

LETTER OF TRANSMITTAL

To: **Victoria Stovall**
 Wisconsin Department of Natural Resources
 2300 N. Dr. Martin Luther King, Jr. Drive
 Milwaukee, WI 53212-3128

From: **Stephen Meer, P.E.**
Sigma Environmental Services, Inc.
 1300 W. Canal St.
 Milwaukee, WI 53233

Date: August 29, 2011
 Site Name: 1136 E. North Avenue
 Address: 1136 E. North Avenue
Milwaukee, WI
 FID# _____
 BRRTS # _____

Please check the type(s) of documents you have enclosed. Submittals will be tracked and filed based on the information you provide. **Include the FID and BRRTS numbers which have been assigned to this site, and identify the intent of the document(s) you are submitting in order to speed processing.** Please attach any required fees to this checklist.

IS THIS RELEASE PECFA-ELIGIBLE?
 YES NO UNKNOWN AT THIS TIME

Type of Submittal:
 LUST ERP VPLE OTHER

CHECK	TYPE OF DOCUMENT / REPORT	FEE	DNR CODE (office use only)
	Notification of Release	none	01
	Tank Closure/Site Assessment <i>where release(s) have been detected*</i>	none	33
	Site Investigation Workplan	\$500 if review is requested ~	35, 135~
x	Site Investigation Report Please Provide the Following Information	\$750 if review is requested ~	37, 137~
	<input type="checkbox"/> petroleum constituents detected		96~
	<input checked="" type="checkbox"/> non-petroleum constituents detected		(if SI is incomplete)
	<input type="checkbox"/> groundwater impacts <input type="checkbox"/> above PAL <input type="checkbox"/> above ES		
	<input type="checkbox"/> free product		
	<input type="checkbox"/> contamination in fractured bedrock or within 1 meter of fractured bedrock		
	<input type="checkbox"/> PAL exceedance in potable well		
	<input type="checkbox"/> groundwater impacts >ES, within <input type="checkbox"/> 100' of private well or <input type="checkbox"/> 1,000' of public well		
	Request to Transfer Case to Department of Commerce	none	76
	Off-Site Determination Request	\$500 mandatory	638~
x	Remedial Action Options Plan	\$750 if review is requested	39, 143~
	NR 720.19 Site Specific Clean-Up Goal Proposed	\$750 if review is requested	67, 68~
	NR 718 Landspreading Request	\$500 mandatory	61~
	Copy of Notification to Treat or Dispose of Contamination Soil or Water	none	99
	Injection/Infiltration Request	\$500 mandatory	63~
	Quarterly Report or Update	\$500 if review is requested	43~
	O&M Form 4400-194	\$300 if review is requested	92, 192~
	Remedial Action Options Report	\$750 if review is requested	41, 41~
	Closure Review Request	\$750 mandatory	79~
	<input type="checkbox"/> Closure Form (Mandatory For Review)		
	<input type="checkbox"/> GIS Registry groundwater greater >ES	\$250 mandatory	700
	Request for No Further Action Letter, under ch. NR 708	\$250 mandatory	68, 67~
	Copy of Draft Deed Affidavit, Well Abandonment Form Restriction	none	99
	Simple Site Process Submittal Under NR 700.11	none	90~
	Remedial Design Report	\$750 if review is requested	147, 148~
	Construction Documentation Reports	\$250 if review is requested	151, 152~
	Long Term Monitoring Plan	\$300 if review is requested	24, 25~
	Voluntary Party Liability Exemption (VPLE) Application	\$250 mandatory	662~
	VPLE Phase I/II Assessments or Additional Reports	Computed hourly	99
	Tax Cancellation Agreement	\$500 mandatory	654~
	Negotiated Agreement	\$1,000 mandatory	630~
	Lender Assessment	\$500 mandatory	686~
	Negotiation and Cost Recovery (municipalities only) Fee for each service	mandatory	90~
	General Liability Clarification Request	\$500 mandatory	684
	Lease Letter Request - Single Property	\$500 mandatory	646
	Lease Letter Request - Multiple Properties	\$1,000 mandatory	646
	Request for Other Technical Assistance	\$500 mandatory	97~
	Other (please describe): Soil GIS registry fee		

* Closure reports for sites where no releases have been detected should be sent directly to "Clean Closures" c/o DNR Remediation & Redevelopment Program, P.O. Box 7921, Madison, WI 53707

Remarks: _____

August 29, 2011

Project Reference #12910

Ms. Victoria Stovall
Program Assistant, WDNR
2300 N. Martin Luther King Drive
Milwaukee, WI 53212

RE: Site Investigation Report
1136 E. North Avenue, Milwaukee, Wisconsin
Remedial Action Plan
1132 – 1164 E. North Avenue, Milwaukee, Wisconsin

Dear Ms. Stovall:

Enclosed is a document summarizing site investigation activities completed at the property located at 1136 E. North Avenue, Milwaukee, Wisconsin. Also enclosed is a document presenting a remedial action plan for the properties located at 1132 to 1164 E. North Avenue, Milwaukee, Wisconsin. A \$750 check for the required review fee is also attached.

A release notification form was submitted for the 1136 E. North Avenue property on August 24, 2011. As of the date of this letter, the ERP BRRTS number assigned to the site is unknown. However, this submittal should be tracked under the ERP BRRTS number.

If you have any questions, please contact me at 414-643-4124.

Sincerely,

SIGMA ENVIRONMENTAL SERVICES, INC.



Stephen Meer, P.E.
Project Engineer

Attachments

cc: Mr. John Hnat – WDNR
Ms. Karen Dettmer, P.E. – City of Milwaukee, Department of City Development
Mr. Todd Davies – HD Development

SIGMA ENVIRONMENTAL SERVICES, INC.

1300 WEST CANAL STREET
MILWAUKEE, WI 53233

PNC BANK



70.2189-719

CHECK DATE August 26, 2011

PAY Seven Hundred Fifty and 00/100 Dollars

AMOUNT \$750.00

TO Wisconsin DNR

David J. Seibel
AUTHORIZED SIGNATURE

⑈00060099⑈ ⑆071921891⑆ 4643695369⑈

SIGMA ENVIRONMENTAL SERVICES, INC.

60099

Invoice Number	Date	Voucher	Amount	Discounts	Previous Pay	Net Amount
12910 SI rpt review	8/24/11	23298	750.00	0.00	0.00	750.00
Wisconsin DNR PNC 36	E250004	Totals	750.00	0.00	0.00	750.00

Security features. Details on back.

REMEDIAL ACTION PLAN
1150 NORTH DEVELOPMENT
1132 – 1164 EAST NORTH AVENUE
MILWAUKEE, WISCONSIN

PREPARED FOR:

CITY OF MILWAUKEE – DEPARTMENT OF CITY DEVELOPMENT
809 NORTH BROADWAY
MILWAUKEE, WISCONSIN 53202

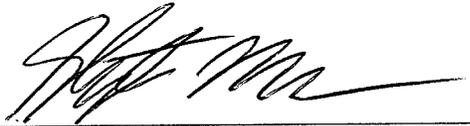
HD DEVELOPMENT
5852 NORTH SHORE DRIVE
MILWAUKEE, WISCONSIN 53217

PREPARED BY:

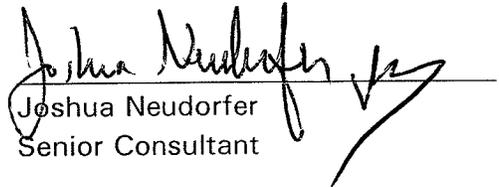

Single Source. Sound Solutions. GROUP
1300 WEST CANAL STREET
MILWAUKEE, WISCONSIN 53233
(414) 643-4200

PROJECT REFERENCE #12053

AUGUST 2011



Stephen Meer, P.E.
Project Engineer



Joshua Neudorfer
Senior Consultant



Randy Boness, P.G.
Geosciences Group Manager

TABLE OF CONTENTS

	<u>Page</u>
1. INTRODUCTION	1
2. BACKGROUND INFORMATION	1
2.1 Project Location	1
2.2 Project Team	1
2.3 Historical Operations	2
2.4 Current Property Conditions	2
2.5 Phase I Environmental Site Assessment	2
3. SITE INVESTIGATION RESULTS	4
4. REMEDIAL ACTION PLAN	6
4.1 Remedial Action Objectives	6
4.2 Proposed Redevelopment Plan	6
4.3 Soil Management Plan	7
4.4 Institutional Controls	8
4.5 Reporting	8
5. RECOMMENDATIONS	8

TABLE OF CONTENTS
(Continued)

Tables

1. Soil Analytical Results
2. Groundwater Analytical Results

Figures

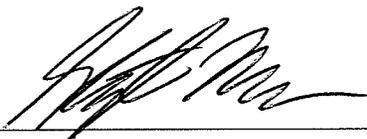
1. Site Location Map
2. Site Plan Map
3. Boring Location Map

Appendices

- A. Subject Property Legal Descriptions
- B. Proposed Site Plan

CERTIFICATIONS

"I, Stephen R. Meer, hereby certify that I am a registered professional engineer in the State of Wisconsin, registered in accordance with the requirements of ch. A-E 4, Wis. Adm. Code; that this document has been prepared in accordance with the Rules of Professional Conduct in ch. A-E 8, Wis. Adm. Code; and that, to the best of my knowledge, all information contained in this document is correct and the document was prepared in compliance with all applicable requirements in chs. NR 700 to 726, Wis. Adm. Code."

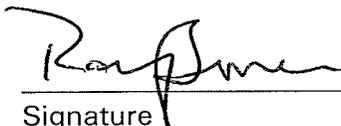


Signature
Project Engineer

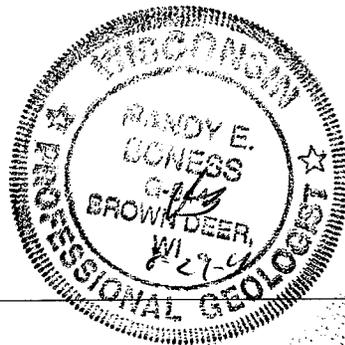


Date and State

"I, Randy E. Boness, hereby certify that I am a registered professional geologist in the State of Wisconsin, registered in accordance with the requirements of ch. A-E 10, Wis. Adm. Code; that this document has been prepared in accordance with the Rules of Professional Conduct in ch. A-E 8, Wis. Adm. Code; and that, to the best of my knowledge, all information contained in this document is correct and the document was prepared in compliance with all applicable requirements in chs. NR 700 to 726, Wis. Adm. Code."



Signature
Geosciences Group Leader



1. INTRODUCTION

Sigma Environmental Services, Inc. (Sigma) was retained by the City of Milwaukee to complete a Supplemental Phase II Environmental Site Assessment/Site Investigation for the property located at 1136 – 1146 E. North Avenue, Milwaukee, Wisconsin (hereinafter the "Site"). Sigma prepared a Site Investigation Report (SI) as a separate document. Sigma has prepared this Remedial Action Plan (RAP) in general accordance with Wisconsin Administrative Code (WAC) Chapters NR 700 through NR 724 requirements. This RAP includes background information about the project site, a brief summary of site investigation findings, remedial action objectives, and then presents the recommended remedial actions. Sigma and the City of Milwaukee are seeking the Wisconsin Department of Natural Resources' (WDNR's) review and approval of this RAP.

An updated Application for an Exemption to Build on a Historic Fill Site associated with the proposed redevelopment will also be submitted to the WDNR under a separate cover.

2. BACKGROUND INFORMATION

2.1 Project Location. The site is located in the southwest ¼ of the southeast ¼ of Section 16, Town 7 North, Range 22 East in the City of Milwaukee, Milwaukee County as shown in **Figure 1**. The subject property consists of three adjacent parcels of land. An approximate 0.09-acre parcel located at 1132 East North Avenue, an approximate 1.42-acre parcel located at 1136 East North Avenue and an approximate 0.44-acre parcel located at 1164 East North Avenue all in the City of Milwaukee, Milwaukee County, Wisconsin. Legal descriptions and GIS Images of the subject property parcels, obtained from Milwaukee County, are included in **Appendix A** of this report. The subject property location is presented on **Figures 1 and 2**.

2.2 Project Team. The following parties involved in this project include:

Property Owner:

1136 E. North Avenue:
City of Milwaukee
809 N. Broadway
Milwaukee, WI 53202
Contact: Ms. Karen Dettmer, P.E.

1132 & 1164 E. North Avenue:
HD Development
5852 North Shore Drive
Milwaukee, WI 53217
Telephone: (414) 232-6500
Contact: Mr. Todd Davies

Developer:

HD Development
5852 North Shore Drive
Milwaukee, WI 53217
Telephone: (414) 232-6500
Contact: Mr. Todd Davies

Environmental Consultant:

Sigma Environmental Services, Inc.
1300 West Canal Street
Milwaukee, WI 53233
Telephone: (414) 643-4132
Contact: Mr. Joshua Neudorfer

- 2.3 Historical Operations.** Historical occupants of the subject property parcels included residential occupants at the 1132 East North Avenue parcel and Tews Lime & Cement Company, Western Brick Company, Ricketson & Schwartz Inc (brick) and City of Milwaukee Sanitation Bureau at the 1136 East North Avenue parcel. No listings were found for the 1164 East North Avenue parcel.

A review of aerial photographs indicated that a residence was located on the 1132 East North Avenue parcel in the 1937 through 1992 photographs. The residence is no longer depicted in the 2005 and 2008 photographs. Structures were present on the 1136-1164 parcels in the 1937 through 1969 photographs. The 1979 through 2008 photographs depicts the parcels as mainly undeveloped with one structure remaining on the north end of the 1136 parcel. Railroad tracks are present on the east side of the property in the 1937 through 1969 photographs. The railroad tracks appear to be abandoned in the 1979 photograph.

The Wisconsin Ice & Coal Bulk Plant was formerly located on the adjacent property to the east of the site (2340 North Commerce Street, also known as 1194 East North Avenue). The 1194 East North Avenue site (BRRTS# 03-41-544964) has been redeveloped as student housing associated with the University of Wisconsin-Milwaukee and received case closure from the WDNR in 2008.

- 2.4 Current Property Conditions.** The site is currently vacant with a single story concrete block garage building located on the 1136 E. North Avenue parcel. The site is currently covered with a mixture of vegetation, grass, gravel, asphalt pavement and concrete pavement. Based on the information obtained from site surveys completed to date, the elevation of the site slopes from approximately 660 feet MSL on the west to approximately 644 feet MSL on the east.
- 2.5 Phase I Environmental Site Assessment.** Sigma completed a Phase I ESA of the subject property in July 2011. A copy of the text portion of the Phase I ESA was

included with the SI. Phase I identified the following Recognized Environmental Conditions (RECs) associated with the subject property:

- The subject property was identified as a registered Underground Storage Tank (UST) site with an 800-gallon leaded gasoline UST and a 500-gallon waste motor oil UST closed/removed on July 11, 1990. An EDR UST database review performed for the Phase I completed in 2006 by Earth Tech indicated that four USTs were located and removed from the property. A 500-gallon waste oil tank and two 800-gallon leaded gasoline tanks closed/removed on July 11, 1990 and a 500-gallon tank closed/removed on August 2, 1990. No further information regarding the tank closures was available. The subject property could have been negatively impacted by a release from the UST systems.
- A review of City of Milwaukee building inspection records indicated that a 10,000-gallon oil tank was installed at the subject property in 1960. It appears that the tank was removed in 1972; however, the removal could not be confirmed. Closure assessment information from the tank removal was not available; therefore, a release from the UST system could have negatively impacted the subject property.
- Mr. Todd Davies, owner of the 1132 and 1164 East North Avenue parcels, reported that the subject property is required to comply with a soils management plan that was approved for the adjacent property (1194 East North Avenue).
- A Phase I report prepared by Earth Tech in 2006 for the subject property identified "a large volume of reportedly contaminated soil" was covered and stockpiled on the subject property. The stockpiled soil was not evident during the site visit conducted by Sigma; however, it appeared that a grassy area on the northwest corner of the property was not natural to the site. The contaminated soil that was stockpiled on the property could have negatively impacted the subject property.
- Historical records indicate a railroad spur was present along the eastern property boundary. Contamination associated with historical loading and unloading practices is common along railroad spurs. The subject property could have been negatively impacted by a release along the railroad spur.
- Historical records indicate a pit for holding unidentified products was present near the former railroad tracks. Additionally, the subject property was historically occupied by the Tews Lime and Cement Company and the City of Milwaukee Sanitation Bureau. Historical activities performed at the subject property could have negatively impacted the subject property.

3. SITE INVESTIGATION RESULTS

A detailed discussion of the site investigation activities completed to date and the results of those site investigation activities was included in the SI prepared by Sigma. The site investigation results are summarized as follows:

- Subsurface lithology at the site consists of a surficial layer of fill soils underlain by native silts, sands, and clays. In general, fill soils extended to depths ranging between 8 to 12 feet below ground surface. Fill material consisted of a mixture of reworked silts and clays, sands, and sandy silt with traces of brick fragments and cinders at select boring locations.
- Perched groundwater was identified at a depth of approximately 10 feet bgs at monitoring well MW-1. Shallow groundwater appears to be located at depths greater than 30 feet bgs.
- Naphthalene was reported at concentrations greater than ch. NR 720 Residual Contaminant Levels (RCLs) for the protection of groundwater pathway within the soil samples collected from EDS soil borings P-1, P-2, and P-4. Diesel Range Organics (DRO) was also reported at concentrations greater than the ch. NR 720 RCL within the soil samples collected from EDS soil borings P-2 and P-4. The reported naphthalene and DRO concentrations appear to be associated with shallow fill material at the site.
- One or more Polynuclear Aromatic Hydrocarbon (PAH) constituents were reported at concentrations greater than the generic RCL for direct contact at a non-industrial site within the soil samples collected from EDS soil borings P-1 through P-4, P-6 and P-7, and from Sigma soil borings B-9, B-11, and B-12. The reported PAH concentrations appear to be associated with shallow fill material identified at the site.
- Arsenic was reported at concentrations greater than the generic RCL for direct contact at non-industrial site within all soil samples submitted for laboratory analysis of RCRA metals, however, the reported arsenic concentrations were less than 10 mg/kg and within the background range typically encountered at urban sites in southeastern Wisconsin.
- Concentrations of lead greater than the non-industrial direct contact RCL were reported within soil samples collected from EDS borings P-1 and Sigma soil borings B-8 and B-9. The elevated lead concentrations appear to be associated with shallow fill material present at the site.
- Grab groundwater samples collected from the site by EDS in 2006 contained reported concentrations of select PAH constituents (benzo(b)fluoranthene, benzo(a)pyrene, and chrysene) greater than ch. NR 140 Enforcement Standards (ESs) and select PAH constituents and lead greater than ch. NR 140 Preventive Action Limits (PALs). The grab groundwater samples were collected from temporary groundwater monitoring wells and were collected for screening purposes only.

- The groundwater sample collected from MW-1 during Sigma's Phase II activities contained a reported concentration of cadmium greater than the ch. NR 140 PAL. No Volatile Organic Compound (VOC) or PAH constituents were reported at concentrations greater than applicable ch. NR 140 PALs.

Based on the information provided in the Phase I ESA, a release was previously reported for the subject property associated with former USTs removed from the site in 1990. The WDNR issued case closure for the release associated with the former USTs in 1992. No impacts associated with the former USTs were identified during the Phase II/SI activities completed by Sigma.

The apparently non-native soil pile identified in the Phase I ESA was characterized by Sigma's soil boring B-12. Based on the analytical results, the non-native soil pile contains elevated concentrations of select PAH constituents that are typical of fill material present at other areas of the site.

Based on the presence, nature, and extent of fill material observed at the site and the nature of the subsurface impacts, the identified PAH and lead impacts appear to be associated with fill material present at the site and not with a specific "release". Nevertheless, a release has been reported for the subject site in order to enter the ch NR 700-726 tracking process and achieve closure under ch NR 726 for identified impacts at the site.

The naphthalene impact identified during EDS's previous investigation activities appears to be limited to shallow fill/soil material. The identified naphthalene concentrations within fill/soil material have not significantly impacted shallow groundwater beneath the site. Based on the degree and extent of naphthalene impacts identified to date, the residual naphthalene impacts are not expected to pose a vapor intrusion risk to the proposed redevelopment.

PAH and lead concentrations greater than RCLs for the residential direct contact pathway appear to be more widespread across the site and also associated with fill material.

Although concentrations of naphthalene and select PAH constituents were identified greater than protection of groundwater RCLs in soil samples collected by EDS, naphthalene was not detected greater than ch. NR 140 ESs within groundwater samples collected from the site. The risk posed by potential groundwater impact of other PAH constituents is low – there are currently no standards for benzo(a)anthracene, acenaphthene, 2-methylnaphthalene or phenanthrene in groundwater under ch NR 140. Cadmium has been reported within groundwater samples collected at the site at concentrations greater than the ch. NR 140 PAL but below the ES. In addition, potential risk to human health via migration to groundwater for the site is very low as the City of Milwaukee supplies residents with treated water originating in Lake Michigan.

Therefore, the primary risk to human health and the environment at the site is the direct contact risk for PAH and lead impacts associated with fill material at the site. Despite the presence of VOC and PAH concentrations greater than protection of

than protection of groundwater RCLs, perched groundwater beneath the site has not been impacted at concentrations greater than ch. NR 140 ESs within groundwater samples collected from ch. NR 141-compliant monitoring wells and no further action with respect to groundwater is warranted.

4. REMEDIAL ACTION PLAN

4.1 **Remedial Action Objectives.** The remedial action objectives associated with the site include the following:

- Prevent exposure by human receptors to residual soil impacts in the shallow subsurface. The direct contact exposure route includes dermal contact, ingestion, and/or inhalation of vapors.
- Limit the potential for identified residual soil impacts to negatively impact shallow groundwater beneath the site.

As discussed in the Phase I ESA report, the WDNR has approved a general soil management plan/remedial action approach for the adjacent property (1194 East North Avenue) that also includes the subject property. The proposed remedial action will, in general, conform to the WDNR approved approach for managing existing site materials during site redevelopment activities.

4.2 **Proposed Redevelopment Plan.** As discussed above, HD Development is currently planning to redevelop the site beginning in 2012 as residential housing with lower-level parking, and space for commercial occupation within the lower level, and additional surface parking areas. The proposed site plan is included as **Appendix B**.

Due to the presence of fill material identified at the site, an Application for Exemption to Build on a Historic Fill Site, along with supporting information, will be submitted to the WDNR under separate cover.

The proposed development requires that the elevation of the site, particularly within the central portion of the property, be raised (the proposed elevation of the surface level parking area is approximately 4 to 11 feet above the current ground surface within the central portion of the site). The elevation change will be accomplished by importing clean fill material along with cutting the elevation along the southwestern and southern property boundary and transferring a portion of the cut material that is suitable for re-use to the central/north central part of the site.

Soil Remediation Actions. Residual PAH and lead impacts greater than direct contact and/or protection of groundwater RCLs have been identified in the shallow fill material/soils beneath portions of the site.

As part of the proposed site redevelopment, concrete and asphalt used for parking areas, sidewalks, building floor slab and foundations will be placed as designed by others (site development engineers and architects). Green space areas (grass, landscaping areas, etc.) will be covered by a warning layer of geotextile fabric and

18 inches of clean, imported fill or clean imported topsoil. All land surfaces within the site will be covered by one of these two types of engineered barriers. The engineered barriers will prevent direct contact with remaining fill/soil impacts that exceed the direct contact pathway.

Barrier Operation and Maintenance Plan. A Barrier Operation and Maintenance Plan for maintenance of the engineered barriers will be prepared and submitted following completion of the proposed remedial actions.

4.3 Soil Management Plan. Excavation activities will occur for the purpose of foundation and utility construction for the site redevelopment. In addition, cut material from the southwestern and southern portions of the site is proposed for re-use as fill material in the north-central portion of the site, assuming geotechnical suitability. Handling and placement of the excavated and cut soils, soil sampling, and installation of engineered barriers will be documented per the requirements of the RAP approval and Exemption to Build on a Historic Fill Site. The general soil sampling protocol requirement of ch. NR 718 will include collecting confirmation samples of excavated soils during relocation at the site and submitting the samples for laboratory analyses of PAHs and lead. The confirmation samples will be collected to document the soil conditions at the time of placement and provide current information for the case closure request. During soil excavation activities, the following items shall be addressed and implemented:

- All temporary stockpiles of impacted fill/soil created during the earthwork activities shall be stockpiled on an impervious surface (concrete, asphalt, plastic, etc.) and be covered with plastic and secured at the end of each work day to prevent water infiltration, dust, odors, and erosion. Temporary stockpiles shall be limited to less than 2,500 cubic yards of material and stored less than 15 days unless the general requirements as outlined in NR 718.05(2) are followed or exemptions to parts of NR 718.05(2) are obtained.
- During earthmoving and soil disturbance activities, all workers directly involved in the handling of subsurface material should be 40-hour OSHA trained and notified of the residual subsurface impacts.
- Precautions shall be taken to prevent off-site tracking of impacted material.
- If, during the course of earthmoving activities, unanticipated environmental conditions (such as a buried tank or barrel, strong unidentifiable odors, or discolored soil) are uncovered, the construction worker shall immediately report their findings and the location of the environmental condition to the project engineer. The project engineer should notify the environmental consultant. The environmental consultant will assess the environmental condition and visit the site, if necessary, to monitor the air quality and/or collect soil or groundwater samples, as necessary, to determine if a new release has been identified or a hazardous environment exists.

4.4 Institutional Controls. Residual soil impacts above ch. NR 720 RCLs and groundwater impacts above ch. NR 140 PALs may remain beneath the site at the time of case closure. Therefore, the property may be listed in the WDNR's Geographic Information System (GIS) Registry for sites with residual soil and impacts at the time of case closure and a PAL-exemption may be required.

4.5 Reporting. Following construction of the engineered barriers as described above, a request for case closure will be made to the WDNR. The case closure report will document the remediation/redevelopment activities completed at the site and will include the required institutional control documents.

5. RECOMMENDATIONS

Sigma recommends that the recommended remediation activities be approved by the WDNR as presented in this SI & RAP. The placement of engineered barriers across the site will prevent direct contact with underlying impacted soils. Shallow groundwater has not been impacted at concentrations greater than ch NR 140 ESs based on groundwater samples collected from a ch. NR 141-compliant well and no further action with respect to groundwater is warranted. Sigma, the City of Milwaukee, and HD Development respectfully request the WDNR provide a written approval of the recommended remedial approach presented in this RAP.

TABLES

Table 1
Soil Quality Results
1150 E. North Avenue, Milwaukee, WI
Sigma Project No. 12053

Soil Sample Location: Sample Depth (feet bgs):	B-1	B-4	B-4	B-8	B-9	B-9	B-11	B-11	B-12	GP-1	GP-4	GW RCLs ⁴	DC RCLs for Non-Industrial Soil ⁵	PRG for Residential Soil ⁶	SSL ⁷
	4-6	2-4	18-20	2-4	2-4	8-10	0-2	6-8	0-10	2-4	8-10				
Date:	07/28/11	07/28/11	07/29/11	07/29/11	07/29/11	07/29/11	07/29/11	07/29/11	07/29/11	07/29/11	07/29/11				
Organic Vapor Monitor Reading	0	5	0	0	0	0	1.4	1.4	1.4	1.4	1.4	NS	NS	NS	NS
PVOCs & Detected VOCs															
Naphthalene	<107	<107	<107	<107	120 "J"	<107	<107	<107	<107	<107	<107	NS	2,700 / NS	56,000	84,000
PAHs															
Acenaphthene	<9.7	<9.7	<9.7	13.2 "J"	99	<9.7	10.9 "J"	<9.7	145	<9.7	<9.7	38,000	9,000,000		
Acenaphthylene	<8.4	<8.4	<8.4	<8.4	72	<8.4	17.7 "J"	<8.4	26.4 "J"	<8.4	<8.4	700	180,000		
Anthracene	49	<10.2	<10.2	47	550	17.1 "J"	80	20.5 "J"	450	<10.2	11.9 "J"	3,000,000	50,000,000		
Benzol(a)anthracene	69	<14.6	<14.6	96	[1,470]	43 "J"	244	81	820	<14.6	25.2 "J"	17,000	880		
Benzol(a)pyrene	41 "J"	<16.6	<16.6	67	[1,370]	35 "J"	[213]	74	[720]	<16.6	<16.6	48,000	88.0		
Benzol(b)fluoranthene	85	<16.7	<16.7	103	[1,960]	56	320	127	[1,010]	<16.7	29.2 "J"	360,000	880		
Benzol(ghi)perylene	36	<8.2	<8.2	54	950	27	162	66	500	<8.2	<8.2	6,800,000	18,000		
Benzol(k)fluoranthene	32 "J"	<16.1	<16.1	38 "J"	720	20.7 "J"	122	47 "J"	400	<16.1	<16.1	870,000	8,800		
Chrysene	66	13.7 "J"	<9.2	84	1,240	41	254	91	680	<9.2	24.6 "J"	37,000	88,000		
Dibenzol(a,h)anthracene	<10.5	<10.5	<10.5	10.5	[183]	<10.5	29 "J"	<10.5	198]	<10.5	<10.5	38,000	6,000,000		
Fluoranthene	200	22.3 "J"	<9.8	211	2,740	81	510	167	1,720	<9.8	<10.7	500,000	6,000,000		
Indeno(1,2,3-cd)pyrene	11 "J"	<10.7	<9.5	37	126	<10.7	12.6 "J"	<10.7	160	<10.7	<10.7	100,000	6,000,000		
1-Methyl-naphthalene	27.6 "J"	<9.5	<17.9	11.5 "J"	770	21.9 "J"	123	49	410	<9.5	<9.5	680,000	880		
2-Methyl-naphthalene	<17.9	<17.9	<17.9	<17.9	67	<17.9	<17.9	<17.9	94	<17.9	<17.9	23,000	11,000,000		
Naphthalene	<9.6	<9.6	<9.6	11 "J"	67	<9.6	<9.6	<9.6	142	<9.6	<9.6	20,000	6,000,000		
Phenanthrene	<10.8	<10.8	<10.8	138	74	<10.8	32 "J"	94	94	<10.8	<10.8	400	200,000		
Pyrene	96	16 "J"	<9.8	138	1,320	46	298	67	1,280	<9.8	22.2 "J"	1,800	180,000		
Pyrene	156	21 "J"	<9.5	179	2,360	73	500	149	1,460	<9.5	54	8,700,000	5,000,000		
Metals															
Arsenic	mg/kg	NA	12.3 J]	NA	NA										
Barium	mg/kg	NA	45.7	NA	NA										
Cadmium	mg/kg	NA	<0.08	NA	NA										
Chromium	mg/kg	NA	11.7	NA	NA										
Lead	mg/kg	2	3.8	NA	[307]	41.8	39.2	25.1	9.48	5	3.5		50	400	NS
Mercury	mg/kg	NA	0.019	NA	NA										
Selenium	mg/kg	NA	<3.5	NA	NA										
Silver	mg/kg	NA	<1.7	NA	NA										

Notes:

1. µg/kg = micrograms per kilogram (equivalent to parts per billion, ppb)
2. mg/kg = milligrams per kilogram (equivalent to parts per million, ppm)
3. NA = not analyzed
4. GW RCLs = Groundwater Residual Contaminant Levels based on the following:
 For petroleum hydrocarbons, GW RCLs based on Wisconsin Administrative Code, Chapter NR 720.09 generic Residual Contaminant Level for protection of groundwater.
 For PAHs, GW RCLs based on interim guidance RCL for protection of groundwater pathway from PAH compounds, from WDNR publication RR-519-97 "Soil Cleanup Levels for Polycyclic Aromatic Hydrocarbons (PAHs) Interim Guidance" (April 1997)
5. DC RCLs for Non-Industrial Soil = Direct Contact Residual Contaminant Levels based on the following:
 For petroleum hydrocarbons, DC RCLs based on Wisconsin Administrative Code, Chapter NR 746.06 Table 1 ("Indicators of Residual Petroleum Product in Soil Pores") soil screening levels / Table 2 ("Protection of Human Health from Direct Contact with Contaminated Soil") concentrations.
 For PAHs, DC RCLs based on interim guidance RCL for protection of groundwater pathway from PAH compounds, from WDNR publication RR-519-97 "Soil Cleanup Levels for Polycyclic Aromatic Hydrocarbons (PAHs) Interim Guidance" (April 1997), target risk of 1 x 10⁻⁶ used per NR 720.19(5)(a).
 For metals, DC RCLs based on Wisconsin Administrative Code, Chapter NR 720.11 generic Residual Contaminant Level for protection of direct contact for non-industrial land use
6. PRG for Residential Soil = US EPA Region IX Soil Screening Level for protection of groundwater with a dilution-attenuation factor of 20 (October 2004) - provided as a guideline to evaluate soil
7. SSL = US EPA Region IX Soil Screening Level for protection of groundwater with a dilution-attenuation factor of 20 (October 2004) - provided as a guideline to evaluate soil
8. --- = PRG and SSL not provided for PAHs because complete list of WDNR interim guidance standards exists for the PAH compounds
9. NS = no standard established
10. Laboratory flags:
11. Exceedances:

"J" = Analyte detected between Limit of Detection and Limit of Quantitation
 [] = Concentration exceeds DC RCL
 [] = Concentration exceeds GW RCL

[brackets] = Concentration exceeds DC RCL for Non-Industrial Soil (note that soil is located within 4 feet of the ground surface)
 underline = Concentration exceeds DC RCL for Non-Industrial Soil (note that soil is located deeper than 4 feet of the ground surface)

Table 2
Groundwater Quality Results -1150 E. North Avenue

Sigma Project No. 12053

Well ID:		MW-1					NR 140	NR 140
Analytes	Date	08/05/11					ES	PAL
RCRA Metals - Soluble								
Arsenic	µg/L	<5.4					10	1
Barium	µg/L	130					2,000	400
Cadmium	µg/L	1.3					5	0.5
Chromium	µg/L	<1.7					100	10
Lead	µg/L	<1.8					15	1.5
Mercury	µg/L	<0.017					2	0.2
Selenium	µg/L	<6.3					50	10
Silver	µg/L	<3.3					50	10
PVOCs/Detected VOCs								
Benzene	µg/L	<0.5					5	0.5
1,2-Dichloroethane	µg/L	<0.5					6	0.6
Ethylbenzene	µg/L	<0.78					700	140
Isopropylbenzene	µg/L	<0.92					NS	NS
Methyl-tert-butyl-ether	µg/L	<0.8					60	12
Naphthalene	µg/L	<2.1					100	10
n-Propylbenzene	µg/L	<0.59					NS	NS
Toluene	µg/L	<0.53					1,000	200
1,1,1-Trichloroethane	µg/L	<0.85					200	40
Trichloroethene	µg/L	<0.47					5	0.5
1,2,4-Trimethylbenzene	µg/L	<0.8					NS	NS
1,3,5-Trimethylbenzene	µg/L	<0.74					NS	NS
Total Trimethylbenzene	µg/L	<1.54					480	96
Vinyl Chloride	µg/L	<0.18					0.2	0.02
Xylenes, Total	µg/L	<1.9					10,000	1,000
PAHs								
Acenaphthene	µg/L	0.83					NS	NS
Acenaphthylene	µg/L	<0.014					NS	NS
Anthracene	µg/L	0.26					3000	600
Benz(a)anthracene	µg/L	0.028 "J"					NS	NS
Benzo(b)fluoranthene	µg/L	<0.013					0.2	0.02
Benzo(k)fluoranthene	µg/L	<0.015					NS	NS
Benzo(a)pyrene	µg/L	<0.011					0.2	0.02
Benzo(ghi)perylene	µg/L	<0.015					NS	NS
Chrysene	µg/L	0.014 "J"					0.2	0.02
Dibenz(a,h)anthracene	µg/L	<0.016					NS	NS
Fluoranthene	µg/L	0.25					400	80
Fluorene	µg/L	0.49					400	80
Indeno(1,2,3-cd)pyrene	µg/L	<0.015					NS	NS
1-Methylnaphthalene	µg/L	0.08					NS	NS
2-Methylnaphthalene	µg/L	0.08					NS	NS
Naphthalene	µg/L	0.12					40	8
Phenanthrene	µg/L	0.92					NS	NS
Pyrene	µg/L	0.19					250	50

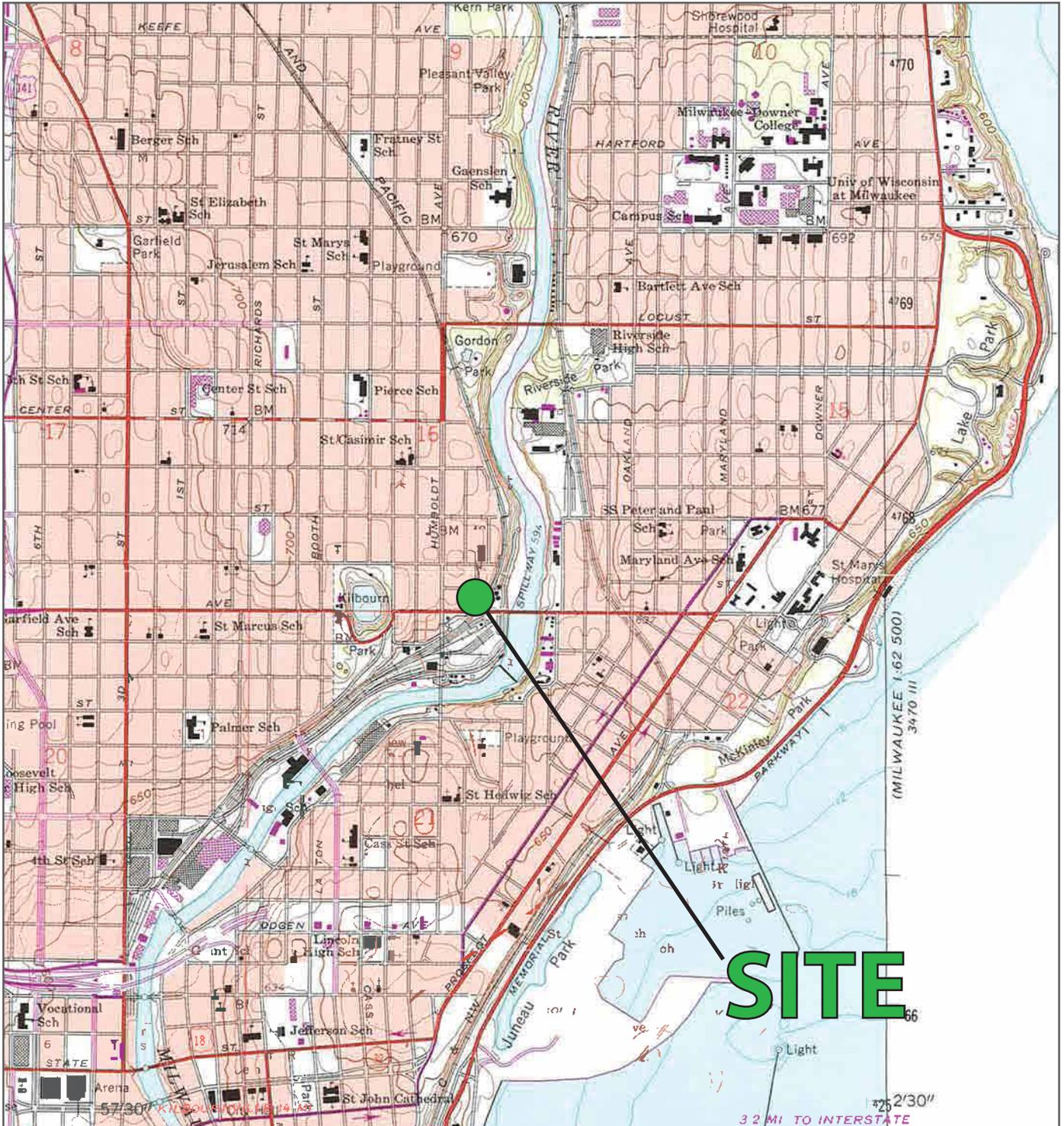
Notes:

- NR 140 ES = Wisconsin Administrative Code, Chapter NR 140 Enforcement Standard.
- NR 140 PAL = Wisconsin Administrative Code, Chapter NR 140 Preventive Action Limit.
- NS = no standard
- µg/L = micrograms per liter (equivalent to parts per billion, ppb)
- mg/L = milligrams per liter (equivalent to parts per million, ppm)
- NA = Not Analyzed
- J = Results are qualified due to the uncertainty of the parameter concentration between the Limit of Detection and Limit of Quantitation.
- Exceedances:

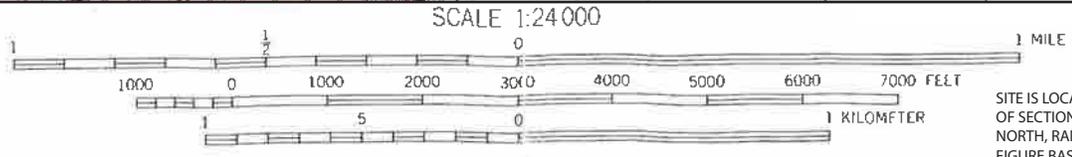
	= Concentration exceeds NR 140 ES
	= Concentration exceeds NR 140 PAL

FIGURES

Plot File: 12053 SLM Figures 07-13-2011.pdf
 Date: 07/13/2011
 Created By: ERS
 Filename: 12053 SLM Figures 07-13-2011.al
 Directory: I:\P\Development\Projects\12053 SIGMA\FIGURES\07-13-2011



SITE



CONTOUR INTERVAL 10 FEET
 NATIONAL GEODETIC VERTICAL DATUM OF 1929
 DEPTH CURVES AND SOUNDINGS: IN FEET DATUM IS 578 FEET

SITE IS LOCATED IN THE S.E. 1/4 OF SECTION 16, TOWNSHIP 7 NORTH, RANGE 22 EAST. FIGURE BASED ON USGS "MILWAUKEE, WIS: 7.5" TOPOGRAPHIC QUADRANGLE DATED 1958, PHOTOREVISED 1971.

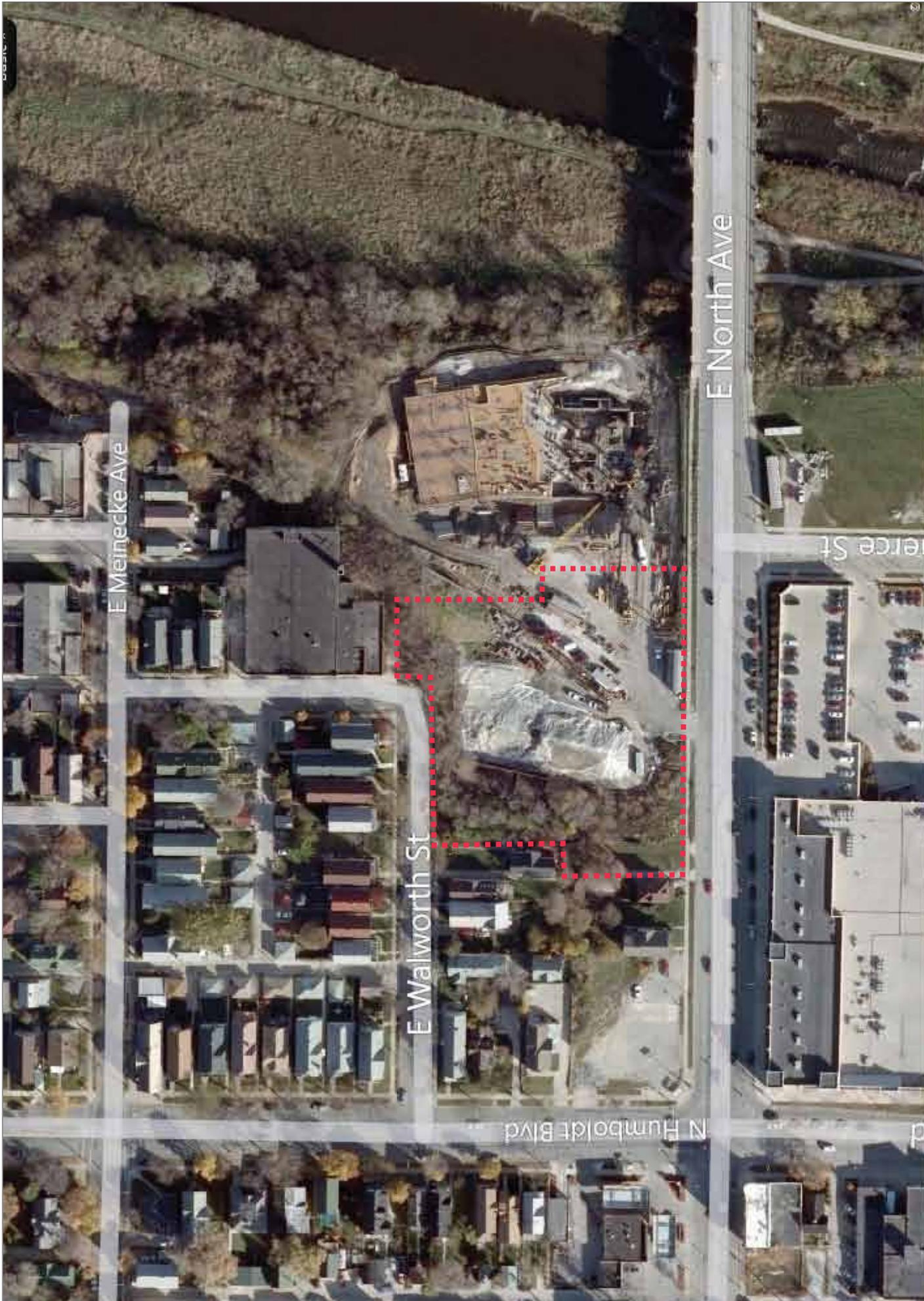


SITE LOCATION MAP

1132 - 1164 East North Avenue, Milwaukee, Wisconsin

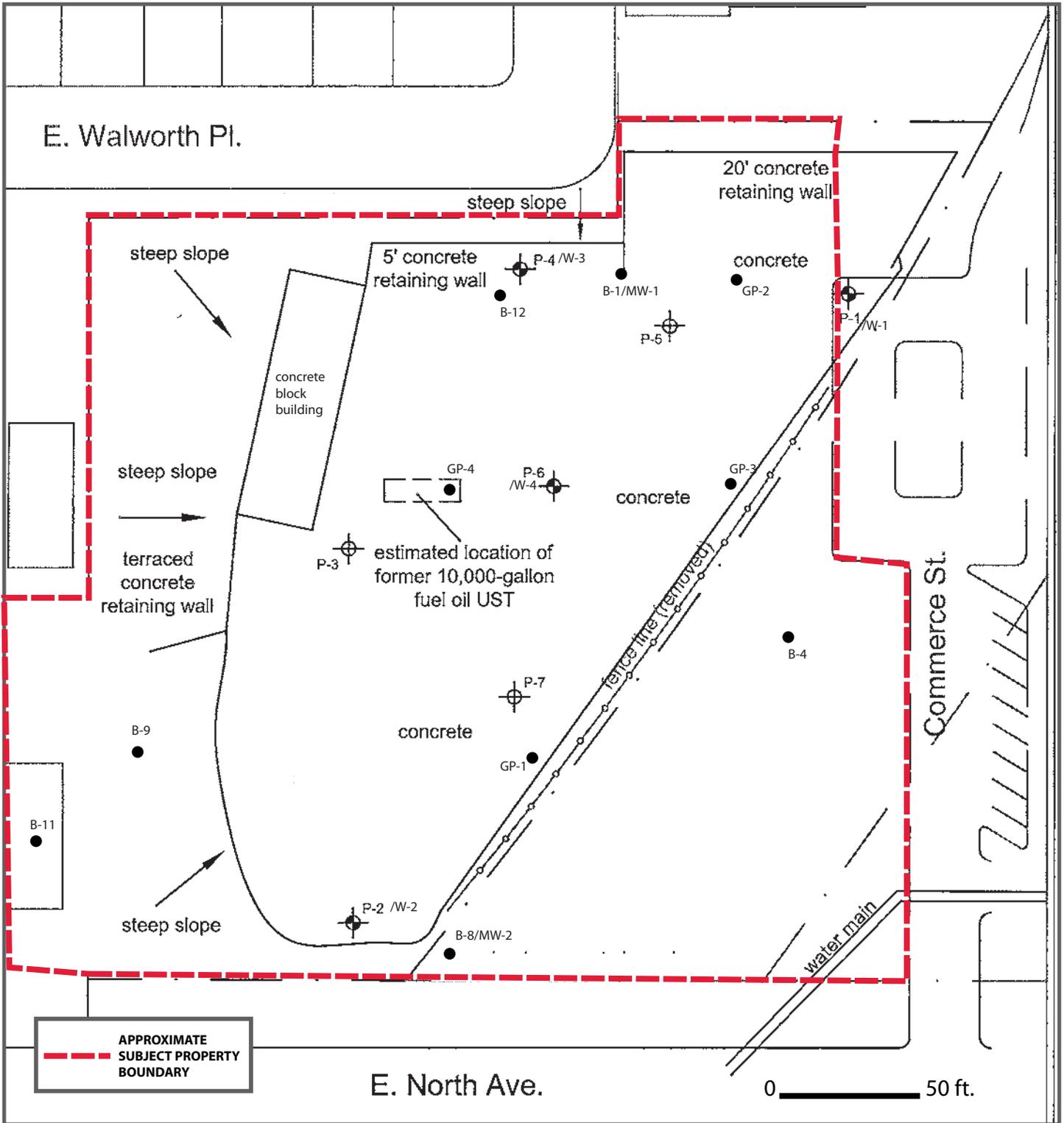
FIGURE

1



APPROXIMATE PROPERTY BOUNDARIES





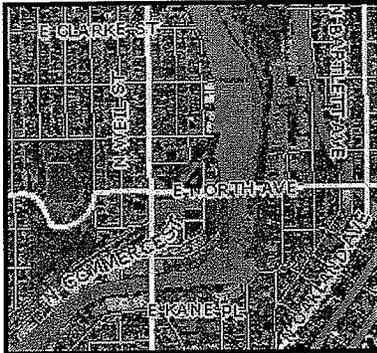
Client: City of Milwaukee	 www.thesigmagroup.com 1300 West Canal Street Milwaukee, WI 53233 414-643-4200
Site Address: 1132 - 1146 E. North Avenue Milwaukee, WI	
Project: #12053	
	FIGURE 3 BORING LOCATION MAP

APPENDIX A
Subject Property Legal Descriptions

Milwaukee County Land Information Parcel Report

TAXKEY: 3201692000

Report generated 7/13/2011 6:59:17 AM



Parcel location within Milwaukee County



Selected parcel highlighted

Parcel Information

TAXKEY: 3201692000

Record Date: 04/12/2011

Owner(s): READCO

Address: 1164 E NORTH AVE

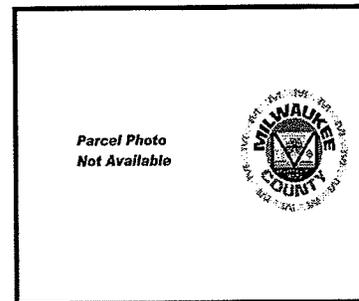
Municipality: Milwaukee

Acres: 0.44

Assessed Value: \$144,500

Parcel Description: COMMERCIAL

Legal Description: CERTIFIED SURVEY MAP NUMBER 7980 IN SE 1/4 SEC 16-7-22 LOT 2



Parcel photo

This map is a user generated static output from an Internet mapping site and is for reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable.



1164 East North Avenue



Notes
Enter Map Description

THIS MAP IS NOT TO BE USED FOR NAVIGATION © MCAMLIS

DISCLAIMER: This map is a user generated static output from the Milwaukee County Land Information Office Interactive Mapping Service website. The contents herein are for reference purposes only and may or may not be accurate, current or otherwise reliable. No liability is assumed for the data delineated herein either expressed or implied by Milwaukee County or its employees.



245 0 122 245 Feet

Legend 1: 1,470

- County Boundary
- Highways, to 8k
- Street Centerlines, 0k to 8k
- Railroad 8k
- Water 8k
- Rivers 8k
- Airport 8k
- Landmarks 8k
- County Parks 8k
- Municipal Subdivisions 25k



1136 East North Avenue

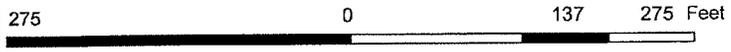


Notes
 Enter Map Description

THIS MAP IS NOT TO BE USED FOR NAVIGATION © MCAMLIS



DISCLAIMER: This map is a user generated static output from the Milwaukee County Land Information Office Interactive Mapping Service website. The contents herein are for reference purposes only and may or may not be accurate, current or otherwise reliable. No liability is assumed for the data delineated herein either expressed or implied by Milwaukee County or its employees.



Legend 1: 1,649

- County Boundary
- Highways, to 8k
- Street Centerlines, 0k to 8k
- Railroad 8k
- Water 8k
- Rivers 8k
- Airport 8k
- Landmarks 8k
- County Parks 8k
- Municipal Subdivisions 25k



1136 East North Avenue



Legend

- County Boundary
- Highways, to 8k
- Street Centerlines, 0k to 8k
- Railroad 8k
- Water 8k
- Rivers 8k
- Airport 8k
- Landmarks 8k
- County Parks 8k
- Municipal Subdivisions 25k
- Tax Parcels
- 2007 (Med Res)
- Red: Band_1
- Green: Band_2
- Blue: Band_3

1:1,563



Notes

Enter Map Description

DISCLAIMER: This map is a user generated static output from the Milwaukee County Land Information Office Interactive Mapping Service website. The contents herein are for reference purposes only and may or may not be accurate, current or otherwise reliable. No liability is assumed for the data delineated herein either expressed or implied by Milwaukee County or its employees.

260 Feet

130

0

260

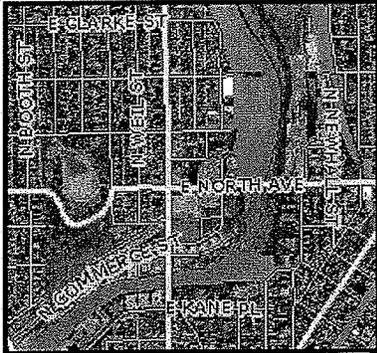
THIS MAP IS NOT TO BE USED FOR NAVIGATION

© MCAMLLIS

Milwaukee County Land Information Parcel Report

TAXKEY: 3201416100

Report generated 7/13/2011 6:46:53 AM



Parcel location within Milwaukee County



Selected parcel highlighted

Parcel Information

TAXKEY: 3201416100

Record Date: 04/12/2011

Owner(s): DIRECT READCO LLC

Address: 1132 E NORTH AVE

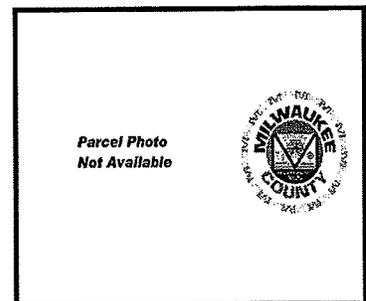
Municipality: Milwaukee

Acres: 0.09

Assessed Value: \$29,900

Parcel Description: COMMERCIAL

Legal Description: WALWORTH'S SUBD OF A PART OF LOT 17 IN SE 1/4 SEC 16-7-22 BLOCK 1 LOT 27 EXC S 2' FOR ST 25-26

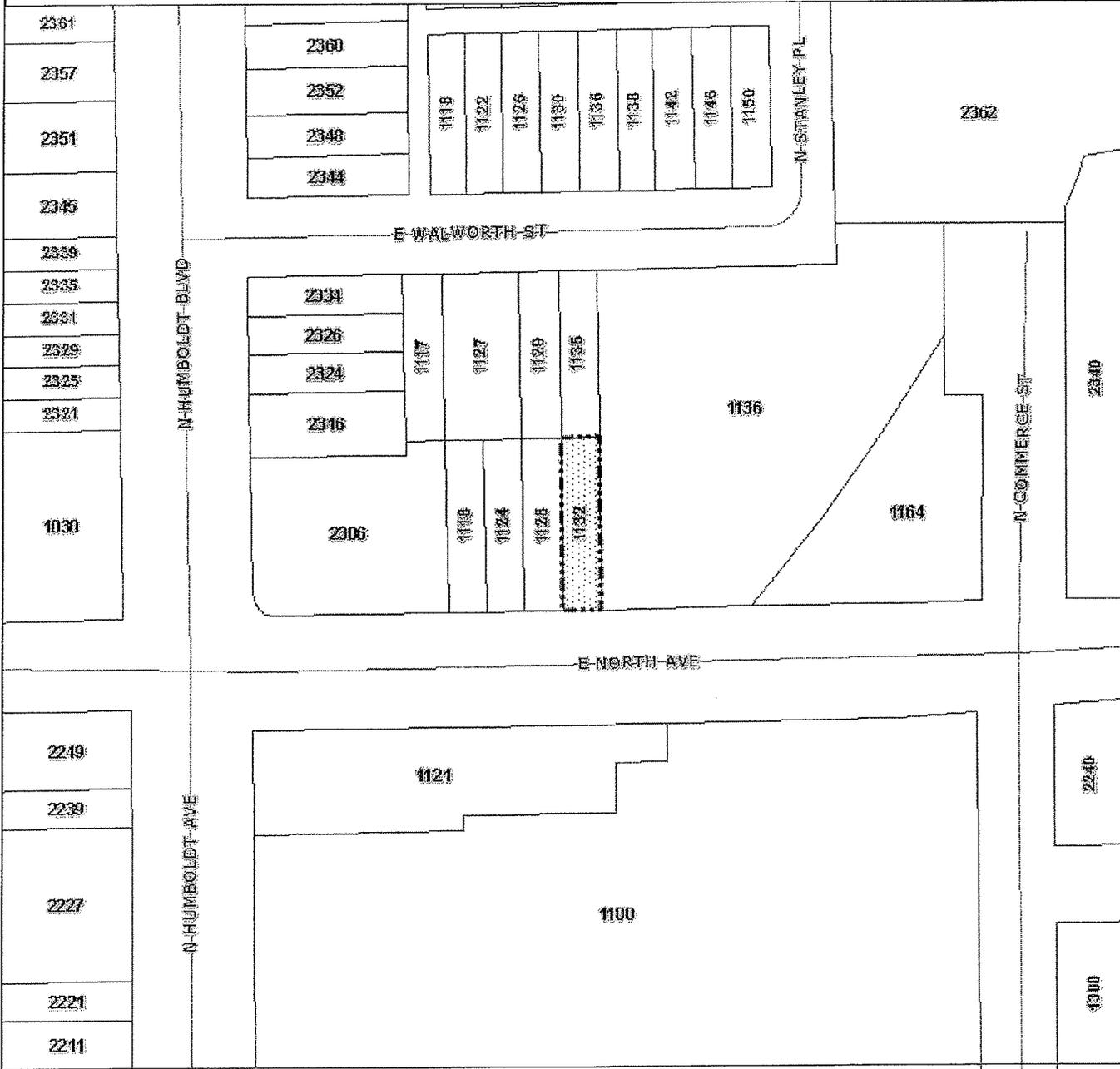


Parcel photo

This map is a user generated static output from an Internet mapping site and is for reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable.



1132 East North Avenue



Notes
Enter Map Description

THIS MAP IS NOT TO BE USED FOR NAVIGATION © MCAMLIS

DISCLAIMER: This map is a user generated static output from the Milwaukee County Land Information Office Interactive Mapping Service website. The contents herein are for reference purposes only and may or may not be accurate, current or otherwise reliable. No liability is assumed for the data delineated herein either expressed or implied by Milwaukee County or its employees.



219 0 110 219 Feet



Legend 1: 1,314

- County Boundary
- Highways, to 8k
- Street Centerlines, 0k to 8k
- Railroad 8k
- Water 8k
- Rivers 8k
- Airport 8k
- Landmarks 8k
- County Parks 8k
- Municipal Subdivisions 25k



1132 East North Avenue



Notes

Enter Map Description

THIS MAP IS NOT TO BE USED FOR NAVIGATION

© MCAMLIS



DISCLAIMER: This map is a user generated static output from the Milwaukee County Land Information Office Interactive Mapping Service website. The contents herein are for reference purposes only and may or may not be accurate, current or otherwise reliable. No liability is assumed for the data delineated herein either expressed or implied by Milwaukee County or its employees.

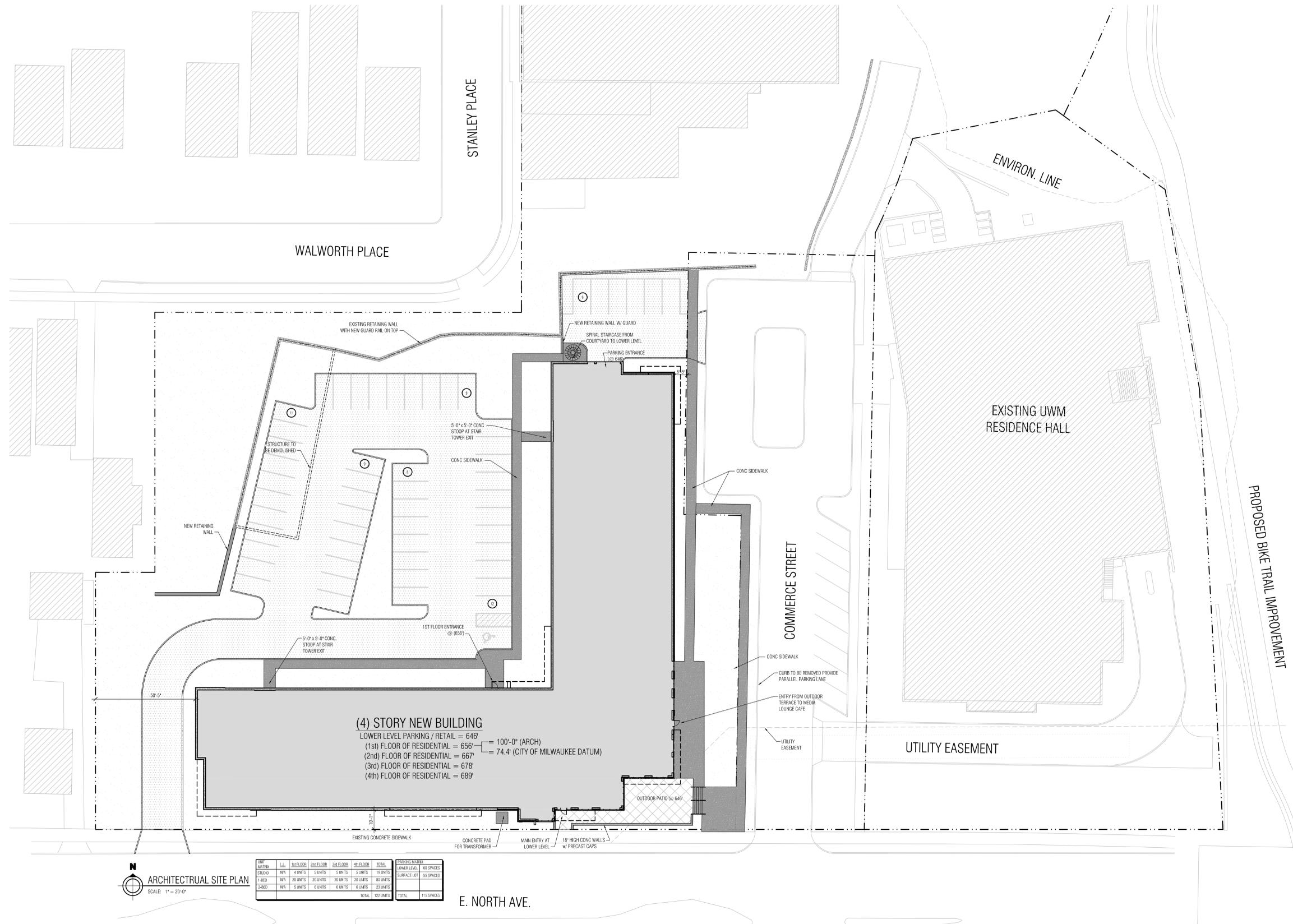
219 0 110 219 Feet

Legend

1 : 1,314

- County Boundary
- Highways, to 8k
- Street Centerlines, 0k to 8k
- Railroad 8k
- Water 8k
- Rivers 8k
- Airport 8k
- Landmarks 8k
- County Parks 8k
- Municipal Subdivisions 25k

APPENDIX B
Proposed Site Plan



(4) STORY NEW BUILDING
 LOWER LEVEL PARKING / RETAIL = 646'
 (1st) FLOOR OF RESIDENTIAL = 656' = 100'-0" (ARCH)
 (2nd) FLOOR OF RESIDENTIAL = 667' = 74.4' (CITY OF MILWAUKEE DATUM)
 (3rd) FLOOR OF RESIDENTIAL = 678'
 (4th) FLOOR OF RESIDENTIAL = 689'

ARCHITECTURAL SITE PLAN
 SCALE: 1" = 20'-0"

FLOOR	UNIT TYPE	1st FLOOR	2nd FLOOR	3rd FLOOR	4th FLOOR	TOTAL
1-BED	N/A	20 UNITS	20 UNITS	20 UNITS	20 UNITS	80 UNITS
2-BED	N/A	5 UNITS	6 UNITS	6 UNITS	6 UNITS	23 UNITS
						122 UNITS

LEVEL	SPACES
LOWER LEVEL	60 SPACES
SURFACE LOT	55 SPACES
TOTAL	115 SPACES