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REMEDIAL ACTION OPTIONS REPORT

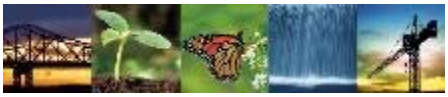
Clare Central
1003 and 1033 West Atkinson Avenue
Milwaukee, Wisconsin
BRRTS #02-41-549867 / FID #341148720

June 28, 2021
File No. 20.0156038.02

PREPARED FOR:
Telos, Inc.
c/o Axley Brynelson, LLP

GZA GeoEnvironmental, Inc.
17975 West Sarah Lane, Suite 100 | Brookfield, WI 53045
262-754-2560

30 Offices Nationwide
www.gza.com



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17975 West Sarah Lane
Suite 100
Brookfield, WI 53045
T: 262.754.2560
F: 262.923.7758
www.gza.com

June 28, 2021
File No. 20.0156038.02

Mr. Adam McIlheran, Advanced Hydrogeologist
Wisconsin Department of Natural Resources
2300 North Dr. Martin Luther King, Jr. Drive
Milwaukee, Wisconsin 53212-3128

Re: Remedial Action Option Report
Clare Central
1003 and 1033 West Atkinson Avenue
Milwaukee, Wisconsin
BRRTS #02-41-549867 / FID #341148720

Dear Mr. McIlheran:

As a follow-up to our telephone conversation on April 29, 2021, and on behalf of Telos, Inc., GZA GeoEnvironmental, Inc. (GZA) is pleased to provide the Wisconsin Department of Natural Resources (WDNR) this Remedial Action Options Report (RAOR) for the Clare Central properties located at 1003 and 1033 West Atkinson Avenue in the City of Milwaukee, Wisconsin (collectively, the "Site"). The RAOR has been prepared following completion of and the WDNR submittal of the Site Investigation Report on March 29, 2021. The purpose of the RAOR is to provide an evaluation of remedial alternatives for the Site. Based on an evaluation of the technical and economic feasibility of the alternatives in accordance with Chapter NR 722 of the Wisconsin Administrative Code, excavation, treatment, and off-Site disposal of trichloroethene (TCE)-affected soils, engineering controls, and vapor mitigation represents the best interests and is protective of the residential users at the Site, and also represents the most cost-effective remedial solution.

This RAOR represents a careful evaluation of the existing conditions and the development of a remedial action plan to restore the environment and remain protective of the occupants of Clare Central. Approval of the recommended plan and the treatment strategy for the TCE-affected soils prior to off-Site disposal in a licensed Resource Conservation and Recovery Act (RCRA) Subtitle D landfill, is requested.

Thank you for your review of the attached report. Should you have any questions or comments, please feel free to contact the undersigned at (262) 754-2594.

Very truly yours,

GZA GeoEnvironmental, Inc.

Heidi A. Woelfel
Project Manager

James F. Drought, P.H.
Principal Hydrogeologist

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Attachments

FIGURES

APPENDICES

1.0 INTRODUCTION

At the request of Telos, Inc. ("Client"), GZA GeoEnvironmental, Inc. (GZA) is pleased to present this Remedial Action Options Report (RAOR) for the Clare Central Apartment properties located at 1003 and 1033 West Atkinson Avenue in the City of Milwaukee, Wisconsin (collectively, the "Site"). Site investigation activities were conducted by GZA and others from 2006 through 2019, to define the extent and degree of chlorinated volatile organic compounds (CVOCs) in soil, groundwater, and vapors that became affected from historic operations at the Site as a wire manufacturer and automotive repair facility. The Site Investigation Report ("SI Report")[1] was submitted to the Wisconsin Department of Natural Resources (WDNR) on March 29, 2021.

Based on the Site investigation findings, GZA prepared this evaluation of remedial options to address the applicable exposure pathways for CVOCs identified at Site. The remedial options considered in this RAOR are considered technically and economically feasible and will reduce the mass of CVOCs, primarily trichloroethene (TCE) and its daughter products, in soil and groundwater. The reduction in mass will position the Site for closure in accordance with the requirements of Chapter NR 726 of the Wisconsin Administrative Code (Wis. Adm. Code) and will reduce the potential exposure of vapor intrusion from partitioning from soil and groundwater gases into the Site buildings. Vapor intrusion is currently being managed in the apartment buildings by sub-slab depressurization systems, which were demonstrated through sampling to be effective. The Site is enrolled in the Voluntary Party Liability Exemption (VPLE) program with the WDNR (BRRTS #06-41-560680). Please note that this RAOR is subject to the Limitations provided in Appendix A.

1.1 SITE INFORMATION

The Site is located at the street addresses of 1003 and 1033 West Atkinson Avenue in the City of Milwaukee, within the southwest quarter, of the northwest quarter, of the United States Public Land Survey Section 8, Township 7 North, Range 22 East, Milwaukee County, Wisconsin. The Wisconsin Transverse Mercator coordinates for the Site are X: 688979 Y: 292235 and the Site latitude is 43.084° and the longitude is -87.924°. A Site Location map showing the location and surrounding area is provided as Figure 1.

1.2 SITE CONTACT INFORMATION

Responsible Party: Telos, Inc.
Attn: Ms. Elaine Wenig
1545 South Layton Boulevard
Milwaukee, Wisconsin 53215
414-385-5321

Consultant: GZA GeoEnvironmental, Inc.
Attn: Ms. Heidi Woelfel
17975 West Sarah Lane, Suite 100
Brookfield, Wisconsin 53045
262-754-2594

[1] *Site Investigation Report, Clare Central, 1003 and 1033 West Atkinson Avenue, Milwaukee, Wisconsin, BRRTS #02-41-549867 / FID #341148720*, dated March 29, 2021, GZA File No. 20.0156038.01.

2.0 BACKGROUND

The Site is located in a mixed commercial and residential area on the north side of Milwaukee and is an irregularly-shaped polygon that covers an area of approximately 0.75-acre with separate multi-family, residential buildings on the west and east halves of the property. The Site is bordered to the north by West Atkinson Street, beyond which are a park and residential properties; to the west by North 11th Street, beyond which are residential properties; to the south by an alleyway and residential units; and to the east by North 10th Street, beyond which are residential properties. The Site is currently developed with two slab-on-grade, two-story, eight-unit apartment buildings with paved parking for the buildings between the buildings. Sheds, utilized for storage of equipment and tools, are also attached to each building. The apartment buildings are situated in an east-west orientation along West Atkinson Street and cover an area of approximately 6,136 and 4,640 square feet, respectively. The areas surrounding the buildings that are not part of the asphalt parking area are covered by grass, landscaping, and/or concrete sidewalks. Figure 2 presents the Site Plan showing the Site layout and features.

A Phase I Environmental Site Assessment (ESA) was conducted by SCI Engineering, Inc. (SCI) in April 2006, in accordance with American Society for Testing and Materials (ASTM) E1527-13, *Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process*, which identified several recognized environmental conditions (RECs) at the Site, including the following:

- A former gasoline filling station was located west of the property across 11th Street and a former dry cleaner facility was identified on the property adjacent to the northwest across West Atkinson Avenue. These properties are not identified in the WDNR BRRTS, indicating that a release notification has not been submitted for these properties.
- The Site was historically operated as an automatic control manufacturing facility, a wire and iron works factory, and an automotive service facility.
- A leaking underground storage tank (LUST) facility (Smith Property, BRRTS #03-41-506431) is located northwest of the Site across West Atkinson Avenue. The release was reported in 2003, for gasoline petroleum hydrocarbons detected in soil, groundwater, and the right-of-way. The tanks were removed in 2003, and soil samples indicated gasoline range organic (GRO) levels exceeding the WDNR regulatory levels, but no groundwater samples were collected. The most recent correspondence available on BRRTS indicates that a Closure Request was submitted and denied for this Site, and additional groundwater sampling is being requested by the WDNR.

Based on the identified RECs, Site investigation activities were conducted at the Site between 2006 and 2020, which identified CVOCs, primarily TCE, in the soil and groundwater at concentrations exceeding the respective soil Residual Contact Levels (RCLs) and groundwater NR 140 Enforcement Standards (ESs). The highest soil and groundwater concentrations are located near the center of the Site beneath the parking lot and grass area and extend up to and around the apartment buildings. The TCE concentrations in some of the soils beneath the parking lot may exceed the toxicity characteristic leaching procedure (TCLP) limit and may be considered as hazardous waste. The extent of the affected soils is delineated within the property boundaries, but the groundwater appears to extend off-Site southwest of the affected soils. Currently, this Site does not have an ongoing source of chlorinated hydrocarbons on-Site.

The mass of TCE historically released to and currently present within the soil within the upper 8 feet, which is the area of the accessible soils for remedial efforts, is calculated from soil concentrations to be approximately 111.97 pounds. The soil mass to a depth of approximately 8 feet is in the area between and adjacent to the foundation of the buildings and is causing vapor intrusion into the buildings. A breakdown of the mass indicates that the interval from surface to a depth of 4 feet below ground surface (bgs) contains approximately 7.84 pounds of TCE and the interval from 4 to 8 feet bgs contains approximately 104.13 pounds of TCE. The confirmation of the mass of TCE, a requirement of NR 716 and 726 of the Wis.

Adm. Code, represents a potential for future partitioning of TCE from the sorbed to the vapor and dissolved phases. Based on the groundwater sample results, there is limited partitioning from the soils to the groundwater and most of the partitioning is occurring to the vapor phase. Figures 3, 4, and 5 present the TCE soil for the soil intervals of 0 to 4 feet bgs, 4 to 8 feet bgs, and 8 to 12 feet bgs, respectively.

The dissolved groundwater TCE plume is located near monitoring well MW-4, which is located near the historic source area, and has migrated a limited distance. Figure 6 presents the TCE groundwater distribution for samples collected on August 26, 2019. The TCE concentration in MW-10, located approximately 60 feet southwest of MW-4, indicates that the TCE concentration exceeds the NR 140 Preventive Action Limit (PAL), or 0.5 micrograms per liter (µg/L), but does not exceed the NR 140 ES of 5 µg/L. Vinyl chloride also exceeds the ES of 0.2 µg/L in monitoring well MW-2 north of the historic source area. Figure 6 presents the groundwater contour map for August 26, 2019.

TCE vapors partitioning from soil and/or groundwater were identified in the soils beneath the two apartment buildings. Vapor samples collected from sub-slab vapor points within each of the apartment buildings have identified concentrations of TCE in exceedance of the vapor risk screening levels (VRSLs) for residential properties. A sub-slab vapor mitigation system is installed in each apartment building to prevent the partitioning and preferential migration of vapors from the soil into the overlying buildings. The most recent ambient air samples, collected in August 2019, indicate TCE vapor concentrations and its daughter products at concentrations less than the indoor air vapor action levels (VALs). However, concentrations of naphthalene, ethylbenzene, 1,2-dichloroethene (DCE), 1,4-dichlorobenzene, and chloroform were reported in ambient air samples collected from inside of the buildings in August 2019, at concentrations exceeding the VALs. These compounds were not analyzed in previously ambient air samples. These compounds are likely due to background vapors from materials and products stored in the building and apartments, as the apartments were occupied by tenants at the time of the August 2019 sampling event.

2.1 SUBSURFACE CONDITIONS

The subsurface conditions at the Site consist of silty clay or clayey silt with layers of sand, silt, and variable amounts of gravel to a depth of 8 feet bgs. The underlying native soils consist of silty clay to the maximum depth investigated of 35 feet bgs. The Site is underlain by Silurian age Niagara Dolomite. Based on water well logs for the area, bedrock is expected at a depth of 100 feet bgs.

Depth to groundwater at the Site ranges from 0.7 feet bgs in MW-1 to 9.7 feet bgs in MW-3. Groundwater appears to have a higher elevation along Atkinson Avenue and south of the Site with an area of lower groundwater elevation extending from the historic source area near monitoring well MW-4 to the west. The elevations cause groundwater flow on the northwest corner of the Site to flow northwest and the area near the historic source area to flow west and beneath the residential buildings along 11th Street. Using the average hydraulic gradient of 0.032 feet per foot (ft/ft) from the historic source area (MW-4) to MW-3, a hydraulic conductivity of 10.39 feet per year (ft/yr) or 1 x 10^{-5} centimeters per second (cm/sec), and a total porosity of 0.35 the calculated average linear groundwater velocity is approximately 0.95 ft/yr. Figures 7 and 8 present geologic cross-sections for the Site and Figure 9 presents the groundwater flow map for August 26, 2019.

3.0 CONTAMINANT PATHWAY EVALUATIONS

This section presents an evaluation of the contaminant exposure pathway in relation to the soil, groundwater, and vapor data collected at the Site. A summary of this information was also presented in the March 2021 SI Report, which was submitted to the WDNR.

3.1 SOIL PATHWAY EVALUATION

Soil samples results at the Site identified chlorinated hydrocarbons in exceedance of the respective RCLs and VRSLs. The apparent source area is near MW-4, which is located between the apartment buildings in the parking lot and alley area and chlorinated hydrocarbons were also identified in the soils adjacent to and beneath the apartment buildings. The soil concentrations in the 0- to 4-foot depth interval exceed the non-industrial direct contact RCL for TCE and the soil concentrations in the 0- to 4-foot and 4- to 8-foot depth intervals exceed the soil-to-groundwater RCL. The soils exceeding the RCLs are also in contact with and beneath the foundations of the existing buildings, which increases the potential for vapor intrusion. In addition, the chlorinated hydrocarbon concentrations in the unsaturated zone have the potential to migrate through preferential pathways and affect surrounding residential properties. Based on the investigation data and the toxicity of TCE through vapor intrusion, soil remediation is warranted to remove the highest soil TCE concentrations to reduce the potential for partitioning from soil to air and to reduce the potential for partitioning from soil to groundwater in the vicinity of MW-4. The calculated TCE mass currently present within the soil from 0 to 12 feet bgs is estimated to be approximately 130.4 pounds. Approximately 111.97 pounds, or 80% of the TCE, are present within the upper 8 feet of the soil column, which is accessible for remedial efforts.

3.2 GROUNDWATER PATHWAY EVALUATION

Chlorinated hydrocarbons were identified in groundwater at the Site at concentrations exceeding the respective NR 140 ESs. The highest TCE concentration is detected in monitoring well MW-4 at concentrations ranging from 16,000 µg/L in March 2011 to 38,200 µg/L in August 2019. Daughter products of the degradation of TCE, cis-1,2-DCE, and vinyl chloride, are present in MW-4 at concentrations exceeding the respective ESs and vinyl chloride is present in MW-2 at concentrations exceeding the ES. The other NR 141-compliant monitoring wells at the Site and off-Site do not have TCE or daughter product concentrations exceeding the respective ESs or PALs. Groundwater flow is west from MW-4 toward MW-3, but samples from MW-3 have not detected chlorinated hydrocarbons, indicating that the migration of chlorinated hydrocarbons have not reached this area. The soil concentrations across much of the Site exceed the soil-to-groundwater RCL; however, the lack of chlorinated hydrocarbon concentrations in groundwater indicate it is not partitioning from soil to groundwater. The chlorinated hydrocarbons in groundwater are limited in extent and the soils at the Site are predominantly clay in nature with a low hydraulic conductivity causing active groundwater remediation to be difficult regardless of the remedial option. The mass of TCE in groundwater was calculated to be approximately 10% of the soil mass. Based on this information, active groundwater remediation is not warranted.

3.3 VAPOR PATHWAY EVALUATION

Chlorinated hydrocarbons have been identified in vapors at the Site that exceed the VRSLs and indoor ambient air levels. Terracon conducted the installation of a sub-slab depressurization system (SSDS) in both the 1003 and 1033 buildings in 2011, with subsequent sub-slab vapor sampling events, system redesign, and maintenance activities performed in 2012 and 2013. A sub-slab venting system was installed at the residential property west of the Site at 3618 North 11th Street in March 2015. GZA collected indoor air samples from the 1003 and 1033 buildings in August 2019, to confirm the SSDS influence. The indoor air samples indicated that TCE vapors were not migrating into the apartments. Due to the presence of TCE in the 2011 sub-slab vapor samples, the SSDS continues to operate and be regularly maintained to eliminate the vapor intrusion pathway. Based on the results of the vapor sampling performed at the Site, the SSDS appears to be mitigating the vapor intrusion into the building. An inspection of the elevator pit in the building at 1003 West Atkinson Avenue indicated that there were cracks in the concrete. The elevator pit represents a pathway for vapor intrusion, therefore, the elevation pit should be sealed to prevent migration into the building.

The SSDS in the residence at 3618 North 11 Street has not been evaluated, but efforts have been made to inspect the system to ensure its operation and effectiveness. Access to the property has not been granted by the property owner. Continued efforts should be made to inspect and monitor this SSDS.

4.0 REMEDIAL ACTION OBJECTIVES

4.1 REMEDIAL ACTION OBJECTIVES FOR GROUNDWATER

To achieve regulatory closure and receive a Certificate of Completion under the VPLE program, as well as achieve the remedial action objective established in Wis. Adm. Code NR 722, the groundwater will need to be remediated for TCE and/or its daughter products to achieve the PALs at the point of compliance within a reasonable timeframe. The requirements of Wis. Adm. Code NR 722 do allow for residual groundwater concentrations to remain that exceed the PAL at the point of compliance if a PAL exemption is granted by the WDNR.

4.2 REMEDIAL ACTION OBJECTIVES FOR SOIL

To satisfy the remedial action objective established in Wis. Adm. Code NR 722, soils must be remediated to the standards established in Wis. Adm. Code NR 720. Two types of standards have been established; numerical and performance. Numerical standards, referred to as RCLs, are concentration-based standards. If soil contaminants are remediated to concentrations below the RCLs, then adequate soil remediation has been completed. However, given the location of the affected soils within the vadose beneath the building and the Site-wide soils exceeding the soil to groundwater standards, the remediation of the CVOCs to numerical RCLs that are protective of both groundwater quality and human health, is considered impractical. Since it may not be practical to achieve a numerical RCL, a performance-based standard may be more applicable to the Site. As an alternative to numeric RCLs, Wis. Adm. Code NR 720 allows the use of standards that demonstrate that the soil or groundwater contaminants will not affect human health or the environment. A performance-based alternative could consist of an engineered remedial system, a mass reduction goal, and/or engineered barriers and natural attenuation.

4.3 REMEDIAL ACTION OBJECTIVES FOR AIR

The volatilization and partitioning of chlorinated hydrocarbons from soil and groundwater beneath the buildings could potentially cause vapor intrusion of TCE and daughter compounds into the buildings. To break the pathway and the possible migration of vapors entering the buildings, soil and/or groundwater remediation may be required to reduce the concentrations to levels that will not cause a potential for vapor intrusion. The existing SSDS within each building will need to be regularly inspected and maintained in order to continue to break the vapor intrusion pathway into the buildings. The SSDS will need to be continuously operated until the soil and groundwater have been sufficiently remediated to remove the potential for vapor intrusion into the surrounding buildings.

4.4 REVIEW OF REMEDIAL OPTIONS

Considering the degree and extent of impairment at the Site, the implementation of a remedial program will be required to achieve the remedial objective for the affected media or performance standard. In identifying potential remedial action options for the Site, the following items were considered:

- The characteristics and physical and chemical properties of the identified contaminants;
- Current Site conditions and locations of soil and groundwater concentrations that exceed the applicable regulatory standards;
- The potential for incorporating performance-based remedial alternatives to satisfy the requirements for remediation and to protect human health and the environment in accordance with NR 700; and
- The requirements for Site closure under Wis. Adm. Code NR 726 and the issuance of a Certificate of Completion under the VPLE program.

Several remedial action options were identified and each was evaluated based on remediation effectiveness, implementability, and overall cost. The identification and evaluation of remedial action options were conducted in accordance with the requirements of Wis. Adm. Code NR 722 to determine the remedial action option that constituted the most appropriate combination of technologies to cost-effectively restore the environment, to the extent practicable, within a reasonable period of time and to minimize the harmful effects of the impairment to the air, land, and groundwater and be protective of the occupants of the Site.

The following remedial action options were identified and evaluated for addressing the affected soil:

- Limited soil excavation with hazardous off-Site soil disposal in a Resource Conservation and Recovery Act (RCRA) Subtitle C landfill:
- Limited soil excavation, on-Site treatment, and off-Site disposal in a RCRA Subtitle D landfill;
- In-situ treatment of soils within the vadose zone;
- Limited direct contact interval soil removal, on-Site treatment, and disposal in a RCRA Subtitle D landfill; and
- Use of engineered barriers.

The following remedial action options were identified and evaluated for addressing the affected groundwater:

- Natural attenuation;
- Implementation of in-situ groundwater treatment during soil excavation activities prior to excavation backfilling; and
- Treatment of groundwater by creating conditions to enhance biodegradation from injection of a carbon source.

The following remedial action options were identified and evaluated for addressing the vapors:

- Installation of vapor recovery trench to intersect the backfill material adjacent to the apartment buildings and create a pathway for venting the vapors to the atmosphere outside of the buildings;
- Continued use and maintenance of the SSDS located within each apartment building; and
- Sealing of the elevator shaft in the building at 1003 West Atkinson Avenue.

4.4.1 Soil Remedial Action Options

As part of the evaluation of technical effectiveness, the following soil remedial action options were evaluated to determine the effectiveness to achieve the soil cleanup standard established for the Site. Remedial options figures are provided in Appendix B (Figures A, B, and C).

4.4.1.1 Limited Soil Excavation With Hazardous Waste Disposal in RCRA Subtitle C Landfill

The objective of this remedial option is to remove the highest concentrations of TCE in soil from the Site to reduce the potential for direct contact and reduce the potential for vapor intrusion into nearby buildings. This remedial action option involves a one-time excavation of a limited area and transportation of TCE-affected soils for off-Site disposal as a hazardous waste to a RCRA Subtitle C landfill. TCE is a listed waste in Chapter NR 600 of the Wis. Adm. Code and the concentrations of TCE in soil at the Site exceed the "Contained-Out" value of 8.8 milligrams per kilogram (mg/kg), therefore, if the soils are excavated the soils need to be disposed as hazardous waste.

The excavation area would be from west of the 1003 building extending to the northwest for approximately 75 feet and would be approximately 50 feet wide (Figure A, Appendix B). This area encompasses the highest mass of TCE-affected soils located within the alleyway around monitoring well MW-4. The excavation would extend to a depth of approximately 8 to 10 feet. The total volume of soil excavated is estimated to be approximately 1,400 cubic yards or 2,000 to 2,500 tons of soil.

Based on the soil concentrations, the TCE concentration of these soils is anticipated to exceed the 8.8 mg/kg threshold for "Contained-Out," therefore, the soils would be transported to a Subtitle C hazardous waste landfill for disposal. The schedule for the excavation activities would be limited by the ability to transport the soils from the Site to the closest hazardous landfill located in Bellville, Michigan. The Subtitle C landfill requires that the trucks be scheduled to deliver the soils to the landfill and the landfill generally limits the number of trucks that can be transported to the landfill.

During the excavation activities, the alleyway will need to be secured with chain-link fencing to prevent unauthorized persons from access to the excavation. Additionally, a security guard would likely be necessary to be stationed at the excavation during all working hours to provide additional safety and protection for the excavation crew and equipment. The tenants of the 1033 and 1003 buildings will have to access the buildings from West Atkinson Avenue and will need to utilize street parking for cars.

- *Effectiveness:* The excavation of soils is a proven remedial method if the soil contamination is accessible. This remedial action option would result in the immediate removal of the affected soils with the highest mass and TCE concentrations. Excavation would proceed until accessible contaminated soils were removed. The length of this option would be solely dependent on scheduling the haul trucks to the hazardous waste landfill. The excavation could require up to four weeks to complete and require constant oversight by a security firm. This option alone would address the soil-to-groundwater pathway in the immediate area of the excavation, but would have limited effectiveness to address the soil-to-groundwater beyond the extent of the excavation. This option would remove the soils with the highest potential for vapor concentrations exceeding the vapor intrusion pathways, but would not address vapors outside of the excavation area. It would be effective in meeting the soil remediation objective for the Site. However, this method, in combination with other methods, could be effective in achieving the remedial action objectives for vapor and groundwater.
- *Implementability:* To implement this remedial action option, an excavation contractor and trucking contractor would be retained. This excavation and disposal method requires obtaining approval from the landfill, but does not present significant permitting issues. The excavation depth and extent would be limited by the accessible area around the foundation of the 1003 building; serious impacts to the building could occur if soils are not properly shored to prevent failure of the excavation walls. This option would have some impact to both the apartment tenants, some of whom have mobility requirements for Site and building access, and residences in the area during the excavation, until the Site could be restored. It is anticipated that this option would require approximately three to six weeks for completion, including backfill placement and compaction.

4.4.1.2 Limited Soil Excavation, On-Site Treatment, and Off-Site Disposal in RCRA Subtitle D Landfill

The objective of this remedial option is to remove the highest concentrations of TCE in soil from the Site to reduce the potential for direct contact and reduce the potential for vapor intrusion into nearby buildings. This remedial action option involves a one-time excavation of a limited area on-Site soil treatment to reduce the TCE in soils and off-Site disposal at a Subtitle C landfill. TCE is a listed waste in accordance with NR 600, but NR 600 also allows for the treatment of soils in an on-Site container to reduce the concentrations below the "Contained-Out" value of 8.8 mg/kg. By reducing the concentration under this treatment method, the soils can be transported for a local Subtitle D landfill for off-Site disposal.

The excavation area would be from west of the 1003 building extending to the northwest for approximately 75 feet and would be approximately 50 feet wide (Figure C, Appendix B). This area encompasses the highest TCE-affected soil mass located within the alleyway around monitoring well MW-4 and west of the 1003 building. The excavation would extend to a depth of approximately 8 to 10 feet. The total volume of soil excavated would be approximately 1,400 cubic yards or 2,000 to 2,500 tons of soil.

The soils would be excavated in a phased approach because soil concentrations below the 8.8 mg/kg "Contained-Out" threshold could be transported directly to the landfill. The soils with concentrations that are less than the "Contained-Out" concentration of 8.8 mg/kg would be excavated and transported directly to the Subtitle D landfill followed by excavation of the soils with concentrations exceeding the 8.8 mg/kg threshold. These soils would be removed in 3- to 4-foot intervals, to a total depth of 8 feet bgs, and be placed into stockpiles in a containment built on-Site for treatment to reduce the soil concentrations. The soils would be staged on-Site on a protective cover and periodically aerated under the influence of a mechanical blower to promote the volatilization of TCE from soils. Each batch of on-Site treated soils would be sampled for TCE and also the TCLP for TCE, to confirm the concentration is below the "Contained-Out" value and the soils could be disposed at a Subtitle D landfill.

During the excavation activities, the alleyway will need to be secured with chain-link fencing to prevent unauthorized persons from access to the excavation. Additionally, a security guard would likely be necessary to be stationed at the excavation during all working hours to provide additional safety and protection for the excavation crew and equipment. The tenants of the 1033 and 1003 buildings will have to access the buildings from West Atkinson Avenue and will need to utilize street parking for cars.

- *Effectiveness:* The excavation of soils is a proven remedial method if the soil contamination is accessible. This remedial action option would result in the immediate removal of the affected soils with the highest TCE soil mass and concentrations. The removed soils would be treated in manageable volumes that could be stored and mechanically treated on-Site. The storage area of the soils could require the removal of on-Site trees to allow the needed area for storage and soil treatment and remediation. The length of this treatment option would last two to four weeks beyond the schedule estimate provided above, depending on the climate conditions and the time to treat the soils for off-Site disposal. Additionally, the tenants of the apartments would need to have continued accessibility to their apartments and cars during the Site activities. This option would address the soil-to-groundwater pathway in the immediate area of the excavation, but would have limited effectiveness to address the soil-to-groundwater beyond the limits of the excavation. This option would remove the soils with the highest potential for vapor concentrations exceeding the vapor intrusion pathways, but would not address vapors outside of the excavation area. It would be effective in meeting the soil remediation objective for the Site. However, as stated above, this method in combination with other methods could be effective in achieving the remedial action objectives for vapor and groundwater.
- *Implementability:* To implement this remedial action option, an excavation contractor and trucking contractor would be retained. This excavation and disposal method requires obtaining approval from the landfill, but does not present significant permitting issues. The excavation depth and extent would be limited by the accessible area around the

foundation of the 1003 building; serious impacts to the building could occur if soils are not properly shored to prevent failure of the excavation walls. This option would have some impact to both the apartment tenants, some of whom have mobility requirements for Site and building access, and residences, in the area during the excavation and until the Site could be restored. The removal of trees may be required to provide enough on-Site area to treat the soils. It is anticipated that this option would require approximately four to eight weeks for completion, including backfill placement and compaction, based on logistics and weather conditions.

4.4.1.3 In-situ Treatment of Soil Within the Vadose Zone

The objective of this remedial option is to reduce the soil concentrations using in-situ techniques since they could address the soil-to-groundwater and soil objectives while being less disruptive to the normal activities at the Site. This remedial action option involves injecting an aqueous solution of oxidizing reagent into the unsaturated subsurface soils through a series of injection wells surrounding the apartment buildings. The oxidant can degrade organic contaminants present in the unsaturated soil at the Site through controlled chemical reactions. The reagent would have a built-in catalyst for activation. Temporary injection wells would be installed in a grid pattern throughout the estimated extent of contaminated soils within the vadose zone. The full-scale injection process would require approximately two to four weeks for completion followed by the collection of soil and groundwater samples to evaluate remedial performance and mass reduction. The solution is injected under pressure, therefore, the solution could follow preferential pathways which could affect the ability to distribute the reagent throughout the soil column. Based on the results of the post-injection soil sampling, additional injections may be necessary following the initial injections.

- *Effectiveness:* The injected reagent would allow oxidation reactions to occur repeatedly on the surface of the catalyst and result in the breakdown of TCE and the daughter products of TCE. This technology has been utilized at numerous TCE-impacted sites across the United States with high success rates. This remedial option is limited by the ability to distribute the reagent throughout the soil column vertically and horizontally, relies on contact with the contaminant for remediation, and also overcoming the natural contaminant demand of the native soils. The soils at this Site consist of predominantly clay soils that can make it difficult to distribute the oxidant and catalyst and can cause preferential flow paths because of the pressure required to inject the solution. This injection process and the chemical reactions also have the potential to generate vapors during the treatment and cause migration of vapors. Due to the nearby residences and the use of the alleyway, the number of injection points in the alley may be limited causing limited distribution and treatment of the soil. The coverage of the reagent within the alley may not be enough around the source area and may require additional injections. This remedial option has the potential to effectively treat the soil and groundwater concentrations if adequate distribution can be achieved, but also has the potential to cause vapor migration.
- *Implementability:* To implement this remedial action option, a pilot test would be required to verify the feasibility of this remedial alternative and to obtain design parameters for the full-scale application. In addition, an injection permit would likely need to be obtained from the WDNR prior to the injection of the reagents. A contractor would be retained to install a network of shallow (10 to 15 feet bgs) injection wells. The contactor would then use portable equipment to inject the reagents. Following treatment, a Geoprobe® unit would be used to collect soil samples to confirm adequate remediation was achieved. During the injection activities, the Site will need to be secured with fencing to prevent unauthorized persons from access to the work area. Additionally, a security guard will be stationed on-Site during all working hours to provide additional safety and protection for the injection crew and equipment.

4.4.1.4 Limited Direct Contact Interval Soil Removal With On-Site Treatment and Disposal in a RCRA Subtitle D Landfill

The objective of this remedial action option is to remove soils within the direct contact interval (0 to 4 feet bgs) in the area between and adjacent to the apartment buildings. The concentrations TCE in the shallow soils are lower, which would result in a smaller volume of soil requiring treatment. This remedial option would consist of a one-time excavation, on-Site treatment to reduce the TCE concentration of soils, off-Site disposal of soils at a RCRA Subtitle D Landfill, and installation of vapor trenches adjacent to buildings 1003 and 1033.

The excavation area would be approximately 110 feet long by 50 feet wide and would excavate the soils adjacent to the buildings. The soils would be excavated to a depth of approximately 4 to 6 feet. The total volume of soil excavated would be approximately 1,200 cubic yards of soil or about 1,800 tons of soil. The soils would be excavated in a phased approach depending on the concentrations. The soils with concentrations that are less than the "Contained-Out" concentration of 8.8 mg/kg, could be excavated and transported directly to the Subtitle D landfill. The soils that exceed the 8.8 mg/kg threshold, approximately 150 cubic yards, would require treatment on-Site. The soils requiring treatment would be removed to a total depth of 4 feet bgs and staged on-Site on a protective cover and periodically turned over under the influence of a mechanical blower to promote the volatilization of TCE from soils. Each batch of on-Site treated soils would be sampled for TCE to confirm the concentrations are below the "Contained-Out" value and the soils would be disposed at a Subtitle D landfill. During the excavation activities, the excavation will need to be secured with chain-link fencing to prevent unauthorized persons from access to the excavation. Additionally, a security guard will be stationed at the excavation during all working hours to provide additional safety and protection for the excavation crew and equipment. The tenants of the 1033 and 1003 buildings will have to access the buildings from West Atkinson Avenue and will need to utilize street parking for cars.

Following removal of the TCE-affected soils, a layer of clear stone would be placed into the excavation and a perforated piping manifold would extend from approximately the center of the excavation toward each building. The purpose of the perforated pipe is to remove vapors that collect in the gravel backfill and vent them to the atmosphere outside of the buildings. The remaining excavated area would be backfilled with gravel and re-paved or landscaped. The manifold would be connected to a vertical riser pipe near the 1003 and 1033 buildings, which would act as a passive venting system for soil vapors. If necessary in the future, the passive vent system could be connected to a blower to enhance the soil vapor recovery.

- *Effectiveness:* Excavation of soils is a proven remedial method of reducing mass if the soil contamination is accessible. This remedial action option results in the immediate removal of the affected soils in the shallow excavation. Excavation would proceed until the extents of the excavation are reached. The removed soils would be treated in manageable volumes that could be stored and mechanically treated on-Site. Given the limited soils expected to require treatment, the treatment will require less time. The storage area of the soils could require the removal of on-Site trees to allow the needed area for storage and soil treatment and remediation. The length of this treatment option would last four to six weeks, depending on the climate conditions and the time to treat the soils for off-Site disposal. Due to the limited excavation, the soils with the highest concentrations of TCE below 4 feet bgs would remain in place. The vapor manifold and the backfilling and compaction of the excavation could take place following the soil excavation activities, minimizing the disturbance to the alley way. The excavation of the soil and the in-situ vapor system will also assist in reducing the potential for vapor intrusion and break the vapor pathway, as the TCE in soil and groundwater will be addressed.
- *Implementability:* To implement, an excavation contractor and trucking contractor would be retained. This excavation and disposal method requires obtaining approval from the landfill, but does not present significant permitting issues. The excavation depth and extent would be limited due to the foundation of the 1003 building and the garage

associated with the residence located at 3614 11th Street; serious impacts to the buildings could occur if soils are not properly shored to prevent failure of the excavation walls. This option would have an impact to both the apartment tenants and residences in the area during the excavation and until the Site could be restored. The removal of trees may be required to provide enough on-Site area to treat the soils. Additionally, the vapor piping manifold would need to be conveyed to the 1003 and 1033 buildings where a passive vent would be installed. It is anticipated that this option would require approximately four to six weeks for completion, including backfill placement and compaction, based on logistics and weather conditions.

4.4.1.5 Use of Engineered Barriers

Engineered barriers allow for residual contamination to remain on-Site, provided it can be demonstrated that the residual media will not affect human health or the environment. Following soil excavation activities, soils with residual TCE exceeding the non-industrial direct contact RCL which cannot be excavated near buildings 1003 and 1033, will have additional soil cover and landscaping to prevent contact with the underlying soils.

- *Effectiveness:* Up to 24 inches of clean topsoil will be spread over the existing landscape at the southeast corner of building 1033. The soils will be seeded and landscaped. The alleyway over the excavated soils would need to be re-paved and maintained, as well as an additional area of the alleyway south of building 1033 due to the current asphalt condition.
- *Implementability:* To implement this remedial action option, the City of Milwaukee would need to approve the asphalting plans within the alleyway to meet the requirements of the Street Construction Ordinances. No disruption to the tenants will be made during the soil capping and landscaping.

4.4.2 Groundwater Remedial Action Options

4.4.2.1 Natural Attenuation (Without Enhancement)

In the implementation of this remedial option, natural attenuation of groundwater concentrations would be utilized without enhancement. A groundwater monitoring program would be established using the existing groundwater monitoring network and a few supplemental wells as a means for monitoring natural attenuation processes and to demonstrate that the mass and concentrations of TCE and the degradation products of TCE are declining through time. Groundwater sampling and gauging would be conducted on a quarterly basis for evaluating volatile organic compound (VOC) concentrations and natural attenuation indicator parameters. The purpose of the monitoring program would also be to monitor the extent of affected groundwater for evidence of further migration and the performance of natural attenuation in reducing mass and concentration. A reduced sampling frequency could be reviewed for implementation based on a review of the quarterly sampling results and the historic groundwater concentrations.

- *Effectiveness:* Natural attenuation represents a viable remedial alternative recognized by the WDNR that can effectively reduce the concentrations to meet the remedial goals if the groundwater conditions are favorable. Natural attenuation is best used as a complement to an active remedy to confirm the remaining groundwater will degrade in mass and concentration over time.

  Reductive dechlorination of TCE can occur under natural conditions existing in the groundwater. Through the reductive dechlorination process, TCE is sequentially degraded to cis-1,2-DCE and vinyl chloride, and, eventually, to carbon dioxide and water, given that reducing conditions persist and there is sufficient availability of natural organic carbon, which will serve as an electron donor. During this process, the chlorinated hydrocarbon serves as an electron

acceptor during microbially-induced oxidation-reduction reactions, with the sequential replacement of chlorine atoms with hydrogen atoms.

At Clare Central, groundwater sampling has been performed for an extended period of time, so trends in the groundwater breakdown products can be evaluated. The results of cis-1,2-DCE and vinyl chloride are evident in the groundwater plume. These daughter products indicate that the subsurface conditions are favorable for reductive dichlorination under the existing geochemical conditions. However, the rate of the reductive dichlorination appears to be minimal given the concentrations in the source area and the limited extent of the breakdown products across the Site. Further, the mass and concentration of TCE in and near the source area have remained consistently elevated over time.

- *Implementability:* Natural attenuation monitoring would likely require the installation of additional monitoring wells on- and off-Site to supplement the existing well network and the approval of a monitoring program by the WDNR. If the monitoring results indicate that natural attenuation is not effectively reducing the groundwater concentrations, or the groundwater plume is expanding, the WDNR may require active remediation to reduce the source area concentrations and prevent off-Site migration. The natural attenuation alternative could be implemented without significant disruption to the residences.

4.4.2.2 Enhanced Biodegradation with Carbon Injection

The goal of this remedial option is specifically intended to treat groundwater. The area of groundwater treatment is very limited and is within the limits of the affected soil. Under this remedial action option, a limited number of injection wells would be installed adjacent to the containment area within and near the source areas. Due to the clay nature of the soils, the carbon source solution would be injected into the groundwater under pressure. The injection under pressure could cause flow of the carbon solution through preferential flow paths and limit the effectiveness of distributing the solution. The solution is intended to increase the concentration of dissolved organic carbon. This carbon source is fermented by naturally occurring microbes, which cause the reduction in electron acceptors in the groundwater to create conditions favorable for reductive dechlorination of the TCE mass in groundwater. This remedial method creates an anaerobic treatment zone within the groundwater and provides an electron donor to promote the biologically-mediated reductive dechlorination reactions.

- *Effectiveness:* By introducing a carbon source to the groundwater system, the microbial population within the groundwater plume uses the carbon as an energy substrate, which for the natural populations of microbes also creates strongly reducing conditions. The organic carbon is supplied as a dilute solution, which is a cost-effective, innocuous amendment for groundwater that has been accepted by both state and federal agencies to enhance bioremediation. This option needs to be evaluated to determine if the groundwater conditions can be favorably maintained to facilitate reductive dechlorination. The treatment area is expected to be within and near the source areas, therefore, it is expected that dissolved oxygen (DO) concentrations can be reduced and maintained at acceptable levels for reductive dechlorination. The fine-grained nature of the soils reduces the effectiveness of this technology due to the ability to inject the carbon source and the distribution within the groundwater.

- *Implementability:* The implementation of this remedial option would require obtaining a Wisconsin Pollutant Discharge Elimination System (WPDES) permit and Wis. Adm. Code NR 140 variance from WDNR, for injection of the dilute carbon source solution through a network of injection wells. The performance of this enhancement is measured by monitoring for reductions in TCE and the presence of daughter products, as well as other indicator parameters, such as organic carbon and DO in groundwater. To implement the enhanced biodegradation with carbon injection, a pilot test would be required to verify the feasibility of injecting into the clay soils and to obtain design parameters for a full-scale system. This option would cause some relatively minor disruption to the residences on a periodic basis

during the injection events. The number of injection events would be determined by the results of the performance groundwater monitoring and groundwater conditions.

4.4.3 Vapor Remedial Action Options

4.4.3.1 Sealant of Elevator Shafts

GZA conducted an inspection of each elevator shaft area for each apartment building in August 2020, and identified cracks in the floors of the shafts. The elevator shafts within each apartment building will need to be sealed with Liquid Boot® or similar product to prevent vapor intrusion into the buildings. This work would be required in addition to one of the other remedial alternatives. This would not require additional work or remedial activities.

- *Effectiveness:* A protective coating barrier would be applied to the existing concrete floors within the elevator shafts. No additional construction or disruption of Site activities would be required. The protective coating is chemically resistant and is used at various settings, such as dry cleaners and gas stations, where vapor intrusion is a concern.
- *Implementability:* To implement this remedial action option, a contractor would be retained to seal cracks and holes within the existing elevator shaft floor, prime the floor, and seal the floor. Disruption at the building would likely be for one to two days. The elevator shaft floor with the protective coating would prevent vapor intrusion into the building from soils in contact with floor slab. The projected life of the sealed floor would be 20 or more years with ongoing maintenance.

4.4.3.2 Vapor Mitigation System O&M

The installation of SSDSs in both the 1003 and 1033 buildings was conducted in 2011, with subsequent sub-slab vapor sampling events, system redesign, and maintenance activities performed in 2012 and 2013. A sub-slab venting system was also installed at the residential property located at 3618 North 11th Street in March 2015. GZA collected indoor air samples from the 1003 and 1033 buildings in August 2019 to confirm the SSDSs' influence. The indoor air samples indicated that TCE vapors were not migrating into the apartments. However, due to the presence of TCE in the 2011 sub-slab vapor samples, the SSDSs should continue to operate and be regularly maintained to break the vapor intrusion pathway, during and following the active remediation activities.

- *Effectiveness:* The SSDSs prevent the vapor intrusion of TCE vapors from the subsurface into the overlying apartment buildings and the residence at 3618 North 11th Street. Operation and maintenance (O&M) should be conducted annually to ensure the SSDSs continue to work effectively by capturing the vapors beneath the buildings.
- *Implementability:* The SSDSs have already been installed and O&M activities have been ongoing. The projected life of the blower fans is about 20 years, so new fans will be installed as needed.

5.0 REMEDIAL REVIEW AND RECOMMENDATIONS

A summary of the remedial alternatives considered and evaluated, together with the principal components and estimated costs, are presented in Table 1. The soil and groundwater remedial action options were evaluated based on effectiveness, implementability, and cost. In addition, long-term goals, such as achieving closure under Wis. Adm. Code NR 726 and a Certificate of Completion under the VPLE Program, as well as the health and safety of the occupants of the residences, were carefully considered. **Based on these factors, the recommended option for addressing the TCE-affected soils is limited excavation within the direct contact interval and on-Site treatment of the affected soils in accordance with**

Chapter NR 600 of the Wis. Adm. Code for subsequent disposal of the treated soils in a RCRA Subtitle D landfill. The recommended option for addressing the limited TCE-affected groundwater is natural attenuation, given the limited groundwater TCE mass and limited partitioning of TCE from soils into groundwater. The vapor remedial options presented above will be implemented concurrently with the selected remedial alternatives, as discussed herein. These two options are complementary and provide a comprehensive solution to address the TCE-affected soil, vapors, and groundwater. Additionally, the soil capping and repaving of the alleyway will limit direct contact with the underlying soils, and the sealing of the apartment building shafts and continued O&M of the SSDSs will continue to prevent vapor intrusion into the buildings.

6.0 SUMMARY AND CONCLUSIONS

As the investigation activities confirmed, chlorinated hydrocarbons in the soil, groundwater, and vapors are present at concentrations in exceedance of regulatory levels at the Site, but the extent has been defined at the Site and protective measures remain in place for vapor intrusion. This RAOR presents an evaluation of remedial alternatives for the Site to address the soil, groundwater, and vapors. Based on an evaluation of the technical and economic feasibility of the alternatives, limited excavation of TCE-affected soils within the direct contact zone with on-Site treatment and off-Site disposal, capping , and the continued use and maintenance of the SSDSs and elevator shaft sealing will restore the Site conditions, represent the most cost effective remedial solutions, will position the Site for closure under Chapter NR 726 of the Wis. Adm. Code, and protect the residential users at and surrounding the Site.

7.0 CERTIFICATION

"I, James F. Drought, P.H., hereby certify that I am a hydrogeologist as that term is defined in s. NR 712.03 (1), Wis. Adm. Code, am registered in accordance with the requirements of ch. GHSS 2, Wis. Adm. Code, or licensed in accordance with the requirements of ch. GHSS 3, 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."

James Drought

Signature

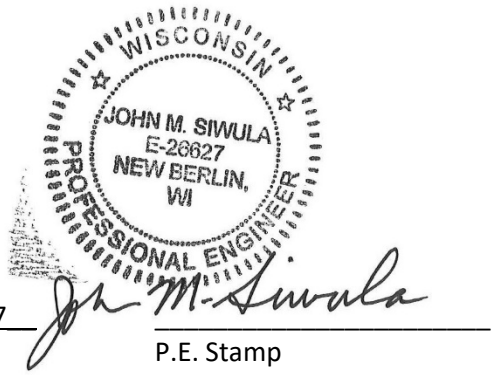
6/28/21

Date

Principal Hydrogeologist

Title

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



John M. Siwula, P.E., D. GE; Associate Principal; P.E. No. E-26627
Signature, Title, and P.E. Number

P.E. Stamp

TABLES

TABLE 1
CONCEPTUAL REMEDIAL ALTERNATIVES FOR NR 726 SITE CLOSURE
Clare Central
1003 and 1033 West Atkinson Avenue
Milwaukee, Wisconsin

DESCRIPTION	PRINCIPAL COMPONENTS AND PROJECTED LIFE TO CLOSURE	ADVANTAGES	DISADVANTAGES	RANGE OF ESTIMATED COST
Limited Soil Excavation With Hazardous Waste Disposal in RCRA Subtitle C Landfill	a. Excavation of CVOC-affected soil within the alley and west of building 1033, encompassing MW-4 and would consist of the removal of about 2,000 to 2,500 tons of soil.	a. Removes accessible CVOC-affected soil and remove the direct contact soils, breaking the vapor migration from soils into overlying buildings.	a. Disrupts residents within both the apartment building and the residential properties accessing the alleyway.	$1,300,000 to $1,500,000
	b. Soils will be direct-hauled as a hazardous waste to a RCRA Subtitle C landfill facility in Michigan; 1-2 trucks per day; excavation would last approximately 2 weeks.	b. Removes saturated soils to address the groundwater conditions at MW-4.	b. Due to scheduling requirements for the RCRA Subtitle Landfill, soil excavation activities would be limited based on the number of trucks scheduled for disposal at the landfill. Ongoing security would be needed to secure the excavation and prevent access to the soils.	
	c. A security guard would likely be necessary to be stationed at the excavation during all working hours to provide additional safety and protection for the excavation crew and equipment. The tenants of the 1033 and 1003 buildings will be moved from their apartments to temporary housing to help limit traffic within the alley and to spare the residents the noise and interruption.		c. On-going vapor mitigation would be required for the buildings to ensure any residual soils affected by CVOCs will have vapor migration addressed.	
	d. Projected Life: 4 years for excavation and follow-up groundwater and vapor monitoring and reporting.			
Limited Soil Excavation and On-Site Treatment for Off-Site Disposal in Subtitle D Landfill	a. Excavation of CVOC-affected soil within the alley and west of building 1033, encompassing MW-4, consisting of the removal of about 2,000 to 2,500 tons of soil. Soils would be treated on-Site to remediate CVOCs to below the "Contained-Out" standard of 8.8 mg/kg. Soils would then be disposed at a Subtitle D landfill.	a. The on-Site treatment would allow the soils to be disposed in a local Subtitle D landfill.	a. Disrupts residents within both the apartment building and the residential properties accessing the alleyway.	$800,000 to $1,000,000
	b. Soils would be treated on-Site in a container where the soils would be turned over to reduce the CVOC concentrations. The soil would be excavated in increments and treated until levels of CVOCs were below the "Contained-Out" limits.	b. Removes accessible CVOC-affected soil and removes both direct contact soils and breaks the vapor migration from soils into overlying buildings.	b. On-Site treatment would require a larger remedial footprint of the Site to accommodate the staged soils.	
	c. A security guard would likely be necessary to be stationed at the excavation during all working hours to provide additional safety and protection for the excavation crew and equipment. The tenants of the 1033 and 1003 buildings will be moved from their apartments to temporary housing to help limit traffic within the alley and to spare the residents the noise and interruption.	c. Would not require any soil continuing obligations for soil capping.	c. Ongoing vapor mitigation would be required for the buildings to ensure any residual soils affected by CVOCs will have vapor migration addressed.	
	d. Projected Life: 10 years for excavation and follow up groundwater and vapor monitoring. Residual soils would be left in-place			

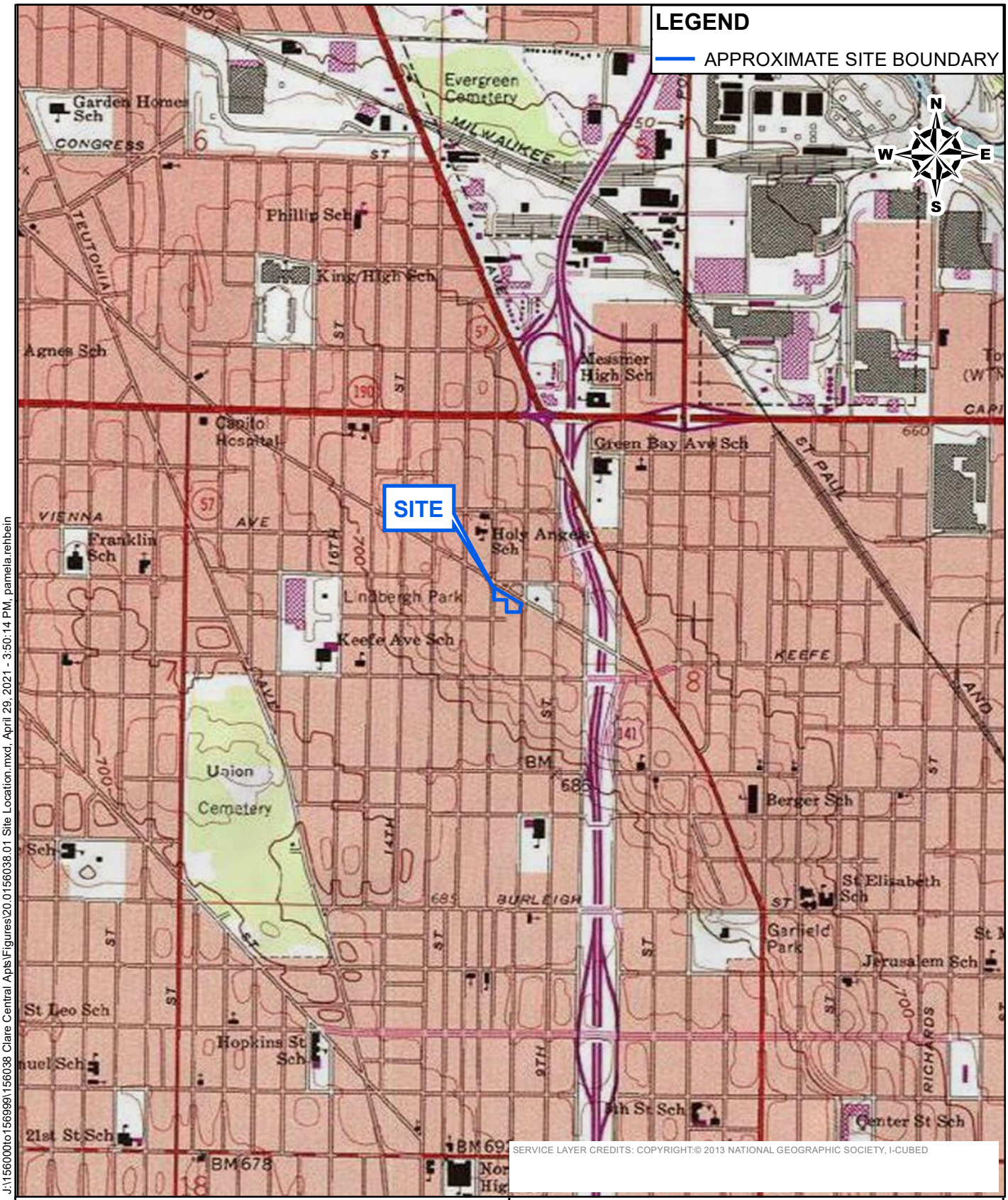
TABLE 1
CONCEPTUAL REMEDIAL ALTERNATIVES FOR NR 726 SITE CLOSURE
Clare Central
1003 and 1033 West Atkinson Avenue
Milwaukee, Wisconsin

DESCRIPTION	PRINCIPAL COMPONENTS AND PROJECTED LIFE TO CLOSURE	ADVANTAGES	DISADVANTAGES	RANGE OF ESTIMATED COST
In-situ Treatment of Soil Within the Vadose Zone	a. This remedial action option involves injecting an aqueous solution oxidizing reagent into the unsaturated subsurface soils through a series of injection wells surrounding the apartment buildings.	a. Injection activities will present less interruption to the residents with less equipment on-Site.	a. Requires a pilot test to determine the specifics for a Site-wide injection. Determination of the injection amendment needs to be made based on Site-specific data and consideration of the adjacent residential buildings will need to be considered so amendment will not enter the basements.	$600,000 to $800,000
	b. Temporary injection wells would be installed in a grid pattern throughout the estimated extent of contaminated soils within the vadose zone. The full-scale injection process would require approximately 2-4 weeks for completion, followed by the collection of soil and groundwater samples to evaluate remedial performance and mass reduction.	b. Injection could address CVOCs in both soils and groundwater; however, there is limited partitioning of CVOCs from soil to groundwater at the Site. Alternative requires that reagent can overcome the natural organic carbon demand and also degrade TCE to below regulatory levels.	b. Depending on the ability to distribute the reagent throughout the soil column and the results of the soil sampling, additional injections may be necessary following the initial injections, along with multiple confirmation sampling events for both soil and groundwater.	
	c. Projected Life: 10 years for injections and follow-up groundwater and soil sampling.		c. Does not address vapor migration pathways into the overlying buildings from residual soil impacts.	
			d. Would require additional Site soil and groundwater sampling to determine the effectiveness of the injection.	
Limited Alley Soil and Direct Contact Soil Removal with On-Site Treatment and off-Site Disposal with Vapor Recovery Trench (GZA-Recommended Alternative)	a. Soils within the direct contact zone with reported concentrations of TCE in exceedance of the non-industrial direct contact standards consisting of 550 cubic yards would be excavated.	a. Soil excavation could be conducted within 2 weeks, as less soil would need to be treated on-Site as compared to other in-situ treatment options	a. Disrupts residents within both the apartment building and the residential properties accessing the alleyway.	$600,000 to $700,000
	b. Granular, clean fill will be placed within the excavation near the building to create a pathway to vent vapor to the atmosphere prior to entering the building.	b. Soil vapor pathway would be addressed around buildings and help to prevent further migration from the residual soils.	b. Cap maintenance would be required to address stormwater infiltration into the underlying soils.	
	c. Soils would be treated on-Site in a container where the soils would be turned over to reduce the CVOC concentrations. The soil would be excavated in increments and treated until levels of CVOCs were below the "Contained-Out" limits.	c. Soil excavation will allow for engineered cap material to prevent direct contact with soils and limit stormwater infiltration.	c. On-site treatment would require a larger remedial footprint of the Site to accommodate the staged soils.	
	d. A security guard would likely be necessary to be stationed at the excavation during all working hours to provide additional safety and protection for the excavation crew and equipment. The tenants of the 1033 and 1003 buildings will be moved from their apartments to temporary housing to help limit traffic within the alley and to spare the residents the noise and interruption.			
	e. Projected Life: 4 years for injections and follow-up groundwater, soil, and vapor sampling.			

TABLE 1
CONCEPTUAL REMEDIAL ALTERNATIVES FOR NR 726 SITE CLOSURE
Clare Central
1003 and 1033 West Atkinson Avenue
Milwaukee, Wisconsin

DESCRIPTION	PRINCIPAL COMPONENTS AND PROJECTED LIFE TO CLOSURE	ADVANTAGES	DISADVANTAGES	RANGE OF ESTIMATED COST
Use of Engineered Barriers	a. Engineered barriers allow for residual contamination to remain on-Site, provided it can be demonstrated that the residual media will not affect human health or the environment. The existing concrete surface along the alleyway and the apartment would be improved or maintained to ensure that soils are not accessible for direct contact with the underlying soils. Additional landscaping would be conducted in areas of green space near the apartment buildings with direct contact exceedances. b. Projected Life: 20+ years to maintain barriers.	a. No remedial action conducted and no disturbances to the residents.	a. Would need to be conducted in conjunction with another remedial option.	$50,000 to $100,000
Sealing of the Elevator Shafts	a. GZA conducted an inspection of each elevator shaft area for each apartment building in August 2020, and identified cracks in the floors. The elevator shafts within each apartment building will need to be sealed with Liquid Boot® or similar product to prevent vapor intrusion into the buildings. This work would be required in addition to one of the other remedial alternatives. b. Projected Life: 20+ years to maintain barriers.	a. Would break the vapor migration pathway from the elevator shafts into each of the apartment buildings.	a. Would need to be conducted in conjunction with another remedial option.	$6,500 to $10,000

FIGURES



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SCALE IN FEET

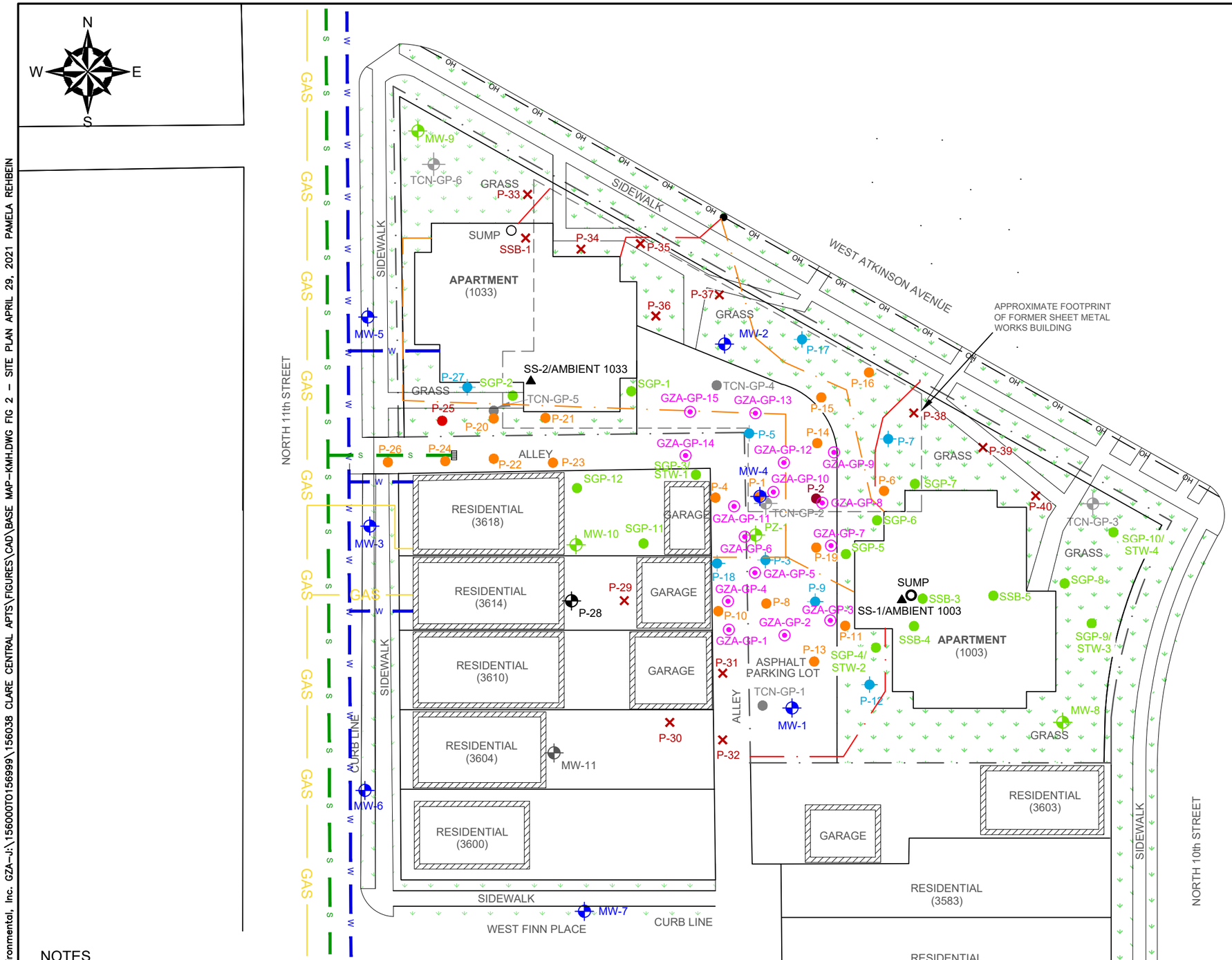
CLARE CENTRAL
1003 AND 1033 WEST ATKINSON AVENUE
MILWAUKEE, WISCONSIN

PREPARED BY:
GZA GeoEnvironmental, Inc.
Engineers and Scientists
www.gza.com

PREPARED FOR:
AXLEY BRYNELSON, LLP

SITE LOCATION

PROJ MGR: HAW	REVIEWED BY: JFD	CHECKED BY: JJLP	FIG 1
DESIGNED BY: MJS	DRAWN BY: MJS	SCALE: 1 in = 2,000 ft	
DATE: 04/29/2021	PROJECT NO: 20.0156038.01	REVISION NO:	SHEET NO: 1 OF 9



LEGEND

- APPROXIMATE SITE BOUNDARY
- ELECTRIC (WE ENERGIES)
- COMMUNICATION (AT & T)
- GAS LINE
- OVERHEAD LINES
- WATER LINE
- SEWER LINE
- SOIL & GROUNDWATER PROBE LOCATION (TERRACON, AUGUST 16, 2006)
- SOIL PROBE LOCATION (TERRACON, AUGUST 16, 2006)
- GROUNDWATER MONITORING WELL LOCATION
- GEOPROBE BORING LOCATION (20 FEET BGS)
- GEOPROBE BORING LOCATION (20 FEET BGS) WITH TEMPORARY WELL
- GEOPROBE BORING LOCATION (35 FEET BGS)
- SUB SLAB VAPOR MONITORING POINT (FEBRUARY 11, 2011)
- SOIL BORING LOCATION (TERRACON, JUNE 23, 2016)
- GROUNDWATER TEMPORARY/ MONITORING WELL LOCATION (TERRACON, JUNE 23, 2016)
- GROUNDWATER MONITORING WELL/ PIEZOMETER LOCATION (SIGMA)
- GEOPROBE BORING LOCATION (SIGMA)
- 2020 SOIL BORINGS INSTALLED BY GZA

NOTES

1. BASE MAP DEVELOPED BY TERRACON CONSULTANTS, INC. (TERRACON).
2. TERRACON MAP SOURCE: MILWAUKEE COUNTY LAND INFORMATION OFFICE INTERACTIVE MAPPING SERVICE WEBSITE (2010 AERIAL).
3. 'BGS' = BELOW GROUND SURFACE.

NO.	ISSUE/DESCRIPTION	BY	DATE

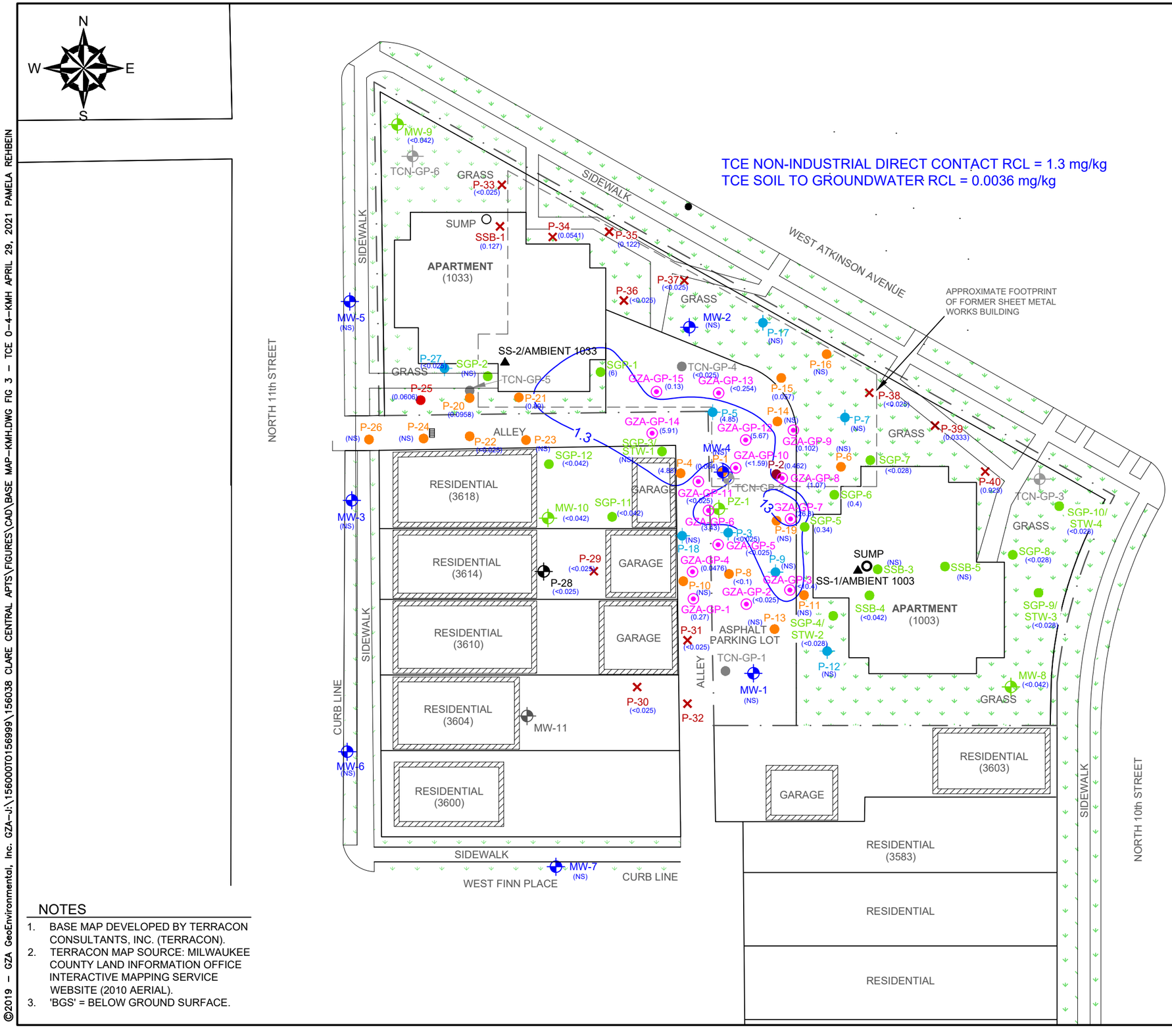
CLARE CENTRAL
1003 AND 1033 WEST ATKINSON AVENUE
MILWAUKEE, WISCONSIN

SITE PLAN

PREPARED BY:
GZA GeoEnvironmental, Inc.
Engineers and Scientists
www.gza.com

PREPARED FOR:
AXLEY
BRYNELSON,
LLP

PROJ MGR: HAW	REVIEWED BY: JFD	CHECKED BY: JJLP	FIG 2
DESIGNED BY: MJS	DRAWN BY: MJS	SCALE: 1" = 40'	
DATE: 4/29/2021	PROJECT NO. 20.0156038.01	REVISION NO.	SHEET NO. 2 OF 12



NOTES

1. BASE MAP DEVELOPED BY TERRACON CONSULTANTS, INC. (TERRACON).
2. TERRACON MAP SOURCE: MILWAUKEE COUNTY LAND INFORMATION OFFICE INTERACTIVE MAPPING SERVICE WEBSITE (2010 AERIAL).
3. 'BGS' = BELOW GROUND SURFACE.

NO.	ISSUE/DESCRIPTION	BY	DATE

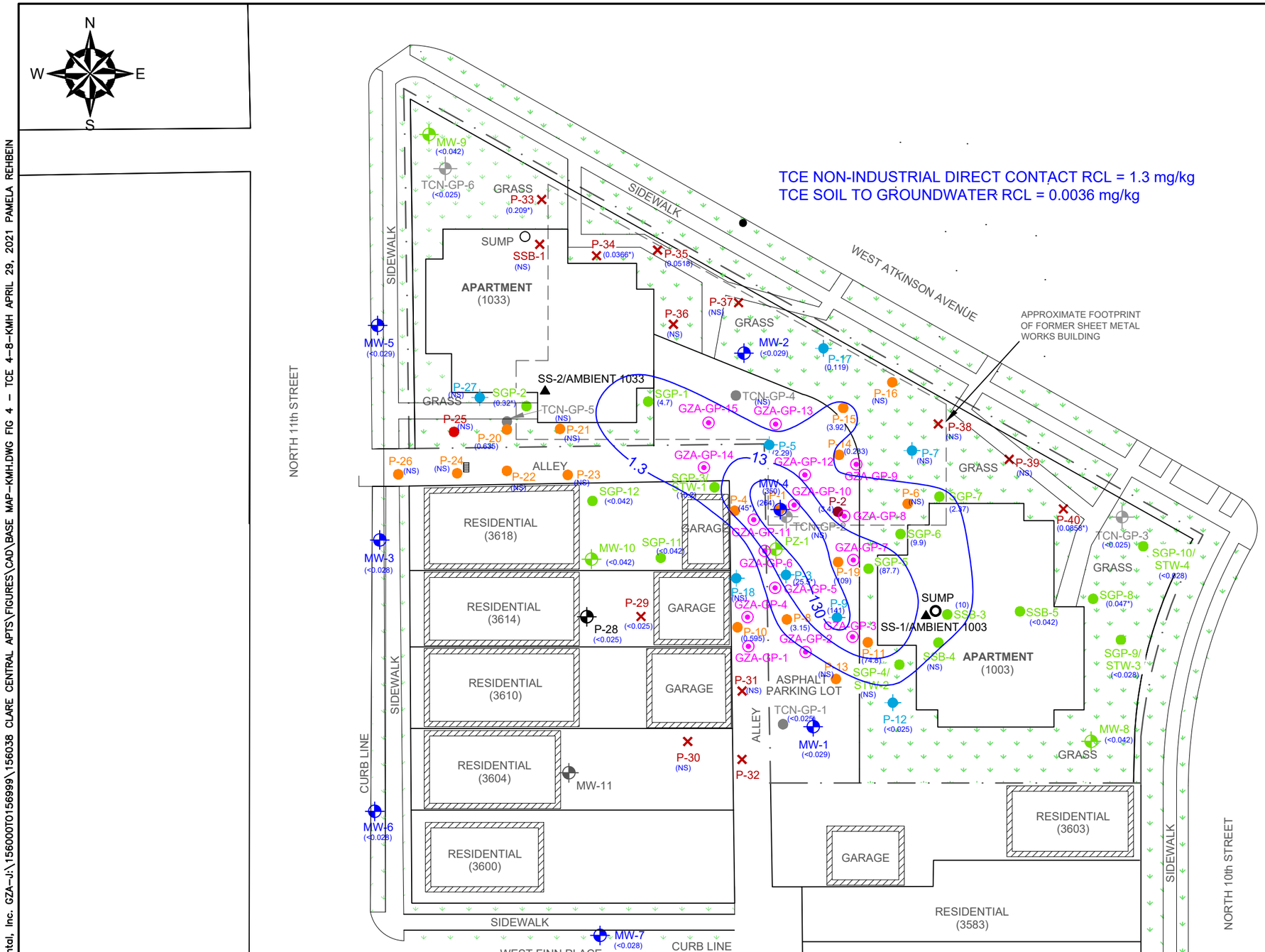
CLARE CENTRAL
1003 AND 1033 WEST ATKINSON AVENUE
MILWAUKEE, WISCONSIN

TCE SOIL DISTRIBUTION 0 TO 4 FEET

PREPARED BY:
GZA GeoEnvironmental, Inc.
Engineers and Scientists
www.gza.com

PREPARED FOR:
AXLEY BRYNELSON, LLP

PROJ MGR: HAW	REVIEWED BY: JFD	CHECKED BY: JJLP	FIG 3
DESIGNED BY: MJS	DRAWN BY: MJS	SCALE: 1" = 40'	
DATE: 4/29/2021	PROJECT NO. 20.0156038.01	REVISION NO.	SHEET NO. 2 OF 12



LEGEND

- APPROXIMATE SITE BOUNDARY
- ELECTRIC (WE ENERGIES)
- COMMUNICATION (AT & T)
- GAS LINE
- OVERHEAD LINES
- WATER LINE
- SEWER LINE
- SOIL & GROUNDWATER PROBE LOCATION (TERRACON, AUGUST 16, 2006)
- SOIL PROBE LOCATION (TERRACON, AUGUST 16, 2006)
- GROUNDWATER MONITORING WELL LOCATION
- GEOPROBE BORING LOCATION (20 FEET BGS)
- GEOPROBE BORING LOCATION (20 FEET BGS) WITH TEMPORARY WELL
- GEOPROBE BORING LOCATION (35 FEET BGS)
- SUB SLAB VAPOR MONITORING POINT (FEBRUARY 11, 2011)
- SOIL BORING LOCATION (TERRACON, JUNE 23, 2016)
- GROUNDWATER TEMPORARY/ MONITORING WELL LOCATION (TERRACON, JUNE 23, 2016)
- GROUNDWATER MONITORING WELL/ PIEZOMETER LOCATION (SIGMA)
- GEOPROBE BORING LOCATION (SIGMA)
- 2020 SOIL BORINGS INSTALLED BY GZA

NOTES

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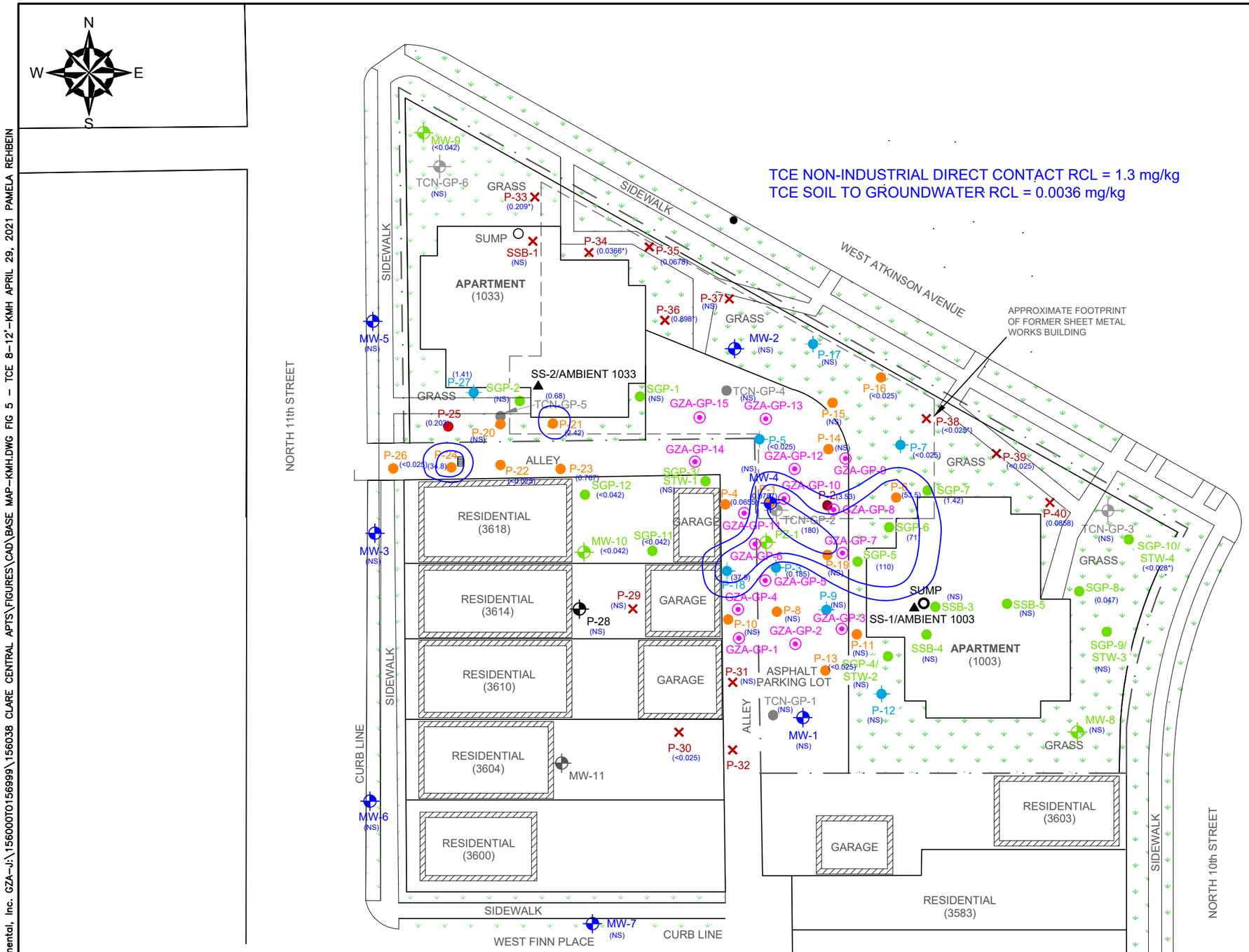
CLARE CENTRAL
1003 AND 1033 WEST ATKINSON AVENUE
MILWAUKEE, WISCONSIN

TCE SOIL DISTRIBUTION 4 TO 8 FEET

PREPARED BY: GZA GeoEnvironmental, Inc. Engineers and Scientists www.gza.com

PREPARED FOR: AXLEY BRYNELSON, LLP

PROJ MGR: HAW	REVIEWED BY: JFD	CHECKED BY: JJLP	FIG 4
DESIGNED BY: MJS	DRAWN BY: MJS	SCALE: 1" = 40'	
DATE: 4/29/2021	PROJECT NO. 20.0156038.01	REVISION NO.	SHEET NO. 2 OF 12



LEGEND

- APPROXIMATE SITE BOUNDARY
- ELECTRIC (WE ENERGIES)
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NO.	ISSUE/DESCRIPTION	BY	DATE

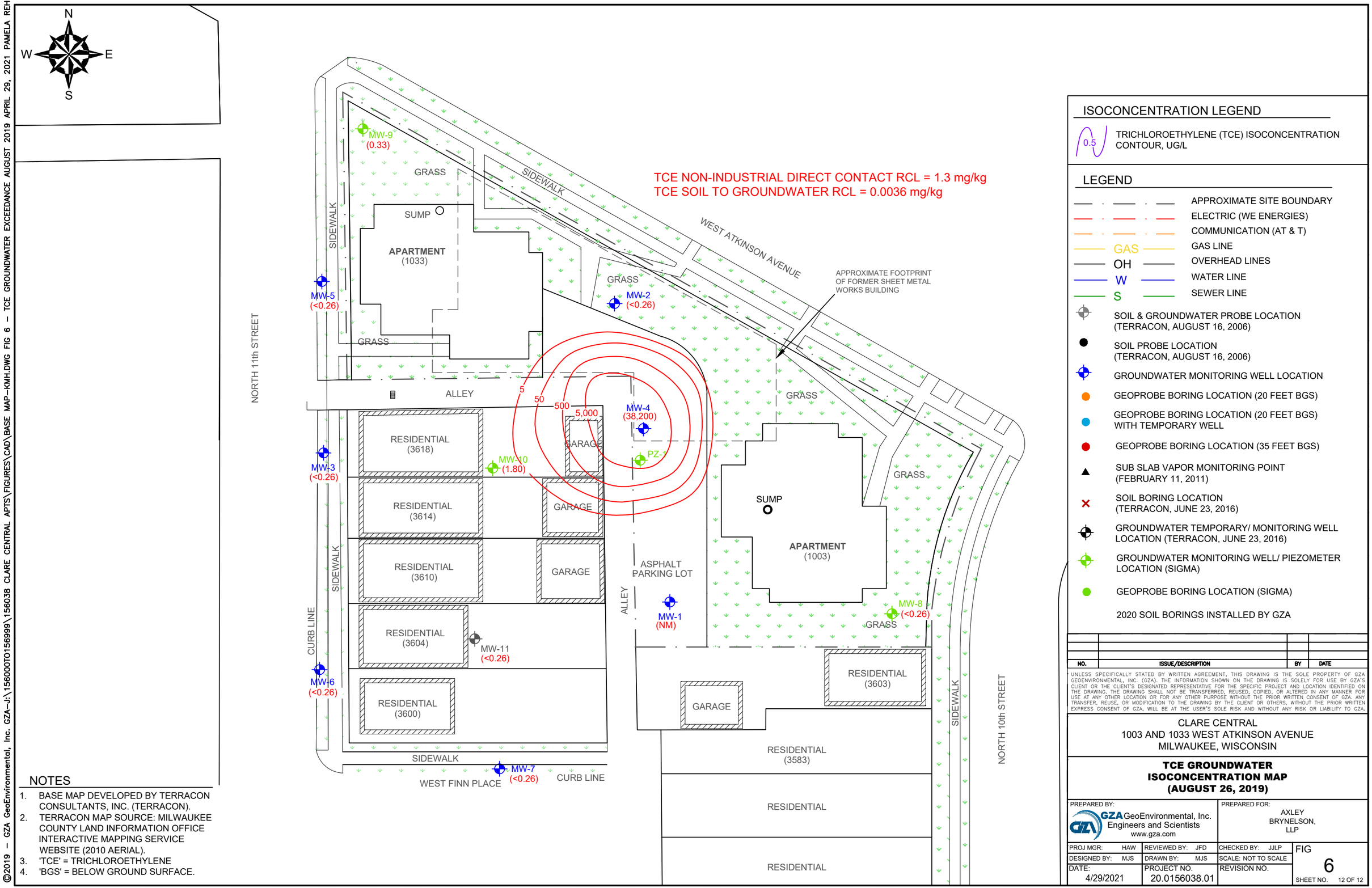
CLARE CENTRAL
1003 AND 1033 WEST ATKINSON AVENUE
MILWAUKEE, WISCONSIN

TCE SOIL DISTRIBUTION 8 TO 12 FEET

PREPARED BY:
GZA GeoEnvironmental, Inc.
Engineers and Scientists
www.gza.com

PREPARED FOR:
AXLEY
BRYNELSON, LLP

PROJ MGR: HAW	REVIEWED BY: JFD	CHECKED BY: JJLP	FIG 5
DESIGNED BY: MJS	DRAWN BY: MJS	SCALE: 1" = 40'	
DATE: 4/29/2021	PROJECT NO. 20.0156038.01	REVISION NO.	SHEET NO. 2 OF 12



ISOCONCENTRATION LEGEND

0.5 — TRICHLOROETHYLENE (TCE) ISOCONCENTRATION CONTOUR, UG/L

LEGEND

- APPROXIMATE SITE BOUNDARY
- ELECTRIC (WE ENERGIES)
- COMMUNICATION (AT & T)
- GAS — GAS LINE
- OH — OVERHEAD LINES
- W — WATER LINE
- S — SEWER LINE
- SOIL & GROUNDWATER PROBE LOCATION (TERRACON, AUGUST 16, 2006)
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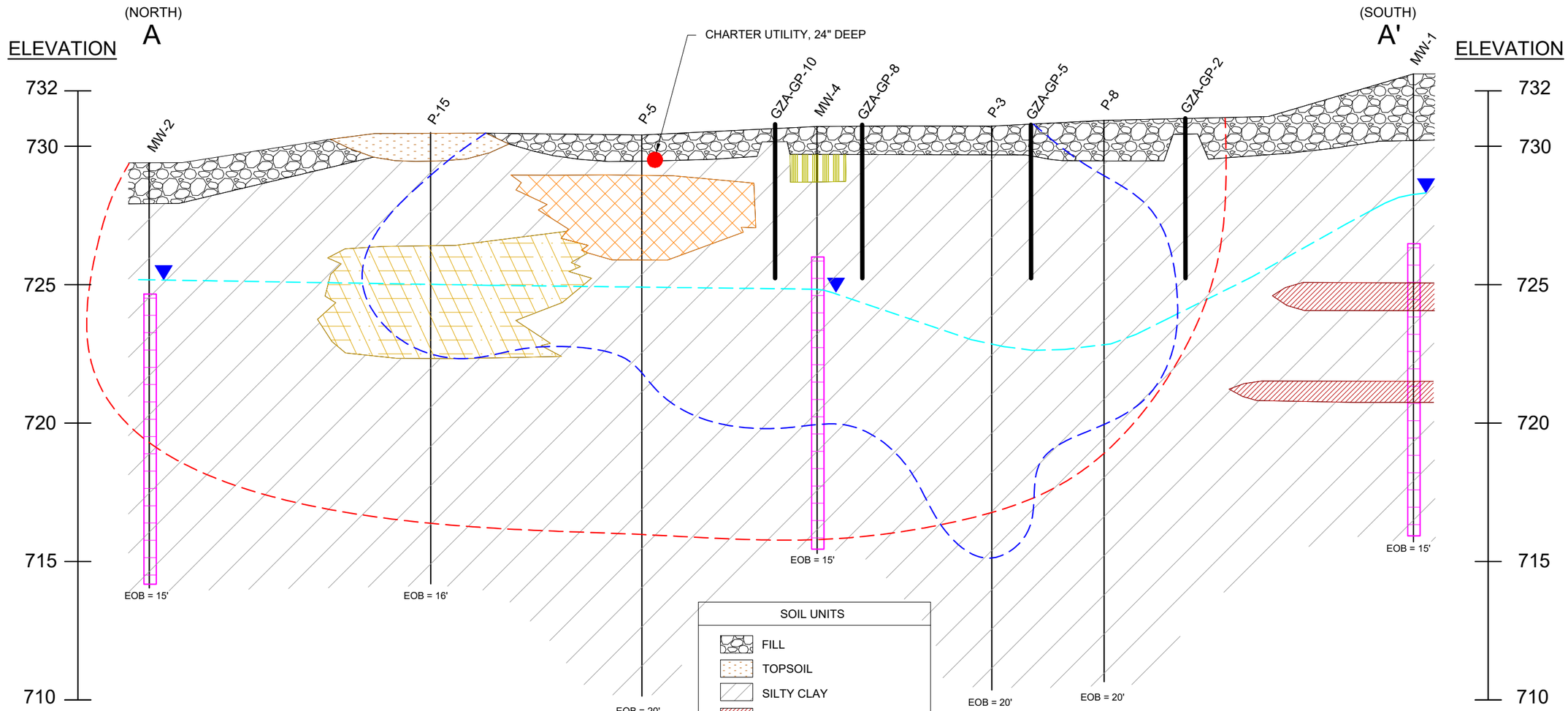
3. 'TCE' = TRICHLOROETHYLENE
4. 'BGS' = BELOW GROUND SURFACE.

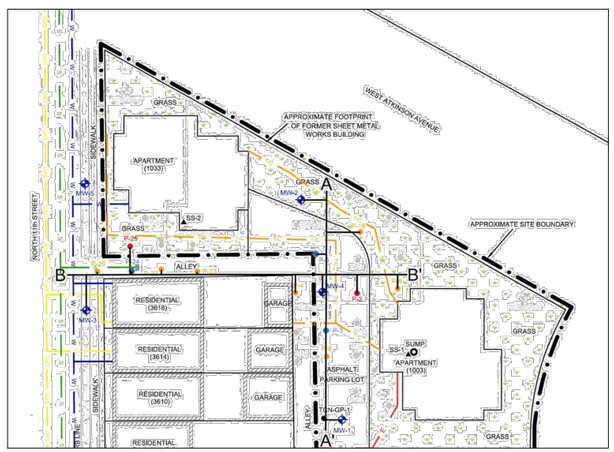
NO.	ISSUE/DESCRIPTION	BY	DATE

CLARE CENTRAL
1003 AND 1033 WEST ATKINSON AVENUE
MILWAUKEE, WISCONSIN

TCE GROUNDWATER ISOCONCENTRATION MAP (AUGUST 26, 2019)

PREPARED BY: GZA GeoEnvironmental, Inc. Engineers and Scientists www.gza.com		PREPARED FOR: AXLEY BRYNELSON, LLP	
PROJ MGR: HAW	REVIEWED BY: JFD	CHECKED BY: JJLP	FIG 6
DESIGNED BY: MJS	DRAWN BY: MJS	SCALE: NOT TO SCALE	
DATE: 4/29/2021	PROJECT NO. 20.0156038.01	REVISION NO.	SHEET NO. 12 OF 12





LEGEND

- ASPHALT/CONCRETE
- SOIL CONTACT LINE
- GROUNDWATER TABLE (BASED ON 6/24/11 DEPTH TO WATER DATA)
- STATIC GROUND WATER LEVEL (6/24/11)
- GROUNDWATER MONITORING WELL SCREENED INTERVAL
- APPROXIMATE AREA OF SOIL RCL EXCEEDANCES
- APPROXIMATE AREA OF GROUNDWATER ES EXCEEDANCES

NOTES

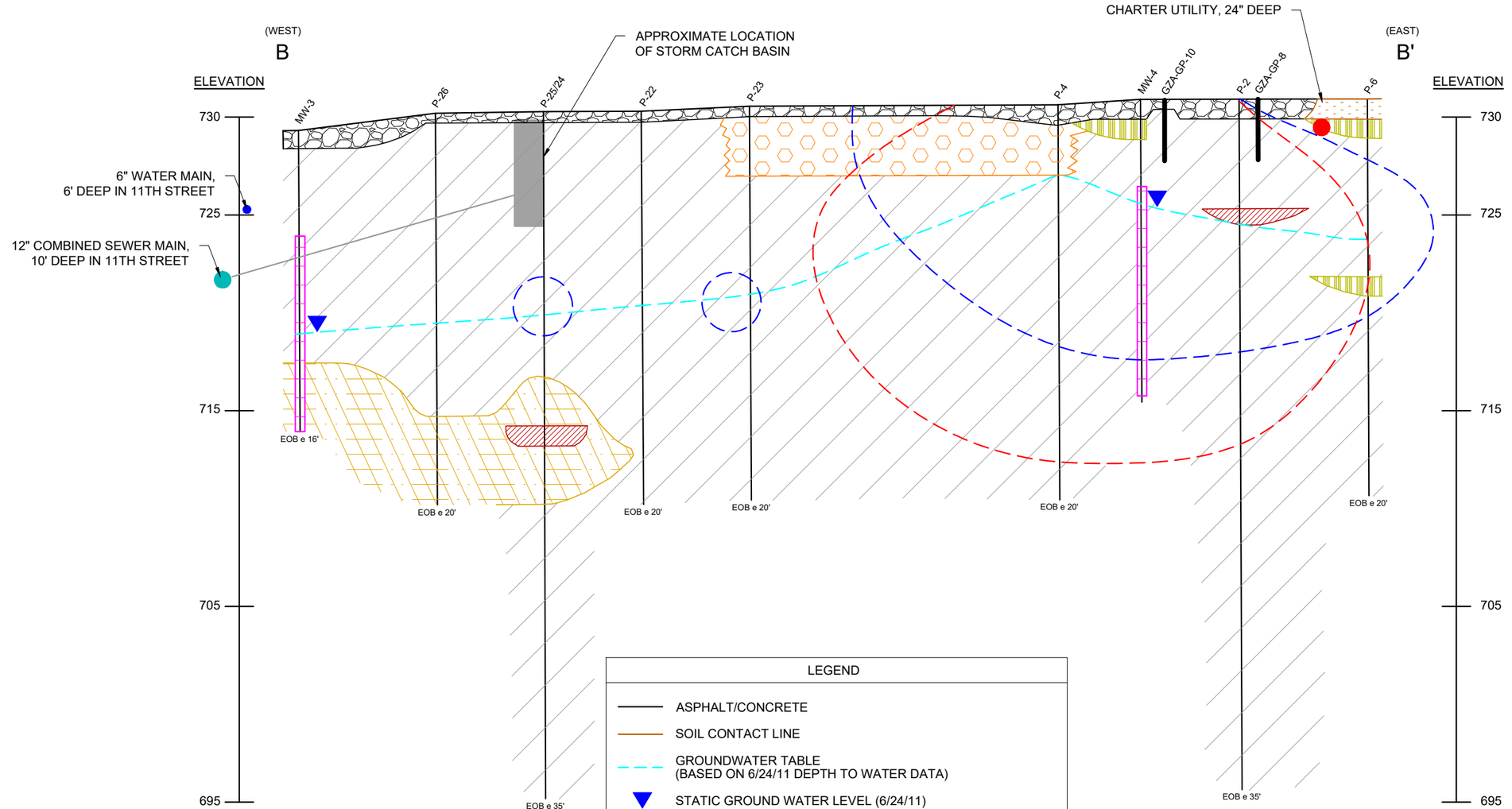
1. BASE MAP DEVELOPED BY TERRACON CONSULTANTS, INC. (TERRACON).
2. GEOPROBE ELEVATIONS WERE NOT SURVEYED BY TERRACON.
3. TERRACON BASED ELEVATIONS ON FIRE HYDRANT LOCATED ON NORTHEAST CORNER OF 11TH AND FINN STREETS (ELEVATION 152.6 FEET).
4. TERRACON BASED SOIL STRATIGRAPHY CLASSIFICATION ON DRILLED LOCATIONS, AND INFERRED BETWEEN DRILLING LOCATIONS.
5. TERRACON INFERRED CONTACT LINES, INTERPOLATION BETWEEN GROUNDWATER MONITORING WELL LOCATION.
6. SEE FIGURE 5 IN SITE INVESTIGATION AND INTERIM ACTION REPORT DATED MARCH 1, 2013 FOR ORIGINAL SCALE AND VERTICAL EXAGGERATION.

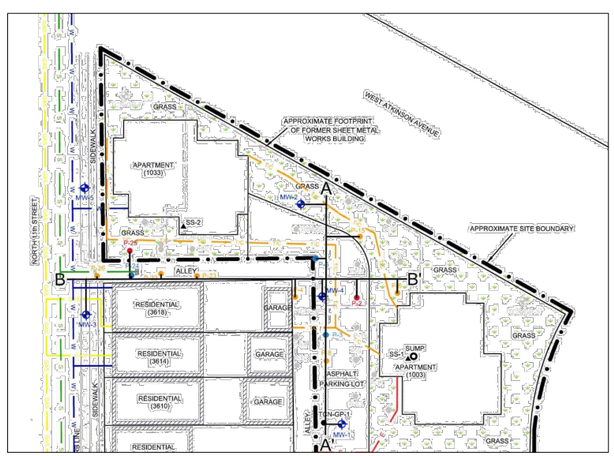
NO.	ISSUE/DESCRIPTION	BY	DATE

CLARE CENTRAL
1003 AND 1033 WEST ATKINSON AVENUE
MILWAUKEE, WISCONSIN

GEOLOGIC CROSS SECTION A-A'

PREPARED BY: GZA GeoEnvironmental, Inc. Engineers and Scientists www.gza.com		PREPARED FOR: AXLEY BRYNELSON, LLP	
PROJ MGR: HAW	REVIEWED BY: JFD	CHECKED BY: JJLP	FIG 7
DESIGNED BY: MJS	DRAWN BY: MJS	SCALE: NOT TO SCALE	
DATE: 6/25/2021	PROJECT NO. 20.0156038.01	REVISION NO.	SHEET NO. 3 OF 12





LEGEND

- ASPHALT/CONCRETE
- SOIL CONTACT LINE
- GROUNDWATER TABLE (BASED ON 6/24/11 DEPTH TO WATER DATA)
- STATIC GROUND WATER LEVEL (6/24/11)
- GROUNDWATER MONITORING WELL SCREENED INTERVAL
- APPROXIMATE AREA OF SOIL RCL EXCEEDANCES
- APPROXIMATE AREA OF GROUNDWATER ES EXCEEDANCES

SOIL UNITS

- FILL
- TOPSOIL
- SILTY CLAY
- SAND - FINE GRAIN
- SILT
- SANDY SILT
- SAND AND GRAVEL
- SILTY CLAY AND GRAVEL

NOTES

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6. SEE FIGURE 5 IN SITE INVESTIGATION AND INTERIM ACTION REPORT DATED MARCH 1, 2013 FOR ORIGINAL SCALE AND VERTICAL EXAGGERATION.

NO.	ISSUE/DESCRIPTION	BY	DATE

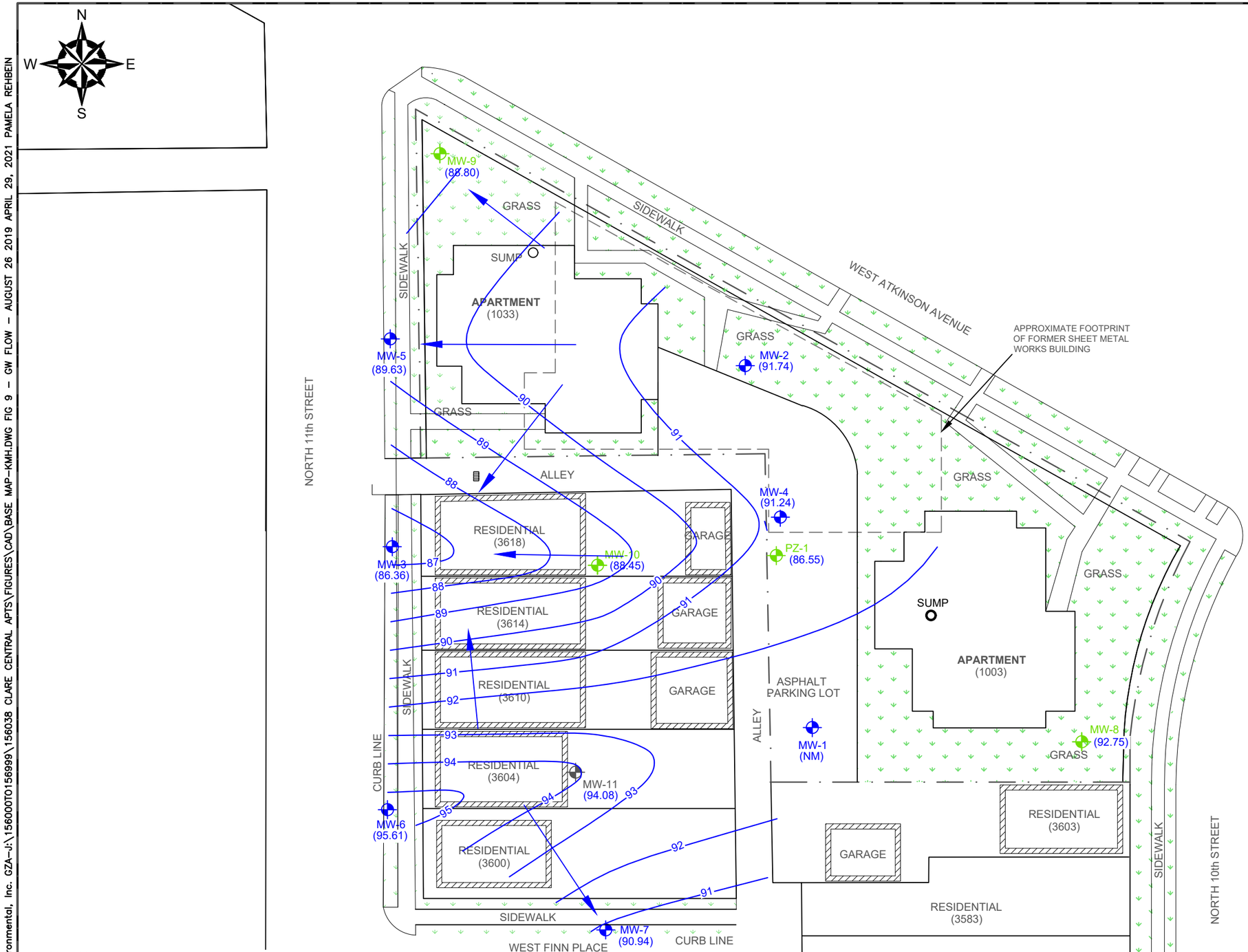
CLARE CENTRAL
1003 AND 1033 WEST ATKINSON AVENUE
MILWAUKEE, WISCONSIN

GEOLOGIC CROSS SECTION B-B'

PREPARED BY:
GZA GeoEnvironmental, Inc.
Engineers and Scientists
www.gza.com

PREPARED FOR:
AXLEY
BRYNELSON, LLP

PROJ MGR: HAW	REVIEWED BY: JFD	CHECKED BY: JJLP	FIG 8
DESIGNED BY: MJS	DRAWN BY: MJS	SCALE: NOT TO SCALE	
DATE: 6/25/2021	PROJECT NO. 20.0156038.01	REVISION NO.	SHEET NO. 4 OF 12



GROUNDWATER FLOW LEGEND

- 91 — GROUNDWATER ELEVEATION CONTOUR, FEET
- GROUNDWATER FLOW DIRECTION

LEGEND

- APPROXIMATE SITE BOUNDARY
- ELECTRIC (WE ENERGIES)
- COMMUNICATION (AT & T)
- GAS — GAS LINE
- OH — OVERHEAD LINES
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NO.	ISSUE/DESCRIPTION	BY	DATE

CLARE CENTRAL
1003 AND 1033 WEST ATKINSON AVENUE
MILWAUKEE, WISCONSIN

GROUNDWATER FLOW DIRECTION (AUGUST 26, 2019)

PREPARED BY: GZA GeoEnvironmental, Inc. Engineers and Scientists www.gza.com		PREPARED FOR: AXLEY BRYNELSON, LLP	
PROJ MGR: HAW	REVIEWED BY: JFD	CHECKED BY: JJLP	FIG 9
DESIGNED BY: MJS	DRAWN BY: MJS	SCALE: NOT TO SCALE	
DATE: 4/29/2021	PROJECT NO. 20.0156038.01	REVISION NO.	SHEET NO. 6 OF 12

APPENDIX A

LIMITATIONS

LIMITATIONS

Standard of Care

1. GZA's findings and conclusions are based on the work conducted as part of the Scope of Services set forth in the Proposal for Services and/or Report and reflect our professional judgment. These findings and conclusions must be considered not as scientific or engineering certainties, but rather as our professional opinions concerning the limited data gathered during the course of our work. Conditions other than described in this Report may be found at the subject location(s).
2. GZA's services were performed using the degree of skill and care ordinarily exercised by qualified professionals performing the same type of services, at the same time, under similar conditions, at the same or a similar property. No warranty, expressed or implied, is made. Specifically, GZA does not and cannot represent that the Site contains no hazardous material, oil, or other latent condition beyond that observed by GZA during its study. Additionally, GZA makes no warranty that any response action or recommended action will achieve all of its objectives or that the findings of this study will be upheld by a local, state, or federal agency.
3. In conducting our work, GZA relied upon certain information made available by public agencies, Client and/or others. GZA did not attempt to independently verify the accuracy or completeness of that information. Inconsistencies in this information which we have noted, if any, are discussed in the Report.

Subsurface Conditions

4. The generalized soil profile(s) provided in our Report are based on widely spaced subsurface explorations and are intended only to convey trends in subsurface conditions. The boundaries between strata are approximate and idealized and were based on our assessment of subsurface conditions. The composition of strata and the transitions between strata, may be more variable and more complex than indicated. For more specific information on soil conditions at a specific location, refer to the exploration logs. The nature and extent of variations between these explorations may not become evident until further exploration or construction. If variations or other latent conditions then become evident, it will be necessary to reevaluate the conclusions and recommendations of this Report.
5. Water level readings have been made, as described in this Report, in monitoring wells at the specified times and under the stated conditions. These data have been reviewed and interpretations have been made in this Report. Fluctuations in the level of the groundwater, however, occur due to temporal or spatial variations in areal recharge rates, soil heterogeneities, the presence of subsurface utilities, and/or natural or artificially induced perturbations. The observed water table may be other than indicated in the Report.

Compliance with Codes and Regulations

6. We used reasonable care in identifying and interpreting applicable codes and regulations necessary to execute our scope of work. These codes and regulations are subject to various, and possibly contradictory, interpretations. Interpretations and compliance with codes and regulations by other parties are beyond our control.

Screening and Analytical Testing

7. GZA collected environmental samples at the locations identified in the Report. These samples were analyzed for the specific parameters identified in the Report. Additional constituents, for which analyses were not conducted, may be present in soil, groundwater, surface water, sediment, and/or air. Future Site activities and uses may result in a requirement for additional testing.
8. Our interpretation of field screening and laboratory data is presented in the Report. Unless otherwise noted, we relied upon the laboratory's QA/QC program to validate these data.

9. Variations in the types and concentrations of contaminants observed at a given location or time may occur due to release mechanisms, disposal practices, changes in flow paths, and/or the influence of various physical, chemical, biological, or radiological processes. Subsequently observed concentrations may be other than indicated in the Report.

Interpretation of Data

10. Our opinions are based on available information as described in the Report, and on our professional judgment. Additional observations made over time and/or space may not support the opinions provided in the Report.

Cost Estimates

11. Unless otherwise stated, our cost estimates are only for comparative and general planning purposes. These estimates may involve approximate quantity evaluations. Note that these quantity estimates are not intended to be sufficiently accurate to develop construction bids, or to predict the actual cost of work addressed in this Report. Further, since we have no control over either when the work will take place or the labor and material costs required to plan and execute the anticipated work, our cost estimates were made by relying on our experience, the experience of others, and other sources of readily available information. Actual costs may vary over time and could be significantly more, or less, than stated in the Report.

Additional Information

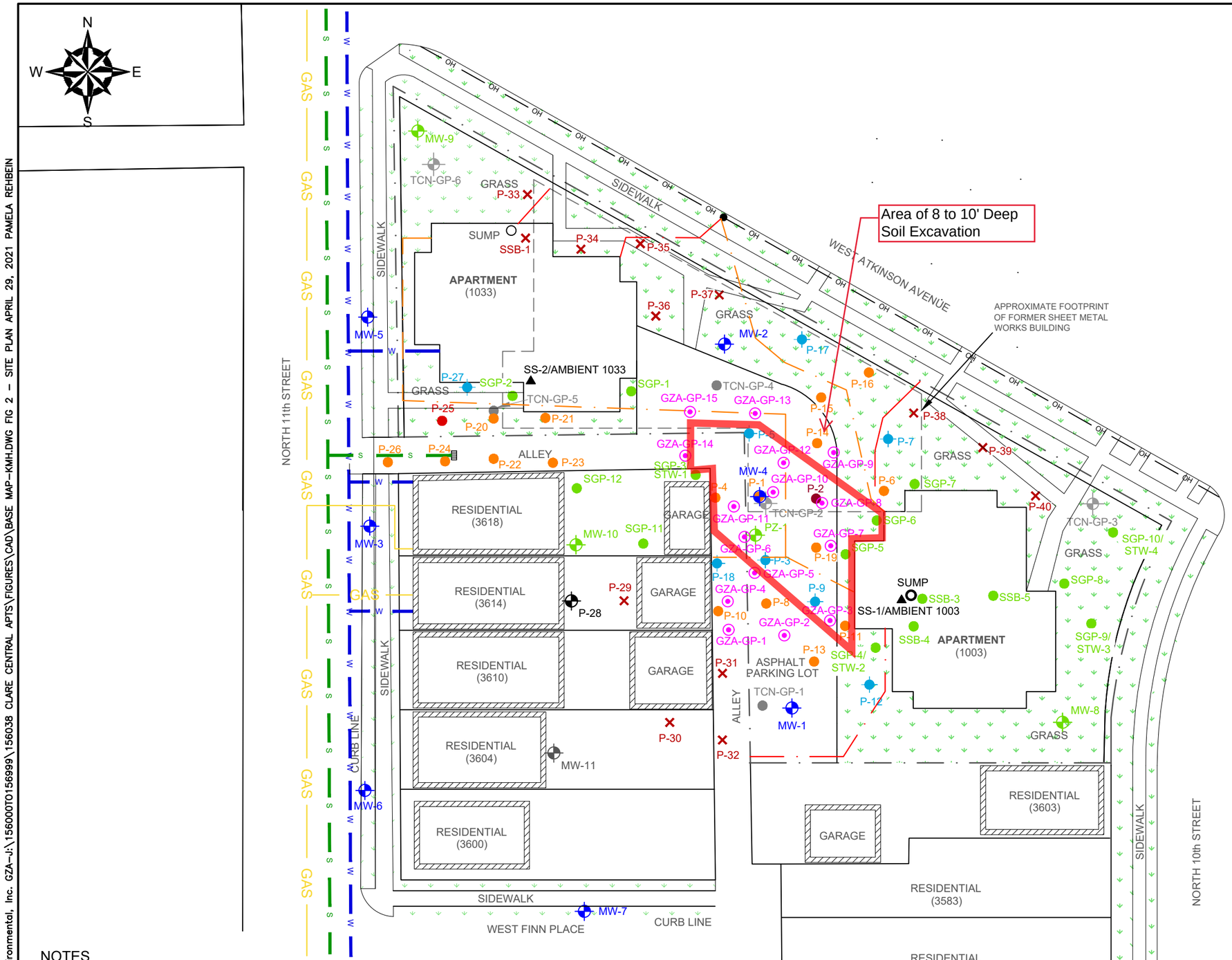
12. In the event that the Client or others authorized to use this Report obtain additional information on environmental or hazardous waste issues at the Site not contained in this Report, such information shall be brought to GZA's attention forthwith. GZA will evaluate such information and, on the basis of this evaluation, may modify the conclusions stated in this Report.

Additional Services

13. GZA recommends that we be retained to provide services during any future investigations, design, implementation activities, construction, and/or property development/redevelopment at the Site. This will allow us the opportunity to: i) observe conditions and compliance with our design concepts and opinions; ii) allow for changes in the event that conditions are other than anticipated; iii) provide modifications to our design; and iv) assess the consequences of changes in technologies and/or regulations.

APPENDIX B

DRAFT REMEDIAL OPTIONS FIGURES (FIGURES A, B, AND C)



LEGEND

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CLARE CENTRAL

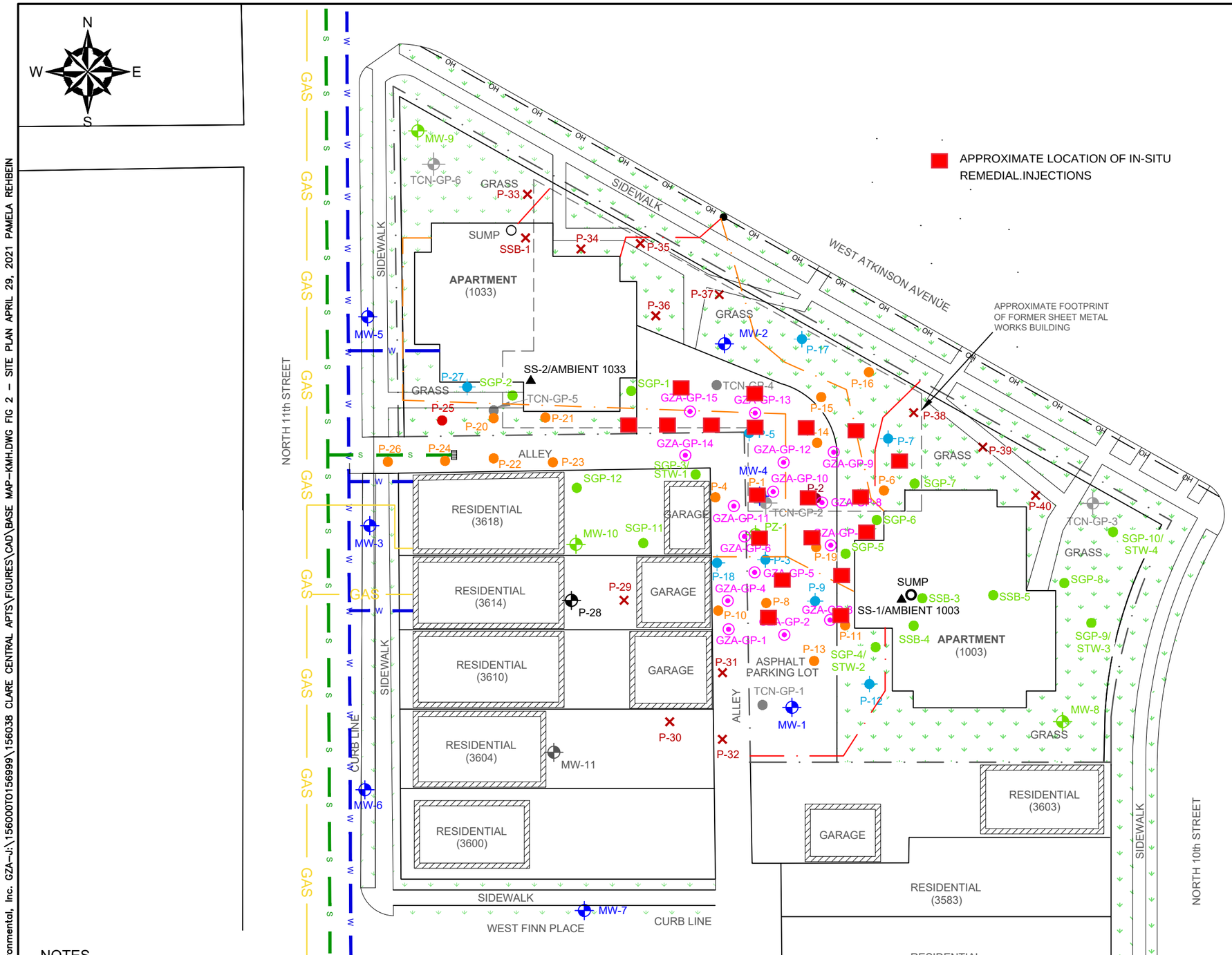
1003 AND 1033 WEST ATKINSON AVENUE
MILWAUKEE, WISCONSIN

Limited Soil Excavation to 8 to 10 Feet Deep

PREPARED BY:
GZA GeoEnvironmental, Inc.
Engineers and Scientists
www.gza.com

PREPARED FOR:
AXLEY BRYNELSON, LLP

PROJ MGR: HAW	REVIEWED BY: JFD	CHECKED BY: JJLP	FIG
DESIGNED BY: MJS	DRAWN BY: MJS	SCALE: 1" = 40'	A
DATE: 4/29/2021	PROJECT NO. 20.0156038.01	REVISION NO.	SHEET NO. 2 OF 12



LEGEND

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NO.	ISSUE/DESCRIPTION	BY	DATE

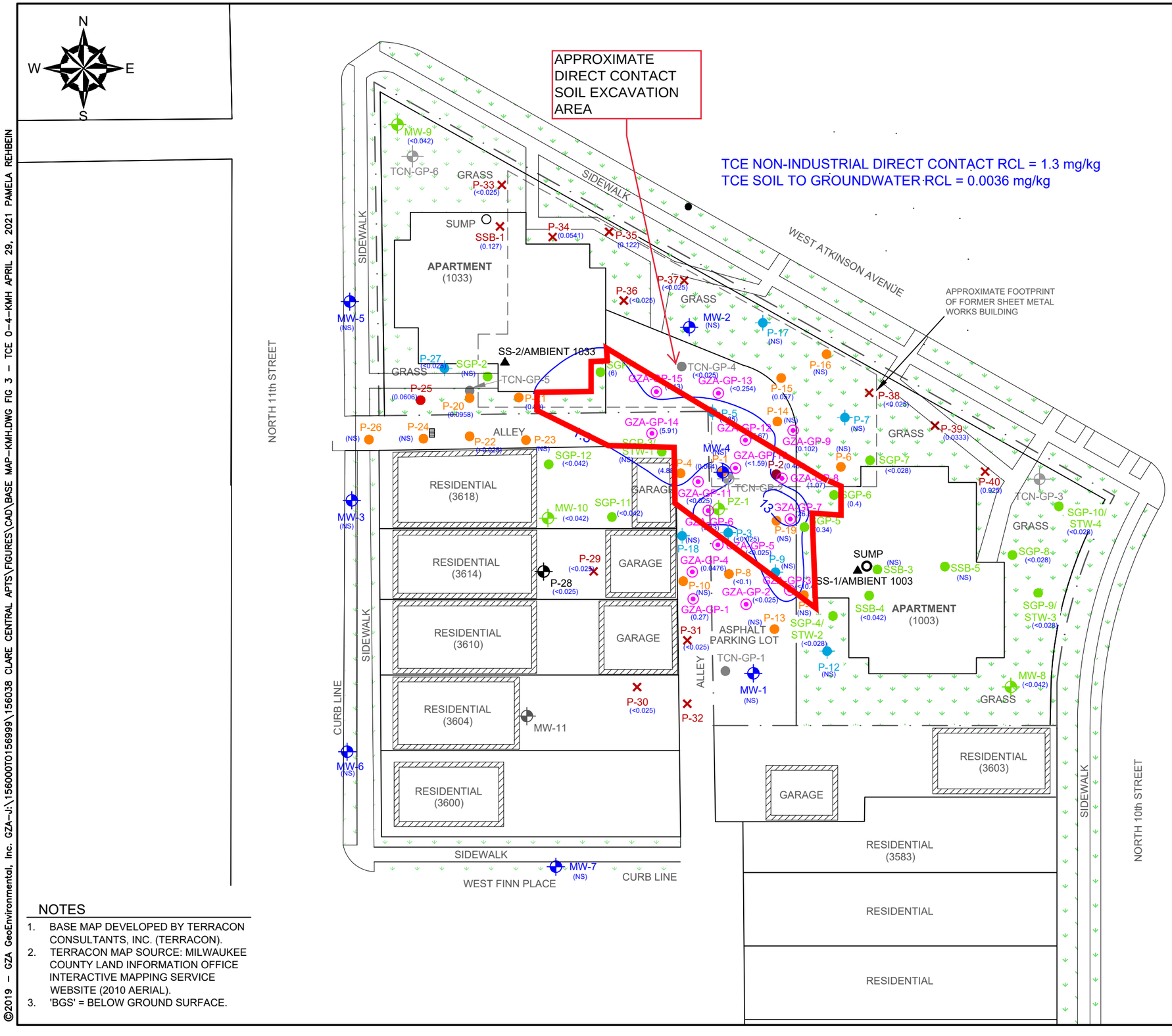
CLARE CENTRAL
1003 AND 1033 WEST ATKINSON AVENUE
MILWAUKEE, WISCONSIN

In-situ Treatment of Soil

PREPARED BY:
GZA GeoEnvironmental, Inc.
Engineers and Scientists
www.gza.com

PREPARED FOR:
AXLEY BRYNELSON, LLP

PROJ MGR: HAW	REVIEWED BY: JFD	CHECKED BY: JJLP	FIG
DESIGNED BY: MJS	DRAWN BY: MJS	SCALE: 1" = 40'	B
DATE: 4/29/2021	PROJECT NO. 20.0156038.01	REVISION NO.	SHEET NO. 2 OF 12



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- GROUNDWATER MONITORING WELL LOCATION
- GEOPROBE BORING LOCATION (20 FEET BGS)
- GEOPROBE BORING LOCATION (20 FEET BGS) WITH TEMPORARY WELL
- GEOPROBE BORING LOCATION (35 FEET BGS)
- SUB SLAB VAPOR MONITORING POINT (FEBRUARY 11, 2011)
- SOIL BORING LOCATION (TERRACON, JUNE 23, 2016)
- GROUNDWATER TEMPORARY/ MONITORING WELL LOCATION (TERRACON, JUNE 23, 2016)
- GROUNDWATER MONITORING WELL/ PIEZOMETER LOCATION (SIGMA)
- GEOPROBE BORING LOCATION (SIGMA)
- 2020 SOIL BORINGS INSTALLED BY GZA

NO.	ISSUE/DESCRIPTION	BY	DATE

CLARE CENTRAL
1003 AND 1033 WEST ATKINSON AVENUE
MILWAUKEE, WISCONSIN

Limited Direct Contact Interval Soil Removal

PREPARED BY: GZA GeoEnvironmental, Inc. Engineers and Scientists www.gza.com

PREPARED FOR: BRYNELSON, LLP

PROJ MGR: HAW	REVIEWED BY: JFD	CHECKED BY: JJLP	FIG C
DESIGNED BY: MJS	DRAWN BY: MJS	SCALE: 1" = 40'	
DATE: 4/29/2021	PROJECT NO. 20.0156038.01	REVISION NO.	SHEET NO. 2 OF 12