PRGs are currently not available. Instead, PRGs developed for domestic use scenarios (e.g., drinking water) were conservatively used as RBSLs to evaluate chemicals in groundwater. The results of the Tier I evaluation are discussed below and summarized in Tables 3-1 (soil) and 3-2 (groundwater).

Chemicals with maximum detected concentrations below its RBSL are not expected to adversely impact human health and were eliminated from further evaluation in this RBCA. However, detected chemicals were retained for Tier II under the following conditions:

- The maximum detected concentration of a chemical exceeded its PRG; or
- A PRG has not been developed for a detected chemical.

In soil, only the maximum detected concentration of benzene (5.1 mg/kg) exceeded it's PRG (1.5 mg/kg; Table 3-1). A PRG is currently not available for 2-methylnaphthalene which was detected at 3.6 mg/kg (Table 3-1). In groundwater, benzene, MTBE and naphthalene exceeded their PRGs (Table 3-2) . In addition, a PRG is not available for 2-methylnaphthalene in groundwater. These chemicals were all retained for the Tier II RBCA evaluation (Section 4.0).

4.0 TIER II RBCA EVALUATION

As indicated earlier, a Tier II Evaluation was conducted to evaluate chemicals retained through the Tier I RBCA evaluation (Section 3.0). These chemicals include benzene and 2-methylnaphthalene in both soil and groundwater, and MTBE and naphthalene in groundwater only (Tables 3-1 and 3-2). This section summarizes the methods used to conduct the Tier II RBCA evaluation as described by ASTM (1995) . For this Site, this includes the following items:

- Developing a site-specific Conceptual Site Model;
- Identifying intake/exposure assumptions;
- Identifying chemical-specific toxicity values;
- Estimating exposure point concentrations;
- Discussing Tier II results; and
- Estimating chemical-specific SSTLs.

The conceptual site model is used to identify relevant receptors and exposure pathways for quantitative evaluation in the Tier II RBCA. Intake assumptions are used in combination with chemical-specific exposure point concentrations to estimate doses, and these are combined with chemical-specific toxicity values to generate noncancer hazards and excess cancer risks associated with the estimated doses. Each of above-listed bulleted items is discussed in more detail below.

4.1 DEVELOPING A SITE-SPECIFIC CONCEPTUAL SITE MODEL

A conceptual site model (CSM) was developed to identify complete and significant pathways based on current and expected future uses of the Site. As indicated earlier in Section 2.0, the Site is paved and contains a manufacturing and distribution facility. The Site will remain industrial in the future. Because the Site is paved, direct contact with soils or groundwater is not a complete exposure pathway for the commercial worker who is assumed to work primarily indoors. However, a construction worker involved in invasive activities (e.g., utility line repair) could directly contact both soil and shallow groundwater.

Based on this information and the analysis summarized in the CSM diagram (Figure 4-1) the following two hypothetical human receptors and complete and significant exposure pathways were evaluated in this assessment:

I. Hypothetical Onsite Indoor Commercial Worker Receptor

- Inhalation of chemical vapors emanating from soil and/or groundwater.

II. Hypothetical Onsite Construction Worker Receptor; and

- Incidental ingestion of soil;
- Dermal contact with soil;
- Inhalation of chemical vapors emanating from soil;
- Inhalation of fugitive dust; and
- Inhalation of chemical vapors emanating from groundwater.

Only the above-listed exposure pathways were quantified; although other exposure pathways might exist, they are considered minor and were not quantitatively evaluated in this Tier II assessment. Receptor-specific exposure pathways are summarized in Figure 4-1.

4.2 IDENTIFYING INTAKE/EXPOSURE ASSUMPTIONS

Exposure assumptions used to conduct the Tier II evaluation were based on those values developed by either USEPA (1989, 1991, 1992, 1997) or CalEPA (1992). In cases where agency-developed values were not available, SECOR applied best professional judgement (BPJ). A complete summary of all intake/exposure assumptions used to conduct the Tier II evaluation is provided in Tables 4-1 and 4-2. As indicated in the table, BPH was applied to the following parameters:

- An exposure time of 8 hours per day for both the hypothetical onsite indoor commercial worker and the construction worker receptor; and
- An exposure duration of 90 days for a hypothetical onsite construction worker receptor.

All other parameters were compiled from the sources listed above.

4.3 IDENTIFYING CHEMICAL-SPECIFIC TOXICITY VALUES

Chemical-specific toxicity values were obtained from CalEPA and USEPA sources in the following order of priority:

- California Cancer Potency Factoors (CalEPA, 1994);
- Integrated Risk Information System (USEPA, 1999b); and
- Region 9 Preliminary Remediation Goal Memorandum (USEPA, 1999a).

Toxicity values are currently unavailable for 2-methylnaphthalene and a chronic oral reference dose is not yet available for MTBE. To fully quantify exposures associated with these two chemicals:

- Toxicity values developed for naphthalene were used to evaluate 2-methylnaphthalene; and
- The chronic MTBE inhalation reference dose was used to represent the chronic oral reference dose for MTBE to evaluate ingestion and dermal-related exposures (i.e., route-to-route extrapolation was conducted).

Reference doses (RfDs) used to evaluate noncancer effects are summarized in Table 4-3. Slope factors (SFs) used to evaluate cancer risks are summarized in Table 4-4.

4.4 ESTIMATING EXPOSURE POINT CONCENTRATIONS

As a conservative measure the exposure point concentrations (EPC) used in this Tier II evaluation are based on the maximum detected media concentrations. For the direct exposure pathways to chemicals in soil, the EPC is equal to the maximum detected concentration. Inhalation exposure pathways evaluated for both the hypothetical onsite construction worker and indoor commercial worker receptor were evaluated using "modeled" air concentrations. These concentrations were estimated using a two-step process by first estimating a vapor flux from soil or groundwater at the surface of the soil. The flux is then used to estimate chemical concentrations in either indoor or outdoor air. In the case of chemicals in soil, the flux was estimated using the Behavior Assessment Model (Jury et al., 1984). Flux associated with chemicals in groundwater were based on the models developed by Karimi et al., (1987) Shen, 1981; and USEPA, 1988. Indoor air vapors associated with chemicals in either soil or groundwater were estimated using models as described by ASTM (1995); Wadden and Scheff (1989); and Johnson and

Ettinger (1991). Chemical concentrations in outdoor air were estimated using the box model as described by USEPA, 1991; Dobbins, 1979, and CalEPA 1994a. All modeling inputs, outputs, and equations used to estimate chemical concentrations in indoor and outdoor air are presented in Appendix B. All EPCs used in this assessment are summarized in Table 4-5.

EPCs were then combined with intake/exposure factors to estimate daily doses. These doses were then used to estimate noncancer effects (hazard quotients [HQs] for individual chemicals and hazard indices [HIs] for multichemical and multipathway exposures) and cancer risks based on the methods outlined by USEPA (1989). Daily doses are summarized in Appendix C for the hypothetical onsite indoor commercial worker receptor and in Appendix D for the hypothetical onsite construction worker receptor. The daily dose resulting from dermal exposure to chemicals in groundwater requires development of an absorbed dose, which is different from the dose estimates derived for the ingestion and inhalation exposure pathways. The absorbed dose (DA_{event}) for each chemical in groundwater was calculated using methods consistent with USEPA (1992) which are summarized in Table 4-6. These DA_{event} terms are then used in the exposure equations as summarized in Appendix D.

4.5 RESULTS OF THE TIER II EVALUATION

This section summarizes the results of the Tier II RBCA for the hypothetical onsite indoor commercial worker (Section 4.5.1) and onsite construction worker receptor (Section 4.5.2).

4.5.1 Hypothetical Onsite Indoor Commercial Worker Receptor

The estimated noncancer multipathway HI and the total excess cancer risk for this hypothetical receptor are 0.01 and 8×10^{-7}, respectively. In both cases, these values are well below the USEPA and CalEPA threshold levels of 1 (USEPA, 1989; CalEPA, 1992). The cancer risk is also below the State of California's threshold level of 1×10^{-5} for workers (California Health and Welfare Agency, 1988). Pathway-specific HIs and cancer risks estimated for this receptor are summarized in Table 4-7. Individual and chemical-specific HQs and cancer risks are provided in Appendix C.

4.5.2 Hypothetical Onsite Construction Worker Receptor

The estimated noncancer multipathway HI and the total excess cancer risk for this hypothetical receptor are 5 and 1×10^{-5}, respectively. The HI exceeds the USEPA and CalEPA threshold level of 1 (USEPA, 1989; CalEPA, 1992). The cancer risk estimate is equal to the California cancer risk threshold of 1×10^{-5} for workers (California, 1988). Exposures associated with the inhalation of benzene vapors emanating from soil (Table D-4) and dermal contact with benzene in groundwater (Table D-5) account for virtually

the entire HI and cancer risks estimated for this hypothetical human receptor. Pathway-specific HIs and cancer risks estimated for this receptor are summarized in Table 4-7. Individual chemical-specific HQs and cancer risks are provided in Appendix D.

4.6 ESTIMATION OF SITE-SPECIFIC TARGET LEVELS (SSTLs)

Similar to RBSLs, site-specific Target Levels (SSTLs) represent chemical concentrations below which adverse health effects are not expected. However, unlike RBSLs, SSTLs are developed for a specific site. For this Site, the results of the Tier II evaluation indicate (Section 4.5.1) that adverse impacts to a hypothetical onsite indoor commercial worker are not expected. However, the estimated HIs estimated for the hypothetical onsite construction worker receptor exceed USEPA's (1989) threshold of 1 for noncancer effects. Inhaling benzene vapors emanating from soil (Table D-4) and dermal contact with benzene in groundwater (Table D-5) represent nearly all of the estimated HI for this receptor. Appropriate SSTLs benzene in soil and groundwater were estimated using the following equation:

$$SSTL_{soil\ or\ groundwater} = B_{s\ or\ gw} \times CHI^{-1} \times HI$$

Where:

$SSTL_{soil\ or\ gw}$	=	Site specific target level for benzene in soil or groundwater;
$B_{s\ or\ gw}$	=	Concentration of benzene in soil (mg/kg) or groundwater (mg/L);
CHI	=	The corresponding HI associated with B_s; and
THI	=	Target Hazard Index (1).

Based on this equation, the SSTL for benzene in soil and groundwater are 2 mg/kg and 0.16 mg/L, respectively. Spreadsheets used to estimate these SSTLs are presented in Appendix E.

5.0 RISK MANAGEMENT PLAN

This Risk Management Plan (RMP) has been prepared to address the presence of residual petroleum-related hydrocarbons at and near the Site. The residual concentrations found in soil and groundwater do not pose a threat to current onsite workers based upon the detailed risk-based evaluation summarized in the previous sections of this report. However, exposure to petroleum-related hydrocarbons, and particularly benzene may pose a threat to a construction worker if soil is disturbed and/or groundwater is exposed at the Site. As a result, onsite workers performing short-term construction activities at the Site in the future will need to be notified and prepared for potential exposure to benzene, and minimal exposures to other TPH-related hydrocarbons. The RMP provides a decision framework to manage exposures to gasoline-related hydrocarbons and the potential short-term exposure to onsite construction workers, if soil or groundwater containing residual petroleum-related hydrocarbons are disturbed. This RMP also contains a description of monitoring well abandonment activities. These activities would be performed upon approval of Site closure and of this RMP by the RWQCB.

5.1 WELL ABANDONMENT PLAN

This section summarizes activities to be performed during well abandonment activities. Each of the seven groundwater monitoring wells at the Site will be abandoned by over-drilling, or as required by the Alameda County Water Resources Agency (ACWRA). A permit for abandonment of the wells will be obtained from the ACWRA and an encroachment permit will be obtained from the City of Oakland Engineering Division to perform work in the public right-of-way for those wells located in the street or on sidewalks. The wells will be over-drilled to just beyond the total depth of the original boring. These boreholes will then be backfilled with neat cement using a tremie pipe. All nearby storm drains will be protected from any accidental runoff, soil cuttings generated will be stockpiled onsite with plastic sheeting placed under and over the pile, and liquids generated will be stored in 55-gallon drums. Both soils and liquids will be disposed of at an offsite location after profiling of the waste materials. A report of the well abandonment activities will be prepared for submittal to the ACHSA, RWQCB and ACWRA.

5.1.1 Risk Management Protocols

This section identifies protocols to be followed to prepare for earthwork and construction at the Site that may be implemented by the current, or a future, owner. These protocols include:

- Establishing worker health and safety training requirements, worker notification and protection objectives, and worker health and safety monitoring procedures for workers who may directly contact hydrocarbon-containing soil or groundwater during Site preparation, grading, or foundation construction;

- Establishing notification objectives for offsite receptors who may be exposed to petroleum hydrocarbons; and

- Establishing procedures to manage soil and/or groundwater on the Site during construction to minimize worker or offsite receptor exposures.

5.1.2 Site-Specific Worker Health and Safety Planning Requirements

During construction activities those workers that may directly contact soil or groundwater will perform construction activities in accordance with a Site-specific health and safety plan (HASP). Preparation of the Site specific HASP will be required for earthwork construction (e.g., site preparation, grading and foundation construction) or other activity in which workers may directly contact soil or groundwater potentially containing petroleum hydrocarbons. The contractor or owner will be responsible for preparing the HASP. The HASP will be consistent with State and Federal Occupational Safety and Health Administration (OSHA) standards for potential hazardous waste operations (CCR, Title 8, Section 5192 and 29 CFR 1910.120, respectively).

5.1.3 Offsite Resident Notification

Prior to any construction activities, notification of pending construction activities shall be given to the ACHSA and RWQCB. If deemed necessary by the local regulatory agencies, a fact sheet can be prepared to notify nearby residents of potential exposures to petroleum-related hydrocarbons. The fact sheet will include owner, contractor, and regulatory contact names and telephone numbers that can be used by the public to gather information on Site conditions.

5.1.4 Soil Management Protocols

The general protocol for excavating and handling soil potentially containing petroleum hydrocarbons at the Site is as follows:

- Excavated or exposed soil will be managed in such a manner as to minimize exposure of onsite workers or offsite residents to petroleum-related hydrocarbons;

- Soil excavated from the Site with detectable concentrations of petroleum hydrocarbons will not be used as fill at the Site;

- Excavated soil is to be disposed offsite. Sampling frequencies and parameters will be determined by the disposal facility; and

- Excavated soil will be managed in such a manner as to minimize transport of sediments from the Site in surface water runoff, in airborne dust particles, or on the tires or shells of construction equipment.

Based on the results of the Tier II RBCA, a construction worker should not be allowed to work in a trench in excess of 30 days due to potential exposures to benzene vapors in areas where the soil concentration exceeds 2 mg/kg.

5.1.5 Groundwater Management Protocols

The general protocol for managing exposed groundwater or groundwater removed from beneath the Site is as follows:

- No shallow groundwater from beneath the Site will be used for irrigation or as drinking water;
- Exposed groundwater or groundwater removed during construction will be managed in such a manner as to minimize exposure by onsite workers or offsite residents to petroleum-related hydrocarbons; and
- Groundwater that is removed during construction activities will either be discharged to surface water under the terms of a National Pollutant Discharge Elimination System (NPDES) permit issued by the RWQCB or disposed appropriately at an offsite treatment facility.

Based on the results of the Tier II RBCA, a construction worker should either wear protective clothing to reduce skin contact with groundwater or implement appropriate engineering controls (e.g., dewatering) to prevent prolonged skin contact with groundwater containing benzene above 0.16 mg/L.

5.2 REPORTING PROTOCOLS

The following protocols will be followed by the current Site owners and their successors to maintain compliance with the RMP:

- If title to the property is transferred to a new owner, the former owner is responsible to notify the new owner of the conditions of this RMP; and
- If during activities associated with any construction, environmental conditions are found to differ from those described in the historic reports of investigation and remedial activities, then the ACHSA and RWQCB will be notified and risk management protocols may have to be modified to accommodate the differing conditions.

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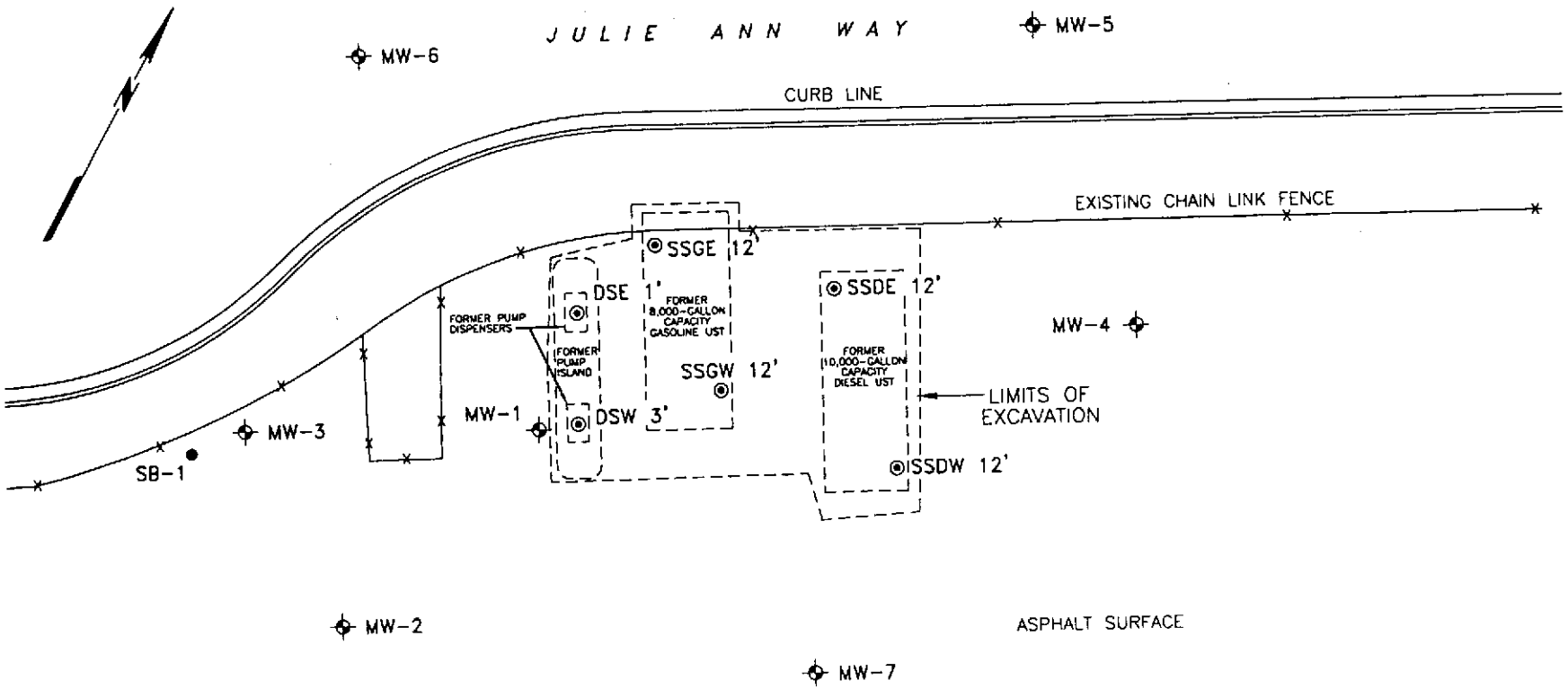


LEGEND

⊕ MW-1	EXISTING GROUNDWATER MONITORING WELL
● SB-1	SOIL BORING LOCATION
◉ SSDW 12'	TANK REMOVAL CONFIRMATION SOIL SAMPLE LOCATION (AND DEPTH)

EXISTING BUILDING

REFERENCE: RON ARCHER CIVIL ENGINEER INC., DATED AUGUST 15, 1996.

0 20 40

APPROXIMATE SCALE IN FEET

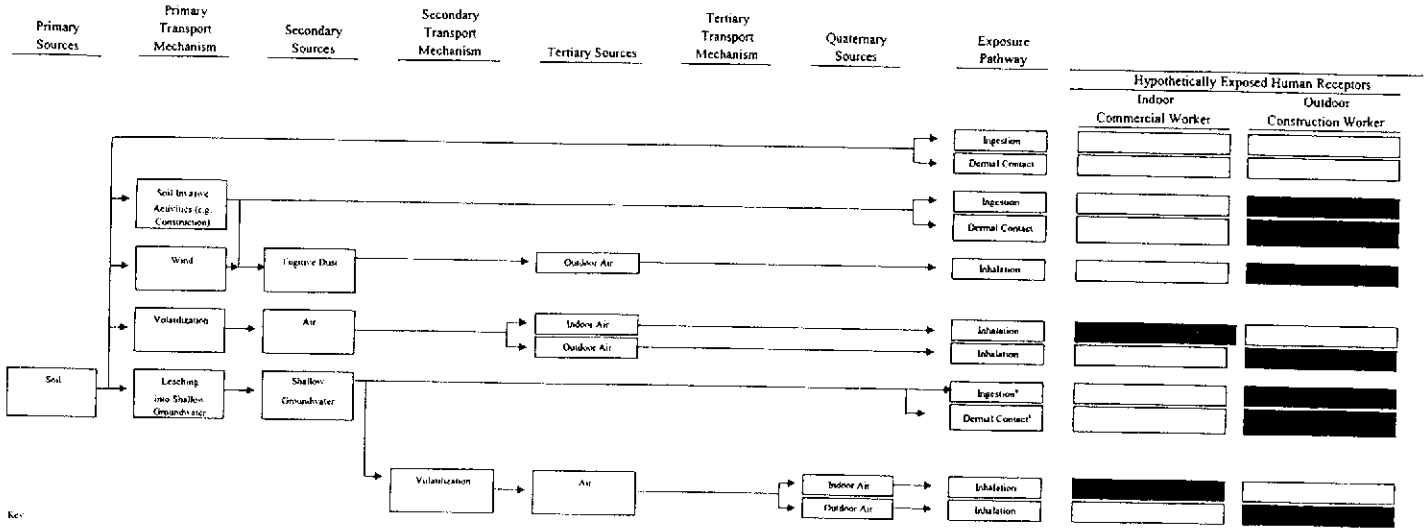
SECOR
International Incorporated

DRAWN	GEL
APPR	WEB
DATE	7DEC99
JOB NO.	005.02811.004

FIGURE 2-1
SAN FRANCISCO FRENCH BREAD
580 JULIE ANN WAY
OAKLAND, CALIFORNIA

SITE PLAN

Figure 4-1.
Human Health Conceptual Site Model Diagram
Metz Baking Company Risk-Based Corrective Action Evaluation
580 Julie Ann Way
Oakland, California
Project No. 005.02811.002



Footnote:

* Hypothetical potential receptors may directly contact groundwater (i.e., incidental ingestion and dermal contact) while performing soil invasive activities (e.g., construction)

Table 3-1.
Tier I Assessment of Chemicals Detected in Soil
Metz Baking Company Risk-Based Corrective Action Evaluation
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Chemical	Maximum Detected Concentration (mg/kg)[a]	Region 9 PRG[b]	Does the Maximum Detected Concentration Exceed the PRG?	Chemical Retained for Tier II Evaluation
Volatile Organic Compounds (VOCs)				
Benzene	5.1	1.5	**Yes**	**Yes**
Toluene	1.4	520	No	No
Ethylbenzene	3.3	230	No	No
Xylenes	12	210	No	No
Semi-Volatile Organic Compounds (SOCs)				
Naphthalene	3.3	190	No	No
2-Methylnaphthalene	3.6	**NA**	**Yes**	**Yes**
Di-n-Butylphthalate	0.76	88,000	No	No

Footnotes:

[a] mg/kg = milligrams per kilogram

[b]Preliminary Remediation Goal (PRG) for industrial soil.

References:

United States Environmental Protection Agency (USEPA), 1999. Region 9 Preliminary Remediation Goals (PRGs), 1999a. Memo from Stanford J. Smucker, Ph.D. October 1.

Table 3-2.
Tier I Assessment of Chemicals Detected in Groundwater
Metz Baking Company Risk-Based Corrective Action Evaluation
580 Julie Ann Way
Oakland, California
Project No. 005.02811.002

Chemical	Maximum Detected Concentration (µg/L)[a]	Region 9 PRG[b]	Does the Maximum Detected Concentration Exceed the PRG?	Chemical Retained for Tier II Evaluation
Benzene	**270**	**0.41**	**Yes**	**Yes**
Toluene	15	720	No	No
Ethylbenzene	510	1300	No	No
Xylenes	41	1400	No	No
Methyl Tert Butyl Ether	**60**	**20**	**Yes**	**Yes**
Naphthalene	**260**	**6.2**	**Yes**	**Yes**
2-Methyl Naphthalene	**93**	**NA**	**Yes**	**Yes**

Footnotes:

[a] µg/L = Microgram per liter.

[b] Preliminary Remediation Goal (PRG) for tapwater.

References:

United States Environmental Protection Agency (USEPA), 1999.Region 9 Preliminary Remediation Goals (PRGs). Memo from Stanford J. Smucker, Ph.D. October 1.

Table 4-1.
Exposure Intake Assumptions for Hypothetical Onsite Worker Receptors
Metz Baking Company Risk-Based Corrective Action Evaluation
580 Julie Ann Way
Oakland, California
Project No. 005.02811.002

Parameter	Acronym	Value	Unit[a]	Source
For All Hypothetical Onsite Worker Receptors				
Target Cancer Risk	TR	1.00E-05	Unitless	USEPA, 1989
Target Hazard Index	THI	1	Unitless	USEPA, 1989
Indoor Commercial Worker				
Averaging Time - Noncarcinogens	ATn	9125	days	USEPA, 1989
Averaging Time - Carcinogens[b]	ATc	25550	days	USEPA, 1989
Lifetime	LT	70	years	USEPA, 1989
Exposure Time	ET	8	hours/day	BPJ[h]
Exposure Frequency	EF	250	days/year	USEPA, 1991
Exposure Duration	ED	25	years	USEPA, 1991, CalEPA, 1992
Body Weight	BW	70	kg	USEPA, 1989, CalEPA, 1992
Inhalation Rate[c]	InR	1.0	m^3/hour	USEPA, 1997, CalEPA, 1992
Outdoor Construction Worker				
Averaging Time - Noncarcinogens	ATn	365	days	USEPA, 1989
Averaging Time - Carcinogens[b]	ATc	25550	days	USEPA, 1989
Lifetime	LT	70	years	USEPA, 1989
Exposure Time	ET	8	hours/day	BPJ
Exposure Frequency	EF	90	days/year	BPJ
Exposure Duration	ED	1	year	BPJ
Body Weight	BW	70	kg	USEPA, 1989
Soil Ingestion Rate[d]	IR	480	mg/day	USEPA, 1997
Conversion Factor	CF1	1.00E-06	kg/mg	--[i]
Skin Surface Area[e]	SA	5800	cm^2/day	USEPA, 1997, CalEPA, 1992
Soil Adherence Factor[f]	AF	0.24	mg/cm^2	USEPA, 1997
Dermal Absorption Factor	DAF	Chemical-Specific	unitless	See Table 4-2
Conversion Factor	CF2	1.00E-03	L/cm^3	--
Inhalation Rate[g]	InR	2.76	m^3/hour	USEPA, 1997
Particulate Emission Factor	PEF	1.32E+09	m^3/kg	USEPA, 1999a

Table 4-1.
Exposure Intake Assumptions for Hypothetical Onsite Worker Receptors
Metz Baking Company Risk-Based Corrective Action Evaluation
580 Julie Ann Way
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Footnotes:

[a] kg=kilograms; m^3/hour = cubic meters per hour; mg/day = milligrams per day; kg/mg = kilograms per milligram; cm^2/day = square centimeters per day; mg/cm^2 = milligrams per square centimeter; L/cm^3 = liters per cubic centimeter; m^3/kg = cubic meters per kilogram.

[b] Based on a 70-year lifetime.

[c] Based on a recommended hourly average inhalation rate for an adult engaged in light activities.

[d] Value for adult soil ingestion rate while performing outdoor work.

[e] Recommended upper percentile value for adult outdoor soil contact. Value assumes approximately 25-percent (i.e., head, hands, forearms, and lower legs) of the total skin area (23,000 cm^2) may be exposed to soil.

[f] Based on the data presented in Table 6-12 (USEPA, 1997), the maximum soil adherence value for construction workers of 0.24 mg/cm^2 is used. Activities for the construction worker field study included mixing bare earth and concrete surfaces, dust and debris (Table 6-11 in USEPA, 1997).

[g] 95th percentile value was estimated by adding two standard deviations of 0.66 m^3/hr to the mean inhalation rate of 1.44 m^3/hr for a general construction worker (GCW).

[h] Best professional judgement.

[i] "- -" = Not applicable.

References:

CalEPA 1992. Supplement Guidance

U.S. Environmental Protection Agency (USEPA). 1989. Risk Assessment Guidance for Superfund, Volume I, Human Health Evaluation Manual (Part A), Interim Final. Office of Emergency and Remedial Response, Washington D.C., EPA/540/1-89/002, July.

U.S. Environmental Protection Agency (USEPA). 1991. Risk Assessment Guidance for Superfund: Volume I - Human Health Evaluation Manual (Part B, Development of Risk-based Preliminary Remediation Goals), Interim. Office of Emergency and Remedial Response, Washington D.C., Publication 9285.7-01B. December.

U.S. Environmental Protection Agency (USEPA). 1997. Exposure Factors Handbook, Volume I, II, and III. Office of Research and Development, National Center for Environmental Assessment, Washington D.C., EPA/600/P-95/002Fa. August.

U.S. Environmental Protection Agency (USEPA). 1999a. Region 9 Preliminary Remediation Goals (PRGs). Memo from Stanford J. Smucker, Ph.D. October 1.

Table 4-2.

Soil Dermal Absorption Factors (DAFs)[a]
Metz Baking Company Risk-Based Corrective Action Evaluation
580 Julie Ann Way
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Chemical of Potential Concern	Value
<u>Volatile Organic Compounds</u>	
Benzene	0.1
<u>Semi-Volatile Organic Compounds</u>	
2-methylnaphthalene	0.15

Footnotes:

[a] From CalEPA, 1994a.

References:

California Environmental Protection Agency (CalEPA). 1994a. Preliminary Endangerment Assessment Guidance Manual. Department of Toxic Substances Control (DTSC). January.

Table 4-3.

Toxicity Values - Reference Doses[a]

Metz Baking Company Risk-Based Corrective Action Evaluation

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Chemical	Chronic Oral Reference Dose (RfDo)[b]		Chronic Inhalation Reference Dose (RfDi)		Subchronic Oral Reference Dose (RfDo)[b]		Subchronic Inhalation Reference Dose (RfDi)	
	(mg/kg-day)[c]		(mg/kg-day)		(mg/kg-day)		(mg/kg-day)	
	Value	Source	Value	Source	Value	Source	Value	Source
Volatile Organic Compounds								
Benzene	3.0E-03	USEPA, 1999a	1.7E-03	USEPA, 1999a	3.0E-03	[d]	1.7E-03	[d]
Methyl-tert-butyl ether	8E-01	rtr[f]	8E-01	USEPA, 1999b	8E-01	USEPA, 1999b	8E-01	[d]
Semi-Volatile Organic Compounds								
Naphthalene	2E-02	USEPA, 1999b	8.6E-04	USEPA, 1999b	2E-01	[e]	8.6E-04	[d]
2-Methylnaphthalene[g]	2E-02	USEPA, 1999b	8.6E-04	USEPA, 1999b	2E-01	[e]	8.6E-04	[d]

Footnotes:

[a] Toxicity values were obtained from the following sources of information in order of priority: USEPA, 1999b; 1997b; 1999a; and NCEA, as cited in USEPA, 1999a.

[b] In the absence of dermal toxicity values the oral reference doses were used to evaluate dermal exposure.

[c] mg/kg-day = milligrams per kilogram body weight per day.

[d] In the absence of specific values for subchronic exposure, the chronic toxicity value was adopted as the subchronic toxicity value.

[e] The subchronic RfD was assumed by SECOR to be 10 times higher than the chronic RfD because an uncertainty factor of 10 was used by USEPA for extrapolation from subchronic to chronic exposure for the chronic RfD.

[f] rtr = route-to-route extrapolation conducted by SECOR.

[g] In the absence of chemical-specific toxicity values, the values for naphthalene were used to evaluate this chemical.

References:

National Center for Environmental Assessment (NCEA). As cited in USEPA 1999a.

U.S. Environmental Protection Agency (USEPA). 1999. Region 9 Preliminary Remediation Goals (PRGs) 1999a. Memorandum from S.J. Smucker, USEPA Region 9, San Francisco, California. October1.

U.S. Environmental Protection Agency (USEPA). 1999b. Integrated Risk Information System (IRIS). On-line computer database.

Table 4-4.

Toxicity Values - Slope Factors[a]

Metz Baking Company Risk-Based Corrective Action Evaluation

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Chemical	Oral Slope Factor (SFo)[b]		Inhalation Slope Factor (SFi)		Carcinogenic Weight-of-Evidence[c]
	(mg/kg-day)$^{-1}$ [d]		(mg/kg-day)$^{-1}$		
	Value	Source	Value	Source	
Volatile Organic Compounds					
Benzene	1.0E-01	CalEPA, 1994	1.0E-01	CalEPA, 1994	A
Methyl-tert-butyl ether	--[e]	USEPA, 1999b	--	USEPA, 1999b	--
Semi-Volatile Organic Compounds					
Naphthalene	--	USEPA, 1999b	--	USEPA, 1999b	C
2-Methylnaphthalene	--	USEPA, 1999b	--	USEPA, 1999b	--

Footnotes:

[a] Toxicity values were obtained from the following sources of information in order of priority: CalEPA, 1994; USEPA, 1999b; 1997b; 1999a; and NCEA, as cited in USEPA, 1999a.

[b] In the absence of dermal toxicity values the oral slope factors were used to evaluate dermal exposure.

[c] Cancer weight-of-evidence categories are as follows:

Group A: Human Carcinogen (sufficient evidence of carcinogenicity in humans).

Group B: Probable Human Carcinogen (B1 - limited evidence of carcinogenicity in humans; B2 - sufficient evidence of carcinogenicity in animals with inadequate or lack of evidence in humans).

Group C: Possible Human Carcinogen (limited evidence of carcinogenicity in animals and inadequate or lack of human data).

Group D: Not Classifiable as to Human Carcinogenicity (inadequate or no evidence).

Group E: Evidence of Noncarcinogenicity for Humans (no evidence of carcinogenicity in adequate studies).

[d] mg/kg/day = milligrams per kilogram body weight per day.

[e] "- -" = value was not available from the sources listed above or not applicable for this exposure route.

References:

CalEPA. 1994. California Cancer Potency Factors: Update. November 1.

National Center for Environmental Assessment (NCEA). As cited in USEPA 1999a.

U.S. Environmental Protection Agency (USEPA). 1997b. Health Effects Assessment Summary Tables (HEAST) FY 1997 Update. Office of Solid Waste and Emergency Response. July.

U.S. Environmental Protection Agency (USEPA). 1999a. Region 9 Preliminary Remediation Goals (PRGs) 1999. Memorandum from S.J. Smucker, USEPA Region 9, San Francisco, California. October1.

U.S. Environmental Protection Agency (USEPA). 1999b. Integrated Risk Information System (IRIS). On-line computer database.

Table 4-5.

Exposure Point Concentrations for the Chemicals Evaluated Under the Tier II RBCA Evaluation[a]

Metz Baking Company Risk-Based Corrective Action Evaluation

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COPC	Construction Worker Receptor					Indoor Commercial Worker Receptor	
			Outdoor Air			Indoor Air	
	Soil (mg/kg)[b]	Groundwater (mg/L)[c]	From Soil (mg/m^3)[d]	From Groundwater (mg/m^3)	Dust-in-Air (mg/m^3)	From Soil (mg/m^3)	From Groundwater (mg/m^3)
Volatile Organic Compounds							
Benzene	5.1	0.270	6.15E-02	8.96E-10	--[f]	2.80E-04	3.58E-10
Methyl Tert Butyl Ether	--	0.060	--	2.11E-11	--	--	8.43E-12
Semi-Volatile Organic Compounds							
Naphthalene	NSC[e]	0.26	--	--	--		
2-Methylnaphthalene	3.6	0.093	--	--	2.74E-09		

Footnotes:

[a] These outdoor and indoor air concentrations account for concentrations of chemicals of potential concern (COPCs) in either soil or groundwater. In all cases vapor fluxes were estimated separately for COPCs detected in both soil and groundwater.

[b] mg/kg = milligrams per kilogram.

[c] mg/L = milligrams per liter.

[d] mg/m^3 = milligrams per cubic meter.

[e] Chemical not identified as a COPC for this medium.

[f] Not applicable for this chemical and medium

Table 4-6.
Chemical-Specific Estimation of Dermally Absorbed Dose in Groundwater
Metz Baking Company Risk-Based Corrective Action Evaluation
580 Julie Ann Way
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Chemical of Potential Concern	B[a] (unitless)	Permeability Coefficient (K_p)[a] (cm/hr)	τ[a] (hr)	t*[a] (hr)	DAevent_gw[b] (mg/cm^2)
Volatile Organic Compounds					
Benzene[c]	1.3E-02	1.1E-01	2.6E-01	6.3E-01	2.5E-04
Methyl-tert-butyl ether[c,d]	7.8E-04	1.7E-02	2.5E-01	5.9E-01	8.7E-06
Semi-Volatile Organic Compounds					
Naphthalene[e]	2.0E-01	6.9E-02	5.3E-01	2.2E+00	1.4E-04
2-Methyl Naphthalene[f]	2.0E-01	6.9E-02	5.3E-01	2.2E+00	5.2E-05

Footnotes:

[a] All values obtained from USEPA (1992).

[b] DAevent = $K_p \times C_w \times 0.001$ L/cm^3 x $[(t_{event}/(1+B))+(2\tau((1+3B)/(1+B)))]$ Equation from USEPA (1992a) used reflects daily exposure time of 8 hours which is greater than t* for all chemicals.
K_p = permeability coefficient from water (cm/hr).
C_w = EPC in groundwater (mg/L).
t_{event} = Duration of event (hr/event).
B = constant reflecting the partitioning properties of a compound.
τ = lag time (hour).

[c] Measured permeability coefficient (K_p) for chemical from an aqueous media through the skin.

[d] Values for methyl-tert-butyl ether were not available. The values for ethyl ether, a structurally similar compound, were used.

[e] Measured K_p for chemical from an aqueous media was not available; therefore an estimated K_p for chemical from an unspecified vehicle through the skin was used.

[f] Chemical-specific values for 2-methylnaphtalene are not available. For this reason, values developed for naphthalene were used to evaluate this chemical.

References:

U.S. Environmental Protection Agency (USEPA). 1992. Dermal Exposure Assessment: Principles and Applications, Interim Report. Office of Research and Development, Washington D.C., EPA/600/8-91/011B. January.

Table 4-7.
Summary of Noncancer Adverse Health Effects and Excess Cancer Risks for Hypothetical Onsite Receptors
Metz Baking Company Risk-Based Corrective Action Evaluation
580 Julie Ann Way
Oakland, California
Project No. 005.02811.002

Exposure Pathway	Hypothetical Potential Receptors			
			Onsite	
	Indoor Commercial Worker Receptor		Onsite Construction Worker Receptor	
	Hazard Index	Cancer Risk	Hazard Index	Cancer Risk
Soil				
Incidental Ingestion of Soil	--[a]	--	3 E-03	1 E-08
Dermal Contact with Soil	--	--	8 E-04	4 E-09
Inhalation of Fugitive Dust	--	--	2 E-16	--
Inhalation of Vapors Emanating from Soil	1 E-02	8 E-07	3 E+00	7 E-06
Multipathway Total for Soil	**1 E-02**	**8 E-07**	**3 E+00**	**7 E-06**
Groundwater				
Dermal Contact with Groundwater	--	--	2 E+00	7 E-06
Inhalation of Vapors Emanating From Groundwater	2 E-08	1 E-12	4 E-08	1 E-13
Multipathway Total for Groundwater	**2 E-08**	**1 E-12**	**2 E+00**	**7 E-06**
Total Multipathway	**1 E-02**	**8 E-07**	**5 E+00**	**1 E-05**

Footnote:
[a] "--" = Not applicable.

APPENDIX A
DATA USED TO CONDUCT THE TIER I AND TIER II RBCA EVALUATIONS

LIST OF TABLES FOR APPENDIX A

TABLE A-1
SOIL ANALYTICAL RESULTS
Metz Baking Company Risk-Based Corrective Action Evaluation
580 Julie Ann Way
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Sample Number	Media	Sample Date	Sample Depth[a]	Units	TPHg[b]		TPHd[c]		TPHmo[d]	TRPH[d]	Benzene	Toluene	Ethylbenzene	Xylenes	MTBE[e]	Naphthalene	2-Methylnaphthalene	Di-n-Butylphthalate
MW-1-5.5	Soil	2/27/96	5.5-6.0	mg/kg[f]	15	15	ND	g	240		0.17	0.03	1.3	0.84		3.3	3.6	0.76
MW-2-6	Soil	8/14/96[i]	6.0-6.5	mg/kg	8	8	ND		110		0.13	0.02	0.57	1.8				
MW-3-5	Soil	8/14/96	5.0-5.5	mg/kg	ND	0.5	ND		220		ND	ND	ND	0.01				
MW-4-6	Soil	8/14/96	6.0-6.5	mg/kg	15	15	ND		1,000		ND	0.049	0.046	0.072				
MW-5-4	Soil	5/20/98[j]	4.0-4.5	mg/kg	ND	5	ND		ND		2.1	ND	ND	1.2	ND			
MW-6-4	Soil	5/20/98	4.0-4.5	mg/kg	ND	0.5	12	h	110		ND	ND	ND	ND	ND			
MW-7-4	Soil	5/20/98	4.0-4.5	mg/kg	ND	0.5	3.3	h	ND		ND	ND	ND	ND	ND			
MW-7-10	Soil	5/20/98	10.0-10.5	mg/kg		- -												
MW-7-15	Soil	5/20/98	15.0-15.5	mg/kg		- -												
SSDE-12	Soil	9/15/95	12'	mg/kg	62	k - -	12	n		20	5.1	1.4	3.3	12				
SSDW-12'	Soil	9/15/95	12'	mg/kg	- -	- -	220	k,o		2100	0.75	0.084	0.35	0.35				
SSGE-12'	Soil	9/15/95	12'	mg/kg	20	k 20	11	n		17	1.1	0.17	0.48	1.3				
SSGW-12'	Soil	9/15/95	12'	mg/kg	12	l,m 12				23	0.75	0.010	0.043	0.063				
DSE-1'	Soil	9/15/95	1'	mg/kg	15	b,d 15	41	k,n		120	0.034	ND	0.10	0.22				
DSW-3'	Soil	9/15/95	3'	mg/kg	270	b,d 270	840	k		2000	0.59	0.59	0.38	1.2				
Historical Maximum Detected Concentration					270		840		1000	2100	5.1	1.4	3.3	12	ND	3.3	3.6	0.76
Historical Minimum Detected Concentration					8		3.3		110	17	0.034	0.02	0.043	0.01	ND	3.3	3.6	
Arithmetic Mean					52.13		162.76		336.00	713.33	1.192	0.335	0.809	1.732	ND	3.3	3.6	0.76

Footnotes:

[a] Measured in feet below ground surface.
[b] Total petroleum hydrocarbons as gasoline.
[c] Total petroleum hydrocarbons as diesel.
[d] Total petroleum hydrocarbons as motor oil/Total recoverable petroleum hydrocarbons
[e] Methyl tertiary butyl ether.
[f] Milligrams per kilogram.
[g] ND: Not detected at specified laboratory reporting limit.
[h] Hydrocarbon reported is in the late diesel range and does not match the laboratory diesel standard.
[i] By Bayland Drilling of Menlo Park, Ca.
[j] By Gregg Drilling & Testing, Inc. of Martinez, Ca.
[k] Unmodified or weakly modified gasoline is significant.
[l] Heavier gasoline range compounds are sisngificant (aged gasoline?)
[m] Lighter gasoline range compounds (the most mobile fraction) are significant.
[n] Gasoline range compounds having broad chromatographic peaks are significant, biologically altered gasoline?
[o] Strongly aged gasoline or diesel range compounds are significant.

TABLE A-2
GROUNDWATER ANALYTICAL RESULTS
Metz Baking Company Risk-Based Corrective Action Evaluation
580 Julie Ann Way
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Sample Number	Media	SampleDate	Units	TPHg[a]	TPHd[b]	TPHmo[c]	Benzene	Toluene	Ethylbenzene	Xylenes	MTBE[d]	Naphthalene	2-Methyl Naphthalene	Lead
MW-1	Groundwater	2/28/96	(µg/L)[e]	5,900	ND [f]	1,700	540	9	950	110				
MW-1	Groundwater	02/28/96	(µg/L)	5,900	ND	1,700	540	9	950	110				
MW-1	Groundwater	08/16/96	(µg/L)	5,600	5,400 [g]	4,000	540	7.3	950	110		260	93	ND
MW-2	Groundwater	08/16/96	(µg/L)	2,700	3,000 [g]	1,800	63	36	65	100				ND
MW-3	Groundwater	08/16/96	(µg/L)	ND	730 [h]	640	3.1	ND	ND	ND				ND
MW-4	Groundwater	08/16/96	(µg/L)	460	2,800 [i]	3,000	17	1	9.1	1.4				ND
MW-1	Groundwater	07/31/97	(µg/L)	5,900	3,200	1,600	630	8	900	34	ND			
MW-2	Groundwater	07/31/97	(µg/L)	1,800	3,300	1,800	20	1.8	22	4.6	7			
MW-3	Groundwater	07/31/97	(µg/L)	ND	1,600	1,500	ND	ND	ND	ND	ND			
MW-4	Groundwater	07/31/97	(µg/L)	360	2,000	1,800	1.8	0.6	7.6	0.8	ND			
MW-1	Groundwater	06/04/98	(µg/L)	1,800	1,600 [h]	640 [i]	160	2.6	300	1.6	ND			
MW-2	Groundwater	06/04/98	(µg/L)	ND	4,100 [h]	ND	10	0.72	2.3	3.5	ND			
MW-3	Groundwater	06/04/98	(µg/L)	ND	860 [h]	ND	3.9	ND	ND	ND	ND			
MW-4	Groundwater	06/04/98	(µg/L)	ND	1,400 [h]	710 [i]	18	1.6	2.5	1.9	ND			
MW-5	Groundwater	06/04/98	(µg/L)	ND	970 [h]	ND	7.2	ND	ND	ND	ND			
MW-6	Groundwater	06/04/98	(µg/L)	ND	120 [h]	ND	ND	ND	ND	ND	ND			
MW-7	Groundwater	06/04/98	(µg/L)	ND	900 [h]	540 [i]	ND	ND	ND	ND	ND			
MW-1	Groundwater	09/11/98	(µg/L)	4,800	3,300 [j]	900	270	15	510	41	ND			
MW-2	Groundwater	09/11/98	(µg/L)	ND	3,700 [j]	750	65	15	39	5.7	ND			
MW-3	Groundwater	09/11/98	(µg/L)	ND	570 [h]	ND	4	ND	ND	ND	ND			
MW-4	Groundwater	09/11/98	(µg/L)	ND	1,200 [h]	ND	0.93	ND	1	ND	ND			
MW-5	Groundwater	09/11/98	(µg/L)	ND	810 [h]	ND	5.7	ND	ND	ND	10			
MW-6	Groundwater	09/11/98	(µg/L)	ND	410 [j]	ND	ND	ND	ND	ND	ND			
MW-7	Groundwater	09/11/98	(µg/L)	ND	3,700 [j]	ND	ND	ND	ND	ND	ND			
MW-1	Groundwater	12/03/98	(µg/L)	ND	1,500 [h]	ND	140	5.7	170	1.4	ND			
MW-2	Groundwater	12/03/98	(µg/L)	ND	3,800 [h]	ND	15	4.3	3.5	5.3	ND			
MW-3	Groundwater	12/03/98	(µg/L)	ND	1,200 [h]	ND	3.3	2.1	ND	ND	ND			
MW-4	Groundwater	12/03/98	(µg/L)	ND	1,700 [h]	980	23	2.1	2.3	2.4	ND			
MW-5	Groundwater	12/03/98	(µg/L)	ND	840 [h]	ND	8.4	ND	ND	ND	ND			
MW-6	Groundwater	12/03/98	(µg/L)	ND	350 [h]	ND	ND	2.6	ND	ND	ND			
MW-7	Groundwater	12/03/98	(µg/L)	ND	780 [h]	ND	ND	ND	ND	ND	ND			
MW-1	Groundwater	03/17/99	(µg/L)	2,000	1,000 [h]	740	88	3.3	190	1.2	60			
MW-2	Groundwater	03/17/99	(µg/L)	3,500	1,400 [h]	ND	33	3.7	28	1.7	21			
MW-3	Groundwater	03/17/99	(µg/L)	ND	870 [h]	590	ND	ND	ND	ND	ND			
MW-4	Groundwater	03/17/99	(µg/L)	600	840 [h]	900	2.2	ND	ND	ND	39			
MW-5	Groundwater	03/17/99	(µg/L)	130	820 [h]	640	7.4	ND	ND	ND	17			
MW-6	Groundwater	03/17/99	(µg/L)	ND	290 [h]	770	ND	ND	ND	ND	ND			
MW-7	Groundwater	03/17/99	(µg/L)	ND	700 [h]	600	ND	ND	ND	ND	ND			
Maximum Detected Concentration Over the Last 4 Quarters				4800	4100	980	270	15	510	41	60	260	93	ND[f]
Minimum Detected Concentration Over the Last 4 Quarters				130.0	120.0	540.0	0.9	0.7	1.0	1.2	10.0	260	93	ND
Arithmetic Mean				2138	1419	730	46	5	114	7	29	260	93	ND

Footnotes:

[a] Total petroleum hydrocarbons as gasoline.
[b] Total petroleum hydrocarbons as diesel.
[c] Total petroleum hydrocarbons as motor oil.
[d] Methyl tertiary butyl ether.
[e] Micrograms per liter.
[f] ND: Not detected at specified laboratory reporting limit.
[g] Lighter and heavier hydrocarbons were found in the range of diesel, but do not resemble a diesel fingerprint. Possible gasoline and motor oil.
[h] Hydrocarbon reported does not match the pattern of the laboratory diesel standard.
[i] Hydrocarbon reported does not match the pattern of the laboratory motor oil standard.
[j] Hydrocarbon reported is in the early diesel range and does not match the laboratory diesel standard.

APPENDIX B

METHODS USED TO ESTIMATE CHEMICAL VAPORS IN AIR

LIST OF TABLES FOR APPENDIX B

Table B-1.

Vapor Flux from Soil at Soil Surface for the Hypothetical Onsite Indoor Commercial Worker Receptor [a]
Metz Baking Company Risk-Based Corrective Action Evaluation
580 Julie Ann Way
Oakland, California
Project No. 005.02811.002

Parameter definition	Units	Symbol	Benzene
Maximum detected concentration in soil [b]	mg/kg	C_s	5.1
Air-filled porosity [c]	--	θ_a	0.28
Water-filled porosity [c]	--	θ_w	0.15
Total soil porosity [c,d]	--	n	0.43
Chemical diffusivity in air [c]	cm^2/sec	D_i	8.80E-02
Dimensionless Henry's Law constant [c]	--	H'	2.28E-01
Chemical diffusivity in water [c]	cm^2/sec	D_w	9.80E-06
Dry soil bulk density [c]	g/cm^3	ρ_b	1.50
Soil particle density [c]	g/cm^3	ρ_s	2.65
Soil organic carbon partition coefficient [c]	cm^3/g	K_{oc}	3.07E+03
Fraction of organic carbon in soil [c]	g/g	f_{oc}	0.006
Soil-water partition coefficient [e]	cm^3/g	K_d	1.84E+01
Exposure interval [f]	secs	T	7.88E+08
Apparent diffusivity [g]	cm^2/sec	D_A	5.78E-05
Vapor flux at soil surface from shallow soils [h]	**mg/m^2-sec**	**F**	**2.34E-05**

Footnotes:

[a] Chemical vapor flux at soil surface from volatilization is based on Jury et al. (1984) model, as described in Soil Screening Guidance: User's Guide (USEPA, 1996c).

[b] From Table 4-5.

[c] Chemical and default soil properties were obtained from USEPA Soil Screening Guidance User's Guide (USEPA, 1996c).

[d] $(1 - (\rho_b / \rho_s))$

[e] $K_{oc} \times f_{oc}$

[f] Represents the number of seconds in 25 years of exposure.

[g] $[(\theta_a^{10/3} \times D_i \times H' + \theta_w^{10/3} \times D_w) / n^2] / (\rho_b \times K_d + \theta_w + \theta_a \times H')$.

[h] $[C_s \times ((2 \times \rho_b \times D_A) / (3.14 \times D_A \times T)^{1/2} \times 10^{-4}))] \times 0.001$ kg soil/g soil.

References:

Jury, W.A., W.J. Farmer, and W.F. Spencer. 1984. Behavior Assessment Model for Trace Organics in Soil: II. Chemical Classification and Parameter Sensitivity. J. Environ. Qual. 13(4):567-572.

Mackay, D., W.Y. Shiu, and K.C. Ma. 1992. Illustrated Handbook of Physical-Chemical Properties and Environmental Fate for Organic Chemicals, Vol. I, Monoaromatic Hydrocarbons, Chlorobenzenes, and PCBs. Lewis Publishers, Inc., Chelsea, Michigan.

Mackay, D., W.Y. Shiu, and K.C. Ma. 1993. Illustrated Handbook of Physical-Chemical Properties and Environmental Fate for Organic Chemicals, Vol. III. Volatile Organic Compounds. Lewis Publishers, Inc., Chelsea, Michigan.

USEPA. 1996c. Soil Screening Guidance: User's Guide.

Table B-2.
Estimated Indoor Chemical Vapor Air Concentrations
from Soil for the Hypothetical Onsite Indoor Commercial Worker Receptor[a]
Metz Baking Company Risk-Based Corrective Action Evaluation
580 Julie Ann Way
Oakland, California
Project No. 005.02811.002

Parameter Definition	Units [b]	Symbol	Benzene
Estimated vapor flux at soil surface from soil[c]	mg/sec-m^2	F	1.99E-10
Aerial fraction of cracks in concrete slab-on-grade foundation [d]	- -	Fc	1.00E-02
Sensitivity of crack fraction to vapor retardation[e]	--	Sc	5.00E-01
Adjusted vapor flux at building floor surface[f]	mg/sec-m^2	F"	3.99E-12
Volumetric flow rate for infiltration air per unit area[g]	L/sec-m^2	Q	6.49E-01
Unit conversion factor	m^3/L	CF	1.00E-03
Volumetric flow rate for infiltration air per unit area[h]	m^3/sec-m^2	Q'	6.49E-04
Concentration of chemical in indoor air[i]	mg/m^3	C_{in}	6.14E-09

Footnotes:

[a] Model for estimating chemical vapors in indoor air from ASTM, 1995; Wadden and Scheff, 1983; Johnson and Ettinger, 1991.

[b] mg/sec-m^2 = milligrams per second per square meter; L/sec-m^2 = liters per second per square meter; m^3/L = cubic meters per liter; m^3/sec-m^2 = cubic meters per second per square meter; mg/m^3 = milligrams per cubic meter.

[c] From Table B-1.

[d] Default value from ASTM, 1995.

[e] Based on Johnson and Ettinger (1991) for medium permeability vadose soils. The vadose soil type is characterized as "sandy silty clays". (SECOR

[f] (F' x [Fc/ Sc]).

[g] Value based on the average of ASHRAE's reported range of 0.75 to 2 cfm/ft^2, which was multiplied by 0.472 to obtain a value of 0.649.

[h] (Q x CF).

[i] (F" / Q').

References:

American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE). 1999. ASHRAE Handbook: Heating, Ventilating, and A

American Society for Testing and Materials (ASTM). 1995. Standard Guide for Risk-Based Corrective Action Applied at Petroleum Release Sites. Designation E 1739-95.American Society for Testing and Materials, West Conshohocken, PA. November.

Johnson and Ettinger. 1991. Heuristic Model for Predicting the Intrusion Rate of Contaminated Vapors into Buildings. P.C. Johnson and R.A. Ettinger, Environ. Sci. Technol.25: 1445-1452.

SECOR International, Inc. 1999. Quarterly Groundwater Monitoring Report for First Quarter 1999, 580 Julie Ann Way, Oakland, CA,

Wadden and Scheff. 1983. Air Quality Models. Chapter 6 in Indoor Air Pollution. R.A. Wadden and P.A. Scheff, J. Wiley & Sons, Interscience.

American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE). 1989. ASHRAE Standard: Ventilation for Acceptable Indoor Air Quality. American Society of Heating, Refrigerating, and Air-Conditioning Engineers, Inc., Atlanta, GA. ASHRAE 62-1989.

Table B-3.

Estimated Vapor Flux at Soil Surface for Hypothetical Onsite Construction Worker Receptor [a]

Metz Baking Company Risk-Based Corrective Action Evaluation

580 Julie Ann Way

Oakland, California

Project No. 005.02811.002

Parameter definition	Units	Symbol	Benzene
Maximum Detected Concentration in soil [b]	mg/kg	C_s	5.1
Air-filled porosity [c]	--	θ_a	0.28
Water-filled porosity [d]	--	θ_w	0.15
Total soil porosity [e,f]	--	n	0.43
Chemical diffusivity in air [c]	cm^2/sec	D_i	8.80E-02
Dimensionless Henry's Law constant [c]	--	H'	2.28E-01
Chemical diffusivity in water [c]	cm^2/sec	D_w	9.80E-06
Dry soil bulk density [c]	g/cm^3	ρ_b	1.50
Soil particle density [c]	g/cm^3	ρ_s	2.65
Soil organic carbon partition coefficient [c]	cm^3/g	K_{oc}	3.07E+03
Fraction of organic carbon in soil [c]	g/g	f_{oc}	0.006
Soil-water partition coefficient [e]	cm^3/g	K_d	1.84E+01
Exposure interval [f]	secs	T	3.15E+07
Apparent diffusivity [g]	cm^2/sec	D_A	5.78E-05
Vapor flux at soil surface [h]	**mg/m^2-sec**	**F**	**1.17E-04**
Agitation factor [i]	--	AF	37
Adjusted vapor flux at soil surface from shallow soils [k]	**mg/m^2-sec**	**F'**	**4.32E-03**

Footnotes:

[a] Chemical vapor flux at soil surface from volatilization is based on Jury et al. (1984) model, as described in Soil Screening Guidance: User's Guide (USEPA, 1996c).

[b] From Table 4-5.

[c] Chemical and default soil properties were obtained from USEPA Soil Screening Guidance User's Guide (USEPA, 1996c).

[d] $(1 - (\rho_b / \rho_s))$

[e] $K_{oc} \times f_{oc}$

[f] Represents the number of seconds in 1 year of exposure.

[g] $[(\theta_a^{10/3} \times D_i \times H' + \theta_w^{10/3} \times D_w) / n^2] / (\rho_b \times K_d + \theta_w + \theta_a \times H')$

[h] $[C_s \times ((2 \times \rho_b \times D_A) / (3.14 \times D_A \times T)^{1/2} \times 10^{-4}))] \times 0.001$ kg soil/g soil

[i] The average agitation factor of 37 was used to represent construction worker soil handling (USEPA, 1989a).

[j] (AF x F)

References:

Jury, W.A., W.J. Farmer, and W.F. Spencer. 1984. Behavior Assessment Model for Trace Organics in Soil: II. Chemical Classification and Parameter Sensitivity. J. Environ. Qual. 13(4):567-572.

Mackay, D., W.Y. Shiu, and K.C. Ma. 1992. Illustrated Handbook of Physical-Chemical Properties and Environmental Fate for Organic Chemicals, Vol. I, Monoaromatic Hydrocarbons, Chlorobenzenes, and PCBs. Lewis Publishers, Inc., Chelsea, Michigan.

Mackay, D., W.Y. Shiu, and K.C. Ma. 1993. Illustrated Handbook of Physical-Chemical Properties and Environmental Fate for Organic Chemicals, Vol. III, Volatile Organic Compounds. Lewis Publishers, Inc., Chelsea, Michigan.

USEPA. 1988. Superfund Exposure Assessment Manual.

USEPA. 1989a. Air/Superfund National Technical Guidance Study Series, Vol. III - Estimation of Air Emissions from Cleanup Activities at Superfund Sites.

USEPA. 1996c. Soil Screening Guidance: User's Guide.

Table B-4
Concentration in Ambient Air from Soils
for the Hypothetical Onsite Construction Worker Receptor[a]
Metz Baking Company Risk-Based Corrective Action Evaluation
580 Julie Ann Way
Oakland, California
Project No. 005.02811.002

Parameter definition	Units	Symbol	Benzene
Adjusted vapor flux at soil surface from shallow soils [b]	mg/sec-m^2	F'	4.32E-03
Area of source [c]	m^2	A	80
Length dimension perpendicular to the wind [d]	m	LS	12.5
Wind speed [e]	m/sec	V	0.225
Ambient air mixing zone [f]	m	MH	2
Concentration of chemical in ambient air [g]	**mg/m^3**	**C_a**	**6.15E-02**

Footnotes:

[a] Concentration in ambient air is evaluated based on the model described in the Preliminary Endangerment Assessment Guidance Manual (California,1994).

[b] Based on adjusted vapor flux at soil surface for the construction worker receptor (Table B-3).

[c] Based on the excavated area of the UST area, 21ft x 41ft (SECOR, 1999).

[d] Estimated based on the area of impacted area (former location of USTs) - 21 ft x 41 ft. Using a conversion factor of 0.305, 41 ft is equal to 12

[e] Estimated based on the largest impacted area assessed, assuming wind direction is west to east. This includes a stagnation factor for the expected lower winds in a trench.

[f] Default value for California (1994).

[g] (F x A) / (LS x V x MH)

References:

California. 1994. Preliminary Endangerment Assessment Guidance Manual. State of California Environmental Protection Agency,

Table B-5.

Emissions of Chemical Vapors from Groundwater for the Hypothetical Onsite Indoor Commercial Worker Receptor[a]
Metz Baking Company Risk-Based Corrective Action Evaluation
580 Julie Ann Way
Oakland, California
Project No. 005.02811.002

Parameter Definition	Units	Symbol	Benzene	Methyl-tert-Butyl Ether
Groundwater concentration[b]	ug/l	Cp	270	60
Temperature of groundwater	degsK	T	293	293
Gas constant	atm-m^3/mole-degK	R	0.000082	0.000082
Dimensionless Henry's Law constant[c]	ug/l//ug/l	H'	2.28E-01	4.22E-01
Soil gas concentration[d]	ug/l	Cm	6.16E+01	2.53E+01
Air diffusion coefficient[c]	cm^2/sec	Di	1.04E-01	7.90E-02
Unit conversion factor	mg-l/ug-cm^3	CF1	1.00E-06	1.00E-06
Soil gas concentration[e]	mg/cm^3	Cm'	6.16E-05	2.53E-05
Air-filled soil porosity[f]	--	Pa	0.28	0.28
Total soil porosity [f]	--	Pt	0.43	0.43
Depth of soil cover [g]	cm	L	140.8176	140.8176
Estimated flux rate at soil surface[h]	mg/cm^2-sec	F	3.63E-09	1.14E-09
Unit conversion factor	cm^2/m^2	CF2	1.00E+04	1.00E+04
Estimated flux rate at soil surface[i]	mg/m^2-sec	F'	3.63E-05	1.14E-05

Footnotes:

[a] Model from Karimi et al., 1987, based on Shen's model (Shen, 1981; USEPA, 1988).

[b] Maximum detected chemical concentration. From Table 4-5.

[c] Values from USEPA (1996).

[d] H' x Cp

[e] Cm x CF1

[f] Default screening values (California, 1994).

[g] Average based on SECOR's reported range of 3.52 to 5.79 feet below ground surface (SECOR, 1999)

[h] [(Di)(Cm')(Pa^3.333/Pt^2)]/L

[i] F x CF2

References:

California. 1994. Preliminary endangerment assessment guidance manual. State of California Environmental Protection Agency,

Karimi et al. 1987. Vapor-Phase Diffusion of Benzene in Soil. A.A. Karimi, W.J. Farmer, and M.M. Cliath, J. Environ. Qual. 16(1): 38-43.

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Shen. 1981. Estimating Hazardous Air Emissions from Disposal Sites. T.T. Shen, Poll. Engin. 13(8): 31-34.

USEPA. 1988. Superfund exposure assessment manual. U.S. Environmental Protection Agency, Office of Remedial Response, Washington, D.C., EPA/540/1-88/001. April.

USEPA. 1996. Soil Screening Guidance: User's Guide. United States Environmental Protection Agency, Office of Solid Waste and Emergency Response, Washington D.C., Publication 9355.4-23, July.

Table B-6.

Estimated Indoor Chemical Vapor Air Concentrations for the Onsite Indoor Commercial Worker Receptor[a]

Metz Baking Company Risk-Based Corrective Action Evaluation

580 Julie Ann Way

Oakland, California

Project No. 005.02811.002

Parameter Definition	Units [b]	Symbol	Benzene	Methyl-tert-Butyl Ether
Estimated vapor flux at soil surface from groundwater volatilization[c]	mg/sec-m^2	F'	3.63E-05	1.14E-05
Aerial fraction of cracks in concrete slab-on-grade foundation [d]	- -	Fc	1.00E-02	1.00E-02
Sensitivity of crack fraction to vapor retardation[e]	--	Sc	5.00E-01	5.00E-01
Adjusted vapor flux at building floor surface[f]	mg/sec-m^2	F"	7.27E-07	2.27E-07
Volumetric flow rate for infiltration air per unit area[g]	L/sec-m^2	Q	6.49E-01	6.49E-01
Unit conversion factor	m^3/L	CF	1.00E-03	1.00E-03
Volumetric flow rate for infiltration air per unit area[h]	m^3/sec-m^2	Q'	6.49E-04	6.49E-04
Concentration of chemical in indoor air[i]	mg/m^3	C_{in}	1.12E-03	3.50E-04

Footnotes:

[a] Model for estimating chemical vapors in indoor air from ASTM, 1995; Wadden and Scheff, 1983; Johnson and Ettinger, 1991.

[b] mg/sec-m^2 = milligrams per second per square meter; L/sec-m^2 = liters per second per square meter; m^3/L = cubic meters per liter; m^3/sec-m^2 = cubic meters per second per square meter; mg/m^3 = milligrams per cubic meter.

[c] From Table B-5.

[d] Default value from ASTM. 1995.

[e] Based on Johnson and Ettinger (1991) for medium permeability vadose soils. The vadose soil type at the site can be characterized as "sandy silty clays".

[f] (F' x [Fc/ Sc]).

[g] Refer to Footnote g from Table B-2.

[h] (Q x CF).

[i] (F" / Q').

References:

American Society for Testing and Materials (ASTM). 1995. Standard Guide for Risk-Based Corrective Action Applied at Petroleum Release Sites. Designation E 1739-95.American Society for Testing and Materials, West Conshohocken, PA. November.

Johnson and Ettinger. 1991. Heuristic Model for Predicting the Intrusion Rate of Contaminated Vapors into Buildings. P.C. Johnson and R.A. Ettinger, Environ. Sci. Technol.25: 1445-1452.

Wadden and Scheff. 1983. Air Quality Models. Chapter 6 in Indoor Air Pollution. R.A. Wadden and P.A. Scheff, J. Wiley & Sons, Interscience.

American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE). 1989. ASHRAE Standard: Ventilation for Acceptable Indoor Air Quality. American Society of Heating, Refrigerating, and Air-Conditioning Engineers, Inc., Atlanta, GA. ASHRAE 62-1989.

Table B-7.
Estimated Chemical Vapor Flux from Groundwater for the Hypothetical Onsite Construction Worker Receptor
Onsite Construction Worker Receptor[a]
Metz Baking Company Risk-Based Corrective Action Evaluation
580 Julie Ann Way
Oakland, California
Project No. 005.02811.002

Parameter definition	Units[b]	Symbol	Benzene	Methyl-tert-Butyl Ether
Groundwater concentration [c]	ug/L	Cp	270	60
Dimensionless Henry's Law constant[d]	ug/L//ug/L	H'	2.28E-01	2.20E-02
Soil gas concentration[e]	ug/L	Cm	6.16E+01	1.32E+00
Air diffusion coefficient[d]	cm^2/sec	Di	7.20E-02	7.90E-02
Unit conversion factor	g-L/ug-cm	CF1	1.00E-06	1.00E-06
Soil gas concentration[f]	mg/cm^3	Cm'	6.16E-05	1.32E-06
Air-filled soil porosity[g]	--	Pa	2.80E-01	2.80E-01
Total soil porosity [g]	--	Pt	0.43	0.43
Depth of soil cover [h]	cm	L	30	30
Estimated flux rate at soil surface[i]	mg/cm^2-sec	F	1.13E-08	2.66E-10
Unit conversion factor	cm^2/m^2	CF2	1.00E+04	1.00E+04
Estimated vapor flux at soil surface from groundwater volatilization[j]	mg/m^2-sec	F'	1.13E-04	2.66E-06

Footnotes:

[a] Model from Karimi et al., 1987; based on Shen's model (Shen, 1981; USEPA, 1988).

[b] ug = micrograms; L = liters; cm = centimeters; sec = seconds; m = meters; mg = milligrams; g = grams; kg = kilogram.

[c] Maximum detected concentration as reported in Table 4-5.

[d] USEPA (1996).

[e] H' x Cp.

[f] Cm x CF1.

[g] Default ASTM, 1995.

[h] Corressponds to one foot of vadose zone.

[i] [(Di)(Cm')(Pa^3.333/Pt^2)]/L

[j] F x CF2

References:

Karimi et al. 1987. Vapor-Phase Diffusion of Benzene in Soil. A.A. Karimi, W.J. Farmer, and M.M. Cliath, J. Environ. Qual. 16(1): 38-43.

Shen. 1981. Estimating Hazardous Air Emissions from Disposal Sites. T.T. Shen, Poll. Engin. 13(8): 31-34.

USEPA. 1988. Superfund exposure assessment manual. U.S. Environmental Protection Agency, Office of Remedial Response, Washington, D.C., EPA/540/1-88/001. April.

USEPA. 1996. Soil Screening Guidance: User's Guide. United States Environmental Protection Agency, Office of Solid Waste and Emergency Response, Washington D.C., Publication 9355.4-23, July.

Table B-8.

Estimated Outdoor Chemical Vapor Air Concentrations for the Onsite Construction Worker Receptor[a]

Metz Baking Company Risk-Based Corrective Action Evaluation

580 Julie Ann Way

Oakland, California

Project No. 005.02811.002

Parameter definition	Units[b]	Symbol	Benzene	Methyl-tert-Butyl Ether
Estimated vapor flux at soil surface from groundwater volatilization[c]	mg/sec-m^2	F'	1.13E-04	2.66E-06
Length of emissions source[d]	m	d	15	15
Site wind speed[e]	m/sec	u_s	2.25	2.25
Trench wind speed stagnation factor[f]	--	Tf	0.1	0.1
Trench wind speed[g]	m/sec	u	0.225	0.225
Air mixing zone height[e]	m	h	2	2
Air concentration of vapor[h]	mg/m^3	Ca	3.77E-03	8.86E-05

Footnotes:

[a] Model based on box model (USEPA, 1991; Dobbins, 1979; California, 1994).

[b] mg = milligrams; sec = seconds; m = meters.

[c] From Table B-7.

[d] Assumed dimension of trench prallel to predominant wind direction.

[e] Standard default assumption for box model (USEPA, 1991; California, 1994).

[f] Assumed stagnation factor for below ground trench.

[g] u_s x Tf.

[h] (F' x d)/(u x h).

References:

California. 1994. Preliminary endangerment assessment guidance manual. State of California Environmental Protection Agency, Department of Toxic Substances Control. January.

Dobbins. 1979. Dispersion of Pollutants- Reacting Components and Unsteady Flows. Chapter 11 in Atmospheric Motion and Air Pollution, R.A. Dobbins, John Wiley and Sons, New York.

Kansas. 1998. Telephone conversation between Trish Miller (SECOR) and Mary Knapp (Kansas University Climatological Library), March. 23

USEPA. 1991. Risk assessment guidance for Superfund: volume I- human health evaluation manual (part b, development of risk-based preliminary remediation goals), interim. Office of Emergency and Remedial Response, Washington, D.C., December, Publication 9.

APPENDIX C

PATHWAY-SPECIFIC RISK CHARACTERIZATION TABLES FOR THE HYPOTHETICAL ONSITE INDOOR COMMERCIAL WORKER RECEPTOR

LIST OF TABLES FOR APPENDIX C

Table C-1. Risk Characterization for the Hypothetical Onsite Indoor Commercial Worker Receptor Inhalation of Chemical Vapors Volatilizing from Soil Metz Baking Company Risk-Based Corrective Action Evaluation 580 Julie Ann Way Oakland, California Project No. 005.02811.002

Pathway: Inhalation of Chemical Vapors Volatilizing from Soil[a]

Chronic Daily Intake (CDI)[b] = (Cas_in x InR x ET x EF x ED) / (BW x AT)

Chemical	Noncarcinogenic Effects			Carcinogenic Effects		
	CDI (mg/kg-day)[c]	Inhalation Reference Dose (RfDi) (mg/kg-day)	Hazard Quotient (HQ) (unitless)	CDI (mg/kg-day)	Inhalation Slope Factor (SFi) $(mg/kg\text{-}day)^{-1}$	Excess Cancer Risk (unitless)
Volatile Organic Compounds						
Benzene	2.2E-05	1.7E-03	1 E-02	7.8E-06	1.0E-01	8 E-07
		Total Hazard Index =	1 E-02		Total Excess Cancer Risk =	8 E-07

Footnotes:

[a] For the purposes of this assessment, it is assumed that this receptor will be exposed to chemical vapors volatilizing from the subsurface soil.

[b] Refer to Table 4-1 for explanation of acronyms used in equation.

[c] mg/kg-day = milligrams per kilogram body weight per day.

[d] "- -" = Not applicable.

Table C-2. Risk Characterization for the Hypothetical Onsite Indoor Commercial Worker Receptor Inhalation of Chemical Vapors Volatilizing from Groundwater Metz Baking Company Risk-Based Corrective Action Evaluation 580 Julie Ann Way Oakland, California Project No. 005.02811.002

Pathway: Inhalation of Chemical Vapors Volatilizing from Groundwater[a]

Chronic Daily Intake (CDI)[b] = (Cas_in x InR x ET x EF x ED) / (BW x AT)

Chemical	Noncarcinogenic Effects			Carcinogenic Effects		
	CDI (mg/kg-day)[c]	Inhalation Reference Dose (RfDi) (mg/kg-day)	Hazard Quotient (HQ) (unitless)	CDI (mg/kg-day)	Inhalation Slope Factor (SFi) $(mg/kg\text{-}day)^{-1}$	Excess Cancer Risk (unitless)
Volatile Organic Compounds						
Benzene	2.8E-11	1.7E-03	2 E-08	1.0E-11	1.0E-01	1 E-12
Methyl-tert-butyl ether	6.6E-13	8.0E-01	8 E-13	2.4E-13	- -	- -
		Total Hazard Index =	2 E-08	Total Excess Cancer Risk =		1 E-12

Footnotes:

[a] For the purposes of this assessment, it is assumed that this receptor will be exposed to chemical vapors volatilizing from groundwater up through the subsurface soil.

[b] Refer to Table 4-1 for explanation of acronyms used in equation.

[c] mg/kg-day = milligrams per kilogram body weight per day.

[d] "- -" = Not applicable.

APPENDIX D

PATHWAY-SPECIFIC RISK CHARACTERIZATION TABLES FOR THE HYPOTHETICAL ONSITE CONSTRUCTION WORKER RECEPTOR

LIST OF TABLES FOR APPENDIX D

Table D-1. Risk Characterization for the Hypothetical Onsite Outdoor Construction Worker Receptor Incidental Ingestion of Soil Metz Baking Company Risk-Based Corrective Action Evaluation 580 Julie Ann Way Oakland, California Project No. 005.02811.002

Pathway: Incidental Ingestion of Soil

Chronic Daily Intake (CDI)[a] = (Cs x IR x CF1 x EF x ED) / (BW x AT)

Chemical	Noncarcinogenic Effects			Carcinogenic Effects		
	CDI (mg/kg-day)[b]	Subchronic Oral Reference Dose (RfDo) (mg/kg-day)	Hazard Quotient (HQ) (unitless)	CDI (mg/kg-day)	Oral Slope Factor (SFo) $(mg/kg\text{-}day)^{-1}$	Excess Cancer Risk (unitless)
<u>Volatile Organic Compounds</u>						
Benzene	8.6E-06	3.0E-03	2.9E-03	1.2E-07	1.0E-01	1 E-08
<u>Semi-Volatile Organic Compounds</u>						
2-Methylnaphthalene	6.1E-06	- -	- -	8.7E-08	- -[c]	- -
		Total Hazard Index =	3 E-03	**Total Excess Cancer Risk =**		1 E-08

Footnotes:

[a] Refer to Table 4-1 for explanation of acronyms used in equation.

[b] mg/kg-day = milligrams per kilogram body weight per day.

[c] "- -" = Not applicable.

Table D-2. Risk Characterization for the Hypothetical Onsite Outdoor Construction Worker Receptor Dermal Contact with Soil Metz Baking Company Risk-Based Corrective Action Evaluation 580 Julie Ann Way Oakland, California Project No. 005.02811.002

Pathway: Dermal Contact with Soil

Chronic Daily Intake (CDI)[a] = (Cs x CF1 x SA x AF x DAF x EF x ED) / (BW x AT)

Chemical	Noncarcinogenic Effects			Carcinogenic Effects		
	CDI (mg/kg-day)[c]	Subchronic Oral Reference Dose (RfDo) (mg/kg-day)	Hazard Quotient (HQ) (unitless)	CDI (mg/kg-day)	Oral Slope Factor (SFo) $(mg/kg\text{-}day)^{-1}$	Excess Cancer Risk (unitless)
Volatile Organic Compounds						
Benzene	2.5E-06	3.0E-03	8 E-04	3.6E-08	1.0E-01	4 E-09
Semi-Volatile Organic Compounds						
2-Methylnaphthalene	2.6E-06	- -	- -	3.8E-08	- -[d]	- -
	Total Hazard Index =		8 E-04	Total Excess Cancer Risk =		4 E-09

Footnotes:

[a] Refer to Table 4-1 for explanation of acronyms used in equation.

[b] mg/kg-day = milligrams per kilogram body weight per day.

[c] "- -" = Not applicable.

Table D-3. Risk Characterization for the Hypothetical Onsite Outdoor Construction Worker Receptor Inhalation of Fugitive Dust Metz Baking Company Risk-Based Corrective Action Evaluation 580 Julie Ann Way Oakland, California Project No. 005.02811.002

Pathway: Inhalation of Fugitive Dust

Chronic Daily Intake (CDI)[a] = (Cs x InR x ET x EF x ED x (1/PEF)) / (BW x AT)

Chemical	Noncarcinogenic Effects			Carcinogenic Effects		
	CDI (mg/kg/day)[b]	Subchronic Inhalation Reference Dose (RfDi) (mg/kg/day)	Hazard Quotient (HQ) (unitless)	CDI (mg/kg/day)	Inhalation Slope Factor (SFi) $(mg/kg/day)^{-1}$	Excess Cancer Risk (unitless)
Semi-Volatile Organic Compounds						
2-methylnaphthalene	1.6E-19	--	2 E-16	2.3E-21	--	--
		Total Hazard Index =	2 E-16		Total Excess Cancer Risk =	--

Footnotes:

[b] Refer to Table 4-1 for explanation of acronyms used in equation.

[c] mg/kg/day = milligrams per kilogram body weight per day.

[d] "- -" = Not applicable.

Table D-4. Risk Characterization for the Hypothetical Onsite Outdoor Construction Worker Receptor Inhalation of Chemical Vapors Volatilizing from Soil Metz Baking Company Risk-Based Corrective Action Evaluation 580 Julie Ann Way Oakland, California Project No. 005.02811.002

Pathway: Inhalation of Chemical Vapors Volatilizing from Soil

Chronic Daily Intake (CDI)[a] = (Cas_out x InR x ET x EF x ED) / (BW x AT)

Chemical	Noncarcinogenic Effects			Carcinogenic Effects		
	CDI (mg/kg-day)[b]	Subchronic Inhalation Reference Dose (RfDi) (mg/kg-day)	Hazard Quotient (HQ) (unitless)	CDI (mg/kg-day)	Inhalation Slope Factor (SFi) $(mg/kg\text{-}day)^{-1}$	Excess Cancer Risk (unitless)
Volatile Organic Compounds						
Benzene	4.8E-03	1.7E-03	3 E+00	6.8E-05	1.0E-01	7 E-06
		Total Hazard Index =	3 E+00		Total Excess Cancer Risk =	7 E-06

Footnotes:

[a] Refer to Table 4-1 for explanation of acronyms used in equation.

[b] mg/kg/day = milligrams per kilogram body weight per day.

Table D-5. Risk Characterization for the Hypothetical Onsite Outdoor Construction Worker Receptor Dermal Contact with Groundwater Metz Baking Company Risk-Based Corrective Action Evaluation 580 Julie Ann Way Oakland, California Project No. 005.02811.002

Pathway: Dermal Contact with Groundwater

Chronic Daily Intake (CDI)[a] = (DAevent_gw x SA x EF x ED) / (BW x AT)

Chemical	Noncarcinogenic Effects			Carcinogenic Effects		
	CDI (mg/kg-day)[b]	Subchronic Oral Reference Dose (RfDo) (mg/kg-day)	Hazard Quotient (HQ) (unitless)	CDI (mg/kg-day)	Oral Slope Factor (SFo) $(mg/kg\text{-}day)^{-1}$	Excess Cancer Risk (unitless)
Volatile Organic Compounds						
Benzene	5.1E-03	3.0E-03	2 E+00	7.3E-05	1.0E-01	7 E-06
Methyl-tert-butyl ether	1.8E-04	8.0E-01	2 E-04	2.5E-06	--e	--
Semi-Volatile Organic Compounds						
Naphthalene	3.0E-03	2.0E-01	1 E-02	4.2E-05	--	--
2-Methylnaphthalene	1.1E-03	2.0E-01	5 E-03	1.5E-05	--	--
	Total Hazard Index =		2 E+00	Total Excess Cancer Risk =		7 E-06

Footnotes:

[a] Refer to Table 4-1 for explanation of acronyms used in equation.

[b] mg/kg-day = milligrams per kilogram body weight per day.

[c] "- -" = Not applicable.

Table D-6. Risk Characterization for the Hypothetical Onsite Outdoor Construction Worker Receptor Inhalation of Chemical Vapors Volatilizing from Groundwater Metz Baking Company Risk-Based Corrective Action Evaluation 580 Julie Ann Way Oakland, California Project No. 005.02811.002

Pathway: Inhalation of Chemical Vapors Volatilizing from Groundwater

Chronic Daily Intake (CDI)[a] = (Caw_out x InR x ET x EF x ED) / (BW x AT)

Chemical	Noncarcinogenic Effects			Carcinogenic Effects		
	CDI (mg/kg-day)[b]	Subchronic Inhalation Reference Dose (RfDi) (mg/kg-day)	Hazard Quotient (HQ) (unitless)	CDI (mg/kg-day)	Inhalation Slope Factor (SFi) $(mg/kg\text{-}day)^{-1}$	Excess Cancer Risk (unitless)
Volatile Organic Compounds						
Benzene	7.0E-11	1.7E-03	4.09813E-08	1.0E-12	1.0E-01	9.9526E-14
Methyl-tert-butyl ether	1.6E-12	8.0E-01	2.04887E-12	2.3E-14	- -	- -
		Total Hazard Index =	4 E-08		Total Excess Cancer Risk =	1 E-13

Footnotes:

[a] Refer to Table 4-1 for explanation of acronyms used in equation.

[b] mg/kg-day = milligrams per kilogram body weight per day.

APPENDIX E

METHODS USED TO ESTIMATE SSTLS

Table E-1
Methods Used to Estimate Site-Specific Target Levels (SSTLs) for Benzene in Soil and Groundwater
for the Hypothetical Onsite Construction Worker Receptor Only
Metz Baking Company Risk-Based Corrective Action Evaluation
580 Julie Ann Way
Oakland, California
Project No. 005.02811.002

Estimating SSTL for Benzene in Soil[a]

CHI[b]	B_s	THI	$SSTL_{soil}$
(Unitless)	(mg/kg)[c]	(Unitless)	(mg/kg)
3	5.1	1	2

Estimating SSTL for Benzene in Groundwater[d]

CHI	B_{gw}	THI	$SSTL_{gw}$
(Unitless)	(mg/L)[e]	(Unitless)	(mg/L)
2	0.27	1	0.2

Footnotes:

[a]This SSTL applies to benzene vapors emanating from soil. Refer to Section 4.5 and 4.6 for more information.

[b]Refer to Section 4.6 for a complete description of all parameters.

[c]mg/kg = milligrams per kilogram.

[d]This SSTL applies to dermal contact with benzene in groundwater. Refer to Section 4.5 and 4.6 for more information.

[e]mg/L = milligrams per liter.

The EDR GeoCheck® Report

Former Penske Truck Leasing Facility
725 Julie Ann Way
Oakland, CA 94621

Inquiry Number: 0924914.1r

February 11, 2003

Environmental Data Resources, Inc.

The Source For Environmental Risk Management Data

3530 Post Road
Southport, Connecticut 06890

Nationwide Customer Service

Telephone: 1-800-352-0050
Fax: 1-800-231-6802
Internet: www.edrnet.com

TABLE OF CONTENTS

Thank you for your business.
Please contact EDR at 1-800-352-0050
with any questions or comments.

THE EDR GEOCHECK™ REPORT

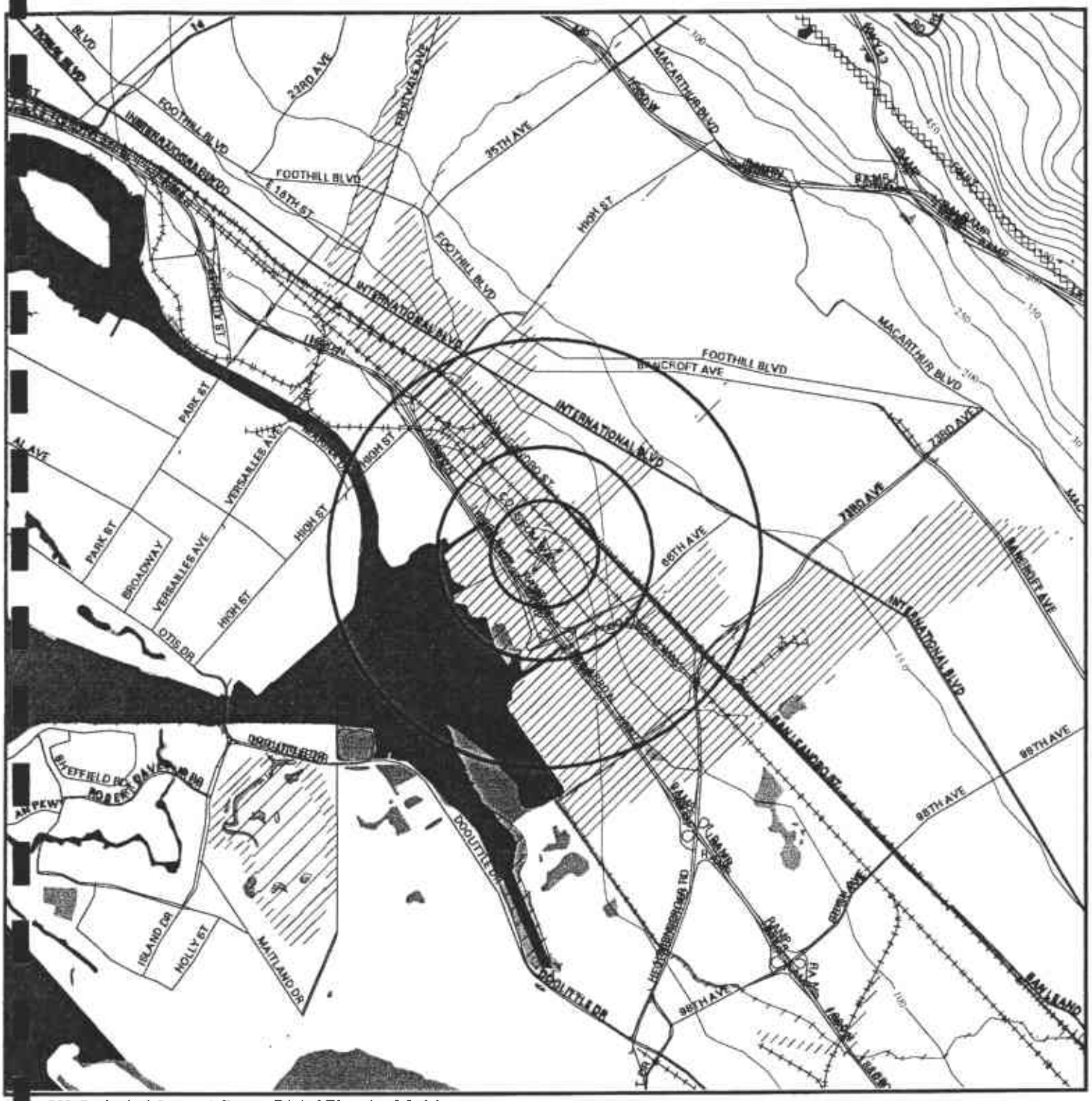
The EDR GeoCheck™ Report is a screening tool designed to assist in the hydrogeological assessment of a particular geographic area based upon publicly available information.

The EDR GeoCheck™ Report consists of the following information within a customer specified radius of the target property.

- topography (25 foot intervals unless otherwise shown)
- major roads
- surface water bodies
- railroad tracks
- flood plains (available in selected counties)
- wetlands (available in selected counties)
- wells including depth to water table and water level variability (in federal and selected state databases)
- public water supply wells (including violations information)
- geologic data
- radon data.

The EDR GeoCheck™ Report is a general area study. It may or may not be accurate at any specific location.

TOPOGRAPHIC MAP –0924914.1r –'SECOR/EPA, Inc.'



Source: US Geological Survey 1-Degree Digital Elevation Model
Compiled 09/15/92

0 1/2 1 2

scale in miles

N

- –Major Roads
- –Contour lines (25 foot interval unless otherwise shown)
- –Waterways
- –Wells within search distance to Target Property
- –Earthquake Epicenters (Richter 5 or greater)
- –Power lines
- –Pipe lines
- –Fault lines
- –Water
- –Wetlands
- –100-year flood zone
- –500-year flood zone

TARGET PROPERTY:	Former Penske Truck Leasing Facility	CUSTOMER:	SECOR/EPA, Inc.
ADDRESS:	725 Julie Ann Way	CONTACT:	Kit Soo
CITY/STATE/ZIP:	Oakland CA 94621	INQUIRY #:	0924914.1r
LAT/LONG:	37.7595 / 122.2092	DATE:	February 11, 2003

WELL SEARCH SUMMARY

GEOLOGIC AGE IDENTIFICATION†

Geologic Code:	Q
Era:	Cenozoic
System:	Quaternary
Series:	Quaternary

ROCK STRATIGRAPHIC UNIT†

Category:	Stratifed Sequence

SEARCH DISTANCE RADIUS INFORMATION

DATABASE	SEARCH DISTANCE (miles)
Federal Database	1.000
State Database	1.000
PWS Database	1.000

FEDERAL DATABASE WELL INFORMATION

MAP ID	WELL ID	LOCATION FROM TP

NO WELLS FOUND

STATE DATABASE WELL INFORMATION

MAP ID	WELL ID	LOCATION FROM TP

NO WELLS FOUND

PUBLIC WATER SUPPLY SYSTEM INFORMATION

NO WELLS FOUND

AREA RADON INFORMATION

Federal EPA Radon Zone for ALAMEDA County: 2

Note: Zone 1 indoor average level > 4 pCi/L.
: Zone 2 indoor average level >= 2 pCi/L and <= 4 pCi/L.
: Zone 3 indoor average level < 2 pCi/L.

Federal Area Radon Information for ALAMEDA COUNTY, CA

Number of sites tested: 49

Area	Average Activity	% <4 pCi/L	% 4-20 pCi/L	% >20 pCi/L
Living Area - 1st Floor	0.776 pCi/L	100%	0%	0%
Living Area - 2nd Floor	-0.400 pCi/L	100%	0%	0%
Basement	1.338 pCi/L	100%	0%	0%

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

CALIFORNIA GOVERNMENT WELL RECORDS SEARCHED

PWS: Public Water Systems
Source: EPA/Office of Drinking Water
Telephone: 202-564-3750
Public Water System data from the Federal Reporting Data System. A PWS is any water system which provides water to at least 25 people for at least 60 days annually. PWSs provide water from wells, rivers and other sources.

PWS ENF: Public Water Systems Violation and Enforcement Data
Source: EPA/Office of Drinking Water
Telephone: 202-564-3750
Violation and Enforcement data for Public Water Systems from the Safe Drinking Water Information System (SDWIS) after August 1995. Prior to August 1995, the data came from the Federal Reporting Data System (FRDS).

Area Radon Information
Source: USGS
Telephone: 303-202-4210
The National Radon Database has been developed by the U.S. Environmental Protection Agency (USEPA) and is a compilation of the EPA/State Residential Radon Survey and the National Residential Radon Survey. The study covers the years 1986 - 1992. Where necessary data has been supplemented by information collected at private sources such as universities and research institutions.

EPA Radon Zones
Source: EPA
Telephone: 202-564-9370
Sections 307 & 309 of IRAA directed EPA to list and identify areas of U.S. with the potential for elevated indoor radon levels.

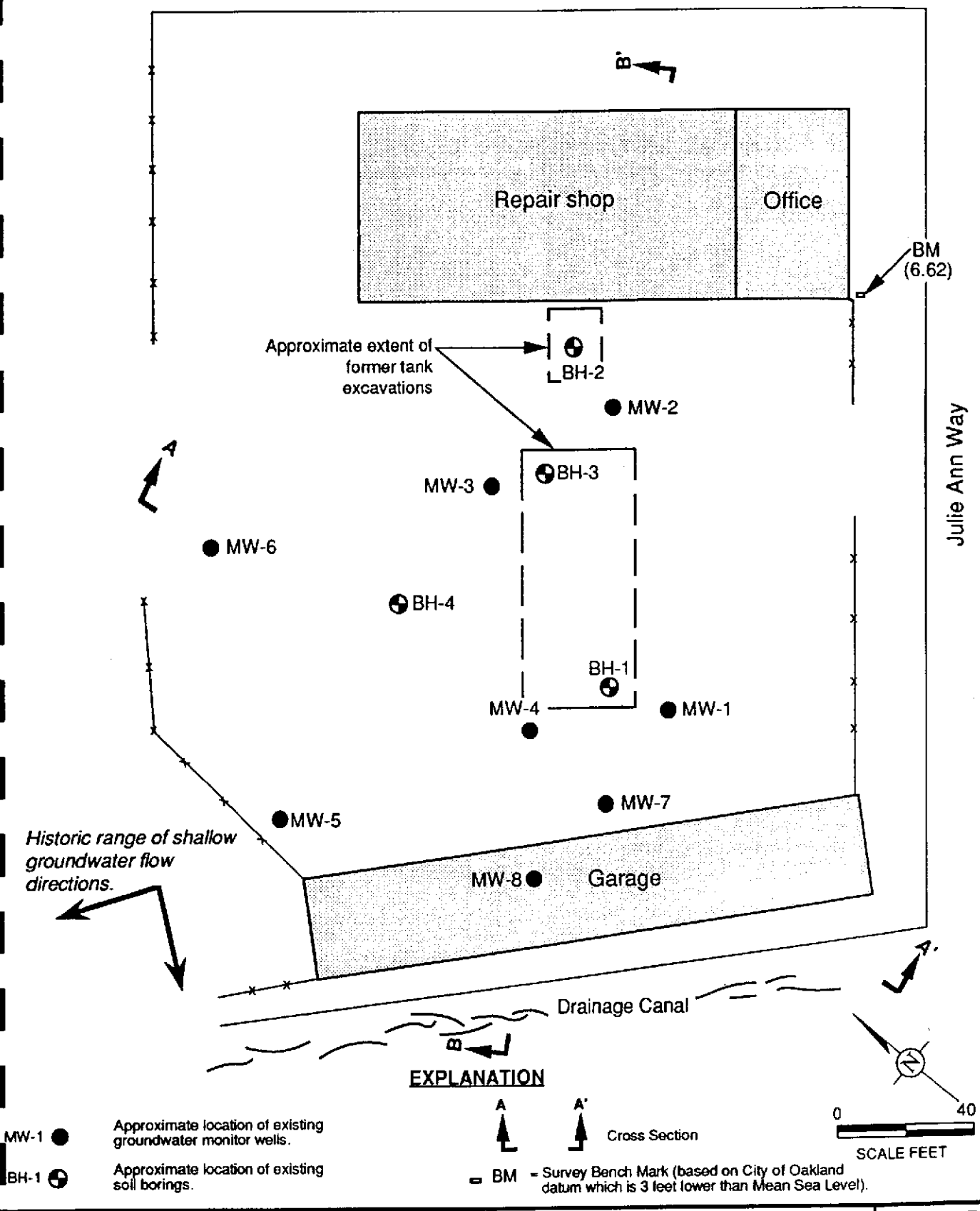
USGS Water Wells: In November 1971 the United States Geological Survey (USGS) implemented a national water resource information tracking system. This database contains descriptive information on sites where the USGS collects or has collected data on surface water and/or groundwater. The groundwater data includes information on more than 900,000 wells, springs, and other sources of groundwater.

California Drinking Water Quality Database
Source: Department of Health Services
Telephone: 916-324-2319
The database includes all drinking water compliance and special studies monitoring for the state of California since 1984. It consists of over 3,200,000 individual analyses along with well and water system information.

California Oil and Gas Well Locations for District 2, 3, 5, and 6
Source: Department of Conservation
Telephone: 916-323-1779

STREET AND ADDRESS INFORMATION

Site Assessment Report
Additional Soil and Groundwater Assessment
9/29/94
Cross Sections

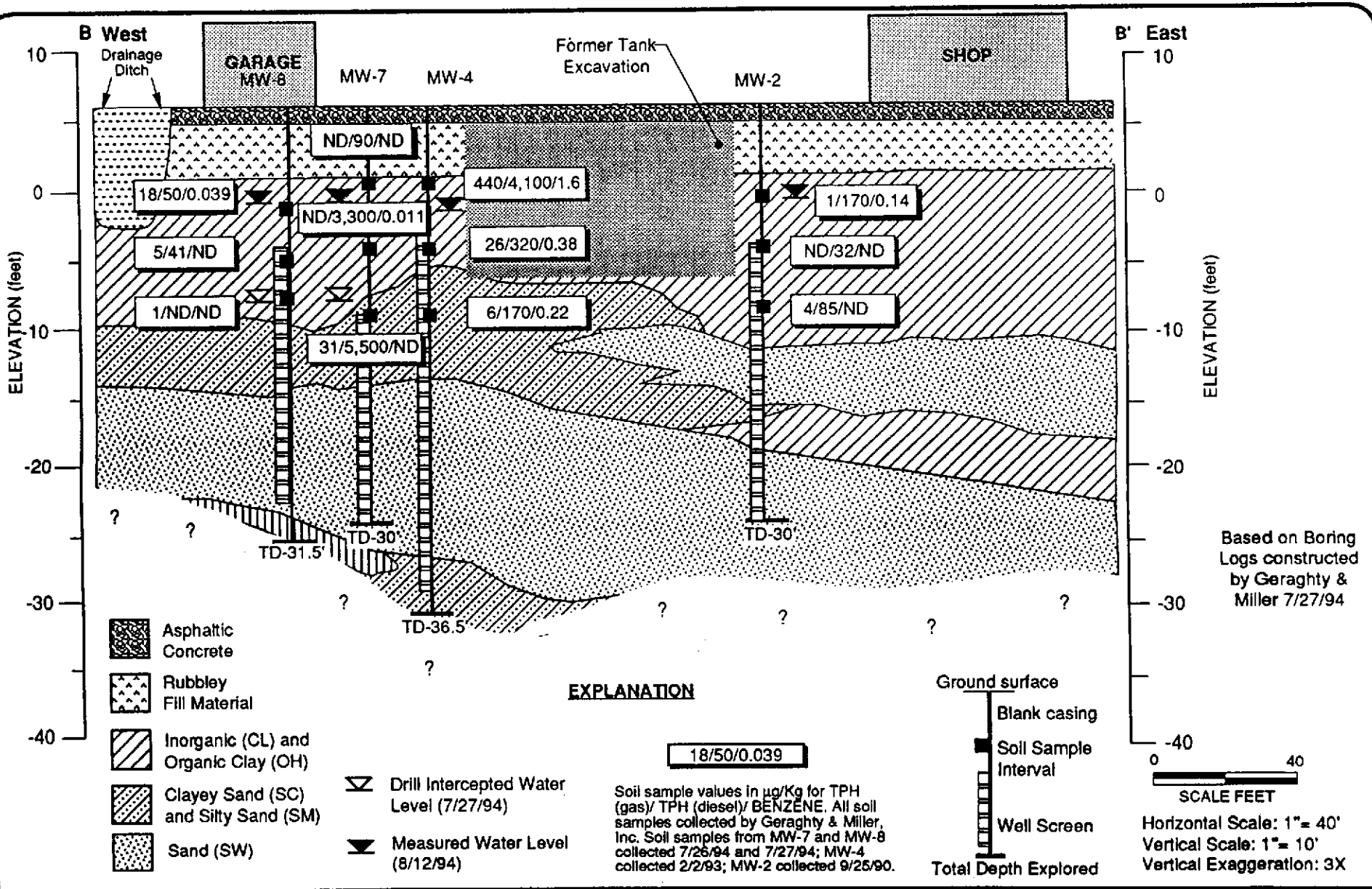


GERAGHTY & MILLER, INC.
Environmental Services

Project No. RC0019.007

MONITOR WELL AND SOIL BORING LOCATIONS
Former Penske Truck Leasing Co.
725 Julie Ann Way
Oakland, California

FIGURE
2



GERAGHTY & MILLER, INC.
Environmental Services

Project No. RC0019.000

CROSS SECTION B - B'

FORMER PENSKE TRUCK LEASING CO. FACILITY
725 Julie Ann Way
Oakland, California

FIGURE
4

KEY TO BORING LOG SYMBOLS

UNIFIED SOIL CLASSIFICATION SYSTEM - ASTM D2488

MAJOR DIVISIONS			SYMBOL/ GRAPHIC		DESCRIPTIONS
COARSE GRAINED SOILS (>50% by weight larger than #200 sieve)	GRAVELS (More than 50% of coarse fraction is larger than the #4 sieve size.)	Clean gravels with little or no fines	GW		Well Graded Gravels, Gravel - Sand Mixtures
			GP		Poorly Graded Gravels, Gravels - Sand Mixtures
		Gravels with over 12% fines	GM		Silty Gravels, Poorly Graded Gravel - Sand - Silt Mixtures
			GC		Clayey Gravels, Poorly Graded Gravel - Sand - Clay Mixtures
	SANDS (More than 50% of coarse fraction is smaller than #4 sieve size.)	Clean sands with little or no fines	SW		Well Graded Sands, Gravelly Sands
			SP		Poorly Graded Sands, Gravelly Sands
		Sands with over 12% fines	SM		Silty Sands, Poorly Graded Sand - Silt Mixtures
			SC		Clayey Sands, Poorly Graded Sand - Clay Mixtures
FINE GRAINED SOILS (>50% smaller than #200 sieve)	SILTS AND CLAYS (liquid limit less than 50)		ML		Inorganic Silts and Very Fine Sands, Silty or Clayey Fine Sands
			CL		Inorganic Clays of Low to Medium Plasticity; Gravelly, Sandy or Silty Clays; Lean Clays
			OL		Organic Clays and Organic Silty Clays of Low Plasticity
	SILTS AND CLAYS (liquid limit greater than 50)		MH		Inorganic Silts, Micaceous or Diatomaceous Fine Sandy or Silty Soils, Elastic Silts
			CH		Inorganic Clays of High Plasticity, Fat Clays
			OH		Organic Clays of Medium to High Plasticity, Organic Silts
HIGHLY ORGANIC SOILS			Pt		Peat and other Highly Organic Soils

Stabilized water level (date)

Water level encountered during drilling

Shaded interval represents soil sample. Blackened interval indicates portion of sample prepared for laboratory analysis.

Indicates no recovery of sample

Monitoring well

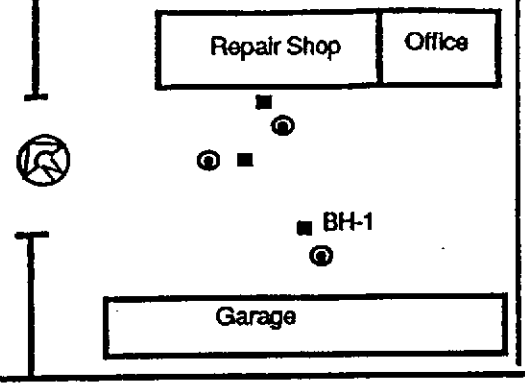
Soil boring

	Asphaltic Concrete
	Portland Cement Concrete
	Cement Grout

PID Photo-ionization detector readings (ppmv)

FID Flame-ionization detector readings (ppmv)

EXP Gastech explosimeter readings (ppmv)

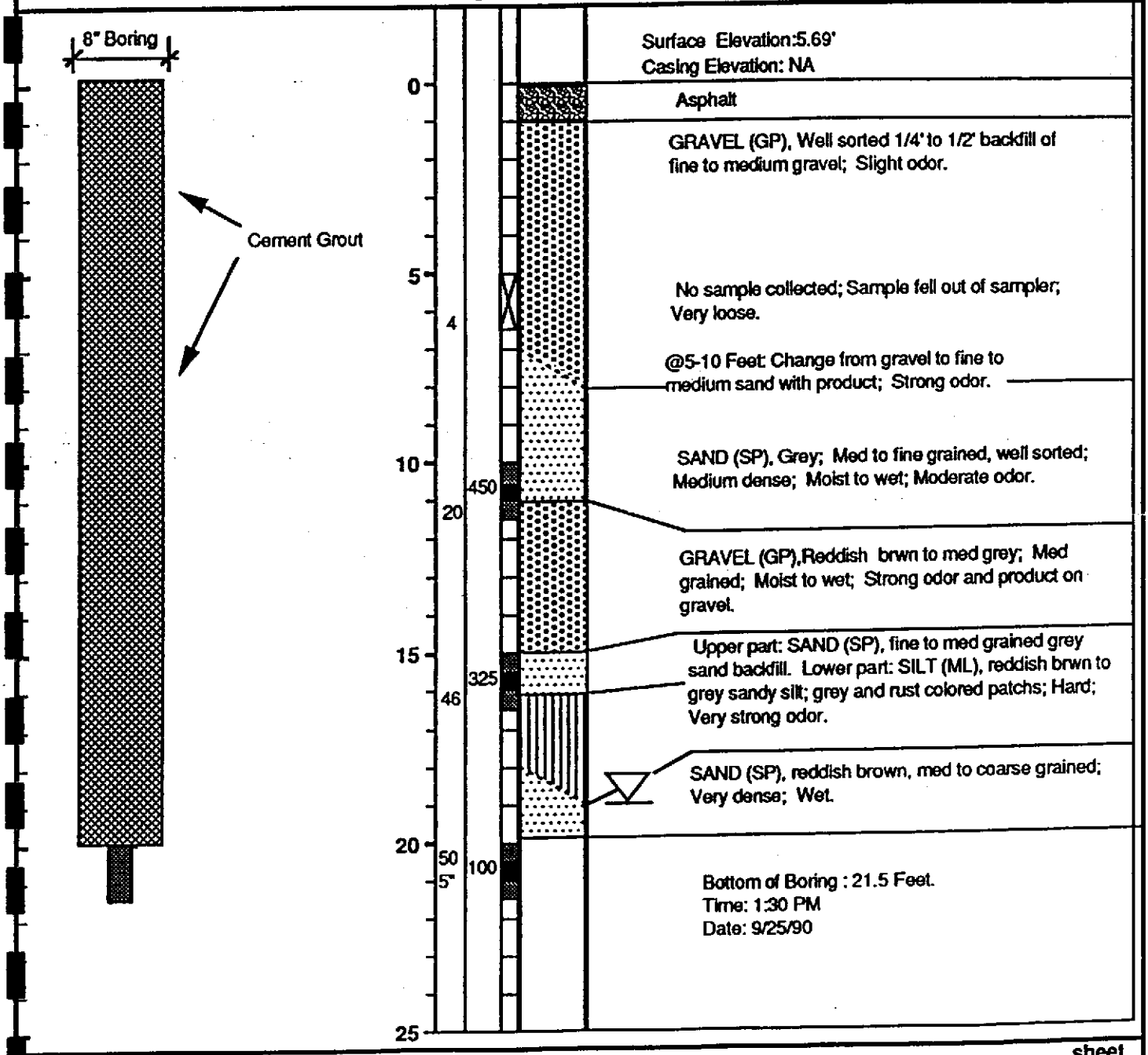


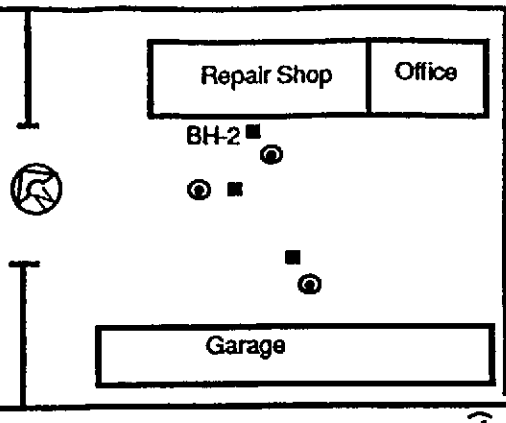
LOG OF BORING BH-1

Former Penske Truck Leasing Facility
725 Julie Ann Way
Oakland, California

Project No.: RC01903
Logged By: Paul V. Hehn
Drilling Co.: West HazMat
Driller: Mark Thorp

Date Drilled: September 25, 1990
Drilling Method: 8" Hollow Stem Auger.
Sampling Method: 2" Split spoon
Inclination: Vertical





Julie Ann Way

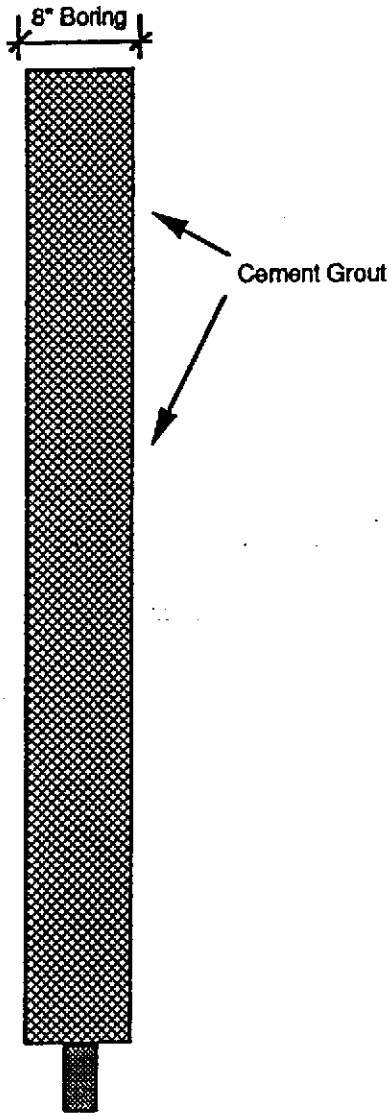
LOG OF BORING BH-2

Former Penske Truck Leasing Facility
725 Julie Ann Way
Oakland, California

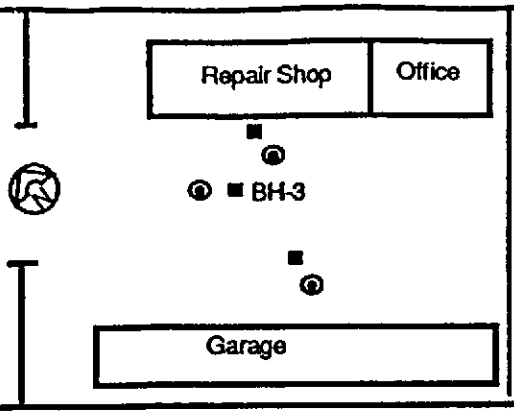
Project No.: RC01903
Logged By: Paul V. Hehn
Drilling Co.: West HazMat
Driller: Mark Thorp

Date Drilled: September 27, 1990
Drilling Method: 8" Hollow Stem Auger.
Sampling Method: 2" Split spoon
Inclination: Vertical

WELL CONSTRUCTION



Depth (ft.)	Blows/ft.	EXP Samples	Graphic	DESCRIPTION
				Surface Elevation: 6.66' Casing Elevation: NA
0				Asphalt
				GRAVEL (GP), light reddish brwn to light grey fine to medium gravel and sand fill - 75% gravel and 25% sand.
5	4			No sample collected; Sample fell out of sampler even with catcher screen in place; Very loose. @5-10 Feet: Mix of drk brwn to greenish silty sand (30%), silty clay (20%), and gravel (50%) backfill; Slight odor (old oil smell).
10	24	175		CLAY (CL), olive grey to olive brwn (5y;5/2)silty clay with <5% rounded to subangular fine gravel; Very stiff; Moderate odor. @ 10-15 feet: upper part is drk grey to black vfg silty clay w/ moderate odor; Lower part is light to med grey clay w/ weak to no odor; Water at 13-15 feet.
15		75		@ 15': light yellow brwn (10YR;5/3),w/ grey patches; Hard; Slight odor. SAND (SW), brown (10YR;5/3), poorly sorted, med to coarse grained sand and fine gravel; Subrounded to subangular; Very dense; Wet.
20	55	30		Bottom of Boring : 21.5 Feet. Time: 9:10 AM Date: 9/27/90
25				



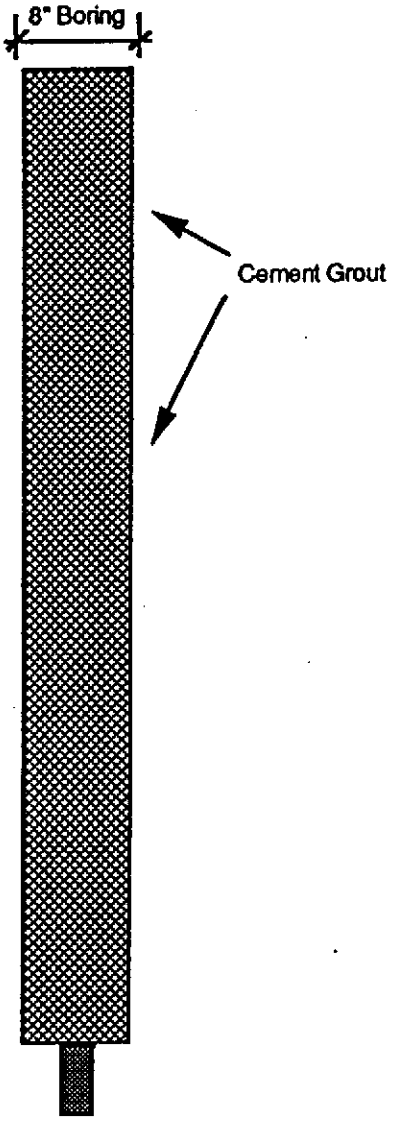
LOG OF BORING BH-3

Former Penske Truck Leasing Facility
725 Julie Ann Way
Oakland, California

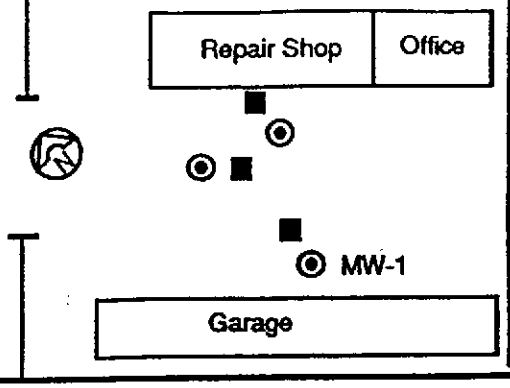
Project No.: RC01903
Logged By: Paul V. Hehn
Drilling Co.: West HazMat
Driller: Mark Thorp

Date Drilled: September 28, 1990
Drilling Method: 8" Hollow Stem Auger.
Sampling Method: 2" Split spoon
Inclination: Vertical

WELL CONSTRUCTION



Depth (ft.)	Blows/ft.	EXP	Samples	Graphic	DESCRIPTION
					Surface Elevation: 6.44' Casing Elevation: NA
0					Asphalt
					GRAVEL (GP), Reddish brwn to dark grey sandy to silty gravel and clayey sand to sandy clay; Slight odor.
5	43	75			@ 5'; Silty Gravel, yellowish brwn (10YR;5/4); silty sand backfill material; Dense; Slight odor.
					@5-10 feet: As above w/ pieces of red brick in gravel and minor black clay; Slight to moderate odor.
10	29	130			CLAY (CL), Pale brwn (10YR;6/3), to grey brwn ; silty w/ 10% subrounded fine gravel; Very stiff;. Slight odor.
					@ 10-15 feet, Dark grey to black to olive grey silty clay w/ 5% fine gravel.
15	60	225			@ 15', Silty clay,light brwnish grey (2.5YR; 6/2); Rust to grey patches; Hard; Slight odor.
					@ 15-20 feet: Sand, fine to med grained; interbedded with sandy to silty clay and fine gravel.
					SAND (SP), Brown (10YR;5/3), 95% fine to med, well sorted and 5% fine to coarse gravel; Flowing sands; Medium dense; Wet.
20	13	60			Bottom of Boring : 21.5 Feet. Time: 9:30 AM Date: 9/28/90
25					



LOG OF BORING MW-1

Former Penske Truck Leasing Facility
725 Julie Ann Way
Oakland, California

Project No.: RC01903
Logged By: Paul V. Hehn
Drilling Co.: West HazMat
Driller: Mark Thorp

Date Drilled: September 25, 1990
Drilling Method: 10" Hollow Stem Auger.
Sampling Method: 2" Split spoon
Inclination: Vertical

WELL CONSTRUCTION

DESCRIPTION

Depth (ft.) | Blows/ft. | EXP | Samples | Graphic

10" Boring
G-5 Christy Utility Box
Locking water-tight cap
Concrete
Cement Grout
Bentonite
4" Sch 40 PVC Blank casing
3 Monterey Sand
4" Sch 40 PVC 0.010" slotted casing

0
5
10
15
20
25

21
20
36
43
500
60
125
50

Surface Elevation:5.42'
Casing Elevation:4.98'

Asphalt

CLAY (CL), red brick, sand, gravel and clay fill. Light yellowish brown silty, sandy clay w/<10% fine gravel; mixed with layers of dark brwn silty ,sandy clay; Gravel to cobbles increase to 20 to 30% at bottom.

@5 feet, Sandy to silty, dark brown, w/10% fine gravel; Very stiff; Slight odor.

@5-10 Feet: Interbedded sand and gravel;Dark gray to black; moderate odor.

@10 feet, Silty to very slighty sandy clay w/ 10% fine gravel; Medium grey to medium olive green; Minor interbedded sandy lenses; Very stiff; Moderate odor.

@ 10-15 feet: Sandy lenses; dark grey to black.

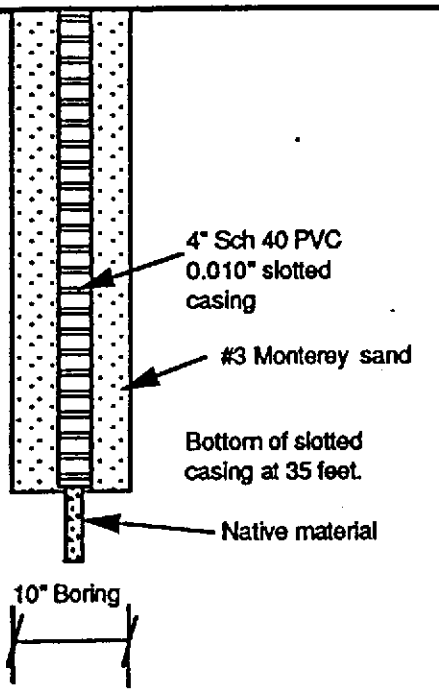
@15 feet,, same as above; interbedded layers of sandy silt to silty sand (light brwn) & dark grey to black clay to silty,sandy clay; Slighty moist; Hard; Slight odor.

@15-20 feet: Interbedded silty, sandy clay (dark grey) and light to medium reddish brwn fine grained to very fine grained silty sand.

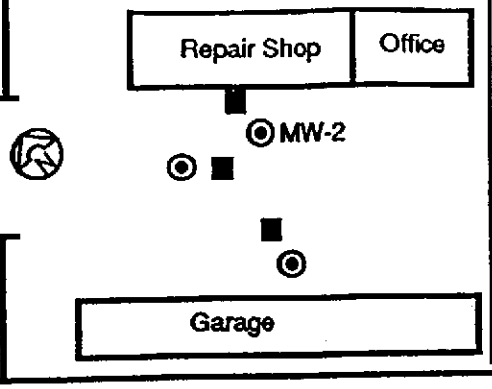
SILTY SAND (SM), light brwn to reddish brwn, interbedded with light to medium brwn fine to coarse sand with subangular fine gravel; Reddish brwn stain; Dense; Slight odor.

LOG OF BORING MW-1 (continued)

WELL CONSTRUCTION



Depth (ft.)	Blows/ft.	EXP	Samples	Graphic	DESCRIPTION
30	34	25			CLAY (CL), Lght brwnish grey to greyish brwn; Fine grained silty w/minor fg sand; Scattered rusty patches and streaks. Hard; Wet.
	32				@ 30 feet, Silty, reddish brwn (5YR;4/3); Very stiff; Slight odor; Wet.
35	15				@ 35 feet, Interbedded silty clay, yellowish brown (5RY;4/3), with small pieces of coarse sand to fg silty sand ; Stiff; Sticky, hard drilling.
40					Bottom of Boring: 36.5 Feet. Time: 10:20 AM Date: 9/25/90
45					
50					
55					
60					



Julie Ann Way

LOG OF BORING MW-2

Former Penske Truck Leasing Facility
725 Julie Ann Way
Oakland, California

Project No.: RC01903
Logged By: Paul V. Hehn
Drilling Co.: West HazMat
Driller: Mark Thorp

Date Drilled: September 26, 1990
Drilling Method: 10" Hollow Stem Auger.
Sampling Method: 2" Split spoon
Inclination: Vertical

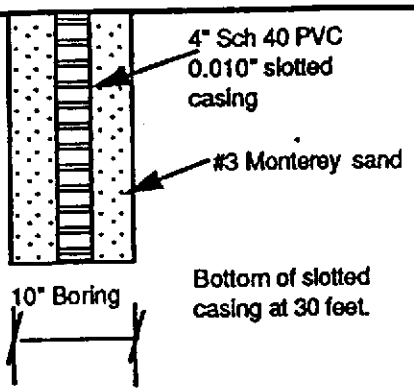
WELL CONSTRUCTION

10" Boring
G-5 Christy Utility Box
Locking water-tight cap
Concrete
Cement Grout
Bentonite
4" Sch 40 PVC Blank casing
3 Monterey Sand
4" Sch 40 PVC 0.010" slotted casing

Depth (ft.)	Blows/ft.	EXP Samples	Graphic	DESCRIPTION
				Surface Elevation: 6.21'
				Casing Elevation: 5.85'
0				Asphalt
				CLAY (CL), clay, red brick and backfill material as part of fill under parking lot. Red brick pieces in cuttings to appro. 4.5 feet.
5	50 6"	260		@ 5 feet: Silty, Dark grey to black to dark olive grey; With pieces of red brick in sample; Hard; Slight odor.
				@5-10 Feet: Clayey, Light olive green to brwn to dark grey; With red brick pieces; moderate odor.
10	16	100		@ 10 feet: Silty,pale olive (5Y;6/3),to olive grey; Stiff; Slight odor.
				@ 10-15 feet: Med to light grey; With<5% fine gravel. Slight to mod odor.
15	29	60		@ 15 feet: Silty, Light olive grey (5Y;6/2); Very stiff; Tight; Dry to moist.
20	63	40		SAND (SW), Pale brwn (10YR;6/3), fine to med grained with 10-40% fine rounded to sudangular gravel; Dense; Wet; Slight odor.
				@ 22 feet: CLAY (CL), Light olive brwn; sandy to silty with fine gravel.
25				

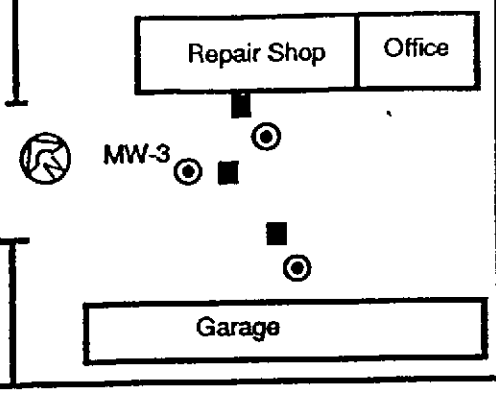
LOG OF BORING MW-2 (continued)

WELL CONSTRUCTION



Depth (ft.)	Blows/ft.	EXP Samples	Graphic	DESCRIPTION
30	34	25		SAND (SW), Yellowish brwn (10YR;5/4); Med to coarse grained ; With 10% clay and 20% subangular to rounded 1/4" gravel; Dense; Wet; Very slight odor. No sample collected. Sticking, heaving mud and flowing sands prevent sample collection or further drilling advance. Trouble pulling out sample tube and inner drill rods. Boring stopped at 30-feet.

Bottom of Boring: 30 Feet.
Time: 11:20 AM
Date: 9/26/90



Julie Ann Way

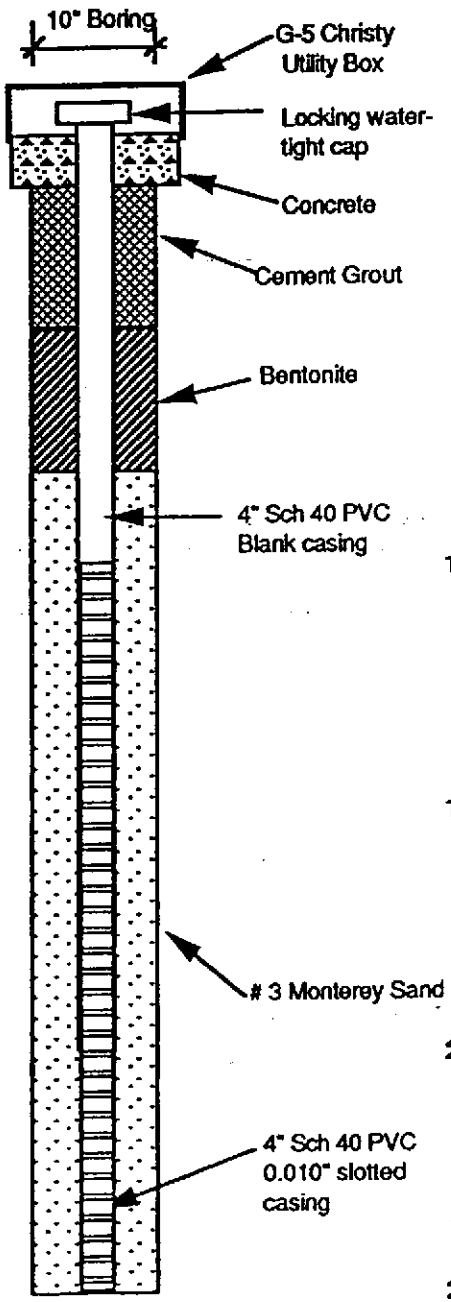
LOG OF BORING MW-3

Former Penske Truck Leasing Facility
725 Julie Ann Way
Oakland, California

Project No.: RC01903
Logged By: Paul V. Hehn
Drilling Co.: West HazMat
Driller: Mark Thorp

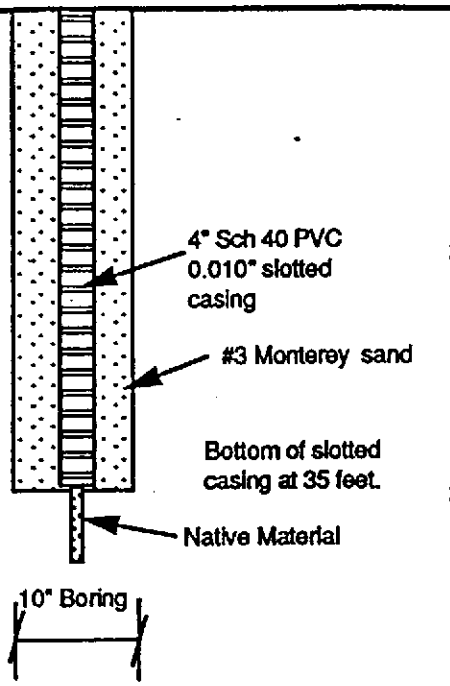
Date Drilled: September 27, 1990
Drilling Method: 10" Hollow Stem Auger.
Sampling Method: 2" Split spoon
Inclination: Vertical

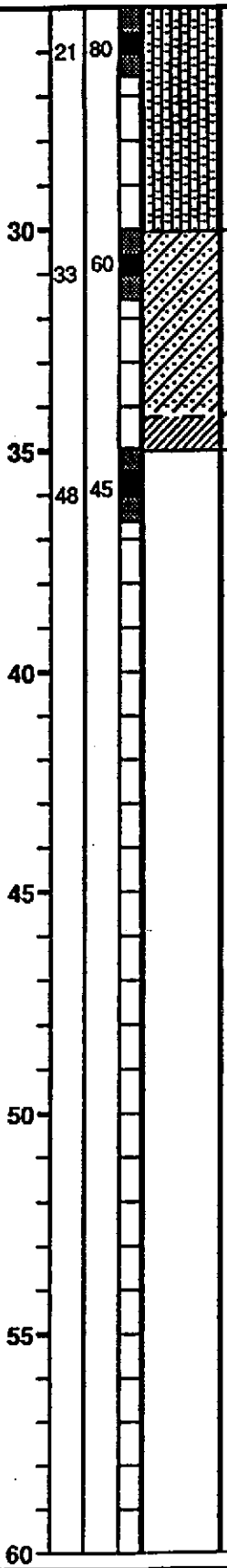
WELL CONSTRUCTION



Depth (ft.)	Blows/ft.	EXP	Samples	Graphic	DESCRIPTION
					Surface Elevation: 6.10' Casing Elevation: 5.69'
0					Asphalt
					CLAY (CL), Light to med brwn silty sand to silty clay to dark grey to black sandy clay w/ pieces of wood in cuttings. Fill. Minor amount of red brick in cuttings.
5	43				@ 5 feet: Light to dark grey to black; Interbedded fine to med grained gravel; Hard; Very slight odor.
					@8 feet: Change from fill to native formation; With <5% fine gravel; Slight odor.
10	29	115			@ 10 feet: Olive grey to blue grey (5Y;5/2); With interbedded gravel; Some pieces of wood; Very stiff; Damp; Slight odor.
15	38	200			@ 15 feet: Sandy, Light olive grey (5Y;6/2); sandy to silty clay; Thin interbedded gravelly sand lense in upper part; Rust to grey colored patches; Hard; Slight odor.
					@15-20 feet: Light to med olive grey;
20	44	120			@ 20 feet: Silty to sandy,Very pale brwn (10YR;7/4); With fine gravel and interbedded sandy layer w/ gravel; Hard; No odor.
25					@ 23 feet: Silty sand,reddish to yellowish brwn; With sandy clay and <5% subrounded gravel.

LOG OF BORING MW-3 (continued)





DESCRIPTION

SAND (SM), Brown (7.5YR;5/2), fine to med grained; Intebedded with silty sand and dark grey fine to coarse gravel lenses; Medium dense; Slight odor.

@ 25-30 feet: Silty sand to sandy silts; Drilling getting tight; trouble pulling rods.

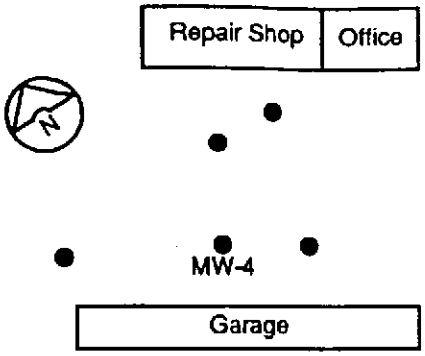
SAND (SC), Light brwn (10YR;6/4); With silty to sandy clays; Very fine grained; Very fluid, flowing sands; Dense; Wet.

CLAY (CL), Yellowish brwn (10YR;6/4); Sandy to silty ; Hard; Wet.

Bottom of Boring: 36.5 Feet.
Time: 12:00 PM
Date: 9/27/90

SECOR

Site Assessment Report
Additional Soil and Groundwater Assessment
3/15/93



Julie Ann Way

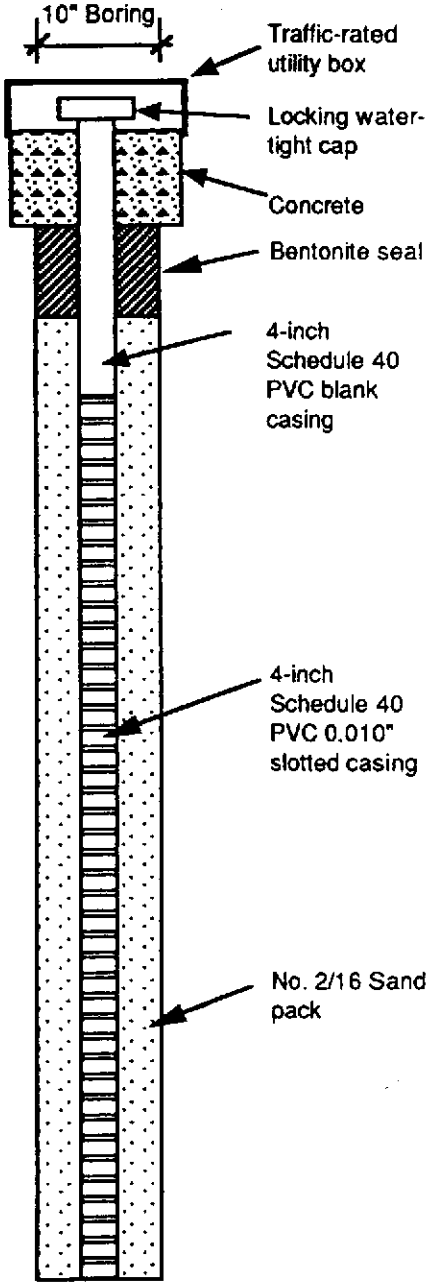
LOG OF BORING MW-4

Former Penske Truck Leasing Facility
725 Julie Ann Way
Oakland, California

Project No.: RC01906
Logged By: M. M. Bessette
Drilling Co.: West Hazmat
Driller: Bill Smith

Date Drilled: February 2, 1993
Drilling Method: 10" Hollow stem auger
Sampling Method: 2" Split spoon
Inclination: Vertical

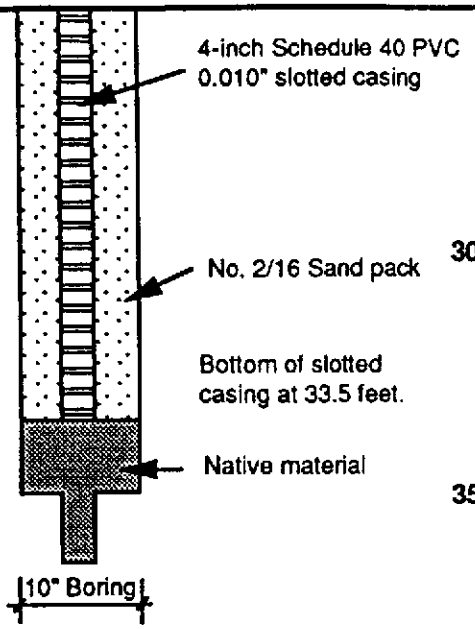
WELL CONSTRUCTION



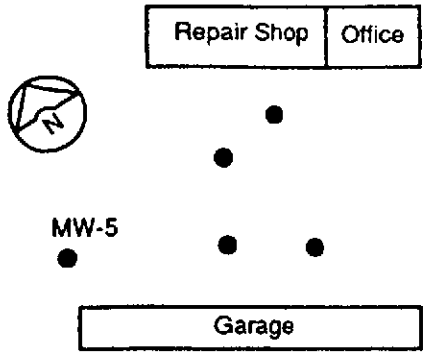
Depth (ft.)	Blows/ft.	Samples	Graphic	DESCRIPTION
				Surface Elevation: 5.55 feet Casing Elevation: 5.18 feet
0				Asphaltic Concrete
				FILL: Gravel, rubble and brick
5	12			ORGANIC CLAY (OH); black (10YR 2/1); trace fine sand; abundant roots: stiff; moist.
10	24			2/4/93 CLAYEY SAND (SC); yellowish brown (10YR 5/4); poorly sorted; 50-60% fine sand, 30-40% clay, 5-15% medium sand; roots: medium dense; moist.
15	27			@ 15 feet: yellowish brown (10YR 5/6); 75-85% fine sand; 10-15% clay; 5-10% medium sand: trace fine gravel. 2/2/93
20	36			SAND (SM); yellowish brown (10YR 5/4): moderately sorted; 70-80% fine sand; 20-30% silt; trace medium sand; iron oxidation; medium dense: moist.
25				

LOG OF BORING MW-4 (continued)

WELL CONSTRUCTION



Depth (ft.)	Blows/ft.	Samples	Graphic	DESCRIPTION
30	20			@ 26 feet: wet.
	13			
35	58			CLAYEY SAND (SC); yellowish brown (10YR 5/6); poorly sorted; 50-60% fine sand; 30-40% clay; 5-15% silt; dense; wet.
				Bottom of Boring: 36.5 Feet. Time: 10:12 AM Date: 2/2/93
40				
45				
50				
55				
60				



Julie Ann Way

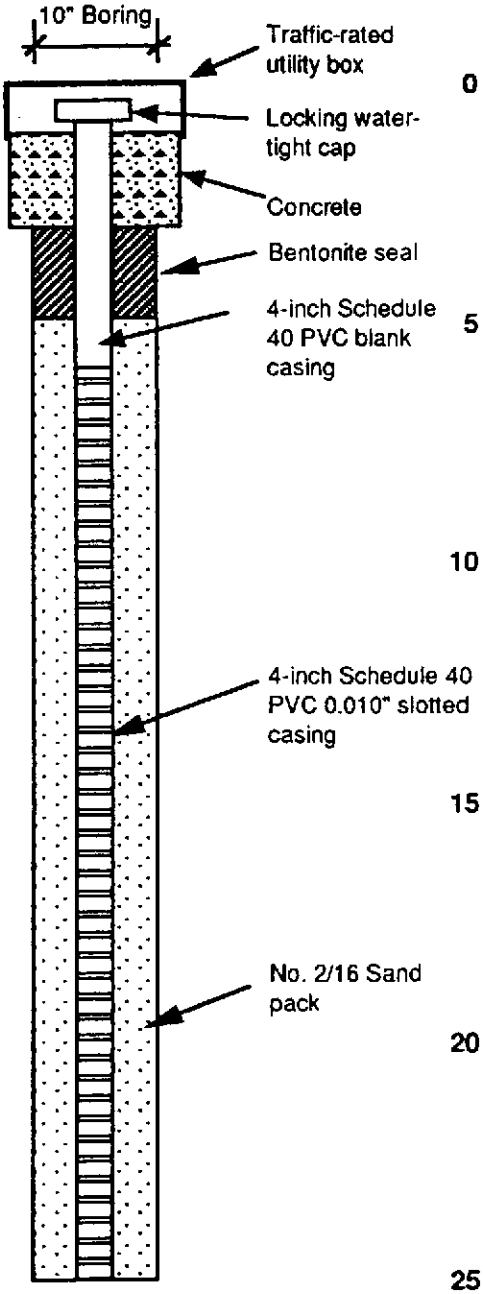
LOG OF BORING MW-5

Former Penske Truck Leasing Facility
725 Julie Ann Way
Oakland, California

Project No.: RC01906
Logged By: M. M. Bessette
Drilling Co.: West Hazmat
Driller: Bill Smith

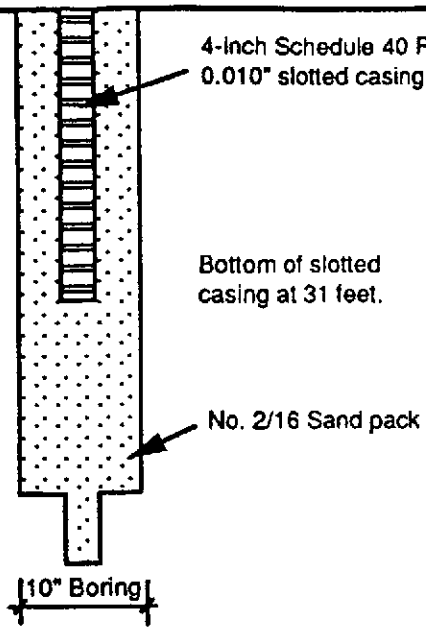
Date Drilled: February 2, 1993
Drilling Method: 10" Hollow stem auger
Sampling Method: 2" Split spoon
Inclination: Vertical

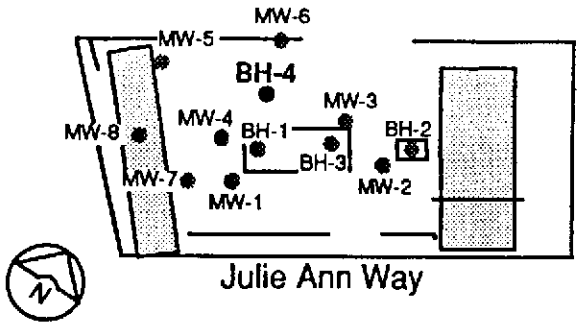
WELL CONSTRUCTION



Depth (ft.)	Blows/ft.	Samples	Graphic	DESCRIPTION
				Surface Elevation: 4.95 feet Casing Elevation: 4.71 feet
0				Asphaltic Concrete
				FILL: Gravel and rubble
5	11			ORGANIC CLAY (OH); black (10YR 2/1): trace fine sand; abundant roots: stiff; moist.
				▼ 2/4/93
10	11			CLAY (CL); dark greenish gray (5GY 4/1): trace medium grained sand; abundant roots: stiff; moist.
				▽ 2/2/93
15	29			SAND (SP); yellowish brown (10YR 5/4); well sorted; 85-95% fine sand; 5-10% silt; medium dense: wet.
20	17			CLAYEY SAND (SC); brownish yellow (10YR 6/6); poorly sorted; 55-65% fine sand; 35-45% clay; finely laminated (>1mm); medium dense; wet.
25				

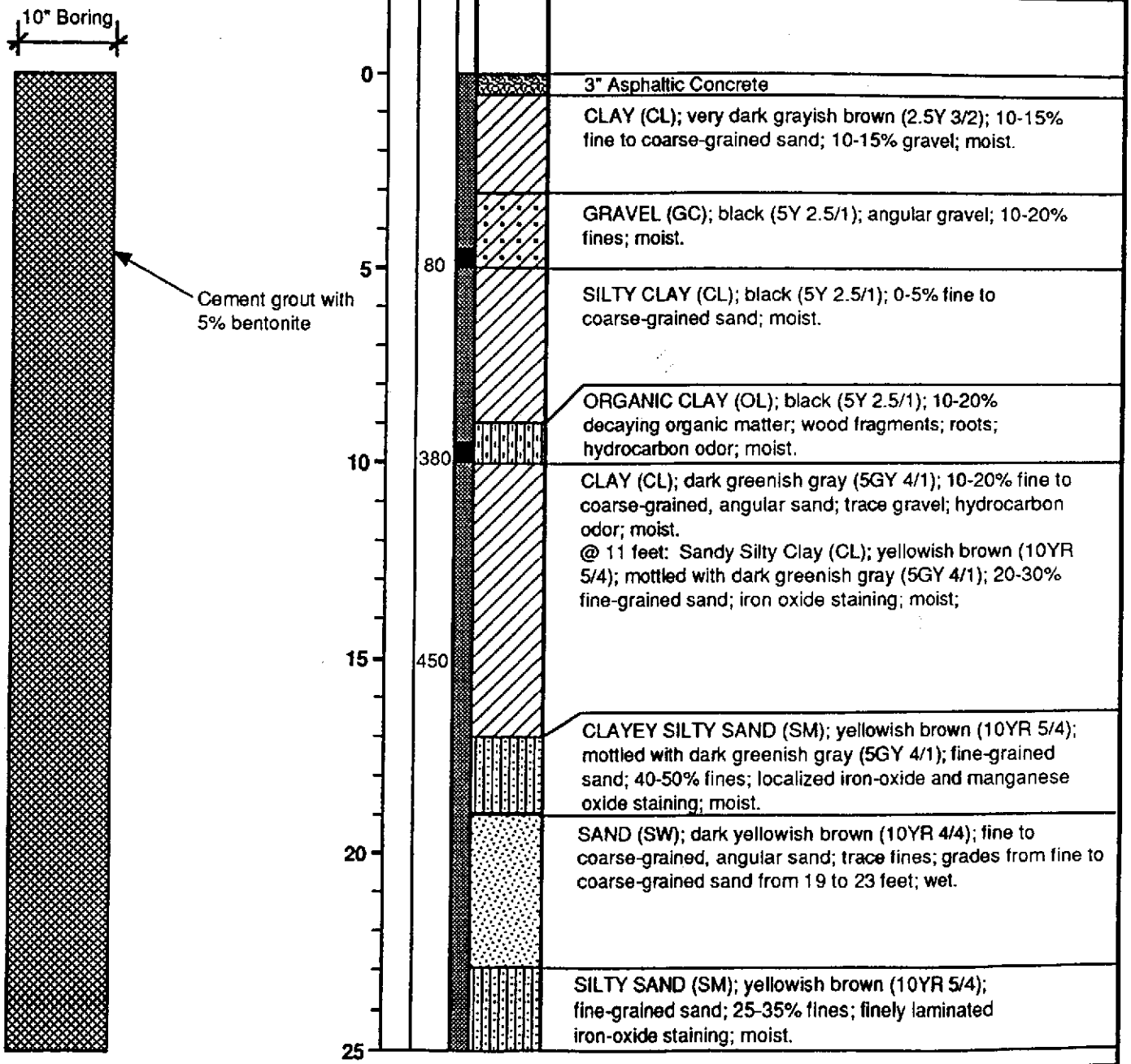
LOG OF BORING MW-5 (continued)

WELL CONSTRUCTION	Depth (ft.)	Blows/ft.	Samples	Graphic	DESCRIPTION
	15				SILTY SAND (SM); yellowish brown (10YR 5/4); poorly sorted; 65-75% fine sand; 25-35% silt; trace clay; loose; moist.
	30	16			SANDY CLAY (CL); yellowish brown (10YR 5/4); poorly sorted; 65-75% clay; 25-35% fine sand; finely laminated; stiff; moist.
	35	39			@ 35 feet: 80-90% clay; 10-20% fine sand; trace silt; very stiff.
					Bottom of Boring: 36.5 Feet. Time: 2:36 PM Date: 2/2/93
	40				
	45				
	50				
	55				
	60				

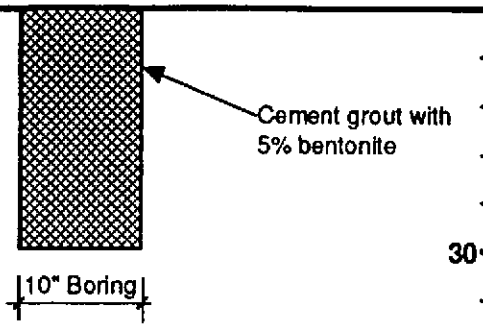


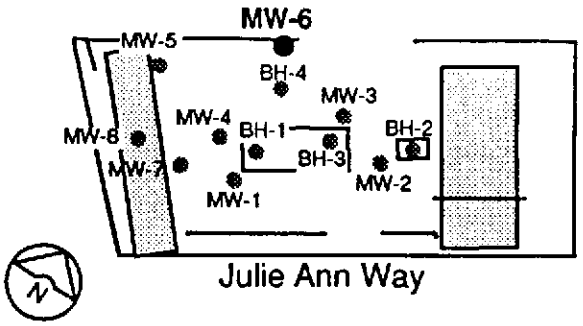
LOG OF BORING BH-4
Former Penske Truck Leasing Facility
725 Julie Ann Way
Oakland, California

Project No.: RC0019.007 Date Drilled: July 27, 1994
Logged By: C. Sean Bisch Drilling Method: 10" Hollow stem auger
Drilling Co.: West Hazmat Sampling Method: Continous Core
Driller: Scott Irwin Driller's License: 554979



LOG OF BORING BH-4 (continued)

WELL CONSTRUCTION	Depth (ft.)	Blows/ft.	Samples	Graphic	DESCRIPTION
	30				SAND (SW); yellow brown (10YR 5/4); 95-100% fine to coarse-grained sand; 0-5% fines; grades from fine to coarse-grained sand from 25 to 30 feet; wet. @ 29 feet: iron-oxide staining.
					Total Depth Explored: 30 feet. Date: July 27, 1994 Time: 1145
	35				
	40				
	45				
	50				
	55				
	60				



LOG OF BORING MW-6
Former Penske Truck Leasing Facility
725 Julie Ann Way
Oakland, California

Project No.: RC0019.007 Date Drilled: July 27, 1994
Logged By: C. Sean Bisch Drilling Method: 10" Hollow stem auger
Drilling Co.: West Hazmat Sampling Method: Continuous core
Driller: Scott Irwin Driller's License: 554979

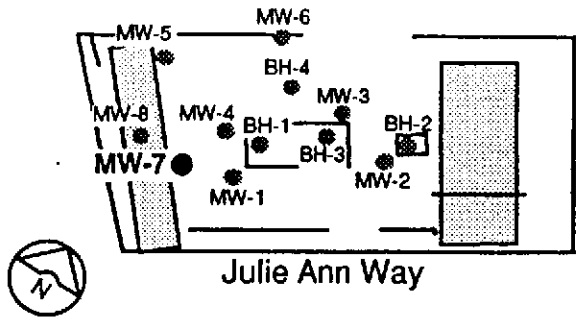
WELL CONSTRUCTION

10" Boring
Traffic-rated utility box
Locking water-tight cap
Concrete
Cement grout with 5% bentonite
4-inch Schedule 40 PVC blank casing
Bentonite seal
4-inch Schedule 40 PVC 0.010" slotted casing
7/27/94 8:01 a.m.
No. 2/12 Sand
Bottom of slotted casing at 25 feet.

Depth	Blows/ft.	PPM	Samples	Graphic	DESCRIPTION
0					3" Asphaltic Concrete
		100			CLAY (CL); very dark grayish brown (2.5Y 3/2); mottled with grayish green (5G 5/2); 10-15% fine to coarse-grained sand; 10-15% angular gravel; wood fragments; possible fill material; moist.
					GRAVEL (GW); light olive brown (2.5Y 5/4); 80-90% angular gravel; 10-20% fine to coarse-grained sand; dry.
5					ORGANIC CLAY (OL); black (2.5Y 2/0); 10-20% decaying organic matter; wood fragments; moist.
		260			SANDY CLAY (CL); very dark grayish brown (2.5Y 3/2); 25-35% fine to coarse-grained sand; root traces; moist.
10		110			SANDY SILT (ML); yellowish brown (10YR 5/4); 25-35% fine-grained sand; moist.
		100			CLAY (CL); dark greenish gray (5GY 4/1); 10-20% fine to coarse-grained sand; roots; moist.
					@ 14.5 feet: very dark gray (5Y 3/1); 5-15% fine to coarse-grained sand; wet.
15					SAND (SP); yellowish brown (10YR 5/4); medium to coarse-grained, angular sand; 0-5% fines; wet.
					SILTY SAND (SM); yellow brown (10YR 5/4); fine-grained sand; 10-20% fines; moist.
					SAND (SP); coarse-grained; wet.
					CLAYEY SAND (SC); yellowish brown (10YR 5/4); fine to medium-grained sand; 5-15% fines; wet.
20					SAND (SW); dark yellowish brown (10YR 4/4); fine to coarse-grained, angular sand; 5-15% fines; wet.
					SILT (ML); olive (5Y 5/4); trace fine-grained sand; moist.
					SAND (SW); dark yellowish brown (10YR 4/4); fine to coarse-grained angular sand; trace fines; wet.
25					

LOG OF BORING MW-6 (continued)

WELL CONSTRUCTION	Depth (ft.)	Blows/ft.	Samples	Graphic	DESCRIPTION
Native material					SAND (SW); continued.
					CLAYEY SILT (ML); olive (5Y 5/3); 95-100% fines; 0-5% fine-grained sand; moist.
10" Boring	30				Total Depth Explored: 29.25 feet Date: July 27, 1994
	35				
	40				
	45				
	50				
	55				
	60				



LOG OF BORING MW-7
Former Penske Truck Leasing Facility
725 Julie Ann Way
Oakland, California

Project No.: RC0019.007 | Date Drilled: July 27, 1994
Logged By: C. Sean Bisch | Drilling Method: 10" Hollow stem auger
Drilling Co.: West Hazmat | Sampling Method: Continuous core
Driller: Scott Irwin | Driller's License: 554979

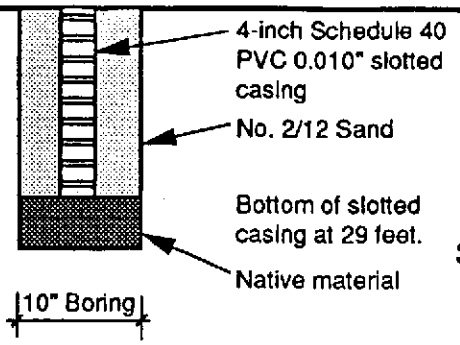
WELL CONSTRUCTION

10" Boring
Traffic-rated utility box
Locking water-tight cap
Concrete
Cement grout with 5% bentonite
4-inch Schedule 40 PVC blank casing
Bentonite seal
7/27/94 1:18 p.m.
4-inch Schedule 40 PVC 0.010" slotted casing
No. 2/12 Sand

Blows/ft	PPM	Samples	Graphic	DESCRIPTION
0				6" Asphaltic Concrete
				CLAYEY GRAVEL (GC); olive (5Y 4/4); fine to coarse, subangular gravel; 25-35% fines; 10-20% fine to medium-grained sand; brick fragment; moist.
5	1,650			SILTY CLAY (CL); black (10YR 2/1); 80-90% fines; 10-20% fine to coarse-grained sand; trace coarse-grained, subangular gravel; trace roots; moist.
				@ 9 feet: abundant wood fragments; hydrocarbon odor; wet.
10	1,320			@ 10 feet: gray (5Y 5/1); 5-15% fine to coarse-grained sand; petroleum hydrocarbons; wood fragments; moist.
				@ 13 feet: yellowish brown (10YR 5/4); mottled; trace coarse-grained sand.
15	2,750			SAND (SW); very dark gray (5Y 3/1); fine to coarse-grained, angular sand; 5-15% fines; petroleum hydrocarbons; wet.
				SILTY SAND (SM); yellowish brown (10YR 5/4); fine-grained sand; 10-20% fines; wet.
20	13,750			SAND (SW); dark yellowish brown (10YR 4/4); fine to coarse-grained, angular sand; 0-5% fines; wet.
				@ 23 feet: iron-oxide lamination.
25				

LOG OF BORING MW-7 (continued)

WELL CONSTRUCTION



PID (PPM) | Samples | Graphic

DESCRIPTION

SAND (SW); continued.

30

Total Depth Explored: 30 feet
Date: July 27, 1994 Time: 1420

35

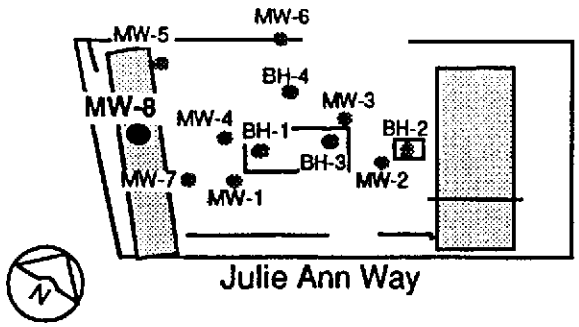
40

45

50

55

60



LOG OF BORING MW-8
Former Penske Truck Leasing Facility
725 Julie Ann Way
Oakland, California

Project No.: RC0019.007
Logged By: C. Sean Bisch
Drilling Co.: West Hazmat
Driller: George

Date Drilled: July 26, 1994
Drilling Method: 10" Hollow stem auger
Sampling Method: Continuous core
Driller's License: 554979

WELL CONSTRUCTION

10" Boring

Traffic-rated utility box

Locking water-tight cap

Concrete

Cement grout with 5% bentonite

4-inch Schedule 40 PVC blank casing

Bentonite seal

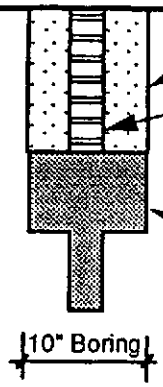
No. 2/12 Sand

7/26/94 9:49 a.m.

4-inch Schedule 40 PVC 0.010" slotted casing

Depth	Blows/ft.	PPM	Samples	Graphic	DESCRIPTION
0					3" Asphaltic Concrete
					CLAY (CL); black (7.5YR 2/0); 0-5% fine-grained sand; hydrocarbon odor; moist.
5	41	45			CLAYEY GRAVEL (GC); black (7.5YR 2/0); fine gravel; 30-40% fines; 10-15% fine-grained sand; dense; moist.
	20	0			SILTY SAND (SM); brown (7.5YR 5/4); fine to coarse-grained, angular sand; 20-30% fines; 5-15% fine, subangular gravel; medium dense; moist.
10	23				CLAY (CL); dark gray (5Y 4/1); 10-20% fine-grained sand; trace medium to coarse-grained sand; very stiff; moist.
	18				SANDY SILT (ML); dark brown (10YR 4/3); 25-35% fine-grained, angular sand; hard; wet.
15	36				CLAYEY SAND (SC); dark gray (10YR 4/1); fine to coarse-grained, angular sand; 25-35% fines; medium dense; wet.
					CLAY (CL); dark gray (5Y 4/1); 10-20% fine-grained sand; very stiff; moist.
	21				SAND (SP); dark yellowish brown (10YR 4/4); fine-grained sand; 5-15% fines; iron oxide staining; medium dense; wet.
20		125			CLAY (CL); dark gray (5Y 4/1); 10-20% fine-grained sand; very stiff; moist.
	6				SAND (SP); dark yellowish brown (10YR 4/4); fine-grained sand; 5-15% fines; loose; wet.
	23				@ 24 feet: medium dense.
25					

LOG OF BORING MW-8 (continued)

WELL CONSTRUCTION	Depth (ft.)	Blows/ft.	Samples	Graphic	DESCRIPTION
 No. 2/12 Sand pack 4-inch Schedule 40 PVC 0.010" slotted casing Bottom of casing at 28 feet. Native material 10" Boring	30	49			SAND (SP); continued. CLAY (CL); grayish brown (10YR 5/2); hard; moist. Total Depth Explored: 31.5 feet Date: July 26, 1994 Time: 11:12 a.m.
	35				
	40				
	45				
	50				
	55				
	60				

9/29/94
Boring Logs

Table 2 - Soil Analytical Results
Former Penske Truck Leasing Facility, 725 Julie Ann Way, Oakland, CA.

Boring	Date	Depth (feet)	TPH Gasoline (A) (mg/kg)	TPH Diesel (A) (mg/kg)	Benzene (B) (mg/kg)	Toluene (B) (mg/kg)	Ethyl-benzene (B) (mg/kg)	Xylenes (B) (mg/kg)	Total Oil & Grease (mg/kg)	VOCs (C)
MW-1	25-Sep-90	5	2	ND(<10)	0.04	0.015	0.01	0.051	NA	NA
		10	820	760	1	0.56	0.46	4.1	NA	NA
		15	2	980	0.53	2.2	0.93	4.5	NA	NA
MW-2	26-Sep-90	5	1	170	0.14	0.02	0.006	0.031	1400	(D)
		10	ND(<1)	32	ND(<.003)	ND(<.003)	ND(<.003)	ND(<.003)	ND (<50)	ND (E)
		15	4	85	ND(<.003)	ND(<.003)	ND(<.003)	ND(<.003)	68	ND (E)
MW-3	27-Sep-90	5	ND(<1)	ND(<10)	0.005	ND (<.003)	ND(<.003)	ND(<.003)	NA	NA
		10	26	190	ND(<.003)	0.018	0.007	0.096	NA	NA
		15	44	150	0.025	0.18	0.087	0.33	NA	NA
		20	ND (<1)	ND(<10)	ND(<.003)	0.017	ND (<.003)	0.005	NA	NA
BH-1	25-Sep-90	10	ND(<1)	ND(<10)	0.01	ND(<.003)	ND(<.003)	0.006	NA	NA
		15	380	460	3.2	15	4.4	28	NA	NA
		20	150	ND(<10)	2.1	8.1	2.1	12	NA	NA
BH-2	27-Sep-90	10	ND(<1)	ND(<10)	ND (<.003)	ND (<.003)	ND (<.003)	ND (<.003)	ND (<50)	ND (E)
		15	ND(<1)	36	ND(<.003)	ND(<.003)	ND(<.003)	ND(<.003)	ND (<50)	ND (E)
BH-3	28-Sep-90	5	ND(<1)	56	0.004	0.13	0.004	0.019	NA	NA
		10	22	54	ND(<.003)	0.015	0.006	0.057	NA	NA
		15	35	200	0.049	0.44	0.33	1.9	NA	NA

Notes:
(A) Total Petroleum Hydrocarbons Analyzed by USEPA Method 8015, modified.
(B) Analyzed by USEPA Method 8020.
(C) Analyzed by USEPA Method 8240.
(D) Detected: acetone (0.072 mg/kg); benzene (0.045 mg/kg); toluene (0.03 mg/kg); xylenes (0.015 mg/kg).
(E) For detection limits of individual compounds see certified laboratory reports.

( ) = Detection limit
ND= Not detected
NA = Not analyzed

Analysis by Superior Analytical Laboratories, Inc. Martinez, California.

Project No. RC01903

Table 2: Soil Sample Analytical Results
Former Penske Truck Leasing Co. Facility
725 Julie Ann Way, Oakland, California.

Boring	Date	Depth (feet)	TPH Gasoline (a) (mg/kg)	TPH Diesel (a) (mg/kg)	Benzene (b) (mg/kg)	Toluene (b) (mg/kg)	Ethyl-benzene (b) (mg/kg)	Xylenes (b) (mg/kg)
MW-4	2-Feb-93	5	440	4100	1.6	ND (<0.15)	8.3	1.4
		10	26	320	0.38	0.009	0.7	0.56
		15	6	170	0.022	0.045	0.045	0.15
MW-5	2-Feb-93	5	ND (<1)	21	ND(<.003)	ND(<.003)	ND(<.003)	ND(<.003)
		10	ND (<1)	ND (<1)	ND(<.003)	ND(<.003)	ND(<.003)	ND(<.003)
		15	ND(<1)	130	ND(<.003)	ND(<.003)	ND(<.003)	ND(<.003)
Composite Soil Sample:								
SP-1 A-D			ND(<1)	37	ND(<.003)	ND(<.003)	ND(<.003)	0.014

Total Organic Lead:	ND (<2 mg/kg)	(by DHS Method - Luft Manual)
pH:	8.9	(by USEPA Method 9041)
Flashpoint:	>100 degrees C	(by USEPA Method SW-846 Method 1010)
Reactive Cyanide:	ND (<1 mg/kg)	(by USEPA Method 9010)
Reactive Sulfide:	ND (<10 mg/kg)	(by USEPA Method SW 7.3.4.2)

(a) Analyzed by USEPA Method 8015, modified.
(b) Analyzed by USEPA Method 8020.

mg/kg Milligrams per kilogram
( ) Detection limit
ND Not detected

Analysis by Superior Precision Analytical, Inc., San Francisco, California.

Project No. RC01906

Table 2: Soil Sample Analytical Results
Former Penske Truck Leasing Co. Facility
725 Julie Ann Way, Oakland, California.

Boring	Date	Depth (feet)	TPH Gasoline (a) (mg/kg)	TPH Diesel (a) (mg/kg)	Benzene (b) (mg/kg)	Toluene (b) (mg/kg)	Ethyl-benzene (b) (mg/kg)	Xylenes (b) (mg/kg)
BH-4	27-Jul-94	5	5	ND(<10)	0.008	0.100	ND<(0.005)	0.160
		10	5	1,300	ND<(0.005)	0.018	0.013	0.079
		15	11	1,200	0.009	0.098	0.037	0.310
MW-6	27-Jul-94	7	7	ND(<10)	ND<(0.005)	0.030	0.006	0.067
		11	2	ND(<10)	ND<(0.005)	0.013	ND<(0.005)	0.036
		13	ND(<1)	ND(<10)	ND<(0.005)	0.017	ND<(0.005)	0.032
MW-7	27-Jul-94	5	ND (<1)	90	ND<(0.005)	0.016	0.006	0.030
		10	ND (<1)	3,300	0.011	0.017	0.005	0.031
		15	31	5,500	ND(<0.025)	0.160	0.200	0.650
MW-8	26-Jul-94	5.5	18	50	0.039	0.230	0.300	0.850
		10.5	5	41	ND<(0.005)	0.011	ND<(0.005)	0.200
		15.5	1	ND(<10)	ND<(0.005)	0.013	0.005	0.037
Composite Soil Sample:								
SP-1 A-D			6	280	0.057	0.10	0.070	0.210

Total Organic Lead:	ND (<2 mg/kg)	(analyzed by DHS Method - Luft Manual)
pH:	8.9	(analyzed by USEPA Method 9041)
Flashpoint:	>100 degrees C	(analyzed by USEPA Method SW-846 Method 1010)
Reactive Cyanide:	ND (<1 mg/kg)	(analyzed by USEPA Method 9010)
Reactive Sulfide:	ND (<10 mg/kg)	(analyzed by USEPA Method SW 7.3.4.2)

(a) Analyzed by USEPA Method 8015, modified.
(b) Analyzed by USEPA Method 8020.
mg/kg Milligrams per kilogram
( ) Detection limit
ND Not detected

Analysis by Superior Precision Analytical, Inc., San Francisco and Martinez, California.

CONCEPTUAL SITE MODEL

Constituents of Concern - Petroleum Hydrocarbon Release Areas

Selection of petroleum hydrocarbons as constituents of concern (COC) in soil and groundwater is based on a comparison of site concentrations to Environmental Screening Levels (ESLs) for subsurface soils greater than and/or less than 3 meters (as appropriate), permitted for industrial land-use, where groundwater is not a current or potential source of drinking water (Interim Final – July 2003, San Francisco Bay Area Regional Water Quality Control Board). COCs retained for evaluation in soil are TPHg, TPHd, benzene, toluene and xylenes (total); and TPHg for groundwater.

Petroleum hydrocarbons appear to have been released at the Facility in the central portion of the Site around the former UST and waste oil tank. Figure 9 illustrates petroleum hydrocarbon concentrations in the upper fifteen to twenty feet of soil, obtained from historical data collected by other consultants. Figure 9 also illustrates the approximate boundaries of previous excavation activities. Figures 2 and 4 in Appendix D (site map with cross-section locations, and cross-sections A to A' and B to B', respectively) illustrate the release scenario of the site conceptual model indicating the relative location of USTs and the waste oil tank, the TPHg/TPHd/benzene concentrations in soil from July 1994, and the location of the drainage ditch. Figure 4 in Appendix D is a schematic of the conceptual site model showing the point of release, the direction of groundwater flow and the location of potentially sensitive areas (the drainage ditch).

Source Remediation

Shallow unsaturated soils containing significant concentrations of petroleum hydrocarbons were excavated from the Site at the time of the tank pull. Additional mass was found to remain in the MW-1 and MW-7 area where separate phase TPHd was observed. In October 2000 SECOR treated the vadose zone, saturated soils and groundwater in the source area and the vicinity of MW-1 and MW-7 with Fenton's Reagent which significantly reduced contamination, and removed all separate phase TPHd, from MW-1 and MW-7. Separate phase TPHd has not been observed in these wells since the Fenton's Reagent treatment.

Migration in Soils

Petroleum hydrocarbon concentrations in soils are shown on Figures 9 and Appendix E. These data suggest that petroleum hydrocarbons exceeding the soil ESLs were concentrated in the central portion of the Site (namely in the vicinity of BH-1, BH-4, MW-1, MW-4 and MW-7), at depths of approximately 5 and 15 feet below ground surface. PID readings from the borings (see Appendix E) are consistent with the laboratory analytical data. The soil samples were taken five to seven years prior to Fenton's Reagent treatment and greater than ten years prior to now. Fenton's Reagent treatment

conducted in October 2000 significantly reduced soil and groundwater concentrations, and eliminated residual separate phase observed in MW-1 and MW-7. Groundwater monitoring results since 2000 have shown the TPHd was drastically reduced in all wells, and separate phase TPHd is no longer observed in MW-1 and MW-7. The available analytical data conducted before the Fenton's Reagent treatment suggests that petroleum hydrocarbons have not migrated vertically into deeper soils or laterally off-site. All petroleum hydrocarbons appear to have remained on-site based on soil groundwater data.

Migration in Groundwater

Petroleum hydrocarbons reported as TPHd in groundwater at the Site are presented on Figures 3 and 6. These data suggest the following:

- TPHd concentrations exceeding the diesel ESL is concentrated in the central portion of the Site (namely, MW-1, MW-4 and MW-7) and bounded by a clean down gradient well, MW-8.

As shown on Table 2, TPHd concentrations continue to generally decrease in groundwater samples collected from monitoring wells MW-1, MW-4 and MW-7. These data suggest that Fenton's Reagent treatment conducted in October 2000 has been successful in eliminating free-product from monitoring wells MW-1, MW-4 and MW-7 and creating a more conducive environment for biodegradation. The greatest effect of the Fenton's Reagent treatment was observed within a year of treatment, continuing TPHd concentration reductions are attributable to less residual source in soils from the elimination of separate phase and anaerobic biodegradation.

Potential Receptors

The ACHCSA has approved or is in the process of approving risk-based closure for an adjacent TPH and BTEX impacted site located at 580 Julie Ann Way (in close proximity to the Site), which has TPHg and BTEX concentrations at approximately the same or higher levels as the Site. According to the Tier I and Tier II Risk-Based Corrective Action Evaluation Report and addendum prepared for the 580 Julie Ann Way site (see attached), benzene is the chemical at that site driving the estimated hazard index (HI) and cancer risk for both the hypothetical on-site indoor commercial worker and the on-site commercial worker receptor. Therefore, a Risk Management Plan was prepared to address potential exposure risk to potential on-site construction workers.

There are no other potential receptors at the Site or off-site, because groundwater in this area is not used for beneficial use, the drainage ditch is not impacted by petroleum hydrocarbons from the Site, and the COCs in soils above ESLs have decreased significantly as a result of Fenton's Reagent treatment and the COCs in groundwater are

all below the ESLs with the exception of TPHd, which is not volatile or mobile in groundwater.

CONCLUSIONS

Based on the results of site characterizations, source remediation and long term monitoring, the Site Conceptual Model indicates that the COCs are:

- contained on-site by low permeability soils, a flat groundwater gradient; and
- natural attenuation.

There are no potential receptors except industrial workers working in upgradient and down gradient buildings which do not overlie the impacted areas, and the potential the down gradient drainage ditch, that is down gradient of MW-8, which only had 97 µg/L of TPHd or greater than 6 times lower than the TPHd ESL. The groundwater aquifer is designated a non-beneficial use aquifer. Although soil benzene and xylene concentrations exceeded ESLs a decade ago, Fenton's Reagent treatment and natural attenuation has degraded both of these COCs as is observed by their absence in groundwater. TPHd currently exceeds ESLs for soil and groundwater in three monitoring wells, but it is not volatile or mobile, and poses no danger to any potential receptors off-Site or on-Site, including industrial workers working in excavations.

EXECUTIVE SUMMARY

On behalf of Penske Truck Leasing Company, L.P. (Penske), SECOR International Incorporated (SECOR) is submitting this Case Closure Summary as part of the Alameda County Health Care Services Agency (ACHCSA) Underground Fuel Storage Tank Local Oversight Program requirement. The Case Closure Summary presents the case information, release and site characterization information, site history and description of corrective actions.

In addition, the figures, tables and appendices shown below further present the site characterization data:

Figures

- Figure 1 – Site Location Map,
- Figure 2 – Shallow Groundwater Contours 2nd Semiannual Event, 2002,
- Figure 3 – Petroleum Hydrocarbon Concentrations 2nd Semiannual Event, 2002,
- Figure 4 – Fenton's Reagent Treatment Area,
- Figure 5 – Benzene Concentrations in Groundwater, December 2002,
- Figure 6 – Total Petroleum Hydrocarbon as diesel (TPHd) Concentrations in Groundwater, December 2002,
- Figure 7 – Historical Benzene Concentrations in Soil,
- Figure 8 – Historical TPHd Concentrations in Soil,
- Figure 9 – Soil Location and Concentration Map;

Tables

- Table 1 – Tables and report from *Tank Removal Report, Scott Co.*, November 6, 1989,
- Table 2 – Chronological Listing of Groundwater Analytical Results,
- Table 3 – Chronological Listing of Groundwater Elevation Data;

Appendices

- Appendix A – *Revised RBCA Evaluation, San Francisco French Bread Facility, 580 Julie Ann Way*, February 17, 2000,
- Appendix B – *Tier I and Tier II Risk-Based Corrective Action Evaluation, Metz Baking Company*, December 7, 1999,
- Appendix C – *EDR GeoCheck Report*, February 11, 2003,
- Appendix D – Figures and Associated Cross Sections from *Numerous Site Assessments, Geraghty & Miller, Inc.*, September 1990, February 1990 and July 1994,
- Appendix E – Boring Logs and Tables showing Soil Analytical Results from *Numerous Site Assessments, Geraghty & Miller, Inc.*, September 1990, February 1990 and July 1994, and

- Appendix F – Site Conceptual Model.

CONCEPTUAL SITE MODEL

Constituents of Concern - Petroleum Hydrocarbon Release Areas

Selection of petroleum hydrocarbons as constituents of concern (COC) in soil and groundwater is based on a comparison of site concentrations to Environmental Screening Levels (ESLs) for subsurface soils greater than and/or less than 3 meters (as appropriate), permitted for industrial land-use, where groundwater is not a current or potential source of drinking water (Interim Final – July 2003, San Francisco Bay Area Regional Water Quality Control Board). COCs retained for evaluation in soil are TPHg, TPHd, benzene, toluene and xylenes (total); and TPHg for groundwater.

Petroleum hydrocarbons appear to have been released at the Facility in the central portion of the Site around the former UST and waste oil tank. Figure 9 illustrates petroleum hydrocarbon concentrations in the upper fifteen to twenty feet of soil, obtained from historical data collected by other consultants. Figure 9 also illustrates the approximate boundaries of previous excavation activities. Figures 2, 3 and 4 in Appendix D (site map with cross-section locations, and cross-sections A to A' and B to B', respectively) illustrate the release scenario of the site conceptual model indicating the relative location of USTs and the waste oil tank, the TPHg/TPHd/benzene concentrations in soil from July 1994, and the location of the drainage ditch. The majority of shallow unsaturated soils containing significant concentrations of petroleum hydrocarbons were excavated from the Site at the time of the tank pull. In October 2000 SECOR treated the vadose zone, saturated soils and groundwater in the source area and the vicinity of MW-1 and MW-7 with Fenton's Reagent which significantly reduced contamination, and removed all separate phase TPHd, which had been observed in MW-1 and MW-7.

Migration in Soils

Petroleum hydrocarbon concentrations in soils are shown on Figures 9 and Appendix E. These data suggest that petroleum hydrocarbons exceeding the respective ESLs were concentrated in the central portion of the Site (namely in the vicinity of BH-1, BH-4, MW-1, MW-4 and MW-7), at depths of approximately 5 and 15 feet below ground surface. PID readings from the borings (see Appendix E) are consistent with the laboratory analytical data. Fenton's Reagent treatment conducted in October 2000 was designed to significantly reduce soil and groundwater concentrations, and eliminate residual separate phase observed in MW-1 and MW-7. Groundwater monitoring results since 2000 have shown the TPHd was drastically reduced in all wells, and separate phase TPHd is no longer observed in MW-1 and MW-7. The available analytical data conducted before the Fenton's Reagent treatment suggests that petroleum hydrocarbons have not migrated vertically into deeper soils or laterally off-site. All

petroleum hydrocarbons appear to have remained on-site based on soil groundwater data.

Migration in Groundwater

Petroleum hydrocarbons reported as TPHd in groundwater at the Site are presented on Figures 3 and 6. These data suggest the following:

- TPHd concentrations exceeding the diesel ESL is concentrated in the central portion of the Site (namely, MW-1, MW-4 and MW-7) and bounded by a clean down gradient well, MW-8.

- As shown on Table 2, TPHd concentrations continue to generally decrease in groundwater samples collected from monitoring wells MW-1, MW-4 and MW-7. These data suggest that Fenton's Reagent treatment conducted in October 2000 has been successful in eliminating free-product from monitoring wells MW-1, MW-4 and MW-7 and creating a more conducive environment for biodegradation. The greatest effect of the Fenton's Reagent treatment was observed within a year of treatment, continuing TPHd concentration reductions are attributable to less residual source in soils from the elimination of separate phase and anaerobic biodegradation.

CURRENT SOIL AND GROUNDWATER CONDITIONS

The anticipated current soil concentrations are below any of the concentrations observed in the past. For evaluation purposes, post excavation soil concentrations were used here to assess soil concentrations prior to Fenton's Reagent treatment (based on soil data taken during well/boring installation from 1990 to 1994). Current groundwater (based on data collected during the Second Semiannual Groundwater Monitoring Report for 2002) concentrations for the constituents of concern are shown below from the most recent sampling events. For comparison purposes, the ESLs are shown (in parentheses) as well. These screening levels are extremely conservative since they are risk-based levels.

- Soil
  - TPHg – 820 ppm (400 ppm)
  - TPHd – 5,500 ppm (500 ppm)
  - Benzene – 3.2 ppm (0.5 ppm)
  - Toluene – 15 ppm (9.3 ppm)
  - Ethylbenzene – 8.3 ppm (13 ppm)
  - Xylenes (Totals) – 28 ppm (1.5 ppm)

The soil ESLs for each of the constituents summarized were exceeded, with the exception of ethylbenzene. However, note that the soil concentrations above were collected during well installation from 1990 to 1994 and since then, Fenton's Reagent treatment was conducted in October 2000 and groundwater concentrations demonstrate that the affected soil has ceased impacting groundwater above ESLs for all of the constituents except TPHd at MW-1 and MW-7. Further, TPH and BTEX concentrations in groundwater show a significant decreasing trend since the Fenton's Reagent treatment. The change in soil impacts is supported strongly by groundwater data, which is a reflection of the soil hydrocarbon concentrations.

- Groundwater
  - TPHg – 340 ppb (500 ppb)
  - TPHd – 17,000 ppb (640 ppb)
  - Benzene – 2.2 ppb (46 ppb)
  - MTBE – 6 ppb (1800 ppb)

None of the groundwater ESLs were exceeded for each of the constituents, with the exception of TPHd.

The ACHCSA has approved risk-based closure for an adjacent TPH and BTEX impacted site located at 580 Julie Ann Way (in close proximity to the Site), which has TPHg and BTEX concentrations at approximately the same or higher levels as the Site. According to the Tier I and Tier II Risk-Based Corrective Action Evaluation Report and addendum prepared for the 580 Julie Ann Way site (see attached), benzene is the chemical at that site driving the estimated hazard index (HI) and cancer risk for both the hypothetical on-site indoor commercial worker and the on-site commercial worker receptor. Therefore, a Risk Management Plan was prepared to address potential exposure risk to potential on-site construction workers. The pre-Fenton's Reagent treatment soil concentrations (1990 and 1994) shown above for TPH and BTEX were slightly higher at the Penske Site than the 580 Julie Ann Way site, but the Site BTEX concentrations were well below the Region 9 Preliminary Remediation Goals (PRGs; these guidelines are used to determine which constituents are to be retained for the Tier II risk evaluation), with the exception of benzene. Benzene concentrations at the Site may have exceeded the PRGs, but were well below the benzene specific ESL.

CONCLUSIONS

Based on the results of site characterizations, source remediation and long term monitoring, the Site Conceptual Model indicates that the COCs are:

- contained on-site by low permeability soils, a flat groundwater gradient; and
- natural attenuation.

There are no potential receptors except industrial workers working in upgradient and down gradient buildings which do not overlie the impacted areas, and the potential the down gradient drainage ditch, that is down gradient of MW-8, which only had 97 µg/L of TPHd or greater than 6 times lower than the TPHd ESL. The groundwater aquifer is designated a non-beneficial use aquifer. Although soil benzene and xylene concentrations exceeded ESLs a decade ago, Fenton's Reagent treatment and natural attenuation has degraded both of these COCs as is observed by their absence in groundwater. TPHd currently exceeds ESLs for soil and groundwater in three monitoring wells, but it is not volatile or mobile, and poses no danger to any potential receptors off-Site or on-Site, including industrial workers working in excavations.

As a result, the site meets requirements for conditional closure, and SECOR, on behalf of Penske, respectfully requests conditional site closure with a deed restriction to limit site use to commercial industrial, as the Site is currently zoned and used.