



October 15, 2009

Mr. J. Hnat, PG, CPG
Southeast Region Headquarters
Wisconsin Department of Natural Resources
2300 N. Dr. Martin Luther King Jr. Drive
Milwaukee, WI 53212

OCT 19 2009

File

**Re: Work Plan for Further Site Investigation Activities
Shirdon Corp. d/b/a Shorewood Queensway Dry Cleaners
4300 N Oakland Ave
Shorewood, Wisconsin
WDNR BRRTS: 02-41-552089
EnviroForensics Project # 6107**

FID 241094 590

Dear Mr. Hnat:

On behalf of Shorewood Queensway Dry Cleaners, Environmental Forensic Investigations, Inc. (EnviroForensics) has prepared this work scope to conduct Further Site Investigation (FSI) activities for the property located at 4300 N Oakland Ave in Shorewood, Wisconsin (Site). The purpose of the FSI is to further evaluate the nature and extent of soil and groundwater contamination discovered during previously conducted Site Investigation (SI) activities, and to address the comments set forth in the letter dated June 17, 2009 from the State of Wisconsin Department of Natural Resources (WDNR). This Work Plan has been prepared per the Site Investigation requirements set forth in MR 716 of the Wisconsin Administrative Code (WAC). A written response to this submittal is not requested.

I appreciate your assistance with this matter. If you have any questions or comments, feel free to contact me at 317.770.9892.

Sincerely,

Jeff Carnahan, LPG
Senior Project Manager

Copy: Shirley Carlson, Shorewood Queensway Dry Cleaners

Enclosure

Environmental Forensic Investigations, Inc.
1060 North Capitol Avenue, Suite E230, Indianapolis, IN 46204
Phone: 317-972-7870 • Fax 317-972-7875

**WORK PLAN
FURTHER SITE INVESTIGATION
SHOREWOOD QUEENSWAY DRY CLEANERS
SHOREWOOD, WISCONSIN
BRRTS: 02-41-552089**

October 15, 2009

1.0 INTRODUCTION AND BACKGROUND

The Site location is shown in the attached Figure 1, and a Site map with adjacent properties is provided as Figure 2. Based on previous site investigation results, it was determined that the onsite soils have been impacted by the release of the dry cleaning solvent tetrachlorethene (PCE). The highest soil contaminant concentrations appear to be located in the northwest portion of the property beneath the building and the area adjacent to the east. The horizontal and vertical extents of impacts are unknown. The results of previous soil sampling are summarized in Figure 3, attached.

Site investigation groundwater sample results indicate groundwater has been impacted with contaminants above the WDNR enforcement standards. The horizontal and vertical extent of groundwater impacts have not yet been defined, although the area of highest impacts appears to be located in the northwest portion of the property. The results of previous groundwater sampling are summarized in Figure 4.

2.0 SCOPE OF WORK

The scope of work presented below proposes additional investigation activities to further evaluate the extent of soil and groundwater contamination at and downgradient of the Site.

Task 1: Site-Specific Health and Safety Plan Revision

EnviroForensics will revise the existing Health and Safety Plan (HASP) for this Project prior to initiating field activities. The HASP will be used by members of the Project team, all of whom have completed and are current with the requisite Hazardous Waste Operations Training. The revised HASP will provide health and safety guidelines for the FSI activities and will address key safety issues and potential hazards associated with the Project. The HASP will describe the scope of work, specify the appropriate personal protective equipment (PPE), discuss emergency procedures and contacts, list project team member responsibilities, and outline work zones and decontamination procedures to be used during the Project. All site personnel will be required to read and sign the HASP prior to beginning work, to acknowledge that they understand the contents of the HASP

and will abide by it. All personnel that enter the work areas will be equipped with at least the minimum level of PPE specified by the HASP.

It is assumed that all work activities can be performed in Level D PPE. This is the same level of PPE that was utilized in past sampling efforts at the Site.

Task 2: Utility Corridor Investigation

Underground gas and water utilities have been identified at the Site and mapped. The gas line corridor is well beyond the source area of observed impacts. The water line is also located outside of the area of highest impacts, but conditions are unknown. The location of the sewer line exiting the building has not been identified. It is presumed that the sewer may be adjacent to or within the impacted area. As such, an investigation of the water and sewer line corridors will be conducted in general accordance with WDNR Bureau for Remediation and Redevelopment (BRR) publication PUBL-RR-649, *Guidance for Documenting the Investigation of Utility Corridors*.

EnviroForensics will attempt to acquire a map from the property owner and the local municipality that indicates the location of the sewer line. In addition to having underground utilities located and marked by Wisconsin's One-Call Digger's Hotline, a private utility locator will then be utilized to investigate the location of all underground utilities prior to sampling activities. Additional soil and groundwater samples will be collected along the water and sewer line corridors to evaluate whether they may act as preferential pathways for the migration of volatile organic compounds (VOCs) from the contaminant source area. It is anticipated that four (4) soil borings (HA-1 through HA-4) will be advanced along the sewer line and the water line using a hand-auger or direct-push technology. The proposed locations for these borings are shown on Figure 5.

It is anticipated that the borings will be advanced to a depth of up to 5 feet (ft) below ground surface (bgs), or approximately 1-ft below the estimated depth of the utility line. The utility corridor backfill materials encountered during sampling will be documented on boring logs (WDNR 4400-122) and will be field-screened using a photoionization detector (PID). One (1) soil and one (1) water grab-sample, if water is present within the sewer corridor, will be collected from each boring.

Soil samples will be collected using direct methanol permeation methods in accordance with SW-846 Method 5035 and water samples, if encountered, will be collected using a bailer placed into the open borehole. The soil and groundwater samples will be submitted to an environmental laboratory for analysis of VOCs via EPA Method 8260.

Task 3: Direct Push Sampling

Data from previous borings indicate that the subsurface soils at the Site contain a high percentage of clay and are not highly permeable. Groundwater appears to be present as a

perched saturated zone at a depth of approximately 10 ft bgs where the lithology changes from reddish-brown silty-clay to grayish-brown clay in the eastern portion of the Site. Groundwater in the western portion of the Site appears to be present in discontinuous seams of higher permeability. Previous data also suggests that the perched zone may serve as a preferential pathway for the horizontal distribution of impacts. The soil and groundwater sampling approach described below has been designed to further evaluate the extent of soil and groundwater impacts at the Site and to further develop the conceptual site model (CSM).

A total of ten (10) borings (SB-6 through SB-15) will be advanced using direct-push drilling methods to depths up to approximately 25 ft bgs. Figure 6 indicates the proposed soil boring locations. Dual-tube soil coring methods will be utilized to a depth of approximately 12 ft bgs to minimize the down-hole migration of potentially impacted perched groundwater.

A minimum of two (2) soil samples will be collected from each boring. One soil sample will be collected from above the lithological transition described above (approximately 10 ft bgs) where PID readings indicate the highest potential for impacts. A second soil sample will be collected from an interval below the lithological transition where PID readings indicate that the depth of impacts has been reached. If perched groundwater is encountered above the lithological transition, a water sample will be collected. If no perched water is encountered, a soil sample will be collected.

In borings SB-10 and SB-14, an attempt will be made to collect a groundwater sample from a depth of approximately 25 ft bgs while isolating any encountered perched saturated zones to evaluate the vertical extent of impacts on-site and off-site.

Soil Sampling

During the boring activities, direct-push soil samples will be collected in 4-foot long by 1.5-inch diameter vinyl acetate plastic sample sleeves, sampled and logged. A portion of each sample will be described lithologically and recorded on boring logs (WDNR 4400-122) in accordance with the United Soil Classification System (USCS). The results of field-screening using a PID will also be recorded on the boring logs.

Soil samples will be collected using direct methanol preservation methods in accordance with SW-846 Method 5035, and placed in a cooler on ice. Latex gloves will be changed and new plastic sleeves will be inserted into the sample probe between each sample interval. The sample sleeve containing retrieved sample intervals will be placed on plastic and the cutting tool will be decontaminated prior to reuse.

One (1) duplicate soil sample will be collected for every ten (10) or fewer investigative samples, one (1) MS/MSD soil sample will be collected for every 20 or fewer investigative samples, one (1) field blank sample will be collected for every ten (10) or

fewer investigative soil samples, and one (1) trip blank sample will be analyzed per sample cooler for quality assurance and quality control (QA/QC) purposes. It is estimated that two (2) duplicate soil samples, 1 MS/MSD soil samples, 2 field blank samples and two (2) trip blank samples will be submitted for laboratory analysis.

All investigative soil samples and associated QA/QC samples will be submitted to an environmental laboratory, certified and registered per NR 149, for analysis of VOCs using US EPA Method 8260. The sample results will include a laboratory Level IV QA/QC data package.

Investigation-derived media generated during direct push sampling will include soil cuttings and will be contained in labeled U.S. Department of Transportation (DOT) 17H-rated drums, or equivalent, and staged onsite awaiting management as set forth in Task 6.

Groundwater Sampling

Groundwater samples will be collected at the depth of occurrence in each of the ten (10) borings. A deeper groundwater sample will be collected from borings SB-10 and SB-14. Groundwater samples will be collected by via one-time, temporary monitoring wells constructed of a ¾-inch diameter PVC casing equipped with a one-ft section of slotted screen. As such, these groundwater sampling ports are not subject to standard WDNR monitoring well construction standards, as discussed in PUB-RR-647. Groundwater will be purged from the sampling port using disposable tubing and a peristaltic pump. Grab samples will be collected using a peristaltic pump. Bottles will be labeled in the field and placed in a cooler following sampling.

One (1) duplicate groundwater sample will be collected for every ten (10) or fewer investigative samples, one (1) MS/MSD groundwater sample will be collected for every 20 or fewer investigative samples, one (1) field blank sample will be collected for every ten (10) or fewer investigative groundwater samples for QA/QC purposes. It is estimated that 3 duplicate groundwater samples, 2 MS/MSD groundwater samples and 3 field blank samples will be submitted for laboratory analysis.

All investigative groundwater samples and associated QA/QC samples will be submitted to an environmental laboratory certified and registered per NR 149, for analysis of VOCs using US EPA Method 8260. The sample results will include a laboratory Level IV QA/QC data package.

Investigation-derived media generated during direct push groundwater sampling will include purge water and decontamination fluids, which will be contained in labeled U.S. Department of Transportation (DOT) 17H-rated drums, or equivalent, and staged onsite awaiting management as set forth in Task 6.

Task 4: Monitoring Well Installation and Sampling

Based on the observations made during the Direct-Push investigation, task 4 of the scope of work for this project will include the installation of up to three (3) additional permanent monitoring wells. It is likely that the monitoring wells (MW-4 through MW-6) will be installed in the general locations depicted in Figure 7. If obstructions, including utility locations, do not allow one or more borings to be drilled in the designated location(s), the boring will be moved to the nearest possible location.

Well Construction and Development

Monitoring wells will be drilled, constructed, surveyed and recorded in accordance with NR 141. Expandable locking caps and keyed alike locks will be placed on each well. Flush mount well boxes will be set in 2-ft square concrete pads. Soil cuttings from the drilling and construction activities will be placed in DOT 17H-rated drums, or equivalent for disposal. Investigation derived media will be managed in accordance with the methods set forth in Task 6.

The wells will be developed approximately 24 hours after well installation. Well development procedures will consist of removing three to five well volumes of water with a peristaltic or submersible pump, or with a dedicated, disposable bailer. If ample groundwater is not present, development will consist of completely evacuating the well. If utilized, disposable tubing will be used during the well development activities with new tubing employed at each new well.

Surveying

Upon completion of the installation of the new monitoring wells, a licensed surveyor will locate each new monitoring well by standard surveying methods. A vertical survey will be conducted to establish the elevation of each monitoring well based on the existing benchmark, which will be utilized as a vertical control for the Site. The horizontal and vertical grid coordinates of each monitoring well and soil boring location will be recorded to within 0.1 foot and 0.01 foot, respectively. Horizontal locations will be referenced to the State Plane Coordinate System. The wells will also be recorded with the WDNR per NR 141.

Well Sampling

EnviroForensics personnel will conduct groundwater sampling approximately 24 hours after new well development activities have been completed. Groundwater level measurements will be obtained from all wells at the Site, and one round of groundwater samples will be collected from the three (3) new wells and the three (3) existing wells.

When appropriate, groundwater sampling will be conducted in accordance with the *Groundwater Sampling Field Manual* (PUBL-DG-038 96). Groundwater purging and sample collection will be conducted using peristaltic or submersible pump and disposable bailer. If ample water exists in the well, field parameters including dissolved oxygen (DO) and oxidation-reduction potential (ORP) will be measured. Water levels at each well will be measured and an interface tape will be used to estimate the presence of dense non-aqueous phase liquid (DNAPL).

All groundwater samples and associated QA/QC samples will be submitted to an environmental laboratory certified and registered per NR 149, for analysis of VOCs using US EPA Method 8260. The sample results will include a laboratory Level IV QA/QC data package.

Investigation-derived media generated during groundwater sampling will include purge water, which will be contained in labeled U.S. Department of Transportation (DOT) 17H-rated drums, or equivalent, and staged onsite awaiting management as set forth in Task 6 and RR 556 *General Interim Guidelines for the Management of Investigative Waste*.

Task 5 Evaluation of Vapor Intrusion Pathway

EnviroForensics will assess the soil-to-air pathway at and surrounding the Site utilizing the following documents as guidance:

- *Vapor Intrusion Pathway: A Practical Guideline*; Interstate Technology & Regulatory Council (ITRC), January 2007
- *Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils* (EPA 530-D-02-004); U.S. EPA Office of Solid Waste and Emergency Response (OSWER), November 2002)
- *Chemical Vapor Intrusion and Residential Indoor Air; Guidance for Environmental Consultants and Contractors*; State of Wisconsin Department of Health and Family Services, February 2003.

The results of the additional soil and groundwater investigation presented in this Work Scope will be utilized during further assessment of a potential Vapor Intrusion (VI) concern for the adjacent properties. If conditions warrant, following the proposed soil and groundwater sampling, additional VI evaluation activities will be proposed.

Task 6: Investigation Derived Media

One (1) composite soil sample and one (1) composite groundwater sample will be collected from the drums of soil cuttings and purge water for characterization purposes. Both samples will be analyzed for total VOCs. If appropriate, a contained-in determination request will be made to WDNR in accordance with Chapter IV of the

Guidance for Hazardous Waste Remediation document (RR-705; May, 2006). A determination will be made if the materials are hazardous or non-hazardous and profiles will be provided by the WDNR, accordingly. A licensed sub-contractor will properly transport and manage investigation derived media. A representative of the Site will be required to sign all manifests and shipping documents. Costs to characterize the materials are included in this proposal. The cost to manage the materials off-site will be completed as-needed on a time-and-materials basis in accordance with the results of characterization process.

Task 7: Site Investigation Report

Once the SI results are available, EnviroForensics will complete a *Site Investigation Report* that complies with NR 716.15. The report will summarize the results of the work activities associated with the proposed tasks. The report will also include information on further delineation of the horizontal and vertical extent of soil and/or groundwater contamination, and a summary of all analytical testing results and field measurements. The report will also summarize the results of the vapor intrusion evaluation. The report will include tables, maps, figures, and appendices, as appropriate, to aid data presentations and interpretation and the findings of the FSI as outlined in the WDNR Guidelines. A copy of the report will be provided to you for comment prior to submittal to WDNR. For the purposes of estimating costs, it is assumed that only one review/revision cycle will be required for the report.

3.0 SCHEDULE

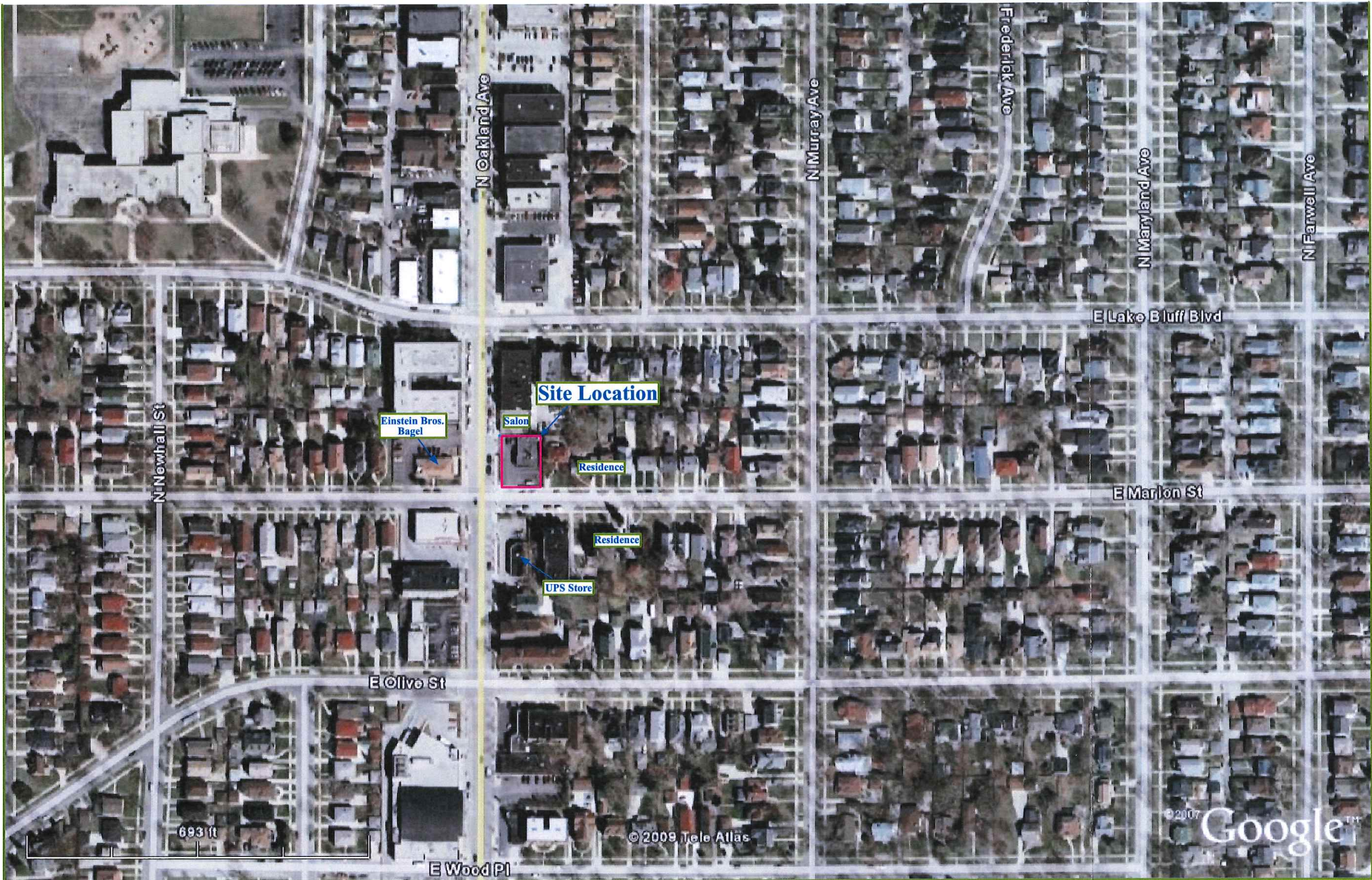
EnviroForensics anticipates that the proposed Work Plan could be prepared and submitted to the WDNR within two weeks of receiving authorization to proceed. Once the Work Plan has been accepted by the WDNR, it is anticipated that fieldwork could commence within two (2) weeks. It is anticipated that the direct push sampling and monitoring well installation activities can be completed in approximately 3 days onsite. Groundwater sampling activities will be completed in an additional day. Indoor air and sub-slab sampling activities are anticipated to take two (2) days to complete. We anticipate completing the FSI Report within three weeks of receiving laboratory results.



FIGURES



FIGURES



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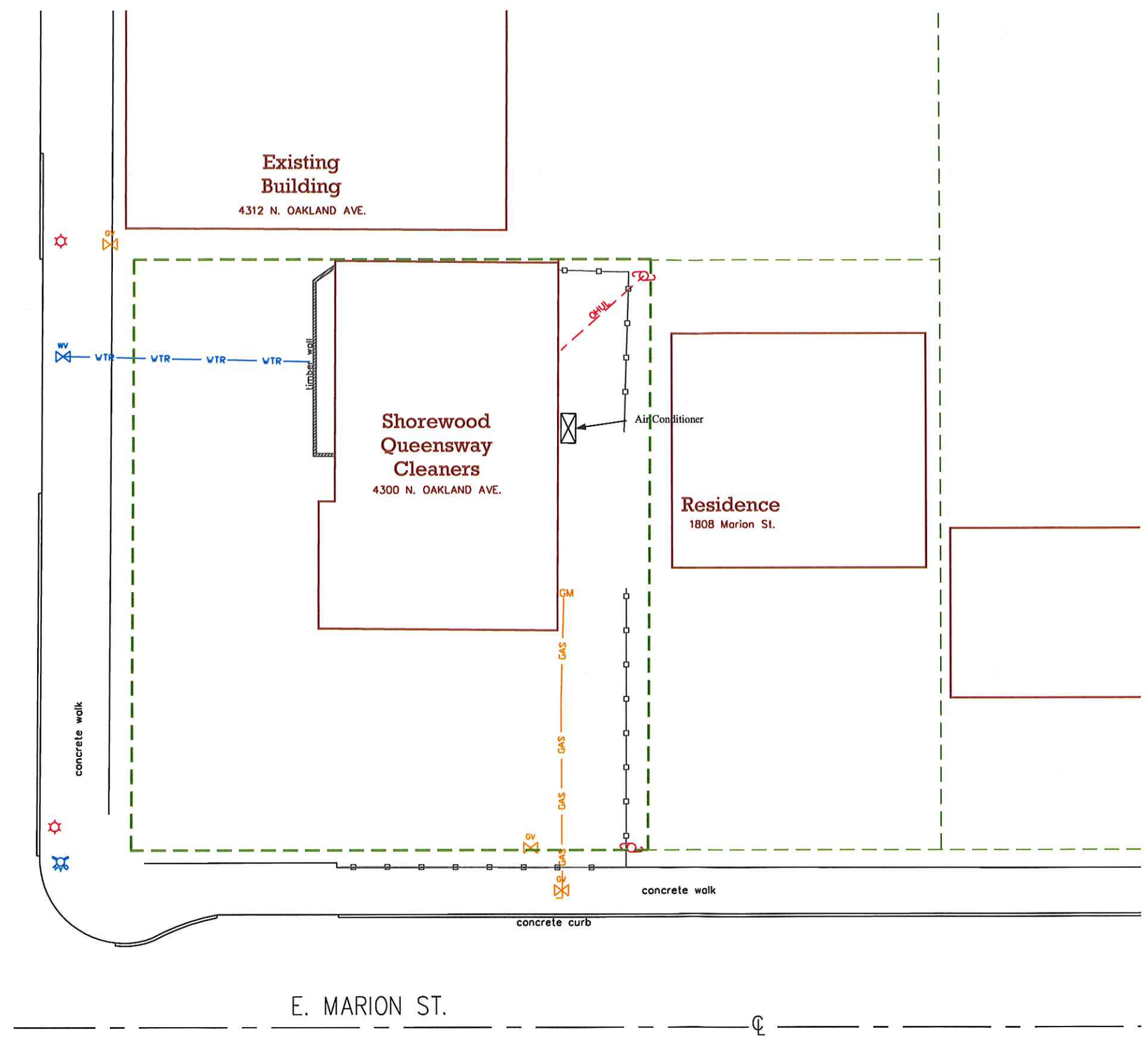
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SITE VICINITY MAP
 Further Site Investigation
 Shorewood Queensway Cleaners
 4300 N. Oakland Avenue; Shorewood, WI

Figure	1
Project	6107

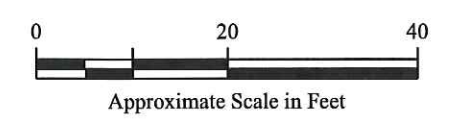


N. OAKLAND AVE.



Legend

- Property boundary
- Underground gas utility line
- Underground water utility line
- Over head utility line



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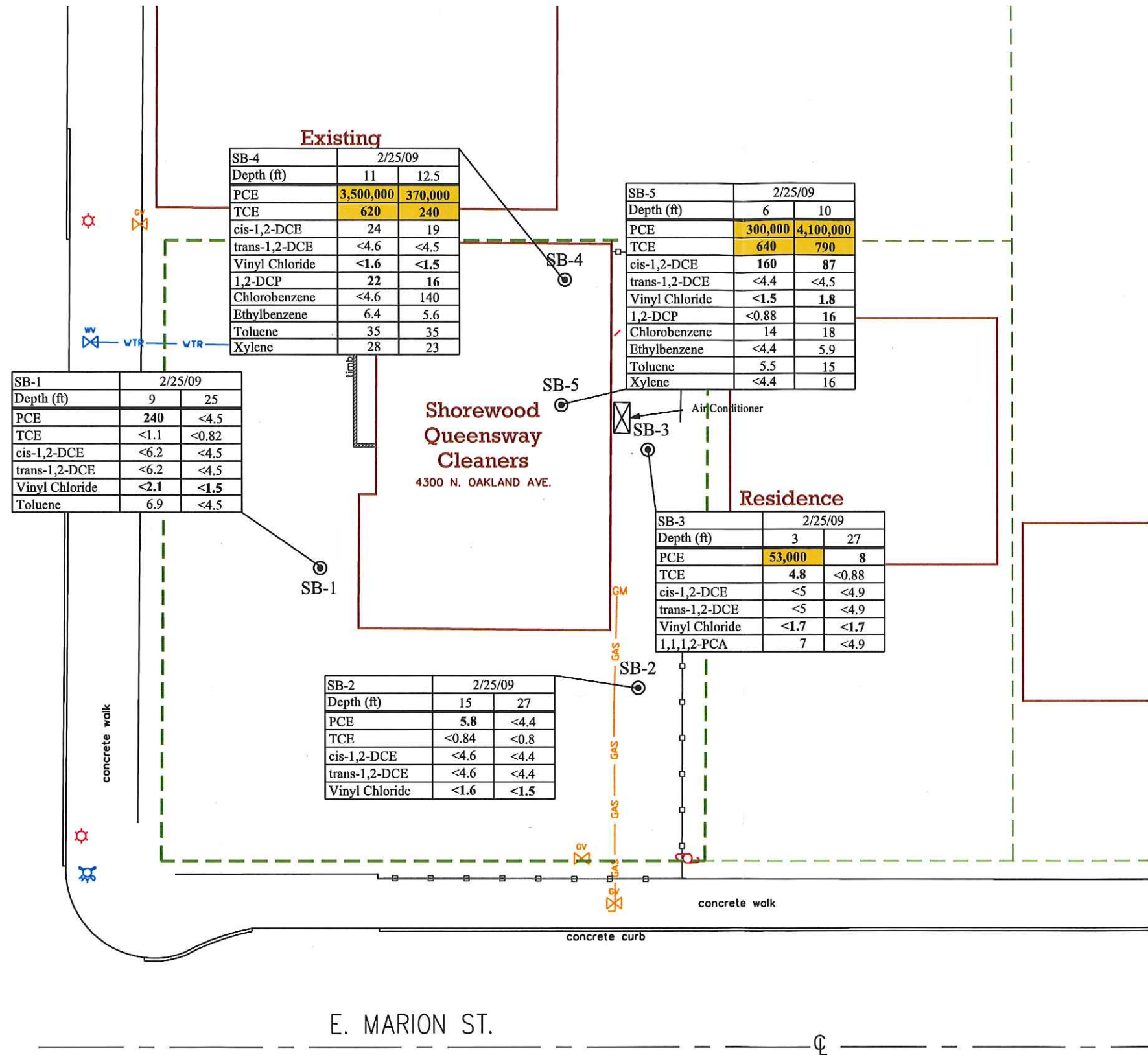
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SITE LAYOUT
 Further Site Investigation
 Shorewood Queensway Cleaners
 4300 N. Oakland Avenue; Shorewood, WI

Figure	2
Project	6107



N. OAKLAND AVE.

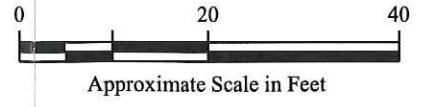


	Soil Residual Contaminant Level		
	Inhalation		Soil to Groundwater
	Industrial	Non-Industrial	
PCE	34,000	2,000	4.1
TCE	230	14	3.7
cis-1,2-DCE	1,300,000	1,300,000	55
trans-1,2-DCE	3,200,000	3,200,000	98
Vinyl Chloride	890	53	0.13
1,1,1,2-PCA	21,000	1,300	7.4
1,2-DCP	40,000	5,800	3.9
Chlorobenzene	340,000	49,000	150
Ethylbenzene	400,000	400,000	1,500
Toluene	670,000	670,000	1,400
Xylene	1,900,000	270,000	160,000
Chloroform	910	54	39

Legend

- Property boundary
- SB-4 ⊙ Soil boring location

- Notes:
1. Concentrations in ug/kg
 2. Bolded values are above Soil Residual Contaminant Level - Soil to Groundwater
 3. Bolded and shaded values are above Soil Residual Contaminant Level - Inhalation, Industrial
 4. ft = feet below ground surface
 6. PCE = Tetrachloroethene
 7. TCE = Trichloroethene
 8. cis-1,2-DCE = cis-1,2-Dichloroethene
 9. trans-1,2-DCE = trans-1,2-Dichloroethene
 10. 1,1,1,2-PCA = 1,1,2-Tetrachloroethane
 11. 1,2-DCP = 1,2-Dichloropropane



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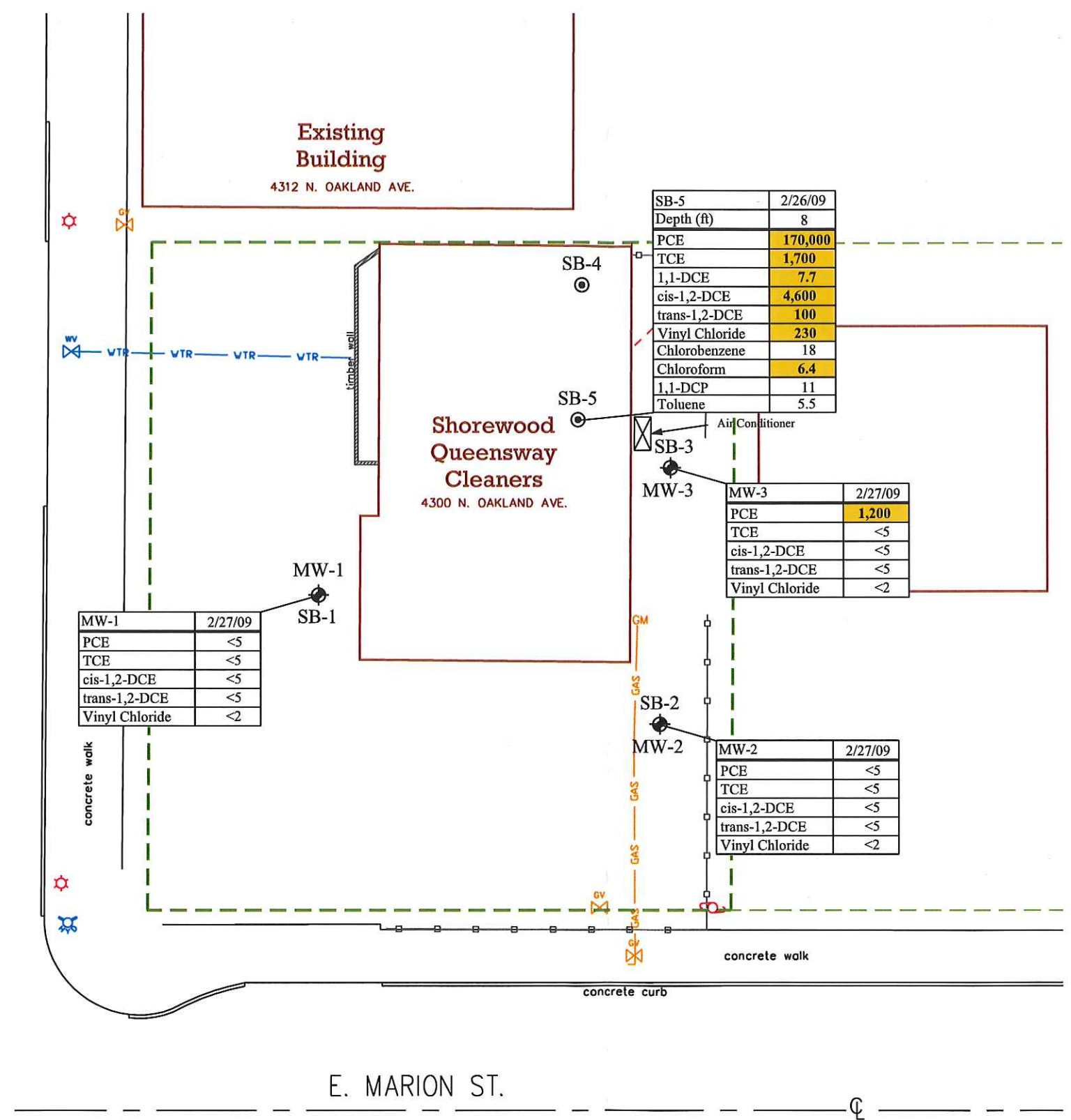
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PREVIOUS SOIL ANALYTICAL RESULTS
Further Site Investigation
Shorewood Queensway Cleaners
4300 N. Oakland Avenue, Shorewood, WI

Figure	3
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N. OAKLAND AVE.



SB-5	2/26/09
Depth (ft)	8
PCE	170,000
TCE	1,700
1,1-DCE	7.7
cis-1,2-DCE	4,600
trans-1,2-DCE	100
Vinyl Chloride	230
Chlorobenzene	18
Chloroform	6.4
1,1-DCP	11
Toluene	5.5

MW-3	2/27/09
PCE	1,200
TCE	<5
cis-1,2-DCE	<5
trans-1,2-DCE	<5
Vinyl Chloride	<2

MW-1	2/27/09
PCE	<5
TCE	<5
cis-1,2-DCE	<5
trans-1,2-DCE	<5
Vinyl Chloride	<2

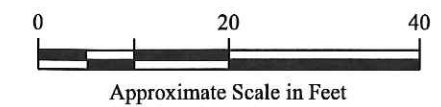
MW-2	2/27/09
PCE	<5
TCE	<5
cis-1,2-DCE	<5
trans-1,2-DCE	<5
Vinyl Chloride	<2

	Public Health	
	Enforcement Standards	Preventive Action Level
PCE	5	0.5
TCE	5	0.5
cis-1,2-DCE	70	7
trans-1,2-DCE	100	20
Vinyl Chloride	0.2	0.02
1,1-DCE	7	0.7
Chlorobenzene	100	--
Chloroform	6	0.6
1,1-DCP	--	--
Toluene	1,000	200

Legend

- Property boundary
- SB-4 ⊙ Soil boring location
- MW-1 ⊕ Monitoring well location

- Notes:
1. Concentrations in ug/L
 2. Bolded and shaded values are above Public Health Enforcement Standards
 3. ft = feet below ground surface
 4. PCE = Tetrachloroethene
 5. TCE = Trichloroethene
 6. cis-1,2-DCE = cis-1,2-Dichloroethene
 7. trans-1,2-DCE = trans-1,2-Dichloroethene
 8. 1,1-DCE = 1,1-Dichloroethene
 9. 1,2-DCP = 1,2-Dichloropropane



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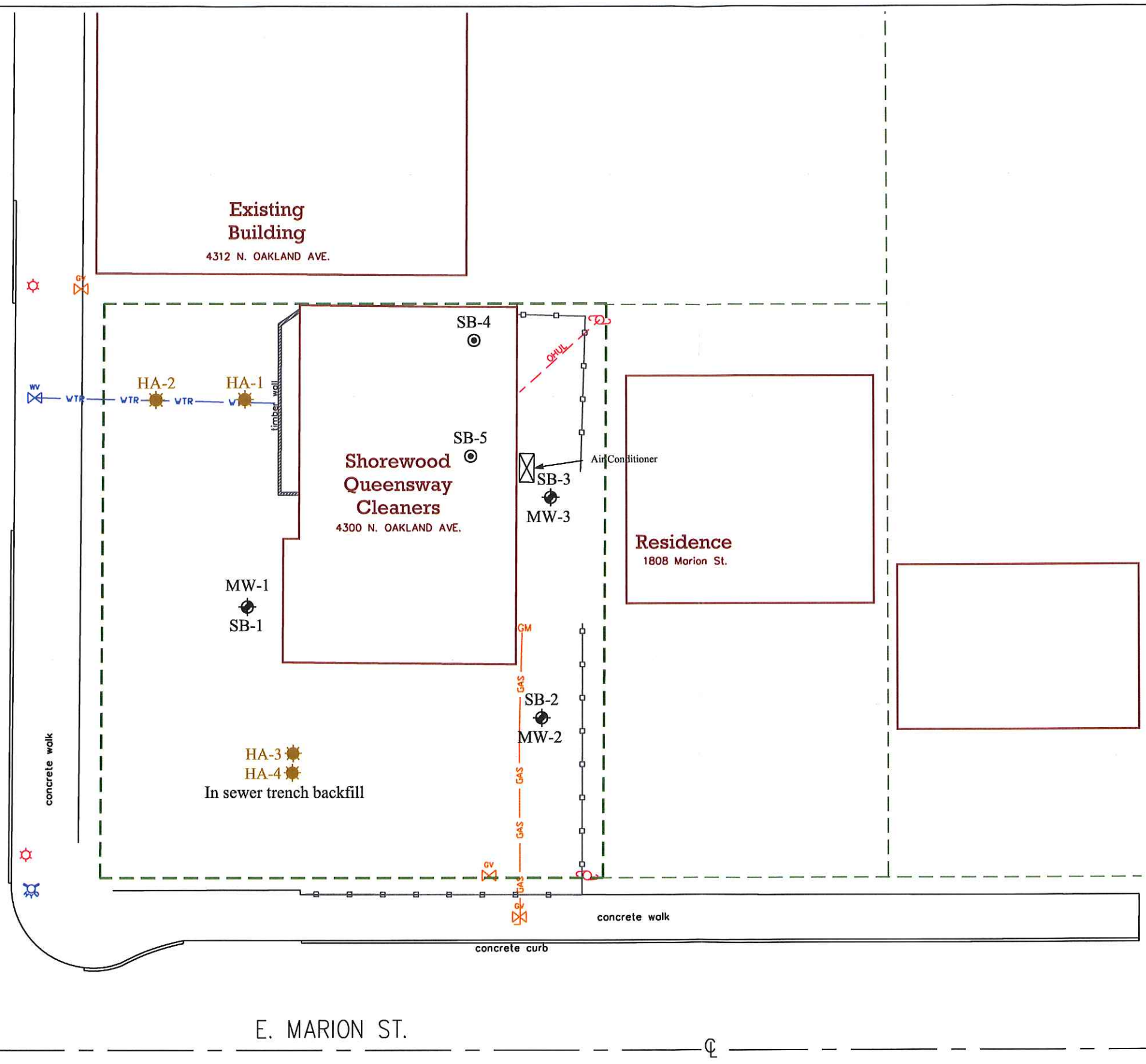
PREVIOUS GRAB GROUNDWATER AND MONITORING WELL ANALYTICAL RESULTS

Further Site Investigation
 Shorewood Queensway Cleaners
 4300 N. Oakland Avenue; Shorewood, WI

Figure	4
Project	6107



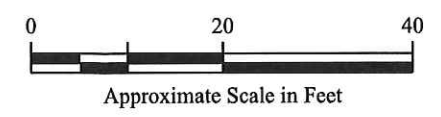
N. OAKLAND AVE.



E. MARION ST.

Legend

- Parcel boundary
- Fence
- SB-4 ⊙ Previous Soil boring location
- MW-2 ⊕ Previous Monitoring well location
- HA-1 ★ Proposed Hand Auger location



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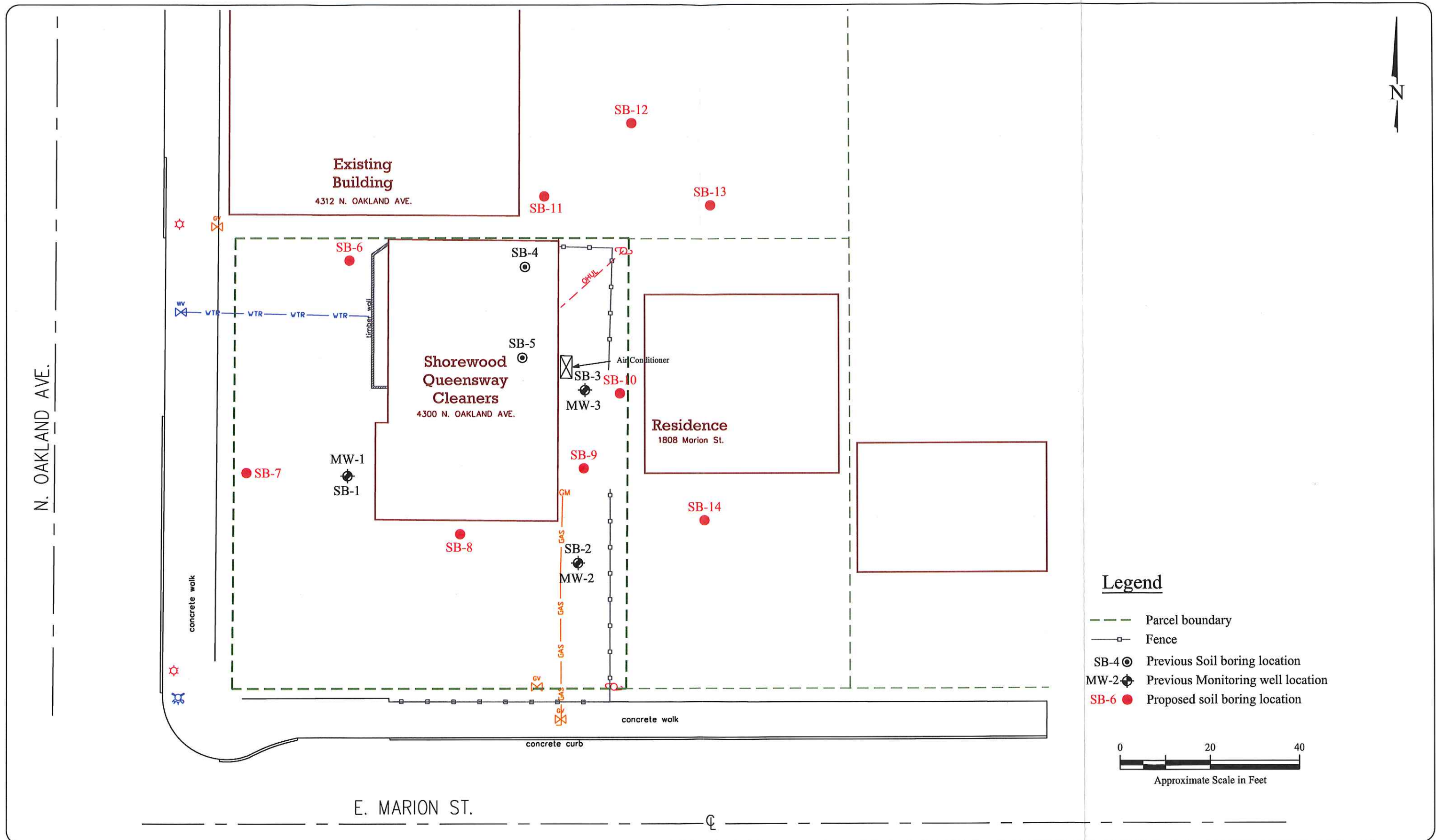
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PROPOSED HAND AUGER LOCATION MAP

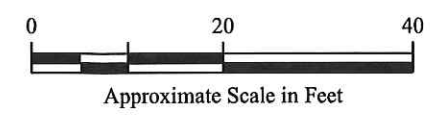
Further Site Investigation
 Shorewood Queensway Cleaners
 4300 N. Oakland Avenue; Shorewood, WI

Figure	5
Project	6107



Legend

- Parcel boundary
- Fence
- SB-4 ⊙ Previous Soil boring location
- MW-2 ⊕ Previous Monitoring well location
- SB-6 ● Proposed soil boring location



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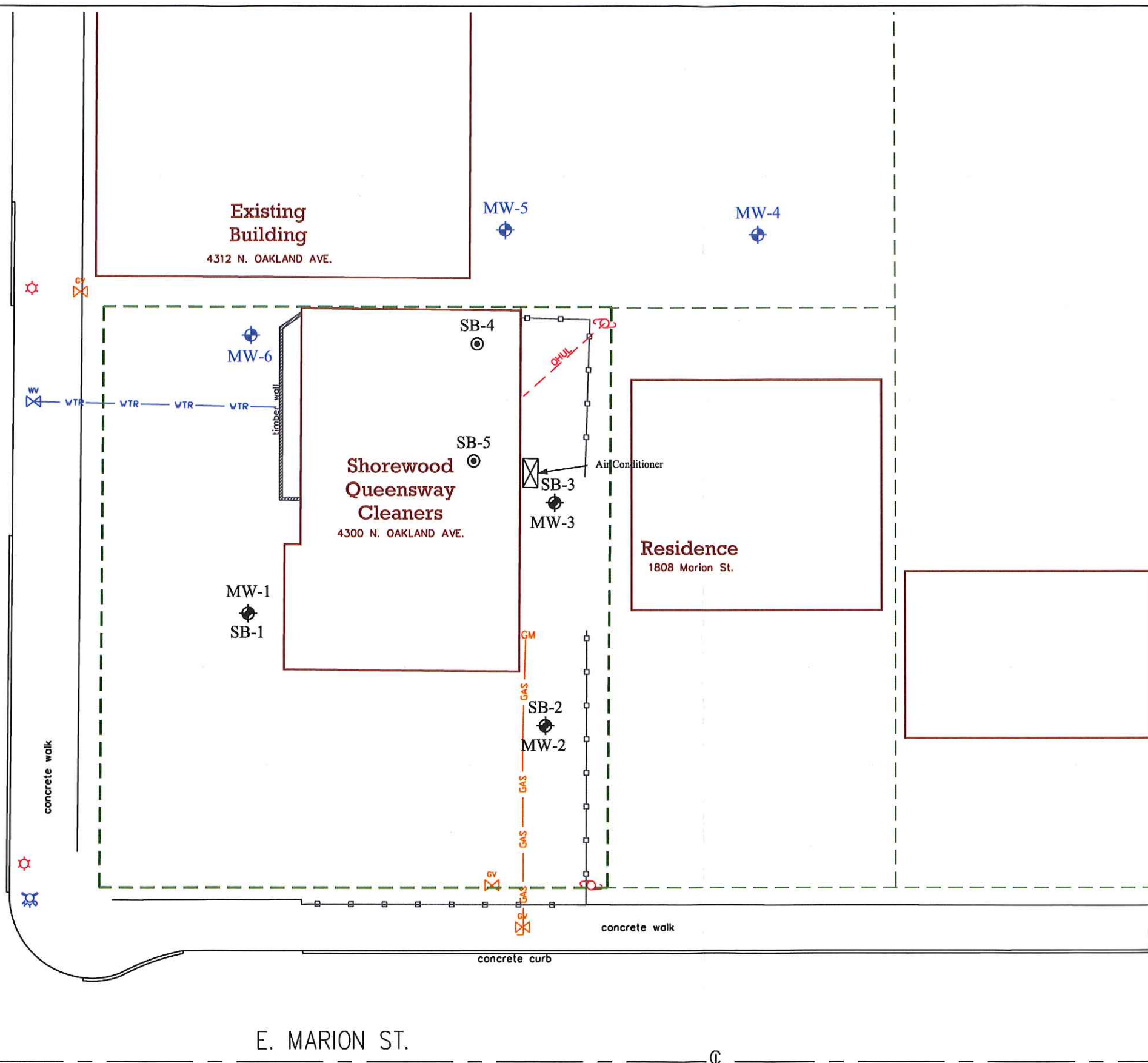
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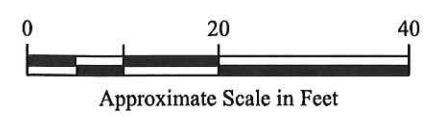
PROPOSED SOIL BORING LOCATION MAP
 Further Site Investigation
 Shorewood Queensway Cleaners
 4300 N. Oakland Avenue; Shorewood, WI

Figure	6
Project	6107

N. OAKLAND AVE.



- Legend**
- Parcel boundary
 - Fence
 - SB-4 ⊙ Previous Soil boring location
 - MW-2 ⊕ Previous Monitoring well location
 - MW-5 ⊕ Proposed Monitoring well location



E. MARION ST.

No.	Date	Revision	Approved

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PROPOSED MONITORING WELL LOCATION MAP
 Further Site Investigation
 Shorewood Queensway Cleaners
 4300 N. Oakland Avenue; Shorewood, WI

Figure	7
Project	6107