

# **Supplemental Phase II Environmental Site Investigation Report**

**Redevelopment Area 3  
Former Park East Freeway**

**September 2004**

**Parcel 124**

(BLOCK 2)

(also indicated as Block 22  
of the City of Milwaukee Park  
East Redevelopment Plan)



DEPARTMENT OF PUBLIC WORKS

# *Milwaukee County*

To Reader,

Please note that this is a condensed synopsis of a larger report. For in-depth information on this parcel, review the Phase II reports by HNTB and RMT. These reports are available at Milwaukee County, Environmental Services through Gertie Payne at (414) 278-4874 or the undersigned.

Sincerely,

Sean Hayes, EIT  
Environmental Engineer  
(414) 278-4891

I:\ParkEast\preface.doc

12/16/2004

# Executive Summary

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The Park East Freeway, an approximate 1-mile long elevated freeway spur just north of downtown Milwaukee, Wisconsin, was recently demolished and is being replaced with an at-grade boulevard. Replacing the elevated freeway with the at-grade boulevard has freed up certain areas for redevelopment. A Phase II Environmental Site Assessment (ESA) was performed in 2001 for one of these areas – Former Park East Freeway Redevelopment Area 3 (Area 3), which is bounded by North Broadway Street, North Water Street, East Lyon Street, North Jefferson Street and East Ogden Street in the City of Milwaukee, Wisconsin. The Phase II ESA performed indicated the presence of primarily total lead, polynuclear aromatic hydrocarbons (PAHs), and volatile organic compound (VOC) concentrations in soil.

Milwaukee County received a Site Assessment Grant (SAG) and hired RMT, Inc. (RMT) to complete the site investigation for Area 3 using the information collected during the Phase II ESA as appropriate.

RMT conducted additional investigation between November 2003 and June 2004. A total of 32 soil probes, two hollow-stem auger soil borings, ten test pits, one temporary well and two NR 141 groundwater monitoring wells have been installed in Area 3 during the 2001, 2003, and 2004 investigations.

Based on the investigative activities conducted to date for Area 3: total lead concentrations exceeding the 250 mg/kg cleanup level for Area 3 has been detected within the upper four feet of soils in two locations; PAH concentrations have been detected above the calculated site-specific RCLs in two locations; and VOC concentrations have been detected above the NR 720 generic RCLs in two locations. The area of total lead and PAH RCL exceedances in soils at Area 3 total approximately 2,500 cubic yards, although the PAH concentrations detected above the site specific calculated RCLs do not appear to be a threat to either direct contact or to groundwater. Soils containing VOCs above generic RCLs have already been excavated from the site. Soils at the site consist primarily of 2 to at least 14 feet of various fill materials, primarily clay, gravel and sand fill overlying grayish silt and sand with seashells.

Groundwater samples collected from the one temporary well and two NR 141 groundwater monitoring wells did not indicate the presence of VOCs or metals compounds above the NR 141 Preventive Action Limit. The groundwater table is present between 22 and 29 feet bgs within the native gray silty soils.

# Section 1

## General Information

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### 1.1 Purpose

On behalf of Milwaukee County (the County), RMT, Inc. (RMT) prepared this Supplemental Phase II Environmental Site Investigation Report for the Former Park East Freeway Redevelopment Area 3 ("Area 3") which is bounded by North Broadway Street, North Water Street, East Lyon Street, North Jefferson Street, and East Ogden Street in the City of Milwaukee, Wisconsin. Area 3 is comprised of Parcels 124 and 125. A Phase II Environmental Site Assessment (ESA) was performed in 2001 for Area 3 by HNTB. The Phase II ESA identified total lead, polynuclear aromatic hydrocarbons (PAH), and slight volatile organic compound (VOC) concentrations in soil and slightly elevated barium, diesel range organics (DRO), and naphthalene concentrations in groundwater.

Supplemental investigation activities were conducted in late 2003 and 2004 to complete the subsurface investigation for Area 3. The results of the supplemental investigation are included in this report. The supplemental investigation activities were performed using Site Assessment Grant (SAG) monies which the County received from the Wisconsin Department of Natural Resources (WDNR).

### 1.2 Involved Parties

Milwaukee County currently owns the properties included in Area 3. The work described herein was performed on behalf of the County. Other parties involved with gathering the information during the supplemental investigation are listed in Appendix A.

### 1.3 Site Location, Layout, and Description

The site is located at the eastern end of the former Park East Freeway and is bounded by North Broadway Street, North Water Street, East Lyon Street, North Jefferson Street, and East Ogden Street in the City of Milwaukee, Wisconsin [southwest quarter of Section 21, Township 7 North, Range 22 East in Milwaukee County (see Figure 1)]. Area 3 is currently undeveloped with primarily clay and gravel fill soils at the ground surface. The site is in a primarily commercial area within the City of Milwaukee. Other properties immediately adjacent to Area 3 include a former tannery to the northwest, a residential neighborhood to the north, a commercial area (e.g., grocery store) to the east, office buildings to the south, and the former Park East Redevelopment Area 2 to the west. Figure 2 shows the site layout, locations of former buildings, approximate Parcel boundaries, and other similar features.

April 11, 2002 – WDNR Letter

- This letter, among other things, establishes cut-off levels for lead and arsenic in soils within the former Park East corridor.

July 21, 2003 – Test Pit Investigation Report by RMT

- In order to assess soil conditions in Area 3 and other areas prior to grading activities for the Wisconsin Department of Transportation (WisDOT), RMT directed and documented the advancement of 3 test pits on Parcel 124 and seven test pits on Parcel 125 on June 26, 2003. This investigation revealed elevated VOC concentrations in soils at TP-17 and TP-19 on Parcel 125, including benzene, ethylbenzene, xylenes, naphthalene, and others.

## Section 2

# Background Information

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A Phase II ESA was performed for Area 3 in 2001 by HNTB as part of roadway planning and design. The Phase II ESA identified primarily lead, PAHs, and slight VOC concentrations in soil and slightly elevated barium, DRO and naphthalene concentrations in groundwater. RMT was selected to complete the subsurface investigation in October 2003. The investigative activities performed by both HNTB in 2001 and by RMT in 2003 and 2004 are incorporated into this report.

Several reports and correspondences have been prepared for Area 3. These documents are identified in chronological order below. A summary of the pertinent information contained in these reports and correspondences is summarized below, and pertinent portions of these historical documents (*i.e.*, drawings, boring logs, findings) are included in Appendix B of this report.

### September 18, 2000 – Phase IA Environmental Site Assessment by HNTB

- Parcel 124 - previous uses of this parcel include asphalt-paved parking lot, steep embankment beneath westbound lanes of the former Park East Freeway, dwellings, a cigar store, flats, a motor boat sales and service company and Cihak Marine Company Sales and Service.
- Addresses formerly associated with Parcel 124 include: 1420 North Broadway Street and 1422 North Broadway Street.
- Parcel 125 - previous uses of this parcel include a grassy area south of the eastbound lanes of the former Park East Freeway, dwellings, a shed, stables, a carpenter shop, an auto building and a parking lot.
- Addresses formerly associated with Parcel 125 include: 418 East Ogden Avenue.

### September 21, 2001 – Phase II Environmental Site Assessment by HNTB

- The Phase II ESA indicated the presence of primarily lead, PAHs and slight VOC concentrations in soil and slightly elevated barium, DRO and naphthalene concentrations in groundwater. Sampling was also performed for other metals (arsenic, barium, cadmium, total chromium, lead, mercury, selenium, and silver) and DRO in soil and groundwater.

# Section 3

## Sampling Approach and Methods for 2003 and 2004 Investigations

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Data collection activities for Area 3 included collection and analysis of soil and groundwater samples on-site and off-site. The goals of the 2003 and 2004 subsurface investigation were to further define the extent of shallow soil impacts and to install and sample NR 141, Wisconsin Administrative Code, groundwater monitoring wells to further assess groundwater conditions for Area 3.

### 3.1 Installation of Soil Probes

Fifteen soil probes were installed in Area 3 on November 5 through November 7, 2003; April 21, 2004; and June 4, 2004 (see Figure 2 for locations). Probes were advanced to depths varying from 8 feet below the ground surface (bgs) to 12 feet bgs, depending on the purpose of the probe. Soils were sampled continuously in 4-foot intervals during advancement of the probes. Soil boring logs for the probes are included in Appendix C. The following soil samples have been collected from Area 3 and analyzed at a state-certified laboratory during the 2003 and 2004 investigations:

- Twenty-two for total lead (EPA Method 7421);
- One for Toxicity Characteristic Leaching Procedure (TCLP) lead (EPA Method 7421);
- Six for PAHs (EPA Method 8310);
- One for total chromium (EPA Method 6010); and
- One for hexavalent chromium (EPA Method 7196).

Upon completion of soil sampling, the probe holes were abandoned in accordance with NR 141, Wisconsin Administrative Code. The probe hole abandonment forms are included in Appendix C.

### 3.2 Groundwater Monitoring Wells

Two groundwater monitoring wells were installed on Area 3 on November 6, 2003 (see Figure 2 for locations): one on Parcel 124 and one on Parcel 125. The well on Parcel 124 (MW-124-1) was installed to a depth of 35 feet bgs in the vicinity of SB-124-5, the 2001 soil probe boring with the highest detected lead and VOC concentrations. The well on Parcel 125 (MW-125-1) was

installed to a depth of 30 feet bgs in the southwest corner of Parcel 125. The wells were developed, purged, and sampled for VOCs (EPA Method 8260) and total metals (arsenic, barium, cadmium, total chromium, lead, mercury, selenium, and silver; see Table 6 for analytical methods used to analyze these metals). The soil boring logs, well construction, and well development forms for these wells are in Appendix C.

### **3.3 Elevation Survey**

RMT surveyed the elevations of monitoring wells on November 7, 2003, and December 3, 2003. The survey results are listed on Table 1, and were used in determining the groundwater flow direction and horizontal and vertical hydraulic gradients for the site.

### **3.4 Investigative Wastes**

Monitoring well purge and development water were containerized until laboratory results from the groundwater sampling were completed. Since the VOC content of the water from the monitoring wells were well below the Milwaukee Metropolitan Sewerage District's (MMSD) acceptance criteria of 5 parts per million (ppm), this water were discharged to the MMSD on December 3, 2003, and the required notification to the MMSD was made that same day (copy of notification included in Appendix D). Purge water from these wells during the March 2004 sampling event was discharged to the ground surface.

Soil cuttings from the installation of the soil probes and the groundwater monitoring wells were containerized until laboratory results from the soil sampling activities were completed. Onyx Environmental Services picked-up drums of soil cuttings from the November 2003 investigation on December 3, 2003, and from the 2004 investigation on July 12, 2004, and transported the drums to Emerald Park Recycling and Disposal Facility in Muskego, Wisconsin. Documentation of soil cutting disposal is included in Appendix D.

# Section 4

## Results

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### 4.1 Geology and Hydrogeology

Generally, the upper 2 to at least 14 feet of soils at the site consist of fill materials. These fill materials primarily consist of clay, gravel and sand fill, but also include relatively isolated areas of brick pieces and wood. Beneath the fill materials is a grayish-colored clayey silt with varying sand contents and sea shells. Geologic cross-sections of the soils encountered at the site are included as Figure 3 (note that geologic cross sections for Parcel 125 are not presented since much of the surface soils present during the November 2003 investigation have since been removed to bring the site to grade).

Groundwater measurements in NR 141 groundwater monitoring wells between November 2003 and March 2004 ranged between approximately 22.5 and 28.8 feet bgs. Based on literature values, the hydraulic conductivity of the native clayey silt at the site is expected to be between 0.001 and 0.00001 cm/s. Based on the groundwater elevation contours included on Figure 7, the horizontal hydraulic gradient at the site is approximately 0.07. Groundwater generally flows to the northwest towards the Milwaukee River.

### 4.2 Residual Contaminant Levels

Soil sampling results were compared to residual contaminant levels (RCLs). The RCL for total lead in soils for Area 3 has been determined to be 250 milligrams per kilogram (mg/kg), per WDNR Publication RR653 (note also that in an April 11, 2002, letter, the WDNR approved a lead cut-off level of 250 mg/kg for soils at this site; a copy of this letter is included in Appendix B). The RCL for total arsenic in soils for Area 3 has been determined to be 5 mg/kg based on United States Geological Survey (USGS) Professional Paper 1648 which documents the background arsenic concentration in Southeastern Wisconsin soils to be approximately 5 mg/kg (see Appendix E). RCLs for PAHs are the more stringent of the suggested RCL for the groundwater pathway listed in WDNR publication RR-519-97 or the calculated RCL for the direct contact pathway using the methodologies in WDNR publication RR-519-97 and a target risk of  $1 \times 10^{-6}$  or target hazard quotient of one in accordance with NR 720.19(5)(a), WAC (see Appendix E).

### 4.3 Soil Sampling Results

The soil sampling results from the 2001 Phase II ESA are summarized in Table 2, the test pit investigation soil sampling results from June 2003 are summarized in Table 3, and the soil sampling results from the November 2003 and 2004 sampling events are summarized in Table 4. The laboratory analytical reports for the November 2003 and 2004 soil sampling events for Area 3 are included in Appendix F.

Metals in Soil - During the 2001 subsurface investigation, HNTB collected 17 soil samples for metals analysis (arsenic, barium, cadmium, total chromium, lead, mercury, selenium, and silver) from Area 3. The results from these metals analyses indicated the presence of total lead above 250 mg/kg at two sampling locations and one location where arsenic exceeded the RCL. The arsenic sample that exceeded the RCL was collected from a depth greater than 4 feet bgs, and is therefore not considered a threat for direct contact. Groundwater samples that were collected and analyzed for arsenic in 2003 and 2004 indicate that arsenic is not a threat to groundwater, as discussed below. Hexavalent chromium was not detected in the three soil samples analyzed for hexavalent chromium. Additional soil sampling for total lead was performed by RMT in November 2003 and 2004 as discussed below.

Total Lead in Soil - Sixty-one total lead samples have been collected for Area 3. Total lead was detected above the RCL in 11 of these soil samples at concentrations up to 550 mg/kg. The soil sample with the highest total lead concentration during the November 2003 investigation was also submitted for Toxicity Characteristic Leaching Procedure (TCLP) lead testing. The results from this sample indicated the TCLP lead concentration to be 0.014 mg/l. Total lead soil samples were generally collected from the upper 4 to 8 feet of soil in Area 3. Some deeper total lead soil samples were also collected (*i.e.*, to define the vertical extent of lead impacts).

Total lead sampling results are shown on Figure 4. There appears to be two areas on Parcel 124 in which total lead concentrations in soil exceed the identified RCL. Total lead RCL exceedances are present above 250 mg/kg within fill soils at two locations: in the northeast portion of Parcel 124 (including GP-15, GP-48, GP-49, GP-58, GP-59, and SB-124-5); and in the central portion of Parcel 124 (including GP-53, GP-54, GP-55, and SB-124-7). The volume of soil that contains total lead above 250 mg/kg and/or PAHs above the RCLs (see next section for a discussion of PAH exceedances) is approximately 2,100 cubic yards. Two total lead soil samples collected from deeper than 10 feet bgs in this area indicate that total lead RCL exceedances are limited to the upper 10 feet of fill soils. Four soil samples collected from the soil boring locations just outside of this area did not contain total lead above the RCL.

The volume of soil in the central portion of Parcel 124 that contains total lead above 250 mg/kg is approximately 340 cubic yards. Three soil samples collected from six to eight bgs from within

this area indicate that total lead RCL exceedances are limited to the upper six feet of fill soils at this location. Two soil samples collected from the upper 4 feet and one composite soil sample from the upper 5 feet of soils just outside of this area did not contain total lead above the RCL.

Given the sporadic locations of total lead RCL exceedances, it appears that either the various fill materials that were historically brought to the site contained lead or that vehicular traffic in the area may have deposited lead historically, or both. It does not appear that the total lead concentrations in soil in Area 3 are due to a single release.

PAHs in Soil - Eight PAH soil samples have been collected for Area 3 and PAHs were detected above the RCLs in four of these soil samples. PAH soil samples were generally collected from the upper five to eight feet of soil in Area 3, although one deeper sample was also collected.

PAH soil sampling results are shown on Figure 5. There appears to be two areas on Parcel 124 in which PAHs exceed the RCLs: in the northeast portion of Parcel 124 (GP-16, SB-124-5, and MW-124-1; note that this area of PAH RCL exceedances overlaps with the area of total lead RCL exceedances here); and, at SB-124-5.

As discussed in the previous section, the volume of soil exceeding the PAH RCLs and the total lead RCL in the northeast portion of Parcel 124 appears to be approximately 2,100 cubic yards. PAH soil sampling results to date appear to indicate that PAH RCL exceedances in the northeast portion of Parcel 124 are limited to the upper 8 feet of fill soils. Three soil samples collected from just outside this area did not contain PAHs above the RCLs.

The naphthalene concentration detected in the soil sample collected from SB-124-11 from 4 to 6 feet bgs exceeded the site-specific calculated RCL of 400 mg/kg (based on the groundwater pathway). Naphthalene was not detected in two rounds of groundwater samples collected from the monitoring wells installed on Area 3. The volume of soils exceeding 400 mg/kg naphthalene at SB-124-11 appears to be approximately 80 cubic yards.

VOCs in Soil - Forty VOC soil samples have been collected for Area 3. Aside from the naphthalene concentration detected in SB-124-11 discussed above (naphthalene is both a PAH and a VOC), the only other VOC compounds detected above the RCLs in soil samples analyzed for VOCs were benzene in test pits 17 and 19 (TP-17 and TP-19) advanced in June 2003 on Parcel 125. Soils in the areas of these two test pits were excavated and disposed of off-site by the City of Milwaukee as part of a project to regrade Parcel 125 in 2004. Soil samples were collected from the base of the finished excavation for TP-17 on March 10, 2004. Confirmation soil sampling results did not reveal any detections of DRO or the VOC compounds for which analysis was performed. Soil samples were collected from the base of the finished excavation for TP-19 on April 2, 2004. Confirmation soil sampling results did not reveal any detections of

the VOC compounds for which analysis was performed. The laboratory analytical reports for the 2004 conformational soil sampling at TP-17 and TP-19 are included in Appendix F.

Additional investigation for VOCs in soils was not performed during the November 2003 and 2004 subsurface investigations.

DRO in Soil – Forty-four DRO soil samples have been collected for Area 3. None of the DRO soil samples collected contained DRO above 100 mg/kg.

Estimated Volumes of Soils >RCLs within the fill soils on Parcel 124 – Based on the calculations included in Appendix G, it appears that the following volumes of soil in Parcel 124 exceed the RCLs (note that contaminant concentrations in Parcel 125 soils were not detected above the RCLs).

- Northeast Portion of Parcel 124 – approximately 2,100 cubic yards (includes both total lead and PAH RCL exceedances).
- Central Portion of Parcel 124 – approximately 340 cubic yards (PAH RCL exceedances)
- SB-124-11 – approximately 80 cubic yards (PAH RCL exceedances)

#### 4.4 Groundwater Sampling Results

The groundwater sampling results from temporary wells and groundwater monitoring wells are summarized in Tables 5 and 6, respectively. The laboratory analytical reports for the 2003 and 2004 groundwater sampling events are included in Appendix F.

A single temporary well, SB-124-2, was installed and sampled in Area 3 during HNTB's 2001 subsurface investigation. Groundwater collected from this temporary well was analyzed for metals (arsenic, barium, cadmium, total chromium, lead, mercury, selenium, and silver), DRO and VOCs in 2001. This sampling did not indicate any NR 140 Preventive Action Limit exceedances.

Groundwater samples were also collected from MW-124-1 and MW-125-1 in November 2003 and 2004 for metals (arsenic, barium, cadmium, total chromium, lead, mercury, selenium, and silver) and VOCs. This sampling did not indicate any NR 140 Preventive Action Limit exceedances.

# Section 5

## Conclusions

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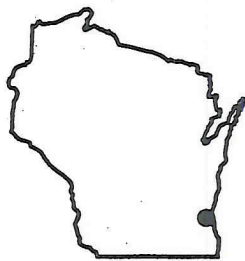
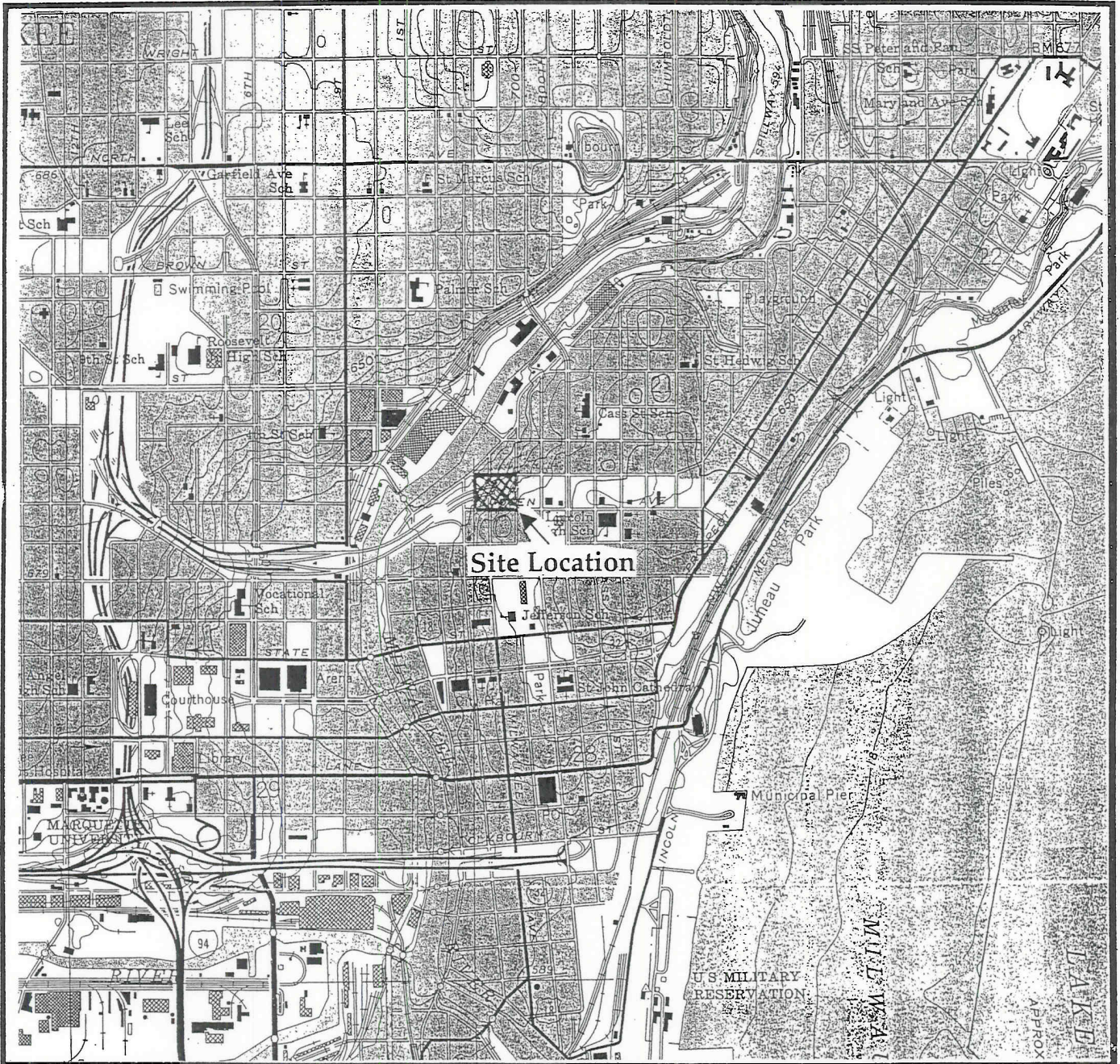
The activities, observations, and results of the site investigation conducted to date are summarized in the following sections.

### 5.1 Soil

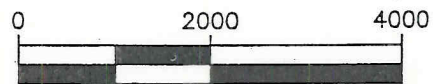
- A total of 32 soil probe borings, two hollow-stem auger soil borings, and 10 test pits have been advanced in Area 3 between June 2001 and June 2004.
- A total of 61 total lead soil samples have been collected, 11 of which exceeded the total lead RCL established for the site. The one soil sample that was analyzed for TCLP lead had a detected concentration of 0.014 mg/l, well below the concentration at which a waste would be considered hazardous (5 mg/l).
- A total of eight PAH soil samples have been collected, four of which exceeded the PAH RCLs established for the site.
- A total of 40 VOC soil samples have been collected, two of which contained benzene above the generic RCL in NR 720. Soils in the areas of the two benzene exceedances have been excavated and disposed of off-site; confirmation soil samples collected did not indicate detectable concentrations of the VOC analyzed.
- Soil total lead and PAH RCL exceedances were identified within the various fill materials that have been placed at the site over the years and do not appear to be from a single point source release.
- Total lead and PAH RCL exceedances were detected within the upper 10 feet of soils in the northeast portion of Parcel 124. The volume of soils exceeding the RCLs here appears to be 2,100 cubic yards.
- Total lead RCL exceedances are present in the upper six feet of soils in the central portion of Parcel 124. The volume of soils exceeding the total lead RCL here is approximately 340 cubic yards.
- Although naphthalene was detected above the groundwater pathway RCL at SB-124-11, naphthalene was not detected in the four groundwater samples collected from Area 3. The volume of soils exceeding the naphthalene RCL here appears to be approximately 80 cubic yards.
- Soils at the site consist primarily of 2 to at least 14 feet of various fill materials, primarily clay, gravel, and sand fill overlying grayish silt and sand with seashells.

## 5.2 Groundwater

- Groundwater samples have been collected from one soil probe temporary well and two groundwater monitoring wells for metals and VOCs.
- No NR 140 Preventive Action Limits were exceeded in any of the groundwater samples collected for Area 3.
- The groundwater table is present between 22.5 and 28.8 feet bgs.
- Groundwater flows to the northwest towards the Milwaukee River under a horizontal hydraulic gradient of approximately 0.07.



**STATE LOCATION**



SCALE: 1"=2000'



**SITE LOCATION MAP**  
**Milwaukee County Department of Public Works**  
**Former Park East Freeway - Redevelopment Area 3**  
**MILWAUKEE, WISCONSIN**

SOURCE: BASE MAP FROM MILWAUKEE, WISCONSIN  
 7.5 MINUTE USGS QUADRANGLE, 1971



DWN. BY: MSK
APPROVED BY: KWY
DATE: DEC 2003
PROJ. # 6493.02
FILE # sitelocator02.DWG

**FIGURE 1**

**LEGEND**

- ⊕ SB-124-4
- ⊕ SB-124-7
- ⊕ TP-11
- ⊕ GP-1
- ⊕ MW-149-1

APPROXIMATE SOIL BORING LOCATION INSTALLED JUN 2001  
 APPROXIMATE TEMPORARY WELL LOCATION INSTALLED JUN 2001  
 APPROXIMATE TEST PIT LOCATION ADVANCED JUN 2003  
 APPROXIMATE SOIL BORING LOCATION INSTALLED NOV 2003,  
 APR 2004, OR JUN 2004  
 APPROXIMATE MONITORING WELL LOCATION INSTALLED NOV 2003

4-B-40



POLYNUCLEAR AROMATIC HYDROCARBONS (PAH) COMPOUNDS AND CONCENTRATION (mg/kg) DETECTED IN SOIL SAMPLE ABOVE THE RESIDUAL CONTAMINANT LEVEL (RCL) IDENTIFIED ON THE ACCOMPANYING TABLES, AT THE SPECIFIED INTERVAL (FEET BELOW THE GROUND SURFACE)

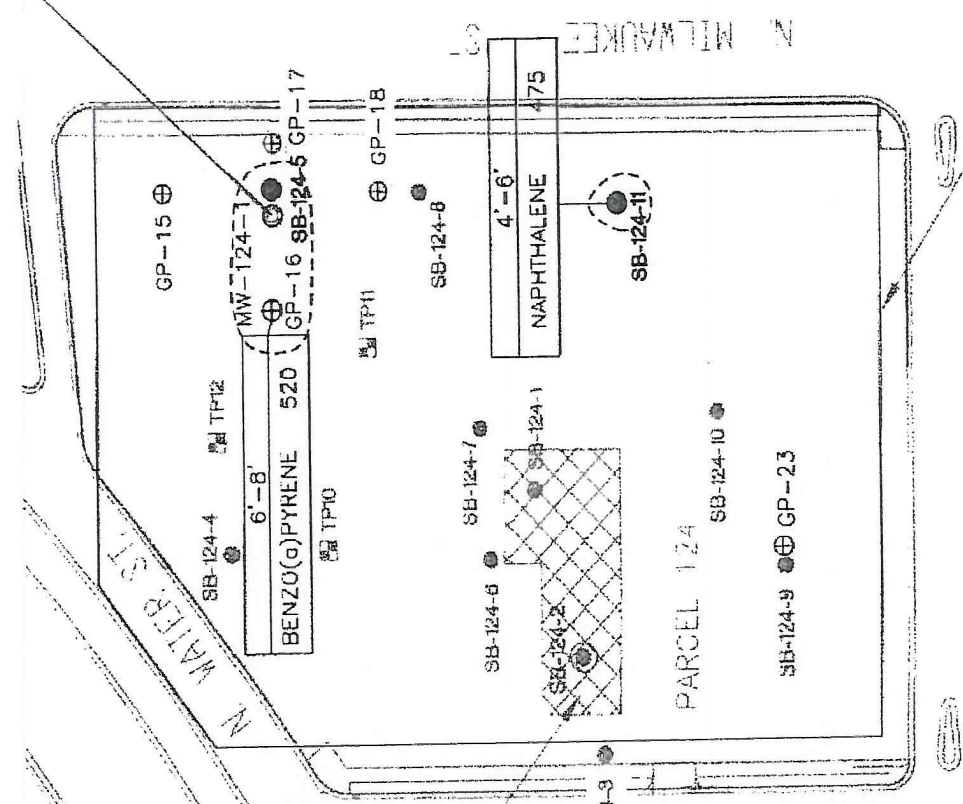
APPROXIMATE AREA OF TOTAL LEAD >250 mg/kg WITHIN UPPER 4 FEET OF SITE SOILS (DASHED WHERE INFERRER)

**NOTES**

1. BASE MAP FROM 2001 PHASE II REPORT FOR REDEVELOPMENT AREAS BY HNTB AND FROM WISDOT CONSTRUCTION DRAWINGS FOR PARK EAST FREEWAY.
2. BOLDDED RED SOIL BORING LOCATIONS INDICATE THAT AT LEAST ONE PAH COMPOUND WAS DETECTED ABOVE THE RCL IN AT LEAST ONE SOIL SAMPLE COLLECTED FROM THIS LOCATION.
3. NONE OF THE RCL EXCEEDANCES WERE DETECTED IN THE UPPER 4 FEET OF SOILS, AND NONE APPEAR TO HAVE CONTAMINATED GROUNDWATER

2001 - PAH RCL EXCEEDANCES FROM 6'-8' FOR:  
 2-METHYLNAPHTHALENE  
 ACENAPHTHENE, BENZO(g)ANTHRACENE,  
 BENZO(a)PYRENE, BENZO(b)FLUORANTHENE,  
 BENZO(k)FLUORANTHENE,  
 DIBENZ(a,h)ANTHRACENE, INDENO(1,2,3-cd)PYRENE,  
 NAPHTHALENE, PHENANTHRENE


2003 - PAH RCL EXCEEDANCE FROM 6'-8' FOR:  
 BENZO(g)ANTHRACENE



**PAH CONCENTRATIONS IN SOIL >RCLs**  
**FORMER PARK EAST FREEWAY**  
**REDEVELOPMENT AREA 3**  
**MILWAUKEE, WISCONSIN**

**Parcel 124**

Adapted from the following map by  
 Sean Hayes of Milwaukee County 12/9/04



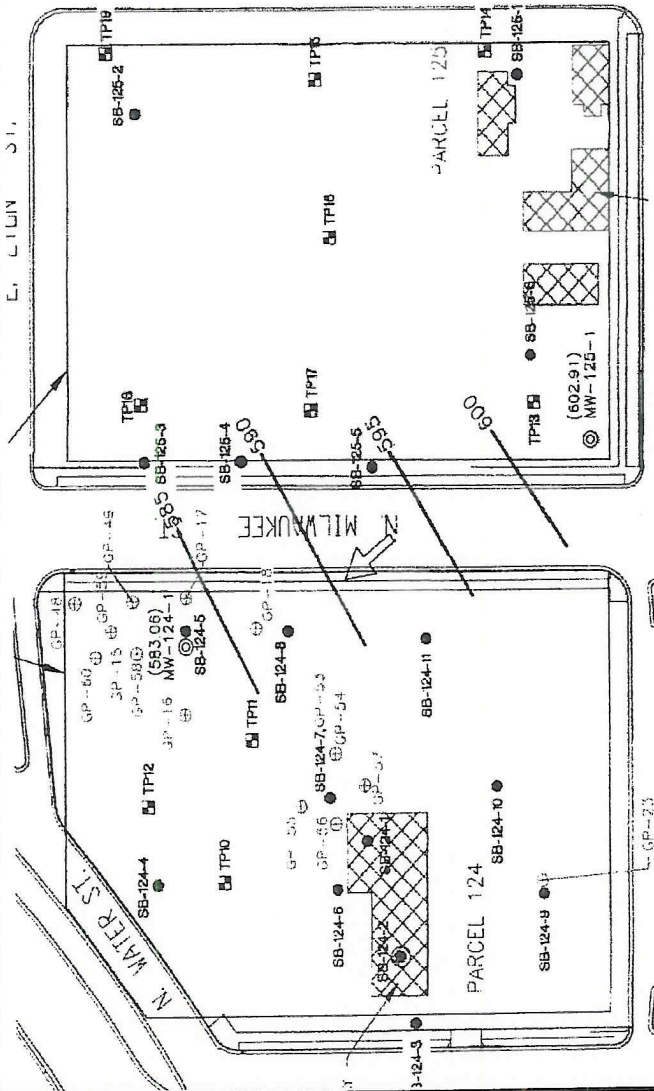
DWG. BY: MHS  
 APPROVED BY: KVV  
 DATE: JULY 2004  
 PROJ. # 00-08493.02  
 FILE # 64930204.DWG

**LEGEND**

- SB-124-4 APPROXIMATE SOIL BORING LOCATION INSTALLED JUN 2001
- SB-124-2 APPROXIMATE TEMPORARY WELL LOCATION INSTALLED JUN 2001
- TPI1 APPROXIMATE TEST PIT LOCATION ADVANCED JUN 2003
- ⊕ TPI 1 APPROXIMATE SOIL BORING LOCATION INSTALLED NOV 2003, APR 2004, OR JUN 2004
- ⊙ MW-149-1 APPROXIMATE MONITORING WELL LOCATION INSTALLED NOV 2003 (579.63)
- GROUNDWATER ELEVATION IN MONITORING WELL ON 3/31/04
- INTERPOLATED GROUND WATER ELEVATION CONTOUR
- ↑ INTERPOLATED GROUND WATER FLOW DIRECTION

**NOTES**

1. BASE MAP FROM 2001 PHASE II REPORT FOR REDEVELOPMENT AREAS BARRIED FROM WISDOT CONSTRUCTION DRAWINGS FOR PARK EAST FREEWAY.
2. NO METALS OR VOCs HAVE BEEN DETECTED IN GROUNDWATER COLLECTED FROM MW-124-1 & MW-125-1 ABOVE THE RESPECTIVE NR140 PREVENTION ACTION LIMITS.



**GROUNDWATER CONTOUR MAP  
FORMER PARK EAST FREEWAY  
REDEVELOPMENT AREA 3  
MILWAUKEE, WISCONSIN**

**Parcels 124 and 125**

Adapted from the following map by  
Sean Hayes of Milwaukee County 12/9/04

<b>RMT</b>	
DWN. BY: MHS	APPROVED BY: KMY
DATE: JULY 2004	PROJ. # 00-06493.02
FILE # 64930205.DWG	

**LEGEND**

- SB-124-4 APPROXIMATE SOIL BORING LOCATION INSTALLED JUN 2001
- SB-124-2 APPROXIMATE TEMPORARY WELL LOCATION INSTALLED JUN 2001
- ⊕ TP11 APPROXIMATE TEST PIT LOCATION ADVANCED JUN 2003
- ⊕ TP1 APPROXIMATE SOIL BORING LOCATION INSTALLED NOV 2003, APR 2004, OR JUN 2004
- ⊕ MW-149-1 APPROXIMATE MONITORING WELL LOCATION INSTALLED NOV 2003

394 4'-6'

TOTAL LEAD CONCENTRATION (mg/kg) DETECTED IN SOIL SAMPLE FROM SPECIFIED INTERVAL (FEET BELOW THE GROUND SURFACE)  
 SAMPLE COLLECTED EITHER DID NOT CONTAIN DETECTABLE LEAD OR CONTAINED <250 mg/kg TOTAL LEAD.  
 APPROXIMATE AREA OF TOTAL LEAD ≥250 mg/kg WITHIN UPPER 4 FEET OF SITE SOILS (DASHED WHERE INFERRED)

**NOTES**

1. BASE MAP FROM 2001 PHASE II REPORT FOR REDEVELOPMENT AREAS BY RWIS AND FROM WISDOT CONSTRUCTION DRAWINGS FOR PARK EAST FREEWAY.
2. COMPOSITE SAMPLE COLLECTED FROM TP-10, TP-11 AND TP-12 CONTAINED <250 mg/kg TOTAL LEAD.
3. COMPOSITE SAMPLE COLLECTED FROM TP-13, TP-16, TP-17 AND TP-18 CONTAINED <250 mg/kg TOTAL LEAD.
4. BOLDLED RED SOIL BORING LOCATIONS INDICATE THAT TOTAL LEAD WAS DETECTED ≥250 mg/kg IN AT LEAST ONE SOIL SAMPLE COLLECTED FROM THIS LOCATION.

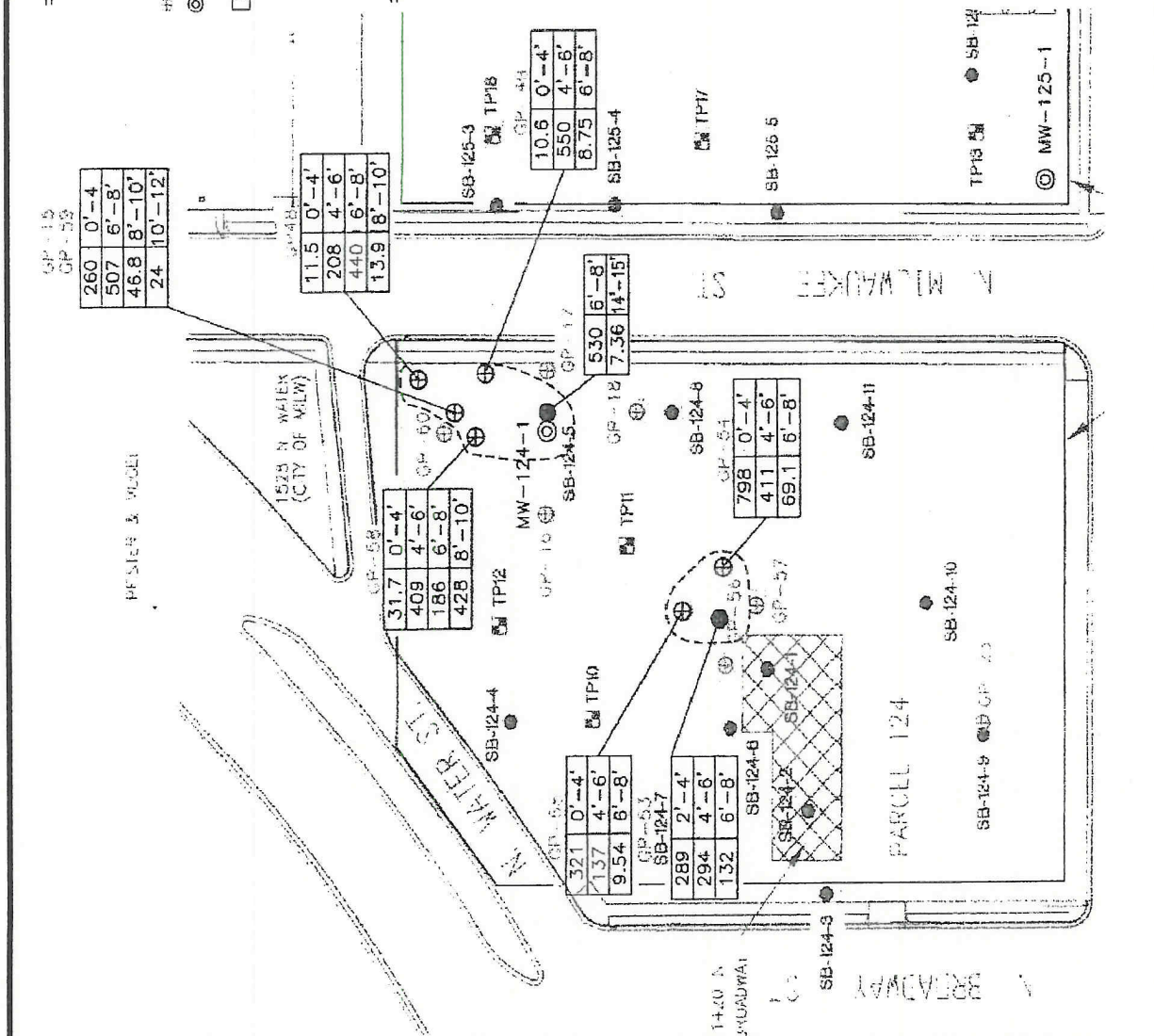
**TOTAL LEAD IN SOIL >260 mg/kg  
 FORMER PARK EAST FREEWAY  
 REDEVELOPMENT AREA 3  
 MILWAUKEE, WISCONSIN**

**Parcel 124**

Adapted from the following map by  
 Sean Hayes of Milwaukee County 12/9/04

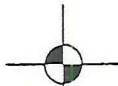


DWG. BY: MHS  
 APPROVED BY: KMY  
 DATE: JULY 2004  
 PROJ. # 00-06493.02  
 FILE # 64930203.DWG



LEGEND

ENVIRONMENTAL BORING



PIER BORING



EXISTING WELL



124

PARCEL BOUNDARY

SB-124-4

SB-124-5

FORMER BUILDING FOOTPRINT

SB-124-7

SB-124-8

PROPERTY 1

SB-124-6

SB-124-2 WELL

SB-124-1

SB-124-11

SB-124-3

SB-124-10

PIER LOCATION

SB-124-9

EAST OGDEN AVENUE

NORTH MILWAUKEE STREET

NORTH WATER STREET

NORTH BROADWAY STREET

Times: 01-OCT-2001 16:15  
Plotted by: JSovinski

FILE NAME: P:\projects\1458\1458\development\parcel 124.dgn  
PEN TABLE: k:\config\plot\hpatcnh.pen

TABLE 2

**PARK EAST FREEWAY PHASE II  
GROUNDWATER ELEVATION DATA**

Well Number	Top of Protective Casing Elevation (feet, MSL)	Depth to Groundwater July 30, 2001 (feet)	Groundwater Elevation (feet, MSL)
119-5	646.18	11.76	634.42
129-2	627.68	18.67	609.01
129-6	641.84	19.67	622.17
129-9	643.72	20.74	622.98
129-11	642.4	10.08	632.32
129-12	634.56	7.8	626.76
131-5	610.08	15.38	594.7
131-6	605.87	12.64	593.23
131-9	625.72	17.53	608.19
37-3	595.97	17.8	578.17
37-6	599.1	DRY	NA
37-11	597.41	8.22	589.19
37-15	597.21	8.95	588.26
37-18	595.04	23.52	571.52
38-2	594.02	12.32	581.7
38-7	594.22	16.03	578.19
39-2	592.48	15.95	576.53
39-7	593.3	17.58	575.72
40-2	593.14	13.14	580
153-2	589.93	5.69	584.24
147-1	590.88	12.2	578.68
147-4	588.23	10.75	577.48
148-1	589.65	9.49	580.16
148-5	589.09	10.15	578.94
149-1	590.97	11.13	579.84
149-5	589.93	12.02	577.91
149-7	589.35	11.08	578.27
150-8	596.92	14.07	582.85
150-10	603.4	8.9	594.5
145-1	589.97	9.08	580.89
24-2	592.17	12.88	579.29
2-1	600.38	10.49	589.89
8-1	592.16	9.84	582.32
8-3	592.22	10.71	581.51
10-2	589.59	product in well	NA

Notes:

All groundwater elevation data are presented in feet below the mean sea level (MSL).

**Table 1**  
**Groundwater Elevations**  
**Former Park East Freeway Redevelopment Area 3**  
**City and County of Milwaukee, Wisconsin**

Well ID	Top of PVC Well Casing <sup>1</sup>	Ground Surface <sup>1</sup>	11/7/2003		12/3/2003		3/31/2004	
			DTW <sup>2</sup>	ELEV <sup>3</sup>	DTW <sup>2</sup>	ELEV <sup>3</sup>	DTW <sup>2</sup>	ELEV <sup>3</sup>
MW-124-1	605.58	603.1	31.87	573.71	23.03	582.55	22.52	583.06
MW-125-1	628.77	626.3	28.49	600.28	28.82	599.95	25.86	602.91

**Notes:**

1. Water table elevation referenced to Mean Sea Level. Elevations surveyed by RMT, Inc. on 11/7/03 and 12/3/03.
2. Depth to water measured in feet below the top of the PVC well casing.
3. Water table elevation referenced to Mean Sea Level.

Summary of Temporary Well Sampling Results - HNTB - 2001  
Former Park East Freeway Redevelopment Area 3  
City and County of Milwaukee, Wisconsin

	NR 140 Standard		Soil Probe Temp. Well
	ES	PAL	124-2
			7/10/01
<b>Metals</b>			
Barium (mg/l)	2	0.4	0.35
Chromium (µg/l)	100	10	<0.008
Silver (µg/l)	50	10	<0.004
Arsenic (µg/l)	50	5	<5.6
Cadmium (µg/l)	5	0.5	<0.4
Lead (µg/l)	15	1.5	<1.5
Selenium (µg/l)	50	10	<4.8
DRO (mg/l)	NA	NA	<b>44</b>
<b>VOCs (µg/l)</b>			
1,1,1-Trichloroethane	200	40	<0.31
1,1-Dichloroethane	850	85	<0.32
1,1-Dichloroethene	7	0.7	<0.34
1,2,3-Trichlorobenzene	NA	NA	<0.50
Trimethylbenzenes	480	96	<0.30
1,2-Dichloroethane	5	0.5	<0.35
4-Methyl-2-Pentanone	NA	NA	<0.80
Benzene	5	0.5	<0.27
Chloroethane	400	80	<0.64
Chloroform	6	0.6	<0.24
Chloromethane	3	0.3	<0.49
cis-1,2-Dichloroethene	70	7	<0.27
Ethylbenzene	700	140	<0.25
Isopropylbenzene	NA	NA	<0.33
Xylenes	10,000	1,000	<0.53
MTBE	60	12	<0.39
n-Butylbenzene	NA	NA	<0.36
n-Propylbenzene	NA	NA	<0.28
Naphthalene	40	8	1.6
sec-Butylbenzene	NA	NA	<0.34
Tetrachloroethene	5	0.5	<0.31
Toluene	1,000	200	<0.29
Trichloroethene	5	0.5	<0.34
Vinyl Chloride	0.2	0.02	<0.20
Depth to Water			12.88

**Notes:**

1. mg/l - milligrams per liter (ppm)
2. µg/l = micrograms per liter (ppb)
3. VOCs = Volatile Organic Compounds
4. Only compounds that have been detected in any of the above wells are shown here.
5. NR 140 ES = Wisconsin Administrative Code Chapter NR 140 Enforcement Standard
6. NR 140 PAL = Wisconsin Administrative Code Chapter NR 140 Preventive Action Limit
7. Detections of analytes are bolded

**#** = NR 140 ES exceedance

Table 1a  
 Summary of Constituents Detected in Soil Samples During 2001 Phase II Investigation  
 Former Park East Freeway Redevelopment Area 3  
 City and County of Milwaukee, Wisconsin

	Non-Industrial RCL	Soil Boring Identification										
		124-6	124-7	124-7	124-8	124-8	124-9	124-9	124-10	124-10	124-11	124-11
		8'-10'	2'-4'	10'-12'	2'-4'	10'-12'	4'-6'	8'-10'	4'-6'	8'-10'	4'-6'	10'-12'
		6/25/01	6/22/01	6/22/01	6/22/01	6/22/01	6/25/01	6/25/01	6/25/01	6/25/01	6/22/01	6/22/01
Metals (mg/kg)												
Arsenic	5	--	<2.51	--	<2.46	--	<2.75	--	<2.53	--	<2.49	--
Barium		--	287	--	51	--	157	--	73	--	43	--
Cadmium	8	--	1.8	--	1.5	--	2.0	--	<0.42	--	1.2	--
Chromium, Total	14	--	15	--	16	--	47	--	23	--	11	--
Lead	250	--	289	--	6.1	--	62	--	8.2	--	51	--
Mercury		--	<0.024	--	<0.023	--	0.06	--	0.11	--	<0.024	--
Selenium		--	<4.19	--	<4.09	--	<4.58	--	<4.21	--	<4.15	--
Silver		--	<0.24	--	<0.23	--	<0.26	--	<0.24	--	<0.24	--
DRO, mg/kg	100	2.5	38	3.6	5.7	<1.1	<1.2	11	<1.2	1.9	4.1	7.5
VOCs, µg/kg												
Trimethylbenzenes		<16	<18	<19	<18	<17	<19	<17	<18	<18	<18	<18
1,2-Dichlorobenzene		<18	<20	<21	<20	<20	<22	<20	<20	<21	<20	<21
Benzene	5.5	<15	<16	<17	<16	<16	<17	<15	<16	<16	<16	<17
Ethylbenzene	2,900	<14	<15	<16	<15	<15	<16	<15	<15	<15	<15	<16
Isopropyl Ether		<16	<18	<18	<17	<17	<19	<17	<18	<18	<18	<18
Isopropylbenzene		<18	<20	<20	<19	<19	<21	<19	<20	<20	<19	<20
Xylenes	4,100	<29	<32	<33	<31	<31	<34	<31	<32	<32	<32	<33
n-Butylbenzene		<19	<21	<22	<21	<21	<23	<21	<21	<22	<21	<22
n-Propylbenzene		<15	<17	<17	<16	<16	<18	<16	<17	<17	<17	<17
Naphthalene	400 <sup>GW</sup>	270	<45	<47	<44	<44	<48	<43	<45	<46	475	<47
p-Isopropyltoluene		<17	<19	<19	<18	<18	<20	<18	<19	<19	<19	<19
sec-Butylbenzene		<18	<20	<21	<20	<20	<22	<19	<20	<20	<20	<21
Toluene	1,500	<16	<17	<18	<17	<17	<19	<17	<17	<18	<17	<18
PAHs, µg/kg												
1-Methylnaphthalene	23,000 <sup>GW</sup>	--	--	--	--	--	--	--	--	--	--	--
2-Methylnaphthalene	20,000 <sup>GW</sup>	--	--	--	--	--	--	--	--	--	--	--
Acenaphthene	38,000 <sup>GW</sup>	--	--	--	--	--	--	--	--	--	--	--
Acenaphthylene	700 <sup>GW</sup>	--	--	--	--	--	--	--	--	--	--	--
Anthracene	3,000,000 <sup>GW</sup>	--	--	--	--	--	--	--	--	--	--	--
Benzo (a) anthracene	3,920 <sup>DC</sup>	--	--	--	--	--	--	--	--	--	--	--
Benzo (a) pyrene	392 <sup>DC</sup>	--	--	--	--	--	--	--	--	--	--	--
Benzo (b) fluoranthene	3,920 <sup>DC</sup>	--	--	--	--	--	--	--	--	--	--	--
Benzo (g,h,i) perylene	39,200 <sup>DC</sup>	--	--	--	--	--	--	--	--	--	--	--
Benzo (k) fluoranthene	39,200 <sup>DC</sup>	--	--	--	--	--	--	--	--	--	--	--
Chrysene	37,000 <sup>DC</sup>	--	--	--	--	--	--	--	--	--	--	--
Dibenz (a,h) anthracene	392 <sup>DC</sup>	--	--	--	--	--	--	--	--	--	--	--
Fluoranthene	500,000 <sup>GW</sup>	--	--	--	--	--	--	--	--	--	--	--
Fluorene	100,000 <sup>GW</sup>	--	--	--	--	--	--	--	--	--	--	--
Indeno (1,2,3-cd) pyrene	3,920 <sup>DC</sup>	--	--	--	--	--	--	--	--	--	--	--
Naphthalene	400 <sup>GW</sup>	--	--	--	--	--	--	--	--	--	--	--
Phenanthrene	1,800 <sup>GW</sup>	--	--	--	--	--	--	--	--	--	--	--
Pyrene	2,346,429 <sup>DC</sup>	--	--	--	--	--	--	--	--	--	--	--

Notes:

1. RCRA Metals analyzed using EPA Method 6010 except for mercury which was analyzed using EPA Method 7471
2. DRO = diesel range organic analyzed using the Wisconsin Modified Method
3. VOC's = Volatile Organic Compounds analyzed using EPA Method 8260
4. mg/kg = milligrams per liter (ppm)
5. µg/kg = micrograms per liter (ppb)
6. All samples collected by HNTB.
7. RCL = Residual Contaminant Level. The RCL listed above for arsenic is the background arsenic concentration in southeastern Wisconsin soils according to USGS Professional Paper 1648. RCLs listed above for cadmium and chromium are the NR 720.11 non-industrial table value for the direct contact pathway (the total chromium sampling result is compared to the NR 720.11 RCL table value for hexavalent chromium in this table). The RCL listed for total lead is the lead cleanup level which the WDNR assigned to the Park East project in a 4/11/02 WDNR letter to the Wisd. DOT. RCLs listed above for benzene, 1,2-dichloroethane, ethylbenzene, toluene and xylenes are the NR 720.09 table values for protection of groundwater. RCL listed for DRO is the more conservative NR 720.09 value. RCLs listed for PAHs (including naphthalene) are the more stringent of a) the generic RCL listed in WDNR Publication RR-519-97 for the protection of groundwater and b) the direct contact RCL calculated using methodologies in WDNR Publication RR-519-97 and using the NR 720.19(5)(a) (target risk of 1 x 10<sup>-6</sup> or hazard quotient of 1). DC = non-industrial site direct contact pathway; GW = protection of groundwater
8. Samples above were analyzed by APL, Inc. in Milwaukee, Wisconsin; WDNR Certification #241340580
9. Detections of analytes are bolded
10. -- not analyzed

**#** = NR 720 RCL Exceedance

Table 1a  
 Summary of Constituents Detected in Soil Samples During 2001 Phase II Investigation  
 Former Park East Freeway Redevelopment Area 3  
 City and County of Milwaukee, Wisconsin

	Non-Industrial RCL	Soil Boring Identification											
		124-1	124-1	124-2	124-2	124-3	124-3	124-4	124-4	124-5	124-5	124-6	
		6'-8'	14'-15'	4'-6'	10'-12'	2'-4'	6'-8'	2'-4'	12'-14'	6'-8'	14'-15'	2'-4'	
		6/25/01	6/25/01	6/25/01	6/25/01	6/25/01	6/25/01	6/25/01	6/25/01	6/25/01	6/25/01	6/25/01	
Metals (mg/kg)													
Arsenic	5	<2.52	--	<b>28</b>	--	<2.25	--	<2.74	--	<2.40	--	<2.47	
Barium		92	--	27	--	9.0	--	63	--	166	--	68	
Cadmium	8	1.0	--	1.1	--	1.0	--	<0.46	--	<0.40	--	1.0	
Chromium, Total	14	15	--	9.6	--	4.5	--	26	--	21	--	13	
Lead	250	51	--	8.9	--	5.8	--	155	--	<b>530</b>	--	14	
Mercury		<0.024	--	<0.023	--	<0.022	--	0.05	--	0.08	--	0.19	
Selenium		<4.21	--	<3.99	--	<3.75	--	<4.57	--	<4.00	--	<4.11	
Silver		<0.24	--	0.50	--	<0.21	--	<0.26	--	<0.23	--	<0.23	
DRO, mg/kg	100	<1.2	3.3	4.7	2.7	3.8	3	7.8	2.4	72	1.6	35	
VOCs, µg/kg													
Trimethylbenzenes		<18	<16	<17	<16	<16	<17	<19	<23	583	<18	<18	
1,2-Dichlorobenzene		<20	<18	<19	<18	<18	<19	<22	<26	<78	<21	<20	
Benzene	5.5	<16	<14	<15	<14	<15	<15	<17	<21	<62	<16	<16	
Ethylbenzene	2,900	<15	<14	<14	<13	<14	<14	<16	<19	<58	<15	<15	
Isopropyl Ether		<18	<16	<17	<15	<16	<16	<19	<23	<68	<18	<17	
Isopropylbenzene		<20	<18	<19	<17	<18	<18	<21	<25	<75	<2	<19	
Xylenes	4,100	<32	<29	<30	<28	<29	<30	<35	<41	<122	<33	<31	
n-Butylbenzene		<21	<19	<20	<18	<19	<20	<23	<27	161	<22	<21	
n-Propylbenzene		<17	<15	<16	<15	<15	<16	<18	<22	<64	<17	<16	
Naphthalene	400 <sup>GW</sup>	<45	<40	<43	<39	<41	<42	78	<58	<b>31,100</b>	102	<44	
p-Isopropyltoluene		<19	<17	<18	<16	<17	<17	<20	<24	<72	<19	<18	
sec-Butylbenzene		<20	<18	<19	<17	<18	<19	<22	<26	<77	<21	<20	
Toluene	1,500	<18	<16	<17	<15	<16	<16	<19	<22	<67	<18	<17	
PAHs, µg/kg													
1-Methylnaphthalene	23,000 <sup>GW</sup>	--	--	--	--	--	--	--	--	16,600	--	--	
2-Methylnaphthalene	20,000 <sup>GW</sup>	--	--	--	--	--	--	--	--	<b>26,700</b>	--	--	
Acenaphthene	38,000 <sup>GW</sup>	--	--	--	--	--	--	--	--	<b>56,300</b>	--	--	
Acenaphthylene	700 <sup>GW</sup>	--	--	--	--	--	--	--	--	<1,830	--	--	
Anthracene	3,000,000 <sup>GW</sup>	--	--	--	--	--	--	--	--	<b>71,400</b>	--	--	
Benzo (a) anthracene	3,920 <sup>DC</sup>	--	--	--	--	--	--	--	--	<b>42,500</b>	--	--	
Benzo (a) pyrene	392 <sup>DC</sup>	--	--	--	--	--	--	--	--	<b>25,900</b>	--	--	
Benzo (b) fluoranthene	3,920 <sup>DC</sup>	--	--	--	--	--	--	--	--	<b>28,200</b>	--	--	
Benzo (g,h,i) perylene	39,200 <sup>DC</sup>	--	--	--	--	--	--	--	--	5,850	--	--	
Benzo (k) fluoranthene	39,200 <sup>DC</sup>	--	--	--	--	--	--	--	--	11,600	--	--	
Chrysene	37,000 <sup>DC</sup>	--	--	--	--	--	--	--	--	<b>34,500</b>	--	--	
Dibenz (a,h) anthracene	392 <sup>DC</sup>	--	--	--	--	--	--	--	--	<b>2,860</b>	--	--	
Fluoranthene	500,000 <sup>GW</sup>	--	--	--	--	--	--	--	--	145,000	--	--	
Fluorene	100,000 <sup>GW</sup>	--	--	--	--	--	--	--	--	<b>67,400</b>	--	--	
Indeno (1,2,3-cd) pyrene	3,920 <sup>DC</sup>	--	--	--	--	--	--	--	--	<b>7,220</b>	--	--	
Naphthalene	400 <sup>GW</sup>	--	--	--	--	--	--	--	--	<b>94,000</b>	--	--	
Phenanthrene	1,800 <sup>GW</sup>	--	--	--	--	--	--	--	--	<b>231,000</b>	--	--	
Pyrene	2,346,429 <sup>DC</sup>	--	--	--	--	--	--	--	--	<b>121,000</b>	--	--	

Notes:

- RCRA Metals analyzed using EPA Method 6010 except for mercury which was analyzed using EPA Method 7471
- DRO = diesel range organic analyzed using the Wisconsin Modified Method
- VOCs = Volatile Organic Compounds analyzed using EPA Method 8260
- mg/kg = milligrams per liter (ppm)
- µg/kg = micrograms per liter (ppb)
- All samples collected by HNTB.
- RCL = Residual Contaminant Level. The RCL listed above for arsenic is the background arsenic concentration in southeastern Wisconsin soils according to USGS Professional Paper 1648. RCLs listed above for cadmium and chromium are the NR 720.11 non-industrial table value for the direct contact pathway (the total chromium sampling result is compared to the NR 720.11 RCL table value for hexavalent chromium in this table). The RCL listed for total lead is the lead cleanup level which the WDNR assigned to the Park East project in a 4/11/02 WDNR letter to the WisDOT. RCLs listed above for benzene, 1,2-dichloroethane, ethylbenzene, toluene and xylenes are the NR 720.09 table values for protection of groundwater. RCL listed for DRO is the more conservative NR 720.09 value. RCLs listed for PAHs (including naphthalene) are the more-stringent of a) the generic RCL listed in WDNR Publication RR-519-97 for the protection of groundwater and b) the direct contact RCL calculated using methodologies in WDNR Publication RR-519-97 and using the NR 720.19(5)(a) (target risk of 1 x 10<sup>-6</sup> or hazard quotient of 1). DC = non-industrial site direct contact pathway; GW = protection of groundwater.
- Samples above were analyzed by APL, Inc. in Milwaukee, Wisconsin; WDNR Certification #241340550
- Detections of analytes are bolded
- = not analyzed

# = NR 720 RCL Exceedance

Table 1c  
 Summary of Constituents Detected in Soil Samples  
 During November 2003 & April 2004 Investigations  
 Former Park East Freeway Redevelopment Area 3  
 City and County of Milwaukee, Wisconsin

	Non-Industrial RCL	GP-15	GP-16	GP-17	GP-18	GP-23	MW-124-1	MW-124-1	GP-48	GP-48	GP-48	GP-48	GP-48	GP-49
		6'-8' 11/5/03	6'-8' 11/5/03	6'-8' 11/5/03	6'-8' 11/5/03	4'-6' 11/6/03	6'-8' 11/6/03	6'-8' 11/6/03	14'-15' 11/6/03	0'-4' 4/21/04	4'-6' 4/21/04	6'-8' 4/21/04	8'-10' 4/21/04	8'-10' 4/21/04
Total Metals, mg/kg						11.5								
Chromium, Total	16,000					<0.501								
Chromium, Hexavalent	14													
Lead	250	507	132	13.3	145		65.9	7.36	11.5	208	440			10.6
Lead XRF Field Screening Result, mg/kg		253	68	0	125									
TCCLP Lead, mg/l		0.0136												
PAHs, µg/kg														
Acenaphthene	38,000 <sup>GW</sup>	<166	<112	<118	<112		322	<108						
Acenaphthylene	700 <sup>GW</sup>	<332	<224	<236	<224		<252	<216						
Anthracene	3,000,000 <sup>GW</sup>	<166	285	<118	<112		<126	<108						
Benzo (a) anthracene	3,920 <sup>DC</sup>	<83.0	487	<59.0	<56.1		212	<54.1						
Benzo (a) pyrene	392 <sup>DC</sup>	<8.30	520	20.1	36.7		183	23.5						
Benzo (b) fluoranthene	3,920 <sup>DC</sup>	<83.0	583	<59.0	<56.1		219	<54.1						
Benzo (g,h,i) perylene	39,200 <sup>DC</sup>	<166	326	<118	<112		148	<108						
Benzo (k) fluoranthene	39,200 <sup>DC</sup>	<166	245	<118	<112		<126	<108						
Chrysene	37,000 <sup>DC</sup>	<166	501	<118	<112		234	<108						
Dibenz (a,h) anthracene	392 <sup>DC</sup>	<8.30	89.5	<5.90	<5.61		23.5	<5.41						
Fluoranthene	500,000 <sup>GW</sup>	<166	1,300	<118	<112		727	<108						
Fluorene	100,000 <sup>GW</sup>	<166	171	<118	<112		<126	<108						
Indeno (1,2,3-cd) pyrene	3,920 <sup>DC</sup>	<83.0	341	<59.0	<56.1		157	<54.1						
1-Methylnaphthalene	23,000 <sup>GW</sup>	<166	<112	<118	<112		<126	<108						
2-Methylnaphthalene	20,000 <sup>GW</sup>	<166	<112	<118	<112		147	<108						
Naphthalene	400 <sup>GW</sup>	<166	<112	<118	<112		<126	<108						
Phenanthrene	1,800 <sup>GW</sup>	<166	806	<118	<112		368	<108						
Pyrene	2,346,429 <sup>DC</sup>	<166	570	<118	<112		228	<108						

Notes:  
 1. Total chromium analyzed using EPA Method 8010; hexavalent chromium analyzed using EPA Method 7196; lead analyzed using EPA Method 7421 or 63108  
 2. PAHs = polycyclic aromatic hydrocarbons analyzed using EPA Method 8310  
 3. mg/kg = milligrams per kilogram  
 4. µg/kg = micrograms per kilogram  
 5. All samples collected by RMT, Inc.  
 6. RCL = Residual Contaminant Level. RCLs listed above for chromium are the NR 720.11 non-industrial table values for the direct contact pathway. The RCL listed for total lead is the lead cleanup level which the WDNR assigned to the Park East project in a 7/11/02 WDNR letter to the WisDOT. RCLs listed for PAHs (including naphthalene) are the more-stringent of the generic RCL listed in WDNR Publication RR-519-97 for protection of groundwater and b) the direct contact RCL calculated using methodologies in WDNR Publication RR-519-97 and using the NR 720.19(5)(a) (target risk of 1 x 10<sup>-6</sup> or hazard quotient of 1). DC - non-industrial site direct contact pathway; GW - protection of groundwater.  
 7. Samples above were analyzed by Great Lakes Analytical in Oak Creek, Wisconsin (WDNR Certification #3100MS03) and in Buffalo Grove, Illinois (WDNR Certification #999917161)  
 8. Detections of analytes are bolded  
 9. ... not analyzed

**#** = NR 720 RCL Exceedance

Table 1c  
 Summary of Constituents Detected in Soil Samples  
 During November 2003 & April 2004 Investigations  
 Former Park East Freeway Redevelopment Area 3  
 City and County of Milwaukee, Wisconsin

	Non-Industrial RCL	GP-49	GP-49	GP-53	GP-53	GP-54	GP-55	GP-56	GP-57	GP-58	GP-59	GP-60
		4' - 6' 4/21/04	6' - 8' 4/21/04	6' - 8' 6/4/04	8' - 10' 6/4/04	6' - 8' 6/4/04	6' - 8' 6/4/04	8' - 10' 6/4/04	8' - 10' 6/4/04	8' - 10' 6/4/04	10' - 12' 6/4/04	8' - 10' 6/4/04
Total Metals, mg/kg												
Chromium, Total	16,000											
Chromium, Hexavalent	14											
Lead	250	550	8.75	132	144	69.1	9.54	224	18.6	428	24.0	239
Lead XRF Field Screening Result, mg/kg												
TCCLP Lead, mg/l												
PAHs, µg/kg												
Acenaphthene	38,000 <sup>GW</sup>											
Acenaphthylene	700 <sup>GW</sup>											
Anthracene	3,000,000 <sup>GW</sup>											
Benzo (a) anthracene	3,920 <sup>DC</sup>											
Benzo (a) pyrene	392 <sup>DC</sup>											
Benzo (b) fluoranthene	3,920 <sup>DC</sup>											
Benzo (g,h,i) perylene	39,200 <sup>DC</sup>											
Benzo (k) fluoranthene	39,200 <sup>DC</sup>											
Chrysene	37,000 <sup>DC</sup>											
Dibenz (a,h) anthracene	392 <sup>DC</sup>											
Fluoranthene	500,000 <sup>GW</sup>											
Fluorene	100,000 <sup>GW</sup>											
Indeno (1,2,3-cd) pyrene	3,920 <sup>DC</sup>											
1-Methylnaphthalene	25,000 <sup>GW</sup>											
2-Methylnaphthalene	20,000 <sup>GW</sup>											
Naphthalene	400 <sup>GW</sup>											
Phenanthrene	1,800 <sup>GW</sup>											
Pyrene	2,346,429 <sup>DC</sup>											

Notes:  
 1. Total Chromium analyzed using EPA Method 6010; hexavalent chromium analyzed using EPA Method 7196; lead analyzed using EPA Method 7221 or 6010B  
 2. PAHs - polycyclic aromatic hydrocarbons analyzed using EPA Method 8310  
 3. mg/kg - milligrams per liter (ppm)  
 4. µg/kg - micrograms per liter (ppb)  
 5. RCL - Remedial Action Level  
 6. RCL - Remedial Compliance Level. RCLs listed above for chromium are the NR 720.11 site-specific RCL values for the direct contact pathway. The RCL listed for total lead is the lead element level which the WDNR assigned to the Park East project on 4/11/03. WDNR RCLs listed for PAHs (including naphthalene) are the maximum of a) the generic RCL listed in WDNR Publication BR-519-97 for protection of groundwater and b) the direct contact RCL calculated using methodologies in WDNR Publication BR-519-97 and using the NR 720.19(5)(6) target risk of 1 x 10<sup>-6</sup> or hazard quotient of 1. DC - non-hazardous site direct contact pathway; GW - protection of groundwater.  
 7. Samples above were analyzed by Great Lakes Analytical in Oak Creek, Wisconsin (WDNR Certification #S4100230) and in Radnor Grove, Illinois (WDNR Certification #99997166)  
 8. Detectable analytes are indicated  
 9. ... not analyzed

# = NR 720 RCL Exceedance

**Table 3**  
**Summary of Constituents Detected in Groundwater Samples During November 2003 Investigation**  
**Former Park East Freeway Redevelopment Area 3**  
**City and County of Milwaukee, Wisconsin**

	NR 140 Standard		Well Identification		
	ES	PAL	11/7/03	MW-124-1	
				11/7/03	3/31/04
<b>Total Metals, mg/l</b>					
Arsenic	50	5	<0.00500	--	<0.00500
Barium	2,000	400	<0.400	--	<0.400
Cadmium	5	0.5	<0.000500	--	<0.000500
Chromium, Total	100	10	<0.0100	--	<0.0100
Lead	15	1.5	<0.00150	--	<0.00150
Mercury	2	0.2	<0.000200	--	<0.000200
Selenium	50	10	<0.0100	--	<0.0100
Silver	50	10	<0.0100	--	<0.0100
<b>VOCs (ug/l)</b>					
Benzene	5	0.5	<0.352	<0.352	<0.500
Chloroethane	400	80	<5.00	<5.00	<5.00
Chloroform	6	0.6	<0.463	<0.463	<0.316
1,1-Dichloroethane	850	85	<5.00	<5.00	<5.00
1,2-Dichloroethane	5	0.5	<0.240	<0.240	<0.500
1,1-Dichloroethene	7	0.7	<0.414	<0.414	<0.500
cis-1,2-Dichloroethene	70	7	<5.00	<5.00	<5.00
trans-1,2-Dichloroethene	100	20	<5.00	<5.00	<5.00
Methylene Chloride	5	0.5	<0.641	<0.641	<0.386
Tetrachloroethene	5	0.5	<0.479	<0.479	<0.500
1,1,1-Trichloroethane	200	40	<5.00	<5.00	<5.00
Trichloroethene	5	0.5	<0.396	<0.396	<0.500
Vinyl Chloride	0.2	0.02	<0.652	<0.652	<0.217

**Notes:**  
1. Arsenic analyzed using EPA Method 7060; barium, chromium and silver analyzed using EPA Method 6010; cadmium analyzed using EPA Method 7131; lead analyzed using EPA Method 7421; mercury analyzed using EPA Method 7470; and, selenium analyzed using EPA Method 7740  
2. mg/l = milligrams per liter (ppm)  
3. VOCs = Volatile Organic Compounds analyzed using EPA Method 8260  
4. mg/l = micrograms per liter (ppb)  
5. Only compounds that have been detected in any of the above wells are shown here.  
6. NR 140 ES = Wisconsin Administrative Code Chapter NR 140 Enforcement Standard  
7. NR 140 PAL = Wisconsin Administrative Code Chapter NR 140 Preventive Action Limit  
8. Detections of analytes are bolded  
9. Samples above were analyzed by Great Lakes Analytical in Oak Creek, Wisconsin (WDNR Certification #4-100330) and in Buffalo Grove, Illinois (WDNR Certification #999171R)

**#** = NR 140 ES exceedance

**Table 1b**  
**Summary of Constituents Detected in Soil Samples - June 26, 2003 Sampling Event**  
**Former Park East Freeway Redevelopment Area 3**  
**City and County of Milwaukee, Wisconsin**

	Non-Industrial RCL	TP-10	TP-11	TP-12	TP-14	TP-15	TP-19	TP-13	TP-16	TP-17	TP-18
		10'	5'	5'	5'	5'	6'	5'	10'	10'	10'
		6/26/03	6/26/03	6/26/03	6/26/03	6/26/03	6/26/03	6/26/03	6/26/03	6/26/03	6/26/03
<b>Metals (mg/kg)</b>		<b>(Composite Sample)</b>			<b>(Composite Sample)</b>			<b>(Composite Sample)</b>			
Arsenic	5	3.33			<2.81			<3.00			
Barium		114			51.3			62.5			
Cadmium	8	<0.648			<0.562			<0.601			
Chromium, Total	14	12.8			16.1			10.1			
Lead	250	132			9.34			135			
Mercury		0.0607			0.0520			0.579			
Selenium		<3.24			<2.81			<3.00			
Silver		<3.24			<2.81			<3.00			
DRO, mg/kg	100	18.4	21.5	13.0	12.7	8.77	<5.86	13.9	10.0	10.1	31.9
GRO, mg/kg	100	<5.79	<5.79	<7.19	<5.87	<6.17	<5.86	<5.71	<5.92	<5.83	<5.74
<b>VOCs, µg/kg</b>											
Trimethylbenzenes		<50	<50	--	--	<50	31.8	<50	--	<50	--
1,2-Dichlorobenzene		<25	<25	--	--	<25	<25	<25	--	<25	--
Benzene	5.5	<25	<25	--	--	<25	<b>90.7</b>	<25	--	<b>284</b>	--
Ethylbenzene	2,900	<25	<25	--	--	<25	138	<25	--	50.2	--
Isopropyl Ether		<25	<25	--	--	<25	<25	<25	--	<25	--
Isopropylbenzene		<25	<25	--	--	<25	<25	<25	--	29.1	--
Xylenes	4,100	<25	30	--	--	<25	45	<25	--	60	--
n-Butylbenzene		<25	<25	--	--	<25	<25	<25	--	117	--
n-Propylbenzene		<25	<25	--	--	<25	<25	<25	--	<25	--
Naphthalene	400 <sup>GW</sup>	40.2	108	--	--	<25	382	42.5	--	161	--
p-Isopropyltoluene		<25	<25	--	--	<25	<25	<25	--	36.7	--
sec-Butylbenzene		<25	<25	--	--	<25	<25	<25	--	<25	--
Toluene	1,500	<25	<25	--	--	<25	<25	<25	--	<25	--
<b>PAHs, µg/kg</b>											
1-Methylnaphthalene	23,000 <sup>GW</sup>	--	--	--	--	<128	--	--	--	--	--
2-Methylnaphthalene	20,000 <sup>GW</sup>	--	--	--	--	<128	--	--	--	--	--
Acenaphthene	38,000 <sup>GW</sup>	--	--	--	--	<128	--	--	--	--	--
Acenaphthylene	700 <sup>GW</sup>	--	--	--	--	<128	--	--	--	--	--
Anthracene	3,000,000 <sup>GW</sup>	--	--	--	--	<128	--	--	--	--	--
Benzo (a) anthracene	3,920 <sup>DC</sup>	--	--	--	--	79.8	--	--	--	--	--
Benzo (a) pyrene	392 <sup>DC</sup>	--	--	--	--	72.4	--	--	--	--	--
Benzo (b) fluoranthene	3,920 <sup>DC</sup>	--	--	--	--	65.0	--	--	--	--	--
Benzo (g,h,i) perylene	39,200 <sup>DC</sup>	--	--	--	--	<128	--	--	--	--	--
Benzo (k) fluoranthene	39,200 <sup>DC</sup>	--	--	--	--	<128	--	--	--	--	--
Chrysene	37,000 <sup>DC</sup>	--	--	--	--	<128	--	--	--	--	--
Dibenz (a,h) anthracene	392 <sup>DC</sup>	--	--	--	--	<6.41	--	--	--	--	--
Fluoranthene	500,000 <sup>GW</sup>	--	--	--	--	253	--	--	--	--	--
Fluorene	100,000 <sup>GW</sup>	--	--	--	--	<128	--	--	--	--	--
Indeno (1,2,3-cd) pyrene	3,920 <sup>DC</sup>	--	--	--	--	<64.1	--	--	--	--	--
Naphthalene	400 <sup>GW</sup>	--	--	--	--	<128	--	--	--	--	--
Phenanthrene	1,800 <sup>GW</sup>	--	--	--	--	<128	--	--	--	--	--
Pyrene	2,346,429 <sup>DC</sup>	--	--	--	--	206	--	--	--	--	--

**Notes:**

1. RCRA Metals analyzed using EPA Method 6010 except for mercury which was analyzed using EPA Method 7471 [CONFIRM]
2. DRO = diesel range organic analyzed using the Wisconsin Modified Method
3. VOCs = Volatile Organic Compounds analyzed using EPA Method 8260 [CONFIRM]
4. mg/kg = milligrams per liter (ppm)
5. µg/kg = micrograms per liter (ppb)
6. RCL = Residual Contaminant Level. The RCL listed above for arsenic is the background arsenic concentration in southeastern Wisconsin soils according to USGS Professional Paper 1648. RCLs listed above for cadmium and chromium are the NR 720.11 non-industrial table value for the direct contact pathway (the total chromium sampling result is compared to the NR 720.11 RCL table value for hexavalent chromium in this table). The RCL listed for total lead is the lead cleanup level which the WDNR assigned to the Park East project in a 4/11/02 WDNR letter to the WisDOT. RCLs listed above for benzene, 1,2-dichloroethane, ethylbenzene, toluene and xylenes are the NR 720.09 table values for protection of groundwater. RCL listed for DRO is the more conservative NR 720.09 value. RCLs listed for PAHs (including naphthalene) are the more-stringent of a) the generic RCL listed in WDNR Publication RR-519-97 for the protection of groundwater and b) the direct contact RCL calculated using methodologies in WDNR Publication RR-519-97 and using the NR 720.19(5)(a) (target risk of  $1 \times 10^{-6}$  or hazard quotient of 1). DC - non-industrial site direct contact pathway; GW - protection of groundwater.
7. Samples above were analyzed by APL, Inc. in Milwaukee, Wisconsin; WDNR Certification #241340550 [CONFIRM]
8. Detections of analytes are bolded
9. -- not analyzed

**#** = NR 720 RCL Exceedance