

May 12, 2021  
File No. 25221094.00

Mr. Matt Vitale  
Wisconsin Department of Natural Resources  
1300 W Clairemont Ave.  
Eau Claire, WI 54701-6127

Subject: Site Investigation Work Plan  
Blackhawk Drycleaners  
700 East Blackhawk Avenue  
BRRTS #02-12-552357

Dear Mr. Vitale:

SCS Engineers (SCS) has prepared the enclosed Site Investigation Work Plan for the Blackhawk Drycleaners site for approval by the Wisconsin Department of Natural Resources (WDNR).

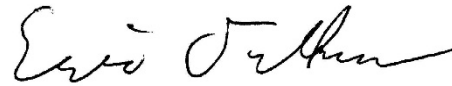
The Work Plan provides a proposed scope of work to further assess the degree and extent of chlorinated volatile organic compounds (CVOCs) in groundwater.

If you have any questions regarding this Work Plan, please contact Robert Langdon at 608-212-3995.

Sincerely,



Robert Langdon  
Senior Project Manager  
SCS Engineers



Eric Oelkers, PG  
Senior Hydrogeologist  
SCS Engineers



Mark R. Huber, PE  
Project Director  
SCS Engineers

REL/AJR\_lmh/MRH

cc: Garth Fable, City of Prairie du Chien

Encl. Site Investigation Work Plan

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# Site Investigation Work Plan

Blackhawk Drycleaners  
700 East Blackhawk Avenue  
Prairie du Chien, Wisconsin 53821

**SCS ENGINEERS**

25221094.00 | May 12, 2021

2830 Dairy Drive  
Madison, WI 53718-6751  
608-224-2830

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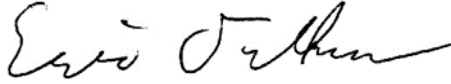
- Figure 1. Site Location Map
- Figure 2. Site Plan
- Figure 3. Groundwater Results and Proposed Monitoring Wells

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## CERTIFICATIONS

I, Eric Oelkers, hereby certify that I am a hydrogeologist as the term is defined in s. NR 712.03(1), Wis. Adm. Code, and that, to the best of my knowledge, all of the 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

Senior Hydrogeologist  
\_\_\_\_\_

Title

May 12, 2021  
\_\_\_\_\_

Date

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## 1.0 INTRODUCTION AND BACKGROUND

### 1.1 PURPOSE

The purpose of this investigation is to further evaluate the degree and extent of chlorinated volatile organic compounds (CVOCs) in groundwater and soil gas.

### 1.2 LOCATION AND PROJECT INFORMATION

1. Site Owner: Redevelopment Authority (RDA) of the City of Prairie du Chien  
P.O. Box 324  
Prairie du Chien, WI 53821  
(608) 326-6406
2. Owner Contact: Chad Abram, City Administrator  
(608) 326-6406
3. Site Address: 700 East Blackhawk Avenue  
Prairie du Chien, WI 53821
4. Site Location (**Figure 1**): NW 1/4 of the SW 1/4 of Sec 30, T07N, R06W  
Crawford County  
Wisconsin Transverse Mercator (WTM) Coordinates  
X Coordinate (WTM91): 427346  
Y Coordinate (WTM91): 287095
5. Environmental Consultant: SCS Engineers (SCS)  
2830 Dairy Drive  
Madison, WI 53718-67581  
(608) 224-2830 Phone  
(608) 224-2839 Fax
6. Project Director/Engineer: Mark Huber
7. Project Manager: Robert Langdon
8. Hydrogeologist: Eric Oelkers
9. BRRTS #: 02-12-552357
10. WDNR Contact: Matt Vitale  
(715) 492-1222

## 2.0 PREVIOUS INVESTIGATION

Prior soil, groundwater, and vapor sampling field work has been performed by the City of Prairie du Chien (City) and the Wisconsin Department of Natural Resources (WDNR). A site plan with sampling locations is provided as **Figure 2**.

## 2.1 CITY OF PRAIRIE DU CHIEN

Work for the City in 1991 was performed by Advent Environmental Services, Inc. (AESI) to evaluate potential sources of CVOCs in the area due to the presence of tetrachloroethylene (PCE) discovered in two municipal wells located to the east of the subject property. Work included the following:

- Sampling of municipal wells for PCE.
- Advancement of hollow stem auger soil borings for construction of monitoring wells MW-1 through MW-5. Soil samples and groundwater samples were collected from the monitoring well borings and wells. We understand that the AESI wells were subsequently abandoned.
- Performing water level measurements at monitoring wells to evaluate groundwater flow and the influence of municipal well pumping.
- Installation and sampling of 56 soil gas probes for analysis of PCE.

Work for the City in 2009 and 2010 was performed by Ayres Associates (Ayres) to evaluate for the presence of CVOCs in soil and groundwater near Blackhawk Drycleaners. Work included advancement of direct push borings GP-1 through GP-7 for collection of soil and groundwater samples.

## 2.2 WDNR

Work for WDNR has been performed by Bay West, LLC (Bay West) under a U.S. Environmental Protection Agency (USEPA) brownfield grant beginning in 2020 and has included the following:

- Advancement of eight direct push borings SB-1 through SB-8 for soil and groundwater sampling. Soil and groundwater samples were collected from borings SB-1 through SB-4, which were advanced near the former Blackhawk Drycleaners. The samples were analyzed for volatile organic compounds (VOCs). Soil samples were collected from borings SB-5 through SB-8, which were advanced at the northeast side of the subject property near a former auto filling station and car wash. The soil samples were analyzed for VOCs, diesel range organics (DRO), and metals.
- Advancement of borings SV-1 through SV-6 for soil gas sampling. Borings SV-1 through SV-4 were advanced near the former Blackhawk Drycleaners. Borings SV-5 and SV-6 were advanced near the former filling station and car wash. All soil gas samples were analyzed for VOCs.
- Installation and sampling of five additional groundwater monitoring wells, identified as MW-01 through MW-05.

## 2.3 FINDINGS

- Groundwater is present at a depth of approximately 20 feet below ground surface (bgs) within unconsolidated sand. Sandstone bedrock is present at a depth of approximately 134 feet bgs.



- Groundwater flow is to the west-southwest at a horizontal gradient of approximately 0.0003 to 0.0008 feet/foot as reported by AESI in 1991 and Bay West in 2021. A vertical downward gradient of 0.0004 feet/foot was reported by AESI in 1991 for AESI well nest MW2/MW3.
- PCE is present in groundwater at concentrations in excess of the NR 140 enforcement standard (ES). No other CVOCs have been detected in groundwater in excess of ESs. PCE concentrations in excess of the ES appear to extend from the source property and off-site to the west-southwest in the direction of groundwater flow (**Figure 3**). PCE has been detected in the furthest downgradient monitoring well (Bay West MW-5), located approximately 250 feet west of the subject property. Based on groundwater samples from AESI MW-2, PCE may be present in groundwater to depths greater than 50 feet bgs. The lateral and vertical extent of CVOCs in groundwater has not been determined.
- PCE is present in unsaturated soil at concentrations in excess of the NR 720 residual contaminant level (RCL) for groundwater protection, but has not been observed at concentrations in excess of the direct contact RCL. No other CVOCs have been identified in soil at concentrations in excess of RCLs. The extent of soil contamination appears mostly limited to the source property.
- PCE is present in soil gas in excess of the WDNR's shallow soil gas vapor risk screening level (VRSL) for residential settings. No other CVOCs have been detected in soil gas at concentrations in excess of residential VRSLs.

## 3.0 FIELD INVESTIGATION

### 3.1 PROPOSED INVESTIGATION

Per communications with the WDNR, we understand that further sampling is needed to evaluate the degree and extent of CVOCs in groundwater and soil gas. SCS plans to install three additional water table wells and one piezometer and continue monitoring of the updated monitoring well network. Proposed well locations in City right-of-way and at the 127 South Dousman Street residence are shown on **Figure 3**.

Per April 28, 2021 email correspondence with WDNR, we understand that vapor assessment is recommended for residences downgradient of the source property, starting with the home at the northwest corner of East Wisconsin Street and South Dousman Street (127 South Dousman Street). Proposed vapor sampling is described in **Section 3.3.2**, below.

### 3.2 METHODS OF INVESTIGATION

#### 3.2.1 Groundwater

- Install three additional water table monitoring wells and one piezometer. The wells will be installed using a direct push drill rig equipped with hollow stem augers. A soil boring log will be prepared for each boring and soils will be documented consistent with the Unified Soil Classification System.
- Construct water table wells with 2-inch-diameter PVC casing and 15-foot screen set at approximately 10 to 25 feet bgs. The piezometer will be constructed with 2-inch-diameter

PVC casing and 5-foot screen set at approximately 55 to 60 feet bgs. All wells will be completed with locking well plugs and steel flush mount protective casings. Well construction details will be recorded on WDNR well construction forms.

- Develop wells. The new wells and piezometer will be developed consistent with NR 141 by alternately surging and purging with a PVC bailer or a submersible pump for 30 minutes. The wells will then be purged continuously until 10 well volumes of water are removed or the water is clear. Development water will be contained for disposal. Well development will be documented on WDNR well development forms.
- Survey monitoring wells and piezometer. The survey will include the top of PVC casing to the nearest 0.01 feet based on national geodetic datum and horizontal location to the nearest 1 foot in state plane coordinates per NR 141.065(2).
- Conduct four rounds of quarterly groundwater sampling (up to nine wells). Groundwater sampling will be performed consistent with the WDNR's Groundwater Sampling Field Manual (WDNR PUBL-DG-038 96), Groundwater Sampling Desk Reference (PUBL-DG-037 96), and other requirements specified under Wisconsin Administrative Code, Chapter NR 140.16. A submersible pump or dedicated bailer will be used to purge the wells. Sampling will be conducted via low-flow sampling methods or by bailer. During each event, SCS will measure water levels and sample the wells and piezometer for VOCs. Samples will be submitted to a Wisconsin-certified laboratory for VOC analysis via EPA Method 8260.
- Contain and dispose of investigation-derived wastes. Monitoring well water will be transported to a local wastewater treatment plant for disposal. Soil cuttings will be transported to a solid waste landfill for disposal or thin spread on the subject property.
- Abandon one or more of the source property monitoring wells MW-01 through MW-04 as needed for redevelopment. Monitoring wells MW-01 through MW-04 may be in the way of construction and ultimately need to be abandoned. The wells will be maintained as long as practicable prior to abandonment, and the WDNR will be notified prior to abandonment. The wells will be abandoned in place per NR 141 requirements.

### **3.2.2 Soil Gas**

Vapor assessment sampling will be performed consistent with WDNR RR-800 vapor sampling guidance dated January 2018. Work will include the following:

- Prepare and transmit access agreement to owner of 127 South Dousman Street.
- Install one sub-slab Vapor Pin™ (vapor pin) sampling port in basement of home.
- Perform sampling equipment vacuum shut-in and vapor pin seal leak tests and collect sub-slab sample from vapor pin.
- Collect an indoor air sample from lowest level of the home.

- Transport samples to Wisconsin-certified laboratory under chain of custody for analysis of PCE, trichloroethylene (TCE), cis-1,2-dichloroethylene (cis-1,2-DCE), trans-1,2-dichloroethylene (trans-1,2-DCE), and vinyl chloride via EPA Method TO-15.

## 4.0 DATA ANALYSIS AND REPORT PREPARATION

Data obtained during the above-proposed field investigation activities and previous investigations will be used to prepare a Site Investigation Report (SIR) consistent with NR 716.15. The report will summarize the results of the investigation and include the following:

- Site background information
- Soil boring logs provided on WDNR forms
- Tabulated results of laboratory chemical analyses performed on soil, groundwater, and soil vapor samples
- Groundwater laboratory reports for SCS monitoring well sampling work
- Site location map, site layout map, and a geologic cross section of the site
- Findings, conclusions, and recommendations based on the site investigation data

## 5.0 SCHEDULE

We anticipate conducting the well installation activities outlined in this Work Plan in June 2021. After receiving the analytical results from the initial activities, we will evaluate the need for additional investigation. A tentative schedule of site investigation activities is provided below.

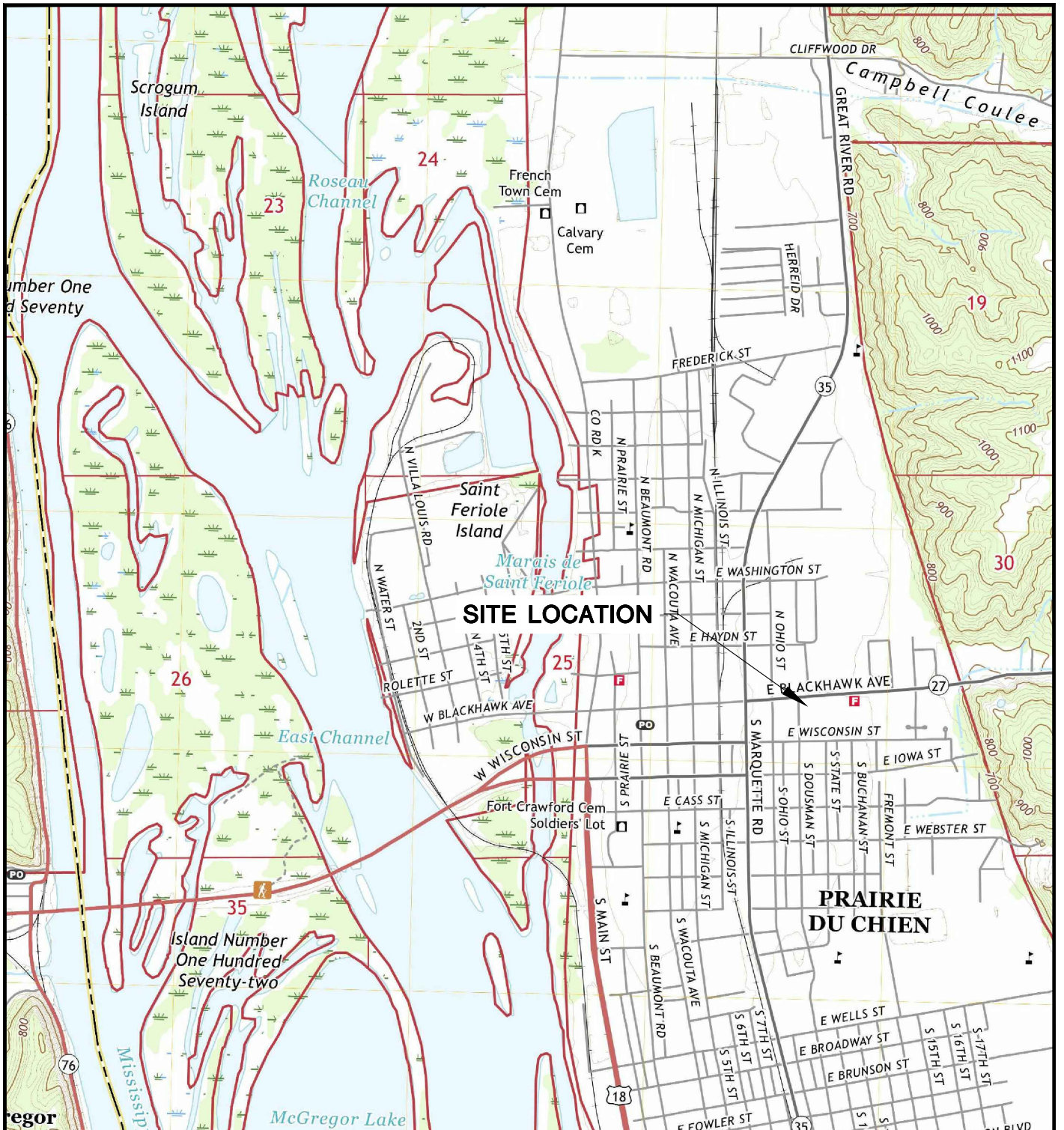
Activity	Estimated Completion Date
Work Plan Completion and Submittal to WDNR	May 2021
Monitoring Well Installations, Initial Groundwater Sampling, and Vapor Sampling	June 2021
Final Round of Groundwater Sampling	March 2022
Submittal of Site Investigation Report	May 2022

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## Figures

- 1 Site Location Map
- 2 Site Plan
- 3 Groundwater Results and  
Proposed Monitoring Wells





PRAIRIE DU CHIEN QUADRANGLE  
 WISCONSIN-IOWA  
 7.5 MINUTE SERIES (TOPOGRAPHIC)  
 2018  
 SCALE: 1" = 2,000'



CLIENT	PRAIRIE DU CHIEN REDEVELOPMENT AUTHORITY		SITE	BLACKHAWK JUNCTION REDEVELOPMENT 700 EAST BLACKHAWK AVENUE PRAIRIE DU CHIEN, WISCONSIN		ENGINEER	SCS ENGINEERS 2830 DAIRY DRIVE MADISON, WI 53718-6751 PHONE: (608) 224-2830		FIGURE 1
	PROJECT NO.	25221094.00		DRAWN BY:	KP		APPROVED BY:	REL 04/20/2021	
	DRAWN:	04/05/2021	CHECKED BY:	MRH					
	REVISED:	04/05/2021							





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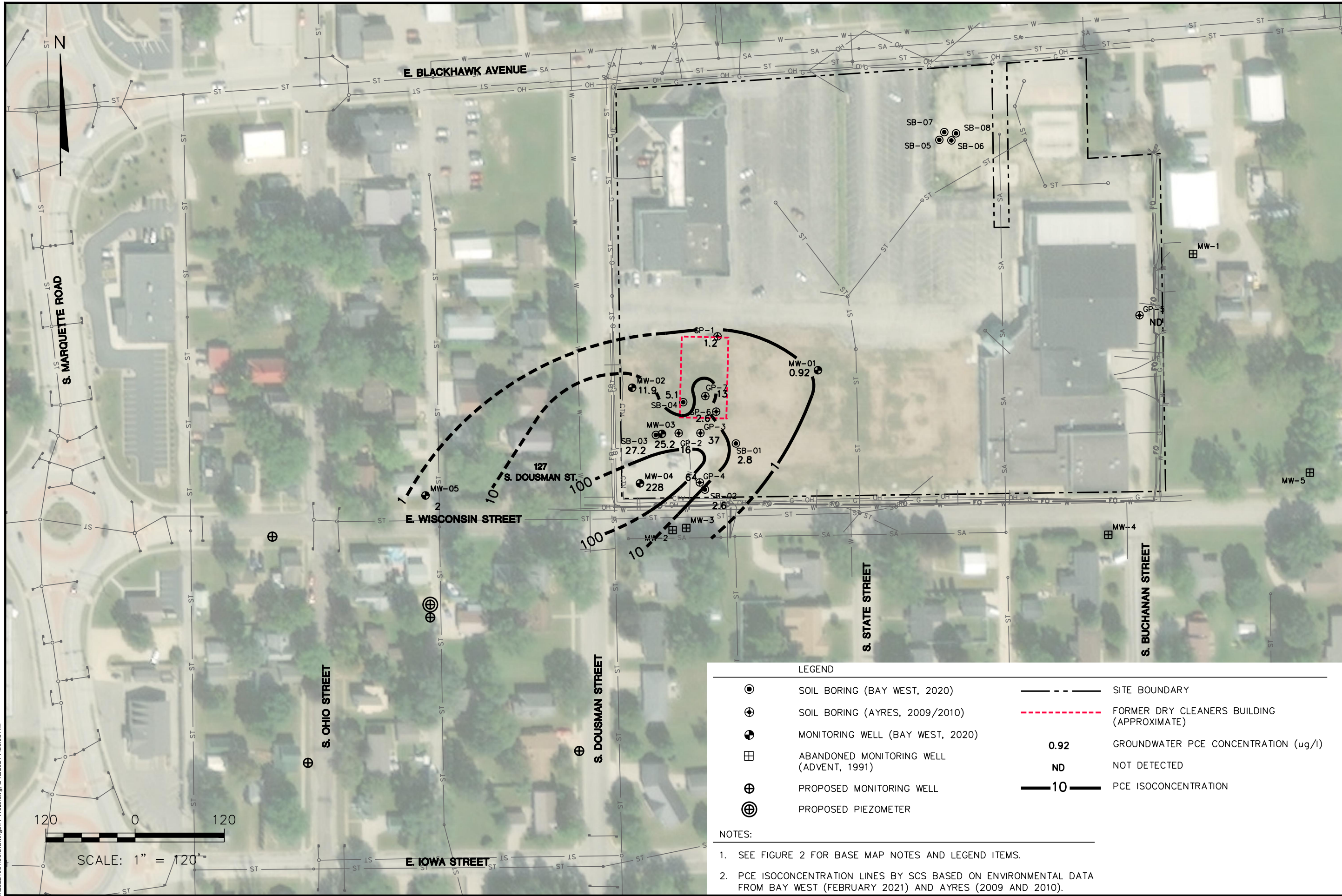
LEGEND	
	SITE BOUNDARY
	FORMER DRY CLEANERS BUILDING (APPROXIMATE)
	CABLE TELEVISION (BURIED)
	ELECTRIC (BURIED)
	FIBER OPTIC (BURIED)
	GAS MAIN (BURIED)
	OVERHEAD UTILITY
	SANITARY SEWER (BURIED)
	STORM SEWER (BURIED)
	TELEPHONE (BURIED)
	WATER MAIN (BURIED)
	MANHOLE
	STORM INLET
	UTILITY POLE
	TELEPHONE PEDESTAL
	TRANSFORMER
	FIRE HYDRANT
	SOIL BORING (BAY WEST, 2020)
	SOIL BORING (AYRES, 2009/2010)
	MONITORING WELL (BAY WEST, 2020)
	ABANDONED MONITORING WELL (ADVENT, 1991)

- NOTES:**
- SEPTEMBER 2018 AERIAL PHOTOGRAPH SOURCES: ESRI, DIGITALGLOBE, GEOEYE, I-CUBED, USDA FSA, USGS, AEX, GETMAPING, AERODIG, IGN, IGP, SWSTOPPO, AND THE GIS USER COMMUNITY.
  - BAY WEST MONITORING WELLS AND AYRES AND BAY WEST SOIL BORINGS BASED ON BAY WEST FIGURE 1, SITE MAP WITH MONITORING WELL LOCATIONS DATED JANUARY 27, 2021.
  - ABANDONED MONITORING WELLS (ADVENT) FROM ADVENT ENVIRONMENTAL SERVICES OVERLAY OF WELL LOCATION MAP DATED SEPTEMBER 13, 1991.
  - UTILITY LOCATIONS FROM WIERBICHER EXISTING CONDITIONS DRAWING DATED MARCH 7, 2021, STORM SEWER SYSTEM DRAWING DATED MARCH 19, 2019, AND SANITARY LATERAL SYSTEM DRAWING DATED MARCH 2, 2020.
  - BORING AND WELL LOCATIONS ARE APPROXIMATE.

PROJECT NO.	25221094.00	DRAWN BY:	KP
DRAWN:	04/05/2021	CHECKED BY:	MRH
REVISED:	05/12/2021	APPROVED BY:	REL/05/2021
CLIENT	PRAIRIE DU CHIEN REDEVELOPMENT AUTHORITY		
ENGINEER	<b>SCS ENGINEERS</b> 2830 DARIY DRIVE WADSWORTH, WI 53718-6751 PHONE: (608) 224-2838		
SITE PLAN	BLACKHAWK JUNCTION REDEVELOPMENT 700 EAST BLACKHAWK AVENUE PRAIRIE DU CHIEN, WISCONSIN		
FIGURE	2		



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LEGEND	
	SOIL BORING (BAY WEST, 2020)
	SOIL BORING (AYRES, 2009/2010)
	MONITORING WELL (BAY WEST, 2020)
	ABANDONED MONITORING WELL (ADVENT, 1991)
	PROPOSED MONITORING WELL
	PROPOSED PIEZOMETER
	SITE BOUNDARY
	FORMER DRY CLEANERS BUILDING (APPROXIMATE)
<b>0.92</b>	GROUNDWATER PCE CONCENTRATION (ug/l)
<b>ND</b>	NOT DETECTED
<b>10</b>	PCE ISOCONCENTRATION

- NOTES:
- SEE FIGURE 2 FOR BASE MAP NOTES AND LEGEND ITEMS.
  - PCE ISOCONCENTRATION LINES BY SCS BASED ON ENVIRONMENTAL DATA FROM BAY WEST (FEBRUARY 2021) AND AYRES (2009 AND 2010).

CLIENT PRAIRIE DU CHIEN REDEVELOPMENT AUTHORITY	PROJECT NO.	25221094.00	ENGINEER	SCS ENGINEERS 2830 DAIRY DRIVE MADISON, WI 53718-6751 PHONE: (608) 224-2830
	DRAWN BY:	04/05/2021	REL 05/12/2021	
	CHECKED BY:	MRH		
	APPROVED BY:			
				FIGURE 3

BLACKHAWK JUNCTION REDEVELOPMENT  
700 EAST BLACKHAWK AVENUE  
PRAIRIE DU CHIEN, WISCONSIN

GROUNDWATER RESULTS AND  
PROPOSED MONITORING WELLS