RAMBOLL

ENVIRONMENT
& HEALTH

Mr. Binyoti Amungwafor
Hydrogeologist
Wisconsin Department of Natural Resources – Southeast Region
2300 Dr. Martin Luther King, Jr. Drive
Milwaukee, WI 53212

INFILTRATION APPROVAL REQUEST FOR IN-SITU ENHANCED REDUCTIVE DECHLORINATION THROUGH SOIL BLENDING
FORMER ONE-HOUR VALET DRY CLEANERS PROPERTY
1214 WEST WELLS STREET, MILWAUKEE, WISCONSIN
BRRTS NO. 02-41-152248 AND FID NO. 241086120

Dear Mr. Amungwafor:

February 12, 2018

Ramboll
175 North Corporate Drive
Suite 160
Brookfield, WI 53045
USA

T +1 262 901 0099
F +1 262 901 0079
www.ramboll.com

Ref. 1690005819

On behalf of the Marquette University, Ramboll US Corporation[1] (Ramboll) has prepared the attached Infiltration Approval Request for Former One-Hour Valet Dry Cleaners property located at 1214 West Wells Street in Milwaukee, Wisconsin (Site) in accordance with the Wisconsin Pollutant Discharge Elimination System (WPDES) general permit requirements to request a temporary exemption for injection in accordance with Wisconsin Administrative Code (WAC) NR 140.28(5), and approval to inject remedial materials under WAC NR 812.05. Injection/infiltration of remedial materials are proposed for discharge to groundwater at the Site.

Based on the evaluation of remedial technologies presented in the *Proposal for Remedial Action Services* and subsequent updates, Ramboll recommended implementation of enhanced reductive dechlorination of a combined *in-situ* chemical and biological reduction approach through *in-situ* blending of zero-valent iron (ZVI) and carbon amendment. The Wisconsin Department of Natural Resources (WDNR) approved Ramboll's proposal for remedial action services in a letter dated March 3, 2017. Additional details regarding the proposed remedial action activities are presented in the *Remedial Design Report* which is being submitted concurrently to the WDNR.

Included with this submittal please find the Infiltration Approval Request and accompanying attachments along with a check for $700 for the technical review fee.

The soil blending activities are scheduled to begin in April 2018. We greatly appreciate your timely review of this request so we can maintain the proposed redevelopment schedule.

[1] Effective on December 28, 2017, the legal corporate name of Ramboll Environ US Corporation (formerly ENVIRON International Corporation) was changed to Ramboll US Corporation.

If you have any questions or comments regarding this submittal, please feel free to contact us.

Yours sincerely,

Susan Petrofske
Managing Consultant

D 262.901.3501
spetrofske@ramboll.com

Jeanne M. Tarvin, PG,
Principal

D 262.901.0085
jtarvin@ramboll.com

cc: Mr. Trevor Nobile, WDNR
Mr. Joel Smullen, WDNR.

Attachments: Infiltration Approval Request

Prepared for:
Marquette University
517 North 14th Street
Milwaukee, Wisconsin

Date:
February 2018

Project Number:
1690005819

FORMER ONE-HOUR VALET DRY CLEANERS SITE

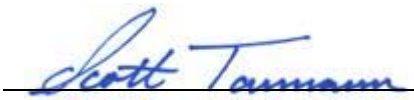
BRRTS NO. 02-41-152248
FID NO. 241086120

INFILTRATION APPROVAL REQUEST

RAMBOLL

CERTIFICATIONS

I, Scott W. Tarmann, hereby certify that I am a Professional Engineer as that term is defined in s. NR 712.03(2), 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.

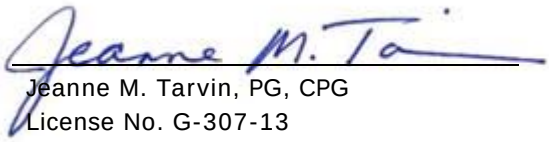


February 12, 2018

Scott W. Tarmann, PE
License No. 33530-006

Date

I, Jeanne Tarvin, hereby certify that I am a Hydrogeologist as that 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.



February 12, 2018

Jeanne M. Tarvin, PG, CPG
License No. G-307-13

Date

Ramboll US Corporation
175 North Corporate Drive
Suite 160
Brookfield, WI 53045
USA
T +1 262 901 0099
F +1 262 901 0079
www.ramboll.com

CONTENTS

FIGURES

APPENDICES

1. INTRODUCTION AND BACKGROUND

On behalf Marquette University (Marquette), Ramboll US Corporation[1] (Ramboll) has prepared this Infiltration Approval Request for the Former One-Hour Valet Dry Cleaners in Milwaukee, Wisconsin (the Site), in accordance with the Wisconsin Pollutant Discharge Elimination System (WPDES) general permit requirements to request a temporary exemption for injection in accordance with Wisconsin Administrative Code (WAC) NR 140.28(5) and approval to inject remedial materials under WAC NR 812.05. Injection/infiltration of remedial materials are proposed for discharge to groundwater at the Site.

An *Updated Proposal for Remedial Action Services* (Ramboll Environ US Corporation [Ramboll Environ], June 2016) was submitted to Marquette for review on June 7, 2016. As part of the *Updated Proposal for Remedial Action Services*, remedial technologies for impacted soil and groundwater were identified and screened based on effectiveness, implementability, and cost criteria. The technologies evaluated are potentially applicable for the conditions at the site and can most effectively address chlorinated volatile organic compounds (CVOCs) detected in the soil and groundwater, and achieve WAC NR 140 enforcement standard (ES) values within a reasonable timeframe. Based on this evaluation of remedial technologies, the June 7, 2016 *Updated Proposal for Remedial Action Services* recommended implementation of enhanced reductive dechlorination of a combined *in-situ* chemical and biological reduction approach through *in-situ* soil blending of zero-valent iron (ZVI) and carbon amendment.

In a letter dated March 3, 2017, the Wisconsin Department of Natural Resources (WDNR) approved the remedial activities described in the June 7, 2016 *Updated Proposal for Remedial Action,* as amended by Ramboll Environ's October 31, 2016 letter response to WDNR questions and comments. This Infiltration Approval Request meets the following requirements:

- WAC Chapter NR 140, NR 700, and NR 800 Rule Series; and
- WDNR Publication PUB-RR-935 (Infiltration and Injection Requests).

A WAC NR 724 Remedial Design Report documenting the intended implementation methodology of the selected remedial action option at the Site will be submitted to the WDNR under separate cover concurrently with this Infiltration Approval Request.

1.1 Regulatory Agency/Project Manager

Mr. Trevor Nobile
Wisconsin Department of Natural Resources
2300 North Dr. Martin Luther King, Jr. Drive
Milwaukee, Wisconsin 53212-3128
(414) 263-8524

1.2 Responsible Party/Site Owner

Marquette University
Joel Smullen, AIA
517 North 14th Street
Milwaukee, Wisconsin 53233
(414) 288-4620

[1] Effective on December 28, 2017, the legal corporate name of Ramboll Environ US Corporation (formerly ENVIRON International Corporation) was changed to Ramboll US Corporation.

1.3 Consultant Information

Ms. Jeanne Tarvin, PG, CPG
Ramboll US Corporation
175 North Corporate Drive, Suite 160
Brookfield, Wisconsin 53045
(262) 901-0085

1.4 Site Setting

The Site is located at 1214-1222 West Wells Street in the southwest ¼ of the northwest ¼ of Section 29, Township 7 North, Range 22 East, City of Milwaukee, Milwaukee County, Wisconsin (Figure 1). The geographic position of the Site in WTM 91 (x, y) coordinates obtained from the WDNR Remediation and Redevelopment (RR) interactive Site Map (http://dnrmaps.wi.gov) is 688795, 287401.

The Site is bounded on the west by a public alley and Marquette parking structure, on the north by a hospital parking garage, on the east by North 12th Street and on the south by West Wells Street, as shown on Figure 2. The Site is currently owned by Marquette and is enrolled in the WDNR-administered Dry Cleaner Environmental Response Fund Program (DERP) for claimants seeking financial assistance with the site investigation and remediation of dry cleaning solvent releases to the subsurface.

The Site includes a one-story building with a basement. Marquette currently uses a garage located within the northeast portion of the building for storage of landscape equipment and de-icing salt; however, the remainder of the building is vacant. The building is bounded on the east by an adjoining vacant brick and block building with a slab-on-grade foundation that was last occupied by a child daycare. The Site reportedly consisted of a parking lot prior to 1961, and three different tenants of the property operated dry cleaning operations beginning in 1961. Dry cleaning operations ended in 2008, when Marquette purchased the Site. The last dry cleaning operation at the Site was conducted by the One-Hour Valet Cleaners, which was located on the ground floor of the one-story building, and utilized space in the basement for dry cleaning solvent storage and laundering operations. An approximate 300-gallon aboveground storage tank (AST) that contained tetrachloroethene (PCE) was present in the basement within the northwest portion of the building at the approximate location shown on Figure 2.

The Site slopes from the northwest to the east and south, resulting in storm water drainage toward North 12th Street and West Wells Street. The Site and vicinity commercial properties are served by the Milwaukee municipal water supply that obtains potable water from Lake Michigan. The nearest surface water body is the Menomonee River, which is located approximately 1/2 mile to the south of the Site.

The Site and adjacent areas to the west (alley and portions of the Marquette parking garage property) have been the subject of several subsurface investigations since 1998. The WDNR has assigned Bureau for Remediation and Redevelopment Tracking System (BRRTS) #02-41-152248 and Federal Identification (FID) #241086120 to the case file. The existing on-site buildings have been identified for demolition in advance of the remediation activities. Marquette may eventually redevelop the site as a parking lot or it may remain vacant for a period of time following the completion of active remedial site work. The site includes two tax parcels in the City of Milwaukee, including Tax Parcels No. 3910218000 and 3910219000.

1.5 Project Contacts and Emergency Procedures

The proposed *in-situ* enhanced reductive dechlorination using *in-situ* blending methods will be performed on behalf of Marquette (property owner), under the direction of Ramboll and the oversight of the WDNR. The project contact personnel for the enhanced reductive dechlorination program are as follows:

Regulating Agency: Wisconsin Department of Natural Resources

- Trevor Nobile, WDNR Project Manager, Direct: (414) 263-8524

Responsible Party's Environmental Consultant: Ramboll US Corporation

- Jeanne M. Tarvin, Project Principal, Direct: (262) 901-0085, Cell: (414) 326-5365
- Susan M. Petrofske, Project Manager, Direct (262) 901-3501, Cell: (262) 391-5990

Chemical and Biological Reduction Injection Contractor: Redox Tech, LLC

- Steve Markesic, Project Manager, Direct: (630) 705-0390

Local community questions or concerns should be directed to the attention of Mr. Smullen of Marquette who will engage Ramboll to assist, as appropriate. In the event of an emergency, Mr. Smullen is the primary contact, and the secondary contact is Ms. Tarvin/Ms. Petrofske of Ramboll.

2. SITE INVESTIGATION INFORMATION

2.1 Geologic and Hydrologic Setting

The predominant lithologic units encountered at the Site at depths ranging from 28 feet below ground surface (bgs) (Boring PZ-4) to 35 feet bgs (Boring PZ-3) include granular and cohesive fill and glacial deposits comprised of silty clay and clayey silt with interbedded thin discontinuous silt and fine sand seams. These glacial deposits shift to silty sand and sand deposits that contain thin discontinuous lenses of silt and silty clay to the maximum depth of the GZA GeoEnvironmental, Inc.'s (GZA) 2012 Site Investigation (51 feet at boring PZ-3 and 45 feet at boring PZ-4) (GZA, 2012).

Water levels in the water table monitoring wells have ranged between approximately 7 and 17 feet bgs, and are within approximately 1 to 2 feet of the former dry cleaning building's basement floor slab. At times, water has been present in the basement of the building. Water table elevations are highest in the northwestern portion of the Site (approximately 642.5 to 648.5 feet above mean sea level [msl] at MW-2), and the lowest water table elevations are present within the eastern portion of the Site (approximately 635.6 to 637.5 feet msl at MW-5 and MW-1, respectively).

Shallow groundwater generally flows from northwest to southeast with a horizontal hydraulic gradient of 0.03 to 0.05 feet per foot (ft/ft) (GZA, 2012). Based on the invert elevations of 12-inch diameter sanitary sewer lines reportedly located near the eastern and southern property boundary, groundwater may be intercepted by the sanitary sewers. Previous water level measurements obtained from monitoring well/piezometer nests MW-5/PZ-4, MW-6/PZ-2 and PZ-I/PZ-3 indicate downward vertical hydraulic gradients that range from approximately 0.5 to 1 ft/ft (GZA, 2012).

With respect to monitoring wells previously subjected to in-situ hydraulic conductivity testing by GZA in 2011, MW-3 is screened in the upper clayey silt deposit, MW-5 is screened in the upper sand/silty sand deposit, and PZ-3 and PZ-4 are screened in the deeper sand/silty sand deposit (GZA, 2012). The results of the in-situ aquifer testing revealed hydraulic conductivities in the range of 7.8×10^{-5}

centimeters per second (cm/sec) to 6 x 10^{-4} cm/sec, with a geometric mean of 3 x 10^{-4} cm/sec. Based on the low, mean and high hydraulic conductivities, the measured hydraulic gradient and an estimated porosity of 25 percent, the horizontal groundwater flow velocity was calculated to range between 15 feet per year (ft/yr) to 100 ft/yr, with a mean of 50 ft/yr (GZA, 2012).

2.2 Previous Investigations

Several investigation reports have been submitted to the WDNR by previous consultants that contain additional background information regarding this Site. Key documents identified by GZA (2012) for the site include the following:

STS, January 14, 2000, Results of the Environmental Assessment at 1214-1222 West Wells Street, Milwaukee, Wisconsin.

GeoTrans, Inc., June 30, 2003, Results of Soil Sampling at Parking Lot at N. 13th Street & Wells Street, Milwaukee, Wisconsin.

GeoTrans, Inc., October 2, 2003, One Hour Valet Cleaners, 1214 W. Wells Street, Milwaukee, WI 53223, FID #241086120, BRRTS #02-41-152248.

Arcadis, November 14, 2005, Draft Site Investigation Report Valet Cleaners, 1214-1222 West Wells Street, Milwaukee, Wisconsin.

WDNR, January 12, 2006, Request for Letter of Concurrence for Hazardous Waste Determination Former Valet Dry Cleaners Site, 1214 West Wells Street, Milwaukee.

Prior to the November 2017 groundwater sampling event completed by Ramboll, subsurface investigation activities had not been completed at the Site since 2011. Based on the GZA 2012 Site Investigation report, the timeline below summarizes work completed by others prior to 2012:

February 1997 through November 1999 – STS observed the installation of 16 Geoprobe® borings at the Site (GP-1 through GP-16), and borings GP-1 and GP-5 through GP-15 were completed as temporary monitoring wells.

May 2003 – GeoTrans, Inc. observed the installation of three Geoprobe® borings (GP-1 through GP-3) southwest of the Site. Boring GP-1 was completed as a temporary monitoring well. This work was conducted as part of pre-construction activities related to the Marquette parking garage construction to the west of the Site.

2004 – As part of further pre-construction-related activities, the excavation of six test pits and advancement of two hand-augered soil borings to the west of the Site within the public alley was conducted by GeoSyntec.

January 2002, July 2003, and August 2004 – Arcadis observed the installation of five groundwater monitoring wells (MW-1 through MW-5) and three piezometers (PZ-1 through PZ-3) at the Site.

August 2009 – GZA installed six hand-augered soil borings (HA-1 through HA-6) within the basement of the Site building, three of which (HA-1, HA-4, and HA-5) were completed as temporary monitoring wells. In addition, GZA observed the installation of three exterior Geoprobe® borings (SB-1 through SB-3), four 1-inch diameter monitoring wells (MW-6 through MW-9), and one piezometer (PZ-4).

February and March 2011 – GZA observed the installation of eight Geoprobe® borings (GP-17 through GP-24), one of which was completed as a one-inch diameter monitoring well (GP-24).

November 2011 – In-situ hydraulic conductivity testing of monitoring wells MW-3 and MW-5, and piezometers PZ-3 and PZ-4 was conducted by GZA.

2.3 November 2017 Investigation

In accordance with the June 6, 2016 *Updated Proposal for Remedial Action Services*, Ramboll conducted pre-remedial groundwater sampling and concrete sampling in November 2017. Soil and groundwater samples were also collected in November 2017 for a treatability study.

Ramboll Environ conducted a round of baseline groundwater monitoring in November 2017, which included twelve of thirteen monitoring wells. One monitoring well, MW-8 was not sampled in November 2017 because the well did not sufficiently recharge for sample collection. The twelve monitoring wells were sampled for volatile organic compounds (VOCs). Monitoring wells MW-1, MW-2, MW-6 and piezometers PZ-1 and PZ-2, located within, upgradient, and downgradient of the treatment area, were also sampled for the following natural attenuation parameters: ethene/ethane/methane (Method 8015), dissolved iron (Method 8146), total organic carbon (Method 5310), nitrate+nitrite (Method 353.2), and sulfate (Method 300).

As part of the pre-remedial investigation activities, four concrete samples were also collected from the concrete slab in the existing building basement, in the vicinity of the former location of the reported 300-gallon PCE storage tank. The concrete samples were submitted for laboratory analysis of VOCs and Toxicity Characteristic Leaching Procedure (TCLP) -VOCs.

A pre-remedial treatability study was also completed in order to obtain information related to the dose of ZVI to be applied to the soil. In November 2017, Ramboll collected a 2-liter representative sample of contaminated soil, using a Geoprobe® soil boring (TB-1) advanced to a depth of approximately 28 feet bgs in the vicinity of soil boring location GP-23 (Figure 3). Additionally, 1 liter of site groundwater was collected from piezometer PZ-1. The results of the November 2017 groundwater sampling, concrete sampling, and treatability study activities are being submitted to the WDNR under a separate cover.

2.4 Potential Receptors and Migration Pathways

Potential routes of exposure to impacted soil and groundwater at the Site include direct contact (dermal and inhalation), vapor intrusion, and groundwater ingestion. Local surface waters consist of the Milwaukee River, which is located approximately ¾ mile to the east of the Site, and the Menomonee River, which is located approximately ½ mile to the south of the Site. Impacts to local surface waters could potentially occur due to off-site migration of CVOC-impacted groundwater towards such surface water bodies; however, based on groundwater analytical results, groundwater impacts are limited to the immediate site area. Therefore, the surface water exposure pathway is not complete on site.

Potential concerns for sites with chlorinated-solvent contamination include migration of contaminants along utility corridors. The depth to the water table at the Site ranges between 7 and 17 feet bgs. Based on their invert elevations relative to the water table, 12-inch diameter sanitary sewer lines reportedly located adjacent to the southern (hydraulically downgradient) and eastern property boundaries may receive groundwater from the Site.

Previous subsurface investigations have identified the presence of CVOCs in soil at the site. Potential scenarios by which CVOCs may come in contact with receptors include direct dermal contact during drilling, soil excavation, or soil blending activities. Such activities at the site will be monitored to reduce potential risk due to inhalation of vapors or particulate matter and dermal protection will be utilized as necessary to protect field personnel from direct contact.

Potential ingestion of CVOC-impacted groundwater could hypothetically occur if affected groundwater were to migrate off-site to a private or municipal well used for potable water supply. However, no

such groundwater receptors are currently present within the site vicinity, as it is served by the Milwaukee municipal water supply that obtains potable water from Lake Michigan. As such, the groundwater exposure pathway is not complete.

Potential concerns for sites with CVOC contamination include vapor migration into buildings. WDNR's vapor intrusion guidance for CVOCs indicates that the vapor intrusion pathway should be investigated if any of the following conditions are met:

- the building of interest is located over a CVOC source;
- the building is located within 100 feet of a CVOC source;
- the building overlies a groundwater plume that exceeds WAC NR 140 Enforcement Standard ES concentrations;
- groundwater with CVOC concentrations that exceed WAC NR 140 Preventive Action Limit (PAL) values is entering the building or is in contact with the building foundation or sump; and
- vapors have the potential to enter preferential pathways that connect to the building.

As no occupied buildings are located within 100 feet of the on-site CVOC source and none of the other conditions identified above have been met, Ramboll concludes that an investigation of the vapor intrusion pathway is not currently warranted at the Site. However, as part of the final close-out of the site, the potential for vapor migration along utilities adjacent to the site will be evaluated. As described in Ramboll Environ's June 7, 2016 proposal, the utility vapor migration evaluation will be conducted along a north-south trending sanitary sewer line reportedly located adjacent to the site in North 12th Street. The utility vapor migration evaluation will be completed after the remediation activities described in this report are completed. In addition, the Site may potentially be redeveloped as a parking lot, or it may remain vacant for a period of time following the completion of active remediation work. If the Site redevelopment plans change such that the construction of any on-site buildings is considered, the vapor pathway will need to be evaluated at that time.

3. APPLICATION COMPONENTS

3.1 Description of Proposed Remedial Technology

As indicated in Section 1, the evaluation of remedial alternatives documented in the June 7, 2016 *Updated Proposal for Remedial Action,* as amended by Ramboll Environ's October 31, 2016 letter response to WDNR's questions and comments, resulted in the identification of combined *in-situ* chemical and biological reduction via *in-situ* soil blending as the preferred remedial alternative for the Site.

Treatment of CVOCs by ZVI and carbon amendment has been demonstrated and widely-accepted as an effective *in-situ* remediation technology. ZVI destroys CVOCs in groundwater, including PCE and its degradation products detected in soil and groundwater at the Site. The abiotic reductive dehalogenation process occurs on the surface of the granular iron, with the iron acting as an electron source. Additional electron donor is provided via fermentation of carbon amendment, which facilitates biotic reductive dehalogenation. This reductive dehalogenation remedial alternative is consistent with and supportive of naturally-occurring degradation of the detected PCE in Site groundwater (based on the presence of PCE degradation products).

3.2 Implementation of *In-Situ* Enhanced Reductive Dechlorination

The extent of the treatment area and layout for soil blending are shown on Figure 2. The designated soil blending treatment area will be gridded into approximately 20-foot by 20-foot treatment cells by the remediation contractor.

In-situ soil blending involves using an *in-situ* blender to effectively distribute chemical amendments throughout the soil medium to treat the contaminants of concern. The *in-situ* blender is a proprietary system that is mounted on a large excavator with a modified diesel engine and hydraulic system. The *in-situ* blender utilizes a 28-inch diameter mixing drum with specially designed "teeth" which rotates at speeds up to 120 revolutions per minute (rpm) with torque in excess of 20,000 foot-pounds. This allows the mixing drum to penetrate all soil types, even backfill materials such as bricks, rebar, and small rocks.

An excavator will work in tandem with the in situ blending equipment. The excavator will be used to excavate soils as needed and to "loosen" the soils prior to blending and verify that there are no buried items such as boulders or debris that may damage the blending head. The excavator will also help to manage soil and movement of the chemical amendments as needed. All excavation activities will be conducted in accordance with Occupational Safety and Health Administration (OSHA) excavation standards where applicable. Excavation protection methods may include a combination of benching and shoring, and the remediation contractor will be responsible for developing the excavation protection methods. The remediation contractor will provide an implementation plan for Ramboll's review and approval prior to commencement of remediation activities.

The *in situ* blending process will be performed systematically in treatment cells that are approximately 20-feet by 20-feet across the treatment area as indicated above. The treatment volume for each cell will be further subdivided into lifts, with the number of lifts to be specified in the remediation contractor's implementation plan. The depth will be verified visually by a visible mark on the boom of the excavator and the soil blender. When the target depth has been reached, this mark will be level with the ground surface that the soil blender and/or excavator is operating from. The visible mark on the boom of the treatment equipment will allow all field personnel to verify that the required treatment depths have been achieved.

When soil blending within a treatment cell, the upper lift(s) of soil will be excavated and placed on the adjacent cell within the treatment area. Once the lower lift(s) has been blended with the predetermined quantity of ZVI and carbon amendment (ABC+), the upper lift(s) will be backfilled and the process repeated with additional ABC+. The purpose of performing the soil blending in lifts is to verify that the amendments are properly distributed throughout the soil column and to thoroughly mix and homogenize the entire cell. Each cell will be blended independently. Only after a targeted cell/lift has been fully completed will the equipment move the next cell/lift. The strategy proposed is intended as a guide and is subject to change if field conditions require. The specific soil blending strategy will be at the discretion of the operator and field lead.

The application of approximately 167,000 pounds of ZVI and carbon amendment is recommended to treat the target CVOC-impacted soil and groundwater. The ZVI content will be equivalent to approximately 2.5 percent of the weight of the target treatment volume. The blending and addition of amendments and water will increase the volume of soils. After soil blending has been completed, any mounded or excess soil will be appropriately managed within the treatment area. It is estimated that the degree of soil swell resulting from soil swell will not exceed 2 feet and will therefore be readily accommodated by the post-demolition building excavation. The *in-situ* soil blending activities are anticipated be completed within a 2-week timeframe.

3.3 Notifications and Permits

The following sections identify the permits and notifications that are anticipated to be required to conduct the proposed soil blending activities.

3.3.1 Wisconsin Pollutant Discharge Elimination System Coverage

A "Request for Coverage Under Wisconsin Pollutant Discharge Elimination System (WPDES) Wastewater Discharge Permit (WI-0046566-06) for Contaminated Groundwater from Remedial Action Operations" is provided as Appendix A.

3.3.2 Potable Water Use

Potable water will be obtained from a faucet located in the adjacent Marquette parking garage immediately west of the remediation area. The remediation contractor will attempt to use as little water as possible (less than 500 gallons per cell) to avoid producing extremely wet conditions. Blending will continue until a homogenous consistency is attained. The amount of water that is used will be monitored using a water meter or other method employed by the remediation contractor.

3.3.3 Air Permit Applicability

Based on the previous investigation results, Ramboll completed an evaluation of CVOC mass present in Site soil and groundwater within the 1,940 cubic yard target treatment volume. Based on the results of this evaluation, the estimated PCE mass totals 1,692 pounds, the estimated TCE mass totals 9 pounds, the estimated DCE mass (cDCE and tDCE) totals 27 pounds, and the estimated aggregate CVOC mass totals 1,728 pounds. Ramboll anticipates that approximately 175 cubic yards of soil will be treated per day. As such, approximately 9 percent of the target treatment volume is anticipated to be subjected to soil blending per day.

Emissions of VOCs from the blended soils will be substantially suppressed by the application of an estimated 15,000 to 30,000 gallons of water that will be mixed with the ZVI and carbon amendment, in addition to groundwater present with the treatment zone itself. Emissions of VOCs will be further reduced by relatively low ambient temperatures, as the soil blending activities are scheduled to be conducted during early April 2018. Moreover, the remedial process consists of enhanced reductive dechlorination of CVOCs, with no component of soil vapor extraction. Regardless, based on the assumption that 50 percent of the contaminant mass present below the basement slab at a depth of 32 to 35 feet bgs could be discharged to the atmosphere during soil blending and that 25 percent of this estimated CVOC mass could be discharged to the atmosphere during the soil blending process, such hypothetical air emissions are below the corresponding WAC NR 445 Regulatory Thresholds and WAC NR 406 General Exemption Levels, as provided below:

Contaminant	Assumed Emissions	NR 445 Regulatory Threshold	NR 406 General Exemption
1,2-Dichloroethene	0.051 lbs/hr or 6.8 lbs/yr	–––	–––
Tetrachloroethene	1.69 lbs/hr or 224.6 lbs/yr	9.11 lbs/hr or 301 lbs/yr	–––
Trichloroethene	0.017 lbs/hr or 2.3 lbs/yr	14.4 lbs/hr or 888 lbs/yr	–––
Total VOCs	1.76 lbs/hr	–––	5.7 lbs/hr

3.4 Remedial Action Monitoring

3.4.1 Ambient Air

During implementation of the *in-situ* soil blending activities, air quality around the Site will be monitored to verify that safe conditions are maintained and on-site workers and the surrounding community is protected. Air monitoring is also useful in determining the necessary level of worker respiratory protection. It can also provide first indication that emissions are elevated and gives workers and Site managers an early warning that elevated emissions are present before air quality at the perimeter zone is affected.

Work Zone Monitoring: The purpose of monitoring air quality within the work zone is to verify worker safety and provide an early warning (before air quality at the perimeter zone is affected) that elevated emissions are present. A portable instrument (Gasmet DX4040) will be used to measure the levels of VOCs in the areas where workers are located--generally near the edge of the immediate work zone (when soil blending is paused), around stockpiled material, near mixing operations, etc. The instrument will be operated by trained air monitoring technicians, who will move around the work zone. Additional information on the air monitoring in the work zone will be provided in a project Health and Safety Plan. These monitors will provide the most immediate alert if emissions are becoming elevated.

A photoionization detector (PID) or other air monitoring device will be used by the remediation contractor to measure the levels of VOCs for on-site workers who are operating equipment or are working near the edge of the immediate work zone (while soil blending is occurring).

During operations, if it is determined that a contaminant-specific action level has been exceeded in the work zone, work will be stopped, the level of personal protective equipment (PPE) for on-site workers will be upgraded as necessary, and actions will be initiated to reduce volatile air emissions.

Vapor controls will be provided during soil blending activities to suppress volatile vapors that may be driven off during soil blending that are in excess of the established work zone monitoring action levels. If necessary, a vapor control system consisting of Rusmar® Foam will be used to produce a thick, long-lasting, viscous foam barrier within the blending area for immediate control of VOCs. The foam will be applied during active soil blending activities or for overnight coverage of exposed contaminated soils within the blending area. The foam can supply up to 17 hours of continuous and effective emission control and is non-hazardous, non-combustible, biodegradable, and safe for Site personnel and the environment.

Perimeter Zone Monitoring: During routine operations, the air monitoring technician will monitor the air concentration around the property boundary at 30-minute to 1-hour intervals using the calibrated portable FTIR described above. As previously noted, exceedance of the perimeter zone action level is unlikely since the air monitoring system is designed to register an exceedance of an action level in the work zone before the perimeter zone is affected. If the air action level at a perimeter location is exceeded or if operations in the work zone require an increase in respiratory protection, actions will be immediately implemented to reduce air emissions and continuous monitoring at a downwind perimeter location will be initiated and continued until air quality is below the established action level. If necessary, the primary responses for reducing air emissions will likely include the use of vapor suppressant foam that can be applied immediately to the soil blending area by the remediation contractor, or the application of treated or staged material to cover the exposed soil.

3.4.2 Soil

Verification of soil remediation will be conducted through confirmation soil sampling and analysis. To evaluate post-remediation soil conditions, eight hydraulic probes will be installed approximately 20 months after completion of the *in situ* chemical reduction remedial action. The eight hydraulic probes will be installed to approximately 27 feet below post-remediation ground surface.

Two soil samples will be collected at each probe location, for 16 confirmation soil samples in total. The proposed sampling depths for the confirmation soil boring locations are as follows:

- **C-1:** 16-17' and 25-27' below post-remediation ground surface (bpgs)
- **C-2:** 16-17' and 25-27' bpgs
- **C-3:** 16-17' and 25-27' bpgs
- **C-4:** 16-17' and 28-30' bpgs
- **C-5:** 16-17' and 22-24' bpgs
- **C-6:** 16-17' and 18-19' bpgs
- **C-7:** 16-17' and 18-19' bpgs
- **C-8:** 16-17' and 18-19' bpgs

Confirmation soil samples will not be collected from the upper 4 feet of soil for evaluation of the direct contact exposure pathway because the upper 4 feet of the treatment area will be backfill material and crushed concrete. The confirmation soil sampling will include the collection of treated soil samples, which will be used to evaluate the treatment effectiveness of the remedial action.

A total of 16 post-remediation soil samples will be submitted for laboratory analysis of VOCs using United States Environmental Protection Agency (USEPA) Method 8260. Following soil sample collection, each sample container will be labelled with the sample location identification, date of sample collection, and intended analysis. The sample containers will then be packed in an iced, insulated container. A chain-of-custody form will be filled out upon completion and will accompany the container of soil samples to the laboratory. The samples will be transported from the Site to the laboratory via same-day or overnight courier. Laboratory results of soil samples collected prior to commencement of *in-situ* chemical reduction that revealed detectable concentrations of PCE will be compared to the results of soil samples collected after completion of *in-situ* chemical reduction.

3.4.3 Groundwater

Subsequent to completion of the *in-situ* soil blending remedial action, natural attenuation monitoring will be implemented on a quarterly basis to evaluate and document the progress of groundwater remediation at the Site. Groundwater monitoring will be initiated approximately 5 months following the completion of the soil remediation to allow for the stabilization of the groundwater following *in-situ* enhanced reductive dechlorination of the source area. Modification to this monitoring program may be recommended, based on an evaluation of the results received.

A total of eight quarterly groundwater monitoring events will be conducted. As part of this task, five existing monitoring wells (MW-4, MW-5, MW-6, PZ-2, and PZ-4) and two new monitoring wells (PZ-1R, PZ-3R, and MW-10 [if required]) will be sampled for VOCs (Method 8260). Monitoring wells MW-1, MW-2, MW-3, MW-7, MW-8, and MW-9 have historically not revealed detectable VOC concentrations, and based on the results of the baseline monitoring event, these wells will not be included as part of the subsequent quarterly monitoring program. However, all 13 wells and piezometers will be sampled as part of the eighth (and assumed final) quarterly groundwater monitoring event prior to preparation of a Case Closure Request.

Monitoring wells MW-6, PZ-1R, and PZ-2 will also be sampled on a semi-annual basis for the following natural attenuation parameters: ethene/ethane/methane (Method 8015), dissolved iron (Method 8146), total organic carbon (Method 5310), nitrate+nitrite (Method 353.2), and sulfate (Method 300). One Quality Assurance/Quality Control (QA/QC) duplicate groundwater sample and one QA/QC laboratory trip blank sample will be submitted for laboratory analysis of VOCs as part of each groundwater monitoring event. All monitoring wells will be sampled for VOCs (Method 8260).

Groundwater elevations will also be collected and documented from the quarterly groundwater monitoring events and will be used to plot equipotential contours of shallow groundwater. The resulting equipotential contours will be used to evaluate hydraulic gradients across the Site, to assist with the estimation of groundwater flow and solute transport analysis.

3.5 Level of Contaminated Groundwater Pre-Treatment Prior to Reinfiltration

The proposed electron donor soil blending activities at the subject property will not involve reinfiltration or reinjection of contaminated groundwater.

3.6 Types and Quantities of Substances Proposed for Soil Blending

The soil within the target treatment zone will be blended with approximately 150,000 pounds of ZVI, 17,000 pounds of carbon amendment and 15,000 to 30,000 gallons of water. The ZVI content will be equivalent to approximately 2.5 percent of the weight of the soil within the target treatment volume. Safety data sheets (SDS) for the carbon amendment and ZVI are provided in Appendix B. The carbon amendment is identified (in Appendix B) as "Anaerobic BioChem (ABC)," and the ZVI is identified as "ATOMET."

3.7 Locations Where Remedial Material will be Blended

The soil mixing zone will cover an approximate 3,280-square-foot area, as shown on Figure 2. The vertical treatment zone varies based on location but will extend to a maximum depth of 35 feet bgs.

3.8 Project Schedule

The following estimated milestone initiation dates are provided after receipt of WDNR approval to this Infiltration Approval Request:

Task	Anticipated Completion Date
In-Situ Soil Blending Event	April 2018
Initial Groundwater Monitoring Event[2]	September 2018

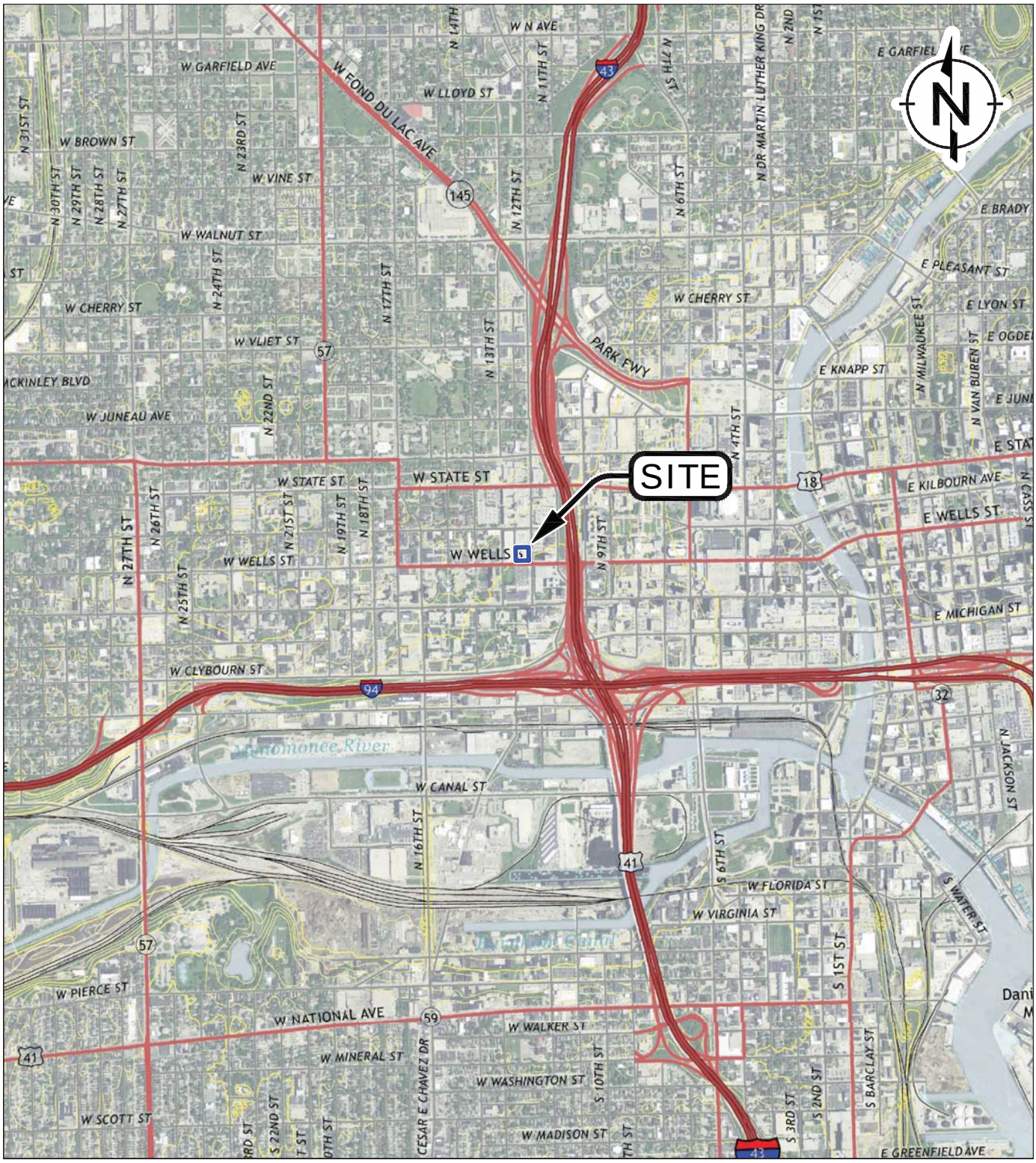
4. REFERENCES

Ramboll Environ, 2016. *Updated Proposal for Remedial Action Services.* June 7.

GZA GeoEnvironmental, Inc., 2012. Site Investigation Report Dry Cleaner Solvent Release, Former One-Hour Valet Dry Cleaners Property. February 24.

[2] Represents initial groundwater monitoring event in terms of post-blending quarterly groundwater monitoring.

FIGURES



CONTOUR INTERVAL 10 FEET

0 1/2 1 MILE

0 2000 4000 FEET

LEGEND:

PROPERTY BOUNDARY (APPROXIMATE)

WISCONSIN

QUADRANGLE LOCATION

SOURCE:
2016 USGS 7.5 Minute Series Milwaukee, Wisconsin Topographic Quadrangle.
Site Location; N: 43.040537° W: 87.927706 WGS84

RAMBOLL

SITE LOCATION MAP

FORMER ONE-HOUR VALET DRY CLEANERS
1214 WEST WELLS STREET
MILWAUKEE, WISCONSIN

FIGURE 1

DRAFTED BY: APR

DATE: 12/25/17

1690005819

E:_CAD\1690005819_Former 1hr Dry Cleaners_RAP\01_Site Location Map.dwg

HOSPITAL PARKING STRUCTURE

UNIVERSITY PARKING STRUCTURE

PUBLIC ALLEY

MW-2

MW-8

MW-7

MW-4

MW-3

PZ-1

PZ-3

PZ-2

PZ-4

MW-5

MW-9

MW-1

MW-6

GUY

ASPHALT

SALT / LANDSCAPE GARAGE

HALLWAY

BOILER ROOM (IN BASEMENT)

OPEN ROOM

OPEN ROOM

BUS GARAGE

HALLWAY

OFFICES / BATHROOMS

OFFICES / BATHROOMS

CONCRETE WALK

CONCRETE WALK

FORMER PCE STORAGE AREA (IN BASEMENT)

EXTENT OF CONTAMINATED CONCRETE ON BASEMENT SLAB

1

2

3

4

5

N 12th STREET

WELLS STREET

EMH

GV

TMH

WSV

GSV

WV

LEGEND

- PROPERTY BOUNDARY
- BUILDING FOOTPRINT
- ASPHALT
- CONCRETE
- FENCE LINE
- 75 — 1-FT ELEVATION CONTOUR
- E E — UNDERGROUND ELECTRIC
- OHE — OVERHEAD ELECTRIC
- T T — TELEPHONE
- W W — WATER LINE
- G G — GAS
- TV — CABLE TV
- FO FO — FIBER OPTIC
- STM — STORMWATER SEWER
- SAN — SANITARY SEWER
- STEAM — STEAM
- CATCH BASIN
- MANHOLE
- VALVE
- TRAFFIC LIGHT
- TRANSFORMER
- AIR CONDITIONER
- METER
- LIGHT POLE
- GUY UTILITY POLE / GUY
- TREE
- FIRE HYDRANT
- T TELEPHONE PEDESTAL
- CONTROL BOX
- MONITORING WELL
- EXTENT OF CONTAMINATED CONCRETE ON BASEMENT SLAB
- SOIL TREATMENT BOUNDARY
- 1 SOIL BLENDING TREATMENT AREA

REFERENCE: THE SITE LAYOUT, SITE FEATURES, ELEVATIONS, UTILITIES, AND OTHER FEATURES NEAR THE PROPERTY WERE OBTAINED FROM GRAEF-USA IN DECEMBER 2017.

0 25

SCALE IN FEET

SITE PLAN AND SOIL TREATMENT AREA

FORMER ONE-HOUR VALET DRY CLEANERS
1214 WEST WELLS STREET
MILWAUKEE, WISCONSIN

RAMBOLL

FIGURE 2

DRAFTED BY: APR | DATE: 1/28/18 | 1690005819

E:_CAD\1690005819_Former 1hr Dry Cleaners_Other\02_Site Plan & Soil Treatment Area.dwg

HOSPITAL PARKING STRUCTURE

UNIVERSITY PARKING STRUCTURE

PUBLIC ALLEY

N 12th STREET

WELLS STREET

SOIL TREATMENT BOUNDARY

MW-1 MW-2 MW-3 MW-4 MW-5 MW-6 MW-7 MW-8 MW-9 PZ-1R PZ-2 PZ-3R PZ-4

C1 C2 C3 C4 C5 C6 C7 C8

GUY

LEGEND

- PROPERTY BOUNDARY
- BUILDING FOOTPRINT
- ASPHALT
- CONCRETE
- FENCE LINE
- 1-FT ELEVATION CONTOUR
- UNDERGROUND ELECTRIC
- OVERHEAD ELECTRIC
- TELEPHONE
- WATER LINE
- GAS
- CABLE TV
- FIBER OPTIC
- STORMWATER SEWER
- SANITARY SEWER
- STEAM
- CATCH BASIN
- MANHOLE
- VALVE
- TRAFFIC LIGHT
- TRANSFORMER
- METER
- LIGHT POLE
- UTILITY POLE / GUY
- TREE
- FIRE HYDRANT
- TELEPHONE PEDESTAL
- CONTROL BOX
- MONITORING WELL
- SOIL TREATMENT BOUNDARY
- POST REMEDIATION SOIL SAMPLING LOCATION

NOTE: CONCEPTUAL REDEVELOPMENT PLAN MAY BE A PARKING LOT AS SHOWN, OR THE SITE MAY REMAIN A VACANT LOT FOR A PERIOD OF TIME FOLLOWING COMPLETION OF ACTIVE REMEDIAL SITE WORK.

REFERENCE: THE SITE LAYOUT, SITE FEATURES, ELEVATIONS, UTILITIES, AND OTHER FEATURES NEAR THE PROPERTY WERE OBTAINED FROM GRAEF-USA IN DECEMBER 2017.

0 25
SCALE IN FEET

POST-REMEDIATION SOIL SAMPLING LOCATIONS

FORMER ONE-HOUR VALET DRY CLEANERS
1214 WEST WELLS STREET
MILWAUKEE, WISCONSIN

RAMBOLL

FIGURE 3

DRAFTED BY: APR | DATE: 12/25/17 | 1690005819

E:_CAD\1690005819_Former 1hr Dry Cleaners_Design Report\08_Post-Remediation Soil Samp Locs.dwg

APPENDIX A

REQUEST FOR INITIAL COVERAGE UNDER WPDES (WI-0046566-05,12/07)

Date Received_____
(Leave blank)

Request for Coverage Under
Wisconsin Pollutant Discharge Elimination System (WPDES)
Wastewater Discharge Permit (WI-0046566-06) for
Contaminated Groundwater from Remedial Action Operations

(Revised 8 / 2012)

Please type or print required information, except for the signature.

I. GENERAL INFORMATION

A: FACILITY LOCATION INFORMATION		
Name of Facility / Project Former One-Hour Valet Dry Cleaners	Official Representative Onsite Mr. Joel Smullen	Title Project Manager
(Address or Highway / Road with Distance and Direction from nearest City) 1214-1222 West Wells Street	Telephone No.: (414) 263-8524	Fax #
City, State, Zip Code Milwaukee, Wisconsin 53233	County Milwaukee	Email Address joel.smullen@marquette.edu

B: Individual, parent company, or organization with direct control over the facility. Enter full official legal name of the owner or parent company, if there is one, the mailing address, and the name and title of the official representative (responsible party) signing this application if he/she is located at address of parent company.

Parent Company/Owner Marquette University	Company Contact Mr. Joel Smullen	Title Project Manager
Mailing Address - PO Box, Street, or Route 517 North 14th Street	Telephone No.: (414) 263-8524	Fax #
City, State, Zip Code Milwaukee, Wisconsin 53233	Email Address joel.smullen@marquette.edu	

C: Consulting Firm for Groundwater		
Company Name Ramboll US Corporation	Company Contact Ms. Jeanne Tarvin	Title Managing Principal
Mailing Address - PO Box, Street, or Route 175 N. Corporate Drive Suite 160	Telephone No.: (262) 901-0085	Fax # (262) 901-0079
City, State, Zip Code Brookfield, Wisconsin 53045	Email Address jtarvin@ramboll.com	

D. **Name of Person to Receive Discharge Monitoring Report Forms** from Department:

Ms. Jeanne Tarvin, (262) 901-0085, jtarvin@ramboll.com

E. **Any Other Necessary Contact Person** (name, phone, email)

Ms. Susan Petrofske, (262) 901-3501, spetrofske@ramboll.com

F. **DNR Environmental Response & Repair Project Number, and DNR Project Manager name:**

BRRTS No. 02-41-152248, Mr. Trevor Nobile

II. SPECIFIC INFORMATION ON PROJECT

A. Pollutants

1. The suspected **sources of the pollutants** (estimate of material release quantity and contributing activities)

2. Check **all fuel and waste types** suspected in the contamination at this site:

- ☐ Unleaded Gasoline
- ☐ Leaded Gasoline
- ☐ Diesel Fuel
- ☐ Heating Oil
- ☐ Jet Fuel
- ☐ Waste Oil
- ☒ Solvents
- ☐ Other:
- ☐ Pesticides
- ☐ Fertilizers

3. Check **all pollutants identified at this site**:

- ☐ BETX (Benzene, Ethylbenzene, Toluene, Xylene)
- ☐ PAHs (Polynuclear aromatic hydrocarbons)
- ☒ VOCs (Volatile Organic Chemicals)
- ☐ Pesticides/Fertilizers
- ☐ Total Recoverable Lead *
- ☐ Other_____

* Include upstream receiving water hardness analysis if lead is detected.

B. Treatment

1. **Describe the existing treatment system**:

In-Situ enhanced reductive dechlorination of chlorinated volatile compound impacted soil and groundwater through soil blending with the addition of carbon amendment and zero valent iron (ZVI).

Treatment Techniques Used

- ☐ Pump & Treat
  - ☐ Air stripping
  - ☐ GAC (Granular Activated Carbon)
- ☒ Augmented Insitu Bioremediation (with chemicals or nutrient addition)
- ☐ Other (describe)

2. **If any cleaning, softening or descaling of the treatment system**

a. Identify any additives that are proposed or being used for cleaning, softening, or descaling of the treatment system. Provide Material Safety Data Sheets, and describe dosage.

Not applicable as no cleaning, softening, or descaling activities will be conducted. Safety data sheets for carbon amendment and ZVI are provided as Appendix B of the Infiltration Approval Request.

b. Describe what is done to clean, soften or descale, and how often it is done.

c. Where is the reject water from cleaning and descaling discharged?

☐ same discharge point as treated effluent ☐ sanitary sewer ☐ other (please describe)

3. **Anticipated operating schedule** during the new permit term (2012 – 2017)

March/April 2018

4. **Anticipated flowrate** (in gpm), and total volume of treated water to be discharged per month:

Approximately 167,000 pounds of ZVI and carbon amendment will be blended with soil in the treatment area during one mobilization, anticipated to be conducted over a 1-2 week timeframe.

5. **Effluent discharge point location**:

As indicated in the attached Ramboll US Corporation Infiltration Approval Request.

6. Is an **air permit** from the DNR air management program required? If not, why not

Not required, as indicated in the attached Ramboll US Corporation Infiltration Approval Request.

III. DISCHARGE MANAGEMENT PLAN UPDATE

Include the following information:

1. A **summary** of analytical results for contaminants **detected** at the site.

2. Results from the most recent **volatile organic compounds (VOC) scan**, including methods used and detection levels.

3. Results from an analysis of the **poly-nuclear aromatic hydrocarbons (PAHs)** shown on the right, including methods used and detection levels (unless PAH data are already submitted)

   The lab needs to reach the lowest detection level achievable for each parameter because of the low limit for total PAHs. EPA test method SW-846 8310 is recommended.

benzo(a)anthracene	dibenzo(a,h)anthracene
benzo(a)pyrene	fluoranthene
benzo(b)fluoranthene	indeno(1,2,3-cd)pyrene
benzo(g,h,i)perylene	naphthalene
benzo(k)fluoranthene	phenanthrene
chrysene	pyrene

4. **Contaminants proposed for periodic monitoring** and demonstration of why any monitoring required in the permit should be exempted due to low level of contaminants in the wastewater discharge.

5. **Information to support request for any alternate effluent limit** for discharges to groundwater (Part 5 of permit) or request for temporary exemption for in-situ discharges (Part 6 of permit).

6. **Plans and specifications for the proposed treatment system** identifying sampling points. For supplier furnished package treatment units, only a flow diagram, design summary, and unit sizing calculations are required.

7. **General description of operations**, identifying operational tasks, who is responsible to do that task, and how frequently the task is done (particularly needed at pump & treat systems).

8. A **site plan** that identifies general land uses, underground storage tanks and pipelines, groundwater monitoring and recovery wells, contaminant plume definition and zone of influence, other known spills in the area, septic tanks and drain fields, separation distances to potable water supply wells and residences, and other pertinent information.

9. A **detailed map** of the discharge location, showing if discharge is direct or via a storm sewer or other conveyance. Indicate distance from site to discharge location and other impacted water bodies or wetlands.
   - If a city storm sewer is used, approval from the municipality is required.
   - If a new outfall structure is proposed, the plans should identify the outfall and incorporate appropriate erosion control methods. A permit for riprap projects (available at most DNR offices) should be obtained.
   - Wetland discharges are not allowed unless they meet wetland protection requirements of Ch. NR 103, Wis. Admin. Code.

III. SIGNATURES

A. Signature of person completing the form, attesting to the accuracy and completeness of the statements made.

Jeanne Tarvin	Managing Principal	2/12/18
Name	Title	Date Signed
175 N Corporate Dr. Suite 160, Brookfield, Wisconsin 53045	jtarvin@ramboll.com	(262) 901-0085
Address	Email	Telephone Number

B. This application must be signed by the official representative of the permitted facility (responsible party) who is: the owner, the sole proprietor for a sole proprietorship, a general partner for a partnership, or by a ranking elected official or other duly authorized representative for a unit of government, or an executive officer of at least the level of vice president for a corporation, having overall responsibility for the operation of the facility. If the application is not signed, or is found to be incomplete, it will be returned.

JOEL M. SMULLEN	PROJECT MANAGER
Typed or Printed Name of Official Representative	Title
Joel M. Smullen	2/9/18
Signature of Official Representative	Date Signed

Submit this General Permit Request for Coverage:

Department of Natural Resources,
Water Permits Central Intake - WT/3,
P.O. Box 7185,
Madison, WI 53707-7185.

The decision on whether to cover this discharge under the remediation general permit will be made by regional DNR wastewater staff. Upon receipt in Madison, this application will be forwarded to the appropriate regional staff person.

A copy of the submittal should also be sent to the Department Remediation & Redevelopment Project Manager.
Watershed Central:\General Permits\Reissue Docs\Grw Remediation\Request For Coverage 2012.doc

APPENDIX B

SAFETY DATA SHEETS FOR PROPOSED CHEMICAL AMENDMENTS

SAFETY DATA SHEET
Anaerobic BioChem (ABC)

1. PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: **Anaerobic BioChem**
GENERAL USE: **Bioremediation of halogenated organics and metals**

MANUFACTURER:

Redox Tech, LLC
200 Quade Drive
Cary, NC 27513
919-678-0140

EMERGENCY TELEPHONE:

Within USA and Canada: 1-800-424-9300
+1 703-527-3887 (collect calls accepted)

2. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW: Product is generally recognized as safe. May cause irritation exposure to eyes. Long term contact to skin may cause some drying and minor irritation.

3. COMPOSITION INFORMATION ON INGREDIENTS

Proprietary mixture of fatty acids, glycerol, lactates and dipotassium phosphate.

4. FIRST AID MEASURES

EYES: Immediately flush with water for up to 15 minutes. If irritation persists, seek medical attention.

SKIN: Rinse with water. Irritation is unlikely, but if irritation occurs or persists, seek medical attention.

INGESTION: Generally safe to ingest but not recommended.

INHALATION: No first aid required.

5. FIRE FIGHTING MEASURES

EXTINGUISHING MEDIA: Deluge with water

FIRE/EXPLOSION HAZARDS: Product is combustible only at temperatures above 600C

FIRE FIGHTING PROCEDURES: Use flooding with plenty of water, carbon dioxide or other inert gasses. Wear full protective clothing and self-contained breathing apparatus. Deluging with water is the best method to control combustion of the product.

FLAMMABILITY LIMITS: non-combustible

SENSITIVITY TO IMPACT: non-sensitive

SENSITIVITY TO STATIC DISCHARGE: non-senstive

6. ACCIDENTAL RELEASE MEASURES

Confine and collect spill. Transfer to an approved DOT container and properly dispose. Do not dispose of or rinse material into sewer, stormwater or surface water. Discharge of product to surface water could result in depressed dissolved oxygen levels and subsequent biological impacts.

7. HANDLING AND STORAGE

HANDLING: Protective gloves and safety glasses are recommended.

STORAGE: Keep dry. Use first in, first out storage system. Keep container tightly closed when not in use. Avoid contamination of opened product. Avoid contact with reducing agents.

8. EXPOSURE CONTROLS – PERSONAL PROTECTION

EXPOSURE LIMITS

Chemical Name	ACGIH	OSHA	Supplier
ABC	**NA**	**NA**	**NA**

ENGINEERING CONTROLS: None are required

PERSONAL PROTECTIVE EQUIPMENT

EYES and FACE: Safety glasses recommended
RESPIRATOR: none necessary
PROTECTIVE CLOTHING: None necessary
GLOVES: rubber, latex or neoprene recommended but not required

9. PHYSICAL AND CHEMICAL PROPERTIES

Odor:	none to mild pleasant organic odor
Appearance:	clear to light amber
Auto-ignition Temperature	Non-combustible
Boiling Point	>600 C
Melting Point	NA
Density	1.15 gram/cc
Solubility	infinite
pH	7-9

10. STABILITY AND REACTIVITY

CONDITIONS TO AVOID: Do not contact with strong oxidizers
STABILITY: product is stable
POLYMERIZATION: will not occur
INCOMPATIBLE MATERIALS: strong oxidizers
HAZARDOUS DECOMPOSITION PRODUCTS:

11. TOXICOLOGICAL INFORMATION

Acute Toxicity
A: General Product Information
Acute exposure may cause mild skin and eye irritation.
B: Component Analysis - LD50/LC50

No information available.

B: Component Analysis - TDLo/LDLo
TDLo (Oral-Man) none

Carcinogenicity
A: General Product Information
No information available.
B: Component Carcinogenicity
Product is not listed by ACGIH, IARC, OSHA, NIOSH, or NTP.

Epidemiology
No information available.

Neurotoxicity
No information available.

12. ECOLOGICAL INFORMATION

Ecotoxicity
Discharge to water may cause depressed dissolved oxygen and subsequent ecological stresses
Environmental Fate
No potential for food chain concentration

13. DISPOSAL CONSIDERATIONS

DISPOSAL METHOD: Material is not considered hazardous, but consult with local, state and federal agencies prior to disposal to ensure all applicable laws are met.

14. TRANSPORT INFORMATION

NOTE: The shipping classification information in this section (Section 14) is meant as a guide to the overall classification of the product. However, transportation classifications may be subjectto change with changes in package size. Consult shipperrequirements under I.M.O., I.C.A.O. (I.A.T.A.) and 49 CFR to assure regulatory compliance.

US DOT Information
Shipping Name: Not Regulated
Hazard Class: Not Classified
UN/NA #: Not Classified
Packing Group:None
Required Label(s):None

50th Edition International Air Transport Association (IATA):
Not hazardous and not regulated

INTERNATIONAL MARITIME DANGEROUS GOODS (IMDG)

Material is not regulated under IMDG

15. REGULATORY INFORMATION

UNITED STATES

SARA TITLE III

SECTION 311 No Hazard for Immediate health Hazard
SECTION 312 No Threshold Quanitity
SECTION 313 Not listed

CERCLA NOT REGULATED UNDER CERCLA

TSCA NOT REGULATED UNDER TSCA

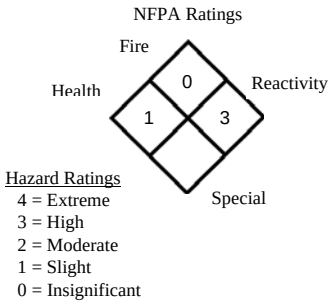
CANADA (WHIMS): NOT REGULATED

16. OTHER INFORMATION

HMIS:

Health	1
Flammability	0
Physical Hazard	0
Personal Protection	E

E: Safety Glasses, gloves



FORM NO. 7963-F
DATE REVISED: 01/23/2007

Material Safety Data Sheet

(Essentially Similar to U.S. Department of Labor Suggested Form For Hazard Communication Compliance)

I. Product Identification

Product Type - OXWELD IRON CUTTING & SCARFING POWDER

Manufacturer - THE ESAB GROUP, INC.
Website: www.esabna.com

Address - 801 Wilson Avenue, P. O. Box 517
Hanover, PA 17331

Telephone No. - 1-717-637-8911
1-800-933-7070

Emergency No. - 1-717-637-8911
(CHEMTREC) 1-800-424-9300

COMPOSITION OF CUTTING & SCARFING POWDER
(Weight %)

Product Trade Name	Iron Powder
Oxweld 200	100

THE ESAB GROUP requests the users of these products to study this Material Safety Data Sheet (MSDS) and the product labels and become fully aware of the product hazards and safety information. To promote the safe use of these products a user should (1) notify and train its employees, agents and contractors concerning the information on this MSDS and any product hazards and safety information, (2) furnish this same information to each of its customers for these products, and (3) request that such customers notify and train their employees and customers, for these products, of the same product hazards and safety information.

II. Hazardous Ingredients

IMPORTANT: This section covers the materials from which this product is manufactured. The fumes and gases produced during normal use of these products are covered in Section V. The term **HAZARDOUS** should be interpreted as a term required and defined by Laws, Statutes, or Regulations, and does not necessarily imply the existence of any hazard when the products are used as directed by **THE ESAB GROUP**.

			ACGIH TLV	OSHA - PEL	
Material	**(CAS No.)**	**SARA**	**TWA (mg/m^3)**	**TWA (mg/m^3)**	**STEL (mg/m^3)**
Iron	(7439-89-6)		5 (Oxide Fume)	10 (Total Particulate)	--

NOTE: In the ingredients table, an asterisk (*) after the CAS number indicates a toxic chemical subject to the reporting requirements of Section 313 of the Emergency Planning and Community Right-To-Know Act of 1986 (SARA) and 40 CFR Part 372.

Some of these products may not contain all of the materials listed. For details of composition, refer to the COMPOSITION TABLE in Section I.

III. Physical Data

As shipped, these products are nonflammable, non-explosive, non-reactive, and non-hazardous.

Physical State: GAS ( ) LIQUID ( ) SOLID (X)

Odor and Appearance: Grey, granular powder. Odorless.

IV. Fire & Explosion Hazard

Flammable/Explosive: NO ( ) YES (X)

Under what conditions: Fine dust concentrations can explode in the presence of an ignition source.

Extinguishing Media: Carbon dioxide or water. Apply extinguishing media with fog nozzles and fine spray to prevent dusting. Flame, hot metal and sparks can ignite combustible and flammable materials. Use the extinguishing media recommended for the burning materials and fire situation. See ANSI Z49.1 "Safety in Welding and Cutting" and "Safe Practices" Code: SP, published by the American Welding Society, P. O. Box 351040, Miami, FL 33135, and NFPA 51B "Standard for Fire Prevention During Welding, Cutting, and Other Hot Work," published by the National Fire Protection Association, Batterymarch Park, Quincy, MA 02269 for additional fire prevention and protection information.

V. Reactivity Data

Stability: Stable (X) Unstable ( ) Polymerization will not occur.

Incompatible products: None currently known.

Hazardous decomposition products: The fumes and gases produced during cutting and scarfing cannot be classified simply. The composition and quantity of both are dependent upon the material being worked, the process, procedures, and consumables used. Other conditions which also influence the composition and quantity of the fumes and gases to which workers may be exposed include: coatings on the material being worked (such as paint, plating or galvanizing), the number of cutting and scarfing operations and the volume of the work area, the quality and amount of ventilation, the position of the worker's head with respect to the fume plume, as well as the presence of contaminants in the atmosphere (such as chlorinated hydrocarbon vapors from cleaning or painting activities). When the materials are consumed, the fume and gas decomposition products generated are different in percent and form from the ingredients listed in Section II. Decomposition products of normal operation include those originating from the volatilization, reaction, or oxidation of the ingredients, plus those from the material being worked and the coatings etc. noted above.

Reasonably expected decomposition products from normal use of these products include a complex of the oxides of the materials listed in Section II, as well as carbon monoxide, carbon dioxide and nitrogen oxides. The only way to determine the true identity of the decomposition products is by sampling and analysis. The composition and quantity of the fumes and gases to which a worker may be overexposed can be determined from a sample obtained from inside the welder's helmet, if worn, or in the workers breathing zone. See ANSI/AWS F1.1 "Method for Sampling Airborne Particles Generated by Welding and Allied Processes," available from the American Welding Society.

VI. Physical and Health Hazard Data

Cutting and scarfing may create one or more of the following health or physical hazards. Fumes and gases can be dangerous to your health. Electric shock can kill you. Arc rays can injure eyes and burn skin. Noise can damage hearing. An additional detailed description of the Health and Physical Hazards and their consequences may be found in ESAB's publications F52-529 "Precautions and Safe Practices for Electric Welding and Cutting" and F1798 "Precautions and Safe Practices for Gas Welding, Cutting and Heating." You may obtain copies from your local supplier or by writing to the address in Section I.

Route of overexposure: The primary route of entry of the decomposition products is by inhalation. Skin contact, eye contact, and ingestion are possible. Absorption by skin contact is unlikely. When these products are used as recommended by **THE ESAB GROUP**, and ventilation maintains exposure to the decomposition products below the limits recommended in this section, overexposure is unlikely.

Effects of acute (short-term) overexposure to the gases, fumes and dusts may include irritation of the eyes, lungs, nose and throat. Some toxic gases associated with cutting and scarfing may cause pulmonary edema, asphyxiation, and death. Acute overexposure may include signs and symptoms such as watery eyes, nose and throat irritation, headache, dizziness, difficulty in breathing, frequent coughing, or chest pain.

Pre-existing Medical Conditions Aggravated by Overexposure: Individuals with allergies or impaired respiratory function may have symptoms worsened by exposure to cutting/scarfing fumes; however, such reaction cannot be predicted due to the variation in composition and quantity of the decomposition products.

Effects of chronic (long-term) overexposure to air contaminants may lead to their accumulation in the lungs, a condition which may be seen as dense areas on chest X-rays. The severity of the change is proportional to the length of the exposure. The changes seen are not necessarily associated with symptoms or signs of reduced lung function or disease. In addition, the changes on X-rays may be caused by non-work factors such as smoking, etc.

Exposure limits for the ingredients are listed in Section II. The 1989 OSHA TWA for welding fume is 5 mg/m^3. TLV-TWAs should be used as a guide in the control of health hazards and not as fine lines between safe and excessive concentrations. When these products are used as recommended by **THE ESAB GROUP**, and the preventive measures taught in this MSDS are followed, overexposure to hazardous substances will not occur.

Emergency First Aid Measures: In case of emergency**,** call for medical aid. Employ first aid technique recommended by the Red Cross. **IF BREATHING IS DIFFICULT,** give oxygen and call for a physician. **FOR ELECTRIC SHOCK**, disconnect and turn off the power. If not breathing, begin artificial respiration, preferably mouth-to-mouth. If no detectable pulse, begin Cardio Pulmonary Resuscitation (CPR). Immediately call a physician. **FOR ARC BURN**, apply cold, clean compresses and call a physician.

Carcinogenic Assessment (NTP Annual Report, IARC Monographs, Other): NONE

VII. Precautions for Safe Handling and Use/Applicable Control Measures

Read and understand the manufacturer's instructions and the precautionary label on this product. See American National Standard Z-49.1, "Safety in Welding and Cutting," published by the American Welding Society, P. O. Box 351040, Miami, FL 33135 and OSHA Publication 2206 (29 C.F.R. 1910), U.S. Government Printing Office, Superintendent of Documents, P.O. Box 371954, Pittsburgh, PA 15250-7954 for more detail on many of the following:

Ventilation: Use enough ventilation, local exhaust, or both, at the work area to keep the fumes and gases below the TLVs in the worker's breathing zone and the general area. Train the worker to keep his head out of the fumes.

Respiratory Protection: Use respirable fume respirator or air supplied respirator when cutting in confined space or where local exhaust or ventilation does not keep exposure below TLV.

Eye Protection: Wear correct eye protection such as safety glasses and eye shields for radiation and flying particles. Provide protective screens and flash goggles, if necessary, to shield others.

Protective Clothing: Wear head, hand and body protection which help to prevent injury from radiation, sparks and electrical shock. See ANSI Z-49.1. At a minimum, this includes welder's gloves and a protective face shield and may include arm protectors, aprons, hats, shoulder protection, as well as dark substantial clothing. Train the worker not to touch live electrical parts and to insulate himself from work and ground.

Procedure for Cleanup of Spills or Leaks: NOT APPLICABLE

Waste Disposal Method: Prevent waste from contaminating surrounding environment. Discard any product, residue, disposable container, or liner in an environmentally acceptable manner, in full compliance with Federal, State and Local regulations.

The opinions expressed in this MSDS are those of qualified experts within **THE ESAB GROUP**. We believe that the information contained herein is current as of the date of this MSDS. Since the use of this information and these opinions and the conditions of use of these products are not within the control of **THE ESAB GROUP**, it is the user's obligation to determine the conditions of safe use of these products.

APPENDIX C

SOIL AND GROUNDWATER ANALYTICAL RESULTS FROM PREVIOUS INVESTIGATIONS

Table 1. Historical Soil Analytical Results - Summary of Detected Constituents
Fromer One-Hour Valet Dry Cleaners
1214 West Wells Street, Milwaukee, Wisconsin
Ramboll Project No. 1690005819

Parameters	Soil RCLs			GP-1 (5.5')	GP-1 (11-13')	GP-1 (5-7')	GP-2 (9-11')	GP-2 (2')	GP-3 (3-5')	GP-3 (6')	GP-4 (5-7')	GP-4 (13-15')	GP-5 (6-8')	GP-5 (14-16')	GP-6 (2-4')	GP-6 (6-8')	GP-7 (4-6')	GP-7 (6-8')
	Non-Industrial Direct Contact	Industrial Direct Contact	Groundwater Pathway	5/29/2003	2/7/1997	2/7/1997	2/7/1997	5/29/2003	2/7/1997	5/29/2003	2/7/1997	2/7/1997	7/13/1999	7/13/1999	7/13/1999	7/13/1999	7/13/1999	7/13/1999
VOCs (µg/kg)																		
Benzene	1600	7070	5.12	<30	<30	<28	<30	<30	<30	<30	<31	<29	<11.5	<11.9	**84.2 C**	<12.7	<11.5	<12.6
1,1-Dichloroethene	320000	1190000	5.02	<30	#N/A	#N/A	#N/A	<30	#N/A	<30	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
cis-1,2-Dichloroethene	156000	2340000	41.2	<30	**48 C**	<28	30	<30	<30	<30	<31	<29	<11.4	<11.8	<41.5	<12.5	<11.4	<12.5
trans-1,2-Dichloroethene	1560000	1850000	62.6	<30	<30	<28	<30	<30	<30	<30	<31	<29	<12.9	<13.3	<46.9	<14.2	<12.8	<14.1
Methylene chloride	61800	1150000	2.56	<61	**34 C**	**29 C**	<30	<60	<30	<60	<31	**31 C**	<48.7	<50.3	<177	<53.5	<48.6	<53.2
Tetrachloroethene	33000	145000	4.54	**14500 C**	<30	**1157 C**	**6738 C**	<30	**384 C**	<30	**467 C**	<29	<20.6	<21.3	**6960 C**	<22.6	**289 C**	**3900 C**
Toluene	818000	818000	1107.2	<30	<30	<28	<30	<30	<30	<30	<31	<29	<6.74	<6.97	<24.6	<7.41	<6.73	<7.37
Trichloroethene	1300	8410	3.58	<30	<30	<28	**295 C**	<30	<30	<30	<31	<29	<13	<13.4	<47.3	<14.3	<13	<14.2
1,2,4-Trimethylbenzene[1]	219000	219000	1382.1	<30	<30	<28	<30	<30	<30	<30	<31	<29	<28.4	<29.4	<104	<31.3	<28.4	<31.1
o-Xylene	434000	434000	--	<42	<30	31	<30	<42	39	<42	<31	<29	<10.9	<11.3	<39.7	<12	<10.9	<11.9

Notes:
VOCs = Volatile Organic Compounds
RCL = Residual Contaminant Level
µg/kg = micrograms per kilogram
[1] Groundwater Pathway RCL listed is for 1,2,4- and 1,3,5-Trimethylbenzenes combined.
[2] Direct Contact RCL listed is for the more stringent m-Xylene.
A Parameter exceeds NR 720 Residual Contaminant Level (RCL) for Non-Industrial Direct Contact.
B Parameter exceeds NR 720 RCL for Industrial Direct Contact.
C Parameter exceeds NR 720 RCL for Groundwater Pathway.
J Estimated concentration at or above the LOD and below the LOQ.
-- No RCL established.
#N/A = Not analyzed

Direct contact RCL exceedances apply to soil from 0 to 4 feet below ground surface.
Soil RCLs established by the WDNR RR program using the EPA's RSL web-calculator with WAC NR 720 default parameters (WDNR PUB-RR-890, June 2014 - updated RCL spreadsheet, March 2017).
All sampling results obtained from a Site Investigation Report prepared by GZA GeoEnvironmental, Inc. on February 24, 2012.

Table 1. Historical Soil Analytical Results - Summary of Detected Constituents
Fromer One-Hour Valet Dry Cleaners
1214 West Wells Street, Milwaukee, Wisconsin
Ramboll Project No. 1690005819

Parameters	Soil RCLs			GP-8 (2-4')	GP-8 (8-10')	GP-9 (0.4-2')	GP-10 (0.5-2')	GP-11 (0-2')	GP-11 (2-4')	GP-11 (4-6')	GP-12 (0-2')	GP-12 (2-4')	GP-12 (4-6')	GP-13 (12-14')	GP-13 (2-4')	GP-14 (12-14')	GP-14 (2-4')	GP-15 (12-14')
	Non-Industrial Direct Contact	Industrial Direct Contact	Groundwater Pathway	7/13/1999	7/13/1999	7/13/1999	7/13/1999	11/8/1999	11/8/1999	11/8/1999	11/8/1999	11/8/1999	11/8/1999	11/8/1999	11/8/1999	11/8/1999	11/8/1999	11/8/1999
VOCs (µg/kg)																		
Benzene	1600	7070	5.12	<12.3	<12	<11.3	<116	<13	<11	<12	<11	<12	<13	<11	<13	<11	<12	<11
1,1-Dichloroethene	320000	1190000	5.02	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
cis-1,2-Dichloroethene	156000	2340000	41.2	<12.2	<11.9	<11.2	**4410 C**	26	<11	<11	**1120 C**	**1870 C**	**391 C**	<11	<13	<11	<12	<11
trans-1,2-Dichloroethene	1560000	1850000	62.6	<13.8	<13.4	<12.6	<130	<12.6	<13	<13	23	**63 C**	**17**	<13	<15	<12	<13	<12
Methylene chloride	61800	1150000	2.56	<52	<50.6	<47.7	<490	<53	<47	<49	<48	<50	<53	<49	<55	<46	<51	<46
Tetrachloroethene	33000	145000	4.54	**59.2 C**	**495 C**	<20.2	**73700 A,C**	<23	<20	<21	**71200 A,C**	**1680 C**	**398 C**	<21	<23	<20	<21	<19
Toluene	818000	818000	1107.2	<7.21	<7.01	<6.6	106	20	<6.5	<6.8	<6.6	<6.9	<7.4	<6.7	<7.6	<6.4	<7	<6.4
Trichloroethene	1300	8410	3.58	<13.9	<13.5	<12.7	**3680 A,C**	<14	<12	<13	**3110 A,C**	**50 C**	<14	<13	<15	<12	<14	<12
1,2,4-Trimethylbenzene[1]	219000	219000	1382.1	<30.4	<29.6	<27.9	444	<31	<27	<29	<28	<29	<31	<28	<32	<27	<30	<27
o-Xylene	434000	434000	--	<11.7	<11.3	<10.7	<110	<31.6	<27.9	<29.2	<29.1	<30.3	<31.6	<29.1	<32.8	<27.9	<30.4	<27.9

Notes:
VOCs = Volatile Organic Compounds
RCL = Residual Contaminant Level
µg/kg = micrograms per kilogram
[1] Groundwater Pathway RCL listed is for 1,2,4- and 1,3,5-Trimethylbenzenes combined.
[2] Direct Contact RCL listed is for the more stringent m-Xylene.
A Parameter exceeds NR 720 Residual Contaminant Level (RCL) for Non-Industrial Direct Contact.
B Parameter exceeds NR 720 RCL for Industrial Direct Contact.
C Parameter exceeds NR 720 RCL for Groundwater Pathway.
J Estimated concentration at or above the LOD and below the LOQ.
-- No RCL established.
#N/A = Not analyzed

Direct contact RCL exceedances apply to soil from 0 to 4 feet below ground surface.
Soil RCLs established by the WDNR RR program using the EPA's RSL web-calculator with WAC NR 720 default parameters (WDNR PUB-RR-890, June 2014 - updated RCL spreadsheet, March 2017).
All sampling results obtained from a Site Investigation Report prepared by GZA GeoEnvironmental, Inc. on February 24, 2012.

Table 1. Historical Soil Analytical Results - Summary of Detected Constituents
Fromer One-Hour Valet Dry Cleaners
1214 West Wells Street, Milwaukee, Wisconsin
Ramboll Project No. 1690005819

Parameters	Soil RCLs			GP-15 (2-4')	GP-16 (12-14')	GP-16 (2-4')	GP-17 (10-12')	GP-17 (18-20')	GP-18 (6-8')	GP-18 (10-12')	GP-19 (6-8')	GP-19 (10-12')	GP-20 (8-10')	GP-20 (14-16')	GP-21 (1.5-3')	GP-21 (6.5-8')	GP-22 (3-5')	GP-22 (8-10')
	Non-Industrial Direct Contact	Industrial Direct Contact	Groundwater Pathway	11/8/1999	11/8/1999	11/8/1999	2/25/2011	2/25/2011	2/25/2011	2/25/2011	2/25/2011	2/25/2011	2/25/2011	2/25/2011	2/28/2011	2/28/2011	2/28/2011	2/28/2011
VOCs (µg/kg)																		
Benzene	1600	7070	5.12	<12	<12	<12	<14,000	<140	<30	<27	<29	<29	<58	<30	<31	<30	<31	<30
1,1-Dichloroethene	320000	1190000	5.02	#N/A	#N/A	#N/A	<14,000	<140	<30	<27	<29	<29	<58	<30	<31	<30	<31	<30
cis-1,2-Dichloroethene	156000	2340000	41.2	<11	<12	<12	<14,000	<140	<30	<27	<29	<29	**1200 C**	<30	<31	<30	<31	<30
trans-1,2-Dichloroethene	1560000	1850000	62.6	<13	<14	<13	<14,000	<140	<30	<27	<29	<29	<58	<30	<31	<30	<31	<30
Methylene chloride	61800	1150000	2.56	<49	<52	<50	<28,000	<280	<59	<55	<58	<58	<120	<60	<62	<60	<61	<61
Tetrachloroethene	33000	145000	4.54	<21	<22	<21	**6700000 C**	**29000 C**	**1100 C**	**120 C**	**99 C**	**68 C**	**170 C**	**120 C**	**120 C**	**42 C**	**600 C**	**240 C**
Toluene	818000	818000	1107.2	<6.8	<7.2	<6.9	<14,000	<140	<30	<27	<29	<29	<58	<30	<31	<30	<31	<30
Trichloroethene	1300	8410	3.58	<13	<14	<13	<14,000	<140	<30	<27	<29	<29	<58	<30	<31	<30	<31	<30
1,2,4-Trimethylbenzene[1]	219000	219000	1382.1	<29	<30	<29	<14,000	<140	<30	<27	<29	<29	<58	<30	<31	<30	<31	<30
o-Xylene	434000	434000	--	<29.2	<31.5	<30.3	<47,000	<480	<100	<93	<99	<99	<200	<100	<110	<100	<100	<100

Notes:
VOCs = Volatile Organic Compounds
RCL = Residual Contaminant Level
µg/kg = micrograms per kilogram
[1] Groundwater Pathway RCL listed is for 1,2,4- and 1,3,5-Trimethylbenzenes combined.
[2] Direct Contact RCL listed is for the more stringent m-Xylene.
A Parameter exceeds NR 720 Residual Contaminant Level (RCL) for Non-Industrial Direct Contact.
B Parameter exceeds NR 720 RCL for Industrial Direct Contact.
C Parameter exceeds NR 720 RCL for Groundwater Pathway.
J Estimated concentration at or above the LOD and below the LOQ.
-- No RCL established.
#N/A = Not analyzed

Direct contact RCL exceedances apply to soil from 0 to 4 feet below ground surface.
Soil RCLs established by the WDNR RR program using the EPA's RSL web-calculator with WAC NR 720 default parameters (WDNR PUB-RR-890, June 2014 - updated RCL spreadsheet, March 2017).
All sampling results obtained from a Site Investigation Report prepared by GZA GeoEnvironmental, Inc. on February 24, 2012.

Table 1. Historical Soil Analytical Results - Summary of Detected Constituents
Fromer One-Hour Valet Dry Cleaners
1214 West Wells Street, Milwaukee, Wisconsin
Ramboll Project No. 1690005819

Parameters	Soil RCLs			GP-23 (18-20')	GP-23 (26.5-28')	GP-24 (18-20')	GP-24 (26-28')	HA-1 (2-4')	HA-1 (6-7')	HA-2 (4-6')	HA-3 (4-6')	HA-4 (2-4')	HA-4 (6-8')	HA-5 (4-6')	HA-6 (0-2')	MW-1 (11-13')	MW-2 (11-13')	MW-3 (9-11')
	Non-Industrial Direct Contact	Industrial Direct Contact	Groundwater Pathway	2/28/2011	2/28/2011	3/1/2011	3/1/2011	8/21/2009	8/21/2009	8/21/2009	8/21/2009	8/21/2009	8/21/2009	8/21/2009	8/21/2009	1/7/2002	1/7/2002	1/7/2002
VOCs (µg/kg)																		
Benzene	1600	7070	5.12	<29	<2,800	<28	<28	<29	<29	<28	<29	<30	<120	<300	<29	#N/A	#N/A	#N/A
1,1-Dichloroethene	320000	1190000	5.02	<29	<2,800	<28	<28	**35 C**	<29	<28	<29	<30	<120	<300	<29	#N/A	#N/A	#N/A
cis-1,2-Dichloroethene	156000	2340000	41.2	<29	<2,800	<28	<28	**4900 C**	**3700 C**	**480 C**	<29	**3100 C**	**18000 C**	**19000 C**	**51 C**	<25	<25	<25
trans-1,2-Dichloroethene	1560000	1850000	62.6	<29	<2,800	<28	<28	**75 C**	51	<28	<29	**79 C**	**220 C**	<300	<29	<25	<25	<25
Methylene chloride	61800	1150000	2.56	<58	<5,500	<55	<56	<57	<57	<57	<59	<59	<240	<590	<58	#N/A	#N/A	#N/A
Tetrachloroethene	33000	145000	4.54	**840 C**	**350000 C**	<28	<28	**9200 C**	**45000 C**	<28	<29	<30	**11000 C**	**59000 C**	**12000 C**	<25	<25	<25
Toluene	818000	818000	1107.2	<29	<2,800	<28	<28	<29	<29	<28	<29	<30	<120	<300	<29	#N/A	#N/A	#N/A
Trichloroethene	1300	8410	3.58	<29	**9300 C**	<28	<28	**4700 A,C**	**6400 C**	<28	<29	<30	**1800 C**	**3200 C**	**110 C**	<25	<25	<25
1,2,4-Trimethylbenzene[1]	219000	219000	1382.1	<29	<2,800	<28	<28	<29	<29	<28	<29	<30	<120	<300	<29	#N/A	#N/A	#N/A
o-Xylene	434000	434000	--	<98	<9,400	<94	<95	<57	<57	<57	<59	<59	<240	<590	<58	#N/A	#N/A	#N/A

Notes:
VOCs = Volatile Organic Compounds
RCL = Residual Contaminant Level
µg/kg = micrograms per kilogram
[1] Groundwater Pathway RCL listed is for 1,2,4- and 1,3,5-Trimethylbenzenes combined.
[2] Direct Contact RCL listed is for the more stringent m-Xylene.
A Parameter exceeds NR 720 Residual Contaminant Level (RCL) for Non-Industrial Direct Contact.
B Parameter exceeds NR 720 RCL for Industrial Direct Contact.
C Parameter exceeds NR 720 RCL for Groundwater Pathway.
J Estimated concentration at or above the LOD and below the LOQ.
-- No RCL established.
#N/A = Not analyzed

Direct contact RCL exceedances apply to soil from 0 to 4 feet below ground surface.
Soil RCLs established by the WDNR RR program using the EPA's RSL web-calculator with WAC NR 720 default parameters (WDNR PUB-RR-890, June 2014 - updated RCL spreadsheet, March 2017).
All sampling results obtained from a Site Investigation Report prepared by GZA GeoEnvironmental, Inc. on February 24, 2012.

Table 1. Historical Soil Analytical Results - Summary of Detected Constituents
Fromer One-Hour Valet Dry Cleaners
1214 West Wells Street, Milwaukee, Wisconsin
Ramboll Project No. 1690005819

Parameters	Soil RCLs			MW-4 (4-6')	MW-5 (6-8')	MW-5 (18-20')	MW-7 (2-4')	MW-8 (2-4')	PZ-1 (9-11')	PZ-2 (6-8')	PZ-2 (12-14')	SB-1 (2.5-5')	SB-2 (2.5-5')	SB-2 (17.5-20')	SB-3 (15-17.5')
	Non-Industrial Direct Contact	Industrial Direct Contact	Groundwater Pathway	7/24/2003	7/24/2003	7/24/2003	8/20/2009	8/20/2009	1/8/2002	7/24/2003	7/24/2003	8/21/2009	8/21/2009	8/21/2009	8/21/2009
VOCs (µg/kg)															
Benzene	1600	7070	5.12	#N/A	#N/A	#N/A	<29	<29	#N/A	#N/A	#N/A	<30	<30	#N/A	<30
1,1-Dichloroethene	320000	1190000	5.02	#N/A	#N/A	#N/A	<29	<29	#N/A	#N/A	#N/A	<30	<30	<29	<30
cis-1,2-Dichloroethene	156000	2340000	41.2	<30	**1770 C**	<30	<29	<29	<25	<30	<28	<30	<30	<29	<30
trans-1,2-Dichloroethene	1560000	1850000	62.6	<30	**76 C**	<30	<29	<29	<25	<30	<28	<30	<30	<29	<30
Methylene chloride	61800	1150000	2.56	#N/A	#N/A	#N/A	<59	<58	#N/A	#N/A	#N/A	<60	<60	<59	<60
Tetrachloroethene	33000	145000	4.54	**583 C**	**38 C**	<30	<29	<29	**21000 C**	<30	<28	**1400 C**	**1500 C**	<29	**730 C**
Toluene	818000	818000	1107.2	#N/A	#N/A	#N/A	<29	<29	#N/A	#N/A	#N/A	<30	<30	<29	<30
Trichloroethene	1300	8410	3.58	<30	**272 C**	<30	<29	<29	**32 C**	<30	<28	<30	<30	<29	**270 C**
1,2,4-Trimethylbenzene[1]	219000	219000	1382.1	#N/A	#N/A	#N/A	<29	<29	#N/A	#N/A	#N/A	<30	<30	<29	<30
o-Xylene	434000	434000	--	#N/A	#N/A	#N/A	<59	<58	#N/A	#N/A	#N/A	<60	<60	<59	<60

Notes:
VOCs = Volatile Organic Compounds
RCL = Residual Contaminant Level
µg/kg = micrograms per kilogram
[1] Groundwater Pathway RCL listed is for 1,2,4- and 1,3,5-Trimethylbenzenes combined.
[2] Direct Contact RCL listed is for the more stringent m-Xylene.
A Parameter exceeds NR 720 Residual Contaminant Level (RCL) for Non-Industrial Direct Contact.
B Parameter exceeds NR 720 RCL for Industrial Direct Contact.
C Parameter exceeds NR 720 RCL for Groundwater Pathway.
J Estimated concentration at or above the LOD and below the LOQ.
-- No RCL established.
#N/A = Not analyzed

Direct contact RCL exceedances apply to soil from 0 to 4 feet below ground surface.
Soil RCLs established by the WDNR RR program using the EPA's RSL web-calculator with WAC NR 720 default parameters (WDNR PUB-RR-890, June 2014 - updated RCL spreadsheet, March 2017).
All sampling results obtained from a Site Investigation Report prepared by GZA GeoEnvironmental, Inc. on February 24, 2012.

Table 2. Groundwater Analytical Results - Summary of Detected Constituents
Former One-Hour Valet Dry Cleaners
1214 West Wells Street, Milwaukee, Wisconsin
Ramboll Project No. 1690005819

Analyte[1,2]		Benzene	Chloroform	1,1-Dichloroethene	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	Ethylbenzene	Methylene chloride	Tetrachloroethene	Toluene	Trichloroethene	1,2,4-Trimethylbenzene[3]	Vinyl chloride	Xylenes, total[4]
CAS		71-43-2	67-66-3	75-35-4	156-59-2	156-60-5	100-41-4	75-09-2	127-18-4	108-88-3	79-01-6	95-63-6	75-01-4	1330-20-7
Units		ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
NR 140 ES		5	6	7	70	100	700	5	5	800	5	480	0.2	2000
NR 140 PAL		0.5	0.6	0.7	7	20	140	0.5	0.5	160	0.5	96	0.02	400
MW-1	1/14/2002	ND	<0.23	<0.27	<0.21	<0.25	<0.22	<0.24	<0.22	<0.41	0.46 J	<0.15	**44**	#N/A
	5/8/2002	ND	<0.1	<0.11	<0.11	<0.11	<0.08	<0.24	<0.15	<0.08	<0.13	<0.11	<0.16	#N/A
	8/7/2003	ND	<0.25	<0.5	<0.5	<0.5	<0.5	<1	<0.5	0.9	0.3 J	<0.25	<0.25	<0.5
	10/7/2003	ND	<0.25	<0.5	<0.5	<0.5	<0.5	<1	<0.5	<0.25	<0.25	<0.25	<0.25	<0.5
	8/25/2009	<0.2	<0.2	<0.5	<0.5	<0.5	<0.5	<1	<0.5	<0.5	<0.2	<0.2	<0.2	<0.5
	11/1/2017	<0.50	<2.5	<0.41	<0.26	<0.26	<0.50	<0.23	<0.50	<0.50	<0.33	<0.50	<0.18	<1.5
MW-2	1/14/2002	ND	<0.23	<0.21	<0.21	<0.25	<0.22	<0.22	<0.22	<0.41	<0.24	<0.26	<0.25	#N/A
	5/8/2002	ND	<0.1	<0.11	<0.11	<0.11	<0.08	<0.24	<0.15	<0.08	<0.13	<0.11	<0.16	#N/A
	8/7/2003	ND	<0.25	<0.5	<0.5	<0.5	<0.5	<1	<0.5	0.32 J	<0.25	<0.25	<0.25	<0.5
	10/7/2003	ND	<0.25	<0.5	<0.5	<0.5	<0.5	<1	<0.5	<0.25	<0.25	<0.25	<0.25	<0.5
	8/27/2009	<0.2	<0.2	<0.5	<0.5	<0.5	<0.5	<1	<0.5	<0.5	<0.2	<0.2	<0.2	<0.5
	11/1/2017	<0.50	<2.5	<0.41	<0.26	<0.26	<0.50	<0.23	<0.50	<0.50	<0.33	<0.50	<0.18	<1.5
MW-3	1/15/2002	ND	<0.23	<0.27	<0.21	<0.25	<0.22	<0.22	<0.22	<0.41	<0.24	<0.26	<0.25	#N/A
	5/8/2002	ND	<0.1	<0.11	<0.11	<0.11	<0.08	<0.24	<0.15	0.32	0.34 J	<0.11	<0.16	#N/A
	8/7/2003	ND	<0.25	<0.5	<0.5	<0.5	<0.5	<1	<0.5	0.88	0.42 J	<0.25	<0.25	<0.5
	10/7/2003	ND	<0.25	<0.5	<0.5	<0.5	<0.5	<1	<0.5	<0.25	<0.25	<0.25	<0.25	<0.5
	8/27/2009	<0.2	<0.2	<0.5	<0.5	<0.5	<0.5	<1	<0.5	<0.5	<0.2	<0.2	<0.2	<0.5
	11/1/2017	<0.50	<2.5	<0.41	<0.26	<0.26	<0.50	<0.23	<0.50	<0.50	<0.33	<0.50	<0.18	<1.5
MW-4	8/7/2003	ND	<0.25	<0.5	<0.5	<0.5	<0.5	<1	*0.88 J*	0.9	*0.71 J*	0.34 J	<0.25	<0.5
	10/7/2003	ND	<0.25	<0.5	<0.5	<0.5	<0.5	<1	*0.57 J*	<0.25	<0.25	<0.25	<0.25	<0.5
	8/25/2009	<0.2	<0.2	<0.5	<0.5	<0.5	<0.5	<1	**7**	<0.5	<0.2	<0.2	<0.2	<0.5
	11/2/2017	<0.50	<2.5	<0.41	<0.26	<0.26	<0.50	<0.23	**7.8**	<0.50	<0.33	<0.50	<0.18	<1.5
MW-5	8/7/2003	ND	<0.25	<0.5	*11*	<0.5	<0.5	<1	**80**	0.9	**7.9**	0.34 J	<0.25	<0.5
	10/7/2003	ND	<0.25	<0.5	**150**	1.2	<0.5	<1	**93**	<0.25	**6.4**	<0.25	<0.25	<0.5
	8/27/2009	<0.2	<0.2	<0.5	**110**	1.2	<0.5	<1	**140**	<0.5	<0.2	32	**22**	<0.5
	11/2/2017	<0.50	<2.5	<0.41	**73.6**	1.5	<0.50	<0.23	**30.3**	<0.50	*3.2*	<0.50	**0.45 J**	<1.5
MW-6	8/25/2009	<0.2	<2	<5	**980**	<5	<5	<10	<5	<5	**18**	<2	**57**	<5
	11/9/2017	<0.50	<2.5	<0.41	4.5	<0.26	<0.50	<0.23	<0.50	<0.50	<0.33	<0.50	**1.0**	<1.5
MW-7	8/26/2009	<0.2	<0.2	<0.5	<0.5	<0.5	<0.5	<1	<0.5	<0.5	<0.2	<0.2	<0.2	<0.5
	11/9/2017	<0.50	<2.5	<0.41	<0.26	<0.26	<0.50	<0.23	<0.50	<0.50	<0.33	<0.50	<0.18	<1.5
MW-8	8/26/2009	<0.2	<0.2	<0.5	<0.5	<0.5	<0.5	<1	<0.5	<0.5	<0.2	<0.2	<0.2	<0.5
	11/9/2017[5]	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
MW-9	8/27/2009	0.28	<0.2	<0.5	<0.5	<0.5	<0.5	<1	<0.5	0.64	<0.2	<0.2	<0.2	<0.5
	11/9/2017	<0.50	<2.5	<0.41	<0.26	<0.26	<0.50	<0.23	<0.50	0.59 J	<0.33	<0.50	<0.18	<1.5

Table 2. Groundwater Analytical Results - Summary of Detected Constituents
Former One-Hour Valet Dry Cleaners
1214 West Wells Street, Milwaukee, Wisconsin
Ramboll Project No. 1690005819

Analyte[1,2]		Benzene	Chloroform	1,1-Dichloroethene	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	Ethylbenzene	Methylene chloride	Tetrachloroethene	Toluene	Trichloroethene	1,2,4-Trimethylbenzene[3]	Vinyl chloride	Xylenes, total[4]
CAS		71-43-2	67-66-3	75-35-4	156-59-2	156-60-5	100-41-4	75-09-2	127-18-4	108-88-3	79-01-6	95-63-6	75-01-4	1330-20-7
Units		ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
NR 140 ES		5	6	7	70	100	700	5	5	800	5	480	0.2	2000
NR 140 PAL		0.5	0.6	0.7	7	20	140	0.5	0.5	160	0.5	96	0.02	400
PZ-1	1/15/2002	ND	<1.2	<1.4	**400**	4 J	<1.1	<1.1	<1.1	<2.1	<1.2	<0.75	<1.3	#N/A
	5/8/2003	ND	<5	<5.5	**3000**	*22*	<4	**23** J	**8500**	<4	**2800**	<5.5	**22** J	#N/A
	8/8/2003	ND	0.3 J	**8.4**	**2600**	18.0	1.8	<1	**27000**	4.8	**2500**	<0.25	**11**	1.2
	10/7/2003	ND	<120	<250	**2600**	<250	<250	<500	**36000**	<120	**2600**	<120	<120	<250
	8/25/2009	<32	<32	<80	**2000**	<80	<80	<160	**61000**	<80	**1600**	<32	<32	<80
	11/2/2017	<125	<625	<103	**414**	<64.1	<125	<58.1	**16200**	<125	**435**	<125	<43.9	<375
PZ-2	8/8/2003	ND	<0.25	<0.5	<0.5	<0.5	<0.5	<1	<0.5	0.43 J	<0.25	<0.25	**5.8**	<0.5
	10/6/2003	ND	<0.25	<0.5	<0.5	<0.5	<0.5	<1	<0.5	<0.25	<0.25	<0.25	**8.9**	<0.5
	8/27/2009	<0.2	<0.2	<0.5	<0.5	<0.5	<0.5	<1	<0.5	<0.5	<0.2	<0.2	**14**	<0.5
	11/1/2017	<0.50	<2.5	<0.41	4.1	<0.26	<0.50	<0.23	<0.50	<0.50	<0.33	<0.50	**11.0**	<1.5
PZ-3	8/26/2004	ND	<2	<5	**440**	<5	<5	<10	**56**	<2	<2	<2	<2	<5
	10/7/2004	ND	<1	<2.5	**300**	<2.5	<2.5	<5	**73**	<1	<1	<1	<1	<2.5
	8/25/2009	<2	<2	<5	**1100**	11.0	<5	<10	**5.6**	<5	**7.1**	<2	**3.9**	<5
	11/2/2017	<25.0	<125	<20.5	**2060**	*22.4* J	<25.0	<11.6	<25.0	<25.0	**144**	<25.0	<8.8	<75.0
PZ-4	8/25/2009	<0.20	<0.2	<0.5	4.4	<0.5	<0.5	<1	*0.84*	<0.5	*0.56*	<0.2	<0.2	<0.5
	11/2/2017	<0.50	<2.5	<0.41	<0.26	<0.26	<0.50	<0.23	<0.50	<0.50	<0.33	<0.50	**1.3**	<1.5

Notes:
VOCs = Volatile Organic compounds
All results reported in micrograms per Liter (ug/L)
ES = Enforcement Standard
PAL = Preventive Action Limit
Bold value = NR 140 ES Exceedance
Italic Value = NR 140 PAL Exceedance
-- = No NR 140 ES or PAL established.
#N/A = Not analyzed
NS = Not sampled
J = Estimated concentration. Laboratory results reported between the limit of detection and limit of quantification.
[1] Analytical results are displayed for detected parameters only.
[2] All sampling results prior to 2017 obtained from a Site Investigation Report prepared by GZA GeoEnvironmental, Inc. on February 24, 2012.
[3] Standards are for 1,2,4- and 1,3,5-Trimethylbenzene
[4] Standards are for Total Xylenes (-m, -p, and -o).
[5] MW-8 not sampled during the November 2017 groundwater sampling event because well did not recharge sufficiently.